ROMP TR7-4 "WARD LAKE"
EXECUTIVE SUMMARY
MANATEE COUNTY
BASIN 21/S.22,T.35S,R.18E/21-020-040

April 13, 1989 J.L. DECKER

I. SITE LOCATION

The ROMP TR7-4 wellsite is located within the Bill Evers Reservoir area owned by the City of Bradenton, Manatee County, Florida (Figure 1). The wellsite can be found by proceeding 2 miles west on SR 70 from I-75; then turning left onto Natalie Way and continuing south for .45 mile. The wellsite is located about 1.0 mile south of the Bill Evers Reservoir entrance (Figure 2). The wellsite has a 20' x 40' perpetual easement with a 200' x 200' temporary construction easement (Figure 3). TR7-4 is located in the NW 1/4 of the SW 1/4 of the NE 1/4 of Section 22, Township 35S, Range 18E; at latitude 27° 25' 39.355" N, longitude 82° 29' 20.562" W.

II. GEOLOGY

TR7-4 "Ward Lake" wellsite is located in Manatee County near the west-central coast of Florida. The wellsite lies within the physiographic province known as the Gulf Coastal Lowlands (Figure 4). During Pleistocene time, ancient stands of sea level above its present level shaped the topography in the wellsite vicinity into marine terraces. The TR7-4 wellsite is located on the Pamlico Terrace (of Pleistocene age) at an elevation of about 15 feet above NGVD. The Pamlico Terrace forms a relatively flat coastal lowland that is generally less than 20 feet above sea level, although it contains a few low hills and ridges that rise

to altitudes of 30 feet or more. It was formed when the sea was about 25 feet above the present level (Peek, 1958).

Principal surface drainage in the vicinity of the TR7-4 wellsite is through the Manatee River and one of its tributaries, the Braden River.

The geologic formations penetrated by exploratory wells in the vicinity of TR7-4, range from Cretaceous to Holocene in age. A thin veneer of Holocene age fluvial deposits, consisting of quartz sand, silt, clay and organic material, may have existed before the upper surficial deposits along the Braden River in the wellsite locality was disrupted during the construction of Bill Evers Reservoir. The remaining surficial deposits are probably Pleistocene age sediments which overlie Tertiary-age clastics and carbonates. At the TR7-4 wellsite the formational contacts as described from core samples are stratigraphically lower then was expected and tend to dip to the west and south of TR7-4.

The uppermost and youngest formation at the TR7-4 wellsite, based on samples retrieved during coring operations, are the Undifferentiated Surficial Deposits (Pamlico Terrace) of Pleistocene age. From the surface to a depth of 18' below LSD the strata are predominantly quartz sand and accessory constituents consisting of detrital clay, organics (plant remains) and phosphate. Some iron staining was observed near the bottom of the unit.

The Undifferentiated Surficial Deposits unconformably overlie beds of clay, quartz sand, dolosilt, dolomite, chert and calcilutite limestone which compose the Hawthorn Formation (18'-374' below LSD). The geologic age of these sediments range from Pliocene to Middle Miocene age. Note: under Tom Scott's Revised nomenclature (Florida Geological Survey) the Hawthorn Formation has been upgraded to group status, and includes Miocene carbonates formerly of the Tampa Formation. Scott (1988) proposes two new formations: the Peace River Formation (18'-64" below LSD), consisting predominantly of siliciclastic sediments which composes the Upper Hawthorn Group, whereas the basal, predominantly carbonate units of the Lower Hawthorn Group has been named the Arcadia Formation (64'-549' below LSD). The summary of stratigraphy is shown in Figure 5. Near the base of the Hawthorn Formation of former usage, the limestone and dolomite beds have clay-filled fractures and a brecciated appearance. A layer of brown chert and dolomite forms the unconformable contact between the Hawthorn and Tampa Formations.

The Hawthorn Formation of former usage (Peace River and Upper Arcadia Formation) in the TR7-4 wellsite locality serves as an effective confining unit between the Undifferentiated Surficial Deposits and the underlying carbonates of the Floridan Aquifer System.

The Tampa Formation of former usage (374'-549' below LSD) consists of siliceous and silty calcilutitic sand, calcarenitic limestone, clay, and dolomite beds. Under revised nomenclature (Scott, 1988) the Tampa Formation is reduced to member status and becomes part of the basal Arcadia Formation of the Hawthorn Group (Figure 5). This formation is differentiated from the overlying Peace River and Upper Arcadia Formation by a decrease in phosphorite described in the core samples and lower activity as shown on the gamma ray log. Much of the formation between 374' and 514' is composed of alternating beds of calcilutitic sand, shell, clay and limestone (calcilutite, calcarenite). Varying amounts of clay and quartz sand are disseminated through the Tampa Member. The base of the Arcadia Formation (514'- 549' below LSD) is more consolidated, but still variable in its composition. Some of the dolomite and calcarenite has a mottled appearance. Clay-filled fractures in the calcarenite and clay near the base of the formation appear to represent the unconformable contact with the Suwannee Formation.

The Suwannee Formation (549'-768' below LSD) of Oligocene age lies unconformably below the Hawthorn Group (Tampa Member of the Arcadia Formation). The Suwannee Formation appears to be broken down into two units. Much of the upper unit (549'-724.6' below LSD) is composed of yellowish gray, very light orange, calcarenitic, fossiliferous limestone. Some of the upper unit is partially dolomitzed and variably recrystallized.

The lower unit of the Suwannee Formation (724.6'-768' below LSD) is composed predominantly of very light orange and yellowish gray calcilutite. The formation material in the lower unit is more variable than the upper unit, consisting of not only of finer grained calcilutite, but also calcarenite and some seams of clay and dolomite.

The Suwannee Formation is generally marked geophysically by significantly less gamma ray activity than the formations above it. Even though the core samples retrieved at the TR7-4 wellsite indicate little phosphorite, gamma ray activity was considerably higher than was thought to be normal for this locality. Three minor calcareous clay seams and a dolomite seam (744.4'-745.2' below LSD) separate the Suwannee Formation into different water bearing zones. The base of the Suwannee Formation has a mottled, brecciated appearance. A gray clay seam, with algal laminations and black organic material, is the unconformable contact with the underlying Ocala Group.

The Ocala Group (768'-1031' below LSD) of late Eocene age is composed predominantly of chalky, fossiliferous, calcilutitic limestone. The Ocala Group was differentiated from the above Suwannee Formation partially on the basis of fossils. The Ocala Group consists of three units. In descending order

these units are the Crystal River, Williston, and Inglis Formations. These formations were not differentiated at the TR7-4 wellsite. All three units generally consist of coquinal, foraminiferal limestone, usually yellowish gray to very light orange in color. Some beds of calcarenitic limestone and calcareous clay were identified within the three units. The base of the Ocala Group (1016'-1029.5' below LSD), consisting of calcilutitic limestone, becomes increasily harder, crystalline and dolomitic. A layer of dolomite (1029.6'-1034' below LSD) is the unconformable contact between the Ocala Group and the underlying Avon Park Formation of Middle Eocene age.

The Avon Park Formation (1031'-1250' below LSD) is composed of dolomitic limestone (calcilutite, calcarenite) and brown crystalline dolomite. The top of the Avon Park Formation was identified partially on its carbonaceous and dolomitic character. In addition to the lithologic change, the fossils (Coskinolina floridana, Dictyconus cookei and Neolaganum dalli) were identified in the core and cutting samples. The Avon Park Formation was cored to a depth of 1110' below LSD. Between 1089.2' and 1097.6' below LSD, fractured, crystalline dolomite beds were described. A selenite crystal was identified within this interval. Core operations were terminated upon encountering a sand-filled solution cavity at 1110' below LSD. At the TR7-4 wellsite, drill cutting samples were described between 1100' and 1256' below LSD. The Avon Park Formation between 1110' and 1170' below LSD is predominantly a calcilitutic limestone. Some organics, clay and dolomite were described in the drill cuttings. The interval between 1170' and 1250' below LSD is a crystalline, sucrosic, transmissive, and occasionally fractured yellowish brown dolomite. Only 86' of the expected 100'-150' thick transmissive zone (Avon Park Zone) was penetrated during the construction of the Deep Floridan Monitor.

The stratigraphic sequence for the TR7-4 wellsite as interpreted from core samples, drilling cuttings and geophysical logs are described below (Figure 6).

WELL DEPTH (Ft.Below LSD)	STRATGRAPHIC UNIT/AGE Lithologic Description
LSD-18'	**UNDIFFERENTIATED SURFICIAL DEPOSITS PLEISTOCENE-PLIOCENE AGE** **Sand**; quartz, very light gray to dark gray, light greenish gray to light olive gray, grayish green, very fine to medium grain size, subangular to angular, medium sphericity, frosted, unconsolidated to poorly indurated; accessory constituents-heavy

minerals, clay, plant remains, phosphatic sand and gravel; moderate-high porosity and permeability.

Clay; grayish green, intergranular, poorly indurated; accessory constituents-quartz sand, phosphatic sand; low permeability.

18'-374' **HAWTHORN FORMATION/MIOCENE AGE (PEACE RIVER AND UPPER ARCADIA FORMATIONS OF THE HAWTHORN GROUP)**

Limestone; yellowish gray, intergranular porosity; biogenic, calcilutitic, skeletal grain type; accessory constituents-clay, phosphatic sand; fossils-mollusks; low permeability.

Dolomite; yellowish gray, light olive gray, light gray to medium gray; microcrystalline to cryptocrystalline; intergranular, intercrystalline, vuggy, moldic porosity; mottled, laminated, massive; accessory constituents-phosphatic sand and gravel, clay, sand, chert; fossils-bryozoan, mollusk, shell fragments, barnacles; low-moderate porosity, usually low permeability.

Calcilutite; yellowish gray, light olive gray, light gray, white; intergranular, vuggy porosity, interbedded, mottled, laminated, moderate-good induration; skeletal, calcilutitic, biogenic grain type; accessory constituents - clay, phosphatic sand and gravel, quartz sand, chert; fossils-mollusks, shell fragments and molds; moderate porosity, low permeability.

Clay; grayish yellow green to grayish green, pale olive, greenish gray to dark greenish gray; intergranular porosity, poorly to moderately indurated, laminated, plastic; accessory constituents-phosphatic sand and gravel, quartz sand, organics; low permeability.

Dolosilt; light gray, yellowish gray, greenish gray to dark greenish gray, very fine to microcrystalline grain type; low permeability.

374'-549' **TAMPA FORMATION/MIOCENE AGE (TAMPA MEMBER OF THE ARCADIA FORMATION OF THE HAWTHORN GROUP)**

Shell bed; pale greenish yellow, very pale orange, moldic, intergranular porosity; biogenic, calcilutitic, skeletal grain type; accessory constituents-quartz sand, phosphatic sand, calcite; clay, fossils-coquina, worm traces, bryozoans; poor to moderately indurated; moderately high permeability.

Sand; yellowish gray, light brown, very fine to medium grain size, subangular, rounded, medium sphericity, interbedded, unconsolidated, calcilutitic; accessory constituents-quartz and phosphatic sand.

Dolomite; yellowish gray, light bluish gray; very fine to microcrystalline grain size, interbedded, good induration; accessory constituents-clay, calcilutite; fossils-fossil molds; low porosity and permeability.

Calcarenite; yellowish gray, light brown, moderate yellowish brown, very pale orange; intergranular, moldic porosity; biogenic, calcilutitic, skeletal, grain type; interbedded, fractures, laminated, bioturbated, chalky, partings, low recrystallization; fossils-algae, mollusk fragments, miliolids, organics; low-moderate porosity and permeability.

549'-768' **SUWANNEE FORMATION/OLIGOCENE AGE**

Calcarenite; yellowish gray, very pale orange; intergranular, moldic porosity; biogenic, calcilutite, skeletal grain type; massive, bioturbated, laminated, streaked, mottled, brecciated, granular, chalky, dolomitic, low recrystallization; accessory constituents-calcilutite, calcite, clay, silt; fossils-mollusks, echinoids, miliolids, coquina, foraminifera(Sorites), bryozoans; low-moderate porosity and permeability.

Calcilutite; yellowish gray, grayish orange pink, very pale orange; intergranular, moldic porosity; biogenic, skeletal grain type; interbedded, laminated, fractured, streaked, mottled; accessory constituents-clay,

calcite, dolomite, quartz sand; fossils-algae, organics, mollusk fragments, worm traces; low-moderate porosity and permeability.

Clay; yellowish gray, moderate yellowish green, medium gray; intergranular porosity, moderately indurated, interbedded; accessory constituents-calcilutite; low permeability.

Dolomite; yellowish gray, pale olive; very fine to microcrystalline grain size; interbedded, good induration; fossils-mollusk fragments; low permeability.

768'-1031' **OCALA GROUP/EOCENE AGE**

Calcarenite; yellowish gray, very pale orange; intergranular, moldic porosity; biogenic, calcilutite, skeletal grain type; bioturbated, granular, chalky; accessory constituents-calcite, calcilutite, dolomite; fossils-foraminifera (Nummulites , Lepidocyclina , Operculinoides , Gypsina globula, Heterostegina ocalana) echinoids, (Durahamella ocalana), coquina, bryozoans, coral; moderate porosity and permeability.

Calcilutite; very pale orange, yellowish gray, pale olive; intergranular, pin point vug porosity, biogenic, calcilutite, skeletal grain type; massive, bioturbated, fractured, mottled, laminated, good induration, partings, platy; accessory constituents-dolomite, chert, quartz sand; fossils-foraminifera (Operculinoides, Heterstegina ocalana, Globula gypsina, Nummulites, Lepidocyclina), coquina, organics, mollusk fragments, coral; low-moderate porosity, low permeability.

Clay; grayish yellow green; intergranular, interbedded, moderate induration; accessory minerals-dolomite, calcilutite, organics; low permeability.

1031'-1250'TD **AVON PARK/EOCENE AGE**

Dolomite, light brown, yellowish gray, pale yellowish brown, grayish brown, olive brown, pale olive, moderate dark gray; intergranular -intercrystalline porosity, very fine to

microcrystalline to cryptocrystalline grain size, sucrosic, mottled, massive, occasionally fractured, laminated, subhedral, moderate-good induration; accessory constituents, anhydrite, calcite; fossils-echinoids (Neolaganum dalli), organics, algae, mollusk fragments; low to high porosity and permeability.

Clay (1147'-1150'); light green, grayish green; intergranular, plastic, moderate induration; fossils-organic; low permeability.

Calcarenite, calcilutite; yellowish gray, pale yellowish brown, light greenish gray, moderate brown; intergranular porosity, laminated, interbedded, massive, poor to good induration; biogenic, calcilutite, skeletal gran type; accessory constituents-dolomite, calcite, quartz sand, calcilutitic sand, clay; fossils-foraminifera (Coskinolina floridan, Dictyconus cookei), echinoids (Neolaganum dalli), organics, algae, coquina; low-moderate porosity and permeability.

III. HYDROGEOLOGY

The Surficial Aquifer System, Intermediate Aquifer System (Upper Confining Unit) and the Floridan Aquifer System were identified at the TR7-4 wellsite.

A. SURFICIAL AQUIFER SYSTEM

The Surficial Aquifer System at the TR7-4 wellsite extends from land surface to 21' below LSD. This system includes the entire Undifferentiated Surficial Deposits (LSD-18') and the uppermost sand layer (18'-21' below LSD) of the Peace River Formation within the Hawthorn Group. During construction of the Bill Evers Reservoir, some of the Surficial Aquifer System in the vicinity of the TR7-4 wellsite was disrupted as the result of earth removal.

The thickness of the Surficial Aquifer System includes both unsaturated and saturated deposits of the Undifferentiated Surficial Deposits. In Manatee County the thickness of surficial sediments which compose the Surficial Aquifer System is variable, and usually averages less than 40 feet in western Manatee County.

The Surficial Aquifer System at the TR7-4 wellsite is

composed of unconsolidated to poorly consolidated quartz sand, phosphatic sand and gravel, sandy clay and clay. The hydraulic properties of these deposits vary widely due to the variation of thickness and the types of material that compose the Surficial Aquifer System.

Locally, in some areas of Manatee County, there are layers within this aquifer system that poorly confine the groundwater. In these areas the water may be confined under slight artesian head by layers of hard pan, clay or limestone. The Surficial Aquifer System at the TR7-4 wellsite is an unconfined water table aquifer, extending from land surface (15' above NGVD) to the top of the first confining clay layer of the Hawthorn Group. The water table at the TR7-4 wellsite appears to be coincident with the water level of Bill Evers Reservoir. The water level varies in response to seasonal changes and the control structure existing at a outlet on the reservoir which feeds into the Braden River. During well construction at the TR7-4 wellsite, water levels ranged from 9.5' to about 11' below LSD.

The Surficial Aquifer System in the TR7-4 locality yields limited quantities of water to domestic users. In the extreme coastal and peninsular area, wells penetrating shallow sediments tend to produce poor quality water due to saltwater intrusion. Inland, the quality of the water is less variable and is dependent on local recharge. At the TR7-4 wellsite, specific conductivity of one sample at 25.5°C was 925 Umhos. The chloride value was 36 mg/l, while the sulfate value was 280 mg/l.

B. INTERMEDIATE AQUIFER SYSTEM

The Intermediate Aquifer System (Upper Confining Unit) includes all water-bearing units and confining units between the overlying Surficial Aquifer System and the underlying Floridan Aquifer System. At the TR7-4 wellsite, the Intermediate Aquifer System includes the clastic and carbonate units of the Hawthorn Formation (Upper Hawthorn Group) from 21' to 374' below LSD. The water bearing units, consisting of dolomite (117'-135' below LSD), calcarenite, calcilutite (184'-186' below LSD), calcilutitic sand, limestone (236'-263' below LSD), appear to be somewhat hydraulically isolated from the Surficial and Floridan Aquifer Systems.

A confining unit consisting of clay, dolosilt, dolomite, calcilutite and limestone (21' to 117' below LSD) separates the upper water-bearing unit (117'-135' below LSD) from the Surficial Aquifer System. The most prominent water-bearing unit (236'-263' below LSD), appears to be the most hydraulically isolated interval from the overlying and underlying confining beds. The confining beds are composed of dolomite, dolosilt,

clay, calcilutite, and limestone. Wells penetrating the water bearing units in the Intermediate Aquifer System (Upper Confining Unit) yield low to moderate quantities of water, ranging up to a few hundred gallons per minute. Although the Intermediate Aquifer System includes three small three water-bearing units, it acts as one confining unit above the underlying Floridan Aquifer System.

Review of USGS potentiometric surface maps for north central Manatee County since 1974, suggests that water levels range from 19' to 25' above NGVD during the wet season to -10' to +15' above NGVD during the dry season. Average range is about 20'. This seasonal cycle reflects heavy irrigation, municipal and industrial withdrawals. Potentiometric surface at the TR7-4 wellsite varied from 8.22' to 9.15' below LSD while coring from 84' to 214' below LSD. These measurements were fairly close to the Surficial Aquifer System water level of 10.25' below LSD (5-19-87). From 234' to 354' below LSD potentiometric surface began to rise, varying from 6.94' to 3.77' below LSD. These figures were closer to measurements recorded under higher artesian head in the Floridan Aquifer System. Potentiometric surface continued to rise with depth during coring operations. Increases in precipitation were also occurring during June, 1987, contributing to this rise in potentiometric surface. Following construction of the Hawthorn Monitor (9-22-88), with a open hole interval (213'-268' below LSD), potentiometric surface ranged from 2.8' below LSD in October, 1988 to 6.0' below LSD in November, 1988. These values reflected seasonal changes taking place, dropping with the onset of the dry season and increased groundwater withdrawals.

Specific conductivity of water samples collected during coring operations (84'-544' below LSD) varied between 590 and 1250 Umhos. Chloride values were fairly constant, ranging from 32 to 58 mg/1. The sulfate values were somewhat variable, ranging from 70 to 408 mg/1. Total dissolved solids (TDS) values ranged from 328 to 940 mg/1. An existing well open to the Floridan Aquifer System, located about 100' from the corehole, may have biased the water quality results during coring operations. Following construction of the Hawthorn Monitor, specific conductivity within the open hole interval (213'-265' below LSD) was 1000 Umhos.

Transmissivity of the permeable deposits (Intermediate Aquifer System) in western Manatee County averages about 1500 ft^2/day. Leakance in the uppermost Intermediate Aquifer System in Manatee County ranges from 1×10^{-5} to 7×10^{-5}.

Transmissivity varies substantially within the Intermediate Aquifer System. The confining beds generally have low vertical hydraulic conductivity and retard interaquifer ground-water flow. However, the confining beds do transmit, or

leak, water from one water-bearing unit to another. The system is referred to as a leaky-aquifer system (Wilson, 1977).

C. Floridan Aquifer System

A shell bed (374.1'-379.8') below LSD) was identified as the top of the Floridan Aquifer System at the TR7-4 wellsite. The shell bed also coincides with the top of the Tampa Formation (Tampa Member, Arcadia Formation). The strata between 374' and 1250' below LSD is composed chiefly of limestone (calcilutite, calcarenite) and dolomite beds that range in age from early Miocene to middle Eocene. At least three subdivisions, the Tampa Zone, Suwannee Zone, and the Avon Park Zone of the upper Floridan Aquifer System were identified at the TR7-4 wellsite (Figure 6). Although the bottom of the upper Floridan Aquifer System was not defined at the TR7-4 wellsite, it is considered as the beginning of the vertically consistent intergranular evaporites (gypsum or anhydrite).

The Tampa Zone (374'-542' below LSD) is composed of permeable shell, calcarenite, sand (calcarenitic calcilutitic) and limestone. A semi-confining unit consisting of discontinuous clay, dolomite, limestone (calcilutite, calcarenite) beds lie between 506' and 542' below LSD. The Tampa Zone is a higher water-yielding hydraulic unit than the Hawthorn Formation (Upper Hawthorn Group) due to the numerous sand-filled solution cavities or poorly consolidated intervals. These intervals are separated occasionally with low permeable material, consisting of clay, dolomite and calcilutite.

Potentiometric surface (May - September, 1987) in the Upper Floridan Aquifer System in the vicinity of the TR7-4 wellsite ranged from -5' to 1' above LSD. It should be noted that the natural gradient for the potentiometric surface appears to be toward the west in September and north or northwest in May of any given year. Wet and dry seasonal variations tend to be exacerbated by ground-water withdrawals that are responsible for the shifts in gradient.

During coring operations at the TR7-4 wellsite substantial changes in potentiometric surface occurred near the top and bottom of the Tampa Zone. Hydrostatic head rose from 3.77' to .1' below LSD between the depths of 354' and 394' below LSD. At the bottom of the Tampa Zone (494'-542' below LSD), hydrostatic head increased from .84' to 2.5' above LSD.

The Suwannee Zone includes three intervals from 542' to 780' below LSD. The lower Tampa Member, Arcadia Formation (542'-549' below LSD) and the upper Ocala Group (768'-780' below LSD) are included in the Suwannee Zone. Within these producing zones are semi-confining beds of lower permeable material retarding

vertical movement of water. The beds are discontinuous and not completely impermeable, allowing water to move from one permeable zone to another. In Manatee County, the Suwannee Zone has low to moderate transmissivity, with values ranging from 4,000 ft^2/day to 20,000 ft^2/day.

The Upper Floridan Aquifer System (Tampa and Suwannee Zones) is being recharged not only from precipitation that infiltrates the aquifer from the recharge areas in Polk County, but from some recharge which occurs in the northeastern part of Manatee County. Recharge, to a lesser degree, takes place through the Hawthorn Formation (Upper Hawthorn Group), with its minor transmissive zones.

During an aquifer test conducted at an exploratory test site about 8 miles west of the TR7-4 wellsite, specific capacity in the Upper Floridan Aquifer System was determined to be about 141 gpm/ft. This specific capacity represents a transmissivity value of about 305,000 gpd/ft which is consistent with values reported in the literature.

Another aquifer test was conducted north of the TR7-4 wellsite and adjacent to Bill Evers Reservoir. Transmissivity, using the methods of Hantush and Jacob as modified by Walton for semi-confined aquifers was estimated to be 280,000 gpd/ft during the drawdown phase of the aquifer test. Leakance and storage coefficient values were 4.7×10^{-3} and 5.5×10^{-4} respectively. Analyses of recovery data of the two methods yielded transmissivity values of 297,000 and 260,000 gpd/ft. Storage coefficient values were 5.8×10^{-3} and 3×10^{-3} respectively.

Data from other aquifer tests conducted at other wellsites in Manatee County indicate that the transmissivity of the Upper Floridan Aquifer System ranges from 100,000 gpd/ft to 460,000 gpd/ft.

Below the Tampa and Suwannee Zones, the Ocala Group (Crystal River, Williston, and the Inglis Formations) and the upper Avon Park Formation behave as a confining unit which retards vertical movement of water. Much of the Ocala Group and the upper Avon Park Formation is composed of a uniform, fine grained to chalky calcilutitic limestone of low permeability. The confining unit extends from 780' to about 1097' below LSD. A transmissive zone (994'-1016' below LSD) was identified near the bottom of this confining unit.

The Ocala confining unit produces very little water as was evident from coring operations at the TR7-4 wellsite. Low specific capacities were observed during withdrawal and packer tests (0.33 to 1.2 gpm/ft) at an exploratory test site near Lake Manatee in Manatee County. Vertical permeability in the Ocala confining unit is usually lower than horizontal permeability,

except in the two producing transmissive zones near the top and bottom of the Ocala Group.

During packer and confining bed pump tests at the exploratory test site (8 miles west of TR7-4), and assuming a thickness of 300', horizontal permeability was estimated to be 1.9×10^{-1} ft/day. Vertical permeability was estimated to be 1.3×10^{-1} ft/day. A sonic log completed through the Ocala confining unit indicated an average porosity of 35%. Core data indicated an average porosity of 40%.

Seasonal changes and local municipal and agricultural pumpage affect potentiometric surface within the Ocala confining unit. During coring operations potentiometric surface (Aug.-Sept. 1987) dropped from 2.8' to .18' above LSD for the depths from 779' to 1014' below LSD.

Water quality varied slightly, ranging from 890 to 1100 Umhos while coring in the Ocala Group. Chlorides remained fairly low, ranging from 38 to 50 mg/1. Sulfates ranged from 311 to 414 mg/1. Temperature of water samples ranged from 27° to 28°C.

The Avon Park Formation was encountered at 1031' below LSD. The lithology changed from a chalky, fine grained dolomitic limestone to a crystalline dolomitic limestone and dolomite. This appears to be the unconformable contact between the Inglis Formation (Ocala Group) and Avon Park Formation. The upper Avon Park Formation (1031'-1097' below LSD) alternates between calcarenite, calcilutite and dolomite.

The interval of increased transmissivity in the middle of the Avon Park Formation (1097'- ? below LSD) at the TR7-4 wellsite is called the Avon Park Zone. The Avon Park Zone is composed of calcarenite, calcilutite and yellowish brown, sucrosic dolomite. Transmissivity within this zone is variable due to its crystalline and fractured characteristics ranging from 40,000 ft^2/day to nearly 100,000 ft^2/day.

The lower Avon Park Formation is probably composed of gypsum bearing limestone and dolomite. The bottom of the upper Floridan Aquifer System is defined as the beginning of vertical consistent intergranular evaporites (gypsum or anhydrite) occurring in either the Avon Park or Lake City Formation of Eocene age (Wolansky and Garbade, 1981).

Potentiometric surface within the Avon Park Formation during coring operations (1034'-1110' below LSD, dropped from .6' above LSD to 2.53' below LSD (Sept. 1987 - Jan. 1988). Upon completion of the Avon Park Monitor (Oct., 1988), with an open hole interval from 1162'-1250' below LSD, potentiometric surface was measured at 4.42' below LSD.

Specific conductivity of water samples retrieved from the top of the Avon Park Formation (1034'-1110' below LSD) ranged from 950 to 1100 Umhos. Chlorides remained low, ranging from 40 to 58 mg/l, while sulfates ranged from 265 to 372 mg/l. Total dissolved solids (TDS) ranged from 668 to 795 mg/l. During construction of the Avon Park Monitor, specific conductivity of water samples retrieved from the depths (1120'-1160' below LSD) ranged from 990-1180 Umhos. Chlorides values remained low, ranging from 4.7 to 54 mg/l. Sulfate values ranged from 450 to 490 mg/l. According to the fluid conductivity geophysical log water quality begins to degrade about 1220' below LSD. Specific conductivity of a thief sample collected at a depth of 1250' below LSD was 2100 Umhos. Chlorides increased to 260 mg/l, while sulfates increased to 725 mg/l due to increasingly presence of evaporates observed in the drill cuttings. Temperature increased within the Avon Park Formation, ranging from about 27.5° to 29°C.

IV. AQUIFER TESTS

Specific capacity tests were performed during construction of the Upper Tampa, Suwannee, and Avon Park Monitors prior to the aquifer test. The data was used to estimate the amount of drawdown expected during the aquifer test as well as the rate of discharge.

Two specific capacity tests with pumping rates of 61 and 120 gpm were completed during the construction of the Upper Tampa Monitor. Specific capacities of 2.13 and 4.88 gpm/ft, based on drawdown, were determined from the open hole intervals (380'-452', and 380'-500' below LSD). Specific capacities based on recovery for these two intervals were 2.25 and 5.07 gpm/ ft respectively.

One specific capacity test at a discharge rate of 137 gpm was completed following construction of the Suwannee Monitor (open hole interval, 560'-800' below LSD). Specific capacity based on drawdown was 7.49 gpm/ft. Specific capacity based on recovery was 7.48 gpm/ft.

During the construction of the Avon Park Monitor specific capacity tests were also completed from a depth of 380' to 1250' below LSD in the Tampa, Suwannee, Ocala Group, and Avon Park Formations. Pumping rates ranged from 94 to 118 gpm. Specific capacity based on drawdown increased with depth and ranged from 4.39 gpm/ft. to 41.6 gpm/ft. Specific capacity based on recovery ranged from 4.3 gpm/ft to 41.6 gpm/ft (See ROMP file).

A discharge rate of 230 gpm was determined from a preliminary pump test performed on the Upper Tampa Monitor a day prior to the aquifer test.

The aquifer test was conducted during the time period (November 28-29, 1988). A six (6") dia. submersible pump was provided by (Bruce Inc. DBA, Sherouse Well Drilling and Pump Supply). Duration of the pumping phase of the aquifer test was 23 hours (1380 min). Following the pumping phase, recovery measurements continued for a period of 6 hours (360 min). A manometer and ultrasonic flowmeter were used to calibrate the discharge rate. During the pumping phase the discharged water was moved off the wellsite by irrigation pipe. Removal of water into Bill Evers Reservoir was necessary to avoid a loading effect or leakage which might affect the validity of water level measurements retrieved during the drawdown and recovery phases of the aquifer test. Five (5) monitor wells and two (2) observation wells were used for drawdown and recovery measurements (Figure 7). The data was obtained by the District's data logger (Enviro-Lab Equipment) and by electric tape measurements.

Hydraulic characteristics in the form of transmissivity (T), storage (S) and leakance (k'/b') were determined from stressing the Tampa Zone (374'-514' below LSD) in the upper Floridan Aquifer System.

Analysis of the drawdown and recovery data was made using the Hantush leaky artesian aquifer method (1956) as modified by Walton (1962). At the TR7-4 wellsite very little water was released from the Intermediate Aquifer System (Upper Confining Unit). Most of the leakage occurred through the semi-pervious layer (514'-542' below LSD) between the Upper Tampa Zone and the Suwannee Zone.

Drawdown verses time data was plotted on a log-log plot, with a resultant curve match to the appropriate Walton function type curve. It is a non equilibrium curve under unsteady state conditions. The Jacob straight line method for a leaky artesian aquifer was used as a check on the analysis of the Walton method. The Jacob method is based on evaluating an aquifer whose confining beds are no longer releasing water from storage. A semi-log plot was used for analysis of the drawdown and recovery data. The Jacob straight line method was used even though steady state conditions were not achieved during the aquifer test. Assumptions derived from the Walton and Jacob methods were determined from the aquifer conditions at the TR7-4 wellsite.

Values of transmissivity, storage coefficient, leakance and permeability were calculated from the analysis of the data.

1. T=transmissivity (gpd/ft)
2. Q=discharge (gpm)
3. S=storage coefficient
4. k'=permeability (gpd/ft^2)

5. dd=drawdown (ft)
6. s=drawdown/log cycle (ft.)
7. s=drawdown as derived from the match point (ft)
8. s'=residual drawdown as derived from the match point (ft)
9. r=distance of the pumped well from the observation well (ft)
10. b=thickness of the aquifer (ft).
11. b'=thickness of the confining bed (ft).
12. t=time of the pumping phase (min,day).
13. t'=time following cessation of pumping (min,day).
14. t^{o}=intercepting the time axis where s=o.
15. $W(u,{}^{r}/_{b})$=well function for a leaky artesian aquifer (Walton).
16. u=Walton curve function.
17. ${}^{r}/_{b}$=Walton curve function.

The following Walton type equation was used to obtain values of transmissivity, storage and leakance.

$$T = \frac{114.6Q}{s} W(u,{}^{r}/_{b})$$

$$S = \frac{uTt,}{1.87r^{2}} \qquad {}^{K'}/_{b'} = \frac{T({}^{r}/_{B})^{2}}{r^{2}}$$

The Jacob straight line equation was used as a check on the Walton method for calculations values of transmissivity and storage.

$$T = \frac{264(Q)}{s} \qquad S = \frac{0.3Tt_{o}}{r^{2}}$$

Transmissivity values ranged from 18,512 gpd/ft to 26,358 gpd/ft for the pumped well (Upper Tampa Monitor) during the pumping and the recovery phases in the upper Tampa Zone. Specific capacity values were 3.74 and 3.73 gpm/ft respectively. Hydraulic conductivity values were 5.94 and 5.93 ft/day at 230 gpm (See ROMP File and Table 1).

Transmissivity values for the observation well (Upper Tampa Zone), using the Walton type equation during the pumping and recovery phases, were 13,873 and 13,179 gpd/ft respectively. Storage coefficient values were 1.43×10^{-4} and 1.63×10^{-3} for the Walton method and 1.15×10^{-5} and 1.1×10^{-5} for the Jacob Straight Line method (See ROMP File and Table 1).

Leakance for the pumping and recovery phases was derived from the following equations.

$${}^{K'}/_{b'} = \frac{T({}^{r}/_{b})^{2}}{r^{2}}, \qquad \frac{13,179(.3)^{2}}{(190)^{2}} = 3.28\text{x}10^{-2}$$

$$\frac{13,873(.3)^2}{(190)^2} = 3.46x10^{-2}$$

Hydraulic conductivity for the Tampa zone, assuming a thickness of 140', was 4.85 gpd/ft^2 and 4.60 gpd/ft^2 for the pumping and recovery phases. Hydraulic conductivity for the aquitard or semi-pervious interval between the Tampa Zone and Suwannee Zone (514'-542' below LSD) was .97 and .92 gpd/ft^2 during the pumping and recovery phases for the Tampa observation well.

During the aquifer test water level departures occurred from the expected drawdown and recovery plots on the Walton and Jacob type curves. Between 4 and 6 minutes into the pumping phase, water level dropped abnormally in the pumped well due to a delayed yield effect from storage. Most of the leakage came from the Suwannee Zone. It was at this time that drawdown was first observed in the Suwannee Monitor and Suwannee observation well. After pumping for a period of 9 1/2 - 10 hours, a departure from the drawdown curves was also noted on the semi-log and log-log plots. Water levels began to rise in the Upper Tampa and Suwannee wells.

Continuous water level recorders recorded a noticeable rise in water level during the time period (11-23 to 12-4-88). A heavy rainfall (11-22-88) created a regional trend in water level rise in the Floridan Aquifer System. Recharging of the Upper Floridan Aquifer System from the heavy rainfall and the subsequent water level rise may have more than offset the 9 1/2-10 hours pumping at 230 gpm. Well development may have had some effect on water level rise in the pumped well (Upper Tampa Monitor), but was not responsible for water level rise in the other Upper Floridan Aquifer System wells. A shutdown of pumps by the City of Bradenton was not a factor in water level rise, as none were in operation during this period of time. Barometric pressure was minimal, ranging from 30.1 to 30.23 inches of mercury. Water quality variations were also minimal, ranging from 800 to 900 Umhos. Tidal effects appeared to cause slight variations in the drawdown and recovery curves, but not enough to affect calculations.

Water level measurements recorded in the Surficial Aquifer Monitor did not change during the aquifer test. The Intermediate Aquifer System (Upper Confining Unit) is 351' thick at the TR7-4 wellsite. Leakage did not appear to occur through this unit during the aquifer test.

Very little water was pumped from storage in the Intermediate Aquifer system. Water level response in the Hawthorn Monitor (213'-265' below LSD), was observed to be opposite of predicted. Water levels in the Hawthorn Monitor

began to rise about 8 minutes after pumping commenced in the Tampa Zone. Water level rose .16' during the pumping phase. The pumping activity caused an increase in pore pressure in the clay adjacent to the pumped aquifer. Radial surface strains near a pumped well is translated into compression which is then changed to tension farther away. The increase in pore pressure in the clay is related to the development of the strains (Wolff, 1970). Reversibility of pore pressure creates elastic deformation in the aquifer. If appreciable strain occurs in the pumped aquifer, strain is transferred across the confining beds to an artesian aquifer (Wolff, 1970). This accounts for the reverse water level fluctuations during the pumping phase. During the recovery phase, a decrease in pore pressure had an opposite effect, creating conditions for water levels to drop. During recovery water levels in the Hawthorn Monitor continued to rise another .04'. Eleven (11) minutes after pumping ceased, water levels began to drop from 6.08' to 6.18' below LSD. Although no Hawthorn observation well was constructed at the TR7-4 wellsite it is predicted that the magnitude of strain and the consequent pore pressure rise should decrease with distance away from the Upper Tampa Zone (Wolff, 1970).

Drawdown and recovery measurements were recorded in the Suwannee Zone (542'-780' below LSD) during the aquifer test. Leakage was mainly through the aquitard or semi-pervious layer (514'-542' below LSD). Drawdown in the Suwannee Monitor and Suwannee Observation well did not begin to occur until enough water was withdrawn from storage in the semi-pervious layer about 4-6 minutes into the pumping phase of the aquifer test. The effects of this drawdown were noted in the pumped well (Upper Tampa Monitor) about the same time. Note: a flow log conducted in the Upper Tampa Monitor during the pumping phase indicated flow at 500' below LSD. Maximum drawdown in the Suwannee Monitor and the Suwannee observation well after 10 hours pumping was .69' and .71' respectively. Between 10 hours and 23 hours pumping water levels began to rise. Recovery began to take place 1 3/4 minutes after pump shutdown in the Suwannee Monitor and after 2 1/2 minutes in the Suwannee observation well.

The Ocala Group formations behaved as an effective confining unit during the pumping phase of the aquifer test. Hydrostatic level in the Avon Park Monitor rose from 4.2' to 3.85' below LSD during the pumping and recovery phases. As indicated earlier in the report, a regional trend in water level rise was occurring in the Upper Floridan Aquifer System during this period of time. The water level rise in the Avon Park Monitor was probably not due to radial strain and matrix compression as described by Wolff (1970).

V. TYPE AND PURPOSE OF THE MONITORS

Five permanent wells, an Avon Park Monitor, Suwannee Monitor, Upper Tampa Monitor, Hawthorn Monitor and a Surficial Monitor were constructed on the permanent easement at the TR7-4 wellsite. In addition to these five permanent monitors, one Suwannee observation well and one Upper Tampa observation well were constructed on the temporary construction easement (Figure 7). These observation wells were constructed for the purpose of gathering aquifer drawdown and recovery data during the aquifer test conducted at the TR7-4 wellsite, Nov. 28-29, 1989. The observation wells were cement-plugged to 3' below LSD following completion of aquifer testing.

The five permanent monitors were constructed for the purpose of providing a long term record of hydrostatic water level and water quality in the Surficial, Intermediate (Upper Confining Unit) and the Floridan Aquifer Systems. Data collected during coring operations, during and following construction of the Monitor and observation wells include: water quality, lithology, identification of geological formations, hydrostatic boundaries and hydrologic characteristics of the Surficial, Intermediate and Floridan Aquifer Systems.

It is hoped that the geologic and hydrologic data collected during coring operations and construction of the monitor wells will aid in updating and verifying a modeling project (SUTRA) completed by the USGS in cooperation with the Southwest Florida Water Management District.

VI. WELL CONSTRUCTION

A. AVON PARK MONITOR (UPPER FLORIDAN AQUIFER)

The Avon Park Monitor was designed to monitor and record fluctuations in the potentiometric surface (hydrostatic level) and water quality in the dolomite beds which compose the Avon Park Formation in the upper Floridan Aquifer System. The Avon Park Monitor was drilled to a depth of 1250' below LSD (Figure 8).

The construction of the Avon Park Monitor was initiated by drilling a 22" dia. nominal borehole, using mud-rotary drilling techniques, to a depth 40' below LSD. Eighteen (18") dia. steel casing was set (LSD-40' below LSD) and cement-grouted to land surface. An 17 1/2" dia. nominal borehole was then drilled out of the 18" dia. steel casing to a depth of 380' below LSD. Ten inch (10") dia. PVC casing was then set (+1.5' to 380' below LSD) and cement-grouted to land surface. This casing will effectively isolate the Surficial and Intermediate Aquifer

Systems from the Floridan Aquifer System at the TR7-4 wellsite. A 10" dia. nominal borehole was then drilled out of the 10" dia. PVC casing, using mud-rotary and reverse-air drilling techniques, to a depth of 1162' below LSD. Six (6") inch dia. PVC casing was then set (+3' to 1162' below LSD) and cement-grouted to land surface. A 6" dia. nominal borehole was then drilled out of the bottom of the 6" dia. PVC casing from 1162' to 1250' below LSD.

B. SUWANNEE MONITOR (UPPER FLORIDAN AQUIFER)

The Suwannee Monitor was constructed for the purpose of monitoring water quality and fluctuations in the potentiometric surface in the Suwannee Formation. The Suwannee Monitor was drilled to a depth of 800' below LSD (Figure 9).

The construction of the Suwannee Monitor was initiated by drilling a 17" dia. nominal borehole, using mud-rotary drilling techniques, to a depth of 80' below LSD. Fourteen (14") inch dia. steel casing was set (LSD-80' below LSD) and cement-grouted to land surface. A 12" dia. nominal borehole was then drilled out of the 14" dia. steel casing to a depth of 560' below LSD. Six (6") inch dia. PVC casing was then set (+6' to 560' below LSD) and cement-grouted to land surface. This casing will effectively isolate the Surficial and Intermediate Aquifer Systems from the Floridan Aquifer System. An 6" dia. nominal borehole was drilled out of the 6" dia. PVC casing to a total depth of 800' below LSD.

C. UPPER TAMPA MONITOR(UPPER FLORIDAN AQUIFER)

The Upper Tampa Monitor was designed to monitor and record fluctuations in the potentiometric surface (hydrostatic level) in the Tampa Formation. This monitor served as the pumped well during the aquifer test at TR7-4 (Figure 10).

The construction of the Upper Tampa Monitor was initiated by drilling an 18" dia. nominal borehole, using mud-rotary drilling techniques, to a depth of 80' below LSD. Fourteen (14") inch dia. steel casing was set (LSD-80' below LSD) and cement-grouted to land surface. A 12" dia. nominal borehole was then drilled out of the 14" dia. steel casing to a depth of 380' below LSD. Eight (8") inch dia. PVC casing was then set (+6' to 380' below LSD) and cement-grouted to land surface. This casing will effectively isolate the Surficial and Intermediate Aquifer Systems from the Floridan Aquifer System at the TR7-4 wellsite. An 8" dia. nominal borehole was drilled out of the 8" dia. PVC casing to a total depth of 500' below LSD.

D. HAWTHORN MONITOR(INTERMEDIATE AQUIFER SYSTEM)

The Hawthorn Monitor was designed to monitor and record fluctuations in potentiometric surface in the Intermediate Aquifer System. This monitor was drilled to a depth of 268' below LSD (Figure 11).

The construction of the Hawthorn Monitor was initiated by drilling an 14" dia. nominal borehole, using mud-rotary techniques, to a depth of 40' below LSD. Ten (10") inch dia. PVC casing was set (LSD-40 below LSD) and cement-grouted to land surface. A 10" dia. nominal borehole was then drilled out of the 10" dia. PVC casing to a depth of 213' below LSD. Six inch (6") dia. PVC casing was then set (+3' to 213' below LSD) and cement-grouted to land surface. A 6" dia. nominal borehole was then drilled out of the 6" dia. PVC casing to a total depth of 268' below LSD.

E. SURFICIAL MONITOR(SURFICIAL AQUIFER SYSTEM)

The Surficial Monitor was designed to monitor and record fluctuations in the water table (hydrostatic level) in the Surficial Aquifer System (Figure 12).

The construction of the Surficial Monitor was initiated by drilling a 11" dia. nominal borehole, using mud-rotary drilling techniques, to a depth of 21' below LSD. A six (6") PVC sediment trap (20'-20.5' below LSD), five (5') feet of 6" PVC (0.010" slot) wellscreen (10'-15' below LSD) was coupled onto 18' of 6" dia. PVC casing (+3' to 15' below LSD) and set into the borehole. The wells annulus from 21' to 5' below LSD was sand-packed with 6-20 type silica sand and was then cement-grouted from 5' to land surface.

F. TEMPORARY SUWANNEE OBSERVATION WELL

The temporary Suwannee observation well was constructed for the purpose of acquiring pump test data in the upper Floridan Aquifer System. This temporary observation well was drilled to a depth of 800' below LSD (Figure 13).

The construction of the temporary Suwannee observation well was initiated by drilling a 13" dia. nominal borehole to a depth of 40' below LSD. Ten (10") dia. PVC casing was set (LSD-40') and cement-grouted to 3' below land surface. A 10" dia. nominal borehole was drilled out of the 10" dia. casing to a depth of 562' below LSD. Six (6") dia. PVC casing was set (+4' to 562' below LSD) and cement-grouted to 3' below LSD. A 5" dia. nominal borehole was drilled out of the 6" dia. PVC casing, using

reverse-air drilling techniques, to a depth of 800' below LSD.

The temporary Suwannee observation well was cement-plugged from bottom (800' below LSD) to 3' below LSD following completion of the aquifer test.

G. TEMPORARY UPPER TAMPA OBSERVATION WELL

The temporary upper Tampa observation well was constructed for the purpose of acquiring pump test data in the upper Floridan Aquifer System. This temporary observation well was drilled to a depth of 504' below LSD.

The construction of the temporary upper Tampa observation well was initiated by drilling a 13" dia. nominal borehole to a depth of 40' below LSD. Ten (10") dia. PVC casing was set (LSD to 40') and cement-grouted to 3' below LSD. A 10" dia. nominal borehole was drilled out of the 10" dia. PVC casing to a depth of 380' below LSD. Six (6") inch PVC casing was set (+5' to 380' below LSD) and cement-grouted to 3' below LSD. A 6" dia. nominal borehole was drilled out of the 6" dia. PVC casing, using reverse-air drilling techniques, to a total depth of 504' below LSD.

The temporary upper Tampa observation well was cement-plugged from bottom (504' below LSD) to 3' below LSD following completion of the aquifer test. The 6" and 10" dia. PVC casings of the upper Tampa and Suwannee observation wells were cut off 3' below LSD. Fill dirt was used to cover the 3' depressions.

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TABLE 1 Summary of Hydraulic Parameters determined from the Upper Floridan Aquifer System (Upper Tampa Zone)

WELL	METHOD OF ANALYSIS	TRANSMISSIVITY (FT^2/DAY)	STORAGE COEFFICIENT	LEAKANCE COEFFICIENT
Upper Tampa Monitor (Pumped Well) (Pumping)	Walton Jacob	26,358 gpd/ft 18,512 gpd/ft		
Upper Tampa Monitor (Pumped Well) (Recovery)	Walton Jacob	26,358 gpd/ft 24,583 gpd/ft		
Upper Tampa Observation Well (Pumping)	Walton Jacob	13,873 gpd/ft 19,908 gpd/ft	1.43×10^{-4} 1.15×10^{-5}	3.46×10^{-2}
Upper Tampa Observation Well (Recovery)	Walton Jacob	13,179 gpd/ft 19,094 gpd/ft	1.63×10^{-3} 1.1×10^{-5}	3.28×10^{-2}

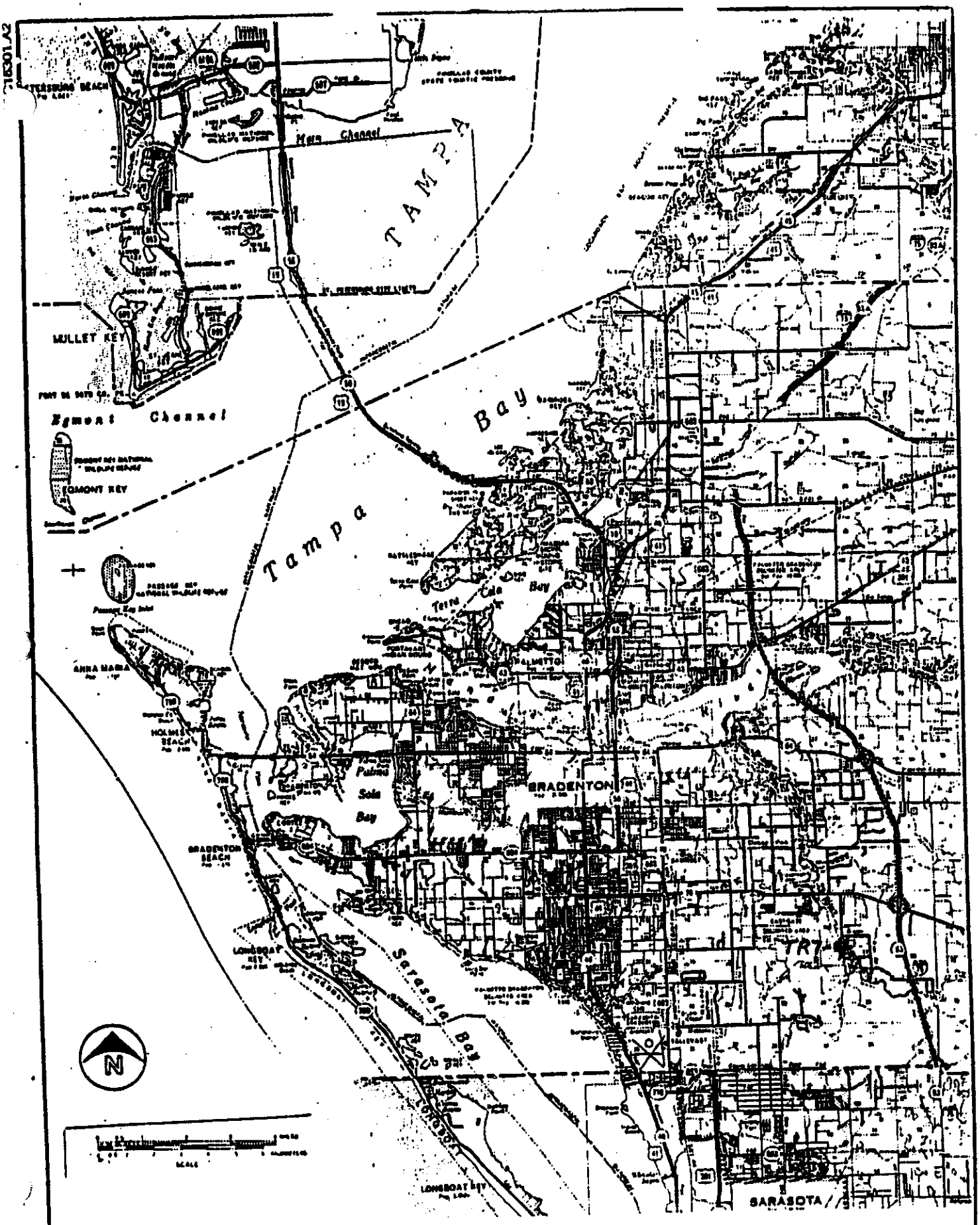
TAMPA
Bay
Tampa
Hunn Channel
Egmont Channel
MULLET KEY
EGMONT KEY
ANNA MARIA
HOLMES BEACH
BRADENTON BEACH
LONGBOAT KEY
Palma Sola Bay
BRADENTON
SARASOTA
Sarasota Bay
N

FIGURE /

7-16-86

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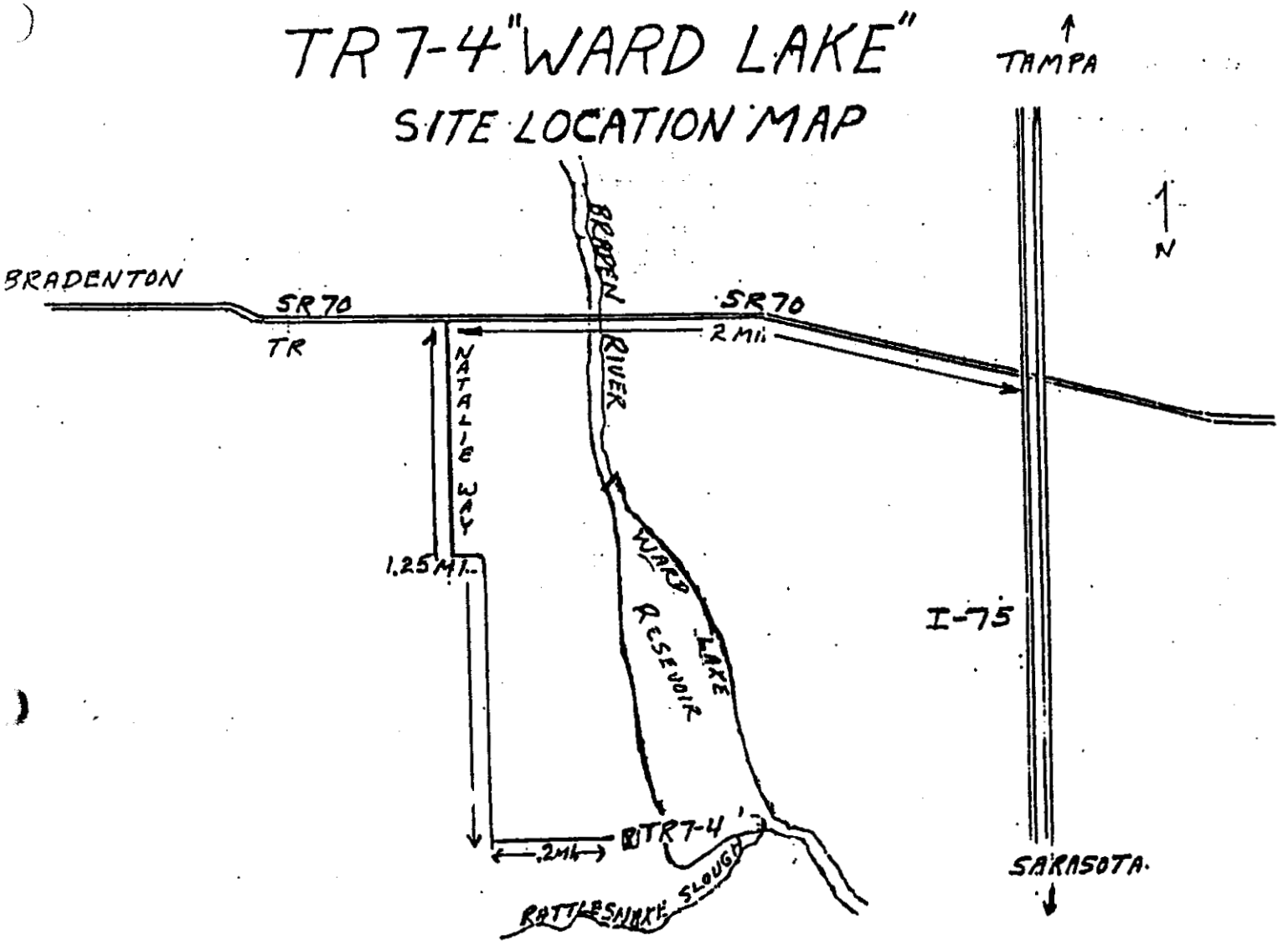
TR 7-4 "WARD LAKE"

SITE LOCATION MAP



SITE SURVEY MAP

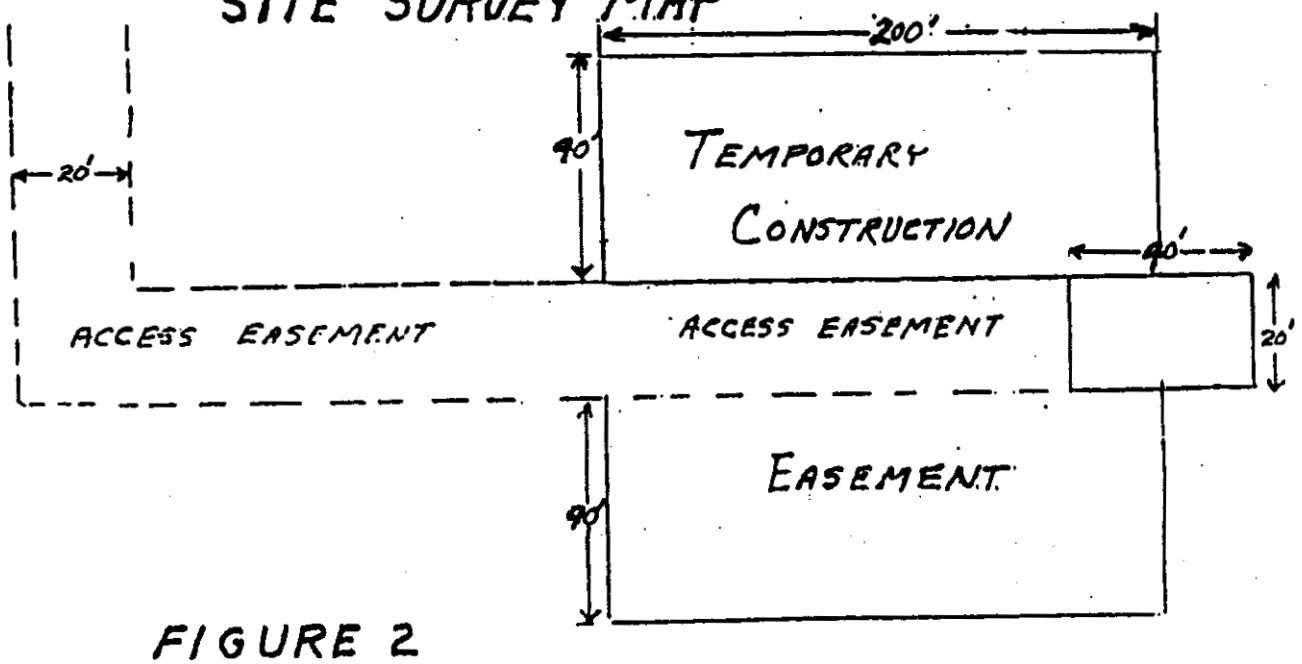


FIGURE 2

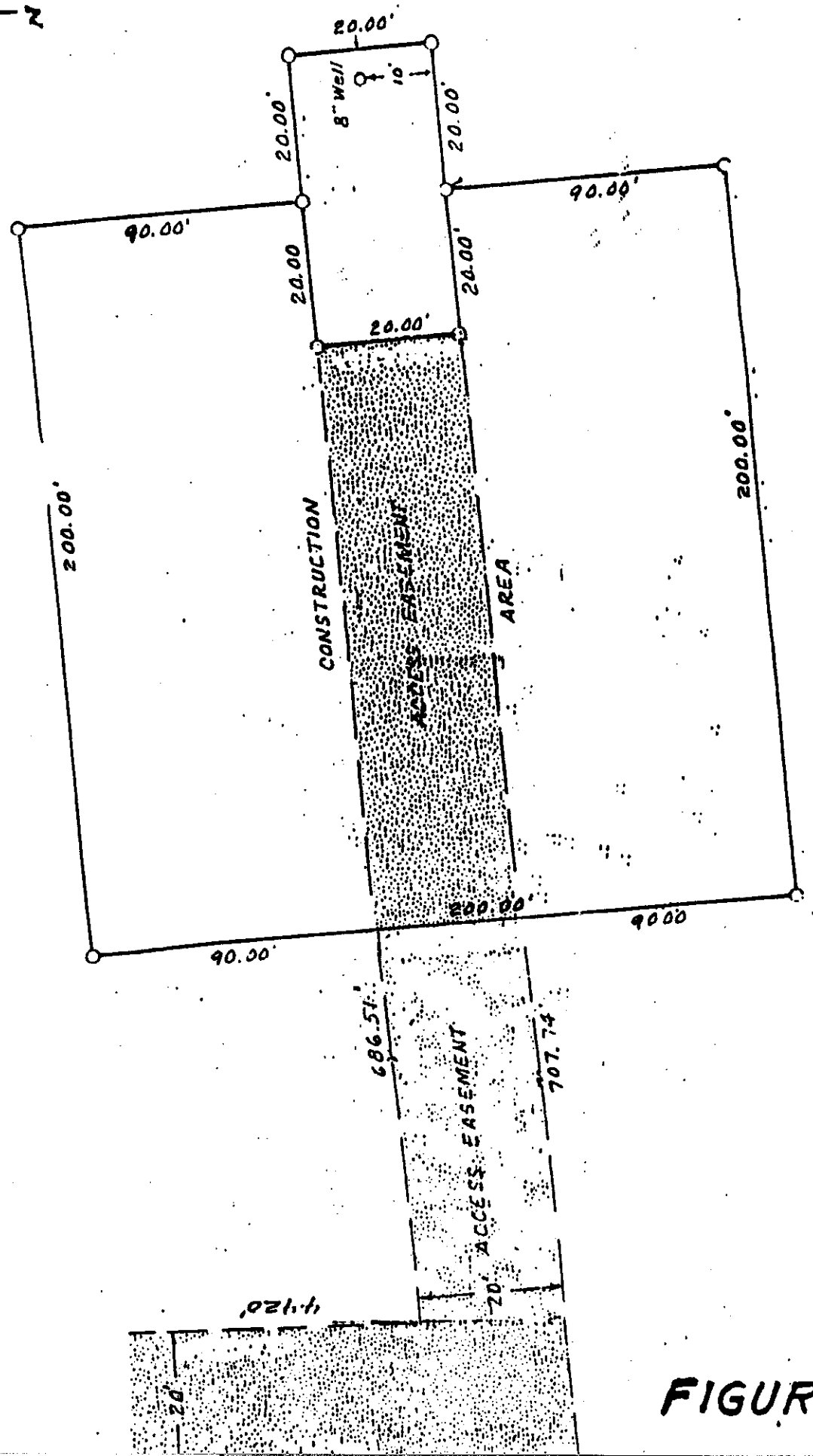

N
20.00'
8" Well
10'
20.00'
20.00'
90.00'
90.00'
20.00'
20.00'
20.00'
200.00'
200.00'
CONSTRUCTION
ACCESS EASEMENT
AREA
200.00'
90.00'
90.00'
686.51'
707.74'
ACCESS EASEMENT
20'
1,120'
20'

FIGURE 3

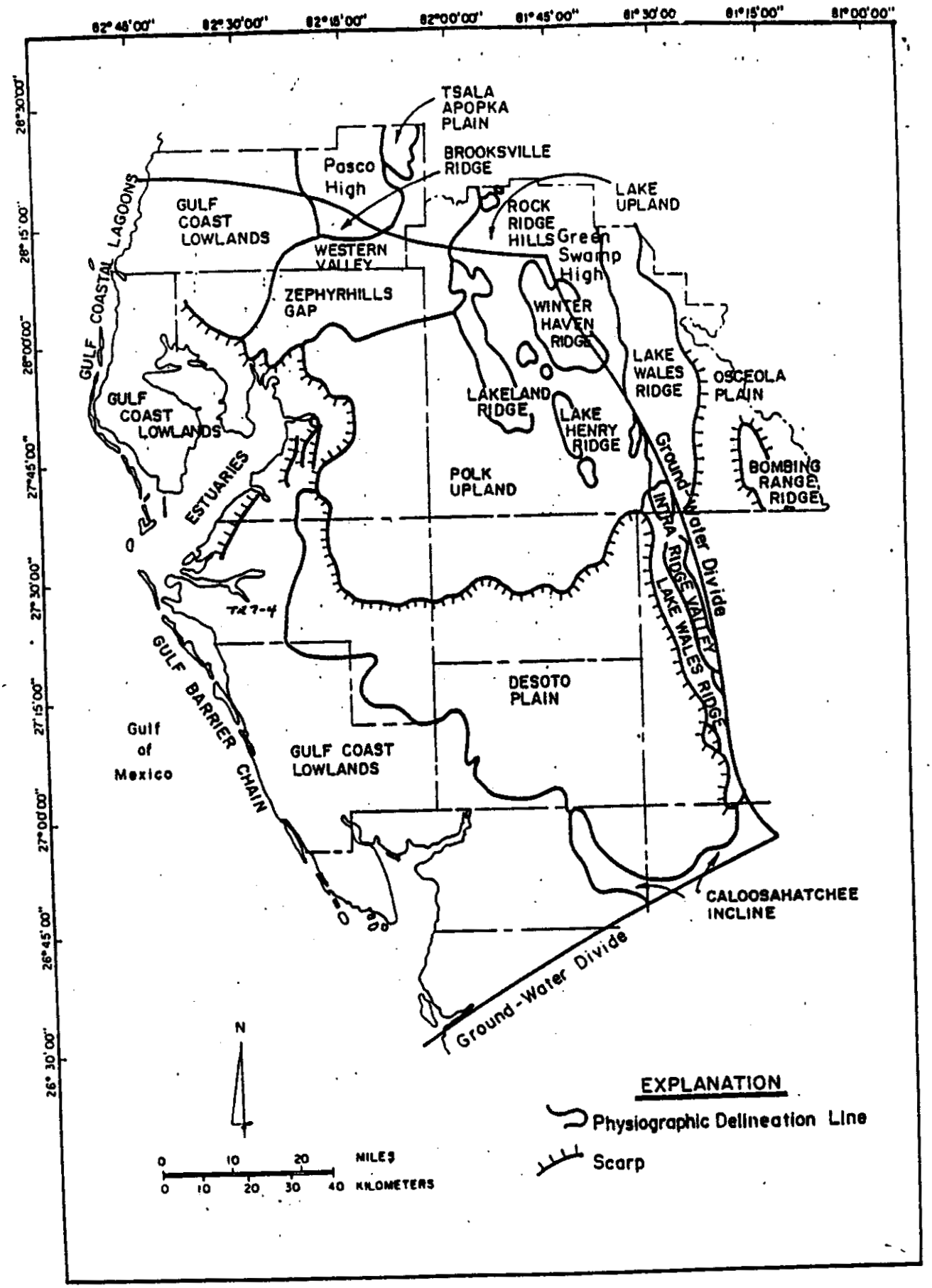


Figure 4 Physiographic map of the Southern West-Central Florida Ground-Water Basin (modified from White, 1970)

TR - 4 WARD LAK
WELL PLACEMENT DIAGRAM

11-14-89

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PUMP TEST

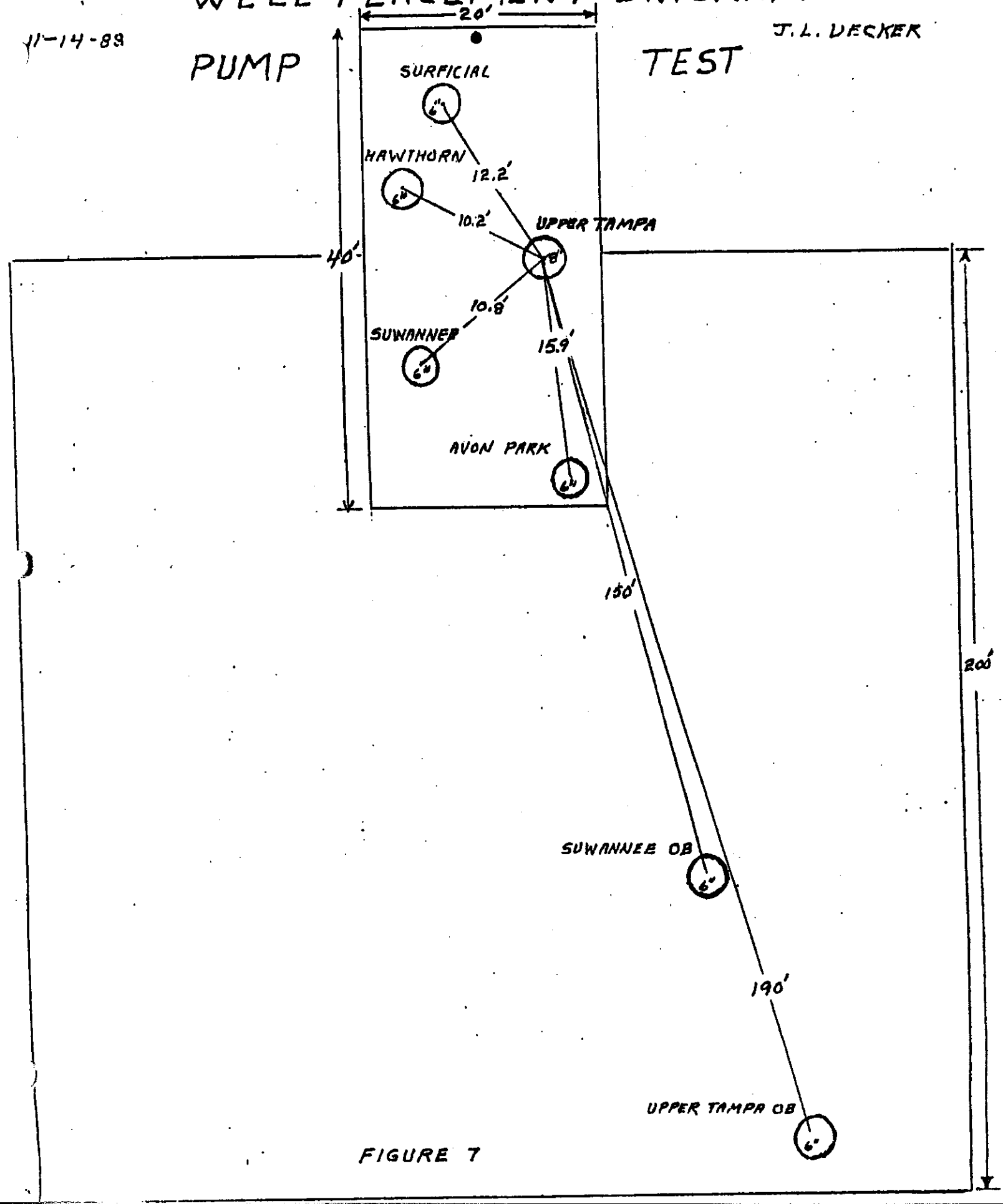
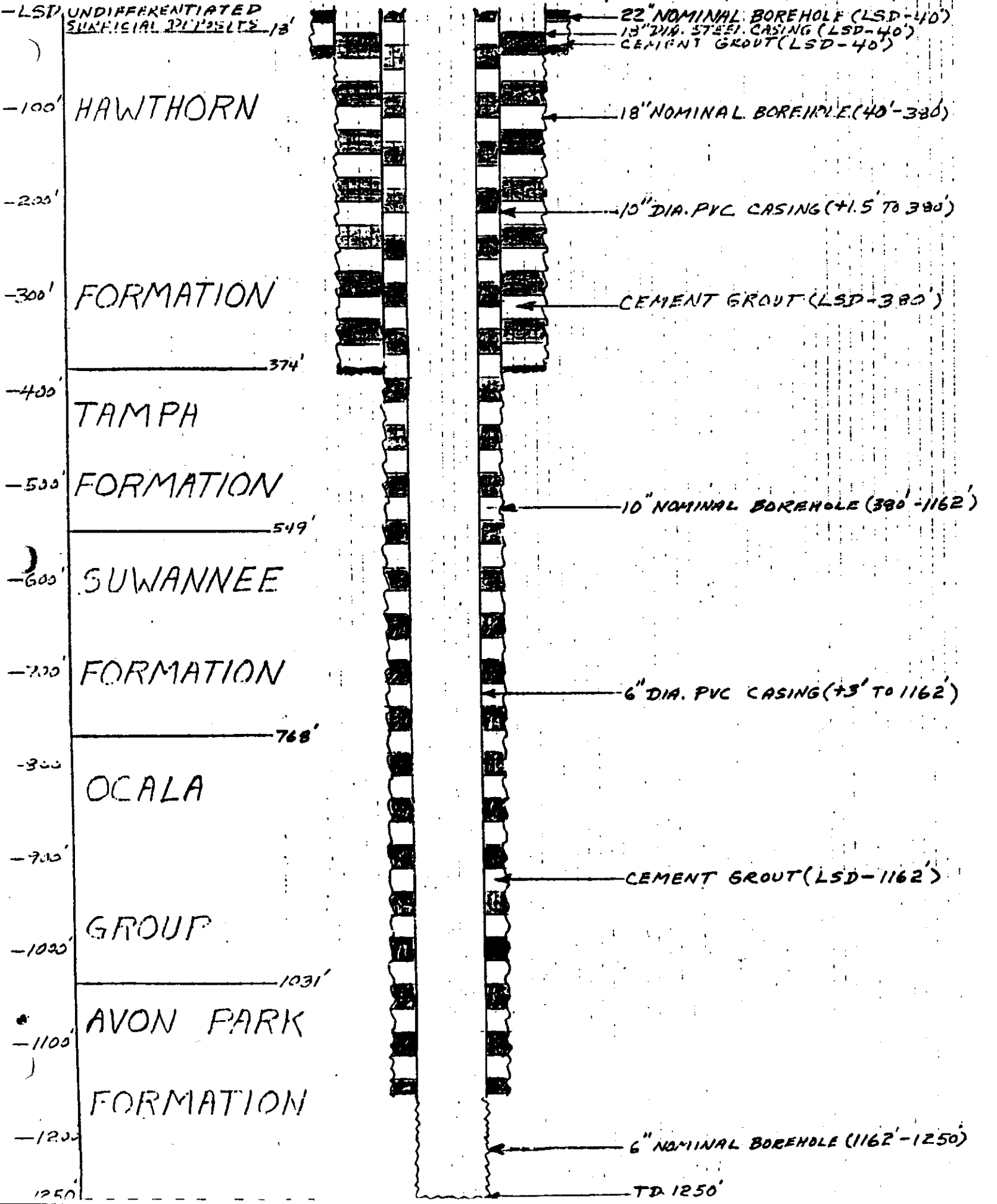


FIGURE 7

AVON PARK MONITOR
AS BUILT -- FLORIDAN AQUIFER SYSTEM



6- -88

TR 7-4 "WARD LAKE" J.L. DECKER

SUWANNEE MONITOR-UPPER FLORIDAN AQUIFER

"AS BUILT"

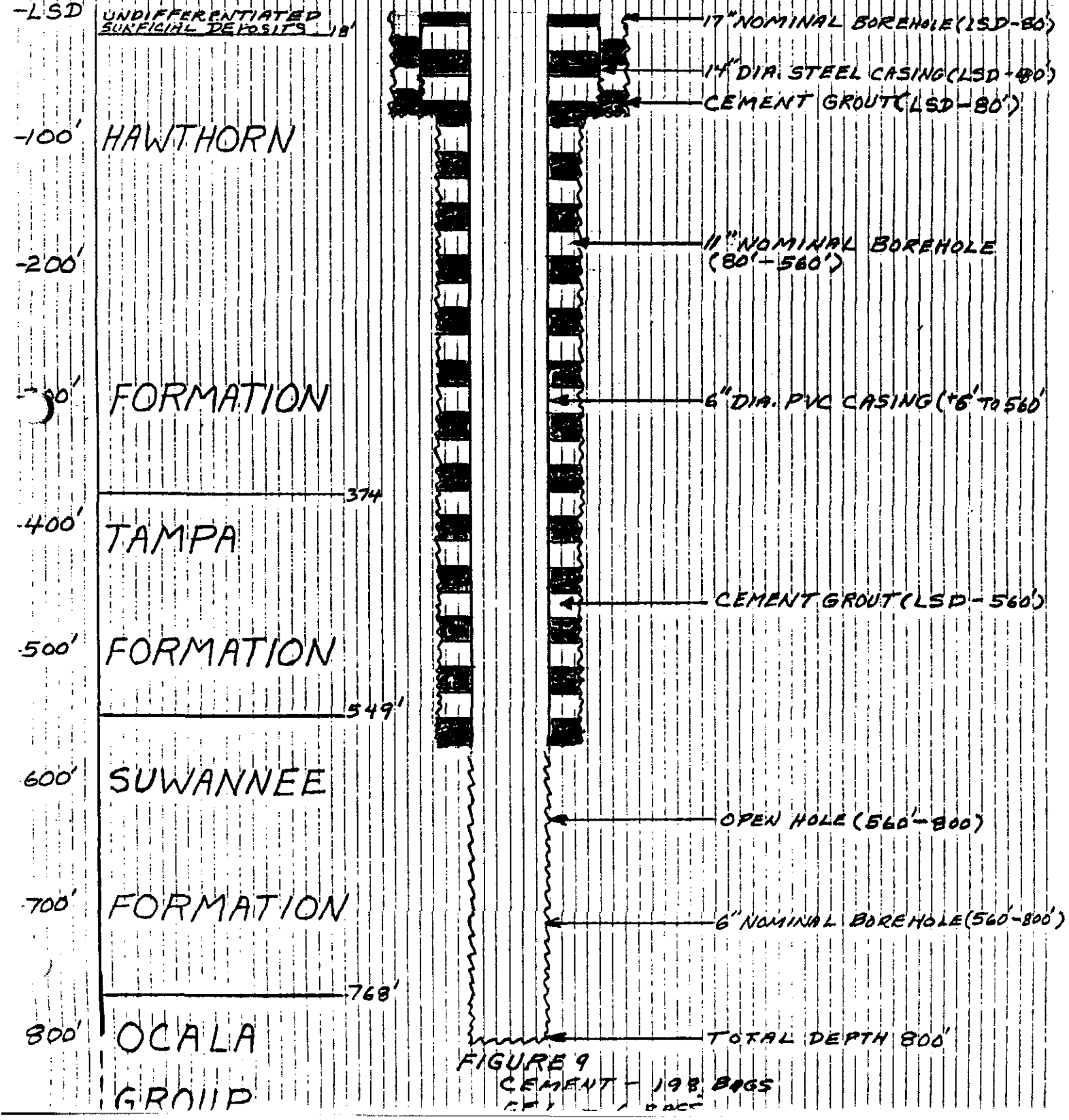


FIGURE 9

CEMENT - 198 BAGS

6-24-88 TR7-4 "WARD LAKE" J.L. DECKER

UPPER TAMPA MONITOR - UPPER FLORIDAN AQUIFER

"AS BUILT"

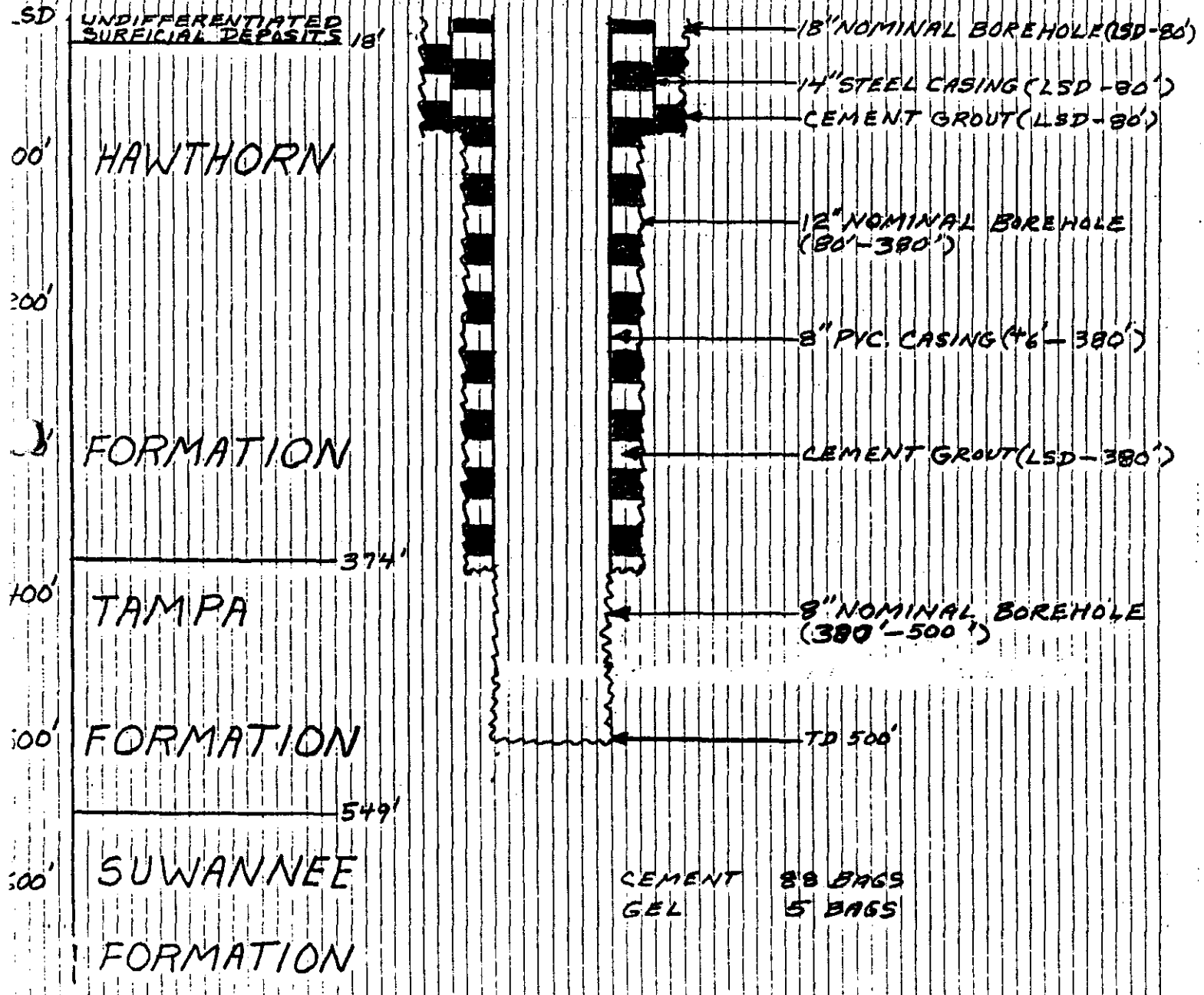


FIGURE 10

8-8-88
27-88

TR 7-4 "WARD LAKE"

J. L. DECKER

HAWTHORN MONITOR-INTERMEDIATE AQUIFER

AS BUILT

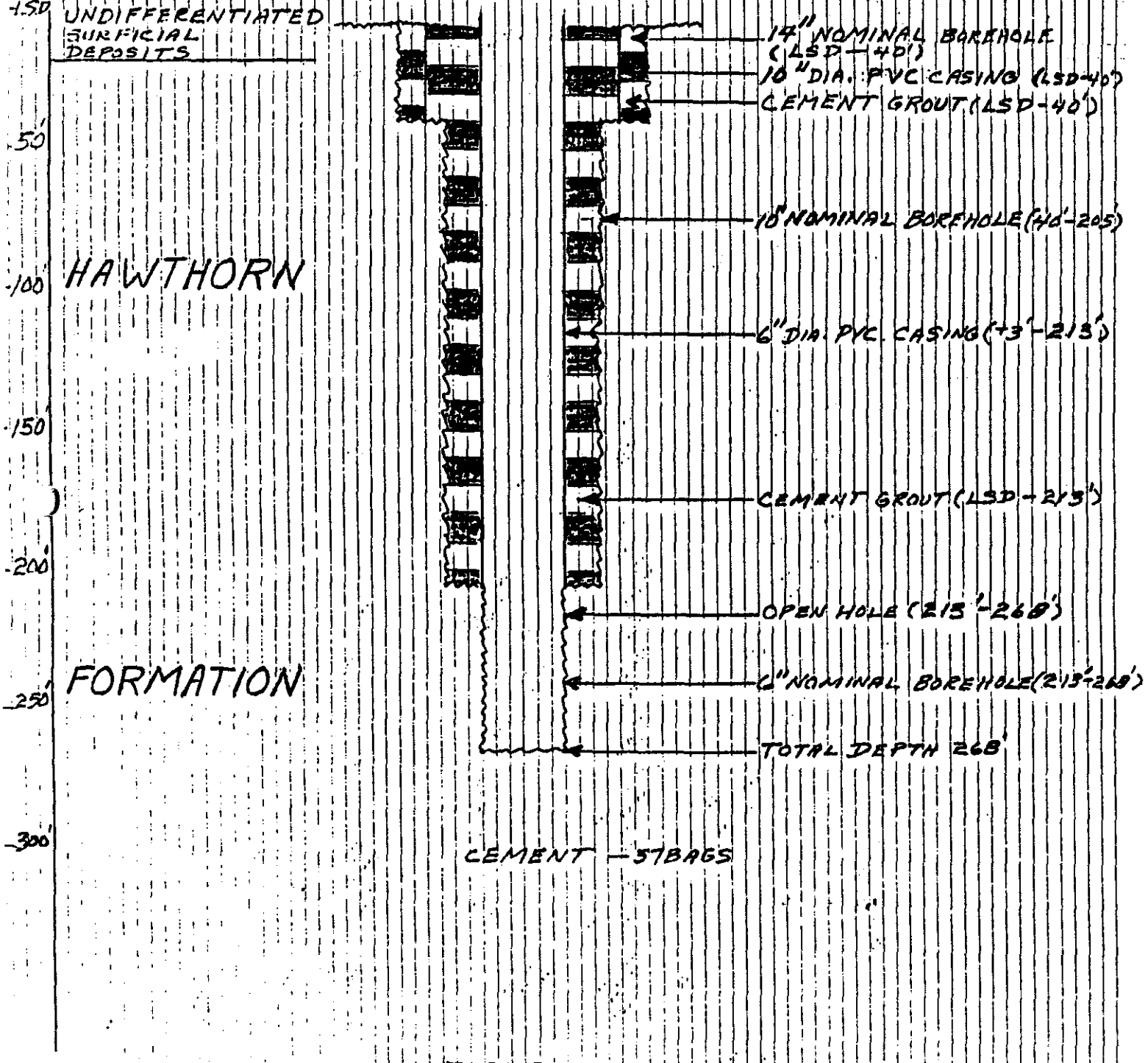


FIGURE II

6-6-88

TR 7-4 "WARD LAKE" SURFICIAL MONITOR AS BUILT

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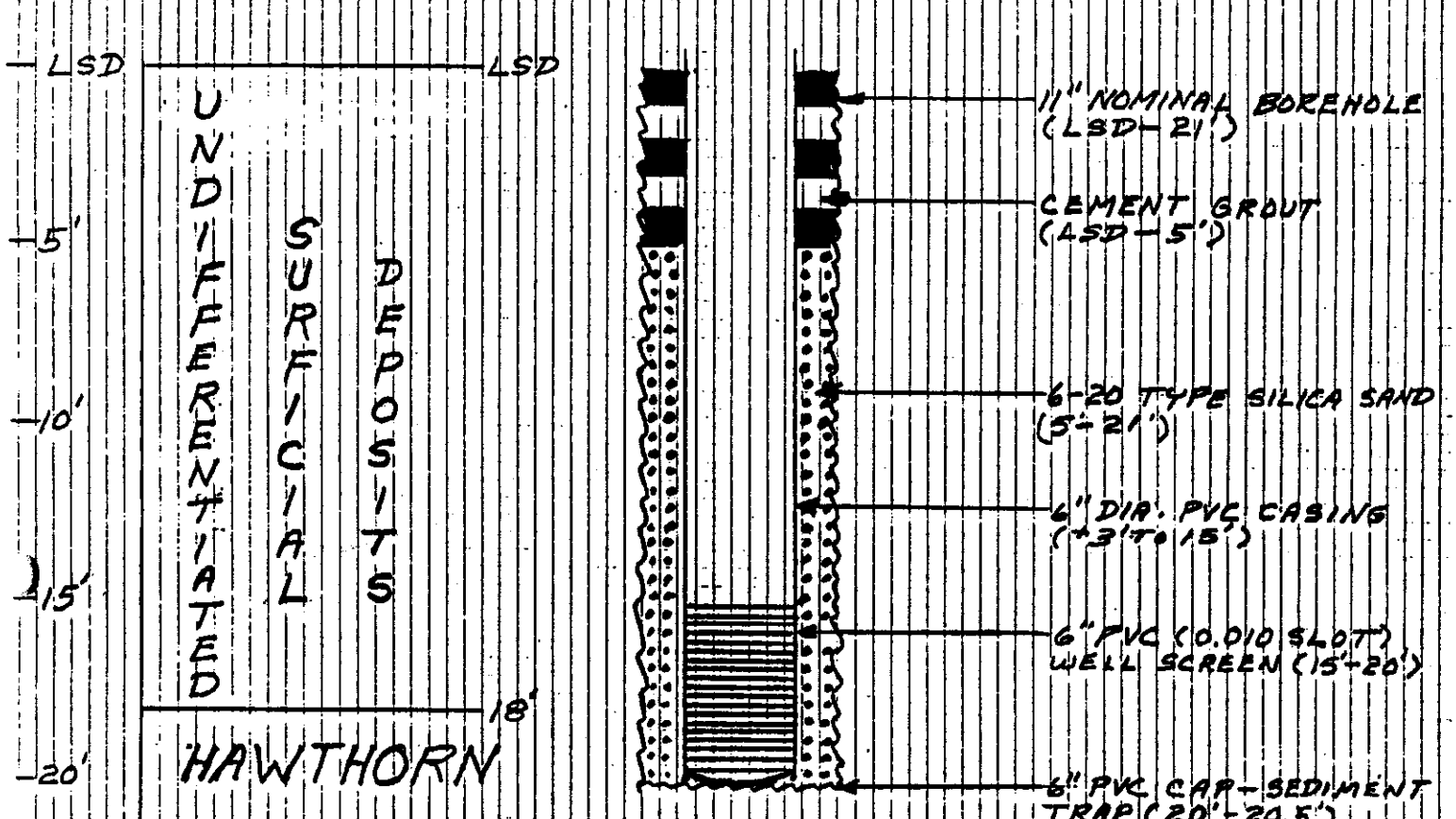


CEMENT 3 BAGS
SILICA SAND 16 BAGS

FIGURE 12

9-9-88

TR 7-4 WARD LAKE" J.L. DECKER

SUWANNEE OBSERVATION WELL
UPPER FLORIDAN AQUIFER

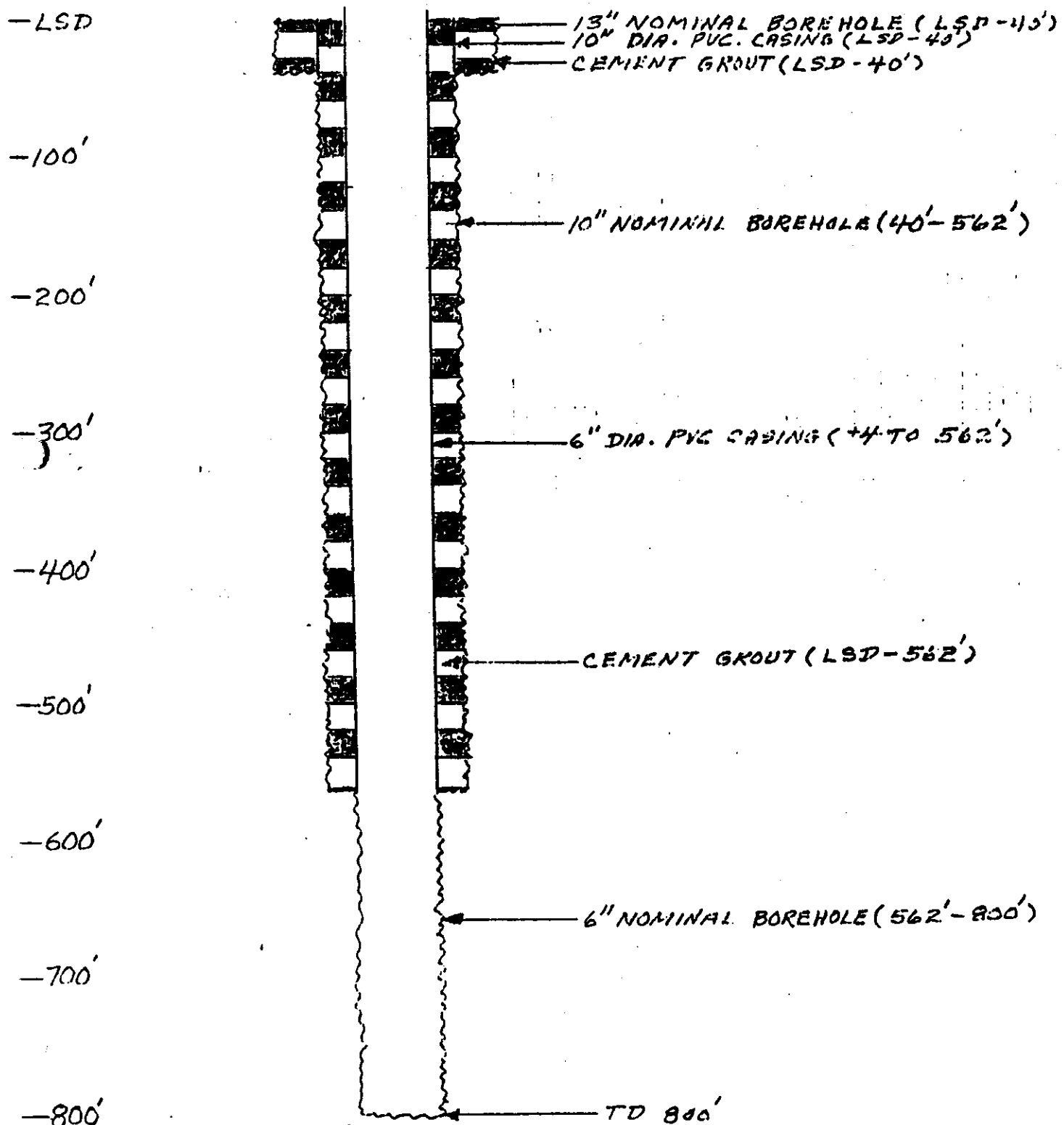


FIGURE 13

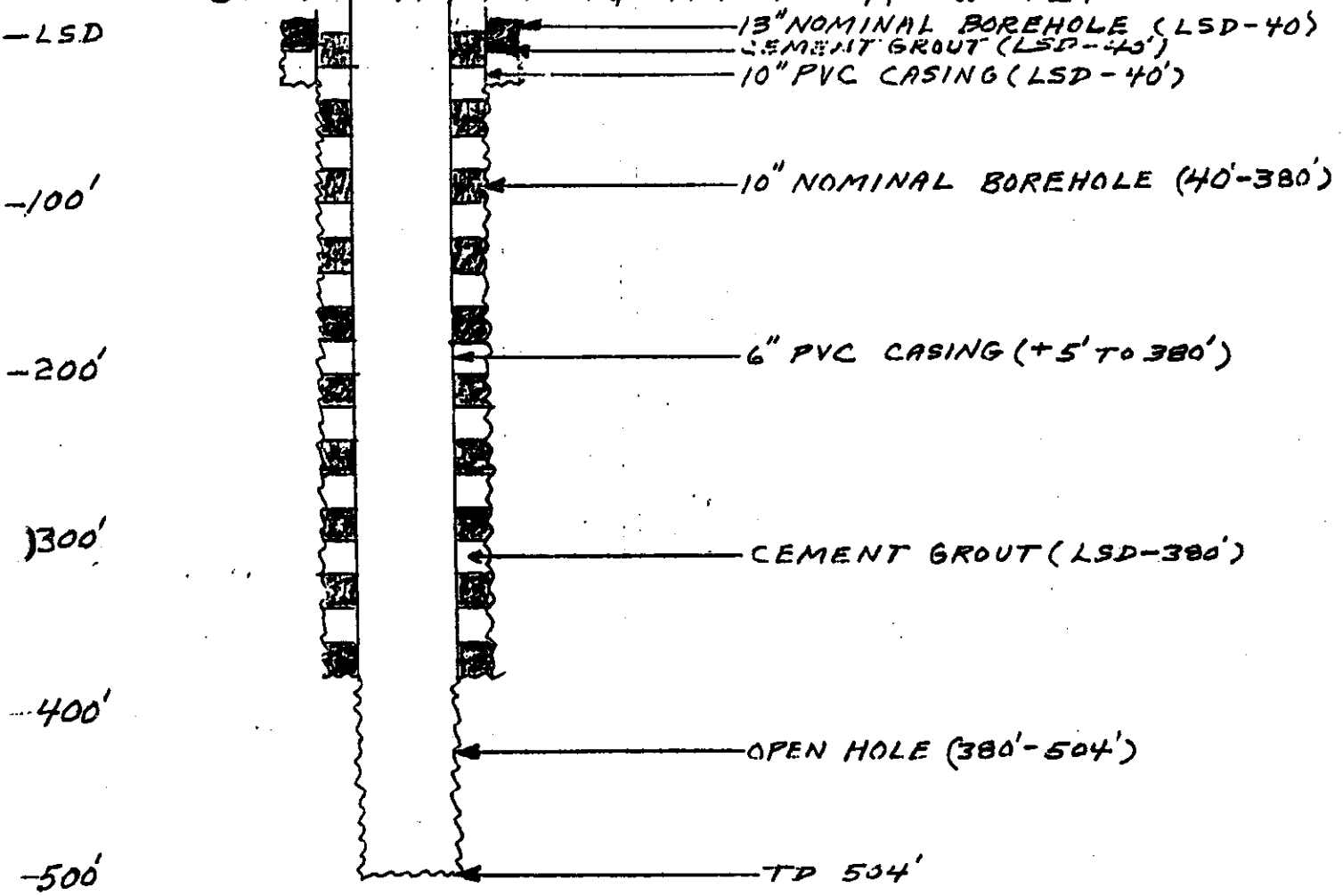
LSD-40' 20 BAGS OF CEMENT

LSD-562' 92 BAGS OF CEMENT

10-2-89 TR 7-4 "WARD LAKE" J.L. DECKER

UPPER TAMPA OBSERVATION WELL

UPPER TAMPA AQUIFER--AS BUILT



CEMENT BAGS - 43

SLURRY GAL 833

FIGURE 14

9-8-88

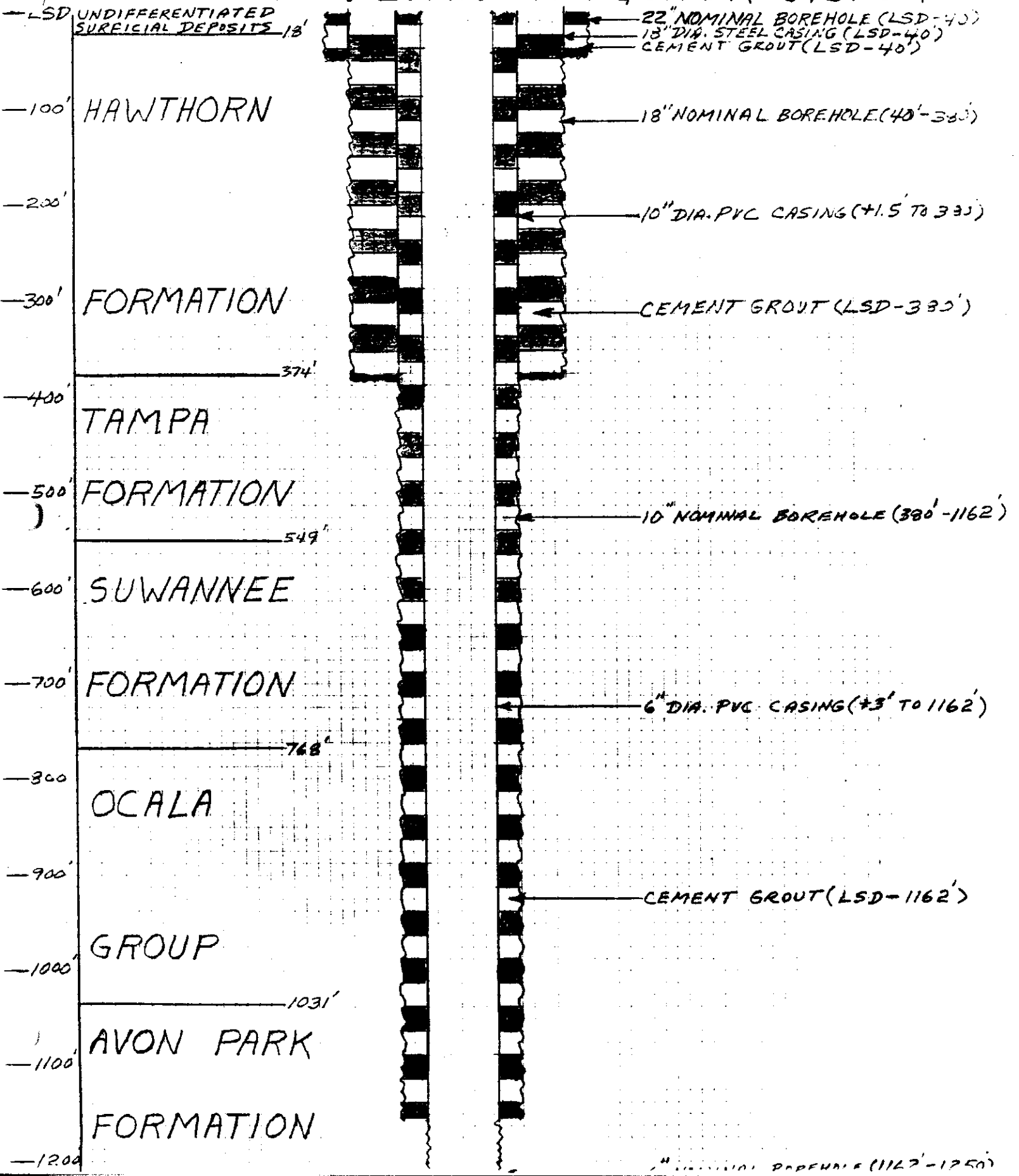
TR 7-4 "WARD L. KE"

J.L. DECKER

AVON PARK MONITOR

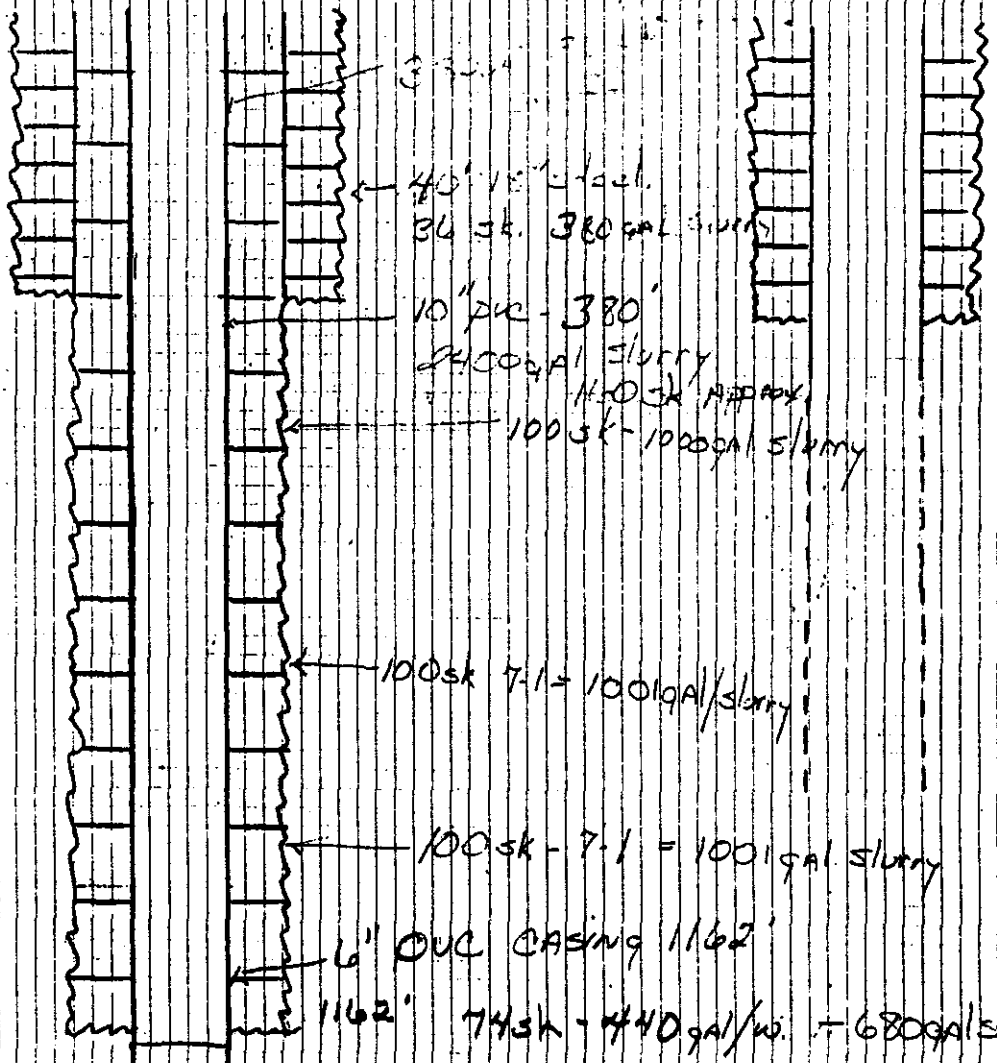
FLORIDAN AQUIFER SYSTEM

AS BUILT



MONITOR WELL DESIGN DIAGRAM R20

Lower Floridan



		Slurry (Cement)
40	18" steel	380 - 36 sk.
380	10" PVC -	2400 gal 140 sk
1162	6" PVC -	3823 gal 440 sk
1582' casing		6603 gal 606 sk

T.A. Lott
Speed Star

LITHOLOGIC WELL LOG PRINTOUT SOURCE - FGS

WELL NUMBER: W- 30024 COUNTY - MANATEE
TOTAL DEPTH: 1250 FT. LOCATION: T.35S R.18E S.22 C
SAMPLES - NONE LAT = N 27D 25M 39
LON = W 82D 29M 20
COMPLETION DATE - 01/14/88 ELEVATION - 015 FT
OTHER TYPES OF LOGS AVAILABLE - CALIPER, TEMPERATURE, GAMMA, ELECTRIC

OWNER/DRILLER: ROMP TR7-4 "WARD LAKE"; SWFWMD; CORED BY L. H. JOHNSON;

WORKED BY: J.L. DECKER, HOLLOW-STEM AUGER(LSD-13 FEET BELOW LSD.
DRILL CUTTINGS(13-38); WIRELINE CORE(38-1110 FEET); DRILL CUTTINGS(1110-1250).

0. -	18.	090UDSC	UNDIFFERENTIATED SAND AND CLAY
18. -	374. 549	122HTRN	HAWTHORN FM.
374. -	549.	122TAMP	TAMPA LIMESTONE
549. -	768.	123SWNN	SUWANNEE LIMESTONE
768. -	1031.	124OCAL	OCALA GROUP
1031. -	1250TD.	124AVPK	AVON PARK LIMESTONE

0 - .6 SAND; MODERATE LIGHT GRAY TO MODERATE GRAY; 25% POROSITY, INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: FINE; RANGE: VERY FINE TO FINE;
ROUNDNESS: SUB-ANGULAR TO ANGULAR; MEDIUM SPHERICITY; UNCONSOLIDATED;
CEMENT TYPE(S): ORGANIC MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: PLANT REMAINS-30%;
OTHER FEATURES: FROSTED;
FOSSILS: PLANT REMAINS;

.6- 3 SAND; VERY LIGHT GRAY TO DARK GRAY; 23% POROSITY, INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: FINE; RANGE: VERY FINE TO MEDIUM;
ROUNDNESS: SUB-ANGULAR TO ANGULAR; MEDIUM SPHERICITY; UNCONSOLIDATED;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: PLANT REMAINS-08%;
FOSSILS: PLANT REMAINS;

3 - 5.2 SAND; GREENISH BLACK TO MODERATE OLIVE BROWN; 21% POROSITY, INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: FINE; RANGE: VERY FINE TO FINE;
ROUNDNESS: SUB-ANGULAR TO ANGULAR; MEDIUM SPHERICITY; UNCONSOLIDATED;
CEMENT TYPE(S): CLAY MATRIX, ORGANIC MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: PLANT REMAINS-15%, CLAY-05%;
OTHER FEATURES: FROSTED;
FOSSILS: PLANT REMAINS;

5.2- 8 SAND; YELLOWISH GRAY TO LIGHT GRAYISH GREEN; 24% POROSITY, INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: FINE; RANGE: VERY FINE TO FINE;
ROUNDNESS: SUB-ANGULAR TO ANGULAR; MEDIUM SPHERICITY; UNCONSOLIDATED;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: HEAVY MINERALS-01%, PHOSPHATIC SAND-01%, PLANT REMAINS- %;
OTHER FEATURES: FROSTED;
FOSSILS: PLANT REMAINS;

8 - 10.2 SAND; LIGHT OLIVE GRAY TO LIGHT GRAYISH GREEN; 20% POROSITY, INTERGRANULAR;
GRAIN SIZE: VERY FINE; RANGE: FINE TO VERY FINE;
ROUNDNESS: SUB-ANGULAR TO ANGULAR; MEDIUM SPHERICITY; UNCONSOLIDATED;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: CLAY-15%, PHOSPHATIC SAND-01%;
OTHER FEATURES: FROSTED;
FOSSILS: PLANT REMAINS;

10.2- 10.5 CLAY; GRAYISH GREEN; INTERGRANULAR, LOW PERMEABILITY; POOR INDURATION;
CEMENT TYPE(S): CLAY MATRIX, ORGANIC MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: QUARTZ SAND-45%, PHOSPHATIC SAND-01%;
FOSSILS: PLANT REMAINS;

10.5- 13 SAND; GRAYISH GREEN TO MODERATE YELLOWISH GREEN; 20% POROSITY, INTERGRANULAR;
GRAIN SIZE: VERY FINE; RANGE: VERY FINE TO FINE;
ROUNDNESS: SUB-ANGULAR TO ANGULAR; MEDIUM SPHERICITY; UNCONSOLIDATED;
CEMENT TYPE(S): CLAY MATRIX, ORGANIC MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: CLAY-25%, PHOSPHATIC SAND-03%, PHOSPHATIC GRAVEL-03%;
OTHER FEATURES: FROSTED;
FOSSILS: PLANT REMAINS;

13 - 18 SAND; LIGHT OLIVE GRAY TO GRAYISH GREEN; 18% POROSITY, INTERGRANULAR;
GRAIN SIZE: FINE; RANGE: VERY FINE TO MEDIUM;
ROUNDNESS: SUB-ANGULAR TO ANGULAR; MEDIUM SPHERICITY; POOR INDURATION;
CEMENT TYPE(S): CLAY MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: PHOSPHATIC GRAVEL-03%, PHOSPHATIC SAND-15%, IRON STAIN- %, CLAY-10%;
OTHER FEATURES: FROSTED;
UNDIFFERENTIATED SANDS--HAWTHORN FORMATION CONTACT.

18 - 21 SAND; LIGHT OLIVE GRAY TO DARK RED PURPLE; INTERGRANULAR;
GRAIN SIZE: FINE; RANGE: VERY FINE TO MEDIUM;
ROUNDNESS: SUB-ANGULAR TO ANGULAR; MEDIUM SPHERICITY; POOR INDURATION;
CEMENT TYPE(S): CLAY MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: CALCILUTITE-10%, PHOSPHATIC GRAVEL-05%, PHOSPHATIC SAND-18%, CLAY-25%;
OTHER FEATURES: FROSTED;

21 - 23 CLAY; LIGHT GRAYISH GREEN TO MODERATE GREENISH YELLOW; INTERGRANULAR, LOW PERMEABILITY;
MODERATE INDURATION;
CEMENT TYPE(S): CLAY MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: CALCILUTITE-01%, PHOSPHATIC GRAVEL-02%, PHOSPHATIC SAND-13%,
QUARTZ SAND-10%;
OTHER FEATURES: PLASTIC;

23 - 31 CLAY; MODERATE GREENISH YELLOW TO GRAYISH GREEN; INTERGRANULAR, LOW PERMEABILITY;
MODERATE INDURATION;
CEMENT TYPE(S): CLAY MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: QUARTZ SAND-15%, CALCILUTITE- %, PHOSPHATIC GRAVEL-04%,
PHOSPHATIC SAND-18%;
OTHER FEATURES: PLASTIC;

31 - 33 LIMESTONE; YELLOWISH GRAY; 12% POROSITY, INTERGRANULAR, LOW PERMEABILITY;
GRAIN TYPE: CALCILUTITE;
GRAIN SIZE: FINE; MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, CLAY MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: CLAY-40%;

33 - 38 CLAY; MODERATE YELLOWISH GREEN TO GRAYISH GREEN; INTERGRANULAR, LOW PERMEABILITY;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, CLAY MATRIX, IRON CEMENT;
ACCESSORY MINERALS: LIMESTONE-30%, QUARTZ SAND-08%, PHOSPHATIC SAND-10%, SILT- %;
OTHER FEATURES: PLASTIC;

38 - 49.1 CLAY; MODERATE YELLOWISH GREEN TO LIGHT OLIVE; INTERGRANULAR, LOW PERMEABILITY;
POOR INDURATION;
CEMENT TYPE(S): CLAY MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: QUARTZ SAND- %, SILT- %;
OTHER FEATURES: MUDDY, CALCAREOUS;

49.1- 50.7 DOLO-SILT; GREENISH GRAY TO LIGHT GRAYISH GREEN; INTERGRANULAR, LOW PERMEABILITY,
PIN POINT VUGS; MODERATE INDURATION;
CEMENT TYPE(S): CLAY MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: CLAY- %, PLANT REMAINS- %, SILT- %;
OTHER FEATURES: MUDDY, DOLOMITIC;
FOSSILS: FOSSIL MOLDS, FOSSIL FRAGMENTS;

50.7- 52 CLAY; MODERATE YELLOWISH GREEN; INTERGRANULAR, LOW PERMEABILITY; POOR INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, CLAY MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: SILT- %;
OTHER FEATURES: DOLOMITIC, WEATHERED, MUDDY;

52 - 55.9 LIMESTONE; YELLOWISH GRAY; 06% POROSITY, INTERGRANULAR, LOW PERMEABILITY, PIN POINT VUGS;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELTAL CAST;
GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: PHOSPHATIC SAND- %, QUARTZ SAND- %;
OTHER FEATURES: DOLOMITIC, SPECKLED;
FOSSILS: MOLLUSKS, FOSSIL FRAGMENTS, FOSSIL MOLDS;

55.9- 62.5 DOLO-SILT; LIGHT OLIVE GRAY TO LIGHT GRAYISH GREEN; 06% POROSITY, INTERGRANULAR, LOW PERMEABILITY, PIN POINT VUGS; GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MOTTLED, INTERBEDDED,
ACCESSORY MINERALS: PHOSPHATIC SAND- %, SILT- %, CLAY- %, QUARTZ SAND- %;
OTHER FEATURES: DOLOMITIC;
FOSSILS: FOSSIL MOLDS, ORGANICS, WORM TRACES;

62.5- 64 CLAY; MODERATE BROWN TO LIGHT OLIVE GRAY; INTERGRANULAR, LOW PERMEABILITY; POOR INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: INTERBEDDED,

64 - 65.5 DOLOMITE; GRAYISH BROWN TO GREENISH GRAY; 04% POROSITY, INTERGRANULAR, LOW PERMEABILITY, PIN POINT VUGS; 50-90% ALTERED; ANHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; RANGE: VERY FINE TO MICROCRYSTALLINE; GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED, MOTTLED, BRECCIATED, LAMINATED,
ACCESSORY MINERALS: PHOSPHATIC SAND- %, PHOSPHATIC GRAVEL- %;
OTHER FEATURES: DOLOMITIC;

65.5- 67.7 DOLOMITE; MODERATE LIGHT GRAY; 01% POROSITY, INTERGRANULAR, LOW PERMEABILITY, INTRAGRANULAR; 50-90% ALTERED; ANHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: INTERBEDDED,

67.7- 69 DOLO-SILT; GREENISH GRAY TO DARK GREENISH GRAY; 08% POROSITY, INTERGRANULAR, LOW PERMEABILITY, VUGULAR; GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: PHOSPHATIC SAND- %, CLAY- %;
OTHER FEATURES: DOLOMITIC, GRANULAR;

69 - 71.5 DOLOMITE; YELLOWISH GRAY TO MODERATE BLUISH GRAY; 08% POROSITY, INTERGRANULAR, LOW PERMEABILITY, MOLDIC; 50-90% ALTERED; ANHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: INTERBEDDED, MOTTLED, BRECCIATED,
ACCESSORY MINERALS: PHOSPHATIC SAND- %, PHOSPHATIC GRAVEL- %, CLAY- %;
FOSSILS: FOSSIL MOLDS, WORM TRACES, FOSSIL FRAGMENTS;

71.5- 74 DOLOMITE; LIGHT GREENISH GRAY TO LIGHT BLUISH GRAY; 12% POROSITY, INTERGRANULAR,
LOW PERMEABILITY, MOLDIC; 50-90% ALTERED; ANHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: INTERBEDDED, MOTTLED, BRECCIATED, BIOTURBATED,
ACCESSORY MINERALS: PHOSPHATIC GRAVEL- %, PHOSPHATIC SAND- %;
OTHER FEATURES: DOLOMITIC;
FOSSILS: CORAL, BRYOZOA, MOLLUSKS, FOSSIL FRAGMENTS, FOSSIL MOLDS;

74 - 78.8 DOLOMITE; YELLOWISH GRAY TO LIGHT GREENISH GRAY; 12% POROSITY, INTERGRANULAR,
LOW PERMEABILITY, VUGULAR; 50-90% ALTERED; ANHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: INTERBEDDED, MOTTLED, BIOTURBATED,
ACCESSORY MINERALS: PHOSPHATIC GRAVEL- %, PHOSPHATIC SAND- %, CLAY- %;
OTHER FEATURES: DOLOMITIC;
FOSSILS: MILIOLIDS, FOSSIL FRAGMENTS, FOSSIL MOLDS;
GREEN CLAY-FILLED VUGS

78.8- 79 CLAY; LIGHT GREEN; INTERGRANULAR, LOW PERMEABILITY; MODERATE INDURATION;
CEMENT TYPE(S): CLAY MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: INTERBEDDED,

79 - 83.7 DOLOMITE; LIGHT GREENISH GRAY TO LIGHT OLIVE; 06% POROSITY, INTERCRYSTALLINE,
LOW PERMEABILITY, MOLDIC; 50-90% ALTERED; ANHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: INTERBEDDED,
OTHER FEATURES: DOLOMITIC;
FOSSILS: FOSSIL FRAGMENTS, FOSSIL MOLDS, WORM TRACES;

83.7- 86 CLAY; GREENISH GRAY TO LIGHT GREEN; INTERGRANULAR, LOW PERMEABILITY; POOR INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: DOLOMITE- %;
OTHER FEATURES: DOLOMITIC;
FOSSILS: NO FOSSILS;

86 - 91 CLAY; DARK GREENISH GRAY TO LIGHT OLIVE GRAY; INTERGRANULAR, LOW PERMEABILITY;
POOR INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE, LAMINATED,
ACCESSORY MINERALS: DOLOMITE- %;
OTHER FEATURES: DOLOMITIC, PLASTIC;
FOSSILS: NO FOSSILS;

91 - 94 CALCILUTITE; YELLOWISH GRAY TO LIGHT OLIVE GRAY; 03% POROSITY, INTERGRANULAR,
LOW PERMEABILITY;
GRAIN TYPE: CALCILUTITE;
MODERATE INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: MOTTLED,
ACCESSORY MINERALS: DOLOMITE- %, PHOSPHATIC SAND-01%, CLAY- %;
OTHER FEATURES: DOLOMITIC;
FOSSILS: NO FOSSILS;

94 - 95.6 CALCILUTITE; VERY LIGHT GRAY TO LIGHT GRAY; 03% POROSITY, INTERGRANULAR, LOW PERMEABILITY;
GRAIN TYPE: CALCILUTITE;
MODERATE INDURATION;
CEMENT TYPE(S): CLAY MATRIX;
SEDIMENTARY STRUCTURES: LAMINATED,
ACCESSORY MINERALS: CLAY- %, PHOSPHATIC SAND-01%;
OTHER FEATURES: CHALKY, SPECKLED;

95.6- 99 NO SAMPLES

99 - 105 DOLOMITE; YELLOWISH GRAY TO LIGHT OLIVE GRAY; 01% POROSITY,
LOW PERMEABILITY, MOLDIC; 50-90% ALTERED; ANHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; RANGE: CRYPTOCRYSTALLINE TO MICROCRYSTALLINE;
GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, CLAY MATRIX;
SEDIMENTARY STRUCTURES: LAMINATED, MOTTLED, BRECCIATED,
ACCESSORY MINERALS: CLAY-25%, PHOSPHATIC SAND-03%, PHOSPHATIC GRAVEL-01%;
OTHER FEATURES: SPECKLED;
FOSSILS: NO FOSSILS;

105 - 106.2 CALCILUTITE; YELLOWISH GRAY TO LIGHT OLIVE GRAY; 08% POROSITY, INTERGRANULAR, VUGULAR,
LOW PERMEABILITY;
GRAIN TYPE: CALCILUTITE;
GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: LAMINATED, MASSIVE,
ACCESSORY MINERALS: PHOSPHATIC SAND-03%, PHOSPHATIC GRAVEL-02%, CLAY-01%;
OTHER FEATURES: SPECKLED;
FOSSILS: FOSSIL MOLDS, FOSSIL FRAGMENTS;

106.2- 107.2 DOLOMITE; YELLOWISH GRAY TO LIGHT OLIVE GRAY; 05% POROSITY, INTERGRANULAR,
LOW PERMEABILITY, VUGULAR; 50-90% ALTERED;
POOR INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, CALCILUTITE MATRIX, CLAY MATRIX;
SEDIMENTARY STRUCTURES: LAMINATED,
ACCESSORY MINERALS: PHOSPHATIC SAND-01%, PHOSPHATIC GRAVEL-02%, CLAY- %, CHERT- %;
FOSSILS: NO FOSSILS;

107.2- 111 LIMESTONE; VERY LIGHT GRAY TO YELLOWISH GRAY; 10% POROSITY, INTERGRANULAR, MOLDIC,
LOW PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL;
GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: LAMINATED, MASSIVE,
ACCESSORY MINERALS: DOLOMITE-06%, PHOSPHATIC SAND-02%, QUARTZ- %;
OTHER FEATURES: VARIEGATED, SUCROSIC;
FOSSILS: FOSSIL MOLDS;

111 - 113.6 LIMESTONE; VERY LIGHT GRAY TO YELLOWISH GRAY; 03% POROSITY, INTERGRANULAR, LOW PERMEABILITY, VUGULAR;
GRAIN TYPE: CALCILUTITE;
GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: LAMINATED, MASSIVE,
ACCESSORY MINERALS: DOLOMITE-05%, PHOSPHATIC SAND-02%, CLAY-01%;
OTHER FEATURES: VARIEGATED;

113.6- 117.2 DOLOMITE; LIGHT GRAY TO MODERATE LIGHT GRAY; 12% POROSITY, INTERGRANULAR, LOW PERMEABILITY, MOLDIC; 50-90% ALTERED; ANHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; RANGE: CRYPTOCRYSTALLINE TO MICROCRYSTALLINE;
GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: LIMESTONE-40%, PHOSPHATIC SAND-01%;
OTHER FEATURES: VARIEGATED, SPECKLED;
FOSSILS: FOSSIL MOLDS;

117.2- 124 DOLOMITE; LIGHT GRAY TO MODERATE GRAY; 20% POROSITY, INTERGRANULAR, MOLDIC, POSSIBLY HIGH PERMEABILITY; 90-100% ALTERED; ANHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; RANGE: CRYPTOCRYSTALLINE TO MICROCRYSTALLINE;
GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: MOTTLED,
ACCESSORY MINERALS: LIMESTONE-05%, PHOSPHATIC SAND-01%;
OTHER FEATURES: COQUINA;
FOSSILS: MOLLUSKS, FOSSIL FRAGMENTS, FOSSIL MOLDS;

124 - 128.2 DOLOMITE; LIGHT GRAY TO MODERATE GRAY; 18% POROSITY, INTERGRANULAR, MOLDIC, POSSIBLY HIGH PERMEABILITY; 50-90% ALTERED; ANHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; RANGE: CRYPTOCRYSTALLINE TO MICROCRYSTALLINE;
GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: MOTTLED, BANDED, NODULAR,
ACCESSORY MINERALS: LIMESTONE-20%, PHOSPHATIC SAND-01%;
OTHER FEATURES: COQUINA;
FOSSILS: BRYOZOA, MOLLUSKS, FOSSIL FRAGMENTS, FOSSIL MOLDS;

128.2- 131 CALCILUTITE; VERY LIGHT GRAY TO LIGHT GRAY; 03% POROSITY, INTERGRANULAR, PIN POINT VUGS;
GRAIN TYPE: CALCILUTITE;
GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: LAMINATED, MASSIVE,
ACCESSORY MINERALS: DOLOMITE-10%, PHOSPHATIC SAND-01%;
OTHER FEATURES: CHALKY;
FOSSILS: NO FOSSILS;

131 - 134.8 DOLOMITE; MODERATE GRAY TO VERY LIGHT ORANGE; 18% POROSITY, INTERGRANULAR, VUGULAR; 50-90% ALTERED; ANHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; RANGE: CRYPTOCRYSTALLINE TO MICROCRYSTALLINE;
GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: MOTTLED, NODULAR,
ACCESSORY MINERALS: CALCILUTITE-10%, PHOSPHATIC GRAVEL-01%, PHOSPHATIC SAND-01%;
OTHER FEATURES: VARIEGATED, COQUINA;
FOSSILS: BRYOZOA, MOLLUSKS;

134.8- 135.3 DOLOMITE; LIGHT GRAY TO WHITE; 22% POROSITY, VUGULAR, MOLDIC, INTERGRANULAR; 10-50% ALTERED; ANHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; RANGE: CRYPTOCRYSTALLINE TO MICROCRYSTALLINE;
MODERATE INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MOTTLED,
ACCESSORY MINERALS: CALCILUTITE-50%;
OTHER FEATURES: VARIEGATED;
FOSSILS: BRYOZOA, MOLLUSKS, FOSSIL FRAGMENTS, FOSSIL MOLDS;

135.3- 139.6 DOLOMITE; WHITE TO VERY LIGHT GRAY; 05% POROSITY, INTERGRANULAR, PIN POINT VUGS, LOW PERMEABILITY; 10-50% ALTERED; ANHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; RANGE: CRYPTOCRYSTALLINE TO MICROCRYSTALLINE;
GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: PHOSPHATIC SAND-01%, CLAY-02%;
OTHER FEATURES: CHALKY;
FOSSILS: WORM TRACES;

139.6- 146.2 CALCILUTITE; LIGHT GRAY TO PINKISH GRAY; 08% POROSITY, INTERGRANULAR, PIN POINT VUGS, LOW PERMEABILITY;
GRAIN TYPE: CALCILUTITE, SKELETAL, INTRACLASTS;
GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE, MOTTLED, BIOTURBATED,
ACCESSORY MINERALS: PHOSPHATIC SAND-05%, QUARTZ SAND-08%, CHERT-02%, PHOSPHATIC GRAVEL- X;
OTHER FEATURES: CHALKY, CALCAREOUS, SPECKLED;
FOSSILS: FOSSIL FRAGMENTS;

146.2- 146.7 CALCILUTITE; WHITE TO OLIVE GRAY; 05% POROSITY, INTERGRANULAR;
GRAIN TYPE: CALCILUTITE;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, CLAY MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: NODULAR,
ACCESSORY MINERALS: QUARTZ SAND-25%, CLAY-15%, PHOSPHATIC SAND-02%;
OTHER FEATURES: CALCAREOUS;
FOSSILS: NO FOSSILS;

146.7- 147.9 LIMESTONE; YELLOWISH GRAY TO LIGHT OLIVE GRAY; 08% POROSITY, INTERGRANULAR, MOLDIC;
GRAIN TYPE: CALCILUTITE;
GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MOTTLED, NODULAR, BIOTURBATED,
ACCESSORY MINERALS: QUARTZ SAND-10%, CLAY-10%, PHOSPHATIC SAND-07%, PHOSPHATIC GRAVEL-01%;
FOSSILS: MOLLUSKS, FOSSIL MOLDS;

147.9- 148.4 CLAY; MODERATE LIGHT GRAY; 05% POROSITY, INTERGRANULAR; GOOD INDURATION;
CEMENT TYPE(S): CLAY MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: QUARTZ SAND-30%, PHOSPHATIC SAND-02%;
OTHER FEATURES: CALCAREOUS, PLASTIC;
FOSSILS: NO FOSSILS;

148.4- 150.2 CALCILUTITE; VERY LIGHT GRAY; 05% POROSITY, INTERGRANULAR, PIN POINT VUGS,
LOW PERMEABILITY;
GRAIN TYPE: CALCILUTITE, SKELETAL;
GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE, MOTTLED,
ACCESSORY MINERALS: PHOSPHATIC SAND-01%, CLAY-02%, DOLOMITE-40%;
OTHER FEATURES: CHALKY, SPECKLED;
FOSSILS: MOLLUSKS, FOSSIL FRAGMENTS;

150.2- 152.9 CLAY; YELLOWISH GRAY TO OLIVE GRAY; 05% POROSITY, INTERGRANULAR, LOW PERMEABILITY;
GOOD INDURATION;
CEMENT TYPE(S): CLAY MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: LAMINATED,
ACCESSORY MINERALS: LIMESTONE-10%;
OTHER FEATURES: COQUINA;
FOSSILS: NO FOSSILS;

152.9- 156.7 CALCILUTITE; YELLOWISH GRAY TO LIGHT OLIVE GRAY; 08% POROSITY, INTERGRANULAR,
LOW PERMEABILITY, PIN POINT VUGS;
GRAIN TYPE: CALCILUTITE;
GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: BIOTURBATED,
ACCESSORY MINERALS: CLAY-10%, QUARTZ SAND-01%, PHOSPHATIC SAND-20%;
OTHER FEATURES: SPECKLED, VARIEGATED;
FOSSILS: NO FOSSILS;

156.7- 159 CLAY; OLIVE GRAY; 05% POROSITY, INTERGRANULAR, LOW PERMEABILITY; MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, CLAY MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE;
ACCESSORY MINERALS: PHOSPHATIC SAND-30%, CALCILUTITE- %;
OTHER FEATURES: CALCAREOUS, SPECKLED;

159 - 163.8 CALCILUTITE; LIGHT GRAY TO YELLOWISH GRAY; 10% POROSITY, INTERGRANULAR, MOLDIC;
GRAIN TYPE: BIOGENIC, SKELETAL, CALCILUTITE;
GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
ACCESSORY MINERALS: PHOSPHATIC SAND-03%;
OTHER FEATURES: SPECKLED, COQUINA;
FOSSILS: BARNACLES;

163.8- 164.2 DOLOMITE; VERY LIGHT GRAY TO LIGHT GRAY; 05% POROSITY, INTERGRANULAR,
LOW PERMEABILITY; 50-90% ALTERED; ANHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; RANGE: CRYPTOCRYSTALLINE TO MICROCRYSTALLINE;
GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: MOTTLED, STREAKED,
ACCESSORY MINERALS: PHOSPHATIC SAND-01%, CHERT- %;
FOSSILS: BARNACLES, FOSSIL MOLDS, FOSSIL FRAGMENTS;

164.2- 166.1 CALCILUTITE; LIGHT GRAY TO LIGHT OLIVE GRAY; 05% POROSITY, INTERGRANULAR, LOW PERMEABILITY,
MOLDIC;
GRAIN TYPE: BIOGENIC, SKELETAL, CALCILUTITE;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT, CLAY MATRIX;
SEDIMENTARY STRUCTURES: LAMINATED, MOTTLED,
ACCESSORY MINERALS: PHOSPHATIC SAND-10%, PHOSPHATIC GRAVEL-02%, CLAY-10%, QUARTZ SAND-02%;
OTHER FEATURES: SPECKLED, CHALKY;
FOSSILS: FOSSIL FRAGMENTS, BARNACLES, FOSSIL MOLDS;

166.1- 169 DOLOMITE; LIGHT GRAY TO YELLOWISH GRAY; INTERGRANULAR; 10-50% ALTERED;
GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT;
ACCESSORY MINERALS: PHOSPHATIC SAND-01%, PHOSPHATIC GRAVEL-02%, CHERT-04%;
FOSSILS: CORAL, BRYOZOA, MOLLUSKS, FOSSIL FRAGMENTS, FOSSIL MOLDS;

169 - 174 CALCILUTITE; LIGHT GRAY TO YELLOWISH GRAY; 10% POROSITY, INTERGRANULAR,
POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: CALCILUTITE;
GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, CLAY MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: MOTTLED, BIOTURBATED,
ACCESSORY MINERALS: PHOSPHATIC SAND-20%, CLAY-10%;
OTHER FEATURES: SPECKLED, VARIEGATED;
FOSSILS: NO FOSSILS;

174 - 177.3 CLAY; GREENISH GRAY TO DARK GREENISH GRAY; INTERGRANULAR, LOW PERMEABILITY;
GOOD INDURATION;
CEMENT TYPE(S): CLAY MATRIX, DOLOMITE CEMENT, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: LAMINATED,
ACCESSORY MINERALS: PHOSPHATIC SAND-01%, CALCILUTITE-02%;
OTHER FEATURES: CALCAREOUS, PLASTIC, PARTINGS;
FOSSILS: NO FOSSILS;

177.3- 184.8 CALCILUTITE; YELLOWISH GRAY TO LIGHT GRAY; 13% POROSITY, INTERGRANULAR, MOLDIC, LOW PERMEABILITY;
GRAIN TYPE: CALCILUTITE;
GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT, CLAY MATRIX;
SEDIMENTARY STRUCTURES: LAMINATED, BIOTURBATED, MOTTLED,
ACCESSORY MINERALS: PHOSPHATIC SAND-10%, PHOSPHATIC GRAVEL-15%, CLAY-05%, CHERT-10%;
OTHER FEATURES: SPECKLED;
FOSSILS: BARNACLES, MOLLUSKS, FOSSIL FRAGMENTS, FOSSIL MOLDS;

184.8- 185.7 CALCARENITE; YELLOWISH GRAY; 30% POROSITY, INTERGRANULAR, MOLDIC, POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, SKELETAL, CALCILUTITE;
GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT;
ACCESSORY MINERALS: PHOSPHATIC SAND-05%, CALCILUTITE-30%, DOLOMITE-40%;
OTHER FEATURES: SPECKLED, COQUINA;
FOSSILS: MOLLUSKS, BARNACLES, FOSSIL FRAGMENTS, FOSSIL MOLDS;

185.7- 186.3 CALCILUTITE; VERY LIGHT GRAY TO YELLOWISH GRAY; 20% POROSITY, INTERGRANULAR, MOLDIC;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL;
GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: LAMINATED,
ACCESSORY MINERALS: CLAY-05%, PHOSPHATIC GRAVEL-02%, PHOSPHATIC SAND-05%;
FOSSILS: FOSSIL FRAGMENTS, FOSSIL MOLDS;

186.3- 189 DOLOMITE; LIGHT GRAY TO YELLOWISH GRAY; LOW PERMEABILITY, INTERGRANULAR;
10-50% ALTERED;
GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: LAMINATED, BIOTURBATED,
ACCESSORY MINERALS: PHOSPHATIC GRAVEL-01%, PHOSPHATIC SAND-01%, CHERT-02%;
OTHER FEATURES: CHALKY;
FOSSILS: NO FOSSILS;

189 - 189.3 CALCILUTITE; VERY LIGHT GRAY; INTERGRANULAR, LOW PERMEABILITY;
GRAIN TYPE: CALCILUTITE;
GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: LAMINATED, BIOTURBATED,
ACCESSORY MINERALS: PHOSPHATIC SAND-01%;
OTHER FEATURES: CHALKY;
FOSSILS: NO FOSSILS;

189.3- 189.4 CLAY; LIGHT OLIVE GRAY; INTERGRANULAR, LOW PERMEABILITY; MODERATE INDURATION;
CEMENT TYPE(S): CLAY MATRIX, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: LAMINATED,
ACCESSORY MINERALS: PHOSPHATIC GRAVEL-05%, PHOSPHATIC SAND-05%;
OTHER FEATURES: CALCAREOUS;
FOSSILS: NO FOSSILS;

189.4- 190.2 CALCILUTITE; LIGHT GRAY TO YELLOWISH GRAY; 08% POROSITY, INTERGRANULAR, LOW PERMEABILITY, MOLDIC;
GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE, LAMINATED,
ACCESSORY MINERALS: PHOSPHATIC GRAVEL-15%, PHOSPHATIC SAND-02%;
OTHER FEATURES: DOLOMITIC, SPECKLED;
FOSSILS: MOLLUSKS, FOSSIL MOLDS;

190.2- 191.4 CLAY; LIGHT GRAY; LOW PERMEABILITY, INTERGRANULAR; POOR INDURATION;
CEMENT TYPE(S): CLAY MATRIX, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: PHOSPHATIC GRAVEL-08%, PHOSPHATIC SAND-02%;
OTHER FEATURES: POOR SAMPLE;
FOSSILS: NO FOSSILS;

191.4- 191.8 CALCILUTITE; LIGHT GRAY; 12% POROSITY, INTERGRANULAR, MOLDIC, LOW PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: PHOSPHATIC GRAVEL-02%, PHOSPHATIC SAND-01%;
OTHER FEATURES: COQUINA;
FOSSILS: MOLLUSKS, FOSSIL FRAGMENTS, FOSSIL MOLDS;

191.8- 192.2 CLAY; LIGHT GRAY TO MODERATE LIGHT GRAY; INTERGRANULAR, LOW PERMEABILITY; GOOD INDURATION;
CEMENT TYPE(S): CLAY MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: PHOSPHATIC GRAVEL-02%, CALCILUTITE-05%;
OTHER FEATURES: PLASTIC, CHALKY, DOLOMITIC;
FOSSILS: NO FOSSILS;

192.2- 198.1 CALCILUTITE; VERY LIGHT GRAY TO LIGHT GRAY; INTERGRANULAR, LOW PERMEABILITY, MOLDIC;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: PHOSPHATIC GRAVEL-05%, PHOSPHATIC SAND-01%;
OTHER FEATURES: COQUINA, DOLOMITIC, SPECKLED;
FOSSILS: MOLLUSKS, FOSSIL FRAGMENTS, FOSSIL MOLDS, BRYOZOA, CORAL;

198.1- 202.5 CALCILUTITE; YELLOWISH GRAY TO LIGHT OLIVE GRAY; 05% POROSITY, INTERGRANULAR,
LOW PERMEABILITY;
GRAIN TYPE: CALCILUTITE;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: PHOSPHATIC GRAVEL-20%, PHOSPHATIC SAND-03%;
OTHER FEATURES: DOLOMITIC, SPECKLED;
FOSSILS: NO FOSSILS;
PHOSPHATIC GRAVEL IN CALCILUTITE MATRIX

202.5- 204.8 CALCILUTITE; LIGHT OLIVE GRAY TO YELLOWISH GRAY; 05% POROSITY, INTERGRANULAR,
LOW PERMEABILITY, VUGULAR;
GRAIN TYPE: CALCILUTITE;
GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: DOLOMITE- %, CLAY- %, PHOSPHATIC GRAVEL-20%, PHOSPHATIC SAND- %;
OTHER FEATURES: DOLOMITIC, SPECKLED;
FOSSILS: NO FOSSILS;

204.8- 206 CALCARENITE; PINKISH GRAY TO VERY LIGHT GRAY; 15% POROSITY, INTERGRANULAR, MOLDIC,
LOW PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL;
GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: PHOSPHATIC SAND-05%, CLAY-10%, CALCILUTITE-40%;
FOSSILS: MOLLUSKS, FOSSIL FRAGMENTS, FOSSIL MOLDS;

206 - 209.9 CLAY; LIGHT OLIVE GRAY TO GREENISH GRAY; INTERGRANULAR, LOW PERMEABILITY;
MODERATE INDURATION;
CEMENT TYPE(S): CLAY MATRIX, DOLOMITE CEMENT, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE, FISSILE,
ACCESSORY MINERALS: CALCILUTITE-10%, PHOSPHATIC SAND-01%;
OTHER FEATURES: CALCAREOUS, PARTINGS, DOLOMITIC;
FOSSILS: NO FOSSILS;

209.9- 209.9 CALCILUTITE; YELLOWISH GRAY TO LIGHT OLIVE GRAY; INTERGRANULAR, MOLDIC, LOW PERMEABILITY;
GRAIN TYPE: CALCILUTITE, SKELETAL, PELLET;
GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, CLAY MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: LAMINATED, MOTTLED,
ACCESSORY MINERALS: PHOSPHATIC SAND-05%;
OTHER FEATURES: LOW RECRYSTALLIZATION;
FOSSILS: NO FOSSILS;

209.9- 210.6 DOLOMITE; DARK GREENISH GRAY; INTERGRANULAR, LOW PERMEABILITY;
90-100% ALTERED; ANHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; RANGE: CRYPTOCRYSTALLINE TO MICROCRYSTALLINE;
GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, SILICIC CEMENT;
SEDIMENTARY STRUCTURES: LAMINATED,
ACCESSORY MINERALS: CLAY-40%, PHOSPHATIC GRAVEL-05%, CHERT-%;

210.6- 221.7 CLAY; GREENISH GRAY TO LIGHT OLIVE GRAY; INTERGRANULAR, LOW PERMEABILITY;
MODERATE INDURATION;
CEMENT TYPE(S): CLAY MATRIX, CALCILUTITE MATRIX, IRON CEMENT;
SEDIMENTARY STRUCTURES: BEDDED,
ACCESSORY MINERALS: PHOSPHATIC SAND-20%, DOLOMITE- %, CALCILUTITE-01%,
PHOSPHATIC GRAVEL- %;
OTHER FEATURES: PARTINGS, SUCROSIC, SPECKLED, DOLOMITIC;
FOSSILS: NO FOSSILS;

221.7- 224 NO SAMPLES

224 - 226 CALCILUTITE; YELLOWISH GRAY TO LIGHT YELLOWISH GREEN; LOW PERMEABILITY, INTERGRANULAR, VUGULAR;
GRAIN TYPE: CALCILUTITE;
GOOD INDURATION;
CEMENT TYPE(S): CLAY MATRIX, PHOSPHATE CEMENT, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: LAMINATED, BIOTURBATED,
ACCESSORY MINERALS: CLAY-15%, PHOSPHATIC GRAVEL-05%, PHOSPHATIC SAND-30%, DOLOMITE- %;
OTHER FEATURES: SUCROSIC, SPECKLED, DOLOMITIC;
FOSSILS: WORM TRACES;

226 - 234 CLAY; LIGHT GREENISH GRAY TO LIGHT YELLOWISH GREEN; LOW PERMEABILITY, INTERGRANULAR, VUGULAR; MODERATE INDURATION;
CEMENT TYPE(S): PHOSPHATE CEMENT, CALCILUTITE MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: LAMINATED, INTERBEDDED,
ACCESSORY MINERALS: CALCILUTITE-10%, QUARTZ SAND-20%, PHOSPHATIC SAND-20%, DOLOMITE- %;
OTHER FEATURES: SUCROSIC, SPECKLED, DOLOMITIC;
FOSSILS: FOSSIL MOLDS, WORM TRACES;

234 - 235.6 CLAY; GRAYISH GREEN TO MODERATE GREEN; LOW PERMEABILITY, INTERGRANULAR, VUGULAR; MODERATE INDURATION;
CEMENT TYPE(S): PHOSPHATE CEMENT, CALCILUTITE MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: CALCILUTITE-10%, QUARTZ SAND-10%, PHOSPHATIC SAND-20%, DOLOMITE- %;
OTHER FEATURES: SUCROSIC, CALCAREOUS, SPECKLED, DOLOMITIC;
FOSSILS: ORGANICS;

235.6- 243.1 DOLO-SILT; LIGHT GRAY TO GRAYISH GREEN; LOW PERMEABILITY, INTERGRANULAR, VUGULAR; MODERATE INDURATION;
CEMENT TYPE(S): PHOSPHATE CEMENT, CALCILUTITE MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: CALCILUTITE-15%, QUARTZ SAND-10%, PHOSPHATIC SAND-25%, PHOSPHATIC GRAVEL-02%;
OTHER FEATURES: SUCROSIC, CALCAREOUS, SPECKLED, DOLOMITIC, GRANULAR;
FOSSILS: WORM TRACES;

243.1- 244 DOLOMITE; YELLOWISH GRAY TO PINKISH GRAY; LOW PERMEABILITY, INTERGRANULAR, MOLDIC; 10-50% ALTERED; ANHEDRAL;
GRAIN SIZE: VERY FINE; RANGE: MICROCRYSTALLINE TO VERY FINE; GOOD INDURATION;
CEMENT TYPE(S): PHOSPHATE CEMENT, CALCILUTITE MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: INTERBEDDED, MOTTLED,
ACCESSORY MINERALS: CALCILUTITE-15%, QUARTZ SAND-03%, PHOSPHATIC SAND-20%, PHOSPHATIC GRAVEL-15%;
OTHER FEATURES: SUCROSIC, CALCAREOUS, SPECKLED, DOLOMITIC;
FOSSILS: FOSSIL MOLDS;

244 - 253.4 SAND; MODERATE GRAY TO BLACK; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: MEDIUM; RANGE: FINE TO MEDIUM;
ROUNDNESS: SUB-ANGULAR TO ROUNDED; MEDIUM SPHERICITY; UNCONSOLIDATED;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: PHOSPHATIC SAND-40%, LIMESTONE- %, CLAY-01%, PHOSPHATIC GRAVEL-03%;
OTHER FEATURES: FROSTED;
QUARTZ AND PHOSPHATIC SAND-FILLED CAVITY.

253.4- 255.2 LIMESTONE; YELLOWISH GRAY TO PINKISH GRAY; INTERGRANULAR, MOLDIC;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL;
MODERATE INDURATION;
CEMENT TYPE(S): PHOSPHATE CEMENT, CALCILUTITE MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: CALCILUTITE-15%, DOLOMITE-40%, PHOSPHATIC SAND-15%, QUARTZ SAND-20%;
OTHER FEATURES: FROSTED, DOLOMITIC, GRANULAR;
FOSSILS: ORGANICS, FOSSIL MOLDS, FOSSIL FRAGMENTS;

255.2- 255.6 CLAY; LIGHT GRAYISH GREEN TO LIGHT GREEN; INTERGRANULAR, LOW PERMEABILITY;
MODERATE INDURATION;
CEMENT TYPE(S): CLAY MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: PLANT REMAINS- %, DOLOMITE- %, PHOSPHATIC SAND- %, CALCILUTITE- %;
OTHER FEATURES: CHALKY, CALCAREOUS;
FOSSILS: ORGANICS;

255.6- 263.1 LIMESTONE; YELLOWISH GRAY TO PINKISH GRAY; INTERGRANULAR, MOLDIC;
GRAIN TYPE: BIOGENIC, CALCILUTITE;
MODERATE INDURATION;
CEMENT TYPE(S): PHOSPHATE CEMENT, CALCILUTITE MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: CALCILUTITE-15%, DOLOMITE-30%, PHOSPHATIC SAND-25%, QUARTZ SAND-15%;
OTHER FEATURES: FROSTED, DOLOMITIC, GRANULAR, CALCAREOUS;
FOSSILS: FOSSIL MOLDS, ORGANICS, FOSSIL FRAGMENTS;

263.1- 285.2 CLAY; LIGHT GREENISH GRAY TO LIGHT GREENISH GRAY; INTERGRANULAR, LOW PERMEABILITY;
MODERATE INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, CLAY MATRIX, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED, LAMINATED, MOTTLED,
ACCESSORY MINERALS: QUARTZ SAND-30%, CALCILUTITE- %, PHOSPHATIC SAND-01%,
PHOSPHATIC GRAVEL- %;
OTHER FEATURES: DOLOMITIC, SPECKLED, FROSTED, CALCAREOUS;
FOSSILS: WORM TRACES;

285.2- 289 CALCILUTITE; LIGHT GREENISH GRAY; INTERGRANULAR, LOW PERMEABILITY;
GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, CLAY MATRIX, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: CLAY-40%, PHOSPHATIC SAND- %, PHOSPHATIC GRAVEL- %, CALCILUTITE- %;
OTHER FEATURES: DOLOMITIC, CALCAREOUS, SPECKLED;
FOSSILS: WORM TRACES, FOSSIL FRAGMENTS, ORGANICS;

289 - 292.6 CLAY; GREENISH GRAY TO GRAYISH GREEN; INTERGRANULAR, LOW PERMEABILITY; MODERATE INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, CLAY MATRIX, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE, MOTTLED, LAMINATED,
ACCESSORY MINERALS: DOLOMITE- %, SILT- %, PHOSPHATIC SAND- %;
OTHER FEATURES: CHALKY, PLATY;

292.6- 299.9 CLAY; GRAYISH GREEN TO LIGHT GREENISH GRAY; INTERGRANULAR, LOW PERMEABILITY;
MODERATE INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, CLAY MATRIX, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE, MOTTLED,
ACCESSORY MINERALS: DOLOMITE- %, SILT- %, PHOSPHATIC SAND- %;
OTHER FEATURES: CHALKY, PLATY;

299.9- 304 CLAY; GRAYISH GREEN TO LIGHT GREEN; INTERGRANULAR, LOW PERMEABILITY; POOR INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, CLAY MATRIX, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: DOLOMITE- %, PHOSPHATIC SAND- %;
OTHER FEATURES: CHALKY, PLATY;

304 - 307.3 CLAY; MODERATE GREEN TO GREENISH GRAY; INTERGRANULAR, LOW PERMEABILITY;
MODERATE INDURATION;
CEMENT TYPE(S): CLAY MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE, MOTTLED, LAMINATED,
OTHER FEATURES: DOLOMITIC, PLATY, PARTINGS;

307.3- 311 CLAY; LIGHT GREENISH GRAY TO LIGHT GREEN; INTERGRANULAR, LOW PERMEABILITY;
MODERATE INDURATION;
CEMENT TYPE(S): CLAY MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: PHOSPHATIC GRAVEL- %, LIMESTONE- %, QUARTZ SAND- %;
OTHER FEATURES: DOLOMITIC, SPECKLED;

311 - 314 LIMESTONE; LIGHT GREENISH GRAY; INTERGRANULAR, LOW PERMEABILITY;
GRAIN TYPE: CALCILUTITE;
GOOD INDURATION;
CEMENT TYPE(S): CLAY MATRIX, CALCILUTITE MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: PHOSPHATIC GRAVEL- %, CLAY- %, PHOSPHATIC SAND- %, QUARTZ SAND- %;
OTHER FEATURES: DOLOMITIC, SPECKLED, WEATHERED;
FOSSILS: FOSSIL MOLDS;

314 - 314.4 CLAY; YELLOWISH GRAY; INTERGRANULAR, LOW PERMEABILITY; POOR INDURATION;
CEMENT TYPE(S): CLAY MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: PHOSPHATIC GRAVEL- %;
OTHER FEATURES: DOLOMITIC, PARTINGS;

314.4- 316.2 CALCILUTITE; LIGHT GREENISH GRAY; LOW PERMEABILITY, INTERGRANULAR;
GRAIN TYPE: CALCILUTITE;
GOOD INDURATION;
CEMENT TYPE(S): CLAY MATRIX, CALCILUTITE MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: PHOSPHATIC SAND- %, CLAY- %;
OTHER FEATURES: DOLOMITIC, SPECKLED, WEATHERED;

316.2- 319.8 CLAY; GRAYISH GREEN TO GREENISH GRAY; INTERGRANULAR, LOW PERMEABILITY; MODERATE INDURATION;
CEMENT TYPE(S): CLAY MATRIX, CALCILUTITE MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: PHOSPHATIC SAND- %, QUARTZ SAND- %;
OTHER FEATURES: DOLOMITIC, PARTINGS;

319.8- 320.5 CALCILUTITE; LIGHT GREENISH GRAY TO LIGHT GREENISH GRAY; INTERGRANULAR, VUGULAR;
GRAIN TYPE: CALCILUTITE, BIOGENIC;
GOOD INDURATION;
CEMENT TYPE(S): CLAY MATRIX, CALCILUTITE MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: PHOSPHATIC SAND- %;
OTHER FEATURES: DOLOMITIC;
FOSSILS: FOSSIL FRAGMENTS;

320.5- 337.7 CLAY; GRAYISH GREEN TO MODERATE GREEN; INTERGRANULAR, LOW PERMEABILITY; POOR INDURATION;
CEMENT TYPE(S): CLAY MATRIX, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: PHOSPHATIC SAND-05%, LIMESTONE-09%, QUARTZ SAND-01%;
OTHER FEATURES: DOLOMITIC, PARTINGS, PLATY, MUDDY;

337.7- 342 CALCILUTITE; YELLOWISH GRAY TO YELLOWISH GRAY; INTERGRANULAR, FRACTURE, PIN POINT VUGS;
GRAIN TYPE: CALCILUTITE;
GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, CLAY MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: INTERBEDDED, LAMINATED, MOTTLED,
ACCESSORY MINERALS: PHOSPHATIC SAND-01%, CHERT- %, DOLOMITE- %, CLAY- %;
OTHER FEATURES: SPECKLED, CALCAREOUS;
FOSSILS: ORGANICS;
CLAY-FILLED FFRACTURES, BROWN CHERT, BLACK ORGANIC LAMINATIONS.

342 - 344.6 CLAY; LIGHT GRAYISH GREEN TO MODERATE GREEN; INTERGRANULAR, LOW PERMEABILITY;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, CLAY MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: INTERBEDDED, LAMINATED,
ACCESSORY MINERALS: PHOSPHATIC SAND- %, SILT- %, CALCILUTITE- %;
OTHER FEATURES: CHALKY;
FOSSILS: ORGANICS;

344.6- 346.1 LIMESTONE; YELLOWISH GRAY TO WHITE; INTERGRANULAR, FRACTURE, VUGULAR;
GRAIN TYPE: CALCILUTITE, INTRACLASTS;
GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, CLAY MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: INTERBEDDED, BRECCIATED,
ACCESSORY MINERALS: PHOSPHATIC SAND- %, SILT- %, CALCILUTITE- %, CLAY- %;
OTHER FEATURES: SPECKLED;
BRECCIATED, CLAY-FILLED FRACTURES AND VUGS.

346.1- 354.2 LIMESTONE; YELLOWISH GRAY TO GRAYISH GREEN; INTERGRANULAR, LOW PERMEABILITY, VUGULAR;
GRAIN TYPE: CALCILUTITE, INTRACLASTS;
MODERATE INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, CLAY MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED, FISSILE, BRECCIATED, LAMINATED, MOTTLED,
ACCESSORY MINERALS: CLAY-40%, SILT- %, DOLOMITE- %, CHERT- %;
OTHER FEATURES: DOLOMITIC, WEATHERED, SPECKLED;
CLAYEY DOLOSILT; BRECCIATED AND FRACTURED APPEARANCE.

354.2- 357.2 CLAY; YELLOWISH GRAY TO LIGHT GREEN; INTERGRANULAR, LOW PERMEABILITY, VUGULAR;
GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, CLAY MATRIX, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED, MOTTLED, LAMINATED,
ACCESSORY MINERALS: CALCILUTITE- %, DOLOMITE- %, CHERT- %, PHOSPHATIC SAND- %;
OTHER FEATURES: DOLOMITIC;

357.2- 368 DOLOMITE; LIGHT GREENISH GRAY TO LIGHT GREENISH GRAY; INTRAGRANULAR, LOW PERMEABILITY,
INTERGRANULAR; 10-50% ALTERED; ANHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; RANGE: VERY FINE TO MICROCRYSTALLINE; GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, CALCILUTITE MATRIX, CLAY MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED, MOTTLED, FISSILE, LAMINATED,
ACCESSORY MINERALS: CLAY-01%, PHOSPHATIC SAND- %, CHERT- %, DOLOMITE- %;
OTHER FEATURES: DOLOMITIC, CHALKY;
FOSSILS: FOSSIL FRAGMENTS, ORGANICS;

368 - 368.8 BROWN CHERT; CLAY-FILLED FRACTURES, MOTTLED APPEARANCE.

368.8- 369.4 CLAY; LIGHT GRAYISH GREEN TO GRAYISH GREEN; INTERGRANULAR, LOW PERMEABILITY;
MODERATE INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, CALCILUTITE MATRIX, CLAY MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: PHOSPHATIC SAND- %, QUARTZ SAND- %;
OTHER FEATURES: DOLOMITIC, CHALKY;

369.4- 373.8 DOLOMITE; GREENISH GRAY TO LIGHT OLIVE GRAY; INTERGRANULAR, PIN POINT VUGS,
VUGULAR; 10-50% ALTERED; ANHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; RANGE: VERY FINE TO MICROCRYSTALLINE; GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE, MOTTLED,
ACCESSORY MINERALS: CLAY- %, PHOSPHATIC SAND- %, CHERT- %;
OTHER FEATURES: DOLOMITIC, SPECKLED;
FOSSILS: FOSSIL FRAGMENTS, FOSSIL MOLDS, WORM TRACES;

373.8- 374.1 CLAY; GRAYISH GREEN TO GRAYISH GREEN; INTERGRANULAR, LOW PERMEABILITY; GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED, LAMINATED,
ACCESSORY MINERALS: PHOSPHATIC GRAVEL- %;
OTHER FEATURES: DOLOMITIC;
FOSSILS: ORGANICS;

374.1- 379.8 SHELL BED; LIGHT GREENISH YELLOW TO VERY LIGHT ORANGE; INTERGRANULAR,
POSSIBLY HIGH PERMEABILITY, MOLDIC; MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED, BIOTURBATED,
ACCESSORY MINERALS: CLAY- %, PHOSPHATIC SAND- %, QUARTZ SAND- %, CALCITE- %;
OTHER FEATURES: CALCAREOUS, COQUINA;
FOSSILS: FOSSIL FRAGMENTS, FOSSIL MOLDS, WORM TRACES, BRYOZOA, CORAL;

379.8- 384 SAND; YELLOWISH GRAY; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: FINE; RANGE: MEDIUM TO VERY FINE;
ROUNDNESS: SUB-ANGULAR TO ROUNDED; MEDIUM SPHERICITY; UNCONSOLIDATED;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: CALCILUTITE-45%, PHOSPHATIC SAND-04%, CLAY-02%;
OTHER FEATURES: CALCAREOUS, GRANULAR, FROSTED;
CALCARENITIC, QUARTZ, PHOSPHATE SAND.

384 - 384.8 CALCARENITE; LIGHT GREENISH YELLOW TO VERY LIGHT ORANGE; INTERGRANULAR,
POSSIBLY HIGH PERMEABILITY, MOLDIC;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL;
POOR INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED, BIOTURBATED,
ACCESSORY MINERALS: PHOSPHATIC SAND- %, QUARTZ SAND- %, CALCITE- %;
OTHER FEATURES: CALCAREOUS, COQUINA;

384.8- 389 SAND; YELLOWISH GRAY; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: FINE; RANGE: MEDIUM TO VERY FINE;
ROUNDNESS: SUB-ANGULAR TO ROUNDED; MEDIUM SPHERICITY; UNCONSOLIDATED;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: CALCILUTITE-45%, QUARTZ SAND-04%;
OTHER FEATURES: CALCAREOUS, GRANULAR, FROSTED;

389 - 394 CLAY; YELLOWISH GRAY; INTERGRANULAR; MODERATE INDURATION;
CEMENT TYPE(S): CLAY MATRIX, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: PHOSPHATIC SAND- %, CALCILUTITE-40%, QUARTZ SAND-08%, SILT- %;
OTHER FEATURES: CALCAREOUS, CHALKY;

394 - 404 LIMESTONE; VERY LIGHT ORANGE TO PINKISH GRAY; INTERGRANULAR, PIN POINT VUGS,
POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL;
GRAIN SIZE: VERY FINE; RANGE: FINE TO VERY FINE; MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: CALCILUTITE- %, QUARTZ SAND- %, CALCITE- %;
OTHER FEATURES: GRANULAR, CALCAREOUS, COQUINA;
FOSSILS: FOSSIL FRAGMENTS, FOSSIL MOLDS, WORM TRACES;

404 - 407 LIMESTONE; VERY LIGHT ORANGE TO LIGHT BROWN; INTERGRANULAR, MOLDIC,
POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL;
POOR INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED, BIOTURBATED,
ACCESSORY MINERALS: CALCILUTITE- %, QUARTZ SAND- %, DOLOMITE- %, CLAY- %;
OTHER FEATURES: COQUINA, CALCAREOUS;
FOSSILS: FOSSIL FRAGMENTS, FOSSIL MOLDS;

407 - 409 SAND; LIGHT BROWN TO YELLOWISH GRAY; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: FINE; RANGE: VERY FINE TO MEDIUM;
ROUNDNESS: SUB-ANGULAR TO ANGULAR; MEDIUM SPHERICITY; UNCONSOLIDATED;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: PHOSPHATIC SAND-01%;
OTHER FEATURES: CALCAREOUS, GRANULAR;

409 - 413 CALCARENITE; LIGHT BROWN TO YELLOWISH GRAY; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: CALCILUTITE, BIOGENIC;
POOR INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED, LAMINATED, FISSILE,
ACCESSORY MINERALS: CALCITE- %, CALCILUTITE-30%;
OTHER FEATURES: COQUINA, CALCAREOUS;
FOSSILS: WORM TRACES, FOSSIL MOLDS, ORGANICS;
CALCITE-FILLED FRACTURE

413 - 414 SAND; LIGHT BROWN; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: FINE; RANGE: VERY FINE TO MEDIUM;
ROUNDNESS: SUB-ANGULAR TO ANGULAR; MEDIUM SPHERICITY; UNCONSOLIDATED;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: QUARTZ SAND-15%;
OTHER FEATURES: CALCAREOUS, GRANULAR;

414 - 418 CALCARENITE; YELLOWISH GRAY TO VERY LIGHT ORANGE; INTERGRANULAR,
POSSIBLY HIGH PERMEABILITY, MOLDIC;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL;
POOR INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED, BIOTURBATED, LAMINATED,
ACCESSORY MINERALS: CALCILUTITE- %, LIMESTONE- %, CALCITE- %, QUARTZ SAND- %;
OTHER FEATURES: CALCAREOUS, SPECKLED;
FOSSILS: FOSSIL FRAGMENTS, FOSSIL MOLDS;

418 - 419 SAND; YELLOWISH GRAY; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: FINE; RANGE: VERY FINE TO MEDIUM;
ROUNDNESS: SUB-ANGULAR TO ANGULAR; MEDIUM SPHERICITY; UNCONSOLIDATED;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: CALCILUTITE-45%, PHOSPHATIC SAND-01%;
OTHER FEATURES: CALCAREOUS, SPECKLED;

419 - 422 CALCARENITE; MODERATE YELLOWISH BROWN TO YELLOWISH GRAY; INTERGRANULAR,
POSSIBLY HIGH PERMEABILITY, MOLDIC;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL;
POOR INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED, LAMINATED,
ACCESSORY MINERALS: CALCILUTITE- %, LIMESTONE- %, QUARTZ SAND- %, CALCITE- %;
OTHER FEATURES: CALCAREOUS, GRANULAR, SPECKLED, COQUINA;
FOSSILS: FOSSIL FRAGMENTS, FOSSIL MOLDS;

422 - 424 SAND; YELLOWISH GRAY TO YELLOWISH GRAY; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: VERY FINE; RANGE: VERY FINE TO FINE;
ROUNDNESS: SUB-ANGULAR TO ANGULAR; MEDIUM SPHERICITY; UNCONSOLIDATED;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: CALCILUTITE-45%, PHOSPHATIC SAND-06%;
OTHER FEATURES: CALCAREOUS, GRANULAR;

424 - 426 CALCARENITE; MODERATE YELLOWISH BROWN TO YELLOWISH GRAY; INTERGRANULAR,
POSSIBLY HIGH PERMEABILITY, MOLDIC;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL;
POOR INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED, BIOTURBATED,
ACCESSORY MINERALS: CALCILUTITE- %, QUARTZ SAND-01%, LIMESTONE- %, CALCITE- %;
OTHER FEATURES: CALCAREOUS, GRANULAR, SPECKLED, COQUINA;
FOSSILS: FOSSIL FRAGMENTS, FOSSIL MOLDS;

426 - 429.9 SAND; YELLOWISH GRAY TO YELLOWISH GRAY; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: FINE; RANGE: VERY FINE TO MEDIUM;
ROUNDNESS: SUB-ANGULAR TO ANGULAR; MEDIUM SPHERICITY; UNCONSOLIDATED;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: CALCILUTITE-45%, PHOSPHATIC SAND-04%;
OTHER FEATURES: CALCAREOUS, GRANULAR;

429.9- 434 SAND; YELLOWISH GRAY TO YELLOWISH GRAY; 35% POROSITY, INTERGRANULAR,
POSSIBLY HIGH PERMEABILITY, MOLDIC;
GRAIN SIZE: FINE; RANGE: VERY FINE TO MEDIUM;
ROUNDNESS: SUB-ANGULAR TO ANGULAR; MEDIUM SPHERICITY; POOR INDURATION;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: PHOSPHATIC SAND-04%, QUARTZ SAND-15%, DOLOMITE-30%;
OTHER FEATURES: CALCAREOUS, GRANULAR;

434 - 439.4 CALCARENITE; VERY LIGHT ORANGE TO YELLOWISH GRAY; 25% POROSITY, INTERGRANULAR,
POSSIBLY HIGH PERMEABILITY, MOLDIC;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: INTERBEDDED, LAMINATED,
ACCESSORY MINERALS: CALCILUTITE- %, PHOSPHATIC SAND-07%, CALCITE- %, QUARTZ SAND-01%;
OTHER FEATURES: CALCAREOUS;
FOSSILS: FOSSIL FRAGMENTS, MOLLUSKS, MILIOLIDS, ORGANICS, ALGAE;

439.4- 454 CALCILUTITE; YELLOWISH GRAY TO LIGHT GRAY; 30% POROSITY, INTERGRANULAR,
POSSIBLY HIGH PERMEABILITY, MOLDIC;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL;
POOR INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: MOTTLED, INTERBEDDED, LAMINATED,
ACCESSORY MINERALS: QUARTZ SAND-03%, DOLOMITE- %, PHOSPHATIC SAND- %, CALCILUTITE- %;
OTHER FEATURES: CALCAREOUS, CHALKY;
FOSSILS: FOSSIL FRAGMENTS, FOSSIL MOLDS, MOLLUSKS, ORGANICS, ALGAE;

454 - 467.5 LIMESTONE; YELLOWISH GRAY TO LIGHT GREENISH GRAY; 14% POROSITY, INTERGRANULAR,
LOW PERMEABILITY, PIN POINT VUGS;
GRAIN TYPE: BIOGENIC, CALCILUTITE;
MODERATE INDURATION;
SEDIMENTARY STRUCTURES: INTERBEDDED, MOTTLED, FISSILE,
ACCESSORY MINERALS: CALCITE- %, CALCILUTITE- %, PHOSPHATIC SAND-10%, QUARTZ SAND- %;
OTHER FEATURES: WEATHERED, CALCAREOUS;
FOSSILS: FOSSIL FRAGMENTS, FOSSIL MOLDS, WORM TRACES, ORGANICS, ALGAE;

467.5- 473.5 CALCILUTITE; YELLOWISH GRAY TO VERY LIGHT ORANGE; 14% POROSITY, INTERGRANULAR,
LOW PERMEABILITY, PIN POINT VUGS;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: INTERBEDDED, LAMINATED, FISSILE,
ACCESSORY MINERALS: PHOSPHATIC SAND-01%, DOLOMITE- %, PHOSPHATIC GRAVEL- %;
OTHER FEATURES: CALCAREOUS, WEATHERED, PARTINGS, CHALKY;
FOSSILS: FOSSIL FRAGMENTS, FOSSIL MOLDS, ORGANICS, ALGAE;

473.5- 492.7 CALCARENITE; YELLOWISH GRAY TO YELLOWISH GRAY; 18% POROSITY, INTERGRANULAR, MOLDIC,
POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: CALCILUTITE-40%, CHERT- %, PHOSPHATIC GRAVEL- %, QUARTZ SAND- %;
OTHER FEATURES: CALCAREOUS, COQUINA, LOW RECRYSTALLIZATION;
FOSSILS: FOSSIL FRAGMENTS, FOSSIL MOLDS, MOLLUSKS;

492.7- 494.6 CALCILUTITE; LIGHT GREENISH GRAY TO YELLOWISH GRAY; 12% POROSITY, INTERGRANULAR, VUGULAR,
PIN POINT VUGS;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: BRECCIATED, INTERBEDDED, LAMINATED, MOTTLED, FISSILE,
ACCESSORY MINERALS: LIMESTONE- %, CALCITE- %;
OTHER FEATURES: CALCAREOUS, CHALKY;
FOSSILS: FOSSIL FRAGMENTS, FOSSIL MOLDS, MOLLUSKS;

494.6- 506.3 CALCILUTITE; YELLOWISH GRAY TO YELLOWISH GRAY; 14% POROSITY, INTERGRANULAR, VUGULAR,
PIN POINT VUGS;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: DOLOMITE- %;
OTHER FEATURES: CALCAREOUS, WEATHERED, CHALKY;
FOSSILS: WORM TRACES, FOSSIL MOLDS, FOSSIL FRAGMENTS, ORGANICS, SPICULES;

506.3- 509 CLAY; GRAYISH GREEN TO LIGHT GRAYISH GREEN; INTERGRANULAR, LOW PERMEABILITY;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, CLAY MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: CALCILUTITE-30%;
OTHER FEATURES: CALCAREOUS, CHALKY;
FOSSILS: WORM TRACES;

509 - 513.5 CALCILUTITE; LIGHT BROWN TO VERY LIGHT ORANGE; INTERGRANULAR, PIN POINT VUGS,
POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED, MOTTLED, BRECCIATED, FISSILE,
OTHER FEATURES: CALCAREOUS, WEATHERED, GRANULAR;
FOSSILS: FOSSIL FRAGMENTS, FOSSIL MOLDS, MILIOLIDS;

513.5- 514.3 CALCILUTITE; YELLOWISH GRAY TO YELLOWISH GRAY; INTERGRANULAR, PIN POINT VUGS, MOLDIC;
GRAIN TYPE: BIOGENIC, CALCILUTITE;
POOR INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED,
OTHER FEATURES: CALCAREOUS, WEATHERED, CHALKY;
FOSSILS: FOSSIL MOLDS;

514.3- 516.6 DOLOMITE; YELLOWISH GRAY TO LIGHT BLUISH GRAY; 04% POROSITY, INTERGRANULAR,
LOW PERMEABILITY, PIN POINT VUGS; 10-50% ALTERED; ANHEDRAL;
GRAIN SIZE: VERY FINE; RANGE: MICROCRYSTALLINE TO VERY FINE; GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: INTERBEDDED, MOTTLED, FISSILE,
ACCESSORY MINERALS: CALCILUTITE-40%, CLAY-15%;
OTHER FEATURES: CALCAREOUS;
FOSSILS: FOSSIL MOLDS;
FRACTURED,MOTTLED APPEARANCE.

516.6- 529 CALCARENITE; YELLOWISH GRAY TO VERY LIGHT ORANGE; 14% POROSITY, INTERGRANULAR,
POSSIBLY HIGH PERMEABILITY, VUGULAR;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: CALCILUTITE-40%, CALCITE- %;
OTHER FEATURES: CALCAREOUS, WEATHERED, CHALKY;
FOSSILS: FOSSIL MOLDS, FOSSIL FRAGMENTS, CONES;

529 - 541.5 CALCARENITE; VERY LIGHT ORANGE TO YELLOWISH GRAY; 25% POROSITY, INTERGRANULAR, MOLDIC,
POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: CALCILUTITE-40%, CALCITE-02%;
OTHER FEATURES: CALCAREOUS, GRANULAR, WEATHERED;
FOSSILS: FOSSIL FRAGMENTS, FOSSIL MOLDS, MILIOLIDS;

541.5- 542 CLAY; LIGHT GRAYISH GREEN; LOW PERMEABILITY, INTERGRANULAR; MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED,
OTHER FEATURES: CALCAREOUS, WEATHERED, GREASY;
FOSSILS: MOLLUSKS, FOSSIL FRAGMENTS;

542 - 551 CALCARENITE; YELLOWISH GRAY TO YELLOWISH GRAY; 14% POROSITY, INTERGRANULAR, MOLDIC, POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELTAL CAST;
GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT, SPARRY CALCITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE, INTERBEDDED, LAMINATED,
ACCESSORY MINERALS: CALCILUTITE-35%, SPAR-03%, DOLOMITE-02%, CLAY- %;
OTHER FEATURES: CALCAREOUS, GRANULAR, SPLINTERY, WEATHERED, MEDIUM RECRYSTALLIZATION;
FOSSILS: MOLLUSKS, MILIOLIDS, FOSSIL FRAGMENTS, FOSSIL MOLDS;
TAMPA-SUWANNEE FORMATION CONTACT AT 549'. CLAY SEAM. SOME CLAY-FILLED FRACTURES. VARVED BY CALCILUTIE.

551 - 562 CALCARENITE; YELLOWISH GRAY TO YELLOWISH GRAY; 12% POROSITY, INTERGRANULAR, MOLDIC, LOW PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELTAL CAST;
MODERATE INDURATION;
CEMENT TYPE(S): CLAY MATRIX, CALCILUTITE MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: CALCILUTITE-35%, SPAR-02%, DOLOMITE-02%, CLAY- %;
OTHER FEATURES: CALCAREOUS, GRANULAR, SPLINTERY, WEATHERED, LOW RECRYSTALLIZATION;
FOSSILS: MOLLUSKS, MILIOLIDS, FOSSIL FRAGMENTS, FOSSIL MOLDS, BENTHIC FORAMINIFERA;
CLAY INFILLED FRACTURES & VUGS. CALCITE -LINED MOLDS.

562 - 579 CALCARENITE; VERY LIGHT ORANGE TO YELLOWISH GRAY; 10% POROSITY, INTERGRANULAR, MOLDIC, LOW PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL;
GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE, BIOTURBATED,
ACCESSORY MINERALS: CALCILUTITE-40%, DOLOMITE-01%;
OTHER FEATURES: CALCAREOUS, GRANULAR, CHALKY, LOW RECRYSTALLIZATION;
FOSSILS: MOLLUSKS, BENTHIC FORAMINIFERA, ECHINOID, FOSSIL FRAGMENTS, FOSSIL MOLDS;
MOLLUSKS, FORAMINIFERA(SORITES), ECHINOID SPINES.

579 - 588.6 CALCARENITE; VERY LIGHT ORANGE TO YELLOWISH GRAY; 28% POROSITY, INTERGRANULAR, MOLDIC, POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELTAL CAST;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, SPARRY CALCITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE, BIOTURBATED,
ACCESSORY MINERALS: CALCILUTITE-40%, SPAR-02%;
OTHER FEATURES: CALCAREOUS, GRANULAR, CHALKY, LOW RECRYSTALLIZATION;
FOSSILS: CORAL, MOLLUSKS, MILIOLIDS, FOSSIL FRAGMENTS, FOSSIL MOLDS;

588.6- 604 CALCARENITE; YELLOWISH GRAY TO YELLOWISH GRAY; 25% POROSITY, INTERGRANULAR, MOLDIC, POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELTAL CAST;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, SPARRY CALCITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE, BIOTURBATED,
ACCESSORY MINERALS: CALCILUTITE-40%, SPAR-03%;
OTHER FEATURES: CALCAREOUS, SUCROSIC, CHALKY, LOW RECRYSTALLIZATION;
FOSSILS: MILIOLIDS, ECHINOID, MOLLUSKS, FOSSIL FRAGMENTS, FOSSIL MOLDS;
MILIOLIDS, MOLLUSK CASTS AND MOLDS, CORAL.

604 - 615.5 CALCARENITE; VERY LIGHT ORANGE; 26% POROSITY, INTERGRANULAR, MOLDIC, POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL;
RANGE: MEDIUM TO MEDIUM; MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, SPARRY CALCITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE, BIOTURBATED,
ACCESSORY MINERALS: CALCILUTITE-42%, SPAR-03%;
OTHER FEATURES: CALCAREOUS, GRANULAR, CHALKY, SUCROSIC, LOW RECRYSTALLIZATION;
FOSSILS: MILIOLIDS, ECHINOID, MOLLUSKS, FOSSIL FRAGMENTS, FOSSIL MOLDS;

615.5- 625 CALCARENITE; YELLOWISH GRAY TO VERY LIGHT ORANGE; 14% POROSITY, INTERGRANULAR, MOLDIC, LOW PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELTAL CAST;
GRAIN SIZE: MEDIUM; RANGE: MEDIUM TO GRAVEL; MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, SPARRY CALCITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: CALCILUTITE-45%;
OTHER FEATURES: CALCAREOUS, GRANULAR, CHALKY, LOW RECRYSTALLIZATION, MEDIUM RECRYSTALLIZATION;
FOSSILS: MOLLUSKS, MILIOLIDS, ECHINOID, FOSSIL FRAGMENTS, FOSSIL MOLDS;
ECHINOID TESTS(CASSIDULUS OR RHYNCHOLAMPAS, MILIOLIDS.

625 - 640 CALCARENITE; YELLOWISH GRAY TO GRAYISH YELLOW; 12% POROSITY, INTERGRANULAR, MOLDIC, LOW PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT, CLAY MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE, BIOTURBATED,
ACCESSORY MINERALS: CALCILUTITE-40%, DOLOMITE-02%, CLAY-01%;
OTHER FEATURES: CALCAREOUS, GRANULAR, SUCROSIC, CHALKY, LOW RECRYSTALLIZATION;
FOSSILS: MILIOLIDS, ECHINOID, FOSSIL FRAGMENTS, FOSSIL MOLDS, BENTHIC FORAMINIFERA;
ECHINOID SPINES, CRAB CLAW, MILIOLIDS, ECHINOID TEST FRAGMENTS.

640 - 652.8 CALCARENITE; YELLOWISH GRAY TO GRAYISH YELLOW; 20% POROSITY, INTERGRANULAR, MOLDIC, POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELTAL CAST;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, SPARRY CALCITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE, BIOTURBATED,
ACCESSORY MINERALS: CALCILUTITE-40%, SPAR-04%;
OTHER FEATURES: CALCAREOUS, GRANULAR, CHALKY, COQUINA, LOW RECRYSTALLIZATION;
FOSSILS: MOLLUSKS, MILIOLIDS, ECHINOID, FOSSIL FRAGMENTS, FOSSIL MOLDS;
MILIOLIDS, SHELL FRAGMENTS(PECTEN), COSKINOLINA FLORIDANA.

652.8- 678.4 CALCARENITE; YELLOWISH GRAY TO LIGHT OLIVE GRAY; 30% POROSITY, INTERGRANULAR, MOLDIC, POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELTAL CAST;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, SPARRY CALCITE CEMENT;
ACCESSORY MINERALS: CALCILUTITE-30%, SPAR-05%, SILT- %, CLAY- %;
OTHER FEATURES: CALCAREOUS, GRANULAR, LOW RECRYSTALLIZATION, WEATHERED, COQUINA;
FOSSILS: FOSSIL FRAGMENTS, FOSSIL MOLDS, MOLLUSKS, MILIOLIDS, FOSSIL MOLDS;

678.4- 683 CALCARENITE; VERY LIGHT ORANGE TO LIGHT OLIVE GRAY; 30% POROSITY, INTERGRANULAR, PIN POINT VUGS;
GRAIN TYPE: BIOGENIC, SKELETAL, SKELTAL CAST;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: SPAR- %, CALCILUTITE-20%;
OTHER FEATURES: CALCAREOUS, LOW RECRYSTALLIZATION, WEATHERED, GRANULAR, COQUINA;
FOSSILS: MOLLUSKS, FOSSIL FRAGMENTS, MILIOLIDS, SPICULES, BENTHIC FORAMINIFERA;
GRADES TO A FRACTURED, MOLDIC, VUGGY CALCARENITE.

683 - 691.8 CALCILUTITE; YELLOWISH GRAY TO LIGHT OLIVE GRAY; 15% POROSITY, INTERGRANULAR, MOLDIC;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL;
MODERATE INDURATION;
CEMENT TYPE(S): CLAY MATRIX, CALCILUTITE MATRIX, ORGANIC MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED, STREAKED, LAMINATED,
ACCESSORY MINERALS: DOLOMITE-20%, CALCILUTITE- %, CLAY-20%;
OTHER FEATURES: CALCAREOUS, CHALKY, WEATHERED, DOLOMITIC, SUCROSIC;
FOSSILS: ORGANICS, FOSSIL FRAGMENTS, ALGAE, FOSSIL MOLDS;
ALGAL LAMINATIONS, CALCIFIED FOSSILS, BLACK ORGANICS.

691.8- 697.5 CALCARENITE; YELLOWISH GRAY; 35% POROSITY, INTERGRANULAR, POSSIBLY HIGH PERMEABILITY, MOLDIC;
GRAIN TYPE: BIOGENIC, CALCILUTITE, OOLITE;
GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: BIOTURBATED, MASSIVE,
ACCESSORY MINERALS: CALCILUTITE- %;
OTHER FEATURES: COQUINA, CALCAREOUS, CHALKY, GRANULAR;
FOSSILS: FOSSIL FRAGMENTS, FOSSIL MOLDS, MOLLUSKS, MILIOLIDS, OOLITES;
OOLITIC INCLUSIONS, MILIOLIDS.

697.5- 697.9 CLAY; YELLOWISH GRAY; INTERGRANULAR, LOW PERMEABILITY; MODERATE INDURATION;
CEMENT TYPE(S): CLAY MATRIX, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: CALCILUTITE-45%;
OTHER FEATURES: WEATHERED, CHALKY, CALCAREOUS;

697.9- 704 CALCARENITE; YELLOWISH GRAY TO VERY LIGHT ORANGE; 17% POROSITY, INTERGRANULAR, MOLDIC;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL;
GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED, MOTTLED, LAMINATED,
ACCESSORY MINERALS: CALCILUTITE-40%, DOLOMITE-0E%;
OTHER FEATURES: CALCAREOUS, DOLOMITIC;
FOSSILS: FOSSIL FRAGMENTS, FOSSIL MOLDS, MILIOLIDS, ORGANICS;

704 - 720.7 CALCARENITE; YELLOWISH GRAY TO VERY LIGHT ORANGE; 25% POROSITY, INTERGRANULAR, MOLDIC, POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL;
GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE, MOTTLED,
ACCESSORY MINERALS: CALCILUTITE-40%, DOLOMITE- %, CLAY- %, CALCITE- %;
OTHER FEATURES: CALCAREOUS, DOLOMITIC;
FOSSILS: FOSSIL FRAGMENTS, FOSSIL MOLDS, BRYOZOA, BENTHIC FORAMINIFERA, MILIOLIDS; MILIOLIDAL.

720.7- 724.6 CALCARENITE; YELLOWISH GRAY TO VERY LIGHT ORANGE; 18% POROSITY, INTERGRANULAR, MOLDIC;
GRAIN TYPE: BIOGENIC, CALCILUTITE;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED, MOTTLED, BRECCIATED,
ACCESSORY MINERALS: CALCILUTITE- %, SPAR- %, CALCITE- %, CLAY- %;
FOSSILS: FOSSIL FRAGMENTS, FOSSIL MOLDS, CORAL, BENTHIC FORAMINIFERA, MOLLUSKS;
MOTTLED, BRECCIATED APPEARANCE(INTERCLASTS), CLAY LENS AT 724'.

724.6- 734.9 CALCILUTITE; YELLOWISH GRAY TO GRAYISH ORANGE PINK; 07% POROSITY, INTERGRANULAR, LOW PERMEABILITY, MOLDIC;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL;
GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: INTERBEDDED, LAMINATED, STREAKED,
ACCESSORY MINERALS: DOLOMITE-20%;
OTHER FEATURES: DOLOMITIC;
FOSSILS: WORM TRACES, ORGANICS, SPICULES, MOLLUSKS, FOSSIL FRAGMENTS; DOLOMITIC, SUCROSIC,SOME ORGANICS, ECHINOID SPINE.

734.9- 735.1 CLAY; MODERATE YELLOWISH GREEN; INTERGRANULAR, LOW PERMEABILITY; POOR INDURATION;
CEMENT TYPE(S): CLAY MATRIX, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED,
OTHER FEATURES: WEATHERED, CHALKY;

735.1- 741.9 CALCILUTITE; GRAYISH ORANGE PINK TO YELLOWISH GRAY; 12% POROSITY, INTERGRANULAR, LOW PERMEABILITY, FRACTURE;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL;
GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: INTERBEDDED, MOTTLED,
ACCESSORY MINERALS: CALCITE- %, DOLOMITE- %, QUARTZ SAND- %, CLAY- %;
OTHER FEATURES: DOLOMITIC;
FOSSILS: FOSSIL FRAGMENTS, FOSSIL MOLDS;

741.9- 744.4 CALCARENITE; YELLOWISH GRAY; 30% POROSITY, INTERGRANULAR, POSSIBLY HIGH PERMEABILITY, MOLDIC;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL;
GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: CALCITE- %, CALCILUTITE-40%;
OTHER FEATURES: WEATHERED, CALCAREOUS, COQUINA;
FOSSILS: FOSSIL FRAGMENTS, FOSSIL MOLDS, MILIOLIDS;

744.4- 745.2 DOLOMITE; YELLOWISH GRAY TO LIGHT OLIVE; 04% PORDSITY, INTERGRANULAR, LOW PERMEABILITY,
MOLDIC; 50-90% ALTERED; ANHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; RANGE: VERY FINE TO MICROCRYSTALLINE; GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: CALCILUTITE- %;
OTHER FEATURES: SUCROSIC;
FOSSILS: FOSSIL FRAGMENTS, FOSSIL MOLDS;

745.2- 750.7 CALCILUTITE; YELLOWISH GRAY; 08% POROSITY, INTERGRANULAR, LOW PERMEABILITY, FRACTURE;
GRAIN TYPE: CALCILUTITE;
GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: INTERBEDDED, LAMINATED,
ACCESSORY MINERALS: DOLOMITE- %;
OTHER FEATURES: CALCAREOUS;
FOSSILS: FOSSIL FRAGMENTS, ORGANICS;

750.7- 759.8 CALCARENITE; YELLOWISH GRAY TO VERY LIGHT ORANGE; 14% POROSITY, INTERGRANULAR,
PIN POINT VUGS, MOLDIC;
GRAIN TYPE: BIOGENIC, CALCILUTITE;
GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: LAMINATED, INTERBEDDED,
ACCESSORY MINERALS: CALCILUTITE- %;
OTHER FEATURES: GRANULAR, WEATHERED;
FOSSILS: MILIOLIDS;

759.8- 766.2 CALCILUTITE; VERY LIGHT ORANGE TO YELLOWISH GRAY; 10% POROSITY, INTERGRANULAR,
PIN POINT VUGS, MOLDIC;
GRAIN TYPE: BIOGENIC, CALCILUTITE;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: INTERBEDDED, MOTTLED,
ACCESSORY MINERALS: CLAY- %;
OTHER FEATURES: WEATHERED, CALCAREOUS;
FOSSILS: FOSSIL FRAGMENTS, FOSSIL MOLDS;

766.2- 766.9 CLAY; VERY LIGHT ORANGE TO MODERATE GRAY; INTERGRANULAR, LOW PERMEABILITY;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: INTERBEDDED, MOTTLED,
ACCESSORY MINERALS: DOLOMITE- %, CALCILUTITE- %;
OTHER FEATURES: CALCAREOUS, SPECKLED, CHALKY;
FOSSILS: NO FOSSILS;

766.9- 768.7 CALCILUTITE; VERY LIGHT ORANGE TO YELLOWISH GRAY; 10% POROSITY, INTERGRANULAR,
LOW PERMEABILITY, PIN POINT VUGS;
GRAIN TYPE: BIOGENIC, CALCILUTITE;
GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT, IRON CEMENT;
SEDIMENTARY STRUCTURES: MOTTLED, LAMINATED,
ACCESSORY MINERALS: DOLOMITE- %, CLAY- %;
OTHER FEATURES: CALCAREOUS, CHALKY;
FOSSILS: FOSSIL MOLDS;

768.7- 768.9 SUWANNEE-OCALA GROUP(CRYSTAL RIVER FORMATION) CONTACT, 768'.

768.9- 772.4 CALCARENITE; YELLOWISH GRAY; 20% POROSITY, INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE;
GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: CALCILUTITE- %;
OTHER FEATURES: CALCAREOUS, CHALKY, WEATHERED;
FOSSILS: FOSSIL FRAGMENTS, FOSSIL MOLDS, ECHINOID;

772.4- 776.1 CALCILUTITE; YELLOWISH GRAY TO VERY LIGHT ORANGE; 10% POROSITY, INTERGRANULAR,
LOW PERMEABILITY, PIN POINT VUGS;
GRAIN TYPE: BIOGENIC, CALCILUTITE;
GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: CALCILUTITE- %, CALCITE- %;
OTHER FEATURES: CALCAREOUS, WEATHERED;
FOSSILS: FOSSIL MOLDS;

776.1- 780.3 CALCARENITE; MODERATE BROWN; 20% POROSITY, INTERGRANULAR, VUGULAR,
POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, OOLITE;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: CALCITE- %, CALCILUTITE- %;
OTHER FEATURES: CALCAREOUS, WEATHERED, GRANULAR;
FOSSILS: FOSSIL FRAGMENTS, FOSSIL MOLDS, BENTHIC FORAMINIFERA, BRYOZOA, CORAL;
LEPIDOCYCLINA SP., LAGENA, NUMMULITES, ASTERCYCLINA SP.

780.3- 816.8 CALCILUTITE; VERY LIGHT ORANGE TO YELLOWISH GRAY; 10% POROSITY, INTERGRANULAR,
LOW PERMEABILITY, PIN POINT VUGS;
GRAIN TYPE: BIOGENIC, CALCILUTITE;
GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: DOLOMITE- %, CALCITE- %;
OTHER FEATURES: CALCAREOUS, CHALKY, COQUINA;
FOSSILS: FOSSIL FRAGMENTS, FOSSIL MOLDS, BENTHIC FORAMINIFERA, ORGANICS, CORAL;
LEPIDOCYCLINA SP., NUMMULITES, GYPSINA GLOBULA.

816.8- 819.3 CALCILUTITE; VERY LIGHT ORANGE; 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY,
PIN POINT VUGS;
GRAIN TYPE: BIOGENIC, CALCILUTITE;
GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: CALCITE- %;
OTHER FEATURES: CALCAREOUS, CHALKY;
FOSSILS: FOSSIL FRAGMENTS, FOSSIL MOLDS, BENTHIC FORAMINIFERA;

819.3- 828.1 CALCARENITE; YELLOWISH GRAY TO VERY LIGHT ORANGE; 14% POROSITY, INTERGRANULAR, LOW PERMEABILITY, MOLDIC;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL;
GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: CALCITE- %, CALCILUTITE-45%;
OTHER FEATURES: CALCAREOUS, WEATHERED;
FOSSILS: FOSSIL FRAGMENTS, FOSSIL MOLDS, BENTHIC FORAMINIFERA; NUMMULITES, OPERCULINOIDES?, LEPIDOCYCLINA SP., GYPSINA GLOBULA.

828.1- 854.5 CALCILUTITE; VERY LIGHT ORANGE TO YELLOWISH GRAY; 08% POROSITY, INTERGRANULAR, PIN POINT VUGS, LOW PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE;
GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: DOLOMITE- %, CALCITE- %;
OTHER FEATURES: WEATHERED, CHALKY;
FOSSILS: FOSSIL FRAGMENTS, FOSSIL MOLDS, BENTHIC FORAMINIFERA;

854.5- 857.2 CALCARENITE; VERY LIGHT ORANGE TO YELLOWISH GRAY; 12% POROSITY, INTERGRANULAR, FRACTURE, MOLDIC;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: CALCITE- %, CALCILUTITE-45%;
OTHER FEATURES: CALCAREOUS, CHALKY, GRANULAR;
FOSSILS: FOSSIL FRAGMENTS, FOSSIL MOLDS, BENTHIC FORAMINIFERA, ECHINOID, BRYOZOA; OPERCULINOIDES SP., NUMMULITES, LEPIDOCYCLINA.

857.2- 879.9 CALCILUTITE; VERY LIGHT ORANGE TO YELLOWISH GRAY; 12% POROSITY, INTERGRANULAR, LOW PERMEABILITY, PIN POINT VUGS;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: CALCITE- %;
OTHER FEATURES: CALCAREOUS, CHALKY, WEATHERED;
OPERCULINOIDES SP., LEPIDOCYCLINA SP., NUMMULITES SP.

879.9- 894 CALCARENITE; VERY LIGHT ORANGE TO YELLOWISH GRAY; 17% POROSITY, INTERGRANULAR, PIN POINT VUGS, MOLDIC;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE, BIOTURBATED,
ACCESSORY MINERALS: DOLOMITE- %, CALCILUTITE-45%;
OTHER FEATURES: CALCAREOUS, CHALKY, WEATHERED, GRANULAR;
FOSSILS: ECHINOID, BENTHIC FORAMINIFERA;

894 - 934 CALCILUTITE; VERY LIGHT ORANGE TO YELLOWISH GRAY; 12% POROSITY, INTERGRANULAR,
PIN POINT VUGS, LOW PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELTAL CAST;
GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE, BIOTURBATED,
ACCESSORY MINERALS: DOLOMITE- %, CALCITE- %;
OTHER FEATURES: CALCAREOUS, WEATHERED, CHALKY, PARTINGS;
FOSSILS: BENTHIC FORAMINIFERA, FOSSIL FRAGMENTS, FOSSIL MOLDS, ORGANICS, ECHINOID;

934 - 946.6 CALCILUTITE; VERY LIGHT ORANGE TO YELLOWISH GRAY; 07% POROSITY, INTERGRANULAR,
PIN POINT VUGS, LOW PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE;
GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: DOLOMITE-01%, QUARTZ SAND- %, CALCITE- %;
OTHER FEATURES: DOLOMITIC, PARTINGS, CALCAREOUS;
FOSSILS: BENTHIC FORAMINIFERA, ORGANICS, ECHINOID, SPICULES;
MINOR FRACTURING; OPERCULINOIDES, DURHAMELLA OCALANA?

946.6- 947 CLAY; LIGHT GRAYISH GREEN; INTERGRANULAR, LOW PERMEABILITY; MODERATE INDURATION;
CEMENT TYPE(S): CLAY MATRIX, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: PLANT REMAINS- %, PHOSPHATIC GRAVEL- %, PHOSPHATIC SAND- %,
DOLOMITE-30%;
OTHER FEATURES: DOLOMITIC, PARTINGS, CALCAREOUS;
FOSSILS: ORGANICS;

947 - 964 CALCILUTITE; VERY LIGHT ORANGE TO YELLOWISH GRAY; 08% POROSITY, INTERGRANULAR,
LOW PERMEABILITY, PIN POINT VUGS;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL;
GRAIN SIZE: VERY FINE; RANGE: FINE TO VERY FINE; GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED, BIOTURBATED,
ACCESSORY MINERALS: DOLOMITE- %, PHOSPHATIC GRAVEL- %, PHOSPHATIC SAND- %;
OTHER FEATURES: DOLOMITIC, PARTINGS, CALCAREOUS;
FOSSILS: BENTHIC FORAMINIFERA, FOSSIL FRAGMENTS, ORGANICS, ECHINOID;
MINOR FRACTURES; OPERCULINOIDES SP.

964 - 984 CALCILUTITE; YELLOWISH GRAY TO YELLOWISH GRAY; 06% POROSITY, INTERGRANULAR,
LOW PERMEABILITY, FRACTURE;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL;
GRAIN SIZE: VERY FINE; GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: DOLOMITE- %, QUARTZ SAND- %;
OTHER FEATURES: DOLOMITIC, PARTINGS, CHALKY, CALCAREOUS;
FOSSILS: BENTHIC FORAMINIFERA, ECHINOID, SPICULES, ORGANICS;
NUMEROUS FORAMINIFERA-OPERCULINOIDES,NUMMULITES; ORGANICS.

984 - 994 CALCILUTITE; YELLOWISH GRAY; 04% POROSITY, INTERGRANULAR, LOW PERMEABILITY, FRACTURE;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELTAL CAST;
GRAIN SIZE: VERY FINE; GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE, LAMINATED,
ACCESSORY MINERALS: DOLOMITE- %, QUARTZ SAND- %, CALCITE- %, CHERT- %;
OTHER FEATURES: DOLOMITIC, CALCAREOUS;
FOSSILS: BENTHIC FORAMINIFERA, ORGANICS, ECHINOID;
CALCITE-FILLED FRACTURES; DURHAMELLA OCALANA?, OPERCULINOIDES.

994 - 1002.5 CALCILUTITE; YELLOWISH GRAY; 12% POROSITY, INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELTAL CAST;
GRAIN SIZE: VERY FINE; MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: BIOTURBATED,
ACCESSORY MINERALS: DOLOMITE- %, QUARTZ SAND- %, CALCITE- %, PHOSPHATIC GRAVEL- %;
OTHER FEATURES: PARTINGS, DOLOMITIC, COQUINA, CALCAREOUS, PLATY;
FOSSILS: BENTHIC FORAMINIFERA, ORGANICS, ECHINOID, BRYOZOA;
BRYOZOAN PAVEMENT; OPERCULINOIDES SP. HETROSTEGINA OCALANA.

1002.5- 1008.9 CALCILUTITE; YELLOWISH GRAY TO LIGHT OLIVE; 04% POROSITY, INTERGRANULAR, LOW PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELTAL CAST;
GRAIN SIZE: VERY FINE; GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: BIOTURBATED,
ACCESSORY MINERALS: DOLOMITE- %, QUARTZ SAND- %, CALCITE- %;
OTHER FEATURES: DOLOMITIC, CALCAREOUS;
FOSSILS: BENTHIC FORAMINIFERA, ORGANICS, ECHINOID;

1008.9- 1016 CALCARENITE; YELLOWISH GRAY; 12% POROSITY, INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELTAL CAST;
GRAIN SIZE: VERY FINE; RANGE: VERY FINE TO GRANULE; MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: BIOTURBATED,
ACCESSORY MINERALS: DOLOMITE- %, QUARTZ SAND- %, PHOSPHATIC GRAVEL- %;
OTHER FEATURES: PARTINGS, CALCAREOUS, COQUINA, DOLOMITIC, PLATY;
FOSSILS: BENTHIC FORAMINIFERA, ORGANICS;
PARTINGS, OPERCULINOIDES, HETEROSEGINA OCALANA, WEATHERING.

1016 - 1024 CALCILUTITE; YELLOWISH GRAY TO VERY LIGHT ORANGE; 06% POROSITY, INTERGRANULAR, FRACTURE, LOW PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELTAL CAST;
GRAIN SIZE: VERY FINE; GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: INTERBEDDED, FISSILE, MOTTLED, LAMINATED,
ACCESSORY MINERALS: DOLOMITE-30%, QUARTZ SAND- %, PHOSPHATIC GRAVEL- %;
OTHER FEATURES: DOLOMITIC, POOR SAMPLE, PARTINGS;
FOSSILS: BENTHIC FORAMINIFERA, ORGANICS, FOSSIL FRAGMENTS;
OPERCULINOIDES, DURHAMELLA OCALANA, FRACTURES, ALGAL-ORGANICS?

1024 - 1029.5 CALCILUTITE; YELLOWISH GRAY TO GRAYISH BROWN; 04% POROSITY, INTERGRANULAR, FRACTURE,
LOW PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELTAL CAST;
GRAIN SIZE: VERY FINE; GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: INTERBEDDED, FISSILE,
ACCESSORY MINERALS: DOLOMITE-40%, QUARTZ SAND- %;
OTHER FEATURES: DOLOMITIC, PARTINGS, PLATY, SUCROSIC;
FOSSILS: BENTHIC FORAMINIFERA, FOSSIL FRAGMENTS, ORGANICS;

1029.5- 1029.6 SUCROSIC,DOLOMITIC, OPERCULINOIDES; FORMATION CHANGING.

1029.6- 1034 DOLOMITE; VERY LIGHT ORANGE TO YELLOWISH GRAY; 04% POROSITY, INTERGRANULAR,
LOW PERMEABILITY; 10-50% ALTERED; ANHEDRAL;
GRAIN SIZE: VERY FINE; RANGE: MICROCRYSTALLINE TO VERY FINE; GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED, MOTTLED, LAMINATED,
ACCESSORY MINERALS: CALCILUTITE-45%;
OTHER FEATURES: DOLOMITIC, SUCROSIC;
FOSSILS: ORGANICS, ECHINOID, FOSSIL FRAGMENTS;
INGLIS-AVON PARK FORMATION CONTACT(1031'). ORGANICS, ECHINOIDS.

1034 - 1037 CALCILUTITE; YELLOWISH GRAY TO LIGHT GREENISH GRAY; 08% POROSITY, INTERGRANULAR,
LOW PERMEABILITY, PIN POINT VUGS;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELTAL CAST;
GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED, MOTTLED, LAMINATED,
ACCESSORY MINERALS: DOLOMITE-45%, CLAY- %, QUARTZ SAND- %;
OTHER FEATURES: DOLOMITIC;
FOSSILS: ORGANICS, ECHINOID, FOSSIL FRAGMENTS, MOLLUSKS;
CLAY LENS. ECHINOIDES-NEOLAGANUM DALLI?, ALGAL LAMINATIONS?

1037 - 1043.5 CALCARENITE; YELLOWISH GRAY TO GRAYISH BROWN; 06% POROSITY, INTERGRANULAR,
LOW PERMEABILITY, MOLDIC;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELTAL CAST;
GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: INTERBEDDED, MOTTLED, BIOTURBATED,
ACCESSORY MINERALS: DOLOMITE- %, QUARTZ SAND- %, CALCITE- %, PHOSPHATIC GRAVEL- %;
OTHER FEATURES: DOLOMITIC, GRANULAR, MEDIUM RECRYSTALLIZATION;
FOSSILS: ECHINOID, ORGANICS, FOSSIL FRAGMENTS, CORAL, MILIOLIDS;
FRACTURES, NEOLAGANUM DALLI? CALCIFIED INTERNAL MOLDS & CASTS.

1043.5- 1047.5 DOLOMITE; LIGHT BROWN TO MODERATE YELLOWISH BROWN; 16% POROSITY,
INTERGRANULAR, MOLDIC; 50-90% ALTERED; ANHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; RANGE: VERY FINE TO MICROCRYSTALLINE; GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT;
SEDIMENTARY STRUCTURES: INTERBEDDED, BIOTURBATED,
ACCESSORY MINERALS: CALCILUTITE- %, QUARTZ SAND- %;
OTHER FEATURES: DOLOMITIC, GRANULAR, SUCROSIC, MEDIUM RECRYSTALLIZATION, COQUINA;
FOSSILS: ECHINOID, FOSSIL FRAGMENTS, FOSSIL MOLDS;
NUMEROUS NEOLAGANUM DALLI.

1047.5- 1050.1 CALCARENITE; VERY LIGHT ORANGE TO YELLOWISH GRAY; 14% POROSITY, INTERGRANULAR, MOLDIC, PIN POINT VUGS;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL;
GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: DOLOMITE- %, CALCILUTITE-45%, CALCITE- %;
OTHER FEATURES: DOLOMITIC, GRANULAR, MEDIUM RECRYSTALLIZATION, COQUINA;
FOSSILS: ECHINOID, FOSSIL FRAGMENTS, FOSSIL MOLDS, CONES, ORGANICS;

1050.1- 1068.8 CALCILUTITE; MODERATE LIGHT GRAY TO YELLOWISH GRAY; 14% POROSITY, INTERGRANULAR, MOLDIC, PIN POINT VUGS;
GRAIN TYPE: CALCILUTITE, BIOGENIC, SKELETAL;
GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE, MOTTLED,
ACCESSORY MINERALS: DOLOMITE- %, CALCITE- %;
OTHER FEATURES: DOLOMITIC, MEDIUM RECRYSTALLIZATION;
FOSSILS: ECHINOID, CONES, BENTHIC FORAMINIFERA;
FRACTURES; COSKINOLINA FLORIDANA, NEOLAGANUM DALLI.

1068.8- 1070 CALCARENITE; YELLOWISH GRAY TO YELLOWISH GRAY; 18% POROSITY, INTERGRANULAR, PIN POINT VUGS, MOLDIC;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL;
GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: DOLOMITE- %, CALCITE- %;
OTHER FEATURES: DOLOMITIC, LOW RECRYSTALLIZATION;
FOSSILS: ECHINOID, CONES;

1070 - 1074 CALCILUTITE; YELLOWISH GRAY TO YELLOWISH GRAY; 08% POROSITY, INTERGRANULAR, PIN POINT VUGS;
GRAIN TYPE: BIOGENIC, CALCILUTITE;
GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE, LAMINATED,
ACCESSORY MINERALS: DOLOMITE- %;
OTHER FEATURES: DOLOMITIC, LOW RECRYSTALLIZATION;
FOSSILS: ECHINOID;

1074 - 1082 NO SAMPLES

1082 - 1084.5 CALCARENITE; YELLOWISH GRAY; 06% POROSITY, INTERGRANULAR, PIN POINT VUGS, LOW PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE;
GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, CALCILUTITE MATRIX, SILICIC CEMENT;
SEDIMENTARY STRUCTURES: INTERBEDDED, LAMINATED, MOTTLED,
ACCESSORY MINERALS: DOLOMITE-30%, CALCILUTITE-45%, QUARTZ SAND- %, CALCITE- %;
OTHER FEATURES: DOLOMITIC, MEDIUM RECRYSTALLIZATION, SUCROSIC;
FOSSILS: ORGANICS, FOSSIL FRAGMENTS, CONES, ECHINOID, ALGAE;
COSKINOLINA FLORIDANA; SILICEOUS, ORGANICS, ALGAL LAMINATIONS.

1104.5- 1105.6 CALCILUTITE; YELLOWISH GRAY; 10% POROSITY, INTERGRANULAR, PIN POINT VUGS;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL;
MODERATE INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, CALCILUTITE MATRIX, ORGANIC MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED, LAMINATED,
ACCESSORY MINERALS: LIMESTONE-30%, DOLOMITE-20%;
OTHER FEATURES: LOW RECRYSTALLIZATION, DOLOMITIC;
FOSSILS: ORGANICS, ALGAE;

1105.6- 1109.5 CALCILUTITE; YELLOWISH GRAY; 25% POROSITY, INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE;
POOR INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: QUARTZ SAND- %, DOLOMITE-05%;
FOSSILS: ORGANICS, MILIOLIDS, BENTHIC FORAMINIFERA;
CALCARENITIC SAND-FILLED SOLUTION CAVITY?

1109.5- 1120 CALCILUTITE; YELLOWISH GRAY TO VERY LIGHT ORANGE; 25% POROSITY, INTERGRANULAR,
POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE;
GRAIN SIZE: MEDIUM; RANGE: FINE TO MEDIUM; POOR INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: LIMESTONE-45%, QUARTZ SAND- %;
OTHER FEATURES: CALCAREOUS, CHALKY, GRANULAR;
FOSSILS: MILIOLIDS, BENTHIC FORAMINIFERA, FOSSIL FRAGMENTS;
POORLY CONSOLIDATED CALCILUTITIC, BIOGENIC SAND.

1120 - 1140 CALCILUTITE; YELLOWISH GRAY TO VERY LIGHT ORANGE; 20% POROSITY, INTERGRANULAR,
POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE;
GRAIN SIZE: FINE; RANGE: MEDIUM TO FINE; POOR INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: QUARTZ SAND- %;
OTHER FEATURES: CALCAREOUS, CHALKY, GRANULAR;
FOSSILS: MILIOLIDS, BENTHIC FORAMINIFERA, FOSSIL FRAGMENTS, CONES;

COSKINOLINA FLORIDANA, DICTYOCONUS COOKEI; SOME CALCIFICATION. SOME QUARTZ SAND; HEAVY MINERALS?

1140 - 1147 CALCILUTITE; YELLOWISH GRAY TO VERY LIGHT ORANGE; 20% POROSITY, INTERGRANULAR;
GRAIN TYPE: BIOGENIC, CALCILUTITE;
GRAIN SIZE: FINE; RANGE: MEDIUM TO FINE; POOR INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: QUARTZ SAND- %, DOLOMITE- %, CALCITE- %;
OTHER FEATURES: CALCAREOUS, CHALKY;
FOSSILS: MILIOLIDS, FOSSIL FRAGMENTS;
COSKINOLINA FLORIDANA; SOME ALTERATION(CALCIFICATION).

1147 - 1150 CLAY; LIGHT GREEN TO GRAYISH GREEN; INTERGRANULAR, LOW PERMEABILITY; MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, CLAY MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED,
OTHER FEATURES: PLASTIC;
FOSSILS: ORGANICS;
GREEN-GRAYISH GREEN CLAY; SOME ORGANICS, STICKY, PLASTIC.

1150 - 1159 CALCILUTITE; YELLOWISH GRAY TO VERY LIGHT ORANGE; 15% POROSITY, INTERGRANULAR;
GRAIN TYPE: BIOGENIC, CALCILUTITE;
GRAIN SIZE: FINE; RANGE: MEDIUM TO FINE; POOR INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: QUARTZ SAND- %, DOLOMITE- %;
OTHER FEATURES: CALCAREOUS, CHALKY;
FOSSILS: MILIOLIDS, BENTHIC FORAMINIFERA, ECHINOID;
NEOLAGANUM DALLI? SOME LIGHT BROWN SUCROSIC DOLOMITE

1159 - 1163 DOLOMITE; LIGHT BROWN TO MODERATE YELLOWISH BROWN; INTERGRANULAR, LOW PERMEABILITY,
INTERCRYSTALLINE; 50-90% ALTERED; ANHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; RANGE: CRYPTOCRYSTALLINE TO MICROCRYSTALLINE;
GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: CALCILUTITE-30%, QUARTZ SAND- %, HEAVY MINERALS-%;
INTERBEDDED CALCILUTIE AND DOLOMITE; MILLIOLIDS.

1163 - 1170 LIMESTONE; VERY LIGHT ORANGE TO YELLOWISH GRAY; 10% POROSITY, INTERCRYSTALLINE,
LOW PERMEABILITY;
GRAIN TYPE: CALCILUTITE;
GRAIN SIZE: MICROCRYSTALLINE; RANGE: MICROCRYSTALLINE TO VERY FINE; GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: DOLOMITE-02%;
OTHER FEATURES: DOLOMITIC;
FOSSILS: NO FOSSILS;

1170 - 1170 DOLOMITE; GRAYISH ORANGE TO MODERATE YELLOWISH BROWN; 10% POROSITY, INTERCRYSTALLINE,
LOW PERMEABILITY; 10-50% ALTERED; SUBHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; RANGE: CRYPTOCRYSTALLINE TO VERY FINE; GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: CALCILUTITE-02%;
OTHER FEATURES: CALCAREOUS;
FOSSILS: NO FOSSILS;

1170 - 1170 DOLOMITE; MODERATE DARK GRAY; 05% POROSITY, INTERCRYSTALLINE,
LOW PERMEABILITY; 10-50% ALTERED; SUBHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; RANGE: CRYPTOCRYSTALLINE TO VERY FINE; MODERATE INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: CALCILUTITE-04%;
OTHER FEATURES: CALCAREOUS;
FOSSILS: NO FOSSILS;
40% LS., 40% DOL(GRY ORNG), 20% DOL(MED. DK GRY).

1170 - 1180 DOLOMITE; MODERATE YELLOWISH BROWN; 15% POROSITY, INTERCRYSTALLINE,
POSSIBLY HIGH PERMEABILITY; 10-50% ALTERED; SUBHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; RANGE: CRYPTOCRYSTALLINE TO VERY FINE; MODERATE INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: CALCILUTITE-02%;
OTHER FEATURES: CALCAREOUS;
FOSSILS: NO FOSSILS;

1180 - 1190 DOLOMITE; MODERATE YELLOWISH BROWN; 30% PORDSITY, INTRAGRANULAR, INTERCRYSTALLINE,
POSSIBLY HIGH PERMEABILITY; 50-90% ALTERED; SUBHEDRAL;
GRAIN SIZE: VERY FINE; RANGE: MICROCRYSTALLINE TO FINE; MODERATE INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: LIMESTONE-10%;
OTHER FEATURES: CALCAREOUS, SUCROSIC;
FOSSILS: NO FOSSILS;

1190 - 1200 DOLOMITE; MODERATE YELLOWISH BROWN TO DARK YELLOWISH BROWN; 18% POROSITY, INTERCRYSTALLINE,
FRACTURE, POSSIBLY HIGH PERMEABILITY; 10-50% ALTERED; SUBHEDRAL;
GRAIN SIZE: VERY FINE; RANGE: MICROCRYSTALLINE TO FINE; GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE, INTERBEDDED,
OTHER FEATURES: SUCROSIC;
FOSSILS: NO FOSSILS;

1200 - 1210 DOLOMITE; MODERATE YELLOWISH BROWN TO DARK YELLOWISH BROWN; 25% POROSITY, INTERCRYSTALLINE,
VUGULAR, POSSIBLY HIGH PERMEABILITY; 50-90% ALTERED; SUBHEDRAL;
GRAIN SIZE: FINE; RANGE: VERY FINE TO FINE; MODERATE INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE, GRADED BEDDING,
ACCESSORY MINERALS: CALCITE-02%;
OTHER FEATURES: SUCROSIC, GRANULAR;
FOSSILS: NO FOSSILS;

1210 - 1220 DOLOMITE; MODERATE YELLOWISH BROWN; 30% POROSITY, INTERCRYSTALLINE, PIN POINT VUGS,
POSSIBLY HIGH PERMEABILITY; 50-90% ALTERED; SUBHEDRAL;
GRAIN SIZE: FINE; RANGE: VERY FINE TO FINE; MODERATE INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: GRADED BEDDING, MASSIVE,
OTHER FEATURES: SUCROSIC, GRANULAR;
FOSSILS: NO FOSSILS;

1220 - 1230 DOLOMITE; MODERATE YELLOWISH BROWN; 25% POROSITY, INTERCRYSTALLINE,
POSSIBLY HIGH PERMEABILITY; 50-90% ALTERED; SUBHEDRAL;
GRAIN SIZE: FINE; RANGE: VERY FINE TO FINE; GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE,
OTHER FEATURES: SUCROSIC, GRANULAR;
FOSSILS: NO FOSSILS;

1230 - 1235 DOLOMITE; MODERATE YELLOWISH BROWN; 27% POROSITY, INTERCRYSTALLINE,
POSSIBLY HIGH PERMEABILITY; 50-90% ALTERED; SUBHEDRAL;
GRAIN SIZE: FINE; RANGE: VERY FINE TO FINE; MODERATE INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE, INTERBEDDED,
OTHER FEATURES: SUCROSIC, GRANULAR;
FOSSILS: NO FOSSILS;

1235 - 1240 DOLOMITE; MODERATE YELLOWISH BROWN TO GRAYISH BROWN; 10% POROSITY, INTERCRYSTALLINE,
LOW PERMEABILITY; 10-50% ALTERED; SUBHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; RANGE: MICROCRYSTALLINE TO VERY FINE; GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE, GRADED BEDDING,
OTHER FEATURES: VARIEGATED;
FOSSILS: NO FOSSILS;

1240 - 1250 DOLOMITE; MODERATE YELLOWISH BROWN TO DARK YELLOWISH BROWN; 25% POROSITY, INTERCRYSTALLINE,
POSSIBLY HIGH PERMEABILITY; 50-90% ALTERED; SUBHEDRAL;
GRAIN SIZE: FINE; RANGE: VERY FINE TO FINE; MODERATE INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: GRADED BEDDING, INTERBEDDED,
ACCESSORY MINERALS: ANHYDRITE-01%;
OTHER FEATURES: SUCROSIC, GRANULAR;
FOSSILS: NO FOSSILS;
ANHYDRITE?

1250 - 1250 DOLOMITE; DARK YELLOWISH BROWN; 05% POROSITY, INTERCRYSTALLINE,
LOW PERMEABILITY; 10-50% ALTERED; SUBHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; RANGE: MICROCRYSTALLINE TO VERY FINE; GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE, INTERBEDDED,
OTHER FEATURES: VARIEGATED;
FOSSILS: NO FOSSILS;

1250 TOTAL DEPTH