ROMP DOVER #1
(DOVER ELEMENTARY)
EXECUTIVE SUMMARY
BASIN 13 - S4, T29S,R21E/PARCEL # 13-020-018

7-29-91 Jim Clayton

I SITE LOCATION & DESCRIPTION

The Dover 1 wellsite is located on the property of the Hillsborough County School Board at Dover Elementary School in Dover, Florida. The wellsite can be found by heading east from Tampa on Interstate 4 to Exit 10 (Branch-Forbes Rd.). Proceed south on Branch-Forbes Road approximately 2.3 miles and turn west (right) on Downing Avenue and travel approximately 1.4 miles. The wellsite is in a small grassy field on the south side of Downing Avenue, just northeast of Dover Elementary School. (See Figure 1 - Site Location Map).

The wellsite encompasses a 100' x 100' temporary construction easement and a 20' x 60' perpetual easement (See Figure 2 - Well Placement Diagram). The perpetual easement south of the sidewalk has been chain link fenced. The Dover #1 wellsite is located in the west half of the southwest quarter of the northeast quarter of Section 4, Township 29 South, Range 21 East, at latitude 27° 59' 26" north and longitude 82° 12' 34" west.

II TYPE & PURPOSE OF MONITORS

The primary objectives of the four (4) permanent monitor wells are: to monitor the two (2) major productive zones (Permeable zones A & B) within the Upper Floridan Aquifer (See Figure 3), to confirm or refute the existence of the Intermediate Aquifer by monitoring the well completed in the Tampa Member of the Arcadia Formation, and to monitor the Surficial Aquifer. Fluctuations in the

water quality and water levels, surficial and potentiometric, will be monitored through time by the Hydrologic Data Section of the District and/or the U.S. Geological Survey.

It is expected that the Hydrologic Data Section will monitor water level fluctuations at this and other ROMP sites by use of the Supervisory Control And Data Acquisition (SCADA) System. SCADA utilizes in-well transducers to continually measure water level changes and transmits this real time data via FM radio frequencies to the District.

Another major objective is to determine aquifer parameters such as transmissivity and storage coefficient and to determine confining bed parameters such as leakance coefficient and vertical hydraulic conductivity. This was accomplished through an aquifer performance test of the Avon Park Formation (Permeable Zone B) with the temporary core hole being utilized as an Avon Park observation well. Refer to section VII, Aquifer Performance Test and Parameters, for detailed analysis of aquifer parameters.

Both Dover #1 and #2 wellsites were added to the ROMP network as a special project to more closely monitor extreme fluctuations in the potentiometric surface of the Upper Floridan Aquifer in the Dover area during the winter months. These extreme fluctuations are attributed to increased pumpage by agricultural interests as a method of freeze protection for temperature sensitive crops (i.e. strawberries). During the 1985 record cold snap, for example, potentiometric levels of the Upper Floridan Aquifer dropped an estimated 17 feet over a 3-day period. Such rapid fall in water levels was not without attendant problems. Many Dover residents experienced sudden loss of household water supply when water levels dropped below the effective lift depths of their pumps. In addition, 27 new sinkholes developed following this event.

III GEOLOGY

The Dover #1 wellsite is located on the Polk Upland morphological sub-feature of the Central Highlands physiographic province. The Polk Upland is believed to represent the remnant of a former regional upland that was eroded

into a broad terrace by Wicomico-stage seas in the Pleistocene. Ground level elevations of the Polk Upland generally range from 100 to 130 feet above mean sea level. The elevation of the Dover #1 wellsite, ranges from 112.52 feet above mean sea level at the core hole to 112.92 at the Avon Park Monitor. The Polk Upland differs from the surrounding areas both in the degree of stream dissection and karst development. Apparently the siliclastic nature of the surficial sediments and the low permeabilities of the underlying Peace River Formation act to inhibit development of solution features in the underlying carbonates. As a consequence, surface drainage predominates over internal drainage, resulting in a much greater degree of topographic dissection than found in surrounding provinces. Stream channels are "V" shaped and incised from 30 to 40 feet on the Polk Upland.

Geologically, this site consists of a thin mantle of predominantly clastic Quaternary-age sediments overlying a much thicker, mostly carbonate Tertiary sequence. Stratigraphically, these deposits both dip and thicken to the south and west from the wellsite. The following geology was interpreted from the 839' core and the geophysical logs run in the core hole and monitor wells constructed at the Dover #1 wellsite.

DEPTH (Ft.below LSD)	STRATIGRAPHIC UNIT/AGE Lithologic Description
LSD - 16	UNDIFFERENTIATED SURFICIAL DEPOSITS/ PLIO-PLEISTOCENE Sand: dark brown-yellowish brown, quartzose, medium-fine grained, rounded-subangular, unconsolidated-moderately indurated w/clay matrix at bottom of section, 30% porosity, high permeability, some organics and iron stain.
16' - 47'	HAWTHORN GROUP-PEACE RIVER FORMATION-BONE VALLEY MEMBER/MID-LATE MIOCENE Clay: light olive gray-greenish gray-yellowish gray, sandy, phosphatic; Phosphorite: (46.5'-47')

dark gray, unconsolidated, sand-pebble sized, 30% quartz sand.

47' - 86'

HAWTHORN GROUP-ARCADIA FORMATION (UNDIFFERENTIATED)/EARLY MIOCENE

Clay: yellowish gray-greenish gray-bluish gray, moderate induration, 5%-15% quartz sand, 2%-20% phosphatic sand, some yellowish brown chert fragments; Limestone: (80'-86') yellowish gray-very light orange, clayey, moldic porosity, good induration, dolomitic, sandy, phosphatic, fossils-mollusks, corals.

86' - 153'

HAWTHORN GROUP-ARCADIA FORMATION-TAMPA MEMBER/EARLY MIOCENE

Limestone: greenish gray-yellowish gray-very light orange, calcilutite, moderate-good induration, mottled, dolomitic, chalky, bioturabated in part, 10%-40% quartz sand, generally 15%-20% intergranular & vugular porosity; Clay: (144'-153') yellowish gray-light gray, dolomitic, calcareous, splintery, slightly sandy, some interbedded calcilutite fragments.

153' - 344'

SUWANNEE "LIMESTONE"/OLIGOCENE

Limestone: calcarenite, light olive gray-yellowish gray-very light orange, biogenic, skeletal, medium-fine grained, sparry calcite and dolomite cement, generally 20%-35% porosity, intergranular, moldic, probably high permeabilities, fossils-miliolids, pelecypods, gastropods, corals, crustacea, mollusks, Foraminifera-Dictyoconus cookei;

Dolomite: (178'- 179') dark yellowish brown-olive gray, micro-cryptocrystalline, good induration, 20% limestone, very low porosity and permeability.

344'-528'

OCALA GROUP/LATE EOCENE

Limestone: predominantly calcarenite with some calcilutite, very light orange-yellowish gray, biogenic, skeletal, very fine-coarse grained, sparry calcite cement, calcilutite matrix, 10%-20% porosity, intergranular, moldic, generally low-occasionally moderate permeability, fossils-miliolids, mollusks, barnacles, Turitella, bryozoans, Foraminifera-Operculinoides moodybranchensis, Lepidocyclina ocalana, Gypsina globula, Nummulites vanderstoki, Echinoids-Periarchus lyelli floridanus, few Neolaganum durhami.

528'-850'TD

AVON PARK FORMATION/MIDDLE EOCENE

Limestone: (528'-693'), calcarenite with some calcilutite, yellowish gray-very light orange, biogenic, skeletal, very fine-medium-occ. coarse grained, generally good induration, 15%-30% porosity, intergranular, moldic, moderate-high permeability, increasingly dolomitic with depth (653'-693'), fossils-mollusks, Echinoids-Neolaganum dalli, Foraminifera-Dictyoconus cookei; Dolomite: (693'-850'), light brown-yellowish brown-olive brown, cryptocrystalline-very fine grained, medium-high recrystallization, sucrosic in part, 1%-20% intercrystalline porosity, occasionally high degree of secondary porosity (vuggy-solutional), increasing fractures with depth, fossils-echinoid and mollusk molds.

NOTE: A lithologic column of the Dover #1 wellsite is presented in Figure 3.

IV HYDROGEOLOGY

Two aquifer systems, the Surficial and Upper Floridan, were found to exist at the Dover #1 wellsite (See Figure 3, Hydrogeology (ROMP Dover #1)). Existence of an Intermediate Aquifer in the immediate Dover #1 wellsite area was disproven.

Surficial Aquifer

The Surficial Aquifer is the uppermost system and lies within the unconsolidated surficial quartz sands and sandy clays of Pliocene and Pleistocene age. The Surficial Aquifer, which is an unconfined, or water-table aquifer, extends from land surface to the top of the first confining clay layer. Thickness of this aquifer in the Dover area ranges from less than three feet to more than forty feet. The Surficial Aquifer at the Dover #1 wellsite extends from LSD-16' below LSD (112'-96' above MSL).

Permeabilities vary from very good to poor in this unit, reflecting the amount of clay present. The Surficial Aquifer is not widely used as a source of water. Well yields generally range from 25-50 gpm and transmissivities have been estimated from 200-1000 ft^2/day (1500 - 7500 gpd/ft). The storage coefficient and specific yield are virtually equal in an unconfined aquifer. Estimates of the storage coefficient for the Surficial Aquifer in Hillsborough County range from 0.05 to 0.2.

Water table levels ranged from -5.84' LSD (+106.88' MSL) on June 12, 1989 to -0.53' LSD (+112.19'MSL) on August 1, 1991. Seasonal fluctuation in the elevation of the water table often exceeds five (5) feet.

A standard complete water analysis was performed on a water sample taken from approximately 5' below LSD (107' above MSL), just below the water table. Some of the major constituents were: chlorides - 36 mg/l, sulfates - 7.55 mg/l, specific conductivity - 440 umhos at 17°C, total hardness - 162 mg/l, total alkalinity - 198 mg/l, bicarbonate - 241 mg/l, calcium - 60 mg/l, and sodium -

25 mg/l. As the above analysis suggests, water quality within the Surficial Aquifer is generally good, although high iron content may locally present a problem.

Intermediate Confining Unit

Underlying the surficial sands are the Miocene age Peace River Formation-Bone Valley Member and the upper Arcadia Formation, which together comprise the Intermediate Confining Unit from 16' to 80' below LSD (96'-32' above MSL). This Confining Unit is composed primarily of very low permeability grayish green clays with varying amounts of quartz sand and phosphate. The Intermediate Confining Unit acts as a hydraulic barrier between the Surficial Aquifer above and the Upper Floridan Aquifer below. Leakance coefficients for this confiner estimated from aquifer tests range from 10^{-4} to 10^{-6} gpd/ft^3.

Intermediate Aquifer (?)

The existence of an Intermediate Aquifer was strongly suggested in the Dover #1 lithology by the presence of a potential confining clay unit at the base of the Hawthorn Group (Arcadia Formation - Tampa Member) from 144' - 153' below LSD. This yellowish gray to light gray, low permeability clay appeared to be of sufficient thickness to provide confinement, thereby isolating the sandy, moderately permeable, calcilutitic limestones of the Tampa Member (86' - 153' below LSD) from the Suwannee "Limestone".

Of the 67' thickness of the Tampa Member only the lower 56' (97'- 153'below LSD) were cored because 4" steel casing was first set at 97' below LSD. Core recovery through the 56' cored interval averaged 70.8% with a total recovered footage of 39.68'.

The most highly porous section of the Tampa Member is from 110' - 144' below LSD. Porosities, intergranular and vugular, ranged from 15% - 20% in this section. Based on core descriptions of this 34' zone approximately 79% (27') exhibits 20% porosity while 21% (7') exhibits less than 20% porosity. In general the Tampa Member demonstrates low-moderate porosity and permeability.

While coring, the water level through this zone showed considerable fluctuation (See Figure 5, Dover #1 Water Level Profile). At a coring depth of 123.5' below LSD the water level was at it's highest elevation of 53.9' below LSD (+58.1' MSL). While coring from 123.5' to 143.5' below LSD the water level dropped 1.7' to its lowest level within the Tampa Member of 55.6' below LSD (+56.4 MSL). Water quality showed only slight variation through the above interval (See Figure 6, Dover #1 Water Quality Profile). At 123.5' below LSD the specific conductance was 350 umhos at 20°C, chlorides were 40 mg/l and sulfates were 13 mg/l. While not offering excessive quantity the Tampa Member does offer quite potable water in the Dover area.

A monitor well was installed in the Tampa Member, above the potential confining clays, with an open interval from 90' - 140' below LSD. The Tampa well was constructed to monitor this potential Intermediate zone and because this is a common zone of domestic water supply in the Dover area. If an Intermediate Aquifer existed, it was expected that the resulting potentiometric surface would respond differently from that of the Upper Floridan Aquifer.

Water levels taken between February 1990 and August 1991 do not support the existence of a hydrologically isolated Intermediate Aquifer in the immediate Dover #1 area. (See Figure 4, Hydrography of Dover #1 Wells). All confined wells at this site (Tampa, Suwannee and Avon Park) show very similar hydrographic trends. The maximum range of water level differences between any of the three confined water levels was 1.07 feet on 5-3-90 while the minimum difference was only .21 feet on 6-18-91.

The coincidence of the above water levels suggests a hydraulic connection between the Tampa Member of the lower Arcadia Formation (Hawthorn Group) and the remainder of the Upper Floridan Aquifer. This hydraulic connection is most likely attributable to the "potential" confining clays being breached and/or lacking in areal extent.

According to the USGS open-File Report 89-394 "Potentiometric Surface of the Intermediate Aquifer System, West-Central Florida, May 1989" the Dover #1 well site is approximately 3.5 miles northwest of the generally northeast-

southwest trending boundary of the Intermediate Aquifer System. Being on the northwest edge of the thinning Intermediate Confining Unit probably explains why the unit does not effectively isolate the Tampa Member from the remainder of the Upper Floridan Aquifer.

Floridan monitor/observation wells were constructed in the Tampa Member, Suwannee "Limestone", and Avon Park Formation. (See Figure 3, Hydrogeology (ROMP Dover #1)). The core hole was converted to a temporary observation well for the aquifer performance test at this site. Water levels were measured in all four wells on June 12, 1989, and were recorded as follows:

Monitor	Open Hole Interval (below LSD)	Water Levels (+MSL) 6-12-89
Tampa	90'-140'	44.49'
Suwannee	160'-345'	44.14'
Avon Park	530'-850'	44.41'
Avon Park (OB)	495'-850'	44.26'

The similarity of these water levels supports the contention that they are all of one hydrologic unit, the Upper Floridan Aquifer System.

This author feels there is no Intermediate Aquifer at the Dover 1 wellsite and that the Upper Floridan Aquifer System starts at 80' below LSD (+32 MSL) immediately below the Intermediate Confining Unit from 16'-80' below LSD (96'-32' above MSL). (See Figure 3, Hydrogeology (ROMP Dover #1)).

Upper Floridan Aquifer System

The Upper Floridan Aquifer System is the principal source of ground water in Hillsborough County. At the Dover #1 wellsite the aquifer includes the Avon Park Formation, the Ocala Group, the Suwannee "Limestone", and the lower Hawthorn Group. (See Figure 3). The lower Hawthorn Group that is in hydrologic contact

with the Floridan Aquifer includes the Tampa Member of the Arcadia Formation and the lower six (6) foot limestone unit of the undifferentiated Arcadia Formation above the Tampa Member. The portion of the aquifer penetrated at this wellsite was 770' thick and extends from 80'- 850' below LSD (+32' to -738' MSL).

As discussed in the Ground-Water Resource Availability Inventory: Hillsborough County, Florida, prepare by the SWFWMD, "The limestone and dolomite sequence comprising the Upper Floridan Aquifer generally functions as a single hydrologic unit; however, two (2) distinct water-bearing zones are known to exist within the sequence. The zones are separated by beds of low permeability that act as semiconfining beds retarding vertical movement of water." For convenience this author will refer to the two water-bearing zones as "Permeable Zones A & B, from top to bottom, separated by the low permeability beds of the Ocala semiconfiner. (See Figure 3).

PERMEABLE ZONE A

Permeable Zone A includes the lower six (6) feet of the undifferentiated Arcadia Formation, the Tampa Member of the Arcadia Formation (lower Hawthorn Group) and the entire Suwannee "Limestone" and extends from 80'-344' below LSD (+32' to -232' MSL). The Miocene age Tampa Member was discussed in the previous section.

The Oligocene age Suwannee "Limestone" is 191' thick at the Dover #1 wellsite and extends from 153'-344' below LSD (41'-232' below MSL). Core recovery through the 191' thickness averaged 67.8% with a total recovered footage of 129.45'. The Suwannee "Limestone" is bounded by unconformities at both its upper contact with the Hawthorn Group and its lower contact with the Ocala Group. Lithologically it consists of chalky, granular, fossiliferous, calcarenitic limestone. Porosities in this zone, moldic and intergranular, were estimated to range from 15% to 35%. Based on core descriptions approximately 55% (106') of the Suwannee "Limestone" exhibits 25% - 35% porosity, 25% (47') exhibits 20% - 25% porosity while 20% (38') has less than 20% porosity. In general the Suwannee "Limestone" demonstrates high porosities with moderate to high permeabilities.

Water levels while coring through the Suwannee fluctuated 2.76 feet from a high of 54.06' below LSD (58.46' above MSL) to a low of 56.82' below LSD (55.70' above MSL). During an eleven (11) day coring hiatus from February 18 to 29, 1988, the water level dropped 1.76 feet from 54.4' below LSD at a core depth of 233.5' to 56.16' below LSD at a core depth of 254' with no appreciable water quality change. (See Figure 5, Dover #1 Water Level Profile). This water level decline is indicative of regional potentiometric declines during the drier winter months in the Dover area and not directly attributable to the hydrogeology of the additional twenty (20) feet of coring.

The highest water level within the Suwannee of 54.06' below LSD (58.46' above MSL) was encountered at a coring depth of 193.5' below LSD or approximately forty (40) feet into the Suwannee "Limestone". Twenty (20) feet above, at 173.5' below LSD, the water level was measured at 54.9' below LSD (57.62' above MSL). This 0.84 foot rise in the water level was most likely influenced by a combination of hydrogeologic factors. Lithologically, a dense, microcrystalline, relatively impermeable dolomite from 178' - 178.8' below LSD is underlain by 25 feet of highly porous (30%), poorly indurated, fossiliferous calcarenite from 178.8' - 203.5' below LSD. Hydrologically, the relatively impermeable dolomite may act as an aquiclude, whereby vertical movement of water from the underlying porous limestone is locally restricted, hence, a slightly elevated water level within the Suwannee "Limestone".

In general, water levels fluctuated but trended slightly downward through the remainder of the Suwannee "Limestone". The final measured water level while coring in the base of the Suwannee was 56.82' below LSD (55.70' above MSL) taken at a coring depth of 334' below LSD.

Water quality within the Suwannee "Limestone" fluctuated but never exceeded potable standards. Specific conductance ranged from 310 umhos to 450 umhos while chlorides (Cl-) ranged from 8 mg/l to 77 mg/l and sulfates (SO_4^{2-}) ranged from 1 mg/l to 51 mg/l. The upper limit of the sulfate range (51 mg/l) was encountered at 183.5' below LSD and is an anomalously high lab result. The resulting specific conductance of 380 umhos at this depth does not support a sulfates jump of this magnitude while chlorides were analyzed at 39 mg/l. The

poorest water quality encountered while coring at Dover #1, although still quite potable, was at 294' below LSD. At this depth the specific conductance was 450 umhos, chlorides (Cl^-) were 77 mg/l, and sulfates (SO_4^{2-}) were 18 mg/l.

In comparing the hydrogeology of the Tampa Member and the Suwannee "Limestone" it is apparent that the Suwannee "Limestone" is considerably more porous and permeable than the Tampa Member. Due to the ineffective confining capability of the basal Tampa clays, the Tampa Member of the Arcadia Formation and the Suwannee "Limestone" hydrologically combine to form Permeable Zone A. Wells open to Permeable Zone A in the Dover area generally yield from 200-1000 gpm.

OCALA SEMICONFINER

The semiconfiner between Permeable Zones A & B, the Ocala semiconfiner, is composed of calcilutitic-calcarenitic, fossiliferous, moderately indurated limestone and extends from 344'-528' below LSD (232'-416' below MSL) at the Dover #1 wellsite. (See Figure 3, Hydrogeology (ROMP Dover #1)). Core recovery through the 184' thickness of the Ocala semiconfiner averaged 87.0% with a total recovered footage of 160 feet. The geology and hydrology at this site are remarkably coincident. The late Eocene age Ocala Group boundaries and the Ocala semiconfiner boundaries are identical. Porosities, intergranular and moldic, were estimated to range from 10%-20% in this semiconfiner. Based on core descriptions of this 184' thick semiconfiner, approximately 9% (17') exhibits greater than 15% porosity while 91% (167') exhibits 15% porosity or less. In general the Ocala Group limestones demonstrate low to moderate porosity and low permeability. Water levels while coring in the Ocala semiconfiner showed a 2.73 foot range of fluctuation. The lowest water level of 57.73' below LSD (54.79' above MSL) was recorded near the top of the semiconfiner at 354' below LSD while the highest water level of 55.00' below LSD (57.52' above MSL) was recorded near the bottom of the unit at 484' below LSD.

The most significant feature on the graph of water levels (Figure 5) while coring in the Ocala semiconfiner was the 42 day coring hiatus from 3-8-88 to 4-19-88. During this time (3-8 to 3-29) 500' of 6" PVC casing was set. There was

one (1) day of coring during this hiatus, 3-30-88, where the core hole was advanced 22.5' from 501.5' - 524' below LSD. The coring crew was required to work on another site (ROMP 17) from 3-31 to 4-18. No water levels were measured in the Dover #1 core hole between 484'(3-8-88) and 524' (4-19-88). During this interval the water level dropped from 57.52' above MSL to 52.55' above MSL, a total of 4.97'. This dramatic decline was caused in part by setting and grouting in 500' of 6" PVC casing, effectively hydraulically isolating the lower most Ocala Group (495'-528' below LSD) from all water-bearing zones above. Additionally and most significantly, the water level decline is indicative of regional Floridan potentiometric surface declines during the drier winter months coupled with increased agricultural pumpage in the Dover area.

The quality of water within the Ocala semiconfiner never exceeded potable standards during the coring operation at Dover #1. Chlorides (Cl^-) ranged from 11 mg/l to 53 mg/l, sulfates (SO_4^{2-}) ranged from 1.5 mg/l - 22 mg/l, while the specific conductance varied from 290 umhos to 450 umhos. The lowest quality water within this semiconfiner was encountered at 404' below LSD (292' below MSL) and is characterized by all the upper limits of the above mentioned water quality parameters. (See Figure 6, Dover #1 Water Quality Profile).

A standard complete water analysis was conducted on a water sample air-lifted while coring at a depth of 444' below LSD (332' below MSL). Some of the major constituents were: chlorides - 37 mg/l, sulfates - 10 mg/l, specific conductance - 400 umhos, total dissolved solids - 264 mg/l, total hardness - 232 mg/l, total alkalinity - 413 mg/l, bicarbonate - 504 mg/l, calcium - 80 mg/l, and sodium - 22 mg/l. As the above analysis suggests, the water quality in the Ocala semiconfiner is good, however, the generally low porosity and permeability would limit the quantity of water that this unit could yield to a well. This author is unaware of any wells that are completed solely in the Ocala semiconfiner.

PERMEABLE ZONE B

The Ocala semiconfiner is underlain by Permeable Zone B (Figure 3). Zone B extends from 528' to 850' below LSD. Eight hundred fifty feet (850') is merely the total depth (TD) of penetration and not a hydrologic or geologic boundary.

At this site the upper hydrologic boundary of Permeable Zone B and the geologic contact between the Ocala Group and the Avon Park Formation are identical. A total thickness of 322 feet of the middle Eocene age Avon Park Formation (Permeable Zone B) was penetrated. Of the 322 feet penetrated only 311 feet were cored (528' -839' below LSD). The remaining 11 feet (839' - 850') were rotary tricone drilled and cuttings were described. Core recovery through this 311 feet averaged 79.5% with a total recovered footage of 247.1 feet.

Permeable Zone B is predominantly composed of limestone from 528' to 693' below LSD and dolomite from 693' to 850' (TD) below LSD. The limestone is fossiliferous calcarenite that becomes increasingly calcilutitic toward the bottom of the section. The bottom forty feet (40') of this section (653' - 693' below LSD) becomes increasingly dolomitic with depth. The dolomite (693'-850' below LSD) is fossiliferous, crystalline, and exhibits increasing fracture porosity with depth.

The District down hole video camera was utilized in the Avon Park monitor well (open hole 530' - 850' below LSD) to inspect the casing and to inspect gross formation features on 2-8-90. The camera was run from land surface to 727' below LSD where the illumination system failed. The down hole camera was utilized again on 6-11-90. The majority of the remaining open hole section (727'-816' below LSD) was video logged. The heavily fractured and treacherous dolomites at this depth precluded further camera logging. The remaining open hole (816'-850' below LSD) was not video inspected. Several areas of major fracture porosity were observed. An almost vertical fracture bisects the well bore for eight feet (8') from 639'-647' below LSD. Other more minor areas of vugular and fracture porosity were observed at 675', 680', 683', 695', 700', 713', 718', 729'-739', 753'-755', 766'-769', 779', 782'-784', 791'-793', and 800'-810' below LSD. With fractures increasing with depth, several solutional features, what appeared to be small cavities, were observed at 690', 709', 727'-729', 732'-733', 740'-744', 759', and 810'-816' below LSD. Based on core description and the caliper log for this well, another major area of fracture/solutional porosity was encountered from approximately 826'-843' below LSD. It should be noted that the drilling operation can greatly enhance existing fractures, thereby, possibly magnifying their significance. Regardless, the predominant effective porosity

type exhibited in the Avon Park dolomites is fracture porosity. Generally, intercrystalline porosity in the dolomites is 10% or less.

Permeable Zone B (Avon Park Formation) limestones from 528'- 693' below LSD exhibited porosities, moldic and intergranular, that ranged from 15% - 35%. Based on core descriptions of this 165 foot zone approximately 55% (91') exhibits 25% - 35% porosity, 20% (34') exhibits 20% - 25% porosity, while 25% (41') has less than 20% porosity. In general the Avon Park limestones demonstrate moderate to high porosity with moderate permeability. Of course areas of significant fracturing demonstrate higher permeabilities.

Water within Permeable Zone B exhibited the highest and most consistent quality encountered while coring at Dover #1 (Figure 6). Sulfates ranged from 2 mg/l - 12 mg/l, chlorides ranged from 7 mg/l - 18 mg/l, while specific conductance varied from 240 umhos - 370 umhos. Water samples were analyzed for total dissolved solids (TDS) from 789'-824' and TDS ranged from 198 mg/l - 222 mg/l through this interval.

Two (2) standard complete water analyses were performed by the District lab on air-lifted water samples from 749' and 779' below LSD during the coring operation. The results from these analyses were very similar so only the deeper sample will be presented. At 779' below LSD (667' below MSL) the standard complete analysis revealed the following: sulfates - 2 mg/l, chlorides not analyzed, specific conductance - 320 umhos, total dissolved solids - 218 mg/l, total hardness - 234 mg/l, total alkalinity - 188 mg/l, bicarbonate - 239 mg/l, calcium - 79 mg/l and fluoride - .448 mg/l. After construction of the permanent Avon Park monitor well, two (2) wireline thief samples were collected one (1) near the top (580') of the open hole (530'-850') and one (1) near the bottom (845') of the open interval (Figure 6). At 580' below LSD (468' below MSL) chlorides were 8 mg/l, sulfates were less than 5 mg/l, and specific conductance measured 192 umhos. At 845' below LSD (733' below MSL) chlorides remained at 8 mg/l, sulfates increased to 12 mg/l and specific conductance rose to 270 umhos.

During the coring operation water levels in Permeable Zone B were measured on an average of twice a day, once every ten to twenty feet of penetration

(Figure 5). Any significant water quality or water level changes would necessitate higher sampling and measuring frequency.

The average elevation of the water level through the Avon Park limestones (528' - 693' below LSD) while coring was approximately 53' above MSL. The lowest water level of 52.38' above MSL was measured near the top of the limestone sequence at 544' below LSD. The highest Avon Park water level of 53.62' above MSL was recorded at 604' below LSD.

Water levels within the Avon Park dolomite sequence (693'-850' below LSD) of Permeable Zone B fluctuated over a range of 7.97' but generally declined through the coring operation. The highest water level in the dolomite sequence was 53.55' above MSL in the top of the unit at 712.5' below LSD. The lowest water level of 45.58' above MSL was measured at 779' below LSD while coring. This approximate eight foot (8') drop in water level occurred over only 66.5' of coring with no subsequent water quality change. More significantly, it occurred in the month of May (5-5 to 24-88), historically one of the driest months of the year with heavy agricultural pumpage resulting in an annually low Floridan potentiometric surface.

Two (2) drilling hiatus occurred during the coring operation in Permeable Zone B (Figure 5). The first was a seven (7) day interruption in coring from 4-26-88 to 5-4-88. Due to excessive torque on the NQ core rods the core hole was reamed to 5 5/8" from 504'-705' below LSD during this hiatus. No water levels were measured from 684' (4-26-88) to 712.5' (5-5-88). During this time the water level rose 0.81' from 52.74' to 53.55' above MSL. This slight rise in the water level was probably due to the elimination of borehole restrictions by the reaming process coupled with an increase of fracture porosity with depth. The second coring hiatus of almost five (5) months occurred from 5-24-88 to 10-19-88. This hiatus spanned from the dry season in May (low Floridan potentiometric surface) through the wet season to October (elevated Floridan potentiometric surface). This explains the 2.91' rise in water level from 45.58' (5-24-88) to 48.49' (10-19-88) above MSL. During this lengthy hiatus the Speedstar 22M rig reamed the core hole to 5 5/8" from 715'-782.5' below LSD and the CME 75 crew cored at the Dover #2 well site.

During the remainder of the core hole (782.5'-839' below LSD) the water level fluctuated 1.38' between 48.50' and 47.12' above MSL. At the base of the core hole (839' below LSD) the water level was measured at 47.48' above MSL. The core hole was eventually reamed and deepened by the Speedstar rig to 850' below LSD to match the depth of the permanent (pumped) monitor well. This core hole was used as an Avon Park/Permeable Zone B observation well during the Dover 1 aquifer performance test (See Section VII-Aquifer Performance Test & Parameters).

V WELL DESIGN AND CONSTRUCTION

The following "Asbuilt" well diagrams illustrate final construction details and special notes (*) for all wells drilled at Dover #1. Four (4) permanent wells remain at Dover #1 that were completed into the Surficial Aquifer, Tampa Member, Suwannee "Limestone", and the Avon Park Formation. The 839' core hole was converted to an 850' temporary observation well for the aquifer performance test (APT). After the APT the core/observation well was plugged and abandoned.

VI GEOPHYSICAL LOGS

Geophysical logging in general gathers three (3) major types of information from water wells: hydrologic (water quality, water level), geologic (lithology, porosity, etc.) and "in situ" well construction data (casing size & depth, etc). For these purposes the Dover #1 wellsite was extensively geophysically logged. Refer to Table 1, Geophysical Logging at Dover #1, for logging specifics.
The core hole, being of smaller diameter (4" or less), generally provided the best logging environment. Logging of the core hole allows direct correlation of geophysical logs with the cored lithology and also provides the geophysical data prior to designing the monitor wells for the ROMP wellsite. The more information (geologic, hydrologic, geophysical) gathered from the exploratory core hole the better the understanding of the wellsite hydrogeology and the more effective the monitor well design. This explains the more thorough logging of the core hole as evidenced by Table 1.

VII AQUIFER PERFORMANCE TEST & PARAMETERS

An aquifer performance test (APT) was conducted from November 28-30, 1989 on the Avon Park Monitor at Dover #1. The District's 6" lineshaft turbine pump was used to pump the Avon Park Monitor at 1125 gallons per minute (GPM) for 32 1/3 hours (1940 minutes). Following the pumping phase, the recovery phase ran for 19 1/6 hours (1150 minutes). The Polysonic ultrasonic flowmeter and an orifice plate with manometer tube were used to measure discharge (Q = 1125 GPM). Discharge was conducted off site via 30 foot sections of 10" aluminum irrigation pipe. Pumping and recovery water levels were measured automatically with a District owned data logger that utilizes in-well pressure transducers. A total of five (5) wells were monitored during the APT (See Table 2, Dover #1 Well Statistics), four (4) of which remained as permanent monitors.

DOVER #1 WELL STATISTICS

WELL/FORMATION	CASING ID/TYPE	MONITORED INTERVAL (BLS) (OH) = OPEN HOLE	DISTANCE (r) FROM PUMPED WELL	FINAL STATUS OF WELL
AVON PARK MONITOR (PUMPED WELL)	12" PVC 0' - 175' 6" PVC 175'-530'	530' - 850' (OH)		PERM. MONITOR
AVON PARK - TEMP. OB	6" PVC	495' - 850' (OH)	82'	P & A
SUWANNEE MONITOR	6" PVC	160' - 345' (OH)	43.5'	PERM. MONITOR
TAMPA MONITOR	3" PVC	90' - 140' (OH)	33.5'	PERM. MONITOR
SURFICIAL MONITOR	6" PVC	5' - 15' .010" SLOT SCREEN	21.5'	PERM. MONITOR

TABLE 2

Hydraulic characteristics of the pumped portion of the Upper Floridan Aquifer (Permeable Zone B - Avon Park Formation) were calculated in the form of transmissivity (T) and the Storage coefficient (S). Hydraulic characteristics of the semiconfiner (Ocala Group) above the pumped zone were calculated in terms of vertical hydraulic conductivity (K') and the leakance coefficient ($^{K'}/_{b'}$). Analysis of the drawdown and recovery data was accomplished using Walton's leaky artesian aquifer method (1962) without storage in the semiconfining layer and checked using Jacob's straight-line method. Refer to Table 3, Hydraulic characteristics of the Upper Floridan Aquifer at the Dover #1 Wellsite, for the calculated values of T, S, K', and $^{K'}/_{b'}$.

Significant leakage through the Ocala semiconfiner was demonstrated. After a brief upward trend the Suwannee water level started drawing down only 8 minutes after pumping in the Avon Park started. The Tampa water level followed the same pattern and started drawing down only 30 minutes into the pumping phase. This rapid leakance and subsequent drawdown of the Suwannee and Tampa water levels does reduce the reliability of the calculated hydraulic parameters (K', $^{K'}/_{b'}$) for the Ocala semiconfiner.

A wireline flowmeter was inserted into the pumped well prior to installing the turbine pump to locate the significant zones of contribution while pumping. This effort failed because the flowmeter malfunctioned and could not be retrieved and repaired without removing the turbine. Flow from the bottom of the open hole interval was therefore not confirmed.

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HYDRAULIC CHARACTERISTICS OF THE UPPER FLORIDAN AQUIFER AT THE DOVER #1 WELLSITE

WELL NAME	ANALYTICAL METHOD	(T)TRANSMISSIVITY (GPD/FT)	(S)STORAGE COEFFICIENT (UNITLESS)	(K')VERTICAL HYDRAULIC CONDUCTIVITY OF OCALA SEMICONIFER (GPD/FT^2)	(K'/b')LEAKANCE COEFFICIENT THRU OCALA (GPD/FT^3)
AVON PARK OB (CONVERTED COREHOLE)	WALTON (CURVE MATCH) DRAWDOWN VS. TIME	208,000	1.26×10^{-3}	.569	3.09×10^{-3}
	JACOB (STRAIGHT LINE) DRAWDOWN VS. TIME	228,500	1.07×10^{3}		
	JACOB (STRAIGHT LINE) RECOVERY VS. TIME	228,500	1.41×10^{-3}		
AVON PARK MONITOR (PUMPED WELL)	JACOB (STRAIGHT LINE) DRAWDOWN VS. TIME	247,500			
	JACOB (STRAIGHT LINE) RECOVERY VS. TIME	228,500			
	AVERAGE	228,500 GPD/FT ($30,508\ FT^2/d$)	1.25×10^{-3}	.569 GPD/FT^2 (.0761 FT/DAY)	3.09×10^{-3} GPD/FT^3 (4.14×10^{-4} FT/D/FT)

TABLE 3

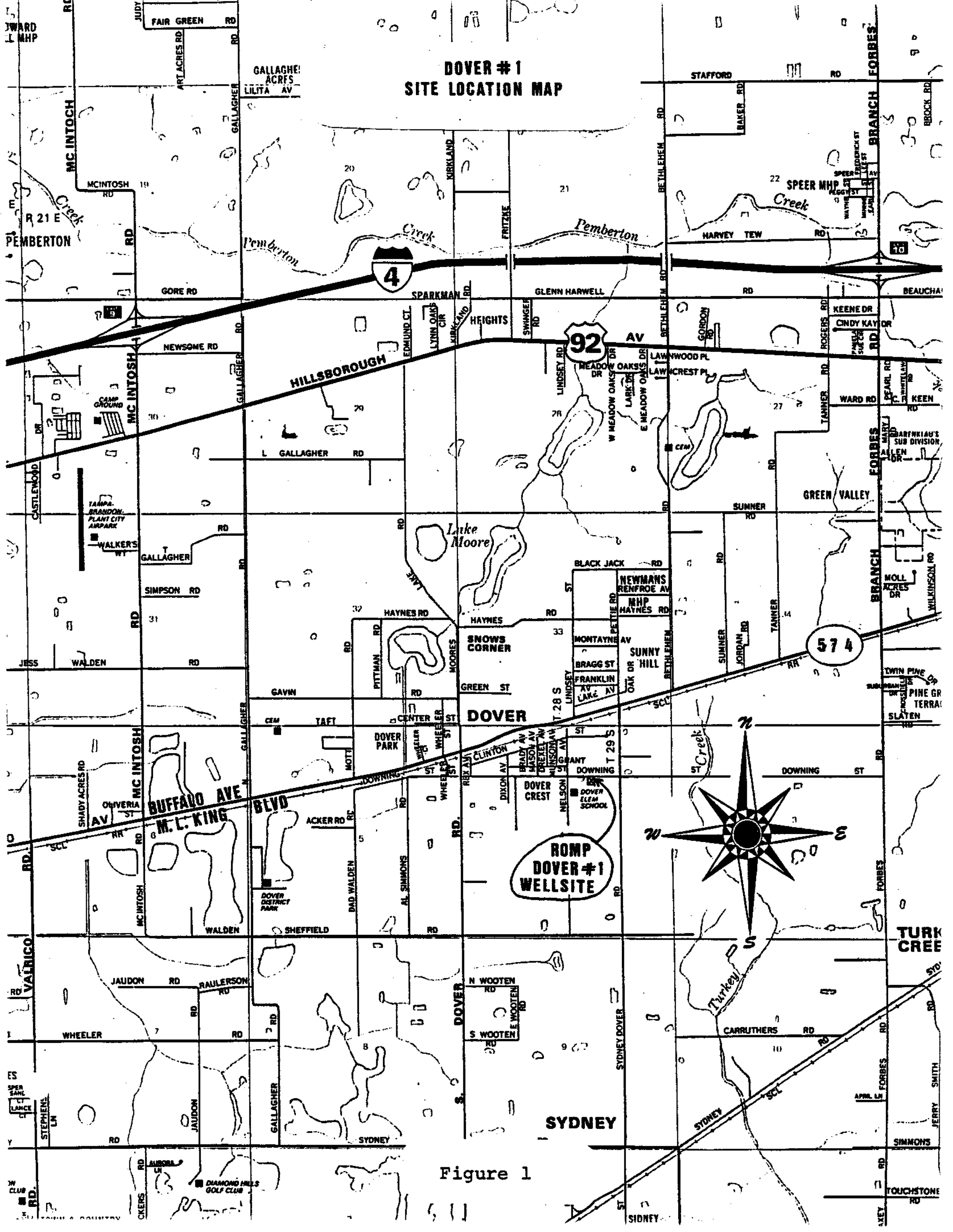

DOVER #1
SITE LOCATION MAP
ROMP
DOVER #1
WELLSITE
DOVER
SNOWS CORNER
SUNNY HILL
DOVER PARK
DOVER CREST
DOVER ELEM SCHOOL
DOVER DISTRICT PARK
SYDNEY
GREEN VALLEY
SPEER MHP
NEWMANS MHP
PEMBERTON
R 21 E
T 28 S
T 29 S
HILLSBOROUGH
AV
BUFFALO AVE
M. L. KING
BLVD
Lake Moore
Pemberton Creek
Turkey Creek
GALLAGHER RD
MC INTOSH RD
STAFFORD RD
GORE RD
SPARKMAN RD
GLENN HARWELL RD
BETHLEHEM RD
KIRKLAND RD
FRITZKE
SWINGER RD
NEWSOME RD
L GALLAGHER RD
SUMNER RD
SIMPSON RD
WALDEN RD
HAYNES RD
BLACK JACK RD
GAVIN RD
TAFT
CENTER ST
DOWNING ST
WALDEN SHEFFIELD RD
JAUDON RD
RAULERSON RD
WHEELER RD
N WOOTEN RD
S WOOTEN RD
CARRUTHERS RD
SYDNEY RD
SYDNEY DOVER RD
DOVER RD
VALRICO RD
FORBES RD
BRANCH FORBES RD
TAMPA-BRANDON-PLANT CITY AIRPARK
CAMP GROUND
DIAMOND HILLS GOLF CLUB
CEM
4
92
574
N
S
E
W

Figure 1

7-29-91

Well Placement Diagram
Dover #1 (Dover Elementary)

Jim Clayton

100'x100' Temporary Construction Easement

20'x60' Perpetual Easement

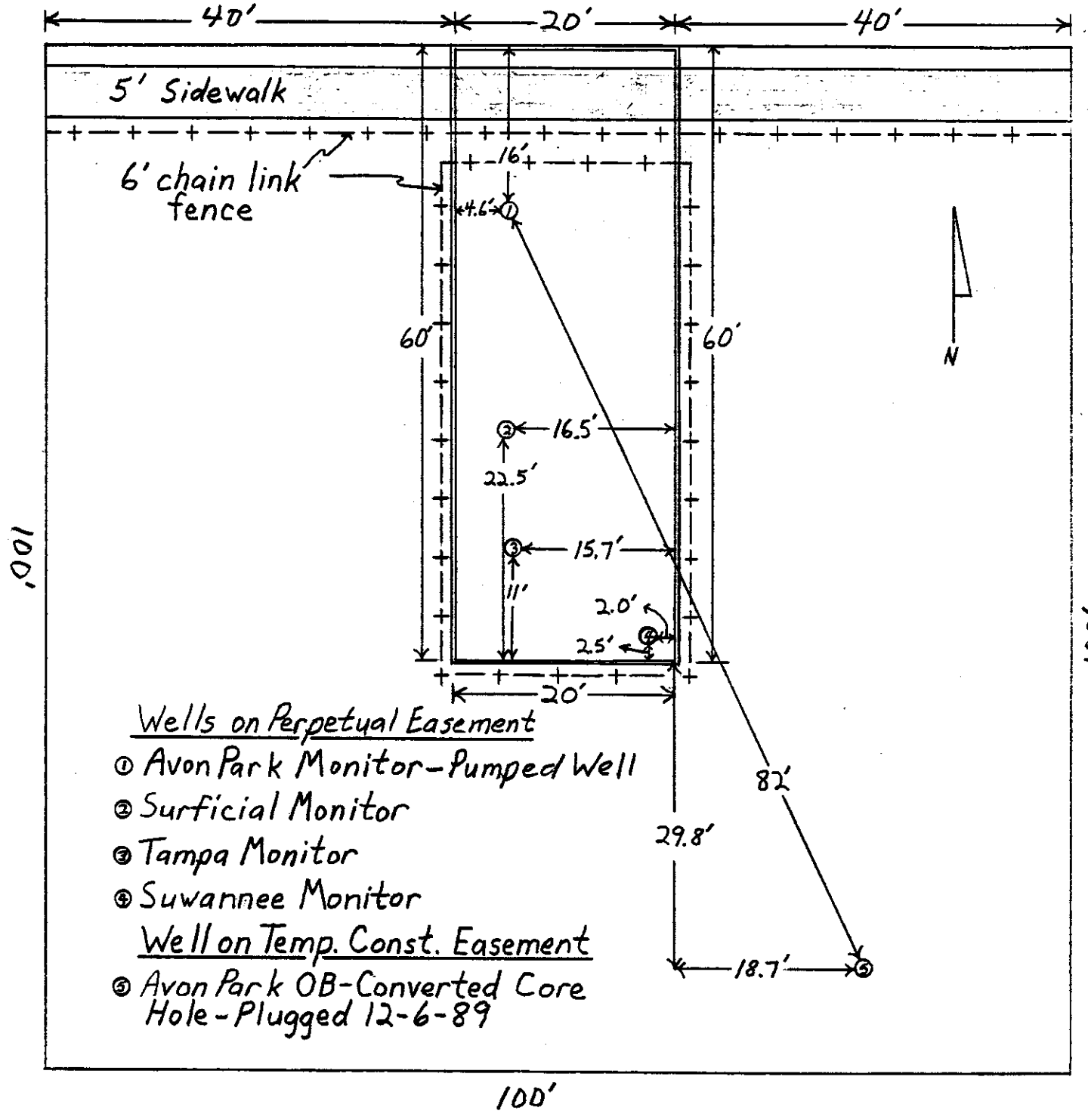


Figure 2

Hydrogeology (ROMP Dover #1)

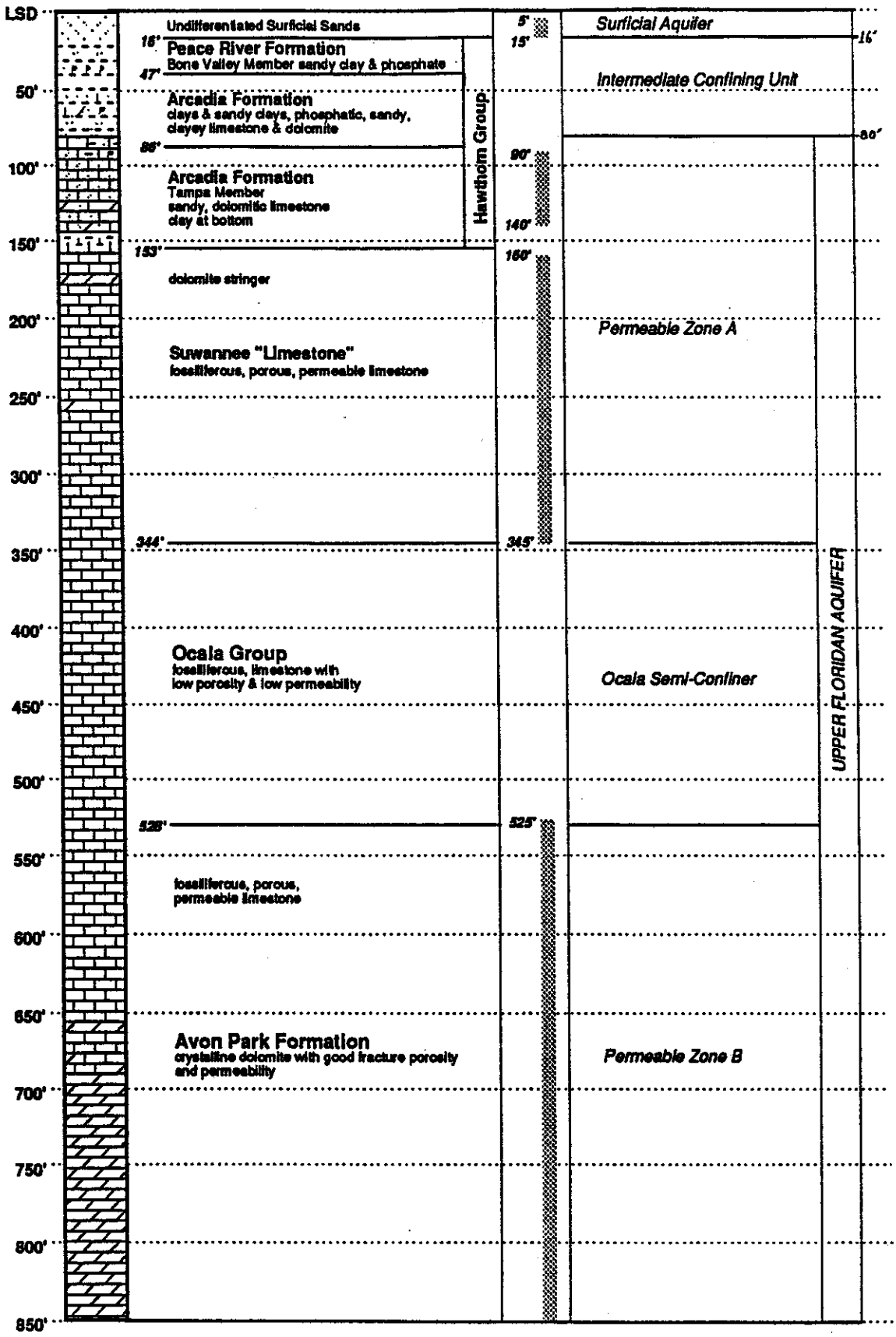
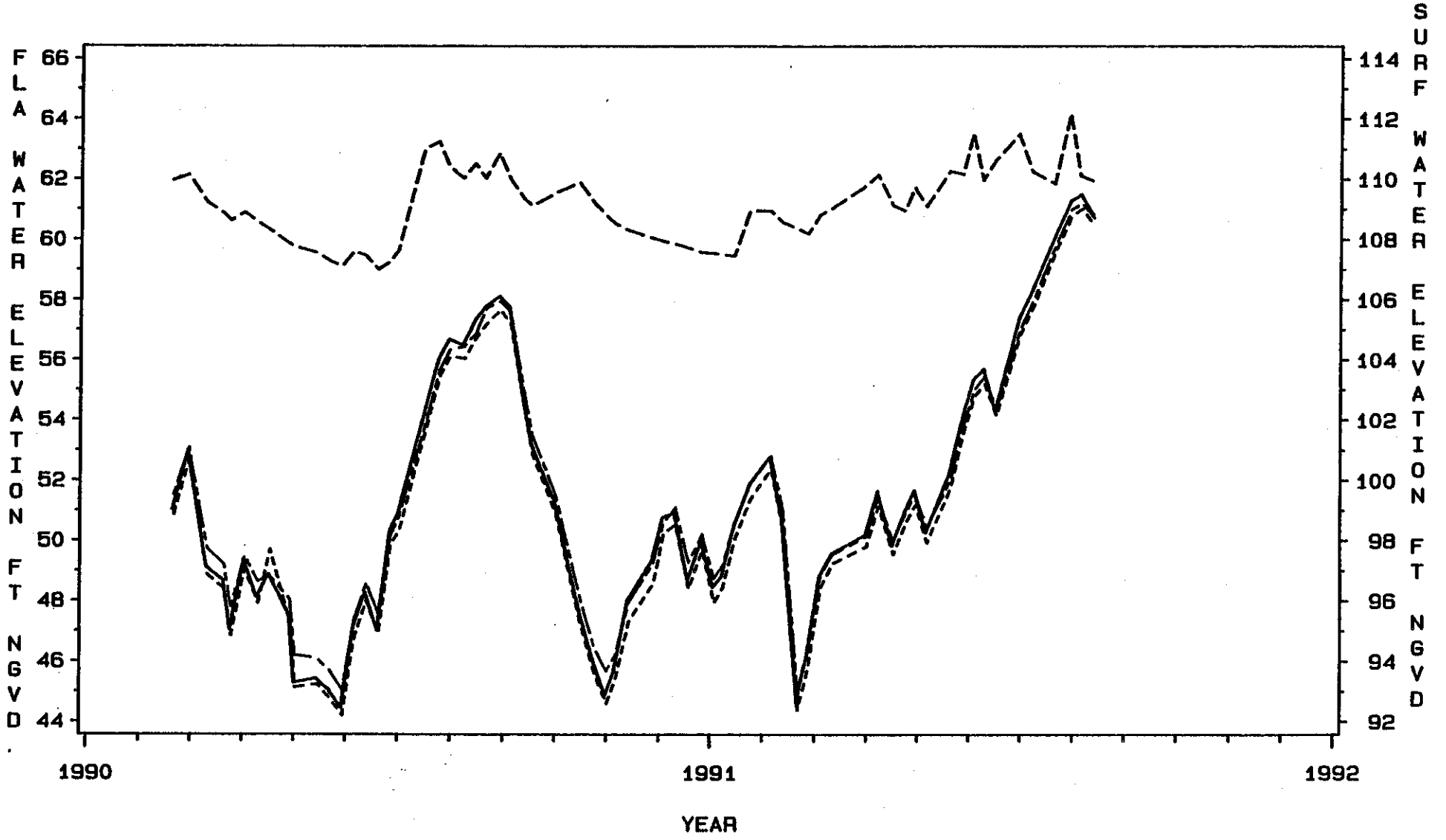


Figure 3

HYDROGRAPHY OF DOVER #1 WELLS

AVON PARK, SUWANNEE AND TAMPA vs SURFICIAL



SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT

AVPK=SOLID SUW=DOT TPA=DOT-DASH SURF=DASH

Figure 4

7-29-91

Dover #1
Water Level Profile
(while coring)

Jim Clayton

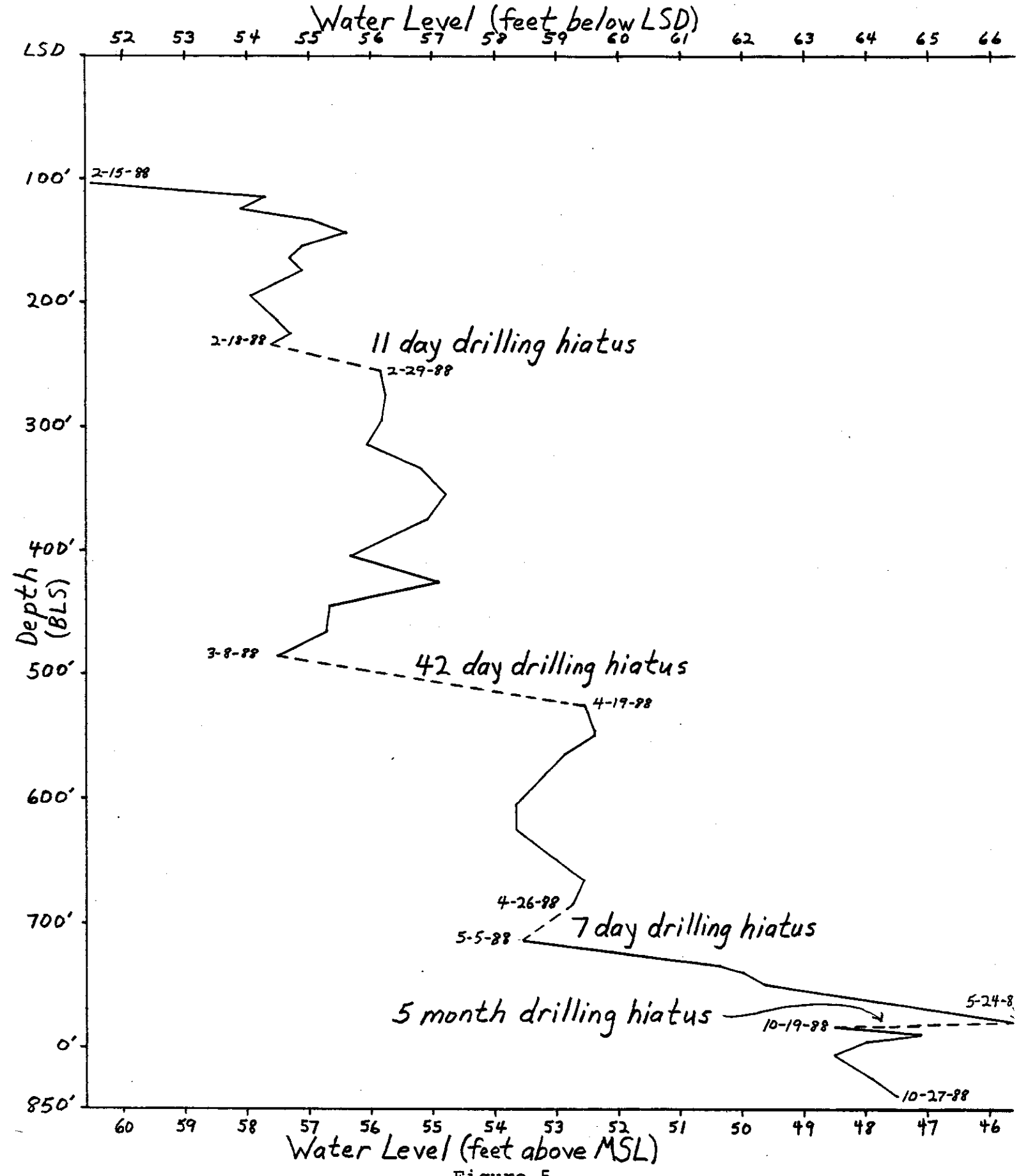


Figure 5

DOVER #1
Water Quality Profile
(while coring)

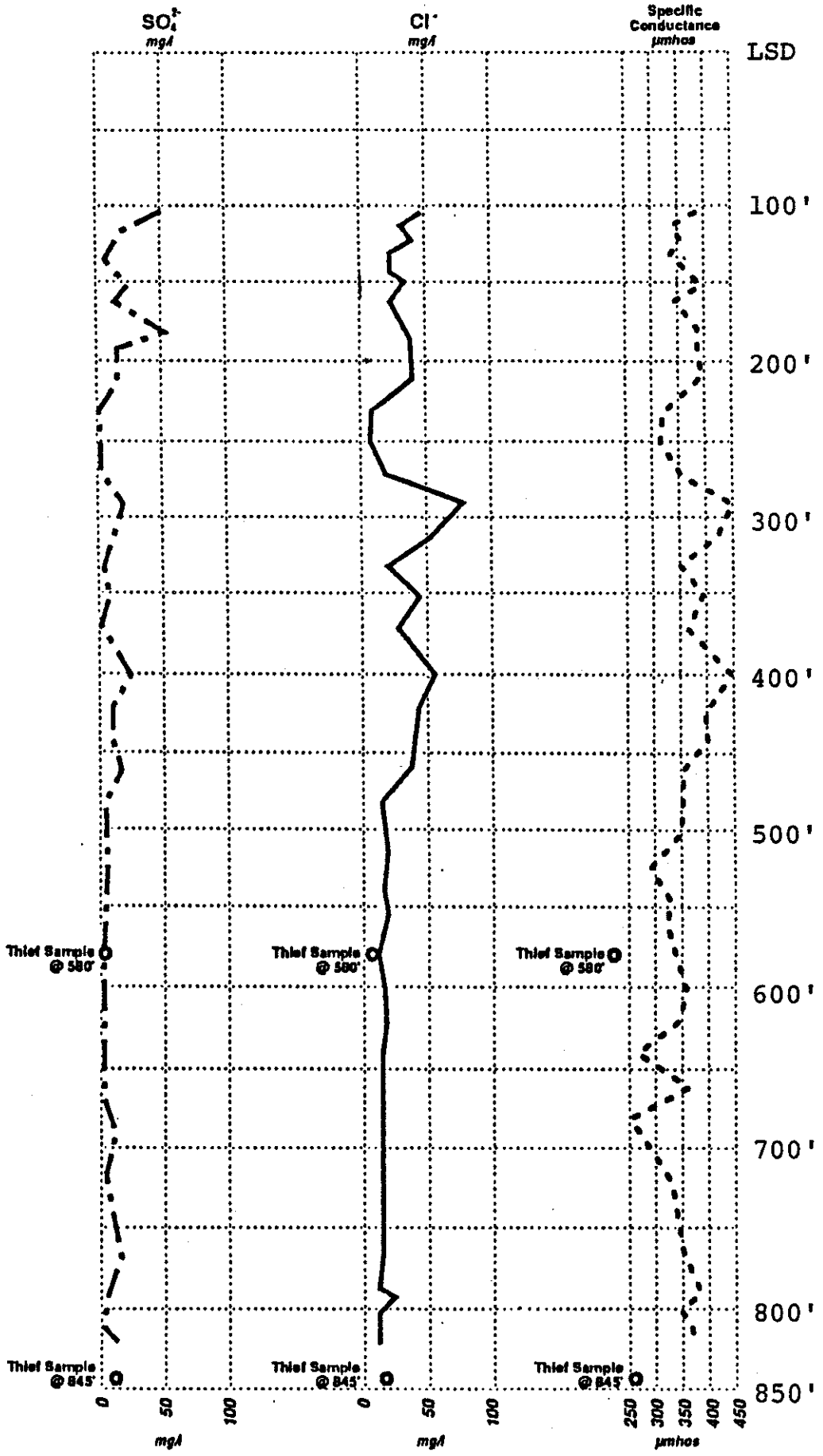
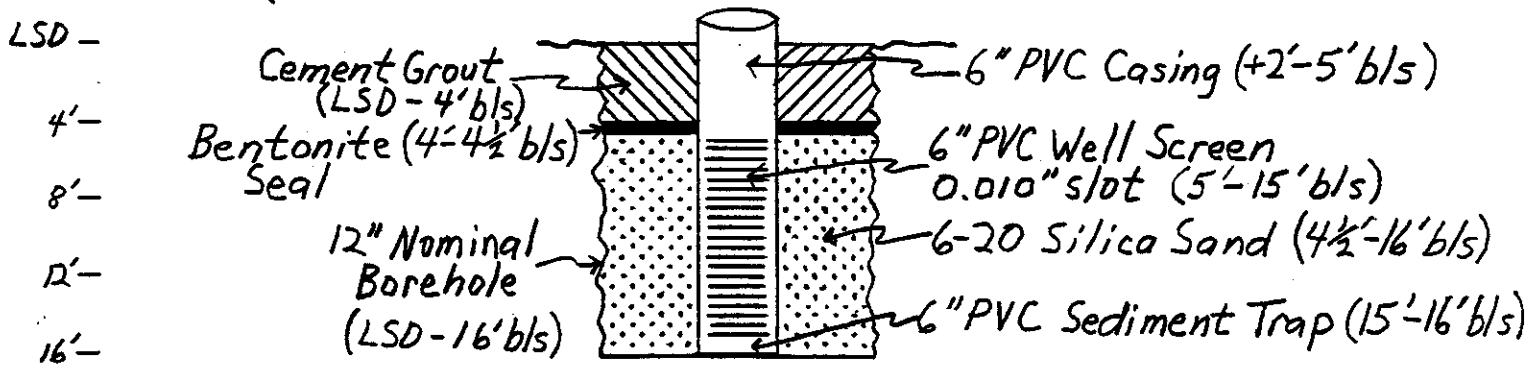


Figure 6

7-29-91 "As Built" Well Diagrams Dover #1 (Dover Elem.) Jim Clayton

Surficial Monitor

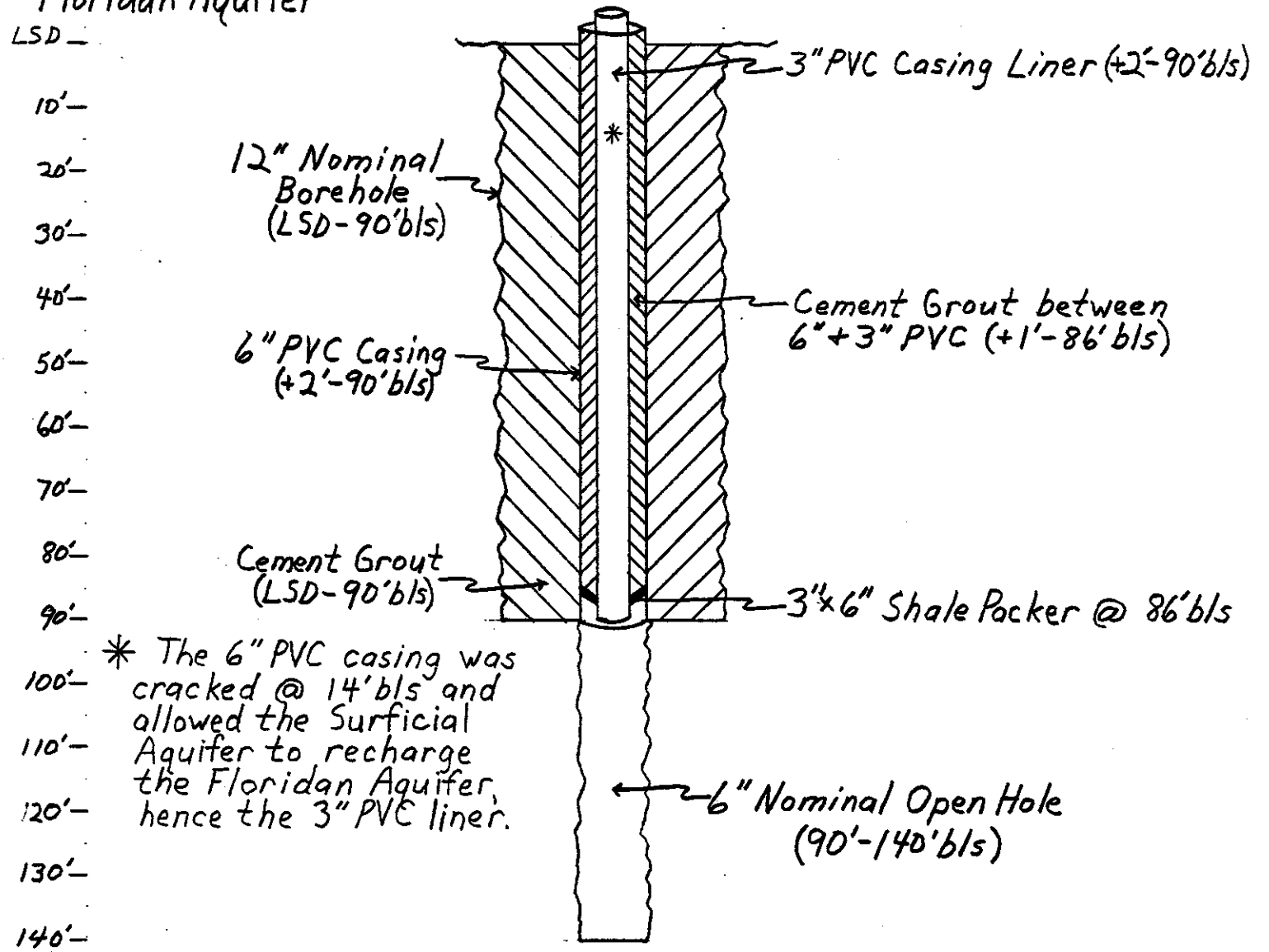
Surficial Aquifer



Tampa Monitor

Upper Permeable Zone A

Floridan Aquifer

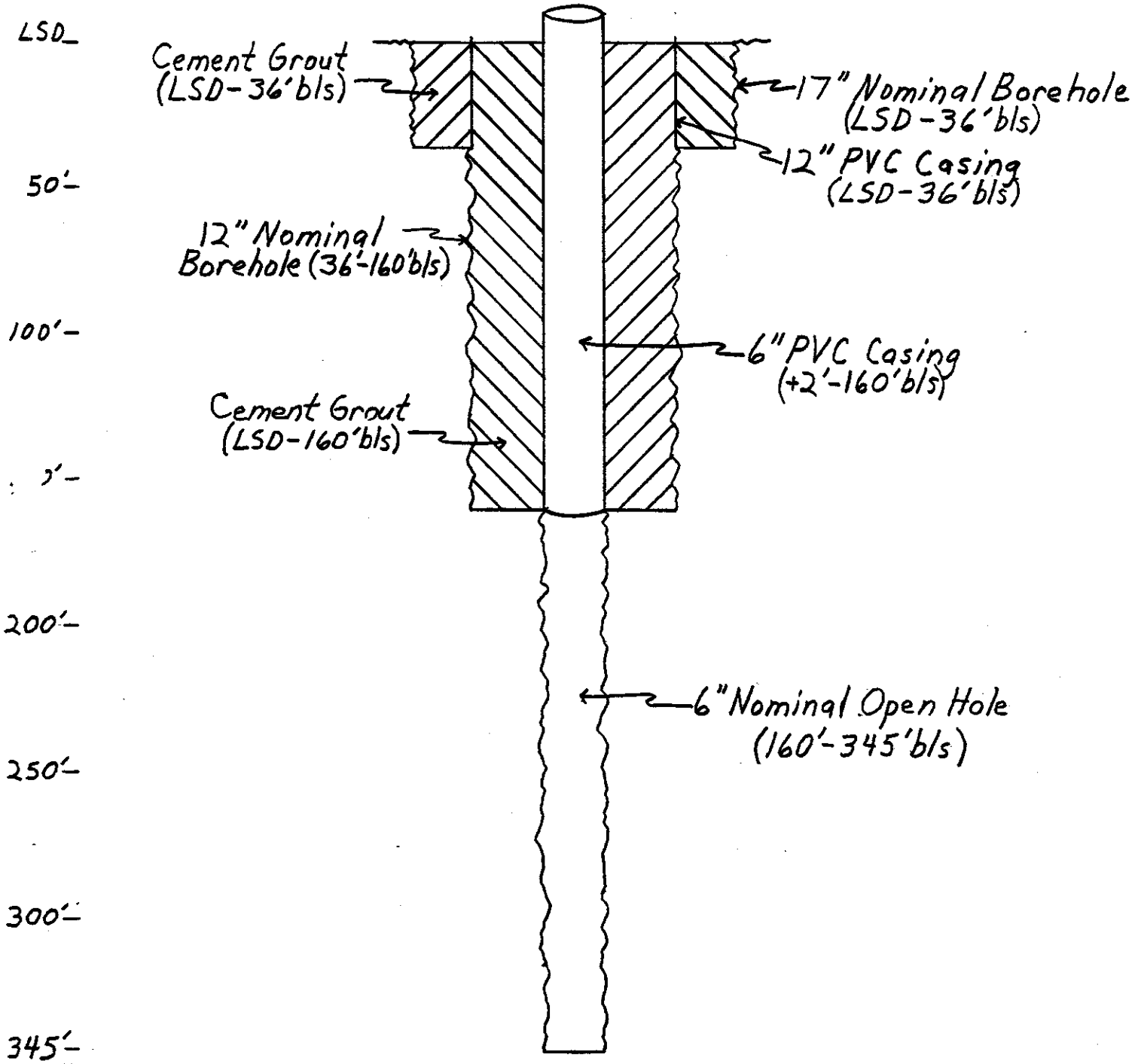


* The 6" PVC casing was cracked @ 14' bls and allowed the Surficial Aquifer to recharge the Floridan Aquifer, hence the 3" PVC liner.

7-29-91

"As Built"
Well Diagram
Dover #1 (Dover Elem.)
Suwannee Monitor
Lower Permeable Zone A
Floridan Aquifer

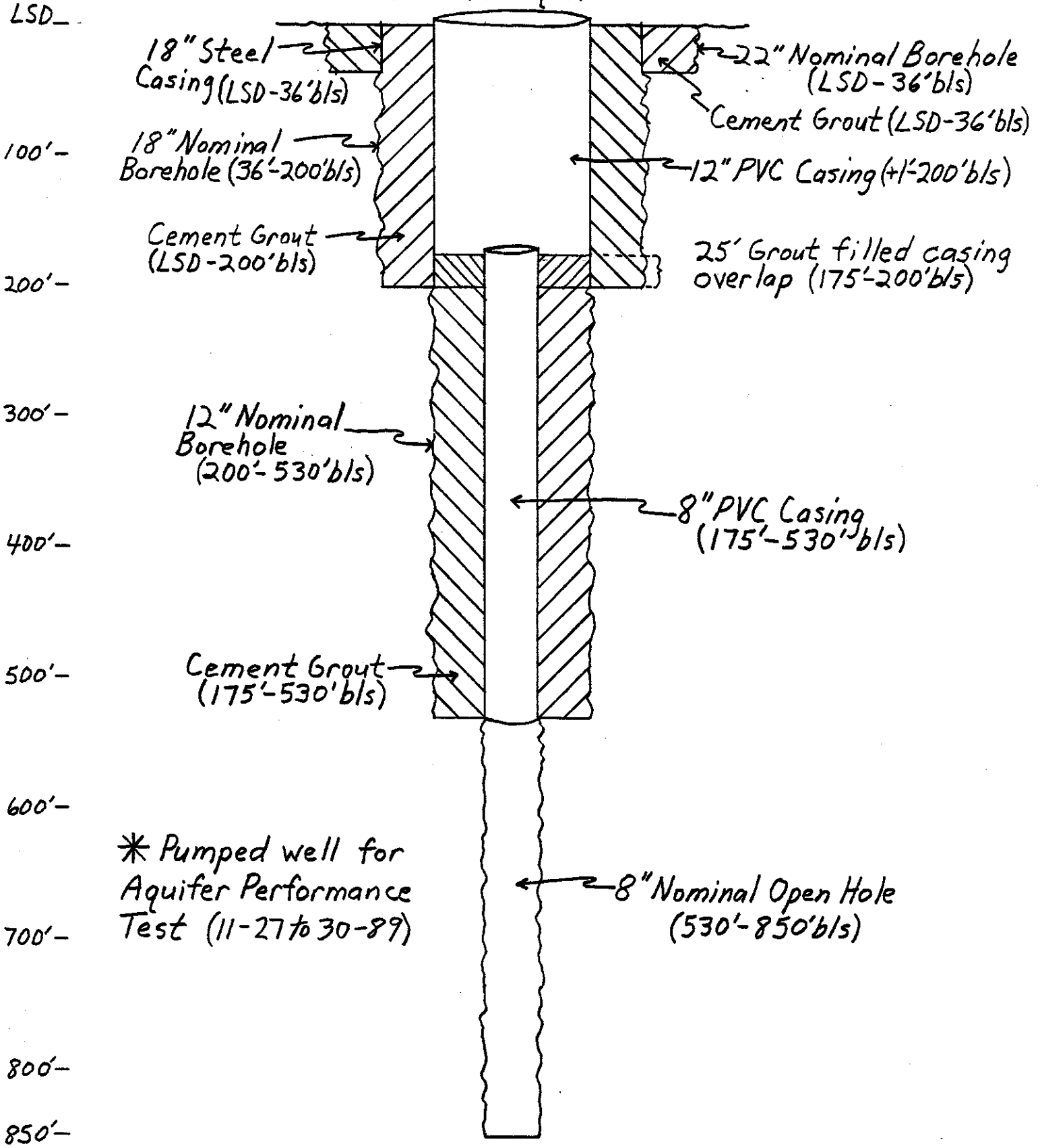
Jim Clayton



7-29-91

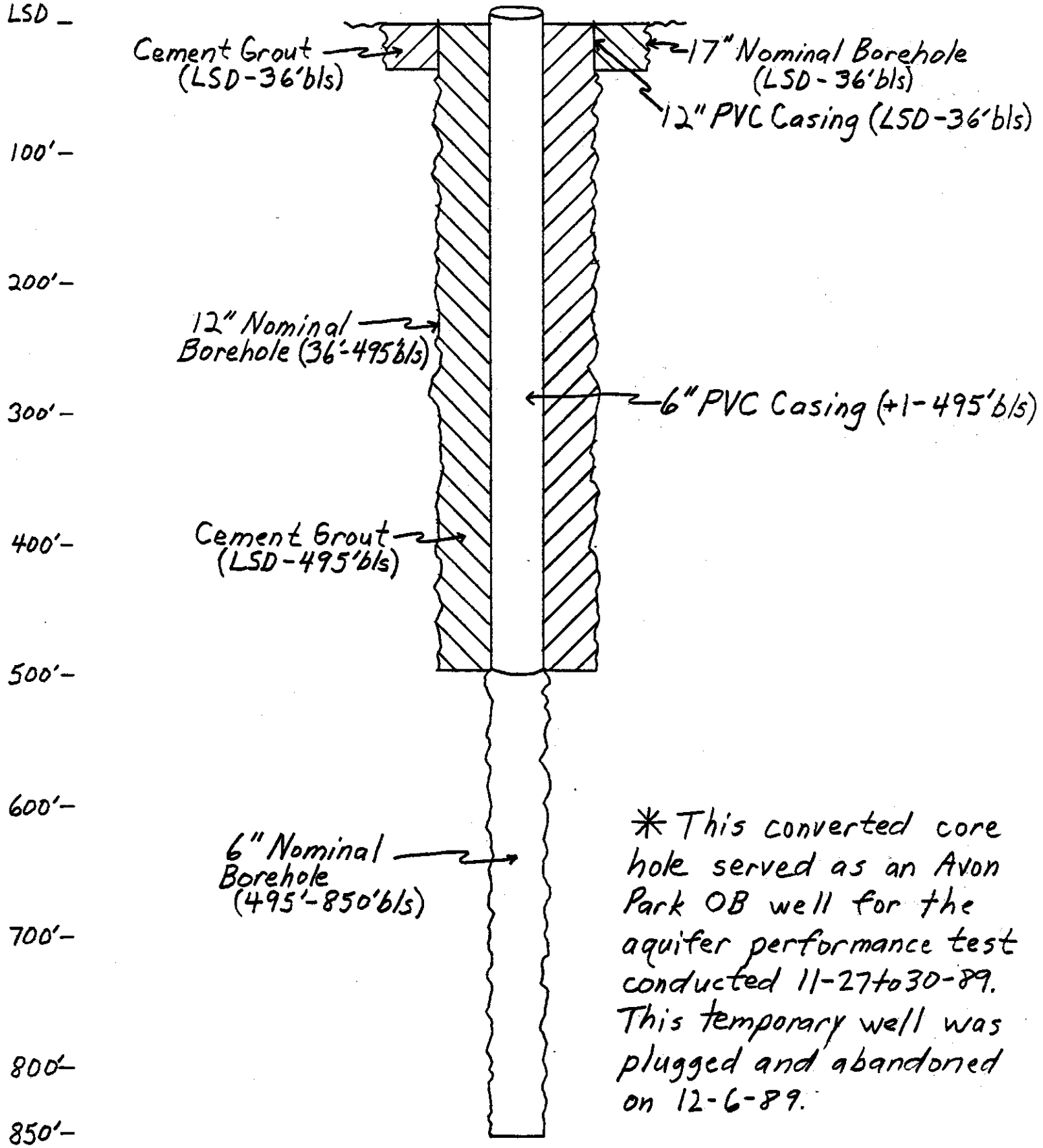
"As Built"
Well Diagram
Dover #1 (Dover Elem.)
Avon Park Monitor
Permeable Zone B
Floridan Aquifer

Jim Clayton



7-29-91 "As Built" Jim Clayton

Well Diagram
Dover #1 (Dover Elem.)
Avon Park Observation Well
Converted Core Hole – Plugged after Aquifer Test



* This converted core hole served as an Avon Park OB well for the aquifer performance test conducted 11-27 to 30-89. This temporary well was plugged and abandoned on 12-6-89.

LITHOLOGIC WELL LOG PRINTOUT

SOURCE - SWFW

WELL NUMBER: W- 16576
TOTAL DEPTH: 850 FT.
SAMPLES - NONE

COUNTY - HILLSBOROUGH
LOCATION: T.29S R.21E S.04
LAT = N 27D 59M 26
LON = W 89D 12M 34

COMPLETION DATE - N/A
OTHER TYPES OF LOGS AVAILABLE - NONE

ELEVATION - 112 FT

OWNER/DRILLER: ROMP DV-1 (DOVER ELEMENTARY); SWFWMD; CORED BY L. H. JOHNSON;

WORKED BY: GRANVILLE KINSMAN (1/26/88-5/11/88).
HOLLOW STEM AUGER LSD-9'
SPLIT-SPOON 9'-15'
MUD ROTARY CUTTINGS 15'- 97'
WIRELINE CORE 97'-779'.

0 - 2.5 SAND; BLACK TO MODERATE LIGHT GRAY; 30% POROSITY, INTERGRANULAR,
POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: FINE; RANGE: MEDIUM TO FINE;
ROUNDNESS: ROUNDED TO SUB-ANGULAR; MEDIUM SPHERICITY; UNCONSOLIDATED;
CEMENT TYPE(S): ORGANIC MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: PLANT REMAINS-02%;
FOSSILS: ORGANICS;

2.5- 9 SAND; DARK BROWN TO DARK REDDISH BROWN; 30% POROSITY, INTERGRANULAR,
POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: FINE; RANGE: MEDIUM TO FINE;
ROUNDNESS: ROUNDED TO SUB-ANGULAR; MEDIUM SPHERICITY; UNCONSOLIDATED;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: IRON STAIN- %, QUARTZ SAND- %;
FOSSILS: ORGANICS, FOSSIL FRAGMENTS;

9 - 13.1 SAND; BLACK TO DARK YELLOWISH BROWN; 30% POROSITY, INTERGRANULAR,
POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: FINE; RANGE: MEDIUM TO FINE;
ROUNDNESS: ROUNDED TO SUB-ANGULAR; MEDIUM SPHERICITY; UNCONSOLIDATED;
SEDIMENTARY STRUCTURES: MASSIVE,
FOSSILS: MOLLUSKS, FOSSIL FRAGMENTS;

13.1- 16.5 SAND; MODERATE BROWN TO MODERATE YELLOWISH BROWN; 10% POROSITY, INTERGRANULAR;
GRAIN SIZE: FINE; RANGE: VERY FINE TO FINE;
ROUNDNESS: ROUNDED TO SUB-ANGULAR; MEDIUM SPHERICITY; MODERATE INDURATION;
CEMENT TYPE(S): CLAY MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: CLAY-40%, IRON STAIN- %;
FOSSILS: MOLLUSKS, FOSSIL FRAGMENTS;
CLAYEY SAND WITH 4 INCH ZONE OF SHELL FRAGS. IN SAND MATRIX.

16.5- 20 SANDSTONE; GRAYISH BROWN TO LIGHT GRAYISH GREEN; 15% POROSITY, INTERGRANULAR;
GRAIN SIZE: VERY FINE; RANGE: VERY FINE TO FINE; GOOD INDURATION;
CEMENT TYPE(S): SILICIC CEMENT;
FOSSILS: NO FOSSILS;

20 - 30 CLAY; LIGHT OLIVE GRAY TO GREENISH GRAY; LOW PERMEABILITY; POOR INDURATION;
CEMENT TYPE(S): CLAY MATRIX;
ACCESSORY MINERALS: QUARTZ SAND-05%, PHOSPHATIC SAND- %;
FOSSILS: NO FOSSILS;
VF-CRSE CLEAR ROUNDED QTZ SAND DISSEMINATED IN ABOVE CLAY.

30 - 37 CLAY; LIGHT OLIVE GRAY TO GREENISH GRAY; POOR INDURATION;
CEMENT TYPE(S): CLAY MATRIX;
ACCESSORY MINERALS: PHOSPHATIC SAND- %;
FOSSILS: NO FOSSILS;
VERY SOFT COLLOIDAL CLAY (30'-37').

37 - 43.5 CLAY; GREENISH GRAY TO GRAYISH GREEN; POOR INDURATION;
CEMENT TYPE(S): CLAY MATRIX;
ACCESSORY MINERALS: QUARTZ SAND-02%, PHOSPHATIC SAND-08%;
OTHER FEATURES: PLASTIC;
FOSSILS: SHARKS TEETH;
YELLOWISH-GREY TO BLACK,ROUNDED, CRSE-GRND PHOSPHORITE SD IN ABOVE CLAY.

43.5- 46.5 CLAY; YELLOWISH GRAY TO LIGHT OLIVE; POOR INDURATION;
ACCESSORY MINERALS: PHOSPHATIC SAND-01%;
FOSSILS: NO FOSSILS;

46.5- 47 PHOSPHATE; MODERATE DARK GRAY TO DARK GRAY; UNCONSOLIDATED;
ACCESSORY MINERALS: QUARTZ SAND-30%;
FOSSILS: NO FOSSILS;

47 - 53.5 CLAY; YELLOWISH GRAY TO LIGHT OLIVE GRAY; MODERATE INDURATION;
CEMENT TYPE(S): CLAY MATRIX;
ACCESSORY MINERALS: QUARTZ SAND-05%, PHOSPHATIC SAND-01%;
FOSSILS: NO FOSSILS;

53.5- 58.5 CLAY; LIGHT BLUISH GRAY TO MODERATE BLUISH GRAY; MODERATE INDURATION;
CEMENT TYPE(S): CLAY MATRIX;
ACCESSORY MINERALS: QUARTZ SAND-05%, PHOSPHATIC SAND-02%;
VF-GRND CLEAR ROUNDED QUARTZ SAND DESSIMINATED IN STIFF CLAY.

58.5- 63 CLAY; YELLOWISH GRAY TO YELLOWISH GRAY; POOR INDURATION;
CEMENT TYPE(S): CLAY MATRIX;
ACCESSORY MINERALS: PHOSPHATIC SAND-15%, QUARTZ SAND-01%;

63 - 68 CLAY; OLIVE GRAY TO MODERATE GRAYISH GREEN; GOOD INDURATION;
CEMENT TYPE(S): CLAY MATRIX;
ACCESSORY MINERALS: PHOSPHATIC SAND-10%;
VERY STIFF CLAY.

68 - 72 CLAY; MODERATE GRAYISH GREEN TO GRAYISH GREEN; POOR INDURATION;
CEMENT TYPE(S): CLAY MATRIX;
ACCESSORY MINERALS: PHOSPHATIC SAND-10%, QUARTZ SAND-15%, CHERT-%;
TAN-BLACK, V. CRSE-V. FINE PHOSPHORITE; VF CLR ROUNDED QTZ SAND DESSIMINATED IN CLAY; FEW FRAGMENTS OF FRACTURED YELLOWISH BROWN CHERT.

72 - 74 CLAY; GREENISH GRAY TO MODERATE BLUISH GRAY; POOR INDURATION;
CEMENT TYPE(S): CLAY MATRIX;
ACCESSORY MINERALS: PHOSPHATIC SAND-20%, QUARTZ SAND-10%, SILT-%;

74 - 80 CLAY; GRAYISH GREEN TO GREENISH GRAY; GOOD INDURATION;
ACCESSORY MINERALS: PHOSPHATIC SAND-20%, QUARTZ SAND-15%, SILT-05%, CHERT- %;
OTHER FEATURES: PLASTIC;
VERY STIFF SANDY PHOSPHATIC CLAY; LARGE CHIPS OF FRACTURED YELLOWISH-BROWN CHERT.

80 - 86 CALCILUTITE; YELLOWISH GRAY TO VERY LIGHT ORANGE; MOLDIC;
GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, CLAY MATRIX;
ACCESSORY MINERALS: QUARTZ SAND-05%, PHOSPHATIC SAND-05%, CLAY-05%, DOLOMITE-03%;
OTHER FEATURES: DOLOMITIC;
FOSSILS: FOSSIL FRAGMENTS, MOLLUSKS, CORAL;
YELLOWISH BROWN TO CLEAR QTZ SAND; TAN-BLACK PHOSPHORITE; DARK YELLOWISH BROWN TO DARK GREY SANDY DOLOMITE.

86 - 96 CALCILUTITE; DARK GREENISH GRAY TO DARK GREENISH GRAY;
GRAIN TYPE: CALCILUTITE;
GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, CLAY MATRIX;
ACCESSORY MINERALS: QUARTZ SAND-35%, PHOSPHATIC SAND-05%, DOLOMITE-05%, CHERT- %;
OTHER FEATURES: DOLOMITIC;
FOSSILS: FOSSIL FRAGMENTS, BARNACLES, MOLLUSKS;
GREY-YELLOWISH BROWN DOLOMITE; VERY SANDY GREENISH-GREY CLAY. VERY COARSE-MED TAN-BLACK PHOSPHORITE; SMALL VUGS IN LS; PHOSPHORITE FOUND MOSTLY IN CLAY; BALANUS;

96 - 102.5 CALCILUTITE; YELLOWISH GRAY; INTERGRANULAR, PIN POINT VUGS;
GRAIN TYPE: CALCILUTITE;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MOTTLED,
ACCESSORY MINERALS: QUARTZ SAND-10%;
OTHER FEATURES: DOLOMITIC, CHALKY, SPECKLED;
FOSSILS: VERTEBRATE;

102.5- 108 CALCILUTITE; VERY LIGHT ORANGE TO YELLOWISH GRAY; 15% POROSITY, INTERGRANULAR, PIN POINT VUGS, FRACTURE;
GRAIN TYPE: CALCILUTITE, INTRACLASTS;
GOOD INDURATION;
SEDIMENTARY STRUCTURES: MOTTLED, INTERBEDDED, LAMINATED,
ACCESSORY MINERALS: QUARTZ SAND-40%, CLAY-10%, PYRITE-05%;
OTHER FEATURES: DOLOMITIC, CHALKY;
SELECTIVE DOLOMITIZATION OF INTRACLASTS AND BURROWS; BRIGHT GREEN VERY SANDY CLAY INFILLING SOME BURROWS; LARGE INTRACLASTS;

108 - 110 AS ABOVE
POORER INDURATION THAN ABOVE.

110 - 118 CALCILUTITE; YELLOWISH GRAY TO VERY LIGHT ORANGE; 20% POROSITY, INTERGRANULAR, VUGULAR, PIN POINT VUGS;
GRAIN TYPE: INTRACLASTS, CALCILUTITE;
GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: MOTTLED, LAMINATED, BIOTURBATED,
ACCESSORY MINERALS: QUARTZ SAND-40%, DOLOMITE-10%, CLAY-02%;
OTHER FEATURES: DOLOMITIC, CHALKY;
DOLOMITIZED BURROWS; SCOUR SURFACES; VERY LARGE INTRACLASTS; HIGH DEGREE OF BIOTURBATION.

118 - 123 CALCILUTITE; VERY LIGHT ORANGE TO YELLOWISH GRAY; 20% POROSITY, INTERGRANULAR, PIN POINT VUGS, VUGULAR;
GRAIN TYPE: CALCILUTITE;
GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: MOTTLED, BIOTURBATED,
ACCESSORY MINERALS: QUARTZ SAND-35%, DOLOMITE-20%;
OTHER FEATURES: DOLOMITIC, CHALKY, VARIEGATED;

123 - 130 CALCILUTITE; VERY LIGHT ORANGE TO YELLOWISH GRAY; 15% POROSITY, INTERGRANULAR, PIN POINT VUGS;
GRAIN TYPE: CALCILUTITE;
GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: MOTTLED, BIOTURBATED,
ACCESSORY MINERALS: QUARTZ SAND-40%, DOLOMITE-25%, CHERT-05%;
OTHER FEATURES: DOLOMITIC, CHALKY, VARIEGATED;
FOSSILS: BARNACLES, MOLLUSKS, FOSSIL FRAGMENTS, FOSSIL MOLDS;
BOTRYOIDAL QUARTZ INFILLING SMALL VUG; SHELL HASH AT BOTTOM OF SECTION (MOLLUSKS);
BALANUS.

130 - 138 CALCILUTITE; VERY LIGHT ORANGE TO YELLOWISH GRAY; 20% POROSITY, INTERGRANULAR, VUGULAR, PIN POINT VUGS;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MOTTLED,
ACCESSORY MINERALS: QUARTZ SAND-30%, DOLOMITE-10%, CLAY-05%;
OTHER FEATURES: CHALKY, DOLOMITIC;
FOSSILS: MOLLUSKS, FOSSIL FRAGMENTS, FOSSIL MOLDS;

138 - 144 CALCILUTITE; VERY LIGHT ORANGE TO YELLOWISH GRAY; 20% POROSITY, INTERGRANULAR, VUGULAR, PIN POINT VUGS;
GRAIN TYPE: BIOGENIC, SKELETAL, CALCILUTITE;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MOTTLED,
ACCESSORY MINERALS: QUARTZ SAND-05%, DOLOMITE-05%, CLAY-05%;
OTHER FEATURES: CHALKY, DOLOMITIC;
FOSSILS: MOLLUSKS, FOSSIL FRAGMENTS, FOSSIL MOLDS;
FOSSILIFEROUS CLAYEY BIOMICRITE; PELECYPODS COMMON;

144 - 153 CLAY; YELLOWISH GRAY TO MODERATE LIGHT GRAY; LOW PERMEABILITY; MODERATE INDURATION;
CEMENT TYPE(S): CLAY MATRIX, DOLOMITE CEMENT, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: CALCILUTITE-20%, DOLOMITE-05%, QUARTZ SAND-03%;
OTHER FEATURES: CALCAREOUS, GREASY, SPLINTERY;
FOSSILS: NO FOSSILS;
SOME CALCILUTITE FRAGMENTS INTERBEDDED.

153 - 159 CALCARENITE; VERY LIGHT ORANGE TO YELLOWISH GRAY; 20% POROSITY, MOLDIC, INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL CAST;
GRAIN SIZE: FINE; RANGE: MEDIUM TO FINE; MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: CLAY-02%, DOLOMITE-05%, CHERT-03%;
OTHER FEATURES: CHALKY;
FOSSILS: MOLLUSKS, MILIOLIDS, FOSSIL FRAGMENTS, FOSSIL MOLDS;
NODULAR CHERT; PELECYPODS, GASTROPODS.

159 - 169 CALCARENITE; VERY LIGHT ORANGE TO YELLOWISH GRAY; 30% POROSITY, INTERGRANULAR, MOLDIC, POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL CAST;
GRAIN SIZE: MEDIUM; RANGE: MEDIUM TO FINE; MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, SPARRY CALCITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: DOLOMITE-01%, SPAR-04%, CHERT- %;
OTHER FEATURES: CHALKY, GRANULAR;
FOSSILS: MOLLUSKS, MILIOLIDS, CORAL, FOSSIL FRAGMENTS, FOSSIL MOLDS;
DICTYOCONUS COOKEI.

169 - 172 CALCARENITE; GRAYISH YELLOW TO YELLOWISH GRAY; 25% POROSITY, INTERGRANULAR, MOLDIC, POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL CAST;
GRAIN SIZE: MEDIUM; RANGE: MEDIUM TO FINE; GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, SPARRY CALCITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: SPAR-04%, DOLOMITE-02%;
OTHER FEATURES: CHALKY, GRANULAR;
FOSSILS: MILIOLIDS, MOLLUSKS, CORAL, FOSSIL FRAGMENTS, FOSSIL MOLDS;

172 - 178 CALCARENITE; LIGHT OLIVE GRAY TO VERY LIGHT ORANGE; 15% POROSITY, INTERGRANULAR, MOLDIC, POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL CAST;
GRAIN SIZE: FINE; RANGE: MEDIUM TO FINE; MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, CLAY MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: SPAR-03%, DOLOMITE-03%, CLAY- %;
OTHER FEATURES: CHALKY, GRANULAR;
FOSSILS: MILIOLIDS, MOLLUSKS, FOSSIL FRAGMENTS, FOSSIL MOLDS;
SOFT CALCARENITE; POOR RECOVERY; SORITES.

178 - 178.8 DOLOSTONE; DARK YELLOWISH BROWN TO OLIVE GRAY; 01% POROSITY, LOW PERMEABILITY; 50-90% ALTERED; SUBHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; RANGE: MICROCRYSTALLINE TO CRYPTOCRYSTALLINE;
GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: CHERT-04%, LIMESTONE-20%;
OTHER FEATURES: HIGH RECRYSTALLIZATION, SPLINTERY;

178.8- 203.5 CALCARENITE; VERY LIGHT ORANGE TO YELLOWISH GRAY; 30% POROSITY, INTERGRANULAR, MOLDIC, POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL CAST;
GRAIN SIZE: FINE; RANGE: MEDIUM TO FINE; POOR INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, SPARRY CALCITE CEMENT;
SEDIMENTARY STRUCTURES: BEDDED,
ACCESSORY MINERALS: DOLOMITE-02%, SPAR-06%;
OTHER FEATURES: CHALKY, GRANULAR;
FOSSILS: MILIOLIDS, MOLLUSKS, FOSSIL FRAGMENTS, FOSSIL MOLDS;
VERY SOFT POORLY INDURATED CALCARENITE WITH FEW THIN BETTER INDURATED FOSSILIFEROUS ZONES;
HARD OLIVE GREY DOLOMITE LENSES; SORITES.

203.5- 209 CALCARENITE; VERY LIGHT ORANGE TO YELLOWISH GRAY; 25% POROSITY, INTERGRANULAR, MOLDIC, POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL CAST;
GRAIN SIZE: FINE; RANGE: MEDIUM TO FINE; MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, SPARRY CALCITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: SPAR-06%, DOLOMITE-03%;
OTHER FEATURES: CHALKY, GRANULAR;
FOSSILS: MILIOLIDS, MOLLUSKS, ECHINOID, FOSSIL FRAGMENTS, FOSSIL MOLDS;
CRAB CLAW, ECHINOID SPINES; LOWER SECTION MORE FOSSILIFEROUS.

209 - 218 CALCARENITE; VERY LIGHT ORANGE TO YELLOWISH GRAY; 30% POROSITY, MOLDIC, INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL CAST;
GRAIN SIZE: MEDIUM; RANGE: MEDIUM TO FINE; MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, SPARRY CALCITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: SPAR-12%, DOLOMITE-02%;
OTHER FEATURES: CHALKY, GRANULAR;
FOSSILS: MOLLUSKS, MILIOLIDS, BRYOZOA, CRUSTACEA, FOSSIL FRAGMENTS;
MORE FOSSILIFEROUS; BRYOZOANS, CRAB CLAWS; ECHINOID (CASSIDULUS GOULDII).

218 - 224 CALCARENITE; YELLOWISH GRAY TO DARK GRAY; 20% POROSITY, MOLDIC, INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL CAST;
GRAIN SIZE: MEDIUM; RANGE: MEDIUM TO FINE; POOR INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, SPARRY CALCITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: DOLOMITE-03%, SPAR-03%;
OTHER FEATURES: GRANULAR, COQUINA;
FOSSILS: MOLLUSKS, BRYOZOA, CRUSTACEA, FOSSIL FRAGMENTS, FOSSIL MOLDS;
VERY POORLY INDURATED; POOR CORE RECOVERY.

224 - 226.5 CALCARENITE; VERY LIGHT ORANGE TO YELLOWISH GRAY; 20% POROSITY, MOLDIC, INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL CAST;
GRAIN SIZE: MEDIUM; RANGE: MEDIUM TO FINE; MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, SPARRY CALCITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: DOLOMITE-02%, SPAR-10%;
OTHER FEATURES: CHALKY, GRANULAR;
FOSSILS: MOLLUSKS, MILIOLIDS, CRUSTACEA, FOSSIL FRAGMENTS, FOSSIL MOLDS;

226.5- 234 CALCARENITE; YELLOWISH GRAY TO LIGHT OLIVE GRAY; 30% POROSITY, MOLDIC, INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL CAST;
GRAIN SIZE: MEDIUM; RANGE: MEDIUM TO COARSE; MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, SPARRY CALCITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: DOLOMITE-03%, SPAR-03%;
OTHER FEATURES: CHALKY, GRANULAR, COQUINA;
FOSSILS: MOLLUSKS, BRYOZOA, CRUSTACEA, FOSSIL FRAGMENTS, FOSSIL MOLDS;

234 - 249 CALCARENITE; YELLOWISH GRAY TO YELLOWISH GRAY; 20% POROSITY, MOLDIC, INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL CAST;
GRAIN SIZE: FINE; RANGE: MEDIUM TO FINE; MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, SPARRY CALCITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: SPAR-08%, DOLOMITE-01%;
OTHER FEATURES: CHALKY, GRANULAR;
FOSSILS: MOLLUSKS, MILIOLIDS, FOSSIL FRAGMENTS, FOSSIL MOLDS;

249 - 255 CALCARENITE; YELLOWISH GRAY TO MODERATE LIGHT GRAY; 15% POROSITY, MOLDIC, INTERGRANULAR, LOW PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL;
GRAIN SIZE: COARSE; RANGE: FINE TO COARSE; GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT, SPARRY CALCITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: DOLOMITE-03%, SPAR-03%;
OTHER FEATURES: GRANULAR, COQUINA;
FOSSILS: MOLLUSKS, ECHINOID, CRUSTACEA, FOSSIL FRAGMENTS, FOSSIL MOLDS;
HIGHLY MACROFOSSILIFEROUS; LARGE MOLDS AND CASTS.

255 - 268 CALCARENITE; YELLOWISH GRAY TO VERY LIGHT ORANGE; 25% POROSITY, INTERGRANULAR, MOLDIC, POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL CAST;
GRAIN SIZE: FINE; RANGE: MEDIUM TO FINE; MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, SPARRY CALCITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: SPAR-10%, DOLOMITE-01%;
OTHER FEATURES: CHALKY, GRANULAR;
FOSSILS: MILIOLIDS, ECHINOID, MOLLUSKS, FOSSIL FRAGMENTS, FOSSIL MOLDS;

268 - 271.5 CALCARENITE; YELLOWISH GRAY TO VERY LIGHT ORANGE; 15% POROSITY, MOLDIC, INTERGRANULAR, LOW PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL CAST;
GRAIN SIZE: MEDIUM; RANGE: MEDIUM TO FINE; GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: SPAR-08%, DOLOMITE-02%;
OTHER FEATURES: GRANULAR;
FOSSILS: MILIOLIDS, MOLLUSKS, ECHINOID, FOSSIL FRAGMENTS, FOSSIL MOLDS;
SIMILAR TO INTERVAL ABOVE, BUT BETTER INDURATED, LOWER POROSITY, PERMEABILITY; LARGE MOLDS.

271.5- 274 CALCARENITE; YELLOWISH GRAY TO VERY LIGHT ORANGE; 20% POROSITY, MOLDIC, INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL CAST;
GRAIN SIZE: FINE; RANGE: MEDIUM TO FINE; MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: SPAR-06%, DOLOMITE-01%;
OTHER FEATURES: CHALKY, GRANULAR;
FOSSILS: MILIOLIDS, MOLLUSKS, ECHINOID, FOSSIL FRAGMENTS, FOSSIL MOLDS;

274 - 288 CALCARENITE; YELLOWISH GRAY TO VERY LIGHT ORANGE; 30% POROSITY, MOLDIC, INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL CAST;
GRAIN SIZE: FINE; RANGE: MEDIUM TO FINE; MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: SPAR-10%, DOLOMITE-01%, CLAY- %;
OTHER FEATURES: CHALKY, GRANULAR;
FOSSILS: MILIOLIDS, MOLLUSKS, FOSSIL FRAGMENTS, FOSSIL MOLDS;

288 - 302 CALCARENITE; YELLOWISH GRAY TO VERY LIGHT ORANGE; 15% POROSITY, MOLDIC, FRACTURE, LOW PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL CAST;
GRAIN SIZE: FINE; RANGE: FINE TO VERY FINE; GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: BIOTURBATED,
ACCESSORY MINERALS: DOLOMITE-40%, SPAR-04%;
OTHER FEATURES: CHALKY, DOLOMITIC;
FOSSILS: MILIOLIDS, FOSSIL MOLDS;
DOLOMITIC LIMESTONE INTERBEDDED WITH SOFTER, MORE POROUS CALCARENITE.

302 - 307 CALCARENITE; YELLOWISH GRAY TO LIGHT OLIVE GRAY; 20% POROSITY, INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL CAST;
GRAIN SIZE: FINE; RANGE: FINE TO VERY FINE;
CEMENT TYPE(S): CALCILUTITE MATRIX, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT;
SEDIMENTARY STRUCTURES: BEDDED, LAMINATED, MASSIVE,
ACCESSORY MINERALS: SPAR-04%, DOLOMITE-05%;
OTHER FEATURES: GRANULAR;
FOSSILS: MILIOLIDS, MOLLUSKS, FOSSIL FRAGMENTS, FOSSIL MOLDS;
THIN, HARD, LOW PERMEABILITY DOLOMITE LENSES.

307 - 312.5 CALCARENITE; VERY LIGHT ORANGE TO LIGHT OLIVE GRAY; 15% POROSITY, MOLDIC, FRACTURE, LOW PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL CAST;
GRAIN SIZE: FINE; RANGE: FINE TO VERY FINE; MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT, SPARRY CALCITE CEMENT;
ACCESSORY MINERALS: DOLOMITE-08%, SPAR-04%, PEAT- %;
OTHER FEATURES: GRANULAR;
FOSSILS: MILIOLIDS, FOSSIL MOLDS, ORGANICS;
THIN DOLOMITIC LAYERS IN FINE GRAINED CALCARENITE.

312.5- 320 CALCARENITE; VERY LIGHT ORANGE TO LIGHT OLIVE GRAY; 20% POROSITY, INTERGRANULAR, MOLDIC, POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL CAST;
GRAIN SIZE: FINE; RANGE: MEDIUM TO FINE; MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: SPAR-08%, DOLOMITE-03%;
OTHER FEATURES: GRANULAR;
FOSSILS: MILIOLIDS, MOLLUSKS, CRUSTACEA, FOSSIL FRAGMENTS, FOSSIL MOLDS;
FEW DOLOMITIC LENSES INTERBEDDED.

320 - 326 CALCARENITE; VERY LIGHT ORANGE TO YELLOWISH GRAY; 25% POROSITY, INTERGRANULAR, MOLDIC, POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL CAST;
GRAIN SIZE: FINE; RANGE: VERY FINE TO MEDIUM; MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT, SPARRY CALCITE CEMENT;
ACCESSORY MINERALS: SPAR-10%, DOLOMITE-05%;
OTHER FEATURES: GRANULAR, COQUINA;
FOSSILS: MILIOLIDS, MOLLUSKS, CRUSTACEA, FOSSIL FRAGMENTS, FOSSIL MOLDS;

326 - 330 CALCARENITE; VERY LIGHT ORANGE TO LIGHT OLIVE GRAY; 35% POROSITY, INTERGRANULAR, MOLDIC, POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL CAST;
GRAIN SIZE: MEDIUM; RANGE: FINE TO MEDIUM; MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, SPARRY CALCITE CEMENT;
ACCESSORY MINERALS: SPAR-12%, DOLOMITE-01%;
FOSSILS: MILIOLIDS, MOLLUSKS, ECHINOID, FOSSIL FRAGMENTS, FOSSIL MOLDS;

330 - 331.5 CALCARENITE; VERY LIGHT ORANGE TO YELLOWISH GRAY; 30% POROSITY, INTERGRANULAR, MOLDIC, POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, INTRACLASTS, SKELETAL CAST;
GRAIN SIZE: MEDIUM; RANGE: FINE TO MEDIUM; MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, SPARRY CALCITE CEMENT;
ACCESSORY MINERALS: SPAR-15%, DOLOMITE-01%;
OTHER FEATURES: CHALKY, GRANULAR, COQUINA;
FOSSILS: MILIOLIDS, MOLLUSKS, ECHINOID, FOSSIL FRAGMENTS, FOSSIL MOLDS;
INTRACLASTS AT BOTTOM OF SECTION.

331.5- 333 CALCARENITE; YELLOWISH GRAY TO LIGHT OLIVE GRAY; 20% POROSITY, MOLDIC, INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL;
GRAIN SIZE: MEDIUM; RANGE: FINE TO COARSE; MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, DOLOMITE CEMENT;
ACCESSORY MINERALS: SPAR-03%, DOLOMITE-05%;
OTHER FEATURES: GRANULAR;
FOSSILS: MOLLUSKS, MILIOLIDS, BENTHIC FORAMINIFERA, FOSSIL FRAGMENTS, FOSSIL MOLDS;

333 - 335 CALCARENITE; VERY LIGHT ORANGE TO LIGHT OLIVE GRAY; 20% POROSITY, INTERGRANULAR, MOLDIC, POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL CAST;
GRAIN SIZE: FINE; RANGE: VERY FINE TO FINE; MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, SPARRY CALCITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: SPAR-02%, DOLOMITE-04%;
OTHER FEATURES: GRANULAR, CHALKY;
FOSSILS: MILIOLIDS, MOLLUSKS, ECHINOID, FOSSIL FRAGMENTS, FOSSIL MOLDS;
DICTYOCONUS COOKEI.

335 - 336 CALCARENITE; GRAYISH YELLOW TO YELLOWISH GRAY; 30% POROSITY, INTERGRANULAR, MOLDIC, POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL CAST;
GRAIN SIZE: MEDIUM; RANGE: FINE TO MEDIUM; MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, SPARRY CALCITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: SPAR-12%, DOLOMITE-05%;
OTHER FEATURES: GRANULAR;
FOSSILS: MILIOLIDS, BENTHIC FORAMINIFERA, MOLLUSKS, FOSSIL FRAGMENTS, FOSSIL MOLDS; FORAMS (DICTYOCONUS COOKEI); ECHINOID (CASSIDULUS GOULDII).

336 - 338 CALCARENITE; VERY LIGHT ORANGE TO GRAYISH YELLOW; 10% POROSITY, MOLDIC, INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL;
GRAIN SIZE: FINE; RANGE: VERY FINE TO FINE; MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, SPARRY CALCITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: SPAR-05%, DOLOMITE-05%, CLAY-10%;
FOSSILS: MOLLUSKS, MILIOLIDS, FOSSIL FRAGMENTS, FOSSIL MOLDS;

338 - 344 CALCARENITE; VERY LIGHT ORANGE TO GRAYISH YELLOW; 30% POROSITY, INTERGRANULAR, MOLDIC, POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL CAST;
GRAIN SIZE: MEDIUM; RANGE: MEDIUM TO FINE; MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, SPARRY CALCITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: SPAR-12%, DOLOMITE-01%;
OTHER FEATURES: GRANULAR, COQUINA;
FOSSILS: MILIOLIDS, MOLLUSKS, BENTHIC FORAMINIFERA, FOSSIL FRAGMENTS, FOSSIL MOLDS; SOME FRACTUES LINED WITH BRIGHT GREEN CLAY; PELECYPOD SHELL BED AT BOTTOM OF SECTION.

344 - 349 CALCARENITE; YELLOWISH GRAY TO GRAYISH YELLOW; 10% POROSITY, INTERGRANULAR, MOLDIC;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL CAST;
GRAIN SIZE: FINE; RANGE: VERY FINE TO FINE; GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, SPARRY CALCITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: SPAR-08%, DOLOMITE-02%;
OTHER FEATURES: CHALKY, GRANULAR;
FOSSILS: MILIOLIDS, MOLLUSKS, BENTHIC FORAMINIFERA, FOSSIL FRAGMENTS, FOSSIL MOLDS; SOME BRIGHT GREEN CLAY.

349 - 349.1 CLAY; DARK YELLOWISH BROWN TO DARK GRAYISH YELLOW; LOW PERMEABILITY; MODERATE INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, CALCILUTITE MATRIX;
ACCESSORY MINERALS: DOLOMITE-10%;
FOSSILS: NO FOSSILS;

349.1- 353 CALCARENITE; YELLOWISH GRAY TO GRAYISH YELLOW; 15% POROSITY, INTERGRANULAR, MOLDIC;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL CAST;
GRAIN SIZE: FINE; RANGE: VERY FINE TO FINE; MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, SPARRY CALCITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: SPAR-02%;
OTHER FEATURES: CHALKY;
FOSSILS: MILIOLIDS, BENTHIC FORAMINIFERA, MOLLUSKS, FOSSIL FRAGMENTS, FOSSIL MOLDS;

353 - 355 CALCARENITE; WHITE TO YELLOWISH GRAY; 20% POROSITY, INTERGRANULAR, MOLDIC,
POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL CAST;
GRAIN SIZE: FINE; RANGE: VERY FINE TO COARSE; MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE,
OTHER FEATURES: CHALKY, GRANULAR;
FOSSILS: MILIOLIDS, BENTHIC FORAMINIFERA, MOLLUSKS, FOSSIL FRAGMENTS, FOSSIL MOLDS;
LEPIDOCYCLINA OCALANA, GYPSINA GLOBULA; LARGE GASTROPODS.

355 - 360 CALCILUTITE; YELLOWISH GRAY TO GRAYISH YELLOW; 15% POROSITY, INTERGRANULAR, MOLDIC,
LOW PERMEABILITY;
GRAIN TYPE: CALCILUTITE, BIOGENIC, SKELETAL;
GRAIN SIZE: VERY FINE; RANGE: VERY FINE TO FINE; MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE,
OTHER FEATURES: CHALKY;
FOSSILS: MILIOLIDS, BENTHIC FORAMINIFERA, FOSSIL FRAGMENTS;

360 - 360 CALCARENITE; VERY LIGHT ORANGE TO YELLOWISH GRAY; 15% POROSITY, INTERGRANULAR, MOLDIC,
LOW PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL;
GRAIN SIZE: VERY FINE; RANGE: VERY FINE TO FINE; GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE, BIOTURBATED,
OTHER FEATURES: CHALKY, GRANULAR;
FOSSILS: MILIOLIDS, BENTHIC FORAMINIFERA, MOLLUSKS, FOSSIL FRAGMENTS, WORM TRACES;

360 - 375 AS ABOVE
LESS FOSSILIFEROUS; POOR INDURATION.

375 - 395 AS ABOVE
MODERATE INDURATION; NUMMALITES VANDERSTOKI, LEPIDOCYCLINA, ECHINOID (PERIARCHUS LYELLI FLORIDANUS).

395 - 402.5 CALCARENITE; VERY LIGHT ORANGE TO YELLOWISH GRAY; 20% POROSITY, INTERGRANULAR, MOLDIC, POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL CAST;
GRAIN SIZE: MEDIUM; RANGE: FINE TO MEDIUM; MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, SPARRY CALCITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: SPAR-12%;
OTHER FEATURES: CHALKY, GRANULAR;
FOSSILS: BENTHIC FORAMINIFERA, MILIOLIDS, MOLLUSKS, FOSSIL FRAGMENTS, FOSSIL MOLDS; OPERCULINOIDES MOODYBRANCHENSIS.

402.5- 415 CALCARENITE; VERY LIGHT ORANGE TO YELLOWISH GRAY; 15% POROSITY, INTERGRANULAR, MOLDIC, LOW PERMEABILITY;
GRAIN TYPE: CALCILUTITE, BIOGENIC, SKELETAL;
GRAIN SIZE: VERY FINE; RANGE: VERY FINE TO FINE; MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, SPARRY CALCITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: SPAR-06%;
OTHER FEATURES: CHALKY, GRANULAR;
FOSSILS: MILIOLIDS, BENTHIC FORAMINIFERA, MOLLUSKS, FOSSIL FRAGMENTS, FOSSIL MOLDS; OPERCULINOIDES, LEPIDOCYCLINA.

415 - 419 AS ABOVE
SLIGHTLY MORE POROUS; MORE FOSSILIFEROUS; GYPSINA GLOBULA.

419 - 423 CALCARENITE; VERY LIGHT ORANGE TO YELLOWISH GRAY; 15% POROSITY, INTERGRANULAR, MOLDIC, LOW PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL;
GRAIN SIZE: MEDIUM; RANGE: FINE TO MEDIUM; MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, SPARRY CALCITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: SPAR-06%;
OTHER FEATURES: CHALKY, GRANULAR;
FOSSILS: MILIOLIDS, BENTHIC FORAMINIFERA, MOLLUSKS, FOSSIL FRAGMENTS, FOSSIL MOLDS; LEPIDOCYLCINA, OPERCULINOIDES.

423 - 424.5 CALCILUTITE; VERY LIGHT ORANGE TO YELLOWISH GRAY; 10% POROSITY, INTERGRANULAR, MOLDIC, LOW PERMEABILITY;
GRAIN TYPE: CALCILUTITE, BIOGENIC, SKELETAL;
GRAIN SIZE: VERY FINE; RANGE: FINE TO FINE; MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: SPAR-08%;
OTHER FEATURES: CHALKY, GRANULAR;
FOSSILS: MILIOLIDS, BENTHIC FORAMINIFERA, MOLLUSKS, FOSSIL FRAGMENTS, FOSSIL MOLDS;

424.5- 430 CALCARENITE; VERY LIGHT ORANGE TO YELLOWISH GRAY; 15% POROSITY, INTERGRANULAR, MOLDIC, LOW PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL CAST;
GRAIN SIZE: MEDIUM; RANGE: MEDIUM TO FINE; MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, SPARRY CALCITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: SPAR-10%;
OTHER FEATURES: CHALKY, GRANULAR;
FOSSILS: BENTHIC FORAMINIFERA, MOLLUSKS, MILIOLIDS, BRYOZOA, FOSSIL FRAGMENTS; LEPIDOCYCLINA, OPERCULINOIDES, GYPSINA.

430 - 437 AS ABOVE
MORE FOSSILIFEROUS.

437 - 451 CALCARENITE; VERY LIGHT ORANGE TO YELLOWISH GRAY; 15% POROSITY, INTERGRANULAR, MOLDIC, POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL;
GRAIN SIZE: FINE; RANGE: VERY FINE TO MEDIUM; MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, SPARRY CALCITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: SPAR-08%;
OTHER FEATURES: CHALKY, GRANULAR, COQUINA;
FOSSILS: BENTHIC FORAMINIFERA, MILIOLIDS, FOSSIL FRAGMENTS, BARNACLES, FOSSIL MOLDS;

LEPIDOCYCLINA, OPERCULINOIDES, ECHINOID SPINES.

451 - 463 CALCILUTITE; VERY LIGHT ORANGE TO YELLOWISH GRAY; 10% POROSITY, INTERGRANULAR, MOLDIC, LOW PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL CAST;
GRAIN SIZE: VERY FINE; RANGE: FINE TO VERY FINE; MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, SPARRY CALCITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: SPAR-04%;
OTHER FEATURES: CHALKY, COQUINA;
FOSSILS: BENTHIC FORAMINIFERA, MILIOLIDS, FOSSIL FRAGMENTS, FOSSIL MOLDS; GYPSINA GLOBULA, LEPIDOCYCLINA, OPERCULINOIDES, NUMMULITES. FINER GRAINED, LESS CONSOLIDATED; LESS FOSSILIFEROUS.

463 - 480 CALCARENITE; YELLOWISH GRAY; 15% POROSITY, INTERGRANULAR, MOLDIC;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL;
GRAIN SIZE: FINE; RANGE: VERY FINE TO MEDIUM; MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, SPARRY CALCITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: SPAR-08%;
OTHER FEATURES: CHALKY, COQUINA;
FOSSILS: BENTHIC FORAMINIFERA, MILIOLIDS, FOSSIL FRAGMENTS, FOSSIL MOLDS, BARNACLES; BARNACLES, TURITELLA, BRYOZOANS, OPERCULINOIDES, LEPIDOCYLINA, NUMMULITES.

480 - 494 CALCARENITE; VERY LIGHT ORANGE TO YELLOWISH GRAY; 15% POROSITY, INTERGRANULAR, MOLDIC, LOW PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL CAST;
GRAIN SIZE: FINE; RANGE: VERY FINE TO MEDIUM; GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, SPARRY CALCITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE, BIOTURBATED,
ACCESSORY MINERALS: SPAR-10%;
OTHER FEATURES: HIGH RECRYSTALLIZATION, CHALKY;
FOSSILS: MILIOLIDS, BENTHIC FORAMINIFERA, MOLLUSKS, ECHINOID, FOSSIL FRAGMENTS; GYPSINA GLOBULA, PERIARCHUS, NUMMULITES; WELL INDURATED.

494 - 501.5 CALCARENITE; VERY LIGHT ORANGE TO YELLOWISH GRAY; 15% POROSITY, INTERGRANULAR, MOLDIC;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL CAST;
GRAIN SIZE: VERY FINE; RANGE: VERY FINE TO FINE; MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, SPARRY CALCITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: SPAR-10%;
OTHER FEATURES: CHALKY, GRANULAR;
FOSSILS: MILIOLIDS, ECHINOID, MOLLUSKS, FOSSIL FRAGMENTS, FOSSIL MOLDS; PERIARCHUS FRAGMENTS.

501.5- 504 NO SAMPLES

504 - 509 CALCARENITE; YELLOWISH GRAY TO GRAYISH ORANGE; 15% POROSITY, INTERGRANULAR, MOLDIC, POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL;
GRAIN SIZE: FINE; RANGE: VERY FINE TO COARSE; GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, SPARRY CALCITE CEMENT;
SEDIMENTARY STRUCTURES: LAMINATED,
ACCESSORY MINERALS: GYPSUM- %, LIMESTONE-0M%, CALCITE-0X%, PHOSPHATIC SAND-%;

509 - 514 CALCARENITE; YELLOWISH GRAY TO GRAYISH ORANGE; 20% POROSITY, INTERGRANULAR, MOLDIC, POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL;
GRAIN SIZE: VERY FINE; RANGE: VERY FINE TO COARSE;

514 - 514 CALCARENITE; YELLOWISH GRAY TO GRAYISH ORANGE; 20% POROSITY, INTERGRANULAR, MOLDIC, POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL;
GRAIN SIZE: VERY FINE; RANGE: VERY FINE TO COARSE; GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, SPARRY CALCITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: GYPSUM- %, LIMESTONE-0M%, CALCITE-0X%, SHALE-%;
MILIODAL BIOMICRITE; BECOMES FINER GRAINED, LESS FOSSILIFEROUS TOWARD BOTTOM; TRACE ORGANICS.

514 - 525 CALCARENITE; YELLOWISH GRAY TO GRAYISH ORANGE; 15% POROSITY, INTERGRANULAR, MOLDIC;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL;
GRAIN SIZE: MEDIUM; MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, SPARRY CALCITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE,
VERY FINE GRAINED PELLETAL BIOMICRITE; FEW MACROFOSSILS (PERONELLA, MOLLUSK FRAGMENTS);
TRACE ORGANICS; SHELL HASH IN LOWER SECTION.

525 - 527 CALCARENITE; YELLOWISH GRAY TO GRAYISH ORANGE; 20% POROSITY, INTERGRANULAR, MOLDIC;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL;
GRAIN SIZE: VERY FINE; RANGE: VERY FINE TO COARSE; GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: CALCILUTITE- %;
FOSSILS: MOLLUSKS, FOSSIL FRAGMENTS, FOSSIL MOLDS;

527 - 555 CALCARENITE; GRAYISH ORANGE TO LIGHT YELLOWISH ORANGE; 35% POROSITY, INTERGRANULAR, MOLDIC,
POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL CAST;
GRAIN SIZE: FINE; RANGE: VERY FINE TO MEDIUM; MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE,
FOSSILS: BENTHIC FORAMINIFERA, MILIOLIDS, MOLLUSKS, ECHINOID, FOSSIL FRAGMENTS;
ABOVE SECTION IS PERMEABLE FORAMINIFERAL CALCARENITE; ECHINOIDS (PERONELLA DALLI) COMMON;
MOD-POOR INDURATION; POOR CORE RECOVERY.

555 - 557 CALCARENITE; YELLOWISH GRAY TO GRAYISH ORANGE; 15% POROSITY, INTERGRANULAR, MOLDIC;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL;
GRAIN SIZE: FINE; RANGE: VERY FINE TO FINE; GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: LAMINATED, BIOTURBATED,
ACCESSORY MINERALS: CALCILUTITE-30%;
FOSSILS: ECHINOID, MOLLUSKS, BENTHIC FORAMINIFERA, FOSSIL FRAGMENTS, FOSSIL MOLDS;

557 - 563 CALCARENITE; VERY LIGHT ORANGE TO YELLOWISH GRAY; 25% POROSITY, INTERGRANULAR, MOLDIC,
POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL;
GRAIN SIZE: FINE; RANGE: VERY FINE TO FINE; GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: LAMINATED,
FOSSILS: MILIOLIDS, BENTHIC FORAMINIFERA, ECHINOID, FOSSIL FRAGMENTS, FOSSIL MOLDS;

563 - 568 CALCARENITE; GRAYISH ORANGE TO YELLOWISH GRAY; 15% POROSITY, INTERGRANULAR;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL;
GRAIN SIZE: VERY FINE; RANGE: VERY FINE TO FINE; GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: LAMINATED,
ACCESSORY MINERALS: CALCILUTITE-25%;
FOSSILS: BENTHIC FORAMINIFERA;
FINE GRAINED FORAMINIFERAL PACKSTONE; LOWER PERMEABILITY.

568 - 573 CALCARENITE; VERY LIGHT ORANGE TO YELLOWISH GRAY; 35% POROSITY,
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL;
GRAIN SIZE: FINE; RANGE: FINE TO MEDIUM; GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
FOSSILS: BENTHIC FORAMINIFERA, ECHINOID, MOLLUSKS, FOSSIL FRAGMENTS, FOSSIL MOLDS;
VERY POROUS, PERMEABLE; PERONELLA DALLI.

573 - 580 CALCARENITE; VERY LIGHT ORANGE TO YELLOWISH GRAY; 20% POROSITY, INTERGRANULAR, MOLDIC;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL;
GRAIN SIZE: VERY FINE; RANGE: VERY FINE TO FINE; GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: LAMINATED,
ACCESSORY MINERALS: CALCILUTITE-20%;
COARSER GRAINED CALCARENITE INTERBEDDED WITH FINE GRAINED LAMINATED CALCILUTITE.

580 - 590 CALCARENITE; YELLOWISH GRAY TO GRAYISH ORANGE; 35% POROSITY, INTERGRANULAR, MOLDIC,
POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL;
GRAIN SIZE: MEDIUM; RANGE: MEDIUM TO COARSE; GOOD INDURATION;
FOSSILS: BENTHIC FORAMINIFERA, ECHINOID, MOLLUSKS, FOSSIL FRAGMENTS, FOSSIL MOLDS;

590 - 594.5 VERY POROUS FORMAINIFERAL PACKSTONE; DICTYOCONUS VERY COMMON. SOME
LAMINATED AND BURROWED CALCILUTITE LAYERS.

594.5- 601 CALCARENITE; YELLOWISH GRAY TO BLACK; 20% POROSITY, INTERGRANULAR, MOLDIC;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL;
GRAIN SIZE: FINE; RANGE: VERY FINE TO FINE; GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: LAMINATED,
ACCESSORY MINERALS: CALCILUTITE-25%;
OTHER FEATURES: FROSTED, COQUINA, POOR SAMPLE, SPLINTERY;
DICTYOCONUS, PERONELLA DALLI;

601 - 604.5 CALCARENITE; YELLOWISH GRAY TO VERY LIGHT ORANGE; 25% POROSITY, INTERGRANULAR, MOLDIC;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL;
GRAIN SIZE: FINE; RANGE: FINE TO MEDIUM; GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
ACCESSORY MINERALS: CALCILUTITE-25%;
OTHER FEATURES: CHALKY;
FOSSILS: BENTHIC FORAMINIFERA, ECHINOID;

604.5- 608 CALCARENITE; YELLOWISH GRAY TO VERY LIGHT ORANGE; 30% POROSITY, INTERGRANULAR, MOLDIC, POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL;
GRAIN SIZE: FINE; RANGE: FINE TO MEDIUM; GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: BIOTURBATED,
ACCESSORY MINERALS: CALCILUTITE-10%;
FOSSILS: BENTHIC FORAMINIFERA, ECHINOID, CONES;
ECHINOID SPINES, PERONELLA DALLI, DICTYOCONUS; FEW MICRITIC INTRACLASTS TOWARDS BOTTOM, ABOVE THIN BURROWED CALCILUTITE LAYER

608 - 614 CALCARENITE; VERY LIGHT ORANGE TO YELLOWISH GRAY; 25% POROSITY, INTERGRANULAR, MOLDIC;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL;
GRAIN SIZE: FINE; RANGE: VERY FINE TO FINE; MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: BIOTURBATED, LAMINATED,
ACCESSORY MINERALS: CALCILUTITE-15%;
FOSSILS: WORM TRACES, BENTHIC FORAMINIFERA, CONES;
ABOVE SAMPLE LAMINATED WITH THIN BURROWED CALCILUTITE LAYERS; SOME INTRACLASTS.

614 - 620 CALCILUTITE; YELLOWISH GRAY TO VERY LIGHT ORANGE; 15% POROSITY, INTERGRANULAR, MOLDIC;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL;
GRAIN SIZE: FINE; RANGE: VERY FINE TO COARSE; GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
FOSSILS: BENTHIC FORAMINIFERA, MOLLUSKS, FOSSIL FRAGMENTS, FOSSIL MOLDS;
CHALKY MACROFOSSILIFEROUS CALCILUTITE.

620 - 629 CALCARENITE; VERY LIGHT ORANGE TO YELLOWISH GRAY; 25% POROSITY, INTERGRANULAR, MOLDIC, POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL;
GRAIN SIZE: FINE; RANGE: VERY FINE TO MEDIUM; GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: LAMINATED, INTERBEDDED,
ACCESSORY MINERALS: CALCILUTITE-30%;
OTHER FEATURES: STROMATAL;
FOSSILS: BENTHIC FORAMINIFERA, ALGAE, CONES, FOSSIL FRAGMENTS, FOSSIL MOLDS;
THINLY INTERBEDDED FORAMINIFERAL CALCARENITE AND CALCILUTITE. NUMEROUS ORGANIC LAMINAE.

629 - 638 LIMESTONE; VERY LIGHT ORANGE TO YELLOWISH GRAY; 15% POROSITY,
GRAIN TYPE: CALCILUTITE, BIOGENIC, SKELETAL;
GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: LAMINATED, INTERBEDDED,
OTHER FEATURES: STROMATAL;
FOSSILS: BENTHIC FORAMINIFERA, MOLLUSKS, ALGAE;
FINE GRAINED LAMINATED FOSSILIFEROUS CALCILUTITE INTERBEDDED WITH FINE TO MEDIUM GRAINED CALCARENITE; NUMEROUS SCOUR SURFACES

638 - 653 CALCARENITE; GRAYISH ORANGE TO YELLOWISH GRAY; 30% POROSITY, INTERGRANULAR, MOLDIC, POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, SKELETAL, CALCILUTITE;
GRAIN SIZE: FINE; RANGE: VERY FINE TO MEDIUM; GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: LAMINATED,
OTHER FEATURES: STROMATAL;
FOSSILS: BENTHIC FORAMINIFERA, CONES, MOLLUSKS, FOSSIL FRAGMENTS, FOSSIL MOLDS;
FORAMINIFERAL GRAIN-PACKSTONE; DICTYOCONUS, ECHINOID SPINES.

653 - 655 CALCARENITE; VERY LIGHT ORANGE TO YELLOWISH GRAY; 15% POROSITY, INTERGRANULAR;
GRAIN TYPE: BIOGENIC, CALCILUTITE;
GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: CALCILUTITE-40%, DOLOMITE-05%;
FOSSILS: BENTHIC FORAMINIFERA, FOSSIL FRAGMENTS, FOSSIL MOLDS;
BECOMING SLIGHTLY DOLOMITIC TOWARD BOTTOM.

655 - 657 DOLOSTONE; DARK YELLOWISH BROWN TO MODERATE YELLOWISH BROWN; 15% POROSITY, MOLDIC, INTERCRYSTALLINE, LOW PERMEABILITY; 50-90% ALTERED; SUBHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; RANGE: CRYPTOCRYSTALLINE TO MICROCRYSTALLINE;
GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE,
OTHER FEATURES: CALCAREOUS;

657 - 664 CALCARENITE; GRAYISH ORANGE TO YELLOWISH GRAY; 20% POROSITY, INTERGRANULAR;
GRAIN TYPE: BIOGENIC, SKELETAL;
GRAIN SIZE: FINE; RANGE: VERY FINE TO MEDIUM; GOOD INDURATION;
CEMENT TYPE(S): SPARRY CALCITE CEMENT, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: LAMINATED, GRADED BEDDING,
FOSSILS: BENTHIC FORAMINIFERA, ECHINOID, CONES, FOSSIL FRAGMENTS, FOSSIL MOLDS;
SEVERAL UPWARDLY FINING SEQUENCES; SOME ORGANIC LAMINAE.

664 - 678 CALCARENITE; YELLOWISH GRAY TO VERY LIGHT ORANGE; 20% POROSITY, INTERGRANULAR, MOLDIC;
GRAIN TYPE: BIOGENIC, SKELETAL, CALCILUTITE;
GRAIN SIZE: FINE; RANGE: VERY FINE TO MEDIUM; GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT, SPARRY CALCITE CEMENT;
SEDIMENTARY STRUCTURES: LAMINATED, GRADED BEDDING,
ACCESSORY MINERALS: DOLOMITE-10%;
OTHER FEATURES: DOLOMITIC;
FOSSILS: BENTHIC FORAMINIFERA, ECHINOID, CONES;
UPWARDLY FINING SEQUENCES; PERMEABLE IN SOME COARSER ZONES. SOME LAMINAE PREFERENTIALLY DOLOMITIZED.

678 - 689 CALCILUTITE; VERY LIGHT ORANGE TO YELLOWISH GRAY; 10% POROSITY, INTERGRANULAR, MOLDIC;
GRAIN TYPE: CALCILUTITE, BIOGENIC, SKELETAL;
GRAIN SIZE: FINE; RANGE: VERY FINE TO FINE; GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT, SPARRY CALCITE CEMENT;
SEDIMENTARY STRUCTURES: LAMINATED, MOTTLED, BIOTURBATED,
ACCESSORY MINERALS: DOLOMITE-10%;
OTHER FEATURES: DOLOMITIC, SPECKLED, CHALKY;
FOSSILS: BENTHIC FORAMINIFERA, ECHINOID, CONES;

689 - 693 CALCILUTITE; VERY LIGHT ORANGE TO YELLOWISH GRAY; 10% POROSITY, INTERGRANULAR, MOLDIC;
GRAIN TYPE: CALCILUTITE, BIOGENIC, SKELETAL;
GRAIN SIZE: FINE; RANGE: VERY FINE TO FINE; GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT, SPARRY CALCITE CEMENT;
SEDIMENTARY STRUCTURES: LAMINATED, MOTTLED, BIOTURBATED,
ACCESSORY MINERALS: DOLOMITE-05%;
OTHER FEATURES: DOLOMITIC, CHALKY;
FOSSILS: BENTHIC FORAMINIFERA, ECHINOID, CONES;
LAMINATED AND BIOTURBATED CALCILUTITE.

693 - 695.2 DOLOSTONE; LIGHT BROWN TO MODERATE BROWN; 15% POROSITY, VUGULAR, INTERCRYSTALLINE,
PIN POINT VUGS; 50-90% ALTERED; SUBHEDRAL;
GRAIN SIZE: VERY FINE; RANGE: MICROCRYSTALLINE TO VERY FINE; GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, SILICIC CEMENT;
SEDIMENTARY STRUCTURES: MOTTLED, MASSIVE,
OTHER FEATURES: HIGH RECRYSTALLIZATION, SUCROSIC;
FOSSILS: FOSSIL MOLDS, ECHINOID;
NEOLAGNUM DALLI (RECRYSTALLIZED).

695.2- 701.3 DOLOSTONE; DARK YELLOWISH BROWN TO MODERATE BROWN; 08% POROSITY, LOW PERMEABILITY,
PIN POINT VUGS, INTERCRYSTALLINE; 50-90% ALTERED; SUBHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; RANGE: VERY FINE TO MICROCRYSTALLINE; GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, SILICIC CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE, MOTTLED,
OTHER FEATURES: HIGH RECRYSTALLIZATION, SUCROSIC;
FOSSILS: FOSSIL MOLDS;
ECHINOID MOLDS, CALCITE FILLED FRACTURES; LOW PERMEABILITY.

701.3- 719 DOLOSTONE; MODERATE BROWN TO GRAYISH BROWN; 06% POROSITY, LOW PERMEABILITY, PIN POINT VUGS,
INTERCRYSTALLINE; 50-90% ALTERED; SUBHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; RANGE: CRYPTOCRYSTALLINE TO MICROCRYSTALLINE;
GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, SILICIC CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE, LAMINATED, MOTTLED,
OTHER FEATURES: HIGH RECRYSTALLIZATION, SUCROSIC;
FOSSILS: ORGANICS, FOSSIL MOLDS;
VERTICAL FRACTURES; VARIABLE POROSITY; ECHINOID MOLDS.

719 - 719.6 CALCARENITE; LIGHT BROWN; 35% POROSITY, INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
UNCONSOLIDATED;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: QUARTZ SAND-01%;
OTHER FEATURES: CALCAREOUS, GRANULAR;
FOSSILS: SPICULES;

CALCARENITIC SAND (VERY FINE TO FINE GRAINED).

719.6- 724 DOLOSTONE; MODERATE YELLOWISH BROWN TO GRAYISH BROWN; 01% POROSITY, PIN POINT VUGS,
LOW PERMEABILITY, INTERCRYSTALLINE; 50-90% ALTERED; SUBHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; RANGE: CRYPTOCRYSTALLINE TO MICROCRYSTALLINE;
GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, SILICIC CEMENT;
SEDIMENTARY STRUCTURES: LAMINATED, MASSIVE,
OTHER FEATURES: HIGH RECRYSTALLIZATION, SUCROSIC;
FOSSILS: NO FOSSILS;

724 - 726 DOLOSTONE; LIGHT OLIVE TO LIGHT GRAYISH BROWN; 01% POROSITY, INTERCRYSTALLINE,
LOW PERMEABILITY; 50-90% ALTERED; SUBHEDRAL;
GRAIN SIZE: CRYPTOCRYSTALLINE; RANGE: MICROCRYSTALLINE TO CRYPTOCRYSTALLINE;
GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, SILICIC CEMENT;
SEDIMENTARY STRUCTURES: MOTTLED, MASSIVE,
OTHER FEATURES: HIGH RECRYSTALLIZATION, SUCROSIC;
FOSSILS: FOSSIL MOLDS;

726 - 728 DOLOSTONE; MODERATE BROWN; 05% POROSITY, INTERCRYSTALLINE, INTERGRANULAR,
PIN POINT VUGS; 10-50% ALTERED; SUBHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; RANGE: CRYPTOCRYSTALLINE TO MICROCRYSTALLINE;
GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, SILICIC CEMENT;
SEDIMENTARY STRUCTURES: INTERBEDDED, MASSIVE,
OTHER FEATURES: MEDIUM RECRYSTALLIZATION, SUCROSIC;
FOSSILS: FOSSIL MOLDS, ORGANICS;
VARIABLE POROSITY (1-5%); ECHINOID AND MOLLUSK MOLDS.

728 - 736 DOLOSTONE; DARK YELLOWISH BROWN TO MODERATE BROWN; 01% POROSITY, INTERCRYSTALLINE,
PIN POINT VUGS, FRACTURE; 50-90% ALTERED; SUBHEDRAL;
GRAIN SIZE: CRYPTOCRYSTALLINE; RANGE: MICROCRYSTALLINE TO CRYPTOCRYSTALLINE;
GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, SILICIC CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE, LAMINATED, MOTTLED,
OTHER FEATURES: HIGH RECRYSTALLIZATION, SUCROSIC;
FOSSILS: FOSSIL MOLDS, ORGANICS;

736 - 737 DOLOSTONE; MODERATE OLIVE BROWN TO MODERATE BROWN; 20% POROSITY, INTERGRANULAR, PIN POINT VUGS, POSSIBLY HIGH PERMEABILITY; 10-50% ALTERED; SUBHEDRAL; GRAIN SIZE: VERY FINE; RANGE: MICROCRYSTALLINE TO VERY FINE; GOOD INDURATION; CEMENT TYPE(S): DOLOMITE CEMENT; SEDIMENTARY STRUCTURES: INTERBEDDED, MASSIVE, OTHER FEATURES: MEDIUM RECRYSTALLIZATION, SUCROSIC; FOSSILS: FOSSIL MOLDS;

737 - 745 DOLOSTONE; MODERATE BROWN TO MODERATE BROWN; INTERCRYSTALLINE, PIN POINT VUGS, LOW PERMEABILITY; 50-90% ALTERED; SUBHEDRAL; GRAIN SIZE: CRYPTOCRYSTALLINE; RANGE: MICROCRYSTALLINE TO CRYPTOCRYSTALLINE; GOOD INDURATION; CEMENT TYPE(S): DOLOMITE CEMENT, SILICIC CEMENT; SEDIMENTARY STRUCTURES: MASSIVE, LAMINATED, MOTTLED, OTHER FEATURES: HIGH RECRYSTALLIZATION, SUCROSIC; FOSSILS: FOSSIL MOLDS; FRACTURED CRYSTALLINE DOLOMITE; SOME SMALL ECHINOID MOLDS; SOME THIN ZONES OF LOW TO MODERATE POROSITY.

745 - 749 DOLOSTONE; DARK YELLOWISH BROWN TO GRAYISH BROWN; 01% POROSITY, INTERCRYSTALLINE, PIN POINT VUGS, LOW PERMEABILITY; 50-90% ALTERED; SUBHEDRAL; GRAIN SIZE: CRYPTOCRYSTALLINE; RANGE: MICROCRYSTALLINE TO CRYPTOCRYSTALLINE; GOOD INDURATION; CEMENT TYPE(S): DOLOMITE CEMENT, SILICIC CEMENT; SEDIMENTARY STRUCTURES: MASSIVE, LAMINATED, OTHER FEATURES: HIGH RECRYSTALLIZATION, SUCROSIC; FOSSILS: FOSSIL MOLDS; VERY HARD CRYSTALLINE DOLOMITE; SOME VERTICAL FRACTURES.

749 - 750 DOLOSTONE; LIGHT BROWN TO MODERATE BROWN; INTERCRYSTALLINE, PIN POINT VUGS, INTERGRANULAR; 50-90% ALTERED; SUBHEDRAL; GRAIN SIZE: MICROCRYSTALLINE; RANGE: CRYPTOCRYSTALLINE TO MICROCRYSTALLINE; GOOD INDURATION; CEMENT TYPE(S): DOLOMITE CEMENT, SILICIC CEMENT; SEDIMENTARY STRUCTURES: MASSIVE, LAMINATED, OTHER FEATURES: MEDIUM RECRYSTALLIZATION, SUCROSIC, PARTINGS; FOSSILS: NO FOSSILS; VARIABLE POROSITY (1-20%); SOME FRACTURES.

750 - 759 DOLOSTONE; MODERATE BROWN TO DARK YELLOWISH BROWN; INTERCRYSTALLINE, FRACTURE, LOW PERMEABILITY; 50-90% ALTERED; SUBHEDRAL; GRAIN SIZE: CRYPTOCRYSTALLINE; RANGE: MICROCRYSTALLINE TO CRYPTOCRYSTALLINE; GOOD INDURATION; CEMENT TYPE(S): DOLOMITE CEMENT, SILICIC CEMENT; SEDIMENTARY STRUCTURES: MASSIVE, LAMINATED, OTHER FEATURES: HIGH RECRYSTALLIZATION, SUCROSIC; FOSSILS: NO FOSSILS; VERTICAL FRACTURES, SOME SECONDARY POROSITY.

759 - 760 DOLOSTONE; MODERATE YELLOWISH BROWN; 20% POROSITY, INTERCRYSTALLINE,
POSSIBLY HIGH PERMEABILITY, VUGULAR; 50-90% ALTERED; SUBHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; RANGE: CRYPTOCRYSTALLINE TO MICROCRYSTALLINE;
GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, SILICIC CEMENT;
SEDIMENTARY STRUCTURES: INTERBEDDED, MASSIVE,
OTHER FEATURES: MEDIUM RECRYSTALLIZATION, SUCROSIC;
FOSSILS: NO FOSSILS;

760 - 762.8 DOLOSTONE; MODERATE BROWN TO MODERATE YELLOWISH BROWN; 15% POROSITY, INTERCRYSTALLINE,
POSSIBLY HIGH PERMEABILITY, VUGULAR; 50-90% ALTERED; SUBHEDRAL;
GRAIN SIZE: CRYPTOCRYSTALLINE; RANGE: MICROCRYSTALLINE TO CRYPTOCRYSTALLINE;
GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, SILICIC CEMENT;
SEDIMENTARY STRUCTURES: INTERBEDDED, LAMINATED, MOTTLED,
OTHER FEATURES: HIGH RECRYSTALLIZATION, SUCROSIC;
FOSSILS: NO FOSSILS;
HIGHER DEGREE SECONDARY POROSITY (VUGGY-SOLUTIONAL).

762.8- 763.3 DOLOSTONE; MODERATE OLIVE BROWN TO MODERATE BROWN; 20% POROSITY, INTERGRANULAR,
POSSIBLY HIGH PERMEABILITY, PIN POINT VUGS; 50-90% ALTERED; SUBHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; RANGE: CRYPTOCRYSTALLINE TO MICROCRYSTALLINE;
GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, SILICIC CEMENT;
SEDIMENTARY STRUCTURES: INTERBEDDED,
OTHER FEATURES: MEDIUM RECRYSTALLIZATION, SUCROSIC;
FOSSILS: NO FOSSILS;

763.3- 779 DOLOSTONE; DARK YELLOWISH BROWN TO MODERATE BROWN; 03% POROSITY, INTERCRYSTALLINE,
FRACTURE, LOW PERMEABILITY; 50-90% ALTERED; SUBHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; RANGE: CRYPTOCRYSTALLINE TO MICROCRYSTALLINE;
GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, SILICIC CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE, LAMINATED, MOTTLED,
ACCESSORY MINERALS: HEAVY MINERALS- %;
OTHER FEATURES: HIGH RECRYSTALLIZATION, SUCROSIC, PARTINGS;
FOSSILS: FOSSIL MOLDS, ORGANICS;
VERTICAL FRACTURES; ECHINOID, MOLLUSK MOLDS; ORGANICS; SOME VUGS.

779 - 782.5 NO SAMPLES
CORE MATERIAL LOST WHEN HOLE REAMED (779'-782').

782.5- 790 DOLOSTONE; YELLOWISH GRAY TO DARK YELLOWISH BROWN; 05% POROSITY, LOW PERMEABILITY,
PIN POINT VUGS, INTERCRYSTALLINE; 50-90% ALTERED; SUBHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; RANGE: CRYPTOCRYSTALLINE TO MICROCRYSTALLINE;
GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE,
FOSSILS: NO FOSSILS;

790 - 799 DOLOSTONE; GRAYISH BROWN TO YELLOWISH GRAY; 05% POROSITY, PIN POINT VUGS, VUGULAR, FRACTURE; 50-90% ALTERED; SUBHEDRAL;
GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE, BANDED,
FOSSILS: NO FOSSILS, FOSSIL MOLDS;
VARIABLE POROSITY; INFILLED FRACTURES/VUGS; MINOR FOSSIL MOLDS (FORAMS?)

799 - 812 AS ABOVE
MOLDIC POROSITY; FORAM MOLDS COMMON.

812 - 815.5 DOLOSTONE; DARK YELLOWISH BROWN TO MODERATE YELLOWISH BROWN; 20% POROSITY, PIN POINT VUGS, MOLDIC, INTERCRYSTALLINE; SUBHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; RANGE: CRYPTOCRYSTALLINE TO MICROCRYSTALLINE;
GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE,
OTHER FEATURES: SUCROSIC;
FOSSILS: NO FOSSILS, FOSSIL MOLDS;

815.5- 816.2 DOLOSTONE; GRAYISH BROWN TO YELLOWISH GRAY; 08% POROSITY, PIN POINT VUGS, VUGULAR, MOLDIC; EUHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; RANGE: CRYPTOCRYSTALLINE TO VERY FINE; GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: BANDED, MASSIVE,
ACCESSORY MINERALS: CALCILUTITE-05%;
OTHER FEATURES: CALCAREOUS;
FOSSILS: NO FOSSILS;

816.2- 819 DOLOSTONE; YELLOWISH GRAY TO LIGHT OLIVE GRAY; 02% POROSITY, INTERCRYSTALLINE, LOW PERMEABILITY; EUHEDRAL;
GRAIN SIZE: CRYPTOCRYSTALLINE; RANGE: CRYPTOCRYSTALLINE TO MICROCRYSTALLINE;
GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: BANDED, MASSIVE, LAMINATED,
ACCESSORY MINERALS: CALCILUTITE-10%;
OTHER FEATURES: CALCAREOUS;
FOSSILS: NO FOSSILS;

819 - 824 DOLOSTONE; YELLOWISH GRAY TO MODERATE BROWN; 08% POROSITY, LOW PERMEABILITY, VUGULAR, FRACTURE; SUBHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; RANGE: CRYPTOCRYSTALLINE TO MICROCRYSTALLINE;
GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: BRECCIATED, MASSIVE,
OTHER FEATURES: CALCAREOUS;
FOSSILS: NO FOSSILS;

824 - 832 DOLOSTONE; DARK YELLOWISH BROWN TO GRAYISH BROWN; 15% POROSITY, POSSIBLY HIGH PERMEABILITY, INTERGRANULAR, VUGULAR; SUBHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; RANGE: MICROCRYSTALLINE TO FINE; GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: BRECCIATED, MASSIVE,
OTHER FEATURES: SUCROSIC;
FOSSILS: NO FOSSILS;
SOME DOLOMITIC MUD-FILLED VUGS.

832 - 834 DOLOSTONE; DARK YELLOWISH BROWN TO MODERATE YELLOWISH BROWN; 20% POROSITY, PIN POINT VUGS, VUGULAR, POSSIBLY HIGH PERMEABILITY; EUHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; RANGE: CRYPTOCRYSTALLINE TO FINE; MODERATE INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: BRECCIATED,
OTHER FEATURES: SUCROSIC;
FOSSILS: NO FOSSILS;

834 - 835.3 DOLOSTONE; GRAYISH BROWN TO DARK YELLOWISH BROWN; 05% POROSITY, INTERCRYSTALLINE, LOW PERMEABILITY; EUHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; RANGE: CRYPTOCRYSTALLINE TO MICROCRYSTALLINE;
GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: LAMINATED, STREAKED, MASSIVE,
ACCESSORY MINERALS: CALCILUTITE-05%;
OTHER FEATURES: SUCROSIC;
FOSSILS: NO FOSSILS;

835.3- 839 DOLOSTONE; GRAYISH BROWN TO MODERATE YELLOWISH BROWN; 15% POROSITY, INTERCRYSTALLINE, VUGULAR, FRACTURE; EUHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; RANGE: CRYPTOCRYSTALLINE TO MICROCRYSTALLINE;
GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: STREAKED, BANDED, MASSIVE,
OTHER FEATURES: CALCAREOUS;
FOSSILS: NO FOSSILS;
CUTTINGS DESCRIBED FROM 839' TO 850'.

839 - 840 DOLOSTONE; GRAYISH BROWN TO DARK YELLOWISH BROWN; 10% POROSITY, INTERCRYSTALLINE, LOW PERMEABILITY; SUBHEDRAL;
GRAIN SIZE: CRYPTOCRYSTALLINE; RANGE: CRYPTOCRYSTALLINE TO MICROCRYSTALLINE;
GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: LIMESTONE-02%;
OTHER FEATURES: SUCROSIC, CALCAREOUS;
FOSSILS: NO FOSSILS;

840 - 850 DOLOSTONE; GRAYISH BROWN TO DARK YELLOWISH BROWN; 05% POROSITY, INTERCRYSTALLINE, PIN POINT VUGS, LOW PERMEABILITY; SUBHEDRAL;
GRAIN SIZE: CRYPTOCRYSTALLINE; RANGE: CRYPTOCRYSTALLINE TO MICROCRYSTALLINE;
GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: LIMESTONE-02%;
OTHER FEATURES: CALCAREOUS;
FOSSILS: NO FOSSILS;

850 TOTAL DEPTH