20 Engineering Geology and Foundation Studies

APPENDIX 2G

ENGINEERING GEOLOGY
AND
FOUNDATION CONSIDERATIONS

APPENDIX 2G

ENGINEERING GEOLOGY AND FOUNDATION CONSIDERATIONS

1 INTRODUCTION

1.1 Summary

This Appendix summarizes the results of all of the data obtained in the subsurface investigation of the Florida Power Corporation's proposed Crystal River Plant, Units 3 and 4. Conclusions on the foundation systems considerations presented in this section are derived from the analysis of data obtained in test borings, field testing and measurements, laboratory testings, aerial photograph interpretation, and a regional surface geological study.

The above information has been incorporated with the related special studies contained in other Appendices of the report to present a comprehensive study of all the geologic and engineering parameters of the subsurface conditions as they relate to the structural integrity of the proposed nuclear facility.

1.2 Location

The existing and proposed facilities are located in the NW 1/4 of Section 33, Township 17 south, range 16 east, Citrus County, Florida. The Florida Power Corporation property adjoins U.S. Route 19/98 near Red Level, approximately 7-1/2 miles NW of Crystal River.

1.3 Physiography

The site is adjacent to the Gulf of Mexico in a former marsh area that has been reclaimed for plant site development. The entire area is one of very low relief (originally two to five feet above mean sea level) and is located within the Terraced Coastal Lowlands of the Coastal Plain of West Florida. For the sake of continuity with the major portion of this report, all elevations hereafter mentioned are referenced to the Florida Power Corporation's Plant Datum (mean Gulf low water level equals plant datum 88).

1.4 Field Investigation

Supplemented by extensive field and laboratory testing, aerial photo interpretation, and a regional surface geologic investigation; a subsurface exploration program consisting of 71 borings, was conducted at the study area of the site. Locations of these borings and subsurface cross sections are shown on Figure 2G-1. 1

In general, 2-3/4 inch core samples were recovered, along with 2 in h split barrel drive samples, to an average depth of 100 feet with three deep holes of 200 ft. Recovered samples were examined and classified to determine:

a. Soil types and configuration
b. Engineering properties of soil and rock
c. Extent and degree of bedrock weathering
d. Extent and magnitude of solution channels and secondary infilling

Data on engineering properties of soil and rock were obtained with in-situ testing utilizing the Menard pressure cell, seismic refraction studies, ground vibration studies, and in-hole plate load testing in the grouted test area. 7

Laboratory testing of core samples was conducted to provide strength parameters of the subsurface materials and to evaluate the results of the in-situ testing.

Water level observations were recorded over the study area and compared with tidal observations to measure groundwater response to tidal fluctuations.

The data collected in all of the above aspects of the field investigation were incorporated into the interpretation of the engineering geology of the site and the foundation systems analysis.

The area studied is indicated in Figure 2G-1 and is referenced to existing column lines in Unit 1. Subsurface conditions encountered in the study area are like those beneath Units 1 and 2.

2 GEOLOGY

2.1 General Stratigraphy

Bedrock at this site is approximately 20 feet beneath the present ground surface which is characterized by surface fills. The thickness of this surface fill is approximately three to five feet in the area studied. The natural soil cover at the site consists of Recent deposits of thinly laminated, organic sandy silts and clays, interspersed with a Pleistocene marine deposit known as the Pamlico Terrace Formation. These deposits blanket the site and have a variable but average thickness of approximately 4 feet. Beneath these soils is the residual limy soil unit derived from the decomposition of the underlying bedrock.

The bedrock examined during this subsurface investigation consists of biogenic carbonates of Tertiary Age. Two distinct Eocene formations were identified during the test boring program. The upper-most member is the Inglis member of the Moodys Branch Formation. This unit overlies an unconformity consisting of very dense silt, sands, and organic clays of variable thickness which represent a formerly exposed erosional surface known as the Jackson-Claiborne Unconformity. The materials comprising this surface are derived, in part, from reworked residual soils, formed from the underlying sequence of carbonates known as the Avon Park Formation, and from fine sands and organic clays deposited on the formerly exposed surface in a subtidal flat environment such as exists today at the present ground surface from the plant site to the coast. The configuration of the unconformity can be represented as an undulatory surface in the area investigated, ranging from an elevation of -10 feet to an elevation of +20 feet (see Figures 2G-2, 2G-3, 2G-4, and 2G-5).

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The Avon Park Formation is a highly variable sequence of carbonates which was formarly exposed prior to Jackson Time and had consequently developed a Karrenfield topography. This irregular surface served as the structural framework for the younger sediments of the Moodys Branch formation which were deposited upon it.

2.2 Detailed Stratigraphy and Lithology*

A detailed description of the above described formational units is as follows:

2.2.1 SURFACE FILL

The surface fill which blankets the major portion of the site area is of variable thickness and density and is comprised of coarse silty sand and rock fragments of biogenic limestone. With the exception of the areas beneath Units 1 and 2, this fill was placed directly over the formerly existing soil and vegetation to provide access for construction of existing plant facilities.

2.2.2 PAMLICO TERRACE FORMATION

The Pamlico formation is the lowest and youngest of four recognizable terrace deposits formed during Pleistocene in a shallow marine environment.

This unit, which generally represents the original ground surface prior to land reclamation, has a thin loamy topsoil zone containing varying amounts of vegetation and irregularly occurring organic silts and clay lenses of Recent origin. It is an irregularly stratified, fine to medium grained, silty quartz sand and sandy silt with some organic silty clay lenses. The grain shapes are sub-rounded to sub-angular. This unit also contains minor amounts of gravel size concretions and ranges from a very loose to a very dense state of compaction.

2.2.3 INGLIS MEMBER

The Inglis member of the Moodys Branch formation is the principal foundation material at the site and is identified as a cream-colored to occasionally tan, porous, granular, biogenic limestone and dolomite deposited in a shallow marine environment. It is essentially comprised of a matrix of carbonate pellet and skeletal detritus. In this study, it has been segregated into distinct units on the basis of the occurrence of coarsely bioclastic shell fragments and casts, degree of cementation, and secondary dolomitization.

This member forms the bedrock at the site and varies in thickness from approximately 70 feet to 90 feet, in the area studied. It is thinnest at the northern end of this area, and gradually thickens to the south. Four distinct lithologic units are represented in this member:

*Note: Formational distinctions referred to in this report are consistent with the stratigraphic Nomenclature outlined in the Florida Geological Survey, Bulletin No. 33.

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a. The upper 10 feet is decomposed and forms the residual soil layer beneath the terrace deposit.

b. The bedrock unit of this member is the bioclastic pelcalcarenite which forms the relatively hard and competent "caprock" at the site. The thickness of this unit varies from 5 to 43 feet, and is, in general, continuous across the area investigated, except as shown by Figure 2G-5. It is characterized by a coarsely bioclastic structure set in a fine to medium-grained pellet matrix. The caprock is generally medium-hard to hard, relatively unbroken, and contains some soft zones, vertical joints, and solution cavities. It exhibits localized secondary oxidation staining, and is uniformly dense and cemented.

c. The Biopelcalcarenite is similar to the unit above, being essentially comprised of fine to medium grained pellets and skeletal detritus. It differs from the above units as follows:

1. It does not contain significant amounts of coarse bioclastic casts.

2. It is variable in density and cementation with soft, poorly cemented zones and differentially cemented, nodular zones.

This unit contains three characteristic zones. The uppermost zone is as described above. Beneath this is a zone that contains variable amounts of coarse sparry bioclasts. The lowest zone is characterized by extensive jointing and solution activity, accompanied by secondary infilling of fine grained sand, silts, organic clays, and small shells of Pleistocene and Recent Ages.

The entire biopelcalcarenite unit is less dense, less competent, and more friable than the overlying caprock unit. Its thickness varies from approximately 27 to 60 feet.

d. The basal unit of the Inglis member is selectively dolomitized, with the degree of dolomitization varying from partial to complete. The entire unit varies in thickness from approximately 10 to 30 feet and can be descriptively subdivided into two subunits:

1. The upper half is commonly structureless, sugary-textured, and contains few bioclastic fragments and fossil casts.

2. With depth, a gradational increase in the size and content of bioclasts constitutes the lower half, or subunit, which is classified as a coarsely bioclastic doloarenite or calcarenite.

The dolomitic phase is a marbled tan to gray colored, very dense, hard rock mass. The calcareous phase of the unit is similar in lithology to the biogenic "limerock" units described above, except

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that it is generally less dense and softer. This calcareous phase is more susceptible to solutioning (and subsequent secondary infilling) and exhibits effects of intense leaching.

2.2.4 JACKSON-CLAIBORNE UNCONFORMITY

This is a former soil zone that represents an erosional surface which was emerged during Eocene time. It is characterized by residual soils derived from the weathering of the underlying Avon Park carbonates. The soils are commonly silts, or sandy silts, with varying amounts of carbonaceous material. Localized lenses of reworked dolomite and chert pebble conglomerates, beach sands, shell fragments, and richly organic clays and silts also occur.

This contact marks a time of non-deposition between sediments of the underlying Avon Park formation and the overlying Moodys Branch formation. The thickness of this zone was measured to vary from a few inches to approximately ten feet in the study area.

2.2.5 AVON PARK FORMATION

This is the oldest and deepest formation encountered in the test boring program. The top of the formation is characterized by a medium soft to medium hard spongy framework of dolarenite with lignitic material subtly to conspicuously disseminated throughout. The underlying stratigraphy consists of several distinct lithologic units which are continuous and traceable throughout the area investigated. Most important of these is: (1) a very light gray to white, pasty and dense calcilutite stratum, which is usually 5 to 15 feet thick, occurs between elevations +10 to -30 and is consistent with the 3 to 5 degree southwest dip. (2) A brown medium-grained thinly bedded medium soft to medium hard calcarenite, selectively dolomitized, which is in excess of 60 feet thick and occurs between elevations - 35 to - 45. 1

2 3 GEOLOGIC DYNAMICS

The dynamic elements which formed the subsurface conditions at the site were considered in the comprehensive foundation systems analysis for the proposed nuclear facility. The principal local geologic control is the irregular configuration of the Avon Park erosional surface, which forms the structural framework for the subsequent deposition of overlying sediments.

The bedding of this formation dips approximately 3 to 5 degrees to the southwest, controlling the average thickness of the Inglis member above. Cross bedding was observed to dip at 15 to 20 degrees. The erosional surface was formed in a tidal flat environment resulting in the accumulation of residual silts, reworked sands and gravels, and organic clays and silts. This surface was resubmerged during Jackson time in a shallow neritic environment from which the biogenic limestone was deposited.

The highly variable lithology of th basal portion of the Inglis member indicates a transgressing shallow marine environment. Dolomitization of the basal portion of the Inglis may have been penecontemporaneous with deposition. Concentrations of dolomitic silts at the top of the Avon Park formation are indicative of the development of a residuum of concentrated dolomite from the less dolomitic doloarenite below. Normal neritic allochemical sedimentation of the Inglis member developed upon complete submergence of the unconformity.

Fracturing of the rock in response to the Ocala Uplift (discussed in Appendix 2F) and consolidation of the thick sequence of Cretaceous and Tertiary sediments over a stable, competent Paleozoic basement, has produced conspicuous systematic conjugate joint sets, composed of nearly vertical and 45 degree dipping joints. The primary conjugate joint set is oriented both parallel and perpendicular to the Ocala Uplift (i.e., Northwest and Northeast trending), while the secondary conjugate joint set is oriented in approximately North-South and East-West trends. 7

Within the Inglis Formation, along fractures (joints), and in particular at bedding-plane fracture intersections; solution of the limestone has occurred, forming a network of essentially vertical solution channels which have been secondarily infilled with very-fine quartz sands, organic silts and clays, and shells.

The more competent caprock, by virtue of its higher degree of interstitial cementation, has been less affected by dynamic elements, and has generally been only slightly altered since lithification, except due to weathering of the surface. 7

2.4 FAULTING

Prior to 1951, faulting was not recognized in Florida, but upon Vernon's publication of Bulletin 33 of the Florida Geological Survey, a well defined system of high angle faulting was mapped along the east side of Citrus and Levy Counties (as shown on Figure 2F-2 and discussed in Appendix 2F).

The western-most extension of the mapped faulting lies 3 miles east of the plant site. All faulting common to Levy and Citrus Counties is oriented along steeply dipping (greater than 60 degree) northwest trending fault planes which have produced displacements of 20 to 160 feet.

Supplemented by photogeologic studies, subsurface explorations in the form of test borings and a seismic refraction survey eliminate the possibility that faulting exists beneath the proposed plant site because:

a. Correlation of marker horizons delineated by rock cores negates any inference that vertical displacement exists in the subsurface. Marker beds exist at expected elevations in points of investigation (drill holes). (Refer to Figures 2G-2 through 2G-8). 1

b. Seismic profiles, likewise, showed no anomalous changes in elevations of velocity layers.

3 FOUNDATION CONSIDERATIONS

The purpose of the subsurface investigation was to evaluate the capability of the geologic elements to safely and effectively support the proposed nuclear powered facility, and to determine the necessity for, and the extent of, any remedial treatment of the foundation materials. 0015

The variable nature of the geology of the site is not conducive to the employment of standard earth sampling and testing techniques. Strength parameters of subsurface materials, and the engineering behavior of the rock mass were evaluated in light of the geologic elements present at the site. On the basis of all test data derived from both field and laboratory testing,

incorporated with, and integrated with the geologic interpretation, three critical items to be considered in the foundation analysis are: (1) the soils which blanket the site, (2) the variable basal unit of the Inglis formation, and the erosional unconformity which marks the contact between the Inglis member and the Avon Park formation, and (3) the extent of existing solution channels and the anticipated future solution rate which could present a latent threat to the structural integrity of the foundation.

3.1 SOILS

The existence of uncontrolled fill material overlying an organic rich soil layer, containing decomposable material (roots, humus, etc.), accompanied with the irregular occurrence of Recent and Pleistocene deposits of variable density, precludes the use of these soils as adequate load bearing materials for any of the principle building foundations. Due to the limited areal extent of the proposed facility, these variable soils should be excavated prior to construction.

Based on wide spacing, limited number of borings, and early drilling techniques, it was concluded that the residual layer of decomposed biogenic limestone should not be used as a foundation material except under lightly loaded structures. Subsequent detailed investigation and in-situ testing revealed that the degree of decomposition of this layer is generally transsitional, and decreases with depth, with a corresponding increase in density. 7

The upper zone of this layer, has been more intensely subjected to oxidation and leaching of limy cement at intergranular contacts, due to surface water infiltration, forming a weakly cemented, relatively dense sand. The lower portion of this units is essentially a soft, friable rock with the degree of intergranular cementation, generally increasing with depth, except where it has been subjected to highly localized controls (i.e., fracture spacing, etc.).

As determined by closely spaced and continuous standard penetration resistance testing, the in-place density and strength properties of this lower zone are similar to the differentially cemented limerock zone that underlies the caprock.

Based on this later criteria, it is concluded that the lower portion of this unit is acceptable as competent bearing material.

3.2 ROCK

All obtainable data recovered in the field investigation within the study area indicate that the caprock is, with local exception, continuous across the site and forms a competent unit capable of sustaining anticipated load on spread footings and mat foundations. The bearing pressure under the mat for the Containment Vessel due to static loads (estimated at less than 5 tons per square foot) should be satisfactorily sustained without detrimental rock deformation.

It is the basal portion of the Inglis member which, due to its hetereogeneous lithology, response to solution activity, and subsequent secondary infilling, represents the prominent zone of low-data yield. For the same reasons, the reliability of data obtained in this zone is questionable. Remedial treatment in the form of consolidation grouting is recommended to provide assurance against detrimental settlement. The depth of the zone to be consolidated by grouting is dependent on the average strength and cavitation of the underlying, untreated materials, all of which must be considered in relationship to calculated rock stresses.

Analysis of a closely controlled and well documented grouting program beneath Unit 2 has demonstrated that effective consolidation grouting permits the utilization of adequate strength parameters of the natural rock mass by:

a. Filling unknown and possibly large solution channels with grout.

b. Confining potential settlement inducing zones.

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c. Eliminating any possibility of abnormal solution rates which could produce a deleterious amount of future solution of the limestone by decreasing the permeability of the rock mass.

3.3 SOLUTION CHANNELS

The presence and extent of solution channels in the limestone have been evaluated, as they would affect the strength of the rock mass. Also, studies (Appendix 2H) were performed to determine whether future solution rates would produce deleterious effects upon the rock mass. Based upon this study, it is concluded that the solution process will not jeopardize the integrity of the foundation.

3.4 GROUNDWATER

The groundwater surface beneath the site fluctuates in response to tidal variation. Mean groundwater level beneath the area investigated was observed to be approximately elevation 90.0 feet, as measured daily in completed boreholes.

Periodic level observations indicate a response lag of approximately one to two hours between tidal crests, as measured in the intake channel and in the area studied. The amplitude of groundwater variation is approximately 40% less than sea level. The attenuation of groundwater response curves is a function of the transmissibility of the bedrock.

The variation in hydrostatic pressures has been considered in the design of foundations which will be influenced by the fluctuating ground water level. 1

3.5 STRUCTURAL FILL

The lowest floor of these structures will be located above competent rock. The spread or mat foundations can be satisfactorily established on controlled, structural fill, replacing the underlying in-situ soil and incompetent rock. The mat for the Reactor Building can be satisfactorily established on controlled, structural fill. 7 1

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TEST BORINGS

The ROCK CLASSIFICATION SHEETS for drill holes shown on Figure 2G-1 (Cross Sections A-A', B-B', and C-C') have been deleted. ROCK CLASSIFICATION SHEETS for drill holes shown on Figure 2G-1 (Cross Sections E-E', F-F', and G-G') for Units 3 and 4 have been added. 1

The following ROCK CLASSIFICATION SHEETS are attached and are a part of Appendix 2G. They are listed in numerical sequence by Drill Hole Number.

Drill Hole No.	Page No.	Drill Hole No.	Page No.
3-29	2G-10	4-5	2G-59
3-34	2G-12	4-6	2G-62
3-39	2G-14	4-7	2G-64
3-46	2G-16	4-8	2G-67
3-53	2G-18	4-9	2G-70
3-60	2G-19	4-10	2G-73
3-64	2G-21	4-11	2G-76
3-30	2G-23	4-12	2G-79
3-40	2G-26	4-13	2G-81
3-54	2G-28	4-14	2G-84
3RB-1	2G-30	4-15	2G-87
3RB-2	2G-33	4-16	2G-90
3RB-3	2G-35	4-17	2G-93
3RB-4	2G-37	4-19	2G-96
3RB-5	2G-39	4-20	2G-98
4RB-1	2G-41	4-21	2G-100
4RB-2	2G-43	4-22	2G-102
4RB-3	2G-45	4-24	2G-104
4-1	2G-47	4-25	2G-106
4-2	2G-50	4-26	2G-108
4-3	2G-53	4-27	2G-110
4-4	2G-56	4-28	2G-112

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GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 1 OF 2

DATE 4-67

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. 3-29

CONTRACTOR Girdler Foundation and Excavation Co. SITE AREA Crystal River Unit #3 ELEV. 97.74

CORE SIZE 2 3/4" COORDINATES + 3+25) ANGLE vert.

CASING 6" and 4" s(0+00) BEARING

LOGGED BY: RRB GWL DEPTH 90.0'

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation, etc.
		%					Not sampled	2" s/s- 140 lbs. 30' drop
	18.5						Begin coring ± 18.5'	
	21.5	56	3.0	1.7			Bioclastic pelcalcarenite: v. lgt. gray to buff; cream-colored; f. to med. grn. mtx.; cse fossil casts; med. hard 21.5-23.0; slightly softer due less cement; rock is generally only moderately cemented with irreg. harder cemented zones.	
	23.0	73	4.5	1.1		24.0	Contact Gradational	
	26.0	100	2.0	2.0			Biopelcalcarenite: color as above; poorly to moderately well cemented; med. hard to med. soft; large (up to 2") sparry bioclasts irreg. dissem.; soft ± 26.0'; irreg. slight oxidation 26.0-29.0'; few harder (dolomitized) zones ± 3" & harder irreg. nodules from 35.0'; becomes cse. bioclastic from 45.0', with sparry detritus 47.0-48.0'; FeOx increasing 48.0- 52.0'; 45 fract. & irreg. vert. fract.	first sparry bioclastic [illegible] at 26'
	29.0	60	3.0	1.8				
	32.0	83	3.0	.7				
	35.0	30	3.0	.9				
	38.0	16	3.0	.5				26-29'
	41.0	43	2.0	.9			Note: only V. subtle lithologic variations from surface to 56.0' are prevalent; most conspicuous is indefinite caprock; 45° & 90° fract. (JOINTS) & cse. sparry fossil hash 47.0-48.0'.	
	43.0	60	2.0	1.2				
	45.0	40	3.0	1.2				
	48.0	56	3.0	1.7				
	53.0	40	5.0	2.0				
	56.0	0	3.0	0		56.0		
	60.0	0	3.0	0			Clay: med. stiff; olive green; blk. organic streak ± 70% high w/c; waxy surface-pasty texture open breaking apart; 1" buff doloritic silt on top of sample; recovered only 1" dense buff dolomitic silt.	1" thin grnd. organic clay on top of 63-65.5' run
	63.0	33	3.0	1.0			Doloarenite: buff & gray marbled; friable along 45° joints; individual pieces of core are v. dense competent rock; some x-bdng of slightly cse. material; this one probably represent diff. dolomitized base of INGLIS member.	
	65.5	48	3.5	1.8				
	67.0	100	1.5	1.5				
	70.5	86	3.5	3.0			Biogenic, massive, hard to very hard	
	73.5	7	3.0	.2				

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2G-10 (Revised 1-15-68)

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GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 2 OF 2

DATE

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. B-29

CONTRACTOR SITE AREA ELEV.

CORE SIZE COORDINATES ANGLE

CASING BEARING

LOGGED BY: GWL DEPTH

Depth	Depth	Rec. %	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation, etc.
	76.5	26	3.0	.8		76.5	Reworked conglomerate soil, chert gravel wit, (med. dense)	Dr. clay
	78.5	0	2.0	0			rod-like pyritized obj.; v. dense buff colored dolomitic silt; some hard nodules.	
80	79.0	23	1.5	.3				
	81.0	23	1.0	.7				
						81.0	Bioclastic dolarentie: buff; soft at top; hard sponge-like framework at base; poor rec. due to grinding of dolomitic silt (softer zones). - Bioclastic	
85	85.5	22	4.5	1.0				V. hard
	88.5	63	3.0	1.9		88.0		
90	90.0	64	1.5	.9		90.0	As above with trace of lignite inclusions 85-90'	

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GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 1 OF 2

DATE 4-67

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. 3-34

CONTRACTOR Girdler Foundation and Excavating Co. SITE AREA Crystal River Unit #3 ELEV. 99.54

CORE SIZE 2 3/4" to 77' NX to 110.5' COORDINATES +(3+04) ANGLE vert.

CASING 4" and 6" s(0+83.2) BEARING

LOGGED BY: RRB GWL DEPTH 110.5

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation, etc.
		4/6					Soil interval- not sampled	2" s/s 140 lbs. 30" drop
							POOR ORIGINAL	
20	22.0					22.0	Begin coring ± 22.0'	
25	25.0	100	3.0	3.0		27.0	Bioclastic pelcalcarenite: cream-color; med. hard; mod. broken; FeOx stained soln. channel ± 26-27'; cse bioclasts & f. to med. mtx. of pellet & detritus.	
30	30.0	90	5.0	4.5		32.0	Biopelcalcarenite: lgt. cream-color; FeOx discoloration 1' above &below 4.0'; void; soft to med. soft with some med. hard nodules; broken	
	34.0	0	4.0	0		CAVITY 34.0		
35	36.0	100	2.0	2.0		36.0		
40	40.0	98	4.0	1.5		43.0	Biopelcalcarenite: cream color with sparry bioclastic frags, thruout; diff. cemented; v. broken to broken; med. soft to med. hard; f. to med. grnd. with cse. bioclasts frags.; nodular.	
	43.0	27	3.0	8			No recovery	
45	45.5	0	2.5	0		45.5	Biopelcalcarenite: as above; v. soft to soft.	
	47.0	65	1.5	.7				20-22-24
	48.5	53	1.5	.7		48.5		33.5/-72
	50.0	47	1.5	.7				
50	52.0	70	2.0	1.4		52.0	Biopelcalcarenite: med. soft to med. hard to 50';vert. joint med. hard to hard- 50-52'.- Sparry Bioclasts FeOx stained	
	53.5	0	1.5	0		53.5	No recovery: as above; v. soft & fragmented	
	57.0	53	1.5	.7		57.0	v. soft	22-26-37
	58.5	53	1.5	.7		58.5	FeOx discoloration	18-29-34
60	62.0	13	1.0	.2			Low recovery: as above; soft with med. hard nodules	
	62.0	20	3.0	.4		62.0		
	64.0	0	2.0	0		64.0	No recovery: as above; v. soft & fragmented	
	65.5	53	1.5	.8		65.5		1.4-4
	68.0	10	2.5	.4				
70	70.5	64	2.5	.6				
	74.5	55	4.0	2.2				

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GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 2 OF 2

DATE

PROJECT Florida Power Corp. NO. DRILL HOLE NO. 3-34

CONTRACTOR SITE AREA ELEV.

CORE SIZE COORDINATES ANGLE

CASING BEARING

LOGGED BY: GWL DEPTH

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation, etc.
	77.6	74	2.5	1.2			Doloarenite: tan & lgt. tan marbleized; essentially hard with some thin med. hard seams; massive bddng.; competent unit; v.f. to med. grnd.. 65.5-73' med.; broken 73-74' urbroken 74-79' mod. broken close jointing (45° to 90°) throughout unit	dip 10°-15° pellet & detritus texture Biogenic unit
10	81.5	47	4.5	2.1				
	83.5	80	2.0	1.6				
25	86.5	57	3.0	1.7				
	90.5	23	4.0	.9		90.5	Bioclastic doloarenite: as above - except course bioclasts - mod. broken	
	93.5	0	3.0	0	HR	93.5	No recovery: unconformity	INGLIS - Avon Park
95	98.0	22	4.5	1.0		97.0 99.0	Doloarenite: dark gray buff-color; lignitic inclusions; f. to med. grnd.; soft to hard; clayey peat & dolomitic zone 97-99'; v. soft decomposed zone at base of unit	spongy texture bddng. horizontal with 15° joints; weathered
100	101.8	79	3.0	2.2		101.0		
105	106.0	44	5.0	3.2			Calcilutite: white- lgt. to gray at bottom of unit; med. hard; competent; massive; slightly clastic at top & bottom of unit; broken from 101-103'; 103-105' low recovery; soft and more clastic content at 110'.	marbleized
110	110.5	13	4.5	1.6		110.5		

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GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 1 OF 2

DATE 3-67

PROJECT Florida Power Corp. NO. 1203-02 DRILL HOLE NO. 3-39

CONTRACTOR Girdler Foundation and Excavation Co. SITE AREA Crystal River Unit #3 ELEV. 96.59'

CORE SIZE 2-3/4" COORDINATES +(3+08.3) ANGLE vert.

CASING 4" + 6" s 1+40 BEARING

LOGGED BY: RRB GWL DEPTH 102.0'

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation, etc.
							0-10' not sampled	
5								
							Started coring at 14'	
10								
	12.0	5/5	2.0				Dense silty sand & rock frags. - soft biopelcalcarenite - decomposed; high FeOx activity.	16-17-19-34
	14.0	5/5	2.0			14.0		16-21-33-53
15							Bioclastic pelcalcarenite: v. lgt. cream color; cse. bioclastic shells & casts, set in f. to med. grnd. pellet & detrital mtx.; diff. cemented with nodular zones; FeOx staining from solutioning evident at top of unit	
20	20.0		4.0	1.8				PMT#1 20.5
	22.5		2.5	1.4		22.5		23.0
25							Biopelcalcarenite: v. lgt. cream color; med. soft to med. hard (nodules); broken to v. broken unit; only med. hard nodules recovered; f. to med. grnd. pellet & skeletal detritus; some med. cse. bioclastic frags; 45° joint FeOx stained 32'	25.5
	27.5		5.0	4				PMT#2 27.0
								30.0
30	32.5		5.0	4.4			22.5-27.5' med. soft with med. hard nodules; v. broken	PMT#3 31.5
							27.5-32.5' med. hard; relatively well cemented; joints 45° (open) & several nearly vertical (closed)	zone of soln. rehealed 33.0
35	37.5		5.0	6			32.5-37.5' soft with med. hard nodules; 2" lutite layer at base; v. broken; soln. etched.	PMT#4 36.5
							37.5-47.5' med. soft with med. hard nodules; v. broken; v. cse fossil casts at base.	40.5
40	42.8		5.0	1.1				PMT#5 42.0
45	47.5		5.0	3		47.5		PMT#6 46.5
								47.0
50							Biopelcalcarenite; as above; med. cse. sparry bioclasts; med. soft; med. hard nodules.	PMT#7 50.5
	52.5		5.0	8		52.5		52.0
55							No recovery	55.5
	57.5		5.0	0		57.5		PMT#8
	59.0		1.5	0		59.0	Void	FeOx stained 57.0
60	60.0	5/5	2.0				V. loose; f. to cse. clastic sand; round to ang.; quartz & [illegible] infill	
	62.5	5/5	1.5			62.5	V. dense; clastic calcareous sand & limerock frags. & ~~secondary quartz sand; oxidized~~ biopelcalcarenite lgt. cream color with FeOx staining; hard core recovered but low recovery; few large fossils & some sparry detritus.	1-2-15-35
65								16-72-23
	67.5		5.0	1.1		67.5		
70							Void	
	72.5		5.0	0		72.5		
75								

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GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 2 OF 2

DATE

PROJECT Florida Power Corp. NO. DRILL HOLE NO. J-33

CONTRACTOR SITE AREA ELEV.

CORE SIZE COORDINATES ANGLE

CASING BEARING

LOGGED BY: GWL DEPTH

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core, Excavating evaluation, etc.
	77.5		5.0	.3		77.5	Doloarenite: tan; f. grnd. hard (only 0.3 recovered) sugary - biogenic	
80							No recovery; core barrel malfunction	
	82.5		5.0	0		82.5		
85	85	5/5	2.5			85.5	V. dense tan dolomitic silt; trace of recent infilling at top (calcareous & quartz sand); recent shell frags.	8-10-20-41
	86.5	3/5	1.5			86.5	V. stiff green & tan silty clay & tan clayey silt	31-48-57
	87.5	5/5	1.0			87.5	Hard brown siltyclay; some dolomitic silt; shell frags.	WOH 87
	89.0	4/5	1.6			89.0	V. dense to dense silt to clayey silt & stiff green silty clay	31-48-67 PMT#9
90	92	4/5	1.0				V. dense tan, gray dolomitic silt; somegreen to tan clayey silt & dolomitic rock frags.	51-73 80.5 PMT#10
	94.0	5/5	2.0	0		94.0		14-23-47
95	95		1.0	.3			Doloarenite: gray buff color; mod. broken; spongy with lignite inclusions; vuggy appearance; several soft decomposed zones. - 'spongy' (Avon Park dolomite)	
100	100		5.0	1.6				
	102.5		2.5	2.5		102.5		
105								

[redacted]

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2G-15 (Revised 1-15-68)

GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 1 OF 2

DATE 4-67

PROJECT Florida Power Corp. NO. 4203-22 DRILL HOLE NO. B-46

CONTRACTOR Girdler Foundation and Excavator Co. SITE AREA Crystal River Unit #3 ELEV. +9.03

CORE SIZE NX COORDINATES N(3+39.2) ANGLE vert.

CASING NX E(2+28.5) BEARING

LOGGED BY: RPB/DG GWL DEPTH 92.5'

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation, etc.
5								
10							10-11.5ft residual calcareous sand; v. dense; high calcium content.	14-21-11
15	14.5						13.5-14.5' calcareous sand; v. dense: high calcium content; some shell frags. Begin coring at 14.5'	14-53
20	19.5		5.0	3.6			Bioclastic pelcalcarenite: white to lgt. gray; med. hard; med. to cse. grnd.; mod. broken; thick bdng. with bdng. at 15-30°; FeOx staining at 15'; vertical jointing at 18'.	pressure meter test 18-19.5'
25	24.5		5.0	0		24.5		22.5 DMT#2 24'
	29.5		5.0	0			Biopelcalcarenite: white to lgt. gray; soft to med. hard; broken; f. to med. grnd.; FeOx staining at 29-30 at 39-40'	DMT#3 29-27-27
30	34.6		5.0	2.0			Biopelcalcarenite: weathered to sand size particles; high calcium content; color as above; residual.	DMT#4 39.5' 40.5' DMT#5
35	39.5		5.0	5		40.0		42.0'
40	42.6		3.0	1.6			Lgt. brown calcareous sand; some shell frags; loose mat'l; high calcium content.	1-2-1-4
	44.5	5/5	2.0				V. loose; calcareous sand; 50% quartz; second infilling; traces of recent shell frags.	1-2-1
45	45	5/5	2.5			Secondary Infilling	Med. dense; brown calcareous sand; low quartz content; some shell frags.; high second filling.	DMT#6 11-8-9 47
	47.5	5/5	2.5				Med. dense; lgt. gray; calcareous sand; low quartz content; some shell frags.	11-10-8
50	50	5/5	2.5				As above; second infilling	DMT#7 8-9-15
	52.5	5/5	2.5					52
55	55.0	5/5	2.5			55.0	Biopelcalcarenite: soft to med. hard; poor recovery	1-3-2
	57.5	5/5	2.5				v. dense calcareous sand; white to lgt. gray; v. little quartz; high content of shell frags.	18-20-22
60	60	5/5	2.5			59.0	As above to 59' Sparry bioclasts	8-11-15 DMT#8
	61.5	5/5	1.5				59-66' dolomitic silt; increasing density with depth; decreasing calcium content with depth; slightly limy-spongy 72-76'. Biogenic	13-36-53
65	66.0		4.5	0				DMT#9
	68	5/5	2.0			68.0		15-16-30-50
70	71		3.0	1.6			Doloarenite: lgt. gray to buff; med. hard to hard; thick bdng. with low bdng.; mod. broken; near vertical jointing; spongy 70-74'. Biogenic	DMT#10
75	76		5.0	2.1			76-81' doloarenite; m. . soft to med. hard; v. broker	

GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 2 OF 2

DATE

PROJECT Florida Power Corp. NO. DRILL HOLE NO. [illegible]

CONTRACTOR SITE AREA ELEV.

CORE SIZE COORDINATES ANGLE

CASING BEARING

LOGGED BY: GWL DEPTH

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation, etc.
	76		5.0	3.1				
80	81.0		5.0	.3				
	84.5		5.0			84.5	84.5-87.5' bioclastic coloarenite; tan; med.soft to hard; broken; f. to med. grnd.; no apparent jointing; spongy doloarenite; brown; soft to med. soft; highly oxidized; v. broken; low calcium content. - 2% of lignite.	(2)' [illegible] (5)' [illegible] (96.5)'
85	87.5		3.0	1.1				
90	92.5		5.0	1.8		87.5	T. D. 92.5'	

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GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 1 OF 1

DATE 4-67

PROJECT Florida Power Corp. NO. 4223-22 DRILL HOLE NO. B-53

CONTRACTOR Girdler Foundation and Excavation Co. SITE AREA Crystal River Unit #3 ELEV. 97.05'

CORE SIZE 2-3/4" COORDINATES +(3+01.5) ANGLE vert.

CASING 6" & 4" s(2+81.0) BEARING -

LOGGED BY: RRB/DS GWL DEPTH 67.0

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation, etc.
							5-6.5' dark brown; med. dense; quartz sand; some organic mat'l.	5-6-8
							10-11.5' lgt. brown; dense; quartz sand; 75% quartz.	7-9-6
							13.5-15' as above; not as dense	4-4-6
							17-20' v. loose; quartz sand; some shell frags.	1-1
							20-21.5' calcareous sand; some quartz; abundant shell frags.	1-2-2
							21.5-23' as above; loos ; red tile frag. found in sample	4-6-9
							25-26.5 v. dense; calcareous sand; decomposed biopelcalcarenite; abundant shell frags.	27-30-25
							26.5-28' dense calcareous sand, abundant shell frags.	10-9-13
							28-29.5' as above	9-8-13
	29.5							
	30.0	5/5	1.0	1.0			29.5-31 weathered biopelcalcarenite; dense; shell frags.	8-13-25
	32.0		1.0	0			32.5-34' dense to v. dense;calcareous sand; no shell frags.	
	34.0	5/5	1.0	4			34-35.5' v. dense calcareous sand with broken pieces of biopelcalcarenite.	9-21-24
	35.5	5/5	1.0	9			35.5- 37' as above with shell frags.	22-40-50
	37.0	5/5	1.0	8			37-38' decomposed biopelcalcarenite; v. dense	50/5"
	38.0	5/5	1.0	5				33-39
	39.0	4.5	2.0	0		40.5	40-40.5' biopelcalcarenite; v. broken; med. to cse. grnd.	10
	41.0		2.0				Biopelcalcarenite: white to lgt. gray; sparry; mod. broken; v. broken at 45-47'; soft to med. hard; bioclastic zone ranges f om f. to med. grnd.; no jointing evident; slight oxidation at 47'; FeOx staining at 49-50'.	
	43.0		2.0	1.0				
	45.0		2.0	1.0				
	47.0		4.0	1.9				
	51.0		8.0	4.0		52.0		
	53.0		8.0	2.1			Biopelcalcarenite: soft FeOx staining at 53'; med. to cse. grnd. relatively unbroken; fairly well cemented.	
	55.0		8.0	2.6		59		
	59.0		8.0	2.2			Dolcarenite: lgt. gray to buff; hard to v. hard; relativelt unbroken; thick bddng.; bdary. at low angles; bioclastic zones from 61-63 ; jointing at 60°; FeOx staining at 63'.	Biogenic
	63.0		8.0	2.7				
	67.0		8.0	1.8			T. D. 67'	

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2G-18 (Revised 1-15-68)

0028

GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 1 OF 2

DATE

PROJECT Florida Power Corp. NO. 4203-22 DRILL HOLE NO. 3-60

CONTRACTOR Girdler Foundation and Excavation Co. SITE AREA Crystal River Unit #3 ELEV. 96.72'

CORE SIZE 2 3/4" COORDINATES +(2+98) ANGLE vert.

CASING 4" & 6" s(3+74) BEARING

LOGGED BY: RRB/DS GWL DEPTH 122.0'

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation, etc.
								Recent soil
5							5'-7½' Black dense peat with organic mat'l & shell frags.	5-10-15
						7.5	7.5-17.5' loose blk quartz sand with organic mat'l & biopelcalcarenite pieces.	2-4
10							15.5-17' loose v. cse. grnd. quartz sand with biopelcalcarenite frags.	4-5-6
								Pamlico Terrace
						17.5		
20							19-20.5' loose, brown calcareous sand with biopelcalcarenite frags.	Residual
	22.0	S/S				22.0		4-3-5
							22-49' decomposed biopelcalcarenite; white to lgt. gray; ranging from v. loose to v. dense; this mat'l becomes more cse. with depth.	11-30-20 2" s/s
25	25.0	S/S	1.5	.4				10-20-30 140 lbs
	26.0	S/S	1.5	.4				
	28.5		2.0	0				1-2-5 140 lbs
30	30.0	S/S	1.5	1.2				
	31.0		1.0	0				5-8-12 140 lbs
	32.5	S/S	1.5	1.0				
	34.0		1.5	0				31-15-13 140 lbs
35	35.5	S/S	1.5	.5				
	37.5		2.0	0				26-9-5 140 lbs
	39.0	S/S	1.5	1.0				
40	41.0		2.0	0				6-27 140 lbs
	42.0	S/S	1.0	1.0				
	44		2.0	0				4-6-7 140 lbs
45	46.5	S/S	1.5	1.5				
	47.5		1.0	0				
	49	S/S	1.5	1.5		49.0		6-29-50 140 lbs
50							Biopelcalcarenite: sparry zone; white to lgt. gray; med. hard with soft bioclasts; relatively unbroken; f. to med. grnd.; FeOx 51-51.5'; bddng @ 30°; no apparent jointing; broken zone 49 [illegible] 51.5'.	
	51.5		2.0	1.9		51.5		
	54.0		2.5	0				
55	55.5	S/S	1.5	1.5				
	57		1.5	0			54-60.5' decomposed biopelcalcarenite: white to lgt. gray ranging from loose 54-55.5' to v. dense 57-58.5' to v. v. dense 60-60.5'; f. to med. grnd.; few shell frags.	1-4-8 140 lbs
	58.5	S/S	1.5					
60	60		1.5	0		60.5		70
	60.5	S/S	.5	.5				
							Biopelcalcarenite: sparry zone; white to lgt. gray; unbroken to 64' & v. broken from 64-65.5'; med. hard to hard; jointing at 60°-70°; bddng. at 15°-30°; abundant bioclasts; FeOx staining in bioclastic zones & on bddng. & jointing planes; zones ranges from med. to cse. grnd. mod. broken 65.5-70' v. broken 75-79'	
65	65.5		5.0	5.0				
	66.5		1.0	.7				
	67.5		1.0	0		CAVITY		
70	70.5		2.5	1.9				
75	75.5		5.0	2.6				

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GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 2 OF 2

DATE

PROJECT Florida Power Corp. NO DRILL HOLE NO. B-3

CONTRACTOR SITE AREA ELEV.

CORE SIZE COORDINATES ANGLE

CASING BEARING

LOGGED BY: GWL DEPTH

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core Excavating evaluation, etc.
	77		2.0	4			As above-not as many bioclasts	
	79		2.0	2		79.0		
80	80.5	5/5	1.5	1.5			Decomposed biopelcalcarenite: white to lt. gray; med. dense to v. dense; frags. ranging from ¼-1" in diameter; sphericity low; roundness high.	1 - 3 - 3
	82	5/5	1.5	4				2 - 4 - 7
	83.5	5/5	1.5	4				4 - 5 - 6
85	85	5/5	1.5	4				4 - 6 - 9
	86.5	5/5	1.5			86.0		5 - 7 - 9
	88		1.0	2			Peat: v. dense; biopelcalcarenite frags.: some white silty	12
	89		1.0	.6		89.0		at base.
90	90.0		2.0	1.8			Doloarenite: lt. gray to buff; slightly marbleized to 94'; marbleized from 95-100'; hard to v. hard; relatively unbroken with broken zone at 94-95'; sugary dolmite at 94-95'; coding. at 30°-45°; jointing high angle 60°-75°; f. to med. grnd.: slightly bioclastic at 99'.	
95	95.0		5.0	4.0				
100	100		5.0	2.2			T. D. at 100'	

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2G-20 (Revised 1-15-68)

0030

GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 1 OF 2

DATE 5-67

PROJECT Florida Power Corp. NO. 6003-22 DRILL HOLE NO. 3-64

CONTRACTOR Circuler foundation and excavation Co. SITE AREA Crystal River Unit #3 ELEV. 96.68

CORE SIZE 2 3/4" COORDINATES +(2+97.9) ANGLE vert.

CASING 6" and 4" s(4+48) BEARING

LOGGED BY: RBW GWL DEPTH 99'

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation, etc.
								HIGH
5	5.0							
	6.5	5/5	1.5				Blows 7-6-6 med. dense; silty sand-organic trace clay	DK.
	8.5							
10	10.0	5/5	1.5				2-4-6 loose; as above	
	12							BROWN
	13.5	5/5	1.5				11-13-15 med. dense; as above	ORGANIC
15	15.5					15.5		
	17.0	5/5	1.5				40-25-25 weathered limerock; v. dense; lgt. gray	
20								
	21.5		2.5	0			Med. dense to dense; weathered limerock; traces organic; oxidation conspicuous by its absence.	5-7-22 (2" 140 lb)
	23.0	5/5	1.5	8				
25	25		2.0	0				20-15-15 (2" 140 lb)
	26.5	5/5	1.5	9				
	28.5		2.0	0				
30	30	5/5	1.5	0				34-2-9 (2" 140 lb)
	31.5	5/5	1.5	8				
	33		1.5	0		33.0		
35	34.5	5/5	1.5	4			Med. dense to dense weathered limerock; solu, channel development indicated by infillings of f. brown (FeOx color) sand intermixed with oxidized limerock.	13-8-9 (2")
	36		1.5	0				
	37	5/5	1.0	2				5-2 (2")
	39		2.0	0				
40	40.0	5/5	1.5	8				10-8-8 (2")
	42.5		2.0	0			42.4' FeOx concentration & MnOx concentration as rusty brown crust. Top of competent rock at 44.0'	
	44.0	5/5	1.5	8		44.0		15-25-50
45							Bioclastic pelcalcarenite: v. lgt. gray to buff; med. grnd.; intense oxidation around fossil casts & at 46.5'	
	47		3.0	2.6			diff. cemented vertical joint at 47'; recovered orly in rgs.	
	49		2.0	1.0			hard limy nodules at 49'-54'; intense FeOx at 56'	
50	51		2.0	6				
	54		3.0	.5				
55	56		2.0	1.0		56.0		
	57.0		2.5	0			Med. dense calcareous sand & sparry clastic shell fragments; med. grnd.; trace of hard nodules.	
60	60	5/5	1.5	4			Heavy Oxidation	8-10-14 (2")
	63		3.	.0				
65	65.		2	.0			Partial secondary infilling from 56 to 66.5 as above; plus 20% TTZ sand & v. soft dark brown organic clay; some sparry bioclasts; tiny 1/4" discoid(nummulities) abundant 72-75'; dolomitic silt becomes abundant at 73.5'	5-7-7 (2" 140 lbs)
	66.5	5/5	1.5	.9				5-5-8 2" (140 lbs)
	68		1.5	0				17-21-14 (2" 140 lb)
	69.5	5/5	1.5	1.1				
70	71.0	5/5	1.5	.9				
	72.0		1.0	.2				
	73.5	5/5	1.5	1.6				
75	75.0	5/5	1.5	1.3	5/5	75.5		19-14-11 2"
								13-11-16 2"

GAI-228 1/66

POOR ORIGINAL

2G-21 (Revised 1-15-68)

0031

GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 2 OF 2

DATE

PROJECT Florida Power Corp. NO. DRILL HOLE NO. 3-6

CONTRACTOR SITE AREA ELEV.

CORE SIZE COORDINATES ANGLE

CASING BEARING

LOGGED BY: GWL DEPTH

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION	REMARKS
							Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	Condition of core. Excavating evaluation, etc.
	76.8	6/5	1.5	1.3			V. dense; lgt. gray silt; stratified	16-20-30 (2" [illegible])
	78	5/5	1.5	.5			V. dense; gravel (oxidized limerock) and lmy silt	9-12-20 (2" [illegible])
80	79.6	4/5	1.5	1.2		80	partially dolomitized	14-18-24 (2" [illegible])
	83		3.0	2.2			Doloarenite: gray; f. to med. grnd.; finely bioclastic; cross bedded; competent but porous. biogenic	barnacle horizon questionable
85	85		2.0	8				
	88		3.0	0		Cavity 88		
90	89.8	2/3	1.5	1.5		89.5	V. hard black organic silty clay lower 1/2; trace green silty clay at base	13-21-30
	92.0		2.0	1.3			Bioclastic doloarenite: gray; fine to med. grnd. mtx.; hard porous framework: some dense aphanic zones of irreg. shaped 45° jointing; soft silty zone 0.3' at 89.5'.	
95	94		2.0	3				
	99.0		5.0	4.1			Tr. of lignite, med. soft to med. hard	Brown from 97.5 - ?
100								

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GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET SHEET 1 OF 3

DATE

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. 3-30

CONTRACTOR Girdler Foundation SITE AREA Crystal River Unit #3 ELEV. 97.00'

CORE SIZE 2 3/4" COORDINATES +(3+63.6) ANGLE

CASING 4" a(0+00) BEARING

LOGGED BY: GWL DEPTH 211.5'

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation, etc.
	2.0						Fill	2" s/s I.C. 16 han. 30" drop
	3.5	2/3	1.5	.5			2.0-5.0' med. dense to dense brown quartz sand; some organic material	8-19-16
5	5.0	2/3	1.5	.6			5.0-10.5' dense to v. dense calcareous sand; decomposed calcarenite @ base; med. to crse. grnd.; increasing density w/depth	9-10-11
	6.5	3/3	1.5	.6				9-44-40
	8.0	2/3	1.5	0				25-27-26
	8.5	2/3	.5	.5				100
10	10.5	0	2.0	0			Begin coring 10.5'	
							Bioclastic pelcalcarenite; white to lgt. gray; med. soft to med. hard w/soft zone @ 180'; unit mod. broken; FeOx staining @ 15'; bedding @ low angles from 15-25°; jointing @ 60-75°; v. broken zone @ 18'; FeOx staining @ 18-19'	No gradational change
15	14.5	100	4.0	4.0				
	18.0	97	3.5	2.4				
20						~20.0	Biopelcalcarenite; white to lgt. gray; unit relatively unbroken to 27'; from 27-50' broken to v. broken; sparry zone @ 28-50'; thick bedded w/bedding @ 25°; jointing @ 60-75°; slight FeOx staining @ 39'; near vertical joint @ 37'	
	22.0	100	6.0	5.0				
25								
	28.0	82	6.0	4.1				
30								
	33.0	30	5.0	1.5				
35								
	37.0	22	4.0	.9				
							20-22' soft to med. soft	
							22-25' v. soft	
							25037' med. soft to hard	
							37-39.5' med. soft to soft	
							39.5-40' v. soft	
40	40.0	66	3.0	2.0			40-50' med. hard w/soft zones due to poor recovery	
	44.0	15	4.0	.6				
45								
	47.0	15	3.0	.4				
50	50.0	33	3.0	1.0		50.0		
					NR		No recovery	
55	56.0	0	6.0	0		56.0		
	56.5	2/3	1.5	.7		57.0	V. dense calcareous sand; med. to crse. grnd. biopel frag. @ base	48-23-15
	57.5	2/3	.5	0				75
60	60.0	0	3.0	0	NR	60.0	No recovery Blow count indicates loose material	
	61.0	0	1.0	0		CAVITY 61.0		
	62.5	2/3	1.5	0				17 } Loosened
	64.0	3/3	1.5	0		64.0		6-3-2 }
65	65.5	3/3	1.5	.4			Dolomitic silt; med. dense to dense; doloarenite pebbles found within the silt; v. low calcium content	6-12-15
	67.0	3/3	1.5	.1				4-11-7
	68.5	3/3	1.0	.5		68.0		10-80
70	71.0	60	3.0	1.8			Doloarenite; lgt. brown or tan; some grayish zones; unit contains slightly spongy zones; relatively unbroken w/ broken zone @ 68-69' & v. broken zone @ 77-78'; hard to v. hard; med. hard @ 68-69.5' & 77'; thick bedded w/ bedding @ 15-25°; jointing @ 60-75° w/vertical joints @ 89'	
	73.0	100	2.0	2.1				
75								

GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 2 OF 3

DATE

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. 3-30

CONTRACTOR SITE AREA ELEV.

CORE SIZE COORDINATES ANGLE

CASING BEARING

LOGGED BY: GWL DEPTH

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation, etc.
80	78.8	98	5.0	4.9			As above	
						~81.0		
85	83.0	72	5.0	3.4			Spongy doloarenite; tan to lgt. gray; v. bioclastic; relatively unbroken w/v. broken zone @ 86.5-87' & 90-91'; extremely bioclastic @ 85.5-86'; bedding @ 15°; jointing @ high angles; vertical joint @ 90'	base of unit 92.5' spongy doloarenite changes to a v. lg' tan
	88.0	90	5.0	4.5			81-84' med. hard to hard	
90							84-86' hard to v. hard	
	93.0	72	5.0	3.6			86-87' med. soft to soft	
95						95.0	87-90' med. hard to hard	
	98.0	88	5.0	4.4			90-93' med. soft to soft	
100							93-95' as above w/lignite traces & darker brown color	
	102	93	4.0	3.9			Dololutite; grayish white; relatively unbroken to 106'; v. broken 106-107'; mod. broken 107-112' w/ broken zones @ 109-111'; med. hard to hard 95-105'; med. soft to med. hard 105-112'; fine grnd. w/crse. dolomite frag. within the matrix; bedding @ low angles @ 15°; jointing @ 75° @ 110'	
105								
	107	100	5.0	6.0				
110								
	112	84	5.0	4.2		112.0		
115						114.0	Calcilutite; white; mod. broken; med. soft to med. hard; fine grnd.; well cemented	
	117	46	5.0	2.3			Doloarenite; lgt. tan; vuggy; med. hard to hard; relatively unbroken; bedding @ 15-25°; jointing @ 60-75°; calcium content of this unit increasing w/depth; fine grnd.	
120								
	122	84	5.0	4.2		122.8	Clay; v. stiff mixed w/below dolomite; black	
125						125.0		
	127	88	5.0	4.4		127.0	As next above; both unit become lighter near the clay mat'l; mod. broken; jointing near vertical; med. hard to hard	FeOx stain @123-124'
130							Dololutite; white w/gray specks; high calcium content in the broken zones; mod. broken w/v. broken zones @ 131.5-136'; some visible bioclasts @ 133'; calcium content increases with depth down to 136'; thin bedded with bedding @ 15°	vert. joint @ 135'
	132	82	5.0	4.1				
135						134.0		
	137	100	5.0	5.0		135.2	1" clay layer; black ; v. stiff	
140							Calcarenite; lgt. brown or tan; darker areas are slightly dolomitized; unit is mod. broken & thin bedded; bedding @ low angles; high calcium content; fine to crse. grnd.; jointing where found is vertical	
	142	100	5.0	6.0				
145								
	147	100	5.0	5.0				
150								

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GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 3 OF 3

DATE

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. 3-30

CONTRACTOR SITE AREA ELEV.

CORE SIZE COORDINATES ANGLE

CASING BEARING

LOGGED BY: GWL DEPTH

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation, etc.
	162	100	5.0	5.0			Jointing @ 139-153-176-187'	
							Hardness; med. soft to med. hard	
165	167	94	5.0	4.7				
160	162	100	5.0	5.0				
165	167	100	5.0	5.0			As above	
170	172	100	5.0	5.0				
175	177	100	5.0	5.0			178' v. slight bioclastic; just one or two bioclasts found here	
180						180.0	~~1' layer of brown clay; stiff; mixed w/calcarenite~~	
	182	88	5.0	4.4		181.0	As next above	
						182.0	Doloarenite; lgt. gray; med. hard to hard; v. fine grnd.	
185	187	96	5.0	4.8		183.0	Calcarenite; as above; massive unit; med. hard; mod. broken; bedding @ low angles	
190						190.0		
	192	96	5.0	4.8			Doloarenite; dark brown; spongy; med. hard to hard; broken w/broken zone @ 195'; unit thin bedded w/bedding @ low angles; jointing @ 75° to 90°; v. spongy porous zone @ 195.5-197'; slightly crystaline texture	
195	197	96	5.0	4.8				
	199	90	2.0	1.8		198.5		
200						199.5	Doloarenite; gray; fine grnd.; hard to v. hard	
						201.0	As next above	
	203	100	4.0	4.0			Doloarenite; bioclastic; lgt. gray; numerous bioclasts; mod. broken from 201-203'; v. broken 203-204.5'; hard w/FeOx stain	
205	204.5	44	1.5	1.0		204.6		
							Doloarenite; dark gray to brown; mod. broken w/ throughout broken zones @ 206-207' & 213-214.5'; med. hard to hard; thin bedded w/bedding @ 15°; jointing @ 75-90°; med. to crse. grnd.; slight crystaline texture	
210	209.5	92	5.0	4.6				
	214	100	4.5	4.5		214.6		
215	214.8	60	.6	.3			T. D. 214.5'	
220								

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GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 1 OF 2

DATE

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. B-40

CONTRACTOR Girdler Foundation SITE AREA Crystal River Unit # 4 ELEV. 96.10'

CORE SIZE 2 3/4" COORDINATES +(3+63) ANGLE

CASING 4" s(1+48) BEARING

LOGGED BY: GWL DEPTH 113.5'

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION	REMARKS
							Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	Condition of core. Excavating evaluation, etc.
							Fill	2" s/s 140 lb hammer 30" drop 7-28-25
5	5.0						V. dense; brown quartz sand; contains organic mat'l	
	6.5	3/3	1.5	.7			6.5-9.5' V. dense; calcareous sand; high calcium content;	11-50-35
	8.0	3/3	1.5	.7			contains some biopelcalcarenite frag.	30-28-25
10	9.5	3/3	1.5	.6			9.5-11.5' dense quartz sand; med. to crse. grnd.; high calcium content	22-30-38
	11.0	3/3	1.5	1.0			11.5-14' V. dense calcareous sand; decomposed pelcalcarenite;	14-32-42
	12.5	5/5	1.5	1.2			high calcium content; no quartz	24-23-22
	14.0	4/5	1.5	.6			14-17' Bioclastic pelcalcarenite; white to lgt. gray; v. soft to med. hard;	
15							abundant bioclasts; FeOx staining @ 14.5'	
	17.0	10	3.0	.3			No recovery	
	19.0	0	2.0	0	NR		~~V. dense decomposed calcarenite; 1" to 2" diameter pieces~~	~~50 blows~~
20	20.5	0	1.0	0	NR		~~no recovery~~	
	23.5	100	3.0	3.0			Bioclastic pelcalcarenite; white to lgt. gray; relatively unbroken w/broken zone @ 24.5'-25'; med. soft to med. hard;	
25	26.0	96	2.5	2.4			bedding @ 30°; jointing @ 60-75°; FeOx staining @ 21, 25-26.5'	
						27.0		
30	31.0	56	5.0	2.8			Biopelcalcarenite; white to lgt, gray; unit thick bedded w/bedding at low angles 15-25°; jointing @ 60-75°; 36' rehealed joint; unit is diff. cemented; relatively unbroken w/several v. broken zones; FeOx staining @ 27.5', 30.0', 40.0' & slight trace @ 51.0'	
35	36.0	98	5.0	4.9			27-31' mod. broken; near vertical joint	27-31' med. hard w/soft zones
							31-35' relatively unbroken	31-35' med. soft to med. hard
40	41.0	94	5.0	4.7			35-36' v. broken zone	
							36-39' relatively unbroken	35-37' med. hard
45	46.0	44	5.0	2.2			39-42' v. broken	37-42' soft to v. soft
							42-46' mod. broken	42-45.5' med. hard
50	51.0	26	5.0	1.3			46-49' v. broken	45.5-49' soft to v. soft
							49-51' unbroken	49-51' med. hard
55	56.0	22	5.0	1.1			51-56' mod. broken	51-59' med. soft to med. hard
	58.0	0	3.0	0	NR			56-59' no return
60	59.5	3/3	.5	.1			~~55 blows~~	
	63.0	73	3.5	1.6				
65							63-68.5' V. dense decomposed biopelcalcarenite; fragmental	sparry zone 59.5-68'
	68.0	50	5.0	2.5			Biopelcalcarenite; sparry zone (59.5-68'); white to lgt. gray; mod. broken; med. soft to med. hard; soft in fossil cast; bedding @ 2°-25°; jointing @ high angles (75°); highly oxidized @ 66' on joint surface	
70					NR			
	73.0	0	5.0	0		73.0		50
	78.0	80	5.0	4.0			V. dense dolomitic silt; low calcium content; fine grain	85

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2G-26 (Revised 1-15-68)

GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 2 OF 2

DATE

PROJECT Florida Rowan Corp. NO. [illegible] DRILL HOLE NO. B-66

CONTRACTOR SITE AREA ELEV.

CORE SIZE COORDINATES ANGLE

CASING BEARING

LOGGED BY: GWL DEPTH

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation, etc.
	77.0	0	3.0	0	N.R.		No recovery	
80	80.0	0	3.0	0		80.0		
	82.0	80	2.0	1.6			Dolarenite; lgt. gray or buff; relatively unbroken; hard to v. hard; slight marblization @ top of unit; bedding @ 15°; jointing @ 60-75°	
85						85.0		
	86.0	18	4.0	.7		86.0	Black organic clay; v. moist; a few frag. from below	
							Spongy dolarenite; tan or lgt. brown; v. broken from 86-95'; mod. broken from 93-96'; med. hard to hard; Fe stained @ 94-96'; abundant bioclasts; bedding @ 25-30°; jointing non-apparent	
95	91.0	12	5.0	.6				
	93.0	45	2.0	.9				
						96.0		
	98.0	42	5.0	2.1			Dolarenite; lgt. gray to buff; relatively unbroken to 102'; v. broken @ 100-103'; Fe/Mn stains on bedding plane; hard to 98'; mod. hard to 100'; soft to 103'; calcium content increasing w/depth; low angle bedding; jointing @ high angles	
100								
	103.0	26	5.0	1.3		103.0		
105							Dolarenite; white to lt. gray; v. broken to broken; high calcium content; hard to v. hard; soft zone probably @ base; [illegible]	
	107.0	30	4.0	1.2		107.0		
	110.0	0	3.0	0	N.R.	110.0	No return; quartz sand; apparently came from above	65 Blows
	113.5	46	3.0	1.2			Calcilutite; white to lt. gray; v. dense; red. soft zones; v. fragmental; @ base there is reworking of below dolomite	
115							T. D. 113.5'	

0037

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GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 1 OF 2

DATE

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. 3-54

CONTRACTOR Girdler Foundation SITE AREA Crystal River Unit #4 ELEV. 96.39'

CORE SIZE 2 3/4" COORDINATES +(3+61) ANGLE

CASING 4" s(3+40) BEARING

LOGGED BY: GWL DEPTH 133.5'

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation, etc.
5								2" s/s 300 lb hammer 18" drop
	8.0	s/s				8.0		
10	9.5	s/s	1.5	.2			8.0-27.0' V. loose to loose decomposed biopelcalcarenite; white to lgt. gray; med. to crse. grnd. w/ pelcalcarenite frag.; 20.5'-22.0' frag 2" in diameter; high roundness; relatively low sphericity	1-2-3
	11.0	s/s	1.5	.2				1-2-1
	14.0	0	3.0	0				
15	16.5	s/s	1.5	.2				9-5-4
	17.5	0	2.0	0				
	19.0	s/s	1.5	.9				2-7-6
20	20.5	0	1.5	0				
	22.0	s/s	1.5	.1				1-2-1
	24.0	0	2.0	0				
25	26.5	s/s	1.5	.3				1-2-9
	27.0	s/s	1.5	.3		27.0		1-75
30	30.0	43	3.0	1.3			Bioclastic pelcalcarenite; white yo lgt. gray; abundant molds; high calcium content; FeOx staining (sly) @ 27', 32.5-35.0'; bedding @ low angles; jointing 60° to 75°; revealed near vertical joint @ 37'	
35	35.0	60	5.0	3.0			unit mod. hard w/ several soft zones 27-30' broken 30-41' mod. broken 41-43' v. broken	
40	40.0	24	5.0	1.2				
	43.0	50	3.0	1.5		~43.0		
45							Biopelcalcarenite; white to lgt. gray; mod. broken; med. soft to soft; FeOx staining 43-48'; bedding @ 15°; no apparent jointing	
	48.0	18	5.0	.9				
50	50.0	0	2.0	0	NR		48.5-51.5' No return	
	51.5	s/s	1.5	.4		51.5	V. loose; quartz sand; crse. grnd.; 50% quartz	1-2-1
55					CAV	CAVITY	No recovery	
	56.0	0	4.5	0		56.0		
	57.5	s/s	1.5	.3			Loose; decomposed biopelcalcarenite; v. crse. grnd.; high calcium content	3-4-3
	59.0	s/s	1.5	.2				3-3-2
60	60.0	s/s	1.0	.4		60.0		3-4
	63.0	13	3.0	.4			Biopelcalcarenite; white to lgt. gray; high calcium content; med to crse. grnd.; diff cemented; unit mod. broken w/v. broken zone @ 63-66'; bedding @ 15-25°; jointing @ 75°; FeOx staining @ 63' (highly); slight from 66-75'	
65	66.0	43	3.0	1.3				sparry zone 64-75'
70	70.0	40	4.0	1.6			60-64' med. hard 64-70' v. soft to med. soft 70-75' med. hard	
75	75.0	16	5.0	.8		~75.0		

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GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 2 OF 2

DATE

PROJECT Florida Power Corp. NO. 1203-02 DRILL HOLE NO. 3-5

CONTRACTOR Pioneer Foundation SITE AREA Crystal River Unit #4 ELEV. 56.30'

CORE SIZE 2 3/4" COORDINATES +(3+62) ANGLE

CASING -(3+40) BEARING

LOGGED BY: GWL DEPTH 133.5'

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation, etc.
75							Dolarenite; tan or lgt. brown; slightly spongy; mod. broken; fine to crse. grnd.; med. hard to hard from 75-82'; soft to v. soft 82-89'; v. low calcium content; bedding ∠ 15°; jointing ∠ 75° w/rehealed vertical joint @ 81' w/slight FeOx staining on the joint surface	2" s/s 300 lb hammer 18" drop
	78.0	20	3.0	.6				
80	80.0	30	2.0	.6				
85	85.0	20	5.0	1.0				
	89.0	8	4.0	.3		89.0		
90								
	92.0	0	3.0	.0	NR	92.0	No recovery	
	93.0	3/5	1.0	.1		93.0	Med. dur. to hard; one (1") diameter dolarenite pebble returned	4-12
95						95.0		
	98.0	34	5.0	1.7			As above; dolarenite; slight coloration change @ 98'; rose to grayish tan; mod. broken; med. hard to hard; slight FeOx staining @ 95' & 102'	
100								
	103	16	5.0	.8		103		Inglis
105							V. hard; nodular dolarenite; crse. grnd.; somewhat crystalline; reworking of below dolomite	unconformity
	106	10	3.0	.3		106		
	108	40	2.0	.8		108	Dolarenite; dark gray; broken; hard; lignite; bedding [illegible]; jointing near vertical	Avonpark
110								
	111	0	3.0	0	NR	111	No recovery	2" s/s; 140 lb hammer; 30" drop
	112.5	3/5	1.5	.7		112.5	Loose; dolomitic silt; decomposition of below dolomite	1-4-15
115							Dolarenite; gray to dark gray; broken to 116'; relatively unbroken to 120'; mod. hard to hard w.soft zones 116'; from 112.5-116' unit is mixed w/silt bedding ∠ 30°; jointing ∠ high angles; efferesces readily	
	115.6	93	3.0	2.8				
120	120	44	4.5	2.1		120		
					NR		No recovery	30" drop 2" s/s 140 lb hammer
125	125	0	5.0	0		125		
	126.5	3/5	1.5	.6		126.5	Decomposed calcilutite; (dense); high calcium content	9-10-26
	128.5	65	2.0	1.1		128.5	Calcilutite; white to lgt. gray; med soft to med. hard; clay layer above; mod. broken; fine grnd. w/bedding ∠ 15-30°	
130							Dolarenite; lgt. brown; spongy texture; broken; hard to v. hard; fine grnd.; slight crystalline; bedding ∠ 25°; jointing near vertical	
	133.5	47	5.0	2.1		133.5		
135							T. D. 133.5'	

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GAI-228 1/66

2G-29 (Revised 1-15-68)

GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 1 OF 3

DATE

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. 3RB-1

CONTRACTOR Girdler Foundation SITE AREA Crystal River Unit #3 ELEV. 98.37'

CORE SIZE 2 3/4" COORDINATES +(4+56) ANGLE vertical

CASING 4" -(2+40) BEARING

LOGGED BY: GWL DEPTH 154.0'

Depth	Depth	% Rec.	Core Rec. Rv.	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core, Excavating evaluation, etc.
							Not sampled	
5							Fill and natural soil	
10								
15							Top of rock at 14'	
20	20.0					~20.0	Very soft; not sampled; started coring at 20'	set 20' of 6" casing
25	25.0		5.0	5.0	1) 2) 3) 4)	29.0	Bioclastic pelcalcarenite; lgt. cream color; relatively unbroken; fine to crse. grnd. w/crse. bioclasts; med. hard; competent	fresh rock
30	30.0		5.0	4.0	1		Biopelcalcarenite; lgt. cream color; broken; diff. cemented; soft to med. hard; fine to crse. grnd.; low recovery 29-36' soft to med. soft; poor cement; mod. broken	
35	36.0		6.0	2.0			36-41' no recovery 41-45' soft w/med. hard nodules	relatively fresh
40	41.0		5.0	0	NR			
45	45.0		4.0	1.0	5	45.0	As above w/ sparry bioclastic frac.	set 45' of 4" FJC
50	50.0		5.0	2.7	6		45-46' med. hard; mod. broken 46-47' soft w/med. hard nodules; v. broken 47-51' med. soft; mod. broken; vertical joint	relatively fresh
55	56.0		6.0	0.5	7 8		51-56' soft w/med. hard nodules; v. broken	
60	61.0		5.0	2.6	9			
65	66.0		5.0	1.2	10 11	66.0		
70	71.0		5.0	0.6			Calcarenite; tan-gray; sugary texture; mod. broken; v. fine grnd.; biogenic; mod. soft w/hard zones (only hard pieces recovered); some FeOx staining on bedding surfaces	low recovery
75	76.0		5.0	0				set 75' of 4" FJC

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2G-30 (Revised 1-15-68)

GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 2 OF 3

DATE

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. 38B-1

CONTRACTOR SITE AREA ELEV.

CORE SIZE COORDINATES ANGLE

CASING BEARING

LOGGED BY: GWL DEPTH

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation, etc.
80	81.0		5.0	0.3		81.0	As above	
85	86.0		5.0	1.2		86.0	As above	
90	91.0		5.0	0.6		91.0	Possible unconformity; reworked hard calcarenite pebbles; highly oxidized & trace of black organic silty clay	
95	96.0		5.0	1.8			Bioclastic dolcarenite; brown-gray; spongy; sugary textured; mod. broken w/crse. lignite inclusions; v. broken at base of unit; crse. bioclastic frag. & casts; higly weathered	set 95' of 4" FJC
100	101.0		5.0	1.7				
105	106.0		5.0	1.6		105.0	Calcilutite; brown-gray; v. broken & fragmented w/blue lutite inclusions; some lignite inclusions also; pasty; v. soft to med. soft	
110	111.0		5.0	2.6		111.0		
						113.0	Calcarenite; gray; v. fine grnd.; hard; highly leached & brown at base	
115	116.0		5.0	2.6			As next above; v. broken & fragmented; soft to med. soft	
120	121.0		5.0	2.0		121.0		
125	126.0		5.0	2.0			Calcarenite; cream to tan; mod. broken; med. hard; finely biogenic; broken & near vertical joints below 123'	v. fine grnd.
130	131.0		5.0	2.6		130.0		
						131.0	Stiff to v. stiff silty clay; thinly laminated; brown-black dip 30°	
						~133.0	As next above; brown; med. hard	
135	136.0		5.0	2.9			Calcilutite; tan to gray; soft to hard; v. broken to mod. broken; pasty with some lutite inclusions; jointed from 133-136'; broken 136-138'; unbroken 138-141'; broken-v. soft laminated layer at base w/ 30° dip	
140	139.0		3.0	3.1		141.0		
145	144.0		5.0	4.6			Calcarenite; brown; med. hard; mod. broken; med. to crse. grnd.; trace lignit inclusions; FeOx discoloration	pieces 3"
150	149.0		5.0	4.8				

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2G-31 (Revised 1-15-68)

GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 3 OF 3

DATE

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. 3RB-1

CONTRACTOR SITE AREA ELEV.

CORE SIZE COORDINATES ANGLE

CASING BEARING

LOGGED BY: GWL DEPTH

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation, etc.
	154.0		5.0	5.0		154.0	As above	
							Boring ended at 154'	

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GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 1 OF 2

DATE 7-5-67

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. 38B-2

CONTRACTOR Girdler Foundation SITE AREA Crystal River Unit #4 ELEV. 99.6'

CORE SIZE 2 3/4" COORDINATES +(4+32) ANGLE

CASING 22' 2" 4" s(1+70) BEARING

LOGGED BY: GWL DEPTH 144.5'

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION	REMARKS
							Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	Condition of core. Excavating evaluation, etc.
5							Not sampled	
10							Fill & natural soil	
15						16.0		
							Roller bit to 20'	
20	20.0		4.0	0			Bioclastic pelcalcarenite; lgt. cream color; soft to med. hard; mod. broken; fine to med. grnd. w/crse. bioclasts; some FeOx discoloration	
25	25.0		5.0	4.3			20-22' med. soft;v. broken; FeOx stained; friable	
							22-26' med. hard; mod. broken; FeOx staining	
30	30.0		5.0	4.2			26-27' soft; v. broken; friable	
							27-32' med. hard; mod. broken; some FeOx staining; some 45° at base	
						~32.0		
	34.0		4.0	2.8		34.0	Biopelcalcarenite; cream color; diff. cemented; fine to crse. grnd.; soft to med. hard; pellet & detrital matrix; trace FeOx staining	
35	36.0		2.0	0	Cav.	CAVITY	32-34' soft w/med. hard nodules;v. broken; low recovery	
						36.0	34-36' cavity	
40	41.0		5.0	1.5			36-41' med soft to med. hard; mod. broken;low recovery	
					NR.		41-46' no recovery	
45	46.0		5.0	0		46.0		set 4" FJC
							As above w/crse sparry bioclasts; lgt. cream to pinkish tan; only crse. material recovered	
50	51.0		5.0	0.4			46-56' soft w/med. hard frag.; lgt. cream color	
55	56.0		5.0	0.3			56-66' soft w/med. hard frag.; FeOx stained	
60	61.0		5.0	0.6			66-72' cavity; some quartz calcareous sand infilling	
65	66.0		5.0	0.6			72-75' med. hard; mod. broken w/v. crse. sparry bioclasts	set 4" FJC
	67.0		1.0	0	NR.	67.0		
70	72.0		5.0	0	Cav.	CAVITY		set 4" FJC
						72.0		
75	76.0		4.0	1.5		75.0		

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GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 2 OF 2

DATE

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. 3BB-2

CONTRACTOR SITE AREA ELEV.

CORE SIZE COORDINATES ANGLE

CASING BEARING

LOGGED BY: GWL DEPTH

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation, etc.
						76.0	Dense clayey silt; thinly laminated; orange tan	
80	81.0		5.0	2.0		83.0	Doloarenite; lgt. tan; med. hard; biogenic; high $CaCO_3$%; mod. broken; numerous joints (vert. +45°); sugary; fine to med. grnd.	
85	86.0		5.0	0.6		~87.0	V. stiff to hard, black organic silty clay; trace shell frag.	
90	91.0		5.0	4.0			Bioclastic doloarenite; tan-gray marbleized; sugary textured; v. fine grnd. w/crse. bioclastic frag. & casts; hard; mod. broken 87-90'; broken 90-94'; trace fine lignite inclusions throughout unit	
	94.0		3.0	2.0		94.0		
95	99.0		5.0	4.4		102	As above; spongy; brown to gray w/crse. lignite inclusions; med. soft to med. hard	
105	104		5.0	2.9		106	Calcilutite; soft to med. soft; transitional unit; lutite matrix; w/high% arenite frag. + crse. lignite inclusions & seams	
110	107		3.0	2.8			Calcilutite; v. lgt. cream to gray; v. soft to med. hard; some broken zones; pasty texture; some concretions & lutite inclusions 106-107' soft; fragmented 107-112' med. hard; mod. broken; some leaching; 45°joint @ 109' 112-121' soft to med. soft; v. broken & fragmented; highly concretionary	
115	116		4.0	2.5				
120	121		5.0	2.1		121.0		
125	126		5.0	4.7		126.0	Doloarenite; tan; unbroken; competent; biogenic; fine to med. grnd.; masssive; hard	fresh rock
						127.0	V. dnse. calcareous silt & lignite layer	
						129.0	As next above; hard	
130	131		5.0	2.8			Calcilutite; lgt. cream to green-gray w/blue lutite inclusions; v.. soft to hard; generally pastty texture; relatively unbroken 129-132' med. hard; unbroken; some % arenite material 123-133' med. hard; unbroken 133-134.5' v. soft to soft; some silty lignite layers; thinly laminated	134.5-138' med. hard to hard; unbrok 138-139' v. soft to soft; concretion
135	134.5		3.6	2.6				
140	139.5		5.0	4.8		139.0 144.5	~~Hard silty organic clay (graycalcareous)~~	
	144.5		5.0	5.0			Calcarenite; tan; hard; unbroken; med. to crse. grnd.; fresh rock; competent	
							Boring ended at 144.5'	

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2G-34 (Revised 1-15-68)

GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 1 OF 2

DATE

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. 3RB-3

CONTRACTOR Girdler Foundation SITE AREA Crystal River Unit #3 ELEV. 96.0'

CORE SIZE 2 3/4" COORDINATES +(5+40) ANGLE Vertical

CASING 4" s(2+40) BEARING

LOGGED BY: GWL DEPTH 153.0'

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core, Excavating evaluation, etc.
20	20						Begin coring @ 20.0'	
25	26.5	91	5.5	5.0		26.0	Bioclastic pelcalcarenite; lgt. cream ; hard; relatively unbroken; good cement; mod. broken zone 23-24'	fresh rock
30	30.0	78	4.5	3.5			Biopelcalcarenite; lgt cream; mod. broken to broken; med. soft to med. hard; friable; trace FeOx stains; fragmentation & staining increases w/depth; diff. cemented	
35	36.0	29	6.0	1.4			26-29' med. hard; mod. broken 29-61' med. soft to med. hard; nodular; broken to v. broken; some FeOx staining 56-61'	
40	41.0	14	5.0	.7				
	44.0	23	3.0	.7				
45	46.0	30	1.0	.3				
	46.0	20	1.0	.2				
	49.0	13	3.0	.4				
50	52.0	27	3.0	.8				
55	56.0	8	4.0	.3				
60	61.0	6	5.0	.3		61.0		
65	66.0	0	5.0	0	N.R.	66.0	No recovery	
	69.0	0	3.0	0	Cav.	69.0	Cavity	
70	70.5	87	1.5	1.3			Biogenic doloarenite; tan-gray marbleized; sugary; med. hard to hard; mod. broken	
75	75.6	40	5.0	2.0		75.6		
	79.0	0	3.5	0	Cav.	79.0	Cavity	
80	84.0	80	5.0	4.0			As next above Poor recovery 84-92'	
85								
90	92.0	6	8.0	5		92.0		

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GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 2 OF 2

DATE

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. 3RB-3

CONTRACTOR SITE AREA ELEV.

CORE SIZE COORDINATES ANGLE

CASING BEARING

LOGGED BY: GWL DEPTH

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation, etc.
95	92	6	8.0	.5			Bioclastic doloarenite; tan-gray marbleized; sugary; somewhat spongy; poor recovery on top & bottom of unit; trace of black organic silty clay @ 99'; med/ hard to hard	
	96	22	4.0	.9		96.0		
	99	0	3.0	0	N.R.	99.0	No recovery	
100	102	16	3.0	.5		102.6	As next above	
105	106	22	4.0	.9			As above; med. hard to hard w/lignite inclusions; poor recovery from 102-104'	
110	111	34	5.0	1.7		111.0		
115	116	22	5.0	1.1		116.0	Calilutite; white to gray; med. soft to med. hard (only med hard frag. recovered); broken	
						118.0	Densecalcareous silt grading downward to sandy clay; some shell frag.; organic; brown	infill or channel fill
120	121	98	6.0	4.9			Calcilutite; white; broken to mod. broken; v. soft to hard; pasty; some nodules 118-120'; v. soft 118-120' v. soft; pasty; broken fragmented 120-131' med. soft to hard; poor recovery (121-126) mod. broken	
125	126	18	6.0	.9				
130	131	40	6.0	2.0		131		
135	136	0	6.0	0	N.R.	136	No recovery	
140	141	0	6.0	0	Cav	141	Cavity	
	144	3	3.0	.1		144.0	Only 1' recovered; cave from above	
145	148	36	4.0	1.4			Calcarenite; tan; mod. broken; mod. soft to med. hard; fragmented from 145-148' & 150-153'	
150	153	62	5.0	3.1		153.0		
155								

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2G-36 (Revised 1-15-68)

GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 1 OF 2

DATE

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. 38B-4

CONTRACTOR Girdler Foundation SITE AREA Crystal River Unit #4 ELEV. 99.17'

CORE SIZE 2 3/4" COORDINATES +(4+38) ANGLE vertical

CASING 4" e(3+08) BEARING

LOGGED BY: GWL DEPTH 161.0'

Depth	Depth	% rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation, etc.
5							Not sampled Fill & natural soil	
10								
15								set 6" casing & started coring at 20'
20								
25	23.5'		3.5	1.3			Bioclastic pelcalcarenite; med. soft to med. hard; broken; FeOx stained joint @ 23-24' (60°) 20-23.5' v. broken; med. soft 23.5-25' mod. broken; med. hard 25-30' broken; med. soft to med. hard	
	26.0		3.0	2.6				
30						~30		
	32.5		6.0	3.4			Biopelcalcarenite; diff. cemented; v. broken; nodular; soft to med. hard nodules & frag.	
35								
	37.5		5.0	1.4				
40								
	42.5		5.0	3.1		~42.0		
45							As above w/crse sparry bioclasts; entire unit med. soft w/med. hard nodules; v. broken & friable	
	47.5		5.0	1.5				
50								
	52.5		5.0	1.2				
55								set 60' of 4" FJC especially below 67';v. crse.
	57.5		5.0	1.1				
60								
	61.0		3.5	1.0				
	64.0		3.0	0.8				
65								
	67.0		3.0	0.7				
70	70.0		3.0	0.5				
	73.0		3.0	0.8		73.0		
75	76.0		3.0	0.5				

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GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 2 OF 2

DATE

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. 3C-

CONTRACTOR SITE AREA ELEV.

CORE SIZE COORDINATES ANGLE

CASING BEARING

LOGGED BY: GWL DEPTH

Depth	Depth	% Rec.	Core Rec. Ft.	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation, etc.
80	79.0		3.0	1.1			Doloarenite; tan; biogenic; broken; sugary; v. fine grnd.; soft w/hard zones (hard pieces recovered only)	set 80' of 4" FJC
	82.0		3.0	0.3			Becomes soft	
85	85.0		3.0	0.2		~85.0		
90	89.5		4.5	1.3			V. dense; dolomitic silt (residual); trace calcareous sand infill (med. crse.)	
	92.5		3.0	1.8		92.5	As next above; hard; competent; unbroken	
95	96.0		3.5	0	NR		No recovery; zone of unconformity	
	98.5		2.5	0		98.5		
100							Bioclastic doloarenite; v. soft w/ 1.4' of hard rock recovered; fine grnd. w/crse lignite inclusions; broken; gray; spongy	set 100' of 4" FJC
105	106		2.5	1.4		~106		
	109		3.0	5/5		109	Dense to v. dense calcarenite & quartz sand; fine to crse. sub ang. to rdd.; trace silt	
110							V. soft calcarenite; white; decomposed	pushes w/hydraulic
	113		4.0	5/5				
115	116		2.0	5/5				
	118.5		3.5	0				
120	119.5		1.0	5/5		119.5		
	124		4.5	1.9			Doloarenite; gray; hard; relatively unbroken; fine to med. grnd.; some 30° joints	
125	129		5.0	2.3				
130	134		6.0	0.6		134		
135	139		5.0	1.2			Calcilutite; soft to med. hard; v. low recovery; gray w/blue lutite inclusions	
140	141		2.0	0		141.0		
145	146		5.0	0.3			Calcarenite; med. hard; fragmented	
150	151		5.0	1.6		151.0	~~Boring ended at 151.0'~~	

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GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 1 OF 2

DATE

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. 3BB-5

CONTRACTOR Girdler Foundation SITE AREA Crystal River Unit #3 ELEV. 97.00'

CORE SIZE 2 3/4" COORDINATES +(3+70) ANGLE vertical

CASING 4" -S(2+40) BEARING 156.0'

LOGGED BY: GWL DEPTH

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation, etc.
20	20					20.0	Begin coring @ 20'	
						21.0	Bioclastic pelsilcarenite; med. hard; cream colored	
25	25	94	5.0	4.7			Biopelcalcarenite; lgt. cre[illegible]r; diff. cemented; relatively unbroken to v. br[illegible] some nodular zones	
30	30	94	5.0	4.7			21-24' med. soft w/ med/ hard nodules; v. broken; poor cement	
35	35	24	5.0	1.2			24-25' med. soft; mod. broken	
							25-29' med. soft w/med. hard nodules; unbroken	
							29-35' med. soft; v. broken; poor recovery	
40	40	44	5.0	2.2			35-50' med. soft w/med, hard nodules; mod. to v. broken	fresh rock
45	45	52	5.0	2.6				
50	50	48	5.0	2.4		50.0		
55	55	0	5.0	0	N.R.		No recovery	
	58	0	3.0	0				
60	61	0	3.0	0		61.0		
65	65	5/5	4.0	—		65.0	Calcareous silt; some shell frag. med. dense; trace sand	sample taken by pushing sample w/Kelley
	68	0	3.0	0	N.R.	68.0	No recovery	
	69	5/5	1.0	—		69.0	As next above	
70								
	72	0	3.0	0	N.R.	72.0	No recovery	
	73	5/5	1.0	—		73.0	~~As next above; trace pebble conglomerate~~	
75	76	35	3.0	1.1		76.0	Biogenic doloarenite; tan; high $CaCO_3$ %	
80	80	0	4.0	0	N.R.	80.0	No recovery	
	82	5/5	2.0	0	N.R.	82.0	No recovery	
	83	5/5	1.0	—		83.0	~~Dolomitic silt zone; med. dense~~	
85	86	35	3.0	1.1			Bioclastic doloarenite; tan gray marbleized; mod. broken; med, hard to hard	
90	91	60	5.0	3.6				

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GAI-228 1/66

2G-39 (Revised 1-15-68)

GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 2 OF 2

DATE

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. 3RB-5

CONTRACTOR SITE AREA ELEV.

CORE SIZE COORDINATES ANGLE

CASING BEARING

LOGGED BY: GWL DEPTH

Depth			Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION	REMARKS
							Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	Condition of core. Excavating evaluation, etc.
95	96	56	5.0	2.8			Bioclastic dolcarenite; tan-gray; spongy textured w/ lignite inclusions; med. hard to hard w/soft broken zone @ 45' & 100'	
100	101	60	5.0	2.5		101.0		
105	106	86	5.0	4.3			Calcilutite; lgt. cream w/some blue lignite inclusions; soft to med. hard; relatively unbroken; pasty; trace organic zone at base of unit; near vertical joints 114-116'	fresh
110	111	98	5.0	4.9				
115	116	94	5.0	4.7		117.0		
120	121	100	5.0	5.0		~121.0	Calcarenite; lgt. cream; somewhat pasty; transitional unit between above & below; med. hard; mod. broken	fresh
125	126	74	5.0	3.7			Calcilutite; cream color; mod. broken; soft to med. hard; massive unit; organic clay layer 131.5-132'	fresh
130	131	74	5.0	3.7				
135	136	100	5.0	5.0		136.0		
140	141	56	5.0	2.8			Calcarenite; lgt. cream color; med. soft to med. hard; mod. broken; massive; poor cement in general; numerous high angle joints throughout unit	fresh
145	146	40	5.0	2.0				
150	151	60	5.0	3.0				
155	156	60	5.0	3.0		156.0		
160							T. D. 156.0'	

GAI-228 1/66

GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 1 OF 2

DATE 7-5-67

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. CRB-1

CONTRACTOR Girdler Foundation SITE AREA Crystal River Unit #4 ELEV. 96.6'

CORE SIZE 2 3/4" COORDINATES +(7+04) ANGLE vertical

CASING 4" s(2+40) BEARING

LOGGED BY: GWL DEPTH 146.0'

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation, etc.
5							Not sampled	Top of rock @ 10'
10						10.0		
	13.0	60	5.0	0.8		13.0	Bioclastic pelcalcarenite: lgt. cream color; med. soft to med. hard; mod. broken; fine; crse. grnd. pellet & detritus w/crse. bioclastic fragments & casts; some FeOx staining at top of unit.	
15					CAVITY		10-13' soft w/med. hard frags.; v. broken; high FeOx staining	
	18.0	5.0	0			18.0	13-18' cavity	
20							18-20' med. soft; broken; FeOx discoloration; poor cement	
	23.0	5.0	4.0				20-35' med. hard; mod. broken; fresh rock; (pieces 4") trace of FeOx staining	
25								
	28.0	5.0	4.1					
30								
	33.0	5.0	2.7					
35	35.0	2.0	2.0			35.0		set 35' of 4" FJC
						37.0	V. soft; organic silty clay; black w/green layers; thinly laminated	
40	44.0	9.0	2.3			~44.0	Biopelcalcarenite; lgt. cream color; broken; diff. cemented; soft w/some med. hard nodules & zones; discolored & stained from jointing & oxidation.	
45	48.0	5.0	2.1				Biopelcalcarenite w/ some crse. sparry bioclasts; lgt. cream color; v. broken to mod. broken; soft to hard; diff. cemented & high degree of leaching & FeOx staining; fine to crse. 43-45' med. hard to hard; mod. broken; pinkish discoloration; v. sparry; leached; 45-50' soft w/med. hard nodules & concretions; v. broken; FeOx staining, 50-55' soft w/med. hard zones; broken; low recovery; highly leached & satined;	
50	52.0	2.5	1.1					
	52.5	2.5	0.6					
55	55.0	2.5	0.2			55.0	v. crse. sparry bioclasts	set 55' of 4"FJC
							Doloarenite; tan; sugary textured; biogenic; soft to v. hard; broken to mod. broken; v. fine grnd.; some vertical jointing at top of unit; entire unit weathered & FeOx stained.	very low recovery through entire unit
60	60.0	5.0	1.4					
65	65.0	5.0	0.8					set 65' of 4" FJC
70	70.0	5.0	0.6					
	73.0	3.0	0.8					
75	76.0	3.0	1.4					

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GAI-228 1/66

GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 2 OF 2

DATE

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. 4RB-1

CONTRACTOR SITE AREA ELEV.

CORE SIZE COORDINATES ANGLE

CASING BEARING

LOGGED BY: GWL DEPTH 146.0'

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation, etc.
80	81.0		5.0	3.1			Bioclastic dolcarenite; tan-gray, marbleized; med. hard to v. hard; v. fine grnd.; sugary textured; only few broken zones (79-80', 81-82', 84-85'); massive competent vertical joint from 86-87'	
85	86.0		5.0	3.8		87.0		
90	91.0		5.0	4.4			Bioclastic dolcarenite; brown to gray; broken to mod. broken; spongy texture with lignite inclusions; upper 1.5' is very decomposed; soft to hard; fine to crse. grnd. 87-88' v. soft; v. broken; weathered; brown; 88-89' med. hard; unbroken; weathered; brown; 89-91' hard; unbroken; gray; 91-94' med. ahrd; v. broken; brown with some med. grnd. sand; 94-99' hard; mod. broken; vertical joints; leached	(qtz. & $CaCO_3$
95	96.0		5.0	3.4		99.0		
100	101		5.0	4.6			Calcilutite; tan to white w/occasional blue inclusions; few mod. broken zones; v. soft to med. hard; pasty texture w/some small fossils & concretions; thin (1") green clay layers at 107' & 109'; 45° joint 99-100'; vertical joint @ 110';99-102' med. hard; unbroken; 102-104' soft; v. broken; 104-109' med. soft; mod. broken; 109-110 med. soft; very broken; 110-115' med. hard; mod. broken	slightly altered
105	106		5.0	2.6				
110	111		5.0	5.0		111.5		
115	116		5.0	4.1		118.0	Calcarenite; biogenic; tan; unbroken; hard; competent; fine grained	fresh rock
120	118		2.0	2.0	CAV.	CAVITY		
125	121		5.0	0		123.0	Calcilutite; lgt. cream color-gray; v. soft to hard; relatively unbroken; pasty 123-128' lgt cream w/blue inclusions; unbroken; 45° joint @ 127.5'; 128-129' green-gray; v. soft; silty; 129-130' lgt gray; fine arenite; pasty; hard; unbroken; 130-134.5' lgt. cream; unbroken; hard; pasty; 134.5-135.5' lgt cream; unbroken; v. soft; pasty; 135.5-136' green - gray; silty; soft; broken	fresh rock
130	126		3.0	1.6				
135	131		5.0	5.0				
140	136		5.0	4.0		136.0		
145	141		5.0	4.8			Calcarenite; tan; biogenic; relatively unbroken; med. hard; fine to crse. grnd.; massive, competent vertical joint 137-138'	fresh rock
	146		5.0	5.6			End of boring at 146'	

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GAI-228 1/66

2G-42 (Revised 1-15-68)

GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 1 OF 2

DATE 6-27-67

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. ARB-2

CONTRACTOR Girdler Foundation SITE AREA Crystal River Unit #4 ELEV. 96.6'

CORE SIZE 2 3/4" COORDINATES +(7+76) ANGLE vertical

CASING 20' of 6", 85' of 4" s(2+76) BEARING

LOGGED BY: GWL DEPTH 131.0'

Depth	Depth	Rec. %	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation, etc.
5							Not sampled - roller bit to 10.5'	
10						10.5		started coring @ 10.5'
15	16.5	22	5.0	1.1			Bioclastic pelcalcarenite; lgt.cream to buff color; fine to med. grnd. matrix w/crse. bioclasts & casts; low recovery & FeOx discoloration indicates active oxidation especially from 10.5-20.5'; core is fragmented & stained; 10.5-20.5' soft w/med. hard fragments (cobble size); v. broken & stained; 20.5-23.0' soft to med. hard; mod. broken; leached & marked discoloration; 25-26' cavity; 26-31' low recovery; soft w/med. hard fragments	20.5' of 6" casing
20	20.5	14	5.0	0.7				
25	25.0	38	4.5	1.7		25.0		
	26.0	0	1.0	0	CAV	CAVITY		
						26.0		
30	31.0	14	5.0	0.2		~31.0	Biopelcalcarenite; pinkish- tancolor; altered rock; fine to crse. grnd. pellets & fine clastic detritus; low recovery and discolored; well jointed throughout w/FeOx staining at joint planes; 31-33.5' med. hard; broken; numerous joints (60-70°) w/ FeOx staining; 33.5-35' soft w/med. hard nodules; v. broken & stained; 35-38' med. soft to med. hard; mod. broken; vertical jointing & stained	
	33.5	80	2.5	2.0				
35	36.0	24	2.5	0.6		~38.0		
40	41.0	44	5.0	2.2			Bioclastic pelcalcarenite; lgt. cream to pinkish tan color; friable; fine to crse. pellet & detrital matrix w/sparry bioclasts; discolored to 40' w/FeOx stained joint faces below 41'; 38-40' med. hard; mod. broken; discolored; 40-46' soft w/med. hard fragments; diff. cemented; vertical solutioning; 46-51' med. hard; mod. broken; vertical jointing & solutioning; staining	45' of 4" FJC
45	46.0	12	5.0	0.6				
50	51.0	60	5.0	2.5		51.0		
55	56.0	26	5.0	1.5		~55.0	Biopelcalcarenite; tan to cream color; friable; med. hard; mod. broken w/numerous joints (30-90°); FeOx stained throughout; f. to crse. grnd. pellets w/occasional crsd. clastic fragments.	
60	61.0	34	5.0	1.7			Doloarenite; biogenic; sugary textured; tan colored; fine to med. grnd.; fossil detritus w/occasional crse. casts; unit is relatively competent w/some high angle vertical joints developed. 55-61' med. hard; mod. broken to broken; extensive jointing (30-90°) 61-67' Med. hard; v. broken; shattered joint zone 67-71' med. hard; mod. broken; several vertical joints	
65	66.0	24	5.0	1.7				
70	71.0	44	5.0	2.2		71.0		
						73.0	Stiff organic silty clay; black w/orange; oxidized zone at base; non- calcareous	
75	76.0		0.0			76.0	Doloarenite; med. hard; finely biogenic; sugary textured; mod. broken; tan-buff	75' of 4" FJC

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POOR ORIGINAL

GAI-228 1/68

2G-43 (Revised 1-15-68)

GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 2 OF 2

DATE

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. 4RB-2

CONTRACTOR SITE AREA ELEV.

CORE SIZE COORDINATES ANGLE

CASING BEARING

LOGGED BY: GWL DEPTH

Depth	Depth	Sec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation, etc.
	77.5	100	1.5	1.5		77.0	Doloarenite; as above; med. stiff; more sugary; broken & oxidized; hard; crystalline calcarenite; pebble conglomerate @ 76'	
80	77.5	60	2.0	1.2			Bioclastic doloarenite; buff-gray marbleized; med. hard to hard; sugary textured; fine grnd. matrix w/crse. bioclastic fragments & casts; mod. broken to unbroken; relatively competent unit; trace of fine lignite inclusions; fragmented; broken zone at base; contains some reworked crystalline calcareous pebbles; possible base of	
	80.5	0	1.0	0	cav	CAVITY		
	83.0	24	2.5	0.6				
85	86.0	33	3.0	1.0		~86.0	Bioclastic doloarenite; brown-gray to brown; occasional unconformity	
90	90.0	100	4.0	4.0			spongy textured; med. soft to hard; mod. broken to unbroken @ 85' of 4" FJC matrix varies from fine grained, sandy calcarenite to crystalline dolutite; crse lignite inclusions throughout; spongy zones are friable &	
95	95.0	88	5.0	4.1			85-85.5' med. soft; spongy; brown arenite; unbroken weathered.	
	99.0	82	4.0	3.3		99.0	85.5-87' hard; lutite matrix; fossil casts; brown-gray; unbroken 87-90' med. soft-med. hard; brown spongy doloarenite: friable; broken at top & bottom; 90-93' hard; v.f. arenite; sugary; biogenic; brown-gray; unbroken (see*)	
100	100.0	90	1.0	0.9		102.0	Dololutite; transitional zone w/some bioclastic frag.; gray to tan w/blue inclusions (clay layer) at base; unbroken; med. hard	
105	106.4	77	6.0	4.6			Calcilutite; white pasty texture: soft to med. hard & relatively unbroken; occasional blue calcilutite inclusions; fine accesory inclusions are horizontal liniations; structureless; massive unit; 102-104' med. hard; unbroken; 104-106' soft;	
110	111.0	90	5.0	5.0		112.0	broken (from drilling); some calcite nodules; darker color; 106-111' med. hard w/few broken zones; near vert. jt.; 111-112' med. hard; broken w/many	
						113.5	Calcarenite; lgt. gray; unbroken; v. hard; biogenic; v.f. grnd.; remarked zone transitional between units above and below	
115	116.0	100	5.0	5.0			Doloarenite; lgt. tan; unbroken; competent; hard to v. hard; fine grnd.; biogenic w/ trace of lignite inclusions; 60° vertical joint from 115-116' with trace of FeOx stain; unit is essentially fresh & unaltered	
120	121.0	100	5.0	5.0		121.0		
						123.0	Calcarenite; gray-tan; biogenic; mod. broken; v.f. grnd.; fragments due to jointing; med. soft to hard	
						124.0	6" layer of hard brn. clay; laminated v clayey silt; calcilutite to 124.2'	
125						125.0	As next above; hard & unbroken	
	126.4	84	5.0	4.2			Calcilutite; lgt. tan-gray w/blue lutite inclusions; relatively unbroken (pieces 1.0') to 129'; pasty; hard to 129';	
130	131.0	100	5.0	6.0		131.0	structureless; massive; 129-130.5' soft to med. hard; broken w/limy concretions; 130.5-131' same as top of unit	
							Boring ended at 131.0'	

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GAI-228 1/68

2G-44 (Revised 1-15-68)

GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 1 OF 2

DATE 6-21-67

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. LBB-3

CONTRACTOR Girdler Foundation SITE AREA Crystal River Unit #4 ELEV. 96.35'

CORE SIZE 2 3/4" COORDINATES +(6+68) ANGLE vertical

CASING s(2+85) BEARING

LOGGED BY: GWL DEPTH 146.0'

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation, etc.
5								140 lb. hammer 30" prod 2" split spoon
10						10.0		started coring @ 10'
15	15.0	60	3.2				Bioclastic pelcalcarenite; very lgt. cream color; fine to crse. grnd. pellet & fossil detritus w/crse. to v. crse. bioclastic frag. & casts; some large (2.0") intact fossils; unit is well cemented & mod. broken; generally med. hard	
20	20.0	60	1.3			20.0	10-15' med. hard; mod. broken; fresh	set 20' of 6" casing
	22.0	40	0	Cav.	CAVITY	22.0	15-20' soft to med. hard; v. broken; oxidized & leached; poor cement 20-22' cavity	
25	26.0	40	1.1				22-29' med. hard; mod. broken; some soft zones (low recovery)	
	29.0	30	0.6			29.0	29-32' cavity	
30	32.0	30	0	Cav.	CAVITY	32.0	32-38' med. hard; mod. broken; well cemented	
35	35.0	30	2.0					
	38.0	20	2.9			38.0		
40	44.0	60	3.0			44.0	Biopelcalcarenite; cream color; med. hard; relatively unbroken; some FeOx discoloration; few rehealed joints; f. to med. grnd.; trace bioclast (crse.)	
	44.0	20	0	Cav.	CAVITY	44.0		
45	46.0	40	1.7			46.0	Bioclastic pelcalcarenite; w/sparry bioclast frag. & shells; ~~med. hard; mod. broken~~	set 45' of 4" FJC
50	51.0	50	4.0				Biopelcalcarenite; pinkish tan; fine to crse. grnd.; recovery unbroken; competent; massive; discoloration due to oxidation soft zone at base (56-59)	
55	58.0	60	1.5					
	59.0	30	0			59.0		
60	62.0	30	1.0			62.0	Med. soft; organic clay; black; some sand lenses & shell frag.; high carbon content	
65	66.0	40	0				Dense to v. dense; fine to crse. sand with dense calcareous silt seams; sand is ang. to sub. ang.; quartz shell frag & calcarenite; tidal flat or low velocity stream deposit	set 65' of 4" FJC
	67.0	10	0.5			67.0		
70	71.5	65	0.8				Dolcarenite; tan; sugary textured; biogenic; med. soft to med. hard; mod. broken; fine grnd.; closely jointed (30-45°) w/FeOx stained joint faces; low recovery	set 75' of 4" FJC
75	76.0	45	1.3			76.0		

GAI-228 1/66

2G-45 (Revised 1-15-68)

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GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 2 OF 2

DATE 6-29-67

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. ARB-3

CONTRACTOR _____ SITE AREA _____ ELEV. _____

CORE SIZE _____ COORDINATES _____ ANGLE _____

CASING _____ BEARING _____

LOGGED BY: _____ GWL _____ DEPTH _____

Depth	Depth	Rec. %	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation, etc.
					N.		No recovery	
90	91.0		5.0	0	R.			
							No recovery	set 85' of 4" FJC
95	96.0		5.0	0				
							Trace of hard, laminated marine clay; brown; semi-translucent w/ some FeOx staining along planes	
	98.5		7.5	0.9		~98.5	highly leached bioclastic doloarenite rock frag.; sub rdd.; gray; med. hard	
100	98.0		2.5	1.8		98.0	Silt; shell frag. & trace of marine clay (above); may be from zone above	
	99.0		3.0	2.0		99.0	Bioclastic doloarenite; buff; fine to crse w/v. crse. sand; med. hard; Bioclastic doloarenite; brown - gray; med. soft to med. hard; spongy frag.; mod. broken w/lignite inclusions; med. to crse. grnd.;	
105	103.0		4.0	0	CAVITY	103.0	spongy texture; cavity from 99-103'; entire unit broken; shows evidence of weathering	
	106.0		3.0	1.5		106.0	Calcilutite; tan gray to white w/blue inclusions; soft to med. hard; v. broken to mod. broken; pasty texture w/numerous fragmental concretions; FeOx discoloration marked throughout unit	set 105' of 4" FJC massive & structureless
110	109.0		3.0	1.7			105-106.5' med. hard; vertical joint; weathered	
	112.5		3.5	1.0			106.5-117.0' soft to med. hard; very broken	
115	116.0		3.5	1.8		117.0		
	119.0		3.0	2.5		118.0	~~Calcarenite; med. hard; gray; finely biogenic; unbroken;~~ Doloarenite; tan; finely biogenic; unbroken; competnnt; 45° joints 120-121'; high calcium content	~~transitional from~~ until above & below
120	124.0		5.0	5.5		123.5		
	127.0		3.0	0.7		126.0	v. dense clayey silt & silt; thinly laminated; green & green-gray clayey silt; highly plastic	
	130.0		3.0	3.0		129.0	Calcilutite; gray w/blue inclusions; hard; unbroken;	
130	133.0		3.0	3.0		129.5	~~Hard silty clay; gray green & tan; very thinly laminated; shell organic layer~~	
	132		2.0	2.0			Calcilutite; v. lgt. gray - white w/blue inclusions; hard & unbroken; vertical joint @ 134'	
135	136.0		4.0	3.6		135.0	~~Calcarenite; tan; med. hard; biogenic; med. to crse. grnd.; unbroken~~	
						136.0	Dense; med to crse. calcareous sand & cobbles; sub rdd. to sub. ang.	
						138.0	not indigenous (either sand or pebbles)	
140	141.0		5.0	4.8		140.0	As next above; some vertical joints	
						141.0	Calcilutite; white; pasty; med. soft; fragmented	
145	146.0		5.0	4.6		146.0	Calcarenite; tan; relatively unbroken; med. hard; biogenic w/trace of fossil shells & lignite inclusions; few small vertical joints throughout; ~~appears fresh & unaltered~~	
							End of boring at 146.0'	

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GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 1 OF 3

DATE

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. A-1

CONTRACTOR Girdler Foundation SITE AREA Crystal River Unit #4 ELEV. 98.90'

CORE SIZE 2 3/4" COORDINATES +(4+63) ANGLE vertical

CASING 4" n(0+01) BEARING

LOGGED BY: GWL DEPTH 200.0'

Depth	Depth	Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation, etc.
5	5.0						Fill	2" o/s 300 lb hammer 12" drop
	6.5	S/S	1.6			6.5		3-4-1
	8.5	0	2.0	0			Loose to v. loose calcareous sand; light brown; fine to med. grnd.; pelcalcarenite frag. at base of deposit; some quartz found in sample 6.5-10.0'; high calcium content; effervesces readily	
10	10.0	S/S	1.5	0				5-3-3
	12.0	0	2.0	0				
	13.5	3/3	1.5					2-2-1
15	15.5	0	2.0	0				
	17.0	S/S	1.5			17.0		3-2-2
	19.0	0	2.0	0			Bioclastic pelcalcarenite; white to lgt. gray; v. broken to broken; med. soft to med. hard; high calcium content; abundant bioclasts; bedding and jointing not apparent	
20	21.5	60	2.5	1.5		~23.0		
25	26.5	23	3.0	.7			Biopelcalcarenite; white to lgt. gray; fine to crse. grnd.; differentially cemented; FeOx staining @ 29' & 31.5'; sparry zone from 44.0-59.0' w/abundant bioclasts @ 44'; bedding @ 15° to 20°; jointing at high angles about 75°; very slight trace of dolomitic silt @ base of unit	
	27.5	26	2.0	.8				
30								
	32.5	58	3.0	2.9				
35	35.5	73	3.0	2.2			23-32.5' broken to mod. broken 32.5-40.5' V. broken 40.5-44.0' mod. broken 44.0-56.5' v. broken 56.5-59.0' mod. broken 23.0-50.0' unit ranges from v. soft to med. hard; med. hard zones occur every 2' w/very soft zones separating them. 50.0-56.5' med. soft to med. hard 56.5-59.0' med. hard to hard	
40	44.5	10	5.0	.5				
45	49.0	96	4.5	4.3				
50	50.0	54	5.0	2.9				
55	56.5	34	6.5	2.0		59.0		
60	60.0	94	3.5	3.3			Doloarenite; lgt. brown or tan; slightly spongy; Inglis; mod. broken; med. hard to hard; fine to med. grnd.; thick bedded w/bedding @ 15°; jointing @ 60-75°; vertical joint @ 63.4'	small calcite crystals
65	65.0	54	2.0	2.7			Sugary doloarenite; lgt. brown or tan; mod. broken; med. soft to hard; fine to med. grnd.; thin bedded w/bedding @ 15-25°; jointing 60-75°	Lost hole moved 4N of hole and started coring @ 65'
70	70.0	46	5.0	2.3				
75	75.0	62	5.0	3.1				

[redacted]

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GAI-228 1/68

GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 2 OF 3

DATE

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. 4-2

CONTRACTOR Girdler Foundation SITE AREA Crystal River Unit #4 ELEV. 98.90'

CORE SIZE COORDINATES ANGLE

CASING BEARING

LOGGED BY: GWL DEPTH

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation, etc.
						79.0	As above	
80	80.0	96	5.0	4.3				
85	85.0	96	5.0	4.8			Doloarenite: lgt. gray; fine grnd.; hard to v. hard w/ soft zone @ 81.0'; unit mod. broken w/very broken zone @ 81.0'; bedding @ low angles & jointing @ 60-75°; several calcite crystals @ 85.0'	
	88.0	63	3.0	1.9		88.0		
90	90.0	16	3.0	.5			Doloarenite; spongy; lgt. brown or tan; broken; med. hard to hard w/soft areas at the more spongy zones; FeOx staining 92-95.5'; bedding @ 15-25°; jointing non-apparent	
	96.0	63	3.0	1.9		96.0		
95	96.0	30	2.0	.6	N.R.	96.0	No recovery (Avon Park doloarenite last 6" of above unit; dark gray; abundant lignite particles)	
	98.8	75	2.8	2.1		98.0	v. pure quartz sand; v. fine grnd.	
100							lgt.; v. dense; laminated	
	103.8	96	5.0	4.8			Dololutite; white to tan; high calcium content; mod. broken w/ broken zone @ 103.0'; fine to med. grnd.; med. soft to med. hard; bedding @ 15°; jointing @ 60-75°	
105						107.0		
	108.8	46	5.0	2.6		108.8	Calcilutite; white; fine grnd.;v. broken; mod. soft to mod. hard	
110					N.R.		No recovery	
	113.0	80	4.8	2.4		113.0		
115							Doloarenite; spongy, tan, relatively unbroken w/broken zone @ 117.0-118.0'; med. hard to hard; bedding @ low angles; jointing near vertical; vertical joints 16.0'	FeOx staining 116-117.0'
	118.0	64	5.0	3.2		118.0		
120							Quartz sand; fine to med. grnd.; shell frag.	secondary infilling
	123.0	100	5.0	5.0		123.8		
125	125.0	0	4.0	0	Cav.	125.0	Dololutite; white to lgt. gray; mod. broken w/very broken zone @ 134.5-135.0'; hard 122.5-133.0'; soft to med. soft 133.0-135.0'; very abundant bioclasts on bedding plane @ 131.0'; bedding @ 15° w/jointing @ 75°	
130	130.0	60	5.0	3.0				
135	135	88	5.0	4.4		135.0	6" clay layer; mixed w/above material	
	140	88	5.0	4.4			Calcarenite; lgt. brown or tan; med. to crse. grnd.; relatively unbroken; bedding @ low angles W/vertical jointing @ 136.0' & 137.0'; broken zone @ 139.0'-140.0'	Med. soft
						143.0		
145	145	92	5.0	4.6		145.0	Doloarenite; dark brown; vuggy; med. hard to hard; mod. broken	
	150	98	5.0	4.4			Calcarenite; as above; v. broken @ 147.0' & 150.0'; med. grnd.; med. soft; thinbedded	

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2G-48 (Revised 1-15-68)

GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 3 OF 3

DATE

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. A-1

CONTRACTOR SITE AREA ELEV.

CORE SIZE COORDINATES ANGLE

CASING BEARING

LOGGED BY: GWL DEPTH

Depth	Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation, etc.
155 150	92	5.0	4.6		155.0	As above	
					157.5	Brown quartz sand; fine to med. grnd. becoming crse. at base	
160 160	78	5.0	3.9		160.0	Calcarenite; lgt. brown as calcarenite above; vertical joint 159.5'	med. soft-med.hard
165 165	46	5.0	2.3		165.0	Doloarenite; dark brown; vuggy; med. soft to hard; mod. broken; fine to med. grnd.; bedding @ 10-15°; no apparent jointing	
170 170	86	5.0	4.3			Calcarenite; lgt. brown or tan; high calcium content; thin bedded; bedding @ 10-15°; jointing @ 90°; unit relatively unbroken between bedding planes; unit med. soft to med. hard	massive unit
175 175	100	5.0	5.0				
					176.0	4" layer of brown clay; v. stiff; mixed w/calcarenite	
180 180	88	5.0	4.4			180' partially dolomitized layer, somewhat darker in color (as above calcarenite) broken from 185.0-186.0'	
185 185	88	5.0	4.4		186.0		
190 190	76	5.0	3.8		190.0	Doloarenite; dark brown; v. broken; med. hard to hard; fine grnd. crystaline texture; joint @ 75°; bedding @ low angles	
					194.5	Brown quartz sand; fine to med. grnd.; high calcium content	
195 195	64	5.0	3.2			As above- doloarenite; broken; med. hard to hard; crystaline texture; jointing near vertical	
200 200	96	5.0	4.8		200.0		
205						T. D. 200.0'	

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GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 1 OF 3

DATE

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. A-2

CONTRACTOR Girdler Foundation SITE AREA Crystal River Unit #4 ELEV. 98.08'

CORE SIZE 2 3/4" COORDINATES +(5+65) ANGLE vertical

CASING 4" s(0+00) BEARING

LOGGED BY: GWL DEPTH 191.0'

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation, etc.
								2" s/s
								140 lb hammer
								30" drop
5	5.0					5.0	Fill	
	6.5	4/5	1.5			6.5	Loose to med. dense; calcareous sand; abundant organic matter	1-7-21
					N.R.		No recovery; rock bit	
10	10	0	4.5	0		10.0		
	11.0	5/5	1.0			11.0	V. dense; calcareous sand; med. to crse. grnd.	23-50
	13.0	5	2.0	1			Bioclastic polcalcarenite; white to lgt. gray; broken	
15	14.2	100	1.0	1.5			11-14'; med. broken 14-21.0'; v. broken 21-24.5'; med.	
	16.0	85	2.0	1.7			soft to med. hard; FeOx staining 13.0', 14.0', 16-21.0';	
							abundant bioclasts; poorly cemented; fine to med. grnd.;	
20	21.0	92	5.0	4.6			bedding @ 15-25°; jointing @ 15' & 60°	
	24.5	34	3.5	1.2		24.5		
25						25.5	Biopelcalcarenite; white to lgt. tan; entire unit v. broken; soft to med.	
	29.5	70	5.0	3.5		29.5	hard; fine to med. grnd.; bedding @ 25°; jointing @ 60-75°; poorly cemented	
30							Calcareous sand; decomposed calcarenite; fine to med. grnd.; was cored	
							Biopelcalcarenite; white to lgt. gray; v. broken throughout; fine to crse, grnd; poorly cemented; FeOx staining	
35	36.6	24	5.0	1.2			34.5-44.5'; highly calcareous; bedding at low angles;	
							jointing non-apparent	
							27.5-34.5' soft to med. soft	
	39.5	82	5.0	4.1			34.5-52.0' med. soft to med. hard w/very soft zone	
40	42.0	48	2.5	1.2			@ 41.5'	
	44.5	40	2.5	1			34.0-52.0' sparry zone	
45	49.5	80	5.0	4.0				
	52.5	27	3.0	1		52.0		
50						52.5	~~Small layer of greenish black marine clay; stiff; biopelcalcarenite frag.~~ within	
	55.5	0	3.0	0	N.			
	57.5	0	2.0	0	R.		No recovery	
60	60.5	0	3.0	0		60.5		
	62.0	5/5	1.5				V. dense dolomitic silt; v. fine grnd.; low calcium content;	42-43-43
	63.5	5/5	1.5			63.6	becoming more crse. grnd. w/depth	50-50-49
65					N.			
					R.		No recovery	
	68.5	0	5.0	0		68.5		
	69.5	5/5	1.0			69.5	As next above	67-113
					N.			
	77.5	0	8.0	0	R.		No recovery	
75								

GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 2 OF 3

DATE

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. A-2

CONTRACTOR Girdler Foundation SITE AREA Crystal River Unit #4 ELEV. 98.08'

CORE SIZE 2 3/4" COORDINATES ±(5+65) ANGLE

CASING " ±(0+02) BEARING

LOGGED BY: GWL DEPTH 191.0'

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation, etc.
75.0	75.0	0	3.5	0			As above	106-100
	77.0	2/5	1.0				78.5-80.0' crse. grnd.; dolomitic silt w/doloarenite frag.; med. dense	11-11-11
	76.5	0	1.5	0				
80	78.0	2/5	1.5					
	81.0	0	1.0	0		81.0		
							Doloarenite; sugary; lgt brown or tan; slightly bioclastic; broken 81-85.5'; v. broken 87.5-92.5'; med. soft to med. hard 81.0-85.5'; soft to med. soft 87.5-92.5'; bedding at low angles; jointing @ 60-75°; FeOx staining @ 83.0'	
85	85.5	42	4.5	1.9		86.5		
	87.6	0	2.0	0		V010 87.5		
90								
	92.5	44	5.0	2.2		92.5		
							Doloarenite; spongy; brown to dark gray; broken 92.5-101.0'; mod. broken 101-102'; very low calcium content; grades into marbleized dolomite which runs from 98.0-102.0'; bedding @ 25° w/jointing @ high angles 75°	92.5'-98.0' med. soft 98.0-102' hard
96	96.0	50	3.5	1.7				
100	101.0	60	5.0	3.0		102.0		
						102.5	~~Dolomitic silt w/1" black clay layer at base~~	
						104.0	Doloarenite; as above	
105	106.0	80	5.0	4.0			Dololutite; white w/gray doloarenite frag.; unit mod. broken; decomposed & silty 104-106'; soft to med. soft 104-112'; med. hard to hard 112-116'; bedding @ 15-25°; no apparent jointing	
110	111.0	80	5.0	4.0			114" 1" layer of black organic clay; med. stiff	
115	116.0	92	5.0	4.6		116.0		
						119.0	Doloarenite; tan or lgt. brown; bioclastic 1st fracture; relatively unbroken; hard to v. hard; bedding @ 15°; jointing @ 60°;	
120	121	84	5.0	4.2		120.6	~~Doloarenite; white; plumose pattern; hard; low calcium content~~ ~~clay; stiff; brownish black mixed w/above doloarenite~~	
							Doloarenite; sugary; lgt. tan; mod. broken; marbleized @ base; (black clay layers-med. stiff 122.0' & 123');	
125	126	90	5.0	4.5		126	med. hard to hard; bedding @ 20°; joint near vertical @ 126'	
							Dololutite; white w/gray streaks; mod. broken 126-131'; relatively unbroken 131-135' w/very broken zone @ 133.5'; v. soft to med. soft 126-131'; med. hard to hard 131-135'; soft @ 133.5'; bedding @ 15°; no apparent jointing	
130	131	170	5.0	8.5				
135	136.0	100	5.0	5.0		130.0 133.5	~~Brown clay; med. stiff; abundant organic material~~	
							Calcarenite; brown; crse. grnd.; broken 135.5-138'; relatively unbroken 138-141'; med. soft 135.5-138'; med. hard 138-141'; bedding @ low angles; jointing @ 137.8' (vertical)	
140	141	100	5.0	5.0				
145	146.0	100	5.0	5.0			As above; mod. broken; vertical joint @ 145.5'; soft zone @ 149.0'	
150								

POOR ORIGINAL

0061

GAI-228 1/68

2G-51 (Revised 1-15-68)

GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 3 OF 3

DATE

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. 4-2

CONTRACTOR Girdler Foundation SITE AREA Crystal River Unit #4 ELEV. 98.08'

CORE SIZE 2 3/4" COORDINATES +(5+65) ANGLE

CASING 4" s(0+00) BEARING

LOGGED BY: GWL DEPTH 191.0'

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation, etc.
155	155.0	100	5.0	5.0			Mod. broken; thin bedded; soft to med. hard	C
	156.0	50	5.0	2.5			Relatively unbroken 156-158.5'; very broken 158.5-161.0'; med. soft; soft in very broken zone	A
160	161.0	92	5.0	4.6				L
165	166.0	84	5.0	4.2			Mod. broken; v. broken 165-166'; med. soft 161-165'; v. soft 165-166'	C
170	171.0	74	5.0	3.7			Mod. broken; med. soft to soft	A
175	176.0	68	5.0	3.4			V. broken @ 171-174'; mod. broken 174-176' soft 171-174'; med. soft 174-176'	R
						178.0	Calcarenite	E
180	181.0	100	5.0	5.0		178.3	(Broken, Med. soft)(Brown clay; v. stiff @ 178'- about a 3" layer)	N
185	186	100	5.0	5.0			Broken to v. broken; med. soft w/soft zones @ 183' & 186'	I
						187		T
190	191	72	5.0	3.6			Doloarenite; dark brown; mod. broken; med. hard; fine grnd.; somewhat crystal texture; slightly spongy; bedding @ 15-25°; jointing @ 60°	D
195							T. D. 191.0'	

0067

GAI-228 1/66

GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 1 OF 3

DATE

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. 4-3

CONTRACTOR Girdler Foundation SITE AREA Crystal River Unit #4 ELEV. 98.52'

CORE SIZE 2 3/4" COORDINATES +(6+64) ANGLE

CASING S(0+00) BEARING

LOGGED BY: GWL DEPTH 175.0'

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation, etc.
							Fill	2" s/s 300 lb hammer 18" drop
5	5.0					5.0		
	6.5	5/5	1.5			6.5	Black quartz sand; med. dense to dense w/calcareous sand & base 6.0-6.5'	2-12-25
					N.R.		No recovery	
10	10	0	3.5	0		10.0		
	11.5	4/5	1.5			11.5	V. dense; decomposed calcarenite; crse. grnd.	28-31-50
					N.R.		No recovery	
15	16.0	0	4.5	0		16.0		
	19.5	63	3.5	2.9			Bioclastic pelcalcarenite; white to lgt. gray; mod. broken w/broken zones @ 19.0', 23.5'; med soft, to med. hard; FeOx staining 21.0'; abundant bioclast; bedding @ low angles @ 15°; jointing @ 60°	
20	23.5	72	5.0	3.6				
	29.0	42	3.0	2.1		29.0		
30							Biopelcalcarenite; white to lgt. gray; entire unit is broken to v. broken; soft to med. soft; fine to med. grnd.; poorly cemented; bedding @ 20°; jointing @ 60°	
	34.5	26	5.0	1.3				
35	39.5	19	4.5	.6				
	43.0	53	3.0	1.6		43.0		
	46.0	33	3.0	1.0			Sparry zone; as above biopelcalcarenite; numerous bioclasts @ 43.0'; FeOx staining @ 46.0'; med. soft to med. hard	
40	48.0	53	3.0	1.6		48.0		
					N.R.		No recovery	
	51.0	0	3.0	0		51.0		
	53.5	38	4.5	.6		54.0	As above; sparry zone; v. broken; med. soft w/FeOx staining @ 53.5'	
55	56.0	44	2.5	1.1		56.0	V. stiff; black marine clay mixed w/calcarenite frag.	
							Dolosrenite; lgt. tan; sugary texture; broken; soft to hard becomes v. soft @ base; bedding @ 15°; jointing @ high angles @ 75°; fine grnd.; FeOx staining @ 58.5'	
60	61.0	10	5.0	.5		61.0		
					N.R.		No recovery	
	63.5	0	3.5	0				
65	66.0	0	2.5	0		66.0		
	67.5	3/5	1.5			67.5	Dolomitic silt; v. dense; low calcium content; v/ fine grnd.	100-133-160
	70.0	0	2.5	0	N.R.	70.0	No recovery	
70							Doloarenite; as above; med. hard to hard; mod. broken; fine grnd.; bedding @ 25°; no apparent jointing	
	73.0	33	3.0	1.0				
75								

0063 POOR ORIGINAL

GAI-228 1/66

2G-53 (Revised 1-15-68)

GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 2 OF 3

DATE

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. 4-3

CONTRACTOR SITE AREA ELEV.

CORE SIZE COORDINATES ANGLE

CASING BEARING

LOGGED BY: GWL DEPTH

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation, etc.
75	78	64	5.0	3.2		78.0	As above; relatively unbroken; hard; bedding @ 25°; jointing @ 75°	Avon Park unconformity
80	83	54	5.0	2.7			Spongy doloarenite; dark brown to gray; lignite throughout; partially marbleized @ 81-83'; low calcium content; bedding @ low angles @ 15° w/jointing @ high angles @ 75°	
85	88	68	5.0	4.4			78-83' mod. broken; 83-85' broken; 85-90' mod. broken w/a v. broken zone @ 87'; 90-98' relatively unbroken; 78-84' hard; 84-85' med. soft; 85-87' hard; 87-89' med. hard; 89-91' med. soft w/soft zone @ 89.5'; 91-98' med. hard to hard	
90	93	100	6.0	5.0				
95	99	90	5.0	4.5		98.0		
100						100.0	V. stiff; greenish black clay; brown dolomite frag. within	
	101	53	3.0	1.6			Dolutite; white w/gray doloarenite frag.; entire unit broken to v. broken; soft to med. soft; bedding @ 15-25°; no apparent jointing; high calcium content	
105	106	84	5.0	4.2		109.0		
110	111	60	5.0	3.0		111.0	Calcilutite; white; soft; broken; fine grnd.; high calcium content	
							Dololutite; as above dololutite; soft to med. soft; mod. broken to broken; bedding @ 15°	
115	116	66	5.8	3.3		115.0	Stiff; brown clay 3" layer	
120	121	100	6.0	5.8		122.0	Doloarenite; lgt. brown or tan; slightly spongy; relatively unbroken; hard to v. hard @121'; low calcium content; small vuggs @ 118'; bedding @ 15-25°; jointing @ 60°	
	124	90	3.0	2.7		125	V. stiff; black marine clay 3" layer	
125							Doloarenite; as above	
							Stiff; black marine clay mixed with doloarenite	
130	129	100	5.0	5.0		130.0	Doloarenite; lgt. brown or tan; relatively unbroken; hard; bedding @ low angles; jointing @ 60-75°	
	134	84	5.0	4.2		134.0	Calcilutite; white to lgt. gray; gradual change from above doloarenite; broken; med. soft	
135							Calcarenite; white to lgt. gray; broken thin bedded; high calcium content; soft to med. soft; partially dolomitized @ 137'	
	139	100	5.0	5.0		135.5	Brownish black very stiff clay	
140	144	96	5.0	4.8			Calcarenite; lgt. tan; med. to crse. grnd.; mod. broken; high calcium content; partially dolomitized @ 143-144'; thin bedded w/bedding @ 15°; jointing @ 60-75°; med. soft to med. hard	
145	149	96	5.0	3.8				
150								

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GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 3 OF 3

DATE

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. 4-3

CONTRACTOR Girdler Foundation SITE AREA Crystal River Unit #4 ELEV.

CORE SIZE COORDINATES ANGLE

CASING BEARING

LOGGED BY: GWL DEPTH

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation etc.
							149.0-154.0' As above; mod. broken @ 149-153'; very broken 153-154'; mod. soft to med. hard	CALCARENITE
150	154	100	5.0	5.0				
	159	84	5.0	4.2			154-159' As above; broken 154-157.5'; unbroken @ 157.5-159'; soft to med. soft	
160								
165	165	83	6.0	5.0		165.0	159-165' As above; mod. broken 159-164'; v. broken @ 164-165'; med. soft; vertical joint @ 165'	
						168.0	Dolarenite; as above; calcarenite only dolomitized; relatively unbroken; med. hard	DOLARENITE
170	170	100	5.0	5.0			Calcarenite; as above; mod. broken; med soft to med. hard; soft @ 174.5-175'; bedding @ 15-25°; jointing near vertical	
175	175	100	5.0	5.0				
							T. D. 175.0'	

0005

GAI-228 1/66

2G-55 (Revised 1-15-68)

GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 1 OF 3

DATE

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. 4-4

CONTRACTOR Girdler Foundation SITE AREA Crystal River Unit #4 ELEV. 98.70'

CORE SIZE 2 3/4" COORDINATES +(7+65) ANGLE vertical

CASING 4" s(0+00) BEARING

LOGGED BY: GWL DEPTH 176.0'

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation, etc.
0	5.0					5.0	Fill	140 lb hammer 2" s/s 30" drop
	6.5	5/5	1.5			6.5	Loose; black quartz sand	6-2-4
10	10.0	0	3.5	0	NR	10.0		
	11.5	3/5	1.5			11.5	Decomposed calcarenite; v. dense; fine grnd.	50-30-21
15	15.0	0	3.5	0	NR			
	18.5	2/5	3.5			18.5	Decomposed calcarenite; v. dense; med. to crse. grnd.	50
20	20.0	100	4.6	4.5			Bioclastic pelcalcarenite; white to lgt. gray; mod. broken; abundant bioclasts; med. to crse. grnd.; mod. hard 15.5-19'; soft 19-25'; bedding @ 15-25°; jointing @ 70°; slight oxidation @ 18.5'	
25	25.0	60	5.0	3.0		~25.0		
30	31.0	31	6.0	1.9			Biopelcalcarenite; white to lgt. gray; poorly cemented; broken 25-32'; mod. broken 37-56' w/very broken zone @ 40.5'; FeOx staining 31', 37', 55'; intense FeOx staining @ 42'; bedding @ 15° with jointing @ 60-75°; mod. hard 25-27'; soft 27-30'; med. hard 30-39'; soft 39-41'; med. soft 41-46' as above	sparry zone 48-50'
35	36.0	30	5.0	1.5				
40	41.0	46	5.0	2.3			As above	
45	46.0	52	5.0	2.6				
50	51.0	34	5.0	1.7				
55	56.0	26	5.0	1.3		96.0		
60	61.0	36	5.0	1.8			Sugary dolocarenite; lgt. brown or tan; relatively unbroken 56-66'; broken 66-76'; hard to med. hard 56-65.5'; soft 65.5-66'; med. soft to med. hard 66-71'; soft to med. soft 71-76'; fine grnd.; bedding @ 25°; jointing @ 60-75°; slight FeOx staining @ 70'	
65	66.0	40	5.0	2.0				
70	71.0	44	5.0	2.2				
75	76.0	12	5.0	0.6				

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GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 2 OF 3

DATE

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. 4-4

CONTRACTOR Girdler Foundation SITE AREA Crystal River Unit #4 ELEV.

CORE SIZE COORDINATES ANGLE

CASING BEARING

LOGGED BY: GWL DEPTH

Depth	Depth @ Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation, etc.
					76.5	As above	
80	81.0	5.0	2.8			Spongy doloarenite; dark gray to brown; mod. broken throughout; med. hard to hard; coarsely bioclastic 82-86'; slight FeOx staining @ 83'; bedding @ 25° w/ jointing @ high angles; vertical joint @ 85'	
85	86.0	5.0	4.7		86.0		
90	91.0	5.0	4.0			Doloarenite; dark brown; partially marbleized; lignite inclusions; relatively unbroken @ 86-94' w/very broken zone @ 88.5'; broken 94-97'; med. hard to hard; soft @ 88.5'; bedding @ 15°; jointing @ 60-75°	
95	96.0	5.0	5.0			95.5' small 2" peat layer laminated w/stiff black marine clay	
					97.0		
					98.0	Stiff; brown and black clay layer; thinly laminated	
100	101	5.0	5.0		101.0	Dololutite; white w/gray dolomite frag.; broken to mod. broken; med. hard to soft	
					103.0	Calcilutite; white; unbroken; fine grnd. w/bedding @ 15°	
105	106	5.0	5.0			Dololutite; white w/gray dolomite specks; broken @ 103-107'; v. broken 107-111'; mod. broken 111-116'; soft to med. soft throughout; bedding @ 15°; thin bedded; jointing @ 60°; high calcium content	
110	111	5.0	4.0				
115	116	5.0	5.0		116.0		
120	121	5.0	6.0			Doloarenite; lgt. brown or tan; mod. broken; med. hard to hard; fine grnd.; slightly spongy; bedding @ 15-25°; jointing @ 60°	
125	126	5.0	5.0		125.0	Brown, v. stiff clay layer @ 3"	
					126.0	Calcilutite; white; fine grnd.; high calcium content; soft	
					128.0	Doloarenite; as above	
130	131	5.0	5.0			Dololutite; white to lgt. gray; mod. broken w/broken zone @ 130.5'; med. soft to hard	
					132.5	V. stiff brown marine clay	
					133.0		
135	136	5.0	5.0		134.0	Dololutite; as above	
						Calcarenite; lgt. brown or tan; fine to med. grnd.; high calcium content; partially dolomitized @ 137-140'; bedding @ 15°; no apparent jointing	soft 134-135.5' med. hard to hard 135.5-140'
140	141	5.0	5.0		140.0		
					141.0	4" v. stiff balck marine clay layer	
145	146	5.0	5.0			Calcarenite; as above; mod. broken; med. grnd.; med. soft to med. hard	
						2" brown, v. stiff, clay layer @ 142.5'	
150	151	5.0	5.0				

POOR ORIGINAL

0067 0051

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2G-57 (Revised 1-15-68)

GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 3 OF 3

DATE

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. 4-4

CONTRACTOR SITE AREA ELEV.

CORE SIZE COORDINATES ANGLE

CASING BEARING

LOGGED BY: GWL DEPTH

Depth			Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION Rock type, color, grain sizu & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS Condition of core. Excavating evaluation, etc.
155	156	100	5.0	5.0			Mod. broken; med. hard	CALCARENITE
160	161	100	5.0	5.0			Mod. broken w/broken zone @ 160.5'; med. soft to med. hard; soft 160-161'	
165	166	100	5.0	5.0			Mod. broken; med. hard; partially dolomitized @ 162-164'	
170	171	100	5.0	5.0			Mod. broken; med. soft to med. hard; vertical joint @ 167.5'	
175	176	100	5.0	5.0			As above	
180							T. D. 176.0'	

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GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 1 OF 3

DATE

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. 4-5

CONTRACTOR Girdler Foundation SITE AREA Crystal River Unit #4 ELEV. 98.45'

CORE SIZE 2 3/4" COORDINATES +(8+65) ANGLE vertical

CASING s(0+00) BEARING

LOGGED BY: GWL DEPTH 175.0'

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation, etc.
5	5.0						Fill	2" s/s 140 lb hammer 30" drop
	6.5	5/5	1.5				V. loose to loose; dark quartz sand; organic mat'l	5-2-1
10	10.0	0	3.5	0	NR			
							Dense to v. dense; decomposed calcarenite	10-15-27
15	15.0	0	3.5	0	NR	15.0	Begin coring @ 15.0'	
	17.5	100	2.5	2.5	1		Bioclastic dolcalcarenite; white to lgt. gray; med. to crse. grnd.; poorly cemented; mod. broken to broken; med. soft to mod. hard w/soft zone @ 23'; oxidation @ 16.5'; bedding @ 15-20°; jointing @ 17' @ 60°	
20	22.5	60	5.0	3.0	2			
25	26.0		3.5	3	3	~26.0		
	31.0	40	5.0	2.0			Biopelcalcarenite; white to lgt. gray; well cemented w/ calcite as the cementing agent; concretions having a somewhat banded appearance; pink & black @ 32.5' & 41'; FeOx staining @ 32' & 43"; bedding @ 15-25°; jointing @ 60°	sparry zone 31-55'
35	36.0	70	5.0	2.0			26-31' broken; 26-31' soft to med. hard 31-36' V. broken; 31-46' med. soft to hard 36-42' mod. broken 42-46' v. broken	
40	42.0	60	6.0	3.6				
45	45.0	100	3.0	3.0		46.0		
	46.0	100	1.0	1.0				
50	50.0	77	4.0	3.1		50.0	Quartz sand; med. to crse. grnd.; secondary infilling	
55	55.0	66	5.0	3.3		55.0	As next above; broken; soft to med. soft; FeOx staining 51-55'	
60					CAVITY	CAVITY	CAVITY	
65	64.5	0	9.5	0		65.0		
70	70.0	6	5.0	.3		73.0	Small nodular pieces of chert & calcite; v. hard; probably formed through fauna concretions; high calcium content	
75	75.0	20	5.0	1.0			Sugary dolcarenite; lgt. tan; broken; med. hard to hard	

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GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 2 OF 3

DATE

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. 4-5

CONTRACTOR SITE AREA ELEV.

CORE SIZE COORDINATES ANGLE

CASING BEARING

LOGGED BY: GWL DEPTH

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation, etc.
80	80	10	50	.5		81.0	Sugary doloarenite; lgt. tan; v. [illegible]oken; soft to med. hard; fine grnd.	
85	85	50	5.0	2.5			Spongy doloarenite; lgt. gray changing to dark brown w/[illegible]; lignite traces throughout; v. broken 81-82'; mod. broken 82-87'; v. broken 87-90'; mod. hard to hard 81-87'; soft to med. soft 87-90'; bedding ∠ 15-25°; jointing ∠ 60-75° w/vertical joints ∠ 81.0'	lignite traces 81', 87' & 88.0'
90	90	94	5.0	4.7		90		
95	94	72	4.0	2.9			Doloarenite; lgt. gray; lignite traces throughout; mod. broken; mod. hard to hard w/soft zones [illegible]'; bedding ∠ 15° w/[illegible] ∠ high angle; vertical joints 92-93'	
100	96	65	2.0	1.3				
	101	36	5.0	1.8		100.0	Soft black marine clay	
	102	100	1.0	1.0		[illegible]	[illegible] as above	
105	106	100	4.0	4.0			Doloarenite; lgt. gray to white; mod. broken 102-[illegible]'; v. broken 103-104'; relatively unbroken 104-107'; v. broken 107-111'; mod. soft to soft w/hard zone 101-103'; bedding ∠ 15°; no apparent jointing; high sulfur content	
110	111	100	5.0	5.0		111.0	Sand [illegible]; white to lt. tan; mod. hard; fine grnd.	
115	116	100	5.0	5.0		112.0	Doloarenite; lgt. tan; relatively unbroken; [illegible]; spongy w/vugs ∠ 117'; hard w/soft zone 115-116' & 123-124'; bedding ∠ 15°; no apparent jointing	
120	121	96	5.0	4.8			As above	
125	126	100	5.0	5.0		126.0	Dolomitic; white w/gray [illegible]; [illegible]; mod. broken 126-128'; mod. broken 128-133'; broken 133-136'; soft 126-129.5'; hard 129.5-131'; soft 131-136'; bedding ∠ [illegible]	
130	131	94	5.0	4.7				
135	136	86	5.0	4.3		136.0	Doloarenite; lgt. gray; relatively unbroken; V. hard; bedding ∠ 15°; no apparent jointing	
140	141	80	5.0	4.0		140.0	Calcarenite; lgt. brown or tan; mod. broken w/broken zone ∠ 140.5'; mod. hard; thin bedded w/bedding ∠ 15°; jointing is vertical w/vertical joints ∠ 142.5-142.6', 142.8-143.0'	3" brown stiff clay layer
145	146	100	5.0	5.0				
150	151	100	5.0	5.0				

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GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 3 OF 3

DATE

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. 4-5

CONTRACTOR SITE AREA ELEV.

CORE SIZE COORDINATES ANGLE

CASING BEARING

LOGGED BY: GWL DEPTH

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation, etc.
155	156	100	5.0	5.0		151-156	Mod. broken w/broken zone @ 155-156'; med. hard; vertical joint 155-156'	C A L C A R E N I T E
						156-161	Mod. broken. med. soft to med. hard	
160	161	100	5.0	5.0			Mod. broken; partially dolomitized 162-164'; med. hard to hard	
165	166	90	5.0	4.5		161-166		
						166-170	Mod. broken to broken; med. soft	
170	170	100	4.0	4.0		170-175	Mod. nroken; vertical jointing; med.hard	
175	175	100	5.0	5.0				
							T. D. 175.0'	

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GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 1 OF 3

DATE 7-27-67

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. A-3

CONTRACTOR Girdler Foundation SITE AREA Crystal River Unit #3 ELEV.

CORE SIZE EX COORDINATES +(0+65) ANGLE vertical

CASING 85' of 4" FJC s(0+00) BEARING

LOGGED BY: GWL DEPTH 80.5'

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation, etc.
5							Not sampled	started coring at 16' set 16' of 4" casing
10								
15								
20	21.0	34	5.0	1.7			Bioclastic pelcalcarenite; lgt. cream color; med. hard; broken ; trace of FeOx discoloration; competent portion begins at 20'	
25	26.0	66	5.0	3.3		~24.0	Biopelcalcarenite; cream colored; mod. soft; mod. broken to broken; poorly cemented; some FeOx staining	
30	31.0	26	5.0	1.3		31.0		
35	36.0	12	5.0	0.6			As above w/chert-like inclusions; nodular; med. soft to med. hard; some oxide staining	
40	41.0	34	5.0	1.7			As above 36-41' broken; poorly cemented; sparry; nodular; mod. soft 41-46' broken; med. hard to hard, good cement; high vertical joints; FeOx stained	
45	46.0	26	5.0	1.3			46-55' v. broken; soft w/med. hard nodules; very low recovery	set 45' of 4" FJC
50	51.0	8	5.0	0.4				
55	56.0	30	5.0	1.5		55.0		
60	61.0	18	5.0	0.9			Bioclastic pelcalcarenite; sparry; soft with hard frag.	set 60' of 4" FJC
65	66.0	34	5.0	1.7		~65.		
70	71.0	14	5.0	0.7		71.0	Dolcarenite; sugary texture; v. broken; low recovery w/ only med. hard frag. recovered; bioclastic from 66-71'	
75	76.0	0	5.0		WR	76.0	No recovery	

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2G-62 (Revised 1-15-68)

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GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 2 OF 2

DATE

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. 4-6

CONTRACTOR SITE AREA ELEV.

CORE SIZE COORDINATES ANGLE

CASING BEARING

LOGGED BY: GWL DEPTH

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation, etc.
80	81.0	16	5.0	0.3		81.0		
85	86.0	60	5.0	3.0		86.0	Bioclastic doloarenite; tan-gray marbleized; hard to v. hard (below 82')	
90	91.0	88	5.0	4.4			Bioclastic doloarenite; spongy texture; unbroken; tan to brown w/lignite inclusions	Avon Park
	93.0	80	2.0	1.6		93		
95	95.0	55	2.0	1.1		95	Doloqubite; gray; hard; unbroken w/white & root-like inclusions; vertical joint for entire unit; weathered	
100	100	18	5.0	0.9			Calcilutite; white to lgt. gray; med. soft to med. hard; pasty texture; recovered core is relatively unbroken; contains some blue inclusions 95-100' med. soft to med. hard; poor recovery; trace of recovered frag.	fresh rock
105	105	32	5.0	1.6		105.0	100-105' med. soft to med. hard; low recovery; blue inclusions	
110	110	56	5.0	2.8			Calcarenite; tan; hard; relatively unbroken; massive unit; vertical joint from 105-106'	fresh rock
115	115	48	5.0	2.4				
120	120	70	5.0	3.5				
						122.0		
125	125	74	5.0	3.7		125.0	Calcilutite; lgt. gray; med. hard; silty laminated zone at top of unit; poorly textured w/some concretions	fresh
130	130	88	5.0	4.4		131.0	Calcarenite; as next above	fresh
135	135	54	5.0	2.7			Calcarenite; as next above w/some blue inclusions	fresh
140	140	60	5.0	3.0			Calcarenite; as next above; broken; med. hard	
							End of boring @ 140.0'	

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2G-63 (Revised 1-15-68)

GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 1 OF 3

DATE

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. 4-7

CONTRACTOR Girdler Foundation SITE AREA Crystal River Unit #4 ELEV. 99.56'

CORE SIZE 2 3/4" COORDINATES +(4+65) ANGLE

CASING s(2+00) BEARING

LOGGED BY: GWL DEPTH 200.0'

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation, etc.
5							Fill	2" s/s 140 lb hammer 30" drop
10	10.0					10.0		
	11.5	5/5	1.5	.5		11.5	Dense; decomposed calcarenite; fine grnd.	8-16-7
15	15.0	0	.25	0	NR	15.0	No recovery (rock bit)	
	16.5	5/5	1.5	.8		16.5	Med. dense to dense; decomposed calcarenite; fine grnd.	9-10-14
20	20.0	0	3.5	0	NR	20.0	No recovery	
	21.5	5/5	1.5	.6		21.5	Dense to med. dense; decomposed calcarenite; becomes more loose @ base	16-8-4
25	25.0	0	3.5	0	NR	25.0	No recovery	
	27.0				CLC		Bioclastic pelcalcarenite; white to lgt. gray; mod. broken w/broken zone @ 30.4'; slight FeOx staining @ 26 & 27.5'; abundant bioclasts; bedding @ 15-25°; jointing @ 60°	med. hard 25-30'; med. soft to med. hard 30-34.5'
30	30.0	86	3.0	2.6				
35	34.5	35	5.0	1.9		34.5		
	38.0	36	3.0	1.1			Biopelcalcarenite; white to lgt. gray; broken to v. broken; med. soft to med. hard 34.5-35'; v. soft 35-41'; med. soft 41-46'; bedding @ 25°; jointing 60-75°; poorly cemented; med. to crse. grnd.	
40	41.0	20	3.0	.6				
	44.0	30	3.0	.9				
45	46.0					~46.0		
	47.0	57	3.0	1.7				
50	50.0	47	3.0	1.4			Sparry zone; biopelcalcarenite; as above w/numerous sparry fossils 46-50' broken 50-53' mod. broken 53-61' mod. broken 61-64' relatively unbroken 64-70' v. broken 47-50' med. soft to soft 50-53' med. hard 53-56' soft 56-60' med. soft 61-70' med. soft to med. hard 64-70' extremely bioclastic	FeOx staining 64-70'
55	53.0	90	5.0	1.5				
	58.0	50	3.0	1.5				
60	61.0	57	3.0	1.7				
	64.0	60	3.0	1.8				
65	67.0	30	3.0	.9				
70	70.0	30	3.0	.9		70.0		
	73.0	0	3.0	0	NR	73.0	No recovery	
75	75.0	15	2.0	.3		75.0	Marine clay; black; stiff	Sample was cored

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GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 2 OF 3

DATE

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. 4-7

CONTRACTOR SITE AREA ELEV.

CORE SIZE COORDINATES ANGLE

CASING BEARING

LOGGED BY: GWL DEPTH

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation, etc.
80	80	22	5.0	1.1			Doloarenite; lgt. brown or tan; Inglis formation; sugary; mod. broken 75-80'; v. broken 80-83'; med. hard to hard 75-80'; soft to med. soft 80-83'; bedding @ 25° and jointing @ 75' @ 60-75°	2" s/s 140 lb hammer 30" drop
	83	23	3.0	.7		83.0		
85	86	0	3.0	0	NR	86.0	No recovery	
	87.5	5/5	1.5	3		88.0	Dolomitic silt w/small layer of marine clay @ 86'; v. dense	24-28-29-60
90	88		3	3				
	91.0	100	3.0	3.0			Doloarenite; gray to dark brown; spongy; gradational change into bioclastic doloarenite @ 90'; relatively unbroken 88-91'; broken 91-103'; v. broken 103-104'; hard to v. hard 88-90'; med. hard to hard 90-103'; med. soft 103-104'; bedding @ 15-30°; jointing 60°	unit becomes darker w/depth
95	94.0	33	3.0	1.0				
	99.0	52	5.0	2.6				
100	104	44	5.0	2.2		104.0		
105	109	22	5.0	1.1		109.0	Calcarenite; tan or lgt. brown; mod. broken; v. soft to mod. soft; fine to med. grnd.; somewhat of spongy texture; high calcium content	
110	112	87	3.0	2.6		112.0	Dololutite; white w/gray particles; mod. broken; hard 109-110'; soft to med. soft 110-112'	
115	116	43	4.0	1.7		117.0	Calcilutite; white; v. broken to broken; med. hard 112-114'; soft to med. soft 114-117'; silty @ 117-118'; high calcium content; bedding @ low angles	
120	119	100	3.0	3.0			Calcarenite; white to lgt. tan; mod. broken; high calcium content; bedding @ 15-25°; jointing @ 60°; med. soft 117-120'; med. hard 120-123'	
	124	88	5.0	4.4		123.0		
125	129	62	5.0	3.1			Doloarenite; lgt. gray; med. hard to v. hard @ 123'; mod. broken w/ v. broken zone @ 131-132'; fine to med. grnd.; bedding @ 15°; jointing @ 60-75°	
130	132	80	3.0	2.4		132		
						133.0	Clay; med. stiff; brown; mixed w/calcareous frag.	
135	137	52	5.0	2.6			Doloarenite; white to lgt. gray; relatively unbroken; calcium content increases w/depth; hard to v. hard; bedding @ low angles; jointing near vertical @ 136'	plumose pattern
						139.0	Calcilutite; v. broken; med. soft; fine grnd.; silty @ base 1" clay layer	
140	144	80	4.0	3.2		140.0	Calcarenite; brown; fine to med. grnd.; high calcium content; bedding @ 15-25°; thin bedded; entire unit med. soft to med. hard	
145	146	50	5.0	2.5				massive unit
150	150	100	4.0	4.0			relatively unbroken (146-150'); jointing @ 60°	

GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET SHEET 3 OF 3

DATE

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. 4-7

CONTRACTOR SITE AREA ELEV.

CORE SIZE COORDINATES ANGLE

CASING BEARING

LOGGED BY: GWL DEPTH

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION	REMARKS
							Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	Condition of core. Excavating evaluation, etc.
155	155	100	50	50			150-155' relatively unbroken w/broken zone @ 154-155'	vertical joint @ 153'
160	160	98	50	49			155-165' mod. broken; jointing @ 75°	
165	165	96	50	48		165.0		
170	170	88	50	44			Calcarenite; as above; lighter color; partially dolomitized; bedding @ 15-25°; jointing 60-75°; med. soft to med. hard; FeOx staining @ 165-& 168'	
						173.0		
175	175	100	50	50			Calcarenite; As next above	
180	180	100	50	50			173-178' broken 178-179' unbroken 179-180' v. broken 180-184.5' relatively unbroken 184.5-188' v. broken 188-189' broken 175-176.5 vertical joint 173-174' med. soft to med. hard 170-180' soft 180-186' med. soft to med. hard 186-187' v. soft 187-199' med. soft to med. hard	
185	185	86	50	43				
190	190	100	50	50				vertical joint 190-192'
195	195	96	50	48				
						196.0		
					C.D.	CAVITY 196.0-200		
200	200	40	4.0	2.0			Doloarenite; dark brown; relatively unbroken; hard to v. hard; fine grnd.; bedding @ 15°; no apparent jointing	
							T. D. 200.0'	

GAI-228 1/66

2G-66 (Revised 1-15-68)

GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 1 OF 3

DATE

PROJECT Florida Power Corp. NO. 6203-02 DRILL HOLE NO. A-5

CONTRACTOR Pirnlon Foundation SITE AREA Crystal River Unit #4 ELEV. 96.78'

CORE SIZE 2 3/4" COORDINATES N(S-N) ANGLE

CASING 4" E(W-E) BEARING

LOGGED BY: GWL DEPTH 102'

Depth	Length	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core, Excavating evaluation, etc.
								140lb Hammer 30" Drop 2" O/S
2	5.0					5.0	Fill	
	6.5	3/3	1.5	1.0		6.5	Loose to v. loose calcareous sand; arse. grnd.	8-13-25
10	10.0	0	3.5	0		10.0	No recovery	
	11.5	3/3	1.5	8		11.5	Loose to med. dense decomposed calcarenite; arse. frag.	5-10-12
15	15.0	0	3.5	0		15.0	No recovery	
	16.5	3/3	1.5	3		16.5	Loose to v. loose decomposed calcarenite; as above	6-6-1
20	20.0	0	3.5	0		20.0	No recovery	
	22.0	3/3	1.0	5		22.0	Loose to v. loose decomposed calcarenite; fine to arse. grnd.	1-3-3-8
25	25.0	5/7	3.0	1.7			Bioclastic pelcalcarenite; white to lgt. gray; entire unit is broken to v. broken; med. soft to med. hard; abundant bioclasts; FeOx staining 23-33'; bedding @ 15-25°; jointing @ 60°	
30	30.0	3/4	5.0	1.7				
	33.0	2/0	3.0	0.6		33.0		
35	36.0	3/3	3.0	1.0			Biopelcalcarenite; white to lgt. gray; pinkish between 36-39'; soft to med. soft; FeOx staining @ 33' & 36'; bedding @ 15-25°; jointing @ 60-75°	
	39.0	1/7	3.0	.5		39.0		
40	42.0	0	3.0	0	N.R.	42.0	No recovery	
	44.0	6/5	2.0	1.3		44.0	As above; broken; soft (sparry zone)	
45	47.0	0	3.0	0	N.R.	47.0	No recovery	
	48.0	3/3	1.0	.3		48.0	V. dense, decomposed calcarenite; arse. grnd.; white	3-5-5
50	51.0	0	3.0	0	N.R.	51.0	No recovery	
	52.5	5/5	1.5	4		52.5	As above; decomposed calcarenite	30-37-50
55	55.0	0	2.5	0	N.R.		No recovery	
	58.0	0	3.0	0		58.0		
60	59.5	3/3	1.5	.2			Doloritic silt; low calcium content 59-59.5'; silt is mixed with calcarenite frag.	24-60-80
	61.0	3/3	1.5	.4		62.0		17-4-8
	62.0	5/8	1.0	.2				37-50
65	67.0	5/5	5.0	2.5		67.0	Doloarenite; lgt. tan to gray; partially marbleized; mod. broken; med. hard to hard; FeOx staining 62'; bedding @ 20°; jointing non-apparent	slightly bioclastic @ base
70	72.0	0	5.0	0	N.R.	72.0	No recovery	
	73.5	3/5	1.5	.3			Med. dense to dense doloritic silt; v. fine grnd.; lgt. tan; v. low CaCO3 content	11-7-22
75	75.0	3/5	1.5	.4				22-31-50

GAI-228 1/68

2G-67 (Revised 1-15-68)

GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET SHEET 2 OF 3

DATE

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. 4-S

CONTRACTOR SITE AREA ELEV.

CORE SIZE COORDINATES ANGLE

CASING BEARING

LOGGED BY: GWL DEPTH

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation, etc.
	78.0	87	3.0	2.6			Doloarenite; lgt. brown; sugary; broken 78-82'; mod. broken 82-83'; mod. hard to hard; FeOx staining @ 83'; v. fine grnd.; bedding @ 15° with jointing @ 60-75°	
80	81.0	25	4.0	1.0		83.0		
85	88.0	80	3.0	2.4			Doloarenite; lgt. brown; partially marbleized; spongy; broken throughout; med. hard to hard 83-94'; soft to med. soft 94-95'; crs. bioclastic @ 84'; bedding @ 15-25°; jointing near vertical; mod. grnd.	Inglis
90	94.0	10	5.0	.5				
	93.0	20	3.0	0.6				
95	98.0	50	2.0	1.0		95.0		
	98.0	10	3.0	.3		98.0	V. broken zone of above doloarenite; contains several small pieces of chert	
100	101.0	100	3.0	3.0		102.0	Doloarenite; dark brown; spongy; lignite traces; relatively unbroken; med. hard; thick bedded w/bedding @ 65°; jointing @ 60°	Avon Park
						102.0	Peat w/black stiff fine clay; silt laminations	
						105.5	Dololutite; mod. broken; mod. hard; low calcium content	
105	106.0	64	5.0	3.2		106.0	Stiff black clay; was cored	
110	111.0	52	5.0	2.6		111.0	Dololutite; white to lgt. gray w/dolomite frag.; mod. broken 106-109'; v. broken 109-111'; soft 106-107'; mod. hard 107-108'; mod. soft 108-111'; bedding @ 15°; vertical joint @ 109'	
						113.5	Calcilutite; white; unbroken; high Ca content; med. soft; bedding @ 25°	
115	116.0	94	5.0	4.7		116.0	Dololutite; as above dololutite; mod. broken; soft to med. soft	
120	121.0	100	5.0	5.0			Doloarenite; lgt. brown or tan; fine to med. grnd.; relatively unbroken; hard to v. hard w/soft zone @ 119.5'; thick bedded w/bedding @ low angles @ 15°; jointing @ 60-75°; near vertical joint 129.5-130'; partially marbleized @ 116-119'	
125	126.0	84	5.0	4.2				
	129.0	63	3.0	1.9		130.0		
130						130.5	Brown; V. stiff caving clay	
	134.0	94	5.0	4.7			Dololutite; as above doloarenite; mod. broken; thin bedded; med. hard to hard	
135	138.0	80	4.0	3.2		137.0	small clay layer; v. stiff; brown	
140	142.0	74	5.0	3.7			Calcarenite; lgt. brown or tan; med. to crso. grnd.; high calcium content; partially dolomitized @ 146', 148'; mod. broken w/broken zones @ 137' & 142'; med. soft to med. hard w/soft zone @ 154-156'; bedding @ 15°; jointing near vertical or 75-90°	
145	148.0	96	5.0	4.8				
150								

0078

POOR ORIGINAL

GAI-228 1/68

2G-68 (Revised 1-15-68)

GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 3 OF 3

DATE

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. 4-3

CONTRACTOR SITE AREA ELEV.

CORE SIZE COORDINATES ANGLE

CASING BEARING

LOGGED BY: GWL DEPTH

Depth	Depth Ref.	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core, Excavating evaluation, etc.
150	153	100	5.0	5.0			As above	
155						156.0		
	158	94	5.0	4.7			Doloarenite; brown; slightly spongy; dolomitized calcarenite bed found above; thin bedded with bedding @ low angles @ 15°; jointing @ 60-75°; somewhat crystal texture; fine to med. grnd.	
160							156-158' relatively unbroken med. soft to med. hard	
	163	90	5.0	4.0			158-160' broken w/soft zones @ 167' &	
165							160-167' mod. broken 184' & 197'	
	168	72	5.0	2.6			167-168' v. broken	
170							168-171' mod. broken	
	173	52	5.0	2.6			171-173' broken	
175								
	178	72	5.0	3.6		178.0		
180						178.2		med. stiff black marine clay
	183	58	5.0	2.9			173-182' mod. broken	
185							182-185' v. broken to broken	
	188	88	5.0	4.4			185-192' mod. broken	
190							192-198' broken w/v. broken zone @ 197'	
	193	64	5.0	3.2				
195								
	198	70	5.0	3.5		198.0		
200							T. D. 198'	

GAI-228 1/68

2G-69 (Revised 1-15-68)

GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 1 OF 3

DATE

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. 4-9

CONTRACTOR Gridler Foundation SITE AREA Crystal River Unit #4 ELEV. 96.86'

CORE SIZE 2 3/4" COORDINATES +(6+65) ANGLE

CASING 4" s(2+00) BEARING

LOGGED BY: GWL DEPTH 173.0'

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation, etc.
5	5.0					5.0	Fill	2" s/s 140 lb hammer 30" drop
	6.5	5/5	1.5	.3		6.5	Fill & organic material; v. loose to loose	2-3-6
10	10.0	0	3.5	0	N.			
	11.5	5/5	1.5	0	R.		No recovery	41-23-6
15	15.0	0	3.5	0		15.0		
	16.5	5/5	1.5	.3		16.5	Decomposed calcarenite; med. dense; fine to med. grnd.	6-6-8
20	20.0	0	3.5	0	N R.	~20.0	No recovery (roller bit)	
	23.0	73	3.0	2.2			Bioclastic pelcalcarenite; white to lgt. gray; abundant bioclasts; med. to crse. grnd.; mod. broken; med. soft to med. hard; bedding @ 15-20°; jointing @ 60°; slight trace of FeOx staining @ 28.5'	
25	28.0	100	5.0	5.0				
30						~31.0		
	33.0	46	5.0	2.3			Biopelcalcarenite; white to lgt. gray; differentially cemented; v. broken to broken throughout; med. soft to med. hard w/soft zone @ 32'; fine to med. grnd.; FeOx staining @ 33-41'; bedding @ 20° w/jointing @ 60-70°	sparry zone 33-57'
35	38.0	60	5.0	3.0				
40	41.0	20	3.0	.6		41.0		
	44.0	0	3.0	0	N R.	44.0	No recovery	
45	45.2	3/5	1.0	.2		45.0	Decomposed calcarenite; v. dense; crse. frag.	17-50
	48.0	53	3.0	1.6			Biopelcalcarenite; as above; v. broken; soft to med. soft; intense FeOx staining @ 52'	
50	51.0	6	3.0	.2				
	54.0	37	3.0	1.1		54.0		
55	57.5	0	3.5	0	N R	57.5	No recovery	
	57.5	5/5	1.0	.3	////		Dolomitic silt; v. dense; v. fine grnd.; low calcium content	30-70
60	58.5	2/5	1.0	0	CAVITY			80
	60.0		.5	.2		60.0		
	63.0	43	3.0	1.3			Doloarenite; light tan; sugary; broken; med. hard w/ soft zone @ 65-66.5'; fine grnd.; FeOx staining @ 64'& 68'; bedding @ 15-20° w/jointing near vertical @ 75-85°	
65	66.0	50	3.0	1.5				
70	71.0	26	5.0	1.3		71.0		
	75.0	0	4.0	0	N R		No recovery	
75								

POOR ORIGINAL

GAI-228 (7/68) 0080

2G-70 (Revised 1-15-68)

GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 2 OF 3

DATE

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. A-9

CONTRACTOR SITE AREA ELEV.

CORE SIZE COORDINATES ANGLE

CASING BEARING

LOGGED BY: GWL DEPTH

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation, etc.
	76	85	10	3		76.0	v. dense; dolomitic silt; v. fine grnd.	7-70
80	79	95	3.0	2.8			Spongy doloarenite; lgt. tan to gray; crse. bioclastic @ 78'; FeOx staining @83'; partially marbleized 76-78' & 82-84'; mod. broken, v. broken 84-85'; mod, hard w/ soft zone @ 84-85'; bedding @ 15°; jointing @ 60°	first occurance of lignite @ 79'
85	84	76	5.0	3.8				
90	89.0	58	5.0	2.9		89.0		
95	94.0	90	5.0	4.5			Doloarenite; dark brown; relatively unbroken; mod. hard w/soft zone @ 92' & 94'; lignite inclusions; bedding @ 15-25°; jointing @ 60° w/vertical joint @ 98-99'	
100	99.0	100	4.0	4.0		99.0		
	100.5	68	2.5	1.7		101.0	Med. stiff; black marine clay; contains dololutite frag.	
						101.3	Dololutite; med. hard; fine grnd.	
105	105.5	72	5.0	3.6			V. stiff; black & brown marine clay	
	109	74	3.5	2.6		108.5	Dololutite; white to gray; broken 101.5-106.5'; relatively unbroken 106.5-108.5'; high calcium content; bedding @ [illegible]; no apparent jointing	soft 101.5-106.5' mod. hard 106.5-108.5'
110						109.8	Med. stiff; black marine clay	
	113	42	4.0	1.7		113.0	Dololutite; as above; v. broken & v. soft; silt like	
115	116	87	9.0	2.6		116.0	Doloarenite; lgt. tan; relatively unbroken; hard; bedding @ 15-25°; no apparent jointing	
120	124.5	0	8.5	0	CAVITY	124.5	CAVITY	
125	126	35	1.5	1.4		126.0	Dolomitic silt (loose) w.soft black clay on top	10-3-2
130	130	75	4.0	3.0		130.0	Calcilutite; white;mod. broken; med. hard; fine grnd.; bedding @ 15°; no apparent jointing	
	133	83	3.0	2.5		133.3	Dark brown clay layer; v. stiff	
135						134.0	Dololutite; mod. broken; white to lgt. gray; med. hard to hard; near vertical jointing	
	138	98	5.0	4.9		137.0	Calcarenite; lgt. tan; see below	
140						137.3	Stiff; brown clay; laminated	
	143	82	5.0	4.1			Calcarenite; lgt. brown or tan; fine to med. grnd.; high calcium content; thin bedded w/bedding @ 15°; jointing near vertical @ 75-90°; med. soft to med. hard w/soft zone @ 140-143'; mod. broken throughout w/v. broken Zone @ 140-143'	
145	148	88	5.0	4.4				
150								

0081

GAI-225 1/66

2G-71 (Revised 1-15-68)

GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 3 OF 3

DATE

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. 4-9

CONTRACTOR SITE AREA ELEV.

CORE SIZE COORDINATES ANGLE

CASING BEARING

LOGGED BY: GWL DEPTH

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION	REMARKS
							Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	Condition of core. Excavating evaluation, etc.
	153	98	5.0	4.9			As above; mod. broken W/v. broken zone @ 152-153'; soft to med. hard	C A L C A R E N I T E
155								
	158	80	5.0	4.0			As above; mod. broken; med. hard; vertical joint @ 153.5'	
160								
	163	100	5.0	5.0			As above; mod. broken w/broken zone @ 163'; soft to med. hard; vertical joint 161-162'	
165								
	168	96	5.0	4.8			As above; mod. broken; med. soft to med. hard; vertical joint 164-165'	
170								
	173	70	5.0	3.5			As above; mod. broken;v. soft 168-168.5'; med. hard 168.5-173'	
175							T. D. 173.0'	

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GAI-228 1/66

GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 1 OF 3

DATE 6-23-67

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. 4-10

CONTRACTOR Girdler Foundation SITE AREA Crystal River Unit #4 ELEV. 97.20'

CORE SIZE 2 3/4" COORDINATES +(7+64) ANGLE vertical

CASING 20' of 6", 90' of 4" FJC s(2+00) BEARING

LOGGED BY: GWL DEPTH 166.0'

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation, etc.
5	5.0						Fill	2" spoon 140 lb hammer 30" drop 9-10-17
	6.5	5/5	1.5	5/5		~8.0		
10	10.0						Soft, decomposed biopelcalcarenite	17-18-19
	11.5	5/5	1.5	5/5				
15	16.0							26-27-50 start coring at 20' set casing
	16.0	5/5	1.5	5/5				
20	20.0	0.5	0.4			20.0	Bioclastic pelcalcarenite; soft to med. soft; mod. broken; med. grnd.; FeOx discoloration (buff)	
25	25.5	6.8	5.0	3.4		25.0		
	28.5	3.3	3.0	1.0			Biopelcalcarenite; lgt. cream colored w/buff colored zones from FeOx staining; diff. cemented & trace of crse. sparry bioclats dissm. throughout; fine to med. grnd.	trace of silicified concretions 28.5-33.5'
30								
	33.5	10	5.0	0.5			25-33.5' soft w/med. hard nodules; v.broken; low recovery; FeOx discoloration	
35							33.5-38.5' Med. soft to med. hard; mod. broken; poor recovery	
	38.6	30	5.0	1.5			38.5-43' soft w/med. hard nodules; broken; low recovery; FeOx stained joint	
40								
	42.5	12	4.0	0.5			43-45' med. hard; relatively unbroken	
45	45.2	8.0	2.5	2.0			45-51' soft w/med. hard nodules; v. broken	
	47.2	1.5	2.0	0.3				set 50' of FJC
50						~51		
	52.0	12	5.0	0.6		53	As above w/crse. sparry bioclasts; med. soft to hard; FeOx staining in casts w/some drusy calcite surfaces; joint @ 52° 30°	
55							Biogenic doloarenite; buff colored; fine to med. grained; sugary; trace of fragmental bioclasts & Cast @ top of unit; v. poor recovery below 57'; only broken pieces recovered w/FeOx staining on one or more faces indicating extensive jointing & oxidation; oxidation, fragmentation & softness increases w/depth	
	57.0	4.6	5.0	2.3				
	58.0	0	1.0	0		CAVITY		
60							53-57' med. soft w/med. hard zones; mod. broken; 45° joints; 57-58' cavity; 58-66' soft w/some hard zones; rehealed (calcite) joints; 66-74' no recovery; soft zone; trace of crse. bioclastic frag.	
	63.0	14	5.0	0.7				
65	66.0	10	9.0	0.3				
70	71.0	0	5.0	0		~74		
75	76.0	4.0	5.0	2.0			V. stiff; gray to green (marine); clay & calcarenite cobbles w/some sparry bioclasts & drusy calcite; high FeOx staining trace of sand	set 75' FJC

GAI-228 1/66

0083

GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 2 OF 3

DATE

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. 4-10

CONTRACTOR SITE AREA ELEV.

CORE SIZE COORDINATES ANGLE

CASING BEARING

LOGGED BY: GWL DEPTH

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation, etc.
	76.6					76.0	V. fine dolomitic layer 4"; cobbles; sub. ang.; gravel size calcarenite frag.; trace quartz, sand; med. grnd.	
	79.0	17	3.0	0.0	CAVITY	79.6		
80	81.0	20	2.0	0.4		81.0	As next above w/sparry bioclasts; few pieces recovered only	
85	86.0	54	5.0	2.7			Biogenic doloarenite; buff gray to brown; relatively competent unit; med. hard to hard w/soft weathered zones @ 85-86' & 95-96'; crse. bioclastic at top of unit; occasional spongy texture	lignite inclusions occur @ 82'
90	91.0	36	5.0	1.8			81-85' unbroken; med. hard to hard 85-89' mod. broken; med. hard w/med. soft zones; broken and jointed at top	set 90' of FJC
95	96.0	60	5.0	3.0		96.0	89-95' unbroken; med. hard to hard	
100	101.0	72	5.0	3.6			Calcilutite; gray to green gray; v. soft to soft w/ occasional med. soft zones; fragmental and pasty - ranges from a plastic silty clay to fragmental silty claystone; broken to v. broken	
105	106.0	100	5.0	5.0				
110	111.0	34	5.0	1.7		111.0		
115	116.0	88	5.0	4.4		115.0	Calcilutite; cream colored; med. hard to hard; unbroken fossiliferous; vertical joint 114-115'; somewhat porous; soft organic; dark brown clay seam w/bioclast frag @ 112.5'	4" organic clay seam
120	121.0	88	5.0	4.4			Doloarenite; tan to gray; med. hard to hard w/soft broken zones & cavity from 120-216'; competent, but mod. broken from 30° to 45° joints; biogenic & somewhat porous	
					CAVITY	122		
125	126.0	20	5.0	1.0		124.5 126.0		
130	131.0	100	5.0	5.0		131.5	Dololutite; lgt. gray w/dark gray dolomite frags.; hard & unbroken; massive unit; bedding nearly horizontal	
135	136.0	100	5.0	5.0		135.0	Calcarenite; buff-gray; med. hard to hard; relatively unbroken; fine; lutite matrix w/med. grnd. arenite structure	
						138.5	~~V. dense; thinly stratified organic silty clay; dark gray~~	~~black; horiz.~~
140	141.0	100	6.0	5.0		141.0	Biopelcalcarenite; buff gray; med. to crse. grnd. pellet structure w/some bioclastic frag.; broken to mod. broken; med. hard; trace lignite inclusions	
145	146.0	40	5.0	2.0		145.0	Unconformity; thinly stratified calcareous silt overlying mod. grnd., well-grnd. calcareous; sand; sub ang. to sub. rnd. w/some quartz; bdrk. units dense to v. dense	
						146.5	~~Recovered several pieces of mod. broken, jointed & oxidized~~	
						148.0	~~v. dense calcareous sand; fine grnd.; brown-gray; trace silt & clay lenses; more silt at top~~	
150	150.0	52	5.0	2.6		151.0	Biogenic calcarenite; tan-gray; mod. broken; med. hard; fine to med. shells in calcilutite matrix	

GAI-226 1/66

GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 3 OF 3

DATE

PROJECT Florida Power Corp. NO. 1203-02 DRILL HOLE NO. 4-10

CONTRACTOR SITE AREA ELEV.

CORE SIZE COORDINATES ANGLE

CASING BEARING

LOGGED BY: GWL DEPTH

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation, etc.
						152.0	~~V. dense & stratified silt & gray calcareous sand; V. crse.; thin lignite~~	
155	156.0	100	5.0	5.0		156.0	As next above; med. soft to med. hard; mod. broken w/ vertical joints at top of unit	seams
						158.0	~~V. dense fine gray sand - calcareous w/trace of silt; undulatified & uniform graded; 1" lignite seam at top; grain size increases at basal contact; med.~~	
160	161.0	100	5.0	5.0			As next above; med. soft to med. hard; broken & vertical jointing from 158-161'; unbroken & competent to 166'	to crse.
165	166	100	5.0	5.0				
							End of boring At 166.0'	

0085

GAI-228 1/68

2G-75 (Revised 1-15-68)

GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 1 OF 3

DATE 6-23-67

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. 4-11

CONTRACTOR ~~Girdler Foundation~~ SITE AREA ~~Crystal River Unit #4~~ ELEV. 96.95'

CORE SIZE 2 3/4" COORDINATES +(8+55) ANGLE vertical

CASING 10' of 6", 55' of 4" FJC s(2+00) BEARING

LOGGED BY: GWL DEPTH 165.0'

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation, etc.
5	6.5		1.5	5/5		~8.0	Fill	2" spoon 140 lb hammer 30" drop 37-25-9
10	11.0		1.0	3/5		11.0	Decomposed biopelcalcarenite	started coring @ 60-75 11.0'
15	16.0	100	5.0	5.0		19.0	Bioclastic pelcalcarenite; lgt. cream color; med. hard; relatively competent; fresh; unaltered & unbroken; fine to med. grnd. w/crse bioclastic frag & casts	set 6" casing
20	21.0	100	5.0	5.0			Biopelcalcarenite; lgt. cream color; soft to med. hard; diff. cemented w/some clastic & nodular zones; fine to crse. grnd.; friable	
25	26.0	80	5.0	4.0			19-20' med. hard; unbroken; unaltered; good cement 20-21' soft; broken; poor cement 21-27' med. soft to med. hard; unbroken; diff. cemented 27-32' med. hard; broken; crse. clastic; jointed; sparry 32-34' med. soft; v. broken; nodular; trace FeOx staining 34-40' med. soft w/med. hard nodules; broken; diff. cemented	fairly good recovery throughout entire unit
30	31.0	50	5.0	2.5				
35	36.0	75	4.0	3.0				
40	40.0	58	5.0	2.9		40.0		
45	45.0	100	5.0	5.0			Biopelcalcarenite; As above; crse. sparry bioclastic zones occuring throughout; Trace FeOx staining throughout unit	
50	50.0	80	5.0	4.0			40-44' med.hard;mod. broken; clastic 44-46' soft; v. broken; nodular 46-48' med. hard; unbroken; clastic 48-50' med. soft to med. hard; unbroken 50-56' med. hard; mod. broken; clastic; highly jointed	set 55' of 4" FJC
55	55.0	66	5.0	3.3		56.0		
60	59.0	30	4.0	1.3		59.0	Low recovery; residual silt zone; few highly FeOx frag. of ~~lower dolomite~~	
	64.0	80	5.0	4.0			Biogenic doloarenite; tan to buff-gray; marbleized color; fine to med. grnd.; sugary textured; slightly bioclastic 60-61' 54-64' hard; v. mod. broken 64-68' hard w/med. soft zones; broken & jointed; FeOx discolored	relatively competent massive unit
70	69.0	52	5.0	2.6				
	72.0	83	3.0	2.5		71.0 72.0	68-71' ~~hard; mod. broken; mod. jointing~~ M. hard; ~~dark gray doloarenite; as above; jointed~~	
75	76.0	92	4.0	3.7		75.0	Hard; black; silty, organic clay; thinly laminated	

GAI-228 1/68

2G-76 (Revised 1-15-68)

0086

GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 2 OF 3

DATE

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. A-11

CONTRACTOR SITE AREA ELEV.

CORE SIZE COORDINATES ANGLE

CASING BEARING

LOGGED BY: GWL DEPTH

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation, etc.
						78.0	Silty dolarenite; buff gray with brown silt laminations; med. soft to med. hard; v. fine grnd.; thin silt layers & lenses; relatively unbroken	
80	80.0	100	5.0	5.0		81.0	Bioclastic dolarenite; tan to gray hardpan; med. hard & unbroken; fine grnd. matrix w/crse. clastic frag. & casts; fresh & unaltered rock	
					CAV	CAV. TY	Possible shells; Avon Park contact	
85	86.0	37	4.0	1.5		82.0	Dolarenite biogenic; gray to brown; med. hard to hard; fine to crse. grnd.; unbroken; some soft zones at top of unit; similar to unit above but w/lignite inclusions from 82-88'; becomes spongy & porous below w/increased amounts of lignite present	
90	91.0	86	5.0	4.3		91.0		
						93.0	Dolarenite; gray; hard; unbroken w/lignite inclusions; grades from finely biogenic at top to dolomitic siltstone at base; core is fresh & unaltered	
95	96.0	92	5.0	4.6		98.5	Biogenic calcarenite; tan color; med. hard w/reworked calcarenite frag; lignite inclusions & thin laminations occur; entire unit is unbroken	
100						99.0	Hard; calcareous; organic clay seam; v. thinly laminated; contains some rock	
	101.0	100	5.0	5.0		103.0	Biogenic calcarenite; calcilutite; med. hard; unbroken; lgt. cream color; essentially lutite matrix w/varying fossil content & type; grain size & fossil content increases w/depth; upper portion contains frag inclusions of limy silt	
105	106.0	100	5.0	5.0			Calcilutite; white to lgt. gray w/blue-gray lutite inclusions; soft to med. hard; variable fossil content; blue clay layer (1") at 104.5'; entire unit fresh & unaltered	
110	110.0	60	4.0	2.5		113.0	103-105' med. hard; unbroken; unaltered; 105-108' soft to med. soft; v. broken; 108-109' med. hard; mod. broken w/numerous vertical fra	
115	116.0	94	5.0	4.7			v. close; 109-110' v. soft; v. broken; v. shear planes; trace FeOx stains (see #) Doloarenite; biogenic; tan; med. hard; fine to med. grnd.; unbroken; finely spongy texture; competent unit; fresh & unaltered; 45° joint @ 119.5'	
120	120.0	96	5.0	4.8		120.5		
						124.0	Dololutite; tan-gray w/blue inclusions; soft to hard; mod. broken; vertical joint from 122-123'; weathered face	
125	125.0	100	5.0	5.0		125.0	Hard & dense; org. silt & clay layers; gray-black; high carbon content @ top	
						126.0	Hard; tan; biogenic doloarenite; fine to med. grnd.; unbroken w/wood chips	
130	130.0	100	5.0	5.0			Calcilutite; cream to lgt. gray w/occasional blue lutite inclusions; relatively unbroken; med. hard to hard w/soft zone from 130-131'; occasional arenite zones; 126-130' hard; unbroken; 130-131' see above; 131-133' med. hard; unbroken; 30° joint @ 132'; 133-136' med. hard; mod. broken; vertical joint from 133-134'	
135	136.0	96	5.0	4.8		136.0		
140	140.0	92	5.0	4.6			Calcarenite; biogenic; tan to buff; massive; competent unit; relatively unbroken & unaltered; apparent bedding 3°; fine to med. grnd.; fossil detritus; well cemented throughout; 136-143' med. hard to hard; unbroken; vertical joint @ 142-143'; 143-145' med. hard; broken @ top & bottom due to vertical fractures; 145-149' med. hard to hard; unbroken & unaltered; 149-153' med. soft; broken; vertical fractures; no recovery from 150-153'	
145	152.0	96	5.0	4.8				
150	156.0	100	5.0	5.0			136-143' (pieces 4"-1.0') 145-149' (pieces 6"-1.0')	

GAI-228 1/66

2G-77 (Revised 1-15-68)

GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 3 OF 3

DATE

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. 4-11

CONTRACTOR SITE AREA ELEV.

CORE SIZE COORDINATES ANGLE

CASING BEARING

LOGGED BY: GWL DEPTH

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION	REMARKS
							Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	Condition of core. Excavating evaluation, etc.
153	153-159	84	5.0	1.2			153-159' med. hard; unbroken; fresh	pieces 3"-8"
159	159-160						159-160' med. soft to med. soft; v. broken; vertical fractures; fresh	
160	160-165	100	5.0	5.0			160-164' med. hard; unbroken; fresh	
							164-165' med. soft; v. broken; vertical fractures; fresh	pieces 3"-1.4'
165	160-165	100	5.0	5.0		165		
							End of borings	
							*110-111' med. hard; unbroken; numerous sparry bioclasts	
							111-112' soft; horizontal liniations; clay layer	
							112-113' unbroken; structureless	

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GAI-228 1/80

2G-78 (Revised 1-15-68)

GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 1 OF 2

DATE

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. 4-12

CONTRACTOR ~~Girdler Foundation~~ SITE AREA Crystal River Unit #4 ELEV.

CORE SIZE 2 2/4" COORDINATES +(9+65) ANGLE vertical

CASING 6" (2.5') & 4" (75') s(2+00) BEARING

LOGGED BY: GWL DEPTH 135.0'

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation, etc.
5							Roller bit to 20' - not sampled	set 20' of 6" casi
10								
15								
20								
25	25.0	44	5.0	2.2			Bioclastic pelcalcarenite; lgt. cream color; med. soft to med. hard; mod. broken 20-25' med. soft to mod. hard; mod. broken; well cemented 25-36' soft to med. hard; v. broken to broken; FeOx @ base	
30	31.0	12	6.0	0.7				
35	36.0	36	5.0	1.8		36.0		
40	41.0	48	6.0	2.4		41.0	Biopelcalcarenite; cream to buff; soft; hard; broken; diff. cemented; some med. hard nodules	
45	46.0	28	5.0	1.4			Bioclastic calcarenite; lgt. cream color; soft to med. hard w/crse sparry bioclasts; diff. cemented; broken to mod. broken; low recovery throughout unit; some FeOx staining from 45-46' 41-46' med. hard; mod. broken 46-55' soft to med. soft w/med. hard nodules; v. broken; some FeOx 55-56' med. hard; mod. unbroken; fresh rock	relatively fresh rock set 55' of 4" PJC
55	57.0	22	5.0	1.1				
60	56.0	32	5.0	1.6		56.0		
	57.5	1.5	0	CAV.		CAVITY		
	61.0	48	3.6	1.7		61.0	Biopelcalcarenite; buff to gray w/orange FeOx discoloration; some sparry bioclasts w/trace of sand infill & secondary stabilization; crse vuggs; high angle solution channels; v. active zone	
65	66.0	16	5.0	0.8			Biogenic; calc. doloarenite; lgt. tan; sugary textured; probably med. soft to hard; only hard rock recovered; mod. broken; joints 30-90°	
70	71.0	16	5.0	0.8		71.0		
75	76.0	6	5.0	0.3		~76.0	Zone of low recovery; 3' of laminated; translucent; brown silty clay recovered	set 75' of 4" PJC

GAI-228 1/66

2G-79 (Revised 1-15-68)

GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 2 OF 2

DATE

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. 4-12

CONTRACTOR SITE AREA ELEV.

CORE SIZE COORDINATES ANGLE

CASING BEARING

LOGGED BY: GWL DEPTH

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation, etc.
80								
	81.0	8	5.0	0.4			As next above; med. soft to med. hard	
85						~85.0		
	86.0	18	5.0	0.9		86.0	Bioclastic dolcarenite; v. crse. casts; tan-gray marbleized; hard	
90							Biogenic dololutite; buff-gray; hard; slightly spongy texture; high % $CaCO_3$ w.trace of silia in matrix; fine grnd.; recrystallized; trace lignite inclusions; relatively unbroken	
	91.0	90	5.0	4.5		91.0		
							Calcarenite; med. hard; tan; fine to crse. grnd.; unbroken; slightly marbleized; trace lignite inclusions; fresh rock; trace organic clay seam @ 94'	
95						95.0		
	96.0	80	5.0	4.0		96.0	Dolocarenite; med. hard; brown; sl. gny; lignite inclusions	
	99.0	97	3.0	2.9		99.0	Calcarepite; buff cream; med. haru w/fine to crse. bioclasts, shells & casts; fresh & unbroken	
100							Calcilutite; white pasty textu.. w/small concretions; massive & relatively unbroken; fresh rock; some reworked frags. dissem. throughout; 3" clay layer (organic) @ 109.5'; med. soft to med. hard	
	104.0	80	5.0	4.0				
105	106.0	80	2.0	1.6				
110	111.0	94	5.0	4.7				
115						115.0		
	116.0	84	5.0	4.2			Cali-doloarenite; tan; med. hard; unbroken	fresh
120	121.0	92	5.0	4.6		121.0		
							Cali-doloarenite; white; pasty; unbroken; med. hard	fresh
125	126.0	86	5.0	4.3		125.0 126.0	As next above	
							Calcilutite; white; pasty; unbroken; med. hard w/some blue lignite inclusions	
130	131.0	88	5.0	4.4				
135	136.0	80	5.0	4.0				
							Boring ended At 136.0'	

0090 GAI-228 1/66

2G-80 (Revised 1-15-68)

GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 1 OF 3

DATE

PROJECT Florida Power Corp. NO. 1203-42 DRILL HOLE NO. A-13

CONTRACTOR Gibbler Foundation SITE AREA Crystal River Unit #4 ELEV. 96.96'

CORE SIZE 2 3/4" COORDINATES N(47.52) ANGLE vertical

CASING 4" E(47.36) BEARING

LOGGED BY: GWL DEPTH 176.0'

Depth	Depth	Rec. %	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION	REMARKS
							Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	Condition of core. Excavating evaluation, etc.
5	5.0					5.0	Fill	2" spoon 140 lb hammer 30" drop
	6.5	5/5	1.5	1.0		6.5	Med. dense to dense calcareous sand; abundant organic mat'l	9-15-17
10	10.0	0	3.5	0		10.0		
	11.0	5/5	1.0	1.0		11.0	V. dense; calcareous sand; mod. to crse. grnd.	9-50
15	15.0	0	4.0	0		15.0		
	16.5	3/5	1.5	1.5		16.5	V. loose to loose; quartz sand; dark brown; shell frag.	1-2-5
20	20.0	0	3.5	0		20.0		
	21.5	5/5	1.5	1.0		21.5	V. dense decomposed calcarenite; white; crse. grnd.	17-38-45
25								
	27.0	0	5.5	0		27.0		
	27.5	5/5	1.5	1.5		27.5	Loose, decomposed calcarenite; crse. grnd.	10
30							Bioclastic pelcalcarenite; white to lgt. gray; mod. broken; mod. hard; abundant bioclasts; bedding @ 15°; no apparent jointing	
	31.5					31.5		
	33.5	4.3	6.0	2.2	CAV	33.5	CAVITY	
35								
	38.5	0	5.0	0	NR	38.5	No recovery	
40								
	41.5	30	3.0	.9			Biopelcalcarenite; white to lgt. gray; entire unit broken to v. broken; med. soft to med. hard 38.5-46.5'; soft 46.5- 61.0'; med. soft to med. hard 61.0-66.0'; intense FeOx staining @ 40'; slight FeOx staining @ 42' & 64'; bedding 15-25°; no apparent jointing; entire unit in a state of decomposition	
45	44.5	37	3.0	1.1				
	46.5	50	2.0	1.0				sparry zone 38.5-66.0'
50	51.0	33	4.5	1.5				
55	56.4	50	5.0	3.5				
60	60.0	60	5.0	3.0			As above	
65	66.0	24	5.0	1.2		66.0		
	69.0	0	3.0	0	NR	69.0	No recovery	
70								
					CAV.	CAVITY	CAVITY	
75	76.0	0	7.0	0		76.0		

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GAI-228 1/66

GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET SHEET 2 OF 3

DATE

PROJECT Florida Power Corp. NO. 423-02 DRILL HOLE NO. A-13

CONTRACTOR SITE AREA ELEV.

CORE SIZE COORDINATES ANGLE

CASING BEARING

LOGGED BY: GWL DEPTH

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation, etc.
	77.5	5/5	1.5	.7		77.5	Loose; v. fine grnd.; brown quartz sand; some shells	2nd infilling
								4-8-6
80	80.5	10	3.0	.3	1 of 1	80.5	Several small pieces of calcarenite; high calcium content	
85					CAVITY		CAVITY	
	88.0	0	7.5	0				
90	88.5	3/3	1.5	.4		88.0	Dense to v. dense; dolomitic silt; quartz sand layer @ 92	12-16-25
	90	0	2.5	0		89.5	No recovery	
						CAVITY		
95	95	18	4.0	.7		92.0	Dolcarenite; gray to brown; mod. broken 92-100'; broken 106-112'; lignite inclusions; med. soft to hard 92-101'; hard 101-106'; med. soft to med. hard 106-112'; bedding @ 20°; jointing @ high angles @ 75°	
100	101	32	5.0	1.6				
105	106	72	5.0	3.6			As above	
110	111	40	5.0	2.0		112.0		
115	116	38	5.0	1.9			Dololutite; white w/gray coloring; entire unit is broken; hard 112-114'; med. soft to soft 114-124'; med. hard 124-127'; FeOx staining @ 125'; bedding @ 15°; jointing @ 75°	
120	121	26	5.0	1.3		121		
	123	0	2.0	0		CAVITY 123	CAVITY	
125	126	20	3.0	.6			As next above	
						127.0		
130	131	48	5.0	2.4			Dolcarenite; lgt. tan to gray; mod. [illegible] ok [illegible] med. [illegible] ard to hard; low calcium content; bedding @ 15-2[illegible]°; jo[illegible]ing @ 0-75°	
						134		
135	136	62	5.0	3.1			1. stiff 6" layer of black marine clay 135-141' calcarenite mixed w/marine clay w/nodular frag. of calcium	
140	141	30	5.0	1.5		141.0		
145	146	72	5.0	3.6			Calcarenite; brown to tan; partially dolomitzed 141-151'; high calcium content; broken; med. hard w/soft zone 145-146'; bedding @ 20°; jointing near vertical	
150	151	10	5.0	.5				

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GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 3 OF 3

DATE

PROJECT Florida Power Corp. NO. 1203-02 DRILL HOLE NO. A-13

CONTRACTOR SITE AREA ELEV.

CORE SIZE COORDINATES ANGLE

CASING BEARING

LOGGED BY: GWL DEPTH

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation, etc.
155	156	72	5.0	3.6		155.0	Quartz sand; med. to crse. grnd.; abundant shell frag.; secondary infilling	cored
160	161	40	5.0	2.0		PASSABLE BEDDING	Calcarenite; lgt. brown to tan; broken; v. broken @ 165-166'; mod. soft; high calcium content; fine to med. grnd.; bedding @ 15°; vertical jointing @ 158'	
165	166	20	5.0	2.0		166.0	Mod. stiff; brown & black clay	
170	171	54	6.0	2.7		170.0	Quartz sand; fine to med. grnd. 166-168'; v. crse. grnd. @ 168-170'; numerous shell frag.	secondary infilling
175	176	62	5.0	3.1		176	Calcarenite; lgt. tan; mod. broken; soft to mod. soft; slight FeOx staining @ 174'	
180							T. D. 176.0'	

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GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 1 OF 3

DATE

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. A-14

CONTRACTOR Girdler Foundation SITE AREA Crystal River Unit #4 ELEV. 96.61'

CORE SIZE 2 3/4" COORDINATES +(5+64) ANGLE vertical

CASING 4" S(4+92) BEARING

LOGGED BY: GWL DEPTH 174.0'

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation, etc.
5	5.0					5.0	Fill	2" s/s 140 lb hammer 30" drop
	6.5	75	1.5	.7		6.5	V. loose, black quartz sand; highly organic	1-2-4
10	10.0	0	3.5	0	NR	10.0	Roller bit	
	11.5	75	1.5	.4		11.5	V. dense decomposed calcarenite; fine to med. grnd.	18-19-22
15	15.0	0	3.5	0	NR	15.0	Roller bit	
	16.5	75	1.5	.3		16.5	Dense; decomposed calcarenite; med. to crse. grnd.	15-12-12
20	20.0	0	3.5	0	NR	~20.0	Roller bit	
	23.0	100	3.0	3.0			Bioclastc pelcalcarenite; white to lgt. gray; mod. broken 20-24'; v. broken 24-25'; mod. broken 25-27.5'; v. broken 27.5-28.5'; broken 28.5-32'; med. hard 20-24'; med. soft 24-25';mod. hard 25-32'; numerous bioclasts; fairly well cemented; bedding @ 20°; jointing @ 60°	
	28.0	92	5.0	4.6				
30	33.0	70	5.0	3.5		32.0		
	38.0	52	5.0	2.6			Biopelcalcarenite; lgt tan because of intense FeOx staining; broken; mod. soft to med. hard w/soft zone @ 37-38'; FeOx staining (highly) from 33-54'; poorly cemented; fine to mod. grnd.;bedding @ 25°; jointing (non-apparent)	Sparry zone 38-68'
40	43.0	8	5.0	.4				
	45.0	40	2.0	.8				
45	48.0	30	3.0	.9			As above	
	51.0	13	3.0	.4				
50	54.0	40	3.0	1.2		54.0		
	56.0	0	2.0	0	NR	56.0	No recovery	
	59.0	13	3.0	.4			As next above; v. broken; soft to med. hard; high amount of FeOx staining	
60	62.0	13	3.0	.4		62.0		
	66.0	0	4.0	0		CAVITY	No recovery	
	68.0	53	3.0	1.6		66.0 68.0	Biopelcalcarenite; v.broken; FeOx stained; soft to med. hard	
70	71.0	60	2.0	1.2			Doloarenite; sugary dolomite that has been marbleized; lgt tan to lgt. gray; broken 68-72';mod. broken 72-77'; broken 77-84'; med. soft to med. hard; bedding @ 15°; jointing @ 60-70°	
75	76.0	58	5.0	2.9				

GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 2 OF 3

DATE

PROJECT Florida Power Corp. NO. 1203-02 DRILL HOLE NO. A-14

CONTRACTOR SITE AREA ELEV.

CORE SIZE COORDINATES ANGLE

CASING BEARING

LOGGED BY: GWL DEPTH

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation, etc.
80							As above	
	81.0	22	5.0	1.1				
	84.0	17	3.0	.5		84.0		
85							V. stiff brownish black marine clay; fine grnd.	cored
	87.0	70	3.0	2.1		87.0		
90	90.0	83	3.0	2.5			Spongy doloarenite; brown to gray due to marbleization; mod. broken; med. hard to hard; crse. bioclastic @ 90'; bedding @ 15° w/ jointing @ 60°	
	95.0	26	5.0	1.3				Avon Park unconformity
	97.0	63	3.0	1.9		97.0		
100							Doloarenite; as above w/lignite traces; broken to v. broken; med. hard 97-99'; soft to med. soft 99-~~104~~.5'; bedding @ ~~1~~5°; no apparent jointing	
	103	50	5.0	2.5				
105	104.5					104.5		
	106	63	3.0	1.9		106.0	V. stiff black marine clay	
	109	60	3.0	1.8			Dololutite; white w/gray dolomite frag.; mod. broken to broken; soft 105-106'; med. hard 106-107'; soft 107-108'; med. hard to hard 108-113'; soft 113-125'; fine grnd.; high calcium content; bedding @ 15°; no apparent jointing	
110	113	48	4.0	1.9				
115							As above	
	118	10	5.0	.5				
120	121	43	3.0	1.3				
125	125	15	4.0	.6		125.0		
	128	10	3.0	.3			Doloarenite; lgt. brown or tan; v. fine grnd.; v. broken 125-136'; mod. broken 136-139'; soft to med. hard 125-136'; med. hard to hard 136-139'; bedding @ 15-25°; jointing @ 60°	
130	130	15	2.0	.3				
135	135	40	5.0	2.0				
	138	90	3.0	2.7				
140	139.0					139.0		
	140	85	2.0	1.7		140.5	Stiff black to brown marine clay	
							~~Doloarenite; as next above~~	
145	145	86	5.0	4.3			Calcarenite; lgt, brown; med. grnd.; partially dolomitized @ 143-145'; 146-148.5'; mod. broken 140-145'; broken 145-149'; med. hard to hard 140-148';soft 148-149'; thin bedded w/bedding @ 15°	
	149	67	4.0	2.7				
150								

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GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 3 OF 3

DATE

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. 4-14

CONTRACTOR SITE AREA ELEV.

CORE SIZE COORDINATES ANGLE

CASING BEARING

LOGGED BY: GWL DEPTH

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION	REMARKS
							Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	Condition of core. Excavating evaluation, etc.
150	154	62	5.0	3.1			149-154' relatively unbroken; dolomitized 149-151'; hard 149-151', med. soft 151-154'	C A G A R E N I T E
	159	94	5.0	4.7			154-159' mod. broken; med. hard; vertical joint @ 155.5'	
160	164	86	5.0	4.3			159-164' relatively unbroken; dolomitized 161-164'; med. hard 159-161'; hard 161-164'	
165	169	76	5.0	3.8			164-169' mod. broken w/broken zone @ 168-169'; dolomitized 166-167';med. soft & hard in the dolomitized zone	
170	174	64	5.0	3.2			161-174' broken to v. broken; entirely dolomitized; vertical joints 169-171'; med. soft to hard	
175							T. D. 174.0'	
180								

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2G-86 (Revised 1-15-68)

GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 1 OF 3

DATE

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. 4-15

CONTRACTOR Girdler Foundation SITE AREA Crystal River Unit #4 ELEV. 96.85'

CORE SIZE 2 3/4" COORDINATES +(6+65) ANGLE vertical

CASING 4" s(4+00) BEARING

LOGGED BY: GWL DEPTH 176.0'

Depth	Depth	Rec. %	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation, etc.
	5.0					5.0		140 lb hammer 2" s/s 30" drop
5	6.5	5/5	1.5			6.5	Med. dense to dense quartz sand; brown; highly organic	8-9-7
10	10.0	0	3.5	0		10.0		
	11.5	5/5	1.5			11.5	Dense to v. dense decomposed calcarenite; large frag.	10-20-40
15	15.0	0	3.5	0		~15.0	Begin coring @ 15.0'	
	18.0	93	3.0	2.8			Bioclastic pelcalcarenite; white to lgt. gray; mod. broken w/v. broken zones @ 18, 20-22'; med. hard 15-18'; soft to med. soft 18-22'; med. soft 22-27'; FeOx staining @ 2;' & 26.5'; bedding @ 15°; vertical joint 25-26'	
20								
	23.0	100	5.0	5.0				
25								
	28.0	90	5.0	4.5		~27.0		
30							Biopelcalcarenite; white to lgt. gray; fine to med. grnd.; diff. cemented; bedding @ 15-25°; jointing @ 60-75°; slight FeOx staining @ 61' & 63'	
	33.0	74	5.0	3.7				
35								
	38.0	12	5.0	6			27-28' mod. broken 28-40' broken 40-43.5' v. broken 43.5-48' mod. broken 48-51.5' broken 51.5-54' mod. broken 54-59.5' v. broken 59.5-63' relatively unbroken 27-29' med. soft 29-33' soft to v. soft 33-40' soft to med. soft 40-42.5' v. soft 42.5-51.5' med. soft 51.5-54' v.soft 54-63' med. soft to med. hard	sparry zone 33-63' v. crse. bioclasti @ 55'
40	40.0	40	2.0	.8				
	43.0	63	3.0	1.9				
45								
	48.0	38	5.0	1.9				
50								
	51.0	17	3.0	.5				
	54.0	100	3.0	3.0				
55								
	59.0	58	5.0	2.9				
60								
	63.0	90	4.0	3.6		63.0		
65	66.0	100	3.0	3.0			Sugary doloarenite; lgt. brown or tan; relatively unbroken 63-65.5'; mod. broken 65-76'; med. hard to hard 63-71'; soft to med. hard @ 71-76'; fine grnd.; slightly spongy 66-68'; bedding @ 15°; jointing @ 60-75°	
70	71.0	74	5.0	3.7				
75	76	14	5.0	.7				

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GAI-228 1/66

2G-87 (Revised 1-15-68)

GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 2 OF 3

DATE

PROJECT Florida Power Corp. NO. 1203-02 DRILL HOLE NO. L-15

CONTRACTOR SITE AREA ELEV.

CORE SIZE COORDINATES ANGLE

CASING BEARING

LOGGED BY: GWL DEPTH

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation, etc.
80	79.0	0	3.0	0	NR	79.0	No recovery	
80	81.0	93	3.0	2.8		81.0	Doloarenite; as above; dark gray; mod. broken; med. hard to hard	
85	84.5					84.5	Med. stiff to stiff black marine clay	
85	86.0	52	4.0	2.1			Doloarenite; spongy; tan to gray; v. bioclastic @ 91.5'; mod. broken 84.5-86.5'; v. broken 86.5-91'; mod. broken 91-94'; broken 94-99'; med. hard to hard w/soft zone 94-99'; bedding @ 15° w/jointing @ 60-75°; slight FeOx staining @ 93.5'	
90	91.0	26	5.0	1.3				
90	94.0	70	3.0	2.1				
95	99.0	8	5.0	.4		99.0		
100	102	73	3.0	2.2		104.0	Doloarenite; lignite traces; dark brown; mod. broken; med. hard w/soft zone @ 101-102'; FeOx staining @ 100-101'	
105	106	92	4.0	3.7		106.0	~~V. stiff black marine clay~~ ~~Calcilutite; white; broken; med. hard; fine grnd.~~ Dololutite; white w/gray striations; high calcium content; FeOx staining @ 106.5'; mod. broken 106-110'; broken 110-114'; mod. broken 114-117'; med. soft to med. hard w/soft zones @ 113.5' & 116-117'; bedding @ 15°; jointing @ 75°	
110	111	68	5.0	3.4				
110	114	53	3.0	1.6				
115	117	53	3.0	1.6		117.0		
120	122	52	5.0	2.6		123.0	Doloarenite; lgt. tan; fine grnd.; bedding @ 25°; jointing @ 60°; broken 117-123'; med. hard to hard	
125	127	54	5.0	2.7		125.5	~~V. stiff brown marine clay~~ As next above; broken to v. broken; v. soft to soft 123.5-127'; med. soft to med. hard 127-131.5'	
130	132	34	5.0	1.7		131.5	~~V. stiff "V" layer brown clay~~	
135	136	45	4.0	1.8		139.0	Dololutite; as next above; relatively unbroken; med. hard to hard w/soft silty zone @ 138-139'	
140	141	100	5.0	5.0			Calcarenite; brown; med. grnd.; high calcium content; relatively unbroken 139-146'; mod. broken 146-150'; v. broken 150-151'; med. soft to med. hard w/soft zone @ 150-151'; bedding @ 15°; jointing (vertical); partially dolomitized 145-146'	0098
145	146	76	5.0	3.8				
150	151	90	5.0	4.5				

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2G-88 (Revised 1-15-68)

GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 3 OF 3

DATE

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. 4-15

CONTRACTOR SITE AREA ELEV.

CORE SIZE COORDINATES ANGLE

CASING BEARING

LOGGED BY: GWL DEPTH

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION	REMARKS
							Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.. permeability, alteration, weathering, chemical composition	Condition of core. Excavating evaluation, etc.
155	156	100	5.0	5.0			151-156' Mod. broken to broken; med. soft to med. hard; vertical joint 153-153.5'	CALCARENITE
160	161	90	5.0	4.5			156-161' Relatively unbroken; med. hard; partially dolomitized 160-161'	
165	166	92	5.0	4.6			161-166' Mod. broken; med. hard to hard; partially dolomitized 161-162.5'	
170	171	94	5.0	4.7			166-171' Mod. broken; med. hard	
175	176	76	5.0	3.8			171-176' Mod. broken; med. soft to med. hard	
180							T. D. 176.0'	

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GAI-228 1/66

2G-89 (Revised 1-15-68)

GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 1 OF 3

DATE

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. A-16

CONTRACTOR Girdler Foundation SITE AREA Crystal River Unit #4 ELEV. 96.6'

CORE SIZE 2 3/4" COORDINATES +(7+65) ANGLE vertical

CASING 4" a(4+00) BEARING

LOGGED BY: GWL DEPTH 166.0'

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION	REMARKS
							Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	Condition of core. Excavating evaluation, etc.
5	5.0					5.0	Fill	
	6.5	33	1.5	.5		6.5	V. dense; calcareous sand; fine grnd.	46-39-25
10	10.0	0	3.5	0		10.0		40-55-60
	11.5	55	1.5	.9		11.5	V. dense; calcareous sand (decomposed calcarenite) fine to crse. grnd.	
15	16.5	100	5.0	5.0			Bioclastic pelcalcarenite; white to lgt. gray; mod. broken; med. soft to med. hard; fairly well cemented; fine to med. grnd.; numerous bioclasts; beading @ 15°; jointing @ 60°	
20	21.0	100	3.5	3.5				
25	25.0	100	4.0	4.0		24.5		
30	30.0	96	5.0	4.8			Biopelcalcarenite; white to lgt. gray; fairly well cemented; fine to med. grnd.; bedding @ 15-25°; jointing @ 60-75°; FeOx staining @ 46 & 59.5'	
35	35.0	72	5.0	3.6			24.5-30' relatively unbroken 30-33' broken 33-35' v. broken 35-39' mod. broken 39-49' v. broken 49-57' broken 57-60' v. broken 24.5-35' med. soft to med. hard 31-35' soft to med. soft 35-40' med. hard 40-47' soft to med. soft 47-49' med. hard 49-57' med. soft to med. hard 57-60' soft	sparry zone 33-60'
40	40.0	70	5.0	3.5				
	43	66	3.0	2.0				
45	45	20	2.0	.5				
	47	100	2.0	2.0				
50	52	52	5.0	2.6				
55	56	32	4.0	1.6				
60	60	56	4.0	2.8		60.0		
65	65	22	5.0	1.1			Sumary dolocarenite; lgt. brown or tan; fine grnd.; low calcium content; broken 60-71'; mod. broken 71-79'; slight FeOx staining @ 62.5' & 68'; med. hard to hard w/ soft zone @ 79'; bedding @ 15°; jointing @ 75°	
	68	20	3.0	.6				
70	71	43	3.0	1.3				
75	76	26	5.0	1.3				

GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 2 OF 3

DATE

PROJECT Florida Power Corp. NO. 42-3-02 DRILL HOLE NO. 4-16

CONTRACTOR SITE AREA ELEV.

CORE SIZE COORDINATES ANGLE

CASING BEARING

LOGGED BY: GWL DEPTH

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation, etc.
						79.0	As above	
80	80	63	40	25		80.0	v. stiff black marine clay w/silica rich soft brown clay	the last 3"
85	85	42	50	21			Spongy doloarenite; tan to gray; fine to med. grnd.; rod. broken w/v. broken zone @ 94.5'; med.hard to hard w/soft zones @ 85' & 94.5'; bedding @ 15-25° w/jointing @ 60°	
90	90	18	50	9				
95	95	72	50	36		94.5		
99	99	92	40	37			Doloarenite; dark gray w/fine striations of lignite; relatively unbroken; med. soft to med. hard, bedding @ 15°; no apparent jointing	
						102.0		
104	104	100	50	50		102.5	Stiff brown marine clay	
108	108	95	40	38			Dololutite; white to gray w/dark dolomite frag.; fine grnd.; high calcium content; bedding @ 15°; vertical joint @ 111-111.5'	
113	113	100	50	50			102.5-103' v. broken; 103-106' mod. broken; 106-108' v. broken; 108-116.5' mod. broken; 102.5-105' med. hard to hard; 105-106' v. soft; 106-116.5' med. soft	
118	118	56	50	28		116.5		
123	123	100	50	50		119.0	Med stiff brown marine clay	
127	127	90	40	36			Doloarenite; tan to gray; slightly spongy; low calcium content; relatively unbroken 117-139'; med. hard to hard; bedding @ 15°; jointing @ 60-75° w/vertical joint @ 133.0-133.5'; slight FeOx staining @ 132'	
132	132	52	50	26				
						133.5		
136	136	100	40	40		134.3	Stiff brownish black marine clay	
							Dololutite; as next above	
						139.0		
141	141	88	50	44			Calcarenite; brown to tan; broken 139-141'; mod. broken 141-151'; w/broken zones @ 145.5' & 150.5'; med. hard; bedding @ 15° w/vertical joint @ 144.5'	
146	146	100	50	50				
151	151	100	50	50				

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2G-91 (Revised 1-15-68)

0101

GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 3 OF 3

DATE

PROJECT Florida Power Corp. NO. 4203.02 DRILL HOLE NO. 4-16

CONTRACTOR SITE AREA ELEV.

CORE SIZE COORDINATES ANGLE

CASING BEARING

LOGGED BY: GWL DEPTH

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION	REMARKS
							Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	Condition of core. Excavating evaluation, etc.
	151							
155	156	100	5.0	5.0			151-156' mod. broken w/v. broken zone @ 155-156'; med. soft w/soft zone @ 155-156'	CALCARENITE
							156-161' mod. broken; med. soft to med. hard	
160	161	64	5.0	3.2			161-166' mod. broken; med. hard to hard; partially dolomitized @ 162-164.5'	
165	166	100	5.0	5.0				
170							T. D. 166.0'	

0102

GAI-228 1/66

2G-92 (Revised 1-15-68)

GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 1 OF 3

DATE

PROJECT Florida Power Corp. NO 4263-02 DRILL HOLE NO. 4-17

CONTRACTOR Girdler Foundation SITE AREA Crystal River Unit #4 ELEV. 96.83'

CORE SIZE 2 3/4" COORDINATES +(8+65) ANGLE vertical

CASING 4" s(0+60) BEARING

LOGGED BY: GWL DEPTH 165.0'

Depth	Depth	Rec. %	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation, etc.
							Fill	2" s/s 140 lb hammer 30" drop
5	5.0					6.0		
	6.5	73	1.5	.9		6.5	V. dense; brown quartz sand; highly organic at base	27-16-50
10	10.0	0	3.5	0		10.0		
	11.0	35	1.0	.4		11.0	V. dense; decomposed calcarenite; crse. frag.	29-70
							Bioclastic pelcalcarenite; white to lgt. gray; abundant bioclasts; fine to med. grnd; FeOx staining @ 17.5' & 11.0'; bedding @ 15-25° w/jointing @ 60° 11-15' v. broken 15-24.5' mod. broken 24.5-25' v. broken 25-27' mod. broken 11-15' soft to med. hard 15-27' med. hard w/soft zone @ 22'	
15	15.0	28	4.0	1.1				
20	20.0	100	5.0	5.0				
25	25.0	82	5.0	4.1				
						~27.0		
							Biopelcalcarenite; white to lgt. gray; poorly cemented; high calcium content; FeOx staining @ 32.5' & 57.5'; bedding @ 15°; jointing @ 60-75° 27-32.5' mod. broken 32.5-43.5' v. broken 43.5-46' mod. broken 46-53' v. broken 53-57.5' mod. broken 27-29' med. hard 29-39' soft to med. hard 39-42' med. hard 42-43.5' soft 43.5-54' med. soft to med. hard 54-55' soft 55-57.5' med. hard	sparry zone 32.5-57.5'
30	30.0	84	5.0	4.2				
35	36.0	52	5.0	2.6				
	39.0	18	4.0	.7				
40								
	43	50	4.0	2.0				
45	46	70	3.0	2.1				
50	51	34	5.0	1.7				
55	55.6	40	4.0	1.6				
	58	57	7.0	1.7		57.5	~~Stiff black marine clay~~	
60							Sugary doloarenite; lgt, brown or tan; fine grnd.; low calcium content; FeOx staining @ 72'; partially marbleized 73-75'; bedding @ 15°; jonting @ 75° 58-75' mod. broken w/ v. broken zone @ 72.5' med. hard to hard w/soft zones @ 58.5' & 72.5'	
	62	5	4.0	.2				
65	65	37	3.0	1.1				
	68	37	3.0	1.1				
70								
	73	84	5.0	4.2				
75								

0103

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GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 2 OF 3

DATE

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. A-17

CONTRACTOR SITE AREA ELEV.

CORE SIZE COORDINATES ANGLE

CASING BEARING

LOGGED BY: GWL DEPTH

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation, etc.
	77	100	4.0	4.0		77.0	V. stiff black marine clay (2' layer)	
80	80	100	3.0	3.0			Spongy doloarenite; brown to gray; fine to med. grnd.; v. crse. bioclastic @ 82-83'; mod. broken 77-93' w/ v. broken zone @ 84-85'; v. soft & silty 77-78'; bedding @ 15° w/jointing @ 75°; first appearance of lignite @ 89'	78-79' hard 79-80' soft 80-93' med hard to hard w/soft zones @ 84&93'
85	85	82	5.0	4.1				
88	88	73	3.0	2.5				
90	89	70	1.0	.7				
	91	100	2.0	2.0				
	94	63	3.0	1.9		~93.0		
95							Spongy doloarenite; brown to gray; laminated w/peat @ 94-95'; mod. broken; bedding @ 15-25°; jointing @ 60°; med. hard to hard w/soft zone @ 97.5'	small clay seam @ 100'
98	98	80	4.0	3.2				
100						101.0		
	103	100	5.0	5.0		103.0	Med. stiff brown clay	
105							Dololutite; white w/gray dolomite frag. within; high calcium content; mod. broken 101.3-106.5'; v. broken 106.5-108.5'; mod. broken 108.5-110.0'; v. broken 110-113'; bedding @ 15°; thin bedded	101-104' med. hard 104-113' soft to med. soft
	108	100	5.0	5.0				
110								
	113	60	5.0	3.0		113.8 114.0	Stiff brown marine clay	
115						115.5 116.8	As next above; mod. broken; med. soft to med. hard V. stiff brown marine clay	
	118	98	5.0	4.9			Doloarenite; lgt.brown; slightly spongy; mod. broken; med. hard to hard; bedding @ 15°; jointing @ 60°; low calcium content small stiff black clay layer @ 127'	
120								
	123	68	5.0	3.4				
125	126	100	3.0	3.0		128.0		
	130	100	4.0	4.0			Dololutite; white to gray w/gray dolomite frag.; mod. broken; high calcium content; med. hard to hard w/soft zones @ 133 & 138'; bedding @ 15-25° w/jointing @ 75°	
130	134	78	4.0	3.1				
	135	80	1.0	.8				
						138.5 140.0	V. stiff brown marine clay	
140	140	98	5.0	4.4				
145	145	100	5.0	5.0			Calcarenite; brown; mod. broken w/v. broken zones @ 140 & 144'; med. hard w/soft zones @ 140 & 144'; high calcium content; fine to med. grnd.; partially dolomitized @ 140- 141.5'; bedding @ 15°; jointing near vertical	0104
150	150	96	5.0	4.8				

GAI-228 1/66

2G-94 (Revised 1-15-68)

PROJECT Florida Power Corp.

CONTRACTOR _____

CORE SIZE _____

CASING _____

LOGGED BY: _____

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	Rock type, joints
155	155	44	5.0	2.2			As a zone
160	160	86	5.0	4.3			
165	165	18	5.0	.9			
							T. D.

0105

GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 1 OF 2

DATE

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. 4-19

CONTRACTOR Girdler Foundation SITE AREA Crystal River Unit #4 ELEV. 98.28'

CORE SIZE 2 3/4" COORDINATES +(5+60) ANGLE vertical

CASING 6" & 4" s(1+00) BEARING

LOGGED BY: GWL DEPTH 142.0'

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation, etc.
6								
10							Top of rock @ 13.5'	
15							Not sampled	
20	21.0		-	-		21.0		← 6" csg.
25	26.0	96	5.0	4.8		25.0	Biocalstic pelcalcarenite; tan-buff; med. hard; relatively unbroken; trace FeOx staining; competent	
30	31.0	32	5.0	1.6			Biopelcalcarenite; cream to tan; mod. broken to v. broken; diff. cemented; soft w/med. hard nodules to med. hard; low recovery throughout unit	
35	36.0	32	5.0	1.6				
40	41.0	60	6.0	3.0				
45	46.0	70	5.0	3.5				
50	49.0	0	3.0	0	NR.	49.0	No recovery	
	53.0	—	—	—	CAV.	CAVITY 53.0	Cavity	
55	56.0	17	3.0	.5				
60	61.0	6	5.0	0.3		61.0		
65	66.0	12	5.0	.6			Doloarenite; tan; sugary; med. soft to med. hard; relatively unbroken; vertical joints throughout unit	← 4" csg.
70	73.0	23	7.0	1.6				
75								

0106

GAI-228 1/66

2G-96 (Revised 1-15-68)

GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 2 OF 2

DATE

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. 4-19

CONTRACTOR SITE AREA ELEV.

CORE SIZE COORDINATES ANGLE

CASING BEARING

LOGGED BY: GWL DEPTH

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation, etc.
80	80.0	29	7.0	2.0		80.0		
85	86.0	40	6.0	2.4			Bioclastic doloarenite; tan-gray; spongy texture; med. hard to v. hard; unbroken; massive; 6' vertical joint @ 100'	← 4" CSG.
90	90.0	25	4.0	1.0				
	92.0	45	2.0	.9		92.0		
95	96.5	-	-	-	CAV	CAVITY 96.5	Cavity	
100	102.0	90	5.5	5.0		102.0		
102	106.0	75	4.0	3.0			Calcilutite; white w/blue-gray lutite inclusions; relatively unbroken; pasty; med. soft to med. hard; fragmented at base of unit; silty, organic zone @ top of unit	
110	111.0	80	5.0	4.0				
115	116.0	54	5.0	2.7		116.0		
120	124.0	56	8.0	4.5		124.0	Calcarenite; tan; biogenic; fresh; unbroken; med. hard to hard; good core; FeOx stained; vugs	
125	126.5	0	2.5	0	CAV	CAVITY 126.5		
130	132.0	74	8.5	3.7				
135	137.0	86	5.0	4.3			Calcilutite; as next above; unbroken; med. hard; silty organic zone 136-137'	
140	142	22	5.0	1.1				
145							Boring ended	
150								

0107

GAI-228 1/66

GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 1 OF 2

DATE

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. 4-20

CONTRACTOR Girdler Foundation SITE AREA Crystal River Unit #1 ELEV.

CORE SIZE 2 3/4" COORDINATES +(6+60) ANGLE vertical

CASING 23' of 6" + 75' of 4" s(1+00) BEARING

LOGGED BY: GWL DEPTH 136.0'

Depth	Depth '	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation, etc.
0							Roller bit - not sampled	
10						12.0	Top of rock at 12.0'	
15							Soft rock - not cored	
20	21.0					21.0		set 6" casing to 21'
					18	23.0	Bioclastic pelcalcarenite; cream colored; med. soft to med. hard; broken	
25	26.0	40	5.0	2.0			Biopelcalcarenite; cream colored; med. soft to med. hard; trace FeOx discoloration; friable; v. broken to broken; poorly cemented	
30	31.	26	5.0	1.3			23- 34' med soft to med. hard; broken; diff. cemented 34-35' med. hard; mod. broken 35-40' med. soft w/med. hard nodules; poor cement 40-41' med. hard; mod. broken; diff. cemented 41-45' med. soft; v. broken; v. poor cement	
35	36.0	41	5.0	2.1				
40	41.0	38	5.0	1.9				
45	46.0	36	5.0	1.8		~47		45' of 4" casing
							Biopelcalcarenite; some crse. sparry bioclasts; med. soft to med. hard; nodular; diff. cemented 45-46' Med. hard; mod. broken 46-51' med. soft w.med. hard nodules; diff. cemented	relatively fresh rock
50	51.0	22	5.0	1.1		51.0		
	56.0	0	5.0	0	WR	56.0	No recovery	
60	60.0	42	5.0	2.1			Biogenic calci-doloarenite; tan; med. hard; relatively unbroken; massive; fresh unaltered rock; fine grnd.; sugary textured; no FeOx discoloration	
65	66.0	34	5.0	1.7				
70	71.0	36	5.0	1.8				set 75' of 4" casing
75	76.0	56	5.0	2.8				

0108

GAI-225 1/66

2G-98 (Revised 1-15-68)

GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 2 OF 2

DATE

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. L-20

CONTRACTOR SITE AREA ELEV.

CORE SIZE COORDINATES ANGLE

CASING BEARING

LOGGED BY: GWL DEPTH

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core, Excavating evaluation, etc.
80	81.0	60	5.0	3.0		84.0	Mod. broken from 81-84'	
85	86.0	48	5.0	2.4			Bioclastic cal'-doloarenite; tan-gray marbleized; med. hard to hard; relatively unbroken	fresh
90	91.0	60	5.0	3.0		91.0		
95	96.0	48	5.0	3.9		99.0	As above; w/lignite inclusions & slightly spongy texture	fresh to slightly weathered
100	101.0	82	5.0	4.1			Calcilutite; white w/some bioclastic casts; pasty w/some concretions & lutite inclusions; soft to med. hard; some lignite laminations at top of unit	
105	106.0	70	5.0	3.5			99-101' soft; laminated; silty w/lignite laminations; v. broken	
110	111.0	44	5.0	2.2			101-105' med. hard; bioclastic casts; relatively unbroken	
115	116.0	44	5.0	4.7			105-106' soft w/med. hard frag.; v. broken	fresh
							106-108' med. hard; trace bioclastic casts; mod. broken	
							108-111' soft w/med. hard frag.; trace blue lutite inclusions	
							111-113' med. hard; unbroken	
							113-114' soft; v. broken	
							114-119' med. hard; unbroken; vertical joint 114-115'	
120	121.0	100	5.0	5.0		119.0	Calcarenite; med. hard; tan; biogenic; unbroken	
						124.0		
125	126.0	60	5.0	3.0			Calcilutite; white; pasty; med. hard to hard w/soft organic clay seams (6") @ 125' & 133'; relatively unbroken w/trace biogenic casts & blue lutite inclusions; trace vertical joints w/FeOx stains at 128'	laminated organic clay 3" @ 125'
130	131.0	80	5.0	4.0			124-126' soft; broken; 126-134' med. hard to hard; unbroken	fragmented translucent clay seam 2" @ 133'
135	136.0	84	5.0	4.2		136.0	Calcarenite; med. hard to hard; relatively unbroken	
							End	fresh rock

0109

GAI-228 1/66

GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 1 OF 2

DATE

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. 4-21

CONTRACTOR Girdler Foundation SITE AREA Crystal River Unit #4 ELEV. 98.44'

CORE SIZE 2 3/4" COORDINATES +(4+60) ANGLE vertical

CASING s(1+00) BEARING

LOGGED BY: GWL DEPTH 145.0'

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation, etc.
5							Roller bit to 21' - not sampled	
10								
15								
20	21.0							set 21' of 6" casing
25	26.0	60	5.0	3.0			Bioclastic pelcalcarenite; lgt. cream color; med. soft to med. hard; relatively unbroken; FeOx stains 26-32'; trace staining above 26'	
30	31.0	14	5.0	0.7		32.0		
35	36.0	100	5.0	5.0			Biopelcalcarenite; lgt. cream; broken to mod. broken; med. soft ot med. hard; cement decreases w/depth 32-34' med. hard; mod. broken; friable 34-36' med. soft w/med. hard nodules; broken; diff. cemented; broken 36-50' soft w/med. hard nodules; v. brcken	
40	41.0	6	5.0	0.3				set 40' of 4"
45	46.0	10	5.0	0.5				
50	51.0	16	5.0	0.8		~50.0		
55	56.0	14	5.0	0.7			Bioclastic calcarenite; soft w/med. hard sparry frag.; highly leached w/FeOx staining	
60	62	40	5.0	2.0		~59.0	Biogenic calci-doloarenite; tan; sugary textured; relatively unbroken at top; broken at base; relatively fresh w/FeOx staining at base	set 60' of 4"
65	66.0	14	5.0	0.4				relatively fresh
70	71.0	0	5.0	0				
75	76.0	18	5.6	0.9		75.0		

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GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 2 OF 2

DATE

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. A-21

CONTRACTOR SITE AREA ELEV.

CORE SIZE COORDINATES ANGLE

CASING BEARING

LOGGED BY: GWL DEPTH

Depth	Depth	Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION	REMARKS
						76.0	Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	Condition of core. Excavating evaluation, etc.
							V. stiff organic silty clay; black & orange w.thin silt layer at base	
80	81.0	14	5.0	0.7		81.0	Bioclastic dolcarenite; tan-gray; marbleized; med. hard; mod. broken; sugary; broken & jointed @ base w/FeOx staining	
85	86.0	80	5.0	4.0		88.0		set 85' of 4"
90	91.0	78	5.0	3.9			Bioclastic doloarenite; brown-gray; spongy w/lignite inclusions; med. hard 88-92' med. hard; relatively unbroken 92-95' med. soft; med. hard; v. broken	
95	96.0	32	5.0	1.6		95.0		
100	100.0	34	4.0	1.7			Calcilutite; white to gray; med. soft to med. hard w/ some soft zones; lignite inclusions in several zones; pasty; somewhat fragmented 95-96' med. soft; white; unbroken 96-99' soft to med. soft; gray w/lignite inclusions; broken 99-104' med. soft to med. hard;slightly biogenic;white w/lignite inclusions mod. broken 104-105' med. soft; broken; fragmented 105-108' med. soft to med. hard; gray w/lignite inclusions; broken to mod. broken 108-110' med. soft; white w/concretions 110-117' med. soft; white w/lignite inclusions; broken	organic clay @ 106' (3")
105	105	42	5.0	2.1				
110	110	64	5.0	3.2				
115	115	40	5.0	2.0		117.0		
120	120	64	5.0	3.2				
125	125	90	5.0	4.5				
130	130	60	5.0	3.0				
135	135	92	5.0	4.6				
140	140	100	5.0	5.0				
145	145	98	5.0	4.9				
							End	

C111 GAI-228 1/66

2G-101 (Revised 1-15-68)

GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 1 OF 2

DATE

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. 4-22

CONTRACTOR Girdler Foundation SITE AREA Crystal River Unit #4 ELEV. 98.19'

CORE SIZE 2 3/4" COORDINATES +(5+60) ANGLE vertical

CASING 6" (21') + 4" (75') s(1+00) BEARING

LOGGED BY: GWL DEPTH 131.0'

Depth	Depth	Rec.%	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core Excavating evaluation, etc.
0								
10								
							Top of rock at 11.5'	
15							Soft rock Roller bit - not sampled	
20						20.0		set 20' of 6" casing
25	250	10	5.0	0.5			Bioclastic pelcalcarenite; lgt. cream to buff; low recovery; soft to med. hard; highly leached & discolored from 20-32'; relatively fresh & unbroken below 32'	
	260	20	1.0	0.2				
	275	13	1.5	0.2				
30							20-32' soft w/med. hard frag.; v. broken; FeOx stained & discolored	
	320	15	4.5	0.7			32-36' med. hard; relatively unbroken; trace FeOx staining	
35	360	50	4.0	2.0		~36.0		
40	410	24	5.0	1.2			Biopelcalcarenite; cream to buff; v. soft to med. hard; low recovery from 41-56'; v. broken 36-37' med. hard; relatively unbroken; FeOx stained 37-46' v. soft w/med. hard frag.; FeOx stained; v. low recovery 46-54' no recovery	
45	460	10	5.0	0.5		46.0	54-56' soft w/med. hard frag; relatively fresh rock (cave mat'l)	45' of 4" casing
50	510	0	5.0	0	NR		No recovery	
	540	0	3.0	0		54.0		
55	560	15	2.0	0.3		~56.0		55' of 4" casing
	590	90	3.0	2.7		59.0	Bioclastic pelcalcarenite; sparry; med. hard; relatively unbroken; FeOx discoloration increases w/depth; jointed at base	
60					NR		No recovery (possible silt zone)	
	640	0	5.0	0		64.0		
65	660	60	2.0	1.2			Biogenic cali-doloarenite; tan; med. soft to med. hard; relatively unbroken; massive	
70	710	16	5.0	0.8		72.0		
75	760	50	5.0	2.5		~75.0	V. stiff to hard, organic silty clay; trace silt	set 75' of 4" casing

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0112

GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 2 OF 2

DATE

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. 4-22

CONTRACTOR SITE AREA ELEV.

CORE SIZE COORDINATES ANGLE

CASING BEARING

LOGGED BY: GWL DEPTH

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation, etc.
						76.0		
80	81.0	42	5.0	2.1		~80.5	As next above; med. soft to med. hard; mod. broken	
85	86.0	18	5.0	0.9		~85.5	Bioclastic doloarenite; med. soft to med. hard; tan-gray; slightly marbleized; low recovery	
90	91.0	66	5.0	3.3			Biogenic doloarenite; spongy texture; tan, brown to gray; w/lignite inclusions; med. soft to med. hard; relatively unbroken	
95	96.0	96	5.0	4.8		96.0		
100	101.0	60	5.0	3.0			Calcilutite; white; pasty texture; v. soft to med. hard; massive; relatively fresh; reworked conglomerate at top of unit; becomes more broken towards base 96-97' broken; soft; conglomeratic 97-105' unbroken; med. soft to med. hard 105-112' mod. broken; med. soft to med. hard	
105	106.0	80	5.0	4.0				
110	111.0	82	5.0	4.1		112.0		
115	116.0	88	5.0	4.4			Calcarenite; tan; med. hard to hard; unbroken & unaltered; trace brown organic clay @ top &bottom from 122-124'	
120	121.0	100	5.0	5.0		124.0		
125	126.0	64	5.0	3.2			Calcilutite; white to buff w/blue lutite inclusions; relatively fresh & unaltered; med. soft to med. hard; unbroken	
130	131.0	100	5.0	5.0		131.0		
							End	

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2G-103 (Revised 1-15-68)

0113

GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 1 OF 2

DATE

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. 4-24

CONTRACTOR Girdler Foundation SITE AREA Crystal River ELEV. 97.27'

CORE SIZE 2 3/4" COORDINATES +(6+12) ANGLE Vertical

CASING 21' of 6" + 95' of 4" s(1+59) BEARING

LOGGED BY: GWL DEPTH 140.0'

Depth	Depth	% Ret.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS Condition of core. Excavating evaluation, etc.
5							Roller bit - not sampled	
10						13.0	Top of rock at 13.7'	
15							Soft rock - not sampled	
20	21.0					21.0		set of 6" casing to 21'
25	26.0	20	5.0	1.0			Biopelcalcarenite; cream colored; broken to v. broken; poorly cemented; s[illegible] to med. soft w/med. hard nodules; friable; low recovery throughout unit; fresh colored rock w/FeOx discoloration from 35-37'	
30	31.0	26	5.0	1.3				
35	36.0	28	5.0	1.4				
40	41.0	58	5.0	2.9				
45	46.0	40	6.0	2.0		~46.0		
50	51.0	58	5.0	2.9			As above w/ some crse. bioclasts	sparry bioclasts occur
55	56.0	32	5.0	1.6		56.0		
60	61.0	18	5.0	0.9			Biogenic calci-doloarenite; tan sugary textured; med. hard portions recovered; high calcium %; trace FeOx staining on joint faces; mod. broken	
65	66.0	26	5.0	1.3		66.0		
70	71.0	0	5.0	0	NR	71.0	No recovery	
75	76.0	20	5.0	1.0		76.6	As next above	set 25' of 4" casing

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GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 2 OF 2

DATE

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. 4-24

CONTRACTOR SITE AREA ELEV.

CORE SIZE COORDINATES ANGLE

CASING BEARING

LOGGED BY: GWL DEPTH

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation, etc.
80							Bioclastic dolcarenite; tan-gray marbleized; unit varies from v. soft, weathered silty zone at base to hard unaltered rock at top; FeOx increases w/depth; relatively unbroken to 81'; mod. broken to 87'; v. broken to 91'; mod. broken to 92'	
	81.0	66	5.0	3.3				
85	86.0	12	5.0	0.6				
90	91.0	60	5.0	3.0		92.0		
95	96.0	72	5.0	3.6			As above w/lignite inclusions; med. hard & unbroken; fresh rock	set 45' of 4" casing
	99.0	56	3.0	1.7				
100	100.0	33	1.0	0.3		100.0		
105	106.0	50	6.0	3.0			Calcilutite; white to gray; pasty; soft to med. hard; mod. to v. broken; trace of FeOx staining near base of unit	
110	111.0	6	5.0	0.3				
	114.0	43	3.5	1.3		114.0		
115	117.5	0	3.5	0	CAV	CAVITY 117.5		
	118.5	100	1.0	1.0		118.5	Calcarenite; biogenic; med. hard; mod. broken; leached	
120	123	0	4.5	0	CAV	CAVITY 123		
125	126.0	50	3.0	1.5			Calcilutite; buff-tan; pasty; med. hard to hard; unbroken w/soft silty zone 132-133'; some high angle joints at base of unit	
130	131.0	44	5.0	2.2				
135	136.0	80	5.0	4.0		137.0		
140	141.0	98	5.0	4.9			Calcarenite; tan-buff; mod. broken; med. soft to med. hard; friable & fragmented at base	
							End	

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2G-105 (Revised 1-15-68)

GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 1 OF 2

DATE

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. 4-25

CONTRACTOR Girdler Foundation SITE AREA Crystal River Unit #4 ELEV. 96.45'

CORE SIZE 2 3/4" COORDINATES +(6+12) ANGLE vertical

CASING 21' of 6" + 65' of 4" s(2+50) BEARING

LOGGED BY: GWL DEPTH 141.0'

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation, etc.
5							Roller bit - not sampled	
10							Top of rock at 11.0'	
15							Soft rock - not sampled	
20	21.0					21.0		set 21' of 6" casing
25	26.0	30	5.0	1.5			Bioclastic pelcalcarenite; lgt. cream; med. soft to med. hard; v. broken to mod. broken; FeOx staining throughout unit;	
30	31.0	54	5.0	2.7		31.0	21-29' med. soft w/med. hard frag.; v. broken; leached	
	33.0	0	2.0	0		CAVITY 33.0	29-31' med. hard; mod. broken; trace FeOx; some high angle joints	
35	36.0	100	3.0	3.0		35.0	31-33' cavity 33-35' med. hard; relatively broken; trace FeOx	
	38.0	65	2.0	1.3			Biopelcalcarenite; lgt. cream to buff; med. soft w/ med. hard nodules; highly fragmented; entire unit leached & oxidized	set 25' of 4"
40	42.0	32	4.0	1.3			35-36' med. hard; unbroken	trace organic clay 40'
45	46.0	47	4.0	1.9			36-55' med. soft w/med. hard nodules; v. broken	
50	51.0	16	5.0	0.8			55-56' med. soft; mod. broken	
55	56.0	18	5.0	0.9			56-59' med. soft w/mod. hard nodules; v. broken; v. crse. sparry bioclasts from 56-59'	
60	61.0	52	5.0	2.6		59.0	Biogenic calc-doloarenite; tan; sugary textured; relatively unbroken; hard; some FeOx staining on joint (low angle) surfaces	set 65' of 4"
65	66.0	22	6.0	1.1				
70	71.0	72	5.0	3.6				
75	76.0	40	5.0	2.0		76.0		

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GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 2 OF 2

DATE

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. A-25

CONTRACTOR SITE AREA ELEV.

CORE SIZE COORDINATES ANGLE

CASING BEARING

LOGGED BY: GWL DEPTH

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation, etc.
80	81.0	44	5.0	2.2			Bioclastic doloarenite; tan-gray; relatively unbroken; some high angle joints at top of unit ; mod. to low recovery; all rock recovered; very competent	fresh rock
85	86.0	38	5.0	1.9				
90	91.0	14	5.0	0.7		92.0		
95	96.0	44	5.0	2.2			As above w/lignite inclusions; spongy textured; tan-gray color; moderately broken; med. hard	fresh rock
100	101.0	72	5.0	3.6		101.0		
105	106.0	32	5.0	1.6			Calcilutite; white; pasty; soft to hard; mod. broken to v. broken; hardness decreases w/depth and fragmentation increases	
110	111.0	60	5.0	3.0				
115	116.0	34	5.0	1.7		114.0 116.0	~~Dense calcareous silt & v. fine calcareous & quartz~~ sand w/soft white frag. at base	
120	121.0	58	5.0	2.9		121.0	Calcarenite; buff; biogenic; unbroken; hard	fresh
125	126.0	26	5.0	1.3			Calcilutite; buff; relatively unbroken; pasty; soft to hard; some blue lutite inclusions 121-126' soft to med. hard; mod. broken; high angle joints 126-129' hard; slightly porous; unbroken 129-130' med. soft; laminated; concentration of re-worked frag. as inclusions above laminar zone 130-135' hard;unbroken;few inclusions;fresh 135-136' med. soft; pasty; fragmented	@ 129-130' laminated silty zone; trace organic @ 134'
130	131.0	78	5.0	3.9				
135	136.0	90	5.0	4.5		136.0		
140	141.0	96	5.0	4.8		141.0	Calcarenite; tan; broken; soft to med. hard; friable; upper 1.0' is highly weathered (dense silt & sand); becomes harder w/depth	
							End	

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GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 1 OF 2

DATE

PROJECT Florida Powdr Corp. NO. 4203-02 DRILL HOLE NO. 4-26

CONTRACTOR Girdler Foundation SITE AREA Crystal River Unit #4 ELEV. 96.65'

CORE SIZE 2 3/4" COORDINATES +(5+60) ANGLE vertical

CASING 21' of 6" + 85' of 4" s(2+90) BEARING

LOGGED BY: OWL DEPTH 139.0'

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION	REMARKS
							Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	Condition of core. Excavating evaluation, etc.
0							Roller bit - not sampled	
10								
15						16.0	Top of rock at 16'	
20	21.0					21.0	Soft rock - not sampled	set 21' of 6" casing
25	26.0	34	5.0	1.7			Bioclastic pelcalcarenite; cream color; relatively unbroken w./ several broken zones; med. soft to med. hard; some FeOx staining	
							21-26' med. hard; mod. broken; some diff. cementation; FeOx discoloration	
30	31.0	62	5.0	3.1			26-28' med. soft w/med. hard frag.; v. broken; leached; FeOx discoloration	
							28-33' med. hard to hard; some diff. cementation; mod. broken; trace organic infill	
35	36.0	94	5.0	4.7			33-36' med. hard to hard; good cement; relatively unbroken; relatively fresh	
	39.0	60	3.0	1.6		39.0	37-39' med. soft w/med. hard frag.; mod. broken; high FeOx staining; highly leached	
40							Biopelcalcarenite; lgt. cream; entire unit broken to mod. broken; med. soft to med. hard; trace FeOx discoloration	
	42.0	32	4.0	1.3				
45	46.0	42	3.0	1.7			39-43' broken; med. hard frag.; low recovery	set 45' of 4" casing
							43-56' mod. broken to broken; diff cemented; med. soft to med. hard; fresh to trace of FeOx stains; clastic zones (sparry) at 46' & 52'	
50	51.0	48	5.0	2.4				
	52.0	80	1.0	0.8				
55	56.0	40	4.0	1.6			56-66' med. soft w/med. hard nodules; v. broken; low recovery	
60	61.0	10	5.0	0.5				set 55' of 4" casing
65	66.0	24	5.0	1.2		66.0		
70	71.0	44	5.0	2.2			Cali-doloarenite; tan; sugary textured; med. hard to hard; mod. broken; some weathering of bedding (5-10°) planes & joint surfaces (high angle); slightly porous	
75	76.0	92	5.0	1.6				

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GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 2 OF 2

DATE

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. 4-26

CONTRACTOR Girdler Foundation SITE AREA Crystal River Unit #4 ELEV.

CORE SIZE COORDINATES ANGLE

CASING BEARING

LOGGED BY: GWL DEPTH

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation, etc.
						76		
					NR		No recovery	
80	81.0	0	5.0	0		81.		
	83.5	12	2.5	0.3		83.5	White biopelsalcarenite frag w/sparry inclusions; recovery from unit above & not inplace	
85	86.0	0	1.6	0	NR	86.0	No recovery	25' of 4" casing
	90.0	32	5.0	1.6		90.0	Bioclastic dolocarenite; tan; sugary textured; hard; mod. broken w/near vertical joints; FeOx staining on joint faces	
95	96.0	48	6.0	2.9			Bioclastic dolocarenite; tan to gray; spongy texture w/ lignite inclusions starting @ 95'; unit is hard w/silty zone @ 95' (also low recovery); unit is thick bedded w/ some weathering of surfaces	
100	101.0	58	5.0	2.9		100.0	V. stiff brick organic silty clay; laminated	
105	106.0	44	5.0	2.2			Calcilutite; white to buff; pasty; fragmented; mod. broken; med. hard to soft; hardness decreases w/depth; some lutite inclusions	
	109.0	40	3.0	1.2			103.5-106' med. soft to med. hard; broken	
110							106-109' med. hard; broken; trace FeOx staining; mod. broken	
	114.0	38	5.0	1.9			109-114' med. soft; pasty; lutite inclusions; broken	
115							114-119' soft; pasty; lutite inclusions	
	119.0	52	5.0	2.6		119.0		
120							Calcarenite; biogenic; tan; broken; trace of clay (spft) @ 127'; med. hard to hard; fresh rock	
	124.0	68	5.0	3.4				
125								
	129.0	50	5.0	2.5				
130								
	134.0	34	5.0	1.7		133.0		
135							Calilutite; lgt. tan; trace blue lutite inclusions; somewhat porous; med. hard; mod. broken; 60° joints; trace FeOx stain on joint faces	
	139.0	34	5.0	1.7		139.0		
							End	

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2G-109 (Revised 1-15-68)

GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 1 OF 2

DATE

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. 4-27

CONTRACTOR Girdler Foundation SITE AREA Crystal River Unit #4 ELEV. 96.88'

CORE SIZE 2 3/4" COORDINATES +(5+12) ANGLE vertical

CASING 21' of 6" + 85' of 4" s(3+40) BEARING

LOGGED BY: GWL DEPTH 146.0'

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation, etc.
5							Roller bit - not sampled	
10								
15								
20	21.0					21.0		set 6" casing to 21'
25	25.0	92	4.0	3.7			Bioclastic pelcalcarenite; lgt. cream; med. hard; relatively unbroken to broken; trace FeOx staining; relatively fresh rock 21-26' med. hard; relatively unbroken 26-29' med. hard; broken; some leaching 29-31' med. hard; relatively unbroken 31-34' med. hard; broken; some leaching	
30	30.0	84	5.0	4.2				
35	36.0	62	6.0	3.7		34.0	Biopelcalcarenite; lgt. cream; med. soft to med. hard; broken; friable; diff. cemented; nodular rock is relatively fresh; broken during drilling trace sparry bioclasts @ 50'	set 45' of 4" casing
40	41.0	20	5.0	1.0				
45	46.0	26	5.0	1.3				
50	51.0	50	5.0	2.5				
55	56.0	62	5.0	3.1		~54.0	Bioclastic pelcalcarenite; lgt cream; mod. broken to v. broken; soft to med. hard; crse. sparry bioclasts; diff. cemented; nodular 54-56' mod. broken; med. soft to med. hard 56-66' v. broken; med. soft to med. hard	
60	61.0	48	5.0	2.4				
65	66.0	42	5.0	2.1		66.0		
70	71.0	0	5.0	0	NR		No recovery	
75	76.0	10	5.0	0.5				set 75' of 4"

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GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 2 OF 2

DATE

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. A-27

CONTRACTOR SITE AREA ELEV.

CORE SIZE COORDINATES ANGLE

CASING BEARING

LOGGED BY: GWL DEPTH

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation, etc.
80	81.0	8	5.0	0.4			Biogenic doloarenite; tan; sugary; soft to hard; mod. broken; only hard portions recovered; some FeOx discoloration in core; low recovery	set 80' of 4"
85	86.0	0	5.0	0	NR	86.0	No recovery	set 85' of 4"
90	91.0	12	5.0	0.6			Bioclastic doloarenite; tan to gray; slightly marbleized; broken; low recovery of hard frag.; sugary textured	
95	96.0	12	5.0	0.6		96.0		
100	101.0	64	5.0	3.2			Bioclastic doloarenite; tan-gray; spongy; med. hard to hard; relatively unbroken; massive w/lignite inclusions; 45° joint @ 111.0'; relatively fresh; trace weathering on joint faces	
105	106.0	18	5.0	0.9				
110	111.0	16	5.0	0.8				
115	116.0	60	5.0	3.0				
120	121.0	48	5.0	2.4		121.0		
125	126.0	10	5.0	0.5			Calcilutite; white w/some blue lutite inclusions; pasty; fragmental; some nodules; soft tohard; broken to relatively unbroken 121-126' soft w/med. soft frag.;v.broken;v. low recovery 126-127' med. soft w/med. hard nodules; unbroken 127-131' soft; pasty 131-136' med. hard w/soft zone; low recovery; broken 136-144' hard; relatively unbroken; fresh;good recovery	trace organic clay 121-126'
130	131.0	42	5.0	2.1				
135	136.0	12	5.0	0.6				
140	141.0	96	5.0	4.8				
145						144.0		
	146.0	92	5.0	4.6		146.0	Calcarenite; tan; hard; unbroken	
							End	

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GAI-228 1/68

2G-111 (Revised 1-15-68)

GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 1 OF 2

DATE

PROJECT Florida Power Corp. NO. 1203-02 DRILL HOLE NO. 4-28

CONTRACTOR Girdler Foundation SITE AREA Crystal River Unit #4 ELEV. 96.77'

CORE SIZE 2 3/4" COORDINATES +(6+13) ANGLE vertical

CASING S(3+42) BEARING

LOGGED BY: GWL DEPTH 146.0'

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation, etc.
5							Roller bit- not sampled	
10							POOR ORIGINAL	
15								set 20' of 6" casing
20								
25	25.0	42	5.0	2.1		26.0	Bioclastic pelcalcarenite; lgt cream; med. soft to med. hard; broken; some FeOx discoloration	
30	30.0	50	5.0	2.5			Biopelcalcarenite; lgt. cream; soft to med. hard; broken; diff. cemented; FeOx staining on joint (nearly vertical) surfaces; nodular zones; poor recovery	
35	35.0	32	5.0	1.6			26-34' med. soft to med. hard; broken; FeOx stained	
40	40.0	22	5.0	1.1		40	34-36' med. soft to med. hard.; mod. broken; trace stain	
					N.R.		36-40' soft; poor cement; v. low recovery	
45	45.0	0	5.0	0		46.0	40-45' no recovery	
							45-50' med. soft w/med. hard frag.; low recovery	set 45' of 4" FJC
50	50.0	14	5.0	0.7		50.0		
	53.0	0	3.0	0	N.R.	53.0	No recovery	
55	55.0	0	2.0	0		CAVITY 55.0		
							53-69' med. soft; fragmented; low recovery; sparry	
60	60.0	14	5.0	0.7				set 65' of 4" FJC
65	65.0	10	5.0	0.6				
						~69.0		
70	70.0	14	5.0	0.7			Biogenic doloarenite; tan to gray; mod. broken; thinly bedded (5"-10"); med. hard to soft (weathered) at base; entire unit FeOx stained; some near vertical joints	
75	76.0	50	5.0	2.5				

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GILBERT ASSOCIATES, INC.

ROCK CLASSIFICATION, SHEET

SHEET 2 OF 2

DATE

PROJECT Florida Power Corp. NO. 4203-02 DRILL HOLE NO. 1-28

CONTRACTOR SITE AREA ELEV.

CORE SIZE COORDINATES ANGLE

CASING BEARING

LOGGED BY: GWL DEPTH

Depth	Depth	% Rec.	Core Rec. Run	Core Rec. Core	Profile	Interval	DESCRIPTION: Rock type, color, grain size & shape, bedding (angle thickness), fractures, faults, joints (angle, filling, etc.), permeability, alteration, weathering, chemical composition	REMARKS: Condition of core. Excavating evaluation, etc.
						79.0		
80	80.0	30	5.0	1.5		80.5	Black organic silty clay; laminated or desiccated	
85	85.0	52	6.0	2.6			Bioclastic doloarenite; buff-gray; relatively unbroken; med. hard to hard; sugary; crse. casts; some vertical jointing w/weathered faces at base	set 85' of 4" FJC
90	90.0	60	5.0	3.0		90.0		
95	95.0	66	6.0	4.0			Bioclastic doloarenite; w/lignite inclusions; spongy texture; tan-gray; med. hard to hard; near vertical joints 91-93'; heavy FeOx stains; relatively unbroken	
100	101.0	66	5.0	3.3				
105	106.0	42	5.0	2.1		105.0		
110	111.0	74	5.0	3.7			Calcilutite; white to gray w/some blue inclusions; pasty w/some nodules; mod. broken to broken; quite fragmented at base; occasional near vertical joints throughout w/FeOx stains; med. soft to med. hard	
115	116.0	48	6.0	2.4		112.0		
120	121.0	26	5.0	1.3		121.0	Calcarenite; biogenic; white to gray; med. hard; mod. broken at top & bottom	
125	126.0	0	5.0	0	C_a	CAVITY		
						126.0	of unit w/cavity in center; joints (60°) at roof and floor of cavity	
131	131.0	30	5.0	1.5		131.0		
135	136.0	26	5.0	1.3			Calcilutite; white to gray; med. hard to hard; fragmented at top & base of unit	
140	141.0	90	5.0	4.5		140.0	Calcarenite; tan to gray; med. hard to hard; unbroken	
145	146.0	92	5.0	4.6		146.0		
							End	

0123

GAI-228 1/68

2G-113 (Revised 1-15-68)

Geologic Glossary

Allochemical	Components formed by chemical precipitations within the basin of deposition, but which have suffered some later transport or can be differentiated from "Normal" chemical precipitates. (Shells, oolites, pellets, etc.)
Alluviation	The deposition of mechanical sediments by rivers anywhere along their course
Anticline	Rock strata that are arched so as to slope away from the plane of axis on either side
Bedrock	Solid rock in-situ, not transported
Bioclastic	Rocks which owe their fragmentation to the activity of organisms
Biogenic	Pertaining to a deposit resulting from the physiological activity of organisms
Biopelcalcarenite	Composite word; "bio" for biogenic type, "pel" for pellet rock, calcarenite if allochems lie within .0625 and 1 mm size range. (Carbonate rocks)
Brachyanticline	A long narrow anticline
Calcilutite	When allochems size is less than .0625 mm (Carbonate rocks)
Clastic	Rock composed principally of detritus, transported mechanically into its place of deposition
Concretions	Nodular concentration developed by localized deposition of material from solution, generally about a nucleus
Diagenic	Alteration of a bed or beds before consolidation or while in environment of deposition
Diastrophism	The process or processes by which the crust of the earth is deformed.
Dip	Angle at which a stratum is inclined from the horizontal
Doloarenite	When size of dolomite allochems lie within .0625 and 1 mm range
Dolomite	A carbonate rock consisting dominatly of $CaMg(CO_3)_2$

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Eustatic	Pertaining to simultaneous, world-wide changes in sea level
Fault	A fracture along which there has been displacement of the two sides relative to one another parallel to the fracture
Flexure	A bend in strata or any planar structure (fold)
Graben	A block that has been downthrown along faults relative to the rocks on either side
Horst	A block that has been uplifted along faults relative to the rocks on either side
Joint	A fracture or parting which interrupts abruptly the physical continuity of a rock mass
Karrenfield (Karrenfelder)	An erosional furrowed surface topography resulting from differential solution of limestone and removal of residual limestone soil
Karst	Marked by sink, or karst, holes interspersed with abrupt ridges and irregular protuberant rocks, usually underlain by caverns and underground streams
Lithification	The complex of processes that converts a newly deposited sediment into an indurated rock
Lithology	Composition and texture of rocks
Lithostrome	A lithostratigraphic layer consisting of one or more beds of essentially uniform or uniformly heterogeneous lithologic character
Littoral	Taking place on or near the shore
Neritic	Of or pertaining to the marine environment which extends from low tide to a depth of 600 feet, or the lower limit of effective penetration of the radiant energy of the sun
Pellet	Tiny ellipsoidal particles of carbonate, usually less than 1 mm in size
Penecontemporaneous	Implies that in a cherty limestone or a concretionary shale, that the chert or concretion was formed at almost the same time as the deposition of the material of the surrounding rock

Quaquaversal	Dipping outward in all directions from a central point, as a dome in stratified rock
Residual	Material resulting from the decomposition of rocks and remaining essentially in place
Saddle	A low point on a ridge or crestline or a structural feature created by the sagging of an anticline
Scarp	An escarpment, cliff or steep slope of some extent along the margin of a plateau, mesa, terrace, or beach
Strand	Synonymous with beach--that portion of the shore between low and high water
Sublittoral	A zone from a depth of 40 to 60 meters to about 200 meters or the edge of the continental shelf
Superjacent	Lying above or upon
Syncline	A fold in the rocks in which the strata dip inward from both sides toward the axis
Tectonics	A study of the structure of the earth in response to earth movements
Terrace	Relatively flat, horizontal, or gently inclined surfaces which are bounded by a steeper ascending slope on one side and a steeper descending slope on the opposite side
Unconformity	A surface of erosion or non-deposition that separates younger strata from older rock
Upwarp	An area that has been uplifted, generally used for broad anticlines

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GEOLOGIC TIME SCALE

ERA	PERIOD	EPOCH	APPROX. AGE IN MILLIONS OF YEARS AGO
CENOZOIC	QUATERNARY	RECENT	10,000 YEARS
		PLEISTOCENE	1
	TERTIARY	PLIOCENE	11
		MIOCENE	25
		OLIGOCENE	40
		EOCENE	60
		PALEOCENE	70
MESOZOIC	CRETACEOUS		135
	JURASSIC		180
	TRIASSIC		225
PALEOZOIC	PERMIAN		270
	PENNSYLVANIAN		350
	MISSISSIPPIAN		400
	DEVONIAN		440
	SILURIAN		500
	ORDOVICIAN		600
	CAMBRIAN		
PRE-CAMBRIAN	LATE PRE-CAMBRIAN	OLDEST RADIOGENIC DATE REPORTED - 1958	3310
	EARLY PRE-CAMBRIAN		

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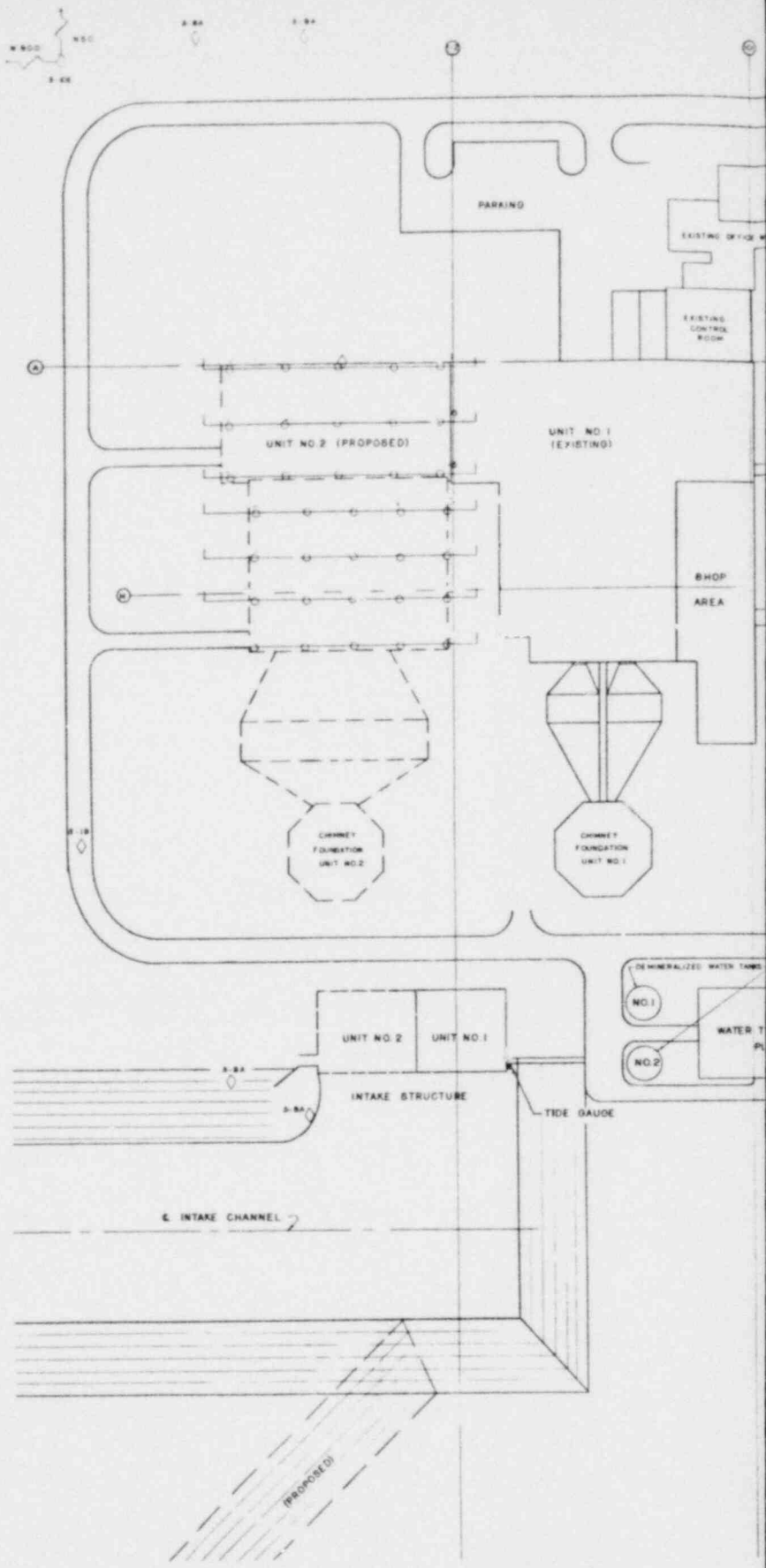
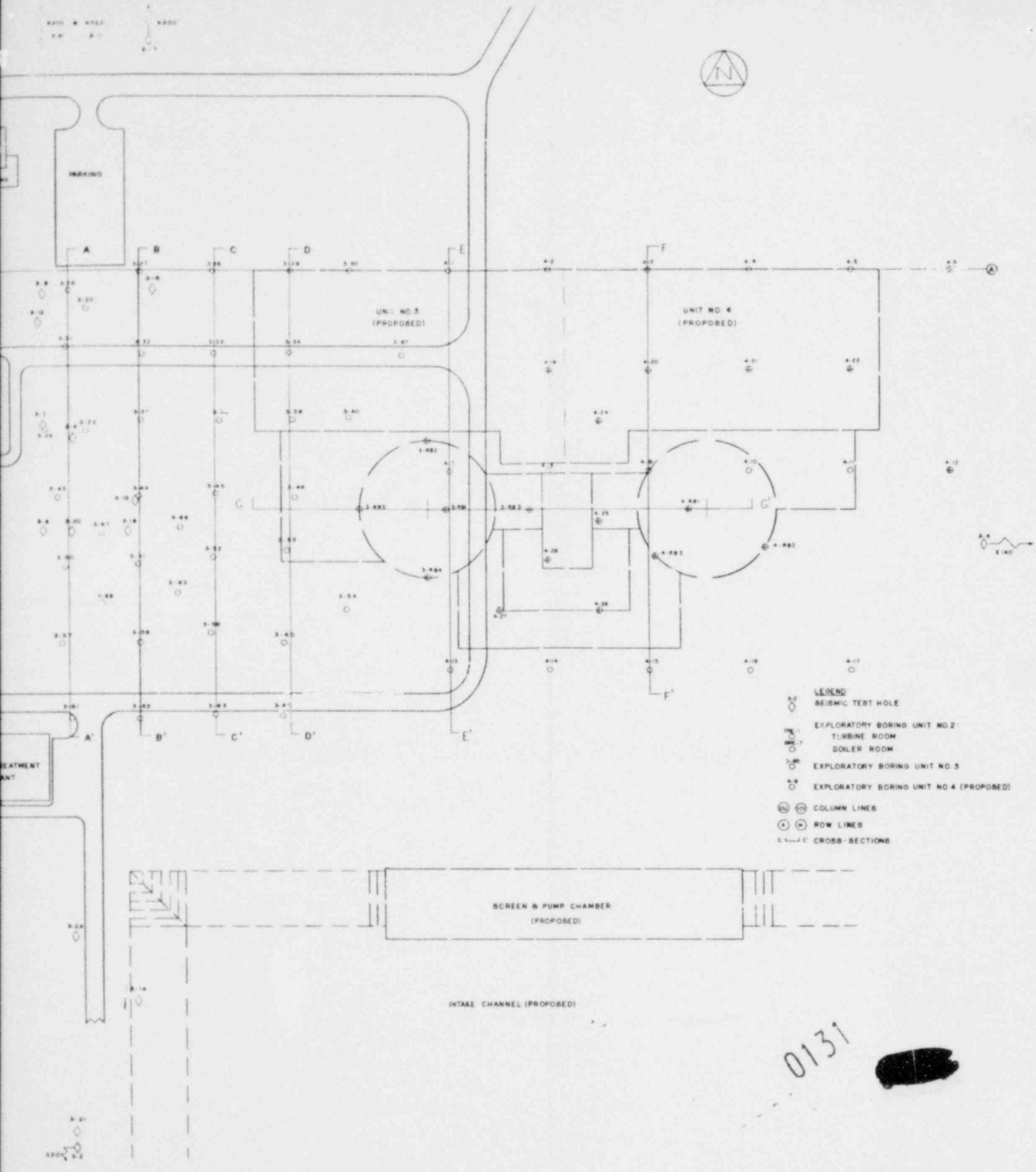
0129


PARKING
EXISTING CONTROL ROOM
UNIT NO. 2 (PROPOSED)
UNIT NO. 1 (EXISTING)
BHOP AREA
CHIMNEY FOUNDATION UNIT NO. 2
CHIMNEY FOUNDATION UNIT NO. 1
DEMINERALIZED WATER TANKS
NO. 1
NO. 2
UNIT NO. 2
UNIT NO. 1
INTAKE STRUCTURE
TIDE GAUGE
℄ INTAKE CHANNEL
(PROPOSED)



0131

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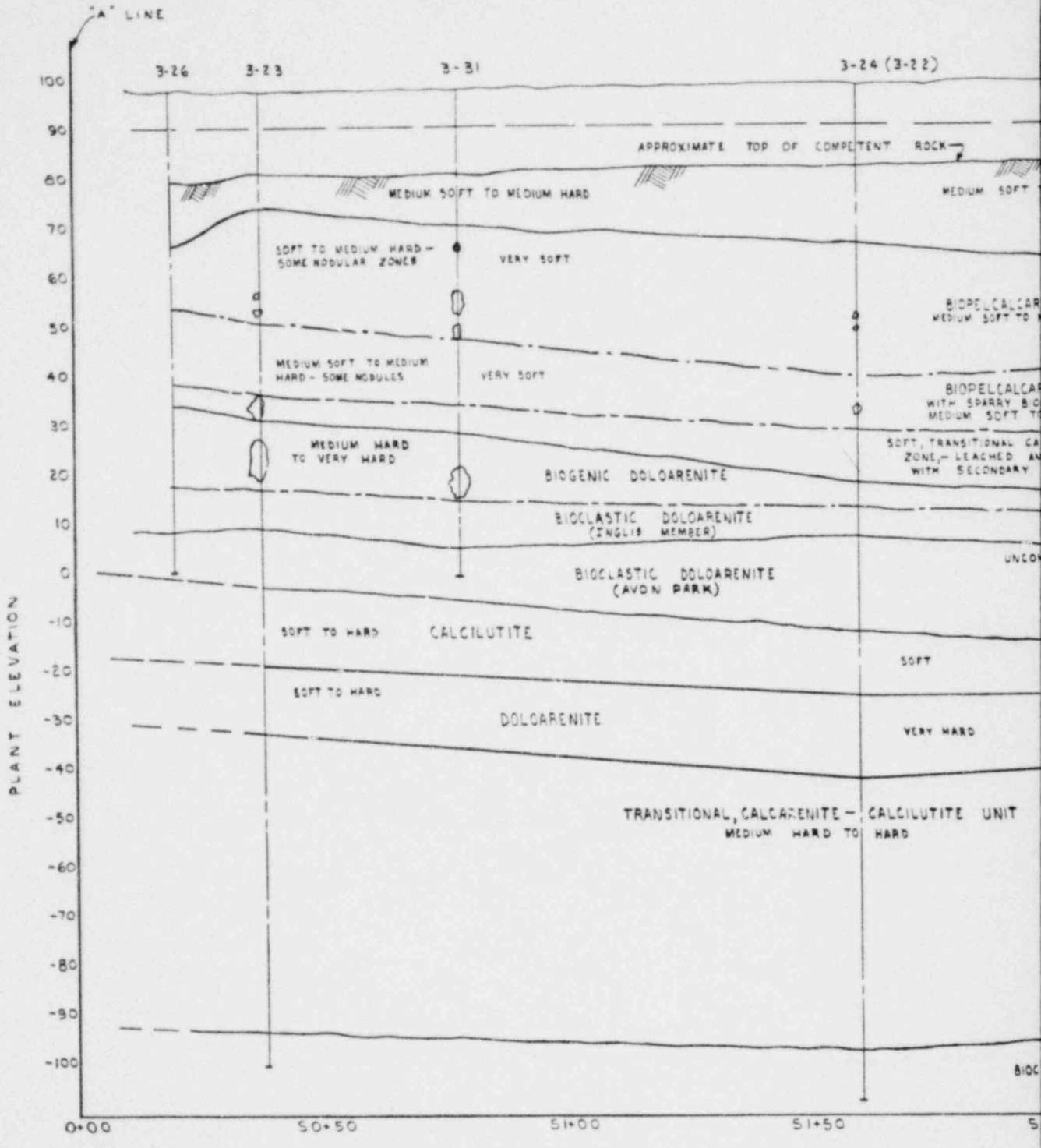
TEST BORING LOCATIONS

CRYSTAL RIVER UNITS 3 & 4

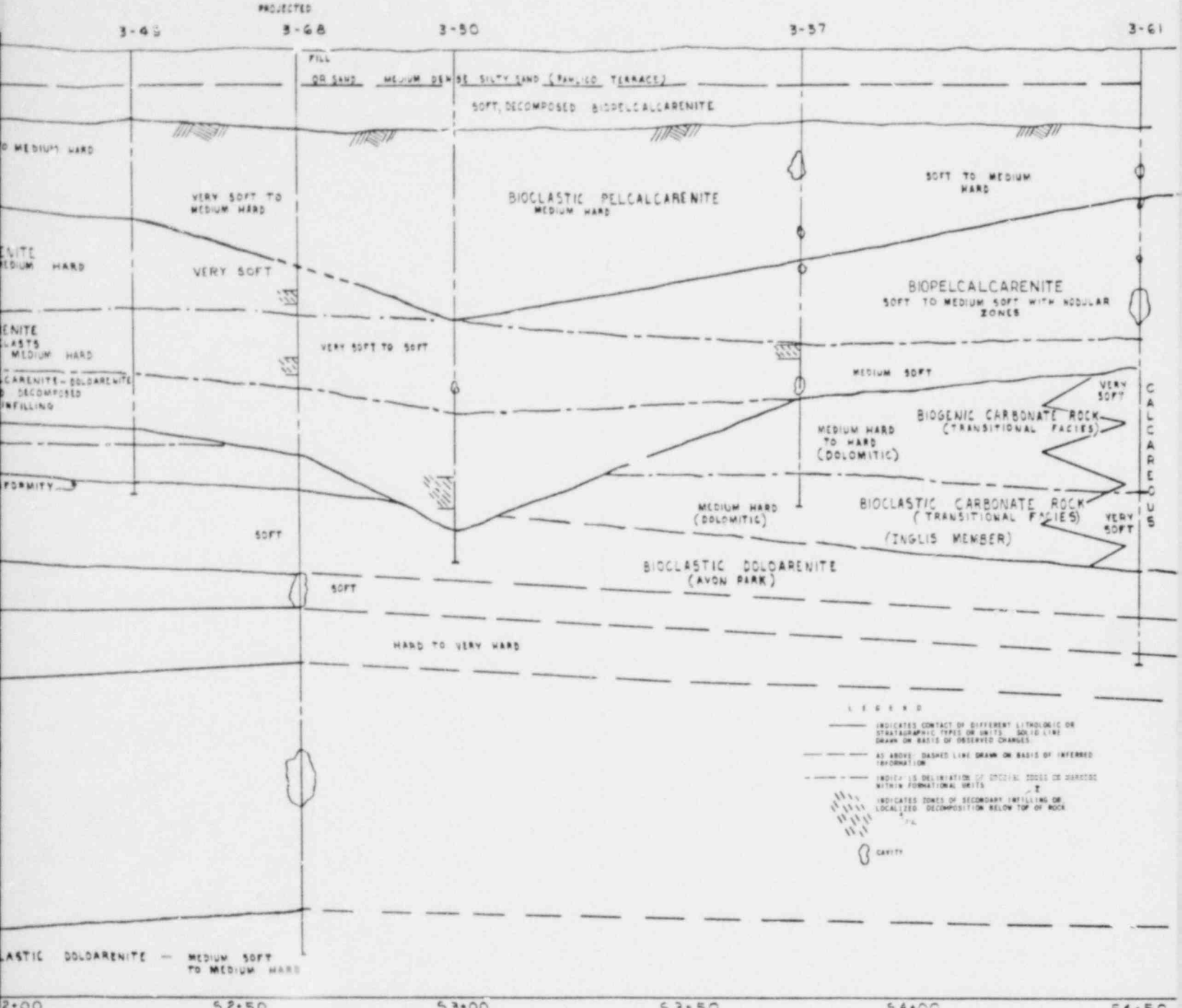
FLORIDA POWER CORPORATION

FIGURE 2G-1

AMEND. 1 (1-15-68)


"A" LINE
3-26
3-23
B-31
3-24 (3-22)
APPROXIMATE TOP OF COMPETENT ROCK
MEDIUM SOFT TO MEDIUM HARD
SOFT TO MEDIUM HARD - SOME NODULAR ZONES
VERY SOFT
MEDIUM SOFT TO MEDIUM HARD - SOME NODULES
VERY SOFT
MEDIUM HARD TO VERY HARD
BIOGENIC DOLOARENITE
BIOCLASTIC DOLOARENITE (INGLIS MEMBER)
BIOCLASTIC DOLOARENITE (AVON PARK)
SOFT TO HARD CALCILUTITE
SOFT TO HARD
DOLOARENITE
SOFT
VERY HARD
TRANSITIONAL, CALCARENITE - CALCILUTITE UNIT
MEDIUM HARD TO HARD
PLANT ELEVATION
100
90
80
70
60
50
40
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
0+00
50+50
51+00
51+50

0132



SECTION A – A'

SCALE: AS SHOWN
HORIZONTAL = VERTICAL

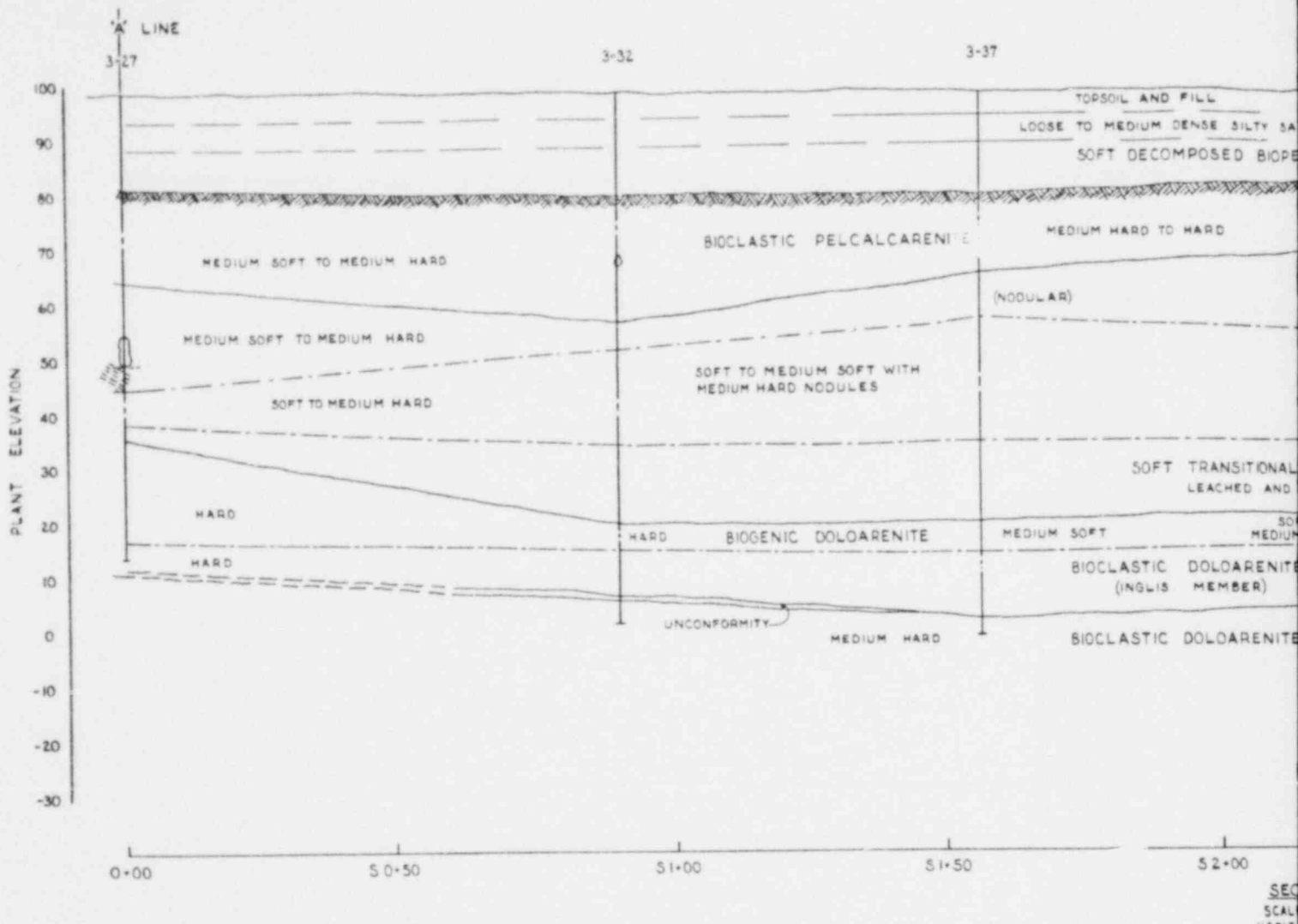
0133

GEOLOGIC CROSS SECTIO

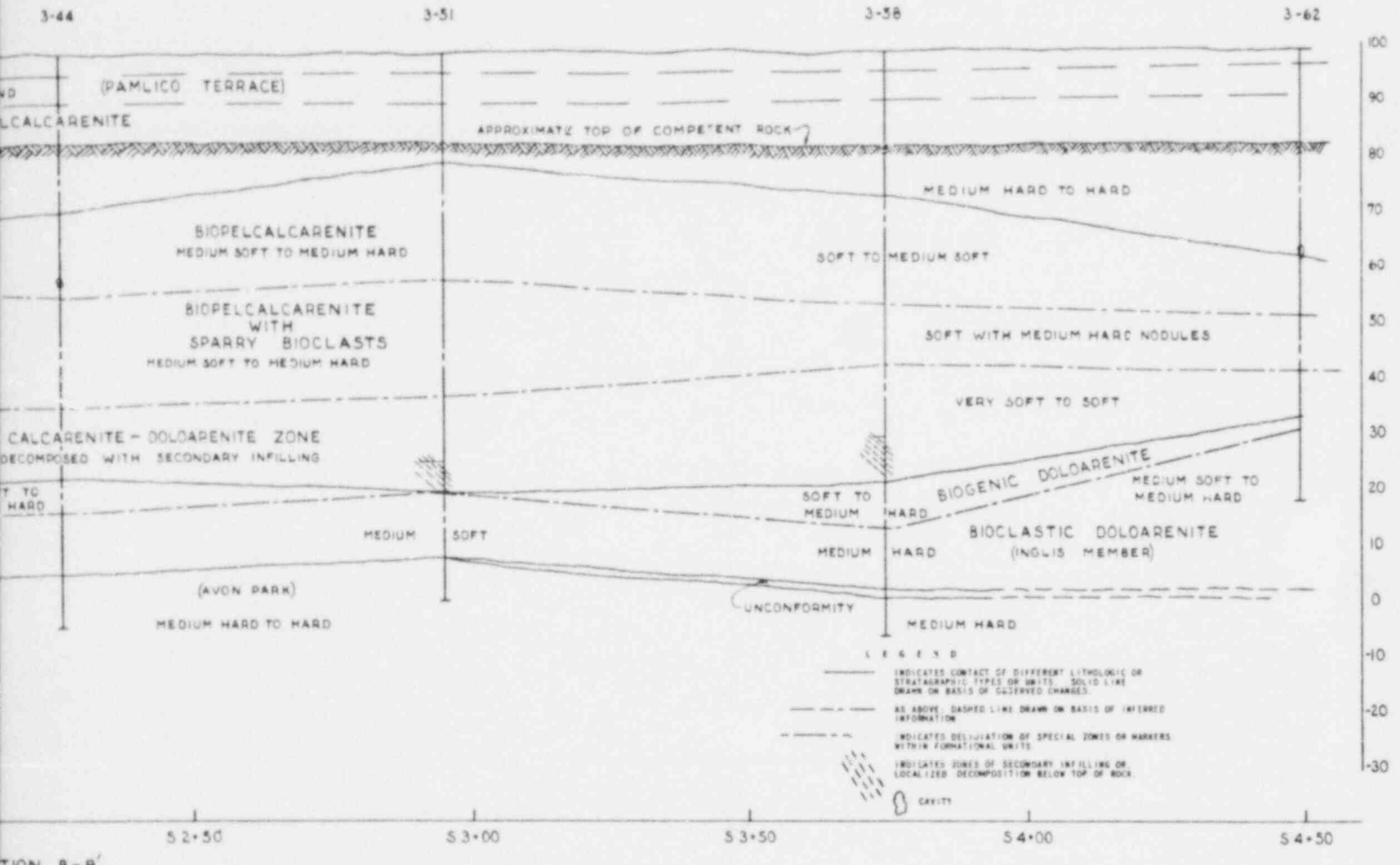
CRYSTAL RIVER UNITS :

FPC FLORIDA POWER CORPORATION

FIGURE


'A' LINE
3-27
3-32
3-37
PLANT ELEVATION
100
90
80
70
60
50
40
30
20
10
0
-10
-20
-30
TOPSOIL AND FILL
LOOSE TO MEDIUM DENSE SILTY SA
SOFT DECOMPOSED BIOPE
BIOCLASTIC PELCALCARENITE
MEDIUM HARD TO HARD
(NODULAR)
MEDIUM SOFT TO MEDIUM HARD
MEDIUM SOFT TO MEDIUM HARD
SOFT TO MEDIUM SOFT WITH
MEDIUM HARD NODULES
SOFT TO MEDIUM HARD
SOFT TRANSITIONAL
LEACHED AND
HARD
HARD
HARD
BIOGENIC DOLOARENITE
MEDIUM SOFT
BIOCLASTIC DOLOARENITE
(INGLIS MEMBER)
UNCONFORMITY
MEDIUM HARD
BIOCLASTIC DOLOARENITE
0+00
S 0+50
S 1+00
S 1+50
S 2+00

0134



TION B-B'
: AS SHOWN
NTAL = VERTICAL

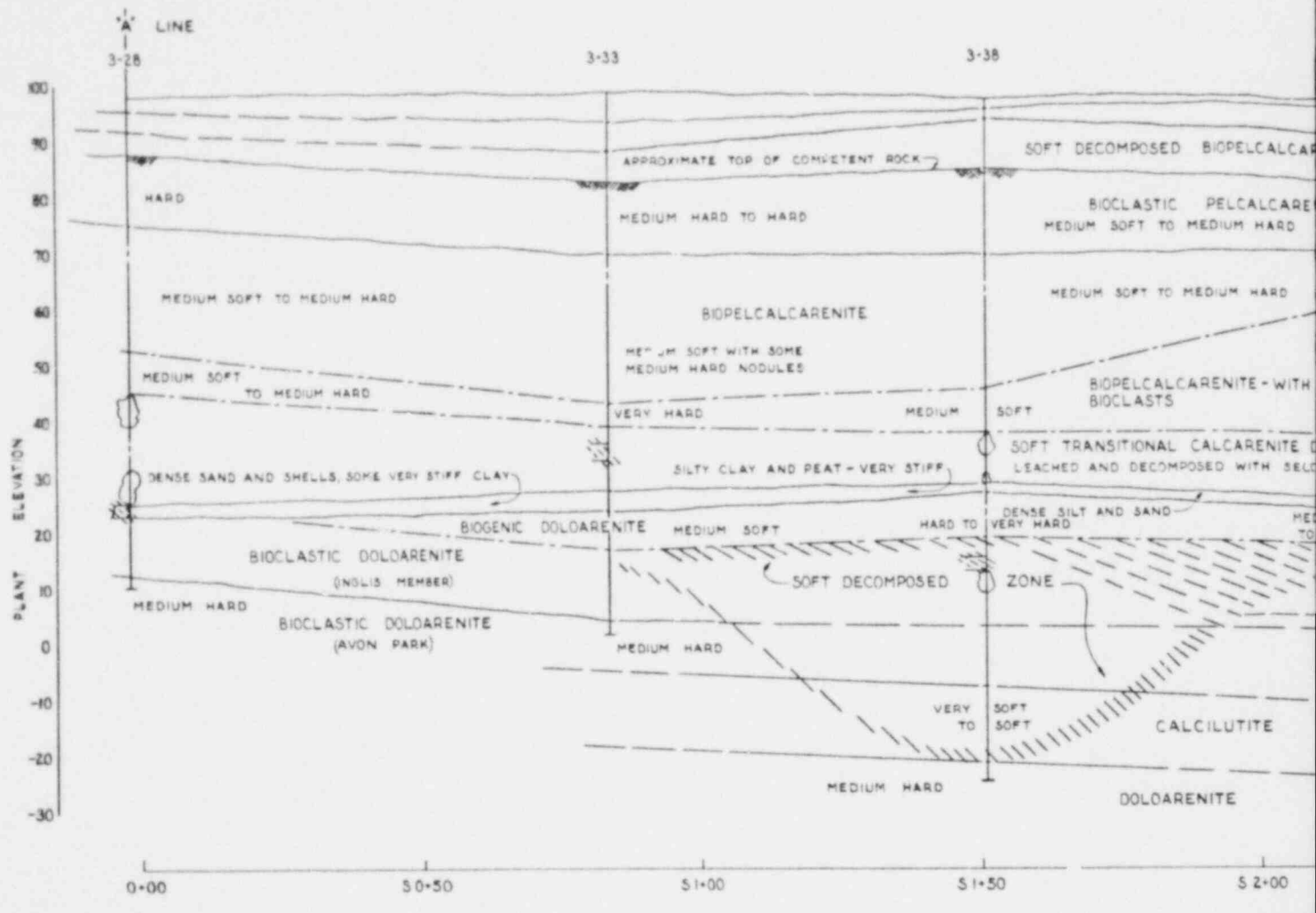
0135

GEOLOGIC CROSS SECTION B-B'

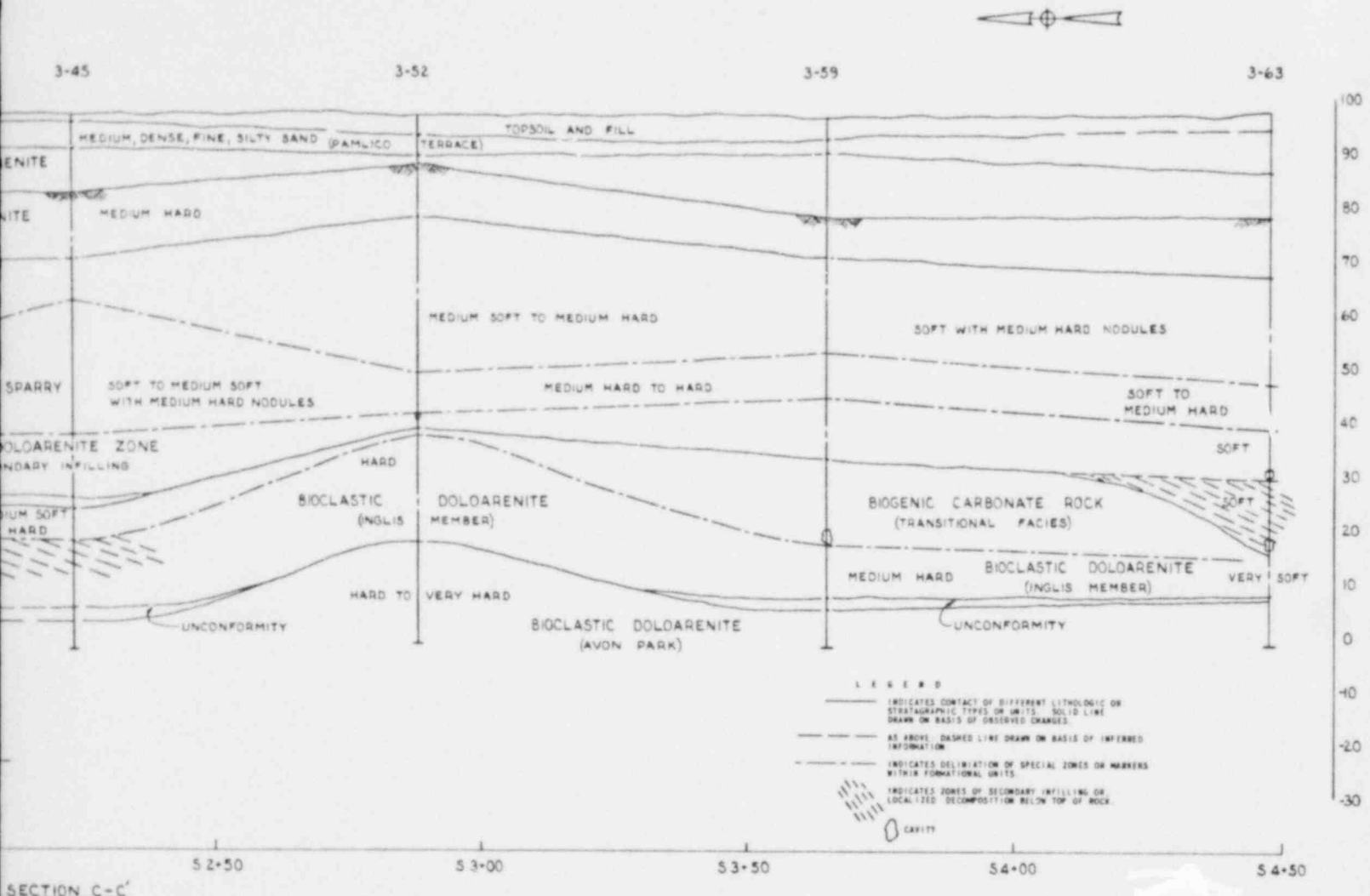
CRYSTAL RIVER UNITS 3 & 4

FPC FLORIDA POWER CORPORATION

FIGURE 2G-3


"A" LINE
3-28
3-33
3-38
PLANT ELEVATION
100
90
80
70
60
50
40
30
20
10
0
-10
-20
-30
HARD
MEDIUM SOFT TO MEDIUM HARD
MEDIUM SOFT TO MEDIUM HARD
APPROXIMATE TOP OF COMPETENT ROCK
MEDIUM HARD TO HARD
BIOPELCALCARENITE
MEDIUM SOFT WITH SOME MEDIUM HARD NODULES
VERY HARD
MEDIUM
SOFT
SOFT DECOMPOSED BIOPELCALCAR
BIOCLASTIC PELCALCARE
MEDIUM SOFT TO MEDIUM HARD
MEDIUM SOFT TO MEDIUM HARD
BIOPELCALCARENITE - WITH BIOCLASTS
SOFT TRANSITIONAL CALCARENITE
LEACHED AND DECOMPOSED WITH SEC
MEDIUM SOFT TO MEDIUM HARD
DENSE SAND AND SHELLS, SOME VERY STIFF CLAY
SILTY CLAY AND PEAT - VERY STIFF
BIOGENIC DOLOARENITE
MEDIUM SOFT
HARD TO VERY HARD
DENSE SILT AND SAND
BIOCLASTIC DOLOARENITE
(INGLIS MEMBER)
MEDIUM HARD
BIOCLASTIC DOLOARENITE
(AVON PARK)
MEDIUM HARD
SOFT DECOMPOSED ZONE
VERY TO SOFT
SOFT
CALCILUTITE
MEDIUM HARD
DOLOARENITE
0+00
S 0+50
S 1+00
S 1+50
S 2+00

0136



LEGEND

INDICATES CONTACT OF DIFFERENT LITHOLOGIC OR STRATAGRAPHIC TYPES OR UNITS. SOLID LINE DRAWN ON BASIS OF OBSERVED CHANGES.

AS ABOVE. DASHED LINE DRAWN ON BASIS OF INFERRED INFORMATION.

INDICATES DELINEATION OF SPECIAL ZONES OR MARKERS WITHIN FORMATIONAL UNITS.

INDICATES ZONES OF SECONDARY INFILLING OR LOCALIZED DECOMPOSITION BELOW TOP OF ROCK.

CAVITY

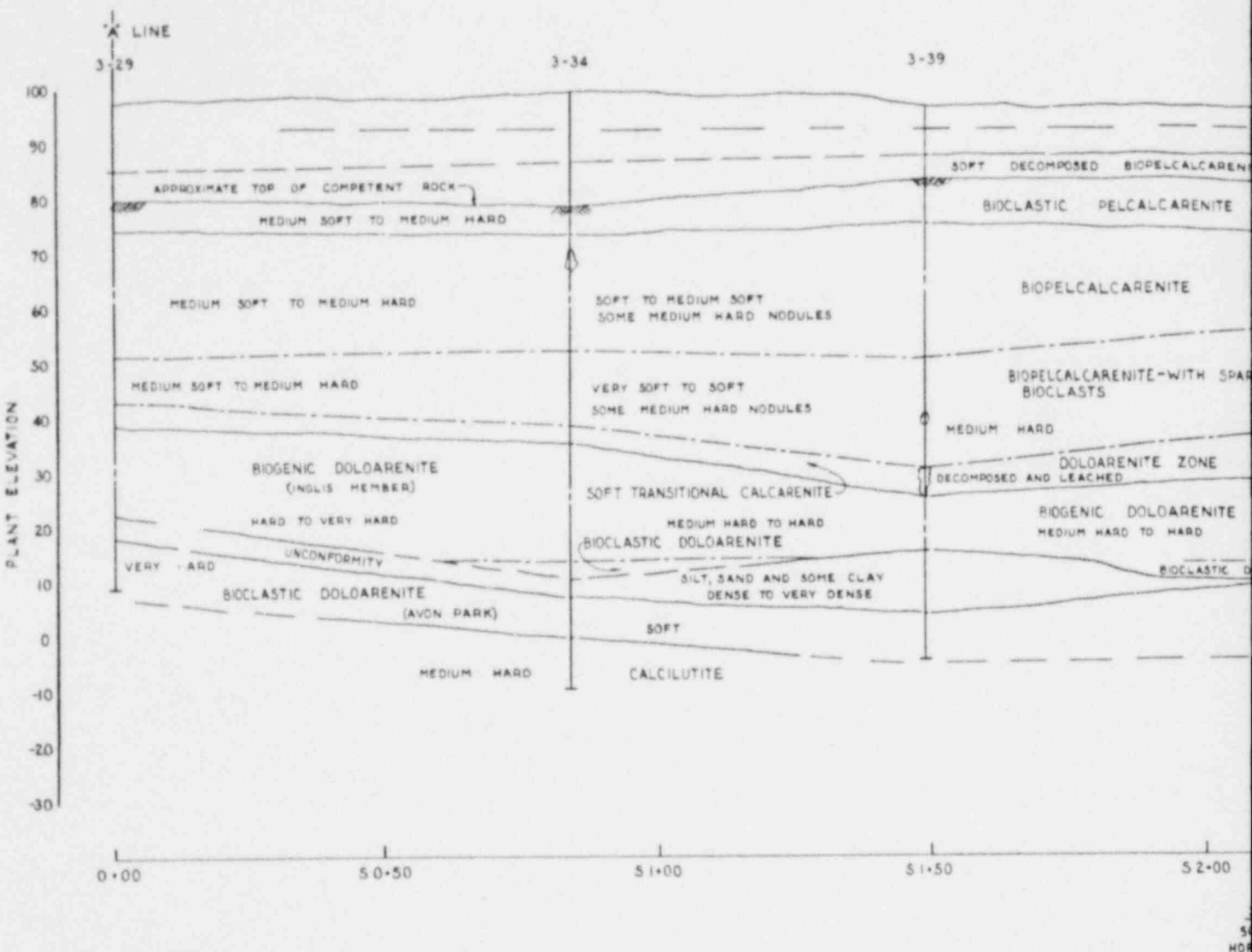
SECTION C-C'
SCALE: AS SHOWN
HORIZONTAL = VERTICAL

0137

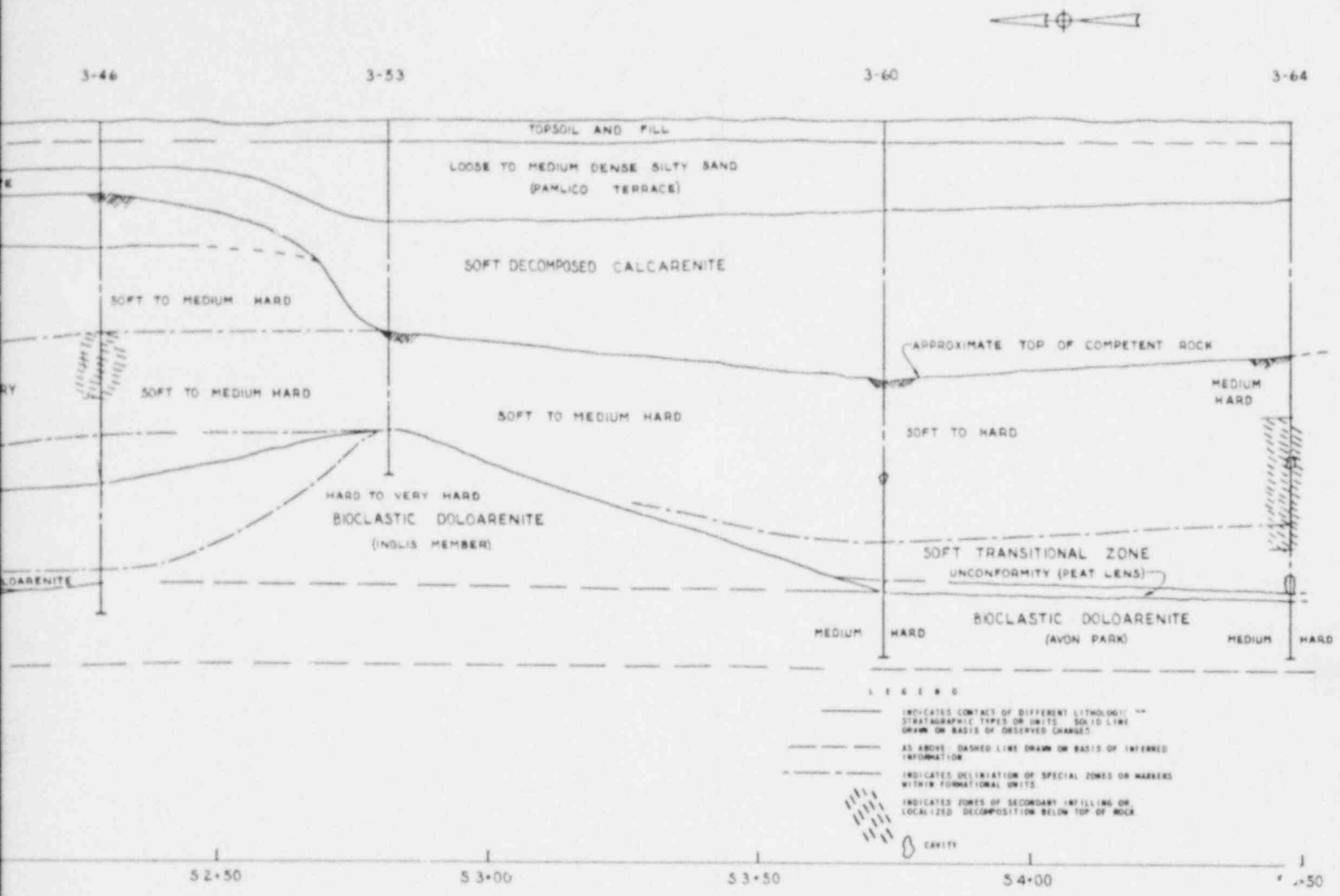
GEOLOGIC CROSS SECTION C-C'
CRYSTAL RIVER UNITS 3 & 4

FLORIDA POWER CORPORATION

FIGURE 2G-4


'A' LINE
3-29
3-34
3-39
PLANT ELEVATION
100
90
80
70
60
50
40
30
20
10
0
-10
-20
-30
APPROXIMATE TOP OF COMPETENT ROCK
MEDIUM SOFT TO MEDIUM HARD
SOFT DECOMPOSED BIOPELCALCARENI
BIOCLASTIC PELCALCARENITE
MEDIUM SOFT TO MEDIUM HARD
SOFT TO MEDIUM SOFT
SOME MEDIUM HARD NODULES
BIOPELCALCARENITE
MEDIUM SOFT TO MEDIUM HARD
VERY SOFT TO SOFT
SOME MEDIUM HARD NODULES
BIOPELCALCARENITE-WITH SPAR
BIOCLASTS
MEDIUM HARD
BIOGENIC DOLOARENITE
(INGLIS MEMBER)
DOLOARENITE ZONE
DECOMPOSED AND LEACHED
SOFT TRANSITIONAL CALCARENITE
HARD TO VERY HARD
MEDIUM HARD TO HARD
BIOGENIC DOLOARENITE
MEDIUM HARD TO HARD
BIOCLASTIC DOLOARENITE
UNCONFORMITY
VERY HARD
SILT, SAND AND SOME CLAY
DENSE TO VERY DENSE
BIOCLASTIC DOLOARENITE
(AVON PARK)
SOFT
MEDIUM HARD
CALCILUTITE
0+00
S 0+50
S 1+00
S 1+50
S 2+00

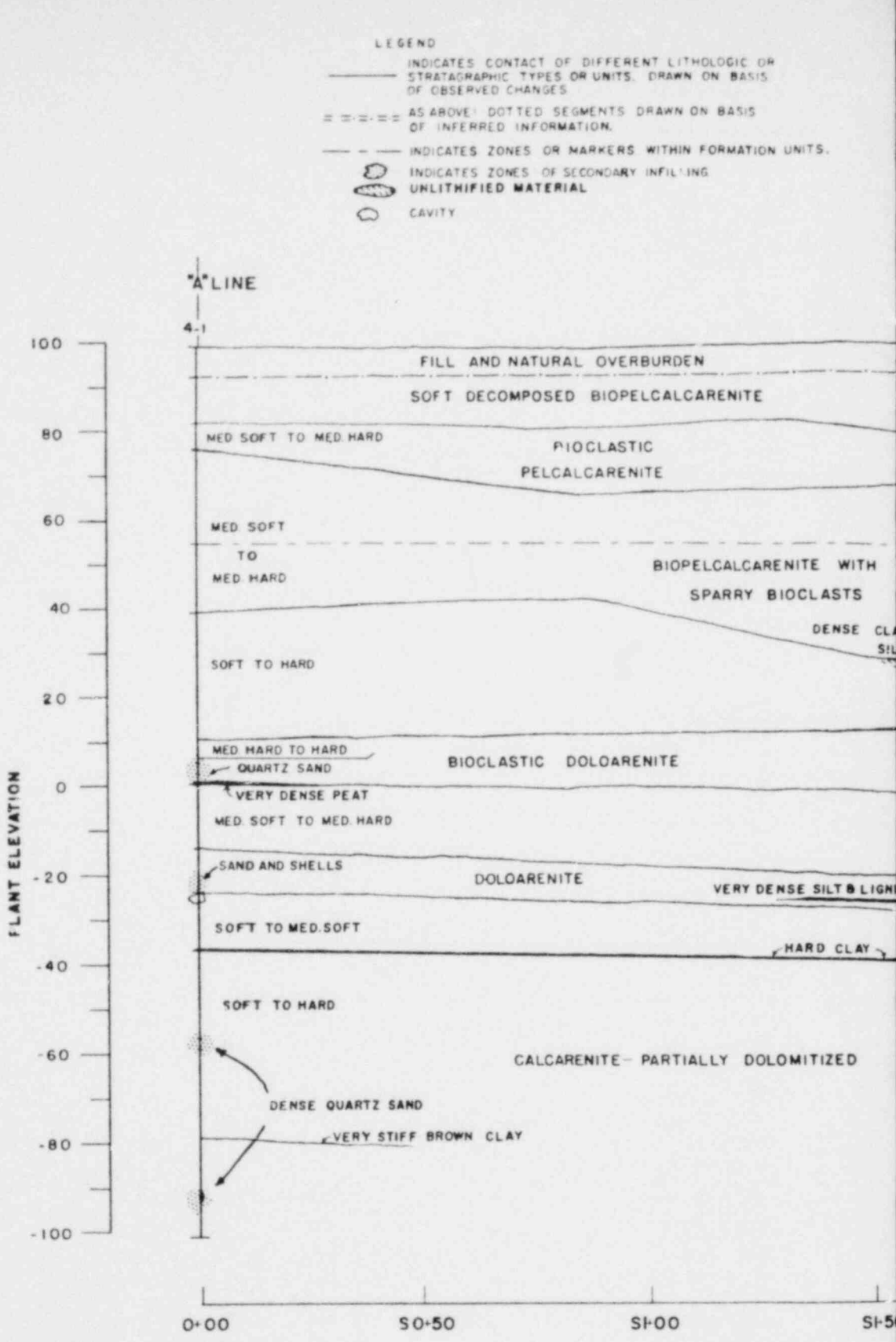
0138



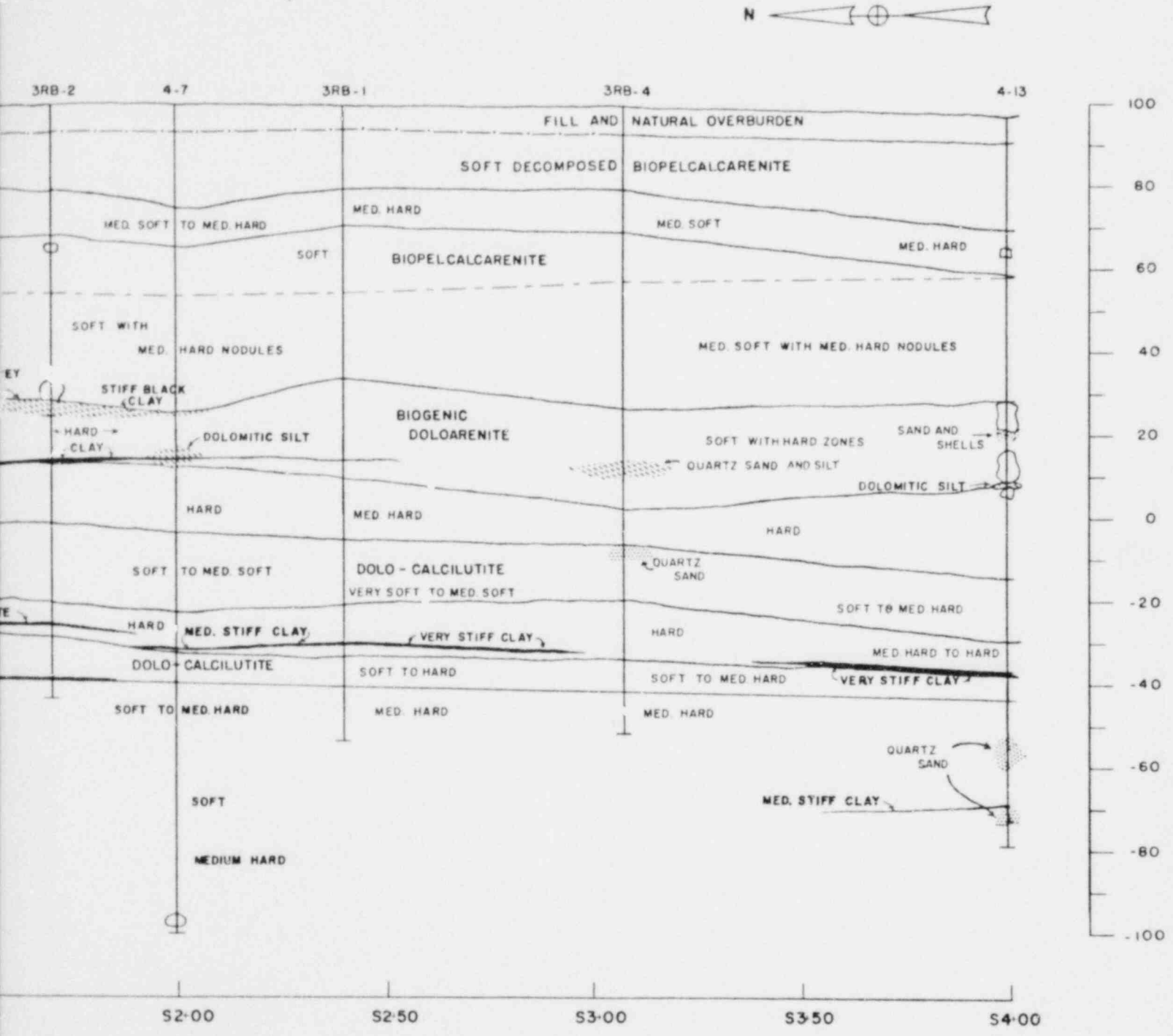
ECTION D-D'
ALE: AS SHOWN
ZONTAL = VERTICAL

0139

GEOLOGIC CROSS SECTION D-D'
CRYSTAL RIVER UNITS 3 & 4
FLORIDA POWER CORPORATION
FIGURE 2G-5


LEGEND
INDICATES CONTACT OF DIFFERENT LITHOLOGIC OR STRATAGRAPHIC TYPES OR UNITS, DRAWN ON BASIS OF OBSERVED CHANGES
AS ABOVE; DOTTED SEGMENTS DRAWN ON BASIS OF INFERRED INFORMATION.
INDICATES ZONES OR MARKERS WITHIN FORMATION UNITS.
INDICATES ZONES OF SECONDARY INFILLING
UNLITHIFIED MATERIAL
CAVITY
"A" LINE
4-1
FILL AND NATURAL OVERBURDEN
SOFT DECOMPOSED BIOPELCALCARENITE
MED SOFT TO MED HARD
BIOCLASTIC PELCALCARENITE
MED SOFT TO MED HARD
BIOPELCALCARENITE WITH SPARRY BIOCLASTS
DENSE CL
SOFT TO HARD
MED HARD TO HARD
QUARTZ SAND
BIOCLASTIC DOLOARENITE
VERY DENSE PEAT
MED SOFT TO MED HARD
SAND AND SHELLS
DOLOARENITE
VERY DENSE SILT & LIGN
SOFT TO MED SOFT
HARD CLAY
SOFT TO HARD
CALCARENITE- PARTIALLY DOLOMITIZED
DENSE QUARTZ SAND
VERY STIFF BROWN CLAY
FLANT ELEVATION
100
80
60
40
20
0
-20
-40
-60
-80
-100
0+00
S0+50
S1+00

0140



SECTION E-E'
SCALE: AS SHOWN
HORIZONTAL = VERTICAL

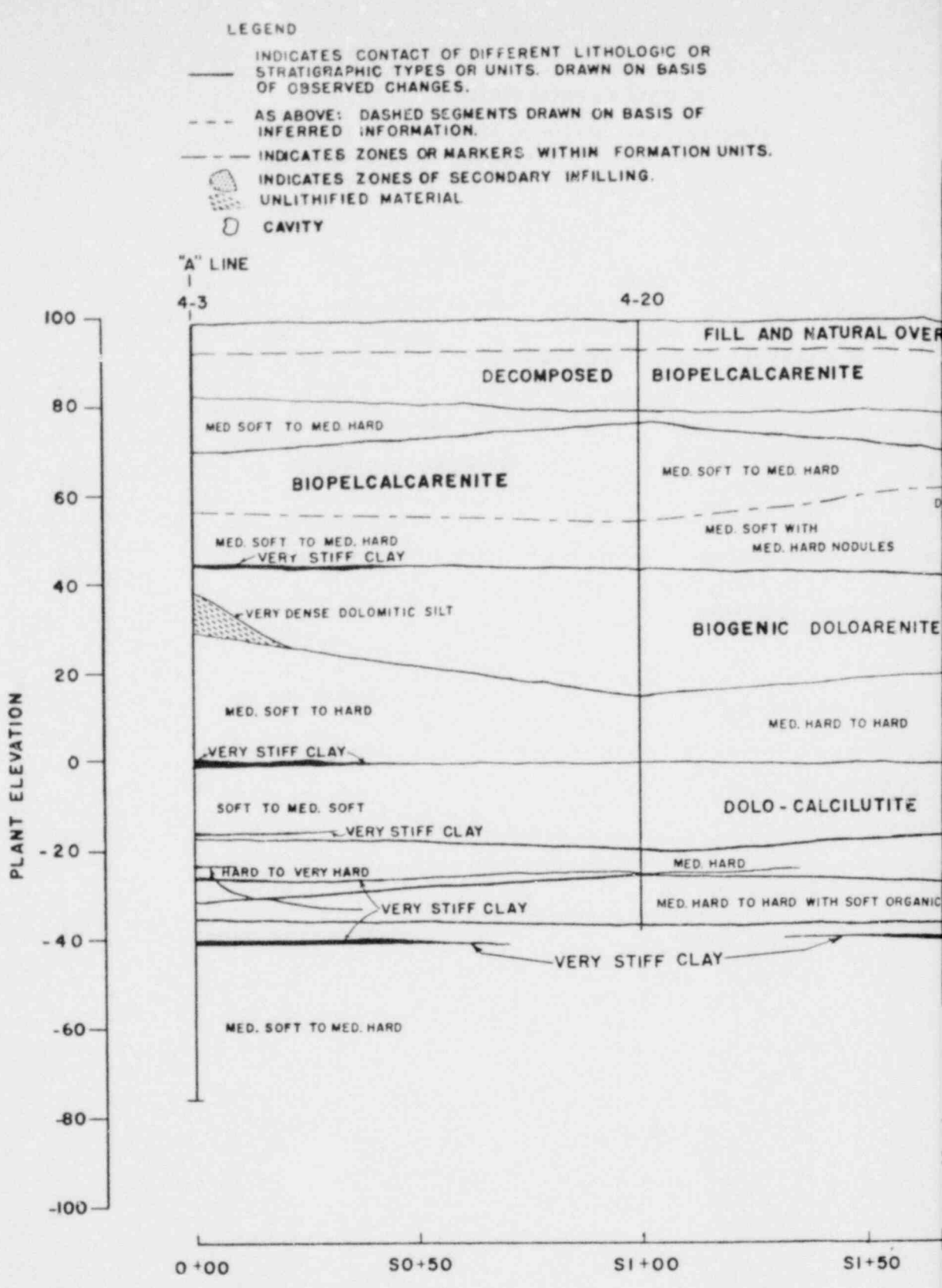
GEOLOGIC CROSS SECTION E-E'
CRYSTAL RIVER UNITS 3 & 4

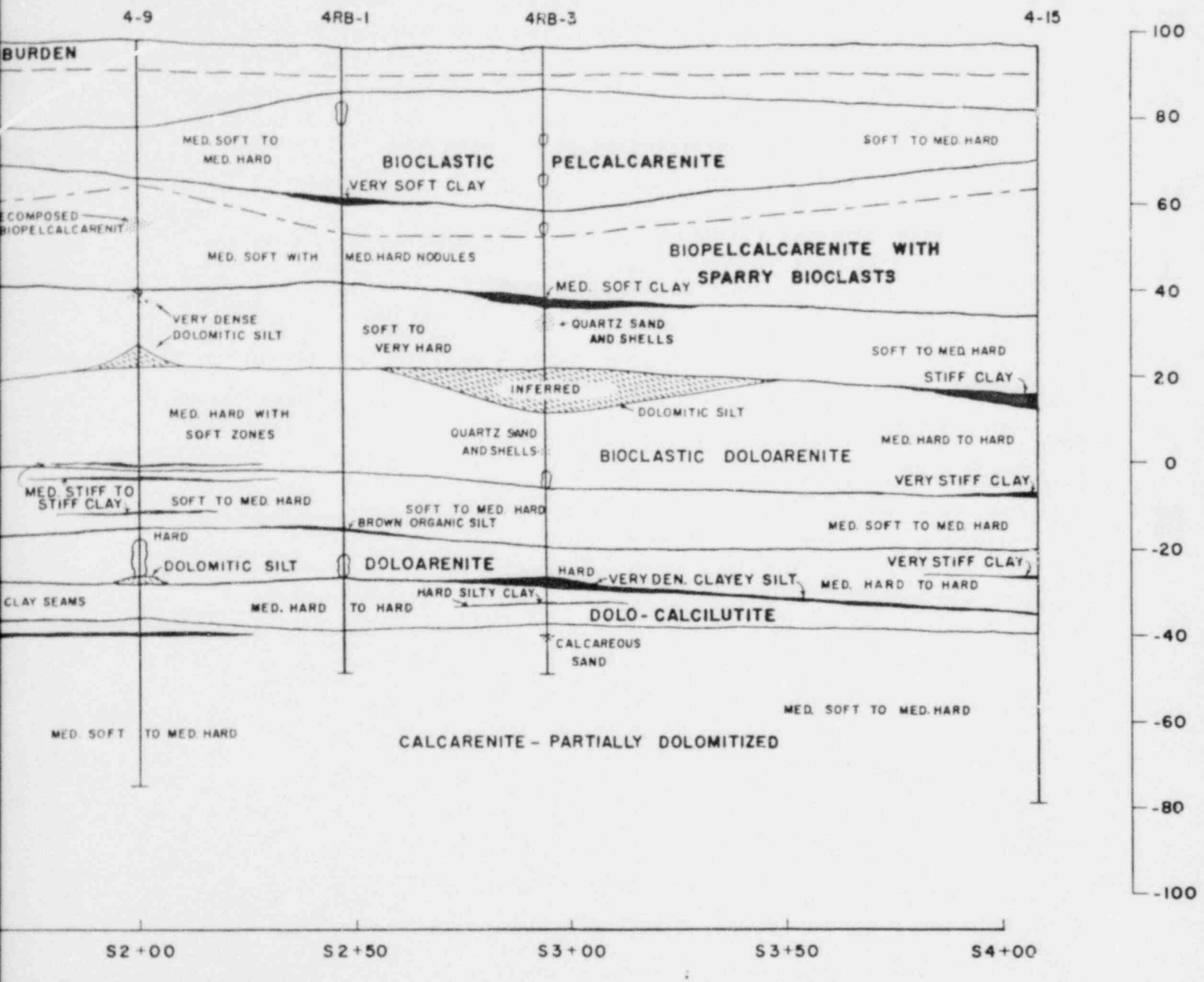
0141

FLORIDA POWER CORPORATION

FIGURE 2G-6

AMEND. 1 (1-15-68)


LEGEND
INDICATES CONTACT OF DIFFERENT LITHOLOGIC OR STRATIGRAPHIC TYPES OR UNITS. DRAWN ON BASIS OF OBSERVED CHANGES.
AS ABOVE: DASHED SEGMENTS DRAWN ON BASIS OF INFERRED INFORMATION.
INDICATES ZONES OR MARKERS WITHIN FORMATION UNITS.
INDICATES ZONES OF SECONDARY INFILLING.
UNLITHIFIED MATERIAL
CAVITY
"A" LINE
4-3
4-20
PLANT ELEVATION
100
80
60
40
20
0
-20
-40
-60
-80
-100
FILL AND NATURAL OVER
DECOMPOSED
BIOPELCALCARENITE
MED SOFT TO MED. HARD
BIOPELCALCARENITE
MED. SOFT TO MED. HARD
MED. SOFT TO MED. HARD
VERY STIFF CLAY
MED. SOFT WITH
MED. HARD NODULES
VERY DENSE DOLOMITIC SILT
BIOGENIC DOLOARENITE
MED. SOFT TO HARD
MED. HARD TO HARD
VERY STIFF CLAY
SOFT TO MED. SOFT
DOLO - CALCILUTITE
VERY STIFF CLAY
HARD TO VERY HARD
MED. HARD
VERY STIFF CLAY
MED. HARD TO HARD WITH SOFT ORGANIC
VERY STIFF CLAY
MED. SOFT TO MED. HARD
0+00
50+50
51+00
51+50



SECTION F-F'

SCALE: AS SHOWN
HORIZONTAL • VERTICAL

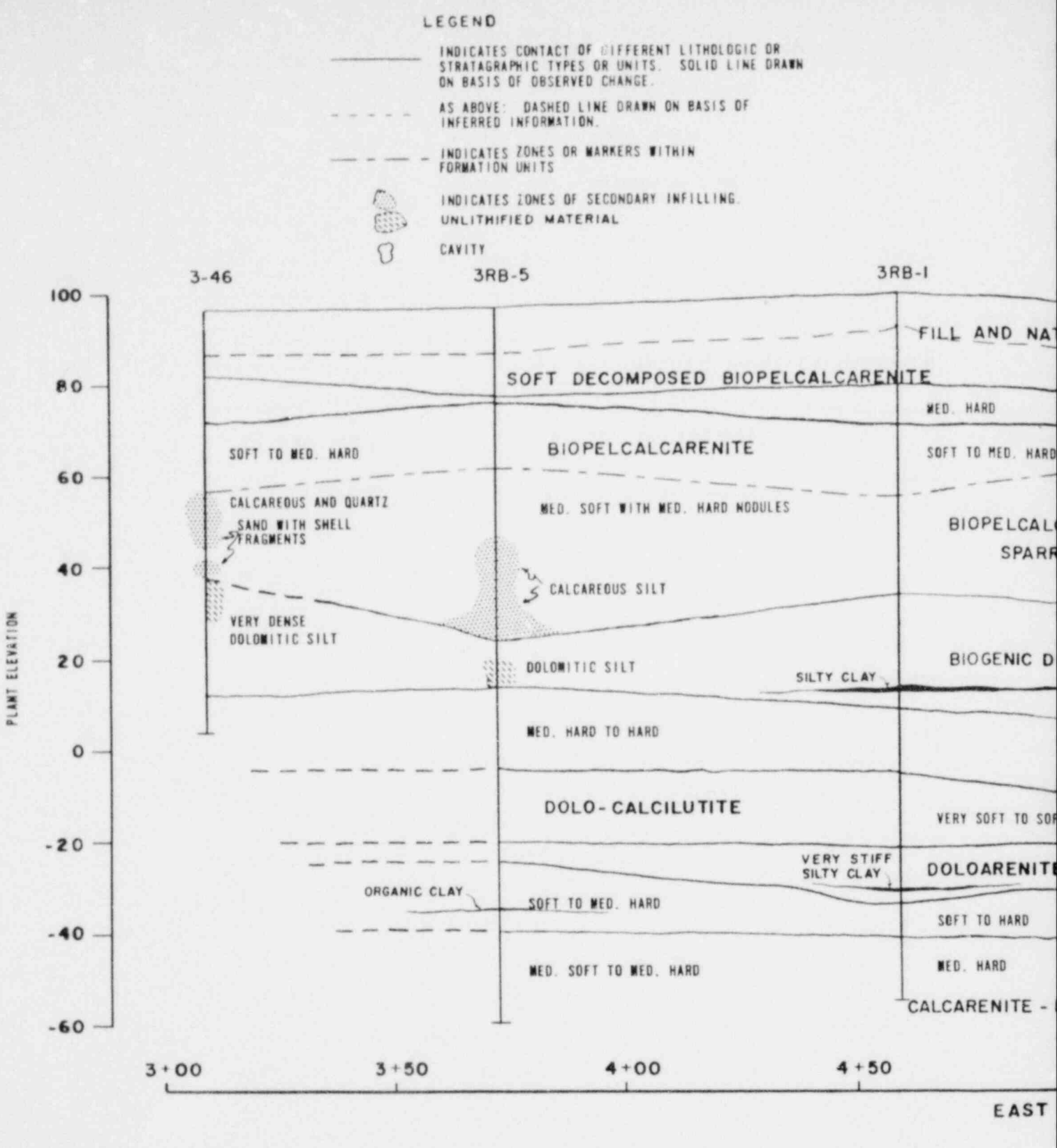
0143

GEOLOGIC CROSS SECTION F-F'
CRYSTAL RIVER UNITS 3 & 4

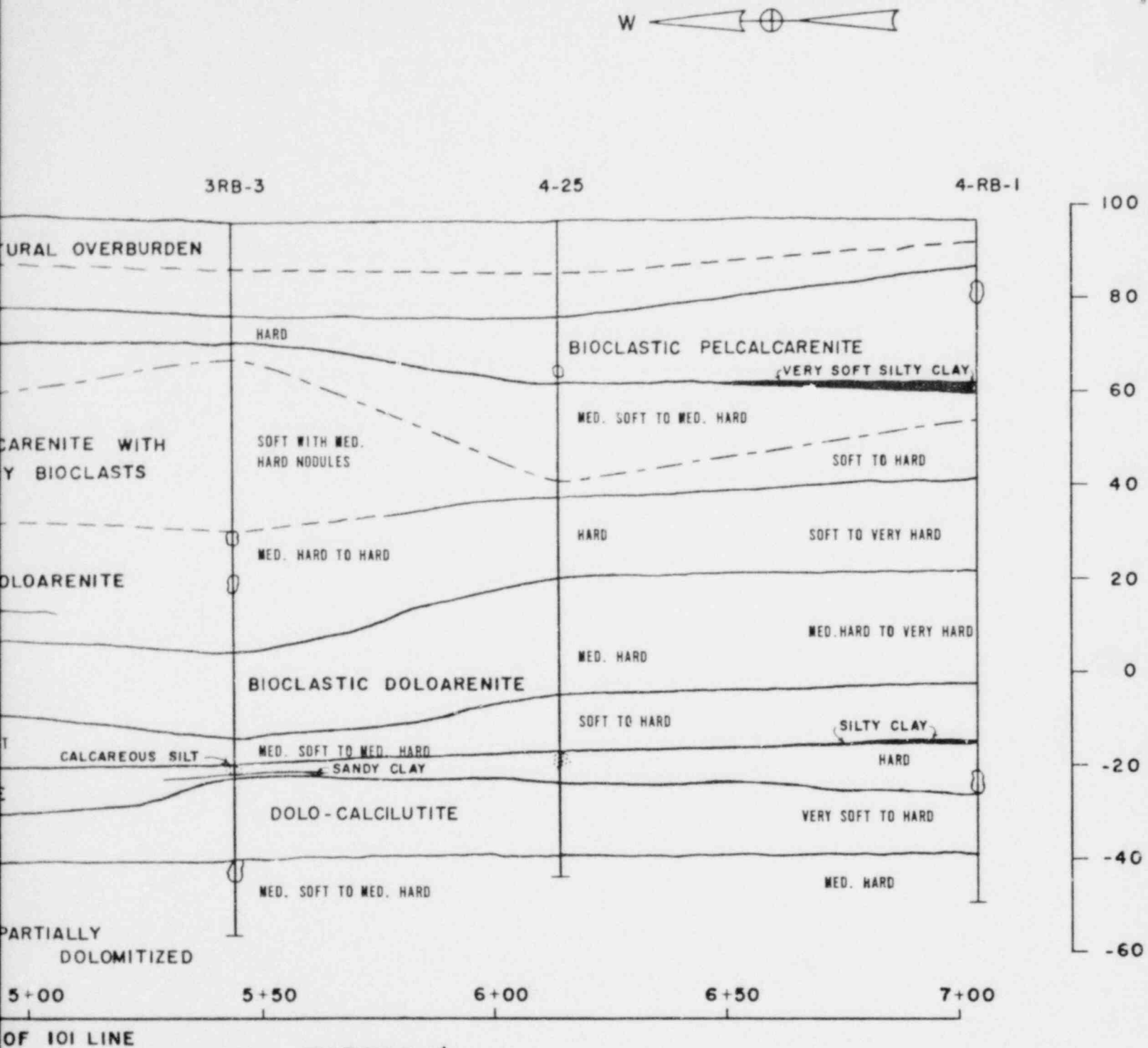
FLORIDA POWER CORPORATION

FIGURE 2G-7

AMEND. 1 (1-15-68)


LEGEND
INDICATES CONTACT OF DIFFERENT LITHOLOGIC OR STRATAGRAPHIC TYPES OR UNITS. SOLID LINE DRAWN ON BASIS OF OBSERVED CHANGE.
AS ABOVE: DASHED LINE DRAWN ON BASIS OF INFERRED INFORMATION.
INDICATES ZONES OR MARKERS WITHIN FORMATION UNITS
INDICATES ZONES OF SECONDARY INFILLING.
UNLITHIFIED MATERIAL
CAVITY
3-46
3RB-5
3RB-1
PLANT ELEVATION
100
80
60
40
20
0
-20
-40
-60
FILL AND NAT
SOFT DECOMPOSED BIOPELCALCARENITE
MED. HARD
SOFT TO MED. HARD
BIOPELCALCARENITE
SOFT TO MED. HARD
CALCAREOUS AND QUARTZ SAND WITH SHELL FRAGMENTS
MED. SOFT WITH MED. HARD NODULES
BIOPELCALC
SPARR
CALCAREOUS SILT
VERY DENSE DOLOMITIC SILT
DOLOMITIC SILT
BIOGENIC D
SILTY CLAY
MED. HARD TO HARD
DOLO-CALCILUTITE
VERY SOFT TO SOF
VERY STIFF SILTY CLAY
DOLOARENITE
ORGANIC CLAY
SOFT TO MED. HARD
SOFT TO HARD
MED. SOFT TO MED. HARD
MED. HARD
CALCARENITE -
3+00
3+50
4+00
4+50
EAST

0144



SECTION G-G'

SCALE: AS SHOWN

HORIZONTAL = VERTICAL

0145

GEOLOGIC CROSS SECTION G-G'

CRYSTAL RIVER UNITS 3 & 4

FPC FLORIDA POWER CORPORATION

FIGURE 2G-8

AMEND. 1 (1-15-68)