ROMP 49 "BALM PARK"
EXECUTIVE SUMMARY
HILLSBOROUGH COUNTY
BASIN 11/S.25, T.31S, R.20E/11-020-007

March 16, 1989 J.L. Decker

I. SITE LOCATION

The ROMP 49 wellsite is located within Balm Park about 1/2 mile northeast of the town of Balm, Hillsborough County, Florida. The wellsite can be found by proceeding about 8.5 miles east on S.R. 672 from I-75. The wellsite is located on the southwestern corner of the intersection of Balm-Wimauma Road and S.R. 672 (Figure 1). The wellsite has a 100' x 100' perpetual easement (Figure 2). ROMP 49 is located in the NE 1/4 of NE 1/4 of NE 1/4 of Section 25, Township 31 S., Range 20E., at latitude 27°45'46" N, longitude 82°15'16".

II. GEOLOGY

The ROMP 49 wellsite lies within the Central Highlands Mid-Peninsular Zone of the Florida peninsula. The Central Highlands is a series of ridges and valleys which run parallel to the peninsular coastline (Gilboy, 1983). This zone is characterized by the discontinuous highlands in the form of sub-parallel ridges separated by the broad valleys.

The ROMP 49 wellsite is located on the western edge of the Polk Upland in Hillsborough County (Figure 3). The Polk Upland is a morphological subfeature of the Central Highlands physiographic province in peninsular Florida. It is characterized by broad uplands, scarps and marine terraces. The Polk Upland may be a former regional upland that was eroded into a broad terrace. This upland subfeature differs from surrounding areas in the degree of stream dissection and karst development. There is more ramification of surface streams in the Polk Upland than in some of the other land features in Hillsborough County. Topographic dissection generally amounts to some fifty feet (White, 1970). Elevations in the Polk Upland generally range from 100'-160' above NGVD.

The Polk Upland is drained by the Alafia and Little Manatee Rivers and their tributaries. Flow of these rivers is westerly into Hillsborough Bay and the Gulf of Mexico. This upland feature is bounded on the west by a western facing scarp called the Valrico Ridge which slopes downward to the DeSoto Plain and the Gulf Coastal Lowlands in central Hillsborough County. The ROMP 49 wellsite is near the Gulf Coastal Lowland boundary on the west and the DeSoto Plain on the south. There appears to be an inconspicuous, but persistent outfacing scarp separating the Polk Upland from the DeSoto Plain on the south. This scarp turns a right angle northward at the southwestern corner of the Polk Upland and dies out about half way up on its western side. The crest of this scarp is variable in elevation, but generally well above 100 feet NGVD (White, 1970). The wellsite is in the vicinity of this scarp, lying on the Sunderland terrace at an elevation of 145' above NGVD. The Sunderland terrace is one of the terraces in Florida which is directly related to ancient sea stands which inundated the Florida peninsula during interglacial episodes.

Hillsborough County is underlain by sedimentary rocks ranging in thickness from about 8000' in the northwest to about 13,000' in the southwest. Sedimentary rocks of Cenozoic age in Hillsborough County were laid down in essentially a horizontal position. During deposition of sediments, the land was tilted downward to the southwest. This resulted in the thickening of the beds in that direction. The forces resulting from differential compaction, along with the regional forces associated with development of the Ocala uplift and the peninsular arch, warped the beds downward to the southwest. Structural features, such as faults, formed as stresses were relieved. Because the beds thicken and dip to the southwest in Hillsborough County, wells of similar depth penetrate older formations in the northeast than in the southwest (Gilboy, 1983).

Material underlying the ROMP 49 wellsite consists of a thin mantle of predominantly clastic sediments of Quaternary age overlying a much thicker, mostly carbonate Tertiary sequence. The geological formations that have been penetrated by exploratory wells in Hillsborough County, range from Recent to Cretaceous age.

The uppermost Undifferentiated Surficial Deposits (Sunderland terrace) at the ROMP 49 wellsite consist of poorly consolidated to unconsolidated quartz sand and accessory constituents consisting of clay, organics, heavy minerals, silt and phosphatic sand and gravel. The quartz sands range from very fine to medium grain size (1/16 mm-

1/2 mm). These Pleistocene terrace sands, deposited during higher sea level stands, cover the wellsite to a depth of 77.5' below LSD. The Undifferentiated Surficial Deposits unconformably overlie beds of clay, limestone (calcilutite, calcarenite), dolomite, quartz sand and chert with variable phosphate content. These sediments compose the Hawthorn Formation (77.5'-249.5' below LSD). In the past these formation materials have been referred as "Upper Hawthorn clastics" and the "Hawthorn carbonate unit". 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, 1986). At the ROMP 49 wellsite, two formations compose the Hawthorn Group. The Peace River Formation (77.5'-118' below LSD) consists predominately of siliciclastic sediments which composes the Upper Hawthorn Group. The Bone Valley Member of the Peace River Formation does not exist at the ROMP 49 wellsite. The wellsite location appears to be outside the boundary limits of the Bone Valley Member. In the wellsite locality, the Bone Valley changes laterally into the undifferentiated "Upper Hawthorn clastic" section which is the Peace River Formation of the Hawthorn Group sediments.

The basal, predominately carbonate units of the Lower Hawthorn Group lie unconformably below the Peace River Formation. Under the revised nomenclature (Scott, 1986) the Lower Hawthorn Group has been named the Arcadia Formation (118' - 379' below LSD). The Arcadia Formation of late Early Miocene age includes carbonates, which were formerly part of the Hawthorn Formation (118' - 249.5' below LSD) and the Tampa Formation (249.5'- 379' below LSD). The summary of stratigraphy is shown in Figure 4.

The Tampa Formation (Miocene age) under prior nomenclature consists of limestone (calcilutite, calcarenite), clay, quartz and phosphatic sand embedded in a carbonate matrix. A laminated, brecciated bed of dolomite appears to be the unconformable contact between the Hawthorn and Tampa Formations. Near the base of the Tampa Formation the limestone beds (calcilutite, calcarenite) have a laminated, mottled, fractured appearance. The fossil molds are calcite-lined (crystallized). The fossil (Sorites sp.), often associated with the Tampa Formation, was identified near the base of the formation. The Hawthorn and Tampa Formations were also differentiated on the basis of a decrease in phosphorite in the core samples and lower activity as shown on the gamma ray log. These characteristics were also useful in identifying the Tampa-Suwannee Formation contact. Note: under revised nomenclature (Scott, 1986) the Tampa Formation is reduced to

member status and becomes part of the basal Arcadia Formation of the Hawthorn Group (Figure 5).

The Hawthorn and Tampa Formation (Peace River and Arcadia Formations of the Hawthorn Group) at the ROMP 49 wellsite locality serve as an effective confining unit as indicated by the large hydrostatic head difference between the surficial aquifer and Floridan aquifer systems.

The Suwannee Formation (379' - 575' below LSD) of Oligocene age lies unconformably below the Hawthorn Group (Tampa Member of the Arcadia Formation). Much of the Suwannee Formation is composed of very pale orange, moderate orange pink, yellowish gray, calcarenitic, fossiliferous limestone. The Upper Suwannee Formation is often characterized by unconsolidated to poorly consolidated calcarenitic and quartz sand. A four foot (4') chert bed was identified between 409' and 413' below LSD. Near the base of the Suwannee Formation (537.0' - 543.9' below LSD) a dolomite bed with calcite - filled fractures (horizontal and vertical) was described in the core samples. A moderate orange pink, laminated clay seam with organic material appears to be the unconformable contact with the underlying Ocala Group.

The Ocala Group (575' - 825' below LSD) of the Late Eocene age is composed of three formations. In descending order, these units are the Crystal River, Williston and Inglis Formations. The Ocala Group was differentiated from the above Suwannee Formation partially on the basis of fossils (foraminifera). The three formations are composed predominantly of chalky, coquinal, foraminiferal limestone (calcilutite, calcarenite). Much of the Ocala Group consists of unconsolidated to moderately consolidated material. The base of Ocala Group and the top of the Avon Park Formation consists of a bed of brown, fractured, mottled dolomite extending from 824.5' to 835.1'below LSD. This bed of dolomite appears to be the unconformable contact between the Ocala Group and the underlying Avon Park Formation of the Middle Eocene age.

The Avon Park of Middle Eocene age (825' - 1575' TD below LSD) is composed of alternating beds of limestone (calcarenite, calcilutite) and brown, sucrosic, crystalline dolomite. The limestone is variably dolomitzed. The top of the Avon Park Formation is characterized by a fractured, crystalline, light brown dolomite with accessory constituents. In addition to lithologic change, the echinoid (Neolaganum dalli) was identified near the top of the Avon Formation contact. Between 825' and 1063' below LSD crystalline, sucrosic and occasionally fractured dolomite was described in the core and drill cutting

samples. Alternating beds of limestone and dolomite were described between 1063' and 1420' below LSD. A seam of anhydrite was described between 1305' and 1310' below LSD. The most consistent anhydrite and gypsum beds and seams impregnated the limestone and dolomite beds between 1420' and 1575' below LSD. These beds characterize the Lower Avon Park Formation at the ROMP 49 wellsite.

The stratigraphic sequence for the ROMP 49 wellsite as interpreted from core samples (LSD - 900' below LSD), drill cuttings (900' - 1575' below LSD) and geophysical logs are described as follows:

WELL DEPTH (Ft. Below LSD)	**STRATIGRAPHIC UNIT/AGE Lithologic Description**
LSD - 77.5'	**UNDIFFERENTIATED SURFICIAL DEPOSITS/PLEISTOCENE-PLIOCENE** **Sand**; quartz, light brownish gray, light yellow gray, pinkish gray, pale brown, moderate brown, dark yellowish brown; very fine to medium grain size, subangular, medium sphericity, frosted, unconsolidated to poorly indurated; accessory constituents-heavy minerals, phosphatic sand and gravel, limestone, organic debris, clay and silt; moderately high porosity, moderate-high permeability.
77.5' - 379'	**HAWTHORN FORMATION/MIOCENE AGE (PEACE RIVER AND ARCADIA FORMATIONS OF THE HAWTHORN GROUP)** **Clay**; green, greenish gray, yellowish gray, light olive gray, white, light gray; intergranular porosity, poorly to moderately consolidated, plastic, non-calcareous, calcareous; accessory constituents-phosphatic sand and gravel, quartz sand; fossils-mollusks, fossils fragments; low permeability. **Calcilutite**; light gray, yellowish gray, light brown; intergranular porosity, interbedded, occasionally mottled and laminated, moderately indurated, argillaceous; grain type - calcilutitic; accessory constituents-clay, phosphatic sand and gravel, quartz sand, chert, dolomite; fossils - spicules, mollusks, shell fragments and molds; low to moderate porosity and

permeability.

Dolomite; yellowish gray, light brownish gray, light olive gray, pale olive, pale yellowish brown; very fine to crystalline grain type; intergranular, intragranular, and vuggy porosity; mottled, laminated, sucrosic, massive; accessory constituents-sand, clay, calcilutite, chert, phosphatic sand; fossils-shell fragments, molds; low porosity and permeability.

Sandstone, quartz sand; yellowish gray, light olive gray, greenish gray, light gray, pale olive; very fine to fine grain size; angular to subangular, medium sphericity; poor to good consolidation; accessory constituents-clay, phosphatic sand, calcilutite, dolomite; fossils - (Sorites sp.), spicules; moderate porosity, low to moderate permeability.

379' - 575' **SUWANNEE FORMATION/OLIGOCENE AGE**

Calcarenite; very pale orange, moderate orange pink, yellowish gray; intergranular, moldic porosity; interclastic, skeletal, biosparite, biogenic (predominantly foraminifera), packstone to grainstone, micritic, fine to medium grained, massive, bedded, interbedded; accessory constituents-quartz sand, silt, minor phosphatic sand, dolomite; fossils - foraminifera (Dictyconus cookei), bryozoan, echinoids (Eupatagus antillarium, Rhyncholampus gouldi; possibly macromoldic porosity, usually good intergranular and granular porosity, moderate permeability.

Calcilutite; very pale orange, moderate orange pink; intergranular, moldic porosity; biogenic, calcilutite, skeletal grain type; unconsolidated to moderately consolidated, occasionally laminated and mottled; accessory constituents-chert bed (409' - 413'), quartz sand, clay, minor phosphatic sand, silt; fossils-shell fragments, milliolids, molds; moderate porosity and permeability.

Dolomite (537' - 543.9'); grayish pink, moderate orange pink, grayish brown; very fine to microcrystalline grain size; intergranular, fracture porosity (vertical, horizontal, calcite-filled); mottled,

laminated, crystalline, sucrosic; fossils-fragments, organics; low porosity and permeability.

Clay; yellowish gray, pinkish gray; intergranular porosity, moderately consolidated, interbedded; accessory constituents-calcilutite, dolomite; low permeability.

575' - 825' **OCALA GROUP/EOCENE AGE**

Calcilutite; yellowish gray, very pale orange; intergranular, vugular porosity; biogenic, calcilutitic, skeletal grain type; massive, interbedded, bioturbated, occasionally fractured, chalky; accessory constituents-silt, quartz sand, clay; fossils-foraminifera (Lepidocyclina sp., Nummulites, Gypsina globula, Operculinoides sp.), echinoid (Durahamella floridana ?); moderate porosity, low-moderate permeability.

Calcarenite; yellowish gray, very pale orange; intergranular, moldic, and vuggy porosity; biogenic, calcilutitic, skeletal grain type, very fine to fine grain size, granular, poorly to moderately consolidated, bioturbated, massive, occasionally fractured; accessory constituents-calcilutite, quartz sand; fossils - foraminifera (Lepidocyclina sp., Nummulites, Operculinoides sp.), echinoids, mollusks, milliolids, molds, fragments, organics; moderate porosity and permeability.

Clay; yellowish gray; intergranular porosity, interbedded, moderately consolidated, calcareous; accessory constituents-calcilutite, quartz crystals; fossils-foraminifera, fragments; low permeability.

Dolomite, light brown; very fine to microcrystalline grain size, moderately consolidated, siliceous, fractured; fossils-fragments, foraminifera, organics, echinoids; low permeability.

825' - 1575' **AVON PARK/EOCENE AGE**

Dolomite; light-moderate brown, light olive gray, dark yellowish brown, pale brown,

grayish brown; intergranular, intercrystalline porosity, microcrystalline-cryptocrystalline grain size, bedded, massive, occasionally laminated, mottled, fractured, sucrosic, moderate-good induration; accessory constituents-quartz, quartz sand, chert, limestone, anhydrite, gypsum; fossils-echinoids (Neolaganum dalli), organics, fossils fragments; usually low porosity and permeability.

Limestone; light brown, yellowish brown, very pale orange, pale brown; intergranular, pin point vugular porosity; massive, interbedded, very fine to microcrystalline grain size; biogenic, micritic grain type; accessory constituents-dolomite, anhydrite, gypsum, quartz, quartz sand; fossils-fragments, molds, fragments, low-moderate porosity and permeability.

Evaporites (Anhydrite, Gypsum); white, very light gray; intergranular porosity, interbedded; accessory constituents-clay, dolomite, limestone; unfossiliferous; low porosity and permeability.

Clay; moderate yellowish green; plastic, intergranular, interbedded, poor to moderate induration; accessory constituents-dolomite, limestone, anhydrite, gypsum; fossils-organics; low permeability.

III HYDROGEOLOGY

The surficial aquifer system, intermediate aquifer system (intermediate confining system) and the Floridan aquifer system exist at the ROMP 49 "Balm Park" wellsite.

A. SURFICIAL AQUIFER SYSTEM

The surficial aquifer system at the ROMP 49 wellsite extends from land surface to 77.5' below LSD. This system includes the entire Undifferentiated Surficial Deposits. The deposits are composed of quartz sand, organic material, heavy minerals, sandy clay, phosphatic sand and gravel and limestone (micrite). The system includes both unsaturated and saturated deposits which are unconsolidated to poorly indurated. In Hillsborough County water-bearing properties of the surficial aquifer system vary because of thickness

and lithology. Average thickness of this system is about 25' in Hillsborough County, but can range from 3' or less to slightly more than 80'. The surficial aquifer system at ROMP 49 is 77.5' thick. The moderately high permeable clastic deposits consist mainly of quartz sand ranging from very fine to medium grain size.

The surficial aquifer system is unconfined at the ROMP 49 wellsite. The water table is variable due to seasonal fluctuations. Water in the surficial aquifer system in the wellsite locality is derived almost entirely from rainfall. Water table levels fluctuate 3' to 5' yearly at the ROMP 49 wellsite. In May 1988, the water level in the surficial aquifer system was 2.85' below LSD. During drilling operations (Aug. 1988 to Aug. 1989) water levels ranged from 2.66' to 3.56' below LSD. Following drilling operations in December 1989 the water level was 4.08' below LSD.

Yield of wells completed in the surficial aquifer system in Hillsborough County range from as little as 5 gpm to as much as 200 gpm. Yield depends upon physical characteristics such as grain size, sorting and thickness of the saturated zone. Transmissivity also varies widely due to the above characteristics. Where fine clayey sand predominates, transmissivity might be as little as 20 ft^2/d, but might be as much as 5,000 ft^2/d in some clean shell beds in Hillsborough County (Kelley, 1988). Transmissivity in two wells at different locations in southeastern Hillsborough County were 254 and 1805 ft^2/d respectively (Kelley, 1988). No pump tests were conducted at ROMP 49 in the surficial aquifer system to determine yield and transmissivity.

In Hillsborough County water quality in the surficial aquifer system varies widely depending upon location. At the ROMP 49 wellsite, specific conductivity of one sample at 25°C was 110 Umhos. The chloride value was 10 mg/l, while the sulfate value was 20 mg/l. Total Dissolved Solids (TDS) was 55 mg/l.

B. INTERMEDIATE AQUIFER SYSTEM

The intermediate aquifer system (intermediate confining system) includes all water-bearing units and confining units between the overlying surficial aquifer system and the underlying Floridan aquifer system. The water-bearing beds include the discontinuous sand, sandstone and the more permeable beds of limestone and dolomite. The confining beds include clay, chert and the hard impermeable beds of dolomitic limestone and dolomite which retard vertical movement of water. These beds consist of fine grained clastic deposits which are interbedded with carbonate sequences belonging to part of the Hawthorn Group (Miocene

age).

At the ROMP 49 wellsite, the intermediate aquifer system includes the clastic and carbonate units of the Hawthorn Formation (Peace River and Upper Arcadia Formations of the Upper Hawthorn Group) and the Tampa Formation (Lower Arcadia Formation of the Lower Hawthorn Group). Except for some thin water-bearing beds consisting of sand and limestone, most of the clay, calcilutite, sandstone and dolomite beds lying between 77.5' and 369' below LSD at ROMP 49 have confining characteristics which retard the vertical movement of ground-water. The entire thickness (291.5') of the intermediate aquifer system (intermediate confining system) can be considered a confining unit at ROMP 49. Small water-bearing units within this system appear to be hydraulically isolated from each other.

The upper confining unit, consisting of almost entirely of clay, extends from 77.5' to 196' below LSD. Below the depth of 196' the lithology of the thin water-bearing units and the lower confining unit is variable, making it difficult to describe any definite zones. According to the geophysical logs (electric, neutron) a water-bearing zone appears to exist from 228' to about 245' below LSD in the Hawthorn Formation. The Tampa Formation appears to have two minor water-bearing units between 268' and 290' below LSD. Another small water-bearing interval may exist between 245' and 260' below LSD.

A substantial hydrostatic head difference head exists between the surficial and intermediate aquifer systems at the ROMP 49 wellsite. The upper and lower confining units prevent infiltration of very much water through the entire intermediate aquifer system. In the wellsite locality the potentiometric surface (hydraulic head) varies significantly seasonally. An 18' difference in hydraulic head occurred in 1988. At the end of the dry season (May 1988), potentiometric head in the wellsite locality was O' NGVD, whereas, the potentiometric surface was 18' above NGVD at the end of the wet season (September 1988). The potentiometric surface (Aug., Nov. 1989) ranged from 105.3' to 143.3' below LSD while coring from 179' to 369' below LSD. Seasonal changes and high ground-water withdrawals are responsible for the large changes in potentiometric surface. The water-bearing units in the Hawthorn and Tampa Formations indicated above appear to have different hydraulic heads. Confining beds above and below these water-bearing units retard vertical flow substantially, but still transmit or leak water. ROMP 49, with an elevation of 145' below LSD, has a high potential for ground-water to flow to the south and west toward Tampa Bay and the Gulf of Mexico which are areas of low potential. In the ROMP 49 locality (May 1988)

the potentiometric surface in the intermediate aquifer system was 18' higher than the Floridan aquifer system. During September 1988 the potentiometric surface in the intermediate aquifer system was 9' higher than the Floridan aquifer system. Some water in the intermediate aquifer system is transmitted downward and recharges the Floridan aquifer system. Heavy local agricultural irrigation pumpage is responsible in part for this differential as most of the wells penetrate the Floridan aquifer system.

In the southern half of Hillsborough County the wells developed in the sand and limestone water-bearing units of the Hawthorn and Tampa Formations yield about 500 GPM (Menke, 1961). The majority of wells in Hillsborough county probably yield only 10-300 gpm.

Transmissivity of the permeable deposits of the intermediate aquifer system in central and southern Hillsborough County ranges from .0001 ft^2/d to as much as 300 ft^2/d. Leakance coefficients are estimated to range from 1 x 10^{-5} to 7 x 10^{-5} ft/d/ft in southeastern Hillsborough County (Kelley, 1988). Other leakance coefficients for the system estimated from pump tests range from 4 x 10^{-4} ft/d/ft near the Tampa Bay coast in the uppermost confining bed to 7 x 10^{-5} ft/d/ft in the lowermost confining layer of the intermediate aquifer system in the eastern part of Hillsborough County (Kelley, 1988).

During coring operations specific conductivity ranged from 225 to 365 Umhos. Temperature of these samples ranged from 25°C to 26.5°C. On December 19, 1989 specific conductivity in the Hawthorn Monitor was 25°C at 300 Umhos. The chloride value was 6 mg/l, while the sulfate value was 5.5 mg/l. Total Dissolved Solids (TDS) was 195 mg/l.

C. FLORIDAN AQUIFER SYSTEM

The Floridan aquifer system is composed of a vertical continuous and extensive sequence of limestone (calcarenite, calcilutite) and dolomite beds. Most of the carbonates are relatively high in permeability and are hydraulically connected (Miller, 1986). At ROMP 49 the Floridan aquifer system consists of two units, the upper and lower Floridan aquifers. These aquifers are separated by a less permeable sequence of carbonates (dolomitic limestone, dolomite) and evaporites. The upper Floridan aquifer system at ROMP 49 is composed of solution-riddled and faulted limestone. The formations in the upper Floridan aquifer system are comprised of chemically precipitated limestones and dolomites that contain foraminifera, echinoids, mollusks and shell fragments. In ascending order they are the Avon Park, Inglis, Williston, Crystal River, Suwannee, and the Lower

Tampa Formations. The age of these formations range from Eocene to Early Miocene. The thickness of the upper Floridan aquifer system at ROMP 49 is 1050'. The upper Florida aquifer system extends from 369' below LSD (base of the Tampa Formation) to the top of the evaporites (1419' below LSD) which is within the Avon Park Formation. The top of the upper Florida aquifer system is located where permeable beds of consistent limestone are found and no extensive clay or dolomite confining beds exist. The structural surface or base of this system is the beginning of vertically consistent intergranular evaporites (Miller, 1986).

The upper Floridan aquifer system at the ROMP 49 wellsite consists of at least two inter-aquifer confining beds within a multi-aquifer system. The Lower Tampa Formation (369'-379' below LSD), and the Upper Suwannee Formation (379'-521' below LSD is the upper water-bearing unit in the upper Floridan aquifer system. A chert bed (409'-413' below LSD) separates this unit into two parts. From 521'-564.5' below LSD water-bearing properties of the Lower Suwannee Formation is variable due to the composition of the formational material (fractured dolomite, clay, fractured calcarenite and calcilutite). The Lower Suwannee Formation 564.5'-579' below LSD and most of the Ocala Group (578'-804' below LSD) appears to be a fairly high water-bearing unit. The base of Ocala Group (804'-825' below LSD) is a confining bed consisting of calcilutite. According to geophysical log interpretation and core descriptions the sucrosic and occasional fractured dolomitic unit in the Avon Park Formation (825'-1063' below LSD) is a highly transmissive water-bearing unit. From 1063' to 1188' below LSD the dolomite and dolomitic limestone beds are variable as is their transmissive water-bearing properties. A low hydraulic unit consisting of dolomitic limestone and dolomite exists near the base of the upper Floridan aquifer system (1188'-1419' below LSD).

Ground-water flow through the water-bearing units in the upper Florida aquifer system at ROMP 49 is generally south and west toward the coast (Tampa Bay, Gulf of Mexico). The wellsite locality is in an area of high potential at an elevation of 145', whereas, the coastal areas are of low potential.

Potentiometric surface in the Floridan aquifer system fluctuates substantially seasonally as does the intermediate aquifer system in the wellsite area. The upper units in the Suwannee Formation and Ocala Group as well as the lower unit in the dolomite sequence of the Avon Park Formation are pumped heavily in the Balm-Wimauma area by agricultural users.

As with the intermediate aquifer system a cone of depression in potentiometric surface forms in south-central Hillsborough County and northern Manatee County during the dry season. The depression is caused from a lack of precipitation and excessive pumping from agricultural interests.

At the end of the dry season (May 1988), potentiometric surface in the Floridan aquifer system was -18' below NGVD in the wellsite locality. This figure was 18' below the intermediate aquifer system's measurement of 0' NGVD. Following the wet season (September 1988), potentiometric surface in the upper Floridan aquifer system was 11' above NGVD. This measurement was 9' below the potentiometric surface of 20' above NGVD in the intermediate aquifer system. During the year 1988 there was a 29' fluctuation in potentiometric surface in the Floridan aquifer system in the wellsite locality.

Even though the upper and lower transmissive units of the upper Floridan aquifer system appear to be hydraulically connected by solution openings along fracture systems, they are not in equilibrium. The lower unit may be pumped more extensively than the upper unit or it may take a longer period of time for the lower unit to reach equilibrium following wet or dry seasons.

During coring and monitor well construction operations (August 1988-June 1989) variations in potentiometric surface were due to a heavy rainfall in late November 1988, heavy pumpage from agricultural interests (February 1989) and recovery at the onset of the wet season (June 1989).

Yield of wells pumping water from the upper transmissive unit (Tampa-Suwannee Formation, Ocala Group) in west-central Floridan may be as much as 1000 gpm, but can range from 500 to an excess of 5000 gpm in the lower transmissive units in the Ocala Group and Avon Park Formation (Wolansky, 1985).

Transmissivity in the ROMP 49 locality ranges from 100,000 to 250,00 ft^2/d (Kelley, 1988). In west-central Florida transmissivity values determined from aquifer tests in the Floridan aquifer system range from 1,900 to 920,000 ft^2/d, storage coefficient from 1.3×10^{-4} to 1.5×10^{-3} and leakance from 5×10^{-5} to 9×10^{-3} (ft^2/d) (Wolansky, 1985). Although the Floridan aquifer system has multiple layers of low porosity in the Suwannee Formation, Ocala Group and Avon Park Formation, aquifer tests indicate that the layers generally respond to pumping as a unit. No aquifer tests were performed in the permeable zones of the upper Floridan aquifer system at ROMP 49. A packer pump test was conducted

at ROMP 49 in the evaporites, a confining unit between the upper and lower Floridan aquifer system. Recharge rates in the upper Floridan aquifer system in the vicinity of ROMP 49 are low (0.0"- to 2.0"/yr in 1987) (Kelly, 1988). The low recharge is due the relatively impermeable confining beds with a thickness of 291.5' overlying the upper Floridan aquifer system at ROMP 49.

During coring and drilling operations water samples were collected and analyzed from 179' to 1575' below LSD. Mineral content increased with depth. From the top of the upper Floridan aquifer system (369' below LSD) to the base of this system (1419' below LSD), specific conductivity ranged from 230 to 650 Umhos. Chlorides ranged from a low of 3 mg/l to a high of 35 mg/l, while sulfates ranged from 38.4 to 154 mg/l. Total Dissolved solids (TDS) results were obtained from samples collected from the drill rig and thief samples from the geophysical logger between 1340' and 1420' below LSD. Total dissolved solids (TDS) ranged from 262 mg/l to 609 mg/l. Results from the fluid conductivity log trace showed a sharp but slight degradation in water quality at 978' below LSD. Gradual deterioration continued until 1376' below LSD. From this depth to the bottom of the upper Floridan aquifer system at 1419' below LSD, water quality as shown on the log trace deteriorated rapidly.

Temperature values of water samples retrieved between the top and the base of the upper Floridan aquifer system ranged from 24°C to 28°C during drilling operations. Temperatures obtained from the geophysical log trace ranged from 24.88°C to 28.77°C within the interval (400'-1400' below LSD). Temperature values gradually increased with depth from 400' to about 825' below LSD (top of Avon Park Formation). A fairly sharp change occurred between 825' and 840' below LSD. Another change of greater magnitude occurred between 960' and 978' below LSD. This zone of temperature change coincided with water degradation as indicate above. At the base of the upper Floridan aquifer system only slight increases in temperature were noted on the geophysical log trace.

Values for water quality in the evaporites (1420'-1575' below LSD) will be given in this section of the report even though they were retrieved in the confining unit below the upper Floridan aquifer system. Specific conductivity ranged from 890 Umhos at 1420' below LSD to 24,000 Umhos at 1575 below LSD. Chlorides in the evaporites ranged from 18 mg/l at a depth of 1420' to 8300 mg/l at 1575' below LSD. Sulfates, within the same depth interval, ranged from 276.9 to 3522.5 mg/l. Total dissolved solids (TDS) ranged from 609 to 1646 mg/l. The water samples retrieved within the evaporites were obtained from the drill rig and the

geophysical logger thief sampler.

IV. WELL CONSTRUCTION

A. DEEP FLORIDAN MONITOR

The Deep Floridan Monitor (Avon Park Formation) was designed to monitor water quality and fluctuations in the potentiometric surface in the transmissive dolomite unit in the Upper Avon Park Formation (Figure 6). This well was drilled to 1575' below LSD to locate the fresh-saltwater interface and to conduct packer-pump tests in the zone of evaporites (gypsum, anhydrite) near the base of the upper Floridan aquifer system.

The Deep Floridan Monitor was initially a modification of a test corehole (LSD-900' below LSD). The construction of this monitor was initiated by drilling a 22" dia. nominal borehole, using mud-rotary drilling techniques to a depth of 100' below LSD. Eighteen inch (18") dia. steel casing was set (LSD-100' below LSD) and cement-grouted to land surface. A 14" dia. nominal borehole was drilled out of the 18" dia. steel casing to a depth of 300' below LSD. Ten inch (10") dia. PVC casing was set and cement-grouted from 300' below LSD to land surface. Upon completion of coring to 505' below LSD, the corehole was reamed to a 10" dia. nominal size to accommodate the temporary 4" dia. steel casing used during coring operations. Following coring to 900' below LSD, the 3" dia. corehole (505'-900' below LSD) was reamed to a 10" dia. nominal borehole.

ROMP 49 is within the south Hillsborough/north Manatee Water Resource Assessment Project (WRAP) area. A packer-pump test was requested following the drilling and reaming of the borehole (900'-1575' below LSD). A 10" dia. nominal borehole was initially drilled to 940' below LSD. From 940' to 1575' below LSD, a 6" dia. nominal borehole was drilled with a 5 5/8" dia. drill bit. Due to borehole conditions, it was necessary to ream the 6" dia. nominal borehole to a 10" dia. nominal size to a depth of 980' below LSD. The borehole was then reamed with a 7 5/8" drill bit to a depth of 1400' before the packer could be properly set. Following the packer-pump test the borehole was back-plugged with cement-grout from 1575' to 1140' below LSD. The borehole from 1140' to 800' below LSD was filled with gravel before the six (6") inch dia. PVC casing could be set and cement-grouted from 800' to land surface. The gravel, extending from 800' to 1140' below LSD, was airlifted by direct air and reverse air methods following cement grouting procedures. An open hole (800'-1140' below LSD) will monitor the sucrosic, transmissive and occasionally fractured dolomite unit within the Avon Park Formation. Following completion of well construction, a three foot (3')

extension of 6" dia. PVC casing was left standing above ground level to facilitate the later installation of a recorder box and instrumentation.

B. UPPER FLORIDAN MONITOR

The Upper Floridan Monitor (Suwannee Formation) was constructed for the purpose of monitoring water quality and fluctuations in the potentiometric surface in the calcarenitic and calcilutitic limestones in the Suwannee Formation. The Upper Floridan Monitor was drilled to a depth of 526' below LSD (Figure 7).

The construction of the Upper Floridan Monitor was initiated by drilling an 18" dia. nominal borehole, using mud-rotary drilling techniques, to a depth of 100' below LSD. Fourteen inch (14") dia. steel casing was set (LSD-100' below LSD) and cement-grouted to land surface. An 11" dia. nominal borehole was then drilled out of the 14" dia. steel casing to a depth of 410' below LSD. Six inch (6") dia. PVC casing was then set from land surface to 410' below LSD and cement-grouted to land surface. This casing will effectively isolate the surficial and intermediate aquifer systems from the Floridan aquifer system. A 6" dia. nominal borehole was then drilled out of the 6" dia. PVC casing to a total depth of 526' below LSD. Following completion of well construction, a three foot (3') extension of 6" dia. PVC casing was left standing above ground level to facilitate the later installation of a recorder box and instrumentation.

C. 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 8).

The construction of the Surficial Monitor was initiated by drilling a 12" dia. nominal borehole to a depth of 58' below LSD. A six inch (6") dia. PVC sediment trap (57'-58' below LSD), twenty feet (20') of six (6") dia. (0.020" slot) well screen (37'-57' below LSD) was coupled onto 40' of 6" dia. PVC casing from land surface to 37' below LSD and set into the borehole. The well's annulus from 58' to 15' below LSD was sand-packed with 6-20 type silica sand and was then cement-grounted from 15' to land surface. Following completion of well construction, a three foot (3') extension of 6" dia. PVC casing was left standing above ground level to facilitate the later installation of a recorder box and instrumentation.

D. INTERMEDIATE AQUIFER MONITOR (HAWTHORN GROUP)

The Intermediate Aquifer Monitor was designed and constructed for the purpose of monitoring water quality and record fluctuations in the potentiometric surface (hydrostatic level) in the intermediate aquifer system. This monitor is a modification of an existing monitor which was completed in 1977. Originally, the monitor well was constructed with 16" dia. steel casing in the initial phase of construction. This casing was set and cement-grouted from 38' below LSD to land surface. A 16" dia. nominal borehole was drilled out of the 16" dia. steel casing to the depth of 82' below LSD. Fourteen inch (14") steel casing was set and cement-grouted to land surface. A twelve inch (12") nominal borehole was then drilled out of the 14" dia. steel casing to a depth of 195' below LSD. Eight inch (8") PVC casing (+3' to 195' below LSD) was set and cement-grouted to land surface. A six inch (6") nominal borehole was drilled out of the 8" dia. PVC casing to depth of 620' below LSD. The well had an open hole from 195' to 620' below LSD prior to modification.

From the year 1977 to 1989 sand had filled in the borehole from 620'to about 230' below LSD. During May 1990 modification of the Intermediate Aquifer Monitor was initiated. Following removal of the sand, the borehole was cement-grouted from 620'to 530'below LSD. Due to the potential for cement-grout to migrate and contaminate the open hole interval in the nearby Upper Floridan Monitor (Suwannee Formation), gravel was injected into the borehole from 530' to 397' below LSD. The borehole was then cement-grouted from 397'to 295' below LSD. A four inch (4") dia. PVC sediment trap (290'-291' below LSD), sixty feet (60') of four inch (4") dia. (0.020") slot well screen (230'-290' below LSD) was coupled onto 230' of four inch (4") dia. PVC casing. A back-off male-female type threaded coupling was attached to the four inch (4") dia. casing at a depth of 175' below LSD so that the upper 175' of the four inch (4") dia. PVC could be removed following the sand-packing of the well's annulus with 6-20 type silica sand from 295' to 182' below LSD and cement-grouting from 182' to 177' below LSD. Following completion of well construction, a three foot (3') extension of eight inch (8") PVC casing was left standing above ground level to facilitate the later installation of a recorder box and instrumentation.

V. PACKER-PUMP TEST

A packer-pump test was conducted in the confining unit between the upper and lower Floridan aquifer systems at the ROMP 49 wellsite. The confining unit is composed of interbedded evaporites (gypsum and anhydrite), dolomite and dolomitc limestone. The evaporites are found in vugs,

seams, lenses, and fractures within the confining unit.

Personnel from the Resource Projects Department are conducting a study called the south Hillsborough/north Manatee Water Resource Assessment Project (WRAP). ROMP 49 "Balm Park" is within their study area. A packer-pump test was performed to obtain quantitative values relating to upward leakage from the confining unit into the upper Floridan aquifer system. Data from this aquifer test will aid in developing a three-dimensional solute-transport model for identifying the susceptibility of the area to saltwater intrusion.

It is hoped that this aquifer test will also aid in the determination of permeabilities, conductivities dispersivities, storage coefficients, and specific capacities in the Balm locality.

A TAM-J inflatable packer was initially set in open hole near the top of the evaporites (1430' below LSD) with the Speedstar drilling rig. During the first aquifer test (9-14-89) the packer was set and inflated so that it would conform to the irregularities of the open hole. A pressure-tight seal did not occur at the depth of 1430', as indicated from the interpretation of data retrieved during the test. A drawdown of 11.37' at a pumping rate ranging between 37 and 50 gpm occurred over a period of 18 minutes in the zone of evaporites (1430'-1575' below LSD). Water level in the evaporites dropped from 128.54' to 139.91' below LSD during this period of time. Water level in the upper Floridan aquifer system dropped from 128.80' to 128.83' during the pumping phase of the aquifer test. Recovery was very rapid in the evaporites, indicating significant leakage around the inflated packer. Over the period of 30 minutes, water level recovered rapidly from 139.91' to 128.64' below LSD. Potentiometric surface in the upper Floridan aquifer system recovered from 128.83' to 128.80' below LSD, again indicating leakage around the inflated packer.

The packer was then lowered to 1500' below LSD, set and inflated on (9-19-89). Three packer-pump tests were performed at pump engine rates - 2200 rpm, 1100 rpm and 1500 rpm respectively.

On the first test at 2200 rpm, the pumping rate ranged between 1.9 and 3.4 gpm. Due to a relatively small open hole interval (1500' - 1575' below LSD) drawdown was very rapid. From a static water level of 118.25' below LSD in the evaporites, the water level dropped to a maximum depth of 415.5' below LSD (297.25') after pumping 120 minutes. The water level fluctuated as much as 2.08' between 120 and 234 minutes during the last phase of the test. The pumping

rate may have varied during this period of time. Water quality progressively degraded substantially, ranging from 450 Umhos after 30 minutes to 17,000 Umhos after 234 minutes. Potentiometric surface in the upper Floridan aquifer system remained fairly constant (130.20' to 130.22' below LSD). Recovery in the evaporites (1500'-1575' below LSD) was very slow. Water level recovered from 413.45' to 224.28' below LSD (189.17') after 60 minutes. The following day (9-20-89), the water level had recovered to 149.35' below LSD.

During the second packer-pump test at 1100 rpm the pumping rate in the evaporites (1500'-1575' below LSD) ranged from a high of 2.3 gpm near the beginning of the test to a low of 1.8 gpm after 210 minutes pumping. Water level dropped from 149.35' to 376.75' below LSD (227.40') after 240 minutes pumping. Water quality degraded from 22,000 to 30,005 Umhos during this test. Potentiometric surface in the upper Floridan aquifer ranged from 130.23' to 129.9' below LSD after 210 minutes pumping. A steady decline in the pumping rate may have been responsible for the rise in water level. Recovery again was very slow. Water level recovered from 376.75' to 162.15' below LSD (214.50') after 420 minutes. The following day (9-21-89), the water level had recovered back to 152.85'below LSD.

During the last packer-pump test at 1500 rpm, the pumping rate in the same zone (1500'-1575' below LSD) ranged from a high of 2.7 gpm after 5 minutes pumping to a low of 1.9 gpm at pump shut down (150 minutes). Water level in the evaporites dropped from 395.24' to 152.75' below LSD (243.49') after 150 minutes pumping. Water quality ranged from 28,000 Umhos after 16 minutes pumping to 29,500 Umhos after 120 minutes pumping. Potentiometric surface in the upper Floridan aquifer system ranged from 129.5' to 129.64' below LSD. Again, recovery was slow. Water level recovered from 396.24' to 173.76' below LSD (222.48') after 120 minutes. Water recovery was still occurring five days later (9-26-89). Water level had recovered to a depth of 137.28' by this date. Potentiometric surface in the upper Floridan aquifer system fluctuated very little during recovery, ranging from 129.68' to 129.64' below LSD over 180 minutes. By 9-26-89 the potentiometric surface had risen to 127.48' below LSD.

Following the packer-pump test a thief sample was retrieved at 1500' below LSD. Specific conductivity was 30,190 Umhos. The chloride value was 9600 mg/l, while the sulfate value was 4098.3 mg/l.

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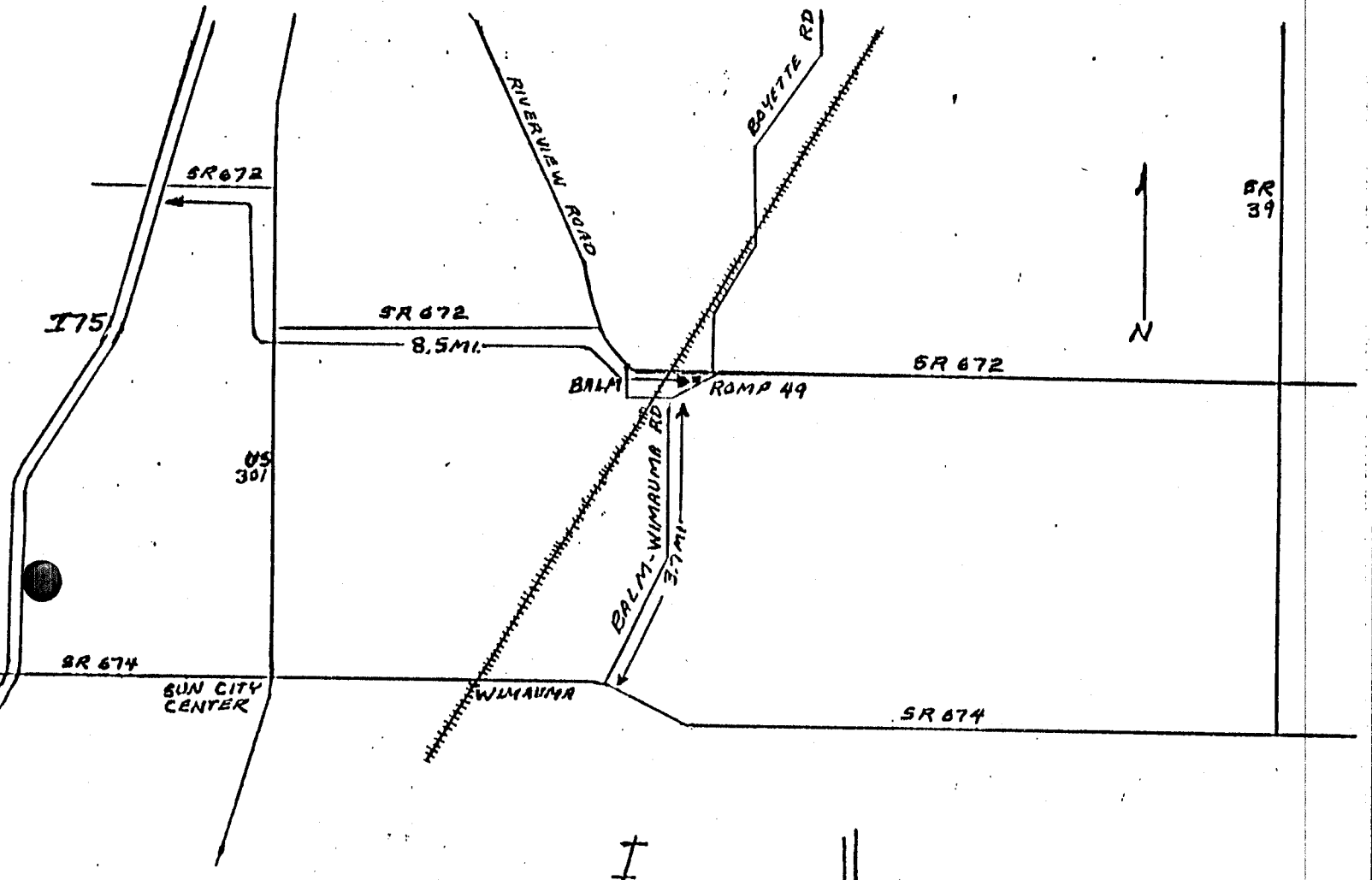
ROMP 49 BALM PARK
SITE LOCATION MAP
S. 25, T 31 S., R. 20 E
LAT. 27° 45' 46" LONG. 82° 15' 15"

6-10-88

J. L. DECKER



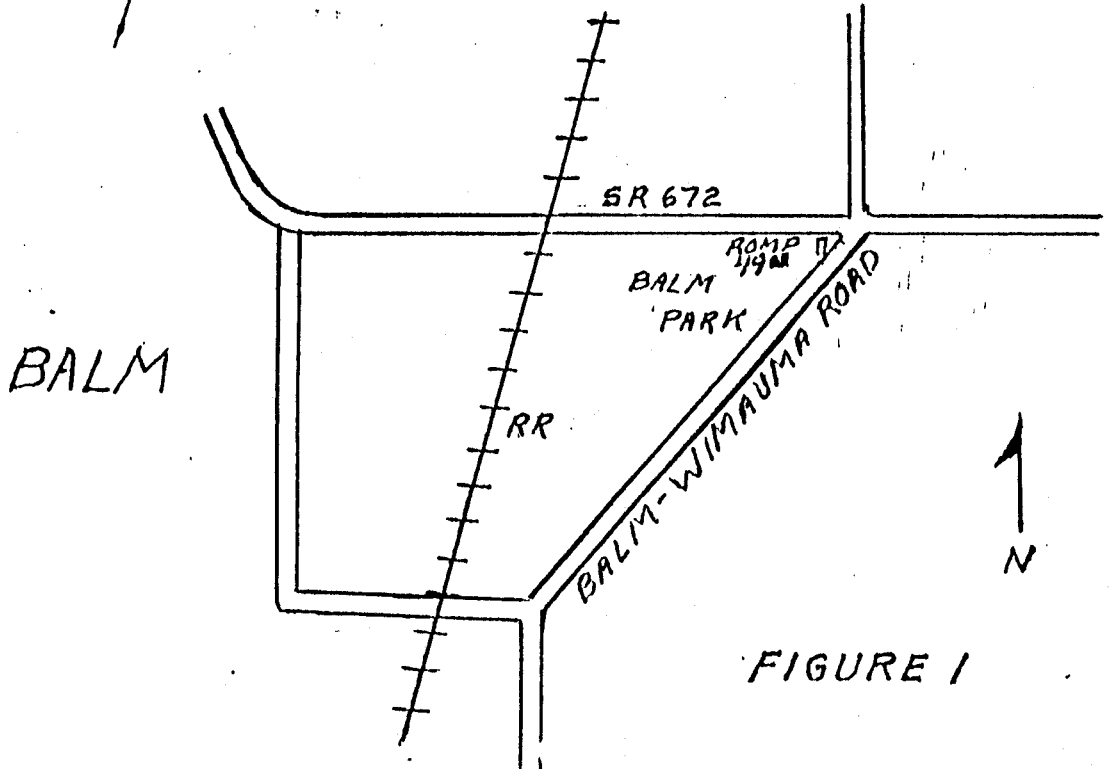


FIGURE 1

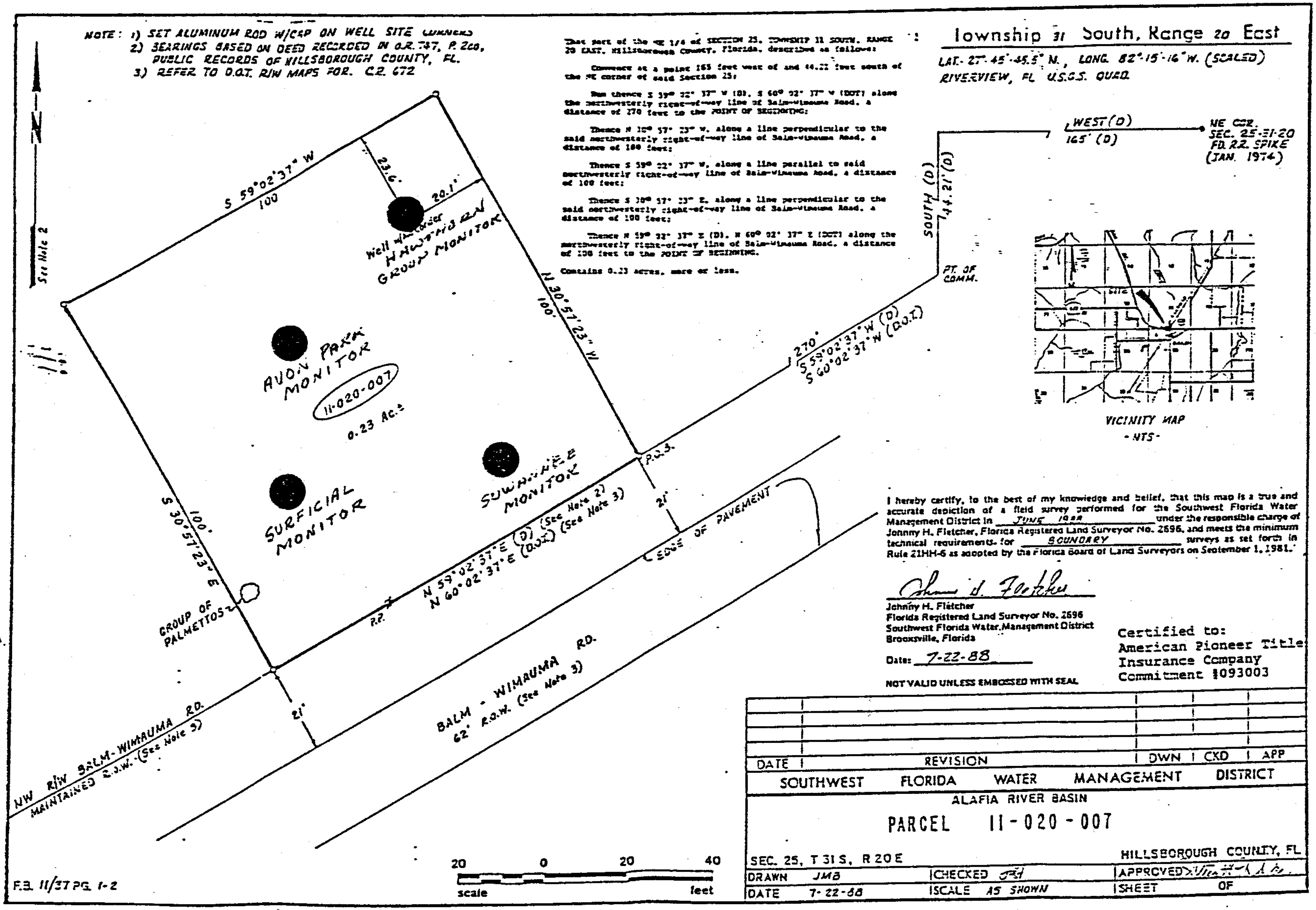

NOTE: 1) SET ALUMINUM ROD W/CAP ON WELL SITE CORNERS
2) BEARINGS BASED ON DEED RECORDED IN O.R. 747, P. 200, PUBLIC RECORDS OF HILLSBOROUGH COUNTY, FL.
3) REFER TO D.O.T. R/W MAPS FOR. C.2. 672
That part of the NE 1/4 of SECTION 25, TOWNSHIP 31 SOUTH, RANGE 20 EAST, Hillsborough County, Florida, described as follows:
Commence at a point 165 feet west of and 44.21 feet south of the NE corner of said Section 25;
Run thence S 59° 02' 37" W (D), S 60° 02' 37" W (DOT) along the northwesterly right-of-way line of Balm-Wimauma Road, a distance of 270 feet to the POINT OF BEGINNING;
Thence N 30° 57' 23" W, along a line perpendicular to the said northwesterly right-of-way line of Balm-Wimauma Road, a distance of 100 feet;
Thence S 59° 02' 37" W, along a line parallel to said northwesterly right-of-way line of Balm-Wimauma Road, a distance of 100 feet;
Thence S 30° 57' 23" E, along a line perpendicular to the said northwesterly right-of-way line of Balm-Wimauma Road, a distance of 100 feet;
Thence N 59° 02' 37" E (D), N 60° 02' 37" E (DOT) along the northwesterly right-of-way line of Balm-Wimauma Road, a distance of 100 feet to the POINT OF BEGINNING.
Contains 0.23 acres, more or less.
Township 31 South, Range 20 East
LAT. 27° 45' 45.5" N., LONG. 82° 15' 16" W. (SCALED)
RIVERVIEW, FL U.S.G.S. QUAD
N
See Note 2
S 59°02'37" W
100
23.6'
20.1'
Well Hawthorn HAWTHORN GROUP MONITOR
N 30°57'23" W
100'
AVON PARK MONITOR
11-020-007
0.23 Ac.±
SURFICIAL MONITOR
SUWANNEE MONITOR
S 30°57'23" E
100'
GROUP OF PALMETTOS
N 59°02'37" E (D) (See Note 2)
N 60°02'37" E (D.O.T.) (See Note 3)
P.P.
P.O.B.
21'
EDGE OF PAVEMENT
270'
S 59°02'37" W (D)
S 60°02'37" W (D.O.T.)
PT. OF COMM.
SOUTH (D)
44.21' (D)
WEST (D)
165' (D)
NE COR. SEC. 25-31-20
FD. R.R. SPIKE
(JAN. 1974)
VICINITY MAP
- NTS -
NW R/W BALM-WIMAUMA RD.
MAINTAINED R.O.W. (See Note 3)
BALM - WIMAUMA RD.
62' R.O.W. (See Note 3)
I hereby certify, to the best of my knowledge and belief, that this map is a true and accurate depiction of a field survey performed for the Southwest Florida Water Management District in JUNE 1988 under the responsible charge of Johnny H. Fletcher, Florida Registered Land Surveyor No. 2696, and meets the minimum technical requirements for BOUNDARY surveys as set forth in Rule 21HH-6 as adopted by the Florida Board of Land Surveyors on September 1, 1981.
Johnny H. Fletcher
Florida Registered Land Surveyor No. 2696
Southwest Florida Water Management District
Brooksville, Florida
Date: 7-22-88
NOT VALID UNLESS EMBOSSED WITH SEAL
Certified to:
American Pioneer Title
Insurance Company
Commitment #093003
DATE
REVISION
DWN
CKD
APP
SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT
ALAFIA RIVER BASIN
PARCEL 11-020-007
SEC. 25, T 31 S, R 20 E
HILLSBOROUGH COUNTY, FL
DRAWN JMB
CHECKED
APPROVED
DATE 7-22-88
SCALE AS SHOWN
SHEET OF
20 0 20 40
scale feet
F.B. 11/37 PG. 1-2

FIGURE 2

3-16-90

ROMP 49 "BALM PARK"

LITHOSTRATIGRAPHY

J.L. DECKER

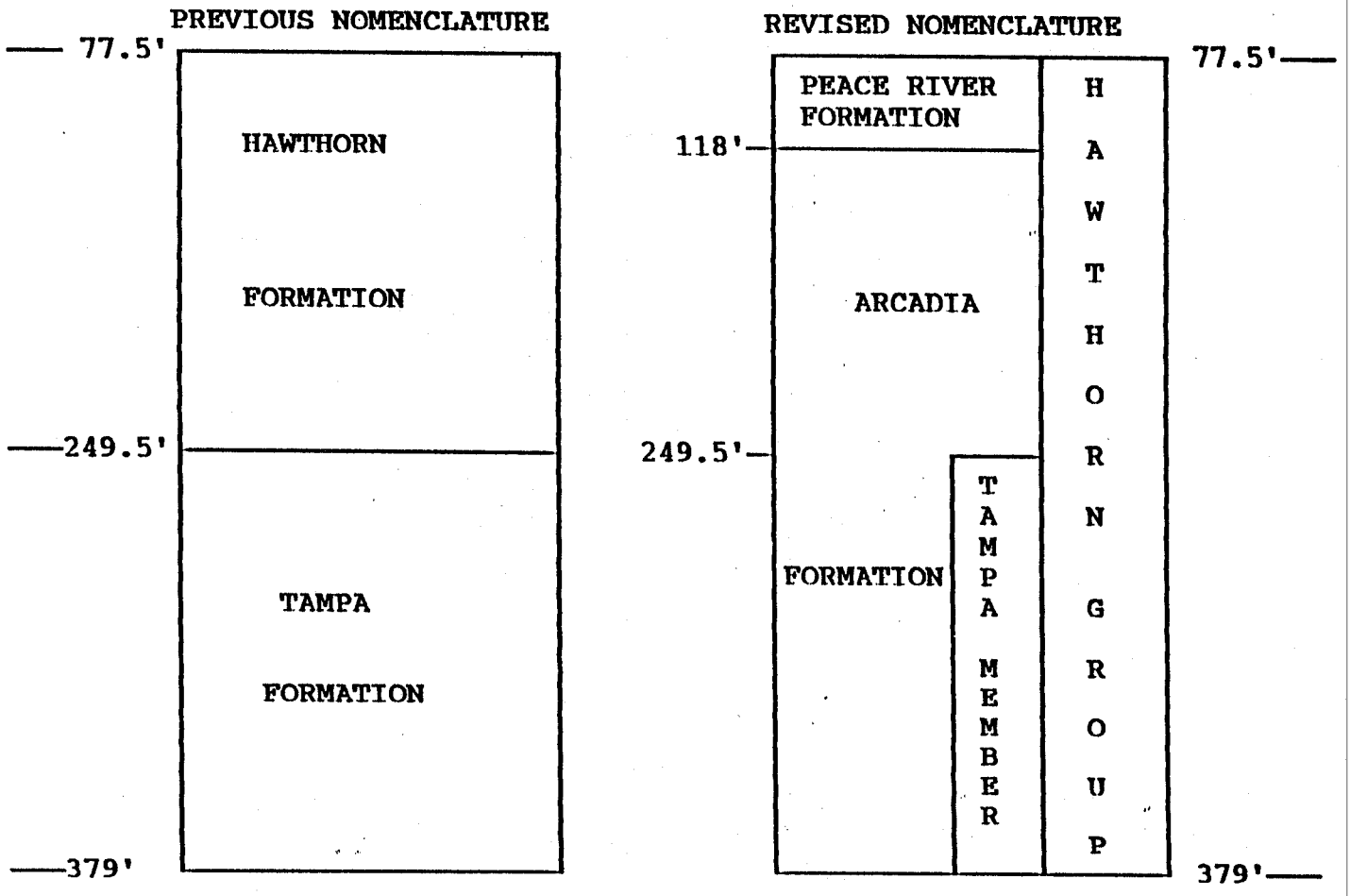


FIGURE 5 (AFTER SCOTT, 1988)

ROMP 49 "BALM PARK"

3-16-90

J.L. DECKER

HYDROGEOLOGY

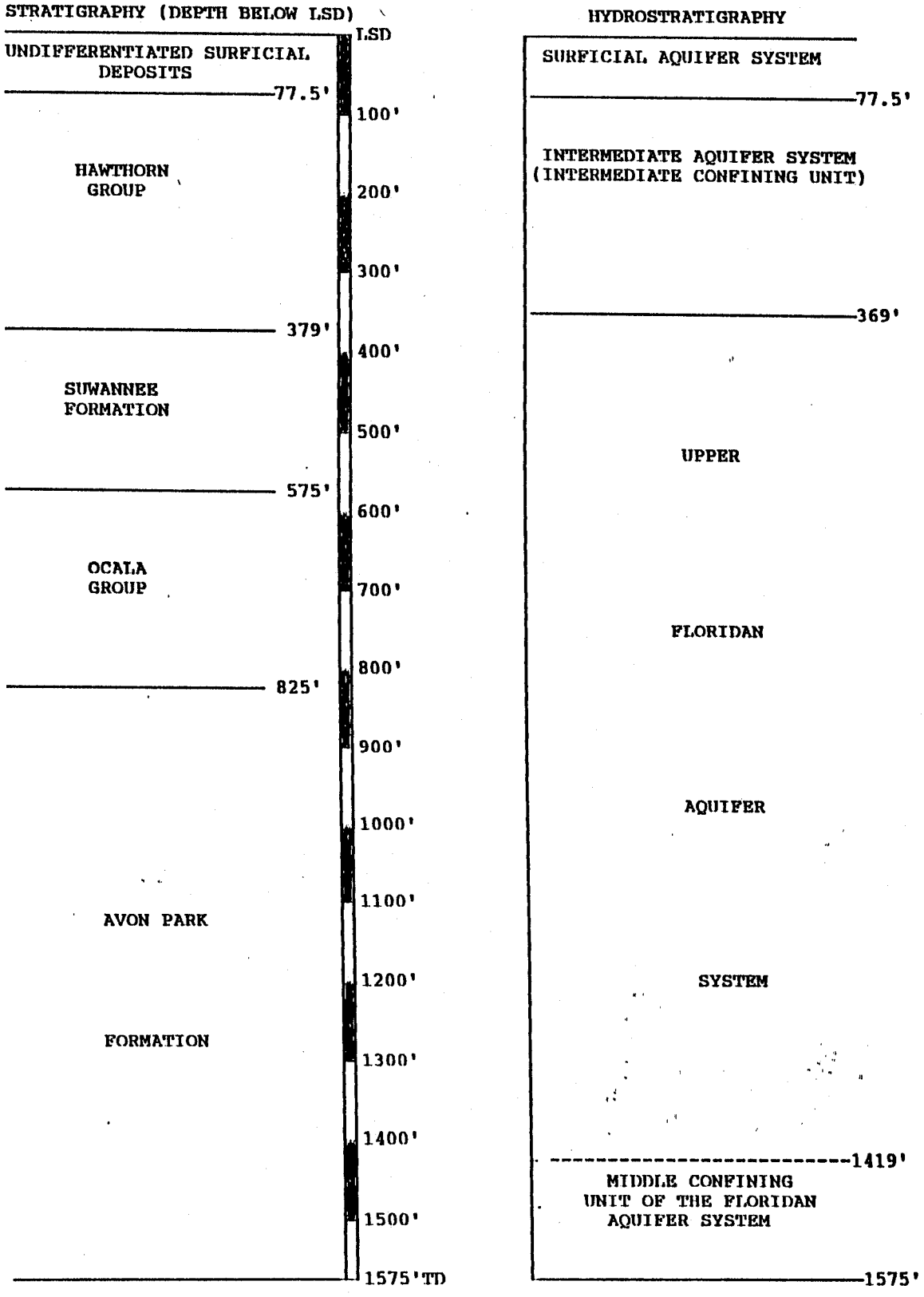
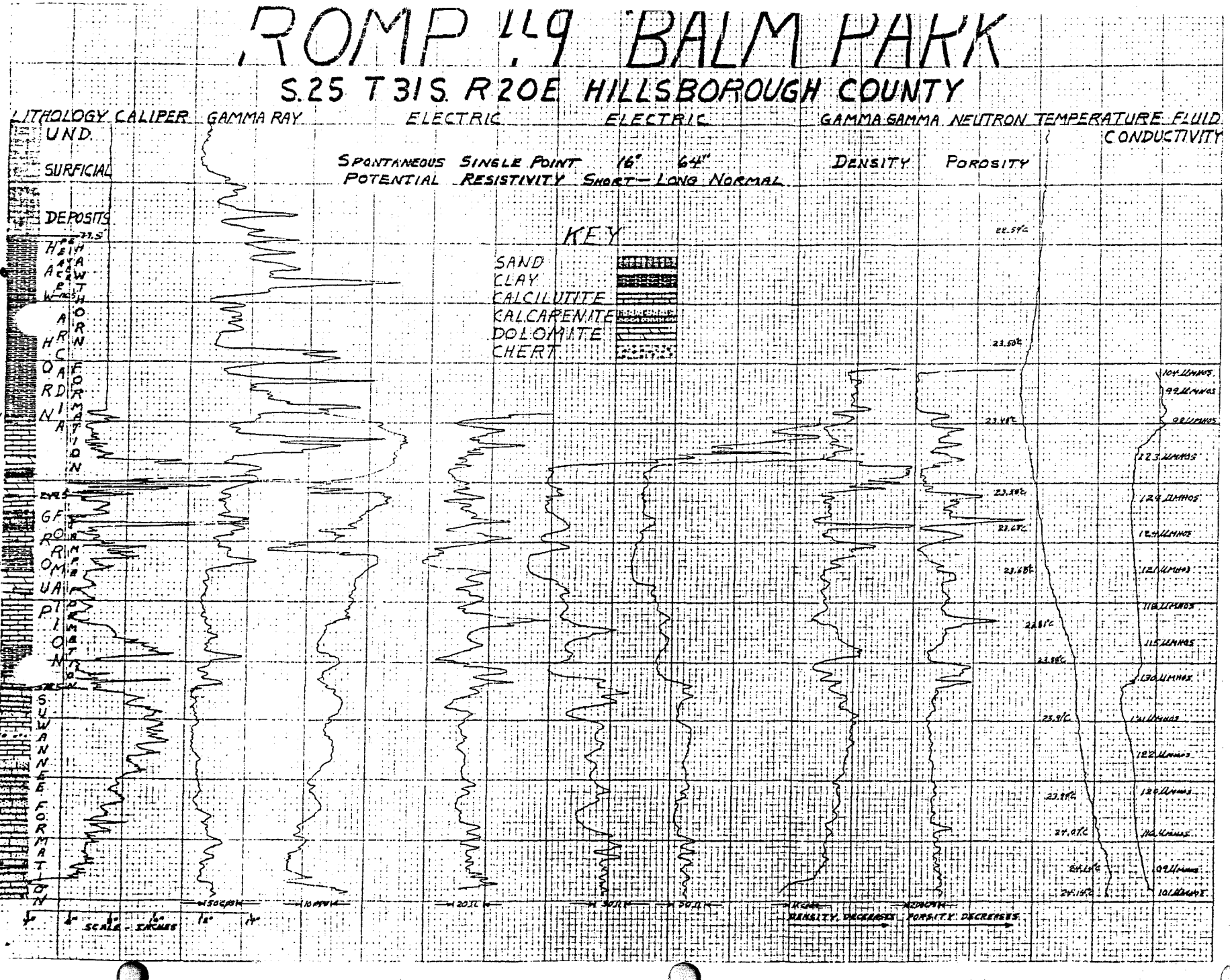


FIGURE 4

ROMP 11.9 BALM PARK

S.25 T31S. R20E HILLSBOROUGH COUNTY



LITHOLOGIC WELL LOG PRINTOUT

SOURCE - FGS

WELL NUMBER: W- 16456
TOTAL DEPTH: 1575 FT.
SAMPLES - NONE

COUNTY - HILLSBOROUGH
LOCATION: T.31S R.20E S.25BB
LAT = N 27D 45M 46
LON = W 82D 15M 16

COMPLETION DATE - 15/06/89
OTHER TYPES OF LOGS AVAILABLE - NONE

ELEVATION - 146 FT

OWNER/DRILLER: ROMP 49 BALM PARK SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT.
OWNER/DRILLER: DRILLER--LLOYD JOHNSON, TOM TOY

WORKED BY: CORE AND CUTTING SAMPLE DESCRIPTIONS-JOHN DECKER, GRANVILLE KINSMAN.
DATE WORKED 8-10-88 TO 6-15-89; AVERAGE TO GOOD SAMPLE QUALITY.
HOLLOW STEM RECOVERY LSD-16'
TRI CONE--BAG SAMPLES 16'-77.5'
WIRE-LINE CORE SAMPLES 77.5'-1575'

0.	- 78.	UNDIFFERENTIATED SAND AND CLAY
78.	- 250.	HAWTHORN GROUP
250.	- 379.	TAMPA MEMBER OF ARCADIA FM.
379.	- 575.	SUWANNEE LIMESTONE
575.	- 825.	OCALA GROUP
825.	- 1575.	AVON PARK FM.

0 - 0.4 SAND; LIGHT BROWNISH GRAY; 45% POROSITY, INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: MEDIUM; RANGE: MEDIUM TO FINE;
ROUNDNESS:SUB-ANGULAR; MEDIUM SPHERICITY; UNCONSOLIDATED;
SEDIMENTARY STRUCTURES: MASSIVE,
FOSSILS: ORGANICS;

0.4- 2.3 SAND; PINKISH GRAY TO YELLOWISH GRAY; 40% POROSITY, INTERGRANULAR,
POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: MEDIUM; RANGE: MEDIUM TO FINE;
ROUNDNESS:SUB-ANGULAR; MEDIUM SPHERICITY; UNCONSOLIDATED;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: HEAVY MINERALS- %;
FOSSILS: ORGANICS;

2.3- 5.8 SAND; MODERATE OLIVE BROWN TO MODERATE BROWN; 40% POROSITY, INTERGRANULAR,
POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: MEDIUM; RANGE: MEDIUM TO FINE;
ROUNDNESS:SUB-ANGULAR; MEDIUM SPHERICITY; POOR INDURATION;
CEMENT TYPE(S): ORGANIC MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE,
OTHER FEATURES: FROSTED;
FOSSILS: ORGANICS;

5.8- 8.8 SAND; DARK BROWN; 40% POROSITY, INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: MEDIUM; RANGE: MEDIUM TO FINE;
ROUNDNESS:SUB-ANGULAR; MEDIUM SPHERICITY; POOR INDURATION;
CEMENT TYPE(S): ORGANIC MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE,
FOSSILS: ORGANICS;

8.8- 11 SAND; YELLOWISH GRAY; 40% POROSITY, INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: MEDIUM; RANGE: MEDIUM TO FINE;
ROUNDNESS:SUB-ANGULAR; MEDIUM SPHERICITY; POOR INDURATION;
CEMENT TYPE(S): ORGANIC MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE,
OTHER FEATURES: FROSTED;
FOSSILS: ORGANICS;

11 - 13.5 SAND; LIGHT GRAYISH BROWN; 40% POROSITY, INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: MEDIUM; RANGE: MEDIUM TO FINE;
ROUNDNESS:SUB-ANGULAR; MEDIUM SPHERICITY; POOR INDURATION;
CEMENT TYPE(S): ORGANIC MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: HEAVY MINERALS- %;
OTHER FEATURES: FROSTED;
FOSSILS: ORGANICS;

13.5- 16 SAND; DARK BROWN TO MODERATE BROWN; 40% POROSITY, INTERGRANULAR,
POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: MEDIUM; RANGE: MEDIUM TO FINE;
ROUNDNESS:SUB-ANGULAR; MEDIUM SPHERICITY; POOR INDURATION;
CEMENT TYPE(S): ORGANIC MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE,
OTHER FEATURES: FROSTED;
FOSSILS: ORGANICS;

16 - 22.5 SAND; LIGHT GRAYISH BROWN TO GRAYISH BROWN; 40% POROSITY, INTERGRANULAR,
POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: MEDIUM; RANGE: MEDIUM TO FINE;
ROUNDNESS:SUB-ANGULAR; MEDIUM SPHERICITY; UNCONSOLIDATED;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: PHOSPHATIC SAND- %, HEAVY MINERALS- %;
OTHER FEATURES: FROSTED;
FOSSILS: ORGANICS;

22.5- 27.5 SAND; MODERATE BROWN; 40% POROSITY, INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: MEDIUM; RANGE: MEDIUM TO FINE;
ROUNDNESS:SUB-ANGULAR; MEDIUM SPHERICITY; UNCONSOLIDATED;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: PHOSPHATIC SAND- %;
OTHER FEATURES: FROSTED;

27.5- 32.5 SAND; MODERATE BROWN TO DARK YELLOWISH BROWN; 35% POROSITY, INTERGRANULAR,
POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: MEDIUM; RANGE: MEDIUM TO VERY FINE;
ROUNDNESS:SUB-ANGULAR; MEDIUM SPHERICITY; POOR INDURATION;
CEMENT TYPE(S): CLAY MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: PHOSPHATIC GRAVEL- %, PHOSPHATIC SAND- %, CLAY- %;
FOSSILS: ORGANICS;

32.5- 37.5 SAND; MODERATE BROWN; 35% POROSITY, INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: MEDIUM; RANGE: MEDIUM TO VERY FINE;
ROUNDNESS:SUB-ANGULAR; MEDIUM SPHERICITY; POOR INDURATION;
CEMENT TYPE(S): CLAY MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: PHOSPHATIC SAND- %, CLAY- %, SILT- %;
OTHER FEATURES: FROSTED;

37.5- 47.5 SAND; LIGHT BROWN; 40% POROSITY, INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: MEDIUM; RANGE: MEDIUM TO VERY FINE;
ROUNDNESS:SUB-ANGULAR; MEDIUM SPHERICITY; UNCONSOLIDATED;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: PHOSPHATIC SAND- %, SILT-%;

47.5- 67.5 SAND; LIGHT GRAYISH BROWN TO GRAYISH BROWN; 40% POROSITY, INTERGRANULAR,
POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: MEDIUM; RANGE: MEDIUM TO VERY FINE;
ROUNDNESS:SUB-ANGULAR; MEDIUM SPHERICITY; UNCONSOLIDATED;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: PHOSPHATIC SAND- %;
OTHER FEATURES: FROSTED;

67.5- 72.5 SAND; LIGHT GRAYISH BROWN TO MODERATE BROWN; 35% POROSITY, INTERGRANULAR,
POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: MEDIUM; RANGE: MEDIUM TO VERY FINE;
ROUNDNESS:SUB-ANGULAR; MEDIUM SPHERICITY; POOR INDURATION;
CEMENT TYPE(S): CLAY MATRIX, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: CLAY- %, PHOSPHATIC SAND- %, LIMESTONE- %, PHOSPHATIC GRAVEL- %;
OTHER FEATURES: FROSTED;

72.5- 77.5 SAND; DARK YELLOWISH BROWN TO LIGHT GRAYISH BROWN; 35% POROSITY, INTERGRANULAR;
GRAIN SIZE: MEDIUM; RANGE: MEDIUM TO FINE;
ROUNDNESS:SUB-ANGULAR; MEDIUM SPHERICITY; POOR INDURATION;
CEMENT TYPE(S): CLAY MATRIX, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: CLAY- %, PHOSPHATIC SAND- %, LIMESTONE- %, PHOSPHATIC GRAVEL- %;
OTHER FEATURES: FROSTED;
BOTTOM OF SURFICIAL DEPOSITS-TOP-HAWTHORN GROUP(PEACE RIVER)

77.5- 82.5 CLAY; LIGHT GREEN; INTERGRANULAR, LOW PERMEABILITY; POOR INDURATION;
CEMENT TYPE(S): CLAY MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: PHOSPHATIC GRAVEL-40%, PHOSPHATIC SAND- %, LIMESTONE- %,
QUARTZ SAND- %;
OTHER FEATURES: GREASY;
FOSSILS: FOSSIL FRAGMENTS;

82.5- 95 CLAY; DARK GREENISH GRAY TO GREENISH GRAY; INTERGRANULAR, LOW PERMEABILITY;
POOR INDURATION;
CEMENT TYPE(S): CLAY MATRIX;
ACCESSORY MINERALS: PHOSPHATIC SAND-30%, QUARTZ SAND-10%;

95 - 97.5 CLAY; LIGHT OLIVE GRAY; INTERGRANULAR, LOW PERMEABILITY; POOR INDURATION;
CEMENT TYPE(S): CLAY MATRIX;
ACCESSORY MINERALS: PHOSPHATIC SAND-30%, QUARTZ SAND-10%, LIMESTONE-05%;

97.5- 99.5 CLAY; LIGHT OLIVE GRAY; INTERGRANULAR, LOW PERMEABILITY; POOR INDURATION;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: PHOSPHATIC SAND-20%;

99.5- 105 CLAY; YELLOWISH GRAY TO LIGHT OLIVE GRAY; INTERGRANULAR, LOW PERMEABILITY; POOR INDURATION;
ACCESSORY MINERALS: PHOSPHATIC SAND-30%, QUARTZ SAND-10%, LIMESTONE-10%;

105 - 110 CLAY; LIGHT OLIVE GRAY; INTERGRANULAR, LOW PERMEABILITY; MODERATE INDURATION;
CEMENT TYPE(S): CLAY MATRIX, CALCILUTITE MATRIX;
ACCESSORY MINERALS: PHOSPHATIC SAND-30%, LIMESTONE-15%, QUARTZ SAND-%;

110 - 112.5 LIMESTONE; YELLOWISH GRAY; INTERGRANULAR, LOW PERMEABILITY;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
ACCESSORY MINERALS: PHOSPHATIC SAND-40%, QUARTZ-05%;

112.5- 116.5 CLAY; GRAYISH GREEN TO DARK GREENISH GRAY; INTERGRANULAR, LOW PERMEABILITY;
MODERATE INDURATION;
CEMENT TYPE(S): CLAY MATRIX;
ACCESSORY MINERALS: PHOSPHATIC SAND-25%, QUARTZ SAND-30%, LIMESTONE-05%;
LIMESTONE CLASTS;BOTTOM OF PEACE RIVER FM--TOP-ARCADIA FM

116.5- 117.5 CLAY; WHITE TO YELLOWISH GRAY; INTERGRANULAR, LOW PERMEABILITY; MODERATE INDURATION;
CEMENT TYPE(S): CLAY MATRIX, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: PHOSPHATIC SAND-05%, QUARTZ SAND-01%;
OTHER FEATURES: CALCAREOUS;

117.5- 119 CLAY; YELLOWISH GRAY TO VERY LIGHT GRAY; INTERGRANULAR, LOW PERMEABILITY; GOOD INDURATION;
CEMENT TYPE(S): CLAY MATRIX, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: BIOTURBATED,
ACCESSORY MINERALS: PHOSPHATIC SAND-08%, CLAY-01%, QUARTZ SAND-02%;
OTHER FEATURES: CALCAREOUS, SPECKLED;
FOSSILS: MOLLUSKS, BENTHIC FORAMINIFERA, FOSSIL FRAGMENTS, FOSSIL MOLDS;
DARK GREENISH GRAY, ROUNDED CLAY CLASTS; SHELL FRAGMENTS.

119 - 122.5 CLAY; VERY LIGHT GRAY TO LIGHT GRAY; INTERGRANULAR, LOW PERMEABILITY; MODERATE INDURATION;
CEMENT TYPE(S): CLAY MATRIX, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: PHOSPHATIC SAND-01%;
OTHER FEATURES: CALCAREOUS;
FOSSILS: VERTEBRATE;

122.5- 124.6 CLAY; VERY LIGHT GRAY TO LIGHT GRAY; INTERGRANULAR, LOW PERMEABILITY; GOOD INDURATION;
CEMENT TYPE(S): CLAY MATRIX, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: PHOSPHATIC SAND-10%, QUARTZ SAND- %;
OTHER FEATURES: CALCAREOUS;
INTERBEDDED CLAY & PHOSPHATIC, QUARTZ SAND LENSES.

124.6- 129 CLAY; VERY LIGHT GRAY TO LIGHT BLUISH GRAY; INTERGRANULAR, LOW PERMEABILITY;
MODERATE INDURATION;
CEMENT TYPE(S): CLAY MATRIX, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: PHOSPHATIC SAND-05%, QUARTZ SAND-01%;
OTHER FEATURES: CALCAREOUS;
FOSSILS: MOLLUSKS;

129 - 134 CLAY; GREENISH GRAY TO LIGHT OLIVE GRAY; INTERGRANULAR, LOW PERMEABILITY;
MODERATE INDURATION;
CEMENT TYPE(S): CLAY MATRIX, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: PHOSPHATIC SAND-20%, QUARTZ SAND-05%;
OTHER FEATURES: CALCAREOUS;

134 - 137.6 CLAY; GREENISH GRAY TO YELLOWISH GRAY; INTERGRANULAR, LOW PERMEABILITY;
MODERATE INDURATION;
CEMENT TYPE(S): CLAY MATRIX, CALCILUTITE MATRIX;
ACCESSORY MINERALS: PHOSPHATIC SAND-10%, QUARTZ SAND-10%;
OTHER FEATURES: CALCAREOUS;

137.6- 139 CLAY; OLIVE GRAY TO DARK GREENISH GRAY; INTERGRANULAR, LOW PERMEABILITY; GOOD INDURATION;
CEMENT TYPE(S): CLAY MATRIX, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MOTTLED,
ACCESSORY MINERALS: PHOSPHATIC SAND-10%, QUARTZ SAND-10%;

139 - 141 CALCARENITE; LIGHT GRAY; LOW PERMEABILITY, INTERGRANULAR;
GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: PHOSPHATIC SAND-01%, CLAY-20%;
FOSSILS: MOLLUSKS, FOSSIL FRAGMENTS;

141 - 144 CALCILUTITE; VERY LIGHT GRAY TO LIGHT GRAY; INTERGRANULAR, LOW PERMEABILITY;
GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: BIOTURBATED,
ACCESSORY MINERALS: PHOSPHATIC SAND-05%, QUARTZ SAND-20%, CLAY-30%;

144 - 155 CLAY; YELLOWISH GRAY TO VERY LIGHT GRAY; INTERGRANULAR, LOW PERMEABILITY; GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, CLAY MATRIX;
SEDIMENTARY STRUCTURES: BIOTURBATED,
ACCESSORY MINERALS: PHOSPHATIC SAND-05%, QUARTZ SAND-05%;
OTHER FEATURES: CALCAREOUS;

155 - 159 CLAY; WHITE TO VERY LIGHT GRAY; INTERGRANULAR, LOW PERMEABILITY; MODERATE INDURATION;
CEMENT TYPE(S): CLAY MATRIX, CALCILUTITE MATRIX;
ACCESSORY MINERALS: PHOSPHATIC SAND-05%, QUARTZ SAND-10%;
OTHER FEATURES: CALCAREOUS;

159 - 165.4 CALCILUTITE; VERY LIGHT GRAY; INTERGRANULAR, LOW PERMEABILITY;
GRAIN TYPE: CALCILUTITE;
GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, CLAY MATRIX;
ACCESSORY MINERALS: PHOSPHATIC SAND-05%, QUARTZ SAND-05%;
FOSSILS: FOSSIL FRAGMENTS;

165.4- 179 CLAY; WHITE TO VERY LIGHT GRAY; INTERGRANULAR, LOW PERMEABILITY; MODERATE INDURATION;
CEMENT TYPE(S): CLAY MATRIX, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: BIOTURBATED,
ACCESSORY MINERALS: PHOSPHATIC SAND-05%;
OTHER FEATURES: CALCAREOUS;
PHOSPHATIC SAND,PEBBLES. CHERT,WHITE FRAGMENTS.

179 - 196.7 CLAY; WHITE TO VERY LIGHT GRAY; INTERGRANULAR, LOW PERMEABILITY; MODERATE INDURATION;
CEMENT TYPE(S): CLAY MATRIX, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: BIOTURBATED,
ACCESSORY MINERALS: PHOSPHATIC GRAVEL-15%, QUARTZ SAND-05%, DOLOMITE-02%;
OTHER FEATURES: CALCAREOUS;

196.7- 200 SAND; YELLOWISH GRAY TO LIGHT OLIVE GRAY; LOW PERMEABILITY, INTRAGRANULAR, VUGULAR;
GRAIN SIZE: VERY FINE; RANGE: FINE TO ; POOR INDURATION;
CEMENT TYPE(S): CLAY MATRIX, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: STREAKED,
ACCESSORY MINERALS: PHOSPHATIC SAND-05%, CLAY-%;
GRAY CLAY STRINGERS, MINOR PHOSPHATIC PEBBLES.

200 - 211 CALCILUTITE; WHITE TO VERY LIGHT GRAY; LOW PERMEABILITY, INTERGRANULAR;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, CLAY MATRIX;
SEDIMENTARY STRUCTURES: BIOTURBATED,
ACCESSORY MINERALS: QUARTZ SAND-30%, PHOSPHATIC SAND-05%, CLAY- %;
OTHER FEATURES: DOLOMITIC;
FOSSILS: MOLLUSKS, FOSSIL FRAGMENTS, ECHINOID;

211 - 225 CALCILUTITE; VERY LIGHT GRAY; INTERGRANULAR, LOW PERMEABILITY, MOLDIC;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, CLAY MATRIX;
SEDIMENTARY STRUCTURES: BIOTURBATED,
ACCESSORY MINERALS: CLAY-01%, QUARTZ SAND-10%, PHOSPHATIC SAND-05%, DOLOMITE- %;
OTHER FEATURES: DOLOMITIC;
FOSSILS: MOLLUSKS, FOSSIL FRAGMENTS;
LT. GRAY BANDED CHERT(218'-219').

225 - 232.5 DOLOSTONE; YELLOWISH GRAY TO LIGHT OLIVE GRAY; LOW PERMEABILITY, VUGULAR,
INTRAGRANULAR; 50-90% ALTERED; ANHEDRAL;
GRAIN SIZE: CRYPTOCRYSTALLINE; RANGE: MICROCRYSTALLINE TO CRYPTOCRYSTALLINE;
GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, SILICIC CEMENT, CLAY MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: CLAY- %, QUARTZ SAND- %, PHOSPHATIC SAND- %;
OTHER FEATURES: DOLOMITIC, SPECKLED, SUCROSIC;
FOSSILS: FOSSIL MOLDS;

232.5- 234.9 SANDSTONE; LIGHT OLIVE GRAY TO GREENISH GRAY; INTERGRANULAR, LOW PERMEABILITY, VUGULAR;
GRAIN SIZE: VERY FINE; RANGE: VERY FINE TO FINE; GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, SILICIC CEMENT, CLAY MATRIX;
SEDIMENTARY STRUCTURES: BRECCIATED, INTERBEDDED,
ACCESSORY MINERALS: CLAY- %, DOLOMITE- %, PHOSPHATIC SAND-20%;
OTHER FEATURES: DOLOMITIC;

234.9- 239 CLAY; GRAYISH GREEN; INTERGRANULAR, LOW PERMEABILITY, VUGULAR; MODERATE INDURATION;
CEMENT TYPE(S): CLAY MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: QUARTZ SAND- %, PHOSPHATIC SAND-%;

239 - 244 DOLOSTONE; YELLOWISH GRAY TO LIGHT BROWNISH GRAY; LOW PERMEABILITY, VUGULAR, INTERGRANULAR;
50-90% ALTERED; ANHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; RANGE: VERY FINE TO MICROCRYSTALLINE; GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, SILICIC CEMENT, CLAY MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED, MOTTLED,
ACCESSORY MINERALS: QUARTZ SAND- %, CLAY- %, PHOSPHATIC SAND- %;
OTHER FEATURES: DOLOMITIC, SUCROSIC;

SOME INTERBEDDED GRAY-GREEN CLAY-FILLED VUGS; SUCROSIC DOLOMITE

244 - 246 DOLOSTONE; LIGHT OLIVE GRAY TO YELLOWISH GRAY; LOW PERMEABILITY,
INTRAGRANULAR, FRACTURE; 50-90% ALTERED; ANHEDRAL;
GRAIN SIZE: CRYPTOCRYSTALLINE; RANGE: MICROCRYSTALLINE TO CRYPTOCRYSTALLINE;
GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE, MOTTLED, LAMINATED, BRECCIATED,
OTHER FEATURES: GREASY;
FOSSILS: FOSSIL MOLDS;

246 - 250 BRECCIATED, FRACTURED APPEARANCE;HAWTHORN-TAMPA FM CONTACT.

250 - 260 CALCILUTITE; YELLOWISH GRAY TO WHITE; LOW PERMEABILITY, INTERGRANULAR;
GRAIN TYPE: CALCILUTITE, INTRACLASTS;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, CLAY MATRIX;
SEDIMENTARY STRUCTURES: MOTTLED, LAMINATED,
ACCESSORY MINERALS: QUARTZ SAND-05%, DOLOMITE- %, CLAY- %;
OTHER FEATURES: CHALKY, DOLOMITIC;

260 - 263 SAND; LIGHT OLIVE GRAY TO YELLOWISH GRAY;
GRAIN SIZE: FINE; RANGE: VERY FINE TO FINE; POOR INDURATION;
ACCESSORY MINERALS: PHOSPHATIC SAND-04%, CLAY-%;

263 - 271 SANDSTONE; YELLOWISH GRAY TO LIGHT GRAY; LOW PERMEABILITY, INTERGRANULAR, VUGULAR;
GRAIN SIZE: VERY FINE; RANGE: VERY FINE TO FINE; GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, CALCILUTITE MATRIX, CLAY MATRIX;
SEDIMENTARY STRUCTURES: BIOTURBATED, MOTTLED,
ACCESSORY MINERALS: DOLOMITE-30%;

271 - 274 SAND; YELLOWISH GRAY TO LIGHT OLIVE; 40% POROSITY, INTERGRANULAR,
POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: VERY FINE; RANGE: VERY FINE TO FINE;
ROUNDNESS: SUB-ANGULAR TO ANGULAR; MEDIUM SPHERICITY; POOR INDURATION;
ACCESSORY MINERALS: PHOSPHATIC SAND-05%;
FOSSILS: NO FOSSILS;

274 - 260 CALCILUTITE; YELLOWISH GRAY TO LIGHT GRAY; INTERGRANULAR, LOW PERMEABILITY;
GRAIN TYPE: INTRACLASTS, CALCILUTITE, BIOGENIC;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: QUARTZ SAND- %, DOLOMITE-45%;
OTHER FEATURES: DOLOMITIC;
FOSSILS: SPICULES;

260 - 265 CALCILUTITE; LIGHT GREENISH GRAY TO LIGHT GREENISH GRAY; INTERGRANULAR, LOW PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: CLAY- %;
OTHER FEATURES: DOLOMITIC;
FOSSILS: FOSSIL MOLDS;

265 - 270 DOLOSTONE; LIGHT OLIVE GRAY TO GRAYISH BROWN; INTRAGRANULAR,
LOW PERMEABILITY; 50-90% ALTERED; ANHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; RANGE: VERY FINE TO MICROCRYSTALLINE; GOOD INDURATION;
CEMENT TYPE(S): SILICIC CEMENT, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: CALCILUTITE-20%, QUARTZ SAND- %, CLAY- %;
OTHER FEATURES: SUCROSIC;

270 - 270 SANDSTONE; YELLOWISH GRAY TO LIGHT GRAY; LOW PERMEABILITY, INTERGRANULAR;
GRAIN SIZE: VERY FINE; RANGE: VERY FINE TO FINE; GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: DOLOMITE-48%, QUARTZ SAND- %, CLAY- %;
FOSSILS: SPICULES;

270 - 275 DOLOSTONE; YELLOWISH GRAY TO LIGHT OLIVE; LOW PERMEABILITY, INTRAGRANULAR;
50-90% ALTERED; ANHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; RANGE: VERY FINE TO MICROCRYSTALLINE; GOOD INDURATION;
CEMENT TYPE(S): SILICIC CEMENT, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: QUARTZ SAND- %, CLAY- %, CALCILUTITE- %;
OTHER FEATURES: SUCROSIC;
FOSSILS: NO FOSSILS;

275 - 276.5 CLAY; LIGHT GRAYISH GREEN TO GRAYISH GREEN; INTERGRANULAR, LOW PERMEABILITY;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, CLAY MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: PHOSPHATIC SAND- %;
OTHER FEATURES: CALCAREOUS, PLASTIC;
FOSSILS: NO FOSSILS;

276.5- 280 CALCILUTITE; YELLOWISH GRAY; INTERGRANULAR;
GRAIN TYPE: BIOGENIC, CALCILUTITE;
GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: PHOSPHATIC SAND- %, DOLOMITE- %, QUARTZ SAND- %, CHERT- %;
OTHER FEATURES: DOLOMITIC;
FOSSILS: FOSSIL FRAGMENTS;

280 - 286 CALCILUTITE; YELLOWISH GRAY TO GREENISH GRAY; INTERGRANULAR;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL CAST;
GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: INTERBEDDED, MOTTLED, LAMINATED,
ACCESSORY MINERALS: PHOSPHATIC SAND- %, DOLOMITE- %, CHERT- %, QUARTZ SAND- %;
OTHER FEATURES: CALCAREOUS, GRANULAR;
FOSSILS: FOSSIL FRAGMENTS;
GRAYISH BROWN CHERT AND CLAY LENSES.

286 - 290 CLAY; LIGHT GREENISH YELLOW TO LIGHT YELLOWISH GREEN; INTERGRANULAR, LOW PERMEABILITY;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, CLAY MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: PHOSPHATIC SAND- %, PHOSPHATIC GRAVEL- %, CALCILUTITE- %, CHERT- %;
OTHER FEATURES: CALCAREOUS, PLASTIC;
FOSSILS: NO FOSSILS;

290 - 296 CLAY; LIGHT GRAYISH GREEN TO LIGHT YELLOWISH GREEN; INTERGRANULAR, LOW PERMEABILITY;
MODERATE INDURATION;
ACCESSORY MINERALS: CALCILUTITE- %, QUARTZ SAND- %, PHOSPHATIC SAND- %;
FOSSILS: NO FOSSILS;

296 - 301 SANDSTONE; GREENISH GRAY; INTERGRANULAR, LOW PERMEABILITY; GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, CLAY MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: PHOSPHATIC SAND- %, CLAY- %;
FOSSILS: NO FOSSILS;

301 - 301 CLAY; LIGHT GRAYISH GREEN; INTERGRANULAR, LOW PERMEABILITY; MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: CALCILUTITE- %, PLANT REMAINS- %, PHOSPHATIC SAND- %;
FOSSILS: NO FOSSILS;
INTERBEDDED CLAY, SANDSTONE; CAVITY; SILICIFIED SHELLS.

301 - 305 DOLOSTONE; GRAYISH BROWN; INTERGRANULAR, LOW PERMEABILITY, PIN POINT VUGS;
50-90% ALTERED; ANHEDRAL;
GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, SILICIC CEMENT;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: CALCILUTITE- %;
FOSSILS: FOSSIL FRAGMENTS;
SILICIFIED FOSSIL ASSEMBLAGE; LAMINATED, BRECCIATED.

305 - 313 DOLOSTONE; YELLOWISH GRAY TO LIGHT GRAY; 20% POROSITY, MOLDIC, LOW PERMEABILITY;
GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: MOTTLED, LAMINATED, BRECCIATED,
FOSSILS: MOLLUSKS;

313 - 316.5 LIMESTONE; YELLOWISH GRAY TO VERY LIGHT GRAY; 10% POROSITY, MOLDIC, FRACTURE,
LOW PERMEABILITY;
GRAIN TYPE: CALCILUTITE;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: BIOTURBATED,
ACCESSORY MINERALS: QUARTZ SAND-05%, PHOSPHATIC SAND- %;
OTHER FEATURES: DOLOMITIC;
FOSSILS: MOLLUSKS, FOSSIL MOLDS;

316.5- 319 DOLOSTONE; YELLOWISH GRAY TO PINKISH GRAY; 05% POROSITY, PIN POINT VUGS, LOW PERMEABILITY;
GOOD INDURATION;
SEDIMENTARY STRUCTURES: MASSIVE, MOTTLED,
ACCESSORY MINERALS: PYRITE-01%;
OTHER FEATURES: SUCROSIC;
FOSSILS: FOSSIL MOLDS;

319 - 328 CALCILUTITE; YELLOWISH GRAY TO VERY LIGHT ORANGE; 05% POROSITY, PIN POINT VUGS,
LOW PERMEABILITY, VUGULAR;
GRAIN TYPE: CALCILUTITE, BIOGENIC;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MOTTLED, BIOTURBATED,
ACCESSORY MINERALS: DOLOMITE-05%, CLAY-05%, QUARTZ SAND-05%;
OTHER FEATURES: WEATHERED;
FOSSILS: FOSSIL MOLDS;

328 - 338 CALCILUTITE; YELLOWISH GRAY TO VERY LIGHT GRAY; 05% POROSITY, PIN POINT VUGS, LOW PERMEABILITY;
GRAIN TYPE: CALCILUTITE;
GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MOTTLED, BIOTURBATED, LAMINATED,
ACCESSORY MINERALS: QUARTZ SAND-05%, PHOSPHATIC SAND-02%, DOLOMITE-20%;
MOTTLED, LAMINATED, VERTICAL FRACTURES(INFILLED), DOLM. SEAMS

338 - 355 CALCILUTITE; LIGHT BROWN TO YELLOWISH GRAY; 08% POROSITY, PIN POINT VUGS, LOW PERMEABILITY, INTERGRANULAR;
GRAIN TYPE: CALCILUTITE, BIOGENIC, SKELETAL;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: MOTTLED, BIOTURBATED, INTERBEDDED, LAMINATED,
ACCESSORY MINERALS: QUARTZ SAND-05%, PHOSPHATIC SAND-01%, DOLOMITE- %, SILT- %;
OTHER FEATURES: PARTINGS, WEATHERED, GRANULAR, MEDIUM RECRYSTALLIZATION;
FOSSILS: FOSSIL MOLDS, FOSSIL FRAGMENTS, WORM TRACES;
CLAY INFILLINGS, PARTINGS, FINER GRAINED AT BOTTOM OF SECTION.

355 - 369.1 CLAY; LIGHT GREEN TO LIGHT GRAYISH GREEN; INTERGRANULAR, LOW PERMEABILITY;
MODERATE INDURATION;
CEMENT TYPE(S): CLAY MATRIX, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: CALCILUTITE-60%;
OTHER FEATURES: CALCAREOUS;

369.1- 369.1 CALCILUTITE; YELLOWISH GRAY TO LIGHT BROWN; 06% POROSITY, INTERGRANULAR, FRACTURE, PIN POINT VUGS;
GRAIN TYPE: BIOGENIC, CALCILUTITE;
GOOD INDURATION;
CEMENT TYPE(S): CLAY MATRIX, DOLOMITE CEMENT, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED, MOTTLED, LAMINATED,
ACCESSORY MINERALS: CLAY-40%;
OTHER FEATURES: CHALKY, CALCAREOUS, WEATHERED;
FOSSILS: WORM TRACES;

369.1- 379 CALCARENITE; VERY LIGHT ORANGE; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY, MOLDIC;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL;
GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: BANDED, BIOTURBATED,
ACCESSORY MINERALS: DOLOMITE- %;
OTHER FEATURES: MEDIUM RECRYSTALLIZATION, CALCAREOUS, REEFAL;
FOSSILS: FOSSIL MOLDS, FOSSIL FRAGMENTS, MILIOLIDS, WORM TRACES;
SORITES SP.;TAMPA-SUWANNEE FORMATION CONTACT.

379 - 384 CALCARENITE; VERY LIGHT ORANGE TO MODERATE ORANGE PINK; INTERGRANULAR,
POSSIBLY HIGH PERMEABILITY, MOLDIC;
GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT;
ACCESSORY MINERALS: QUARTZ SAND- %, DOLOMITE- %;
OTHER FEATURES: CALCAREOUS, MEDIUM RECRYSTALLIZATION, COQUINA;
FOSSILS: FOSSIL FRAGMENTS, FOSSIL MOLDS, MOLLUSKS, MILIOLIDS;

384 - 394 CALCILUTITE; VERY LIGHT ORANGE; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE;
UNCONSOLIDATED;
SEDIMENTARY STRUCTURES: MASSIVE, BEDDED,
ACCESSORY MINERALS: QUARTZ SAND- %, PHOSPHATIC SAND- %;
OTHER FEATURES: CALCAREOUS;
FOSSILS: MILIOLIDS;

394 - 395 CALCARENITE; VERY LIGHT ORANGE TO MODERATE ORANGE PINK; INTERGRANULAR, MOLDIC,
POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: BIOTURBATED,
ACCESSORY MINERALS: DOLOMITE- %, QUARTZ SAND- %;
OTHER FEATURES: CALCAREOUS;
FOSSILS: FOSSIL FRAGMENTS, FOSSIL MOLDS, CORAL, ORGANICS, MILIOLIDS;

395 - 399 CALCARENITE; VERY LIGHT ORANGE TO MODERATE ORANGE PINK; INTERGRANULAR,
POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE;
UNCONSOLIDATED;
SEDIMENTARY STRUCTURES: BEDDED, MASSIVE,
ACCESSORY MINERALS: QUARTZ SAND- %, PHOSPHATIC SAND- %;
OTHER FEATURES: CALCAREOUS;
FOSSILS: MILIOLIDS;

399 - 404 CALCILUTITE; VERY LIGHT ORANGE TO MODERATE ORANGE PINK; INTERGRANULAR,
POSSIBLY HIGH PERMEABILITY, MOLDIC;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: QUARTZ SAND- %, DOLOMITE- %;
OTHER FEATURES: CALCAREOUS;
FOSSILS: FOSSIL FRAGMENTS, FOSSIL MOLDS, WORM TRACES;

404 - 409 CALCILUTITE; VERY LIGHT ORANGE TO MODERATE ORANGE PINK; INTERGRANULAR;
GRAIN TYPE: CALCILUTITE, BIOGENIC;
UNCONSOLIDATED;
SEDIMENTARY STRUCTURES: BEDDED, MASSIVE,
ACCESSORY MINERALS: QUARTZ SAND- %, PHOSPHATIC SAND- %;
OTHER FEATURES: CALCAREOUS;
FOSSILS: MILIOLIDS;

409 - 413 CHERT; MODERATE GREEN TO LIGHT BLUISH GRAY; INTERCRYSTALLINE, MOLDIC, LOW PERMEABILITY;
GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, CALCILUTITE MATRIX, SILICIC CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE, INTERBEDDED, MOTTLED, BIOTURBATED,
ACCESSORY MINERALS: CALCILUTITE- %;
OTHER FEATURES: DOLOMITIC, HIGH RECRYSTALLIZATION, SUCROSIC;
FOSSILS: FOSSIL MOLDS, FOSSIL FRAGMENTS;
QUARTZ CRYSTAL-LINED MOLDS; CRYSTALLIZED FOSSILS IN MATRIX.

413 - 428 CALCILUTITE; VERY LIGHT ORANGE TO MODERATE ORANGE PINK; INTERGRANULAR,
POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE;
UNCONSOLIDATED;
SEDIMENTARY STRUCTURES: BEDDED, MASSIVE,
ACCESSORY MINERALS: QUARTZ SAND- %, SILT- %, CALCILUTITE- %;
OTHER FEATURES: CALCAREOUS;
FOSSILS: MILIOLIDS, FOSSIL FRAGMENTS;

428 - 429 CALCARENITE; MODERATE ORANGE PINK TO VERY LIGHT ORANGE; POSSIBLY HIGH PERMEABILITY, MOLDIC,
INTERGRANULAR;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE, INTERBEDDED,
ACCESSORY MINERALS: SPAR- %, CALCILUTITE- %;
OTHER FEATURES: CALCAREOUS;
FOSSILS: FOSSIL FRAGMENTS, FOSSIL MOLDS;

429 - 449 CALCARENITE; MODERATE ORANGE PINK TO VERY LIGHT ORANGE; INTERGRANULAR,
POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE;
UNCONSOLIDATED;
SEDIMENTARY STRUCTURES: BEDDED, MASSIVE,
ACCESSORY MINERALS: QUARTZ SAND- %, SILT- %, CALCILUTITE- %;
FOSSILS: FOSSIL FRAGMENTS, MILIOLIDS;

449 - 450 CALCARENITE; YELLOWISH GRAY; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY, MOLDIC;
GRAIN TYPE: BIOGENIC, CALCILUTITE;
UNCONSOLIDATED;
SEDIMENTARY STRUCTURES: INTERBEDDED, MASSIVE, BIOTURBATED,
OTHER FEATURES: CALCAREOUS;
FOSSILS: FOSSIL FRAGMENTS, FOSSIL MOLDS, MILIOLIDS;

450 - 474 CALCARENITE; MODERATE ORANGE PINK TO VERY LIGHT ORANGE; 01% POROSITY,
POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE;
UNCONSOLIDATED;
SEDIMENTARY STRUCTURES: MASSIVE, BEDDED,
ACCESSORY MINERALS: SILT- %, CALCILUTITE- %;
OTHER FEATURES: CALCAREOUS;
FOSSILS: FOSSIL FRAGMENTS, MILIOLIDS;

474 - 479 CALCARENITE; YELLOWISH GRAY; INTERGRANULAR;
GRAIN TYPE: BIOGENIC, CALCILUTITE;
MODERATE INDURATION;
SEDIMENTARY STRUCTURES: INTERBEDDED, MASSIVE,
ACCESSORY MINERALS: CALCILUTITE- %;
OTHER FEATURES: CALCAREOUS;
FOSSILS: FOSSIL FRAGMENTS, FOSSIL MOLDS, CORAL;

479 - 494 CALCARENITE; YELLOWISH GRAY; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE;
UNCONSOLIDATED;
SEDIMENTARY STRUCTURES: MASSIVE, INTERBEDDED,
ACCESSORY MINERALS: QUARTZ SAND- %, SILT- %;
OTHER FEATURES: CALCAREOUS, CHALKY;
FOSSILS: FOSSIL FRAGMENTS;

494 - 499 CALCARENITE; YELLOWISH GRAY TO GRAYISH BROWN; 20% POROSITY, INTERGRANULAR, MOLDIC,
POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL CAST;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: CALCILUTITE-20%, PHOSPHATIC SAND- %;
OTHER FEATURES: CALCAREOUS, WEATHERED;
FOSSILS: FOSSIL FRAGMENTS, FOSSIL MOLDS, MOLLUSKS, BENTHIC FORAMINIFERA, SPICULES;

499 - 504.5 NO SAMPLES

504.5- 505.6 CALCARENITE; YELLOWISH GRAY; 18% POROSITY, INTERGRANULAR, MOLDIC,
POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL CAST;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE, MOTTLED,
ACCESSORY MINERALS: CALCILUTITE-10%, QUARTZ SAND- %, SPAR- %;
OTHER FEATURES: CALCAREOUS, WEATHERED, GRANULAR;
FOSSILS: FOSSIL FRAGMENTS, FOSSIL MOLDS, MILIOLIDS;

505.6- 516 CALCARENITE; YELLOWISH GRAY; 08% POROSITY, INTERGRANULAR, PIN POINT VUGS, LOW PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE, LAMINATED, MOTTLED,
ACCESSORY MINERALS: CALCILUTITE-40%;
OTHER FEATURES: CALCAREOUS, WEATHERED;
FOSSILS: FOSSIL FRAGMENTS, FOSSIL MOLDS, ORGANICS, MILIOLIDS;

516 - 519.5 CALCARENITE; YELLOWISH GRAY; 30% POROSITY, INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL CAST;
POOR INDURATION;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: CALCILUTITE-30%, CLAY-10%;
OTHER FEATURES: CALCAREOUS, WEATHERED;
FOSSILS: MILIOLIDS;

519.5- 521 CALCARENITE; YELLOWISH GRAY; 25% POROSITY, INTERGRANULAR, PIN POINT VUGS,
POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL CAST;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE, INTERBEDDED,
ACCESSORY MINERALS: CALCILUTITE-05%;
OTHER FEATURES: CALCAREOUS, WEATHERED, PARTINGS;
FOSSILS: MILIOLIDS, FOSSIL FRAGMENTS, ORGANICS;

521 - 521.4 CLAY; YELLOWISH GRAY TO YELLOWISH GRAY; INTERGRANULAR; MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, CLAY MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: CALCILUTITE-40%;
OTHER FEATURES: CALCAREOUS;

521.4- 529.9 CALCARENITE; YELLOWISH GRAY TO YELLOWISH GRAY; 14% POROSITY, INTERGRANULAR, PIN POINT VUGS;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL CAST;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: INTERBEDDED, MASSIVE,
ACCESSORY MINERALS: CALCILUTITE-45%, DOLOMITE- %;
OTHER FEATURES: CALCAREOUS, PARTINGS;
FOSSILS: FOSSIL FRAGMENTS, FOSSIL MOLDS;

529.9- 533.5 CLAY; PINKISH GRAY TO YELLOWISH GRAY; INTERGRANULAR, LOW PERMEABILITY; MODERATE INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, ORGANIC MATRIX, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED, MOTTLED, LAMINATED,
ACCESSORY MINERALS: CALCILUTITE-40%, DOLOMITE-30%;
OTHER FEATURES: CALCAREOUS, DOLOMITIC;
FOSSILS: ORGANICS;
GRADES FROM AN ORGANIC CLAY TO A DOLOMITE, THEN BACK.

533.5- 537 CALCARENITE; YELLOWISH GRAY; 14% POROSITY, INTERGRANULAR, LOW PERMEABILITY, PIN POINT VUGS;
GRAIN TYPE: BIOGENIC, CALCILUTITE;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE, INTERBEDDED, GRADED BEDDING,
ACCESSORY MINERALS: CALCILUTITE-30%, DOLOMITE- %;
OTHER FEATURES: CALCAREOUS, DOLOMITIC;
FOSSILS: FOSSIL FRAGMENTS, ORGANICS, FOSSIL MOLDS;

537 - 543.9 DOLOSTONE; MODERATE ORANGE PINK TO GRAYISH ORANGE PINK; 04% POROSITY, INTERGRANULAR,
LOW PERMEABILITY, FRACTURE; 10-50% ALTERED; SUBHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; RANGE: VERY FINE TO MICROCRYSTALLINE; GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED, LAMINATED, MOTTLED,
ACCESSORY MINERALS: CALCILUTITE- %;
OTHER FEATURES: DOLOMITIC;
FOSSILS: FOSSIL MOLDS, ORGANICS;
FRACTURES--CALCITE-FILLED(HORIZONAL,VERTICAL); ORGANICS

543.9- 551.5 CALCILUTITE; YELLOWISH GRAY TO YELLOWISH GRAY; 12% POROSITY, INTERGRANULAR, PIN POINT VUGS,
LOW PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, ORGANIC MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE, INTERBEDDED, GRADED BEDDING,
ACCESSORY MINERALS: DOLOMITE- %;
OTHER FEATURES: CALCAREOUS, DOLOMITIC, PARTINGS, SPECKLED;
FOSSILS: FOSSIL MOLDS, FOSSIL FRAGMENTS, WORM TRACES, ORGANICS;

551.5- 552.5 CLAY; MODERATE ORANGE PINK TO MODERATE ORANGE PINK; INTERGRANULAR, LOW PERMEABILITY;
MODERATE INDURATION;
CEMENT TYPE(S): CLAY MATRIX, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED, LAMINATED,
ACCESSORY MINERALS: CALCILUTITE-45%, DOLOMITE- %;
OTHER FEATURES: PLASTIC, CALCAREOUS, CHALKY;
FOSSILS: ORGANICS;

552.5- 555 CALCARENITE; YELLOWISH GRAY TO GRAYISH ORANGE; 24% POROSITY, INTERGRANULAR,
POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL CAST;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED, BIOTURBATED,
ACCESSORY MINERALS: CALCILUTITE-20%;
OTHER FEATURES: CALCAREOUS, GRANULAR, WEATHERED;
FOSSILS: FOSSIL FRAGMENTS, FOSSIL MOLDS, MOLLUSKS, MILIOLIDS;

555 - 559.5 CALCILUTITE; YELLOWISH GRAY TO VERY LIGHT ORANGE; 10% POROSITY, INTERGRANULAR,
LOW PERMEABILITY, PIN POINT VUGS;
GRAIN TYPE: BIOGENIC, CALCILUTITE;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, CLAY MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: CLAY-30%, DOLOMITE-10%;
OTHER FEATURES: CALCAREOUS, CHALKY;
FOSSILS: FOSSIL MOLDS;

559.5- 564.5 CALCARENITE; YELLOWISH GRAY TO VERY LIGHT ORANGE; 16% POROSITY, INTERGRANULAR,
PIN POINT VUGS, FRACTURE;
GRAIN TYPE: BIOGENIC, CALCILUTITE;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: CALCILUTITE-30%, DOLOMITE- %, QUARTZ SAND- %;
OTHER FEATURES: CALCAREOUS, PARTINGS, WEATHERED;
FOSSILS: FOSSIL MOLDS, BRYOZOA, WORM TRACES, MILIOLIDS;
LEPIDOCYCLINA.

564.5- 569.5 CALCILUTITE; VERY LIGHT ORANGE; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: CALCILUTITE;
GRAIN SIZE: VERY FINE; UNCONSOLIDATED;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: SILT- %;
OTHER FEATURES: CHALKY, CALCAREOUS;
FOSSILS: NO FOSSILS;

569.5- 574.5 CALCARENITE; YELLOWISH GRAY TO VERY LIGHT ORANGE; INTERGRANULAR,
POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE;
GRAIN SIZE: FINE; RANGE: VERY FINE TO FINE; POOR INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: CALCILUTITE-20%;
OTHER FEATURES: CALCAREOUS, GRANULAR;
FOSSILS: FOSSIL MOLDS;

574.5- 574 CALCARENITE; NO COLOR GIVEN TO NO COLOR GIVEN; TT% POROSITY, , MOLDIC; ;
CEMENT TYPE(S): ORGANIC MATRIX, CLAY MATRIX;
SEDIMENTARY STRUCTURES: , LAMINATED, , GRADED BEDDING,
ACCESSORY MINERALS: SPAR-OU%, PYRITE- C%, LIMONITE-NT%, ANHYDRITE-CT%;
OTHER FEATURES: ;

574 - 579.5 CALCARENITE; VERY LIGHT ORANGE; 24% POROSITY, INTERGRANULAR, VUGULAR,
POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL CAST;
GRAIN SIZE: FINE; RANGE: VERY FINE TO FINE; MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: CALCILUTITE- %, SPAR- %;
OTHER FEATURES: CALCAREOUS, WEATHERED, CHALKY;
FOSSILS: FOSSIL FRAGMENTS, FOSSIL MOLDS, MOLLUSKS, MILIOLIDS, BENTHIC FORAMINIFERA;

579.5- 601 CALCILUTITE; VERY LIGHT ORANGE; 21% POROSITY, INTERGRANULAR, VUGULAR,
POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE;
GRAIN SIZE: VERY FINE; RANGE: VERY FINE TO FINE; MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: SILT- %;
OTHER FEATURES: CALCAREOUS, CHALKY, WEATHERED;
FOSSILS: FOSSIL MOLDS, BENTHIC FORAMINIFERA, WORM TRACES, FOSSIL FRAGMENTS;

601 - 604.5 CALCILUTITE; VERY LIGHT ORANGE; 24% POROSITY, INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: CALCILUTITE;
GRAIN SIZE: VERY FINE; UNCONSOLIDATED;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: SILT- %;
OTHER FEATURES: CALCAREOUS, CHALKY;
FOSSILS: NO FOSSILS;

604.5- 629.5 CALCILUTITE; VERY LIGHT ORANGE; 16% POROSITY, INTERGRANULAR, PIN POINT VUGS, LOW PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE;
GRAIN SIZE: VERY FINE; RANGE: VERY FINE TO FINE; MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: SILT- %;
OTHER FEATURES: CALCAREOUS, CHALKY, WEATHERED;
FOSSILS: FOSSIL MOLDS, ECHINOID, FOSSIL FRAGMENTS, MOLLUSKS;
NUMMULITES, LEPIDOCYCLINA SP., SOME ECHINOIDS.

629.5- 634.5 CALCILUTITE; VERY LIGHT ORANGE; 24% POROSITY, INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: CALCILUTITE;
GRAIN SIZE: VERY FINE; UNCONSOLIDATED;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: SILT- %;
OTHER FEATURES: CALCAREOUS, CHALKY;
FOSSILS: NO FOSSILS;

634.5- 641 CALCARENITE; VERY LIGHT ORANGE; 20% POROSITY, INTERGRANULAR, POSSIBLY HIGH PERMEABILITY, PIN POINT VUGS;
GRAIN TYPE: BIOGENIC, CALCILUTITE;
GRAIN SIZE: FINE; RANGE: VERY FINE TO FINE; GOOD INDURATION;
SEDIMENTARY STRUCTURES: MASSIVE, BIOTURBATED,
ACCESSORY MINERALS: CALCILUTITE-35%;
OTHER FEATURES: CALCAREOUS, WEATHERED, CHALKY;
FOSSILS: FOSSIL FRAGMENTS, BENTHIC FORAMINIFERA, FOSSIL MOLDS;

641 - 664.5 CALCILUTITE; VERY LIGHT ORANGE TO MODERATE ORANGE PINK; 24% POROSITY, INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: CALCILUTITE;
GRAIN SIZE: VERY FINE; RANGE: VERY FINE TO FINE; UNCONSOLIDATED;
SEDIMENTARY STRUCTURES: INTERBEDDED,
OTHER FEATURES: CALCAREOUS, CHALKY;
FOSSILS: NO FOSSILS;

664.5- 681 CALCARENITE; VERY LIGHT ORANGE; 22% POROSITY, INTERGRANULAR, POSSIBLY HIGH PERMEABILITY, VUGULAR;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE, BIOTURBATED,
ACCESSORY MINERALS: CALCILUTITE-25%;
OTHER FEATURES: CALCAREOUS, GRANULAR;
FOSSILS: FOSSIL FRAGMENTS, BENTHIC FORAMINIFERA, FOSSIL MOLDS;
NUMEROUS FORAMINIFERA(NUMMULITES, LEPIDOCYCLINA).

681 - 689.5 CALCILUTITE; VERY LIGHT ORANGE; 24% POROSITY, POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: CALCILUTITE;
GRAIN SIZE: VERY FINE; RANGE: VERY FINE TO FINE; UNCONSOLIDATED;
SEDIMENTARY STRUCTURES: INTERBEDDED,
OTHER FEATURES: CALCAREOUS, CHALKY;
FOSSILS: NO FOSSILS;

689.5- 727.5 CALCARENITE; VERY LIGHT ORANGE; VUGULAR, POSSIBLY HIGH PERMEABILITY, INTERGRANULAR;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL;
GRAIN SIZE: FINE; RANGE: VERY FINE TO FINE; MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE, BIOTURBATED,
ACCESSORY MINERALS: CALCILUTITE-40%;
OTHER FEATURES: CALCAREOUS, CHALKY;
FOSSILS: FOSSIL FRAGMENTS, BENTHIC FORAMINIFERA, FOSSIL MOLDS, WORM TRACES, ORGANICS;
WILLISTON FORMATION; NUMMULITES, OPERCULINOIDES,GYPSINA GLOBIA

727.5- 734.5 CALCARENITE; VERY LIGHT ORANGE TO YELLOWISH GRAY; 24% POROSITY, INTERGRANULAR,
POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL CAST;
GRAIN SIZE: FINE; RANGE: VERY FINE TO FINE; MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED, BIOTURBATED,
ACCESSORY MINERALS: CALCILUTITE-15%, QUARTZ SAND- %;
OTHER FEATURES: CALCAREOUS, GRANULAR;
FOSSILS: MILIOLIDS, BENTHIC FORAMINIFERA;

734.5- 744.5 CALCARENITE; VERY LIGHT ORANGE; 26% POROSITY, INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL CAST;
GRAIN SIZE: FINE; RANGE: VERY FINE TO FINE; UNCONSOLIDATED;
SEDIMENTARY STRUCTURES: INTERBEDDED,
OTHER FEATURES: CALCAREOUS, GRANULAR;
FOSSILS: MILIOLIDS, BENTHIC FORAMINIFERA;

744.5- 759.5 CALCARENITE; VERY LIGHT ORANGE; 26% POROSITY, POSSIBLY HIGH PERMEABILITY, VUGULAR;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL CAST;
GRAIN SIZE: FINE; RANGE: FINE TO VERY FINE; MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE, BIOTURBATED,
ACCESSORY MINERALS: CALCILUTITE- %;
OTHER FEATURES: CALCAREOUS, GRANULAR, WEATHERED;
FOSSILS: BENTHIC FORAMINIFERA, MILIOLIDS, FOSSIL FRAGMENTS, FOSSIL MOLDS, MOLLUSKS;

759.5- 769 CALCARENITE; VERY LIGHT ORANGE; 28% POROSITY, INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: CALCILUTITE;
GRAIN SIZE: FINE; RANGE: VERY FINE TO FINE; UNCONSOLIDATED;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: CALCILUTITE-40%;
OTHER FEATURES: CALCAREOUS, CHALKY;
FOSSILS: NO FOSSILS;

769 - 804 CALCARENITE; VERY LIGHT ORANGE; 17% POROSITY, INTERGRANULAR, VUGULAR, PIN POINT VUGS;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL CAST;
GRAIN SIZE: FINE; RANGE: VERY FINE TO FINE; MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE, INTERBEDDED,
ACCESSORY MINERALS: CALCILUTITE-35%;
OTHER FEATURES: CALCAREOUS, CHALKY, WEATHERED, GRANULAR;
FOSSILS: FOSSIL FRAGMENTS, BENTHIC FORAMINIFERA, ECHINOID, ORGANICS, MOLLUSKS;
LARGE ECHINOID-DURAHAMELLA FLORIDANA; QTZ CRYSTAL, WORM TRACE

804 - 809.5 CALCILUTITE; YELLOWISH GRAY; LOW PERMEABILITY, INTERGRANULAR;
GRAIN TYPE: CALCILUTITE;
GRAIN SIZE: VERY FINE; GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE, INTERBEDDED,
ACCESSORY MINERALS: CLAY-45%;
OTHER FEATURES: CALCAREOUS, WEATHERED, CHALKY;
FOSSILS: ORGANICS, FOSSIL MOLDS, BENTHIC FORAMINIFERA;
CALCILUTITIC CLAY, QUARTZ CRYSTAL; BOTTOM OF INGLIS FORMATION.

809.5- 824.5 CALCILUTITE; VERY LIGHT ORANGE; INTERGRANULAR, LOW PERMEABILITY, FRACTURE;
GRAIN TYPE: BIOGENIC, CALCILUTITE;
GRAIN SIZE: VERY FINE; POOR INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE, INTERBEDDED,
ACCESSORY MINERALS: DOLOMITE- %;
OTHER FEATURES: CALCAREOUS, CHALKY;
FOSSILS: FOSSIL FRAGMENTS, BENTHIC FORAMINIFERA;

824.5- 835.1 DOLOSTONE; LIGHT BROWN; 04% POROSITY, INTERGRANULAR, PIN POINT VUGS,
LOW PERMEABILITY; 10-50% ALTERED; SUBHEDRAL;
GRAIN SIZE: VERY FINE; RANGE: MICROCRYSTALLINE TO VERY FINE; MODERATE INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, CALCILUTITE MATRIX, SILICIC CEMENT;
SEDIMENTARY STRUCTURES: INTERBEDDED, MASSIVE,
ACCESSORY MINERALS: QUARTZ- %;
OTHER FEATURES: DOLOMITIC, MEDIUM RECRYSTALLIZATION;
FOSSILS: FOSSIL MOLDS, BENTHIC FORAMINIFERA, ORGANICS, ECHINOID;
FRACTURES; TOP OF AVON PARK FORMATION(825.0').

835.1- 844.5 DOLOSTONE; LIGHT BROWN TO MODERATE BROWN; 01% POROSITY, INTERGRANULAR, INTERCRYSTALLINE, MOLDIC; 50-90% ALTERED; SUBHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; RANGE: CRYPTOCRYSTALLINE TO MICROCRYSTALLINE;
GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, SILICIC CEMENT;
SEDIMENTARY STRUCTURES: BEDDED, MASSIVE, MOTTLED,
OTHER FEATURES: DOLOMITIC, SUCROSIC, HIGH RECRYSTALLIZATION;
FOSSILS: FOSSIL MOLDS, FOSSIL FRAGMENTS;
ECHINOIDS(NEOLAGANUM DALLI); LOW MOLDIC PERMEABILITY.

844.5- 853.5 DOLOSTONE; MODERATE BROWN TO LIGHT OLIVE GRAY; 01% POROSITY, INTERGRANULAR, INTERCRYSTALLINE, PIN POINT VUGS; 50-90% ALTERED; SUBHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; RANGE: CRYPTOCRYSTALLINE TO MICROCRYSTALLINE;
GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, SILICIC CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE, BEDDED, MOTTLED,
ACCESSORY MINERALS: QUARTZ- %;
OTHER FEATURES: DOLOMITIC, SUCROSIC, HIGH RECRYSTALLIZATION;
FOSSILS: ECHINOID, FOSSIL MOLDS;
CRYSTALLINE LINED PIN POINT VUGS AND VUGS. FRACTURES(FILLED).

853.5- 859.5 DOLOSTONE; LIGHT GRAYISH BROWN TO DARK YELLOWISH BROWN; 02% POROSITY, INTERGRANULAR, INTRAGRANULAR, PIN POINT VUGS; 50-90% ALTERED; ANHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; RANGE: CRYPTOCRYSTALLINE TO GRANULE; GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, SILICIC CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE, BEDDED, MOTTLED,
ACCESSORY MINERALS: QUARTZ SAND- %;
OTHER FEATURES: SUCROSIC, DOLOMITIC;
FOSSILS: FOSSIL MOLDS, ECHINOID;

FRACTURES(FILLED). LOW PERMEABILITY; CRYSTALLINE LINED MOLDS.

859.5- 879.5 DOLOSTONE; LIGHT BROWN TO GRAYISH BROWN; INTERGRANULAR, INTERCRYSTALLINE, FRACTURE; 50-90% ALTERED; SUBHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; RANGE: VERY FINE TO CRYPTOCRYSTALLINE; GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, SILICIC CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE, BEDDED, MOTTLED,
ACCESSORY MINERALS: QUARTZ SAND- %;
OTHER FEATURES: SUCROSIC, DOLOMITIC, GRANULAR;
FOSSILS: ORGANICS, FOSSIL MOLDS, ECHINOID;

879.5- 885.5 DOLOSTONE; DARK YELLOWISH BROWN TO LIGHT BROWN; 01% POROSITY, INTERCRYSTALLINE, FRACTURE, LOW PERMEABILITY; 50-90% ALTERED; SUBHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; RANGE: CRYPTOCRYSTALLINE TO MICROCRYSTALLINE;
GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, SILICIC CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE, BEDDED, MOTTLED,
ACCESSORY MINERALS: QUARTZ- %;
OTHER FEATURES: SUCROSIC, DOLOMITIC, HIGH RECRYSTALLIZATION;

885.5- 894.5 DOLOSTONE; LIGHT BROWN TO MODERATE BROWN; INTRAGRANULAR, LOW PERMEABILITY, PIN POINT VUGS; 50-90% ALTERED; SUBHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; RANGE: CRYPTOCRYSTALLINE TO MICROCRYSTALLINE;
GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, SILICIC CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE, BEDDED, MOTTLED, LAMINATED,
ACCESSORY MINERALS: QUARTZ- %, QUARTZ SAND- %, DOLOMITE- %;
OTHER FEATURES: SUCROSIC, DOLOMITIC, HIGH RECRYSTALLIZATION;
FOSSILS: ORGANICS, ECHINOID;

894.5- 901 DOLOSTONE; LIGHT BROWN TO DARK YELLOWISH BROWN; INTRAGRANULAR, LOW PERMEABILITY, PIN POINT VUGS; 50-90% ALTERED; SUBHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; RANGE: CRYPTOCRYSTALLINE TO MICROCRYSTALLINE;
GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, SILICIC CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: LIMESTONE- %;
OTHER FEATURES: HIGH RECRYSTALLIZATION, DOLOMITIC, SUCROSIC;

901 - 904 CALCARENITE; VERY LIGHT ORANGE; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL;
MODERATE INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: DOLOMITE- %;
OTHER FEATURES: GRANULAR, LOW RECRYSTALLIZATION;
FOSSILS: FOSSIL FRAGMENTS;

904 - 909 DOLOSTONE; GRAYISH BROWN TO DARK YELLOWISH BROWN; INTRAGRANULAR, FRACTURE, INTERCRYSTALLINE; 50-90% ALTERED; SUBHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; RANGE: CRYPTOCRYSTALLINE TO MICROCRYSTALLINE;
GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, SILICIC CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE, MOTTLED,
ACCESSORY MINERALS: LIMESTONE- %;
OTHER FEATURES: HIGH RECRYSTALLIZATION, SUCROSIC;
FOSSILS: ECHINOID, FOSSIL FRAGMENTS;

909 - 910 SILT-SIZED DOLOMITE; LIGHT BROWN TO MODERATE BROWN; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY; UNCONSOLIDATED;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: CLAY- %, QUARTZ SAND- %, SILT- %;
FOSSILS: ORGANICS, ECHINOID;

910 - 925 DOLOSTONE; MODERATE OLIVE BROWN TO MODERATE BROWN; INTERGRANULAR, INTRAGRANULAR, PIN POINT VUGS; 50-90% ALTERED; SUBHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; RANGE: CRYPTOCRYSTALLINE TO MICROCRYSTALLINE;
GOOD INDURATION;
CEMENT TYPE(S): SILICIC CEMENT, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE, MOTTLED,
ACCESSORY MINERALS: QUARTZ SAND- %;
OTHER FEATURES: HIGH RECRYSTALLIZATION, DOLOMITIC, SUCROSIC;
FOSSILS: ORGANICS;

925 - 930 DOLOSTONE; DARK YELLOWISH BROWN TO LIGHT BROWN; INTERGRANULAR, INTRAGRANULAR, POSSIBLY HIGH PERMEABILITY; 10-50% ALTERED; SUBHEDRAL;
GRAIN SIZE: FINE; RANGE: VERY FINE TO MICROCRYSTALLINE; MODERATE INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, SILICIC CEMENT;
SEDIMENTARY STRUCTURES: INTERBEDDED, MASSIVE,
ACCESSORY MINERALS: QUARTZ SAND- %, LIMESTONE- %;
OTHER FEATURES: MEDIUM RECRYSTALLIZATION, DOLOMITIC, SUCROSIC;

930 - 940 DOLOSTONE; DARK YELLOWISH BROWN TO MODERATE BROWN; INTERCRYSTALLINE, INTRAGRANULAR, PIN POINT VUGS; 50-90% ALTERED; SUBHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; RANGE: VERY FINE TO CRYPTOCRYSTALLINE; GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, SILICIC CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE, INTERBEDDED, MOTTLED,
ACCESSORY MINERALS: QUARTZ SAND-01%, QUARTZ- %;
OTHER FEATURES: HIGH RECRYSTALLIZATION, SUCROSIC;

940 - 955 DOLOSTONE; GRAYISH BROWN TO DARK YELLOWISH BROWN; INTERGRANULAR, FRACTURE, INTERCRYSTALLINE; 50-90% ALTERED; SUBHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, SILICIC CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE, INTERBEDDED,
ACCESSORY MINERALS: QUARTZ- %;
OTHER FEATURES: HIGH RECRYSTALLIZATION, SUCROSIC;

955 - 960 DOLOSTONE; DARK YELLOWISH BROWN TO MODERATE BROWN; FRACTURE, INTRAGRANULAR, PIN POINT VUGS; 50-90% ALTERED; SUBHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, SILICIC CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE, INTERBEDDED, MOTTLED,
ACCESSORY MINERALS: QUARTZ- %, QUARTZ SAND- %;
OTHER FEATURES: HIGH RECRYSTALLIZATION, SUCROSIC;
FOSSILS: ECHINOID;

960 - 965 DOLOSTONE; LIGHT BROWN TO DARK YELLOWISH BROWN; INTRAGRANULAR, FRACTURE;
50-90% ALTERED; SUBHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, SILICIC CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE, INTERBEDDED,
ACCESSORY MINERALS: QUARTZ- %, QUARTZ SAND- %, LIMESTONE- %;
OTHER FEATURES: HIGH RECRYSTALLIZATION;

965 - 970 DOLOSTONE; MODERATE BROWN TO DARK YELLOWISH BROWN; INTRAGRANULAR, FRACTURE;
50-90% ALTERED; SUBHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, SILICIC CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE, INTERBEDDED,
ACCESSORY MINERALS: QUARTZ SAND- %;
OTHER FEATURES: HIGH RECRYSTALLIZATION;

970 - 975 DOLOSTONE; DARK YELLOWISH BROWN TO DARK YELLOWISH BROWN; INTRAGRANULAR, INTERCRYSTALLINE,
FRACTURE; 50-90% ALTERED; SUBHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; RANGE: MICROCRYSTALLINE TO CRYPTOCRYSTALLINE;
GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, SILICIC CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE, INTERBEDDED,
ACCESSORY MINERALS: QUARTZ- %;
OTHER FEATURES: HIGH RECRYSTALLIZATION, SUCROSIC;

975 - 980 DOLOSTONE; GRAYISH BROWN TO MODERATE BROWN; FRACTURE, PIN POINT VUGS,
INTRAGRANULAR; 50-90% ALTERED; SUBHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; RANGE: MICROCRYSTALLINE TO CRYPTOCRYSTALLINE;
GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, SILICIC CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE, INTERBEDDED, MOTTLED, STREAKED,
ACCESSORY MINERALS: QUARTZ- %;
OTHER FEATURES: HIGH RECRYSTALLIZATION, SUCROSIC;

980 - 1000 DOLOSTONE; DARK YELLOWISH BROWN TO DARK YELLOWISH BROWN; INTRAGRANULAR, LOW PERMEABILITY,
INTERCRYSTALLINE; 50-90% ALTERED; SUBHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; RANGE: CRYPTOCRYSTALLINE TO FINE; GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, SILICIC CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE, INTERBEDDED,
ACCESSORY MINERALS: QUARTZ SAND- %;
OTHER FEATURES: SUCROSIC;

1000 - 1015 DOLOSTONE; DARK YELLOWISH BROWN TO GRAYISH BROWN; INTRAGRANULAR, FRACTURE;
50-90% ALTERED; SUBHEDRAL;
GRAIN SIZE: CRYPTOCRYSTALLINE; RANGE: MICROCRYSTALLINE TO CRYPTOCRYSTALLINE;
GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, SILICIC CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE, MOTTLED, LAMINATED,
OTHER FEATURES: HIGH RECRYSTALLIZATION, SUCROSIC;
FOSSILS: ORGANICS;

1015 - 1020 DOLOSTONE; MODERATE BROWN TO DARK YELLOWISH BROWN; INTRAGRANULAR, LOW PERMEABILITY,
PIN POINT VUGS; 50-90% ALTERED; SUBHEDRAL;
GRAIN SIZE: CRYPTOCRYSTALLINE; RANGE: MICROCRYSTALLINE TO CRYPTOCRYSTALLINE;
GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, SILICIC CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE, MOTTLED,
OTHER FEATURES: HIGH RECRYSTALLIZATION, SUCROSIC;

1020 - 1040 DOLOSTONE; LIGHT GRAYISH BROWN TO DARK YELLOWISH BROWN; INTRAGRANULAR, FRACTURE,
INTERCRYSTALLINE; 50-90% ALTERED; SUBHEDRAL;
GRAIN SIZE: CRYPTOCRYSTALLINE; GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, SILICIC CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE, MOTTLED,
ACCESSORY MINERALS: LIMESTONE- %, QUARTZ SAND- %;
OTHER FEATURES: HIGH RECRYSTALLIZATION, SUCROSIC;

1040 - 1050 DOLOSTONE; LIGHT GRAYISH BROWN TO GRAYISH BROWN; INTRAGRANULAR, FRACTURE, INTERCRYSTALLINE;
50-90% ALTERED; SUBHEDRAL;
GRAIN SIZE: CRYPTOCRYSTALLINE; GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, SILICIC CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: LIMESTONE- %, CALCITE- %, QUARTZ SAND- %;
OTHER FEATURES: HIGH RECRYSTALLIZATION, SUCROSIC;

1050 - 1063 DOLOSTONE; LIGHT GRAYISH BROWN TO LIGHT BROWN; INTRAGRANULAR, FRACTURE;
50-90% ALTERED; SUBHEDRAL;
GRAIN SIZE: CRYPTOCRYSTALLINE; GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, SILICIC CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE, MOTTLED, BANDED,
ACCESSORY MINERALS: LIMESTONE-45%, QUARTZ SAND- %;
OTHER FEATURES: HIGH RECRYSTALLIZATION, SUCROSIC;
FOSSILS: SPICULES;

1063 - 1065 LIMESTONE; LIGHT BROWN; PIN POINT VUGS, INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE;
POOR INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, CALCILUTITE MATRIX, SILICIC CEMENT;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: DOLOMITE-40%, QUARTZ SAND- %;
OTHER FEATURES: MEDIUM RECRYSTALLIZATION;
FOSSILS: FOSSIL MOLDS, FOSSIL FRAGMENTS;

1065 - 1085 LIMESTONE; LIGHT BROWN TO VERY LIGHT ORANGE; INTERGRANULAR, PIN POINT VUGS;
GRAIN TYPE: CALCILUTITE;
MODERATE INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, CALCILUTITE MATRIX, SILICIC CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE, INTERBEDDED,
ACCESSORY MINERALS: DOLOMITE-40%, QUARTZ SAND- %;
OTHER FEATURES: MEDIUM RECRYSTALLIZATION;
FOSSILS: MOLLUSKS, FOSSIL MOLDS;

1085 - 1105 LIMESTONE; VERY LIGHT ORANGE TO GRAYISH ORANGE PINK; INTERGRANULAR, PIN POINT VUGS,
POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE;
MODERATE INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE, INTERBEDDED,
ACCESSORY MINERALS: DOLOMITE-35%, QUARTZ SAND- %;
OTHER FEATURES: MEDIUM RECRYSTALLIZATION;
FOSSILS: MOLLUSKS, FOSSIL MOLDS;

1105 - 1115 LIMESTONE; MODERATE ORANGE PINK TO YELLOWISH GRAY; INTERGRANULAR, INTRAGRANULAR,
PIN POINT VUGS;
GRAIN TYPE: BIOGENIC, CALCILUTITE;
MODERATE INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE, INTERBEDDED,
ACCESSORY MINERALS: DOLOMITE-45%, QUARTZ SAND- %;
OTHER FEATURES: HIGH RECRYSTALLIZATION;

1115 - 1120 DOLOSTONE; MODERATE BROWN TO LIGHT BROWN; INTRAGRANULAR, INTERGRANULAR,
PIN POINT VUGS; 10-50% ALTERED; SUBHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; RANGE: CRYPTOCRYSTALLINE TO MICROCRYSTALLINE;
MODERATE INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE, INTERBEDDED,
OTHER FEATURES: MEDIUM RECRYSTALLIZATION, SUCROSIC;

1120 - 1130 LIMESTONE; MODERATE ORANGE PINK TO VERY LIGHT ORANGE; INTERGRANULAR, PIN POINT VUGS, POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE;
MODERATE INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE, INTERBEDDED,
ACCESSORY MINERALS: DOLOMITE-40%, QUARTZ SAND- %;
OTHER FEATURES: MEDIUM RECRYSTALLIZATION;

1130 - 1135 LIMESTONE; MODERATE ORANGE PINK TO VERY LIGHT ORANGE; INTERGRANULAR, PIN POINT VUGS, POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: CALCILUTITE, BIOGENIC;
MODERATE INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE, INTERBEDDED,
ACCESSORY MINERALS: DOLOMITE-40%, QUARTZ SAND- %;
OTHER FEATURES: MEDIUM RECRYSTALLIZATION, DOLOMITIC;
FOSSILS: FOSSIL FRAGMENTS;

1135 - 1150 DOLOSTONE; GRAYISH ORANGE PINK TO LIGHT GRAYISH BROWN; INTERGRANULAR, INTRAGRANULAR; 10-50% ALTERED; SUBHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; RANGE: CRYPTOCRYSTALLINE TO MICROCRYSTALLINE;
MODERATE INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE, INTERBEDDED,
ACCESSORY MINERALS: LIMESTONE-40%, QUARTZ SAND- %;
OTHER FEATURES: MEDIUM RECRYSTALLIZATION, DOLOMITIC, SUCROSIC;
FOSSILS: FOSSIL FRAGMENTS;
QUARTZ CRYSTAL; DARK-PALE BROWN SUCROSIC DOLOMITE LENSES.

1150 - 1170 DOLOSTONE; LIGHT BROWN TO YELLOWISH GRAY; INTERGRANULAR, INTRAGRANULAR, PIN POINT VUGS; 10-50% ALTERED; SUBHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; RANGE: VERY FINE TO MICROCRYSTALLINE; GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE, MOTTLED, INTERBEDDED,
ACCESSORY MINERALS: LIMESTONE- %;
OTHER FEATURES: MEDIUM RECRYSTALLIZATION, SUCROSIC;
FOSSILS: FOSSIL FRAGMENTS;
BROWNISH BLACK SUCROSIC DOLOMITE(1160-1165).

1170 - 1180 DOLOSTONE; LIGHT BROWN TO YELLOWISH GRAY; INTERGRANULAR, INTRAGRANULAR, PIN POINT VUGS; 10-50% ALTERED; SUBHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; RANGE: CRYPTOCRYSTALLINE TO MICROCRYSTALLINE;
GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE, INTERBEDDED,
ACCESSORY MINERALS: LIMESTONE-45%;
OTHER FEATURES: MEDIUM RECRYSTALLIZATION, SUCROSIC;

1180 - 1190 LIMESTONE; LIGHT BROWN TO VERY LIGHT ORANGE; INTERGRANULAR, INTRAGRANULAR, PIN POINT VUGS;
GRAIN TYPE: CALCILUTITE, BIOGENIC;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: DOLOMITE-45%;
OTHER FEATURES: MEDIUM RECRYSTALLIZATION, GRANULAR;
FOSSILS: FOSSIL FRAGMENTS;

1190 - 1200 DOLOSTONE; YELLOWISH GRAY TO LIGHT BROWN; INTERGRANULAR, INTRAGRANULAR,
PIN POINT VUGS; 10-50% ALTERED; SUBHEDRAL;
GRAIN SIZE: FINE; RANGE: MICROCRYSTALLINE TO FINE; MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: INTERBEDDED, MASSIVE,
ACCESSORY MINERALS: LIMESTONE- %;
OTHER FEATURES: MEDIUM RECRYSTALLIZATION, GRANULAR, SUCROSIC;
FOSSILS: ORGANICS, FOSSIL FRAGMENTS;

1200 - 1215 LIMESTONE; YELLOWISH GRAY TO LIGHT BROWN; INTERGRANULAR, PIN POINT VUGS, INTRAGRANULAR;
GRAIN TYPE: CALCILUTITE, BIOGENIC;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: INTERBEDDED, MASSIVE,
ACCESSORY MINERALS: DOLOMITE- %;
OTHER FEATURES: LOW RECRYSTALLIZATION, CALCAREOUS;
FOSSILS: FOSSIL FRAGMENTS;

1215 - 1220 DOLOSTONE; DARK YELLOWISH BROWN TO YELLOWISH GRAY; INTRAGRANULAR, INTERGRANULAR,
PIN POINT VUGS; 10-50% ALTERED; SUBHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; RANGE: VERY FINE TO MICROCRYSTALLINE; GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: INTERBEDDED, MASSIVE,
ACCESSORY MINERALS: LIMESTONE-40%;
OTHER FEATURES: SUCROSIC;
FOSSILS: FOSSIL FRAGMENTS;

1220 - 1240 DOLOSTONE; DARK YELLOWISH BROWN TO LIGHT BROWN; INTRAGRANULAR, INTERGRANULAR,
PIN POINT VUGS; 10-50% ALTERED; SUBHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; RANGE: VERY FINE TO MICROCRYSTALLINE; GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED, MASSIVE, LAMINATED,
ACCESSORY MINERALS: LIMESTONE-35%, QUARTZ- %;
OTHER FEATURES: MEDIUM RECRYSTALLIZATION, SUCROSIC;

1240 - 1255 LIMESTONE; YELLOWISH GRAY TO LIGHT BROWN; INTERGRANULAR, PIN POINT VUGS, INTRAGRANULAR;
GRAIN TYPE: BIOGENIC, CALCILUTITE;
MODERATE INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE, INTERBEDDED,
ACCESSORY MINERALS: DOLOMITE-20%;
OTHER FEATURES: MEDIUM RECRYSTALLIZATION, GRANULAR;
FOSSILS: ORGANICS;

1255 - 1260 DOLOSTONE; LIGHT BROWN TO MODERATE ORANGE PINK; 01% POROSITY, INTERGRANULAR, INTRAGRANULAR;
10-50% ALTERED; SUBHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; RANGE: VERY FINE TO MICROCRYSTALLINE; GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: LIMESTONE- %;
OTHER FEATURES: MEDIUM RECRYSTALLIZATION, SUCROSIC;
FOSSILS: NO FOSSILS;

1260 - 1285 LIMESTONE; LIGHT GRAYISH BROWN TO LIGHT BROWN; INTERGRANULAR, PIN POINT VUGS;
GRAIN TYPE: BIOGENIC, CALCILUTITE;
MODERATE INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE, INTERBEDDED,
ACCESSORY MINERALS: DOLOMITE- %, QUARTZ SAND- %, QUARTZ- %;
OTHER FEATURES: MEDIUM RECRYSTALLIZATION;
FOSSILS: FOSSIL FRAGMENTS;
LENSES OF MODERATE BROWN-PALE OLIVE DOLOMITE.

1285 - 1300 DOLOSTONE; LIGHT GRAYISH BROWN TO DARK YELLOWISH BROWN; INTERGRANULAR, PIN POINT VUGS,
INTRAGRANULAR; 10-50% ALTERED; SUBHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; RANGE: VERY FINE TO CRYPTOCRYSTALLINE; GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED, MASSIVE, LAMINATED,
ACCESSORY MINERALS: LIMESTONE- %;
OTHER FEATURES: MEDIUM RECRYSTALLIZATION, SUCROSIC;
FOSSILS: NO FOSSILS;

1300 - 1315 LIMESTONE; LIGHT BROWN; 01% POROSITY, INTERGRANULAR, PIN POINT VUGS;
GRAIN TYPE: BIOGENIC, CALCILUTITE;
MODERATE INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: DOLOMITE- %, QUARTZ SAND- %, ANHYDRITE- %;
OTHER FEATURES: MEDIUM RECRYSTALLIZATION;
FOSSILS: NO FOSSILS;
ANHYDRITE(1305'-1310').

1315 - 1325 DOLOSTONE; LIGHT BROWN TO DARK YELLOWISH BROWN; INTERGRANULAR,
INTRAGRANULAR; 10-50% ALTERED; SUBHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; RANGE: VERY FINE TO CRYPTOCRYSTALLINE; GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE, INTERBEDDED,
ACCESSORY MINERALS: LIMESTONE- %, QUARTZ SAND- %;
OTHER FEATURES: MEDIUM RECRYSTALLIZATION, SUCROSIC;
FOSSILS: NO FOSSILS;

1325 - 1340 LIMESTONE; LIGHT BROWN; INTERGRANULAR, PIN POINT VUGS;
GRAIN TYPE: BIOGENIC, CALCILUTITE;
GRAIN SIZE: MICROCRYSTALLINE; RANGE: CRYPTOCRYSTALLINE TO FINE; MODERATE INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE, INTERBEDDED,
ACCESSORY MINERALS: DOLOMITE- %, QUARTZ SAND- %;
OTHER FEATURES: MEDIUM RECRYSTALLIZATION;
FOSSILS: NO FOSSILS;

1340 - 1345 DOLOSTONE; MODERATE ORANGE PINK TO MODERATE BROWN; INTERGRANULAR,
INTRAGRANULAR; 10-50% ALTERED; SUBHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; RANGE: VERY FINE TO CRYPTOCRYSTALLINE; GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE, INTERBEDDED,
ACCESSORY MINERALS: LIMESTONE- %;
OTHER FEATURES: MEDIUM RECRYSTALLIZATION, SUCROSIC;
FOSSILS: NO FOSSILS;

1345 - 1355 LIMESTONE; LIGHT BROWN TO VERY LIGHT ORANGE; PIN POINT VUGS, INTERGRANULAR;
GRAIN TYPE: BIOGENIC, CALCILUTITE;
GRAIN SIZE: MICROCRYSTALLINE; RANGE: CRYPTOCRYSTALLINE TO FINE; MODERATE INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: DOLOMITE- %;
OTHER FEATURES: MEDIUM RECRYSTALLIZATION;

1355 - 1365 DOLOSTONE; YELLOWISH GRAY TO LIGHT BROWN; INTERGRANULAR, PIN POINT VUGS,
INTRAGRANULAR; 10-50% ALTERED; SUBHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; RANGE: VERY FINE TO CRYPTOCRYSTALLINE; GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE, INTERBEDDED,
ACCESSORY MINERALS: LIMESTONE- %;
OTHER FEATURES: MEDIUM RECRYSTALLIZATION;
FOSSILS: NO FOSSILS;

1365 - 1375 DOLOSTONE; VERY LIGHT ORANGE TO MODERATE ORANGE PINK; INTERGRANULAR, PIN POINT VUGS, INTRAGRANULAR; 10-50% ALTERED; SUBHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; RANGE: FINE TO CRYPTOCRYSTALLINE; GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE, INTERBEDDED,
ACCESSORY MINERALS: LIMESTONE- %;
OTHER FEATURES: MEDIUM RECRYSTALLIZATION;
FOSSILS: BRYOZOA, FOSSIL MOLDS;

1375 - 1400 LIMESTONE; VERY LIGHT ORANGE TO LIGHT BROWN; INTERGRANULAR, FRACTURE, PIN POINT VUGS;
GRAIN TYPE: BIOGENIC, CALCILUTITE;
GRAIN SIZE: MICROCRYSTALLINE; RANGE: VERY FINE TO MICROCRYSTALLINE; MODERATE INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE, INTERBEDDED,
ACCESSORY MINERALS: DOLOMITE-40%, ANHYDRITE- %;
OTHER FEATURES: DOLOMITIC, MEDIUM RECRYSTALLIZATION;
FOSSILS: FOSSIL FRAGMENTS;

1400 - 1410 DOLOSTONE; VERY LIGHT ORANGE TO YELLOWISH GRAY; INTERGRANULAR,
PIN POINT VUGS; 10-50% ALTERED; SUBHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; RANGE: VERY FINE TO MICROCRYSTALLINE; MODERATE INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED, LAMINATED,
ACCESSORY MINERALS: LIMESTONE-45%;
OTHER FEATURES: MEDIUM RECRYSTALLIZATION;
FOSSILS: ORGANICS, FOSSIL FRAGMENTS;

1410 - 1410 LIMESTONE; VERY LIGHT ORANGE TO LIGHT BROWN; INTERGRANULAR, PIN POINT VUGS;
GRAIN TYPE: CALCILUTITE;
GRAIN SIZE: MICROCRYSTALLINE; RANGE: VERY FINE TO MICROCRYSTALLINE; MODERATE INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED, LAMINATED,
ACCESSORY MINERALS: DOLOMITE-40%, ANHYDRITE- %;
OTHER FEATURES: DOLOMITIC;
FOSSILS: FOSSIL FRAGMENTS;

1410 - 1419.8 CLAY; WHITE; INTERGRANULAR; POOR INDURATION;
CEMENT TYPE(S): ANHYDRITE CEMENT, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: DOLOMITE- %, LIMESTONE- %, ANHYDRITE- %;
OTHER FEATURES: PLASTIC;
FOSSILS: NO FOSSILS;

1419.8- 1430 DOLOSTONE; MODERATE BROWN; INTERCRYSTALLINE, INTRAGRANULAR; 50-90% ALTERED;
SUBHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; RANGE: CRYPTOCRYSTALLINE TO MICROCRYSTALLINE;
GOOD INDURATION;
CEMENT TYPE(S): ANHYDRITE CEMENT, GYPSUM CEMENT, DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: ANHYDRITE-40%, GYPSUM- %;
OTHER FEATURES: SUCROSIC;
FOSSILS: NO FOSSILS;
ANHYDRITE-GYPSUM;INTERBEDDED WITH DOLOMITE AND LIMESTONE.

1430 - 1430 ANHYDRITE; WHITE TO VERY LIGHT GRAY; INTERGRANULAR, INTERCRYSTALLINE; MODERATE INDURATION;
CEMENT TYPE(S): ANHYDRITE CEMENT, GYPSUM CEMENT, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED,
ACCESSORY MINERALS: LIMESTONE- %, GYPSUM- %, DOLOMITE-40%;
OTHER FEATURES: CHALKY;
FOSSILS: NO FOSSILS;

1430 - 1440 DOLOSTONE; VERY LIGHT ORANGE TO DARK YELLOWISH BROWN; INTERCRYSTALLINE, INTERGRANULAR,
PIN POINT VUGS; 10-50% ALTERED; ANHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; RANGE: VERY FINE TO MICROCRYSTALLINE; GOOD INDURATION;
CEMENT TYPE(S): ANHYDRITE CEMENT, GYPSUM CEMENT, DOLOMITE CEMENT;
ACCESSORY MINERALS: LIMESTONE- %, GYPSUM- %, ANHYDRITE- %;
OTHER FEATURES: SUCROSIC;
FOSSILS: NO FOSSILS;

1440 - 1445 CLAY; MODERATE BROWN TO MODERATE YELLOWISH GREEN; INTERGRANULAR; MODERATE INDURATION;
CEMENT TYPE(S): ANHYDRITE CEMENT, DOLOMITE CEMENT, GYPSUM CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE, INTERBEDDED,
ACCESSORY MINERALS: DOLOMITE- %, GYPSUM- %, ANHYDRITE- %;
OTHER FEATURES: PLASTIC;
FOSSILS: ORGANICS;

1445 - 1470 DOLOSTONE; LIGHT BROWN TO DARK YELLOWISH BROWN; INTRAGRANULAR, INTERGRANULAR,
INTERCRYSTALLINE; 10-50% ALTERED; ANHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; MODERATE INDURATION;
CEMENT TYPE(S): ANHYDRITE CEMENT, DOLOMITE CEMENT, GYPSUM CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE, INTERBEDDED,
ACCESSORY MINERALS: LIMESTONE- %, GYPSUM- %, ANHYDRITE- %, QUARTZ SAND- %;
OTHER FEATURES: SUCROSIC;
FOSSILS: NO FOSSILS;

1470 - 1475 LIMESTONE; LIGHT BROWN; INTERGRANULAR;
GRAIN TYPE: CALCILUTITE;
POOR INDURATION;
CEMENT TYPE(S): ANHYDRITE CEMENT, DOLOMITE CEMENT, GYPSUM CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE, INTERBEDDED,
ACCESSORY MINERALS: DOLOMITE- %, GYPSUM- %, ANHYDRITE- %, QUARTZ SAND- %;
OTHER FEATURES: GRANULAR;
FOSSILS: NO FOSSILS;

1475 - 1495 DOLOSTONE; GRAYISH BROWN TO LIGHT BROWN; INTRAGRANULAR, INTERCRYSTALLINE, INTERGRANULAR; 10-50% ALTERED; SUBHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; MODERATE INDURATION;
CEMENT TYPE(S): ANHYDRITE CEMENT, DOLOMITE CEMENT, GYPSUM CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE, INTERBEDDED,
ACCESSORY MINERALS: LIMESTONE- %, GYPSUM- %, ANHYDRITE- %, QUARTZ- %;
OTHER FEATURES: SUCROSIC;
FOSSILS: NO FOSSILS;

1495 - 1510 DOLOSTONE; MODERATE BROWN TO LIGHT BROWN; INTRAGRANULAR, INTERCRYSTALLINE, INTERGRANULAR; 10-50% ALTERED; SUBHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; MODERATE INDURATION;
CEMENT TYPE(S): ANHYDRITE CEMENT, DOLOMITE CEMENT, GYPSUM CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE, INTERBEDDED, MOTTLED,
ACCESSORY MINERALS: LIMESTONE- %, GYPSUM- %, ANHYDRITE- %, CHERT- %;
OTHER FEATURES: SUCROSIC;
FOSSILS: FOSSIL FRAGMENTS;

1510 - 1540 LIMESTONE; VERY LIGHT ORANGE TO LIGHT BROWN; INTRAGRANULAR, INTERGRANULAR, PIN POINT VUGS;
GRAIN TYPE: CALCILUTITE;
MODERATE INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, ANHYDRITE CEMENT, GYPSUM CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE, INTERBEDDED,
ACCESSORY MINERALS: DOLOMITE- %, GYPSUM- %, ANHYDRITE- %;
OTHER FEATURES: CALCAREOUS;
FOSSILS: FOSSIL FRAGMENTS;

1540 - 1550 LIMESTONE; LIGHT BROWN TO MODERATE BROWN; INTRAGRANULAR, INTERGRANULAR, LOW PERMEABILITY;
GRAIN TYPE: CALCILUTITE;
MODERATE INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, ANHYDRITE CEMENT, GYPSUM CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE, INTERBEDDED, MOTTLED,
ACCESSORY MINERALS: DOLOMITE- %, GYPSUM- %, ANHYDRITE- %, CLAY- %;
OTHER FEATURES: CALCAREOUS;
FOSSILS: NO FOSSILS;

1550 - 1565 LIMESTONE; LIGHT BROWN TO DARK YELLOWISH BROWN; INTRAGRANULAR, INTERGRANULAR, PIN POINT VUGS;
GRAIN TYPE: CALCILUTITE;
MODERATE INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, ANHYDRITE CEMENT, GYPSUM CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE, INTERBEDDED,
ACCESSORY MINERALS: DOLOMITE- %, GYPSUM- %, ANHYDRITE- %;
OTHER FEATURES: CALCAREOUS, GRANULAR;
FOSSILS: NO FOSSILS;

1565 - 1570 LIMESTONE; LIGHT BROWN TO LIGHT GRAYISH BROWN; INTRAGRANULAR, INTERGRANULAR, PIN POINT VUGS;
GRAIN TYPE: CALCILUTITE;
GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, ANHYDRITE CEMENT, GYPSUM CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE, INTERBEDDED,
ACCESSORY MINERALS: DOLOMITE- %, GYPSUM- %, ANHYDRITE- %, CHERT- %;
OTHER FEATURES: GRANULAR;
FOSSILS: NO FOSSILS;

1570 - 1575 DOLOSTONE; LIGHT BROWN TO LIGHT GRAYISH BROWN; INTERCRYSTALLINE, INTRAGRANULAR, LOW PERMEABILITY; 10-50% ALTERED; SUBHEDRAL;
GRAIN SIZE: MICROCRYSTALLINE; RANGE: CRYPTOCRYSTALLINE TO MICROCRYSTALLINE;
GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, ANHYDRITE CEMENT, GYPSUM CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE, INTERBEDDED,
ACCESSORY MINERALS: LIMESTONE- %, ANHYDRITE- %, CHERT- %, CLAY- %;
OTHER FEATURES: MUDDY;
FOSSILS: NO FOSSILS;
PALE BROWN-GRAYISH BROWN CHERT AND GRAYISH YELLOW GREEN CLAY LENSES.

1575 TOTAL DEPTH