STORMWATER MANAGEMENT

A. Describe the existing drainage patterns on site, as shown on Map I, including any potential flooding and erosion problems.

The existing topography shows elevations ranging from lows of approximately 18 ft. to highs on the ridges of 29 ft. The surface is characterized by a series of ridges and depressions.

Pursuant to drainage area mapping prepared by SJRWMD and by Volusia County, the site lies within four major drainage basins: Indian River Lagoon (IRL), Upper St. Johns River, Middle St. Johns River, and Northern Coastal. The site appears to be a confluence of an upstream terminus of all four basins. Detailed aerial topographic information (LiDAR - Light Detection and Ranging prepared by Jones Edmunds & Assoc.) has been obtained and utilized to adjust the basin lines preliminarily. Final basin delineation will be produced in conjunction with the design level regional stormwater studies that will be done for Restoration. The existing drainage basins and approximate areas (Including the existing wetland and surface water areas comprising approximately 2,708 acres), are described as follows:

Indian River Lagoon Basin: Southeasterly portion of the site consisting of approximately 969 acres in three major subbasins, IRL-1, IRL-2 and IRL-3. IRL-1 and IRL-2 drain easterly across I-95 and then southerly to Little Cow Creek. IRL-3 drains southerly across Opossum Camp Road (CR 442) and then easterly across I-95 to Little Cow Creek. Little Cow Creek discharges into a large low area east of I-95 referred to as Turnbull Hummuck which discharges to the south through Turnbull Creek into the Northern end of the Indian River Lagoon.

Upper St. Johns River Basin: Central portion of the site consisting of approximately 2,410 acres in one major basin, UPPER-SJ. Approximately 227 acres of adjacent offsite property north of the site (including approximately 67 acres of wetlands) drain southerly onto the Restoration project property. The combined runoff from the onsite and offsite basins drain southerly across Opossum Camp Road (CR 442) and then westerly toward Cow Creek which discharges to Deep Creek and ultimately to the St. Johns River north of Lake Harney.

Middle St. Johns River Basin: The western portion of the site consisting of approximately 2,699 acres in one major basin, SPRUCE-W, drains westerly to the Spruce Creek Swamp. The SJRWMD Water Resource Atlas - Major Surface Water Basins map dated 2003 shows the area of the Spruce Creek Swamp as part of the Middle St. Johns River Basin. However, the Middle St. Johns River Basin map dated February 2005 does not include the Spruce Creek Swamp area. A man-made canal known as the Samsula Canal west of the Spruce Creek Swamp captures much of the Spruce Creek Swamp runoff and conveys it northerly across SR 44 via three 10 ft x 10 ft. box culverts to ultimately discharge to Spruce Creek. Therefore, the basin SPRUCE-W will be included in the Northern Coastal Basin described below and the Middle St. Johns Basin is no longer discussed herein.

Northern Coastal Basin: The project site contains two major basins that are part of the Northern Coastal Basin. The Westerly portion of the site, SPRUCE-W, described above, drains westerly to the Spruce Creek Swamp and then northerly to Spruce Creek. The basin SPRUCE-E is approximately 203 acres located in the northeast portion of the site. Runoff from this basin discharges westerly across I-95 and then northeasterly through a series of ditches to Turnbull Creek and then to Turnbull Bay.

The 100-year flood prone areas for the property are reproduced from the FEMA Flood Insurance Rate Maps (panel numbers 12127C0508G, 12127C0516G, 12127C0525G and 12127C0700G,Volusia, County, Florida, effective date July 3, 2002 and map number 12095C0375 E, Orange County, Florida, effective date April 15, 2002). The site lies in Zone X ("areas determined to be outside the 500-year floodplain") and Zone A ("no base flood elevations determined").

The project will be designed to provide flood management consistent with the design criteria of Edgewater and New Smyrna Beach respectively within each City and of SJRWMD.

Slopes on the property are relatively flat and the property is highly vegetated resulting in minimal erosion potential from the current condition. All new construction will include erosion and flood control techniques to be permitted by SJRWMD and FDEP (NPDES).

B. Describe the various elements of the proposed drainage system shown on Map I, including any wetlands to be used as part of the system, and discuss the design criteria (including stage-storage/stage discharge assumption) to be used for the various elements. Provide typical cross-sections (showing dimensions, slopes, and control elevations) for any proposed lakes or swales. Identify the control elevation for all drainage structures. Include information as to what design storm will be used for what portions of the system.

The post-development drainage basins and conceptual stormwater management facility locations are shown on Map I-2, Proposed Drainage Plan.

The proposed stormwater management systems will be designed in accordance with criteria of the St. Johns Water Management District (SJRWMD), and the City of Edgewater. Approximately 2,731-acres of the site lie within the Spruce Creek Hydrologic Basin, however none of the area is within the designated Riparian Habitat Protection Zone. This area is subject to the District's recharge standards for Most Effective Recharge Areas as represented by hydrologic soil type "A" and for no reduction of floodplain storage criteria will apply within the Spruce Creek Hydrologic Basin. However, the nature of the soils in this area is such that the hydrologic type A/D soils will be characterized as type D and would not function as most effective recharge areas.

Systems will be generally consistent with the natural drainage patterns described above. Should any basins be determined to be completely landlocked, they will be served by wet detention ponds designed to provide pollution abatement and to limit post-development volume and rates to pre-development in accordance with agency criteria. Those basins discharging to basins having positive outfalls will be served by wet detention ponds designed to provide pollution abatement and to limit post-development rates to pre-development in accordance with agency criteria.

Existing wetlands/surface waters that are wholly owned within the property or those that can be shown to have a defined point or points of entry to the site and discharge from the site may be utilized for rate attenuation. In such cases, water quality treatment will be provided in Stormwater Management Areas (SMAs) upstream of and prior to discharge into the wetlands/surface waters. Rate management will be evaluated at the points of discharge across the property lines of the project.

Control elevations for wet detention systems will typically be set at the approximate wet season water table elevation as determined by the project's geotechnical engineer and/or environmental consultant during final engineering. Where discharge is to a water body or wetland, the control elevation will be set at the normal water elevation of the water body or wetland, if higher. Ultimately, normal water elevations will be determined by the geotechnical engineer and/or environmental consultant.

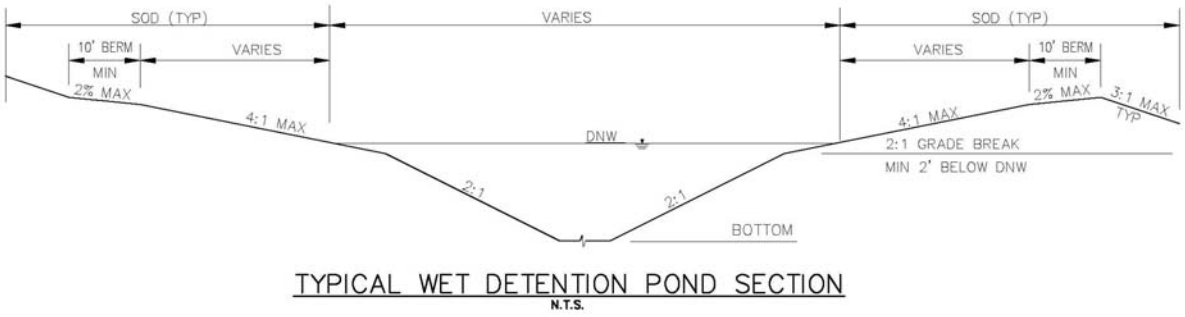
Tailwater-time discharge relationships will be established using the normal water elevations at time zero and the peak stage elevations as determined from the flood routing models to be developed in analyzing and permitting this project.

The design storms to be used are:

Basins with Positive Outfall	Rate:	25 year – 24 hour (P= 9.0")
	Floor elevations:	100 year – 24 hour (P=11.1")
Landlocked Basins	Volume (SJRWMD):	25 year – 96 hour (P= 11.5")
	Volume (NSB)	100 year – 72 hour (P= 13")
	Rate:	25 year – 24 hour (P= 9.0")
	Floor elevations:	100 year – 24 hour (P= 11.1")

Typical SMA cross-sections are shown in Exhibit B-1, Typical Section.

Exhibit B-1
Typical Section



C. From Map I, indicate the total number of acres in each drainage area and specify the acreage of any portions of drainage areas outside the site boundaries. Complete the following table for on site drainage areas.

Table C-1, Drainage Basin Areas is completed based on the following:

Table C-1
Drainage Basin Areas

Phase/Basin	Impervious Surfaces (acres)	Stormwater Management Areas & Wetlands (acres)[1]	Pervious Surfaces (acres)	Total (acres)
SPRUCE CREEK-W	0	476	15	491
SPRUCE CREEK	0	982	1258	2240
TURNBULL CREEK	0	20	51	71
RESTORATION	1074	1376	1027	3477
PROJECT TOTALS	**1074**	**2854**	**4576**	**6279**

[1]Category includes lakes (internal wetlands/surface waters), ponds, storage areas, etc.

D. Specify and compare the volume and quality of run-off from the site in its existing condition to the anticipated run-off at the end of each phase of development. (The parameters to be used to define "quality" and methodology should be agreed to by the regional planning council and other reviewing agencies at the preapplication conference stage.) Identify any changes in timing or pattern of waterflows between pre- and post-development conditions. Indicate major points of discharge and ultimate receiving water body(ies). Indicate what provisions will be incorporated in the design of the drainage system, including a summary description of any Best Management Practices to be utilized, to minimize any increase in run-off from the site and to minimize any degradation of water quality in the ultimate receiving body over that occurring in its pre-development state.

The proposed stormwater management system will be designed to comply with discharge quantity and quality requirements and design criteria of the St. Johns River Water Management District and the City of Edgewater. Water quality of post-development discharges will be accomplished by compliance with Chapter 40C-42, Regulation of Stormwater Management Systems. Management of runoff water quantities will be accomplished by compliance with Chapter 40C-4, Surface Water Management Systems.

The historical use of most of these lands and current land use entitlement of these lands is agricultural/pine plantation production.

The specific peak discharge rates will be determined in the detailed design and permitting phases. An increase in the time to peak discharge rate is anticipated in many of the basins. This is not anticipated to have a measurable affect on the rate of discharge from the wetland sloughs due to their substantial routing and attenuation capacity.

The pre-development and post-development runoff volumes are estimated from the proposed conceptual master plan and development program and are presented in the following tables:

Table D-1
Runoff Volume – Existing Basins

Positive Discharge Basins

Existing Basins	Area (acres)	Curve Number	25-yr.- 24-hr. Runoff (P = 9.0")
SPRUCE CREEK-W	491	97	354
SPRUCE CREEK	2715	85	1625
TURNBULL CREEK	228	83	132
GABORDY CANAL	773	88	486
COW CREEK	1952	88	1228
LITTLE COW CREEK	120	90	78
Totals:	**6279**		**3903**

Table D-2
Runoff Volume – Proposed Basins

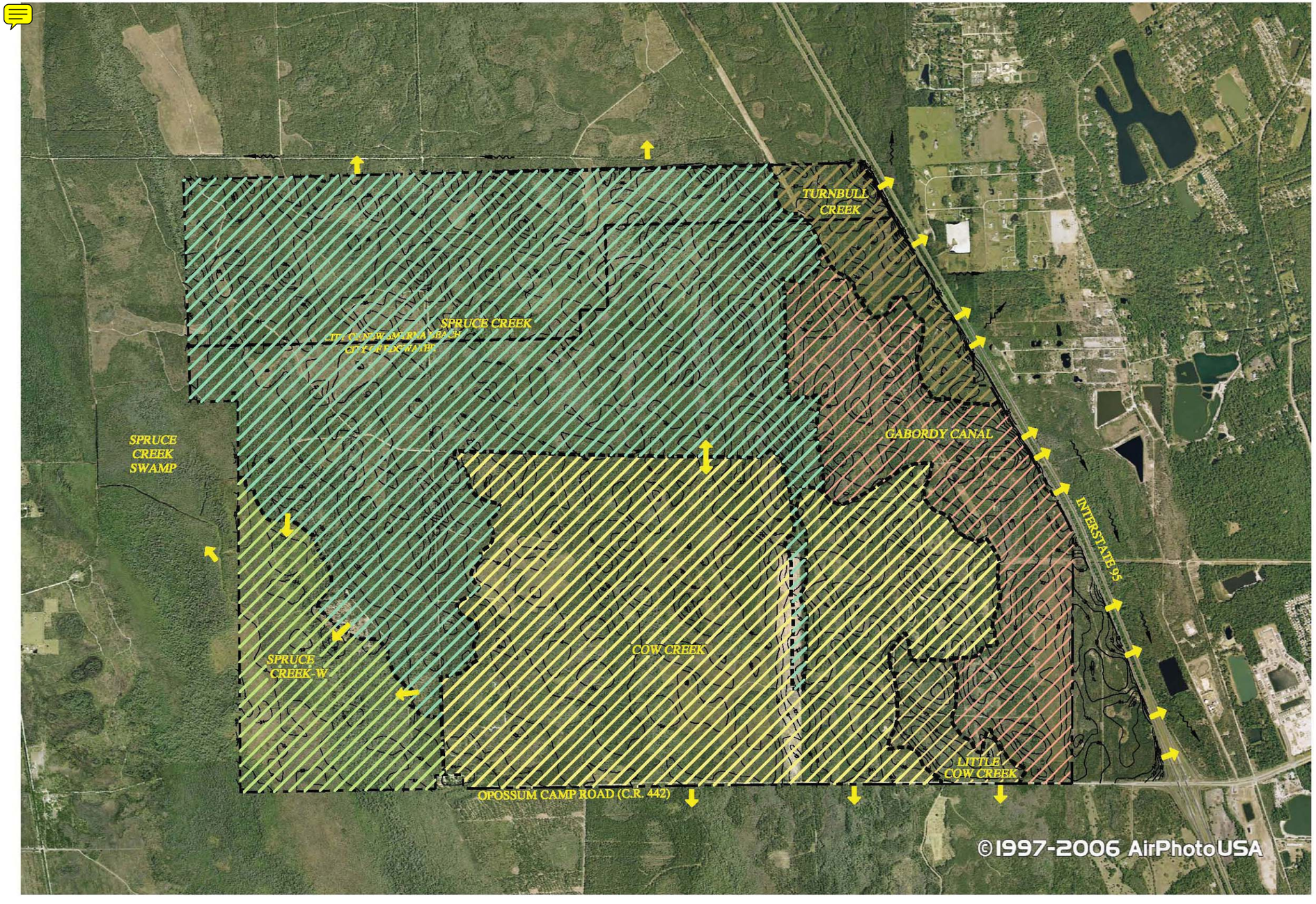
Positive Discharge Basins

Developed Basins	Area (acres)	Curve Number	25-yr. 24-hr. Runoff (P=9.0")(ac-ft)
SPRUCE CREEK-W	491	97	354
SPRUCE CREEK	2240	87	1386
TURNBULL CREEK	71	83	41
RESTORATION	3477	92	2328
Totals:	**6279**		**4109**

Note: Actual runoff volume will be significantly reduced to account for water to be used for irrigation.

E. Who will operate and maintain the drainage system after completion of the development?

The stormwater management systems will be privately owned and maintained by the project owner(s) until such time as they are formally passed to either a Chapter 190 F.S. Community Development District (CDD), or a Property Owners Association (POA) established for the Restoration project.



LEGEND

- DRI BOUNDARY
- MAJOR BASIN BOUNDARY
- 130 ELEVATION CONTOUR
- SPRUCE CREEK, TURNBULL CREEK BASIN NAME
- SURFACE WATER FLOW
- POINT OF DISCHARGE

RESTORATION

Map I-1

Existing Drainage Map

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

N W E S

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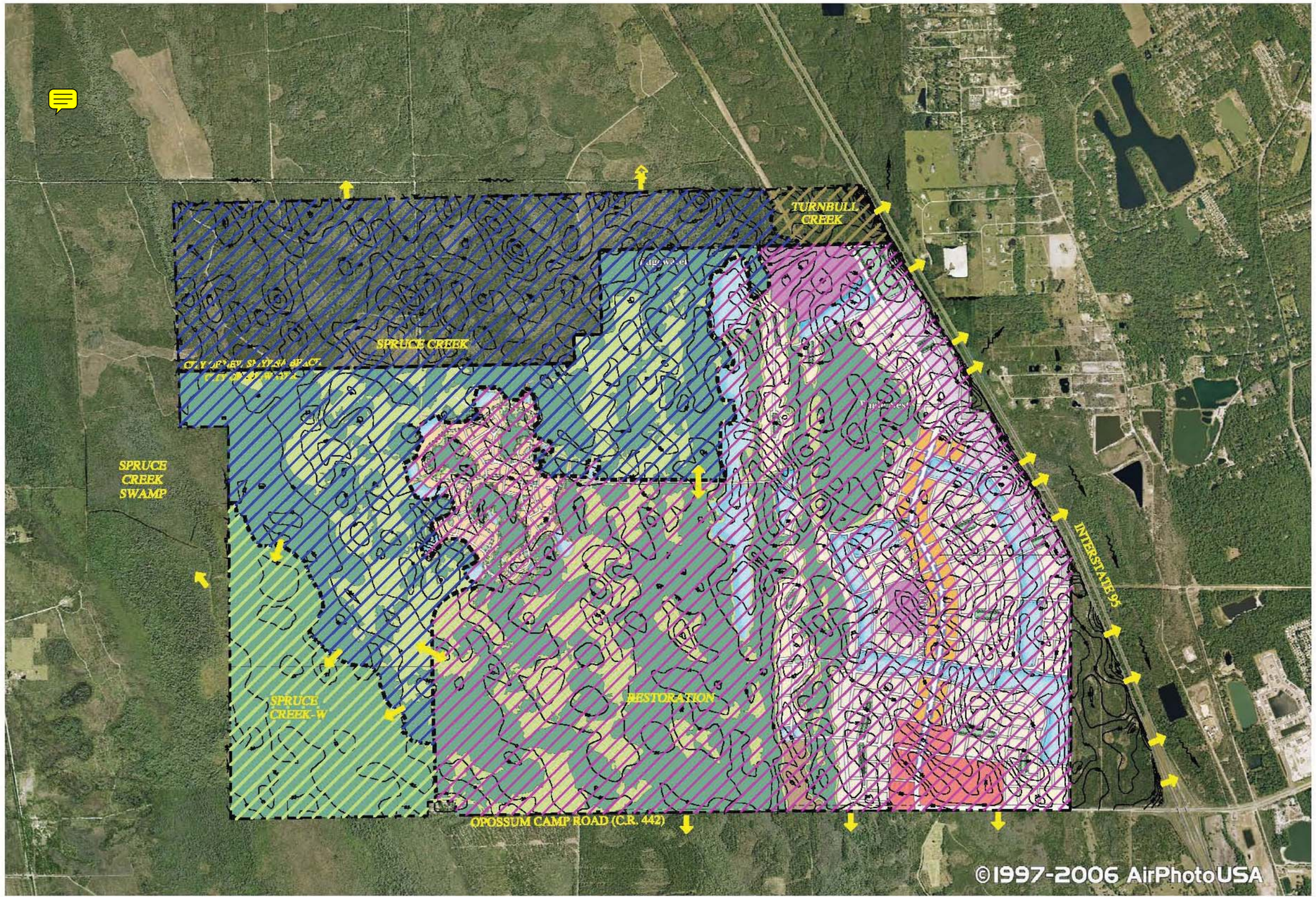
canin associates
urban planning • landscape architecture • architectural design
500 delaney avenue orlando, florida 32801 407.422.4040

DATE	SCALE	JOB NUMBER	SHT. NO.
01 MAR 07	N.T.S.	205115	1 of 1
REVISED 25 OCT 07	REVISED 30 MAY 08	REVISED	REVISED



LEGEND

- DRI BOUNDARY
- MAJOR BASIN BOUNDARY
- 130 ELEVATION CONTOUR
- SURFACE WATER FLOW
- POINT OF DISCHARGE
- STORMWATER MANAGEMENT AREA LOCATION

NOTE: ALL SMA STORMWATER MANAGEMENT AREA LOCATIONS ARE CONCEPTUAL AND SUBJECT TO RELOCATION AND RESHAPING DURING ENGINEERING DESIGN.

RESTORATION

Map I-2

Proposed Drainage Map

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

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