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American Electric Power Service Corporation

Stack Out Area - CCR Groundwater Monitoring Well Network Evaluation (Updated December 2023)

H.W. Pirkey Power Plant 2400 FM 3251 Harrison County Hallsville, Texas

December 11, 2023



Design & Consultancy for natural and built assets



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Stack Out Area - CCR Groundwater Monitoring Well Network Evaluation (Updated December 2023)

H.W. Pirkey Power Plant 2400 FM 3251 Harrison County Hallsville, Texas

Prepared for: AEP

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Acronyms and Abbreviation

AEP	American Electric Power Service Cooperation
amsl	above mean sea level
ARCADIS	Arcadis U.S., Inc.
BAP	bottom ash pond
CCR	Coal Combustion Residual
CFR	Code of Federal Regulations
EPA	U.S. Environmental Protection Agency
EPRI	Electric Power Research Institute
FAP	fly ash pond
FGD	flue gas desulfurization
ft	feet
TAC	Texas Administrative Code
TCEQ	Texas Commission on Environmental Quality
PTI	Permit to Install
TDS	total dissolved solids



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1. Objective

In 2016, as specified in Code of Federal Regulations (CFR) 40 CFR 257.91, ARCADIS U.S., Inc. (Arcadis) assessed the adequacy of the groundwater monitoring well network for the Stack Out Area, which is a Coal Combustion Residual (CCR) Unit at the American Electric Power (AEP) H.W. Pirkey Generating Plant (Plant). The groundwater monitoring well network evaluation report for the Stack Out Area was posted to the operating record on March 9, 2017, and posted to the publicly assessable website within 30 days thereafter.

The Plant is located at 2400 FM 3251 in Hallsville, Harrison County, Texas (Figure 1), and the Stack Out Area is located near the center of the Plant as shown on Figure 2. The Plant is currently being demolished, and one the designated downgradient monitoring wells (AD-7) for the Stack Out Area was plugged during September 2023 because it was located within the boundary (footprint) of the Stack Out Area where demolition activities are occurring. Monitoring well AD-7 has been replaced with monitoring well AD-7R, located directly west of the Stack Out Area and beyond the demolition boundary. Provided herein is the updated Groundwater Monitoring Well Network Evaluation for the Stack Out Area CCR Unit, with monitoring well AD-7R replacing monitoring well AD-7.

The CCR requirements include an evaluation of the adequacy of the groundwater monitoring well network to characterize groundwater quality up and down gradient of the CCR unit and an evaluation of whether the CCR unit meets up to 5 location restrictions, which include: the base of the CCR unit is 5 feet (ft) above and isolated from the uppermost aquifer, the CCR unit may not be located in a wetland, within 200 ft of the damage zone of a fault that has displacement during the Holocene, within a seismic impact zone, or in an unstable area.

Four regulated CCR units associated with the Plant were identified for review, which include the West Bottom Ash Pond (BAP), East BAP, Stack Out Area, and Landfill (Figure 2). This report summarizes the evaluation of the groundwater monitoring well network in the uppermost aguifer at the Stack Out Area. The evaluation of the location restriction criteria for the Stack Out Area is not included in this report and was completed under separate cover (Arcadis, 2016).

This evaluation included a review of AEP-provided data associated with previously completed subsurface investigation activities in the vicinity of the Stack Out Area CCR unit, as well as publicly-available geologic and hydrogeologic data. This report also presents the current Conceptual Site Model based on all documents reviewed and will



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further describe the uppermost aquifer, include an evaluation of the adequacy of the existing monitoring well network, and provide recommendations for monitoring well augmentation, as necessary.

2. Background Information

The following section provides background information for the AEP H.W. Pirkey Generating Plant Stack Out Area.

2.1 Facility Location Description

The AEP H.W. Pirkey Plant is located in southern Harrison County, approximately 5 miles southeast of Hallsville, Texas, and approximately 8 miles southwest of Marshall, Texas. The Stack Out Area CCR unit is located in the central portion of the Plant, and approximately 1,200 feet northwest of Brandy Branch Reservoir (**Figures 1** and **2**).

2.2 Description of Stack Out Area CCR Unit

The following section discusses the embankment configuration, area, volume, construction and operational history, and surface water control associated with the Stack Out Area.

2.2.1 Stack Out Area Configuration

The Stack Out Area is an approximate 7-acre storage area that had been used for stabilized flue gas desulfurization (FGD) sludge until the Plant ceased operation on March 31, 2023. As shown on **Figure 3**, the Stack Out Area is located directly south of the Surge Pond, directly west of Thickener Tanks 1A and 1B, and directly east of a road that runs south to the on-site Landfill. The dimensions of the Stack Out Area are approximately 650 feet from north to south by 450 feet from east to west.

Stabilized FGD sludge was temporarily stockpiled directly above natural ground surface (native clay) in the Stack Out Area using a radial stacker. The maximum height of the stabilized FGD sludge piles were approximately 41 feet above ground surface. There are no solids retention structures in the Stack Out Area. The stabilized FGD sludge piles were located no closer than approximately 50 feet from the perimeter of the Stack Out Area, thereby preventing the stabilized FGD sludge from migrating beyond the boundaries of the Stack Out Area.



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2.2.2 Area/Volume

The Stack Out Area is approximately 7 acres in size. However, as discussed above in Section 2.2.1, the CCR piles in the Stack Out Area were located no closer than approximately 50 feet from the perimeter of the Stack Out Area, therefore the effective storage area of the Stack Out Area is approximately 4.4 acres (550 feet by 350 feet), and the maximum CCR storage volume based on a maximum CCR pile height of 41 feet is 180 acre feet.

2.2.3 Construction and Operational History

The H.W. Pirkey Power Plant was constructed in 1983 and 1984 and began operation in 1985. Throughout the life of the Plant, which ceased operation on March 31, 2023, CCR materials (fly ash, bottom ash, economizer ash, FGD sludge) had been generated. The Stack Out Area received stabilized FGD sludge (Figure 3). Prior to storing the FGD sludge in the Stack Out Area, the FGD sludge was dewatered using belt presses, and the dewatering fluid was routed to the Surge Pond for reuse as FGD makeup water. The stabilized FGD sludge was then stockpiled in the Stack Out Area using a radial stacker with an approximate 3-foot-wide by 120-foot-long conveyor belt.

The stabilized FGD sludge was temporarily stored at the Stack Out Area. The stabilized FGD sludge was removed using front-end loaders or similar equipment, placed into trucks, and disposed of at the on-site Landfill CCR Unit located near the south end of the Plant.

Lithologic data from soil borings and monitoring wells confirm the native soils underling the Stack Out Area consist of low-permeability clay. As shown on Geologic Cross Sections B-B' (Figure 5), E-E' (Figure 8), and F-F' (Figure 9) the native clay directly below the Stack Out Area extends from the surface to an average depth of approximately 20 feet. Therefore, as shown on Figures 5, 8, and 9, the separation distance between the base of the Stack Out Area and uppermost aquifer exceeds 5 feet.

2.2.4 Surface Water Control

The Stack Out Area contained dewatered FGD sludge that was stockpiled using a radial stacker, therefore no sluice water was present in the Stack Out Area. Storm water in the Stack Out Area follows surface topography via gravity sheet flow. The ground surface elevation in the Stack Out Area ranges from approximately 360 to 365



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feet amsl (Akron Consulting, 2015). Storm water flow in the Stack Out Area is in a general northerly direction to the Surge Pond, which is a below-grade (incised) non-CCR unit. The Surge Pond is currently being utilized for storage of storm water during Plant demolition activities.

2.3 Previous Investigations

The initial soils investigation and design of the Plant was provided in a January 31, 1983 report prepared by Sargent & Lundy entitled "*Henry W. Pirkey Power Plant, Design Summary for Lignite Storage Area and Wastewater Pond Facilities*". This investigation included advancement of soil borings throughout the Plant, including the Stack Out Area.

In 2009, ETTL Engineers & Consultants (ETTL) conducted geotechnical investigations of earthen embankments associated with several ponds at the Plant. The Stack Out Area was not included in this evaluation because there are no earthen embankments in the Stack Out Area (ETTL, 2010).

In 2010 and January 2011, Apex Geoscience expanded the groundwater monitoring well system at the Plant, including installation of monitoring wells AD-16 through AD-29. Apex Geoscience also conducted video surveillance of the existing monitoring wells and plugged monitoring wells MW-1, MW-5, MW-6, MW-9, MW-11, MW-14, MW-15, M-2, and M-3 (Apex Geoscience, 2011).

In 2011, Johnson & Pace performed hydraulic analysis of several ponds at the Plant. The Stack Out Area was not included in this evaluation because there is no impounded water in the Stack Out Area (Johnson & Pace, May 2011).

In December 2015, Auckland Consulting further expanded the groundwater monitoring well system at the Plant, including installation of six monitoring wells (AD-30 through AD-35) (Auckland Consulting, 2016).

In 2019, additional monitoring wells were installed at the Plant by Burns & McDonnell, including monitoring wells AD-37, AD-38, and AD-44 through AD-47 to the west (hydraulically downgradient) of the Stack Out Area as shown on **Figure 3**.

In 2020, monitoring well AD-7R was installed directly west of the Stack Out Area by Geosyntec Consultants, Inc. as shown on **Figure 3**.



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2.4 Hydrogeologic Setting

The site area is located within the West Gulf Coastal Plain. Cretaceous formations crop out in belts that extend in a northeasterly direction parallel to the Gulf of Mexico, and dip gently southeast. The central and northern portions of the Plant are located on the outcrop of the Eocene-age Reklaw Formation. The Reklaw Formation consists predominantly of clay and fine grained sand, and attains a maximum thickness of approximately 100 feet (Broom, 1966).

The Reklaw Formation is underlain by the Eocene-age Carrizo Sand, which outcrops in the topographically low southern portion of the Plant. The Carrizo Sand consists of fine to medium grained sand interbedded with silt and clay, and attains a thickness of approximately 100 feet (Broom, 1966).

These features are further illustrated on six lines of cross section that were prepared through the Stack Out Area, with four lines trending from west to east (A-A'; B-B'; C-C'; F-F'), and the other two lines trending from north to south (D-D'; E-E'). The cross section location map is included as **Figure 3** and the lines of cross section are included as **Figure 4** (A-A') through **Figure 9** (F-F').

2.4.1 Climate and Water Budget

Average temperatures in Harrison County, Texas range from 47.1° Fahrenheit (F) in January to 83.8°F in July, and the mean annual growing season is 238 days. Average annual precipitation (including liquid water equivalent from snowfall) is approximately 47 inches (Broom, 1966).

2.4.2 Regional and Local Geologic Setting

The central and northern portions of the Plant, including the Stack Out Area, are located on the outcrop of the Eocene-age Recklaw Formation. The Recklaw Formation is underlain by the Eocene-age Carrizo Sand, which outcrops in the topographically low southern end of the Plant (Broom, 1966; Flawn, 1965).

Detailed regional geologic characterization can be found in several published reports including Texas Water Development Report 27 "*Ground-Water Resources of Harrison County, Texas*" (Broom, 1966), The University of Texas at Austin Bureau of Economic Geology "*Geologic Atlas of Texas – Tyler Sheet*" (Flawn, 1965), and U.S. Geological Survey Open-File Report 88-450K "*Petroleum Geology and the Distribution of*



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Conventional Crude Oil, Natural Gas, and Natural Gas Liquids, East Texas Basin" (USGS, 1988).

Detailed regional and site geologic characterization can also be found in the 2010 ETTL report entitled "Geotechnical Investigation, Pirkey Power Station, Existing Ash, Surge, Lignite and Limestone Runoff, and Landfill Stormwater Ponds Embankment Investigation, Hallsville, Texas" (ETTL, 2010).

2.4.3 Surface Water and Surface Water Groundwater Interactions

Figure 9 is a potentiometric surface map based on January 2016 water level data for the uppermost aquifer at the Site. Figure 10 is a current a potentiometric surface map based on September 2023 water level data for the uppermost aquifer at the Site. and water level elevations in the Site monitoring wells are summarized on **Table 1**. As shown on Figures 9 and 10, shallow groundwater flow direction in the Stack Out Area is southwesterly to westerly at an average hydraulic gradient of approximately 0.01 foot per foot.

The Stack Out Area is located approximately 1,200 feet northwest of Brandy Branch Reservoir, which was dammed during Plant construction in the 1980's. The normal pool level of Brandy Branch Reservoir is approximately 340 feet amsl. As shown on **Figures 9 and 10**, shallow groundwater flow direction at the Site generally follows surface topography to the west and southwest toward Hatley Creek, which is located in a topographically low area approximately one mile west of the Site. Therefore shallow groundwater in the Stack Out Area does not discharge into Brandy Branch Reservoir.

As shown on **Figure 10**, three monitoring wells (AD-7R, AD-22, AD-33) are located directly west of the Stack Out Area. The current (September 2023) water level elevation at monitoring well AD-7R is several feet higher than monitoring wells AD-22 and AD-33. As detailed above in Section 2.2.4, storm water flow in the Stack Out Area is in a general northerly direction to the Surge Pond, which is a below-grade (incised) non-CCR unit. The Surge Pond is currently being utilized for storage of storm water during Plant demolition activities, and the higher water level elevation at monitoring well AD-7R is likely due to a groundwater mound at the Surge Pond which was full of storm water at the time of the September 2023 water level measurements.



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2.4.4 Water Users

An updated water well inventory was conducted by Banks Information Solutions during June 2023 (Banks, 2023). The nearest water well (Well ID 14 "Mohon #6" in Appendix C) was reportedly drilled approximately 1,000 feet north of the Stack Out Area in 2004 by Bennett Drilling for use as a rig supply well. The water well was screened from 350 to 430 feet below ground surface, therefore this water well is completed in a deeper water bearing unit relative to the uppermost water-bearing unit at the Site.

The second closest water well (Well ID 12 "Mohan #13" in Appendix C) was reportedly drilled approximately 1/4-mile west (downgradient) of the Stack Out Area for NFR Energy LLC in 2008 for use as a rig supply well. The water well was screened from 250 to 310 feet below ground surface, therefore this water well is completed in a deeper water bearing unit relative to the uppermost water-bearing unit at the Site.

All of the wells identified within a 1-mile radius of the Site, excluding AEP piezometers and monitoring wells, were drilled to total depths of 160 feet or deeper except one water well (Well ID: 35-37-4E) that was drilled to a total depth of 55 feet in 1982. This water well was completed with concrete tile from the surface to total depth, and is located approximately 1/4-mile east (upgradient) of the Pirkey Power Plant.



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3. Groundwater Monitoring Well Network Evaluation

The existing monitoring well network present at the Site was evaluated to determine if any of the wells were viable for continued use as part of the groundwater monitoring well network or also retained as part of a larger groundwater hydraulic monitoring well network. The hydrogeologic conditions were also evaluated to determine if the uppermost aquifer unit has an effective well network. The evaluation was completed in accordance with 40 CFR 257.91 to have an established monitoring well network that effectively monitors the uppermost aquifer up gradient and down gradient of the Site. The up gradient wells represent background groundwater quality and the down gradient wells are to be placed down gradient of the CCR unit boundary to monitor water quality.

3.1 Hydrostratigraphic Units

3.1.1 Horizontal and Vertical Position Relative to CCR Unit

Geologic data from soil borings, piezometers, and monitoring wells installed at the Site show the uppermost aquifer in the Stack Out Area is a very fine to fine grained clayey and silty sand stratum with an average thickness of approximately 20 feet that is located between an elevation of approximately 320 and 340 feet amsl (**Appendix A**). The base of the Stack Out Area is at an elevation of 360 feet amsl. The separation distance between the uppermost aquifer and the base of the Stack Out Area ranges from approximately 10 to 20 feet. This separation distance is further illustrated on cross section B-B' (**Figure 5**), cross section E-E' (**Figure 8**), and cross section F-F' (**Figure 9**).

3.1.2 Overall Flow Conditions

Groundwater is recharged from regional precipitation infiltration. The uppermost aquifer unit (clayey and silty sand) is expected to have a hydraulic conductivity of approximately 10⁻⁴ centimeters per second (Fetter, 1980). Based on the hydraulic conductivity and saturated thickness in the Stack Out Area (approximately 20 feet), the yield of the uppermost aquifer is anticipated to exceed the TCEQ non-useable (Class 3) limit of 150 gallons per day (TCEQ, 2010).

Groundwater elevations from the monitoring wells at the Site are summarized on **Table 1** for 2011 through 2023. Groundwater flow direction in the Stack Out Area on January 20, 2016 and September 12, 2023 are depicted on **Figures 9** and **10**, respectively.



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The groundwater flow direction in the Stack Out Area is westerly towards Hatley Creek, which is located approximately one mile west of the Site, and southwesterly towards Brandy Branch Reservoir which has a normal pool elevation of approximately 340 feet amsl.

3.2 Uppermost Aquifer

3.2.1 CCR Rule Definition

Per 40 CFR 257.60(a), new CCR landfills, existing and new CCR surface impoundments, and all lateral expansions of CCR units must be constructed with a base that is located no less than 1.52 meters (five ft) above the upper limit of the uppermost aquifer, or must demonstrate there will not be an intermittent, recurring, or sustained hydraulic connection between any portion of the base of the CCR unit and the uppermost aquifer due to normal fluctuations in groundwater elevations (including the seasonal high conditions).

The CCR rule definitions for an aquifer and the uppermost aquifer as specified in 40 CFR 257.53 indicates an aquifer is a geologic formation capable of yielding usable quantities of groundwater to wells or springs while an uppermost aquifer is defined as the geologic formation nearest the natural ground surface that is an aquifer, as well as lower aquifers, that are hydraulically interconnected with this aquifer within the facility's property boundary. Upper limit is measured at a point nearest to the natural groundwater surface to which the aquifer rises during the wet season.

3.2.1.1 Common Definitions

An aquifer is commonly defined as a geologic unit that stores and transmits water (readily or at sufficient flow rates) to supply wells and springs (USGS, 2015; Fetter, 2001). The uppermost aquifer is considered the first encountered aquifer nearest to the CCR unit.

3.2.2 Identified Onsite Hydrostratigraphic Unit

The identified Site hydrostratigraphic unit in the Stack Out Area is the clayey and silty sand stratum that is located between an elevation of approximately 320 and 340 feet amsl within the Reklaw Formation.



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3.3 Review of Existing Monitoring Well Network

3.3.1 Overview

The Site was visited by ARCADIS and AEP personnel on September 12, 2023 to review existing well network conditions and locations. A well construction table that summarizes the location, ground surface elevation, borehole depth, installation date, and associated well construction details of the monitoring well network is included as **Table 2**. Photo documentation of the located wells during the September 12, 2023 site visit is provided in **Appendix B**.

Monitoring wells AD-7, AD-7R, AD-12, AD-13, AD-22, and AD-33 were installed at the Site to monitor the uppermost water-bearing unit (clayey and silty sand stratum) associated with the Stack Out Area. As discussed above in Section 3.1.1, the uppermost water-bearing unit below the Stack Out Area is approximately 20 feet thick and is located between an elevation of approximately 320 and 340 feet amsl.

3.3.2 Gaps in Monitoring Network

As shown on Geologic Cross Sections B-B' (**Figure 5**), E-E' (**Figure 8**), and F-F' (**Figure 9**), monitoring wells AD-7, AD-7R, AD-22 and AD-33 are screened in the uppermost water-bearing unit downgradient (west) of the Stack Out Area. Monitoring well AD-7 was plugged during September 2023 due to Plant demolition activities in the area, and the State of Texas Well Plugging Report is provided in **Appendix D**.

Monitoring wells AD-7R, AD-22, and AD-23 will be utilized as downgradient monitoring wells for the Stack Out Area. Existing monitoring wells AD-12 and AD-13 are screened in the uppermost water-bearing unit up gradient (east) of the Stack Out Area, and will be utilized as up gradient monitoring wells for the Stack Out Area.



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4. Recommended Monitoring Network and PE Certification

The recommended existing groundwater monitoring well network is intended to meet specifications stated in 40 CFR 257.91. Recommended wells are further discussed with respect to location to the Stack Out Area (up gradient or down gradient), well depth, and well construction. The recommended network would provide an improved understanding of groundwater quality, hydraulics, and groundwater flow at the Stack Out Area.

4.1 Recommended Monitoring Well Network Distribution

Two up gradient well locations (existing monitoring wells AD-12 and AD-13) and three down gradient well locations (existing monitoring wells AD-7R, AD-22, and AD-33) are recommended to establish a groundwater quality monitoring well network for the Stack Out Area.

4.1.1 Location

The recommended monitoring well network for groundwater quality of the uppermost aquifer at the Stack Out Area is summarized on **Table 3** and illustrated on **Figure 12**.

4.1.2 Depth

The screen depths for the monitoring wells recommended for inclusion in the monitoring network are within the shallow saturated sand stratum (uppermost aquifer) that occurs between an elevation of approximately 320 and 340 feet amsl as shown on Geologic Cross Sections B-B' (**Figure 5**), E-E' (**Figure 8**) and F-F' (**Figure 9**). The screen elevations are presented in **Table 3**.

4.1.3 Well Construction

As discussed above in Section 3.3.2, the gap in the monitoring well network for the uppermost aquifer at the Stack Out Area by plugging of monitoring well AD-7 was addressed by installation of monitoring well AD-7R during March 2020. Monitoring well AD-7R was installed by a Texas Department of Licensing and Regulation (TDLR)-licensed water well driller. Well construction data for the monitoring well network are summarized on **Tables 2** and **3**, and the monitoring well completion diagrams are provided in **Appendix A**.



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4.2 Professional Engineer's Certification

I, Kenneth J. Brandner, certify that this report was prepared under my direction and supervision, and that the information contained herein is true and accurate to the best of my knowledge. Based on my experience and knowledge of the site, the proposed groundwater monitoring system will be adequate to meet the requirements of 40 CFR Part 257.91.

Kenneth J. Brandner Printed Name of Registered Professional Engineer

enneth dne

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Signature

69586 Registration No. Texas Registration State

Date



12-11-23



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5. References

Akron Consulting, Ltd., "October 2015 Stackout Aerial", October 2015.

AMEC, "Report of Dam Safety Assessment of Coal Combustion Surface Impoundments, American Electric Power (AEP) and Southwest Electric Power Company (SWEPCO) H.W. Pirkey Power Plant, Hallsville, TX", August 2011.

ARCADIS, "Stack Out Area - CCR Groundwater Monitoring Well Network Evaluation, H.W. Pirkey Power Plant, 2400 FM 3251, Harrison County, Hallsville, Texas", May 25, 2016.

ARCADIS, "Stack Out Area – CCR Location Restriction Evaluation, H.W. Pirkey Power Plant, 2400 FM 3251, Harrison County, Hallsville, Texas", July 6, 2016.

Apex Geoscience Inc., "USWAG Monitoring Wells and Groundwater Evaluation, AEP Pirkey Power Station, Hallsville, Texas", March 2011.

Auckland Consulting, LLC, "Monitoring Well Installation – 2015, Pirkey Generating Station, Hallsville, Texas", January 26, 2016.

Banks Information Solutions, "Water Well Report, Pirkey Power Plant, 2400 FM 3251, Hallsville, Texas, Harrison County", June 8, 2023.

Broom, M.E., and B. N. Myers, "Ground-Water Resources of Harrison County, Texas", <u>Texas Water Development Board Report 27</u>, August 1966.

ETTL Engineers & Consultants Inc., "Geotechnical Investigation, Pirkey Power Station, Existing Ash, Surge, Lignite and Limestone Runoff, and Landfill Stormwater Ponds Embankment Investigation, Hallsville, Texas", October 2010.

Fetter, C.W., "Applied Hydrogeology", University of Wisconsin - Oshkosh, 1980.

Flawn, Peter T., "Geologic Atlas of Texas, Tyler Sheet", <u>The University of Texas at</u> <u>Austin Bureau of Economic Geology</u>, March 1965.

George, Peter G., et. al., "Aquifers of Texas", <u>Texas Water Development Board Report</u> <u>380</u>, July 2011.



H.W. Pirkey Power Plant 2400 FM 3251 Hallsville, Texas

Johnson & Pace Incorporated, "Hydrology & Hydraulic Report, North Surge Pond, East & West Ash Ponds, Secondary Ash Pond, Landfill Pond, H.W. Pirkey Power Plant, Hallsville, Texas", May 2011.

Johnson & Pace Incorporated, "East Bottom Ash Pond June 2011 As-Built Plan & Profile, H.W. Pirkey Power Plant, Hallsville, Texas", June 2011.

Sargent & Lundy, "Henry W. Pirkey Power Plant, Design Summary for Lignite Storage Area and Wastewater Pond Facilities", January 31, 1983.

Sargent & Lundy, "Henry W. Pirkey Power Plant Unit 1, Wastewater Ponds – Liner Verification & Monitoring Wells", September 14, 1984.

Southwestern Laboratories, "Subsurface Exploration, Waste Water Ponds, Pirkey Power Plant, Hallsville, Texas", September 7, 1984.

Texas Commission on Environmental Quality, "Groundwater Classification, RG-366/TRRP-8", March 2010.

USGS, Aquifers and Groundwater. 2015. Available online at www.usgs.gov.

USGS, "Petroleum Geology and the Distribution of Conventional Crude Oil, Natural Gas, and Natural Gas Liquids, East Texas Basin", <u>Open-File Report 88-450K</u>, 1988.

USGS, "Texas Seismic Hazard Map", 2014.



Tables

Table 1 Water Level Data **AEP Pirkey Power Plant - CCR Storage Areas** Hallsville, Harrison County, Texas

			Ground	Top of	Borehole	Date	Screen	Well	Top of	Screen ^(b)	Bottom of	of Screen ^(b)	4/13/2011	12/15/2011	6/20/2012	1/23/2013	7/7/2013	1/22/2014	7/9/2014	1/28/2015	1/20/2016	9/12/2023
			Surface	Casing	depth	Installed	Material	diameter	Depth	Elevation	Depth	Elevation	GW Elev.	GW Elev.	GW Elev.	GW Elev.	GW Elev.	GW Elev.	GW Elev.	GW Elev.	GW Elev.	GW Elev.
Well ID	Latitude	Longitude	Elevation ^(a)	Elevation ^(a)	ft. bls			inches	ft. bls	ft. msl	ft. bls	ft. msl	ft. msl	ft. msl	ft. msl	ft. msl	ft. msl	ft. msl	ft. msl	ft. msl	ft. msl	ft. msl
Monitoring Wells	0																					
MW-2/AD-2	32° 27' 54.753"	94° 29' 25.282"	341.25	344.04	40	10/7/83	Sch. 40 PVC	4	20	321.25	40	301.25	326.90	327.12	327.17	327.26	326.62	327.70	327.19	328.62	328.55	326.78
MW-3/AD-3	32° 28' 6.829"	94° 29' 21.498"	372.76	375.30	57	11/4/83	Sch. 40 PVC	4	37	335.76	57	315.76	342.95	341.59	343.70	341.10	343.27	341.42	343.96	345.01	347.03	338.88
MW-4/AD-4	32° 27' 59.247"	94° 29' 4.692"	363.69	366.79	46	10/10/83	Sch. 40 PVC	4	26	337.69	46	317.69	351.45	351.24	352.44	354.42	349.22	355.58	353.33	359.00	359.16	346.98
MW-7/AD-7	32° 27' 43.611"	94° 29' 15.611"	359.61	362.79	40	10/3/83	Sch. 40 PVC	4	20	339.61	40	319.61	344.34	343.75	344.15	344.90	343.35	346.61	346.23	349.17	349.31	
AD-7R	32.46209°	94.48839°	360.31	362.92	40	3/3/20	Sch. 40 PVC	2	20	340.31	30	330.31										351.10
MW-8/AD-8	32° 27' 25.095"	94° 29' 14.925"	356.92	359.84	35	10/4/83	Sch. 40 PVC	4	20	336.92	35	321.92	341.65	340.29	341.65	340.72	341.25	341.67	343.36	344.03	347.21	345.60
MW-10/AD-10	32° 27' 52.446"	94° 29' 16.545"	359.48	362.21	40	10/10/83	Sch. 40 PVC	4	20	339.48	40	319.48	342.03	341.90	342.19	341.41	339.85	342.27	342.22	344.39	343.97	338.45
MW-12/AD-12	32° 27' 51.702"	94° 29' 3.238"	378.84	381.99	51	1/30/86	Sch. 40 PVC	4	31	347.84	51	327.84	358.95	357.99	359.33	368.07	357.41	369.97	367.04	372.75	371.05	361.45
MW-13/AD-13	32° 27' 46.002"	94° 29' 5.71"	361.98	364.76	40.5	2/23/88	Sch. 40 PVC	4	30.5	331.48	40.5	321.48	349.46	348.91	349.52	350.81	348.61	351.97	351.29	354.47	354.15	348.98
AD-16	32° 27' 40.871"	94° 29' 38.637"	356.81	360.05	35	12/30/10	Sch. 40 PVC	2	15.0	341.81	35.0	321.81	338.08	335.50	337.58	335.43	336.67	339.53	340.84	343.34	347.68	340.45
AD-17	32° 28' 2.315"	94° 29' 39.45"	342.65	346.09	30	12/30/10	Sch. 40 PVC	2	10.0	332.65	30.0	312.65	322.66	322.29	323.31	323.51	323.06	325.19	324.15	328.42	326.78	323.27
AD-18	32° 28' 9.245"	94° 29' 6.469"	360.48	363.42	25	1/3/11	Sch. 40 PVC	2	15.0	345.48	25.0	335.48	355.53	351.54	357.21	355.47	357.23	360.03	358.06	359.88	360.52	353.56
AD-19	32° 27' 50.512"	94° 29' 13.973"	359.50	362.82	30	12/30/10	Sch. 40 PVC	2	10.0	349.50	30.0	329.50	344.07	343.58	344.29	344.62	342.60	345.11	345.76	347.92	347.40	342.61
AD-20	32° 27' 51.346"	94° 29' 21.576"	352.30	355.79	35	12/28/10	Sch. 40 PVC	2	15.0	337.30	35.0	317.30	334.50	334.63	334.69	334.78	333.38	335.38	334.87	336.88	336.07	333.27
AD-21	32° 27' 45.403"	94° 29' 19.195"	347.23	350.72	30	12/27/10	Sch. 40 PVC	2	10.0	337.23	30.0	317.23	340.43	340.02	340.22	341.57	339.16	342.36	341.67	345.45	343.82	340.02
AD-22	32° 27' 41.349"	94° 29' 17.779"	355.57	358.51	30	12/16/10	Sch. 40 PVC	2	10.0	345.57	30.0	325.57	343.64	343.16	343.74	344.83	342.90	346.49	345.77	350.24	350.29	344.85
AD-23	32° 27' 3.384"	94° 29' 41.258"	346.72	350.10	35	12/15/10	Sch. 40 PVC	2	15.0	331.72	35.0	311.72	319.65	318.94	319.29	318.66	318.87	319.80	319.79	319.84	321.23	320.55
AD-24	32° 27' 1.455"	94° 29' 56.388"	287.68	291.14	20	12/27/10	Sch. 40 PVC	2	5.0	282.68	20.0	267.68	282.92	284.29	285.10	285.63	285.06	288.30	287.10	288.56		
AD-25	32° 27' 17.187"	94° 29' 58.998"	334.15	337.09	30	12/14/10	Sch. 40 PVC	2	10.0	324.15	30.0	304.15	324.51	321.90	323.14	321.94	322.15	322.56	324.24	326.42	327.00	326.51
AD-26	32° 27' 25.426"	94° 29' 54.775"	342.41	345.25	40	12/14/10	Sch. 40 PVC	2	10.0	332.41	40.0	302.41	324.53	323.77	323.62	322.32	322.09	323.24	322.51	323.04	326.06	329.34
AD-27	32° 27' 36.66"	94° 29' 47.272"	349.83	352.62	37.5	12/15/10	Sch. 40 PVC	2	17.5	332.33	37.5	312.33	325.82	324.54	326.13	325.39	325.35	326.39	327.91	329.69	330.89	329.05
AD-28	32° 27' 55.439"	94° 29' 39.418"	335.92	339.40	40	12/28/10	Sch. 40 PVC	2	15.0	320.92	35.0	300.92	319.67	319.16	319.92	320.21	319.69	320.65	320.22	322.16	321.39	319.92
AD-29	32° 28' 8.271"	94° 29' 31.939"	350.21	353.37	30	1/3/11	Sch. 40 PVC	2	10.0	340.21	30.0	320.21	334.68	333.37	334.74	337.47	336.84	338.55	335.85	340.57	338.48	333.54
AD-30 ^(d)	32° 27' 56.49"	94° 29' 32.53"	339.04	342.02	25	12/8/15	Sch. 40 PVC	2	10.0	329.04	25.0	314.04									323.70	321.37
	32° 28' 02.48"	94° 29' 20.90"	357.75	360.75	35	12/8/15	Sch. 40 PVC	2	20.0	337.75	35.0	322.75									346.60	337.39
	32° 27' 56.20"	94° 29' 11.86"	357.23	359.18	33	12/11/15	Sch. 40 PVC	2	13.0	344.23	33.0	324.23									352.32	341.23
	32° 27' 38.70"	94° 29° 15.82°	359.30	362.37	30	12/11/15	Sch. 40 PVC	2	15.0	344.30	30.0	329.30									351.13	347.36
	32° 27' 10.13"	94° 29° 57.93°	304.64	307.61	25	12/11/15	Sch. 40 PVC	2	10.0	294.64	25.0	279.64									307.61	307.43
AD-35 ^(*)	32° 27' 09.64"	94° 29' 42.74"	316.01	318.95	20	12/11/15	Sch. 40 PVC	2	3.0	313.01	18.0	298.01									309.85	
	32.46560°	94.49518	334.00	336.60	17	3/6/19	Sch. 40 PVC	2	11.7	322.28	16.7	317.28										318.31
AD-38 ^(*)	32.46277°	94.49541°	344.70	347.30	28.5	3/6/19	Sch. 40 PVC	2	13.2	331.53	18.2	326.54										330.77
SB-5S/AD-44 ⁽⁸⁾	32.46352	94.49811	338.80	341.80	25	3/25/19	Sch. 40 PVC	2	14.6	324.23	24.6	314.23										324.52
SB-5D/AD-45 ⁽⁸⁾	32.46349°	94.49810°	338.40	341.00	70	3/25/19	Sch. 40 PVC	2	49.6	288.83	59.6	278.83										299.61
SB-6S/AD-46 ^(e)	32.45843°	94.49105°	346.40	349.40	18	3/25/19	Sch. 40 PVC	2	12.7	333.70	17.7	328.70										343.28
5B-6D/AD-4/	32.45841°	94.49105°	346.10	349.60	/0	3/25/19	Sch. 40 PVC	2	54.7	291.40	64.7	281.40										323.91
Piezometers ^(c)																						
W-3 (PW-3)	32° 27' 57.6"	94° 29' 31.8"	356.30	356.30	38	10/20/09	Sch. 40 PVC	2	28.0	328.30	38.0	318.30	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM

(a) Source: Apex Geoscience Inc. (March 23, 2011).(b) Screen length and screened intervals for AD-2 through AD-12 estimated from video surveillance (Apex Geoscience Inc., March 23, 2011).

(c) Souce: EETL (October 2010).

(d) Source: Auckland Consulting LLC (January 26, 2016). Monitoring wells AD-30 through AD-35 installed during December 2015.
Groundwater Elevation Source: AEP, Pirkey Monitoring Well Groundwater Elevations through January 2015.

NM - Not Measured

Table 2 Well Construction Details AEP Pirkey Power Plant - CCR Units Hallovilla Harria -

Hallsville, Harrison County, Texas																
			Ground	Top of	Borehole	Date	Screen	Well	Top of Filter Pack		Bottom of	Filter Pack	Top of	Screen ^(b)	Bottom of Screen ^(b)	
			Surface	Casing	depth	Installed	Material	diameter	Depth	Elevation	Depth	Elevation	Depth	Elevation	Depth	Elevation
Well ID	Latitude	Longitude	Elevation ^(a)	Elevation ^(a)	ft. bls			inches	ft. bls	ft. msl	ft. bls	ft. msl	ft. bls	ft. msl	ft. bls	ft. msl
Monitoring Wells	0															
MW-2/AD-2	32° 27' 54.753"	94° 29' 25.282"	341.25	344.04	40	10/7/83	Sch. 40 PVC	4	18	323	40	301	20	321.25	40	301.25
MW-3/AD-3	32° 28' 6.829"	94° 29' 21.498"	372.76	375.30	57	11/4/83	Sch. 40 PVC	4	35	338	57	316	37	335.76	57	315.76
MW-4/AD-4	32° 27' 59.247"	94° 29' 4.692"	363.69	366.79	46	10/10/83	Sch. 40 PVC	4	24	340	46	318	26	337.69	46	317.69
MW-7/AD-7 (plugged 9-12-23)	32° 27' 43.611"	94° 29' 15.611"	359.61	362.79	40	10/3/83	Sch. 40 PVC	4	18	342	40	320	20	339.61	40	319.61
AD-7R	32.46209°	94.48839 [°]	360.31	362.92	40	3/3/20	Sch. 40 PVC	2	18	342	31.5	329	20	340.31	30	330.31
MW-8/AD-8	32° 27' 25.095"	94° 29' 14.925"	356.92	359.84	35	10/4/83	Sch. 40 PVC	4	18	339	35	322	20	336.92	35	321.92
MW-10/AD-10	32° 27' 52.446"	94 [°] 29' 16.545"	359.48	362.21	40	10/10/83	Sch. 40 PVC	4	18	341	40	319	20	339.48	40	319.48
MW-12/AD-12	32° 27' 51.702"	94 [°] 29' 3.238"	378.84	381.99	51	1/30/86	Sch. 40 PVC	4	29	350	51	328	31	347.84	51	327.84
MW-13/AD-13	32° 27' 46.002"	94 [°] 29' 5.71"	361.98	364.76	40.5	2/23/88	Sch. 40 PVC	4	17.5	344.5	40.5	321.5	30.5	331.48	40.5	321.48
AD-16	32° 27' 40.871"	94° 29' 38.637"	356.81	360.05	35	12/30/10	Sch. 40 PVC	2	13	344	35	322	15.0	341.81	35.0	321.81
AD-17	32° 28' 2.315"	94° 29' 39.45"	342.65	346.09	30	12/30/10	Sch. 40 PVC	2	8	335	30	313	10.0	332.65	30.0	312.65
AD-18	32° 28' 9.245"	94° 29' 6.469"	360.48	363.42	25	1/3/11	Sch. 40 PVC	2	13	347	25	335	15.0	345.48	25.0	335.48
AD-19	32° 27' 50.512"	94° 29' 13.973"	359.50	362.82	30	12/30/10	Sch. 40 PVC	2	8	352	30	330	10.0	349.50	30.0	329.50
AD-20	32° 27' 51.346"	94° 29' 21.576"	352.30	355.79	35	12/28/10	Sch. 40 PVC	2	13	339	35	317	15.0	337.30	35.0	317.30
AD-21	32° 27' 45.403"	94° 29' 19.195"	347.23	350.72	30	12/27/10	Sch. 40 PVC	2	8	339	30	317	10.0	337.23	30.0	317.23
AD-22	32° 27' 41.349"	94° 29' 17.779"	355.57	358.51	30	12/16/10	Sch. 40 PVC	2	8	348	30	326	10.0	345.57	30.0	325.57
AD-23	32° 27' 3.384"	94° 29' 41.258"	346.72	350.10	35	12/15/10	Sch. 40 PVC	2	13	334	35	312	15.0	331.72	35.0	311.72
AD-24	32° 27' 1.455"	94° 29' 56.388"	287.68	291.14	20	12/27/10	Sch. 40 PVC	2	3	285	20	268	5.0	282.68	20.0	267.68
AD-25	32° 27' 17.187"	94° 29' 58.998"	334.15	337.09	30	12/14/10	Sch. 40 PVC	2	8	326	30	304	10.0	324.15	30.0	304.15
AD-26	32° 27' 25.426"	94° 29' 54.775"	342.41	345.25	40	12/14/10	Sch. 40 PVC	2	8	334	40	302	10.0	332.41	40.0	302.41
AD-27	32° 27' 36.66"	94° 29' 47.272"	349.83	352.62	37.5	12/15/10	Sch. 40 PVC	2	15.5	334.3	37.5	312.3	17.5	332.33	37.5	312.33
AD-28	32° 27' 55.439"	94° 29' 39.418"	335.92	339.40	40	12/28/10	Sch. 40 PVC	2	13	323	35	301	15.0	320.92	35.0	300.92
AD-29	32° 28' 8.271"	94° 29' 31.939"	350.21	353.37	30	1/3/11	Sch. 40 PVC	2	8	342	30	320	10.0	340.21	30.0	320.21
AD-30 ^(d)	32° 27' 56.49"	94° 29' 32.53"	339.04	342.02	25	12/8/15	Sch. 40 PVC	2	8	331	25	314	10.0	329.04	25.0	314.04
AD-31 ^(d)	32° 28' 02.48"	94 [°] 29' 20.90"	357.75	360.75	35	12/8/15	Sch. 40 PVC	2	18	340	35	323	20.0	337.75	35.0	322.75
AD-32 ^(d)	32° 27' 56.20"	94 [°] 29' 11.86"	357.23	359.18	33	12/11/15	Sch. 40 PVC	2	11	346	33	324	13.0	344.23	33.0	324.23
AD-33 ^(d)	32° 27' 38.70"	94° 29' 15.82"	359.30	362.37	30	12/11/15	Sch. 40 PVC	2	12	347	30	329	15.0	344.30	30.0	329.30
AD-34 ^(d)	32° 27' 10.13"	94° 29' 57.93"	304.64	307.61	25	12/11/15	Sch. 40 PVC	2	8	297	25	280	10.0	294.64	25.0	279.64
AD-35 ^(d)	32° 27' 09.64"	94° 29' 42.74"	316.01	318.95	20	12/11/15	Sch. 40 PVC	2	2.5	313.5	20	296	3.0	313.01	18.0	298.01
AD-37 ^(e)	32,46560°	94,49518°	334.00	336.60	17	3/6/19	Sch. 40 PVC	2	8.7	325.3	17	317	11.7	322.28	16.7	317.28
AD-38 ^(e)	32.46277°	94,49541°	344.70	347.30	28.5	3/6/19	Sch. 40 PVC	2	10.3	334.4	18	327	13.2	331.53	18.2	326.54
SB-5S/AD-44 ^(e)	32 46352°	94 49811°	338.80	341.80	25	3/25/19	Sch 40 PVC	2	12.0	326.8	25	314	14.6	324 23	24.6	314 23
SB-5D/AD-45 ^(e)	32,46349°	94,49810°	338.40	341.00	70	3/25/19	Sch. 40 PVC	2	47.0	291.4	70	268	49.6	288.83	59.6	278.83
SB-6S/AD-46 ^(e)	32 45843°	94 49105°	346.40	349.40	18	3/25/19	Sch 40 PVC	2	10.0	336.4	18	328	12.7	333.70	17.7	328.70
SB-6D/AD-47 ^(e)	32 45841°	94 49105°	346 10	349.60	70	3/25/19	Sch 40 PV/C	2	54.0	202.4	67	279	54.7	291 40	64.7	281 40
	02.40041	07.70100	0-0.10	0-13.00	10	5/25/13	0011. 401 VO	۷	54.0	202.1	01	213	J- 1 .1	201.40	0-1.1	201.40
Piezometers ^(c)											ļ					
W-3 (PW-3)	32° 27' 57.6"	94° 29' 31.8"	356.30	356.30	38	10/20/09	Sch. 40 PVC	2	26	330	38	318	28.0	328.30	38.0	318.30

General Note: Elevations in feet above mean sea level.

Footnotes:

(a) Source: Apex Geoscience Inc. (March 23, 2011).

(b) Screen length and screened intervals for AD-2 through AD-12 estimated from video surveillance (Apex Geoscience Inc., March 23, 2011). Top of sand pack estimated 2 feet above top of screened interval. (c) Souce: EETL (October 2010).

(d) Source: Aukland Consulting LLC (January 26, 2016).

(e) Source: Burns McDonnell (February 2019).

Acronyms and Abbreviations:

NA = Data not available

ft = feet

bls = below land surface

msl = mean sea level

Table 3 Proposed Well Network (Updated October 2023) AEP Pirkey Power Plant - Stack Out Area Hallsville, Harrison County, Texas

Well ID	Exisiting/ Proposed	Hydrostratigraphic Unit Target	Location Description		Screen Top Target Elevation ^(a) (ft amsl)	Screen Bottom Target Elevation ^(a) (ft amsl)	Screen Length (ft)	Comments
Upgradient								
AD-12	Exisiting	Uppermost Water- Bearing Unit	Northeast of Stack Out Area	Upgradient	347.8	327.8	20	Existing well installed in 1986; well will be utilitzed to establish backgroud water quality
AD-13	Exisiting	Uppermost Water- Bearing Unit	East of Stack Out Area	Upgradient	331.5	321.5	10	Existing well installed in 1988; well will be utilitzed to establish backgroud water quality
Downgradient								
AD-7R	Existing	Uppermost Water- Bearing Unit	Northwest of Stack Out Area	Down gradient	340.3	330.3	10	Existing well installed in 2020; uppermost shallow aquifer adjacent to Stack Out Area - downgradient
AD-22	Existing	Uppermost Water- Bearing Unit	West of Stack Out Area	Down gradient	345.6	325.6	20	Existing well installed in 2010; uppermost shallow aquifer adjacent to Stack Out Area - downgradient
AD-33	Existing	Uppermost Water- Bearing Unit	West of Stack Out Area	Down gradient	344.3	329.3	15	Existing well installed in 2015; uppermost shallow aquifer adjacent to Stack Out Area - downgradient

Footnotes:

a. Target elevations are an estimated range.

Acronyms and Abbreviations:

U=Upgradient D=Downgradient ft = feet amsl = above mean sea level



Figures







FIGURE

PLANT AND CCR UNIT LOCATION MAP (UPDATED OCTOBER 2023)

PIRKEY POWER PLANT 2400 FM 3251 HALLSVILLE, HARRISON COUNTY, TEXAS



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Appendix A

Boring/Well Construction Logs

	83296	4		LOC	G OF BORIN	IG		
	PROJE(CLIENT	СТ: Г;	Waste Water SWEPCO	Ponds		BC LC	DRING NO.: MW-1 DCATION: Hallsvill	Le
	Date:	10-	-6-83	Type:	Auger	Ground	Elevation:	
			Legend:					
anth	Feet Symbol	Sample	M Sample		X Penetrat	tion	▼ Water	
		1			Description	n of Stratum		
		X	Very dense b 33-17=7" 50	prown and B/7"	d grey cla	ayey silty	v sand w/clay se	am
			Very stiff t 6-9-21 30 B/	an and g 'F	rey very	sandy cla	y w/iron ore	
-11		S	Stiff grey s	ilty san	dy clay			
_20		I	oose grey c	layey si	lty sand			
- 25		н	ard grey sil	lty sandy	y clay le	nses 30-2()=11" 50 B/11"	
- 30		v	ery dense gr	ey claye	y sandy s	silt 19-31	=11½" 50 B/11½"	
-35-		Bo	ottom of bor	ing at 3	0 feet.			
40								
45-								
-50-		617.011.0-11.0-1						

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8329	64	LOG	OF BORING	
PROJE	CT: Waste	Water Ponds		BORING NO.: MW-2 LOCATION: Hallsville
Date:	10-7-83	Type:	Auger	Ground Elevation:
	Legend:			
Depth, Feet Symbol		ple	X Penetration	▼ Water
	12		Description of	Stratum
	Firm	tan clayey sil	ty sand	
-10-	Medium	tan and grey	very sandy	silty clay
	Dense	tan and grey c	layey silty	sand
20	Dense	tan clayey sil	ty sand 10-	15-16 31 B/F
- 25	Dense ·	tan silty sand		
-30-	Very de	ense grey claye	ey silty sar	nd 15-35=12" 50 B/F
-35	Very de	nse grey claye	y silty san	d 21-29=9" 50 B/9"
40 NONX	Hard gr	ey sandy silty	clay 20-30	=12" 50 B/F
	Bottom	of boring at 4	0 feet.	
- 45	Water e	ncountered at :	25 feet.	
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ÞI		. Waeto Nat	or Donda	LUG OF BORIN	G	G NO . Mrs. O
Ç	LIENT:	SWEPCO	er Ponds		LOCAT	G NO.: MW-3 ION: Hallsville,
D	ate:]]	1-4-83	Туре:	Auger	Ground Eleve	ation:
		Legend;				
)epth, eet	ymbol	e Somple		× Penetratio	n	▼ Water
				Description	of Stratum	
-55-		Hard grey	silty sar	ndy clay 28-	·22=10" 50 B	/10"
-60		Bottom of	boring at	57 feet.		
00		Water enco	ountered a	t 42 feet		
65						
70-						
75-						
80-						
5-						
0-						
5-			nder (
			1 200 (PR)			
		and States				
100						

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	83296	4	LO	G OF BORING	
	PROJECT CLIENT:	: Waste Wate SWEPCO	r Ponds		BORING NO.: MW-4 LOCATION: Hallsville
	Date: 1(0-10-83	Type:	Auger	Ground Elevation:
		Legend:			
	Depth, eet Symbol	e Sample		X Penetration	w Water
		/		Description of	Stratum
	5	Stiff tan	and grey	silty sandy	clay w/iron ore
	10	Very stiff	tan and	grey clay	
	15	Very stiff	tan and	grey clay w/	iron ore seam
	20	Stiff tan a	and grey :	silty sandy (clay lenses
- 2	25	Firm grey s	ilty sand	1	
-3		Very dense	grey silt	y sand 30-20	=12" 50 B/F
-3		Hard grey s	ilty sand	y clay 30-20	=8" 50 B/8"
4		Hard grey s:	llty sand	y clay 25-25	=8" 50 B/8"
-4	5X	Hard grey si	lty sandy	y clay 25-25-	=10½" 50 B/10½"
-50		Bottom of bo	ring at 4	16 feet.	

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8329	64		LOG	OF BORING		
PROJ CLIEM	ECT: NT:	Waste Wate SWEPCO	r Ponds		BORING NO. LOCATION:	:MW-5 Hallsville
Date:	9-:	27-83	Type:	Auger	Ground Elevation:	
		Legend:				
Depth, Feet Symbo	Sample	Sample		X Penetration	•	Water
	Image X Penetration ▼ Water Description of Stratum Description of Stratum -5 Very stiff brown and grey clay w/iron ore -10 Very stiff grey clay Very stiff brown clay w/silty sand lenses -15 Pirm brown and grey clayey silty sand -20 Firm grey clayey silty sand					
-5-		Very stiff	brown and	l grey clay	w/iron ore	
-10-		Very stiff	grey clay			
-15-		Very stiff	brown cla	y w/silty	sand lenses	
_20		Firm brown	and grey (clayey silt	y sand	
-25-	F	firm grey c	layey silt	ry sand		
-30	X	ery dense o	rey silty	sand w/cl	ay pockets ll-	-33=7" 50 B/7"
-35-	X v	ery dense g	rey claye	y silty sa	nd 16-34≕11" 5	0 B/ll"
- 40	X v	ery dense g	rey claye	y silty sa	nd 26-24=9" 50	в/9"
-45	V Ve	ery dense g	rey clayey	y silty san	nd 11-39=11½"	50 B/11½"
-50	Bo	ottom of bo	ring at 4	5½'.		

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بالانداد سياريم بمراجر المريم ومراجر الدار المربط ممتومورو وتمري

<u>سرت</u>

	8329	64		LOC	G OF BORING	
	PROJE CLIEN	ECT: IT:	Waste Wa SWEPCO	ater Ponds		BORING NO.: MW-6 LOCATION: Hallsville
	Date:	10-	-3-83	Туре:	Auger	Ground Elevation:
			Legend:			
Jenth	eet	sample	Sample		X Penetration	n 🖤 Water
		17			Description o	of Stratum
			Stiff ta	n and grey	clay w/silt	lenses and iron ore
	0		Very sti:	ff tan and q	grey clay w	/silt lenses and iron ore
-1	5]	Firm tan	and grey cl	ayey silty	sand
2(loose bro	own and grey	clayey sil	lty sand
- 25		X V	'ery dens	e grey clay	ey silty sa	and 25-25=115" 50 B/115"
-30		X F	irm grey	clayey sil	ty sand 7-7	7-17 24 B/F
35-		XV	ery dens	e grey claye	ey silty sa	und 25-25=9" 50 B/9"
- 40			ery dense	e grey claye	ey silty sa	nd 18-32=10½" 50 B/10½"
		Bo	ottom of	boring at 4	0 feet.	
- 45-						
50						

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	8329	64 LO	G OF BORING	
<	PROJEC CLIENT	CT: Waste Water Ponds SWEPCO		BORING NO.: MW-7 LOCATION: Hallsville
	Date: j	1.03-83 Type:	Auger	Ground Elevation:
		Legend:		
	Jepth, -eet Symbol	e Sample	X Penetration	Water
		05	Description of S	tratum
	5	Stiff red, tan and	grey sandy si	lty clay w/iron ore
	-10-	Stiff tan and grey of Stiff tan and grey s	ilay w/iron or	re Lay lenses w/iron ore
(20	Stiff tan and grey v	ery sandy sil	lty clay
	-25	Firm tan and grey cl	ayey silty sa	nd
	<u>-30</u>	Very dense grey silt	y sand 23-27=	12" 50 B/F
	-35	Very dense grey claye	ey silty sand	17-35=12" 50 B/F
	- 40 XEX	Very dense grey claye	y silty sand	25-25=10½" 50 B/10½"
		Bottom of boring at 4	0 feet.	
(:	45			
				۲۰۰۰۰۰۰۰۰۰۰۰۰۰۰۰۰۰۰۰۰۰۰۰۰۰۰۰۰۰۰۰۰۰۰۰۰

Generation	COSYT CONSL	iliant	ς Ο (5 5 γ π Τ	Geosynt 00 W W Vorthing elephor	ec Consultants, Inc /ilson Bridge Rd, Suite 250 ton, OH 43085 te: 614-468-0415	BO	RING NUMBER AD-7R PAGE 1 OF 2
CLI	ENT Am	erica	n Elec	tric Pow	ver (AEP) Company, Inc	PROJECT NAME Pirkey	
PRO	JECT N	UMBE	R C	HA8500	B	PROJECT LOCATION Hallsville TX	
DA1	E STAR	TED_	03/03	/20	COMPLETED	GROUND ELEVATION	HOIE SIZE 8 25 inches
DRI	LLING C	ONTR	АСТО	OR C&	S Lease	GROUND WATER LEVELS	
DRI	LLING M	etho	D G	eoprobe	DPT		
LOG	GED BY	Nat	han Q	uick	CHECKED BY	AT END OF DRILLING	
	ES					AFTER DRILLING	
01 AEP PIRKEY AD-TR.G 0 DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC	00		MATERIAL DESCRIPTION	
2305		SP	- 45	0.4	black SAND, (SP), with silt, moist, veg	getative topsoil.	
00120	7			1.5	GRAVEL, (GP), poorly graded.		
	1				Very stiff, red to light gray CLAY, (CL)	I, (ML), low to moderate cohesion.	sont
IRKEY2023-05 - DIGITIZE BORIN		CL		9.4		, nace sin, and fow plasticity. Iron ore pre	sent.
	4	CL-		10.0	Very stiff, red to light gray silty CLAY, (CL-ML), low plasticity.	
- 1 <u>s</u>	-	CL		11.0	Very stiff, reddish purple to light gray C	CLAY, (CL), moist, low plasticity.	
JERONALISCIAN STATE	-	сн		15.0	Very stiff, reddish purple to gray CLAY	, (CH), wet, medium plasticity. Iron ore p	resent.
]	CL-	h	16.0	Soft, black silty CLAY, (CL-ML), wet, m	edium plasticity.	
		ML	1		reddish purple to orange clayey SILT, (ML), wet, good cohesion. Iron ore prese	nt/
		ML		19.5	אין איז	ood conesion, iron ore present,	
20			\overline{N}	1	No recovery.		
- ~			IX				
			۲'n	22.0	black clavey SILT (ML) wet	· · · · · · · · · · · · · · · · · · ·	
		ML		23.2	delt men Oable (00 or 7 a		
3		SM		24.3	uark gray SAND, (SC-SM), fine grained	I, trace clay, wet.	
3 25		CL- ML	•••••	Jean J	Medium stiff, black silty CLAY, (CL-ML)	, medium plasticity.	/
		SP			aan gey of the, (of), into grained, po	ony graded, wet.	
				28.3	tan SAND, (SP), fine grained, poorly on	aded wet Iron ore present of the ten for	
30		SP		30.0	, (), into grantou, poorty gr	and a more non-one present at the top 100	L
			\bigtriangledown	1	No recovery.		
			\square	31.9			
[]		SP SP		32.0	tan SAND, (SP), fine grained, poorly gra	aded, wet.	A
		ČL-		(orange SAND, (SP), fine grained, poorly	y graded, wet.	
35		ML			meetium sun, biack to dark gray sitty CL/	NT, (UL-ML), Wel, IOW plasticity.	

(Continued Next Page)

	CC Geosyntee 500 W Wil ants Worthingto	: Consultants, Inc son Bridge Rd, Suite 250 nn, OH 43085		BORING NUMBER AD-7R PAGE 2 OF 2
engineers scientists loca	I elephone	: 614-468-0415		
	ICAN Electric Powe	r (AEP) Company, Inc.	PROJECT NAME Pirkey	
TROSECT NON				a, TX
G DEPTH (ft) SAMPLE TYPE NUMBER	U.S.C.S. GRAPHIC LOG		MATERIAL DESCRIPTION	
PIRKEY AD-78.	CL- ML 38.2	Medium stiff, black to dark gray	silty CLAY, (CL-ML), wet, low plasticity. (continued)
₩	SP	Medium dense, tan SAND, (SP), fine grained, poorly graded, wet.	
053055	r+3+140.0		Bottom of borehole at 40.0 fe	ce t.
JENERAL BH / TP / WELL - GINT STD US.GDT - 05/01/23 12:11 - C.IUSERSIASOLTEROIDESKTOPIGEDSYNTECIPROJECTSIAEPURKEY/2023-05 - DIGITIZE BORING				

WELL CONSTRUCTION LOG ABOVE GROUND COMPLETION

Well I.D.: AD-7R

Drilling Company: C & S	
Drillers: DJ Diduch	
Geologist/Engineer: Nathan Quick	
Signature:	



Comments



Site: AEP Pirkey	
Project Number: CHA8495 12	
Installation Method: Hollow Stem Auger	· · · ·
Casing Installation Date: 3/3/20	
Well Type: Monitor Well	
Well Completion Method:	
Geologic Completion Zone: Aquifer	
Well Completion	
Guard Posts YES Date: 3/5/2020	
Surface Pad Size: 4 ft x 4	Ĥ
Protective Casing or Cover	II
Diameter/Type: 4" Steel	
Depth BGS: 2 Weep Hole YES	
Grout	
Composition/Proportions; NA	
Placement Method: NA	
Seal Date: <u>3/3/2</u>	2020
Type: Non-coated bentonite pellets	
Source: PDS	
Set-up/Hydration Time: 24 hours	
Placement Method: surface	
Vol. Fluid Added:	
Filter Pack	
Type: 20/40 Silica Sand	
Source: Pioneer Sand	
Amount Used: <u>8 (50#) bags</u>	
Placement Method: surface	
Well Riser Pipe	
Casing Material: Sch. 40 PVC	
Casing Inside Diameters: 2	_ in.
Screen	
Material: <u>Sch 40 PVC</u>	
Inside Diameter: 2	in.
Screen Slot Size: 0.01	_ in.
Percent Open Area:	
Sump or Bottom Cap YES	
Type/Length: Sch 40 PVC	
Backfill Plug YES	
Material:	
Placement Method:	
Set-up/Hydration Time:	
Total Water Volume During Construction	ı
Introduced (Gal): Recovered	
(Gal):	
Keviewed	

By: _____

Date: _____

Owner:	American Electric Po	wer Company	Owner Well #:	AD-7R	
Address:	502 N. Allen Street Shreveport A 71101	I	Grid #:	35-37-1	
Well Location:	2400 Farm Road 3251		Latitude:	32° 27' 43	.7" N
	Hallsville, TX 75650		Longitude:	094° 29' 18	.3" W
Well County:	Harrison		Elevation:	No Data	
Type of Work:	New Well		Proposed Use:	Monitor	
Filling Start Date	e: 3/3/2020 Drillir	ng End Date: 3/3	/2020		
	Diameter (ii	n.)	Top Depth (ft.)	Bottom Depth (ſŧ.)
3orehole:	8.25		0	31.5	.,
Drilling Method:	Hollow Stem A	uger			
Borehole Comple	tion: Filter Packed				
	Top Depth (ft.)	Bottom Depth (ft.)	Filter Materia	I	Size
ilter Pack Interva	Top Depth (ft.) Ils: 18	Bottom Depth (ft.) 31.5	Filter Materia Sand	1	Size 20/40
ilter Pack Interva Annular Seal Data	Top Depth (ft.) Ils: 18 a: No Data	Bottom Depth (ft.) 31.5	Filter Materia Sand	1	Size 20/40
ilter Pack Interva Annular Seal Data Seal Metho	Top Depth (ft.) als: 18 a: No Data bd: Poured	Bottom Depth (ft.) 31.5	Filter Materia Sand Distance to Propert	y Line (ft.): No	Size 20/40 Data
ilter Pack Interva Annular Seal Data Seal Metho Sealed E	Top Depth (ft.) als: 18 a: No Data bd: Poured By: Driller	Bottom Depth (ft.) 31.5	Filter Materia Sand Distance to Propert Distance to Septic Fie concentrated contami	y Line (ft.): No Id or other nation (ft.): No	Size 20/40 Data Data
ilter Pack Interva unnular Seal Data Seal Metho Sealed E	Top Depth (ft.) als: 18 al: No Data bd: Poured By: Driller	Bottom Depth (ft.) 31.5	Filter Materia Sand Distance to Propert Distance to Septic Fie concentrated contami Distance to Septic	y Line (ft.): No Id or other nation (ft.): No c Tank (ft.): No	Size 20/40 Data Data Data
ilter Pack Interva unnular Seal Data Seal Metho Sealed E	Top Depth (ft.) als: 18 al: No Data bd: Poured By: Driller	Bottom Depth (ft.) 31.5	Filter Materia Sand Distance to Propert Distance to Septic Fie concentrated contami Distance to Septic Method of V	y Line (ft.): No Id or other nation (ft.): No c Tank (ft.): No ferification: No	Size 20/40 Data Data Data Data
ilter Pack Interva Annular Seal Data Seal Metho Sealed E	Top Depth (ft.) Ils: 18 a: No Data bd: Poured By: Driller bon: Surface Slab Ins	Bottom Depth (ft.) 31.5	Filter Materia Sand Distance to Propert Distance to Septic Fie concentrated contami Distance to Septic Method of V Surface	y Line (ft.): No Id or other nation (ft.): No C Tank (ft.): No Verification: No	Size 20/40 Data Data Data Data Data
ilter Pack Interva Annular Seal Data Seal Metho Sealed E	Top Depth (ft.) als: 18 al: No Data bd: Poured By: Driller bon: Surface Slab Ins No Data No Data	Bottom Depth (ft.) 31.5	Filter Materia Sand Distance to Propert Distance to Septic Fie concentrated contami Distance to Septic Method of V Surface	y Line (ft.): No Id or other nation (ft.): No c Tank (ft.): No gerification: No e Completion t	Size 20/40 Data Data Data Data Data
ilter Pack Interva Annular Seal Data Seal Metho Sealed E Sealed E Water Level: Packers:	Top Depth (ft.) als: 18 al: No Data bd: Poured By: Driller bon: Surface Slab Ins No Data No Data No Data No Data	Bottom Depth (ft.) 31.5	Filter Materia Sand Distance to Propert Distance to Septic Fie concentrated contami Distance to Septic Method of V Surface	y Line (ft.): No Id or other nation (ft.): No c Tank (ft.): No gerification: No e Completion t	Size 20/40 Data Data Data Data oy Driller

Well Tests: No Test Data Specified

	Strata Depth (ft.)	Water Type	
Water Quality:	No Data	No Data	
		No	
	Did the driller know	owingly penetrate any strata which contained injurious constituents?:	No
Certification Data:	The driller certified that driller's direct supervisio correct. The driller under the report(s) being retur	the driller drilled this well (or the well on) and that each and all of the stater erstood that failure to complete the re ned for completion and resubmittal.	was drilled under the ments herein are true and equired items will result in
Company Information:	C&S Lease		
	1873 FM 1252 E Kilgore, TX 75663		
Driller Name:	Buford E. Collier	License Nu	umber: 50089
Apprentice Name:	David Diduch	Apprentice	Number: 60297
Comments:	No Data		

Lithology: DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	1.5	Top soil, vegetation, black silt, gravel, light gray/red/brown clayey silt
1.5	10	Red/light gray clay, low plasticity, high stiffness, iron ore present, trace silt,
10	15	Maroon/light gray clay, high stiffness, low plasticity, iron ore, wet
15	20	Black silty clay, low-moderate plasticity, wet, Maroon/orange clayey silt, wet, good cohesion, iron ore, gray/orange clayey silt, iron ore present, wet, good cohesion
20	24.6	Black clayey silt, Dark gray fine grained sand, trace clay, wet, black silty clay, low- moderate plasticity, moderate to low stiffness
24.6	31.5	Dark gray fine grained sand, wet, well sorted, orange fine grained sand, wet, well sorted, tan fine grained sand, wet, well sorted, iron present

Casing: BLANK PIPE & WELL SCREEN DATA

Dla (in.)	Туре	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
2	Riser	New Plastic (PVC)	40	0	20
2	Screen	New Plastic (PVC)	40 0.010	20	30

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) 334-5540

83296	4	LOG OF	BORING	
PROJEC CLIENT	T: Waste Wate SWEPCO	er Ponds		BORING NO.: MW-8 LOCATION: Hallsville
Date:	0-4-83	Type: Aug	er	Ground Elevation:
Jepth, Teet Symbol	Legend:	ХР	enetration	▼ Water
		Des	cription of Stra	atum
	Stiff tan Stiff tan	silty sandy cl and grey silty	lay w/iron sandy cla	ore ay w/iron ore
	Firm tan an Medium tan	nd grey clayey and grey very	silty sar	nd ndy clay w/iron ore
-25-	Very stiff	grey silty cla	ay lenses	
_30X	43-7=5½" 50	B/55"		
_35X	Very dense	tan and grey s	silty sand	50 B/5½"
	Bottom of b	oring at 35 fe	et.	
- 40				
-50_		Secure and secure s		

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832964		LOG OF BORING	
PROJECT: CLIENT:	Waste Water SWEPCO	Ponds	BORING NO.: MW-9 LOCATION: Hallsville
Date: <u>1</u> (0-4-83	Type: Auger	Ground Elevation:
	Legend:		=
eeth, eet ymbo	Sample	X Penetratio	n 🖤 Water
		Description o	of Stratum
	Stiff brown	silty sandy clay w	v/iron ore
-10X	Very stiff t	an and grey silty	sandy clay 21-25 46 B/F
-15-	Medium tan a	nd grey very silty	clay 6-7-8 15 B/F
20	Stiff tan an	d grey silt <mark>y cla</mark> y	lenses
25	Stiff grey ve	ery silty clay lens	ses
30 IIIIX	Very dense gr	ey silty sand ll-3	9=11" 50 B/11"
	Bottom of bor	ing at 30 feet.	
	₩₽₩₽₩₽₩₽₩₽₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩	− ₹₹₽₽₽₽₩₩₩₩₽₽₽₽₩₽₩₽₩₽₩₽₩₽₩₽₩₽₩₽₩₽₩₽₩₽₩₽₩	

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	8	3296	4		LO	G OF BORIN	١G		1
	թ C	ROJEC	:T: ;	Waste Wat SWEPCO	er Ponds			BORING NO .: MW-	-10 .lsville
	D	ate:	10-	10-83	Type:	Auger	Grou	ind Elevation:	
				Legend:					
	Depth, Feet	Symbol	Sample	Sample 📰		X Penetra	tion	👿 Water	
			7			Description	n of Stratum)	· · · · · · · · · · · · · · · · · · ·
	-5			Stiff tan	and grey	silty cla	y w/iron	ore	
	10		F	lard brown	silty cl	ay			
	15		S	tiff tan	and grey s	silty clay	y w/iron	ore	
	20		D	ense browi	n silty sa	and w/iror	ore 13-	-15-19 34 B/	F
-2	5	XX	F	lrm grey c	layey sil	ty sand l	5-9-13 2	2 B/F	
-3			D€	ense grey	clayey si	lty sand	8-12-28	40 B/F	
-3!			Ve	ery dense	grey clay	ey silty :	sand 19-	31=11" 50 B/	/11 "
_ 4(X	Ve	ry dense	grey claye	ey silty s	sand 24-1	26=10" 50 B/	10"
-45			Во	ttom of b	oring at 4	40 feet.			
-50	_		19. 00 .19.00.000000000000000000000000000000						

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	0000		(4) (4)	LOG	F BORING		
PI C	ROJEC	# :T: :	Monitor Wells at Southwestern Ele	: Metal Cl ctric Pow	Leaning Waste wer Company	PondBORING NO.: M LOCATION: Hall	W-11 sville, TX
D	ete:		1/30/86	Туре:	Rotary	Ground Elevation: 361	.61
			Legend:				
epth,	oqu,	aldma	🗮 Sample		X Penetration	▼ Wate	r
Δű	Ś	<i>i</i> s			Description of S	tratum	
-5	\mathbf{N}		Brown and tan	clay			
	$\sum_{i=1}^{n}$	1					
-10-			Duran and tax				
	\sim		Brown and tan	ciay w/ii	on ore		
	\mathbb{N}	U					1
15	\mathbb{N}		Brown and tan	clay w/ir	ion ore		
	\mathbb{N}						
			Brown and tan	sandy cla	y w/iron ore		
	\mathbb{N}						
	\mathbf{A}						
25	N		Brown clayey s	ilty sand	L		
-30-	N)		Brown and grav	clavev s	ilty sand		
	NI	Π			-		
25				-			
-35-		1	Gray silty san	đ			
- 40			Gray silty san	1			
-45-	Į.		Bottom of Bori	ng at 43 :	feet.		
	-		Water encounter	red at 13	feet.		
-50-	1						

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SOUTHWESTERN LABORATORIES

	832	964		LOC	G OF BORING	
	PROJEC	CT: [:	Monitor Well Southwestern	s at Metal Electric	Cleaning Waste Power Company	PondBORING NO.: MW-12 LOCATION: Hallsville, TX
(Date:	· · · · · · · ·	1/30/86	Type:	Rotary	N 6+13.25; W-6+90.36 Ground Elevation: 378.41
			Legend:			
)epth, eet	ymbol	ample	Sample		X Penetration	▼ Water
	0				Description of St	Iratum
	\mathbb{N}					
-5			Brown and t	an sandy ci	lay	
10			Brown, tan	and grav sa	andv clav	
				and going of		
-15			Tan and gray	y sandy cla	ay .	
20			Brown and ta	an sandy cl	ay	
	\mathbb{N}					
25			Crow and to.	condu ala		
			Gray and tar	i sandy cia	Y	
30-			Brown and gr	ay clay		
25			Dramon and			
35-			Brown and gr	ay clay		
	N					
40-			Gray silty s	and		
45			Gray silty s	and		
50	•		Gray silty s	and	Water encounte	red at 27.5 feet.
		-			BOTTOM OF BORI	ng at 51 teet.

Observation Well Installation Report

roject 88.0 rpe of Arg exhod of 1	CME 55	Hollow-ste	latiled by DS n auger	DY, IM	mbar Mi	V-13 Date 2:	-23-88			Tau	
			· · · · · · · · · · · · · · · · · · ·	Log of E	ivting and	Observat	ion Well				
		Boring						Übse	wation W	lali	
Depth in ty	Cored Inserval		Description		Ground	Elav.	Typs of Observ	ration Well: 	🗆 Rush 83 Prote Toj) veling p of Riser Elev.	53 Locking Cap Manhole
1					If Proin	2' 17' 2.5' 23' 10' 42.5'			Prove	er Cop Additional Cosing or Cop Additional Cosing or Cop Additional Cosing of Seal Clav _ of Coment of Seal Masse ellets of Openings _ mater of Cosing of Filter Mote Slasting tom of Cog. Ele- tom of Cog. Ele-	PVC Threaded Ound Ite & Portland Grout Bentonite 1/4" .010" 4" 4" 4" 4" 4" 4" 4" 4" 4"
marks	L2, L5,	L7 are me	sured f	rom the top	o of t	he PV(; pipe,	which j	protr	udes	
	2' abov	e the groun	nd surfa	e,							

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Observation Well Installation Report

Location Plinkey Powe Project 880284 Type of Aug CME 5 Method of Installation	Date Station # Elev. 361.81 wer Plant 2-24-88 & 2-25-88 0+36.3N, 12+34.2W 0bsseration Wall Number [loca 84 MW-14 [loca 55 Installed By S.C., D.Y. 90 Hollow-stem auger, 4" PVC threaded, well sand pack, bentonite seal, cement bentonite grout	L City Hallsville, Texas
	Los of Boring and Observation Well	
	Boring Ö	bservation Well
Depth Cored Interval	Type of Observation Well Bescription Bround Elex. If Proteoding $L_1 = \frac{2 \cdot 5^{12}}{15 - 5^{22}}$ $L_2 = \frac{2 \cdot 5^{12}}{15 - 5^{22}}$ $L_3 = \frac{2 \cdot 5^{12}}{15 - 5^{22}}$ $L_4 = 22 \cdot 5^{12}$ $L_5 = 20^{12}$ $L_6 = 20^{12}$ $L_7 = 42 \cdot 5^{12}$ $L_8 = 20^{12}$ $L_9 = 42 \cdot 5^{12}$ $L_9 $	C Flush C lacking Cap So Protructing D Manhole Top of Riser Else. Type of Pipe Att Type of Backfill Around Riser Cement Bentonite Type of Seal Else Top of Seal Else Top of Seal Else Top of Filter Else. Else. of Openings
erstandard	L2, L5, L7 are measured from the top of the PVC pipe	, which protrudes
Inspected By	2.5' abové the ground surface.	· · · · · · · · · · · · · · · · · · ·

Observation Well Installation Report Station # Blev. 360.27 Oste Location City 2-25-88 & 2-26-88 Observation Well Number Hallsville, La. 1+30.7N. 13+14.5W Pikey Power Plant Project 880284 Location MW-15 Type of Aug CME 55 Installed By S.C. & D.Y. Date Time 2-24-88 Method of Installation Hollow-stem auger Log of Boring and Observation Well Boring **Observation Well** Type of Observation Well, 🛛 Flush E Locking Cap Depth Cared 83 Protructing D Manhole Description in ft Interval Ground Elev. Top of Riser Elev. Protective Cesing or Cap If Protructing E **马拉马**林伊 1.0. Of First First 4" Threaded PVC Type of Pipe ive of Backill Around Cement Bentonite Riser Grout Top of Seal Elev Type of Seal Material Bentonite Pellets 2.5 17 Lg. 2 23' 22.5 LB 201 le 42.5 17 Top of Filter Elev. Eav. of Perforations .010" Size of Openings ... Diamater of Casing 4ⁿ Tie' 💶 Type of Filer Material Well Sand Bottom of Csg. Elev, - Bottom of Boring Elev. _ .11" -Diamater of Bonna ____ **A**emarks L2, L5, L7 are measured from the top of the PVC pipe, which protrudes 2.5' above the ground surface. Inspected By

ACCULTY NAME: ADP. Play Power Plan	АРЕХ	PROJ	ECT NO	L: 110-	-089		·		HORING	MO	NITOR WELL		
AACLITY ADDRESS: <u>Hillprife, Teas</u> PRILLING COMPANY/METHODRIG: <u>App Geoceance inc. / Hollow-starn</u> Augend (ME.53 Track Rig PRILLING COMPANY/METHODRIG: <u>App Geoceance inc. / Hollow-starn</u> Augend (ME.53 Track Rig PRILLING: <u>M227703.3**********************************</u>	FACI	LJTY N	AME:	ARF	- Pirkey	Powe	r iPlans			SACE ITY IN	WALL NUMBER	AD-22	_
DRILLING COMPANY/METHODRIK: Appl Cencelence Inc. COMPLETION DATE: DRILLISE: Ed Witsen, Apen (Encolence Inc. COMPLETION DATE: PREFARED BY: Darid Bedford LOGGED BY: ATTITUDE: M322703.3* Datent: OMGTUDE: WELL LOCATION; Titlangle-Statuk idle Questik Het If Geo If Geo COMPLETION DETAILS If Geo If Geo COMPLETION AND COMMENTS Odar If Geo If Geo Completion None Meta If Geo If Geo Completion Soil, DESCRIPTION AND COMMENTS Odar If Geo If Geo If Geo If Geo None Meta If Geo If Geo If Geo If Geo None Meta If Geo If Geo If Geo If Geo None Meta If Geo If Geo If Geo If Geo None Meta If Geo If Geo If Geo If Geo None None None If Geo If Geo If Geo If Geo None None None If Geo If Geo If Geo If Geo None None None If Geo If Geo If Geo If Geo If Ge	FACI	LITYA	DDRES	5: Hallı	Wille, T	CIVILS.				CONTRACT (1971	NA		
DRILLER 24 Witten, Adex Generitmen Inc. COMPLETION DATE: 12/AG2019 TREPARED BY: David Bedford LOGEDE BY: Envid Regford ATTITUDE: N32/27033* Datext: WOS-44 WELL LOCATION: Titugle: South tide Quantit Het Image: South Devider Completion Details USCS Solution: WOS-44 WELL LOCATION: Titugle: South tide Quantit Het Image: South Devider Completion Details USCS Image: South Devider Completion Devider Completindevelocition Devider	DRIL	LING C	OMPAN	YY/ME	THOD/	RIG	Apex	Geotelea	e inc. / Hollow-stem Au	ores Chill 55 Toude 1			
ARTFARED David Bedfard Construction ATTTUDE: N.32*2703.3* Datam: W05.44 LOGGED BY: David Bedfard ATTTUDE: N.32*2703.3* Datam: W05.44 WELL LOCATION: Triangle: South kids Quench Het Image: South W122841.3* WELL LOCATION: Triangle: South kids Quench Het Image: South W122841.3* WELL LOCATION: Triangle: South kids Quench Het Image: South W122841.3* WELL LOCATION: Triangle: South kids Quench Het Image: South W122841.3* Odor Image: South W121841	DRILI	LER:	Ed Will	son, Ap	ex Geos	cience	Inc.		COMP11	TION DATE: 1944	20010		-
ATTTUDE: N32*2703.* OMETTUDE: W92*2741.3* WELL LOCATION: <u>Timple-South side Quantit Hat</u> WELL LOCATION: <u>Timple-South side Quantit Hat</u> WELL LOCATION: <u>Timple-South side Quantit Hat</u> WELL LOCATION: <u>Timple-South side Quantit Hat</u>	PREP.	ARED E	3Y: Devi	d Bedfe	ard					OCCED BY	12010		_
ONGETTUDE, Wey 224413* WELL LOG AND COMPLETION DETAILS USC3 COMPLETION DETAILS SOL DESCRIPTION AND COMMENTS Oder Mole 1 1 0.4.5 SC Clarge rand, light brown, very fire graited None Mole 1 0.4.5 SC Clarge rand, light brown, very fire graited None Mole 1 0.4.5 SC Clarge rand, light brown solid with light gray None Slight 3 0.4.1 SC Clarge rand, grayth brown with orangith brown streaks, were fire graited Mole Mole 3 12-20 SC Clarge rand, grayth brown with orangith brown streaks, were fire graited None Slight Well 3 12-20 SC Clarge rand, grayth brown with orangith brown streaks, were fire grained, light year, grayth brown, streaks, were fire grained, light year, grayth brown, streaks, were fire grained, were	LATTI	ITUDE:	N 32"2	703.3"			Datam	· Wris.s.		LOCATION THE			
Line Description Solid DESCRIPTION AND COMMENTS Odiar Mota 1 ComPLETION DETAILS CODE SOLIDESCRIPTION AND COMMENTS Odiar Mota 1 ComPLETION DETAILS CODE SOLIDESCRIPTION AND COMMENTS Odiar Mota 1 ComPLETION DETAILS CoDE SOLIDESCRIPTION AND COMMENTS Odiar Mota 1 ComPLETION DETAILS CoDE Classe graded, light brown, very fire gristed None Mota 1 ComPLETION DETAILS CC Classe graded, light brown, very fire gristed None Mota 1 ComPLETION DETAILS CC Classe graded, light brown notice with light gray None Stight 2 ComPLETION DETAILS CC Classe graded Income strake, very fire gristed None Mota 1 ComPLETION DETAILS CC SC Charge graded grad	LONG	ITUDE	: W94 "2!	741.3"						FOCKING 1000	pe- south title Quansa }	fot	_
1 0.0.5 BC Clays yrand, light brown, very fine pruhed None Main 3 0.5-12 CL Lean clay, light brown mobiled with light gray None Stight 5 0.5-12 CL Lean clay, light brown with crangish brown straks, None Stight 6 12-20 SC Chryey send, grayddr brown with orangish brown straks, None Stight 3 12-20 SC Chryey send, grayddr brown with orangish brown straks, None Stight 3 12-20 SC Chryey send, grayddr brown with orangish brown straks, None Wet 12 12-20 SC Chryey send, grayddr brown with orangish brown straks, None Wet 12 12-20 SC Chryey send, grayddr brown with orangish brown straks, None Wet 14 12-20 SC Chryey send, grayddr brown with orangish brown straks, very fine grained, None Wet 15 12-20 SC Chrese crystaffilm moth 21-21-17, light brown straks, very fine grained, None Wet 12 12-23 SC Sec graening brown (1) grating to orangish brown, slipy, None Wet 12 12-530 SM Sec graening grained Sec graening grained Wet	DEFTH (FEET)	(IM44) CI14	SAMPLE	con	WELL, I MPLETI	LOG A ON DI	ND ETAILS	USCI	SOILI	ESCRIPTION AND	COMMENTS	Odar	Moisu
2 1 2 0 3 1 0 3 1 0 3 1 0 3 1 1 2 0 3 1 1 2 0 8 1 </td <td>3</td> <td></td> <td></td> <td></td> <td>HAR -</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>· · · · · · · · · · · · · · · · · · ·</td> <td></td> <td></td>	3				HAR -						· · · · · · · · · · · · · · · · · · ·		
Addit Few fron ore (small) pebbles in clayey sandy streads Mole Few fron ore (small) pebbles in clayey sandy streads None Stightly 12-20 SC Choyey sand, grayith brown with orangish brown streaks, vary fine grained None 12-20 SC Choyey sand, grayith brown with orangish brown streaks, vary fine grained None 12-20 SC Choyey sand, grayith brown with orangish brown streaks, vary fine grained None 12-20 SC Choyey sand, grayith brown with orangish brown streaks, vary fine grained None 12-20 SC Choyey sand, grayith brown clayby and, grayith brown clayby and, grayetab black, new files clay streaks, vary fine grained, wet @ 20' None 12-20 SC SC (Dense crystalline rock 21-21.17), light brown clayby and, grayetab black, new files clay streaks, vary fine grained, wet @ 20' None 12-20 SM Sand, greenish back, clay streaks, vary fine grained, wery fine grained None 12-20 SM Sand, greenish brown (1) grading to orangish brown, silly, None Wet 12-20 SM Sand, greenish brown (1) grading to orangish brown, silly, None Wet 12-20 SM Sand, greenish brown (1) grading to orangish brown, silly, None Wet 12-20 SM Sand, greenish brown (1) grading to orangish brown, silly, None Wet 1	2						0.5-12	CL SC	Lean clay, light brown	mo, very fine grained	y	None None	Moist
12 12-20 SC Chrypy sund, graylish brown with orangish brown streaks, wery fine grained None Slightly weil 13 12-20 SC Chrypy sund, graylish brown with orangish brown streaks, wery fine grained None Slightly weil 14 12-20 SC Chrypy sund, graylish brown with orangish brown streaks, were strea	3 4 5 6 7 8 9 10								Few fron ore (small) p	ebbles in clayey sandy	strooka		Moist
20-25 SC Very firm. 18-18.5 20-25 SC (Dense crystalline rock 21-21.1), light brown chysty sand, greened, black, mice, black clay streaks, very fine grained, wet @ 20' None 20-25 SC (Dense crystalline, black clay streaks, very fine grained, wet @ 20' None 21-20-25 SM Sand, greenish back, mice, black clay streaks, very fine grained, wet @ 20' None 21-20-25 SM Sand, greenish brown (1') grading to ornangish brown, silty, wery fine grained None 220-30 SM Sand, greenish brown (1') grading to ornangish brown, silty, wery fine grained None 80 Bocing Terminated at 30' Bocing Terminated at 30' Very fine grained 80 Total Deptit: 30 feet Filer Sand Very Lavel Filer Sand (Skefinter val): E-30' Scree laterval: 43 (app)-10' Growt (Type/Daterval): Orout from 0-2'; Bentosite from 2-8' Water lavel	12 13 14 15 16			~~			12-20	5C	Chyry sand, grayish b very fine grained Slightly wet @ 12 5' fr	rown with orangish bro	wn streaks,	None	Slightly Wet
23 25-30 SM Send, greenish black, mice, black clay streake, very fine grained, wet @ 20' None Wet 6 25-30 SM Sand, greenish black, mice, black clay streake, very fine grained, wet @ 20' None Wet 6 25-30 SM Sand, greenish black, mice, black clay streake, very fine grained, wet @ 20' None Wet 6 25-30 SM Sand, greenish barown (1') grading to ornangish barown, silty, None None Wet 6 Boring Terminated at 30' Boring Terminated at 30' Vatur Lava Total Depth: 30 feet Riser Interval: 43 (agp)-10' Stree interval: 43 (agp)-10' Sectence Interval: 50 feet Riser Interval: 43 (agp)-10' Sectence Interval: 20 feet Grout (Type/Juterval): 8-30' Water leval: 10-30' Total Depth: 30 feet Riser Interval: 43 (agp)-10' Sectence Interval: 25'	17 18 19 20 21						70-24	80	Very firm 18-18.5	46 17 18 E.c			
25-30 SM Smd, greenish brown (1) grading to orangish brown, silty, very fine grained None Wet Bocing Terminated at 30' Bocing Terminated at 30' Bocing Terminated at 30' Wet EMApex Cement Ententia Filer Sand V Water Laved Filer Sand Size/Interval): 30 feet Riser Interval: 43 (acc)-10'. Filter Sand Grout (Type/Interval): 8-30'. Screen Interval: 10-30'. Grout (Type/Interval): Grout from 9-2'; Bentonite from 2-8'. Water level: 12.5'.	22 23 24 25						20-2.1		grocaish black, mica, bi wet @ 20'	21-21,17, light brown sek city streaks, very .	clayey sand, fine grained,	None	Wet
Boring Terminated at 30' Boring Terminated at 30' Boring Terminated at 30' Coment Coment Total Depth: 30 feet Filter Sand V Water Laved ESApex Science Inc. Total Depth: 30 feet Filter Sand Science Inc.	20 17 18 19						25-30	SM	Sund, greenish brown (1 very fine grained	') grading to orangish	browa, silty,	None	Wet
Coment Total Depth: 30 feet Filer Sand Water Laved ESApex Filter Sand (Size/Interval): 8-30' Screen Interval: 43 (arg)-10' Grout (Type/Interval): 0-30' Grout Som 0-2'; Bentonite from 2-8' Water level: 12.5'	3 4 5								Bocing Terminsted at 30	1			
Coment Total Depth: 30 feet Riser Interval: 43 (ant)-10' ESApex Filter Sand (Skee/Interval): 8-30' Screen Interval: 10-30' Grout (Type/Interval): Grout from 0-2'; Bentonite from 2-8' Water level: 12.5'	6 7 8 9												
Constraint Constraint Constraint Constraint Constraint Image: Constraint Total Depth: 30 feet Riser Interval: 43 (agg)-10' Image: Constraint Filter Sand (Size/Interval): 8-30' Screen Interval: 10-30' Image: Constraint Grout Som 0-2'; Bentonite from 2-8' Water level: 12.5'				Coment					Rentes Ze.				
ascience inc. Filter Sand (Size/Interval): 8-30' Screen interval: 10-30' ascience inc. Grout from 0-2'; Bentonite from 2-8' Water level: 12.5'	Dep		, <u>15-00</u>	e waran Ajd			Ld Total D		0 feet	Filer Sant	Water Law	43 <u>(bes</u>)-10'	
GUIDEE LOUDELLOI PT Fluch E About Count of	toscia	npex Ince is	10.		Filter G	icout (1 Second (1 Second (1	(Size/In) Cype/In) riace Ca	terval): [ierval): [om pietier	-30' Jrout from 0-2'; Bentoni	te from 2-8'	Screen interval: Water level:	10-30 ⁴ 12.5 ⁴	

Note: This log is not to be used separate from this report. $\ensuremath{\mathsf{Burley}}_{100}\ensuremath{\mathsf{Burley}}_{100}\ensuremath{\mathsf{AB}}\e$

Phys.

HUGINGS Monitor Well PROJECT INFORMATION DRILLING INFORMATION PROJECT NOT MEDITAL, INF. DRILLERS LICENSE NO.: 6008 PROJECT NO.: 044-1821 DRILLERS LICENSE NO.: 6008 SUPERVISINO FG: Jathy D. Bannoon, P.G. Bufferd Galary SUPERVISINO FG: Jathy D. Bannoon, P.G. DRILLERS LICENSE NO.: 6008 SUPERVISINO FG: Jathy D. Bannoon, P.G. Bufferd Galary DEVELOPMENT: 12/16/2018 DRILLERS LICENSE NO.: 5008 GUE LOWNER: ALP DEVELOPMENT: 12/16/2018 Water Lowel Upon Installation SZ. Water Lowel at Time of Drilling Goodechnicel Lab Sample TBPG NO. 50027 Metric Lowel Upon Installation SZ. Water Lowel at Time of Drilling Goodechnicel Lab Sample TBPG NO. 50027 DESCRIPTION 20 SR SR Construction CLAYEY BAND: very fine to fine sand, some all, dark brown, and product brown and Brit ingr or congravel at 2.0° SC 1 2 2 93 74 32 42 Berdanilis FAT CLAY: trace and end all, reddiah brown, and Raft and nonsons and and all, reddiah brown, and reddieh br	b.
PROJECT INFORMATION DRILLING INFORMATION PROJECT: Prilag Power Plast Project Plast Prilag Plast	- III III
PROJECT: Price Prover Plant DRULER: Bufford Callier PROJECT: - 4-fibrit DRULER: Bufford Callier LOGGED BY: - 4-fibry D. Sammons, P.G. Bufford Callier DRULER: Bufford Callier SUPERVISING PG: - 4-fibry D. Sammons, P.G. Bufford Callier DRULER: Bufford Callier COMPLETION 1979/2018 Supervising PG: Supervising PG: Bufford Callier DEVELOPMENT: 12/f62018 Supervising PG: Bufford Callier DRULER: Holdow Bam Auger SUPERVISING PG: 12/f62018 Supervising PG: Bufford Callier DRUE PG: Bufford Callier DEVELOPMENT: 12/f62018 Supervising PG: Supervising PG: Supervising PG: Supervising PG: WELL OWNER: AEP User Level at Time of Drilling Gootechnical Lab Sampin TBPG No. 50027 DESCRIPTION 29 29 93 74 32 Construction CLAYEY SAND: very fine to fine sand, some all, dirticredish brown and fight gray. SC 1 Construction Construction 90 SC 1 29 93 74 32	19. 19.
LOGGED BY: Jeffey D. Sammona, P.G. SUPERVISING PG: Jeffey D. Sammona, P.G. COMPLETION: 129132016 DEVELOPMENT: 129132016 STE LOCATION: 3400 PW \$291, Hallowille, Texas WELL OWNER: AEP Wether Level Upon Installation DESCRIPTION DESCRIPTION CLAYEY BAND: very fine to fine sand, some all, dark provide at 2.0" - some all and brown, wery molat FAT CLAY: frace sand end all, reddish brown and fight gray. yellowish brown, and reddish brown and and brown and and and and and and and and and brown and and and and and and and and and an	
SUPERVISING PG: Jetitive D. Benemona, P.G. COMPLETION: 12/162016 BIELOCATION: 2009 PW 3291, Halloville, Texas WELL OWNER: AEP WELL OWNER: AEP CONSTRUCTION SUPERVISION WELL CONNECTION SUPERVISION WELL CONNECTION SUPERVISION WELL CONNECTION SUPERVISION WELL CONSTRUCTION SUPERVISION WELL CONSTRUCTION SUPERVISION WELL CONSTRUCTION SUPERVISION WELL CONSTRUCTION SUPERVISION WELL CONSTRUCTION SUPERVISION WELL CONSTRUCTION SUPERVISION WELL CONSTRUCTION SUPERVISION WELL CONSTRUCTION SUPERVISION WELL CONSTRUCTION SUPERVISION SUPERVISION WELL CONSTRUCTION SUPERVISION WELL CONSTRUCTION SUPERVISION SUPERVISION WELL CONSTRUCTION SUPERVISION SUPERVISION SUPERVISION WELL CONSTRUCTION SUPERVISION S	
COMPLETION: 12/16/2016 DEVELOPMENT: 12/16/2016 SAMPLING METHODS: 32/17 (fop of Casing) SUPFACE ELEVATION: 32/17 (fop of Casing) WELL OWNER: AEP Water Level Upon Installation SZ: Water Level at Time of Drilling Geotechnical Lab Sample TBPG No. 50027 DESCRIPTION SG SG SG SG SG SG SG SG SG SG SG SG SG SG DESCRIPTION SG	SE
STELOCATION: 200 PH 3281, Hallovitle, Texas WELL OWNER: AEP Water Level Upon Installation SZ. Water Level at Thre of Drilling Geodechnical Lab Sample TBPG No. 50027 DESCRIPTION SS. 27 SS. 70 LONGTUDE 94 20' 46.82' WELL CONSTRUCTION DESCRIPTION SS. 28' SS. 20' Construction SS. 28' SS. 20' Construction WELL CONSTRUCTION DESCRIPTION SS. 29' SS. 20' SS. 2	7
WELL OWNER: AEP LATITUDE 32 27 38.30° LONGTUDE 94 28 18.82° Water Level Upon Installation SZ. Water Level at Time of Drifting Geotechnical Lab Sample TBPG No. 50027 DESCRIPTION gg	
Water Level Upon Installation SZ. Water Level at Time of Drifting Geotechnical Lab Sample TBPG No. 50027 DESCRIPTION 90 0000 1 <t< td=""><td></td></t<>	
DESCRIPTION SI SI </td <td></td>	
DESCRIPTION gray gray </td <td></td>	
CLAYEY SAND: very fine to fine sand, some all, dark brownieh black and brown, very molat FAT CLAY: trace sand and all, raddish brown and Bight gray - some aft and increations in thin scame at 2.5°, light gray, yellowish brown, and reddish brown,	
CLAYEY BAND: very fine to fine sand, some allt, dark brownieh black and brown, very molat FAT CLAY: trace sand end allt, raddish brown and light gray - some allt and kronstone in thin seams at 2.5', light gray, yellowish brown, and raddish brown, = Sch 40 PVC	
CLAYEY SAND: very fine to line sand, some allt, dark brownish black and brown, very molat FAT CLAY: trace sand and allt, reddish brown and light gray - some bit and ironstone in thin seams at 2.5', light gray, yellowish brown, and reddieh brown, - some fit and ironstone in thin seams at 2.5', light gray, yellowish brown, and reddieh brown, - some fit and ironstone in thin seams at 2.5', light gray, yellowish brown, and reddieh brown, - some fit and ironstone in thin seams at 2.5', light - some fit and ironstone in thin seams at 2.5', light - some fit and ironstone in thin seams at 2.5', light 	
CLAYEY SAND: very fine to fine sand, some allt, dark brownish black and brown, very molat FAT CLAY: trace sand and allt, reddish brown and light gray - some sit and ronstone in thin seams at 2.5', light gray, yellowish brown, and reddish brown, - some sit and ronstone in thin seams at 2.5', light gray, yellowish brown, and reddish brown, - some sit and ronstone in thin seams at 2.5', light gray, yellowish brown, and reddish brown, - some sit and ronstone in thin seams at 2.5', light gray, yellowish brown, and reddish brown, 	Post R
CLAYEY SAND: very fine to fine sand, some allt, dark brownish black and brown, very molat FAT CLAY: trace sand and allt, reddish brown and light gray - some sit and incusione in this scame at 2.5', light gray, yellowish brown, and reddish brown, gray, yellowish brown, and reddish brown, and reddish brown, and reddish brown, gray trace at 2.5', light	₩P
CLAYEY SAND: very fine to line sand, some allt, dark brownish black and brown, very molat FAT CLAY: trace sand and allt, reddlish brown and light gray - some sit and ironatione in thin scame at 2.5', light gray, yellowish brown, and reddleh brown, Bentonite T T T T T T T T T	
CLAYEY BAND: very fine to fine sand, some allt, dark brownish black and brown, very molat FAT CLAY: trace sand and allt, reddish brown and sight gray - some sit and ironatone in thin seams at 2.5', light gray, yellowish brown, and reddieh brown, Bentanite 7	
FAT CLAY: trace and and allt, reddish brown and light gray - some sit and increations in this scame at 2.5', light gray, yellowish brown, and reddish brown, Bentonite 	
Bight gray - some iton one gravel at 2.0' - some silt and ironatone in thin seams at 2.5', light gray, yellowish brown, and reddleh brown, Bentonite 	
- some for one gravel at 2.0" - some sit and increatione in thin seams at 2.6", light gray, yellowish brown, and reddleh brown, 	
gray, yellowish brown, and reddleh brown, 5 5 6 7 8 93 74 32 42 5 8 entonite 7 8 8 entonite 7 8 8 8 9 9 9 7 4 9 9 7 8 9 9 7 9 7 9 9 7 9 7 9 9 7 9 7 9	
CLAYEY SAND: interbedded clays and fine to very SC	
toddish brown and fight oray	
- Bome clay and trace of iron ore gravel at 11', light	
- trace clay at 13, this saturated ironatone and	
reddish brown, and light gray	
- derk reddish brown at 15'	
light gray	
SILTY CLAYEY SAND: very fine to fine sand, SM-SCT TT-17	
- some clay lanses and iron ore gravel at 20'	
□ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □	
- Some iron are gravel at 26', reddish brown, very	
CLAYEY SAND: very fine to fine sand, dark gray SC 23 30 25 18 7	
NOTES: This log should not be used separately from the original report. Not all USCS descriptors were laboratory verified. Page 1 of 1	

(T)

		Monito	ring Well	Construction	Diagram	
Project Number:	111173			Well Number:	AD-37	
Project Name:	AEP-Pirk	(ev		Property Owner:	AFP	
Geologist:	David Ba	rker	<u> </u>	Northing	303026 2640	
Drilling Company	Plains Fr	vironment	al Senvicor	Facting:	2026676 2407	
Driller		hia		Edoling.	29200/0.310/	
Dimor.	06336 NC	naið		Jourvey Datum.	Texas State Plane	North Central (4202)
Drilling Method Borehole Diameter	Hollow Ster	m Auger	-		Lock Keyed to:	J-plug AEP monitoring well
Elevations		7			Material:	steel
Top of Casing (TOC)	336.6	5			Length:	5
Ground Surface (GS)	334.0	<u>ם</u>			Pea Gravel (Y/N):	N
Reference Point (RP)	protective cove	r)	1 Dr 186	H HARDER	Weep Hole (Y/N):	N
		2 2	T T H	2 1 1 1	Guage Mark (Y/N):	Y
Dates Drilling/Installation Start	2/22/2019				Bollards (# and type):	4 - steel
Installation Complete	2/22/2019	5			Surface Pad:	
Well Completed	3/6/2019				Dimensions:	4' x 4' x 4"
Development Start	2/23/2019		19 A.		Material:	concrete
		1			Annular Seal:	
					Type & Size:	bentonite chips
					Manufacturer:	PDS
	Depth to				Amount Used: (in	cluded with bentonite seal)
Annular Material	Тор	Total	Elevation		-	
Annular Seal	from GS	Pootage	of lop		Bentonite Seal:	
Bentonite Seal	0	0.7	334.0		Type & Size:	chips 3/8"
Secondary Filter Pack					Amount Used:	4.5 bags / 225 lbs
Filter Pack	8.66	8.3	325.3			
Backfill	0				Secondary Filter Pack:	
Bolicin of Borenole	1/		317.0		Type & Size:	
			l l l l l l l l l l l l l l l l l l l		Manutacturer:	
Casing Materials	Total	Elevation			Amount Used:	
Measurements	Footage	of Top			Primary Filter Pack:	
Total Riser Installed	15.01	NA			Type & Size:	sand 12/20
Total Riser Cutoff	0.69	NA			Manufacturer:	Pioneer Sands
Screen	5.00	322.28			Amount Used:	4 bags / 200 lbs
Total Dopth from TOC	0.28	317.28				
	13.0				weil Casing:	DVC
					Diameter	2"
Groundwater Levels					Sch. or Weight:	Sch. 40
		Reference			Manufacturer: Env	vironmental Manufacturing
Date & Time	Depth	Point			Screen Type:	PVC factory slot
02/23/2019 1225	15.12	TOC			Screen Slot Size:	0.010"
02/24/19 1100	15.5	100	t de la companya de la		Bottom Cap Type:	threaded
					Centralizers (Y/N)	N
			EZ EZ	1.07/11/11/1	Material:	_
					Number:	-
					Depth(s):	**
					Backfill Material:	
					Type & Size:	NA
					Manufacturer:	-
					Amount Used:	~~

						Dr	<u>illin</u>	g Lo	g						
			Proje AF	ect Name EP Pirkev CSM				Project N	lo. 11117	3	Borlr	ng/Monitor	ning Well I	Number 17	
	BUR	2NS	Coor	dinates	0000	105.2		Ground E	Elevation	<u> </u>	Page)			
		DONNELL.	N Total	Depth (feet)	: 32034 Hole Si	125.2 ze (inches))		333.60) /ia			1 of	2	_
	- 0'-		<u> 21</u>		2.2	5"/ 8.25'	"	Driller	J. KON	/ig				·	
Drillin		Geoprobe 7822L						Drilling C	ompany	Plair	is Enviro	nment	al Servi	Ces	_
Date	2/22/	2019		Logged By: D.	Barker	1		Reviewe	d by:				Approved	by:	
Elevation (MSL	Depth (feet bgs	Desc	riptic	on		Graphic Log	Sample Tvne	Sample Number	Blow Count	N Value	Sample Recovery/Length (feet)	Penetrometer (tsf)	PID Reading (ppm)	Depth to water while drilling Depth to water after drilling Remarks	-
333 332	1	SAND and SILT (10YR 3/4), fine damp, loose; SM SAND, reddish grained, poorly <u>c</u> CLAY, yellowish Red (2.5YR 3/6) medium density, plasticity; CL.	, dark grain /. /ellov rade Red , with trace	x yellowish Brow ed poorly sorted (7.5YR 6/8), fii d, damp, loose; (5YR 5/8) to da sand, damp, e to medium	n ne SP. rk		мс	1		NA	4.5/5	NA	NA		
330	3 1 1 1														1.11.11.11.1
328	5 1	- sand content in	creas	sing below 5.0'										-	
327		CLAY, light Gray (7.5YR 8/1) to da damp, stiff, trace CL.	r (7.5° ark Re to m	r R 7/1) to White ed (10R 3/6), edium plasticity	;		мс	2		NA	АІА	NA	NIA.		
326		- trace very fine laminations, Red	raine (2.5)	ed sand YR 4/8) below 7.	.0'		MC				4/4	NA	NA		
325	- - 9	SAND, yellowish fine to fine graine clay, damp, loost SP.	Red d, po to m	(5YR 5/6), very orly graded, traded, traded edium plasticity	ce ;									-	
324	- 10													No free water	
323 322		CLAY, light Gray Yellow (7.5YR 6/ medium to stiff, n	(5YR 8), so nediu	7/1) to reddish me sand, damp m plasticity; CL			МС	3		NA	4/4	NA	NA	udserved -	
321	12														
320							мс	4		NA	4/4	NA	NA	-	

				Name AEP Pirkey CSM						Boring/Monitoring Well Number			
	BUR	RNS	Project Name AEP Pirl	key CS	М			Page	2 of 2				
	MC	DONNELL.	Project Number 111173					Date	2/22/2	<u>019</u>			
	• •												
Elevation (MSL)	Depth (feet bgs)	Descr	ription	Graphic Log	Sample Type	Sample Number	Blow Count	Value	Sample Recovery/Length (feet)	Penetrometer (tsf)	PID Reading (ppm)	Remarks	
319	15	SAND, brownish fine to fine grain to some clay, da - medium to high with increased cl SAND and CLAY	Yellow (10YR 6/8), very ed, poorly graded, trace imp to moist, loose; SC. plasticity in portions lay content /, brownish Yellow										
318	16	(10YR 6/8) to lig fine to fine graine damp to moist, n - clay content inc content decreasi - trace sand cond	ht Gray (10YR 7/2), very ed sand, poorly graded, nedium density; SC. reasing, moisture ng below 15.0' cretions below 16.0'		MC	4		NA	4/4	NA	NA		
316	17 18	CLAY, dark Brow damp, stiff, medi CLAY, brownish sand, moist to we plasticity; CH.	vn (10YR 3/3), some silt, um plasticity; CL. Yellow (10YR 6/8), with et, very soft to soft, high										
315 314		CLAY, very dark 3/2), trace sand, medium to stiff, n SAND, dark Gray	grayish Brown (10YR trace silt, damp, nedium plasticity; CL. / (10YR 4/1), very fine		MC	5		NA	4/4	NA	NA		
313	20	grained, poorly gi loose to medium;	raded, with clay, damp, SC.										
	22	21 feet bgs.	, End of boring at									Monitoring well installed on 2/22/2019	
	23												
	24												
	25												
	26												
	28												

AEP PIRKEY SOILBORINGLOGS.GPJ 5/9/19

		Monito	ring Well	Constructio	n Diagram	
Project Number:	111173			Well Number:	AD-38	
Project Name:	AEP-Pirk	ey		Property Owne	r: AEP	
Geologist:	David Ba	rker		Northing	303089 4584	
Drilling Company:	Plains Er	vironment	al Services	Easting:	2926690 2076	
Driller:	Jesse Ko	lvia		Survey Datum:	Texas State Plane North Central	(4202)
				Jourrey Dutani.		(+202)
Drilling Method	: Hollow Ster	n Auger			Lock Keyed to: AEP monitoring	weil
Borehole Diameter	: 8.25-inch					
					Protective Cover:	
Elevations		1		5 5	Size: 4*	
Top of Casing (TOC)	347.3	3			Length: 5	— I
Ground Surface (GS)	344.7	7			Pea Gravel (Y/N): N	
	protective cover	۲ <u>۲</u>	A DESER	inter the	Weep Hole (Y/N): N	
			F	I II I	Guage Mark (Y/N):	—— I
Dates	2/21/2010				Bollards (# and type): 4 - steel	
Installation Complete	2/21/2019	5	1		Surface Pad:	
Well Completed	3/6/2019	1		III IIII 🔅 🛰	Dimensions: 4' x 4' x 4"	
Development Start	2/23/2019		1.000		Material: concrete	
Ceveropment Complete	2/23/2019	<u>'</u>			Appular Sock	
					Type & Size: bentonite chir	s
					Manufacturer: PDS	<u> </u>
	Depth to				Amount Used: (included with bentoni	ite seal)
Annular Material	Тор	Total	Elevation			
Annular Seel	from GS	Footage	of Top		Bentonite Seal:	i.
Bentonite Seal	0	10.5	344.7		Type & Size: chips 3/8" Menufacturar: DDS	
Secondary Filter Pack			III		Amount Used: 5 baos / 250 lt	os I
Filter Pack	10.3	7.7	334.4			
Backfill Bottom of Borebole	19		226 7		Secondary Filter Pack:	
Dottoin or Dorenoie	10		320.7	Ч Ш	l ype & Size:	
			l l l l l l l l l l l l l l l l l l l	3 88	Amount Leed:	—— II
Casing Materials	Total	Elevation				
Measurements	Footage	of Top			Primary Filter Pack:	
Total Riser Installed	17.30	NA NA			Type & Size: sand 12/20	(
Screen	4.99	331.53			Amount Used: A bace / 200 lb	<u>s</u>
Bottom Cap	0.35	326.54			Anoun 0566. 4 06937 200 E	
Total Depth from TOC	21.11				Well Casing:	
					Type: PVC	
Groundwater Levels					Sch or Weight: Sch 40	
		Reference			Manufacturer: Environmental Manufa	cturing
Date & Time	Depth	Point			Screen Type: PVC factory sk	ot
2/24/2019	15.5	TOC		11////	Screen Siot Size: 0.010"	[
					bottom Cap Type:threaded	[]
					Centralizers (Y/N): N	
			L_2	<u> </u>	Material:	
					Number:	[
					Dahu(z):	<u> </u>
					Backfill Material:	li li
					Type & Size: NA	
					Manufacturer: -	
· · · · · · · · · · · · · · · · · · ·						

Drilling Log

			Proje	ct Name			Project	No.	70	Bori	ng/Monito	ring Well	Number	
	BUF	RNS	Coord	dinates			Ground	TTTT Elevation	3	Pag	9	AD-3	38	
	MC	DONNELL.	N	6874854.3 E 320	3331.6			344.2	0			<u>1 of</u>	13	
			28	.5 2	25"/ 8.2	5"	Driller	J. Kol	vig					
Drilli	ng Rig	Geoprobe 7822D	Т				Drilling	Company	Plair	ns Enviro	nment	al Serv	rices	
Date	2/21	/2019		Logged By: D. Bark	er		Reviewe	id by:				Approved	d by:	
SL)	gs)			· _ · · ·					T	-s	` '	T	T T	
Elevation (M:	Depth (feet b	Descr	iptio	n	Graphic Log	Sample	Sample	Blow Count	Value	Sample Recovery/Leng (feet)	Penetrometer (tsf)	PID Reading (ppm)		water Illing water ling
344		CLAY, Brown (2.	5YR	4/3), with sand,	/////			1	†			1		-
343 342	1	SAND, strong Br (10R 4/8), very fi with silt, some m concretions, dam SAND, strong Br grained, poorly g grains, damp, me CLAY, strong Br	own (ne gra ediurn p, me own (raded ediurn	7.5YR 4/6) to Red ained, well graded, adjund density; SM./ 7.5YR 5/6), fine density; SP. 7.5YR 5/8) to dark										
341	3	Red (10R 3/6), to damp, medium to plasticity; CL. - sand content ind	Red stiff, reasi	(4/6), some sand, trace to medium ing below 2.5'		MC			NA	3.5/5	NA	NA		
340	4													
339 338	6 1	CLAY, light Gray (7.5YR 8/1) to Da damp stiff, trace t CL. - trace very fine g laminations, Red	(7.5Y rk Re o me rained (2.5Y	R 7/1) to White d (10R 3/6), dium plasticity; d sand R 4/8)										
337	7	- trace iron stainin SAND, strong Bro	g bel wn (7	ow 7.1' .5YR 5/8), very		мс	2		NA	5/5	NA	NA		
336	8-1	fine grained, poorl damp, medium to	y gra dens	ded, trace silt, e; SP.										- THE F
35	9-1-1-1	- trace clay below SAND, reddish Ye strong Brown (2.5	9.0' llow (/R 5/	7.5YR 6/8) to 8), very fine to										
34	10	tine grained, poort damp, medium to	y grad dense	ded, trace clay, e; SP.									No free water observed	
133	- 11	- clay content incre (7.5YR 7/1) to Whi (2.5 YR 3/1) below	easing te (2. 10.5	g, light Gray 5YR 8/1) to Gray										
32	- 12	SAND, strong Brow fine to fine grained silt, damp, medium	vn (7. , poo i to di	5YR 5/8), very rly graded, trace ense; SP.		MC	3		NA	5/5	NA	NA		<u> </u>
131	13 - 13 - - -													<u> </u>

								Boring/M	lonitoring W	ell Numbe	r	AD-38
	BUR	2NS	Project Name AEP Pi	rkey CS	M			Page	2 of 3			
	MC	DONNELL.	Project Number 111173					Date	2/21/2	2019		
Elevation (MSL)	Depth (feet bgs)	Descr	iption	Graphic Log	Sample Type	Sample Number	Blow Count	Value	Sample Recovery/Length (feet)	Penetrometer (tsf)	PID Reading (ppm)	Remarks
330		SAND, light Gray Yellow (7.5YR 6/ grained, poorly g to moist, loose to	SAND, light Gray (7.5YR 7/1) to reddish Yellow (7.5YR 6/8), very fine to fine grained, poorly graded, with clay, damp to moist loose to medium: SC					NA	5/5	NA	NA	-
329	15	- medium plastic increased clay co	- medium plasticity in portions of increased clay content					1	1			
328	16	- sand content in	- Sand content increasing clay content									
327	17	decreasing below	v 16.5'		мс	4		NA	5/5	NA	NA	
326	18	sand, damp to m medium to high p	oist, soft to medium, lasticity; CL-CH.									
325	19											
324	20	CLAY, very dark 3/2), trace sand, i medium, medium	grayish Brown (10YR trace silt, damp, plasticity; CL.									
323	21											
322	22				мс	5		NA	5/5	NA	NA	
321	23											
320	24	- sand content inc	reasing below 24.0'									
319	25	SAND, dark Gray grained, poorly gra to moist, loose to										
318	26			MC	6		ΝΑ	0 5/0 5				
317	27			MC	U		NA	3.0/3.0	NA	NA		
316	28	Polycal on abote									-	
	-	28.5 feet bgs.										Monitoring well

AEP PIRKEY SOILBORINGLOGS.GPJ 5/9/19

									Boring/Mo	nitoring We	II Number	/	AD-38	
	BUR	RNS	Project Name	AEP Pirk	ey CSI	М	_		Page	3 of 3				
	MC	DONNELL.	Project Number	111173					Date	2/21/20	019			
Elevation (MSL)	Depth (feet bgs)	Desci	iption		Graphic Log	Sample Type	Sample Number	Blow Count	N Value	Sample Recovery/Length (feet)	Penetrometer (tsf)	PID Reading (ppm)	Remarks	
	30 - 31 - 32 - 33 - 33 - 33 - 33 - 33 - 33													

AEP PIRKEY SOILBORINGLOGS.GPJ 5/9/19

		Monito	ring Well	Construction	Diagram	
Project Number:	111173			Well Number:	SB-5S (AD-44)	
Project Name:	AEP-Pirk	ey		Property Owner:	AEP	······
Geologist:	David Ba	rker		Northing:	303116,2329	
Drilling Company:	MHC X-F	Ploration Co	proration	Eastino:	2925753,9859	
Driller:	Jason Sn	nith		Survey Datum:	Texas State Plane	North Central (4202)
					Cap Type:	J-plug
Drilling Method:	Rotary Was	sh	_		Lock Keyed to:	AEP monitoring well
Borenole Diameter:	6.75-Inch		-		Brotastiva Covar	
					Material:	steel
Elevations]			Size:	4"
Top of Casing (TOC)	341.8	8			Length:	5'
Reference Point (RP)	0.000 000und surface	2			Pea Gravel (Y/N):	<u>N</u>
	Broatin on 1999		白 和天行		Guage Mark (Y/N):	Y
Deter			- 1886 F	h in Si		
Drilling/Installation Start	2/24/2010	-			Bollards (# and type): _	4 - steel
Installation Complete	2/24/2019	i i	100		Surface Pad:	
Well Completed	3/18-25/2019	1	Theory I		Dimensions:	4' x 4' x 4"
Development Start	2/25/2019				Material:	concrete
Development Complete	2/25/2019				Annular Seal	
					Type & Size:	bentonite chips 3/8"
					Manufacturer:	Cetco
	Depth to				Amount Used:	1 bag / 50 lbs
Annular Material	Тор	Total	Elevation		_	
Measurements Annular Seal	from GS	Footage	of Top		Bentonite Seal:	
Bentonite Seal	0	12.0	330.0		I ype & Size: Manufacturer:	PDS
Secondary Filter Pack			·		Amount Used:	1 bucket / 50 lbs
Filter Pack	12	13.0	326.8			
Bottom of Borebole	25		313.8		Secondary Filter Pack:	
	<u> </u>				Manufacturer:	
			8		Amount Used:	
Casing Materials	Total	Elevation				
Measurements	Footage	of Top			Primary Filter Pack:	
Total Riser Cutoff	2.43	NA			I ype & Size:	Sand 16/30
Screen	10.00	324.23			Amount Used:	6 bags / 300 lbs
Bottom Cap	0.43	314.23				
Total Depth from 100	28		3		Well Casing:	DVC
					Diameter:	2"
Groundwater Levels					Sch. or Weight:	Sch. 40
Data 8 Time	Denth	Reference			Manufacturer:	Campbell Monoflex
	Depth	Point			Screen Type:	PVC factory slot
					Bottom Cap Type:	threaded
				<u> </u>	Centralizers (Y/N):	<u>N</u>
L					Number	
					Depth(s):	-
					Deal-Sil Material	
					Dackilli Material: Type & Size	NA
					Manufacturer:	-
					Amount Used:	

	·	Monito	ring Well	Construction	Diagram	
Project Number:	111173			Well Number:	SB-5D (AD-45)	<u></u>
Project Name:	AEP-Pirk	ey		Property Owner	: AEP	
Geologist:	David Ba	rker		Northing:	303126,7816	
Drilling Company:	MHC X-F	Ploration C	orporation	Eastino:	2925748.8859	
Driller:	Jason Sr	nith		Survey Datum:	Texas State Plan	e North Central (4202)
					Cap Type:	J-plug
Drilling Method	: Rotary Was	sh	-		Lock Keyed to:	AEP monitoring well
	. <u>0.75-indi</u>		-		Protective Cover:	
i		_			Material:	steel
Elevations	244.0	-			Size:	4 ^m
Ground Surface (GS)	338.4	1			Length: Rea Ground (V/N):	<u>5'</u>
Reference Point (RP)	ground surface		1		Weep Hole (Y/N):	N
			日 1300		Guage Mark (Y/N):	Y
Dates		1				
Drilling/Installation Start	2/23/2019	1			Bollaros (# and type):	4 - steel
Installation Complete	2/23/2019	1			Surface Pad:	
Well Completed	3/18-25/2019	-			Dimensions:	4' x 4' x 4"
Development Complete	2/27/2019				Material:	concrete
					Annular Seal:	ľ
					Type & Size:	bentonite chips 3/8"
					Manufacturer:	Cetco
Ampulas Material	Depth to				Amount Used:	8 bags / 400 lbs
Measurements	from GS	Footage	Elevation		Bandan Ka Osak	
Annular Seal	110111 03	47.0	338.4		Bentonite Seal: Type & Size:	cellets 3/8"
Bentonite Seal	0				Manufacturer:	PDS
Secondary Filter Pack	47	40.0			Amount Used:	1 bucket / 50 lbs
Backfill	47 60	10.0	291.4		Secondary Either Deals	
Bottom of Borehole	70	10.0	268.4		Type & Size	
			×		Manufacturer:	
			. 18	8 88	Amount Used:	
Measurements	Footage	clevation of Top			Dulas Clifere Desit	
Total Riser Installed	60.00	NA			Type & Size	sand 16/30
Total Riser Cutoff	7.83	NA			Manufacturer:	U.S. Silica Company
Screen Bottom Con	10.00	288.83			Amount Used:	7 bags / 350 lbs
Total Depth from TOC	62.6	210.03			Well Casing	
					Type:	PVC
Constanting					Diameter:	2"
Groundwater Levels		Reference		8. <i>1</i> 83	Sch. or Weight:	Sch. 40
Date & Time	Depth	Point			Manutacturer:	Campbell Monoflex
				mmm	Screen Slot Size:	0.010"
					Bottom Cap Type:	threaded
					Controlizons (V/M)	N
			Ľ	1111111	Material:	
					Number:	ne-
					Depth(s):	
					Backfill Meterial	
					Type & Size:	formation
					Manufacturer:	-
					Amount Used:	

_			Le.	-4 Marian	_	D	rillir	ig Lo	g						
	-		AE	ct Name P Pirkey CSN	1			Project N	No. 1111	73	Bo	ring/Monite 3-05 (Al	oring Well D-44 ar	Number nd AD-45)	
			Coord	linates	3202	470 7		Ground I	Elevation	0	Pa	ge			
		DOMNELL.	Total	Depth (feet)	Hole S	Size (inche	s)	Deller	338.4	- <u>U</u>			1 01	15	
Drilli	ng Rig	Ardco 4x4	[70		<u> 6,7</u>	<u>′5″</u>		Drilling C				otion			
Data	2/23/	2019										auon			·
	6	2015		Logged By: D. L	Sarke		T	Reviewe	d by:	·			Approve	d by:	
Elevation (MSI	Depth (feet bg	Descr	iptio	n		Graphic Log	Sample	Sample Number	Blow Count	Value	Sample Recovery/Length	Penetrometer (tsf)	PID Reading (ppm)	Depth to while dri Depth to after drill Remark	water lling water ing S
338		CLAY, pinkish G (2.5YR 4/6), som soft, high plastici	iray (7 ne san ity; Cŀ	.5YR 7/2) to Re id, damp to moi l.	d st,		SS	1			1/1	NA	NA		-
337	2						SS	2			1/1	NA	NA		1 1 1
336	3						SS	3			1/1	NA	NA	_	
335							SS	4			1/1	NA	NA		-
334			_				SS	5			1/1	NA	NA		
333		SAND, Red (2.5Y pinkish Gray (7.5) fine grained, poor medium density; \$	'R 4/6 YR 7/2 ty gra SP.	to 4/8) some 2), very fine to ded, damp,											1
332	7	SAND, reddish Ye yellowish Red (5Y grained, poorly gra SAND, pinkish Gr	ellow ('R 5/8 aded, 'ay (7.	(5YR 6/8) to), very fine damp, loose; S 5YR 7/2 to 6/2)											L
331		trae clay laminatio density; SP. SAND, yellowish F	rained ons, da Red (f	l, poorly graded, amp, medium SYR 5/8) very fir			МС	1		NA	4/5	NA	NA		
330		to fine grained, po medium density; S SAND, pinkish Gra to fine grained, po	orly g SP. ay (51 orly g	raded, damp, /R 7/2), very fin raded, trace cla	e y,										
329		damp, dense; SP- - clay content incre (7.5YR 5/8) below - dark Red (10R 3/	·SC. eases ' 7.5' /6), ce	, strong Brown emented below											
328		Clayey below 7.9 SAND, strong Brow fine to fine grained	wn (7. 1, pool	5YR 5/8), very rly graded, dam	 p				···					No free water observed	
327	12	- iron concretions, to thin beds below CLAY, light Gray (Red (10R 3/6), sor	ceme 10' 7.5YF	ented lamination 7/1) to dark nd, damp,	s		МС	2		NA	5/5	NA	NA		
26	- - 13	medium density, m plasticity, increase base; CL-CH. - ironstone concret	nediur d san tion le	n to high d content at ns at 11.7'			-			t		104			
25		SAND, dark Red (2 (2.5YR 5/6), fine gr damp medium den	2.5YR rained isity; 5	3/6) to Red , poorly graded SP.	-										

								Boring/M	onitoring We	ell Numbe	r SB-05	5 (AD-44 and AD-45)		
	BUF	RNS	Project Name AEP P	irkey CS	M			Page	2 of 5			<u> </u>		
	MC	DONNELL.	Project Number 11117:	3				Date	2/23/2	019				
Elevation (MSL)	Depth (feet bgs)	Descr	iption	Graphic Log	Sample Type	Sample Number	Blow Count	Value	Sample Recovery/Length (feet)	Penetrometer (tsf)	PID Reading (ppm)	Remarks		
324	45	SAND, dark Red (2.5YR 5/6), fine damp medium de	(2.5YR 3/6) to Red grained, poorly graded, ensity; SP.		мс	2		NA	5/5	NA	NA			
323	15	SAND, strong Br Gray (7.5YR 7/1) grained, poorly g clay, damp, med portions through	own (7.5YR 5/8) to light), very fine to fine raded, trace to some ium density, cemented but; SC.											
322	17													
320	18	SILT, very dark G sand, dry to dam trace plasticity; M	Gray (10YR 3/1), some p, very stiff to hard, IL.		MC	3		NA	5/5	NA	NA			
319	19-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-													
318	20	SAND, dark Gray fine grained, poor moist, medium to	(10YR 4/1) very fine to ty graded, damp to dense; SP											
317	21													
316	23-				мс	4		NA	5/5	NA	NA			
315	24							:						
314	25	- moist, with clay t	below 24.5'									- - - 		
313	26	SAND, dark Brown (10YR 4/2), very fi trace to some silt,	n (10YR 3/2) to Brown ine to fine grained, damp, dense; SM.											
312	27				MG	5		NA	5/5	NA	NA			
311	28-1								0/0					
310		SILT and SAND, d to dark Gray (10YF to stiff, trace plasti	lark Brown (7.5YR 3/2) R 4/1), damp, medium city; ML.											
										Boring/M	onitoring We	I Numbe	SB-05	(AD-44 and AD-45)
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	BUR	NS	Project Name	AEP Pirk	ey C	SM				Page	3 of 5			
	MC	DONNELL.	Project Number	111173						Date	2/23/2	019		
Elevation (MSL)	Depth (feet bgs)	Desci	ription		Graphic	fini	Sample Type	Sample Number	Blow Count	N Value	Sample Sample Recovery/Length (feet)	Penetrometer (tsf)	PID Reading (ppm)	Remarks
309		SILT and SAND to dark Gray (10 to stiff, trace place	, dark Brown (7.5 YR 4/1), damp, n sticity; ML.	5YR 3/2) nedium			мс	5		NA	5/5	NA	NA	
308	30	- grades to very	stiff to hard below	w 30.2'										
307	31								:					
306	32													
305	33													
304	34													
303	35					ſ	мс	6		NA	7/10	NA	NA	
302	36	- medium consist	tency from 36.0'-:	36.7'										
301	37—	- sand content ind	creasing below 3	7.0'										-
300	38			ŧ										
299	39 - -													
298	40	CLAY, dark Brown dark Gray (10YR silt, damp, stiff to plasticity; CL.	n (10YR 3/2) to v 3/1), trace sand, very stiff, trace	very trace										
297		SAND, dark Gray dark Gray (10YR3	(10YR 4/1) to ve 3/1), very fine gra	ery lined,										
296	42	poorly grouou, dry	, .ory dense, OF			М	1C	7		NA	10/10	NA	NA	
295	43													

									Boring/M	onitoring We	II Number	SB-05	(AD-44 and AD-45)
	BUF	RNS	Project Name	AEP Pirk	ey CSI	N			Page	4 of 5			
	Mc	DONNELL.	Project Number	111173					Date	2/23/2	019		
			<u> </u>									_	
Elevation (MSL)	Depth (feet bgs)	Desc	ription_		Graphic Log	Sample Type	Sample Number	Blow Count	N Vatue	Sample Recovery/Length (feet)	Penetrometer (tsf)	PID Reading (ppm)	Remarks
294		SAND, dark Gra dark Gray (10YF poorly graded, d	y (10YR 4/1) to v २३/1), very fine gr ry, very dense; Si	ery ained, P.									
293	40	SAND, light Gra Gray (10YR 4/1) poorly graded, d	y (10YR 7/1) to da , very fine grained amp, dense; SP.	ark d,									
292	40					МС	7			40/40			
291	47	- trace lignite at 4	47.0'						NA	10/10	NA	NA	
290	40 -											-	
289	49												
288		SAND, Gray (10) (7.5YR 3/2), very graded, trace silt dense; SP	(R 5/1) to dark Br fine grained, poo trace lignite, dan	rown orly np,									
287	52												-
286													
285		- increased silt co	ntent below 53'										
284	54					мс	8		NA	6/10	NA	NA	
283	55	SAND, Gray (10Y grained, poorly gr medium density; \$	'R 5/1), fine to me aded, moist to we SP.	edium et,									
282	56												
281	57— - -												
280	58												

									Boring/	Monitoring W	ell Numbe	sB-05	(AD-44 and AD-4	45)
	BUI	RNS	Project Name	AEP Pir	key CS	SM			Page	5 of 5				
	M	DONNELL.	Project Number	111173					Date	2/23/2	2019			
<u> </u>	-1													
Elevation (MSL)	Depth (feet bgs)	Descr	iption		Graphic Log	Sample Type	Sample	Blow Count	N Value	Sample Recovery/Length (feet)	Penetrometer (tsf)	PID Reading (ppm)	Remarks	
!79	60	grained, poorly g medium density;	raded, moist to v SP.	vet,		мс	8		NA	6/10	NA	NA		
278	61	LIGNITE, Black (N2), moderately - SAND lamination throughout, Gray	(N1) to grayish B strong. ons to thin beds (10YR 5/1)	lack					1					
277		SAND, Gray (10) grained, poorly g	YR 5/1), fine to m raded, moist to y	edium vet,										
276		medium density;	SP.											
75	63 -													
74	64													111
73	65	SAND and SILT, to Brown (7.5YR sand, poorly grad damp, dense to v	dark Brown (7.5) 4/2), very fine gra ed, trace lignite, ery dense; SM.	(R 3/2) ained dry to		MC	9		NA	6/10	NA	NA		1111
72														
71	67 													
70	68 													
69	69													يأديا
	70	Boring terminated	at 70 feet bgs.										Temporary Piezometer	
	71												Installed on 2/23/2019	
	72													
	73													
	<u> </u>													-

		Monito	ring Well	Construction	Diagram	
Project Number:	111173			Well Number:	SB-6S (AD-46)	
Project Name:	AEP-Pirk	key		Property Owner:	AEP	
Geologist:	David Ba	rker		Northing:	301335,6380	<u> </u>
Drilling Company:	Plains Er	vironment	al Services	Easting:	2927978,4822	
Driller:	Jesse Ko	olvig	10.5	Survey Datum:	Texas State Plane	North Central (4202)
					Cap Type:	J-plug
Drilling Method	Hollow Ster	m Auger			Lock Keyed to:	AEP monitoring well
Borenoie Diamatar	. 0.20-IIICII		-		Protective Cover	
		_			Material:	steel
Elevations	040	-			Size:	4"
Ground Surface (GS)	349.4	1			Length: Pop Gravel (V/N):	5'
Reference Point (RP)	ground surface	1			Weep Hole (Y/N):	N
		1. A.	日 神秘は	1 日本語名	Guage Mark (Y/N):	Y
Dates				1 日前日日		
Drilling/Installation Start	2/24/2019	9			Bollards (# and type):	4 - steel
Installation Complete	2/24/2019				Surface Pad:	
Well Completed	3/18-25/2019				Dimensions:	4' x 4' x 4"
Development Complete	2/27/2019	2			Material:	concrete
		1			Annular Seal:	
					Type & Size:	bentonite chips 3/8"
					Manufacturer:	Cetco
Appular Motorial	Depth to	Tatal	: Filosofica		Amount Used:	6 bags / 300 lbs
Measurements	from GS	Footage	elevation of Top		Pontonito Coali	
Annular Seal	101100	10.0	346.4		Type & Size	pellets 3/8"
Bentonite Seal	0				Manufacturer:	PDS
Secondary Filter Pack	+0	0.0	000 4		Amount Used:	1 bucket / 50 lbs
Backfill	0	0.0	330.4		Secondary Filter Book	
Bottom of Borehole	18	-	328.4		Type & Size:	
			×	3 🐯	Manufacturer:	
					Amount Used:	
Measurements	Footage	of Top			Drimony Eiltor Dooks	
Total Riser Installed	20.00	NA			Type & Size	sand 16/30
Total Riser Cutoff	4.30	NA			Manufacturer:	U.S. Silica Company
Screen	5.00	333.70	6		Amount Used:	4 bags / 200 lbs
Total Depth from TOC	21	320.70			Well Cosing:	
					Type:	PVC
					Diameter:	2"
Groundwater Levels		Reference			Sch. or Weight:	Sch. 40
Date & Time	Depth	Point			Screep Type:	PVC factory slot
			7	11111	Screen Slot Size:	0.010"
					Bottom Cap Type:	threaded
					Contralizors (V/M)	N
			Ľ		Material:	-
					Number:	
					Depth(s):	
					Backfill Material:	
					Type & Size:	NA
					Manufacturer:	-
					Amount Used:	

		Monito	ring Well	Construction	Diagram	
Project Number:	111173			Well Number:	SB-6D (AD-47)	
Project Name:	AEP-Pirk	(ey		Property Owner:	AEP	
Geologist:	David Ba	rker		Northing:	301320 6318	
Drilling Company:	Plains Er	vironment	al Services	Fasting:	2027070 1251	
Driller:	Jesse Ko	lvia	0.00111000	Survey Datum:	Tevas State Plane	North Control (4202)
				jourrey batani.	Can Type:	
Drilling Method	Hollow Ste	m Auger	-		Lock Keyed to:	AEP monitoring well
Dolenola Digitietel	. 0.20-1101		- 1		Protective Cover:	
(Planet)		-	10.5		Material:	steel
Top of Casing (TOC)	240.4	21			Size:	4
Ground Surface (GS)	346.	1			Length:	5'
Reference Point (RP)	ground surface				Weep Hole (Y/N):	N
		-	口 建氯硅	102	Guage Mark (Y/N):	Y
Dates		1 8			Bollards (# and tupo):	4 - steel
Drilling/Installation Start	2/22/2019	2	5 H. E			
Well Completed	2/24/2019	4	and the first		Surface Pad:	At At 41
Development Start	2/27/2019	fi			Dimensions:	4' X 4' X 4'
Development Complete	3/1/2019					
					Annular Seal:	
					Type & Size:	bentonite chips 3/8"
	Denth to	1			Manufacturer:	Cetco
Annular Material	Тор	Total	Elevation		Amount Used:	12 bags / 650 lbs
Measurements	from GS	Footage	of Top		Bentonite Seal:	
Annular Seal		54.0	346.1		Type & Size:	peilets 3/8"
Bentonite Seal	0	· · · · ·			Manufacturer:	PDS
Filter Pack	54	13.0	- 202.1		Amount Used:	1 bucket / 50 lbs
Backfill	67	3.0	279.1		Secondary Filter Pack:	
Bottom of Borehole	70		276.1		Type & Size:	
			XX		Manufacturer:	-
					Amount Used:	
Massumments	Footage	of Top			Drimon Filter Deals	
Total Riser Installed	60.00	NA			Thinary Filter Pack: Type & Size:	eand 16/30
Total Riser Cutoff	1.80	NA			Manufacturer:	U.S. Silica Company
Screen	10.00	291.40			Amount Used:	4 bags / 200 lbs
Total Depth from TOC	0.30	281.40			Malal Carlan	
	00.5				weil Casing:	DVC
					Diameter:	2*
Groundwater Levels					Sch. or Weight:	Sch. 40
Data 8 Time	Danth	Reference			Manufacturer: Er	vironmental Manufacturing
	Depth	Point		····	Screen Type:	PVC factory slot
					Screen Slot Size:	0.010"
					bottom cap rype.	uneaded
					Centralizers (Y/N):	N
<u> </u>					Material:	
					Number:	····
]			Deptn(s):	
					Backfill Material:	
					Type & Size:	formation
					Manufacturer:	
* ····						

Drilling Log

			Proje	ct Name			Project	No.		Borin	g/Monito	ring Well I	Number	
	BU	RNS	Coor	dinates		~	Ground	11111/ Elevation	3	Bage	06 (AD	-46 an	d AD-47)	
	M	DONNELL.	Ν	6873305.8 E 320	4726.9			346.10)	1 age		1 of	5	
			Total 70	Depth (feet) Hole	Size (inches	s) ("	Driller	J. Kolv	/ig				·	
Drilli	ing Rig	Geoprobe 7822D	T	<u>~</u>	2070.10		Drilling C	Company	Plain	s Enviro	nmenta	al Servi	ces	
Date	2/22	/2019 to 2/23/2019	9	Logged By: D. Barke	ЭГ		Reviewe	d by:				Annroved	by:	
	() ()	1					, to none		T		T			_
Elevation (MS	Depth (feet bg	Descr	iptio	n	Graphic Log	Sample	Sample	Blow Count	N Value	Sample Recovery/Length (feet)	Penetrometer (tsf)	PID Reading (ppm)	Depth to wate while drilling	۲ ۲
346		CLAY, pinkish G	ray (7	7.5YR 7/2) to Red										
345 344	1	to moist, very so CH.	ft to s	race sand, damp soft, high plasticity;		МС			NA	5/5		NA		
343	3-	CLAY, very dark Brown (7.5YR 3/2 damp to moist, se CL.	Gray 2), tra oft, m	(10YR 3/1) to dark ace silt, trace sand, nedium plasticity;		IVIC				2/3	NA	NA		
342	4	CLAY, strong Bro (2.5YR 4/6), dam medium to high p	own (i ip, so ilastic	7.5YR 4/6) to Red ft to medium, sity; CL-CH.										
341	5						-						-	
340	6	- sand content ind	creasi	ing below 6.5'									Sampled SB-06 6'-7'	
339	7					мс	2		NA	5/5	NA	NA		
338	8-													
337	9-1-1-1	- damp below 8.7 CLAY, light Gray Red (10R 3/6), tra damp, medium de plasticity: CL-CH.	(7.5Y ace to ensity	(R 7/1) to dark some sand, medium to high										
336		SAND, strong Bro fine grained, poor damp, loose; SC.	wn (7 ly gra	7.5YR 5/6), very ided, with clay,									No free water observed	
335 334	12	SAND, White (7.5 (2.5YR 3/6) to stro very fine to fine gr damp, medium de	YR 8 ong 8 ainec	/1) to dark Red frown (7.5YR 5/8), d, poorly graded, ; SC-SP.		мс	3		NA	5/5	NA	NA	-	
333	13-1 13-1	- ciay content dec	nse b	ng below 12.0' below 13.0'									-	
	1				F////									

1								Boring/Me	onitoring We	I Number	SB-06	(AD-46 and AD-47)
	BUR	INS	Project Name AEP Pi	rkey CS	M			Page	2 of 5			
	MC	DONNELL.	Project Number 111173					Date	2/22/2	019 to	2/23/2	019
Elevation (MSL)	Depth (feet bgs)	Desc	iption	Graphic Log	Sample Type	Sample Number	Blow Count	N Value	Sample Recovery/Length (feet)	Penetrometer (tsf)	PID Reading (ppm)	Remarks
332		SAND, White (7 (2.5YR 3/6) to st very fine to fine of damp, medium of	5YR 8/1) to dark Red rong Brown (7.5YR 5/8), grained, poorly graded, lensity; SC-SP.		мс	3		NA	5/5	NA	NA	
331	15	 - ironstone conci SAND, brownish fine to fine grain clay, wet, very lo 	retions below 14.9 Yellow (10YR 6/8), very ed, poorly graded, some ose; SP.									
330	17-	- medium to higr with increases cl	ay content									Sampled SB-06 16'-17'
329		- clay content de	Creasing below 17.0'		MC	4		NA	5/5	NA	NA	
327	19	Brown (7.5YR 5/ (2.5YR 5/6), very poorly graded, tra to moist, loose, t	 δ) to redish Brown fine to fine grained, ace to some clay, damp race sand concretions 									
326	20	- SAND, White (7 wet from 19.7'-19	7.5YR 8/1), fine grained, 9'				-					- - - - -
325	21											
324	22											- - - - -
323	23				MC	5		NA	5/5	NA	NA	- - - - -
322	24	- increased clay c 5/3), medium to h	ontent, Brown (7.5YR igh plasticity, ironstone									
321	25	CLAY, dark Brow (7.5YR 4/3), dam medium plasticity	/ 24.0 n (7.5YR 3/4) to Brown p, medium to stiff, ; CL.									- -
320	26 	- grades to Black dark Gray (7.5YR	(7.5YR 2.5/1) to very 3/1) at 26.0'									
319	27				мс	6		NA	5/5	NA	NA	
318	28	- sand content inc	reasing below 28.0'									

									Boring/M	onitoring We	ell Number	- SB-06	(AD-46 and AD-47)
	BUR	2NS	Project Name	AEP Pirk	key CS	M			Page	3 of 5			
	MC	DONNELL.	Project Number	111173					Date	2/22/2	<u>019 to</u>	2/23/2	019
									i				
Elevation (MSL)	Depth (feet bgs)	Desci	ription		Graphic Log	Sample Type	Sample Number	Blow Count	N Value	Sample Recovery/Length (feet)	Penetrometer (tsf)	PID Reading (ppm)	Remarks
317	30	SAND and CLAY 4/1), very fine to poorly graded, di density; SC.	r, dark Gray (7.5 fine grained san amp to moist, me	YR d, edium		мс	6		NA	5/5	NA	NA	
316	31	- medium plastic increased clay c	ity in portions wit ontent	'n		_							
314	32-1					MC	7		NA	5/5	NA	NA	
313	33									0/0			
312	34												
311	35	- clay content inc	reasing below 35	i.O'									
310	36					ĺ							
309	37					мс	8		NA	4/5	NA	NA	
308	38												
307	39								1				
306	40	- trace lignite belo	w 40.0'										
305	41					:							
304	42	SAND, Grav (7.5Y	'R 6/1), fine arain	ned.		MC	9		NA	4.5/5	NA	NA	
303	43	poorly graded, dar SP.	np to moist, den	se;									
(<u> </u>	·								_		

	_								Boring/A	Ionitoring W	eli Numbe	r SB-06	(AD-46 and AD-47)
	BUI	RNS	Project Name	AEP Pirke	ey CS	М			Page	4 of 5			
	M	DONNELL.	Project Number	111173					Date	2/22/2	2019 to	2/23/2	2019
		·											
Elevation (MSL)	Depth (feet bgs)	Desc	ription		Graphic Log	Sample Type	Sample Number	Blow Count	N Value	Sample Recovery/Length (feet)	Penetrometer (tsf)	PID Reading (ppm)	Remarks
302	45	SAND and CLA 4/1), very fine to poorly graded, d SC.	r, dark Gray (7.5 fine grained san amp, medium de	YR d, insity;		МС	9		NA	4.5/5	NA	NA	-
301	46-												
299	47—					мс	10		NA	4.5/5	NA	NA	
298	48	CLAY and SAND	very dark Gray	(7.5VD									
297	49-	3/1), damp, soft,	medium plasticit	y; CL.									~
296	50	MacroCore Refus from 50.0'-55.0'.	al. No sample co	ollected		NA	NA	NA	NA	NA	NĂ	NA	-
295	51												
294	52												
293	53												
292	54												
291	55 - -	CLAY, dark grayis trace sand, damp,	h Brown (10YR 4 medium density	4/2), , trace									
290	56	SAND, dark Gray to fine grained, po some silt, wet, loo	(7.5YR 4/1), very orly graded, trace se; SP	/ fine e to									
289	57					мс	11		NA	3.5/3.5	NA	NA	i i i i i i i i i i i i i i i i i i i
288	58												
						NA	NA	NA	NA	NA	NA	NA	1

			ļ						Boring/M	Ionitoring W	ell Numbe	r SB-0	6 (AD-46 and A	D-47)
	BUI	RNS	Project Name	AEP Pirk	ey CS	M			Page	5 of 5				
	M	DONNELL.	Project Number	111173					Date	2/22/2	2019 to	2/23/2	2019	
			l											
Elevation (MSL)	Depth (feet bgs)	Desc	ription		Graphic Log	Sample Type	Sample Number	Blow Count	Value	Sample Recovery/Length (feet)	Penetrometer (tsf)	PID Reading (ppm)	Rema	rks
287	7	MacroCore Refu from 58.5'-65.0'	isal. No sample col	lected		NA	NA	NA	NA	NA	NA	NA		
286	60-													
285	61—													
284	62													111
283	63-													
282	64													
281	65	SAND, dark Gray to fine grained, p some silt, wet, m	/ (7.5YR 4/1), very t oorly graded, trace edium density; SP.	fine to										
280	66					MC	12		NA	2/2	NA	NA		- - - -
279	67—	No sample collec	ted from 67.0'-70.0	· ·		NA	NA	NA	NA	NA	NA	NA		
278	68													-
277	69							-						
	70	Boring terminated	at 70 feet bgs.										Temporary Piezometer	
	71												Installed on 2/23/2019	
	72													
	73			ļ										



Appendix B

Photographic Log

PHOTOGRAPH LOG



Stack Out Area CCR Unit Pirkey Power Plant 2400 FM 3251, Hallsville, TX



Photograph: 1

Description:

Monitoring well AD-7 in Stack Out Area CCR Unit prior to plugging on 9/12/2023.

Direction: North

NOT

Photograph taken by: Kyle DeSantis

Date: 9/12/2023



Photograph: 2

Description:

Monitoring Well AD-7R. Stack Out Area CCR Unit located in background behind railroad tracks.

Direction: East

Photograph taken by: Kyle DeSantis

Date: 9/12/2023

PHOTOGRAPH LOG



Stack Out Area CCR Unit Pirkey Power Plant 2400 FM 3251, Hallsville, TX



Photograph: 3

Description: Monitoring Well AD-22. Stack Out Area CCR Unit located in background.

Direction: East

Photograph taken by: Kyle DeSantis

Date: 9/12/2023



Photograph: 4

Description:

Monitoring Well AD-33. Stack Out Area CCR Unit located in background.

Direction: East

Photograph taken by: Kyle DeSantis

Date: 9/12/2023



Appendix C

Water Well Inventory - 2023

Prepared for:

ARCADIS U.S., Inc-Corpus Christi 711 North Carancahua, #1700 Corpus Christi, TX 78475-1801



Water WellH.W. Pirkey Power Plant2400 FM 3241Hallsville, TX 75650

H.W. Pirkey Power Plant 2400 FM 3241 Hallsville, TX 75650 PO #: 30160167 ES-142232 Thursday, June 8, 2023

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Maps	
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Topographic Overlay Map - 1 Mile Radius	5
Current Imagery Overlay Map - 1 Mile Radius	6
Water Well Details	7
Database Definitions and Sources	47
Disclaimer	48

Geog

1 mile

Geographic Sumn	nary		ENVIRONMENTAL DATA A DIVISION OF THE BANKS GROUP
Location			
ТХ			
Coordinates			
Longitude & Latitude in Degrees	Minutes Seconds	-94° 29' 15", 32° 27' 17"	
Longitude & Latitude in Decimal	Degrees	-94.4875°, 32.4546°	
X and Y in UTM		360189.26, 3591799.89 (Zone 15)	
Elevation			
Target Property lies 348.77 feet abo	ove sea level.		
Zip Codes Searched			
Search Distance	Zip Codes (historical	zip codes included)	
Target Property	75670		
1 mile	75670, 75650		
Topos Searched			
Search Distance	Topo Name		
Target Property	Darco (1983)		

Easton (1983), Darco (1983)



Summary Map - 1 Mile Radius





Topographic Overlay Map - 1 Mile Radius





Current Imagery Overlay Map - 1 Mile Radius





Water Well Details



Map ID	Source ID	Dataset	Owner of Well	Type of Well	Depth Drilled	Completion Date	Longitude	Latitude	Elevation	Driller's Logs
1	35747	TX TWDB SDR	Tom Brown	Rig Supply	426	2/21/2004	-94.491674	32.454729	351 ft (+2)	View
2	35-37-4	TX TCEQ HIST	Amoco Production Co.	Oilfield/Rig Supply	243	11/09/1991	-94.493675	32.452116	372 ft (+23)	View
2	35-37-4	TX TCEQ HIST	Amoco Production Co.	Oilfield/Rig Supply	243	11/09/1991	-94.494062	32.452116	341 ft (-8)	View
3	482297	TX TWDB SDR	American Electric Power Company	Other	20	6/15/2018	-94.495163	32.452142	321 ft (-28)	View
4	482283	TX TWDB SDR	American Electric Power Company	Other	14	6/14/2018	-94.49574	32.453439	310 ft (-39)	View
5	35-37-4	TX TCEQ HIST	Amoco Production Company	Industrial	160	04/11/1992	-94.491669	32.448213	349 ft (+)	View
6	482286	TX TWDB SDR	American Electric Power Company	Other	14	6/14/2018	-94.495882	32.452834	304 ft (-45)	View
7	S1020059 A	TX TCEQ PWS	PIRKEY POWER PLANT SWEPCO	Public Supply	0	n/a	-94.481633	32.4603	341 ft (-8)	View
8	482295	TX TWDB SDR	American Electric Power Company	Other	20	6/15/2018	-94.49604	32.452145	324 ft (-24)	View
9	482288	TX TWDB SDR	American Electric Power Company	Other	14	6/14/2018	-94.496868	32.453009	299 ft (-50)	View
9	482280	TX TWDB SDR	American Electric Power Company	Other	14	6/14/2018	-94.496701	32.453281	305 ft (-44)	View
10	482290	TX TWDB SDR	American Electric Power Company	Other	14	6/15/2018	-94.496876	32.452312	309 ft (-40)	View
11	35-37-4E	TX TCEQ HIST	Cathy Jones	Domestic	55	06/01/1982	-94.476754	32.455617	373 ft (+24)	View
12	163503	TX TWDB SDR	NFR Energy LLC	Rig Supply	320	12/15/2008	-94.495	32.4614	349 ft ()	View
13	35-37-4	TX TCEQ HIST	Amoco Production Co.	Oilfield/Rig Supply	225	01/08/1992	-94.492688	32.446132	368 ft (+19)	View
14	167661	TX TWDB SDR	Tom Brown	Rig Supply	430	9/14/2004	-94.488618	32.465007	359 ft (+10)	View
15	35-37-4	TX TCEQ HIST	Amoco Production Co.	Oilfield Supply	225	01/08/1992	-94.491897	32.444376	372 ft (+23)	N/A
16	35-36-6	TX TCEQ HIST	Matador Operating	Industrial	420	10/17/2000	-94.500562	32.452506	312 ft (-37)	View
17	35-37-4	TX TCEQ HIST	UPRC	Oilfield Supply	500	07/13/1996	-94.493263	32.443894	346 ft (-3)	View
18	412517	TX TWDB SDR	American Electric Power Company	Other	38	12/11/2015	-94.492424	32.465978	358 ft (+9)	View
19	3537103	TX TWDB GW	White #1	N/A	2806	N/A	-94.4978	32.4631	341 ft (-7)	View
20	254371	TX TWDB SDR	Langston Drilling Co.	Rig Supply	155	12/31/2005	-94.4781	32.4431	359 ft (+10)	View

Well Summary

Water Well Dataset	# of Wells
TX TCEQ HIST	8
TX TCEQ PWS	1
TX TWDB GW	1
TX TWDB SDR	12
Total Count	22

	STATE	OF TEX	AS WELL R	EPORT for 1	Fracking #35747	7
Owner:	Tom Brow	'n		Owner Well	#: Mahon #3	
Address:	14001 N. [Dallas PKW	Y,ste.1000	Grid #:	35-37-4	
Well Location:	Dallas, IX	. 75240 ml. Inter EN	12625+EM3251	Latitude:	32° 27' 17" N	
	Darco, TX			Longitude:	094° 29' 30" W	V
Well County:	Harrison			Elevation:	347 ft. above se	ea level
Type of Work:	New Well			Proposed U	se: Rig Supply	
Drilling Start Dat	te: 2/20/200	4 Drilli	ng End Date: 2/2	1/2004		
		Diameter ((in.)	Top Depth (ft.)	Bottom Depth (ft.)	
Borehole:		7.875		0	426	
Drilling Method:	Mu	d (Hydraulio	c) Rotary			
3orehole Compl	etion: Filt	er Packed;	Straight Wall			
	То	p Depth (ft.)	Bottom Depth (ft.)	Filter N	Aaterial	Size
ilter Pack Interv	als:	310	426	Gra	ıvel	
	7	op Depth (ft.)	Bottom Depth	(ft.) De	scription (number of sacks &	material)
Annular Seal Da	ita:	0	11		13 Sakrete	
		300	310		4 Bentinite	
Seal Meth	nod: Manua l	pour		Distance to Pr	operty Line (ft.): No Da	ita
Sealed	By: Driller			Distance to Septi concentrated cor	ic Field or other ntamination (ft.): NA	
				Distance to a	Septic Tank (ft.): No Da	ita
				Metho	d of Verification: None	in area
Surface Comple	tion: Alte	ernative Pro	cedure Used			
Water Level:	10	4 ft. below la	and surface on 2	004-02-21 Meas	surement Method: Unl	known
Packers:	No	Data				
Type of Pump:	No	Data				

Water Quality:	Strata Depth (ft.) 426	Water Type No Data	
		Chemical Analysis Made:	Νο
	Did the driller knowingly p contain	enetrate any strata which ed injurious constituents?:	Νο
Certification Data:	The driller certified that the drille driller's direct supervision) and the correct. The driller understood to the report(s) being returned for c	r drilled this well (or the well) hat each and all of the statem hat failure to complete the re- ompletion and resubmittal.	was drilled under the tents herein are true and quired items will result in
Company Information:	Bennett Drilling Services L.C		
	P.O. Drawer 1320 Carthage, TX 75633		
Driller Name:	Randy Lovejoy	License Nu	ımber: 54944
Comments:	No Data		
Lit DESCRIPTION & COLOF	hology: R OF FORMATION MATERIAL	Ca BLANK PIPE & W	asing: VELL SCREEN DATA
From (ft) To (ft) Desc	ription	Dia. (in.) New/Used Type	Setting From/To (ft.)
0-29 Red Clay, White Clay	y, Sand,Iron Ore Gravel	4in New Blank Plastic 0-3	30ft
29ft-330ft. Grey Clay,Bro	own Clay,Lignite	4in New Plastic,Slotted,Se	creen. 330ft426ft.
330ft-426ft Sand, Rock, (Grey Clay, Lignite		

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.

Send original copy by certified mail to: Texas	s Water Commise, P.O. Box 130	2 087, Austin, Te	- xas 7871	1			Please use	black ink.
ATTENTION OWNER: Confidentiality Privipge Notice on Reverse Side	V	State of Te	oxas ORT			Texas Wa P Aus	ter Well Drill .O. Box 1308 tin, Texas 78	ers Board 37 3711
1) OWNER AMOCO PROD (Na 2) LOCATION OF WELL: County Harrison	DUCTION CO. ame)	ADDRESS _	<u>P. 0</u>	BOX Street or RF	9460 Lon D) (C	gview, W Halls	TX 75 (State	5 6 0 8) (Zip)
Rosa Roscoe GU#2		1	NE, SW,	etc.)		(Tom	m)	. 44
Driller must complete the legal description Quarter- or Half-Scale Texas County Gen LEGAL DESCRIPTION: Section No Block No. Distance and direction from two inter	below with distance and direction fr eral Highway Map and attach the ma Township secting section or survey lines	om two intersec ip to this form. Ab	ting secti stract No	on or survey	lines, or he must locate a	and identify the	e well on an c	Micia)
3) TYPE OF WORK (Check): SNew Well Deepening Reconditioning Plugging	4) PROPOSED USE (Check): Domestic Industrial Irrigation Test Weil	Monitor	R XD1934 ⊡De	ig Sc Supply Watering	5) DRILLING METH 2 Mud Rotary Air Rotary	IOD (Check): Air Hammi Cable Too	er □ Jetted I □ Other	Driven
6) WELL LOG: Date Dritting: Started $11-9$ 19 91 Completed $11-9$ 19 91	DIAMETER OF HOLE Dia. (in.) From (ft.) To 7 7 / 8 Surface 2	43	7) BOI 口(私) II G	REHOLE CO Open Hole Gravel Packet	MPLETION: Straight Wall d Other give interval from _		nderreamed t. to <u>243</u>	t t.
From (ft.) To (ft.) De	scription and color of formation mate	erial I	8) CAS	SING, BLAN	K PIPE, AND WELL SCI	REEN DATA:		
0 23 Red	l clav & sand		New	Steel, Pla	astic, etc.	Settin	ng (ft.)	Gage
23 43 Red	l & tan sand	Dia. (in.)	or Used	Pert., Sic Screen N	Alg., if commercial	From	То	Screen
<u>43 75 Lic</u>	tht tan sand	4	N	PVC J	Blank	0	163	Sch40
75 83 Gra	y sand w/lignite	e 4	N	PVC S	Screen	163	243	020
<u>103 123 Gra</u>	y sand, clay & 1	ignite					1	
123 143 508143 240 808	Sand & clay	217	8) CE		TA 10:00 202 44/11		<u> </u>	
143 240 300 240 243 Gra 243 TD (Use reverse to the second	side If necessary)		Mer Q1 Cer	pottured	<u>0</u> ft to <u>10</u> <u>tt to <u>10</u> <u>Hopper</u></u>	_ft. No.ofS _ft. No.ofS Lawren	acks Used _ acks Used _ <u>CE LO1</u>	12
□ Turbine □ Jet 🏠	Submersible Cylinder							
D Other		TATER CON	IMISSI	QUELITIES SU	rface Slab Installed [Ru	le 287.44(2)(/	v]	
Copin to panp comis, cynniad, jar, ar			D	Specified Ste	el Sleeve Installed [Ru	ie 287.44(3)(A)]	
14) WELL TESTS: Type Test: Pump B	aller 🕱 Jetted 🗌 Estima	ted		Pitiess Adap Approved All	ter Used - [Rule 287.44(3 ternative Procedure Used	3)(B)] 1 (Rule 287,7	711	
Yield: <u>100</u> gpm with	ft. drawdown after	, hrs.	11) WA Stat		5 ft. below land	surface	Date <u>//-</u>	9-91
Did you knowingly penetrate any stri constituents?	ata which contained undesirable		Arte	islan flow	95	м п .	Date	
🗆 Yes 🖄 No 🛛 If yes, submit	REPORT OF UNDESIRABLE WAT	TER	12) PA	CKERS:	Ту	'pe	Dept	1
Type of water? Was a chemical analysis made? 〔	_ Depth of strata ☐ Yes				p	aper		-13'
I hereby certify that this well was drilled by m that failure to complete items 1 thru 15 will re	e (or under my supervision) and that suit in the log(s) being returned for c	each and all of ompletion and r	the state esubmitta	ments herein I.	are true to the best of m	y knowledge a	and belief. I u	nderstand
COMPANY NAME FAS-LINE /	/ HARDBAND e or print)	WI	ELL DRIL	LER'S LICE	NSE NO. 284	6 W		anna an
ADDRESS P1 0. BOX	x 17439	Kil	gore	- A	TX		756	53
(Signed)	rteo) 	(C)	ty) gned) ~	Davis	(Si (Registered Di	tate) riller Trainee)	(Zip)	
Please attach electric ion, chemical enalysis.	, and other pertinent information, if a	vallable.	Γ	For TWC us	e only: Well No	Loca	ited on map	35-37-4



Send original copy by certified mail to: Texas Water Commise	P.O. Box 13087, Austin	, Texas 78711	Please use black ink.
ATTENTION OWNER: Confidentiality Privesge Notice on Reverse Side	State of WELL R	i Texas EPORT	Texas Water Well Drillers Board P.O. Box 13087 Austin, Texas 78711
1) OWNER AMOCO PRODUCTION CO. (Name)	ADDRESS	STREET O. Box 9460 (Street or RFD)	Longview, TX 75608 (City) (State) (Zip)
2) LOCATION OF WELL: County Harrison 9.7 Rosa Roscoe GU#2	, miles in	SE direction from (NE, SW, etc.)	Hallsville (Town)
Driller must complete the legal description below with distance ar Quarter- or Half-Scale Texas County General Highway Map and a LEGAL DESCRIPTION: Section No Block No Township Distance and direction from two intersecting section or surve SEE ATTACHED MAP	nd direction from two inte attach the map to this for 	Abstract No.	a 01240001
3) TYPE OF WORK (Check): 4) PROPOSED US Image: Stress of the s	E (Check):] industrial Annito] Test Well Injecti	Rig 5) DRI or XI P260% Supply XI M Ion □De-Watering □A	LING METHOD (Check): Driven Ud Rotary Air Hammer Jetted Bored ir Rotary Cable Tool Other
6) WELL LOG: DIAMETER C Date Drilling: Started 11-9 19 91 7 7/8 Surfac Completed 11-9 19 91	DF HOLE ft.) To (ft.) xe 2.4.3	7) BOREHOLE COMPLETION Open Hole S Cavel Packed C If Gravel Packed give intervation Hole plug @1	traight Wall [] Underreamed ther
From (ft.) To (ft.) Description and color of fc	ormation material	8) CASING, BLANK PIPE, AN	OWELL SCREEN DATA:
0 23 Red clay & sa	und	Dia. or Perf., Slotted, etc. (in.) Used Screen Mfg., if comm	ercial From To Gage Casting Screen
43 75 Light tan sar 75 83 Gray sand w/1	nd ignite	4 N PVC Blank 4 N PVC Screen	0 163 Sch40 163 243 .020
83 103 Gray clay 103 123 Gray sand, cla 123 143 50% Sand & cl	ay & lignit	e	
143 240 80% Gray sand 240 243 Gray clay 243 TD (Use reverse side if necessary)			287.44(1)] to <u>10</u> ft. No. of Sacks Used <u>12</u> to <u>ft.</u> No. of Sacks Used <u>12</u> Hopper Lawrence Lohr
Turbine Jet Submersible C Other Depth to pump bowls, cylinder, jet, etc.,	TEXAS WATER C	10) SURFACE COMPLETION ()MMISSIGNEETIN Specified Surface Stab II Specified Steel Sleeve Ir Pittess Adapter Used Approved Alternative Pro-	nstalled [Rule 287.44(2)(A)] nstalled [Rule 287.44(3)(A)] Rule 287.44(3)(B)] ocedure Used [Rule 287.71]
Yield: <u>100</u> gpm with ft. drawdown after 15) WATER QUALITY: Did you knowingly penetrate any strata which contained un	er <u>1</u> hrs. desirable	11) WATER LEVEL: Static level 65 f Artesian flow	t, below land surface Date <u>11-9-91</u> gpm. Date
constituents? Yes 凶No If yes, submit "REPORT OF UNDES Type of water? Depth of strata	BIRABLE WATER"	12) PACKERS:	TypeDepthpaper11-13'
Was a chemical analysis made? Yes E No	sion) and that each and a returned for completion a	all of the statements herein are true to and resubmittal.	the best of my knowledge and belief. I understand
COMPANY NAME FAS-LINE/HARDBAND (Type or print)		WELL DRILLER'S LICENSE NO.	2846 W 75662
ADDRESS Pro. Box 19439 (Street grappo) (Signed)	K	(City) (Signed) 1 Arris J	'1'X / 5003 (State) (Zip) '1'A Beoistered Driller Trainee)
(Licensed Well Driller) Please attach electric log, chemical analysis, and other pertinent inf	ormation, if available.	For TWC use only: We	H No Located on map 35-37-4



STATE OF TEXAS WELL REPORT for Tracking #482297							
Owner:	Amer	ican Electric Pow	ver Company	Owner Well #:	PZ-6		
Address:	502 N	I. Allen Strreet		Grid #:	35-37-4		
Well Location:	2400	Farm Road		Latitude:	32° 27' 07.69" N	N	
	Halls	ville, TX 75650		Longitude:	094° 29' 42.56" V	N	
Well County:	Harri	son		Elevation:	No Data		
This v	vell ha	s been plugged	Plugg	ing Report Tracking	g #179508		
Type of Work:	Type of Work: New Well Proposed Use: Piezometer						
Drilling Start Dat	te: 6/1	5/2018 Drillin	ng End Date: 6/15/	2018			
		Diameter (ii	n.) T	op Depth (ft.)	Bottom Depth (ft.)		
Borehole:		8.25		0	20		
Drilling Method:		Hollow Stem Au	uger				
Borehole Compl	etion:	Filter Packed					
		Top Depth (ft.)	Bottom Depth (ft.)	Filter Materia	al	Size	
Filter Pack Interv	/als:	8	20	Sand	2	20/40	
Appular Soal Da	to.	Top Depth (ft.)	Bottom Depth (ft	.) Descripti	on (number of sacks & ma	terial)	
Annular Sear Da	lla.	U 1	1	Ce Ber	ement 1 Bags/Sacks	s	
Seal Meth	nod: Pc	oured		Distance to Proper	tv Line (ft.): No Data	-	
Sealed	By: Dr	iller	[Distance to Septic Fie concentrated contam	eld or other ination (ft.): No Data		
				Distance to Sept	ic Tank (ft.): No Data		
				Method of V	Verification: No Data		
Surface Comple	tion:	Alternative Proc	cedure Used	Surfac	e Completion by Dr	iller	
Water Level:		No Data					
Packers:		No Data					
Type of Pump:		No Data					
Well Tests:		No Test Data S	pecified				

Mator Quality	Strata Depth (ft.)	Water Type	
water Quality:	No Data	No Data	
		Chemical Analysis Made:	Νο
	Did the driller knowingly p contair	penetrate any strata which ned injurious constituents?:	Νο
Certification Data:	The driller certified that the drille driller's direct supervision) and to correct. The driller understood to the report(s) being returned for o	r drilled this well (or the well hat each and all of the stater hat failure to complete the re completion and resubmittal.	was drilled under the ments herein are true and equired items will result in
Company Information:	C&S Lease		
	1873 FM 1252 E Kilgore, TX 75663		
Driller Name:	Buford E. Collier	License N	umber: 50089
Apprentice Name:	Michael Aaron Dodson	Apprentice	e Number: 59693
Comments:	No Data		

Lithology: DESCRIPTION & COLOR OF FORMATION MATERIAL

Casing: BLANK PIPE & WELL SCREEN DATA

Top (ft.)	Bottom (ft.)	Description	Dla (in.)	Туре	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
0	5	Red Soft Sandy Clay	2	Riser	New Plastic	40	0	10
5	10	Very Soft Red/Brown Clay			(PVC)			
10	15	Very Soft Red/Tan Sandy Clay	2	Screen	New Plastic (PVC)	40 0.010	10	20
15	20	Tan/Red Silty Sand						

IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY

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

STATE OF TEXAS WELL REPORT for Tracking #482283							
Owner:	Amer	ican Electric Pow	ver Company	Owner Well #:	PZ-2		
Address:	502 N	I. Allen Strreet		Grid #:	35-37-4		
Well Location:	Shrev	Farm Road		Latitude:	32° 27' 12.36"	N	
	Halls	ville, TX 75650		Longitude:	094° 29' 44.64"	W	
Well County:	Harris	son		Elevation:	No Data		
This w	vell has	s been plugged	Plug	ging Report Trackin	g #179514		
Type of Work:	New V	Vell		Proposed Use:	Piezometer		
Drilling Start Dat	te: 6/14	4/2018 Drillin	g End Date: 6/14	/2018			
		Diameter (ir	л.)	Top Depth (ft.)	Bottom Depth (ft.)		
Borehole:		8.25	,	0	14		
Drilling Method:		Hollow Stem Au	ıger				
Borehole Comple	etion:	Filter Packed					
		Top Depth (ft.)	Bottom Depth (ft.)	Filter Materi	al	Size	
Filter Pack Interv	als:	3	14	Sand	:	20/40	
		Top Depth (ft.)	Bottom Depth (I	t.) Descript	ion (number of sacks & ma	aterial)	
Annular Seal Da	ta:	0	1	Ce	ement 1 Bags/Sacks		
Seal Moth	od: Po	ured	5	Distance to Proper	ty Line (ft.): No Data	.5	
Sealed	By: Dr	iller		Distance to Septic Fig	eld or other ination (ft.): No Data	1	
				Distance to Sept	ic Tank (ft.): No Data	I	
				Method of	Verification: No Data	I	
Surface Complet	tion:	Alternative Proc	cedure Used	Surfac	ce Completion by D	riller	
Water Level:		No Data					
Packers:		No Data					
Type of Pump:		No Data					
Well Tests:		No Test Data S	pecified				

Water Quality:	Strata Depth (ft.) No Data	Water Type No Data	
		Chemical Analysis Made:	Νο
	Did the driller knowi c	ngly penetrate any strata which ontained injurious constituents?:	Νο
Certification Data:	The driller certified that the driller's direct supervision) correct. The driller unders the report(s) being returned	driller drilled this well (or the we and that each and all of the state tood that failure to complete the d for completion and resubmittal.	ll was drilled under the ements herein are true and required items will result in
Company Information	C&S Lease		
	1873 FM 1252 E Kilgore, TX 75663		
Driller Name:	Buford E. Collier	License	Number: 50089
Apprentice Name:	Michael Aaron Dodson	Apprentic	ce Number: 59693
Comments:	No Data		

Lithology: DESCRIPTION & COLOR OF FORMATION MATERIAL

Casing: BLANK PIPE & WELL SCREEN DATA

Top (ft.)	Bottom (ft.)	Description	Dla (in.)	Туре	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
0	5	Red Soft Clay	2	Riser	New Plastic	40	Λ	4
5	10	Very Soft Red/Grey Clay	_		(PVC)		•	•
10	14	Very Soft Brown Sandy Clay	2	Screen	New Plastic (PVC)	40 0.010	4	14

IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY

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

Send original copy by certified mail to: To	exas Water Commit	Box 13087, Au	stin, Te	xas 787	711			Please us	e black ink.
ATTENTION OWNER: Confidentiality Privilege Natice on Reverse Side		State WELL	of To REF	exas PORT	·		Texas Wa P Au	ter Well Dril .O. Box 130 tin, Texas 7	iers Board 87 8711
1) OWNER Amoco Proc 2) LOCATION OF WELL: . County Harrison Bath B #4	luction Company (Name)	ADORI	ESS	Lon P. Su NE, SW	gview Op <u>Box</u> (Street or RFL <u></u> div (, etc.)	Derations Cen 1460 Lone D) (C rection from	ter gview, ' Mars (Tow	Pexas (State hall	75608)) (Zip)
Driller must complete the legal descrip Quarter- or Half-Scale Texas County G LEGAL DESCRIPTION: Section No Block Distance and direction from two in IX SEE ATTACHED MAP	nton below with distance and dire ieneral Highway Map and attach No Township ntersecting section or survey line	action from two f the map to this \$\$	intersec form. Ab	stract N	tion or survey I	ines, or he must locate a	ind identify the	e well on an c	official
3) TYPE OF WORK (Check): New Well Deepening Reconditioning Plugging	4) PROPOSED USE (Ch Domestic Zindus Irrigation Test	eck): strial IMor Well Inje	nitor action		iblic Supply. Watering	5) DRILLING METH Ö Mud Rotary [Air Rotary [OD (Check): Air Hamme Cable Tool	r 🗌 Jetted	Driven Bored
6) WELL LOG: Date Drilling: Started 04/11 19 92 Completed 04/11 19 92	DIAMETER OF HO Dia. (in.) From (ft.) 7 7/8 Surface	LE To (ft.) 160		7) BO D M If G	REHOLE CON Open Hole Gravel Packed ravel Packed g	IPLETION: Straight Wall Other jive Interval from	ft	derreamed) ft.
From (ft.) To (ft.)	Description and color of formatio	m material		B) CA	SING, BLANK	PIPE, AND WELL SCR	EEN DATA:	·	
0 20 C	lay	2	Dia.	New	Steel, Plas Perf., Slott	itic, etc. ed. etc.	Settin	g (ft.)	Gage Casting
20 40 W	ater Sand		(in.)	Used	Screen Mr	g., if commercial	From	То	Screen
<u>40 60 W</u>	ater Sand		4	N	Plastic	/Solid	0	80	.030
<u> </u>	ater Sand/Rock		<u> </u>		FLORelic	- I leaff.	80	160	
100 120 1	5' Water Sand/Sha	le		<u> </u>			· ·		
120 140 S	hale			1			· .		
<u>140 160 S</u>	hale		1	B) CEI	MENTING DAT	A [Rule 287.44(1)]			
				Cer	nented from	0 tt. to _/0	ft. No. of Sa	cks Used	
() los 2010	a alda if maaranaad	•				ft. to	ft. No. of Sa	cks Used	
	e side il necessary)			Cer	noo useo	Prith B	retor		
TYPE POMP: Turbine Jet E Other Depth to pump bowls, cylinder, iet,	Submersible Cylinder	ZEC		io)√su ⊠	FACE COMP	LETION ace Slab Installed [Rule	9 287.44(2)(A)]	
		IIIN	19	1000	Specified Steel	Sleeve Installed [Rule	287.44(3)(A))	
14) WELL TESTS:		=stimateri	1 41	1000 П	Pilless Adapter	r Used [Hule 287.44(3) mative Procedure Lised	(8)) IBule 287 71	11	
Yield: <u>70</u> gpm with	<u>⊳ </u>	YAC WALTE	k m	nănăi N	SULT.			1	`
15) WATER QUALITY: Did you knowingly penetrate any s	trata which contained undesIrab	ié		Y WA Stat Arte	TER LEVEL: ic level sian flow	15 ft. below land s	urlace D n. D	Date <u>4-1</u>	1-92
☐ Yes ĎŇo If yes, subr	HE REPORT OF UNDESIRABLE		1	2) PAC	KERS:	, Тур	6	Depth	
Type of water? Was a chemical analysis made?	Depth of strata	[-		
hereby certify that this well was drilled by	me (or under my supervision) an	d that each and	all of th	ne stater	nents herein ar	re true to the best of my	knowiedoe ar	d bellef. I un	derstand
hat failure to complete items 1 thru 15 will r COMPANY NAME East Texas	result in the log(s) being returned Drilling Co., In pe or print)	I for completion	and res WEL	iubmitta L DRIL	LER'S LICENS	SE NO2977	'W		
ADDRESS P. O. BOX	200	Po	ynor			Texa	15	75	782
Street of Street of	x RFD)		(City)		(Sta	10)	(Zip)	
Signed) <u>(License</u>	d Well Driller)		<u>}}#1</u> [#			d Drill	er Trainee)		
Viease attach electric log, chemical analysis, and other pertinent information, if				Z SØ 370 4					
WWD-012 (Rev. 05-18-90)	TEX	AS 0	1241	001	<u>i a și aș R</u> ț Rț N L	ng 14 milet.			



STATE OF TEXAS WELL REPORT for Tracking #482286						
Owner:	Amer	ican Electric Pow	ver Company	Owner Well #:	PZ-3	
Address:	502 N	. Allen Strreet		Grid #:	35-37-4	
Well Location:	2400	Farm Road		Latitude:	32° 27' 10.18" N	
	Halls	ville, TX 75650		Longitude:	094° 29' 45.15" W	
Well County:	Harris	son		Elevation:	No Data	
This w	vell has	s been plugged	Plugg	ing Report Tracking	g #179513	
Type of Work:	New V	Vell		Proposed Use:	Piezometer	
Drilling Start Dat	te: 6/1 4	1/2018 Drillin	ng End Date: 6/14 /	2018		
		Diameter (ii	n.) T	op Depth (ft.)	Bottom Depth (ft.)	
Borehole:		8.25	,	0	14	
Drilling Method:		Hollow Stem Au	uger			
Borehole Comple	etion:	Filter Packed				
		Top Depth (ft.)	Bottom Depth (ft.)	Filter Materia	l Size	
Filter Pack Interv	als:	3	14	Sand	20/40	I
Association OpenI Day	4	Top Depth (ft.)	Bottom Depth (ft	.) Descripti	on (number of sacks & material)	
Annular Seal Da	ia:	0	1	Ce Bor	ment 1 Bags/Sacks	
Seal Moth	nod' Po	ured	5	Distance to Proper	ty Line (ft): No Data	
Sealed	By: Dr	iller	[Distance to Septic Fie concentrated contam	eld or other ination (ft.): No Data	
				Distance to Sept	c Tank (ft.): No Data	
				Method of V	Verification: No Data	
Surface Complet	tion:	Alternative Proc	cedure Used	Surfac	e Completion by Driller	
Water Level:		No Data				
Packers:		No Data				
Type of Pump:		No Data				
Well Tests:		No Test Data S	pecified			

Water Quality:	Strata Depth (ft.) No Data	Water Type No Data	
		Chemical Analysis Made:	Νο
	Did the driller knowi c	ngly penetrate any strata which ontained injurious constituents?:	Νο
Certification Data:	The driller certified that the driller's direct supervision) correct. The driller unders the report(s) being returned	driller drilled this well (or the we and that each and all of the state tood that failure to complete the d for completion and resubmittal.	ll was drilled under the ements herein are true and required items will result in
Company Information	C&S Lease		
	1873 FM 1252 E Kilgore, TX 75663		
Driller Name:	Buford E. Collier	License	Number: 50089
Apprentice Name:	Michael Aaron Dodson	Apprentic	ce Number: 59693
Comments:	No Data		

Lithology: DESCRIPTION & COLOR OF FORMATION MATERIAL

Casing: BLANK PIPE & WELL SCREEN DATA

Top (ft.)	Bottom (ft.)	Description	Dla (in.)	Туре	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
0	5	Red Soft Clay	2	Riser	New Plastic	40	Λ	4
5	10	Very Soft Red/Grey Clay	_		(PVC)		•	•
10	14	Very Soft Brown Sandy Clay	2	Screen	New Plastic (PVC)	40 0.010	4	14

IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY

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

exas Commission on Environmental Quality	Office of Water	Public Drinking Water Section
<u>County Map of TX</u>	<u>Water System Search</u>	Office of Compliance and Enforcement

06/08/2023Texas Commission on Environmental Quality04:06:06DWW Water System Summary Sheet

PWS ID	PWS Name	Central Registry RN
TX1020059	PIRKEY POWER PLANT SWEPCO	RN101246502

Organization/Customer *	Central Registry CN
SOUTHWESTERN ELECTRIC POWER COMPANY	CN600126767

*Regulatory mail will be addressed to this organization/person

All Water System Contacts				
Туре	Contact	Communication		
AC - Administrative	BOND, BRIAN	Phone Type	Value	
Contact - VICE	2400 FM 3251	BUS - Business	903-935-3181	
PRESIDENT	HALLSVILLE, TX 75650-7634	FAX - Facsimile	903-927-5840	
	GRIFFITH, MARK	Phone Type	Value	
EC - Emergency Contact	2400 FM 3251	EMERG -	002 027 5880	
	HALLSVILLE, TX 75650-7634	Emergency	903-927-3889	
	SOUTHWESTERN ELECTRIC			
OW Owner	POWER COMPANY			
Ow - Owner	PO BOX 16428			
	COLUMBUS, OH 43216-6428			
PWS - Public Water	DUFFY, DONNIE		X7.1.	
System Contact -	2400 FM 3251	Phone Type	value	
SUPERVISOR	HALLSVILLE, TX 75650-7634	BUS - Business	903-935-5848	

Operator Grade	Number
SURFACE WATER TREATMENT OPERATOR Grade C	1

Water Operator Licenses				
License Holder:	TAYLOR, DERRICK R			
CURRENT	Class: C - SURFACE WATER TREATMENT OPERATOR	WS0011891		

Owner Type	Owner Type Options: COUNTY, DISTRICT, FEDERAL GOVERNMENT,
Private	INVESTOR OWNED, MUNICIPALITY, NATIVE AMERICAN, PRIVATE,
	STATE GOVERNMENT, WATER SUPPLY CORPORATION

System Type	System Type Optional COMMENTER TRANSIENT/NON COMMENTER		
NP - NON-	NON-PUBLIC NON-TRANSIENT/NON-COMMUNITY		
PUBLIC			
Population	Population	# of	# I/C
------------	------------	---------	-------------
Туре	Served	Connect	w/other PWS

Total Product (MGD)	Average Daiły Consump.	Max Daily Demand (MGD)	Total Storage (MG)	Elev. Storage (MG)	Service Pump Cap.	Max.Purchase Cap. (MGD/GPM)	Pressure Tank Cap. (MG)

Activity Status	Inactivation Date
I - INACTIVE	07/22/2013

Last Survey Date	Surveyor	Survey Type	Region	County
11/25/2008	SAMANTHA SMITH	Sanitary Survey	TYLER	HARRISON
01/25/2008	SAMANTHA SMITH	Sanitary Survey	TYLER	HARRISON
03/22/2007	SAMANTHA SMITH	Sanitary Survey	TYLER	HARRISON

(Treatment Plant)	
No Active Treatment Plant	ſ

(Entry Point)								
Distribution Point	Sample Point Name/Source Summation (Activity Status)	Entry Point Name (Activity Status)	Entry Point Num	Chemical Mon Type	Chem Sample Point	Distribution Mon Type	Dist Sample Point	
DS01	TRT-TAP / No Source Listed(I)	2400 FM 3251(I)	EP001		NO		NO	

(Active Sources)

Code Explanations

Monitoring Type Codes: (GW) GROUNDWATER, (GUP) GROUNDWATER UNDER THE INFLUENCE - PURCHASED, (SWP) SURFACE WATER - PURCHASED, (GU) GROUNDWATER UNDER THE INFLUENCE OF SURFACE WATER, (N) NO SOURCES, (SW) SURFACE WATER

Activity Status Codes: (A) ACTIVE, (D) DELETED/DISSOLVED, (I) INACTIVE, (P) PROPOSED,

Operational Status Codes: (E) EMERGENCY, (I) INTERIM/PEAK (O) OTHER, (P) PERMANENT, (S) SEASONAL

Source Types: (G) GROUND WATER , (S) SURFACE WATER , (U) GROUND WATER UNDER THE INFLUENCE

- End of Report -

At the time of your query this data was the most current information available from our database, which is in real time. Every effort was made to retrieve it according to your query. Thank-you for using DWW.

	STAT	E OF TEX	AS WELL R	EPORT for	Tracking #48	32295
Owner:	Americ	an Electric Pov	wer Company	Owner W	ell #: PZ-5	
Address:	502 N.	Allen Strreet		Grid #:	35-37-4	
Well Location:	2400 F:	arm Road	I	Latitude:	32° 27'	07.7" N
	Hallsvi	lle, TX 75650		Longitude	e: 094° 29'	45.72" W
Well County:	Harrisc	on		Elevation	: No Data	
**This w	ell has l	been plugged*'	• <u>Plu</u>	gging Report T	racking #179509	
Type of Work: New Well Proposed Use: Piezometer						
Drilling Start Date	e: 6/15/ 2	2018 Drilli	ng End Date: 6/1	5/2018		
		Diameter (in.)	Top Depth (ft.)	Bottom De	oth (ft.)
Borehole:		8.25	,	0	20	
Drilling Method:		Hollow Stem A	uger			
Borehole Comple	etion:	Filter Packed				
		Top Depth (ft.)	Bottom Depth (ft.)	Filte	er Material	Size
Filter Pack Interva	als:	8	20	:	Sand	20/40
		Top Depth (ft.)	Bottom Depth	(ft.)	Description (number of s	sacks & material)
Annular Seal Dat	a:	0	1		Cement 1 Bag	s/Sacks
Seal Meth	od' Pou	red	o	Distance to	Property Line (ft)	ys/Jacks
Sealed E	By: Drill	er		Distance to Se concentrated	ptic Field or other contamination (ft.):	No Data
				Distance	to Septic Tank (ft.):	No Data
				Met	hod of Verification:	No Data
Surface Completi	ion: 1	Alternative Pro	cedure Used		Surface Completi	on by Driller
Water Level:		No Data				
Packers:		No Data				
Type of Pump:		No Data				
Well Tests:		No Test Data S	Specified			

Mator Quality	Strata Depth (ft.)	Water Type	
water Quality:	No Data	No Data	
		Chemical Analysis Made:	Νο
	Did the driller knowingly p contair	penetrate any strata which ned injurious constituents?:	Νο
Certification Data:	The driller certified that the drille driller's direct supervision) and to correct. The driller understood to the report(s) being returned for o	r drilled this well (or the well hat each and all of the stater hat failure to complete the re completion and resubmittal.	was drilled under the ments herein are true and equired items will result in
Company Information:	C&S Lease		
	1873 FM 1252 E Kilgore, TX 75663		
Driller Name:	Buford E. Collier	License N	umber: 50089
Apprentice Name:	Michael Aaron Dodson	Apprentice	e Number: 59693
Comments:	No Data		

Casing: BLANK PIPE & WELL SCREEN DATA

Top (ft.)	Bottom (ft.)	Description	Dla (in.)	Туре	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
0	5	Red Soft Sandy Clay	2	Riser	New Plastic	40	0	10
5	10	Very Soft Red/Brown Clay			(PVC)			
10	15	Very Soft Red/Tan Sandy Clay	2	Screen	New Plastic (PVC)	40 0.010	10	20
15	20	Tan/Red Silty Sand						

IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY

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

	STA	TE OF TEXA	S WELL RE	PORT for Trac	king #482288		
Owner:	Amer	ican Electric Pow	ver Company	Owner Well #:	PZ-7		
Address:	502 N	. Allen Strreet		Grid #:	35-37-4		
Well Location:	5nrev 2400	report, LA 71101 Farm Road		Latitude:	32° 27' 10.81" N		
	Halls	ville, TX 75650		Longitude:	094° 29' 48.7" W		
Well County:	Harris	son		Elevation:	No Data		
This w	vell has	s been plugged	Plugg	ing Report Tracking	g #179512		
Type of Work:	New V	Vell		Proposed Use:	Piezometer		
Drilling Start Date: 6/14/2018 Drilling End Date: 6/14/2018							
		Diameter (il	n.) 7	op Depth (ft.)	Bottom Depth (ft.)		
Borehole:		8.25	,	0	14		
Drilling Method:		Hollow Stem Au	uger				
Borehole Comple	etion:	Filter Packed					
		Top Depth (ft.)	Bottom Depth (ft.)	Filter Materia	al Size		
Filter Pack Interv	als:	3	14	Sand	20/40		
Annulus On al Dat	4	Top Depth (ft.)	Bottom Depth (fi	t.) Descripti	on (number of sacks & material)		
Annular Seal Dai	la:	0	1	Ce	ment 1 Bags/Sacks		
Seal Moth	nd. Po	ured	5	Distance to Proper	ty I ine (ft): No Data		
Sealed	By: Dr i	iller	I	Distance to Septic Fie concentrated contam	eld or other ination (ft.): No Data		
				Distance to Sept	ic Tank (ft.) No Data		
				Method of	Verification: No Data		
Surface Complet	lion:	Alternative Proc	cedure Used	Surfac	e Completion by Driller		
Water Level:		No Data					
Packers:		No Data					
Type of Pump:		No Data					
Well Tests:		No Test Data S	pecified				

Water Quality:	Strata Depth (ft.) No Data	Water Type No Data					
		Chemical Analysis Made:	Νο				
	Did the driller knowi c	ngly penetrate any strata which ontained injurious constituents?:	Νο				
Certification Data:	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	C&S Lease						
	1873 FM 1252 E Kilgore, TX 75663						
Driller Name:	Buford E. Collier	License	Number: 50089				
Apprentice Name:	Michael Aaron Dodson	Apprentic	ce Number: 59693				
Comments:	No Data						

Casing: BLANK PIPE & WELL SCREEN DATA

Top (ft.)	Bottom (ft.)	Description	Dla (in.)	Туре	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
0	5	Red Soft Clay	2	Riser	New Plastic	40	Λ	4
5	10	Very Soft Red/Grey Clay	_		(PVC)		•	•
10	14	Very Soft Brown Sandy Clay	2	Screen	New Plastic (PVC)	40 0.010	4	14

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

STATE OF TEXAS WELL REPORT for Tracking #482280								
Owner:	Ameri	ican Electric Pov	ver Company	Owner Well #:	PZ-1			
Address:	502 N	. Allen Strreet		Grid #:	35-37-4			
Well Location:	2400 I	Farm Road		Latitude:	32° 27' 11.79"	Ν		
	Hallsv	/ille, TX 75650		Longitude:	094° 29' 48.1" \	N		
Well County:	Harris	son		Elevation:	No Data			
This w	/ell has	been plugged	Plugg	ging Report Tracking	g #179515			
Type of Work:	New W	Vell		Proposed Use:	Piezometer			
Drilling Start Date	e: 6/14	1/2018 Drillir	ng End Date: 6/14	/2018				
		Diameter (i	n.) 1	Fop Depth (ft.)	Bottom Depth (ft.)			
Borehole:		8.25		0	14			
Drilling Method:		Hollow Stem A	uger					
Borehole Comple	etion:	Filter Packed						
		Top Depth (ft.)	Bottom Depth (ft.)	Filter Materia	al	Size		
Filter Pack Interva	als:	3	14	Sand		20/40		
Associate Oscil Dat		Top Depth (ft.)	Bottom Depth (f	t.) Descripti	on (number of sacks & n	naterial)		
Annular Seal Dat	la:	0	1	Ce	ement 1 Bags/Sack	(S ke		
Spal Moth	nd Po	ured	J	Distance to Proper	ty Line (ft). No Dat	n <i>a</i>		
Sealed	By: Dri	ller	I	Distance to Septic Fie concentrated contam	eld or other ination (ft.): No Dat	ta		
				Distance to Sept	ic Tank (ft.): No Dat	a		
				Method of	Verification: No Dat	a		
Surface Complet	ion:	Alternative Proc	cedure Used	Surfac	ce Completion by I	Driller		
Water Level:		No Data						
Packers:		No Data						
Type of Pump:		No Data						
Well Tests:		No Test Data S	specified					

Water Quality:	Strata Depth (ft.) No Data	Water Type No Data	
		Chemical Analysis Made:	Νο
	Did the driller knowi c	ngly penetrate any strata which ontained injurious constituents?:	Νο
Certification Data:	The driller certified that the driller's direct supervision) correct. The driller unders the report(s) being returned	driller drilled this well (or the we and that each and all of the state tood that failure to complete the d for completion and resubmittal.	ll was drilled under the ements herein are true and required items will result in
Company Information	C&S Lease		
	1873 FM 1252 E Kilgore, TX 75663		
Driller Name:	Buford E. Collier	License	Number: 50089
Apprentice Name:	Michael Aaron Dodson	Apprentic	ce Number: 59693
Comments:	No Data		

Casing: BLANK PIPE & WELL SCREEN DATA

Top (ft.)	Bottom (ft.)	Description	Dla (in.)	Туре	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
0	5	Red Soft Clay	2	Riser	New Plastic	40	Λ	4
5	10	Very Soft Red/Grey Clay	_		(PVC)		•	•
10	14	Very Soft Brown Sandy Clay	2	Screen	New Plastic (PVC)	40 0.010	4	14

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

STATE OF TEXAS WELL REPORT for Tracking #482290									
Owner:	Amer	ican Electric Pow	ver Company	Owner Well #:	PZ-4				
Address:	502 N	. Allen Strreet		Grid #:	35-37-4				
Well Location:	2400	Farm Road		Latitude:	32° 27' 08.3" N				
	Halls	ville, TX 75650		Longitude:	094° 29' 48.73" \	N			
Well County:	Harris	son		Elevation:	No Data				
This w	vell has	s been plugged	Plugg	ing Report Tracking	g #179510				
Type of Work: New Well Proposed Use: Piezometer									
Drilling Start Dat	Drilling Start Date: 6/15/2018 Drilling End Date: 6/15/2018								
		Diameter (ii	n.) T	op Depth (ft.)	Bottom Depth (ft.)				
Borehole:		8.25		0	14				
Drilling Method:		Hollow Stem Au	uger						
Borehole Comple	etion:	Filter Packed							
		Top Depth (ft.)	Bottom Depth (ft.)	Filter Materia	al	Size			
Filter Pack Interv	als:	3	14	Sand	:	20/40			
Appular Soal Da	tor	Top Depth (ft.)	Bottom Depth (ft	.) Descripti	on (number of sacks & ma	iterial)			
Annular Sear Da	ld.	0	1	Ce Ber	ement 1 Bags/Sacks	e			
Seal Meth	nod: Po	' ured	Ŭ	Distance to Proper	ty I ine (ft): No Data				
Sealed	By: Dr	iller	[c	Distance to Septic Fie concentrated contam	eld or other ination (ft.): No Data	l			
				Distance to Sept	ic Tank (ft.): No Data	I			
				Method of	Verification: No Data				
Surface Complet	tion:	Alternative Proc	cedure Used	Surfac	ce Completion by D	riller			
Water Level:		No Data							
Packers:		No Data							
Type of Pump:		No Data							
Well Tests:		No Test Data S	pecified						

Water Quality:	Strata Depth (ft.) No Data	Water Type No Data	
		Chemical Analysis Made:	Νο
	Did the driller knowi c	ngly penetrate any strata which ontained injurious constituents?:	Νο
Certification Data:	The driller certified that the driller's direct supervision) correct. The driller unders the report(s) being returned	driller drilled this well (or the we and that each and all of the state tood that failure to complete the d for completion and resubmittal.	ll was drilled under the ements herein are true and required items will result in
Company Information	C&S Lease		
	1873 FM 1252 E Kilgore, TX 75663		
Driller Name:	Buford E. Collier	License	Number: 50089
Apprentice Name:	Michael Aaron Dodson	Apprentic	ce Number: 59693
Comments:	No Data		

Casing: BLANK PIPE & WELL SCREEN DATA

Top (ft.)	Bottom (ft.)	Description	Dla (in.)	Туре	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
0	5	Red Soft Clay	2	Riser	New Plastic	40	Ω	4
5	10	Very Soft Red/Grey Clay	-		(PVC)		v	
10	14	Very Soft Brown Sandy Clay	2	Screen	New Plastic (PVC)	40 0.010	4	14

IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY

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

								#8	
Send original copy by certified mail to the Texas Department of Water Resources P. O. Box 13087 Austin, Texas 78711	W ATTENTION OWNER	State o ATER WE	f Te LL dity f	exas REP(Privile	DRT ge Notice on Reverse S	Side	For TDWR us Well No. 33 Located on m Receivert:	e only apye	(E)
Pather	Tomes		R.L		1 W	ann		1.1	756
2) LOCATION OF WELL: County Frankt/SO	me) R 4 ¹ /2	_ Address	1317	001 OT	AFD) direction from	(City)	3 ~ 5 6 3	117	ney
			(N.E.	., S.W	otc.)		(Town	1	.
Driller must complete the legal descrip with distance and direction from two i tion or survey lines, or he must locate- well on an official Quarter- or Half-Sca General Highway Map and attach the r	tion to the right ntersecting sec- and identify the le Texas County nap to this form.	Legal description Section N Abstract I Distance a	No	i: irection	Block No Survey Name , I from two intersecting se	Town	ship vey lines		
TYDE DE MORE (MARK)		K See attache	na ma	p. x	rapon 32	-29	- 6.)_		
New Well Deepening Reconditioning Plugging	a) PROPOSED USE (Cha ☐ Comestic □ Industri □ Itrigation □ Test We	isk): ial 🗆 Public Suj ill 🗆 Other	ylqq		5) DRILLING METHOD Mud Rotary Air Air Rotary Cab	> (Check): Hammer [ile Tool]	⊐Driven X ⊐Jerted ⊡d	r Bared Other	
6) WELLLOG:	DIAMETER OF H Dia. (m.) From (fr.)	OLE To (fr.)	7)		HOLE COMPLETION:	ight Wall	🗆 Ur	vderreamed	
Date drifled			Y	IFG	er Packed Li Othi avel Packed give interval .	•r	3. 17.	10 5	5.1
From To	Description and color of for	mation	<i>p</i> 1	() & 2°	A DI ALIN AGR		***		
$\frac{100}{5}$	material		a) (LASIN	Crash Pipe, AND W	TELL SCRE	ENDATA:	24. 3	
0 c c k	ed Clay		Dia. (in.)	or Used	Perf., Slotted, etc. Screen Mgf., if com	nercial	Erom		Casir Scree
20 30 AM	te Sandy (talf	30	Ν	Concrete -	Jile.	D	55	
20 00 5	- Sand	0			·				
							1	••••••	
35 55 2	ay Shale	-						+000	1
		-						, i	1
			c	amont	CEMI	ENTING D	ATA M		÷.
			Å	dethod	used	······································			
			c	ament	ed by	Company e	r Individual)	•	
······································			9)	WATI					<i></i>
				Static	level <u>30</u> ft. below	v land surfa	ce Date	6-1-	82
D)				Artes	an nowgpm	»	Date	aa.	
<u> </u>		٣	10)	PACK	ERS: Type	1	Depth		
	001 22 1302				,				
********	DEPT. OF	~							
	ATER RESOURCE	\$	11)	TYPE	PUMP:				
· · · · · ·			C] Turb	ine ÉrJet (] Submersil	ble 🖸	Cylinder	
(Use reverse s	ide if necessary)		C] Othe	n numm howiz eutindor 2	et ere		÷1	
13) WATER QUALITY:	-		0	opui ti	a handh maxis' rAnuosi' i			¥£.	
Did you knowingly penetrate any water?	strata which contained unda	esirable	12)	WELI	TESTS:	·····	1*** • · · · ·	X	
If yes, submit "REPORT OF UNI Type of water? Was a chemical analysis made?	Depth of strate	7035-	L	J Type Yield	$\frac{250}{250}$ gp/h with _	ft.	U Jetted 🧳	ter h	ed rš.
. \	I bereby certify that this we cach and all of the statemer $\langle n \rangle$	vell was drilled b nts herein are tro	by me ue to	(or un the bes	der my supervision) and t t of my knowledge and b	hat elief.	¢		
NAME Wayne /	Horgan	Water Well D)riller:	s Regis	tration No.	U P	191	3	
ADD RESS	750		nde	<u>en</u>		<u>TX</u> State)	7 (z	<u>556</u>	3
Signed) Wayal	Moryon		A		REX WATER	WELLS			
(Wate	r Well Denter) Ivsis, and other pertinent inf	ormation if wa	ilshla		P. O. Box LINDEN, TEXA	950 Name S 75563	*)		

TDWR-0392 (Rev. 1-12-79)

DEPARTMENT OF WATER RESOURCES COPY

	STATE OF TEXAS WELL R	EPORT for Trac	king #163503
Owner:	NFR Energy LLC	Owner Well #:	Mohan #13
Address:	1415 Louisiana Street Ste 1600 Houston, TX_77002	Grid #:	35-37-1
Well Location:	Red Oak Road	Latitude:	32° 27' 41" N
	Marshall, TX 75670	Longitude:	094° 29' 42" W
Well County:	Harrison	Elevation:	326 ft. above sea level
Type of Work:	New Well	Proposed Use:	Rig Supply

Drilling Start Date: 12/15/2008 Drilling End Date: 12/15/2008

	Diameter ((in.)	Top Depth (ft.)	Bottom Dept	h (ft.)
Borehole:	7.875	;	0	320	
Drilling Method:	Mud (Hydrauli	c) Rotary			
Borehole Completion:	Filter Packed				
	Top Depth (ft.)	Bottom Depth (ft.)	Fil	ter Material	Size
Filter Pack Intervals:	220	320		Gravel	
	Top Depth (ft.)	Bottom Depth	(ft.)	Description (number of sa	cks & material)
Annular Seal Data:	0	12		10 sks ceme	ent
Seal Method: Ur	nknown		Distance to	Property Line (ft.): N	lo Data
Sealed By: Ur	nknown		Distance to S concentrated	eptic Field or other contamination (ft.): N	lo Data
			Distance	to Septic Tank (ft.): N	lo Data
			Me	thod of Verification: N	lo Data
Surface Completion:	Surface Sleeve	Installed			
Water Level:	120 ft. below la	and surface on 20	008-12-15 M	easurement Method:	Unknown
Packers:	No Data				
Type of Pump:	Submersible			Pump Depth (ft.): 28	0
Well Tests:	Jetted	Yield: 60	GPM with 20 f	t. drawdown after 1	hours

_

Water Quality:	Strata Depth (ft.) No Data	Water Type No Data			
		Chemical Analysis Made:	Unkno	wn	
	Did the driller kno	wingly penetrate any strata which contained injurious constituents?:	Unkno	wn	
Certification Data:	The driller certified that t driller's direct supervision correct. The driller unde the report(s) being return	he driller drilled this well (or the well n) and that each and all of the staten rstood that failure to complete the re ned for completion and resubmittal.	was drille nents he equired ite	ed under the rein are true and ems will result in	
Company Informatio	n: Pinnergy, Ltd.				
	P. O. Box 202 Carthage, TX 75633				
Driller Name:	Randy Williams	License N	umber:	54612	
Apprentice Name:	Billy Kerry				
Comments:	No Data				

Top (ft.)	Bottom (ft.)	Description
0	20	clay, shale, sand
20	40	shale, sand, rock
40	100	shale, sand
100	120	sand
120	140	shale, sand
140	160	shale, rock
160	180	shale
180	200	shale, rock
200	240	shale
240	300	sand
300	320	shale, sand

Casing: BLANK PIPE & WELL SCREEN DATA

Dia. (in.) New/Used Type Setting From/To (ft.)

new pvc casing sch 40 .020ga 0-250, 310-320

new pvc screen sch 40 .020ga 250-310

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.

Send original copy by certified mail to: Tex	as Water Com	In, P.O. Box 13	087, Aus	lin, Tex	as 78)	711				Piease use	ə black ink.
ATTENTION OWNER: Confidentiality Privilege Notice on Reverse Side	· · · · · · · · · · · · · · · · · · ·	N	State (WELL	of Te REP(xas ORT				Texas Wa P Aus	ter Well Drill .O. Box 1306 tin, Texas 76	ers Board 37 3711
1) OWNER <u>AMOCO I</u> (1 2) LOCATION OF WELL: County <u>Harrison</u> Washing	PRODUCTION Name) 6.	5	ADDRE	55 <u>P</u>	W IE, SV) BOX (Street or RFI di /, etc.)	9460) rection from	Long (Ch) Mar	view /) shall (Tow	Tx 7 (State	5608 } (Zip)
Driller must complete the legal descriptin Quarter- or Half-Scale Texas County Ge LEGAL DESCRIPTION: Section No Block No Distance and direction from two Inte SEE ATTACHED MAP	on below with distance neral Highway Map ar b Towns precting section or su	e and direction fr nd attach the ma hip rvey lines	rom two in ap to this f	itersecti form. Abs	tract N	tion or survey o	5. DRI 1 1				
A) TYPE OF WORK (Check): Xnew Well Deepening Reconditioning Plugging	Domestic Inrigation	Industrial	Mon	itor ction	¢r£Cx ⊂⊡	Giblic Supply e-Watering	X Mud I	Rotary [ptary [] Air Hamme] Cable Tool	ar 🗌 Jetted	Bored
6) WELL LOG: Date Drilling: Started $1-8$ 19 92 Completed $1-8$ 19 92	DIAMETER Dia. (in.) From 7.7/8 Sur	R OF HOLE n (ft.) To face 225	o (ft.) 5	7) BC 2 2 11 (DREHOLE COI Open Hole (Gravel Packed) Gravel Packed) Hole p	MPLETION: Straig d Other give interval	Int Wall	□Un 140 tt 0'	nderreamed t. to225	ft,
From (ft.) To (ft.) D	escription and color of	f formation mate	ərial	8) CA	SING, BLANK	PIPE, AND W		EEN DATA:		
0 30	Red sandy	clay		Dia. (in.)	New or Used	Steel, Pia Perf., Slot Screen M	stic, etc. Ited, etc. Ifg., if commerci	ai	Settin From	g (ft.) To	Gage Casting Screen
<u>40</u> <u>40</u> <u>65</u> 85	Tan & gray Gray clay	y shale		4 4	N N	PVC B PVC S	lank Screen		0 140 208	140 208 225	Sch40
$ \begin{array}{r} 85 & 105 \\ 105 & 140 \\ 140 & 145 \\ \end{array} $	Soft gray 5%Sand w/s 100% Fine	soft cla gray sa	ay and	4	1N	FVC E					
145 165 165 208 208 225 (Use reverse	85% Fine G 100% Fine Hard gray side H necessary)	gray sa gray sa shale	and	9) CE Ce Me Ce	emented from	TA [Rule 287 ft. to ft. to ft. to ft. to ft.	44(1)] 10 opper e Loh	ft. No. of Se ft. No. of Se 111	acks Used acks Used	9
Image: State of the state	Submersible	t.	6	迥		IRFACE COMI Specified Stor Specified Stor Pitless Adapti Approved Alty	PLETION Place Slab Instal Sleeve Install of Used [Rule of Mative Proced	ied [Rule ed [Rule 287.44(3) ure Used	287.44(2)(A 287.44(3)(A (B)] [Rule 287.7	0))) (1]	
Yield: 75 gpm with 15) WATER QUALITY: Did you knowingly penetrate any st constituents?	tt. drawdown a	undesirable	TEXA	S W	1) W AT AT	ATER LEVEL: tic level F L esian flow. BUARD	50 ft. be	ow land su	urface n.	Date <u>1-</u> {	3-92
Yes No If yes, subm Type of water? Was a chemical analysis made?	It "REPORT OF UNDE Depth of strata □ Yes ⊠ No	ESIRABLE WAT		1	2) P/			Typ Papei	e <u>·</u>	Dept* 10-12	l T
hereby certify that this well was drilled by n hat failure to complete items 1 thru 15 will re COMPANY NAME FAS-L	ne (or under my super asult in the log(s) bein INE / HARDB2 e or print)	vision) and that g returned for co AND	each and ompletion	all of th and res WEL	ne stati Lubrnitt	ements herein : al. LLER'S LICEN	are true to the t	est of my	knowledge a 16 W	nd belief. I u	nderstand
Signed) P. O. (Street of	Box, 1439		Kilg	ore (City (Sigi) neđ)	Dave	The face	(Sta	te)	7566 (Zip)	3
(License) Please attach electric log, chemical analysis	, and other pertinent i	nformation, if av	aliable.		Ē	For TWC use	only: Well No	·	Loca	ited on map	35-37-4



S	STATE OF TEXA	S WELL REP	ORT for Trac	king #167661
Owner:	Tom Brown		Owner Well #:	Mohon #6
Address:	8340 Meadow Rd, Suite	e 150	Grid #:	35-37-1
Well Location: (Dallas, 1X 75231		Latitude:	32° 27' 54" N
-	Tatum, TX		Longitude:	094° 29' 19" W
Well County:	Harrison		Elevation:	No Data
Type of Work: N	lew Well		Proposed Use:	Rig Supply
Drilling Start Date:	: 9/14/2004 Drillin	g End Date: 9/14/20	004	
	Diameter (ir	а.) Тор	Depth (ft.)	Bottom Depth (ft.)
Borehole:	7.875		0	430
Drilling Method:	Mud (Hydraulic)	Rotary		
Borehole Complet	ion: Filter Packed			
	Top Depth (ft.)	Bottom Depth (ft.)	Filter Materia	al Size
Filter Pack Interval	s: 320	430	Gravel	#9
	Top Depth (ft.)	Bottom Depth (ft.)	Descript	ion (number of sacks & material
Annular Seal Data	: 0	10		8 Cement
Seal Metho	d: Sackrete		Distance to Proper	rty Line (ft.): na
Sealed B	y: Bennett	Dis co	stance to Septic Fie ncentrated contam	eld or other nination (ft.): na
			Distance to Sept	lic Tank (ft.): No Data
			Method of	Verification: none in area
Surface Completic	on: Surface Sleeve	Installed		
Water Level:	186 ft. below la	nd surface on 2004-	09-14 Measurer	ment Method: Unknown
Packers:	No Data			
Type of Pump:	Submersible			
Well Tests:	Jetted	Yield: 55 GPM	Λ	

		Strata Depth (ft.)	Water Type			
Water Q	uality:	348 - 430	na			
			Chemical Analysis Made:	Νο		
		Did the driller knowingly p contair	penetrate any strata which ned injurious constituents?:	Νο		
Certifica	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.					
Compan	y Information	n: Bennett Drilling				
		P.O. Box 1320 Carthage, TX 75633				
Driller N	Name: Randall E. Bowman License Number: 54535					
Dimorte	anne.		License N	lumber: 54535		
Commer	nts:	\$mew	License N	lumber: 54535		
Commer	nts: ION & COLO	\$mew Lithology: DR OF FORMATION MATERIAL	License N C BLANK PIPE & N	Casing: WELL SCREEN DATA		
Commer DESCRIPT Top (ft.)	nts: ION & COLO Bottom (ft.)	\$mew Lithology: DR OF FORMATION MATERIAL Description	License N C BLANK PIPE & N Dia. (in.) New/Used Type	Casing: WELL SCREEN DATA Setting From/To (ft.)		
Commer DESCRIPT Top (ft.) 0	nts: TON & COLO Bottom (ft.) 30	\$mew Lithology: DR OF FORMATION MATERIAL Description Brown Sand	License N C BLANK PIPE & N Dia. (in.) New/Used Type 4" New Plastic 0 - 350 Ca	Casing: WELL SCREEN DATA Setting From/To (ft.)		
Commer DESCRIPT <i>Top (ft.)</i> 0 30	nts: TON & COLO <i>Bottom (ft.)</i> 30 60	\$mew Lithology: DR OF FORMATION MATERIAL Description Brown Sand Gray Clay	License N C BLANK PIPE & N Dia. (in.) New/Used Type 4" New Plastic 0 - 350 Ca 4" New Plastic .020 350 -	Casing: WELL SCREEN DATA Setting From/To (ft.) Asing • 430 Screen		
Commer DESCRIPT <i>Top (ft.)</i> 0 30 60	INC. INN & COLO Bottom (ft.) 30 60 190	\$mew Lithology: DR OF FORMATION MATERIAL Description Brown Sand Gray Clay Brown Sandy Clay	License N C BLANK PIPE & N Dia. (in.) New/Used Type 4" New Plastic 0 - 350 Ca 4" New Plastic .020 350 -	Casing: WELL SCREEN DATA Setting From/To (ft.) Asing • 430 Screen		
Commer DESCRIPT <i>Top (ft.)</i> 0 30 60 190	INC. INN & COLO Bottom (ft.) 30 60 190 348	\$mew Lithology: DR OF FORMATION MATERIAL Description Brown Sand Gray Clay Brown Sandy Clay Gray Clay	License N C BLANK PIPE & N Dia. (in.) New/Used Type 4" New Plastic 0 - 350 Ca 4" New Plastic .020 350 -	Casing: WELL SCREEN DATA Setting From/To (ft.) asing • 430 Screen		

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.

Attention Owner: Confidentiality Privilege Notice on reverse side of owner's copy.	Texa P.O. Box 12	s Departmo Water Well 157 Austin, Tex To Email address: W	ent of Li Driller/Pum (as 78711 (bil free (800) : water.we FLL RI	icense and op Installer Pro (512) 463-788 803-9202 Il@license.s EPORT	I Regu ogram 10 FAX (5 state.tx.u	lation 12) 463-8616 s	This and f and c upon	form must iled with th owner with completio	be comp ne depart in 60 day n of the	oleted tment ys well.
1) OWNER	A. WEI	L IDENTIFI	ICATION	AND LOC	ATION	DATA				
Name Matador Operating	Address 8340 Meado	w Rd.		City Dallas			State TX	Z 7	^{ip} 5231	
2) WELL LOCATION								I		
County	Physical Address		•	City Marshall			State TX	7	որ 15231	
	T at 22	26	69	Long 0	14 3	0 02	Grid # 3	5-36-6		
3) Type of work	A) Proposed	Lise (check)		or T Enviro	mental So	il Boring	Domestic	5)		NŤ
Reconditioning	☐ Industrial [Irrigation	Injection	D Public Su	pply 🛛	De-watering	Testwell			
	If Public Supply	well, were plans	submitted to	the TNRCC?		es 🗖 No				
6) Drilling Date	D	ameter of Ho	ole	7) Drill	ing Met	hod (check)	Driven			
Started 10/17/00	Dia. (in)	From (ft)	To (ft)) 🛛 🗆 Air R	otary E	Mud Rotary	Bored			
	7 7/8	0	420	🗌 Air H	ammer [Cable Tool	Jetted			
Completed 10/17/00				Other						
				-						
From (ft) To (ft) Desc	ription and color	of formation	material	8) Bore	hole Co	mpletion	🛛 Open H	ole 🗹 S	Straigh	t Wall
0 20 clay.	sand	·····		🗌 🗆 Unde	er-reame	d ☑ Grave	l Packed] Other		
20 40 shale	e, water sand, li	gnite		If Gravel	Packed gi	ve the interval f	rom 10	ft. to	420	ft.
<u>40 60 wate</u>	r sand	• (.		Casing	S , Blank	Steel. Plastic.	etc.	Settin	g (ft)	Gage
<u>60 80 shale</u>	e, water sand, li	gnite		Dia.	Or	Perf., Slotted,	etc. f commercial	From	To	Casing
80 120 shah	water cand			4	N	PVC	I COMMINICION	0	340	
120 140 sual	, water sand			4	N	PVC Scree	n	340	420	.020
160 240 shale	, water sand							ļ		. .
240 260 shale	e, rock							<u> </u>		
260 360 shale	e, water sand			9) Cem	enting I	\mathbf{Data}		Hofood		nla
<u>360 420 wate</u>	r sand			Cement	$\begin{array}{c c} \hline Cementing from \underline{10} & ft. to \underline{0} & ft. # of sacks used \underline{1/a} \\ \hline ft. to & ft. # of sacks used \end{array}$					
(Use reverse side (of Well Owner's copy	, If nece		Method	Method Used grout					
13) Plugged 🛛 🖓 Well p	lugged within 48	hours		Cementi	ng By k	eith Bristov	Ŵ			
Casing left in well:	Cement/Bentonite pla	aced in w		Distance t	o septic sy	stem field or oth	er concentrate	d contamin	ation	n/a li.
From (ft) To (ft) F	rom (ft)	To (ft)	o	Method o	f verificat	on of above dis	tance	n/2	3	
				10) 6	fo oo Co	molation				
	-			IU) Sur	ied Surfac	e Slab Installed				
14) Two numn	<u>l</u>	<u></u>			ied Surfac	e Sleeve Install	ed			
$\Box \text{ Turbine} \qquad \Box \text{ Jet}$	🗹 Submer	sible 🛛 C	ylinder	D Pitless	D Pitless Adapter Used					
Other			-		ved Altern	ative Procedure	e Used			
Depth to pump bowls, cylinder, jet, et	<u>c., 300</u>	<u>ft.</u>		11) Wa	ter Lev	el	D :	10/17/00		
15) Water Test				Static lev	81[/ Flow	tt. below	Date /	10/1//00	/	
Type test ∐ Pump ∐ Bai	ier i⊻i Jetted	er 1	hrs	Artesian	10W	gpm	<u>/</u>			
16 Water Quality		<u></u>	1110.	12) Pac	kers		Туре		Depth	
Did you knowingly penetrate any stra	ta which contain und	lesirable constitue	ents?	n/a		······································		SEC 1		
□ Yes ☑ NO If yes, did you submit a REPORT OF UNDESIRABLE WATER?										
Type of water Depth of Strata Was a chemical analysis made? Yes Was a chemical analysis made? Yes										
Company or Individual's Nam	e (type or print)	East Texas J	Drilling C	o., Inc.	Wa	er Well Dril	lers.License	e #: 297	WPK	
Address P O Boy 200	- <u></u>		City P	oynor	1 200	Stat	te TX	Zip 7	5782	
11:41 Pt-	· · · ·	12. 1 21	1 2000	Signature			2000 C	1	1	/
Signature Full Line Driller/Pump	Installer	Date	e		Ар	prentice	م جموني	- 4 11 VA 2. F & S & VA	Date	

Form provided by Forms On-A-Disk, Inc. • Dallas, Texas • (214) 340-9429

Send original copy by certified return receipt requested r	mail IRCC, MC 177, P.O. B	ox 13087, Austin, TX 78711-3087				
ATTENTION OWNER: Conlidentiality Privilege Natice on on reverse side of Well Owner's copy (pink)	State WELL	of Texas Water Well Drillers Advisory Council MC 177 P.O. Box 13087 Austin, TX 78711-3087 512-239-0530				
1) OWNER UPPC 2) ADDRESS ADEPUIDON County 10 3) TYPE OF WORK (Check): 4) P	ADDRE	ss POBCA 901077, (Street or RFD) E Lange J (City) (State) (Z Monitor Finite Stroke Dewetering	$\frac{\mathcal{H}(L)(\mathcal{A}(\mathcal{A}, \mathcal{A}, \mathcal{A}, \mathcal{A}, \mathcal{A})}{(City)} \xrightarrow{(State)} \mathcal{H}(\mathcal{A}(\mathcal{A}, \mathcal{A}))} \\ \qquad $			
New Well Deepening Reconditioning Plugging H Dia. (in the second sec	Industrial Inigation Inigation Public Supply well, were plans su DIAMETER OF HOLE n.) From (ft.) To (ft.) 2) Surface 5(55)	 7) DRILLING METHOD (Check): Air Rotary Air Hammer Cable Tool Other 	o Driven Bored Jetted 			
From (ft.) To (ft.) Description and $6 - 10$ (Manual C) 1(2 - 110) (Manual C)	color of formation material	8) Borehole Completion (Check): Underreamed X Grave/Pa If Gravel Packed give interval fro	$\begin{array}{c c} \hline & \ensuremath{\mathbb{Q}} \text{pen Hele} & \ensuremath{\mathbb{Q}} & \ensuremath{\mathbb{S}} \text{Straight Wall} \\ \hline & \ensuremath{\mathbb{C}} \text{ked} & \ensuremath{\mathbb{Q}} & \ensuremath{\mathbb{O}} & \ensuremath{\mathbb{S}} \ensuremath{\mathbb{C}} \ensuremath{\mathbb{S}} \ensuremath{\mathbb{O}} \ensuremath{\mathbb{S}} \ensuremath{\mathbb{C}} \ensuremath{\mathbb{S}} \ensure$			
<u>400-400 Stial</u> <u>400-500 San</u>	ci (Lesno) anoy	CASING, BLANK PIPE, AND WELL SC Dia. or Dia. or Vew Steel, Plastic, etc. Screen Mfg., if comment 4 W OV C CLoo 4 W VC Screen	CREEN DATA: Setting (ft.) Gage Casting Screen rial From To Screen MM 0 400 500 6.20 MM 400 500 6.20			
(Use reverse side of Well Owner's cop 13) TYPE PUMP:	by, if necessary)	9) CEMENTING DATA [Rule 338.44(1)] Cemented from				
Turbine Jet Submersible Other Depth to pump bowls, cylinder, jet, etc., 14) WELL TESTS: Type test: Pump Bailer Joint	ftttedEstimated					
Yield: <u> </u>	ntained undesirable	11) WATER LEVEL: Static level 130 ft. below land surface Date 1/13/9 lb Artesian flow gpm.				
constituents? Yes X No If yes, submit "REPORT OF Type of water? Depth o Was a chemical analysis made? Yes	UNDESIRABLE WATER" of strata	12) PACKERS:	Type Depth			
I hereby certify that this well was drilled by me (or understand that failure to complete items 1 thru 15 with the stand that failure to complete items 1 thru 15 with the standard sta	der my supervision) and that each It result in the log(s) being returner (1) (1) (1) (1) (1) (1) (1) (1) (1) (1)	and all of the statements herein are true to I for completion and resubmittal. WELL DRILLER'S LICENSE NO.	the best of my knowledge and belief. I 293(EIN) 5602 (State)			
(Signed) (Signed) (Registered Driller Trainee)						
Please atta	ch electric log, chemical analys	s, and other pertinent information, if av	anayıc.			
Minocio ras (nov. core riso) Wł	ute - TNRCC Yellow - D	PSU LPPPS PrUNC = VUPPL CUVIUPPC				

STATE OF TEXAS WELL REPORT for Tracking #412517						
Owner:	American Electric Power Company	Owner Well #:	W-3			
Address:	502 N. Allen Street Shreveport, LA 71101	Grid #:	35-37-1			
Well Location:	2400 Farm Road	Latitude:	32° 27' 57.5" N			
	Hallsville, TX 75650	Longitude:	094° 29' 32.7" W			
Well County:	Harrison	Elevation:	No Data			
Type of Work:	New Well	Proposed Use:	Piezometer			

Drilling Start Date: 12/11/2015 Drilling End Date: 12/11/2015

	Diameter (in.)		Top Depth (ft.) Bottom De		Pepth (ft.)
Borehole:	8.25		0	3	8
Drilling Method:	Hollow Stem A	uger			
Borehole Completion:	Filter Packed				
	Top Depth (ft.)	Bottom Depth (ft.)	Filter	r Material	Size
Filter Pack Intervals:	26	38	S	land	20/40
	Top Depth (ft.)	Bottom Depth	(ft.) L	Description (number o	f sacks & material)
Annular Seal Data:	0	2		Cement 1 Ba	ags/Sacks
	2	26		Bentonite 12 I	Bags/Sacks
Seal Method: Gr	avity		Distance to Property Line (ft.): No Data		
Sealed By: Dr	iller		Distance to Septic Field or other concentrated contamination (ft.): No Data		
			Distance to	o Septic Tank (ft.): No Data
			Meth	od of Verification	t: No Data
Surface Completion:	Surface Slab Ir	nstalled	:	Surface Comple	tion by Driller
Water Level:	No Data				
Packers:	No Data				
Type of Pump:	No Data				
Well Tests:	No Test Data	Specified			

		Strata Depth (ft.)	Water T	ype				
Water Q	uality:	No Data	No Da	ta				
			Chemica	al Analysis	Made: No)		
		Did the driller knowing cor	gly penetrate ntained injurio	any strata us constitu	which ents?: No)		
Certifica	tion Data:	The driller certified that the d driller's direct supervision) and correct. The driller understo the report(s) being returned	friller drilled th nd that each a od that failure for completion	nis well (or t and all of th to comple n and resub	the well was be statement te the requir pmittal.	drilled und ts herein ar ed items w	ler the e true and ill result ir	j 1
Compan	y Information:	C & S Lease Service						
		1873 FM 1252 E Kilgore, TX 75663						
Driller N	ame:	Buford Collier		Lic	cense Numb	er: 5008	39	
Commer	nts:	No Data						
DESCRIPT	Li ION & COLO	thology: R OF FORMATION MATERIA	AL.	BLANK F	Casir PIPE & WEL	ig: L SCREEN	I DATA	
Top (ft.)	Bottom (ft.)	Description	Dla (in.)	Туре	Material	Sch./Gage	Top (ft.)	Bottom (ff.)
0	25	Sandy lean clay, stiff, white	(****		Now Plactic	•		117

0	2.5	and tan
2.5	9	Sandy fat clay, very stiff, red, tan, and white
9	14	Sandy lean clay, very stiff, red and yellow
14	29	Fat clay with sand, very stiff, red and yellow
29	33	Silty sand, very dense, yellow and red
33	38	Sandy lean clay, very stiff, gray with iron oxide cemented sandstone gravel

Dla (in.)	Туре	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
2	Riser	New Plastic (PVC)	40	0	28
2	Screen	New Plastic (PVC)	40 0.010	28	38

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

CROSS REFERENCE SHEET

Date

Name or Subject CR-GWTD HARRISON Located Well Data LK 35-37-103

Regarding Electric Log



Name or Subject

ELECTRIC LOG FILE Q-169

GW-SC

B-152(62-1)

STATE OF TEXAS WELL REPORT for Tracking #254371					
Owner:	Langston Drilling Co.	Owner Well #:	1		
Address:	P.O. Box 746 Shreveport I A 71162	Grid #:	35-37-4		
Well Location:	Waskom Pron	Latitude:	32° 26' 35" N		
	TX	Longitude:	094° 28' 41" W		
Well County:	Harrison	Elevation:	No Data		
Type of Work:	New Well	Proposed Use:	Rig Supply		

Drilling Start Date: 12/31/2005 Drilling End Date: 12/31/2005

	Diameter (in.)		Top Depth (ft.)	Bottom Dept	h (ft.)	
Borehole:	7.875		0	155		
Drilling Method:	Mud (Hydrauli	c) Rotary				
Borehole Completion:	Filter Packed					
	Top Depth (ft.)	Bottom Depth (ft.)	Filt	er Material	Size	
Filter Pack Intervals:	115	155	(Gravel		
	Top Depth (ft.)	Bottom Depth	(ft.)	Description (number of sa	cks & material)	
Annular Seal Data:	0	60		4		
Seal Method: Pu	Distance to Property Line (ft.): > 50					
Sealed By: Dr	iller	Distance to Septic Field or other concentrated contamination (ft.): >100				
			Distance	to Septic Tank (ft.): N	lo Data	
			Met	thod of Verification: s	ight	
Surface Completion:	Surface Slab Ir	nstalled				
Water Level:	50 ft. below la	nd surface on 200	05-12-31 Me	easurement Method:	Unknown	
Packers:	0					
Type of Pump:	Submersible			Pump Depth (ft.): 12	26	
Well Tests:	Jetted	Yield: 50	GPM			

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Water Q	uality:	Strata Depth (ft.) No Data	Water Type No Data			
			Chemical Analysis Made:	Unknown		
		Did the driller knowingly p contain	enetrate any strata which ed injurious constituents?:	Νο		
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.						
Compan	y Information:	Keithville Well Service				
		11719 Mansfield Rd Keithville, LA 71047				
Driller Na	ame:	Howard C. Talley	License Nu	umber: 4403		
Commer	Comments: \$mew Note: point and grid # given on form plots our in/near Brady Branch Reservoir; was unable to confirm location.					
DESCRIPT	Li ION & COLO	thology: R OF FORMATION MATERIAL	C BLANK PIPE & V	asing: VELL SCREEN DATA		
Top (ft.)	Bottom (ft.)	Description	Dia. (in.) New/Used Type	Setting From/To (ft.)		
0	30 (Clay	4 New PVC 0 - 115			
30	60	Stripping Sand	4 New PVC Screen 115 - 1	155 .032		
60	100	Shale				

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) 334-5540

100

150

Sand

Dataset Descriptions and Sources



Dataset	Source	Dataset Description	Update Schedule	Data Requested	Data Obtained	Data Updated	Source Updated
TX HGSD - Texas HGSD	Harris Galveston Subsidence District/Fort Bend Subsidence District	This dataset contains all groundwater well records compiled by Harris Galveston Subsidence District/Fort Bend Subsidence District.	Quarterly	06/06/2023	06/07/2023	06/08/2023	06/07/2023
TX TCEQ HIST - Texas TCEQ Historical	Texas Commission on Environmental Quality	This dataset contains all historical water well records searched from the TCEQ Public Water Well Viewer. Banks Environmental Data plots each well record based on location information found on the log.	As requested	N/A	N/A	N/A	N/A
TX TCEQ PWS - Texas TCEQ PWS	Texas Commission on Environmental Quality	This dataset contains a collection of records from Texas Water Districts, Public Drinking Water Systems and Water and Sewer Utilities who submit information to the TCEQ.	Quarterly	04/05/2023	04/06/2023	04/06/2023	04/06/2023
TX TWDB GW - Texas TWDB Groundwater Database	Texas Water Development Board	This dataset contains water well records contained within Texas Water Development Board Groundwater Database.	Quarterly	05/04/2023	05/04/2023	05/04/2023	05/04/2023
TX TWDB SDR - Texas TWDB Submitted Drillers Reports	Texas Water Development Board	This dataset contains water well records from the Texas Water Development Board Submitted Drillers Reports Database.	Quarterly	05/04/2023	05/04/2023	05/04/2023	05/04/2023
USGS WW - USGS Water Wells	U.S. Geological Survey	This dataset contains groundwater well records from the U.S. Geological Survey.	Semi- annually	04/05/2023	04/05/2023	04/05/2023	04/05/2023

Disclaimer



The Banks Environmental Data Water Well Report was prepared from existing state water well databases and/or additional file data/records research conducted at the state agency and the U.S. Geological Survey. Banks Environmental Data has performed a thorough and diligent search of all groundwater well information provided and recorded. All mapped locations are based on information obtained from the source. Although Banks performs quality assurance and quality control on all research projects, we recognize that any inaccuracies of the records and mapped well locations could possibly be traced to the appropriate regulatory authority or the actual driller. It may be possible that some water well schedules and logs have never been submitted to the regulatory authority by the water driller and, thus, may explain the possible unaccountability of privately drilled wells. It is uncertain if the above listing provides 100% of the existing wells within the area of review. Therefore, Banks Environmental Data cannot fully guarantee the accuracy of the data or well location(s) of those maps and records maintained by the regulatory authorities.



Appendix D

Monitoring Well AD-7 Plugging Report

STATE OF TEXAS PLUGGING REPORT for Tracking #232687										
Owner:	SWEF	PCO			Owner W	/ell #: MW-7 (AD-7)				
Address:	2400 I	FM 3251		Grid		35-37-1				
Well Location:	Halls	/IIIe, IX 75650 FM 3251		Latitude:		32° 27' 40.81" N				
	Hallsville, TX 75650				Longitude	^{e:} 094° 29' 12.31" W				
Well County:	Il County: Harrison				Elevation	¹ No Data				
Well Type:	Μ	onitor								
Drilling Informat	tion									
Company: N	oany: No Data				Date Drilled: 10/3/1983					
Driller: N	lo Data	License Number: No Data								
Borehole:		Diameter (in	.)	Top Depth (ft.)		Bottom Depth (ft.)				
		10		0		40				
Plugging Information Date Plugged: 9/12/2023 Plugger: Rich Herman Plug Method: Pour in 3/8 bentonite chips when standing water in well is less than 100 feet depth, cement top 2 feet										
Casing Left in Well:					Pl	Plug(s) Placed in Well:				
Dla (in.) To	op (ft.)	Bottom (ft.)		Top (ft.)	Bottom (ft.)	Description (number of sacks & material)				
4	0	40		0	40	Bentonite 9 Bags/Sacks				
Certification Data: The driller certified that the driller plugged this well (or the well was plugged 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 reports(s) being returned for completion and resubmittal.										
Company Information: ETTL Engineers & Consultants, Inc.										
		1717 East Erwin Street Tyler, TX 75702								
Driller Name:		Rich Herman				License Number: 59385				
Comments: All casing and screen left in the hole. When attempting to pull, 3' of stickup was all that came out. No cement cap per client request due to grading that is currently going on										