WETLANDS

A. If there are wetlands on the site, discuss and specify the following:

1. Acreage and percentage of property that is currently wetlands. These wetlands should be shown on Map F, Vegetation Associations and identified by individual reference numbers.

Wetlands comprise a lot of the Restoration project site. General wetland descriptions depict wetland cover types which were identified according to the SJRWMD FLUCFCS GIS database. An application for a Formal Wetland Determination has been submitted to the SJRWMD to request an evaluation of the extent of jurisdictional wetlands on the project site. Consequently, the extent of wetlands on the project site will be further defined through additional site evaluations by Breedlove, Dennis & Associates, Inc. (BDA) scientists and subsequent site inspections with SJRWMD staff. Individual reference numbers will be assigned to on-site wetlands following the completion of the final wetland delineation and survey.

Table A.1-1
Cover Type and Acreage of Wetlands Found on the Restoration Project Site, Volusia County, Florida

FLUCFCS Code	Description	Acreage	Percent of Total Wetland Acreage
6211	Cypress Swamps	1,063.72	34.46%
6212	Cypress-Sawgrass Swamps	185.47	5.98%
6271	Slash Pine-Cypress Swamps	1,019.17	32.84%
6411	Sawgrass	44.04	1.42%
6414	Maidencane	55.62	1.79%
[1]	Planted Pine Encroachment Into Wetlands Shown Above	734.98	23.51
Total		**3,103.00**	**100.00%**

[1]Pine plantations, 441 cover types representing various age classes, have been planted into wetland communities described in the above table. Historically, the areas of encroachment would have been potentially hydric pine flatwoods (625), wet prairie (643), freshwater marsh (641), and treeless savanna (646) cover types, but formation of raised beds for planted pine seedlings enabled silviculture to extend into the above wetland types on the Restoration project site.

Please find attached Map F-4, Wetland Impact Analysis from the DRI RAI #3 submittal. This map represents lines within the proposed development footprint that have been reviewed by SJRWMD, the GPS locations of wetland lines delineated by Breedlove Dennis and Associates scientists not yet completely reviewed by SJRWMD, and those

wetlands photo interpreted outside of the proposed development footprint. While there may be modifications to these lines during the review process, they represent a substantially more realistic approximation of wetland areas than the FLUFCS mapping previously presented. Map F-4 will show actual impact acreage when the final review has been completed by the SJRWMD. The final survey following SJRWMD review will be presented as soon as it is available.

2. Historical hydroperiods and seasonal water elevations of on site wetlands.

The current hydrological setting of the site has been altered over the past century from its historical basis. To the north, site inspections suggest the current hydrological setting is influenced by an east-west canal north of the property line which alters water flow into the property and off the property. Similarly, an east-west canal bisects the project site and alters natural water flow. I-95 likely disrupts flow onto and off the property along the eastern border. C.R. 442 borders the project to the south. The number and size of culverts running beneath C.R. 442 are inadequate to accommodate natural drainage from the southern end of the property. Consequently, this road blocks natural drainage and results in water retention and altered hydroperiods of wetlands located in the southern portion of the site. Additionally, smaller road-side ditches and the bedding of pine over much of the site have altered historical hydrological setting of the site.

3. Acreage and location of wetlands, which are to be preserved in their natural or existing state, including proposed hydroperiods, seasonal water elevations and methods for preservation.

Approximately 2,514 acres of wetlands located outside of the areas proposed for development in the Restoration project site are proposed to be preserved within three designated management units: Spruce Creek Swamp Unit, Central Corridor Unit, and East Corridor Unit. The short- and long-term hydroperiods of these preserved wetlands will be maintained or enhanced to the extent practicable to promote plant diversification in the project area, and to provide habitat for wildlife utilizing ephemeral and permanent wetland types for feeding, breeding, and sheltering. A conservation easement will be placed over the wetlands and uplands within the proposed management units post-development. A habitat management plan is being prepared for each of the three management units, which proposes activities to enhance or restore the wetland and upland communities remaining on the project site in conjunction with input from state and federal regulatory authorities.

4. Acreage and location of areas to be enhanced, including proposed hydroperiods, seasonal water elevations and methods of enhancement.

Additional enhancements, (i.e., hydrologic vegetative, etc.) will be conducted in portions of the preserved wetlands. As described in the habitat management plan proposed for the Restoration project site, pine plantations extending into wetland areas would be removed and planting beds graded where needed. Swales and ditches created as borrow areas for roadbeds and to drain ephemeral and permanent wetland sites in favor of pine plantation management would be filled or plugged to restore historic hydrological conditions of these drained wetland systems. No development is proposed in the sensitive and significant wetlands associated with the Spruce Creek Swamp. These enhancement and restoration efforts would serve to restore the hydroperiods within wetlands interspersed throughout the pine flatwoods community, and preserve the significant wetlands in the

floodplain and headwaters of Spruce Creek. The management and storage of surface water system will be designed to facilitate reestablishment of natural wetland hydroperiods for the individual wetland type.

5. Actions taken to minimize or mitigate impacts on wetland areas including maintaining the hydroperiod and providing buffers.

The environmental planning approach used in the design of the proposed Restoration project site emphasizes the importance of the wetlands uplands found within the Restoration project site. These wetlands and uplands are located within the drainage of the headwaters of Spruce Creek, and are significant to the ecological setting of the area and Volusia Corridor region. The majority of the remaining wetlands are proposed for protection as conservation lands to be incorporated into a conservation easement. The easement would preclude future development of all conservation lands.

As described in Parts 3 and 4 above, the restoration and habitat management plan proposed for the project site divides the area into three management units. Wetland preservation and enhancement are integral components of each unit. The plan proposes that management cells would be created in which individual wetlands would be identified, and prescriptions provided in a database describing measures to be scheduled and implemented to preserve and/or enhance their integrity and viability to the ecosystem. These measures may include such prescriptions as use of prescribed fire for reducing fuel loads in upland buffers, removal of planted slash pine and grading planting beds within the wetland proper, planting wetland species where seed bank and natural regeneration sources may be lacking, and plugging ditches and swales to return the wetland's hydrology to more historic conditions.

Planning within proposed development areas would also include the design of structures such as roadway culverts and bridges to facilitate natural drainage, and improving local hydrology where drainage has been impeded due to poor culvert design and elevated roadbeds. In addition, standard construction practices to control soil erosion and special permit conditions contained within the Environmental Resource Permit from the SJRWMD and the Department of the Army Section 404 Permit from the Corps of Engineers would be followed to further minimize adverse affects on wetlands and their hydrological regimes.

6. Precautions to be taken during construction to protect wetland areas.

Wetlands potentially affected by construction activities will be protected through the implementation of temporary erosion and sedimentation control procedures. The limits of wetlands will be clearly identified in construction documents. Temporary erosion controls would include, but are not limited to, grassing, mulching, seeding, watering and reseeding spoil and borrow area surfaces. Temporary sedimentation controls will include, but not be limited to, filter cloths, silt dams, traps, barriers, appurtenances at the foot of the sloped surfaces, which will ensure that sedimentation pollution will either be eliminated or maintained within acceptable limits as established by the Florida Department of Transportation (FDOT). These control mechanisms will be installed and maintained as shown on approved descriptions and working drawings. The contractor shall be responsible for providing these temporary erosion and sedimentation control measures during construction or until final controls become effective. Should any of the control measures fail to produce results that comply with the FDOT, the contractor shall

immediately take whatever steps are necessary to correct the deficiency at his own expense.

7. If available, provide jurisdictional determinations.

A request for a Formal Wetland Determination was submitted to the SJRWMD on June 28, 2006 and is currently pending review.

B. Provide any proposed plans (conceptual or specific) for created or enhanced wetland areas, including littoral lake slopes, buffers, vegetative species to be planted, etc.

A restoration and habitat management plan is being prepared for the Restoration project. The document contains information relevant to this question, and the overall approach proposed for management of the property.

The draft Site Mitigation and Management Plan draft document has been included with the DRI Sufficiency Response #3 to allow sufficient time for the formal wetland jurisdictional determination to be completed with the SJRWMD, and to better address agency concerns about enhancement, restoration, and management of preserved uplands and wetlands for plant and animal resources on the project site.

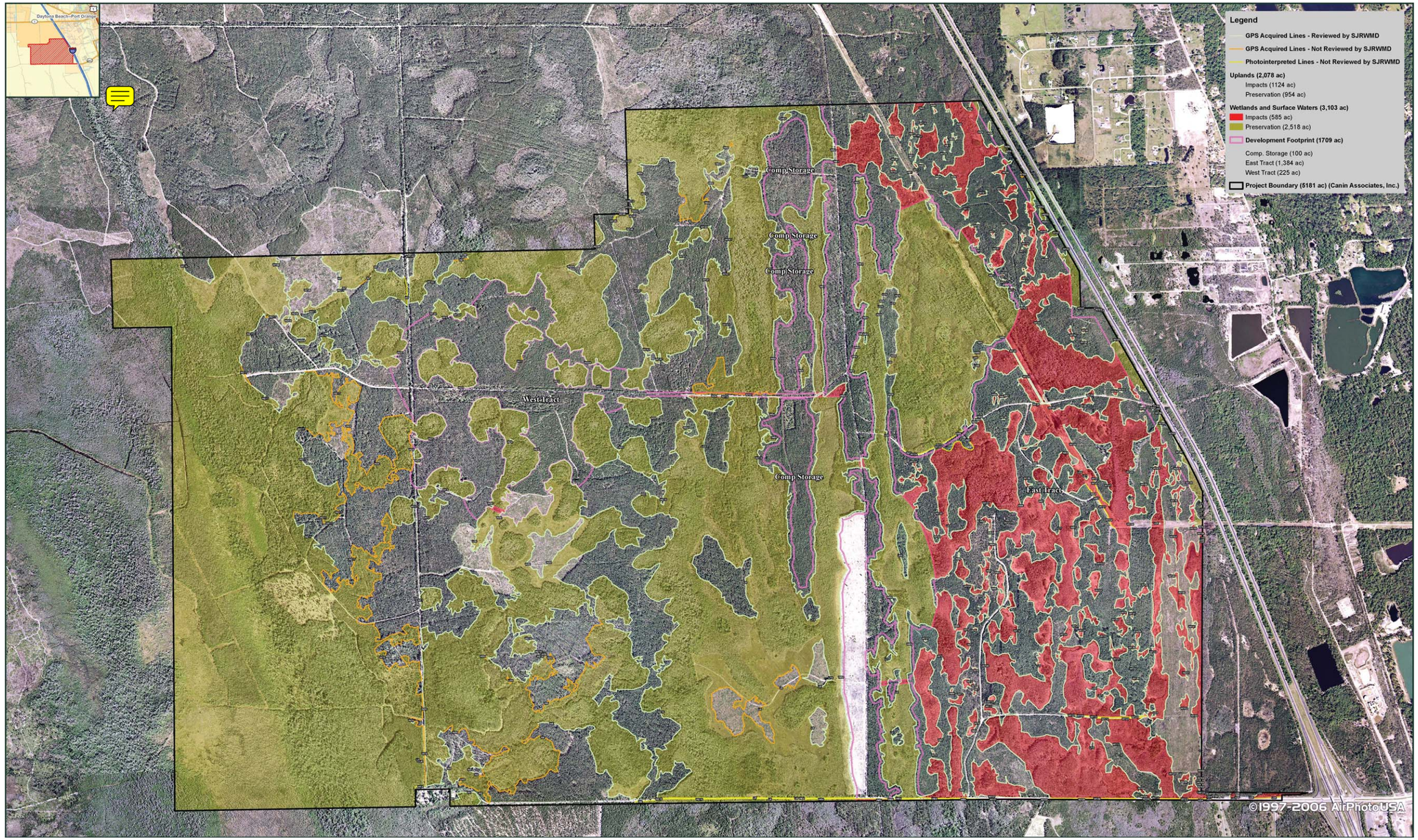
A summary of the measures proposed for enhancement and restoration of wetlands is provided below, with the understanding that more specific information would be forthcoming in the final version of the restoration and habitat management plan. Input into the plan would be provided from additional detailed field surveys of the site, the Formal Wetland Determination, and from development of engineering plans for project implementation.

Historically, many wetlands on the project site have been adversely modified in terms of natural water level elevations and hydroperiods, and by silvicultural activities. Natural drainage on the project site was altered by borrow ditches used for construction of the major elevated roadbeds, and by improper placement and sizing of culverts underneath C.R. 442. The borrow ditches served as conduits for transporting water off surrounding lands, and as linear holding ponds for water along the major north-south and east-west roads on the property, where ditches vary in depth from about three feet to over eight feet. Smaller ditches and swales were constructed off these borrow ditches into surrounding forest land and into wetland areas to promote drainage off sites where slash pine was planted. The habitat management plan proposes installation of plugs in ditches and swales, and/or filling in the ditches and swales by grading roadbeds and ditch berms to normal ground elevations.

Silvicultural activities have significantly affected wetlands on the project site. Early aerial photographs taken in the 1940's and 50's show the property as more open with scattered pine flatwoods interspersed with ephemeral and permanent wetlands and the Spruce Creek Swamp. Beginning about the 1960's the site was converted to slash pine plantations, which are now found throughout the tract in stands of varying ages classes. Raised bed planting allowed slash pine to be planted into some of the larger wetland margins and through some of the smaller, ephemeral wetland communities. The restoration and habitat management plan recommends harvesting of planted slash pine within wetlands, grading raised beds to ground elevation to the extent practicable, and plugging or filling in swales or ditches used to facilitate water removal for pine plantation development. Preliminary field surveys conducted in August 2006 indicate that many of the wetland areas containing pine plantations still have wetland tree species and understory plants of varying density, representative of their former natural composition. Removal of the

planted pine and eliminating unnatural drainage patterns would allow these plants to dominate the site over time. Buffer areas of pine flatwoods would be retained around the majority of protected wetlands in the conservation easement, and the buffers managed with prescribed fire and silvicultural prescriptions to return them to a natural condition for wildlife utilization, aesthetics, and education. On those wetland sites where native vegetation has been seriously diminished or lost, planting of species characteristic of the site's wetland may be recommended such as loblolly bay, pond and bald cypress, water tupelo, and red maple.

The proposed project also affords opportunities for wetland creation with judicious planning and management of the stormwater ponds, a concept that would be refined as the DRI progresses through the review and plan formulation process.



RESTORATION

Map F-4

Wetland Impact Analysis

Edgewater, Florida

Hammock Creek Green, LLC
Owner/Applicant

Canin Associates, Inc.
Planning & Landscape Architecture

Donald W. McIntosh Associates, Inc.
Civil Engineers

Breedlove, Dennis & Associates, Inc.
Environmental Scientist

Kimley-Horn & Associates, Inc.
Transportation

Fishkind & Associates, Inc.
Economics

Baker & Hostetler, LLP
Legal

0 2,000 4,000

N W E S

canin associates
urban planning • landscape architecture • architectural design
500 delaney avenue orlando, florida 32801 407.422.4040

DATE	SCALE	JOB NUMBER	SHT. NO.
01 MAR 07	1" = 2,000'	205115	1 of 1
REVISED 25 OCT 07	REVISED 30 MAY 08	REVISED	REVISED