QUESTION 15 - SOILS

A.1. Provide a description of each of the soils indicated on Map E utilizing the following format:

The Subject Property is made up of nineteen soil types as illustrated on Map E. Please refer to Table 15-1 at the end of this section for a summary of the soil characteristics as described in the Soil Survey of St. Johns County, Florida. Soils with the highest development potential are listed first.

A.2. Describe the potential for subsidence and any unique geologic features (such as sand dunes, bluffs, sinkholes, springs, steepheads, etc.) on the site. Discuss what aspects of the site plan will be used to compensate for or take advantage of these features.

No unique geologic features have been identified within Elkton and none of the geologic features or formations listed above are anticipated to occur.

B. Where a soil presents a limitation to the type of use proposed in the development, state how the limitation will be overcome. Specify construction methods that would be used for building, road and parking lot foundations, and for lake or canal bank stabilization as relevant.

Each soil type found on the property is evaluated as to potential for community development as provided in the Soil Survey Report, St. Johns County, Florida published by the U.S. Department of Agriculture, Natural Resources Conservation Service. Without proper site engineering, a majority of the site's soils have low potential for community development. The soils that have the lowest potential for community development generally exist within the wetland areas of the project. A more detailed description as to how the development will utilize various soil types has been provided below.

The soils rated with severe limitations may be built upon by applying suitable, commonly accepted engineering methods, including proper site planning and adding appropriate amounts of fill material; along with conventional water management practices such as, but not limited to, gravity drainage of developed areas via road and/or lot swales and storm sewers that will discharge to a primarily wet detention stormwater management system. The retention/detention lake system will have outlet structures to control water levels

at desirable elevations. These and other water management improvements will alleviate many limitations by routing excess surface waters to stormwater retention/detention lakes. The stormwater management system must control the seasonal high water table and provide percolation/infiltration of stormwater plus detention of the increased runoff associated with development.

Soil types listed as having a low/very low potential for community development generally occur within the identifiable wetland system and those areas that are not proposed for development except for limited road crossings. Appropriate cut and fill methods will be utilized where road crossings are planned.

Prior to construction activities, site-specific soil investigations will be conducted to determine soil conditions and identify appropriate measures to overcome limitations. The limitations posed by poor soils on-site are primarily due to wetness and a high water table. Conventional engineering and construction techniques can be used to raise site grades with fill for pavement and structural support, as needed. The limitations with pond embankments include excessive wetness, seepage, ponding, and piping. These limitations can be alleviated in part by gentle side slopes of embankments, installing a seepage liner, clay core or other seepage barrier, or sodding the embankment.

A master stormwater management system will be integrated throughout the development and will adapt to existing seasonal high water elevations. Moderate slopes, landscaping, and/or bulkheads will stabilize lake banks. Detailed information regarding the design and location of the various components of the drainage system will be provided as part of the stormwater management program through the permitting process.

C. What steps will be taken during site preparation and construction to prevent or control wind and water soil erosion? Include a description of proposed plans for clearing and grading as related to erosion control.

All local, state and federal regulations that are designed to prevent soil erosion and sedimentation will be followed. Construction will proceed in an orderly fashion, with erosion control measures implemented before or immediately after earthwork, as most appropriate.

The type of erosion control methods utilized during construction will depend on the types of soil and the slope of the construction site. In any event, soil erosion

will be minimized by the scheduling of construction so as to minimize exposure of bare soil prior to landscaping and paving, directing stormwater through broad, shallow swales, creation of berms, and establishing and maintaining natural vegetative buffers, particularly along the wooded areas of the property in an attempt to maintain as much of the tree canopy as possible. Limit-of-work bounds will be established adjacent to heavily wooded areas on the property in an attempt to maintain as much of the tree canopy as possible. Where necessary, slope protection and energy dissipaters will be used in high velocity and outfall areas and temporary silt fences, straw bales and mulching may be used during construction to prevent soil erosion and siltation. If wind erosion becomes a problem during extended dry periods, appropriate soil wetting will be performed. In accordance with the St. Johns River Water Management District (SJRWM D) rules that will be incorporated in to the Environmental Resources Permit (ERP), lakes will have appropriate side slope cross-sections.

During construction, temporary dikes, hay bales, siltation curtains, and other standard means will control erosion by water and to assure that discharge from the property during construction will not increase turbidity in the receiving water by more than 29 nephelometric turbidity units (NTUs). Both wind and water erosion will be controlled by mulching, seeding or sodding, and planting vegetation in cleared areas around buildings as soon as practical. Permanent drainage facilities will be built to keep up with site development and will be closely monitored during the development phase.

At full development, erosion will be controlled by maintenance of ground cover (natural and landscaped) and by a stormwater management system with adequate sized and properly located ponds.

D. To what degree and in what location(s) will the development site be altered by fill material? If known, specify the source location and composition of the fill. Also identify the disposal location for any overburden or spoil.

Fill will be required for some roadbed and roadway construction associated with crossings of low-lying areas. Additionally, based on finished floor elevations of housing areas, some fill may be required for house pad construction, but such use of fill will be minimized. The source and composition of such materials will, by necessity, have to be determined at the time of construction. Roadways will also require some fill to maintain smooth grade changes.

The level of site planning undertaken for the Development of Regional Impact (DRI) Application for Development Approval does not address areas of fill in detail. In general, for economic reasons engineers attempt to balance the cut and fill within project boundaries. During project permitting under the regulations of SJRWMD and the U.S. Army Corps of Engineers, detailed engineering plans will be prepared addressing final site topography and the plans will include cross-sections and quantities of any fill to be placed in wetlands. Disposal locations for overburden and spoils will be limited to upland areas.

Some roads will require a limited fill section to allow for smooth grade changes. The source of the required fill material will primarily be the excavation of the proposed stormwater detention/retention lakes. Any excess material will be temporarily stockpiled for use in later development phases. Temporary spoil locations will be established for use in later phases of development and as needed to surcharge existing soils in building areas.

Table 15-1
Elkton Soil Descriptions and Interpretations

Soil Name & Map Symbol	Brief Soil Description	Seasonal High Water Table Depth Duration		Permeability Rate (in/hour)	Degree & Kind of Limitation for Proposed Uses		Degree & Kind of Limitation for Pond Embankments	
		Depth (ft)	Duration					
St. Johns Fine Sand (13)	Poorly drained, nearly level soil in broad flatwoods and landscapes adjacent to drainageways. Slopes range from 0 – 2% and is convex. Medium potential for community development due to excessive soil wetness.	0-1.0	June – April	6.0-20	Medium	Wetness	Severe	Seepage Piping Wetness
Samsula Muck (26)	Very poorly drained soil in narrow to broad swamps and depressional areas in the flatwoods. Slopes are less than 1% and are concave. Very low potential for community development due to ponding and low soil strength.	+2-1.0	Jan – Dec	6.0-20	Very Low	Ponding Low Strength	Severe	Excess humus; Ponding
Myakka Fine Sand (3)	Nearly level, poorly drained soil occurring in flatwoods and formed in marine deposits of sandy material. Slopes range from 0 – 2 %. Medium potential for community development due to wetness caused by a seasonal high water table.	0-1.0	June – Nov	6.0-20	Medium	Wetness	Severe	Seepage Piping Wetness
Wesconnett Fine Sand, Frequently Flooded (30)	Very poorly drained, nearly level soil in weakly defined drainageways in the flatwoods. Slopes range from 0 – 2 % and are concave. Very low potential for community development due to flooding.	0-1.0	June – Feb	6.0-20	Very Low	Flooding Wetness	Severe	Seepage Piping Wetness

Table 15-1, cont.

Soil Name & Map Symbol	Brief Soil Description	Seasonal High Water Table Depth Duration		Permeability Rate (in/hour)	Degree & Kind of Limitation for Proposed Uses		Degree & Kind of Limitation for Pond Embankments	
Tocoi Fine Sand (34)	Poorly drained, nearly level soil in broad flatwood areas. Slopes range from 0 – 2 %. Medium potential for community development, with seasonal high water table the main limitation.	0-1.0	Aug – Feb	6.0-20	Medium	Wetness	Severe	Seepage Piping Wetness
Hontoon Muck (35)	Very poorly drained, nearly level organic soil in depressional areas. Slopesare less than 1%. Very low potential for community development due to ponding and low soil strength.	+2-1.0	Jan – Dec	6.0-20	Very Low	Ponding Low Strength	Severe	Excess humus; Ponding
Tomoka Muck (41)	Very poorly drained soil in weakly defined drainageways and depressional areas. Slopes are less than 1%. Very low potential for community development due to ponding and low soil strength.	+1-0	June – April	6.0-20	Very Low	Ponding Low Strength	Severe	Piping Ponding
Bluff Sandy Clay Loam, Frequently Flooded (42)	Very poorly drained, nearly level soil in drainageways and on floodplains. Slopes are less than 1%. Very low potential for community development due to flooding and excessive wetness.	0-1.0	July – Dec	6.0-20 0.06-0.2	Very Low	Flooding Wetness Shrink-Swell	Severe	Wetness
Holopaw Fine Sand (46)	Poorly drained, nearly level soil in low, broad areas of flatwoods. Slopes range from 0 – 2%. Medium potential for community development due to seasonal high water table.	0-1.0	June – Nov	6.0-20 0.2-2.0	Medium	Wetness	Severe	Seepage Piping Wetness
Holopaw Fine Sand, Frequently Flooded (47)	Very poorly drained, nearly level sandy soil in broad, shallow drainageways. Slopes are 0 – 2%. Very low potential for community development due to excessive wetness and flooding.	0-1.0	June – Feb	6.0-20	Very Low	Flooding Wetness	Severe	Seepage Piping Wetness
Winder Fine Sand, Frequently Flooded (48)	Poorly drained, nearly level soil formed in loamy marine materials. Slopes are less than 2%. Very low potential for community development sue to excessive wetness and flooding.	0-1.0	June – Dec	6.0-20	Very Low	Flooding Wetness	Severe	Seepage Wetness

Table 15-1, cont.

Soil Name & Map Symbol	Brief Soil Description	Seasonal High Water Table Depth	Duration	Permeability Rate (in/hour)	Degree & Kind of Limitation for Proposed Uses		Degree & Kind of Limitation for Pond Embankments	
St. Johns Fine Sand, Depressional (5)	Nearly level, very poorly drained soil in depressions in the flatwoods. Slopes are less than 1 %. Potential for community development is very low due to ponding.	+2-1.0	June – April	6.0-20	Very low	Ponding	Severe	Seepage Piping Ponding
EauGallie Fine Sand (58)	Poorly drained, nearly level soil on low knolls and ridges, adjacent to depressions and drainageways in the flatwoods. Slopes range from 0 – 2%. Medium potential for community development, with wetness due to a seasonal high water table as the main limitation.	0-1.0	June – Oct	6.0-20 0.6-6.0	Medium	Wetness	Severe	Seepage Piping Wetness
Floridana Fine Sand (62)	Poorly drained, nearly level soil on low broad flats. Slopes range from 0 – 2%. Medium potential for community development, with wetness the primary limitation.	0-1.0	June – Feb	6.0-20	Medium	Wetness	Severe	Wetness
Ellzey Fine Sand (64)	Nearly level, poorly drained soil formed in thick sandy sediments of marine origin. Slopes range from 0 – 2%. Medium potential for community development, with wetness due to a seasonal high water table as the main limitation.	0-1.0	June – Oct	2.0-6.0	Medium	Wetness	Severe	Seepage Piping Wetness
Riviera Fine Sand (65)	Poorly drained, nearly level soil in low, broad areas in the flatwoods. Slopes are 0 – 2%. Medium potential for community development, with wetness due to a seasonal high water table as the main limitation.	0-1.0	June – Dec	6.0-20 <0.2	Medium	Wetness	Severe	Seepage Piping Wetness

Table 15-1, cont.

Soil Name & Map Symbol	Brief Soil Description	Seasonal High Water Table Depth Duration		Permeability Rate (in/hour)	Degree & Kind of Limitation for Proposed Uses		Degree & Kind of Limitation for Pond Embankments	
Bakersville Muck (69)	Nearly level, very poorly drained soil in depressional areas of flatwoods. Slopes are less than 2%. Low potential for community development due to wetness and ponding.	+2-1.0	July – Mar	6.0-20 2.0-6.0	Low	Ponding	Severe	Seepage Ponding Piping
Immokalee Fine Sand (7)	Poorly drained, nearly level soil on broad flats and low knolls in the flatwoods. Slopes range from 0 – 2%. Potential for community development ismedium if measures are taken to lower the seasonal high water table and remove excess surface water.	0-1.0	June – Nov	6.0-20	Medium	Wetness	Severe	Seepage Piping Wetness
Pomona Fine Sand (9)	Poorly drained, nearly level soil in broad areas of flatwoods. Slopes range from 0 – 2 %. Potential for community development is medium, with soil wetness due to a high water table the main limitation.	0-1.0	July – Oct	6.0-20	Medium	Wetness	Severe	Seepage Piping Wetness