

# Well Construction at the Lake Aurora Well Site in Polk County, Florida



Southwest Florida Water Management District Geohydrologic Data Section

**Cover Photo:** Permanent monitor wells at the Lake Aurora well site in Polk County, Florida. In order from left to right: Surf Aq Monitor, U Fldn Aq Monitor. Photograph by Survey staff.

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By Julia Zydek

January 2024

Southwest Florida Water Management District Geohydrologic Data Section

## **Southwest Florida Water Management District**

**Operations, Lands and Resource Monitoring Division** Brian Starford, P.G., Director

## **Data Collection Bureau**

Sandie Will, P.G., Chief

## **Geohydrologic Data Section**

M. Ted Gates, P.G., Manager

Southwest Florida Water Management District 2379 Broad Street Brooksville, FL 34604-6899

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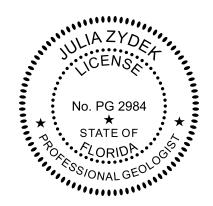
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Name Professional Geologist State of Florida License No. PG 2984

Date: October 17, 2023



## Foreword

The Geohydrologic Data Section (GEO) administers the Regional Observation and Monitor-well Program (ROMP) at the Southwest Florida Water Management District (District). The ROMP was started in 1974 in response to the need for hydrogeologic information by the District. The focus of the ROMP is to quantify the flow characteristics and water quality of the groundwater systems that serve as the primary source of water supply within southwest Florida. The original design of the ROMP consisted of an inland 10-mile grid network composed of 122 well sites and a coastal transect network composed of 24 coastal monitor transects of two to three well sites each. The number of wells at a well site varies with specific regional needs; usually two to five permanent monitor wells are constructed at each site. The numbering system for both networks generally increases from south to north with ROMP-labeled wells representing the inland grid network and TR-labeled wells representing the coastal transect network.

In addition to the ROMP, the GEO section oversees construction of monitor wells and performs aquifer testing activities for other District programs and projects. The broad objectives at each well site are to determine the hydro-geology, water quality, and hydraulic properties of the units present, and to install wells for long-term monitoring. Site activities include exploratory coring and testing, well construction, and aquifer performance testing. These activities provide data for the hydrogeologic and groundwater quality characterization of the well sites. These characterizations are used to ensure the monitor wells are properly designed for intended hydrologic targets. At the completion of each well site, a summary report is generated and can be found at the District's website at www.watermatters.org/data. The monitor wells form the backbone of the District's regional models, hydrologic conditions reporting, and regulatory water use permitting.

M. Ted Gates

Manager

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## **Conversion Factors and Datums**

Multiply	Ву	To obtain
	Length	
inch (in)	2.54	centimeter (cm)
foot (ft)	0.3048	meter (m)
mile (mi)	1.609	kilometer (km)
	Area	
acre	0.004047	square kilometer (km <sup>2</sup> )
square foot (ft <sup>2</sup> )	0.09290	square meter (m <sup>2</sup> )
square mile (mi <sup>2</sup> )	2.590	square kilometer (km <sup>2</sup> )
	Volume	
gallon (gal)	3.785	liter (L)
gallon (gal)	0.003785	cubic meter (m <sup>2</sup> )
cubic foot (ft <sup>3</sup> )	0.02832	cubic meter (m <sup>3</sup> )
	Flow Rate	
foot per day (ft/d)	0.3048	meters per day (m/d)
cubic foot per second (ft <sup>3</sup> /s)	0.02832	cubic meter per second (m <sup>3</sup> /s)
cubic foot per day (ft3/d)	0.02832	cubic meter per day (m <sup>3</sup> /d)
gallon per day (gal/d)	0.003785	cubic meter per day (m <sup>3</sup> /d)

Vertical coordinate information is referenced to the North American Vertical Datum of 1988 (NAVD 88).

Elevation, as used in this report, refers to distance above the vertical datum.

## **Abbreviations and Acronyms**

bls	below land surface
CFWI	Central Florida Water Initiative
District	Southwest Florida Water Management District
fig.	figure
gpm	gallons per minute
gpm/ft	gallons per minute per foot
HQ	3.06-inch internal diameter core drilling rod
Mendez	Mendez Drilling, Incorporated
NAVD 88	North American Vertical Datum of 1988
PVC	polyvinyl chloride
SID	station identification
Surf Aq	surficial aquifer
U Fldn Aq	upper Floridan aquifer
WCP	well construction permit

# Well Construction at the Lake Aurora Well Site in Polk County, Florida

## By Julia Zydek

## Introduction

Eighteen well construction sites were planned to investigate lake and groundwater interactions for the adoption of minimum lake level protocols within the boundary of the Central Florida Water Initiative (CFWI) in Polk County, Florida. The sites are part of the Data, Monitoring, and Investigations Team Work Plan that support the CFWI activities. The well sites will provide lithologic descriptions from land surface to the top of limestone and will provide long-term monitor wells. Two wells will be installed at seven sites, one to monitor the surficial aquifer and the other to monitor the upper Floridan aquifer. The remaining 11 well sites will only have a surficial aquifer monitor well installed. Groundwater level data collected from these wells will help assess the hydraulic connection between the lakes and the surficial and upper Floridan aquifers in the east-central part of the Southwest Florida Water Management District (District). Data collected from the wells will be used to assess the minimum lake levels in accordance with Section 373.042, Florida Statutes and improve model calibration for various District projects.

The sites targeted for investigation are Crystal Lake, Dinner Lake, Eagle Lake, Lake Annie, Lake Amoret, Lake Aurora, Lake Bonnie, Clinch Lake, Lake Easy, Lake Eva, Lake Lee, Lake Lowery, Lake McLeod, Lake Mabel, Lake Starr, Lake Venus, North Lake Wales, and Trout Lake (fig. 1). This report details the well construction and hydrogeology of the Lake Aurora well site.

## Acknowledgments

Special thanks to Mendez Drilling, Incorporated for their continued professionalism.

## Site Location

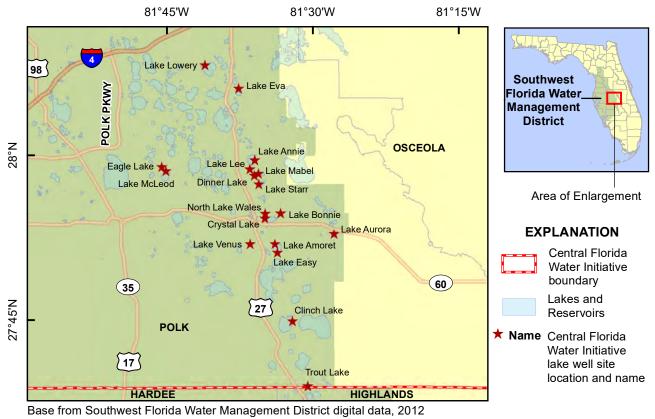
The Lake Aurora well site is in east-central Polk County approximately one mile west of the District boundary (fig. 2). It is in the northwest quarter of the northwest quarter of Section 18, Township 30 South, and Range 29 East at latitude 27° 52′ 46.76″ north and longitude 81° 27′ 53.50″ west (fig.

2). The land surface elevation is approximately 109 feet above the North American Vertical Datum of 1988 (NAVD 88). The Lake Aurora well site is located on a perpetual easement granted to the District by the Lake Aurora Christian Assembly, Incorporated. Figure 3 presents the layout for the Lake Aurora well site. The Lake Aurora well site can be found by taking State Road 60 E/Hesperides Road east in Lake Wales for 7.2 miles, turning south onto Breen Road S for 0.2 miles, turning south onto Acacia Walk, and proceeding for 0.4 miles to the well site.

The Lake Aurora well site is in the Lake Wales Ridge Complex Province in the Lakes District of west-central Florida, which extends from southern Lake County to southern Highlands County (Williams et al, 2022). The Lake Wales Ridge Complex is between the Hardee Upland, and the Osceola Plain to the east. The Lake Wales Ridge Complex Province is primarily made of sand ridges separated by valleys that trend north to south. These sand ridges are underlain by a karstic terrain (Yobbi, 1996). Approximately 200 lakes, ponds, swamps, and sinkholes occur along the Lake Wales Ridge and adjacent areas (Yobbi, 1996). The carbonate materials of the ridge were dissolved, collapsing into sinkholes, and subsequently forming these lakes and ponds (Yobbi, 1996). The Lake Wales Ridge is an area of interest due to the hydrologic connection between surface water systems and groundwater systems via sinkholes and other features characterized by karstic terrain. The Lake Aurora well site is in the Kissimmee River Drainage Basin.

## Methods

Mendez Drilling, Incorporated (Mendez) collected lithologic samples using a Diedrich D-50 drill rig mounted on a Morooka track platform equipped for split-spoon sampling and hydraulic-rotary core drilling and a Failing 1500 drill rig equipped for split-spoon sampling and mud-rotary drilling. Split-spoon sampling occurred between January 21 and 24, 2020, at the surficial aquifer monitor well location. The split-spoon sampler was advanced using a 140-pound hammer through 4.5-inch inside diameter hollow-stem augers, which acted as temporary casing and held the borehole open.



NAD 1983 HARN StatePlane Florida West FIPS 0902 Feet projection

[NAD, North American Datum; HARN, High Accuracy Reference Network; FIPS, Federal Information Processing Standards; N, north; W, west; PKWY, Parkway]

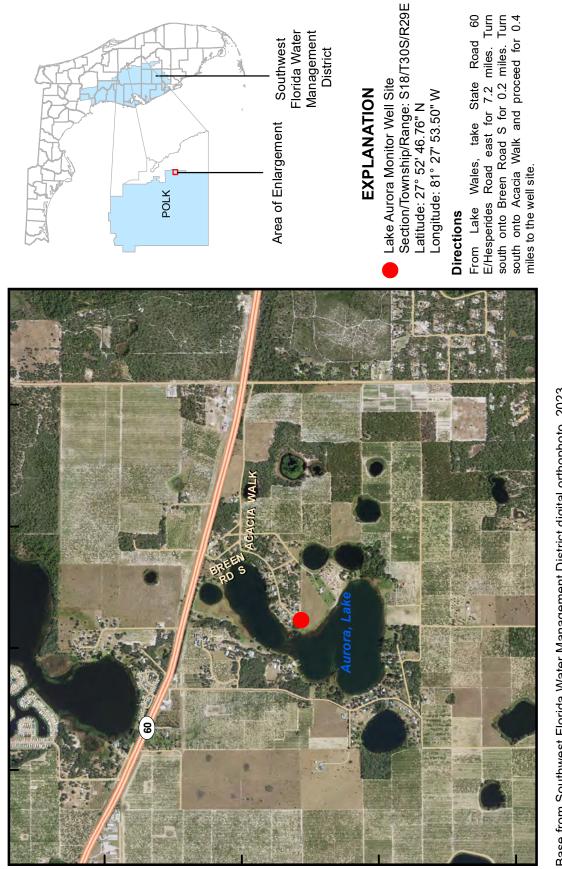
Figure 1. Data, Monitoring, and Investigations Team Minimum Lake Level well sites.

Mendez collected samples in two-foot intervals for every five feet drilled from land surface to 30 feet below land surface (bls). Then, continuous lithologic samples were collected in two-foot intervals from 30 to 60 feet bls. Mendez relocated the Diedrich D-50 drill rig to the upper Floridan aquifer (U Fldn Aq) monitor well location and drilled to 63 feet bls to resume the collection of split-spoon samples in two-foot intervals for every five feet drilled from 63 to 140 feet bls. Then, Mendez moved the Failing 1500 drill rig over the exploratory borehole to construct the U Fldn Aq Monitor well. From January 27 to 30, 2020, grab samples of drill cuttings were collected at five to 10-foot intervals from 120 to 148 feet bls during construction of the U Fldn Aq Monitor well. Mendez switched back to the split-spoon sampling method between 148 and 160 feet bls to collect lithologic samples where green clay containing shell fragments was identified. On January 31, 2020, Mendez drilled from 160 to 168 feet bls. At 168 feet bls, limestone was identified in the drill cuttings; therefore, Mendez switched back to the split-spoon sampling method from 168 to refusal at 170 feet bls. Mendez moved the Diedrich D-50 drill rig mounted on a Morooka track platform back over the borehole

to collect continuous core samples in 5-foot increments using the wireline core drilling method from 170 to 292 feet bls. The samples were boxed, labeled, described, and transported to the Florida Geological Survey for further analysis and storage.

## Well Construction

Monitor well construction at the Lake Aurora well site was completed by Mendez and supervised by District staff. Permanent monitor wells were constructed for long-term water level monitoring. Two monitor wells were constructed, including one permanent surficial aquifer monitor well and one permanent upper Floridan aquifer monitor well (fig. 3). Mendez constructed the two wells between January 21 and February 25, 2020. The exploratory borehole was converted into the upper Floridan aquifer monitor well after exploration was complete. Each well was developed by pumping at least three well volumes until the discharge water was free of sediment and clear, unless otherwise stated. The 4-inch polyvinyl chloride (PVC) casing for each well was raised to three feet



N"0'52°52

N"05'22°7'

81°27'0"W

81°27'30"W

81°28'0"W

81°28'30"W

N"05'53°72



0.5

0.25

N"0'28°72

 Miles [NAD, North American Datum; HARN, High Accuracy Reference Network; FIPS, Federal Information Processing Standards; N, north; S, south; E, east; W, west; Rd, Road]

3

Well Construction

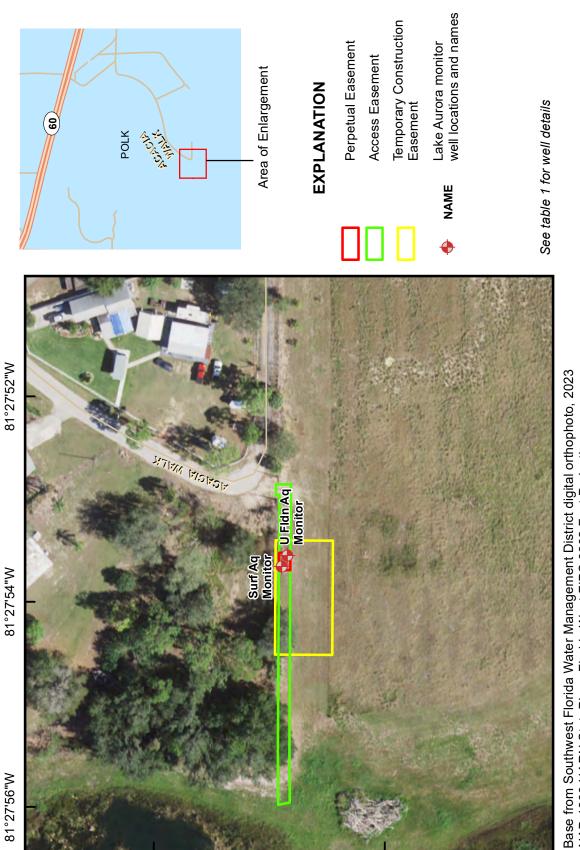
Figure 2. Location of the Lake Aurora well site in Polk County, Florida.

1 Kilometers

0.5

0.25

0



N"84'28°74

27°52'48"N

[NAD, North American Datum; HARN, High Accuracy Reference Network; FIPS, Base from Southwest Florida Water Management District digital orthophoto, 2023 NAD 1983 HARN StatePlane Florida West FIPS 0902 Feet Projection 200 Feet 100 50

Federal Information Processing Standards; N, north; W, west; Rd, Road, U, upper; Fldn, Floridan; Aq, aquifer; Surf, surficial]

Figure 3. Layout of the Lake Aurora well site in Polk County, Florida.

50 Meters

25

12.5

C

 $\overline{}$ 

above land surface. Sand was installed inside a lockable metal well cover around the casing. Concrete pads were installed around the finished wells. The groundwater level in each well was measured after well development using a Solinst electric water level meter. Each well has been surveyed, benchmarked, and equipped for daily water level monitoring.

## **Surficial Aquifer Monitor Well**

The Surf Aq Monitor well (District station ID [SID] 934533) was installed between January 21 and 24, 2020, using well construction permit (WCP) number 885476. The final well specifications can be found in table 1 and figure 4. The well is contained within the undifferentiated sand and clay sediments and will be used to monitor the groundwater level in the surficial aquifer.

Mendez constructed the Surf Aq Monitor well using a Diedrich D-50 drill rig mounted on a Morooka track platform equipped for hollow-stem auguring to drill an 8-inch hole from land surface to 60 feet bls. Next, 4-inch, schedule 40, threaded, PVC screen (0.010-inch slot) was installed between 10.5 and 50.5 feet bls. Then, 4-inch, schedule 40, threaded, PVC casing was installed from land surface to 10.5 feet bls. A 20-30 silica sand filter pack was installed from six to 50.5 feet bls, a 30-65 fine silica sand seal was installed from four to six feet bls, and cement grout was installed from land surface to four feet bls. The well was developed for approximately 35 minutes at 42.85 gallons per minute (gpm). The specific capacity of the well was nine gallons per minute per foot (gpm/ft) and the approximate measurement of the drawdown was recorded at 4.69 feet. The Surf Aq Monitor well was used as the water supply well for the remainder of the core drilling and well construction operations.

## **Upper Floridan Aquifer Monitor Well**

The U Fldn Aq Monitor well (District SID 934534) was installed between January 23 and February 25, 2020, under WCP number 885295. The final well specifications can be found in table 1 and figure 5. The well will be used to monitor the water levels in the upper Floridan aquifer.

On January 27, 2020, Mendez used the Failing 1500 drill rig to widen the exploratory borehole to 18 inches in diameter, from land surface to 114 feet bls. Next, 12-inch, schedule 40, threaded, PVC casing was installed and grouted from 114 feet bls to land surface. The cement was left to harden overnight. On February 3, 2020, Mendez drilled a nominal 12-inch open hole using the mud-rotary method from 114 to 160 feet bls. Next, 8-inch, schedule 40, threaded, PVC casing was installed and grouted from land surface to 160 feet bls. The cement was left to harden overnight.

Between February 5 and 13, 2020, the Failing 1500 drill rig was removed, and the Diedrich D-50 drill rig was set up on the borehole. Mendez drilled a nominal 8-inch open hole using the mud-rotary method from 160 to 240 feet bls. Next, 4-inch,

glued, schedule 40, Certa-Lok PVC casing was installed and grouted from land surface to 240 feet bls. The cement was left to harden overnight. On February 14, 2020, the annulus was tagged at 235 feet bls. Mendez installed 40 bags of 1/4-inch gravel and 200 gallons of cement grout in the annulus. The cement grout was left to harden overnight. On February 17, 2020, the annulus was tagged at 233 feet bls. Mendez installed 76 bags of pea gravel and 300 gallons of cement grout in the annulus. The annulus was tagged at 218 feet bls. On February 18, 2020, Mendez tagged the annulus at 231 feet bls, which is a 13 feet loss from the initial tag. Next, Mendez installed 30 bags of pea gravel and 11 bags of cement grout in the annulus and let the cement harden. The annulus was still tagged at 231 feet bls. A well construction variance was approved to use sections of 1/2-inch PVC pipe of varying lengths (not to exceed six feet) and gravel to create a bridge. On February 19, 2020, Mendez installed the sections of 1/2-inch PVC pipe (ranging from one to five feet in length) through a 1-inch PVC pipe placed at the bottom of the borehole. After several pieces of 1/2-inch PVC pipe were installed at the bottom of the borehole, 20 five-gallon buckets of gravel were also installed at the bottom of the borehole to create the bridge. The gravel was tagged at 227 feet bls. The bridge process was repeated by installing varying lengths of 1/2-inch PVC pipe through the 1-inch PVC pipe at the bottom of the borehole. One five-gallon bucket of gravel was installed in the annulus and the annulus was tagged at 225 feet bls. Next, fifteen bags of cement were installed in the annulus. The cement was left to harden overnight. Mendez encountered intermittent cavities between 189 and 232 feet bls during core drilling. These cavities were noted as circulation losses on the daily drilling logs in appendix A. Therefore, cement loss is likely attributed to the cavities.

On February 20, 2020, the annulus was tagged at 218 feet bls. Mendez installed 10 five-gallon buckets of gravel. Another 1/2-inch PVC bridge was installed but the annulus was still tagged at 218 feet bls. Mendez installed seven five-gallon buckets of gravel in the annulus and tagged it at 216.5 feet bls. Another <sup>1</sup>/<sub>2</sub>-inch PVC bridge was installed and topped with seven five-gallon buckets of gravel. The annulus was tagged at 215 feet bls. A third 1/2-inch PVC bridge was installed and topped with 5.5 five-gallon buckets of gravel. The annulus was tagged at 213 feet bls. Sixteen bags of cement grout were installed in the annulus. After the cement grout hardened, the annulus was tagged at 213 feet bls. Mendez installed 4.5 fivegallon buckets of gravel in the annulus and tagged it at 207 feet bls. Next, Mendez installed 135 gallons of cement grout in the annulus. After the cement grout hardened, the annulus was tagged at 68 feet bls. Mendez installed 21 bags of cement grout in the annulus. The cement was left to harden overnight. On February 21, 2020, Mendez tagged the annulus at 60 feet bls. Mendez installed 107 gallons of cement grout, which made a visible return at land surface.

Between February 24 and 25, 2020, Mendez performed wireline core drilling through the 4-inch PVC casing from 240 feet bls to a total depth of 292 feet bls. Twenty feet of

#### 6 Well Construction at the Lake Aurora Well Site in Polk County, Florida

#### Table 1. Summary of well construction details at the Lake Aurora well site in Polk County, Florida

[SID, station identification; ft, feet; bls, below land surface; MM/DD/YYYY, month/day/year; WCP, well construction permit; No. number; Surf, surficial; Aq, aquifer; PVC, polyvinyl chloride; Inc., Incorporated; U, upper; Fldn, Floridan]

SID	Station Name	Open Interval (ft bls)	Casing Type	Casing Diameter (inches)	Constructed By	Start Date (MM/DD/ YYYY)	Complete Date (MM/ DD/YYYY)	Status	WCP No.
934533	Lake Aurora Surf Aq Monitor	10.5-50.5	PVC screen	4	Mendez Drilling, Inc.	01/21/2020	01/24/2020	Active	885476
934534	Lake Aurora U Fldn Aq Monitor	240-292	PVC	4	Mendez Drilling, Inc.	01/23/2020	02/25/2020	Active	885295

the temporary HQ working casing was tripped out and the borehole was airlifted for 30 minutes. Next, Mendez tripped out 30 more feet of the temporary HQ working casing and airlifted for 30 more minutes. The remainder of the temporary HQ working casing was tripped out of the hole. The well was developed for approximately 57 minutes at 8.82 gpm. The specific capacity of the well was 0.9 gpm/ft, and the approximate measurement of the drawdown was recorded at 10.07 feet. After well construction was completed, a caliper log of the U Fldn Aq Monitor well was collected on February 25, 2020 (fig. 6).

## Geology

The geology of the Lake Aurora well site is based on lithologic samples collected from split-spoon sampling, interpretation of drill cuttings collected during well construction, and lithologic samples collected from hydraulic-rotary core drilling. The geologic units encountered at the well site include, in ascending order: the Ocala Limestone, the Suwannee Limestone, the undifferentiated Arcadia Formation, the Peace River Formation, the Cypresshead Formation, and the undifferentiated sand and clay deposits. A stratigraphic column detailing the lithostratigraphy encountered at the well site is presented in figure 7. The lithologic log is presented in appendix B. Digital photographs of the lithologic core samples are presented in appendix C.

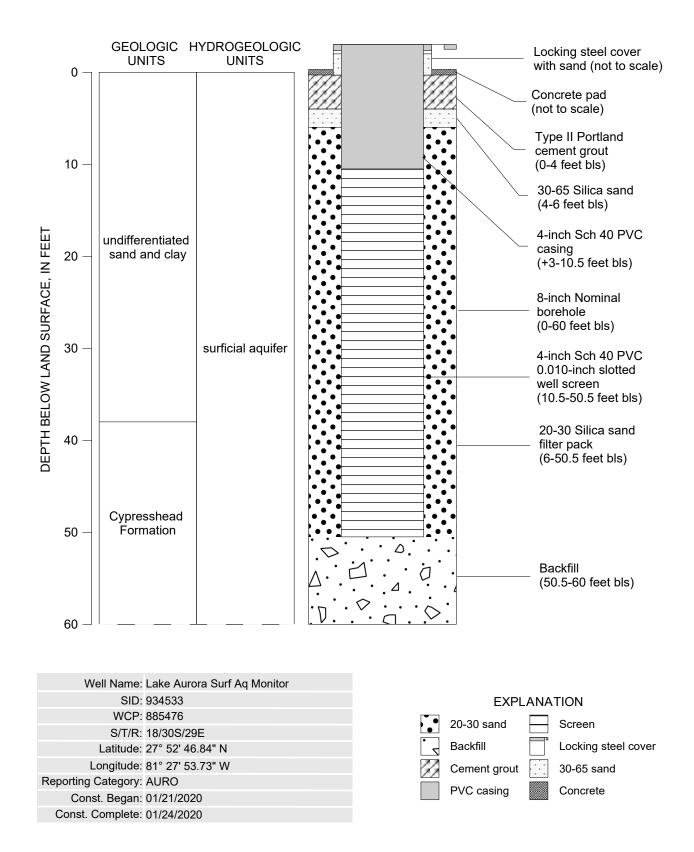
The late Eocene age Ocala Limestone extends from 240 feet bls to beyond the total depth of exploration at 292 feet bls at the Lake Aurora well site. The top of the Ocala Limestone was picked at the top of the very first grab sample interval where the diagnostic benthic foraminifera, *Lepidocyclina ocalana* was identified. The general lithology of the Ocala Limestone at this location consists of very light orange to yellowish gray, fossiliferous, very fine to fine grained limestone

with good induration. Additional fossil molds and fragments observed are mollusks including gastropods, and brachiopods and benthic foraminifera. The porosity of the limestone is predominantly intergranular, pinpoint, vugular, and moldic.

At the Lake Aurora well site, the early Oligocene age Suwannee Limestone extends from 232 to 240 feet bls. The top of the Suwannee Limestone was difficult to pick because a void was present from approximately 228 to 232 feet bls, resulting in 46 percent recovery of cuttings. No phosphate was observed in the interval between 232.5 and 235 feet bls. The general lithology of the Suwannee Limestone at this location consists of very light orange to grayish orange, fossiliferous, very fine to fine grained limestone with good induration. Fossil molds and fragments observed were mollusks including gastropods, and coral.

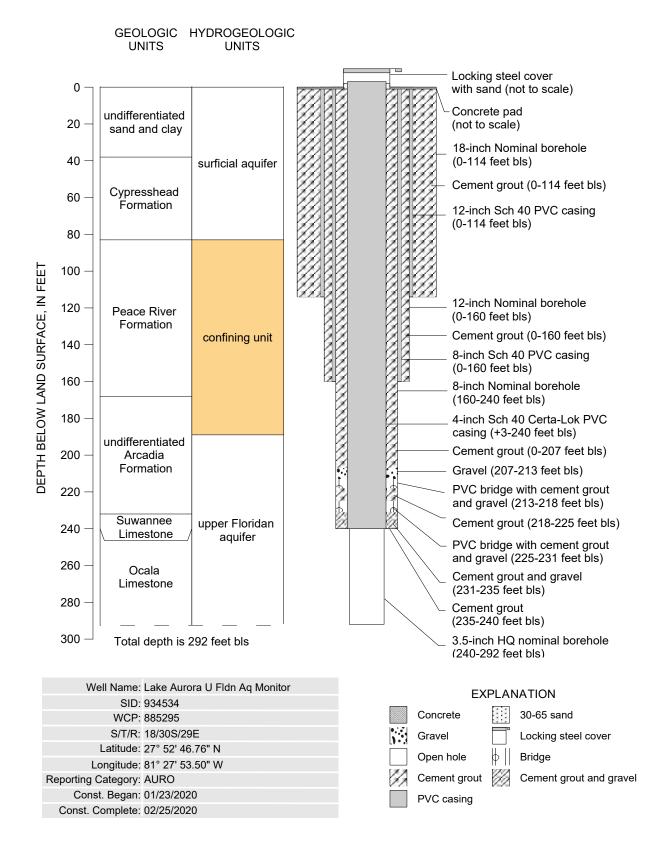
At the Lake Aurora well site, the Miocene to Oligocene age undifferentiated Arcadia Formation is present from 168 to 232 feet bls. The undifferentiated Arcadia Formation primarily consists of very light gray to yellowish gray, phosphatic wackestone, mudstone, and dolostone that are generally microcrystalline to fine grained with good induration. Phosphatic gravel and sand is present throughout this unit, with phosphatic sand being dominant. Fossil molds and fragments observed were mollusks including gastropods. Shark teeth were observed in the core samples between 172 and 176 feet bls. Small clay lenses are present between 215.8 and 218 feet bls.

The Miocene age Peace River Formation is present from 83 to 168 feet bls at the Lake Aurora well site. The top of the Formation was picked at a transition from sand to sandy clay. The general lithology of the Peace River Formation at this location consists of yellowish gray to light olive gray, sub-rounded to rounded sand. Clay, mica, and organics are present throughout the Formation. Fossil fragments increase with depth, and a bed of fragmented mollusk shells is present between 133 and 135 feet bls. Between 148 and 150 feet bls, phosphatic limestone was observed. Silt-sized dolomite was



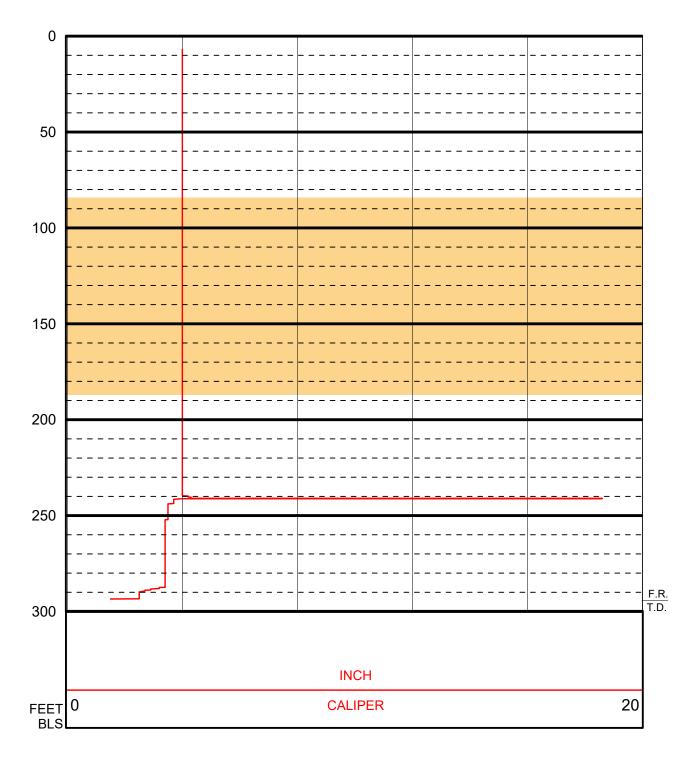
[bls, below land surface; Sch, schedule; PVC, polyvinyl chloride; Surf, surficial, Aq, aquifer; SID, station identification; WCP, well construction permit; S/T/R, Section/Township/Range; S, south; E, east; Const., construction]

Figure 4. Well as-built diagram for the Surf Aq Monitor at the Lake Aurora well site in Polk County, Florida.



[bls, below land surface; Sch, schedule; PVC, polyvinyl chloride; U, upper; Fldn, Floridan; Aq, aquifer; SID, station identification; WCP, well construction permit; S/T/R, Section/Township/Range; S, south; E, east; Const., construction]

Figure 5. Well as-built diagram for the U Fldn Aq Monitor at the Lake Aurora well site in Polk County, Florida.



[BLS, below land surface; F.R., first reading above total depth a geophysical tool makes a measurement; T.D., total depth]

**Figure 6.** Caliper log for the U Fldn Aq Monitor from land surface to 293.5 feet below land surface collected at the Lake Aurora well site in Polk County, Florida. The log was performed on February 25, 2020, using the 9064A (caliper/gamma-ray) tool. The tool was run inside 4-inch schedule 40 polyvinyl chloride casing that was set to 240 feet below land surface. The log scale is 2-inches per 100 feet and is linearly scaled. The first reading is 293.5 feet below land surface. Shaded intervals indicate confining units.

observed in an interval of sand intermixed with clay between 158 and 160 feet bls.

The Late Pliocene Cypresshead Formation is present at the Lake Aurora well site from 38 to 83 feet bls. The top of the Formation was chosen where moderate brown to moderate yellowish brown sands transition to grayish orange to dark yellowish orange sands. The Cypresshead Formation primarily consists of white to very light orange, very fine to fine grained, sub-rounded to rounded, unconsolidated sand with accessory mica and organics.

At the Lake Aurora well site, the Pliocene to Holocene age undifferentiated sand and clay unit is present from land surface to 38 feet bls. The interval from land surface to 28 feet bls consists of very light orange to yellowish brown, fine to medium grained, sub-rounded to rounded, unconsolidated sand with accessory organics. Mica was observed beginning at 18 feet bls. From 28 to 38 feet bls, the sediments are primarily dark yellowish brown to moderate brown, very fine to fine grained, sub-rounded to rounded, unconsolidated sand with accessory mica and organics.

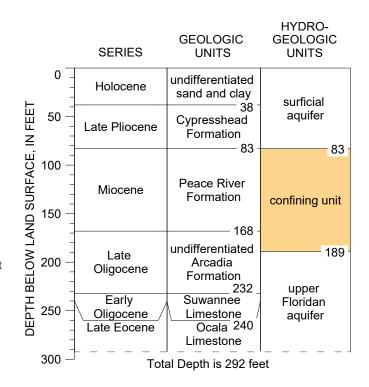
## Hydrogeology

The hydrogeology of the Lake Aurora well site was delineated based on the lithology encountered during splitspoon sampling, core sampling, and rock cuttings collected during well construction, and observed groundwater levels in the wells. Two aquifers were identified at the Lake Aurora well site: the surficial aquifer and the upper Floridan aquifer separated by a confining unit (fig. 7).

The surficial aquifer is the shallowest hydrogeologic unit present at the Lake Aurora well site. It extends from the water table to 83 feet bls and is unconfined. The aquifer is contained within the undifferentiated sand and clay unit and the Cypresshead Formation. The sediments were wet at eight feet bls during sample collection. On December 20, 2021, the groundwater elevation in the Surf Aq Monitor well was measured at 95.59 feet NAVD 88 (fig. 8).

A confining unit is present between 83 and 189 feet bls in the low-permeability mixed clays and limestones of the Peace River Formation and the upper portion of the undifferentiated Arcadia Formation. The confining unit separates the surficial aquifer from the underlying upper Floridan aquifer.

The portion of the upper Floridan aquifer encountered during well construction extends from 189 feet to beyond the depth of exploration and includes the lower portion of the undifferentiated Arcadia Formation, all the Suwannee Limestone, and the Ocala Limestone (fig. 7). The top of the unit occurs near the top of the undifferentiated Arcadia Formation and was chosen within persistent, well indurated, fossiliferous wackestones, where drilling fluid circulation was lost. The base of the unit was not reached during well construction but is predicted to occur around 600 feet bls at this location, at the top of middle confining unit I (Miller, 1986). On December



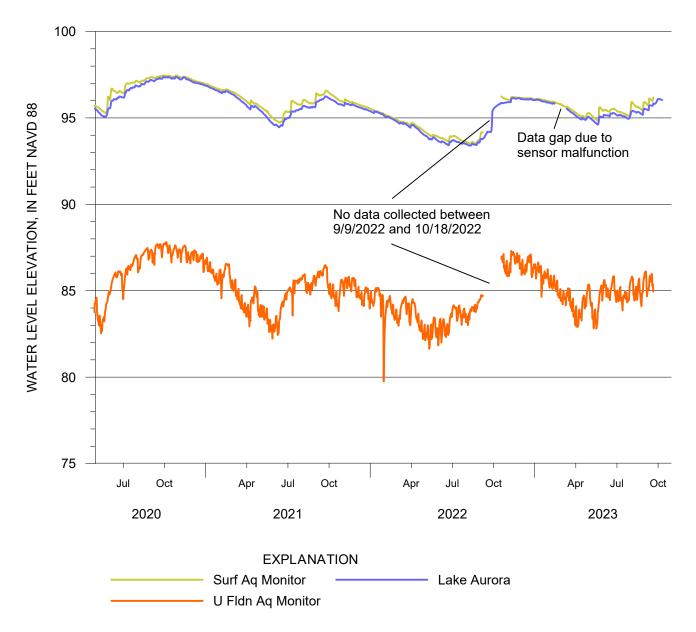
[Land surface elevation is approximately 108.6 feet above the North American vertical datum of 1988 at the U Fldn Aq Monitor well]

**Figure 7.** Stratigraphic column detailing the hydrogeologic setting at the Lake Aurora well site in Polk County, Florida.

20, 2021, the groundwater elevation in the U Fldn Aq Monitor well was measured at 84.75 feet NAVD 88, which was 10.84 feet below the Surf Aq Monitor well water level. Figure 8 presents a hydrograph of the maximum daily water levels for the monitor wells and the daily mean water level for Lake Aurora. The surficial aquifer and Lake Aurora water levels are shallower relative to the upper Floridan aquifer water levels indicating a downward head gradient and suggests the Lake Aurora well site is in a recharge area for the upper Floridan aquifer (fig. 8).

## Summary

Two monitor wells were constructed at the Lake Aurora well site in Polk County, Florida between January and February 2020. The wells were constructed as part of the CFWI to monitor groundwater levels in the surficial and upper Floridan aquifers near Lake Aurora. The casing and total depth of the Surf Aq Monitor well are 10.5 and 50.5 feet bls, respectively. The casing and total depth of the U Fldn Aq Monitor well are 240 and 292 feet bls, respectively. The groundwater levels in the two wells differed by 10.84 feet on December 20, 2021. Both wells are secured with lockable metal well covers and equipped for long-term groundwater level monitoring.



[Apr, April; Aq, aquifer; Fldn, Floridan; Jul, July; NAVD 88, North American Vertical Datum of 1988; Oct, October; Surf, surficial; U, upper]

**Figure 8.** Hydrograph of the maximum daily water levles for the permanent monitor wells at the Lake Aurora well site and the daily mean water level for Lake Aurora in Polk County, Florida.

The hydrogeology of the well site was determined from split-spoon samples collected prior to well construction and core samples and drill cuttings collected during well construction of the upper Floridan aquifer monitor well. The geologic units encountered at the site are: Ocala Limestone from 240 feet bls to beyond the total depth of exploration at 292 feet bls, the Suwannee Limestone from 232 to 240 feet bls, the undifferentiated Arcadia Formation from 168 to 232 feet bls, the Peace River Formation from 83 to 168 feet bls, the Cypresshead Formation from 38 to 83 feet bls, and the undifferentiated sand and clay deposits from land surface to 38 feet bls. The hydrogeologic units encountered at the site are: the surficial aquifer from land surface to 83 feet bls, a confining unit from 83 to 189 feet bls, and the upper Floridan aquifer from 189 feet bls to beyond the total depth of exploration of 292 feet bls.

## References

- Miller, J.A., 1986, Hydrogeologic Framework of the Floridan Aquifer System in Florida and in Parts of Georgia, Alabama, and South Carolina: U.S. Geological Survey Professional Paper 1403-B, 91 p., 33 pls.
- Williams, Christopher P., Scott, Thomas M., and Upchurch, Sam B., 2022, Florida Geomorphology Atlas: Florida Geological Survey Special Publication No. 59, 238 p.
- Yobbi, D.K., 1996, Analysis and Simulation of Ground-Water Flow in Lake Wales Ridge and Adjacent Areas of Central Florida: U.S. Geological Survey Water-Resources Investigations Report 94-4254, 82 p.

## Appendix A. Scanned Daily Drilling Logs Taken During Well Construction at the Lake Aurora Well site in Polk County, Florida

REPORT #	SITE GEOLOGIST	DATE	DATE ON SITE	START DEPTH
1	TJ FALLON, K Mallams	21 Jan 2020	21 Jan 2020	
CONTRACTOR	CREW	PROPOSED TD	PROGRESS	DEPTH
Mendez Drilling	Tony Hudson Moth Herron Roy Smith	40		
	John	· ·	-	
WELL SITE	Lake Aurora	WELL NAME	SA Mo	onitor

TIME	LOG	ΝΕΡΤΗ		1
From	То	DEPTH	DETAILS OF OPERATIONS	$W_{i}$
09:00			Fallon on-site: Mendez-onsite	~ 8'
0952			- Setna Rix up to drill W.S. Well; Mix	
10:28	-	1.5.3 .	Drill	
10:42		3-5 .	SPI (1,2,2,3) 86/00 E SPT per Ando Hammer	
10:44		5-8	- Drill	]
1045		8-10	SPT (3, 4, 4, 4) 15 blows Bassy Mud-	
1047		10-13		
1049		13-15	SPT (2, 3, 5, 6) 14 blows	]
1051		15-10	Dan	
1055		18-20	SPT (2,3,5,5) 15 Blows	
		*	Add water to Mind pit, Add more Mud, desand Mud	
1100		20-23	Dall	
1110		23-25	SPT (3,4,5,8) 20 610WS	]
1112		25-28	Drill	]
1117		28-30	SPT (4,5,5,6) 20 blows	
++20-		30-34	-8-77	
1123		30-32	SPT (2,24,6) 14 blows	
1136		32-34	SPT (1, 2, 3, 5) 11 610WS	
11:44		34-36	SPT (5, 1, 10, 20) 42 blows	
1150		36-38	SPT (15, 21, 23, 24) 83 blows	
1200		38-40	SPT (Y, 13, 17, 21) 59 blows.	
1208		40-42	SPT (7,10, 15, 21) 53 blows 1220 - Add mud	
12:20		42-44	SPT (10, 14, 15, 21) 60 blows	
		44-46	SPT (9, 11, 14, 17) SI blows	
1242		46-48	SPT (7,10,15,19) 51 blows	
1252		45-50	SET 18,89,15,40 blows	
1300		50-52	SPT (8,5,12,14) 45 blows	
1311		52-54	SPT ( 8 9, 10, 13) 40 blows 1318-Add Water - Filling Ris	1.15
1342		54-56	SPT (7,7,8,12) 34 blows Whertank from mobil tank	
1352	· .	56-58	SPT (6,8,11,14) 39 blows Should sind but of Mud tub	
1401		58-60	SPT1 7,79,5) 38 blows Added Mind	
14:44	14:50	1.5-10.	- Augen (91/4-inch screw, outer diometer	
	•		26-inch inner Algareten	
15:20			Drillers off-site	
			· · · · · · · · · · · · · · · · · · ·	
Dist				
Represe	ntative			

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REPORT #	SITE GEOLOGIST	DATE	DATE ON SITE	START DEPTH
2	TJ FALLON	22 Jan 2020	21 Jan 2020	10
CONTRACTOR	CREW	PROPOSED TD	PROGRESS	DEPTH
Mendez Drilling	Tony H. Roy S. Matt H. John	40	40	
			$-N_{\rm eff}$ , $Z_{\rm eff}$	
WELL SITE	Lake Aurora	WELL NAME	SA Monitor	

	From	Τ-	DEPTH	
		То		DETAILS OF OPERATIONS
	07:05		/	- Fallon on-site
	07:30		194 - C	- Kallon on-site Driller on-site; Rig on; Prep Son augen - Augen MI IIII Sand Estimate = 40 sank of 20/20 Sand 7 Paur in Sand - Sacks 20/30 MM MM MHI MHI MHI MHI MHI MHI 11-744 botal bag Driller said Total web depth 15 52'
	07 55	08:40	10'- 50'	- Auger My III
	· · · · ·		ļ	Sand Estimate = 40 sack of 20/20-Sand 7 Paur in Sand
	09:25	11:20	1.550' -	Sacks 20/36 THE
			· -	Driller said Total nee depth 15 52'
				Dr. Here Took wher twels after well was appose to before development,
		•		
				Therse, 10 gpm pump - used by develop will pump set on bothom (52'bis)
	12 2 4	1		pump set on bothom (52'bis)
100	1223	1258		Well development - Pump & bottom of well
			· · · · · ·	5gallon bucket - 28:2 sec to fill (0.47 min) 10.63 gpm
				5gella bucket - 28:2 sec to fill (0.47 min) 10.63 gpm DD-16:08 Decorreng = 15.07
				Specific Capacity = 10,033pm/(10.08-15.07)= 10.53 Jpm/Pt
	1.5	10 40.		
	1312	1336		Development - pump is half way down well
	12.1			$\mathcal{P}$
	1344	- 10 C - 10		Prefing & Mubilizing to UFA well
	-			· · · · · · · · · · · · · · · · · · ·
		-		
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	-			· · · · · · · · · · · · · · · · · · ·
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District		44
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REPORT #		1	SITE GEOLOGIST	DATE	DATE ON SITE	START DEPTH
3			TJ FALLON K. Mallans	22 Jan 2-020 22 Jan 2020 4		
CONTRACTOR		CREW		PROPOSED TD	PROGRESS	DEPTH
Mendez	Drilling	TUP	CM HH TH	60		
WICHUCZ	Drining	Veny H, Koy	S. Matt H. John		-	
WELL	SITE		Lake Aurora	WELL NAME	UFA Mo	onitor
TIME LOG					1710115	
From	То	DEPTH		DETAILS OF OPER		
14:00			Moranka Miedenich or Mendez off-site	er hole, Prento	Drill Sor 23	January
4:25		1.1	Mendez offsile	1 1		/
5:20	1	1.00	-Fallow 055 site			
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### SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT GEOHYDROLOGIC DATA SECTION DAILY DRILLING LOG - CORE REPORT

<b>REPORT #</b>	SITE GEOLOGIST	DATE	DATE ON SITE	START DEPTH
Н	TJ FALLON	23 Jan 2020	21 Jan 2020	4.8
		1		
CONTRACTOR	CREW	PROPOSED TD	PROGRESS	DEPTH
Mendez Drilling	Malt Herron; John Roy S. Tony H	60-	130	. 130

Lake Aurora	WELL NAME	

TIME	LOG	DEPTH	DETAILS OF OPERATIONS
From	То	DEPTH	DETAILS OF OPERATIONS
08:15			· FALLON on-site; SA-W.L. = 15:09 St btoc @ 08:30
58:42			Mendez . on-site Rig-on Quik-Gel dumpster Seams, Circulate Mudy BAdd Quik - Gel - total bago - 11
			4 Add Quik - (reli - total bago - 11
09:41	1022	4.5 43	- Drill out SPT boxehole to 63 bls
			455t Rad Score= THY THE 11
1032	1034	63-65	SPT ( X, 6, 9, 10) 33 blows '
1043	1.1.1	65-68	Drill
1054		68-70	SPT (10,7,8,10) 31 blows
1115	1	70-73	Dell
1124	1	73-75	SPT (6,7,010) 33 blows
1133		75-78	Drill
1141		78-80	SPT (10,16,20,18) (04 blows
1202		80-83	Deill
1211		83-85	SPT (4,5,6,7) 22 blows - Clay content
	1	85-88	Drill
1234		88-90	SP.T (4,2,3,4) 13 blows
1246		90-93	Prill
1256		93-95	SPT (2,2,4,5) 13 blows
1315		95-98	Drill
1326		98-100	SPT (3, 4, 4, 5) 16 blows
1337		100-103	Dall
1349		103-105	
1407		105-108	
1418		108-110	
143D		110-113	Drill
1442.		113-115	SPT (2,3 5,10) 20 blows - (lay Content
1500	1	115-118	Dell
1518		118-120	SPT (8, 11, 21, 29) 129 blows - Dry Clay of shell Freements
1543		120-123	Drill
1605		123-125	SPT (8,11,14,21) 56 51005
16:24		125-128	Drill
16:42		128-130	SPT (7,2131.42 101 blows
16:50			Ria 0 fs
17/15			Driller 055 she
17 35			- FALLOW OSS-Silt
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Starface 12" -> 115 isl. ?

District Representative

WELL SITE

REPORT #	SITE GEOLOGIST	DATE	DATE ON SITE	START DEPTH
5	TJ FALLON	24 Jan 2020	21 Jan 2020	130
CONTRACTOR	CREW	PROPOSED TD	PROGRESS	DEPTH
	Matt & Chance Herrow, Ski, Roy S. Jon H.	60	10	140'

TIM	E LOG	DEPTH	DETAILS OF OPERATIONS
From	То	DEPTH	
08:05			FALLON ON-site; WL'S SA= 14.92 Stoc @ 8:09
08:15			Mendez on site; Fuel Rig Rigon; Circulate Mad Drill : (Driller: Note: Cave in n32 - 50 in SPT Hale - Drill root)
28:46	09:15	130-133	- Drill ' Orillor's Note: Cave-in n32'- 50' in SPT Hole - Drill rood)
09:30		138-175	SPT (8,1325,82) 128 blows
09:48		135-138	- Deill
10:07	1	138-140	Co- (12 10 707 11) 1/7 // -
	) és		4 Trip out: Enety tub: Move Diederich assos Hole.
11:00			4 Trip out; Engly tob; Move Diederich assos Hole. More Failing 1500 over Hole
			Mast- Up, Tub in place.
13:51			Mast-Up , Tuk in place. All parties off-site
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Representative		

	REPORT #	SITE GEOLOGIST	DATE	DATE ON SITE	START DEPTH
	6	TJ FALLON	24 Jan 2020	21 Jan 2020	÷
illing Tony Hudson 60 ~	CONTRACTOR	CREW	PROPOSED TD	PROGRESS	DEPTH
	Mendez Drilling	Tony Hudson	60	-	4
	Mendez Drilling -	Tony Hudson	60	4	-

TIME	.OG	DEPTH	DETAILS OF OPERATIONS
From	То	DEPTH	
0:20			Install 2'x2' x bruch Concrete pade well Shelten
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District Representative	
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REPORT #	SITE GEOLOGIST	DATE	DATE ON SITE	START DEPTH
Fa	TJ FALLON	27 Jan 2020	21 Jan 2020	4.5
CONTRACTOR	CREW	PROPOSED TD	PROGRESS	DEPTH
	Roy Smith Tony Hudson	140 -60-		
WELL SITE	Lake Aurora	WELL NAME	UFA M	onitor

10:43   10:55  1:25 1206 1233   1415  420	То 10120 1225 1400 1640 7.48	DEPTH 4.520 20-40 40-40 40-80 80-100	DETAILS OF OPERATIONS Fallon an-site; WI-SA: 14,22 btos Mender on-site; 08:30 G. Tomlason; 09:00 K. Mallons + Dave Arnold Med Sample · See Report 76 Deill of 18-inch Drag Bit 205t Rod Count IIII + Kelly & Add Quick Gel - 1Bag + Girculate Drill : Add Quick Gel II bags Mail Sample Wall Cake thickness kst Sand Contant, Mud weight, Viscosity (Mud) tests Drill Drill Drill Sand Contant, Mud viscosity, Mud weight tests Drill & Cinculate Mud
08:2-7 09:15 09:15 10:43 10:43 10:55 10:55 10:55 12:06 12:33 14:15 14:15 14:25 14:25 14:25 14:25 14:20 14:55 14:20 14:556 14:55	1225	20-40 40-100 60-80	Mender on-site '08:30 C. Tomlinson; 09:00 K. Mallons + Dare Arnold Mad Sample · See Report 76 Deill of 18-inch Drog Bit 205+ Rod Count IIII + Kelly BAdd Quick Gel - 1Bag + circulate Drill : Add Quick Gel II bags Mail Sample Wall Cake thickness lest Sand Contant, Mud weight, Viscosity (Mud) tests Drill Drill
99:15 99:25 10:43 10:55 10:55 11:25 1206 1233 1415 1415 1423 1640 17:58 18:00	1225	20-40 40-100 60-80	Mender on-site '08:30 C. Tomlinson; 09:00 K. Mallons + Dare Arnold Mad Sample · See Report 76 Deill of 18-inch Drog Bit 205+ Rod Count IIII + Kelly BAdd Quick Gel - 1Bag + circulate Drill : Add Quick Gel II bags Mail Sample Wall Cake thickness lest Sand Contant, Mud weight, Viscosity (Mud) tests Drill Drill
09:30 1 10:43 1 10:55 11:25 1206 1233 1 1415 1415 1423 1640 1 17:58 18:00	1225	20-40 40-100 60-80	BAdd Quick Gel - Bag + circulate -Drill: Add Quick Gel II bags Maid Sample Wall Cake thickness lest Send Content, Mud weight, Viscosity (Mad) tests Drill Drill Drill
10:43   10:55 1206 1233   1415 1415 1420 1640   17:58 18:00	1225	20-40 40-100 60-80	BAdd Quick Gel - Bag + circulate -Drill: Add Quick Gel II bags Maid Sample Wall Cake thickness lest Send Content, Mud weight, Viscosity (Mad) tests Drill Drill Drill
10:43   10:55 1206 1233   1415 1415 1420 1640   17:58 18:00	1225	40 - 100 (00 - 80	BAdd Quick Gel - Bag + circulate -Drill: Add Quick Gel II bags Maid Sample Wall Cake thickness lest Send Content, Mud weight, Viscosity (Mad) tests Drill Drill Drill
10.55   :25  206  233     415  420  420  420  440  : 14:58 18:00	1640	40 - 100 (00 - 80	Drill: Add Quick Gel II bags! Mail Sample Wall Cake thickness lest Sand Content, Mud weight, Viscosity (Mud) tests Drill Drill Drill
10.55 11:25 1206 1233 1415 1415 1420 1640 17:58 18:00	1640	60-80	Mail Sample Wall Cake thickness lest Sand Content, Mud weight, Viscosity (Mud) tests Drill Drill
:25  206  233     415  420  640    17:58 18:00	1640	60-80	Sand Content, Mud weight, Viscosity (Mud) tests Drill Doill
1233   1415 1420 1640 1 17:58 18:00	1640	60-80	Drill Doill
1415 1420 1640 1: 17:58 18:00	1640	60-80	Drill Doill
1420 1640 1: 17:58 18:00		60-80	Drill Sand Context, mud viscosity, mud weight tests Drill & Circulate Mud
1640 1 17:58 18:00		80-100	Sand Conkert, mud viscosity, mid weight tests Drill & Circulate Mud
17:58	7:48	80-100	Drill & Circulate Mud
18:00			
			-Mud Sample -Trip out Rods
18:36			-Trip out Rods
			- Rig OSS - All parties OSS-site
1		1. T	
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	1		Total bass of Mud- THE ITHE THE THE

District Representative		

REP	ORT #		SITE GEOLOGIST		DATE	DATE ON SITE	START DEPTH
76	·Flands		TJ FALLON		27 Jan 2020	2/ Jon 2020	65.
CONT	RACTOR	1	CREW		PROPOSED TD	PROGRESS	DEPTH
	z Drilling	Tony Hudso	n, Ray Smith		60	1	
			1 1				
WEL	WELL SITE		Lake Aurora		WELL NAME	UFAN	Ionitor
TIM	E LOG	DEGTU		0 1	DETAILS OF OPER	ATIONS	
From	То	DEPTH	Drilling Flaid	Properties			
-	-			101	Mud	Marsh Funnel (Viscos	h)
1/	1.1		PH 5	% Sard	Weight 8.9 16/00/ 8.6165/00/	Seconds +1	an Wall Cakel
1/27	09:15	1.5	5	15. %	8.9 165/90/	n	Thrate loss
X	09:40	10			8.6165/gal		
	10:27	20		2.0%	8,5165/gal	375	
	10:55	25		2 L 10	10	375 41	20 00 /26 61
-	11:25	38		12	8.7 155/ml	3950 1	32 - /36 m)
	1206	60		170	8.7 165/gel	40 500	
	1640	80		10/0	8.7 lbs/	1 UL Ser	
	1758	100		2%	8.8 Helaal	1 46 Sec 46 Sec	
	1151		1	0.10		1.01 - 11	1
1/28	1236	115		41%	8.8115/gel	Sosee	4/32/25ml
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REPORT #	SITE GEOLOGIST	DATE	DATE ON SITE	START DEPTH
8	TJ FALLON	2.8 Jan 2020	21 Jan 2020	100
0		2		
CONTRACTOR	CREW	PROPOSED TD	PROGRESS	DEPTH
Mendez Drilling	Tony Hudson, Roy Snith	60	13'	114'
		X		
WELL SITE	Lake Aurora	WELL NAME	UFA Mo	onitor

TIME	LOG	DEPTH	DETAILS OF OPERATIONS
From	То	DEPTH	BEIALS OF OF ERAHORS
07:00			· Driller on-site
07.15			Fallon, Tomlinson on-site
08:00		4.530	Trin in 18-inch hit: Circulate Mud; Add I ban Quik Gel
08:13	08:15	30- 40	hbit sticks at ~30st; Add Valeg Quit Gel
09:28	08:31	40-60	Trip-in Rods; Mad. Hole; Circulate Mud; Add 1/2 Bog Duik-Gel
8:45	9:37	1	· Dumpster Truck on site; Pump cuttings into dumpeter.
09:45	09:55	60-80	Trinue Rod: Drill
10:00	10:05	80-100	Tringing Radi Dall' Run Rods un-down hole Mud the Hole'
10:35	1250	100-113	"Trip-in Rod; Drill; Add & bas Quik-Gel: Fill Make-up Tank Mud Viscosity = 50 Sec (Marsh Funnel), Sand Broket, Mud weight
1236			Mud Viscontra = 50 sec (Marsh Funnel), Sand Constant, Med weight
1			Wall Cake
12:50	13:05		-Trip Oot; Clay on bit
13:10	14:55	1.5114	· Emplace 12-inch PVC Gasing 20Et langthe THL J
13.10	11.00	1.5. 11-1	Note: 12-inch casing is screwed Not glued/solvent welded
	-		on first joint
15:10	-		- Prepare to Pressure Great
19.110		1	Theoretical 18 x 12.75 x 114 Annalys = 751 gollens on 78 sack
16:00			Mix Ceneral 17 sacks
10.00	1		5 Conert (Partland Two 1/11) weight = 12, 8 1/05/20/100
16:31	16:38		4 Cement (Portland Type 1/11) veraht = 12. & 165/99/100 - Pump Coment (Presserve Gract) Flush of water
16.31	17:08		· Mix Coment 17 sacks
16.40	14.00		by 13.4 lbs per gallar
17:12			- Pupp Compart (Pressore Groot); Flush w/ water
			Come Electe a tas head to asses helle beach
17:20			- Casing Floats out of borchole after balts break GAttempt to hammen in y catheod "unsuccessful
17:34		114	4 Rotched Strap used to pull cosing back to 114 St bls
14.54		114	+ Noticker = Trap used to pair cosing care to inter as
14:55		-	+ Secure in place - Remove Tremie: Port land shows at 22' on framile on 69st 6/5
17.33		-	AP to back the back of the Arth All allow
-		-	4 Pamp mud into 12-inch cosing to displace Abat had. 411 gallous mad Son theoretical displacement.
18:00	18:30	-	P M J. CL
-	18.20		- PampMad: Clean-up Distance Stats assit
14:35		-	· DISERICE SEADS DISE
			Cement - 17+17 = 34
-			(enche / / T / ) = 24
(			Drill Rig - Failing 1500
			Bago Quik Gel IIII

District Representative		
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#### Appendix A 23

### SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT GEOHYDROLOGIC DATA SECTION DAILY DRILLING LOG - CORE REPORT

REPORT #	SITE GEOLOGIST	DATE	DATE ON SITE	START DEPTH
9	TJ FALLON	29 Jan 2020	21 Jan 2020	106
CONTRACTOR	CREW	PROPOSED TD	PROGRESS	DEPTH
	Tony Hudson Roy Smith, John Helpen	60		1

WELL SITE	Lake Aurora
WELL SITE	Lake Autora

WELL NAME

**UFA** Monitor

TIME	LOG	DEPTH	DETAILS OF OPERATIONS	
From	То	DEPTH	DETAILS OF OPERATIONS	1.
07:20		-	Fallon onsite; WL-SA = 14.36' btos; Test Portland Sample from 28500	
07.45	1		-Mendez on-site	1
67:55	8:20	1	· Dungsten Truck on-site Transfer Cuttings Prop San Drilling	
09:42		1	- Rigon, take pressure head ass of 12-inch.	1
		106'	+ Rig On; take pressare head ass as 12-inch. 4 Tag 12-inch Portland @ 106 bls Inside casing	1
1		1.1.1.2010.00	4 Tag 18"x 12" annalus @ ~3'St 6/s	11
1000			Note: Bit diameter is 17-inches	7
11:15		G	-Cat-oss-12- Inch casing	_
11:35			- Fluch Drilling Fluid ant of Casing	
	¥ <u>s</u>	-	Trup in 11/4-inch bit inside &-inch casing (Dieg Bit)	
			bRade TH	
13:40		106-118	- Drill out Partland & Formation; Add hag Quek Gal	
14:00	14:20		4 Stop + Circalite Mud	
	15:54	-118		-
16:25	4		Mendez OSS-site	
17:05			- Diduct off site	-
1	1			
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			Quik-Gel=1	

District Representative	

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REPO	ORT #		SITE GEOLOGIST	DATE	DATE ON SITE	START DEPTH	
10	>		TJ FALLON	30 Jan 2020	21 Jan 2020	120/14851	
	ACTOR		CDEW	PROPOSED TD	PROGRESS	DEPTH	
	RACTOR	0 6.11-	CREW		28St-Wash		
Mende	z Drilling	Roy Smith ]	Sony Hudson Matt Herro	<i>w</i> 60	2035-Wash /	14d vash /	
WEL	LSITE		Lake Aurora	WELL NAME	UFA	Monitor	
TIM	E LOG To	DEPTH	DEPTH DETAILS OF OPERATIONS				
07:58		-	- Fallow on-site last	1. (A) 14.28 16Toc			
18:05			Mendez on-site				
09:17			Rigan				
1950		120	Cleaning dut hole				
205	10:50	120-130	Drill V				
0:50	1130		Dumpster Truck	on-site; Pauce Drillian			
1:30	12:40	130-140					
152	1.		Conduct Mud test	3			
1250			Mud Calle how thick	e - need to make n	er mud		
1310	1418	140-148	Drill- Cuttings	indicate Green Clays	Shells; Coarse Ph	esphate grains	
1425			Trip Rods out - put	Spoon down for SPT			
1515	-	148-150	SPT. (14, US)	251 22) Sto ble	ws		
6:31	16:58						
17:20	17:32	158-160		-=) 70 blows -1	Rods bounce on la	st blows	
			4 Trip out Spean				
18.15			All parties off-si	Le			
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District		
Representative		

REPORT #	SITE GEOLOGIST	DATE	DATE ON SITE	START DEPTH
106	TJ FALLON			
CONTRACTOR	CREW	PROPOSED TD	PROGRESS	DEPTH

WELL SITE	Lake Aurora
WELL SITE	Lake Aurora

WELL NAME

Marine Manufactor

	From	E LOG To	DEPTH DETAILS OF OPERATIONS					
			-	Drilling Fluid Properties				
				OH	% Sand	We what (16s/gal)		Wall Cake (inches for)
	11:55	12:40.	132'		2.162	8.8	48 20	(20/57 /~85+)
								20/32
		-	-	-	3	F1 2020		
1.1				1.0	5	February 2020	)	
	09:30		1.0	- Add	15 ml by V	Jone (Graduated Clinder	) of Sodo Ach (S	Juncoast pH Plar)
	01.5	1	- ×			ak to raise off 7	Raises to pt	TG as make up 14,0
	10:30	1		5 Ac	ld ismin	3401	1	1 0-
4		1	- 6e					
0				-			624	
200	1026						37sec	
1			-	-				
	-							
				1				
				оH	7 Seed	Weight (125 Jaal)	Viscosity (s)	Wall Cake (intestal)
	09:36	1104	144	1.5	1 Dand	NC ight (125 [and ] 8.6	3.3	10/32×2= 20/32/>10/m
Quick	1225	1250	148	10.5	NA	NIA	28.5	7/32 = "4/32/210
Added	17:15		160	11.0	-	8.6	31.4	3/32-22 6/32, 225
, neuro								~ /
	1		-		4	February 202	1.6	111011.11
				pH	9 Sand	Weight (Ibs/gal)	Viscosity(s)	Wall Cake (inchestant)
	08:10		162	12		8,6	15,745	/11.5-2-06.54
				-				
	-	5				Portland		
	11:20			M		Weight (165/gal)		
	11:20	·		1~11		( 13.3 16x/		bing
	11:30		-	-	1STB.			
1	11:35					136165	gal	
$\square$	11:42		-	-		( 14.0 15s) ( 13.3 16s	951	
	12:20			1	2nd Bo	atch 2 13.7 155/	da	
	12:30		12:39		En Do	14.0 16s/		
		trict entative				C 1410 1901		

Lake Aurora

WELL SITE

#### SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT GEOHYDROLOGIC DATA SECTION DAILY DRILLING LOG - CORE REPORT

REPORT #	SITE GEOLOGIST	DATE	DATE ON SITE	START DEPTH	
11	TJ FALLON	31 Jon 2020	21 Jun 2020	160	
CONTRACTOR	CREW	PROPOSED TD	PROGRESS	DEPTH	

WELL NAME

**UFA Monitor** 

TIME	To	DEPTH	DETAILS OF OPERATIONS
07:05	10		Mender, Fallow an-site W/1's 14,28 bloc CO7:40 Rig-on: Prepto Drill; Tryp in to 166 Drill: Rit Chetter; Cuttings show L.S. Breok-out; change bit/spons; Trig-in SPT (53 (S-inches)-,-)==================================
77:43		1.5 -112	Pierce Printe Dell' Tari + 110
14.45		11/1-119	Dill Bit Classif de charles
08.10		160-160	Deill Nit Cherler, Cutting Strow Lisi
19:39	0.011	110-110	Spreak Oak Change Distront (right
19:34	09.40	168-170	SPT (33 (3-makes) 3 Solows to Procent, (Fip-000
10:10			+ No Recovery - Rig-oss; Site clean-up FALLON OSS = te
1:60			Fallow ass to
11,00	-		EVEDOR OGT THE
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CONTRACT.			
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District	1	
Representative		

REPORT #	SITE GEOLOGIST	DATE	DATE ON SITE	START DEPTH	
12	TJ FALLON /K Mallams	3 Feb 2020	21 Jan 2020	148	
CONTRACTOR	CREW	PROPOSED TD	PROGRESS	DEPTH	
Mendez Drilling	Tony Hudson, Roy Smith	-60	· · · · · · · /		

Inter Los DEPTH DETAILS OF OPERATIONS   8705 T. Fall on Arking   815 T. Hudson * R. Smith Arrive   905 K. Mallans Marine   905 K. Mallans Marine   905 Drillers discussed on has to lawer pH in Mud + Paris   910 Drillers discussed on has to lawer pH in Mud + Paris   910 Waler kalk - Mud pH = II Su   923 Using Sunchast pH Plus to raise pH (Sade Add) Issulfue   925 Riggins in Clark Jule   927 Using Clark Jule   927 Ridding 2 L of Quick Topi Loal of to Sade get In Mud   925 Adding 2 L of Quick Topi Loal of to Sade get Indian   926 Adding 2 L of Quick Topi Loal of to Sade get Indian   927 Add 2 L of Quick Topi Loal of to Sade get Indian   926 Add 2 Sont of petPlay Sundeast pH Plus to Hzo tank   927 Mud Test   1255 Added 3 Sont of petPlay Sundeast pH Plus to Hzo tank   1300 Patting 12* drill bit down hale Reds TITH. I   1315 Patting 12* drill bit down hale   1326 Patting 12* drill bit down hale   13315 1340   1345 1400   1430 Patting 12* drill bit from diago 11 to the down hale   13315 Patheod Sone oft polyner to wind <td< th=""><th>TIMEL</th><th>106</th><th>1</th><th></th><th>CONTRACTOR DATA</th><th></th></td<>	TIMEL	106	1		CONTRACTOR DATA	
815   T Hudson - R Smith Arrive     905   K Mallans Arrive     910   Drillers discussed on how to lower pH in mul + Paris     Walter Kank - Mud pH = IISU Hyp pH - 5.50     09:30   Using Sunbast pH Plus to raise gH (Sectu Add) ismith     09:30   Using Clarex Plue I = sea pH down to lower pH in Mud     09:30   Prime in Clarex Plue I = sea pH down to lower pH in Mud     09:30   Prime in Clarex Plue I = sea pH down to lower pH in Mud     09:30   Prime in Clarex Plue I = sea pH down to lower pH in Mud     09:30   Prime Solution of the Good and the lower pH in Mud     150   Hadins, 2C of Quick Trol Loold to 300 gal tank of H     120%   Publ L E of Quick Trol Loold to 300 gal tank of H     1214   Pump Solution down hole     1225   Mud Test     1255   Abd d L of Put Phys Sundast pH Plus to Hyp tenk     1300   Putting 12" drill bit down hole     1315   I340     118-140   Reaming hole get mud Cake off     1315   Put Plue T D Drill Ream hole     1324   Publed Tower off polymer to Mud     13345   Hyp mode Arrive - Clean durage off the trianger out     1430   Pump thick Arrive - Clean durage off the trianger			DEPTH	DEPTH DETAILS OF OPERATIONS		
815   T Hudson * R Smith Arrive     905   K Mallams Arrive     910   Drillers discussed on how to lower pH in mul + Paris     Walter kank - Mad pH = IISU Hzp pH - 5 su     09:30   Using Clock public sea pH low to lower pH in Mul     09:30   Using Clock public sea pH down to lower pH in Mul     09:30   Rig-as ; Treme in ; Circulate Mud.     1150   Adding 2L of Quick Trol Loold to 300 gal tank of Il     12254   Add I to of Quick Trol Loold to 300 gal tank of Il     12255   Added 35 mL of pH Plus Suncest pH Plus to Hzo tank     1300   Putting 12" drill bit down hale Rods THL I     1300   Putting 12" drill bit down hale Rods THL I     1301   INS- HQD Reaming hale get mud Cake off     1315   I340     1325   Added more Click puil Sea PH down to mud (no measurement Add)     13316   Putting 12" drill bit down hale Rods THL I     13315   I340     1335   I340     1345   I430     1430   I400 Flow of the polymer to Mud     13345   I400 Flow of the polymer to Mud     13345   I400 Flow of the polymer to Mud     1345   I400 Flow of the polymer to Mud	505		1	TFallon Artin		
905   K Mallams physice     910   Drillers discussed on has to lower PH in mud + Pais     87:30   Walker Hanke - Mud PH = IISU Hyp PH - 5. SU     87:30   Using SunCoast pH Pius to raise pH (Soda Add) ismille     97:50   Rig-on; Tremis in; Circulate Mad.     11:50   Ridon, Ze y Quick Trol Loold to Spo gal ver y Hy     12:55   Add I E y Quick Trol Loold to Spo gal ver y Hy     12:25   Mud Test     13:25   Added 35ml of pH Plus SunCoast pH Plus to Hyp tenk     13:25   Added 35ml of pH Plus to Hyp tenk     13:25   Added 35ml of pH Plus to Hyp tenk     13:26   Ruthing 12° drill Lit down hale     13:31:5   Hyp Plus to Hyp tenk     13:35   Hyp Plus to Hyp tenk     13:35   Hyp Plus to Hyp tenk     13:31:5   Hyp Plus to Hyp tenk <td></td> <td></td> <td></td> <td>T Hudson + RS</td> <td>mith Arrive</td> <td></td>				T Hudson + RS	mith Arrive	
910 Prillers discussed on has to lower pH in mud + Rais Waler kank - mud pH = 11 SU Hyp pH - 5. SU Using SunCoast pH Plus to raise pH (Seek Ach) is mille Using Chirex Dual = sea pH down to lineer pH in Mud Piso Chirex Dual = sea pH down to lineer pH in Mud Piso Redding 2 L y Quick Tool Loold to 300 gal val of Hy Ridding 2 L y Quick Tool Loold to 300 gal val of Hy Ridd I L of Quick Tool Loold to 300 gal val of Hy Ridd I L of Quick Tool Loold to 300 gal tank of H 120% Add I L of Quick Tool Loold to 300 gal tank of H 1214 Ping Solution down hale 12 25 Added 35 mL of pH Plus to Hyo tank 1300 Reaming hole - get mud Cake off 1315 Hall II8-IUD Reaming hole - get mud Cake off 1315 Hall II8-IUD Reaming hole - get mud Cake off 1326 B Added more Clurex Pai - sea pH down to mud (no measurement Add Mud - I 1336 B Adding more pH = palymer to Mud 1345 IU30 JU0 = 150 Drill Zee An hole 1430 Dune to bit on + trip down hole 1430 Dune to bit on + trip down hole 1430 Put for Cons bit on + trip down hole 1400 IU35 J 150-160 Drill; Circulate Flaid, Add Quik Trol-Cold 17:31 Pail op Reds; Rig 255 12:55 All Arties 055-site	_		1	K Mallans Arrive		
Water teak- Maid pH = 11 StaHzp pH - 5. Sta09:30Using Sunchast pH Plus to raise pH (Sada Add) ismilleUsing Clarex piol = spa pH down to line pH in Mud09:50Rig on ; Treme in ; Circalate Made.1150Addim, 2L of Quick Trol Loold to 300 gal ver of Hz120%Add I L of Quick Trol Loold to 300 gal tank of Hz120%Add on ble1214Pune Solution down hale1255Add a Smill of pH Plus Suncest pH Plus to Hzo tank1300Putting 12" drill Lit down hale1301Hold Mud - I1302Addims more ph epilymer to mud (no measurement1315Hold Mud - I13316F1430IY0 = 1501430Iy0 = 150Dump brick Arrive Clean dumster out1400Put theore bit on + trip down hale1430Iyo = 1601540Put theore bit on + trip down hale1400I4:S21550Addims bit on + trip down hale		1		Drillers discussed	I on how to lower pt	I in mud + Raise pH in
09:30   Using Sunchast pill Plus to raise pill (Sade Ach) Ismille     09:50   Rig-no; Tremie in; Circalote Made.     1150   Ridding 2.L y Quick Trop hold to 300 gal val of 11/2     1255   Added 2 L of Quick Trop hold to 300 gal tank y 1     1214   Panel Solution down hole     1255   Added 3 Sml of pit Plus bound to House pit hold to 300 gal tank y 1     1214   Panel Solution down hole     1255   Added 3 Sml of pit Plus Suncest pit Plus to Hoo tank     1300   Putting 12" drill bit down hole Reds Tith 1     1301   Hold Mud - I     1302   Putting 12" drill bit down hole Reds Tith 1     1303   Banning hole - get mud Cake off     1315   Hold Mud - I     1325   Adding more off "polymer to wind     13315   1340     1345   H30     1430   IVO "ISD Drill Ream hole     14332   IVO "ISD Drill Ream hole     14330   IVO "ISD Drill Ream hole     1430   Dume back Arrive - Clean dumster out     1430   Dume back Arrive - Clean dumster out     1430   Pat tricone bit on + tr.p down hole     1400   I4:52   ISP-160				Water tenk - Ma	id old = II SU HID OH	-5. SU
Using Clurex pool = sea pit down to lover pit in Mud Rig-as; Tremie in; Circalote Mad. 1150 1258 1258 1258 1214 1225 1214 1225 1214 1225 1225 1255 1255 1255 1255 126 1275 126 1275 1275 1275 1275 128 128 129 129 129 129 129 129 129 129	9:30			Usin- Sinchest:	of Plus to raise pH	(Soch Ach) 15 m/ (Volume )000 loon 90
1150 120% 120% 120% 120% 1214 1214 1214 1214 1214 1225 1255 1255 1255 1255 1255 1255 1255 1255 1266 1300 1300 1315 1340 1387 1390 1315 1340 1357 1340 1357 1340 1357 1340 1357 1340 1357 1340 1357 1340 1357 1340 1357 1340 1340 1340 1340 1340 1340 1450 157-160 Drill ; Circulate Flaud, Add Quijk -Trol-Cold 17:10 14:50				Using Clorox 2001	= Spa pit down to los	ver pH in Mud
1150 120% 120% 120% 120% 1214 1214 1214 1214 1214 1225 1255 1255 1255 1255 1255 1255 1255 1255 1266 1300 1300 1315 1340 1387 1390 1315 1340 1357 1340 1357 1340 1357 1340 1357 1340 1357 1340 1357 1340 1357 1340 1357 1340 1340 1340 1340 1340 1340 1450 157-160 Drill ; Circulate Flaud, Add Quijk -Trol-Cold 17:10 14:50	9:50			- Ria - On : Tremie in :	Circulate Mud.	*
1205   Add 1 L of Quick Top Bold to 300 gal tank of 1     1214   Phase Solution down hole     1225   Mud Test     1255   Added 35ml of att Ptop Suncoast pt Plus to Hoo tank     1300   Patting 12" drill bit down hole Rods TOTA I     1300   Ratting 12" drill bit down hole Rods TOTA I     1300   Reaming hole - get mud Cake off     1315   Holded more Clarax poil - See Pt down to mud (no measurement     1315   Adding more off epilymer to mud     1345   1430     1430   140 ~ 150     1345   1430     1430   140 ~ 150     1345   1430     1430   140 ~ 150     1345   1430     1430   140 ~ 150     1540   Trip out - exchange bit from drag bit h tri-core bit     1430   1450     1430   150 - 160     1430   150 - 160     1430   150 - 160     1430   150 - 160     1430   150 - 160     1430   150 - 160     1540   Put tricome bit on + trip domm hole     1400   14:52	50			Adding 2L y C	uncle Trol (sold to	300 gal val of HIZ - CITCULO
1225 Mud Test   1255 Added 35 mL of att Ptos Suncoast pt Plus to the tenk   1300 Patting 12" drill bit down hole Rods: THL I   1301 Patting 12" drill bit down hole Rods: THL I   1305 Added more Clarex poil-See pt down to mud (no measurement   1315 Adding more off oplymer to mud   1326 Adding more off oplymer to mud   13316 Adding more off oplymer to mud   1345 1430   1430 1400   1430 1400   1430 1400   1430 1450   1430 1450   1430 1450   1430 1450   1430 150   1430 150   1430 160   1430 170   1430 1450   1430 1450   1430 1450   1430 150   1430 160   1430 160   1430 160   1430 160   1430 170   1430 160   1430 160   1430 170   1440 160   1450 150   150 160 <td< td=""><td>208</td><td></td><td></td><td>Ald I Lol Qu</td><td>uch Imi bold to 31</td><td>DD gal tank of H2D - Circula</td></td<>	208			Ald I Lol Qu	uch Imi bold to 31	DD gal tank of H2D - Circula
1255   Added 35ml of att Ptos Suncoast pt Plus to H20 tank     1300   Patting 12" drill bit down hole Rods: THL I     1300   Patting 12" drill bit down hole Rods: THL I     1301   118-140     1315   Patting 12" drill bit down hole Rods: THL I     1315   Patting 12" drill bit down hole Rods: THL I     1315   Patting 12" drill bit down hole Rods: THL I     1315   Patting 12" drill bit down hole Rods: THL I     1315   Patting 12" drill bit down hole Rods: THL I     1315   Patting 12" drill bit down hole Rods: THL I     1315   Patting 12" drill bit down hole Rods: THL I     1315   Patting 12" drill bit down hole Rods: THL I     1315   Patting 12" drill flear hole     1345   1430     1430   1450     1430   1450     1430   1450     1430   1450     1430   Patt tricom bit on + trip domm hole     1430   150-160     1450   Patt tricom bit on + trip domm hole     1400   14:52     150-160   Drill; Circulate Flaid, Add Quik - Trol-Gold     17:30   All Aurise off-site     14:55				Phane Solution down	a hole	
1300 Putting 12" drill Lit down hole Rods= THL I   #1315 1340 118-140 Reaming hole - get mud Cake off   1315 Added More Clurex Pail-See PH down to mud (no measurement   Add Mud - I   1335 Adding more off oplyments mud   1345 1430 1400 = 1   1335 E Adding more off oplyments mud   1345 1430 1400 = 150   1345 1430 1400 = 150   1345 1430 1400 = 150   1430 1450 Trip out- exchange bit from drag bit h tri-cone bit   1430 1450 Put tricome bit on + trip down hole   1430 157-160 Drill; Circulate Flaid, Add Quik - Trol-Gold   1400 14:52 157-160 Drill; Circulate Flaid, Add Quik - Trol-Gold   14:31 - Rull op Rods; Rig off S   14:50 Add oplic flaid S				Mud Test		
1315 Holded more Clarox Pail-Spe PH down to mud (no measurement Add Mud - 1 1336 E Adding more off " polymer to wind 1345 1430 140 ~ 150 Drill Recard hole 1430 1450 Trip out- exchange bit from drag bit h tri-corre bit 1430 Dump brick Arrive- Clean dumster out 1540 Put tricom bit on + trip down hole 1400 14:52 150-160 Drill; Circulate Fluid, Add Quik-Trol-Gold 14:30 Pail op Rods; Rig off 14:50 All Auction office				Added 35ml of e	HPlus Suncoast pH Plus	s to Hzo tank
1315 Holded more Clarox Pail-Spe PH down to mud (no measurement Add Mud - 1 1336 E Adding more off " polymer to wind 1345 1430 140 ~ 150 Drill Recard hole 1430 1450 Trip out- exchange bit from drag bit h tri-corre bit 1430 Dump brick Arrive- Clean dumster out 1540 Put tricom bit on + trip down hole 1400 14:52 150-160 Drill; Circulate Fluid, Add Quik-Trol-Gold 14:30 Pail op Rods; Rig off 14:50 All Auction office		1.		Putting 12" drill bi	down hale Rods = M	4.1
Add Mud - 1   1336 E Adding more off ° polymer to mud   1345 1430 140~150   1430 1450 Trip out - exchange bit from drag bit h tri-cone bit   1430 1450 Dump brick Arrive - Clean dumster out   1540 Put tricom bit on + trip down hale   1400 14:52 150-160   14:53 150-160 Drill; Circulate Fluid, Add Quik - Trol-Gold   17:30 - Paill op Rods; Rig off			118-140	Reaming hole - get n	nud Cake off	
1336 E Adding more off a polyment to youd   1345 1430 140 ~ 150 Drill Ream hole   1430 1430 140 ~ 150 Drill Ream hole   1430 1450 Trip out - exchange bit from drag bit h tri-cone bit   1430 1450 Dump brack Arrive - Clean dumster out   1540 Put tricom bit on + trip dump hole   1400 14:52 150-160   14:31 - Pull is Rods; Rig off   14:35 - All Arction offset	315	The Part		Hoded more Marox	Pool-Spa PH down to 1	nud (no measurement - Sprinkle w
1345 1430 140~150 Drill Ream hole   1430 1430 Trip out-exchange bit from drag bit h tri-cone bit   1430 1450 Dump Insch Arrive- Clean dumster out   1540 Put tricome bit on + trip down hole   1400 14:52 158-160   1431 Part tricome bit on + trip down hole   1432 158   1433 158-160   1434 14:52		100				
1430 1430 Trip out - exchange bit from drag bit h tri-core bit   1430 Jump brick Arrive - Clean dumster out   1540 Put tricone bit in + trip dums have   1400 14:52   1590 Put tricone bit in + trip dumster out   1400 14:52   1590 Put tricone bit in + trip dumster out   14:52 150-160   14:53 150-160   14:53 150-160   14:53 150-160   14:53 150-160				Adding more of " po	lymer to mind	
1450 1540 1400 14:52 150-160 14:52 150-160 14:52 150-160 14:52 150-160 14:52 150-160 14:52 150-160 14:52 150-160			140 = 150		1.6. 1. 1.1.1.	1 . I.L
1540 1400 14:52 150-160 Drill; Circulate Fluid, Add Quik-Trol-Gold 17:31 Pall op Rods; Rig oss 17:50 All Aurtios oss-site		450		110 out - Cocchange	bit trom arag bit h th.	CORE SIT
1400 14:52 150-160 Drill; Circulate Fluid, Add Quik-Trol+Gold 17:31 Pall op Rods; Rig oss 12:50 All Aurtiss oss-site				DI Lin Lik	the a dumster our	
17:31 Pall op Rods; Rig oss 17:50 All Aurtion oss-site		4.00	169-110	Put memebli on 4	Ind All Orike Trala	Cald
		1.24	150-160	Drill, CircuiaLe P	CC NOR QUIC TRA	Con
			-	All Andias alle o	40	
	1:30			MI TAPLIDS 038-31		
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				100		
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of Mud-11	

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REPO	DRT #		SITE GEOLOGIST	DATE	DATE ON SITE	START DEPTH		
1.	3		TJ FALLON	47eb 2020	21 Jan 2020	162		
CONTR	ACTOR	CREW		PROPOSED TD	PROGRESS	DEPTH		
		RoyRowlong	, TONY Hadson	60	_	162		
WELL SITE			Lake Aurora	WELL NAME	UFA M	onitor		
TIME LOG		DEPTH	1.4	DETAILS OF OPER	DETAILS OF OPERATIONS			
From 07:05	То	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Marcha anoita: F	Por Ful M hora Tark				
07:10			· FALLON OD-site	Prep; Fill Make-up Tonk				
07:50	9:09	e	· Circulate Drilling	Fluid & Work Hole of bi	Z > Hole Open			
9:09		5.20	- This out Rod +	Fluid & Works Hole of bi hit 7-inch (2)Drsalengthis) Weld with Server	/			
04'2-5	1030		Emplace PVC- S	Kinch (21) 54 lengths) )	14111 × Cut 18'	of of last PVCP		
			A PVC Solvent	Weld with Screws	Cont. 1	11.1.		
	-	-	Devin anutine -	Thearer 10 44 bau	3- CONTROPOR SA	ir he has le?		
LLE			MIVIA And Ta	20 bags at 14,465 (a)	al			
1045	11:51		-Puna Coment - A	Anor - 25 Dadlas	a-1			
12:04	11.51		Mix Portland - 20	pprox ~250 gallors = M				
	12:51		- Pump Partland - A	Parox ~ 250 adlers > W	itness Retonn			
			-Site Clean-up	IF J				
14:15	1		- All parties ass	-site				
-								
-								
			4.5					
		-						
		-	Total					
			Cement- 20	170=40				
			Contrary De	the the				
	1							
	1000		1					
			Theoretical 11.75 x 8	.625" Annulas = 421 gal,	2.6 gallst, = 44 50	cks		
	1			9.1				
			-					

District Representative			
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<b>REPORT #</b>	SITE GEOLOGIST	DATE	DATE ON SITE	START DEPTH
14	TJ FALLON	5 Feb 2020	21 Jan 2020	
CONTRACTOR	CREW	PROPOSED TD	PROGRESS	DEPTH
Mendez Drilling	Tony H. Roy R. Matt H. Askiat	60		

08:30	To 08:30 08:37 09:03 69:30	DEPTH	DETAILS OF OPERATIONS District Stass on-site; W.L.'s Mender Drilling Grew on-site; Site Prep; Rigon
08:13 08:30 08:39 09:02	08:39	160	A L D XL A L L L L L A L A
08:13 08:30 08:39 09:02	08:39	160	A L D XL A L L L L L A L A
08:30 08:39 09:02	08:39	160	
0x:39 09:0>	69:03		Remore prossure cap: Frenie: C. Tentisen teas- 12:28 Annulus 412 bis
69:02			Deiller Move Failing Rig 255 Hole78" casing 160'bls (2'055 botton
			Mender Drilling Crew AD-Site; Site Trep; Kig on Remore pressure cap; tremic; C. Tenlisen tags-12:8" Annulus 412 bls Driller Move Failing Rig 285 Hole; '
09.30		2	4 Pump 055 clear water from Dumpsten
	10:16	1	Dumpster Truck on-site & Transfer from ald mad to downster.
10:16	10:50	1	Mare Diederich 50 over borehole: Mast-up: Prentadrillout 8-inch
10:50	11:08	1	Tripin 8-inch Nominal bit + Rod 160 St Rod + 35t bit
11:08	11:25	M	Cable Breaks on Rig > Delay Son Repair
11:05	1000	No.	Circulate Drillsmactluide Can
11:25	11:55	162-167	- Drill; addon TOSt rod; Add Quik-Gel
12:05	12:31	103-	Drill add 55% Rod; Add Quik-Gel;
	12:55	1-168	
	13:17	1	- Prepare 4-inch Casing
17:18	13:35		- Break out drill string
13:35	16:00	1.5~169	
	1	1	
16:00	17:15		Set of Son coring; Pup and drilling Sluid; Adjust + Theigh Rarnel Assembly Barnel 12 13/4 52 long
17:15	12:52	( The second	According HO Parts and 2054 lengths 140 St
17:50		1.5:153	TRIP-IN HQ Rod 1405+ Rool +134 St Barrel; Police Site
18:25		E	- All Parties off-site
		1	
		12	
	1.1.1	1	
	10.000		
	-	Sec. 19	
	1	1 <u>2</u>	
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	1.1		
	1.1	12.	h h

District Representative	171	
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REPO	ORT #		SITE GEOLOGIST	DATE	DATE ON SITE	START DEPTH
15	8 r		TJ FALLON	6 Feb 2020	21 Jan 2020	170
		*			PROCEETE	DEDTU
	RACTOR	1	CREW	PROPOSED TD	PROGRESS	DEPTH
Mende	z Drilling	Tony H. Roy	R. Mott H. Askia	60		
	1.12.11			Course of the		
WELI	SITE	E.	Lake Aurora	WELL NAME	UFA M	onitor
	/			1 - N	Sec. 1	
	ELOG	DEPTH	1	DETAILS OF OPEN	RATIONS	
From	То		M I I GI	ALC D		
07:00			Mendez on-site: Sit			
07:28		-	- Fallon on-site - W.L. Rig on Pres to Core	Con Ide Dull 1	1	
67:40			HEZ-Mad in Flaid	CIRCULE Drilling Flo	4107	
	-			10 1 11		2.0
	10	11.0	6 Adjust Inner B		1	1. D. cr
	08:58	168-170	Core Run; Add 55% R	A + CORE again, Re	LOO I	Tig old
09:32		110	- Dropinnephärrel	Kig-GN, Add 55t	HG Rod.	. 1 1
	10:26	170-176.5.	- Cone Run w/ 55+ &	10 st. mol alternat	ation, ReIneve In	Ner barrel
	11:20		- Split Raw; Core lost	Stast: Retrieve ban	rel	
11:29	11:42	180-185				
12:00	-	185-190	Core Run; Retriere	Barrel		
1227		-	4 Driller's Note:	Briesly Loses + Rega eve barne!	ins Gircalation Th	nce 189-190
12:27	12:50		Core Ran; Retrie	eve barnel	L7 Loses Circulati	on Completely
13:10	13:50	195-200	- Cone Run; Retrieve	barrel		- · ·
14:12	14:46	200-205	· Core Ran; Retriev	e barnel 7 Regain	Partial Circulation	6202
-		· · ·	1.10	4 The	n lose again	
15:03	15:31	205-210	Core Run; Rethieve	barrel	A 1.1 a 11	4
1545	16:16	210-215	· Core Run; Retrie	ve barrel - Regain	Partia Circulation 1	(215
16:31	16:50	215-20	CORE RON - No RECOVE	my - Catchen Block /4	-ose agoin	
17:05	17:21	215-2165	- Cone Ron - Retrieve	Core ~ 156 1		
18:00		14	- All Porties Oss-site			
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Repres	sentative					

<b>REPORT #</b>	SITE GEOLOGIST	DATE	DATE ON SITE	START DEPTH
116	TJ FALLON	7 Feb 2020	21 Jon 2020	
CONTRACTOR	CREW	PROPOSED TD	PROGRESS	DEPTH
Mendez Drilling	Roy R., Mott H. Askia	-60-		

	E LOG	DEPTH	H DETAILS OF OPERATIONS	
From	То	Derm		
68:45	1		Fallow on site SAW.L. 14.31 6tos	
08:55			Mender onside UFAHAS WE 23.99 blog-Sinch	
09:05				
09:30	09:51	216-220	5 Drillen leaves to get Diesel - Core Ran; Partial Circulation Return C-218-219 3 Hultemp @ 168 - Retnieve barrol	
	10:05		4 Retrieve barral	
10:05			HRetnieve barrel Prepare Sor airlisting; Air Compression does not stort > Neby 10:05-12:30 Airlist (12min) 9 Airling out - Prepto Core Core Run; Rotrieve barrel Core Run; Rotrieve barrel Partial Circulation (22); 2	
12:24	12:36	226	Aiclist (12min)	
12.36	12.57		4 Airling Oct - Presto Core	
12:54	13.10	210-115	· Care Ran: Retrieve barrel - Partial Circulation @222.+2	
12:20	15:00	056-260	Gare Run; Retriever homel; Portial Circulation + Sast Drilling 2 and 1/2 Row A Pause to clear barrel -13:36-13:55	
13.30	15.05	0.00 0.00	4 Prince to clede hours 1-12:36-12:55.	
			4 Void Wesher 7 227.7.	
15.14	10.00	730-225	Core Rent - Quick Sost Ren - 4.5.; 2.55t Recovered	
15.14	10.28	230-235	· Cone Raw; Retrieve borrel - partial Recourse	
15:55	16.15	255-240	Cone Ican , reconent a barrer - parena account	
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District Representative		
representative		

REPORT #	SITE GEOLOGIST	DATE	DATE ON SITE	START DEPTH
17	TJ FALLON	10 Feb 2020	21 802020	
			JAN	
CONTRACTOR	CREW	PROPOSED TD	PROGRESS	DEPTH
Mendez Drilling	Tony H. Roy R. Matt H. Chance	60		

WELL SITE	Lake Aurora	
inere one		

WELL NAME

UFA Monitor

TIM From	E LOG To	DEPTH	DETAILS OF OPERATIONS
27:40			- Mendez on-site
8:05	09:12	220-1.5,	Therapy on-site W.L.S. Rig-on Break out HQ; Prop to Rean to 240' Break-Out H-Inch Temp County w/ Hammer Trip in Nominal 8-Inch (~7%) Tri-come button bit.
9:13	10:45	168-1.S	Break Out H-inch Temp Councy w/ Hammer:
0:45	10:55	1. 168-	Trip in Nominal 8-inch (~778) Tri-cone button bit.
0:55	11:10		Reeat
11:10	12:13	L.S-168	Trip in Rod to 168° Mix Quik-Gel I bag- Circalate
2:13	13:15	160-172	Drill
3:15	14:33	12	- Fix/ Adjust Diedersch's Pump' Rog in Pemp - Dr: 11 add EZ-Mud
14.41	15:55	172-179	Drill add E2-Mud
16:06	17:10	179-189 .	Drill: Clear Desarding cone - Lose Circulation (2185
17:15	17:30	159-194	Cleop up Police size
	-	1	Police size
	17:55		All parties 055-site
		1	
1			
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Repres	entative		

REPORT #	SITE GEOLOGIST	DATE	DATE ON SITE	START DEPTH
18	TJ FALLON	11 Feb2020	21.50,2020	189
			JAN	
CONTRACTOR	CREW	PROPOSED TD	PROGRESS	DEPTH
Mendez Drilling	Rov R Mott H Chance.	60		
	· · · · · · · · · · · · · · · · · · ·			
WELL SITE	Lake Aurora	WELL NAME	UFA M	onitor

UFA Moni	WELL NAME	Lake Aurora
	WELL NAME	Lake Aurora

<b>To</b> 9:35 10:20	DEPTH	DETAILS OF OPERATIONS Fallow, Mender on size; W.L.'s; Size Arep Rig on @ 08:10 Rig on; Presite Drill; Add EZ-Mod + Girou lote III Bag Count Drill
	100 1-1	Fallow Mender on site W.L.'s Site Arep Rigon @ 08:10 Ris on Prento Doill' Add FERMAd + Grow late III Backgont
	100 1-1	Ris on Presta Deill- Add EZ-Mad + Circa late Ill Bas Count
	100 1-1	
	181-194	
10.00		Driller 055 site to buy cable cloner to fix draw-cable
1.1		5 Driller off-site to get new starten Till 12:45 Men Starten
15:00	S	End Drus Activity - Diederich cable needs realoced: Driller
10		orders rable from Certified Sling.
T		Spice I is Cable; Staten on Diederich ingerieben 5 Driller oss-site to get new staten Till 12:45 adven Starken Fod Dry's Activity - Diederich cable needs replaced; Driller aders cable from Certified Sling. 5 to be picked up in morning of 12 Feb
15:10		· Driller ass-site
16:19	1 h	- FALLON OSS-site
	10	
1000		
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District Representative		
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REPORT #	SITE GEOLOGIST	DATE	DATE ON SITE	START DEPTH	
19	TJ FALLON	12 Feb 2020	21 Jon 2020	194	
CONTRACTOR	CREW	PROPOSED TD	PROGRESS	DEPTH	
Mendez Drilling	Matt H. Charle H. Roy R	60	THOULEDS	PHT III	

TIME LOG		DEPTH	DETAILS OF OPERATIONS		
From	То				
9:15		1	Fallon on-site Wilis + Mendez on-site; Rigon; Circulate Mud; Replace Cable; Prep to Drill Drill: add Quik-Gel		
11:05	1	0-1	Mender on-site Riagni Circulate Mudi Replace Cable		
	1	11	Pres to Drill		
1:30	11:55	194.199	Doill' add But feel		
:55	12:36	199- 204 -	Drill "		
2:36	12:15	204-209 -	Drill		
17:17	16:55	269-214			
0.00	17:15	209-214	-Drill in assiste		
14.16 - 1	17:15	delal -	23 11 parties 633 SIEF		
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District		
Representative	1	

# SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT GEOHYDROLOGIC DATA SECTION

DAILY DRILLING LO	G - CORE REPORT	7.4	
SITE GEOLOGIST	DATE	DATE ON SITE	START DEPTH
TJ FALLON	13 Feb 2020	2.1 Feb 2020	2.14
		JAN	
CREW	PROPOSED TD	PROGRESS	DEPTH
Matt H. Roy R Chance H. TONY	60		
	SITE GEOLOGIST TJ FALLON CREW	TJ FALLON 13 Feb 2020 CREW PROPOSED TD	SITE GEOLOGIST DATE DATE ON SITE TJ FALLON 13 Feb 2020 21 Feb 2020 FAN CREW PROPOSED TD PROGRESS

WELL SITE Lake Aurora	WELL SITE	Lake Aurora
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WELL NAME

**UFA Monitor** 

TIME LOG		DEPTH	DETAILS OF OPERATIONS	
From	То	DEPTH	DETAILS OF OPERATIONS	
07:45	the second second	1	- Fallon, Tomlinson on-site; W.L.'s	
08:00	1.000		Mender posite	
0825	1007	214-219	START drilling from 214 to 219 drilling BLIND	
1007	1010		MAKE CONNECTION	
1010	1105	219-224	START dilling from 219 to 224	
1105	1115		MAKE CONNECTION LAKE 5 OFF Add 10 WAIT ON WATER	
1115	1215	724-229	START Drilling from 224 to 229 6 bags Gel [1]	
1215	1220		MAKE CONNECTION 10 BRS totA	
1220	1230	1.000	START Drilling from 229-	
1230			MAKE CONNECTION TAKE S'OFF Add 10' pull rods up 20 to Let.	
	100.00	1.000	hader ratch up, cutting fall in Not able to add in red	
1.2			had to put 5' back ou to ream & clean hole back to bottom 229'	
	1250		have fell in to 227	
1250	1320	1	Start reaming hole back to 229' remove 5' add 10' wait on WATER	
1320	1355		REMOVE 5' Add 10' WAIT ON WATER	
1355	1415	229-234	Start drilling from 229 40 234 MAKE CONNECTION	
1415	1420		MAKE CONNECTION	
1420	1435	2241-240	Start dailling from 234-240	
1435			START Tripping codes out 1.5 10 HHT 20 HHT III plus 1 10	
	1515		Plus & Bit	
1515	1530		Trip 4"PVC SCH 40 Corta-LOK CIIC well casing, to 240	
		14	Theoretical is 394 gal. LAND Surface to 240' 778 hole by	
101	-		4.5" O.D. CASING. Setup to MX 20 bags. Pressure Grout 200	
1530	-	-	Serve to Mix 20 Ungs. Herovic Grout 200	
	14.5		14.0 1bs. per gal START Pumping down hole. No returns	
	1615		PULLET 20 La COUR MOLE, NO REGULTS	
1615	1650		PUMPED 20 bags Clean up, Cit, Lenving Site	
1630			Clean up, Cil, Conting Site	
		-		
	-			
	-	-		
			Climent - 20 back	
	1			

District Representative	Chris Tomlinson		
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REPORT #	SITE GEOLOGIST	ITE GEOLOGIST DATE		START DEPTH
2	TJ FALLON	14 Feb 2020	1/21/2020	
CONTRACTOR	CREW	PROPOSED TD	PROGRESS	DEPTH
Mendez Drilling	MAHT H, Chance H, Roy	60		
WELL SITE	Lake Aurora	WELL NAME	-SA-M	MONI for

TIME LOG DEPTH		DEPTH	DETAILS OF OPERATIONS		
From	То	DEPTH			
0800		-	Setup to tag cement, tagged top of cement @ 235' tac cement on inside @ 240' right at bottom of casing.		
	0830		the cement on INSIDE & 240' right at bottom of casing,		
0830	8930		MART apply for dealer		
0130	1	10.000	Setup to pour gravel from 235 to 230		
	1100		MATED BAINING		
1100	1200		MATT & TONY GOING hack to LOWES for more gravel.		
1150	1215		Start back with Gravel. dumped another 20 bags NO GAIN Still @ 233		
1215			Start back with Gravel, dumped another 20 bags NO GAIN		
	1315	1000	Still @ 233		
1315	1400		START MIXING CEMENT 20 bays 200 gallows & 19,9 pg		
1400	1410	1	Pump down trimite pipe Chemispipe, and Secure site by Constructors.		
1410	1		Clean up, and Secure site by Contractors.		
1	1.8				
1430			Cit. Leaving Site		
	1		5		
	1.	10.000			
		all and the			
1		1000			
-					
-					
			Total -		
			Oravel = 20+20=40		
_			Uravel = W120 - 10		
			Penent - 20		

District Representative	Chris Tom LINSON	

REPORT #	SITE GEOLOGIST	DATE	DATE ON SITE	START DEPTH
22	TJ FALLON	2/17/2020	1/21/20	
CONTRACTOR	CREW	PROPOSED TD	PROGRESS	DEPTH
Mondoz Drilling	MATT, Chance, TONY			

TIME LOG		DEDTU	DETAILS OF OPERATIONS
From	То	DEPTH	
0745			CT ONSITE, CONTractors already ONBITE TAG TOP of Cement & 233' poured 39 begs of p-Gravel TAG TOP of Gravel @ 228' Setup to MIX Cement - MIXED 15 bags & MAZPPG.
	1	. )	TAG TOP of Cement & 233' poured 39 bass of p-Grand
	0900		TAG TOP OF Gravel @ 228
0900			Setup to MIX Cement - MIXED 15 bags @ 14/22ppg.
-	0950	1.000	FUMPED down 150 gals
0950	1215		Chean up 4 wait for coment to harden.
1215	1		RIN TAG LINE IN and tagged 218, Mendez will run 1'PUC trimit and tag convert to confirm. @ 218' add arovel to confirm its coming up, Top of comment actual @ 220 Dumped 37 bags Gravel top @ 220 Start MIXING Comment, MIXED 15 bags @ 14.1 PPG
		£	1"PUL trimit and the cement to confirm. @ 218
			add gravel to confirm its coming up, Top of cement actual
	1400		@ 220 Dumped 37 bags Gravel top @ 220
1400	1425		START MIXING Comment, MIXED 15 bras @ 14.1 PPG
1425	1430	1	PUMP 150 gals, down trimie pipe
1430			Clean 10.
1500		1.000	C.T. Leaving Sile
15:10			Mendez oss-site
15:37			· Fallow off Site
1			
<b>E</b>	1		
	1		
	1		
		-	
	-		Total-
			1000vel - 39+37 = 76
		-	$C_{oment} = 15 \pm 15 = 30$
	-		

District Representative	- 8-	(	

Lake Aurora
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TIME LOG DEPT		DEPTH	DETAILS OF OPERATIONS		
From	То				
L'I					
-					
			160 8" PVC CasING		
		· .			
	_				
	_				
·			alichen with a pre part and presserved 231 to Tal of		
L			2/16/20 Matt ran Pic out and remensured, 231 to Pop of Black Tape, so Actual top of Tag this morning @ 231' Pre measurements were off.		
			BLACK TAPE, SO ACTUAL TOP OF TAS THIS MOTING C 201		
			I'l measurmanys were oft.		
218'	008 100		2/17/20 37 bags of grave		
—	008000 008000 008000				
220'	, <u>6-0000</u>		2/17/20 after pumping 150 gals, top of cement @ 220' add gravel		
	1. 1.		2/11/20 deter pumping 100 gals, sup of commences one		
			alle di avel		
<u> </u>					
128			2/17/20 dunged 39 have of P-Convel & Mived 150 gals of		
120	1 83 40-00		2/17/20 dumped 39 bags of P-Genvel + mixed 150 gals of cement @ 1412 ppg.		
· · · ·	8000000				
	800000 650000				
	02000				
232			2/14/20 dumped 40 5016. bags of gravel + Pumped 200 gals cement @ 14.4 ppg 2/14/20 TAg cement @ 235		
- ob let	88892480		cement @ 14.4 ppg		
235	28000		2/4/20 TAG Commit & 235		
<u></u>	10.1				
<i>´</i>					
	State State				
			PUMPED 200 Gallons Cement Presource Crout 2/13/20		
240'	- Official		PUMPED 200 Gallons Cement Prasound Grout 2/13/20 4 PVL CASING C 240		
<u> </u>					
D	istrict				
	sentative	Chris -	TOMINSON		

REPORT #	SITE GEOLOGIST	DATE	DATE ON SITE	START DEPTH
23	TJ FALLON	18 Feb2020	21.Tan 2020	
			· · · · · · · · · · · · · · · · · · ·	
		PROPOSED TD	PROGRESS	DEPTH
CONTRACTOR	CREW	PROPOSED ID	FROGRESS	DEFIN

Lake Aurora 🛛 🐗

WELL SITE

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WELL NAME

UFA Monitor

TIME LOG DEPTH DETAILS OF OPERATIONS		DETAILS OF OPERATIONS	
From	То	DEPTIN	23/
07:55			Fallon on-site; Mender on-site; W.L.'s; Tag 4"x8" annalus & ~ 227 bto Pea Gravel in 4"x8" annalus; 26-Five gallon buckets 7 Minnal Retarn 5 Try to bridge annular funnel @ 228' with 3 final buckets before
08:20	10:00		- Pea Gravel in 4"x8" annalus; 26-Five gallen buckets & Minnal Return
			STry to bridge annular funnel @ 228' with 3 Singl buckets before
			arautian
10:00	11:06		Mix Grout : Va bag hentonite of 11 bags Portland; Pump into annulus
11:00			Mix Grout : 1/8 bag bentonite u/ 11 bags Portland; Pump into annulus - Clean-up + Wait for grout to cure 412.3 Ibs/gol u/ Quik Gel additi
			4 Mender 055-site for lunch + subolies
13:40			Dump 1 bucket Peagrenelin annalus to tag @ 231 Waiting ON Decession from DAVE ARNOLD to approve 42" put
			waiting ON Decesion from DAVE ARNOLD to approve 1/2" PUL
	1500		brida L.
1500			DAVE ARNOLD Called No response from DEP he maio
			call to move forward.
			They will start rounding up material needed for Bridge I"PVC will be sent to bottom of hole and 1/2" PVC
			I"Puc will be sent to bottom of hole and 1/2" Puc
			will be placed through I"PVC and sent to bottom in
			pandom Linsths not to exceed b' in Lin, the ONLE Service
			pieces are placed at bottom we will add gravel to
			Create bridge,
	1530		TIM LEAVING SITE
1600	1		C.T. Leaving Site, Matt & Chonce
_			
			total
			loravel - 210+3+1=30
~ ~			locut - Il
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District		
Representative	Chris Iominson	

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REPORT #	SITE GEOLOGIST	DATE	DATE ON SITE	START DEPTH
.24	TJ FALLON	2/18/20	1/21/20	
	CREW	PROPOSED TD	PROGRESS	DEPTH
Mendez Drilling				
WELL SITE	Lake Aurora	WELL NAME	UFA M	onitor

TIME LOG From To	DEPTH	DETAILS OF OPERATIONS		
From 10				
· ·				
		1500 DAVE gave verbal to proceed with PUC Bridge		
		LAKE Aurora		
		Ч		
		8° PVC @ 160'		
n		<u> </u>		
		8 Normal Bore hold		
		A PI ~ 227 - 232 VOID ALAST Fri 2/14/20		
		THALL LAST FRI 2/14/20		
		1 231 231 23 Sigals Buchets		
		12 (SCAVE) + Cement 40-80 120 lbs		
		240		

Г			•
I.	District		
	Benrocontetivo	Chas Tominson	
1	Representative	UNITS COMTINSON	

REPORT #	SITE GEOLOGIST	DATE	DATE ON SITE	START DEPTH	
24	TJ FALLON	2/19/20	1 21 20		
CONTRACTOR	CREW	PROPOSED TD	PROGRESS	DEPTH	

WELL SITE	Lake Aurora

30

14

#

WELL NAME

UFA Monitor

UFA	INIO	n
 	_	_

	DETAILS OF OPERATIONS	DEPTH	TIME LOG DE	
1		0	_	From
1	C.T. ONSITE			0730
1	Constructors onsite start gluing 1" Pre Trimie Pipe	and the second s		0745
	together. HAD THEM CUMOUS all screws from Trimie		1.0	
Gin	TAG TOP of GRAVEL/CEMENT @ 231, CUT 1/2 INCH PUC INTO	· · · · ·	í	
	TAG TOP of GRAVEL/CEMENT & 231, CUt 1/2 INCH PUCTINTO FANDOM LEASTHS 1, 2, 3, 4, and 5" SENT down well INSIDE			
20	1"PVC trimie to create bridge. Added 20 5 and buckets			
	of graves and tagged at 227 trying to get gravel to			
	225 above voids.	1	10	
1	Gravel would come up to 227 but would not hold	13	10	LAUE
	Graver would come up to cer but would not hold	-	-	1045
4	found more 1/2 inch pic onsite and cut INTO ONE		-	
1	4 TWO foot sections and sent down inside tinch		-	
1.	Puc, added 1 sgal bucket of gravel and tagged			-
-	at 225'	15	11	L
21	WAIT ON Cement, Kristing M. ONSITE.			115
Buch	Drillers leave for Lunch	5	120	1115
Buch	Tony + Roy onsite with cement. drillers setup to mix			1340
	Comment. 0-225' Therefuel 10 370 gals.			
1	Total hage - Ho15 weight of rement 14 165/act			
	Pumping Court drawn Annulus transmiss and start did 15' did lather	21	14	422
	Pumping Grout down Annulus terminice pipe start 1/ 15' 11 hottom Constructors channy up around Site	11	127	166
	Breaking rig down to take to another site, for one DAY.	-	-	
	Dreaking rig down to take to another site, for our DAY.		-	
1	Tony + Chance will continue growing well tomorrow.		-	
	Leaving Site.		-	1700
1		5 I L	-	
1		1.1		
			1	
	Two 12" PUL Bridges Sout down Well			
			-	
			-	_
	Totel -		-	
1			-	
	6revel - 20 + 1 = 21		-	
	Nement - to 15			S
		- 6 Martin - 1	_	
				-

District Representative	Chris Tomlinson		
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Recap for ce

REPORT #	SITE GEOLOGIST	DATE	DATE ON SITE	START DEPTH
	TJ FALLON	2/20/20		
CONTRACTOR	CREW	PROPOSED TD	PROGRESS	DEPTH
Mendez Drilling				

From	E LOG To	DEPTH	DETAILS OF OPERATIONS
FIOIII	10		Cored from 170' - 240'
Cornvel		1	Chee that the etc
	Thurs	2/13/20	4" preset to 240 PumpED 20 bass, commits
40	Fri	2/14/20	Tarred @ 235 Standed around DO around + 20 more bu
10		in the second	Taged @ 235' standad gravel 20 gravel + 20 mine by Pumped another 20 bass Cenent
76	MON	2/17/20	Traged & 233' Pourid 39 bags grave tag @ 228'
11 A		1.0	Mixed 15 beas Cement. The @ 220 dumped another 37
	(i)		bass of growel. The & 220°, Pumped 15 more bags, ceme-
		the second	76 bass Gravel 30 bass cement
30		218 20	TAG 231 SA we lost 13 From Last cement Pump.
		-	Added 26 buckets of gravel, added 3 more bockets
	-	1	mixed 11. bass cement add I bucket grand.
21		the local	30 bags Gravel 11 bags Grout
51	-	2/17/20	20 buckets of Grand tay & 227' Started CT PACKER
	-		added ( bucket of Gravel, mixed 15 begs conwrit.
19.5	-	2/20/20	Tassed 218' 10 buckets gravel added Pre
TUS	-	2/20/20	Add 7 buchets tax @ 216,5' add more buc /2"
-		1	Add 7 publicits tag @ 215' add more PUC /2
	-		Add 5.5 buckets tag 2213' Mix 16 begs comment
•			
			Total Gravel Total Cement
			196.5 112
	1.1		
		1	Theoretucal 394 gals. 40
-			4" PVC cashing Actual Pumped - 1,110 gals 111
-			8" put casing theoretical 392 and 446
	-		8" PVC casing theoretical 392 gal 446 Actual Pumped. 406
			ACTUAL FUMPED,
1000		1	12" PVC casing Theoretical See and BOb.
			Actual Pumpad 600 34h
-			
			34
-			
	trict		
Represe	entative		

# SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT GEOHYDROLOGIC DATA SECTION

DAILY DRILLING LOG - CORE REPORT

REPORT #	SITE GEOLOGISŢ	DATE	DATE ON SITE	START DEPTH	
25	-TJFALLON /K Mallans	2/20/20 1/21/20			
κ.			· · · · · · · · · · · · · · · · · · ·	,	
CONTRACTOR	CREW	PROPOSED TD	PROGRESS	DEPTH	
Mendez Drilling	TONNI. Chance				
	Hudson			4	
WELL SITE	Lake Aurora	WELL NAME	UFA M	lonitor	

	LOG	DEPTH	DETAILS OF OPERATIONS
From	То	DEPTH	DETAILS OF OPERATIONS
0700			C.T. ONSITE
0730			TONY & Chance ONSITE, setup to tag top of cement
			TAG TOP of cement & 218, added 10 buckets of gravel
			CUT more PVC 1/2" to put down have through P" PVC
	à	-	still at 218
	0920		Added 7 buckets of gravel tagged at 216.5
3920			Cut more 1/2 inch. Puc to Send down 1" Puc. added
	1000		7 buckets of gravel tagged @ 215
1000	1010		Cut more 1/2 with pue to serve down 1" Trimie
1010	1030		start with gravel 5.5 buckets tagged @ 213'
1030			Setup to MIX (5) bags ceman + - weight 13.8 155/501
-	1130		Add one more bes of Cement - Weight 1410 165/gal
1130	1140		start pumping Cement.
1140		(A)	Start Chanup
1400	-		tagged growt - Still 2 213' - apput did not remain in Annulus
405			Adding anavel- 5gallon buckets - 1/2, 1, 1, 1, 10 4.5
1419			J tag 207 ft bloc
1425			Preparing to mix grout - only has (3) bags left on truck. I manha
2			that he needs to be careful on how much Water he adds to the Cement
	-		mix - we don't want light Cement.
445			Weish Cement - 14,0 1bs/gal
450		-	Puma Cement down Annulus - got return from Annulus - pumped ~ 135galla
1515			Trammie pipe locked in hole
	625		Tony asing to get more coment - Chance clean up sile
630			Hzo level is ~25' b toc
			Filled 4-Inch PVC Casing up of Hza so grout duesn't welt PVC
1.00			- the work Price Bridgion Sen 1 down with
1435	-	1	Tremmie pipe down - 70 ft of tremmie pipe - Feels growt N 68' 6TOC. Proparing growt - portland type Vil Coment - 20 backs Weight-13.8 16
640	-		Proparing aroust - portland type /11 coment - 20 backs Weight-13.8 16
717			Add 1 more has of Coment - Weight - 14,0 165/ gallon
725	-		Rump Cement in Annulus - Hoo level in 4" recieded a bit ~ 5' bToc
	-		(pravel - 10+7+7+5,5+4,5=.34-'5gallm buckets
			Ament - 15 + 1+ 20+1
			runent = 10 + 1 + 20 + 1
	-		34 well PVC B is seal days hall
	1.5	1	31/2 Inch PVC Bridges sent down well
1735	NF I	/	> no return to surface - had return a Hos the entire time
	101		Clean us- Drillers + beologist leave

20.

REPORT #	SITE GEOLOGIST	DATE	DATE ON SITE	START DEPTH	
26	TJ FALLON	21 Feb 2020	60'		
				1. St. 1.	
CONTRACTOR	CREW	PROPOSED TD	PROGRESS	DEPTH	
Mendez Drilling	Tony H. John			4.5.	

.OG	DEPTH	DETAILS OF OPERATIONS			
То	DEPTH				
		-Menclez on-site Tag Annalas 8"x4"@60' Fallon on-site;			
1.0	11	Ealbo en-site!			
1		- Fallon OR-site; - Mix grout: 10 bdgs at 14.0 tbs/gallon 107 gallons - Runp grout; Witness Growt network @ sunsace - Fallon ass-site			
		Print group Witness Growt network @ SunSace			
		Faile SE the			
2 - 7		TO HOW OSCIENCE			
	-				
-					
	1				
1000	C				
		10			
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		а			
-					
	1.11				
	1				

District Representative		1	- **		
					_

REPORT #		SITE GEOLOGIST		DATE	DATE ON SITE	START DEPTH	
27		TJ FALLON		24 Feb 2020	2.1 Jan 2020	~240	
+				A STATE OF A			
	RACTOR		CREW	PROPOSED TD	PROGRESS	DEPTH	
Mendez Drilling		Matt Heri	Matt Herron, Roy Rowland				
WELL SITE TIME LOG		Lake Aurora DEPTH		WELL NAME	UFA Mo	onitor	
				DETAILS OF OPERATIONS			
07:45	08:30		Mendez on-site; Un:	Trailer Ria: Move N	Innoka over UFA	Barchale: Pren	
07:55			Fallon on-site: W.L.'s	0.20	L	1.1.1	
	09:55	+3 - 2.40	Trip in Rod of Coring bi	1 22051 NO +	13 St barrel + hit		
09.51	1	-	13 Pres for Carine Fi	11 Woter Tank : Fuel	Ria		
	1005		· Core Ran Recover AS	arrel	4		
1045	10:59	245.250	- Core Run: Retrieve	Barrel			
11:19	11:30	250-255	Core Run; Retrieve Core Run; Retrieve	Barrel		-	
11:47	12:05	255.260.	Core Run; Retrieve	Borrel 7 No Rec.	overy	4	
		265-270	Core Run; Retrieve	Barret	/		
12:05	12:30		Prep to Airlist; Airline in				
12:30	13:30		Mender assiste to buy battery + lunch				
1330	1350	in the	Air lift - 80 ft of Airline ' Set up for Care Run				
14:35	1444	260-265	Core Run; Retrieval Barrel				
1000	1010		GPREVIOUS RON in inner barrel				
1505	1515	a	Dumpster pick-up				
1535	1540	265-270	5-270 Core Run; Retreive Barrel				
FFF	Dist	270-	Core Run ; Betrove Be	arel 200 C	11.1		
1555	16:145	-	Airlift - Open interval	Leo- LN JJWEEF	Hak		
16:45	r-1 /h.e	270-275.	Gairline out; Prept	6 Core			
	14:16						
17:16	-	7.42 - 9.80 .	All parties of Size				
10.00			MI parties 033 5122			·	
	4						
P	-			1			
	8 2 1			N.			
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1			1		5	H 2	
				11			
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				1.4			

District Representative	
rioprocentative	

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SOUTHW	EST FLORIDA WATER MANAGEMENT DISTRICT
	GEOHYDROLOGIC DATA SECTION
Se a prel	DAILY DRILLING LOG - CORE REPORT

REPORT #		SITE GEOLOGIST		DATE	DATE ON SITE	START DEPTH	
28		TJ FALLON		25 Feb 2-02	0 21 Jan 2020		
1.1.1.1			and the second	100		Alla.	
CONTRACTOR			CREW	PROPOSED TD	PROGRESS	DEPTH	
Mendez Drilling Matt He		Matt He	Iron, Roy Roubad			and the start of the start	
4	1 de			ale de la care		in the second	
WELL	SITE	Lake Aurora		WELL NAME	UFAN	lonitor	
TIME	LOG	-					
From	То	DEPTH	DETAILS OF OPERATIONS				
7:15	1.2	-	Me les maile P	ig an Pipen Son Airlis.	/		
7:40	1000	-	Fallon on-site VL	ig an T. pep Ser Zyrras			
7:50	01:51	270-2.80.	AichSE' ROST h	seline in hole @ 1]	5 151	19 19 V	
7:57			- Lower Rods; Drops			54	
8:20	08:47	280-285	Core Run: Retrie				
8:47	09:05	285.292.		pause + add 552 HO	Rod . Core La 29	2: Retrieve barrel	
19:05	10:17	280-290	Change Air Compress	son for belt: Prease	Airlist	1	
				Rody; bit 1057 as			
1:10	11:15	1.	SA Snecific Camai		3	Contraction of the	
0:30	11:00	260-290	- Bris out 2056 HA	+ airlist 305t ass Lo	then		
1:13	11:46	230-296		+ airlist 60 st ass 6			
1		20.25	Pump IA + Sarae			10	
:46	12:30	230-1.5.	Break out HQ				
2:30	14:12	2.93-1.5.	Break Down site: Camper/Gamma Log Well				
4:12	15:63		Cut 055 Casings & Pres Sor Well Test				
5:63	16:00	-	PUNDTEST UFA: Submersible Pump				
6:00			Construct and				
6:25	1	1	Fallon ass-site	BAN AND AND	1		
ROX 1		1 1 1		I Then Aris I	and the second second		
- Sandy		-		ALL MARKED			
1.00	2		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1			
			- E - Coul-	and the second second	and the second		
1			*	ALC: LENG			
1		¥			Contraction of the second		
and a		1		c	ecific Capacity	Tod	
1. 11				-4		UFA .	
- P				Initial N.L.		Q5,88' C 15:03	
-				Pumping W.L.		35.95 @ 15:59	
-		2		Recovered W.L.	11.12 @ 10.76	10113 C 1010 1	
1 37		1 21		GPM Rate	42.85 gpm	8.82000	
	4	11		Girin Mart		8.82gpm	
-				Spec Cap	9.14 gon/St	0.875.gpm/86	
1		8 · · · · · ·	4	-pic cap	an shallon	Story St	
Lann	and in	10 A.A.	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1		201	
16.000	·		1			- Je	
		14	12 C C C C C C C C C C C C C C C C C C C			West and the set of	
16	1.00			the second		1a ja	
1.5	1			1 1 2 C 1	1		
Die	rict					11 SA SARMEN	
	entative			1.9		And his	

Appendix B. Lithologic Logs for the Samples Collected at the Lake Aurora Well Site in Polk County, Florida



Florida Department of Environmental Protection

Florida Geological Survey GEODES



descriptions are provided.

### Well Number: W-19796 (Lake Aurora)

Total Depth	Elevation:	County:	Polk
Location: Sec 18 T.30S.,R.29E.	Drill Completion Date:		Other Logs:
USGS Quad: Bartow	<b>Lat/Long:</b> 27° 52' 46.83" N; 81° 53.63" W	27'	<b>Owner/Driller:</b> SWFWMD
Described by: WILLIAM C. GLADWIN	Verified By PG: BAKER_A		<b>Comments:</b> SWFWMD contracted borehole description. This borehole was delivered 9/30/2020 but due to Covid-19 restrictions the description was delayed. This borehole is of good quality, consists of split spoon samples from 0'-170', and HQ core from 170'- 292.6'. Detailed lithologic picks and

Verification: Is Verified

Geological Forma	tion Picks	
0 - 38 ft	UDSC	Undifferentiated Sand and Clay
38 - 83 ft	CYPR	Cypresshead Formation
83 - 168 ft	PCRV	Peace River Formation
168 - 232 ft	ARCA	Arcadia Formation
232 - 240 ft	SWNN	Suwannee Limestone
240 - ft	OCAL	Ocala Limestone

0 - 3 ft No Sample; Comments: Interval labelled. "No recovery"

3 - 5 ft Sand; Color: Very Light Orange (10YR 8/2) to Grayish Orange (10YR 7/4); Porosity: Intergranular; Grain Size: Fine; Range: Fine to Medium; Roundness: Sub-rounded to Rounded; Sphericity: Medium; Unconsolidated; Accessory Minerals: Organics - <1%; General Fossils: No Fossils

5 - 8 ft No Sample; Comments: Interval labelled. "No recovery"

8 - 10 ft Sand; Color: Very Light Orange (10YR 8/2) to Light Yellowish Orange (10YR 8/6); Porosity: Intergranular; Grain Size: Fine; Range: Fine to Medium; Roundness: Sub-rounded to Rounded; Sphericity: Medium; Unconsolidated; Accessory Minerals: Organics - <1%; General Fossils: No Fossils

10 - 13 ft No Sample; Comments: Interval labelled. "No recovery"

13 - 15 ft Sand; Color: White (N9) to Very Light Orange (10YR 8/2); Porosity: Intergranular; Grain Size: Fine; Range: Fine to Medium; Roundness: Sub-rounded to Rounded; Sphericity: Medium; Unconsolidated; Accessory Minerals: Organics - <1%; General Fossils: No Fossils

15 - 18 ft No Sample; Comments: Interval labelled. "No recovery"

18 - 20 ft Sand; Color: Very Light Orange (10YR 8/2) to Dark Yellowish Brown (10YR 4/2); Porosity: Intergranular; Grain Size: Fine; Range: Fine to Medium; Roundness: Sub-rounded to Rounded; Sphericity: Medium; Unconsolidated; Accessory Minerals: Mica - <1%, Organics - <1%; General Fossils: No Fossils; Comments: First appearance of mica minerals. (<1%)

20 - 23 ft No Sample; Comments: Interval labelled. "No recovery"

23 - 25 ft Sand; Color: Very Light Orange (10YR 8/2) to Moderate Yellowish Brown (10YR 5/4); Porosity: Intergranular; Grain Size: Fine; Range: Fine to Medium; Roundness: Sub-rounded to Rounded; Sphericity: Medium; Unconsolidated; Accessory Minerals: Organics - <1%; General Fossils: No Fossils

25 - 28 ft No Sample; Comments: Interval labelled. "No recovery"

28 - 30 ft Sand; Color: Very Light Orange (10YR 8/2); Porosity: Intergranular; Grain Size: Very Fine; Range: Very Fine to Fine; Roundness: Sub-rounded to Rounded; Sphericity: Medium; Unconsolidated; Accessory Minerals: Mica - <1%, Organics - <1%; General Fossils: No Fossils

30 - 32 ft Sand; Color: Dark Yellowish Brown (10YR 4/2) to Dark Yellowish Brown (10YR 2/2); Porosity: Intergranular; Grain Size: Very Fine; Range: Very Fine to Fine; Roundness: Sub-rounded to Rounded; Sphericity: Medium; Unconsolidated; Accessory Minerals: Mica - <1%, Organics - <1%; General Fossils: No Fossils

32 - 34 ft Sand; Color: Dark Yellowish Brown (10YR 2/2) to Moderate Yellowish Brown (10YR 5/4); Porosity: Intergranular; Grain Size: Very Fine; Range: Very Fine to Fine; Roundness: Sub-rounded to Rounded; Sphericity: Medium; Unconsolidated; Accessory Minerals: Mica - <1%, Organics - <1%; General Fossils: No Fossils

34 - 36 ft Sand; Color: Moderate Brown (5YR 4/4) to Moderate Yellowish Brown (10YR 5/4); Porosity: Intergranular; Grain Size: Very Fine; Range: Very Fine to Fine; Roundness: Sub-rounded to Rounded; Sphericity: Medium; Unconsolidated; Accessory Minerals: Mica - <1%, Organics - <1%; General Fossils: No Fossils

36 - 38 ft Sand; Color: Moderate Brown (5YR 4/4) to Moderate Yellowish Brown (10YR 5/4); Porosity: Intergranular; Grain Size: Very Fine; Range: Very Fine to Fine; Roundness: Sub-rounded to Rounded; Sphericity: Medium; Unconsolidated; Accessory Minerals: Mica - <1%, Organics - <1%; General Fossils: No Fossils

38 - 40 ft Sand; Color: Grayish Orange (10YR 7/4) to Dark Yellowish Orange (10YR 6/6); Porosity: Intergranular; Grain Size: Very Fine; Range: Very Fine to Fine; Roundness: Sub-rounded to Rounded; Sphericity: Medium; Unconsolidated; Accessory Minerals: Mica - <1%, Organics - <1%; General Fossils: No Fossils

40 - 42 ft Sand; Color: Very Light Orange (10YR 8/2) to Light Yellowish Orange (10YR 8/6); Porosity: Intergranular; Grain Size: Very Fine; Range: Very Fine to Fine; Roundness: Sub-rounded to Rounded; Sphericity: Medium; Unconsolidated; Accessory Minerals: Mica - 1%, Organics - <1%; General Fossils: No Fossils

42 - 44 ft Sand; Color: White (N9) to Very Light Orange (10YR 8/2); Porosity: Intergranular; Grain Size: Very Fine; Range: Very Fine to Fine; Roundness: Sub-rounded to Rounded; Sphericity: Medium; Unconsolidated; Accessory Minerals: Mica - 1%, Organics - <1%; General Fossils: No Fossils

44 - 46 ft Sand; Color: White (N9) to Very Light Orange (10YR 8/2); Porosity: Intergranular; Grain Size: Very Fine; Range: Very Fine to Fine; Roundness: Sub-rounded to Rounded; Sphericity: Medium; Unconsolidated; Accessory Minerals: Mica - 1%, Organics - <1%; General Fossils: No Fossils

46 - 48.5 ft Sand; Color: White (N9) to Very Light Orange (10YR 8/2); Porosity: Intergranular; Grain Size: Very Fine; Range: Very Fine to Fine; Roundness: Sub-rounded to Rounded; Sphericity: Medium; Unconsolidated; Accessory Minerals: Mica - <1%, Organics - <1%; General Fossils: No Fossils

48.5 - 50 ft Sand; Color: White (N9) to Very Light Orange (10YR 8/2); Porosity: Intergranular; Grain Size: Very Fine; Range: Very Fine to Fine; Roundness: Sub-rounded to Rounded; Sphericity: Medium; Unconsolidated; Accessory Minerals: Mica - <1%, Organics - <1%; General Fossils: No Fossils

### 50 Well Construction at the Lake Aurora Well Site in Polk County, Florida

50 - 52 ft Sand; Color: White (N9) to Very Light Orange (10YR 8/2); Porosity: Intergranular; Grain Size: Very Fine; Range: Very Fine to Fine; Roundness: Sub-rounded to Rounded; Sphericity: Medium; Unconsolidated; Accessory Minerals: Mica - <1%, Organics - <1%; General Fossils: No Fossils

52 - 54 ft Sand; Color: White (N9) to Very Light Orange (10YR 8/2); Porosity: Intergranular; Grain Size: Very Fine; Range: Very Fine to Fine; Roundness: Sub-rounded to Rounded; Sphericity: Medium; Unconsolidated; Accessory Minerals: Mica - <1%, Organics - <1%; General Fossils: No Fossils

54 - 56 ft Sand; Color: White (N9); Porosity: Intergranular; Grain Size: Very Fine; Range: Very Fine to Fine; Roundness: Sub-rounded to Rounded; Sphericity: Medium; Unconsolidated; Accessory Minerals: Mica - <1%, Organics - <1%; General Fossils: No Fossils

56 - 58 ft Sand; Color: White (N9); Porosity: Intergranular; Grain Size: Very Fine; Range: Very Fine to Fine; Roundness: Sub-rounded to Rounded; Sphericity: Medium; Unconsolidated; Accessory Minerals: Mica - <1%, Organics - <1%; General Fossils: No Fossils

58 - 60 ft Sand; Color: White (N9); Porosity: Intergranular; Grain Size: Very Fine; Range: Very Fine to Fine; Roundness: Sub-rounded to Rounded; Sphericity: Medium; Unconsolidated; Accessory Minerals: Mica - <1%, Organics - <1%; General Fossils: No Fossils

60 - 63 ft No Sample; Comments: Interval labelled. "No recovery"

63 - 65 ft Sand; Color: White (N9); Porosity: Intergranular; Grain Size: Very Fine; Range: Very Fine to Fine; Roundness: Sub-rounded to Rounded; Sphericity: Medium; Unconsolidated; Accessory Minerals: Mica - <1%, Organics - <1%; General Fossils: No Fossils

65 - 68 ft No Sample; Comments: Interval labelled. "No recovery"

68 - 70 ft Sand; Color: White (N9); Porosity: Intergranular; Grain Size: Very Fine; Range: Very Fine to Fine; Roundness: Sub-rounded to Rounded; Sphericity: Medium; Unconsolidated; Accessory Minerals: Mica - <1%, Organics - <1%; General Fossils: No Fossils

70 - 73 ft No Sample; Comments: Interval labelled. "No recovery"

73 - 75 ft Sand; Color: White (N9); Porosity: Intergranular; Grain Size: Very Fine; Range: Very Fine to Fine; Roundness: Sub-rounded to Rounded; Sphericity: Medium; Unconsolidated; Accessory Minerals: Mica - <1%, Organics - <1%; General Fossils: No Fossils

75 - 78 ft No Sample; Comments: Interval labelled. "No recovery"

78 - 80 ft Sand; Color: Very Light Orange (10YR 8/2) to Light Yellowish Orange (10YR 8/6); Porosity: Intergranular; Grain Size: Very Fine; Range: Very Fine to Very Fine; Roundness: Sub-rounded to Rounded; Sphericity: High; Unconsolidated; Accessory Minerals: Mica - <1%, Organics - <1%; General Fossils: No Fossils

80 - 83 ft No Sample; Comments: Interval labelled. "No recovery"

83 - 85 ft Sand; Color: Yellowish Gray (5Y 7/2) to Light Olive (10Y 6/2); Porosity: Intergranular; Grain Size: Very Fine; Range: Very Fine to Fine; Roundness: Sub-angular to Sub-rounded; Sphericity: Medium; Poor Induration; Sedimentary Structures: Mottled; Accessory Minerals: Clay - 15%, Heavy Minerals - <1%, Mica - 5%, Organics - <1%; General Fossils: No Fossils; Comments: Interval transitions to a sand and clay sample with mica grains (<5%) throughout.

85 - 88 ft No Sample; Comments: Interval labelled. "No recovery"

88 - 90 ft Sand; Color: Yellowish Gray (5Y 7/2) to Light Olive Gray (5Y 5/2); Porosity: Intergranular; Grain Size: Very Fine; Range: Very Fine to Very Fine; Roundness: Sub-rounded to Rounded; Sphericity: Medium; Unconsolidated; Accessory Minerals: Clay - 2%, Heavy Minerals - <1%, Mica - 5%, Organics - <1%; General Fossils: No Fossils

90 - 93 ft No Sample; Comments: Interval labelled. "No recovery"

93 - 95 ft Sand; Color: Yellowish Gray (5Y 7/2) to Light Olive Gray (5Y 5/2); Porosity: Intergranular; Grain Size: Very Fine; Range: Very Fine to Fine; Roundness: Sub-rounded to Rounded; Sphericity: Medium; Unconsolidated; Accessory Minerals: Clay - 1%, Heavy Minerals - <1%, Mica - 2%, Organics - <1%; General Fossils: No Fossils

95 - 98 ft No Sample; Comments: Interval labelled. "No recovery"

98 - 100 ft Sand; Color: Very Light Orange (10YR 8/2) to White (N9); Porosity: Intergranular; Grain Size: Very Fine; Range: Very Fine to Fine; Roundness: Sub-rounded to Rounded; Sphericity: High; Unconsolidated; Accessory Minerals: Clay -2%, Heavy Minerals - <1%, Mica - <1%, Organics - <1%; General Fossils: No Fossils; Comments: This interval contains white sands with abundant lenses of grey clay near the top of sample.

100 - 103 ft No Sample; Comments: Interval labelled. "No recovery"

103 - 105 ft Sand; Color: Very Light Orange (10YR 8/2) to White (N9); Porosity: Intergranular; Grain Size: Very Fine; Range: Very Fine to Fine; Roundness: Sub-rounded to Rounded; Sphericity: High; Unconsolidated; Accessory Minerals: Clay - <1%, Heavy Minerals - <1%, Organics - <1%; General Fossils: No Fossils

105 - 108 ft No Sample; Comments: Interval labelled. "No recovery"

108 - 110 ft Sand; Color: Very Light Orange (10YR 8/2) to Yellowish Gray (5Y 7/2); Porosity: Intergranular; Grain Size: Very Fine; Range: Very Fine to Fine; Roundness: Sub-rounded to Rounded; Sphericity: High; Unconsolidated; Accessory Minerals: Clay - <1%, Heavy Minerals - <1%, Mica - <1%, Organics - <1%; General Fossils: No Fossils

110 - 113 ft No Sample; Comments: Interval labelled. "No recovery"

113 - 115 ft Sand; Color: Yellowish Gray (5Y 7/2) to Light Olive Gray (5Y 5/2); Porosity: Intergranular; Grain Size: Very Fine; Range: Very Fine to Fine; Roundness: Sub-rounded to Rounded; Sphericity: High; Unconsolidated; Accessory Minerals: Clay - <1%, Heavy Minerals - <1%, Mica - <1%, Organics - <1%; General Fossils: No Fossils

115 - 118 ft No Sample; Comments: Interval labelled. "No recovery"

118 - 120 ft Sand; Color: Yellowish Gray (5Y 7/2) to Light Olive Gray (5Y 5/2); Porosity: Intergranular; Grain Size: Very Fine; Range: Very Fine to Fine; Roundness: Sub-rounded to Rounded; Sphericity: High; Unconsolidated; Accessory Minerals: Calcilutite - 20%, Clay - <1%, Heavy Minerals - <1%, Mica - <1%, Organics - <1%; Other Features: Calcareous; General Fossils: Fossil Fragments

120 - 123 ft No Sample; Comments: Interval labelled. "No recovery"

123 - 125 ft Sand; Color: Yellowish Gray (5Y 7/2) to Light Olive Gray (5Y 5/2); Porosity: Intergranular; Grain Size: Very Fine; Range: Very Fine to Fine; Roundness: Sub-rounded to Rounded; Sphericity: High; Unconsolidated; Accessory Minerals: Calcilutite - 20%, Clay - <1%, Heavy Minerals - <1%, Mica - <1%, Organics - <1%; Other Features: Calcareous; General Fossils: Fossil Fragments

125 - 128 ft No Sample; Comments: Interval labelled. "No recovery"

128 - 130 ft Sand; Color: Yellowish Gray (5Y 7/2) to Light Olive Gray (5Y 5/2); Porosity: Intergranular; Grain Size: Very Fine; Range: Very Fine to Fine; Roundness: Sub-rounded to Rounded; Sphericity: High; Unconsolidated; Accessory Minerals: Clay - <1%, Heavy Minerals - <1%, Mica - <1%, Organics - <1%, Silt-Size Dolomite - 15%; Other Features: Calcareous; General Fossils: No Fossils

130 - 133 ft No Sample; Comments: Interval labelled. "No recovery"

133 - 135 ft Silt; Color: Yellowish Gray (5Y 7/2) to Light Olive Gray (5Y 5/2); Porosity: Intergranular; Grain Size: Very Fine; Range: Very Fine to Fine; Roundness: Sub-rounded to Rounded; Sphericity: High; Unconsolidated; Accessory Minerals: Clay - <1%, Heavy Minerals - <1%, Mica - <1%, Organics - <1%, Silt-Size Dolomite - 15%; Other Features: Calcareous; General Fossils: Fossil Fragments; Comments: Contains highly fragmented mollusk shells that have been bleached white.

135 - 138 ft No Sample; Comments: Interval labelled. "No recovery"

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138 - 140 ft Silt; Color: Yellowish Gray (5Y 7/2) to Light Olive Gray (5Y 5/2); Porosity: Intergranular; Grain Size: Very Fine; Range: Very Fine to Fine; Roundness: Sub-rounded to Rounded; Sphericity: High; Unconsolidated; Accessory Minerals: Clay - <1%, Heavy Minerals - <1%, Mica - <1%, Organics - <1%, Silt-Size Dolomite - 20%; Other Features: Calcareous; General Fossils: Fossil Fragments

140 - 148 ft No Sample; Comments: Interval labelled. "No recovery"

148 - 150 ft Sand; Color: Yellowish Gray (5Y 7/2) to Light Olive Gray (5Y 5/2); Porosity: Intergranular; Grain Size: Very Fine; Range: Very Fine to Fine; Roundness: Sub-angular to Sub-rounded; Sphericity: Medium; Poor Induration; Accessory Minerals: Clay - 2%, Heavy Minerals - <1%, Mica - <1%, Phosphatic Gravel - 1%, Silt-Size Dolomite - 6%; Other Features: Calcareous; General Fossils: Fossil Fragments, Fossil Molds; Comments: This interval marks the change in lithology from unconsolidated sand and silt into limestone with phosphate present.

150 - 158 ft No Sample; Comments: Interval labelled. "No recovery"

158 - 160 ft Sand; Color: Yellowish Gray (5Y 7/2) to Light Olive Gray (5Y 5/2); Porosity: Intergranular; Grain Size: Very Fine; Range: Very Fine to Fine; Roundness: Sub-angular to Sub-rounded; Sphericity: Medium; Poor Induration; Accessory Minerals: Clay - 15%, Mica - <1%, Organics - <1%, Phosphatic Gravel - 1%, Phosphatic Sand - 1%, Silt-Size Dolomite - <1%; Other Features: Calcareous; General Fossils: Fossil Fragments, Fossil Molds; Comments: This interval is sand intermixed with clays. Top of interval is predominantly silt sized dolomite.

160 - 168 ft No Sample; Comments: Interval labelled. "No recovery"

168 - 170 ft Wackestone; Color: Light Gray (N7) to Yellowish Gray (5Y 8/1); Porosity: Intergranular, Moldic, Vugular; Grain Type: Biogenic, Calcilutite; Grain Size: Very Fine; Range: Very Fine to Fine; Good Induration; Cement Type: Calcilutite Matrix; Sedimentary Structures: Mottled; Accessory Minerals: Calcite - <1%, Clay - <1%, Mica - <1%, Organics - <1%, Phosphatic Gravel - 2%, Phosphatic Sand - 1%, Quartz Sand - 6%; Other Features: Calcareous, Fossiliferous, Dolomitic, Low Recrystallization; General Fossils: Fossil Fragments, Fossil Molds, Mollusks; Comments: Change to a well indurated, moldic limestone with numerous fossils. Sample is dolomitic with low recrystallization. Phosphate abundant.

170 - 172 ft Wackestone; Color: Light Gray (N7) to Yellowish Gray (5Y 8/1); Porosity: Intergranular, Moldic, Vugular; Grain Type: Biogenic, Calcilutite, Pellet; Grain Size: Very Fine; Range: Very Fine to Fine; Good Induration; Cement Type: Calcilutite Matrix; Sedimentary Structures: Mottled; Accessory Minerals: Calcite - <1%, Clay - <1%, Mica - <1%, Organics - <1%, Phosphatic Gravel - 3%, Phosphatic Sand - 4%, Quartz Sand - 1%; Other Features: Calcareous, Fossiliferous, Dolomitic, Low Recrystallization; General Fossils: Fossil Fragments, Fossil Molds, Mollusks; Comments: Sample is dolomitic and moderately recrystallized. Increase in phosphate.

172 - 174 ft Wackestone; Color: Light Gray (N7) to Yellowish Gray (5Y 8/1); Porosity: Intergranular, Moldic, Vugular; Grain Type: Biogenic, Calcilutite, Pellet; Grain Size: Very Fine; Range: Very Fine to Fine; Good Induration; Cement Type: Calcilutite Matrix; Sedimentary Structures: Mottled, Bioturbated, Burrowed; Accessory Minerals: Calcite - <1%, Clay - <1%, Mica - <1%, Organics - <1%, Phosphatic Gravel - 8%, Phosphatic Sand - 13%, Quartz Sand - 3%; Other Features: Calcareous, Fossiliferous, Dolomitic, Low Recrystallization; General Fossils: Fossil Fragments, Fossil Molds, Mollusks, Sharks Teeth; Comments: Sample is dolomitic and moderately recrystallized.

174 - 176 ft Wackestone; Color: Light Gray (N7) to Yellowish Gray (5Y 8/1); Porosity: Intergranular, Moldic, Vugular; Grain Type: Biogenic, Calcilutite, Pellet; Grain Size: Very Fine; Range: Very Fine to Fine; Good Induration; Cement Type: Calcilutite Matrix; Sedimentary Structures: Mottled; Accessory Minerals: Calcite - <1%, Clay - <1%, Mica - <1%, Organics - <1%, Phosphatic Gravel - 5%, Phosphatic Sand - 15%, Quartz Sand - 3%; Other Features: Calcareous, Fossiliferous, Dolomitic, Medium Recrystallization; General Fossils: Fossil Fragments, Fossil Molds, Sharks Teeth; Comments: Sample is dolomitic and moderately recrystallized.

176 - 178 ft Dolostone; Color: Light Gray (N7) to Yellowish Gray (5Y 8/1); Porosity: Intergranular, Moldic, Vugular; Alteration: Medium (10-50%); Crystallinity: Anhedral; Grain Size: Microcrystalline; Range: Microcrystalline to Very Fine; Good Induration; Cement Type: Calcilutite Matrix, Dolomite; Sedimentary Structures: Mottled; Accessory Minerals: Calcite - <1%, Clay - <1%, Organics - <1%, Phosphatic Sand - 4%; Other Features: Calcareous, Dolomitic, Medium Recrystallization; General Fossils: Fossil Fragments, Fossil Molds, Bryozoa; Comments: Interval is predominantly dolostone but contains intermixed limestone.

178 - 180 ft Dolostone; Color: Light Gray (N7) to Yellowish Gray (5Y 8/1); Porosity: Intergranular, Moldic, Vugular; Alteration: Medium (10-50%); Crystallinity: Anhedral; Grain Size: Microcrystalline; Range: Microcrystalline to Very Fine; Good Induration; Cement Type: Calcilutite Matrix, Dolomite; Sedimentary Structures: Mottled; Accessory Minerals: Calcite -<1%, Organics - <1%, Phosphatic Gravel - <1%, Phosphatic Sand - 5%, Quartz Sand - 1%; Other Features: Calcareous, Dolomitic, Medium Recrystallization, Fossiliferous; General Fossils: Fossil Fragments, Fossil Molds, Mollusks; Comments: Interval is predominantly dolostone intermixed with limestone.

180 - 182 ft Wackestone; Color: Light Gray (N7) to Yellowish Gray (5Y 8/1); Porosity: Intergranular, Moldic, Vugular; Grain Type: Biogenic, Calcilutite, Pellet; Grain Size: Very Fine; Range: Very Fine to Fine; Good Induration; Cement Type: Calcilutite Matrix; Sedimentary Structures: Mottled; Accessory Minerals: Calcite - <1%, Organics - <1%, Phosphatic Gravel - 3%, Phosphatic Sand - 20%, Quartz Sand - 2%; Other Features: Calcareous, Fossiliferous, Dolomitic, Low Recrystallization; General Fossils: Fossil Fragments, Fossil Molds, Mollusks, Bryozoa; Comments: Moving away from dolomotized rock back to limestone with high phosphate and fossil content.

182 - 184 ft Wackestone; Color: Light Gray (N7) to Yellowish Gray (5Y 8/1); Porosity: Intergranular, Moldic, Vugular; Grain Type: Biogenic, Calcilutite, Pellet; Grain Size: Very Fine; Range: Very Fine to Fine; Good Induration; Cement Type: Calcilutite Matrix; Sedimentary Structures: Mottled; Accessory Minerals: Calcite - <1%, Organics - <1%, Phosphatic Gravel - 3%, Phosphatic Sand - 15%, Quartz Sand - 1%; Other Features: Calcareous, Fossiliferous; General Fossils: Fossil Fragments, Fossil Molds, Mollusks

184 - 186 ft Wackestone; Color: Light Gray (N7) to Yellowish Gray (5Y 8/1); Porosity: Intergranular, Moldic, Vugular; Grain Type: Biogenic, Calcilutite, Pellet; Grain Size: Very Fine; Range: Very Fine to Fine; Good Induration; Cement Type: Calcilutite Matrix; Sedimentary Structures: Mottled; Accessory Minerals: Calcite - 1%, Organics - <1%, Phosphatic Gravel - <1%; Other Features: Calcareous, Fossiliferous; General Fossils: Fossil Fragments, Fossil Molds, Mollusks, Gastropods; Comments: Decrease in phosphate.

184 - 186 ft Wackestone; Color: Light Gray (N7) to Yellowish Gray (5Y 8/1); Porosity: Intergranular, Moldic, Vugular; Grain Type: Biogenic, Calcilutite, Pellet; Grain Size: Very Fine; Range: Very Fine to Fine; Good Induration; Cement Type: Calcilutite Matrix; Sedimentary Structures: Mottled; Accessory Minerals: Calcite - 1%, Organics - <1%, Phosphatic Gravel - <1%, Phosphatic Sand - 3%, Quartz Sand - <1%; Other Features: Calcareous, Fossiliferous; General Fossils: Fossil Fragments, Fossil Molds, Mollusks, Gastropods; Comments: Decrease in phosphate.

186 - 186.9 ft Wackestone; Color: Light Gray (N7) to Yellowish Gray (5Y 8/1); Porosity: Intergranular, Pinpoint, Vugular; Grain Type: Biogenic, Calcilutite, Pellet; Grain Size: Very Fine; Range: Very Fine to Fine; Good Induration; Cement Type: Calcilutite Matrix; Accessory Minerals: Calcite - 1%, Organics - <1%, Phosphatic Gravel - <1%, Phosphatic Sand - <1%; Other Features: Calcareous, Fossiliferous; General Fossils: Fossil Fragments, Fossil Molds, Mollusks, Gastropods; Comments: Clear boundary separates this sample from the coarser grained phosphatic limestone above.

186.9 - 190 ft Mudstone; Color: Light Gray (N7) to Yellowish Gray (5Y 8/1); Porosity: Intergranular, Moldic, Vugular; Grain Type: Biogenic, Calcilutite, Pellet; Grain Size: Very Fine; Range: Very Fine to Fine; Good Induration; Cement Type: Calcilutite Matrix; Accessory Minerals: Calcite - <1%, Organics - <1%, Phosphatic Gravel - <1%, Phosphatic Sand - 4%, Quartz Sand - 2%; Other Features: Calcareous, Fossiliferous; General Fossils: Fossil Fragments, Fossil Molds, Mollusks, Gastropods

190 - 192 ft Mudstone; Color: Very Light Gray (N8) to Yellowish Gray (5Y 8/1); Porosity: Intergranular, Moldic, Vugular; Grain Type: Biogenic, Calcilutite, Pellet; Grain Size: Very Fine; Range: Very Fine to Fine; Good Induration; Cement Type: Calcilutite Matrix; Accessory Minerals: Calcite - <1%, Organics - <1%, Phosphatic Gravel - <1%, Phosphatic Sand - 2%, Quartz Sand - <1%; Other Features: Calcareous, Fossiliferous; General Fossils: Fossil Fragments, Fossil Molds, Mollusks, Gastropods

192 - 194 ft Mudstone; Color: Very Light Gray (N8) to Yellowish Gray (5Y 8/1); Porosity: Intergranular, Moldic, Vugular; Grain Type: Biogenic, Calcilutite, Pellet; Grain Size: Very Fine; Range: Very Fine to Fine; Good Induration; Cement Type: Calcilutite Matrix; Accessory Minerals: Calcite - <1%, Organics - <1%, Phosphatic Gravel - <1%, Phosphatic Sand - 4%, Quartz Sand - <1%; Other Features: Calcareous, Fossiliferous; General Fossils: Fossil Fragments, Fossil Molds, Mollusks, Gastropods

194 - 196.3 ft Mudstone; Color: Very Light Gray (N8) to Yellowish Gray (5Y 8/1); Porosity: Intergranular, Moldic, Vugular; Grain Type: Biogenic, Calcilutite, Pellet; Grain Size: Very Fine; Range: Very Fine to Fine; Good Induration; Cement Type: Calcilutite Matrix; Accessory Minerals: Calcite - <1%, Organics - <1%, Phosphatic Gravel - 1%, Phosphatic Sand - 4%, Quartz Sand - <1%; Other Features: Calcareous, Fossiliferous; General Fossils: Fossil Fragments, Fossil Molds, Mollusks, Gastropods

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196.3 - 198 ft Mudstone; Color: Very Light Gray (N8) to Yellowish Gray (5Y 8/1); Porosity: Intergranular, Moldic, Vugular; Grain Type: Biogenic, Calcilutite, Pellet; Grain Size: Very Fine; Range: Very Fine to Fine; Good Induration; Cement Type: Calcilutite Matrix; Accessory Minerals: Calcite - <1%, Organics - <1%, Phosphatic Gravel - 1%, Phosphatic Sand - 5%, Quartz Sand - 1%; Other Features: Calcareous, Fossiliferous; General Fossils: Fossil Fragments, Fossil Molds, Mollusks, Gastropods

198 - 200 ft Mudstone; Color: Very Light Gray (N8) to Yellowish Gray (5Y 8/1); Porosity: Intergranular, Moldic, Vugular; Grain Type: Biogenic, Calcilutite, Pellet; Grain Size: Very Fine; Range: Very Fine to Fine; Good Induration; Cement Type: Calcilutite Matrix; Accessory Minerals: Calcite - <1%, Organics - <1%, Phosphatic Gravel - 1%, Phosphatic Sand - 5%, Quartz Sand - 1%; Other Features: Calcareous, Fossiliferous; General Fossils: Fossil Fragments, Fossil Molds, Mollusks, Gastropods

200 - 202 ft Mudstone; Color: Very Light Gray (N8) to Yellowish Gray (5Y 8/1); Porosity: Intergranular, Moldic, Vugular; Grain Type: Biogenic, Calcilutite, Pellet; Grain Size: Very Fine; Range: Very Fine to Fine; Good Induration; Cement Type: Calcilutite Matrix; Accessory Minerals: Calcite - 1%, Organics - <1%, Phosphatic Gravel - <1%, Phosphatic Sand - 4%, Quartz Sand - 1%; Other Features: Calcareous, Fossiliferous; General Fossils: Fossil Fragments, Fossil Molds, Mollusks, Gastropods

202 - 204 ft Wackestone; Color: Very Light Gray (N8) to Yellowish Gray (5Y 8/1); Porosity: Intergranular, Moldic, Vugular; Grain Type: Biogenic, Calcilutite, Pellet; Grain Size: Very Fine; Range: Very Fine to Fine; Good Induration; Cement Type: Calcilutite Matrix; Accessory Minerals: Calcite - 1%, Organics - <1%, Phosphatic Gravel - <1%, Phosphatic Sand - 5%, Quartz Sand - 1%; Other Features: Calcareous, Fossiliferous; General Fossils: Fossil Fragments, Fossil Molds, Mollusks, Gastropods; Comments: Increase in density of fossil fragments/molds.

204 - 205.8 ft Wackestone; Color: Very Light Gray (N8) to Yellowish Gray (5Y 8/1); Porosity: Intergranular, Moldic, Vugular; Grain Type: Biogenic, Calcilutite, Pellet; Grain Size: Very Fine; Range: Very Fine to Fine; Good Induration; Cement Type: Calcilutite Matrix; Accessory Minerals: Calcite - 1%, Organics - <1%, Phosphatic Gravel - <1%, Phosphatic Sand - 5%, Quartz Sand - 1%; Other Features: Calcareous, Fossiliferous; General Fossils: Fossil Fragments, Fossil Molds, Mollusks, Gastropods

205.8 - 207.8 ft Wackestone; Color: Very Light Gray (N8) to Yellowish Gray (5Y 8/1); Porosity: Intergranular, Moldic, Vugular; Grain Type: Biogenic, Calcilutite, Pellet; Grain Size: Very Fine; Range: Very Fine to Fine; Good Induration; Cement Type: Calcilutite Matrix; Accessory Minerals: Calcite - 1%, Organics - <1%, Phosphatic Gravel - <1%, Phosphatic Sand - 5%, Quartz Sand - 1%; Other Features: Calcareous, Fossiliferous; General Fossils: Fossil Fragments, Fossil Molds, Mollusks, Gastropods; Comments: Increase in density of fossil fragments/molds.

207.8 - 210 ft Wackestone; Color: Very Light Gray (N8) to Yellowish Gray (5Y 8/1); Porosity: Intergranular, Moldic, Vugular; Grain Type: Biogenic, Calcilutite, Pellet; Grain Size: Very Fine; Range: Very Fine to Medium; Good Induration; Cement Type: Calcilutite Matrix; Sedimentary Structures: Mottled; Accessory Minerals: Calcite - 2%, Organics - <1%, Phosphatic Gravel - <1%, Phosphatic Sand - 5%, Quartz Sand - 1%; Other Features: Calcareous, Fossiliferous; General Fossils: Fossil Fragments, Fossil Molds, Mollusks, Gastropods; Comments: Gradates to packstone at 209.4'. Intraclasts are large shell fossil fragments and molds. (<1.0cm-4.5cm)

210 - 212 ft Wackestone; Color: Very Light Gray (N8) to Yellowish Gray (5Y 8/1); Porosity: Intergranular, Moldic, Vugular; Grain Type: Biogenic, Calcilutite, Pellet; Grain Size: Very Fine; Range: Very Fine to Medium; Good Induration; Cement Type: Calcilutite Matrix; Sedimentary Structures: Mottled, Burrowed; Accessory Minerals: Calcite - 3%, Organics - <1%, Phosphatic Gravel - <1%, Phosphatic Sand - 2%, Quartz Sand - <1%; Other Features: Calcareous, Fossiliferous, High Recrystallization; General Fossils: Fossil Fragments, Fossil Molds, Mollusks, Gastropods; Comments: Intraclasts are large shell fossil fragments and molds (<1.0cm-4.5cm), inlaid within mudstone. Specimen is heavy and highly recrystallized.

212 - 214 ft Wackestone; Color: Very Light Gray (N8) to Yellowish Gray (5Y 8/1); Porosity: Intergranular, Moldic, Vugular; Grain Type: Biogenic, Calcilutite, Pellet; Grain Size: Very Fine; Range: Very Fine to Fine; Good Induration; Cement Type: Calcilutite Matrix; Accessory Minerals: Calcite - 1%, Heavy Minerals - <1%, Organics - <1%, Phosphatic Gravel - 2%, Phosphatic Sand - 12%, Quartz Sand - 2%; Other Features: Calcareous, Fossiliferous; General Fossils: Fossil Fragments, Fossil Molds, Mollusks, Gastropods; Comments: Increase in phosphate sand content and quartz. Trace heavy minerals resembling chalcopyrite.

214 - 215.8 ft Wackestone; Color: Very Light Gray (N8) to Yellowish Gray (5Y 8/1); Porosity: Intergranular, Moldic, Vugular; Grain Type: Biogenic, Calcilutite, Pellet; Grain Size: Very Fine; Range: Very Fine to Fine; Good Induration; Cement Type: Calcilutite Matrix; Accessory Minerals: Calcite - 3%, Organics - <1%, Phosphatic Gravel - <1%, Phosphatic Sand - 6%, Quartz Sand - 2%; Other Features: Calcareous, Fossiliferous, Low Recrystallization; General Fossils: Fossil Fragments, Fossil Molds,

Mollusks, Gastropods; Comments: Top of interval is mostly phosphate and decreases with depth. Bottom 6.0 inch of sample is a mudstone with numerous calcite crystals.

215.8 - 218 ft Dolostone; Color: Very Light Gray (N8) to Yellowish Gray (5Y 8/1); Porosity: Intergranular, Pinpoint; Alteration: Highly (50-90%); Crystallinity: Anhedral; Grain Size: Microcrystalline; Range: Microcrystalline to Very Fine; Good Induration; Cement Type: Calcilutite Matrix, Dolomite; Sedimentary Structures: Mottled; Accessory Minerals: Clay - <1%, Organics - <1%, Phosphatic Gravel - 3%, Phosphatic Sand - 2%, Quartz Sand - 2%; Other Features: Calcareous, Dolomitic, High Recrystallization; General Fossils: Fossil Fragments, Fossil Molds; Comments: Change in lithology to a well indurated, calcareous dolostone with numerous phosphate gravel. Small lenses of clay present.

218 - 220 ft Dolostone; Color: Very Light Gray (N8) to Yellowish Gray (5Y 8/1); Porosity: Intergranular, Pinpoint; Alteration: Highly (50-90%); Crystallinity: Anhedral; Grain Size: Microcrystalline; Range: Microcrystalline to Very Fine; Good Induration; Cement Type: Calcilutite Matrix, Dolomite; Sedimentary Structures: Mottled, Burrowed; Accessory Minerals: Organics - <1%, Phosphatic Gravel - 3%, Phosphatic Sand - 2%, Quartz Sand - <1%; Other Features: Calcareous, Dolomitic, High Recrystallization; General Fossils: Fossil Fragments, Fossil Molds; Comments: This interval consists of a highly recrystallized phosphatic dolostone.

220 - 223 ft Dolostone; Color: Very Light Gray (N8) to Yellowish Gray (5Y 8/1); Porosity: Intergranular, Moldic, Vugular; Alteration: Highly (50-90%); Crystallinity: Anhedral; Grain Size: Microcrystalline; Range: Microcrystalline to Very Fine; Good Induration; Cement Type: Calcilutite Matrix, Dolomite; Sedimentary Structures: Mottled, Burrowed; Accessory Minerals: Calcite - 1%, Organics - <1%, Phosphatic Gravel - 1%, Phosphatic Sand - 2%, Quartz Sand - 1%; Other Features: Calcareous, Dolomitic, High Recrystallization; General Fossils: Fossil Fragments, Fossil Molds, Mollusks, Gastropods

223 - 225.6 ft Limestone; Color: Very Light Gray (N8) to Yellowish Gray (5Y 8/1); Porosity: Intergranular, Moldic, Vugular; Grain Type: Biogenic, Calcilutite, Crystals; Grain Size: Microcrystalline; Range: Microcrystalline to Very Fine; Good Induration; Cement Type: Calcilutite Matrix; Sedimentary Structures: Mottled; Accessory Minerals: Calcite - 1%, Organics - <1%, Phosphatic Gravel - 1%, Phosphatic Sand - 2%, Quartz Sand - 2%; Other Features: Calcareous, Dolomitic, Low Recrystallization; General Fossils: Fossil Fragments, Fossil Molds, Mollusks, Gastropods; Comments: Change in lithology from a dolostone back to a mudstone with low dolomite recrystallization. Decrease in phosphate.

225.6 - 227.7 ft Dolostone; Color: Very Light Gray (N8) to Yellowish Gray (5Y 8/1); Porosity: Intergranular, Pinpoint; Alteration: Highly (50-90%); Crystallinity: Anhedral; Grain Size: Microcrystalline; Range: Microcrystalline to Very Fine; Good Induration; Cement Type: Dolomite, Calcilutite Matrix; Sedimentary Structures: Mottled; Accessory Minerals: Organics - <1%, Phosphatic Gravel - <1%, Phosphatic Sand - <1%, Quartz Sand - <1%; Other Features: Calcareous, Dolomitic, High Recrystallization; General Fossils: Fossil Fragments, Fossil Molds

227.7 - 232.5 ft No Sample; Comments: Labelled "VOID"

232.5 - 235 ft Limestone; Color: Very Light Orange (10YR 8/2) to Grayish Orange (10YR 7/4); Porosity: Intergranular, Moldic, Vugular; Grain Type: Biogenic, Calcilutite, Pellet; Grain Size: Very Fine; Range: Very Fine to Fine; Good Induration; Cement Type: Calcilutite Matrix; Sedimentary Structures: Mottled, Burrowed; Accessory Minerals: Calcite - <1%, Organics - <1%; Other Features: Calcareous, Fossiliferous; General Fossils: Fossil Fragments, Fossil Molds, Mollusks, Gastropods, Coral; Comments: Orange-gray, moldic, fossiliferous limestone. Phosphate all but dissapeared.

235 - 240 ft Limestone; Color: Very Light Orange (10YR 8/2) to Grayish Orange (10YR 7/4); Porosity: Intergranular, Moldic, Vugular; Grain Type: Biogenic, Calcilutite, Pellet; Grain Size: Very Fine; Range: Very Fine to Fine; Good Induration; Cement Type: Calcilutite Matrix; Sedimentary Structures: Mottled, Burrowed; Accessory Minerals: Calcite - 1%, Organics - <1%, Phosphatic Sand - <1%; Other Features: Calcareous, Fossiliferous, Low Recrystallization; General Fossils: Fossil Fragments, Fossil Molds, Mollusks, Gastropods, Coral; Comments: Poor recovery. Only 2.0 feet of sample recovered.

240 - 245.7 ft Limestone; Color: Very Light Orange (10YR 8/2) to Yellowish Gray (5Y 8/1); Porosity: Intergranular, Pinpoint; Grain Type: Biogenic, Calcilutite, Pellet; Grain Size: Very Fine; Range: Very Fine to Fine; Good Induration; Cement Type: Calcilutite Matrix; Accessory Minerals: Calcite - <1%, Organics - <1%; Other Features: Calcareous, Fossiliferous; General Fossils: Fossil Fragments, Fossil Molds, Mollusks, Gastropods; Index Fossils: Lepidocyclina ocalana; Comments: Poor recovery. Only 2.0 feet of sample recovered. Ocala index fossil Lepidocyclina Ocalana present.

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245.7 - 248 ft Limestone; Color: Very Light Orange (10YR 8/2) to Yellowish Gray (5Y 8/1); Porosity: Intergranular, Moldic, Vugular; Grain Type: Biogenic, Calcilutite, Pellet; Grain Size: Very Fine; Range: Very Fine to Fine; Good Induration; Cement Type: Calcilutite Matrix; Accessory Minerals: Calcite - <1%, Organics - <1%; Other Features: Calcareous, Fossiliferous; General Fossils: Fossil Fragments, Fossil Molds, Mollusks, Gastropods, Brachiopod, Benthic Foraminifera; Index Fossils: Lepidocyclina ocalana; Comments: Ocala index fossils present.

248 - 250 ft Limestone; Color: Very Light Orange (10YR 8/2) to Yellowish Gray (5Y 8/1); Porosity: Intergranular, Moldic, Vugular; Grain Type: Biogenic, Calcilutite, Pellet; Grain Size: Very Fine; Range: Very Fine to Fine; Good Induration; Cement Type: Calcilutite Matrix; Sedimentary Structures: Burrowed; Accessory Minerals: Calcite - <1%, Organics - <1%; Other Features: Calcareous, Fossiliferous; General Fossils: Fossil Fragments, Fossil Molds, Gastropods, Brachiopod, Benthic Foraminifera; Index Fossils: Lepidocyclina ocalana; Comments: Ocala index fossils present.

250 - 252 ft Limestone; Color: Very Light Orange (10YR 8/2) to Yellowish Gray (5Y 8/1); Porosity: Intergranular, Moldic, Vugular; Grain Type: Biogenic, Calcilutite, Pellet; Grain Size: Very Fine; Range: Very Fine to Fine; Good Induration; Cement Type: Calcilutite Matrix; Sedimentary Structures: Burrowed; Accessory Minerals: Calcite - <1%, Organics - <1%; Other Features: Calcareous, Fossiliferous; General Fossils: Fossil Fragments, Fossil Molds, Gastropods, Brachiopod, Benthic Foraminifera; Index Fossils: Lepidocyclina ocalana; Comments: Ocala index fossils present.

252 - 254 ft Limestone; Color: Very Light Orange (10YR 8/2) to Yellowish Gray (5Y 8/1); Porosity: Intergranular, Pinpoint, Vugular; Grain Type: Biogenic, Calcilutite, Pellet; Grain Size: Very Fine; Range: Very Fine to Fine; Good Induration; Cement Type: Calcilutite Matrix; Accessory Minerals: Calcite - <1%, Organics - <1%; Other Features: Calcareous, Fossiliferous; General Fossils: Fossil Fragments, Fossil Molds, Gastropods, Brachiopod, Benthic Foraminifera; Index Fossils: Lepidocyclina ocalana; Comments: Ocala index fossils present.

254 - 256.3 ft Limestone; Color: Very Light Orange (10YR 8/2) to Yellowish Gray (5Y 8/1); Porosity: Intergranular, Pinpoint, Vugular; Grain Type: Biogenic, Calcilutite, Pellet; Grain Size: Very Fine; Range: Very Fine to Fine; Good Induration; Cement Type: Calcilutite Matrix; Accessory Minerals: Calcite - <1%, Organics - <1%; Other Features: Calcareous, Fossiliferous; General Fossils: Fossil Fragments, Fossil Molds, Gastropods, Brachiopod, Benthic Foraminifera; Index Fossils: Lepidocyclina ocalana; Comments: Ocala index fossils present.

256.3 - 258 ft Limestone; Color: Very Light Orange (10YR 8/2) to Yellowish Gray (5Y 8/1); Porosity: Intergranular, Pinpoint, Vugular; Grain Type: Biogenic, Calcilutite, Pellet; Grain Size: Very Fine; Range: Very Fine to Fine; Good Induration; Cement Type: Calcilutite Matrix; Accessory Minerals: Calcite - <1%, Organics - <1%; Other Features: Calcareous, Fossiliferous; General Fossils: Fossil Fragments, Fossil Molds, Gastropods, Brachiopod, Benthic Foraminifera; Index Fossils: Lepidocyclina ocalana; Comments: Ocala index fossils present.

258 - 260 ft Limestone; Color: Very Light Orange (10YR 8/2) to Yellowish Gray (5Y 8/1); Porosity: Intergranular, Pinpoint, Vugular; Grain Type: Biogenic, Calcilutite, Pellet; Grain Size: Very Fine; Range: Very Fine to Fine; Good Induration; Cement Type: Calcilutite Matrix; Accessory Minerals: Calcite - <1%, Organics - <1%; Other Features: Calcareous, Fossiliferous; General Fossils: Fossil Fragments, Fossil Molds, Gastropods, Brachiopod, Benthic Foraminifera; Index Fossils: Lepidocyclina ocalana; Comments: Ocala index fossils present.

260 - 262 ft Limestone; Color: Very Light Orange (10YR 8/2) to Yellowish Gray (5Y 8/1); Porosity: Intergranular, Pinpoint, Vugular; Grain Type: Biogenic, Calcilutite, Pellet; Grain Size: Very Fine; Range: Very Fine to Fine; Good Induration; Cement Type: Calcilutite Matrix; Sedimentary Structures: Burrowed; Accessory Minerals: Calcite - <1%, Organics - <1%; Other Features: Calcareous, Fossiliferous; General Fossils: Fossil Fragments, Fossil Molds, Gastropods, Brachiopod, Benthic Foraminifera, Mollusks; Index Fossils: Lepidocyclina ocalana; Comments: Ocala index fossils present.

262 - 264 ft Limestone; Color: Very Light Orange (10YR 8/2) to Yellowish Gray (5Y 8/1); Porosity: Intergranular, Pinpoint, Vugular; Grain Type: Biogenic, Calcilutite, Pellet; Grain Size: Very Fine; Range: Very Fine to Fine; Good Induration; Cement Type: Calcilutite Matrix; Sedimentary Structures: Burrowed; Accessory Minerals: Calcite - <1%, Organics - <1%; Other Features: Calcareous, Fossiliferous; General Fossils: Fossil Fragments, Fossil Molds, Gastropods, Brachiopod, Benthic Foraminifera, Mollusks; Index Fossils: Lepidocyclina ocalana; Comments: Ocala index fossils present.

264 - 266.1 ft Limestone; Color: Very Light Orange (10YR 8/2) to Yellowish Gray (5Y 8/1); Porosity: Intergranular, Pinpoint, Vugular; Grain Type: Biogenic, Calcilutite, Pellet; Grain Size: Very Fine; Range: Very Fine to Fine; Good Induration; Cement Type: Calcilutite Matrix; Sedimentary Structures: Burrowed; Accessory Minerals: Calcite - <1%, Organics - <1%; Other Features: Calcareous, Fossiliferous; General Fossils: Fossil Fragments, Fossil Molds, Gastropods, Brachiopod, Benthic Foraminifera, Mollusks; Index Fossils: Lepidocyclina ocalana; Comments: Ocala index fossils present.

266.1 - 268 ft Limestone; Color: Very Light Orange (10YR 8/2) to Yellowish Gray (5Y 8/1); Porosity: Intergranular, Pinpoint, Vugular; Grain Type: Biogenic, Calcilutite, Pellet; Grain Size: Very Fine; Range: Very Fine to Fine; Good Induration; Cement Type: Calcilutite Matrix; Accessory Minerals: Calcite - <1%, Organics - <1%; Other Features: Calcareous, Fossiliferous; General Fossils: Fossil Fragments, Fossil Molds, Gastropods, Brachiopod, Benthic Foraminifera, Mollusks; Index Fossils: Lepidocyclina ocalana; Comments: Ocala index fossils present.

268 - 270 ft Limestone; Color: Very Light Orange (10YR 8/2) to Yellowish Gray (5Y 8/1); Porosity: Intergranular, Pinpoint, Vugular; Grain Type: Biogenic, Calcilutite, Pellet; Grain Size: Very Fine; Range: Very Fine to Fine; Good Induration; Cement Type: Calcilutite Matrix; Accessory Minerals: Calcite - <1%, Organics - <1%; Other Features: Calcareous, Fossiliferous; General Fossils: Fossil Fragments, Fossil Molds, Gastropods, Brachiopod, Benthic Foraminifera, Mollusks; Index Fossils: Lepidocyclina ocalana; Comments: Ocala index fossils present.

270 - 272 ft Limestone; Color: Very Light Orange (10YR 8/2) to Yellowish Gray (5Y 8/1); Porosity: Intergranular, Pinpoint, Vugular; Grain Type: Biogenic, Calcilutite, Pellet; Grain Size: Very Fine; Range: Very Fine to Fine; Good Induration; Cement Type: Calcilutite Matrix; Accessory Minerals: Calcite - <1%, Organics - <1%; Other Features: Calcareous, Fossiliferous; General Fossils: Fossil Fragments, Fossil Molds, Gastropods, Brachiopod, Benthic Foraminifera, Mollusks; Index Fossils: Lepidocyclina ocalana; Comments: Ocala index fossils present.

272 - 274 ft Limestone; Color: Very Light Orange (10YR 8/2) to Yellowish Gray (5Y 8/1); Porosity: Intergranular, Pinpoint, Vugular; Grain Type: Biogenic, Calcilutite, Pellet; Grain Size: Very Fine; Range: Very Fine to Fine; Good Induration; Cement Type: Calcilutite Matrix; Sedimentary Structures: Burrowed; Accessory Minerals: Calcite - <1%, Organics - <1%; Other Features: Calcareous, Fossiliferous; General Fossils: Fossil Fragments, Fossil Molds, Gastropods, Brachiopod, Benthic Foraminifera, Mollusks; Index Fossils: Lepidocyclina ocalana; Comments: Ocala index fossils present.

274 - 275.5 ft Limestone; Color: Very Light Orange (10YR 8/2) to Yellowish Gray (5Y 8/1); Porosity: Intergranular, Pinpoint, Vugular; Grain Type: Biogenic, Calcilutite, Pellet; Grain Size: Very Fine; Range: Very Fine to Fine; Good Induration; Cement Type: Calcilutite Matrix; Sedimentary Structures: Burrowed; Accessory Minerals: Calcite - <1%, Organics - <1%; Other Features: Calcareous, Fossiliferous; General Fossils: Fossil Fragments, Fossil Molds, Gastropods, Brachiopod, Benthic Foraminifera, Mollusks; Index Fossils: Lepidocyclina ocalana; Comments: Ocala index fossils present.

275.5 - 278 ft Limestone; Color: Very Light Orange (10YR 8/2) to Yellowish Gray (5Y 8/1); Porosity: Intergranular, Pinpoint, Vugular; Grain Type: Biogenic, Calcilutite, Pellet; Grain Size: Very Fine; Range: Very Fine to Fine; Good Induration; Cement Type: Calcilutite Matrix; Sedimentary Structures: Burrowed; Accessory Minerals: Calcite - <1%, Organics - <1%; Other Features: Calcareous, Fossiliferous; General Fossils: Fossil Fragments, Fossil Molds, Gastropods, Benthic Foraminifera, Mollusks; Index Fossils: Lepidocyclina ocalana; Comments: Ocala index fossils present.

278 - 280 ft Limestone; Color: Very Light Orange (10YR 8/2) to Yellowish Gray (5Y 8/1); Porosity: Intergranular, Pinpoint; Grain Type: Biogenic, Calcilutite, Pellet; Grain Size: Very Fine; Range: Very Fine to Fine; Good Induration; Cement Type: Calcilutite Matrix; Sedimentary Structures: Burrowed; Accessory Minerals: Calcite - <1%, Organics - <1%; Other Features: Calcareous, Fossiliferous; General Fossils: Fossil Fragments, Fossil Molds, Gastropods, Benthic Foraminifera, Mollusks; Index Fossils: Lepidocyclina ocalana; Comments: Ocala index fossils present.

280 - 282 ft Limestone; Color: Very Light Orange (10YR 8/2) to Yellowish Gray (5Y 8/1); Porosity: Intergranular, Pinpoint; Grain Type: Biogenic, Calcilutite, Pellet; Grain Size: Very Fine; Range: Very Fine to Fine; Good Induration; Cement Type: Calcilutite Matrix; Accessory Minerals: Calcite - <1%, Organics - <1%; Other Features: Calcareous, Fossiliferous; General Fossils: Fossil Fragments, Fossil Molds, Gastropods, Benthic Foraminifera, Mollusks, Brachiopod; Index Fossils: Lepidocyclina ocalana; Comments: Ocala index fossils present.

282 - 284 ft Limestone; Color: Very Light Orange (10YR 8/2) to Yellowish Gray (5Y 8/1); Porosity: Intergranular, Pinpoint; Grain Type: Biogenic, Calcilutite, Pellet; Grain Size: Very Fine; Range: Very Fine to Fine; Good Induration; Cement Type: Calcilutite Matrix; Accessory Minerals: Calcite - <1%, Organics - <1%; Other Features: Calcareous, Fossiliferous; General Fossils: Fossil Fragments, Fossil Molds, Gastropods, Benthic Foraminifera, Mollusks, Brachiopod; Index Fossils: Lepidocyclina ocalana; Comments: Ocala index fossils present.

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284 - 286 ft Limestone; Color: Very Light Orange (10YR 8/2) to Yellowish Gray (5Y 8/1); Porosity: Intergranular, Pinpoint; Grain Type: Biogenic, Calcilutite, Pellet; Grain Size: Very Fine; Range: Very Fine to Fine; Good Induration; Cement Type: Calcilutite Matrix; Accessory Minerals: Calcite - <1%, Organics - <1%; Other Features: Calcareous, Fossiliferous; General Fossils: Fossil Fragments, Fossil Molds, Gastropods, Benthic Foraminifera, Mollusks, Brachiopod; Index Fossils: Lepidocyclina ocalana; Comments: Ocala index fossils present.

286 - 288 ft Limestone; Color: Very Light Orange (10YR 8/2) to Yellowish Gray (5Y 8/1); Porosity: Intergranular, Pinpoint; Grain Type: Biogenic, Calcilutite, Pellet; Grain Size: Very Fine; Range: Very Fine to Fine; Good Induration; Cement Type: Calcilutite Matrix; Accessory Minerals: Calcite - <1%, Organics - <1%; Other Features: Calcareous; General Fossils: Fossil Fragments, Fossil Molds; Comments: Decrease in fossil content.

288 - 290 ft Limestone; Color: Very Light Orange (10YR 8/2) to Yellowish Gray (5Y 8/1); Porosity: Intergranular, Pinpoint; Grain Type: Biogenic, Calcilutite, Pellet; Grain Size: Very Fine; Range: Very Fine to Fine; Good Induration; Cement Type: Calcilutite Matrix; Accessory Minerals: Calcite - <1%, Organics - <1%; Other Features: Calcareous; General Fossils: Fossil Fragments, Fossil Molds, Gastropods

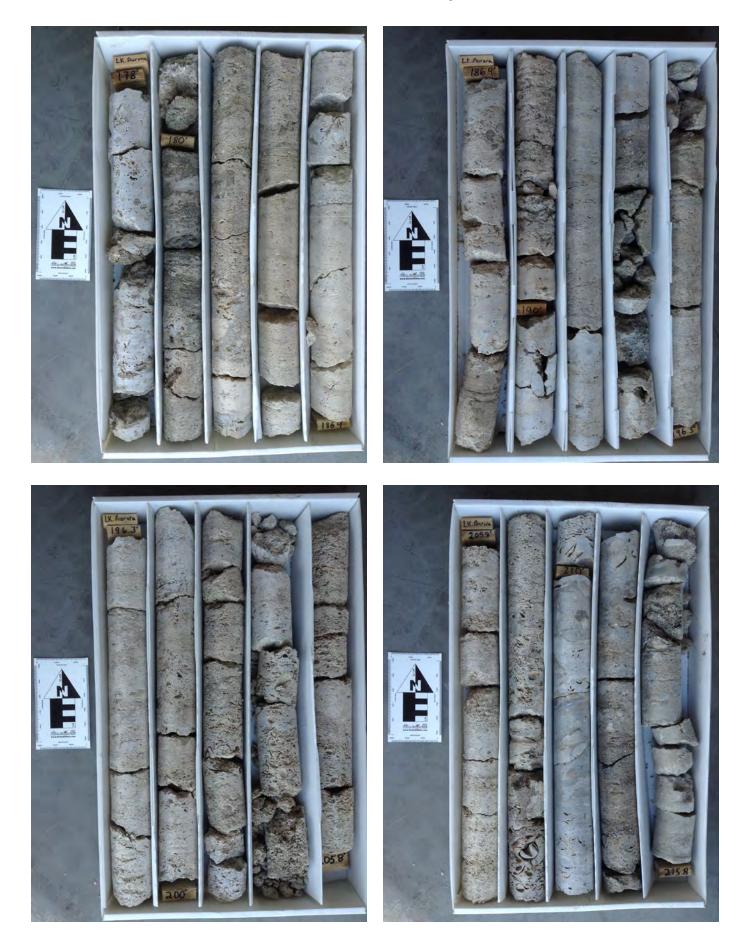
290 - 292 ft Limestone; Color: Very Light Orange (10YR 8/2) to Yellowish Gray (5Y 8/1); Porosity: Intergranular, Pinpoint; Grain Type: Biogenic, Calcilutite, Pellet; Grain Size: Very Fine; Range: Very Fine to Fine; Good Induration; Cement Type: Calcilutite Matrix; Accessory Minerals: Calcite - <1%, Organics - <1%; Other Features: Calcareous; General Fossils: Fossil Fragments, Fossil Molds, Gastropods, Brachiopod

292 - 292.6 ft No Sample; Comments: Labelled "Sample removed. 292-292.6".

Appendix C. Digital Photographs of Samples Retrieved at the Lake Aurora Well Site in Polk County, Florida













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