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**East Central Florida Water Supply Initiative  
St. Johns River Water Supply Project**

**Surface Water Treatment Plant Siting Study  
Level 2 Analysis:  
Preliminary Site-Specific Screening**



# **TECHNICAL MEMORANDUM D2A**

## **EAST CENTRAL FLORIDA WATER SUPPLY INITIATIVE ST. JOHNS RIVER WATER SUPPLY PROJECT**

### **SURFACE WATER TREATMENT PLANT SITING STUDY**

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**ACRONYMS AND ABBREVIATIONS**

AST	Above Ground Storage Tank
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
CERCLIS	Comprehensive Environmental Response Compensation and Liability Information System
CR	County Route
DOQQ	Digital Orthophoto Quarter Quad
EPA	Environmental Protection Agency
ERNS	Emergency Response Notification System
FDEP	Florida Department of Environmental Protection
FEMA	Federal Emergency Management Agency
FFWCC	Florida Fish and Wildlife Conservation Commission
FGDL	Florida Geographic Data Library
FNAI	Florida Natural Areas Inventory
GIS	Geographic Information System
HDR	HDR Engineering, Inc.
LG GEN	Large Generators of Hazardous Wastes
LUST	Leaking Underground Storage Tank
NPL	National Priorities List
NRCS	Natural Resources Conservation Service
RCRA	Resource Conservation and Recovery Act
RCRAGEN	RCRA Generators
SHCA	Strategic Habitat Conservation Areas
SJRWMD	St. Johns River Water Management District
SR	State Route
TDS	Total Dissolved Solids
TIGER	Topologically Integrated Geographic Encoding and Reference
TM	Technical Memorandum
TSD	Treatment, Storage and Disposal Facilities
USGS	United State Geologic Survey
UST	Underground Storage Tank
WTP	Water Treatment Plant
WWTP	Wastewater Treatment Plant

## INTRODUCTION

St. Johns River Water Management District (SJRWMD) implemented an interactive program with utilities, citizens and other interested parties to develop the District's Water Supply Plan (DWSP) through the Water 2020 planning process. The need for alternative water supplies from the traditional use of groundwater became apparent through this process. The St. Johns River Water Supply Project of the East Central Florida Water Supply Initiative comprises five projects, including the St. Johns River Treatability and Demineralized Concentrate Management Study, the Surface Water Treatment Plant Siting Study, the Demand Projection and Affordability Study, the USGS Water Quality Study, and Middle St. Johns River Minimum Flows and Levels Work. These projects focus on the evaluation of surface water withdrawn from the St. Johns River as an alternative or supplemental source of supply for portions of Seminole and Volusia counties, Florida. Three individual projects, the Surface Water Treatment Plant Siting Study, the St. Johns River Treatability Study, and the Demand Projection and Affordability Study, will help to facilitate design, location, and costing of a complete surface water treatment facility, intake structure, and connecting pipelines on a reach of the St. Johns River between the southern end of Lake Monroe and DeLand, Florida.

The purpose of this technical memorandum (TM) is to present the methods, analysis, and results of the Level 1 and Level 2 Siting Analysis phases of the Surface Water Treatment Plant Siting Study (Siting Study). A final stage of analysis will be conducted as a part of this siting study in the Level 3 Analysis.

The Siting Study will include the following project components:

- River intake structure location
- Treatment plant location
- Raw or treated water storage facility
- Demineralized concentrate disposal area
- Pipeline corridors

Through the Level 1 Analysis eleven potential water treatment plant sites were identified. These sites were evaluated through the Level 2 Analysis and five sites were shortlisted for further review in the Level 3 Analysis.

## METHODS

### LEVEL 1 ANALYSIS, PRELIMINARY STUDY AREA SCREENING

The Level 1 Analysis of the St. Johns River Water Project Water Treatment Plant Siting Study consisted of conducting a preliminary screening for water treatment plant sites through a GIS analysis. The screening included evaluating the study area, defined as the reach of the St. Johns River between the southern end of Lake Monroe in Sanford and DeLand extending five miles on each side of the river, for potential sites using a series of GIS overlays. The GIS databases utilized in the preliminary screening process are presented in Table 1 below.

**Table 1. GIS Databases Utilized for Preliminary Screening**

GIS Theme	Source(s)	Description
Biodiversity Hotspots	FFWCC	Areas of high biodiversity
Boating Hazards	HDR	Navigation channels and public boat ramps
Conservation Lands	SJRWMD	Federal, state and District public lands
Conservation Lands	FNAI	Federal, state, local and private conservation lands
Aerial Photography	SJRWMD, FDEP	Digital Orthophoto Quarter Quad aerial imagery
Floodplains	SJRWMD, FEMA	100 year floodplains (Zone A) and 25 year floodplains
Hazardous Materials Sites	EPA, FDEP (via EDR)	Current (2002) CERCLA, RCRA site locations purchased from EDR, Inc.
Hydrography	TIGER	1:100,000 scale TIGER
Land Use/Land Cover	SJRWMD, HDR	General 1995 land use & land cover, including wetlands, spot updated by HDR using 1999 DOQQs as required
Listed Species Occurrences	FNAI	Threatened or endangered species element occurrence records
OFW Boundaries	SJRWMD, FDEP	Outstanding Florida Waters boundaries
Political Boundaries	TIGER	County and municipal boundaries
Roads	TIGER	1:100,000 scale TIGER line files
SHCA	FFWCC	Strategic Habitat Conservation Areas
SSURGO Soils	SJRWMD, NRCS	Detailed soil survey, including hydric soils

A suitability analysis was conducted using the datasets listed in Table 1. This suitability analysis included assigning each of the constraint factors a “High”, “Moderate” or “Low” suitability class. The thresholds for each of the environmental factors and the suitability class are identified in Table 2.

Following the development of the environmental factors and assignment of suitability classes, the factors were combined utilizing GIS into five factor-specific suitability or overlay maps:

- Wetlands and Hydric Soils
- Floodplains
- Floral and Faunal Habitat
- Land Use/Land Cover
- Hazardous Material Sites

### **Wetlands and Hydric Soils**

This overlay map encompassed all areas identified as wetlands in the SJRWMD’s land use/land cover data or areas with hydric soils in the NRCS SSURGO data. Through the analysis an attempt was made to avoid or minimize impacts to wetland or hydric soil areas. Minimization of wetland impacts is a permit requirement of the Environmental Resource Permitting process. In the case where impacts to these systems could not be avoided, impact mitigation would be required. The highest constraint for this overlay map was given to areas with forested wetlands, while non-forested wetlands were identified as a moderate constraint. Forested wetlands will typically require higher mitigation ratios than non-forested wetlands.

### **Floodplains**

This overlay map presents areas that are within the 100-year and 25-year floodplains. Areas within these floodplains were avoided where possible. Where impacts were unavoidable, floodplain compensation will be required. The highest constraint for this overlay map was given to areas within the 25-year floodplain while areas within the 100-year floodplain were considered to be moderately constrained.

**Table 2. Level 1 Analysis – Environmental Factors and Suitability Classes**

Factor Number	Constraint Factors	Criteria	No Constraints	Moderate Constraints	High Constraints
1	Wetlands & Hydric Soils	Avoid areas of wetlands and hydric soils.	Outside Wetlands	Within Non-Forested Wetlands	Within Forested Wetlands
2	Floodplains	Avoid flood hazard areas.	Outside 100-Year Floodplain	Within 100-Year Floodplain	Within 25-year Floodplain
3	Floral & Faunal Habitat	Avoid biodiversity hotspots, SHCAs, and USFWS established T&E species protection zones.	Outside USFWS buffers, > 1000 ft from FNAI element occurrences, Biodiversity Hotspots < 3 focal species	Within USFWS secondary buffer, within 1000 ft of FNAI element occurrences, Biodiversity Hotspots 3 - 6 focal species	Within USFWS no-disturbance buffer, within 500 ft of FNAI element occurrence, SHCA or Biodiversity Hotspots > 7 focal species
4	Land Use	Avoid existing urban uses and agricultural uses.	Non-urban, non-agricultural	Agricultural	Commercial, industrial or residential
5	Waterward Constraints	Avoid OFW waters, waters near channels & boat ramps, waters adjacent to wetlands or urbanized shorelines, and areas near industrial discharges.	No OFW, > 200 ft from channels & boat ramps, no adjacent wetlands or urban land use	No OFW, within 1000 ft of industrial discharge, or > 100 ft from channels & boat ramps.	Within OFW, within 100 ft of channels or boat ramps, within 500 ft of industrial discharge, or adjacent to wetlands or urban land use.
6	Hazardous Materials Sites	Avoid contaminated sites.	No listed contaminated sites	N/A	Listed contaminated sites



## Floral and Faunal Habitat

This overlay map presents areas that are considered to be “biodiversity” hotspots. Habitat quality and the potential for supporting a wide variety of wildlife species were assessed using data available from the Florida Fish and Wildlife Conservation Commission’s (FFWCC) publication, *Closing the Gaps In Florida’s Wildlife Habitat Conservations System* (Cox et al., 1994) and *Habitat Conservation Needs of Rare and Imperiled Wildlife in Florida* (Cox and Kautz, 2000). The Gap analysis, as it is commonly referred to, identified a suite of “focal” species. Where the known or potential occurrences of these focal species overlap, a map of biodiversity “hotspots” was generated. The greater the number of focal species known or expected to co-occur in a given habitat and location, the greater the value of the parcel of land for the support of wildlife. Using the GIS database prepared by the FFWCC, the acreage of habitat at each proposed site potentially supporting 1-2 focal species, 3-4 focal species, 5-6 focal species and 7+ focal species was quantified.

A total of 44 focal species was identified by the FFWCC. Of those, fourteen can be expected to occur within the study area given the type of habitat available and known occurrence records. Table 3 identifies those focal species that are most likely to occur in the study area and comprise the overlapping occurrences.

**Table 3. Focal Species Most Likely to Occur in Study Area**

Amphibians and Reptiles	Birds
Florida scrub lizard	* American swallow-tailed kite
Gopher tortoise	Florida burrowing owl
Mammals	**Florida sandhill crane Florida scrub jay
Bobcat	**Limpkin
Florida black bear	Red-cockaded woodpecker
Sherman’s fox squirrel	Southeastern American kestrel
	Southern bald eagle
	Wild turkey

\* requires wetlands for foraging

\*\* requires wetlands for foraging and nesting

Areas within a 500-foot buffer of a documented listed species or those areas potentially supporting seven or more focal species were

identified as a high constraint area. Areas within an 1,000-foot buffer of a documented listed species or those areas potentially supporting three to six focal species were identified as a moderate constraint area.

### **Land Use/Land Cover**

This overlay map evaluated areas in terms of existing land use/land cover types as provided by the SJRWMD's land use/land cover mapping. To minimize impacts to surrounding land uses and to minimize the land costs associated with the site required for the surface water treatment plant, certain land uses were considered to be less desirable than others for a water treatment plant. Residential, commercial or other urban land uses were considered highly constrained and avoided where feasible. Active agricultural croplands were considered to be moderately constrained and were avoided where feasible.

### **Hazardous Material Sites**

This overlay map presented areas that contained hazardous material sites listed through the Comprehensive Environmental Response Compensation and Liability Act (CERCLA), and Resource, Conservation and Recovery Act (RCRA) databases. This overlay map was considered to have two levels of constraints. The highly constrained areas were those that contained a listed hazardous material site and the low constraint areas were those that did not contain a listed hazardous material site.

### **Constraints Analysis**

Each of these overlay maps showed areas of no/low constraints, moderate constraints, and high constraints. A combined overlay map was generated and levels of constraint were determined based on combined suitability classes. Combined suitability classes were developed and coded from one to five, where one represents an area with very low constraints; five represents an area that is severely constrained; and two, three, and four represent an area with varying combinations of moderate constraints. To ensure that areas of high constraint in any of the factors were treated as highly constrained areas and were not diluted by several low or moderate constraint factors, an area represented as a "High" constraint in any

of the factors automatically resulted in a value of 5 (severely constrained) in the output.

### **Identification of Potential Areas for the Proposed Surface Water Treatment Plant**

The areas represented as those with low constraints (a suitability code of one) were then further screened based on size and distance to the St. Johns River. Size criteria were entered into the GIS model to identify areas with 50 or more acres available for a water treatment plant and its ancillary facilities. A size requirement of 50 acres for the facility was established based on the assumption that the water treatment plant would be a 20 - 40 million gallons per day facility with the process components described in the *Technical Memorandum for Task G of the Conceptual Surface Water Treatment Systems: St. Johns River Near Lake Monroe* prepared by CH2M Hill (1999). The 50-acre water treatment plant site would also include area for 20 million gallons of raw water and finished water storage.

In addition to the site size criteria, a distance criteria of less than three miles from the St. Johns River was treated as the most desirable condition and three to six miles from the St. Johns River was treated in the model as an acceptable condition. Based on the size and distance criteria, areas were identified through the GIS process.

A windshield survey of the identified areas was then conducted to field verify the GIS data and to select 11 potentially feasible areas for further evaluation.

### **Public Outreach**

A public workshop was conducted on November 8, 2002 following the completion of the technical portion of the Level 1 Analysis. This public meeting included an open house presentation by the technical team and small group breakout sessions to obtain input on the siting process and the Level 1 results. Appendix A provides a summary of the meeting and the public input received.

## **LEVEL 2 ANALYSIS, PRELIMINARY SITE-SPECIFIC SCREENING**

The Level 2 analysis was a preliminary site-specific screening analysis which included additional data collection and impact quantification for the eleven (11) sites identified through the Level 1 preliminary study screening process. The Level 2 analysis also included initial identification of pipeline routes from the potential intake locations to the water treatment plant sites and from the water treatment plant sites to the demand centers. Concentrate disposal options were also identified for the water treatment plant sites.

### **Environmental Site Assessment**

Wetland boundaries were delineated using existing land use land cover mapping obtained from the District and digital orthophoto quarter quadrangles. Wetland limits and classifications were refined as necessary to accurately reflect existing site conditions. Through photo-interpretation, site visits, and review of soil data, natural features including uplands, wetlands and stream and river channels were evaluated on a qualitative basis. This assessment, in addition to results from the Gap analysis used in Level I, were used to assess the potential for protected species occurrences.

### **Hazardous Material Site Screening**

The intent of this screening was to identify properties within and adjacent to the proposed water treatment plant (WTP) sites that may have the potential to adversely impact the soil, surface water, or groundwater quality of the site. The screening was performed by a review of regulatory records for each proposed site to assess the likelihood of migrating hazardous substances or petroleum products. Records were obtained from reasonably attainable sources, including Federal, State, and local agencies. Standard sources include: Federal NPL list, Federal CERCLIS list, RCRA TSD facility, RCRA generators (RCRAGEN) list, Federal Emergency Response Notification System (ERNS) list, State list of hazardous waste sites, State landfill and/or solid waste disposal list, and State registered UST/AST list. No site reconnaissance or historical evaluation was performed.

### Evaluation of Land Owner Information

Aerial photography, parcel maps and associated property information were used to evaluate landowner information for the eleven identified areas. The information evaluated included the number of parcels, acreage per parcel, number of landowners, the presence of structures on the site and the just market value based on local property appraiser information.

### Site Boundary Refinement

Through the Level 1 Analysis, potential water treatment plant areas were identified. In most cases these areas were larger than the required 50-acre site footprint. Through the Level 2 Analysis, the boundaries of these areas were refined to include the most feasible site for a water treatment plant within the overall area. These refined boundaries were incorporated into the GIS database for use during the ranking analysis and the Level 2 analysis.

### Intake Locations

Potential intake locations were identified along the St. Johns River between the southern end of Lake Monroe and DeLand. These intake locations were identified through a review of aerial photographs of the river, a review of conservation lands and wetland areas and an analysis of potential linear corridors between the water treatment plant and intake location. The evaluation of the intake locations included the following factors:

- River Accessibility – Access to the river in the study area is limited along a large portion of the St. Johns River due to conservation lands between the northern portion of Lake Konomac and the southern portion of Lake Beresford. In other areas of the river, sites were identified where the access to the river could be obtained through existing roads or other corridors.
- Environmental Impact Quantification – Potential intake sites were further screened through an evaluation of potential effects to wetlands, floodplains and other environmental constraints.
- Pipeline Corridors – The ability to route a pipeline from the intake location to the water treatment plant was a criteria in identifying potential intake locations. An initial review of

the land surrounding the potential intake locations was conducted. These pipeline routes were then refined through the pipeline routing analysis process described below.

- Land Acquisition – Intake locations that involved the least number of property owners were also identified. Where the potential water treatment plants had river frontage, potential intake locations were identified on the water treatment plant site to minimize property acquisition requirements associated with both the intake location and pipeline route.

### Pipeline Routing Analysis

A least-cost path analysis was performed to identify the raw water pipeline routes from the intake locations to the treatment plant sites and finished water pipeline routes from the treatment plant sites to the demand centers with the least impact. This analysis was conducted utilizing GIS overlays. The evaluation of the pipeline paths included the following factors:

- Length – All other things being equal, the pipelines with the shortest lengths were preferable because of the reduced cost associated with the shorter pipeline.
- Environmental Impact Quantification – The routes were evaluated based on the potential effects to wetlands, floodplains and other environmental constraints.
- Existing Linear Corridors – The routes were established so that precedence was given to existing linear corridors such as roads and power line corridors.
- Land Value and Acquisition – All other things being equal, the pipelines with the least land acquisition cost were defined as being preferable because of the potential to reduce the total cost associated with the pipeline.

In establishing these pipeline corridors, not every site was connected to every intake location or demand center. In general, pipeline routes were connected to those intake locations and demand centers that were closest to the water treatment plant site.

### Concentrate Disposal

For the eleven sites identified in the Level 1 analysis, existing literature was reviewed for potential options for concentrate disposal for each site. The literature reviewed included the following documents:

- Technical Memorandum B.5, Applicable Rules and Regulations, Investigation of Demineralization Concentrate Management by Reiss Environmental in January 2002 (Reiss Environmental, 2002a)
- Technical Memorandum J, Risk Assessment of Reverse Osmosis Concentrate Discharge to the Middle St. Johns River, Florida: A Prospective Analysis by CH2MHill in December 2002 (CH2Mhill, 2002)
- Technical Memorandum C.2, Demineralization Concentrate Management Plan, Investigation of Demineralization Concentrate Management by Reiss Environmental in November 2002 (Reiss Environmental 2002b)

According to these sources, the following concentrate management options exist:

- Deep Well Injection
- Surface Water Discharge
- Discharge to Domestic Wastewater Treatment Facilities or Reuse
- Land Spraying and Percolation Ponds

When evaluating different concentrate disposal options, the primary issues to consider are permitability, environmental impacts, and cost. For the purposes of this Level 2 analysis, the ability to obtain a permit was the primary issue addressed for each of the sites.

According to Figure 5 of Technical Memorandum C.2 (Reiss Environmental, 2002b), the average total dissolved solids (TDS) for surface water within the study area is 500-1,000 mg/L. With a source water at this TDS level and a plant capacity of up to 20 MGD, the maximum quantity of concentrate that would need to be disposed is approximately 5 MGD.

### Deep Well Injection

Class I and Class V wells are the two most viable options for obtaining an FDEP permit for deep well injection. The classification of wells depends on the transmissivity, total dissolved solids (TDS) concentrations and presence of a confining zone for the proposed aquifer to be injected with concentrate. A very limited amount of data exists on the presence of existing Class I and Class V wells in Seminole, Volusia, and Lake counties. However, some data (Reiss, November 2002) exists regarding the transmissivity, TDS, and confining zone of the Upper and Lower Floridan Aquifer. This data was evaluated with respect to the location of each site. In addition, the study area is located in the most suitable area for subsurface injection in conjunction with a surface water source (Reiss Environmental, 2002b).

### Surface Water Discharge

Permitting of a surface water discharge of membrane concentrate is accomplished by dilution into a receiving stream. According to Reiss (2002b), the following criteria should be considered when evaluating this concentrate management option:

- Capacity of the receiving water body
- Classification of the water body
- TDS concentration
- Location of environmentally sensitive areas, and
- Potential for blending with wastewater treatment plants (WWTP) and power plant discharges

The highest class of surface waters to receive a membrane concentrate would be Class II and Class III surface waters without the designation of an Outstanding Florida Water (OFW).

According to the results of the GRI-FW-STR model (CH2MHill, 2002), which evaluated concentrate discharge into the St. John's River, the potential toxicity of even the strongest concentrate could be reduced to environmentally safe levels by a 60% dilution. The river discharge will always be at least six times the concentrate discharge, so dilution to safe levels within the required mixing zone should be easily accomplished.

The distance from each site to a suitable surface water discharge location in the St. John's River was estimated. For all sites, the potential for blending the concentrate with a WWTP or power plant



discharge is possible. However, several of the sites would need to discharge into portions of the river designated as an Outstanding Florida Water. Permitting of surface water discharge of concentrate for these sites may be more difficult than other areas. It appears that there are at least three power plants and at least five WWTPs located within the study area. The surface water discharge option should be further evaluated in the Level 3 analysis.

### Discharge to Domestic Wastewater Treatment Plants or Reuse

The discharge of membrane concentrate into a WWTP is feasible if the WWTP influent flow is large enough to dilute the concentrate. The wastewater treatment plants located in the study area do not appear to have enough capacity for the dilution of up to 5 MGD of concentrate. Therefore, this option was not evaluated on a site-specific basis for this level of analysis.

### Land Spraying and Percolation Ponds

Land spraying or percolation ponds must meet groundwater standards at the edge of the zone of discharge. This can greatly limit these two options since the groundwater standards incorporate drinking water standards, such as the requirement that TDS be less than 500 mg/L. A more detailed analysis would be required for the suitability of land spraying for the eleven sites, which is beyond this level of analysis. The detailed analysis should include pre-application treatment, ambient groundwater quality, hydraulic loading rates, land requirements, vegetation selection, distribution techniques, and surface runoff control. Percolation ponds are typically suitable for smaller water treatment systems given the large amount of area that is required. For this reason, percolation ponds were not considered the best concentrate disposal option and therefore were not evaluated on a site-specific basis.

## Site Ranking

Based on the Level 1 and Level 2 Siting Analyses discussed above, each of the sites were ranked for a series of criteria including:

- Site Size and Configuration
- Land Use
- Impact to Wetlands and Floodplains
- Presence of Hazardous Materials
- Habitat/Protected Species

- Location in Relation to Demand Centers
- Location in Relation to Raw Water Intake Locations
- Concentrate Management Options
- Land Ownership
- Public Acceptance
- Cost

Each site was given a score for each of the above criteria. The scoring was from 1 to 5, with 5 indicating an optimal or more desirable condition in terms of the selection criteria for the site, and a score of 1 indicating the least optimal condition for that criterion. This score was considered to be the raw score for that criterion.

Weighting factors were developed by an ad hoc committee through the use of a pairwise comparison matrix. The ad hoc committee was comprised of representatives from utilities, regulatory agencies, environmental groups, District staff, technical team members and citizens. Information about the ad hoc committee and the process utilized to develop these weighting factors is provided in Appendix B and the summary of the ad hoc committee meeting is provided in Appendix C. These weighting factors were utilized to indicate the relative importance of each criterion as compared to the other criteria. For each site, the raw score for each criterion was multiplied by the corresponding weighting factor. The resultants were then summed to create a total weighted score for each site. The weighted totals were used to rank the sites as they compared to one another. The sites with the higher weighted scores were those that appeared to have preferable conditions for the siting of a surface water treatment facility. Five sites were shortlisted for further evaluation in the Level 3 Analysis.

### **Public Involvement**

A public workshop was conducted on June 25, 2003 to receive input on the Level 2 analysis and the five preliminary shortlisted sites. Approximately 1,100 public meeting notices were mailed to property owners either within or adjacent to the eleven site boundaries, property owners of the proposed intake structure locations, and individuals who attended the first public meeting in November 2002. Once the public input was received and taken under consideration the eleven sites were ranked again to determine the five sites that would move forward to the Level 3 analysis.

## RESULTS

### LEVEL 1 ANALYSIS, PRELIMINARY STUDY AREA SCREENING

As discussed above, the Level 1 analysis consisted of preliminary GIS screening, constraints analysis, and preliminary site reconnaissance. As a result, a series of overlay maps was produced, using GIS, to show the no/low, moderate, and high constraint areas within the study area for the following environmental factors:

- Wetlands and Hydric Soils
- Floodplains
- Floral and Faunal Habitat
- Land Use/Land Cover
- Hazardous Material Sites

These overlay maps are presented in Figures 1 through 5.

A combined overlay map (Figure 6) was then generated and levels of constraint were determined based on combined suitability classes. Combined suitability classes were developed and coded from 1 to 5, where 1 represents an area with very low constraints; 5 represents an area that is severely constrained; and 2, 3, and 4 represent an area with varying combinations of moderate constraints.

Once size criteria and the distance to the St. Johns River were considered along with the constraint analysis, a windshield survey was completed to verify the GIS data and identify 10 potential feasible areas for further evaluation. These 10 sites, Sites A – J, are shown on Figure 7.

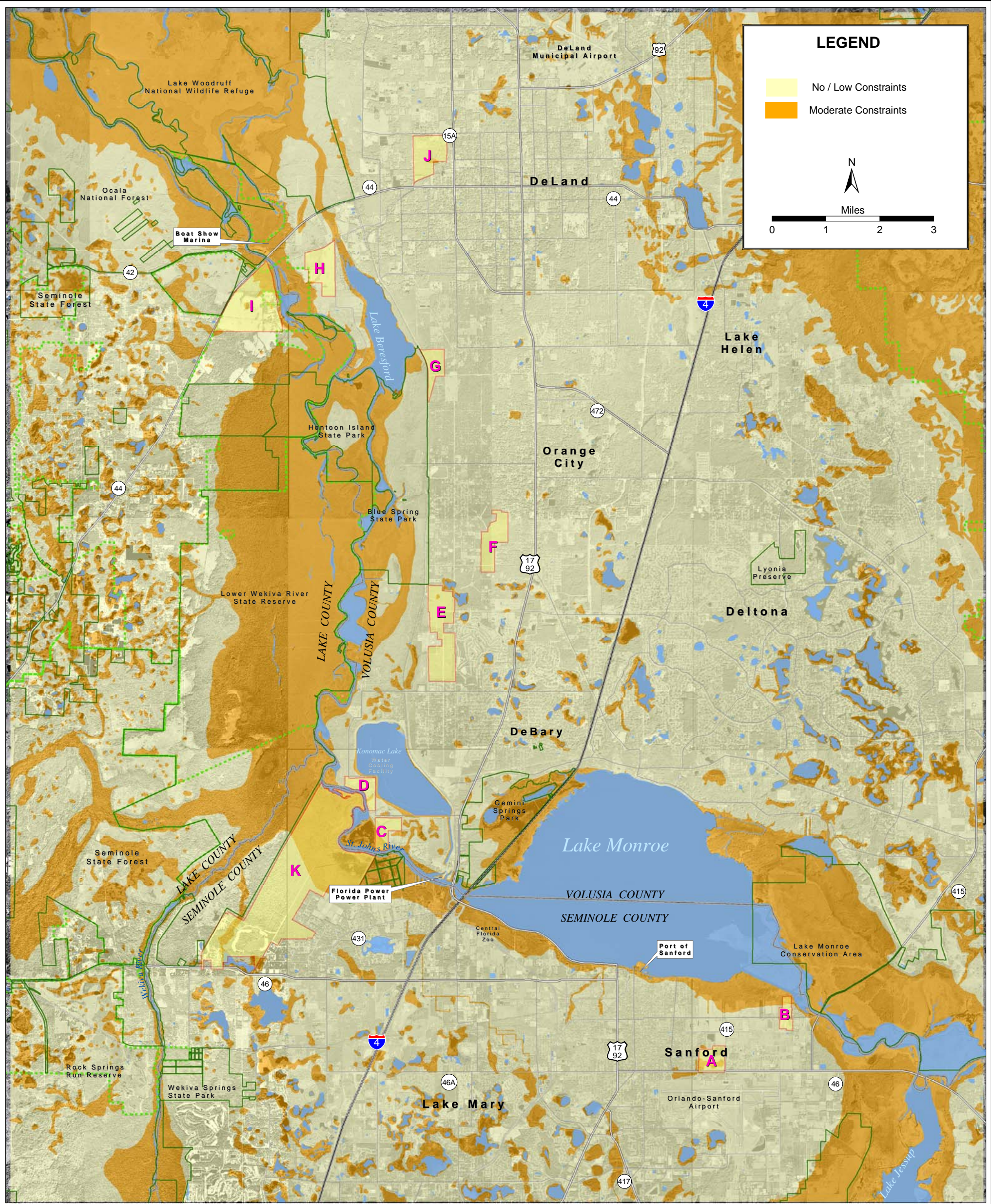
Generally, the sites ranged in size from 85 acres to 648 acres. All of these sites are currently in private ownership. Two sites are located in Seminole County, one site is located in Lake County, and seven sites are located in Volusia County. An additional site was added at the end of the Level 1 analysis as a result of the public outreach process. Seminole County provided information regarding a 2,600 acre site located in northeastern Seminole County near the Lake County line. A constraints analysis was completed for this site, Site K. Therefore, eleven sites (Site A – K) moved forward to the Level 2 analysis. Table 4 provides summary information for each of the sites.





**Figure 1**  
Level 1 Constraints Analysis - Wetlands

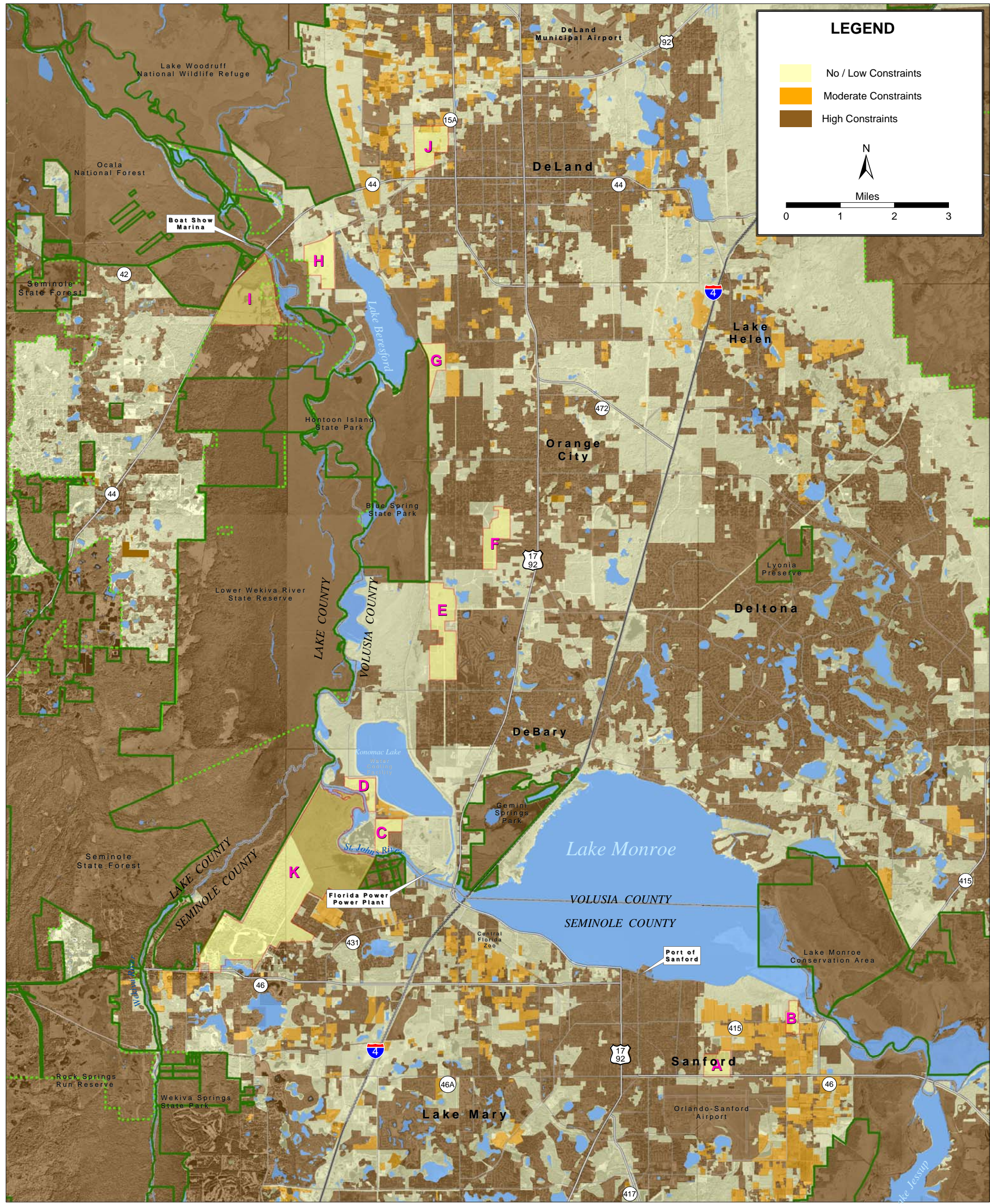








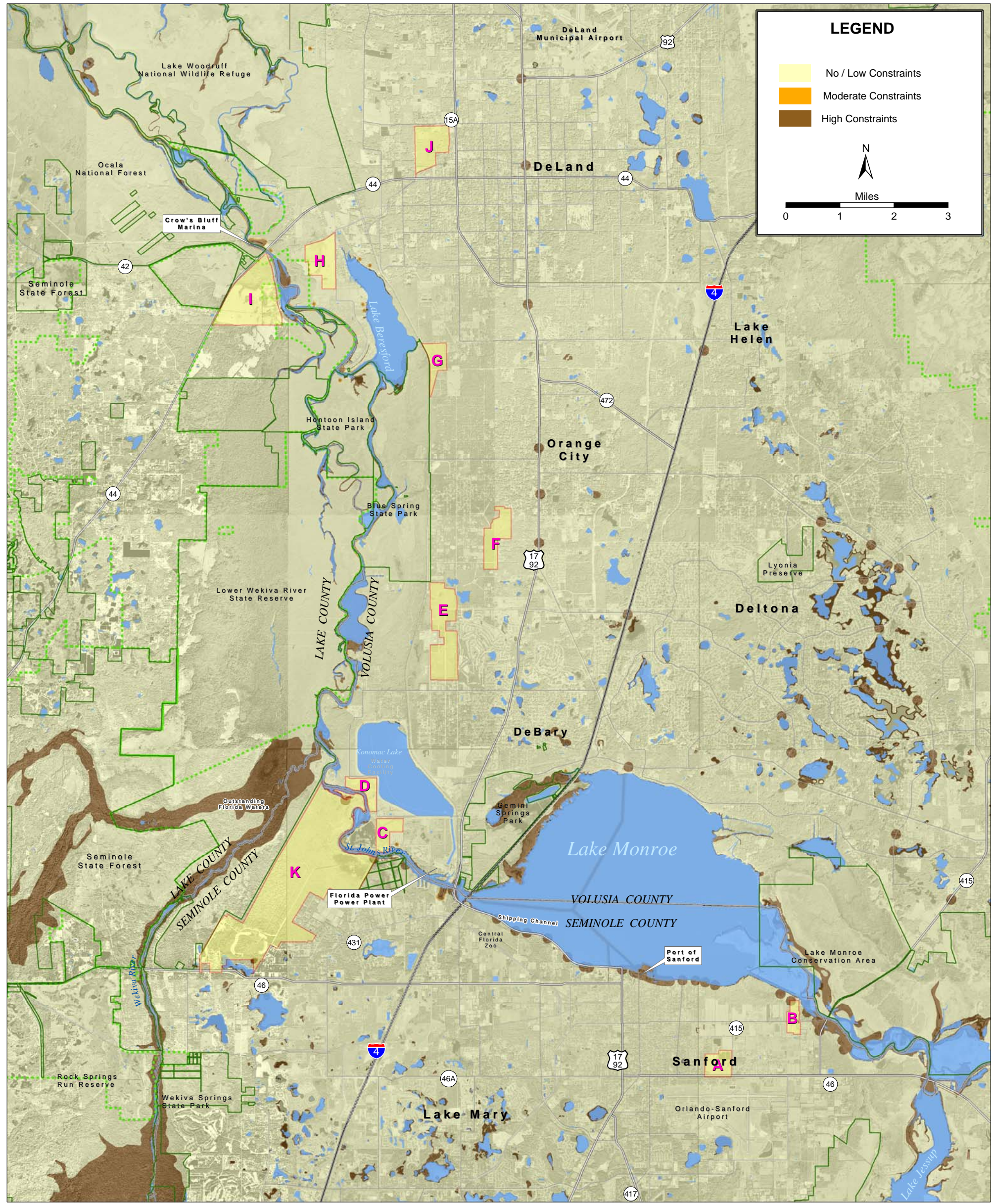




**Figure 4**

Level 1 Constraints Analysis - Land Use / Land Cover

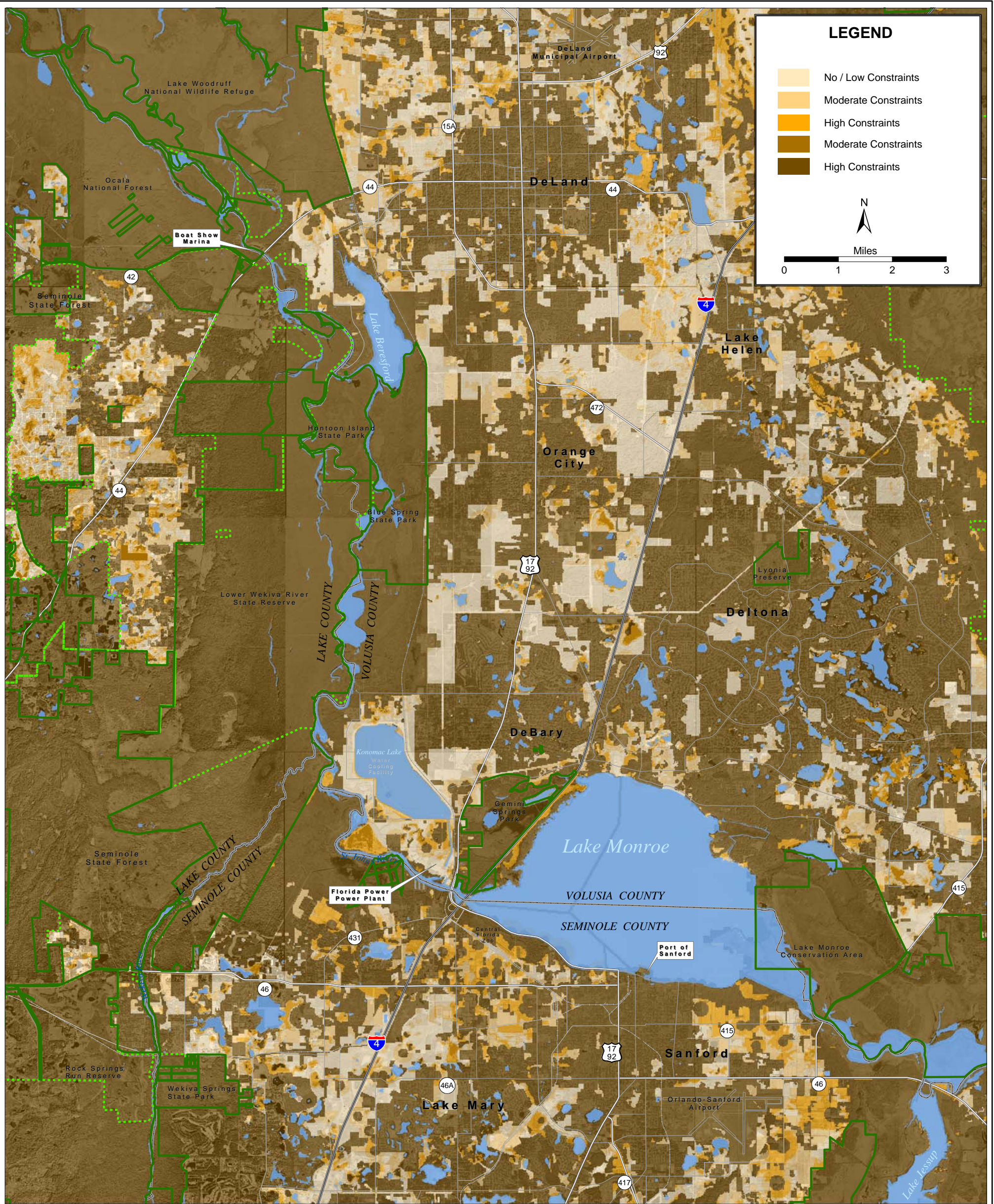




**Figure 5**

Level 1 Constraints Analysis - Hazardous Materials

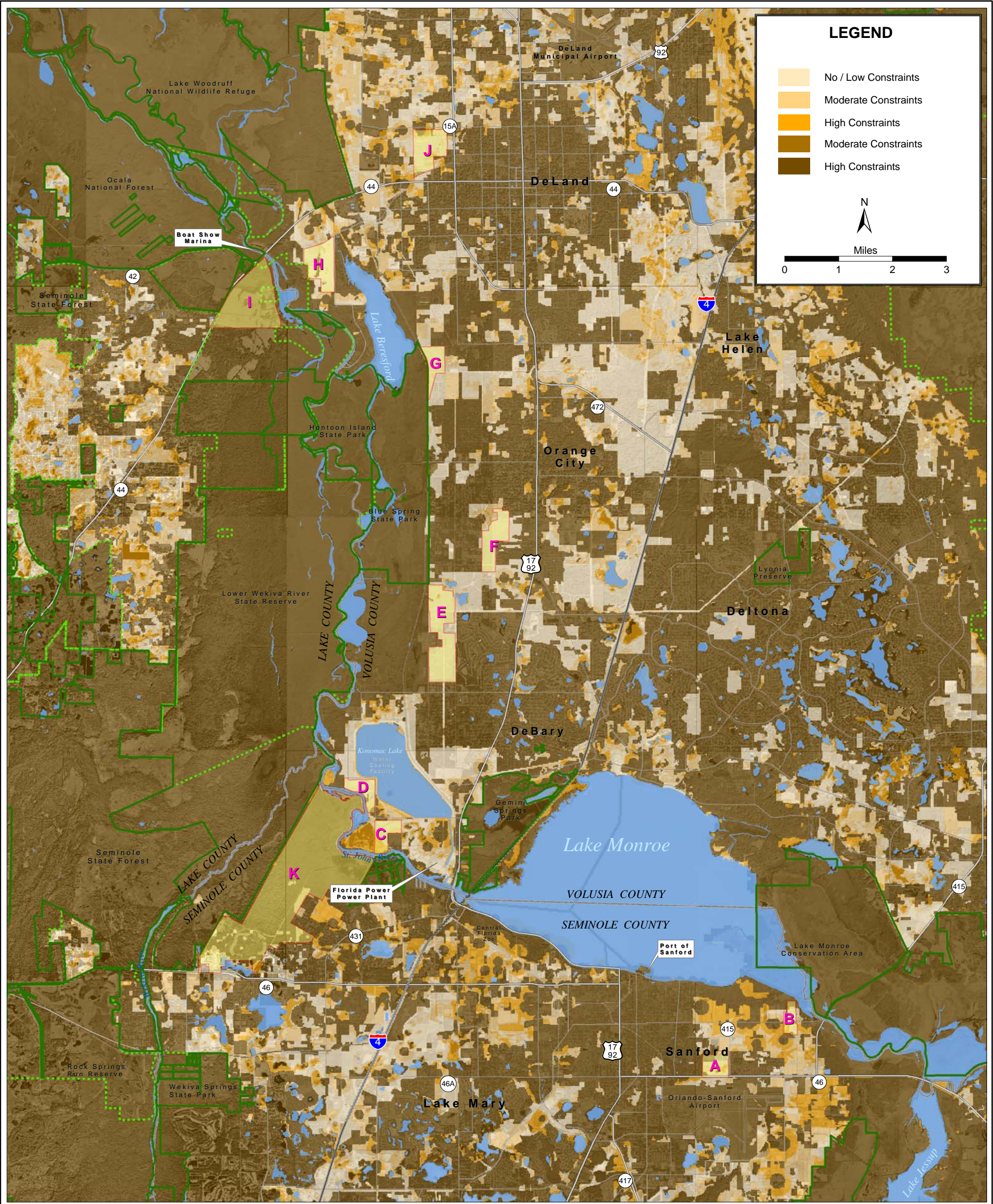




## Figure 6

## Level 1 Combined Constraints Analysis







**Table 4. Summary of Preliminary Site Characteristics**

<b>Site ID</b>	<b>County</b>	<b>Acres</b>
A	Seminole	140
B	Seminole	85
C	Volusia	137
D	Volusia	129
E	Volusia	535
F	Volusia	230
G	Volusia	119
H	Volusia	272
I	Lake	648
J	Volusia	188
K	Seminole	2,600

### LEVEL 2 ANALYSIS, PRELIMINARY SITE - SPECIFIC SCREENING

The Level 2 Analysis included a more detailed analysis of each of the sites identified through the Level 1 Analysis. During the Level 2 analysis, the site boundaries were refined based on environmental and property ownership data. The sites were refined to minimize impacts, minimize the numbers of parcels involved, and minimize the number of property owners potentially affected, while maintaining a site size of approximately 50 acres. The findings of the more detailed analysis are presented below on a site-by-site basis. The information for each site is presented with a general description of the initial site identified during the Level 1 Analysis, a discussion of the site boundary refinement, and a more detailed characterization of the refined site.

#### Site A

##### General Site Description

Site A is generally located in the southern portion of the study area, south of Lake Monroe, east of the intersection of US 17/92 and SR 46. Site A is approximately 140 acres in size and includes eleven parcels. The northern half of the site is an active borrow pit while the southern half is dominated by a combination of improved pasture and seasonal cypress wetlands. The major portion of this site is underlain by the Myakka and EauGallie fine sand soil type, typically occurring in broad plains associated with pine flatwoods and poorly drained conditions.

Wetland pockets are scattered throughout the tract and are comprised of herbaceous wetlands that have been drained for pasture improvements. Surrounding land use includes agriculture, residential, pine plantations and the Sanford Airport. Wildlife and associated habitat issues may include roosting opportunities in the narrow corridor of mixed hardwood forested wetland along the western perimeter.

The majority of Site A is located outside of the 100-year floodplain. However, 35 acres of Site A are located within the 100-year floodplain but do not have established flood elevations.

Regarding wildlife habitat, a total of 131 acres of Site A potentially supports between 1 and 2 focal species while just less than 10 acres potentially support 3 to 4 focal species.

### Site Boundary Refinement

Site A was refined to include one parcel in the southern portion of the original boundary. The refined site boundary is approximately 61 acres (Figure 8). This area was selected because the land use was more compatible with the siting of a water treatment plant on this parcel. The land use in the northern portion of the site, on the other hand, is primarily borrow pits and is, therefore, less compatible for siting a water treatment plant. The refined site boundary affects only one parcel and landowner.

### Environmental Assessment

The refined site boundaries include wetlands discussed above. Although partially drained, these cypress wetlands potentially provide roosting habitat for wading birds. Upland habitats on site have been cleared and “old-field” remains.

### Hazardous Material Site Screening

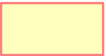

Two Leaking Underground Storage Tank (LUST) sites and one Underground Storage Tank (UST)/Above-ground Storage Tank (AST) site are located in the FirstSearch database in the vicinity of Site A. No sites are listed within the proposed boundaries of Site A. The UST/AST site is the Martin Property, located approximately 0.1 miles to the east of Site A. The site has one aboveground tank storing vehicular diesel.

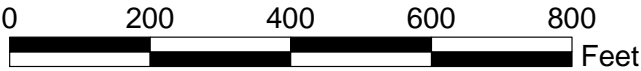
The first LUST site is the Lil’ Champ food store located approximately 0.3 miles southwest of Site A. A discharge was reported in 1992, with remedial action subsequently required. A second cleanup was required in 1998. Two underground tanks storing unleaded gasoline are currently in service at the Lil’ Champ site. The second LUST site is the A&M Discount Beverage store. A discharge was reported in 1988, and remedial action implemented. A second cleanup was required in 1998 by FDEP for the site under the Petroleum Cleanup Program.





Candidate Site Map A

-  Candidate Site A
-  Revised Candidate Site A



**Figure 8**  
Site A



The listed sites are not expected to be a concern for a proposed WTP due to their proximity to the proposed Site A boundary. Field reconnaissance will be conducted during the Level 3 analysis which will further evaluate these sites.

#### Property Ownership

The potential area for the water treatment plant location includes just one parcel (Parcel No. 32-19-31-1300024A0000). This parcel is approximately 61 acres and is located in the southern portion of the site. Three small isolated, disturbed wetland areas are located on this property that could either slightly reduce the acreage on the site available for development or result in an additional cost for mitigation.

There is only one property owner for Site A and there is no involvement with any structures. The just market value for this parcel according to the Seminole County Property Appraiser's Office is presented in Table 4.

**Table 5. Site A Property Owner Summary**

<b>Parcel ID Number</b>	<b>Acreage</b>	<b>Owner</b>	<b>Just Market Value</b>	<b>Per Acre Value</b>	<b>Structures</b>
32-19-31-1300024A0000	60.93	Sandefur Stanely H. Trustee	\$427,000	\$7,008	No

#### Concentrate Disposal

*Deep Well Injection* – Site A appears to be located in an area that would meet regulatory and technical (TDS and transmissivity) criteria for injection of concentrate into the Lower Floridan Aquifer. Exploratory wells and testing would be required to confirm this capability.

*Surface Water Discharge* – Site A is located more than two miles away from a suitable surface water discharge location. The potential for blending concentrate from this site with WWTP or power plant discharges should be explored in the Level 3 analysis.

#### Public Outreach

Through the public outreach process, information was provided regarding the future land use of Site A. Seminole County is currently permitting this parcel as a stormwater facility. This greatly reduces the amount of land available for a potential water

treatment plant and may effect the viability of this site for a water treatment plant.

Other comments received during the public outreach process were positive regarding the use of this site as a potential water treatment plant location. Appendix D provides a summary of the comments received at the public workshop held on June 25, 2003.

### Site B

#### General Site Description

Site B is approximately 85 acres in size and is generally located between Lake Monroe and SR 46 and to the west of CR 415. Site B includes thirteen parcels, with two parcels to the south of CR 415 and the remaining eleven to the north of CR 415. Site B is predominantly active agricultural lands that are used for a variety of agricultural purposes. The northern half is predominantly hayfields that are fringed by mixed hardwood forest and rangeland. The southern half also supports hayfields. There are several small forested and herbaceous wetland strands that jut into the site, along the northern and southeastern fringes.

The site area is underlain predominantly by EauGallie/Immokalee fine sands and St. Johns/EauGallie fine sands, both of which are typically associated with poorly drained pine flatwoods. These have a high water table during the growing season.

Wildlife and associated habitat issues may include wetland-dependent species and nesting/roosting opportunities within the northern fringe that connects to the St. Johns River and associated floodplain. A total of 61 acres of Site B potentially supports 1 to 2 focal species, and 24 acres potentially support 3 to 4 focal species.

The majority of Site B is outside of the 100-year floodplain. Approximately 3.4 acres of Site B are located within the 100-year floodplain.

Land use/land cover adjacent to the proposed site includes agriculture, wetlands, residential, upland forest, light industrial and rangeland.

#### Site Boundary Refinement

CR 415 bisects the original site with two large parcels to the south of the road and the remaining eleven parcels to the north of the



road. The two parcels to the south of the road have several structures on them. Therefore to minimize costs and impacts to developed land, six contiguous parcels to the north of the road were identified as the refined Site B boundary (Figure 9). The refined site boundary encompasses approximately 51 acres.

### Environmental Assessment

The refined site consists primarily of hayfields with forested wind-rows crossing the site. Wetlands are limited to shallow man-made ditches. Wildlife utilization is minimal due to the agricultural improvements on site.

### Hazardous Material Site Screening

The FirstSearch database includes one SPILLS site, three RCRA generators, five UST/AST sites, and one LUST site in the area of Site B. The listed sites are generally located in or near the southern portion of Site B. Seven sites are located within the proposed boundaries of Site B, and three sites are outside of the proposed boundary.



The state SPILLS and LUST sites are identified as Lake Monroe Residual Management Company. The addresses of the actual sites under management by this company are not listed. Three small quantity generators of hazardous waste are listed on the database, two located near the proposed southern boundary of Site B, and one located to the southeast of the proposed Site B boundary. No violations are listed for the RCRA GEN sites. Five UST/AST sites are listed within and in the area of Site B. No violations are listed for the UST/AST sites.

The listed sites are not expected to be a concern for a proposed WTP at Site B. Field reconnaissance will be conducted during the Level 3 analysis to evaluate these sites further.





Candidate Site Map B

-  Candidate Site B
-  Revised Candidate Site B



0 200 400 600 800 1,000 Feet

**Figure 9**  
Site B



Property Ownership

The refined Site B boundary includes six parcels north of CR 415. Table 5 summarizes the information for each of these parcels. Together, the six parcels encompass 50.62 acres. Land acquisition of these six parcels would involve three property owners, and no structures are located on any of these parcels. The just market values of the parcels according to the Seminole County Property Appraiser's Office are presented in Table 5.

**Table 6. Site B Property Summary**

<b>Parcel ID Number</b>	<b>Acreage</b>	<b>Owner</b>	<b>Just Market Value</b>	<b>Per Acre Value</b>	<b>Structures</b>
28-19-31-30002000000	5.21	Woodall, Carol M. Tr.	\$39,480	\$7,578	No
27-19-31-50100000010	4.79	Woodall, Carol M. Tr.	\$35,000	\$7,307	No
28-19-31-30001900000	16.96	Meriwether, Francis T	\$105,000	\$6,191	No
28-19-31-30001700000	15.81	Meriwether, Francis T	\$110,600	\$6,996	No
28-19-31-30001500000	7.87	Meriwether, Francis T	\$54,600	\$6,938	No
28-19-31-300015B0000	0.53	Whitner, Joseph N	\$100.00	\$189	No

Concentrate Disposal

*Deep Well Injection* – Site B appears to be located in an area that would meet regulatory and technical (TDS and transmissivity) criteria for injection of concentrate into the Lower Floridan Aquifer. Exploratory wells and testing would be required to confirm this capability.

*Surface Water Discharge* – Site B is located within a half mile of a suitable surface water discharge location. The potential for blending concentrate from this site with WWTP or power plant discharges should be explored in the Level 3 analysis.

Public Outreach

During the public outreach process, it was learned that additional residential developments are currently being planned or built very close to this site. If this site should move forward to the next level of analysis, additional field review and landowner coordination will occur in the Level 3 analysis to determine the ongoing development patterns around this site. Appendix D provides a summary of the comments received at the public workshop held on June 25, 2003.

### Site C

#### General Site Description

Site C is approximately 137 acres in size and is generally located to the south of Konomac Lake and to the north of the St. Johns River.

Site C is located on the eastern fringe of a large wetland complex that contains both forested and herbaceous wetland types that extend into the proposed site. The northern half of the site has been used for improved pasture. A small intermittent creek conveys runoff in a southeasterly direction, eventually discharging into the St. Johns River floodplain.

Bluff sandy clay loam, listed as a hydric soil, occupies the southwestern portion of this site. The remainder of the site is underlain by poorly to somewhat poorly drained soils typically occurring in flatwoods communities within gently undulating terrain, all of which have a high water table during the growing season.

Wildlife issues potentially associated with this site include primarily wetland-dependent fauna utilizing the riverine corridor and riparian habitat associated with the St. Johns River. A total of 71 acres of Site C potentially supports 1 to 2 focal species and 16 acres potentially support 3 to 4 focal species.

Adjacent land use/land cover includes residential, pasture, pine plantations and mixed wetland communities.

#### Site Boundary Refinement

Because the southern portion of Site C is almost completely covered with wetlands, the site boundary was refined to include 40 acres in the northern portion of the original site (Figure 10). A bottomland hardwood forested wetland area, which connects to the southern wetland system, extends into the open pasture area. This wetland would either reduce the developable portion of the parcel further or if impacted would result in an additional mitigation cost.



#### Environmental Assessment

Large areas of forested wetland were avoided during site refinement. The revised site includes open grassland (pasture) and a forested wetland that drains to the southeast into the St. John's River floodplain. The potential for protected wildlife nesting or denning on site is limited due to the general absence of natural upland habitat.





Candidate Site Map C

-  Candidate Site C
-  Revised Candidate Site C



**Figure 10**  
Site C



#### Hazardous Material Site Screening

The FirstSearch database disclosed one SPILLS site, one ERNS, one UST/AST site, and one LUST site in the area of Site C. The UST/AST site (Florida Power and Light) is shown on the proposed northern boundary of Site C. The FirstSearch database indicates that the tanks on site were removed in 2000. The ERNS site has a report in 1993 of oil dumped on a vacant lot. The site is located to the southwest of the proposed Site C boundary. The state SPILLS site is listed as the Hicks spill site. No detailed information is available for the site. Eighteen non-geocoded sites are listed in the FirstSearch database.

The listed sites are not expected to be a concern for a proposed WTP at Site C. Field reconnaissance will be conducted during the Level 3 analysis to evaluate these sites further.

#### Property Ownership

Site C consists of one large parcel that is approximately 137 acres. Acquisition of this property, or just the northern portion of the property, would involve one property owner and no structures. The just market value of this property according to the Volusia County Property Appraiser's Office is presented in Table 6.

**Table 7. Site C Property Summary**

<b>Parcel ID Number</b>	<b>Acreage</b>	<b>Owner</b>	<b>Just Market Value</b>	<b>Per Acre Value</b>	<b>Structures</b>
900800000010	136.50	Empire Cattle Ltd.	\$386,987	\$2,835	No

#### Concentrate Disposal

*Deep Well Injection* – Site C appears to be located in an area that would meet regulatory and technical (TDS and transmissivity) criteria for injection of concentrate into the Lower Floridan Aquifer. Exploratory wells and testing would be required to confirm this capability.

*Surface Water Discharge* – Site C is located immediately adjacent to a suitable surface water discharge location. The potential for blending concentrate from this site with WWTP or power plant discharges should be explored in the Level 3 analysis.

#### Public Outreach

During the public outreach process, several comments were received regarding Site C. A few of these comments expressed

opposition to the use of this site for a potential water treatment plant because of the residential developments in the vicinity, particularly Meadow Lea. Others expressed concern regarding the potential of increased traffic as a result of the facility. However, excess traffic is not anticipated to be generated by the proposed water treatment plant, except during the construction of the facility. Appendix D provides a summary of the comments received at the public workshop held on June 25, 2003.

### Site D

#### General Site Description

Site D is approximately 129 acres in size and encompasses nine parcels. It is generally located between the western portion of Konomac Lake and the St. Johns River. Site D is primarily a mix of improved pasture along with mixed hardwood/coniferous upland forest fringing the St. Johns River along the western perimeter of the proposed site.

Farmton fine sand and Pomona fine sand soil types occupy the proposed site and are typical of the flatwoods terrain that was formerly situated in this locale, characterized by a high water table during the growing season.

The site is primarily located outside of the 100-year floodplain. Approximately 8.3 acres of the site are located within the 100-year floodplain.

While the southern open pasture area of Site D has a very low potential for wildlife significance, the northernmost portion has greater wildlife significance. Most of the forested area adjacent to the river appears to be upland hardwood habitat that may have wildlife significance. A narrow riparian forest strand extends through the north-central portion of the tract.

Adjacent land use/land cover includes residential, rangeland and pasture.

#### Site Boundary Refinement

The site boundary was refined to encompass two parcels that are owned by the same owner (Figure 11). The southern parcel is approximately 11.61 acres and the northern parcel is 101.72 acres. The southernmost parcel is the only area where impacts to the

potential high quality upland areas found throughout the rest of the site could be avoided. Because this parcel was not large enough for the potential water treatment plant, the parcel adjacent to it was also included in the refined boundary.

#### Environmental Assessment

This site was slightly reduced in size by eliminating portions of oak woodland contiguous with the river. Pasture and oak uplands dominate the site. Two intermittent creeks drain across the site and discharge into the St. John's River. Sherman's fox squirrel potentially occur on site, associated with the mature oak.

#### Hazardous Material Site Screening

The FirstSearch database shows one UST/AST site to the southeast of the proposed Site D boundary. Eighteen non-geocoded sites are listed in the FirstSearch database.

The listed site is not expected to be a concern for a proposed WTP at Site D. Field reconnaissance will be conducted during the Level 3 analysis to evaluate these sites further.

#### Property Ownership

The refined site boundary includes two parcels that are located adjacent to the river and encompass approximately 114 acres. The same property owner owns both of these parcels. The southern parcel is approximately 12 acres and the northern parcel is approximately 102 acres. The southern parcel is primarily cleared with the exception of the land abutting the river. The northern parcel is cleared with several structures on its southern end. The northern end of this parcel does not appear to have any structures on it; however, there is a large amount of high quality upland habitat that has not been cleared from this portion of the parcel.

The just market values of these parcels according to the Volusia County Property Appraiser's Office are presented in Table 7.

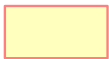

**Table 8. Site D Property Summary**

Parcel ID Number	Acreage	Owner	Just Market Value	Per Acre Value	Structures
900600000070	101.72	Murphy, Frank and Marcia	\$331,339	\$3,257	Several
900700000010	11.61	Murphy, Frank and Marcia	\$30,000	\$2,842	No





Candidate Site Map D

-  Candidate Site D
-  Revised Candidate Site D



0 500 1,000  
Feet

**Figure 11**  
Site D



### Concentrate Management

*Deep Well Injection* – Site D appears to be located in an area that would meet regulatory and technical (TDS and transmissivity) criteria for injection of concentrate into the Lower Floridan Aquifer. Exploratory wells and testing would be required to confirm this capability.

*Surface Water Discharge* – Site D is located immediately adjacent to a suitable surface water discharge location. The potential for blending concentrate from this site with WWTP or power plant discharges should be explored in the Level 3 analysis.

### Public Outreach

During the public outreach process, several comments were received regarding Site D. Several of these expressed opposition to the use of this site for a potential water treatment plant because of the residential developments in the vicinity. Appendix D provides a summary of the comments received at the public workshop held on June 25, 2003.

## Site E

### General Site Description

Site E is approximately 535 acres in size and is generally located west of US 17/92, northeast of Konomac Lake. Site E is predominantly disturbed upland, formerly comprised of mixed hardwood/pine forest tracts.

The site is underlain by Apopka fine sand and Paola fine sand. These soils occupy rolling terrain and are common for high sandhills. Both soils are well drained.

The site is primarily located outside of the 100-year floodplain. Approximately 4.4 acres of the site are located within the 100-year floodplain.

This site consists of 233 acres potentially supporting 1 to 2 focal species, 177 acres potentially supporting 3 to 4 focal species, and 124 acres potentially supporting 5 to 6 focal species. Although Site E is disturbed upland it is suitable habitat for related fauna and flora, including the potential for gopher tortoise, eastern indigo snake, gopher frog and scrub jays.

Adjacent land use/land cover includes residential, light industrial (Progress Energy), mixed upland forest and lands in transition (residential, clear-cut woodland, etc.).

### Site Boundary Refinement

Site E originally consisted of four parcels primarily owned by Progress Energy. The largest portion in the southern portion of the site is bisected by a Progress Energy power transmission line. Therefore, the site boundaries were refined to a 160 acre parcel in the northern portion of the site (Figure 12).

### Environmental Assessment

The site was substantially reduced in size and consists of cut-over sandhill habitat. Potential wildlife species on site include the gopher tortoise, commensals, scrub jays, and other xeric species. Surveys during Level 3 investigations will seek to confirm the presence or absence of these species.

### Hazardous Material Site Screening

The FirstSearch database includes one state SPILLS, two LUST, and one UST/AST site in the area of proposed Site E. The SPILLS site is listed as High Banks Marina and Camp Resort, and is shown on the proposed southern boundary of Site E. Two underground tanks storing unleaded fuel were removed in 1983, and one unleaded tank is currently active. A discharge affecting soils and groundwater was reported in 1995, and apparently the regulatory file was active as of 2002. The site is also listed as a UST/AST site.

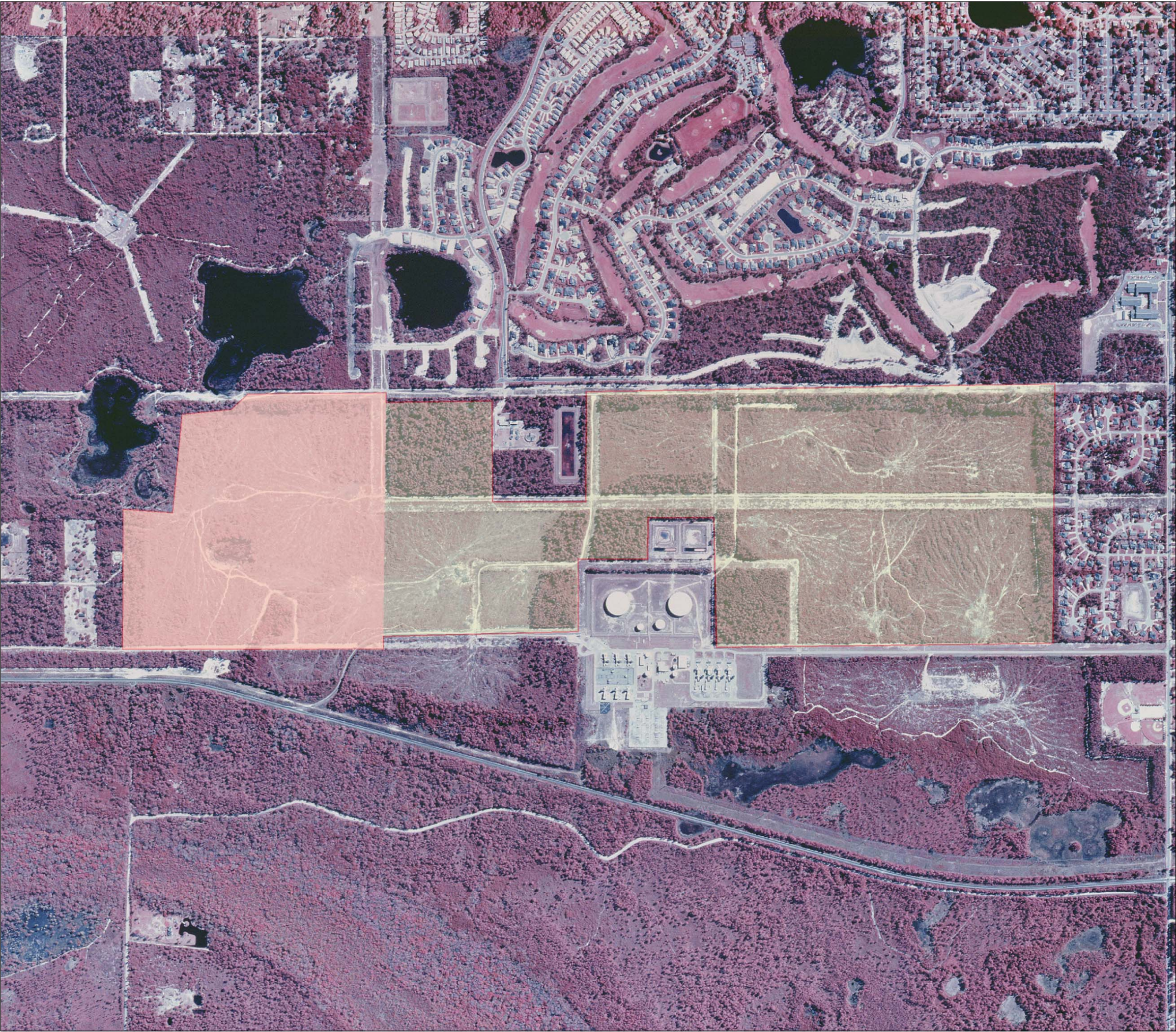
The LUST sites are both listed as the Florida Power Debarry plant located per the FirstSearch database to the southwest of the proposed Site E boundary. Two separate fuel oil discharges affecting soil and groundwater were reported in 1991 and 1992. The database indicates a new cleanup is required by FDEP for the site under the Petroleum Cleanup Program. Six non-geocoded sites are listed in the FirstSearch database.

The listed sites are not expected to be a concern for a proposed WTP at Site E. Field reconnaissance will be conducted during the Level 3 analysis to evaluate these sites further.



### Property Ownership

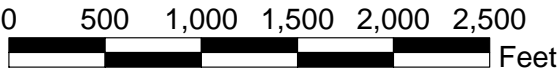
The refined Site E boundary encompasses one parcel owned by Progress Energy (Parcel No. 802100000012) and is approximately 160 acres. There are no structures located on this parcel.





Candidate Site Map E

-  Candidate Site E
-  Revised Candidate Site E



**Figure 12**  
Site E



The just market value for this parcel according to the Volusia County Property Appraiser's Office is presented in Table 8.

**Table 9. Site E Property Summary**

<b>Parcel ID Number</b>	<b>Acreage</b>	<b>Owner</b>	<b>Just Market Value</b>	<b>Per Acre Value</b>	<b>Structures</b>
802100000012	160	Progress Energy	\$740,375	\$4,627	No

Concentrate Management

*Deep Well Injection* – Site E appears to be located in an area that would meet regulatory and technical (TDS and transmissivity) criteria for injection of concentrate into the Lower Floridan Aquifer. Exploratory wells and testing would be required to confirm this capability.

*Surface Water Discharge* – Site E is located more than 2.5 miles away from a suitable surface water discharge location. The portion of the river where this discharge would occur is designated as an Outstanding Florida Water. Permitting of concentrate disposal in this area of the river may be more difficult than other areas. The potential for blending concentrate from this site with WWTP or power plant discharges should be explored in the Level 3 analysis.

Public Outreach

Through the public outreach process, several comments were received regarding the location of a proposed school and road extension in the vicinity of this site. Another comment identified a concern for potential scrub jay habitat on this site. If this site should move forward to the Level 3 analysis, each of these issues will be reviewed with the appropriate agencies. Appendix D provides a summary of the comments received at the public workshop held on June 25, 2003.

Initial discussions with Progress Energy have been initiated through the public outreach process. Progress Energy is currently evaluating the potential for this site to be used for a water treatment plant in relation to its long term plans for the property.

### Site F

#### General Site Description

Site F is approximately 230 acres in size and is generally located between US 17/92 and Blue Springs State Park. Site F is almost exclusively dominated by longleaf pine/xeric oak community type which appears to be minimally disturbed, except for a swath within the western portion of the site. There are no wetlands present within this tract.

The site is underlain by Paola fine sand soils with 0 to 8 percent slopes. These soils support high sandhill habitats which are well drained.

Site F is entirely outside of the 100-year floodplain.

A total of 228 acres of Site F potentially support 1 to 2 focal species and just over one acre potentially supports 5 to 6 focal species. Due to the predominance of longleaf pine and xeric oak throughout this site, listed species may include gopher tortoise, indigo snake, scrub jays, gopher frog and sand skink. In addition, other listed species known to be associated with gopher tortoise burrows may be present.

The surrounding land use is comprised mainly of light residential development and longleaf pine/sandhill communities, along with a large microwave antenna along the northwest corner.

#### Site Boundary Refinement

Site F originally consisted of six parcels. The site boundary was refined to include four parcels approximately 156 acres in size located in the central portion of the original site because of the presence of an upland area that had been previously disturbed (Figure 13). This area was also chosen to provide a buffer from property owned by the Volusia County School Board and a proposed new school site at the very northern portion of the original site.

#### Environmental Assessment

The environmental characterization provided above remains accurate for the refined site. Only the eastern and western portions of the site were eliminated, leaving intact the central portions.





Candidate Site Map F

- Candidate Site F
- Revised Candidate Site F



0 300 600 900 1,200 1,500  
Feet

Figure 13  
Site F



### Hazardous Material Site Screening

The FirstSearch database includes one state landfill site, one RCRA generator, two LUST, and three UST/AST sites in the area of proposed Site F. The state site is the Lake Marie Landfill, and according to the database it is located approximately one mile east of the proposed Site F boundary. The RCRA GEN site is Caprice Printing and Publishing, which is a small quantity generator of hazardous waste located just east of the proposed Site F boundary. No violations were reported per the FirstSearch database.

Two LUST sites are reported approximately one-half mile east of the proposed Site F boundary on S. Volusia Avenue. The Lil' Champ Food store and the Coastal Mart reported discharges of petroleum products in 1994 and 1987, respectively. No cleanup was required at the Lil' Champ store. The database indicates a new cleanup is required by FDEP for the Coastal Mart under the Petroleum Cleanup Program.

Three sites with registered underground tanks are reported by FirstSearch, including one within the boundaries of the proposed Site F boundary and two to the southwest of the proposed Site F boundary. No discharges were reported for these sites. One non-geocoded site is listed in the FirstSearch database.

The listed sites are not expected to be a concern for a proposed WTP at Site F. Field reconnaissance will be conducted during the Level 3 analysis to evaluate these sites further.

### Property Ownership

The refined Site F boundary encompasses four parcels located in the central portion of the original site because of the presence of an upland area that had been previously disturbed. Three separate property owners own the four parcels on which the disturbed upland area is located. No structures have been identified on any of these four parcels. The just market values for these parcels according to the Volusia County Property Appraiser's Office are presented in Table 9.



Table 10. Site F Property Summary

Parcel ID Number	Acreage	Owner	Just Market Value	Per Acre Value	Structures
801500000280	79.0	Ford, Frank A. Trustee	\$358,440	\$4,537	No
801500000200	30.0	Ford, Frank A. Trustee	\$208,800	\$6,960	No
801500000290	1.09	Flag Corp.	\$8,000	\$7,340	No
801000000020	46.02	Threadgill, Robert H. Et Al.	\$190,750	\$4,145	No

#### Concentrate Management

*Deep Well Injection* – Site F appears to be located in an area that would meet regulatory and technical (TDS and transmissivity) criteria for injection of concentrate into the Lower Floridan Aquifer. Exploratory wells and testing would be required to confirm this capability.

*Surface Water Discharge* – Site F is located more than three miles away from a suitable surface water discharge location. The portion of the river where this discharge would occur is designated as an Outstanding Florida Water. Permitting of concentrate disposal in this area of the river may be more difficult than other areas. The potential for blending concentrate from this site with WWTP or power plant discharges should be explored in the Level 3 analysis.

#### Public Outreach

Through the public outreach process, several comments were received regarding Site F. Several expressed opposition to this site because of nearby residential areas and additional planned residential development in the area. In addition, a contact from the Volusia County School Board indicated that the northern portion of the original site is a proposed school site. Another issue that arose was a potential conflict with a proposed north/south roadway, the Westside Parkway Project, in the vicinity of this site. If this site should move forward to the Level 3 analysis, these issues will be further review with the appropriate agencies. Appendix D provides a summary of the comments received at the public workshop held on June 25, 2003.

### Site G

#### General Site Description

Site G is approximately 138 acres in size and is generally located between US 17/92 and Lake Beresford. Site G is primarily comprised of disturbed upland land cover that is interspersed with pockets of pine flatwoods and rangeland. This disturbance includes former and more recent tree harvests associated with the upland coniferous and mixed coniferous/hardwood that extended throughout this locale. There are no wetlands present with this tract.

This site is underlain primarily by Apopka fine sand and Paola fine sand, both of which are typically associated with well-drained sandhill and scrub community types. These soils have a low water table throughout the year, generally below seventy-two inches.

Site G is entirely outside of the 100-year floodplain.

A total of 15 acres of Site G potentially supports 1 to 2 focal species, 104 acres potentially support 3 to 4 focal species, and less than one acre potentially supports 5 to 6 focal species. Although Site G is disturbed upland it is suitable habitat for related fauna and flora, including gopher tortoise colonies. Other listed species may include scrub jays, eastern indigo snake, gopher frog and other species associated with gopher tortoise burrows.

Adjacent land use/land cover includes residential, mixed upland forest, pine flatwoods and rangeland.

#### Site Boundary Refinement

Site G consists of two parcels of equal size totaling approximately 138 acres. Both of these parcels seem suitable for the water treatment plant location. Therefore, the whole site is still under consideration as a potential water treatment plant site location at this time (Figure 14).

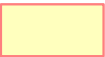

#### Environmental Assessment

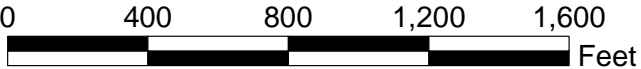
The site was not reduced in size. Descriptions presented above adequately characterize the site.





Candidate Site Map G

-  Candidate Site G
-  Revised Candidate Site G



**Figure 14**  
Site G



#### Hazardous Material Site Screening

The FirstSearch database indicates no listed sites in the area of proposed Site G. Nine non-geocoded sites are listed in the FirstSearch database. Field reconnaissance will be conducted during the Level 3 analysis to evaluate these sites further.

#### Property Ownership

Site G consists of two parcels of equal size totaling approximately 138 acres. Two separate property owners own these two parcels and no structures have been identified on either of them (Table 10).

The just market values for these two parcels according to the Volusia County Property's Appraiser's Office are presented in Table 10.

**Table 11. Site G Property Summary**

<b>Parcel ID Number</b>	<b>Acreage</b>	<b>Owner</b>	<b>Just Market Value</b>	<b>Per Acre Value</b>	<b>Structures</b>
703100000060	67.94	Stewart T.B. & Mary S. Howarth	\$402,000	\$5,917	No
703100000110	69.99	Hicks, John H. & Virginia Et Al.	\$223,872	\$3,199	No

#### Concentrate Management

*Deep Well Injection* – Site G appears to be located in an area that would meet regulatory and technical (TDS and transmissivity) criteria for injection of concentrate into the Lower Floridan Aquifer. Exploratory wells and testing would be required to confirm this capability.

*Surface Water Discharge* – Site G is located more than 5 miles away from a suitable surface water discharge location. The portion of the river where this discharge would occur is designated as an Outstanding Florida Water. Permitting of concentrate disposal in this area of the river may be more difficult than other areas. The potential for blending concentrate from this site with WWTP or power plant discharges should be explored in the Level 3 analysis.

#### Public Outreach

Through the public outreach process, most of the comments received for this site were positive. One comment identified Lake

Beresford as a protected bird sanctuary and was concerned with potential impacts as a result of a potential water treatment plant. Another issue that arose was a potential conflict with a proposed north/south roadway, the Westside Parkway Project, in the vicinity of this site. If this site should move forward to the Level 3 analysis, these issues will be further reviewed with the appropriate agencies. Appendix D provides a summary of the comments received at the public workshop held on June 25, 2003.

### Site H

#### General Site Description

Site H is approximately 272 acres in size and is generally located between SR 44 and the northwest portion of Lake Beresford. Site H is primarily managed as improved pasture, except for the southwest quadrant where upland and wetland forest tracts are present. The improved pasture has been modified through drainage ditches which discharge into a series of herbaceous wetlands scattered throughout the site. The northwestern quadrant is predominantly pine flatwoods that have been selectively logged over the years, interspersed with two herbaceous wetland pockets and a forested wetland strand connected to the St. Johns River floodplain.

The site is underlain primarily by Myakka fine sand and Immokalee fine sand which are both soils typically occurring in a nearly level terrain characteristic of flatwoods communities. The water table is within a foot of the surface during the growing season throughout these areas, but the soil is not listed as a hydric soil type.

The majority of Site H is outside of the 100-year floodplain. Approximately 3 acres are within the 100-year floodplain.

This site has 258 acres potentially supporting 1 to 2 focal species, 12 acres potentially supporting 5 to 6 focal species, and less than 1 acre potentially supporting more than 7 focal species. There may be limited opportunity for nesting and roosting by wetland-dependent wading birds due to the proximity of the riverine floodplain.

Adjacent land use/land cover includes residential, improved pasture and mixed upland forest cover.

#### Site Boundary Refinement

The site boundary was refined to include six parcels, approximately 120 acres in size, within a row along the eastern boundary of the original site (Figure 15). These parcels were selected because they have previously been disturbed and cleared and have no wetlands or structures associated with them.

#### Environmental Assessment

Potential impacts to upland scrub were eliminated during site refinement. The refined site is improved pasture with scattered marsh wetlands that have been drained. These wetland features are of low quality. The site provides foraging habitat for sandhill cranes; however, nesting habitat is marginal due to the extensive drainage on site.

#### Hazardous Material Site Screening

The FirstSearch database indicates no listed sites in the area of proposed Site H. Eight non-geocoded sites are listed in the FirstSearch database. Field reconnaissance will be conducted during the Level 3 analysis to evaluate these sites further.

#### Property Ownership

The refined Site H boundary includes six parcels which combined contains approximately 120 acres. Four different property owners own these six parcels and no structures have been identified on any of them. The just market values for these parcels according to the Volusia County Property Appraiser's Office are presented in Table 11.

**Table 12. Site H Property Summary**

<b>Parcel ID Number</b>	<b>Acreage</b>	<b>Owner</b>	<b>Just Market Value</b>	<b>Per Acre Value</b>	<b>Structures</b>
792300000043	30.62	Stoll, Lester I	\$83,250	\$2,719	No
792300000045	9.99	Stoll, Lester I	\$38,038	\$3,808	No
792300000046	20.12	Gray, George Dennis	\$50,050	\$2,488	No
792300000047	12.59	Weldon, Bill R & Shinda	\$47,766	\$3,794	No
792300000041	38.09	Ainsworth, Willard D	\$100,000	\$2,625	No
792300000070	8.93	Ridenour, John D	\$20,850	\$2,335	No





Candidate Site Map H

- Candidate Site H
- Revised Candidate Site H

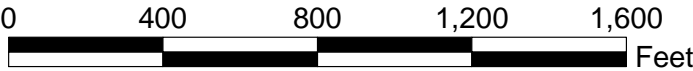


Figure 15  
Site H



### Concentrate Management

*Deep Well Injection* – Site H appears to be located in an area that would meet regulatory and technical (TDS and transmissivity) criteria for injection of concentrate into the Lower Floridan Aquifer. Exploratory wells and testing would be required to confirm this capability.

*Surface Water Discharge* – Site H is located more than two miles away from a suitable surface water discharge location. The portion of the river where this discharge would occur is designated as an Outstanding Florida Water. Permitting of concentrate disposal in this area of the river may be more difficult than other areas. The potential for blending concentrate from this site with WWTP or power plant discharges should be explored in the Level 3 analysis.

### Public Outreach

Through the public outreach process, several comments were received for Site H. Several comments were concerned with the residential development in the area. Other comments were supportive of this site. One comment was concerned with the potential for migratory birds and sandhill cranes that may utilize this area for roosting and nesting. If this site should move forward to the Level 3 analysis, these issues will be evaluated further with the appropriate agencies. Appendix D provides a summary of the comments received at the public workshop held on June 25, 2003.

## Site I

### General Site Description

Site I is approximately 648 acres in size and is generally located at the southwest corner of the CR 44 bridge on the St. Johns River. Site I is primarily a mosaic of forested floodplain (north) and isolated wetlands interspersed within improved pasture (south). The forested floodplain in the northern half of the tract remains intact and connected to the riparian fringe of the St. Johns River, while the improved pasture has modified the drainages formerly connecting the herbaceous wetlands of the southern half of the tract.

Correspondingly, the northern half is underlain by hydric soil types (Anclote fine sand, Montverde muck, Pelham sand and Placid/Myakka sands) while the southern half is underlain by soil generally associated with former mesic flatwoods (Immokalee

sand). Adjacent land use/land cover includes a diversity of wetland community types, sand pine forest and improved pasture.

The majority of Site I is located outside of the 100-year floodplain. The remainder of the site is located within the 100-year floodplain.

This site has 244 acres potentially supporting 1 to 2 focal species, 246 acres potentially supporting 3 to 4 focal species, 24 acres potentially supporting 5 to 6 acres, and 126 acres potentially supporting more than 7 focal species. The mixed hardwood and bottomland floodplain wetlands offer suitable habitat for listed wetland-dependent species.

### Site Boundary Refinement

The Site I boundary was refined to include one parcel, 60 acres in size, in the southwest corner of the original site. This parcel is outside of the forested wetlands of the northern portion of the site and has previously been disturbed.

### Environmental Assessment

This site was significantly reduced in size, effectively minimizing potential wetland and upland habitat impacts. The site can be characterized as improved pasture. A dense network of shallow drainage swales effectively reduce ponding of water on site during periods of heavy rainfall. The site provides habitat for foraging sandhill cranes; however, no nesting sites (marsh wetlands) are present.

### Hazardous Material Site Screening

The FirstSearch database indicates one UST/AST site in the area of proposed Site I. The UST/AST site is the Pier 44 Marina, which operates two aboveground fuel tanks. Ten non-geocoded sites are listed in the FirstSearch database.

The listed site is not expected to be a concern for a proposed WTP at Site I. Field reconnaissance will be conducted during the Level 3 analysis to evaluate these sites further.

### Property Ownership

The refined Site I boundary includes one parcel (Parcel No 22-17-29-000400000200). This parcel is 60 acres and no structures have been identified on it. The just market value for this parcel

according to the Lake County Property Appraiser's Office is presented in Table 12.

**Table 13. Site I Property Summary**

Parcel ID Number	Acreage	Owner	Just Market Value	Per Acre Value	Structures
22-17-29-000400000200	60	Lenholt Farms, Inc	\$75,000	\$1,250	No

Concentrate Management

*Deep Well Injection* – Site I appears to be located in an area that would meet regulatory and technical (TDS and transmissivity) criteria for injection of concentrate into the Lower Floridan Aquifer. Exploratory wells and testing would be required to confirm this capability.

*Surface Water Discharge* – Site I is located more than two miles away from a suitable surface water discharge location. The portion of the river where this discharge would occur is designated as an Outstanding Florida Water. Permitting of concentrate disposal in this area of the river may be more difficult than other areas. The potential for blending concentrate from this site with WWTP or power plant discharges should be explored in the Level 3 analysis.

Public Outreach

Through the public outreach process, several comments were received. These comments were positive toward the selection of this site as a potential water treatment plant. Appendix D provides a summary of the comments received at the public workshop held on June 25, 2003.

**Site J**

General Site Description

Site J is approximately 188 acres in size and is generally located northwest of the intersection of CR 44 and CR 15. Site J is dominated throughout by upland forested and shrub cover, much of which was former groveland that has been abandoned in recent years.

Deland fine sand extends throughout most of the site and is a well-drained soil with a water table below seventy-two inches from the surface. Adjacent land use/land cover includes residential, commercial and groveland (active and abandoned).

The entire Site J is outside of the 100-year floodplain.

A total of 48 acres of Site J potentially supports 1 to 2 focal species, with 134 acres potentially supporting 3 to 4 focal species, and just under 7 acres potentially supporting 5 to 6 focal species. Due to the abandoned nature of the groveland within this tract, there is an opportunity for the occurrence of listed species such as the indigo snake, gopher tortoise, gopher frog and other listed species associated with tortoise burrows.

Mixed light residential development and agricultural activity comprise the land use/land cover surrounding the site.

### Site Boundary Refinement

Site J includes 21 parcels. The northeastern portion of the property included several smaller parcels with multiple property owners. To minimize the number of parcels and property owners involved, the site boundary was refined to include three large contiguous parcels totaling 162.2 acres (Figure 16).

### Environmental Assessment

The refined site eliminated some areas of planted pine. The refined site remains dominated by planted pine and open water wetlands as described above. Wildlife utilization as described above also remains for the refined site.

### Hazardous Material Site Screening

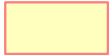

The FirstSearch database lists 30 sites in the area of proposed Site J, including one NPL, nine RCRA generators, one state site, six LUST sites, and 13 UST/AST sites. Most of the listed sites are generally located to the southeast of the proposed Site J boundary. The NPL site is listed as the Plymouth Avenue landfill, located approximately 0.8 miles west of the proposed Site J boundary. The site was used as an open dump from the early 1940's to 1971.

Since 1971, the site has been a sanitary landfill under the ownership of Volusia County. Groundwater contamination due to past landfill practices has been reported at the landfill. This NPL site should not be a concern for Site J due to the distance from Site J, and its location between Site J and the river, indicating groundwater would likely be flowing toward the river.





Candidate Site Map I

-  Candidate Site I
-  Revised Candidate Site I



0 400 800 1,200 1,600 2,000  
Feet

**Figure 16**  
Site I



The listed RCRA GEN sites are all small quantity generators with no reported violations. Of the six LUST sites listed, five are located to the south or southeast of the proposed Site J boundary. One LUST site is located on the east side of the proposed Site J boundary. The listed UST/AST sites are also located south or southeast of the proposed Site J boundary.

Despite their proximity to the proposed Site J boundary, the listed sites are not expected to be a concern for a proposed WTP. Field reconnaissance will be conducted during the Level 3 analysis to evaluate these sites further.

#### Property Ownership

The refined Site J boundary includes three large contiguous parcels totaling 162.2 acres. A separate property owner owns each of these parcels and no structures have been identified on any of these parcels. These parcels consist primarily of disturbed upland areas and agricultural land. The just market values for these parcels according to the Volusia County Property Appraiser are presented in Table 13.

**Table 14. Site J Property Summary**

<b>Parcel ID Number</b>	<b>Acreage</b>	<b>Owner</b>	<b>Just Market Value</b>	<b>Per Acre Value</b>	<b>Structures</b>
700700000460	29.39	Wood, Graciela & Richard H.	\$120,000	\$4.083	No
700700000480	35.13	Adams Drake Matthew Trustee	\$234,000	\$6,661	No
700700000040	97.7	Bosco, Harry & Judith	\$635,050	\$6,500	No

#### Concentrate Management

*Deep Well Injection* – Site J appears to be located in an area that would meet regulatory and technical (TDS and transmissivity) criteria for injection of concentrate into the Lower Floridan Aquifer. Exploratory wells and testing would be required to confirm this capability.

*Surface Water Discharge* – Site J is located more than 5 miles away from a suitable surface water discharge location. The portion of the river where this discharge would occur is designated as an

Outstanding Florida Water. Permitting of concentrate disposal in this area of the river may be more difficult than other areas. The potential for blending concentrate from this site with WWTP or power plant discharges should be explored in the Level 3 analysis.

### Public Outreach

Through the public outreach process, many public comments were received opposing this site as a potential water treatment plant site. The opposition primarily came from property owners located near the project who are concerned with impacts to their neighborhood and property values. Other comments supported this site as a potential water treatment plant site. Appendix D provides a summary of the comments received at the public workshop held on June 25, 2003.

## Site K

### General Site Description

Site K is over 2,600 acres in size and is generally located in northwestern Seminole County. Site K is dominated almost exclusively by an extensive mixed hardwood forested wetland that also contains pockets of herbaceous and shrub wetland cover. These wetlands are all hydrologically connected to the St. Johns River. The southernmost portion of this site contains a mixed land use/land cover made up of wetland pockets, upland forest and former groveland.

This southern portion is underlain by Astatula fine sand which is excessively drained and has a water table more than eighty inches below the surface. Throughout the wetland extent of this site hydric soils (Brighton, Istokpoga, and Okeechobee; Felda fine sand; Iberia clay loam overflow; and unclassified Swamp soil) with high water tables dominate.

More than half of the site potentially supports more than 7 focal species and over 800 additional acres potentially support 3 to 4 focal species. The Wekiva River State Preserve extends along the western border of this tract, and therefore the likelihood exists for the occurrence of wetland-dependent listed species throughout this portion and extending over to the riverine stretch along the St. Johns River.

Adjacent land use is a mosaic of wetland community types along with light residential and mixed upland forest.



### Site Boundary Refinement

To minimize any potential impacts to wetlands on this site, the site boundary was refined to include a 40-acre upland area located near the southeast boundary of the original site (Figure 17).

### Environmental Assessment

The refined site represents a large reduction in area, and the elimination of extensive wetlands on the original footprint. The refined site is composed of mixed hardwood swamp adjacent to clear-cut sand pine forest. The swamp supports a dense shrub layer of saw palmetto, holly, and a canopy including bay, pine, and oak. Uplands consist of clear-cut sand pine forest. Upland soils are suitable for the support of gopher tortoise although none were observed during field reviews. Black bear have been observed on site and utilize the forested wetlands for foraging.

### Hazardous Material Site Screening

The FirstSearch database lists three sites in the area of proposed Site K, including one ERNS, one LUST, and one UST/AST. The ERNS site is identified as Baughn Green House. A fire was reported with a release of unidentified chemicals in 2000. The site is located in the FirstSearch database just south of the proposed Site K boundary. The LUST site is identified as Seminole County NW Regional Wastewater Treatment Plant, and it is located in the southeast area of the proposed Site K boundary. The UST/AST site is David E. Rowland farms, located on the east side of Site K. The farm has two aboveground tanks storing gasoline and diesel.

The listed sites are not expected to be a concern for the proposed WTP Site K. Field reconnaissance would confirm if sites of potential concern during the Level 3 Analysis.

### Property Ownership

Site K is owned by Seminole County and is adjacent to the County's wastewater treatment facility. Because this property is already owned by Seminole County, there is no cost associated with land acquisition.





Candidate Site Map J

- Candidate Site J
- Revised Candidate Site J



0 400 800 1,200 1,600 Feet

Figure 17  
Site J



### Concentrate Management

*Deep Well Injection* – Site K appears to be located in an area that would meet regulatory and technical (TDS and transmissivity) criteria for injection of concentrate into the Lower Floridan Aquifer. Exploratory wells and testing would be required to confirm this capability.

*Surface Water Discharge* – Site K is located immediately adjacent to a suitable surface water discharge location. The potential for blending concentrate from this site with WWTP or power plant discharges should be explored in the Level 3 analysis.

### Public Outreach

Through the public outreach process, several comments were received regarding Site K as a potential water treatment plant location. There were several positive comments in support of this site being selected as a potential water treatment plant location. Several comments noted the wetlands between the proposed site and the river and expressed concerns regarding impacts. Appendix D provides a summary of the comments received at the public workshop held on June 25, 2003.

Discussions regarding this site have been initiated with Seminole County and their staff is providing information for further evaluation.

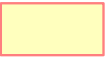
## **RIVER INTAKE LOCATIONS AND PIPELINE CORRIDORS**

The Level 2 Analysis included initial identification of river intakes and pipeline routes from each of the water treatment sites to a river intake and then from each of the water treatment plant sites to the demand center. Through this evaluation eight potential intake locations were identified along the St. Johns River between the southern end of Lake Monroe and DeLand. A brief description of each intake location is provided below. Figure 18 presents the location of each of these intake locations. In addition, the U.S. Army Corps of Engineers has provided information regarding siting and construction of intake structures on the St. Johns River (See Appendix E).





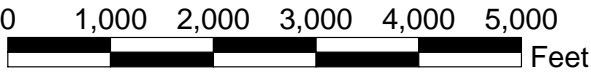
Candidate Site Map K



Candidate Site K



Revised Candidate Site K



**Figure 18**  
Site K



### Intake Site 1

Site 1 is located at the southwest quadrant of the SR 415 crossing of the St. Johns River. Currently this upland site is developed with a riverside restaurant and associated parking. Relocation of the restaurant and parking would be required to develop this site with an intake structure.

### Intake Site 2

Site 2 is located coincident with high voltage power lines that cross the St. Johns River south of Konomac Lake. These power lines extend to the south through Seminole County property and abut candidate Site K. Wetlands are abundant, supporting marsh and scrub shrub communities. Common species include bald cypress, cattail, southern bayberry, saltbush, common reed, and maidencane. These wetlands appear to be an artifact of clearing of forested wetlands under the power lines. Other constraints at this site include the power lines themselves as well as buried gas pipelines.

### Intake Site 3

Site 3 is located on the north side of the St. Johns River just south of Konomac Lake. Herbaceous wetlands dominate the water's edge and extend landward approximately 100 feet. Dominant species include common reed and red maple. Uplands landward of the wetland include live oak hammock. Land use within the uplands appears to be associated with a nearby trailer park and may be used to discard old trailers. Additional field reconnaissance during the Level 3 Analysis at this location is warranted.

### Intake Site 4

Site 4 is located on the St. Johns River just west of Konomac Lake and coincident with treatment plant Site D. The shoreline is comprised of a narrow sandy beach supporting a variety of prostrate herbs which quickly transitions to a bluff and uplands. The bluff is roughly 10 feet in height. Uplands on site are comprised of cleared pasture dotted with scrub live oak and laurel oak near the water's edge. Impacts to wetlands at this location would be minor and land use (pasture) would also present minor impacts related to construction.

### Intake Site 5

Site 5 is located northwest of the northwest corner of Konomac Lake on the eastern shore of the St. John's River. A small private boat docking facility is located just downstream of the intake location. Shrub and marsh wetland dominate the shoreline, extending back approximately 150 feet. Dominant species include common reed, saltbush, southern bayberry, Carolina willow, and red maple. Spatter-dock, a floating aquatic plant, is common along the waters edge. Oak-dominated uplands lie landward of the wetland and intake location. Impacts associated with this site include wetland marsh, scrub shrub and upland forest.

### Intake Site 6

Site 6 is located just west of treatment plant Site G and the railroad on the eastern shore of Lake Bearsford. The site is comprised of hardwood forest wetland extending landward approximately 250 feet. Dominant species include Carolina willow, red maple, elm, buttonbush and bald cypress. Herbaceous cover extends into the water and includes smartweed and pennywort. Impacts associated with this site include forested wetland impacts and crossing of the railroad.

### Intake Site 7

Site 7 is located on the northwest quadrant of the SR 44 crossing of the St. Johns River. This upland site is densely wooded and dominated by a forest of live and laurel oak.

### Intake Site 8

Site 8 is located approximately one mile south of SR 44 on the west bank of the St. John's River. This upland site consists of planted upland grasses, potentially used for cattle grazing, and is dotted by large live oak trees.

### Pipeline Corridors

Pipeline corridors between the water treatment plant sites and the intake locations and demand centers were determined through the use of GIS. These routes are presented in Figure19. Table 14

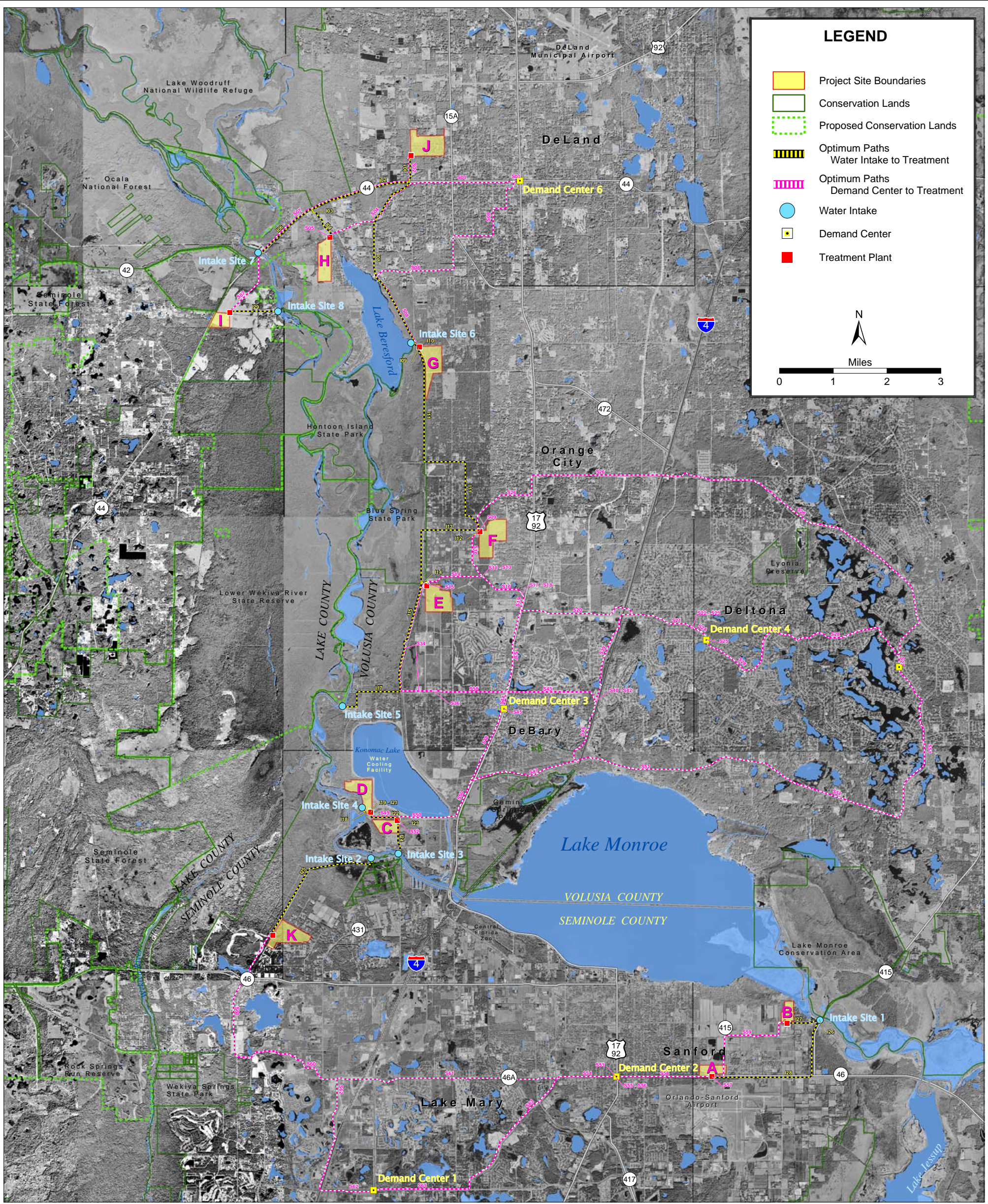


presents the pipeline route combinations considered as a part of this analysis along with a total pipeline length for the raw water transmission mains from the river intakes to the water treatment plant sites. Table 15 presents a total pipeline length for the finished water transmission lines from the water treatment plant site to a demand center.

**Table 15. Raw Water Transmission Lines**

<b>Water Treatment Plant Site</b>	<b>Intake Location</b>	<b>Raw Water Transmission Line Length (feet)</b>
A	IN1	15,500
B	IN1	3,300
C	IN3	3,400
C	IN4	4,600
D	IN3	6,800
D	IN4	1,200
E	IN5	19,700
F	IN5	29,800
F	IN6	24,200
G	IN6	1,400
H	IN7	6,700
I	IN7	6,900
I	IN8	4,700
J	IN6	19,300
J	IN7	20,200
K	IN2	15,200





**Figure 19**  
Level 2 Raw Water Intake and Pipeline Corridor Locations



Table 16. Finished Water Transmission Lines

Water Treatment Plant Site	Intake Location	Finished Water Transmission Line Length (feet)
A	1	40,000
A	2	9,500
B	2	22,000
C	5	74,500
D	3	21,500
D	4	20,200
D	5	77,200
E	3	24,800
E	4	32,800
E	5	60,000
F	3	22,300
F	4	32,400
F	5	60,500
G	6	32,000
H	6	21,600
I	6	35,300
J	6	13,900
K	1	42,800
K	2	53,600

## SITE RANKING

At the conclusion of the Level 2 Analysis the sites were each scored based on the siting criteria presented above. The scoring was from 1 to 5 with “5” indicating an optimal or more desirable condition in terms of the selection criterion for the site and a score of “1” indicating the least optimal condition for that criterion.

Weighting factors were developed for each of the criterion to indicate the relative importance of each criterion as compared to another criterion. For each site, the raw score for each criterion was multiplied by the corresponding weighting factor. The resultants were then summed to create a total weighted score for each site as presented in Table 16. The weighted totals were used to rank the sites as they compared to one another. The five sites with the highest weighted scores are those being carried forward to the

Table 17. Site Rating

Criteria	Weighting Factors	Site A	Site B	Site C	Site D	Site E	Site F	Site G	Site H	Site I	Site J	Site K
Site Size and Configuration	2.33	4	4	4	2	5	5	5	5	5	5	5
Land Use	7.00	4	4	4	3	4	4	4	5	5	4	4
Impacts to Wetlands and Floodplains	8.33	2	4	2	3	5	5	5	3	4	4	5
Presence of Hazardous Materials	1.00	3	3	3	4	3	3	4	4	4	3	4
Environmental Habitat/Endangered Species	9.33	3	4	4	3	4	3	3	4	4	4	4
Location in Relation to Demand Centers	3.67	4	3	3	3	3	3	2	3	2	4	2
Location in Relation to Raw Water Intakes	4.67	3	4	4	5	3	2	5	4	4	3	3
Concentrate Management Options	6.67	4	4	3	3	2	2	3	2	2	2	3
Land Ownership	0.33	5	4	5	3	5	4	5	4	5	4	5
Public Acceptance	8.67	4	4	2	2	3	4	5	3	3	2	5
Cost	5.33	4	4	4	4	3	2	3	3	3	3	2
Total Score		198	225	184	177	204	193	225	199	204	190	220

- Notes:**
- 1. Weighting Factors were developed by an ad hoc committee comprised of representative from local utilities, regulatory agencies, environmental interest groups and citizens.
  - 2. Raw rankings range from 1 to 5; with 5 being the optimal condition for a site as related to the criteria and 1 being the least optimal condition.
  - 3. The total score is the raw ranking times the weighting factor. The five sites with the highest total scores will be further evaluated in Level 3.

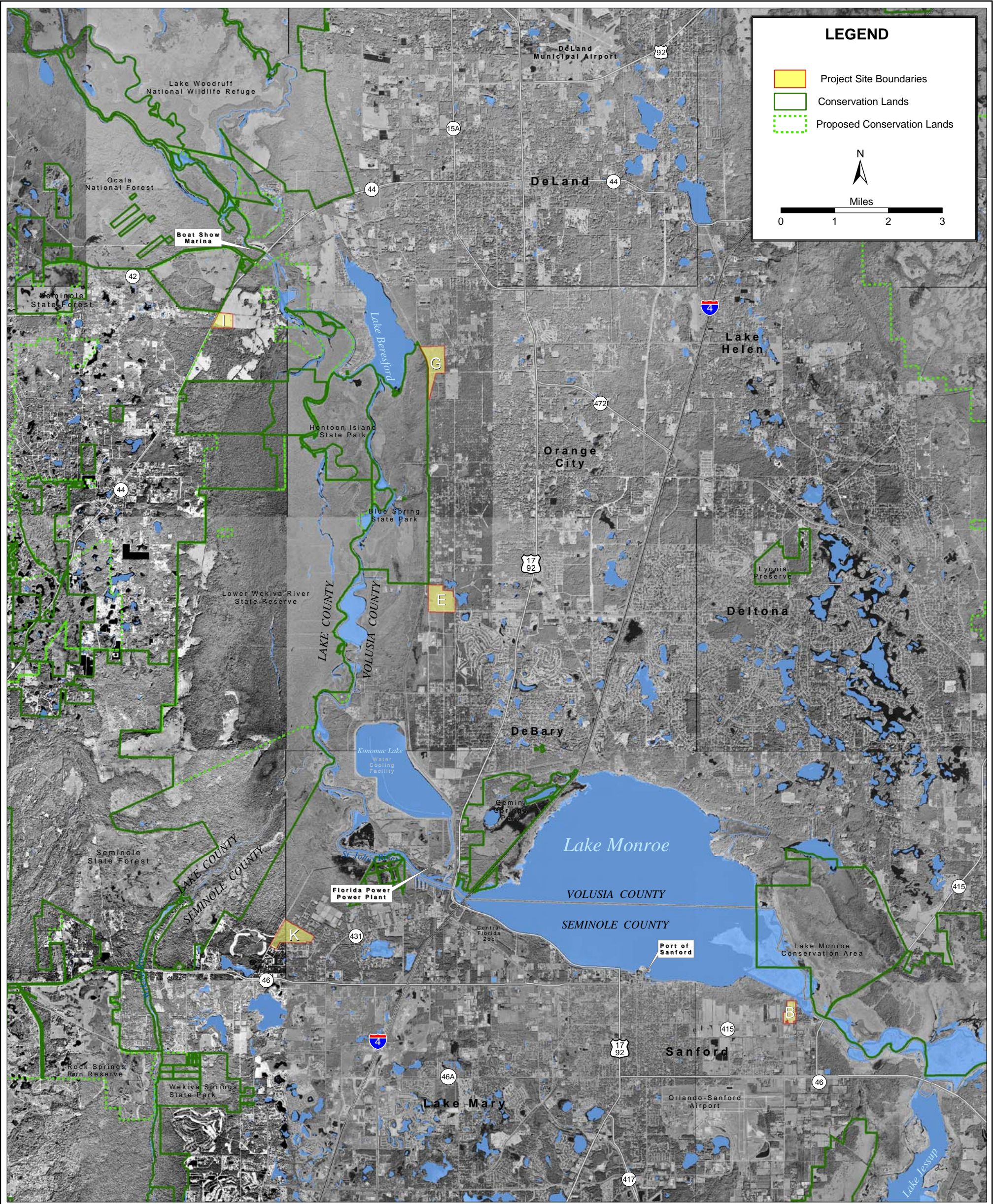


Level 3 Analysis for further evaluation. These five sites are:

- Site B
- Site E
- Site G
- Site I
- Site K

Figure 20 presents these five shortlisted sites.





**Figure 20**  
Level 2 Shortlisted Water Treatment Plant Sites



## DISCUSSION

The five sites shortlisted for further evaluation in the Level 3 Analysis include:

- Site B
- Site E
- Site G
- Site I
- Site K

Further analysis to be conducted on these sites through the Level 3 Analysis includes on-site inspections of habitat type, quality and wildlife utilization, clarification of land use issues, the development of detailed capital cost estimates for a water treatment plant, refinement of the raw water pipeline route from the river intake, and refinement of the finished water pipeline route to the demand center(s). In addition, the opportunity for future expansion of each site will also be evaluated.

At the completion of the Level 3 Analysis, three sites will be recommended as the preferred sites for a surface water treatment plant.

**APPENDIX A**  
**PUBLIC MEETING, NOVEMBER 8, 2002,**  
**FACILITATORS' SUMMARY**



**St. Johns River Water Management District**  
**St. Johns River Water Supply Project – Surface Water Treatment**  
**Plant Siting Study**  
**Public Meeting**  
**November 8, 2002**  
**Facilitators' Summary**

***Introduction***

The first public meeting on the St. Johns River Water Supply Project's Surface Water Treatment Plant Siting Study was held Friday, November 8, 2002 at City Hall in Sanford. The meeting began with an informal review of maps and displays on the project, followed by a presentation from Ed Copeland of HDR, the consulting firm responsible for the siting study.

Meeting notices were mailed to a list of about 500 persons in Lake, Seminole and Volusia counties thought to have an interest in the siting study. Approximately 42 individuals attended the meeting including District staff and its representatives.

***Audience Participation***

Following the presentation, participants were divided into four small groups and asked to share their views and ideas in response to the following questions:

1. Based on what you heard during the presentation, is there anything the project team is overlooking as a siting issue or opportunity?
2. Which of the siting criteria do you consider most important? Which do you consider least important?
3. The presentation may be repeated for other groups. What did you like about it? How do you think it could be improved? What information needs do you or others have in regard to the proposed water treatment plant?

**Additional Siting Issues and Opportunities**

**Group 1**

- Integrate the siting study with aquifer storage and transmission
- Consider different uses of water other than potable
- Treat water to improve groundwater conditions for other potable uses at other locations

- Consider the siting preferences of the group or entity that might own and/or operate the facility
- Consider raw water quality
- Consider the location of existing interconnects

#### Group 2

- Consider the possibility of multiple plants
- Consider siting for other than potable use
- Consider funding sources
- Consider utility acceptance as well as public acceptance
- Look at access to major roadways for operation

#### Group 3

- Consider co-location of future facilities
- Consider socio-political aspects, i.e., who's in charge
- Map DRI's and comprehensive plan amendments
- Consider raw water quality

#### Group 4

- Consider the feasibility and cost of St. Johns River water versus desalination before conducting a siting study for the St. Johns River water treatment plant
- Integrate ASR with the siting study
- Consider the distance to the power supply
- Consider how the withdrawal will affect river flow, the speed of the current, and incidence of reverse flow
- Evaluate the impact of the total cumulative withdrawal contemplated
- Identify demand centers before focusing the siting study on Volusia and Seminole counties
- Consider the overall efficiency of the sites
- Be aware of the overlap among the criteria

### **Most Important Siting Criteria**

#### Group 1

- User interest
- Broader end use of water with a broader range of treatment requirements
- Integration of the ASR component on site
- Funding
- Proximity to demand centers
- Concentrate management
- Environmental factors
- Cost
- Public Acceptance



#### Group 2

- Public acceptance
- Cost
- Environmental factors
- Proximity to demand centers
- Access to major roadways for operation

#### Group 3

- Proximity to demand centers
- Concentrate management
- Cost
- Environmental factors

#### Group 4

- Environmental factors (because they also affect cost and public acceptance)
- ASR feasibility
- Raw water quality
- Cost/efficiency

### **Least Important Siting Criteria**

#### Group 1

- Assumption that one size fits all – not all uses of water require treatment to potable standards
- Site size/configuration
- Land use
- Land ownership

#### Group 2

- Land ownership
- Habitat and endangered species (based on the likelihood of being able to avoid impacting such resources with a 50-acre site)

#### Group 3

- Public acceptance
- Hazardous materials
- Floodplains

#### Group 4

- Cost
- Hazardous materials (may not be a distinguishing factor unless the site is an old industrial site, such as an old power plant site)

## **What Participants Liked about the Presentation/Meeting**

### **Group 1**

- The location

### **Group 2**

- Length of presentation

### **Group 4**

- Having people available who could answers participants' questions
- Maps and the half hour ahead of the presentation to look at them, gather and talk

## **Suggested Improvements in the Presentation/Meeting**

### **Group 1**

- Provide an opportunity for written comments/input

### **Group 2**

- Gear the presentation to the audience, especially lay people
- Provide a broader range of history and technical information
- Omit the 5-site analysis and narrow from 10 sites to 3
- Avoid Fridays and daytime hours

### **Group 3**

- Provide background information on
  - Demand/use
  - Alternatives
  - Policies
  - Minimum flows and levels (MFLs)
  - Options not being considered

### **Group 4**

- Talk about the other pieces of the puzzle, e.g., ASR, MFLs, other alternative sources
- Use available literature and handouts
- Show where you are in the study process
- Provide a summary handout



**APPENDIX B**  
**AD HOC COMMITTEE MEETING NOTICE**



# St. Johns River Water Management District

Kirby B. Green III, Executive Director • John R. Wehle, Assistant Executive Director

Post Office Box 1429 • Palatka, FL 32178-1429 • (386) 329-4500

May 29, 2003

Name

Address

City, State Zip

**RE: St. Johns River Water Supply Project  
Surface Water Treatment Plant Siting Study  
Ad Hoc Committee Meeting**

Dear :

The purpose of this letter is to invite you or your designated representative to participate in an ad hoc committee which will assist the St. Johns River Water Management District in evaluating sites for a potential surface water treatment plant along the St. Johns River. The committee will meet:

**Friday, June 13, 2003  
8:30 to 11:30 am  
City of Sanford Council Chambers  
300 N. Park Avenue  
Sanford, Florida**

As you may be aware, the St. Johns River Water Management District (District) adopted the District Water Supply Plan in April 2000 which is designed to address current and future water demands, traditional and alternative water sources, and water supply infrastructure improvements required to meet the water supply needs within the District's jurisdiction through 2020. One project that was identified as a part of this plan was the St. Johns River Water Supply Project that involved developing the St. Johns River in the area near Lake Monroe as a source of water for use in Seminole and Volusia counties. A fact sheet that describes the overall project and the ongoing studies associated with the project is enclosed.

One study being conducted as a part of the St. Johns River Water Supply Project is the Surface Water Treatment Plant Siting Study. This study involves siting a potential surface water treatment facility on a reach of the St. Johns River between the southern end of Lake Monroe and DeLand, Florida. Through the initial phase of this siting analysis, twelve potential areas were identified for a surface water treatment facility. These areas are currently undergoing more detailed analysis to refine the list to five shortlisted sites. To refine this list of potential sites, siting criteria will be developed to evaluate the sites. Each of these criteria will be assigned a weighting factor to account for the differences in the relative importance of the siting criteria.

---

**GOVERNING BOARD**

Duane Ottenstroer, CHAIRMAN  
JACKSONVILLE

Ometrias D. Long, VICE CHAIRMAN  
APOPKA

R. Clay Albright, SECRETARY  
EAST LAKE WEIR

David G. Graham, TREASURER  
JACKSONVILLE

W. Michael Branch  
FERNANDINA BEACH

Jeff K. Jennings  
MAITLAND

William Kerr  
MELBOURNE BEACH

Ann T. Moore  
BUNNELL

Catherine A. Walker  
ALTAMONTE SPRINGS



To assist in the development of these weighting factors, the District is forming an ad hoc committee in which you are being invited to participate. The ad hoc committee meeting will consist of a half-day session focused on the water treatment plant siting study. An agenda for the meeting is attached along with a description of the siting criteria to be evaluated and the process that will be utilized to develop these weighting factors.

A list of those people invited to participate in this ad hoc committee is provided below.

Name	Organization
Paul Moore	City of Sanford
Keith Riger	City of DeLand
Bob Adolphe	Seminole County
Gloria Marwick	Volusia County
Catherine Johnson	Army Corps of Engineers
Anne Keller	Environmental Protection Agency
Christianne Ferraro	Department of Environmental Protection
Ken John	St. Johns River Water Management District
Charles Lee	Florida Audubon Society
Nancy Prine	Friends of the Wekiva River
Janice Botsco	Sierra Club
Elizabeth Layton	Citizen

The District would greatly appreciate your participation in this ad hoc committee and your input in the site selection process. Please call or email Ed Copeland with HDR Engineering at (813) 282-2463 or at [ed.copeland@hdrinc.com](mailto:ed.copeland@hdrinc.com) if you have any questions regarding your role in this process and to confirm your participation in the ad hoc committee.

Sincerely,



Alfred Canepa  
Assistant Director  
Department of Resource Management

#### Attachments

cc: Bill Marcous – City of Sanford  
Pat Harden - Friends of the Wekiva River  
Jerry Salsano – Taurant Consulting

#### GOVERNING BOARD

Duane Offenstroer, CHAIRMAN JACKSONVILLE	Ometrias D. Long, VICE CHAIRMAN APOPKA	R. Clay Albright, SECRETARY EAST LAKE WEIR	David G. Graham, TREASURER JACKSONVILLE
W. Michael Branch FERNANDINA BEACH	Jeff K. Jennings MAITLAND	William Kerr MELBOURNE BEACH	Ann T. Moore BUNNELL
			Catherine A. Walker ALTAMONTE SPRINGS



# St. Johns River Water Management District

Kirby B. Green III, Executive Director • John R. Wehle, Assistant Executive Director

Post Office Box 1429 • Palatka, FL 32178-1429 • (386) 329-4500

## ST. JOHNS RIVER WATER SUPPLY PROJECT SURFACE WATER TREATMENT PLANT SITING STUDY

### AD HOC COMMITTEE MEETING JUNE 13, 2003

#### AGENDA

- |                           |   |
|---------------------------|---|
| <b>8:30 – 9:00 a.m.</b>   | Welcome & Introductions<br>Project Overview   |
| <b>9:00 – 9:30 a.m.</b>   | Presentation of Siting Criteria<br>Explanation of Paired Matrix Process   |
| <b>9:30 – 10:30 a.m.</b>  | Small Group Work on Paired Matrix   |
| <b>10:30 – 11:30 a.m.</b> | Discussion of Results with Committee<br>Consensus Building on Weighting Factors<br>Presentation of Final Weighting Factor Results |

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#### GOVERNING BOARD

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Duane Ottenstroer, CHAIRMAN  
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MAITLAND

William Kerr  
MELBOURNE BEACH

Ann T. Moore  
BUNNELL

Catherine A. Walker  
ALTAMONTE SPRINGS



## **Process for Developing Weighting Factors for Site Selection Criteria**

The St. Johns River Water Management District adopted the District Water Supply Plan in April 2000 which is designed to address current and future water demands, traditional and alternative water sources and water supply infrastructure improvements required to meet the water supply needs within the District's jurisdiction through 2020. One project that was identified as a part of this plan was the St. Johns River Water Supply Project that involves developing the St. Johns River in the area near Lake Monroe as a source of water for use in Seminole and Volusia counties.

One study being conducted as a part of the St. Johns River Water Supply Project is the Surface Water Treatment Plant Siting Study. This study involves siting a potential surface water treatment facility on a reach of the St. Johns River between the southern end of Lake Monroe and DeLand, Florida. Through the initial phase of this siting analysis, twelve potential areas were identified for a surface water treatment facility. These areas are currently undergoing more detailed analysis to refine the list to five short listed sites. To refine this list of potential sites, siting criteria will be developed to evaluate the sites. Each of these criteria will be assigned a weighting factor to account for the differences in the relative importance of the siting criteria. An ad hoc committee is being formed to develop these weighting factors. The process that will be used by the committee for the development of these factors is described below.

To begin the process of developing the weighting factors for this project, the project team will provide a brief overview of the siting study and the facilities that will be sited or included as a part of this project. The siting criteria used in the selection/ranking process will be reviewed in detail with committee members to ensure that each participant accurately interprets the criteria definitions. An explanation or definition of each of the criteria that will be utilized for the Surface Water Treatment Facility Siting Study is attached.

The committee members will be separated into small groups to work towards developing the weighting factors. These committee members will be assigned one of the following groups based on their affiliation or interest:

- Utility Representatives
- Regulatory Agency Representatives
- Environmental Interest Groups and Citizens

The weighting factors will be developed using an analytical technique known as pairwise comparison, which is designed to reduce subjectivity in the assignment of criteria weights. The technique involves comparing the criteria two at a time, in a matrix format (see Figure 1). The one-to-one criteria comparison will be conducted for all pairs of the different criteria. So that no criterion receives a zero weight, all criteria will be assigned an initial score of one and all additional selections of that criterion will be added to that initial score. The results will be summed and weights will be calculated by dividing the sums by the total number of comparisons. As a result, the weights are scaled between 0 and 1. The weighting factor developed for each of the selection criteria by the small groups will be averaged with the factors

developed by the other groups to obtain a committee weighting factor for each of the selection criteria. Each group will have one vote in the averaging process. An example worksheet is provided as Figure 1 for your information. A detailed explanation of this worksheet and how it will be utilized will be provided at that ad hoc committee meeting.



## **St. Johns River Water Supply Project Surface Water Treatment Plant Siting Study**

### **Site Selection Criteria**

#### **1) Site Size and Configuration**

The ideal site for the surface water treatment facility would be a 50-acre site with a square configuration. However, some sites may have constraints that will result in a smaller site or irregular configuration, which may affect the ability to develop all of the ancillary facilities such as raw water storage or finished water storage at one location. This could require the acquisition of additional sites for these facilities. These constraints can also affect the cost of the facility.

#### **2) Land Use**

The land use criterion addresses the compatibility of a water treatment plant with the existing and future land use for the site and the land use for the areas surrounding the site. For the purpose of this evaluation, areas with open land or pastureland were preferred for this facility. Areas with residential or commercial land use were considered to be significantly constrained.

#### **3) Impact to Wetlands and Floodplains**

This criterion addresses potential impacts to wetlands and FEMA designated 100-year floodplains resulting from construction of a water treatment plant. These impacts would require mitigation through the permitting process. As a part of this initial site screening process, wetlands and floodplains were avoided where possible. However, some portions of the twelve areas identified through the Level 1 analysis have wetlands and floodplain areas that could require mitigation.

#### **4) Presence of Hazardous Materials**

Hazardous materials include a variety of businesses and land uses including gas stations, dry cleaners, chemical supply stores, landfills and areas of known contaminated soils. The presence of hazardous materials will only be viewed as a constraint if they are located on or immediately adjacent to the potential water treatment plant site. Initial data to be used for this review include state and federal lists of known sites. Subsequent assessments will include visual inspection of the sites and testing if necessary.

#### **5) Habitat/Protected Species**

This criterion addresses the presence of protected species on the site and habitat determined to be suitable for the support of protected species, as identified through the Florida Natural Areas Inventory. Level 1 assessment relied on existing data while the more detailed assessments of preferred sites will be surveyed on the ground by environmental scientists.

**6) Location in Relation to Demand Centers**

As a part of a separate study being conducted for the St. Johns River Water Supply Project, demand centers through the year 2020 or areas where a significant water deficit is projected to occur were identified in Seminole and Volusia counties. This criterion addresses the distances and potential pipeline routes required to deliver the treated water from the surface water treatment plant to the identified demand areas.

**7) Location in Relation to Raw Water Intake Locations**

Raw water intake locations along the St. Johns River are being identified as a part of this study. This criterion addresses the length and potential impacts to wetlands, floodplains, landowners, etc. associated with the pipeline required to connect the raw water intake locations to the proposed water treatment plant sites.

**8) Concentrate Management Options**

As with any water treatment process, a concentrate or solids residual will be generated and will require disposal. The St. Johns River Water Management District has conducted a study that addresses the concentrate management options for this project. This criterion will evaluate the suitability of the water treatment plant locations for the various concentrate management options.

**9) Land Ownership**

The purpose of this criterion is to limit the number of parcels or landowners associated with a site to minimize land costs and acquisition efforts. In addition, this criterion addresses the presence of structures and residents on the site. The ideal scenario for this criterion would be a site that consisted of a single parcel owned by one property owner with no structures on the site.

**10) Public Acceptance**

This criterion accounts for public input, i.e. favorable, unfavorable or neutral comments, that will be received at various stages throughout the project. A public workshop will be conducted at the conclusion of each of the three levels of analysis being conducted on the sites.

**11) Cost**

This criterion includes all costs associated with the facility including land acquisition, mitigation costs, raw water pipeline costs, finished water pipeline costs and all design, permitting and construction costs associated with the facility.



Figure 1. Sample Paired Comparison Matrix

	1	2	3	4	5	6	7	8	9	10	11
1 Site Size and Configuration		1 vs. 2	1 vs. 3	1 vs. 4	1 vs. 5	1 vs. 6	1 vs. 7	1 vs. 8	1 vs. 9	1 vs. 10	1 vs. 11
2 Land Use			2 vs. 3	2 vs. 4	2 vs. 5	2 vs. 6	2 vs. 7	2 vs. 8	2 vs. 9	2 vs. 10	2 vs. 11
3 Impacts to Wetlands and Floodplains				3 vs. 4	3 vs. 5	3 vs. 6	3 vs. 7	3 vs. 8	3 vs. 9	3 vs. 10	3 vs. 11
4 Presence of Hazardous Materials					4 vs. 5	4 vs. 6	4 vs. 7	4 vs. 8	4 vs. 9	4 vs. 10	4 vs. 11
5 Environmental Habitat/Endangered Species						5 vs. 6	5 vs. 7	5 vs. 8	5 vs. 9	5 vs. 10	5 vs. 11
6 Location in Relation to Demand Centers							6 vs. 7	6 vs. 8	6 vs. 9	6 vs. 10	6 vs. 11
7 Location in Relation to Raw Water Intake								7 vs. 8	7 vs. 9	7 vs. 10	7 vs. 11
8 Concentrate Management Options									8 vs. 9	8 vs. 10	8 vs. 11
9 Land Ownership										9 vs. 10	9 vs. 11
10 Public Acceptance											10 vs. 11
11 Cost											

How Many Times  
Did You Select:

- 1? \_\_\_\_\_
- 2? \_\_\_\_\_
- 3? \_\_\_\_\_
- 4? \_\_\_\_\_
- 5? \_\_\_\_\_
- 6? \_\_\_\_\_
- 7? \_\_\_\_\_
- 8? \_\_\_\_\_
- 9? \_\_\_\_\_
- 10? \_\_\_\_\_
- 11? \_\_\_\_\_

INSTRUCTIONS: The matrix allows comparison of 11 site selection criteria to each other. In each box of the matrix, circle the number of the criterion that you think is the more important of the two (see example). If you consider the two criteria being compared to be essentially equal, circle both. Once you have completed all of the comparisons, count the number of times you circled each number. Write the score in the blanks on the right side of the matrix.

Example

3

vs. 7



# St. Johns River water supply project

*A component of the east-central Florida water supply initiative*

## **FAST FACTS**

The demand for water in east-central Florida is projected to increase by about 54 percent by 2020.

The St. Johns River has been identified as one of the most favorable and productive alternative sources of water to meet those demands.

This project is being coordinated for the District by Taurant Consulting, Inc., of Longwood. For more information about this project, contact Jerry M. Salsano, project manager, at (407) 884-8800 or e-mail at [jsalsano@cfl.rr.com](mailto:jsalsano@cfl.rr.com).

## **Introduction**

In April 2000, the St. Johns River Water Management District adopted the District Water Supply Plan (DWSP) which is designed to address current and future water demands, traditional and alternative water sources, and water supply infrastructure improvements required to meet the water supply needs within the District's jurisdiction through 2020.

## **The east-central Florida water supply initiative**

The initiative includes a number of projects designed to satisfy the growing needs of east-central Florida while protecting valuable water-dependent natural resources (see map on back).

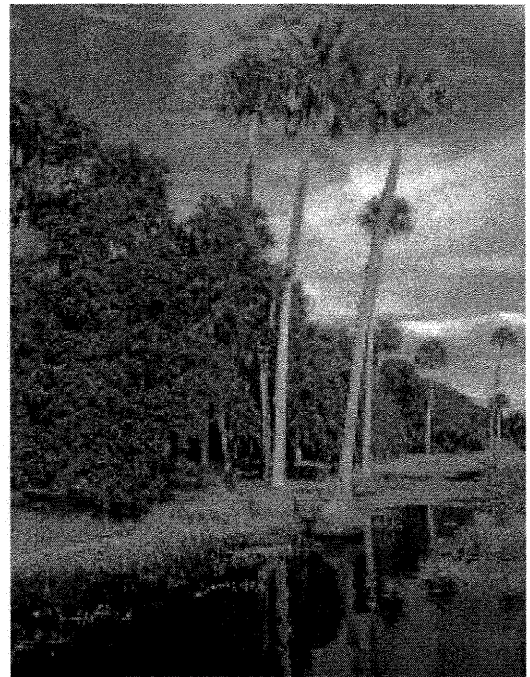
Some of the projects include increased water conservation and reuse, artificial recharge and alternative water supply source development.

Development of alternative water sources, such as surface water and brackish groundwater, will be necessary to supply the increasing demands for water in east-central Florida.

## **Why is the St. Johns River so important?**

It is projected that a significant amount of water from the St. Johns River is available for water supply. This surface water is important because future demands for water from the Floridan aquifer probably cannot be met without harming wetlands, lakes and springs or increasing saltwater intrusion.

To develop this water source, it must first be determined how much can safely be used, how it can be treated to the high standards necessary for public use, where the best locations are to develop treatment facilities, and who may best use the treated water. These investigations are currently under way.



*The St. Johns River has been identified as a potential source of water for east-central Florida.*

## **What are the details?**

Due to strong local interest, the initial investigations are focusing on the river near Lake Monroe as a source of water for use in Seminole and Volusia counties. Because surface water is inherently variable in both quantity and quality, water quality monitoring and treatability studies are required before adequate surface water withdrawal, treatment, and storage systems can be designed.

The investigations include:

### **Water quality and streamflow characteristics**

— St. Johns River water quality and streamflow characteristics are being assessed by the District and the U.S. Geological Survey as part of a federal-state cooperative program. The study area for this project is the area of the St. Johns River from the outlet of Lake Poinsett to De Land, Fla. Four sites on the St. Johns River are being sampled to determine concentrations

*Continued on back*





of a wide variety of constituents. Sampling began in January 2000 and is scheduled to end in September 2002.

**Minimum flows and levels (MFLs)** — MFLs are being developed to ensure that water withdrawals from the St. Johns River will not harm the river, its tributaries and associated wetlands. Establishing MFLs will help determine how much river water is available for other uses, while protecting the upstream and downstream river system.

An MFL environmental advisory group has been established to solicit input and seek consensus from the general public and knowledgeable interested parties.

**Surface water treatment plant siting study** — The purpose of this investigation is to identify the best locations to place surface water treatment facilities. This identification process will evaluate:

- Sites for water intake from the St. Johns River
- Locations for the storage of raw and/or treated water
- Water treatment plant locations
- Suitable locations for management of demineralized concentrate
- Pipeline corridors for moving water

**Surface water treatability and demineralized concentrate management study** — To determine the treatment requirements of the St. Johns River, a pilot-scale water treatment plant will be designed and constructed, and actual testing and treatment of the water will be performed. Throughout this process, scientists will conduct raw and finished water analyses both in the field and in analytical laboratories and engineers will evaluate and select the optimum treatment processes to produce high-quality potable water. They will also develop options and costs for treatment to other standards, such as for reuse system augmentation and for recharge into the aquifer.

A byproduct of the treatment process is a concentrate containing minerals and salts that must be managed in an environmentally safe manner. Options for managing that concentrate will be evaluated as part of this study.

**Demand projection and affordability study** — This study is designed to provide accurate population and appropriate land use projections to determine water demand projections in specific public supply service

areas. Water demand will be projected based upon projections of population, households, utility connections and nonresidential development. An evaluation of the affordability to the end user of the water produced by the surface water plant will be prepared.

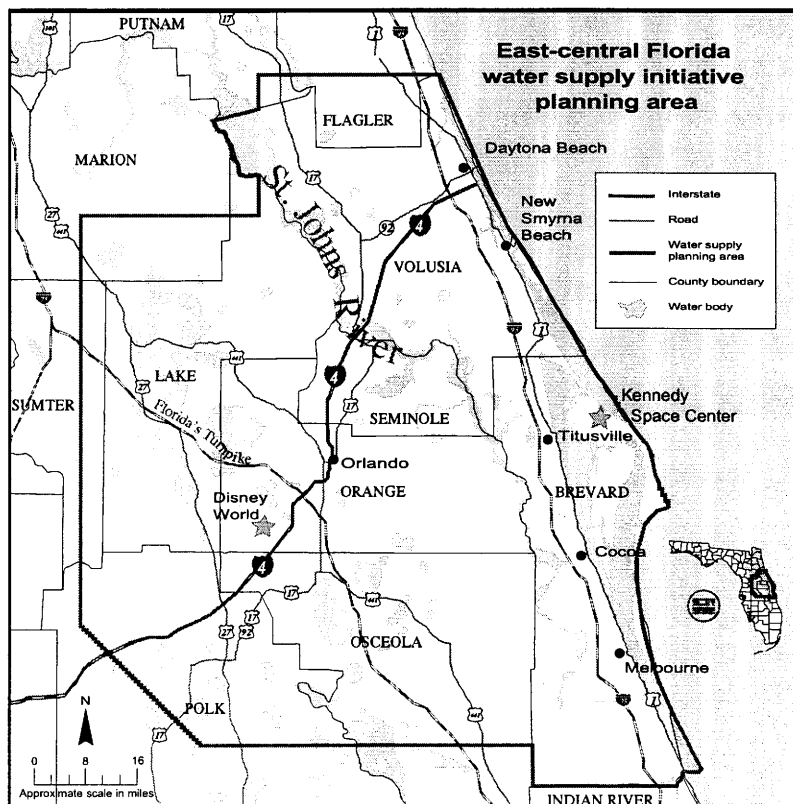
If the St. Johns River is to be developed, a method for storing the water must be established. Aquifer storage recovery is an alternative way of storing water underground in certain locations where the conditions are appropriate. Testing is planned to determine where this technique can best be used.

### ***How long will the project take?***

The project began in 2001 and will take approximately 36 months to complete. The District has estimated a total cost of \$3 million to accomplish all three parts of this project.

### ***Where do we go from here?***

When the studies are completed, enough information will have been obtained for water suppliers in the east-central Florida area to make decisions concerning the development of regional water treatment facilities on the St. Johns River.



**APPENDIX C**  
**AD HOC COMMITTEE MEETING**  
**JUNE 13, 2002, FACILITORS' SUMMARY**



**St. Johns River Water Management District**  
**St. Johns River Water Supply Project – Surface Water Treatment**  
**Plant Siting Study**

**Ad Hoc Committee Meeting**

**June 13, 2002**

**Facilitators' Summary**

***Introduction***

This meeting of the Ad Hoc Committee for the St. Johns River Water Supply Project's Surface Water Treatment Plant Siting Study was held Friday, June 13, 2003 at City Hall in Sanford, Florida. Meeting invitations were mailed to selected representatives of three groups – citizens/environmental interests, regulatory agencies, and utilities. The following individuals attended and participated in an exercise to establish weights for 11 site selection criteria expected to be used in the evaluation of alternative sites. In the Level 2 site analysis, a quantitative evaluation will be performed by HDR to narrow the number of alternative sites from 12 to 5.

<b>Name</b>	<b>Organization</b>
Bill Marcous	City of Sanford
Jim Ailes	City of DeLand
Dennis Westrick/Chuck Drake	Seminole County
Scott Mays	Volusia County
Catherine Johnson	Army Corps of Engineers
Christianne Ferraro	Department of Environmental Protection
Anthony Miller	St. Johns River Water Management District
Nancy Prine	Friends of the Wekiva River
Elizabeth Layton	Citizen

\* Note: Representatives of Audubon Society, Sierra Club and U.S. Environmental Protection Agency were invited but were unable to attend.

The meeting began with a presentation from Ed Copeland of HDR, the consulting firm responsible for the siting study. Mr. Copeland provided a brief overview of the siting study and reviewed in detail the criteria that will be applied in the Level 2 site analysis.

***Development of Weighting Factors***

Following the presentation, participants were divided into three teams, representing citizens/environmental interests, regulatory agencies and utilities. Each team performed a pairwise comparison of the 11 site selection criteria. This methodology is designed to reduce subjectivity in the assignment of criteria weights. The technique involves

comparing the criteria two at a time, in a matrix format. The one-to-one criteria comparison was conducted for all pairs of the different criteria. While the teams performed the pairwise comparisons, members of the consultant team were available to answer questions and provide information about the criteria, the study process, and the alternatives sites. Participants also had access to written descriptions of the criteria. A full package of the information provided to the ad hoc committee is attached.

The pairwise comparison was conducted by each team in two rounds. After the first round, each team shared their results with the other teams and explained why certain criteria were considered more important than others. This process created a common understanding of the criteria and produced greater convergence of views among the three teams in the second round of scoring. At the end of the second round the average score for each criterion was calculated. The teams reviewed the average scores and agreed that the average scores could serve as the criteria weighting factors.

The results of the pairwise comparison process are presented below:

### Round 1 Pairwise Comparison Scores

	Regulatory Agencies	Utilities	Citizens/Environmental Interests
Site Size and Configuration	8	4	4
Land Use	8	5	8
Impact to Wetlands and Floodplains	10	2	10
Presence of Hazardous Materials	1	1	3
Habitat/Protected Species	10	8	10
Location in Relation to Demand Centers	4	4	6
Location in Relation to Raw Water Intake Locations	3	6	7
Concentrate Management Options	1	9	6
Land Ownership	2	0	3
Public Acceptance	7	10	7
Cost	5	7	6



## Round 2 Pairwise Comparison Scores

	Regulatory Agencies	Utilities	Citizens/Environmental Interests
Site Size and Configuration	2	2	3
Land Use	7	6	8
Impact to Wetlands and Floodplains	10	5	10
Presence of Hazardous Materials	0	1	2
Habitat/Protected Species	10	8	10
Location in Relation to Demand Centers	4	3	4
Location in Relation to Raw Water Intake Locations	3	4	7
Concentrate Management Options	6	9	5
Land Ownership	1	0	0
Public Acceptance	8	10	8
Cost	6	7	3

### **Average Scores/Criteria Weighting Factors**

	Average Score Across All Teams	Rank
Habitat/Protected Species	9.33	1
Public Acceptance	8.67	2
Impact to Wetlands and Floodplains	8.33	3
Land Use	7.0	4
Concentrate Management Options	6.67	5
Cost	5.33	6
Location in Relation to Raw Water Intake Locations	4.67	7
Location in Relation to Demand Centers	3.67	8
Site Size and Configuration	2.33	9
Presence of Hazardous Materials	1.0	10
Land Ownership	0.33	11

\*Note: Based on Round 2 results.

### ***Other Issues and Next Steps***

One of the participants pointed out that a more important water supply issue than the site selection for a St. Johns River surface water treatment plant was development of the infrastructure necessary to better match water sources to users based on the users' water quality requirements.

The meeting participants were reminded of the upcoming public meeting, planned for June 25<sup>th</sup> at 5:00 pm in Deland, Florida. Following the public meeting, the project team will perform the Level 2 analysis on the alternative water treatment plant sites, using the criteria and weighting factors identified in this summary, and narrow the number of sites from 12 to 5.



**APPENDIX D**  
**SUMMARY OF SURFACE WATER TREATMENT PLANT**  
**SITING STUDY WORKSHOP OPEN HOUSE**

# **Summary of the St. Johns River Water Supply Project, Surface Water Treatment Plant Siting Study Workshop Open House**

**June 25, 2003**

## **Introduction**

The second of three public meetings for the Surface Water Treatment Plant Siting Study being conducted as a part of the St. Johns River Water Supply Project was held on June 25, 2003 between 5:30 and 7:00 p.m. at the Thomas C. Kelly Administration Center in DeLand, Florida. The purpose of this meeting was to discuss the process utilized as a part of the Level 2 Analysis for the siting study and to present the preliminary shortlisted sites that will undergo further evaluation in the Level 3 Analysis. Exhibits, maps, aerial photographs and handouts pertaining to the St. Johns River Water Supply Project Surface Water Treatment Plant Siting Study were provided. In addition, members of the planning team were available to answer questions and hear the public's views.

The public was notified of the open house in several ways:

- News releases were submitted to local papers in Volusia and Seminole Counties by the St. Johns River Water Management District regarding the project and the public meeting.
- Information about the open house was mailed to individuals on the project mailing list, property owners of the initially identified water treatment plant sites and river intake sites on the St. Johns River and the property owners for the parcels immediately adjacent to these sites. Property owner names and addresses were obtained from the Volusia County and Seminole County tax rolls. Approximately 1,100 invitations were mailed.

According to the sign-in sheets, 68 people attended the open house on June 25, 2003. Each of the attendees was requested to complete a comment form regarding the project and the meeting. The ratings of the meeting are provided in the table below. Other comments received about the sites and the meeting are attached along with the questions and answers provided at the Open House.

## Open House Ratings

<b>Aspect</b>	<b>Excellent</b>	<b>Good</b>	<b>Fair</b>	<b>Poor</b>
Overall	18	6	0	0
Maps	17	7	0	0
Other Displays	11	12	0	0
Staff	21	3	0	0



## Process Overview

The St. Johns River Water Supply Project includes evaluating surface water withdrawn from the St. Johns River as an alternative or supplemental source of water supply for portions of Seminole and Volusia counties. Three individual Phase I projects are being conducted to identify plant locations, facilitate design, and determine costing of a complete surface water treatment facility (or facilities) within the I-4 corridor. The Phase I projects include:

- Surface Water Treatability and Demineralized Concentrate Management Study
- Surface Water Treatment Plant Siting Study
- Service Area Demand Projection and Affordability Study

The Surface Water Treatment Plant Siting Study focuses on identifying potential surface water treatment plant locations but also includes siting of the following project elements:

- River Intake
- Raw Water Storage Facility
- Demineralized Concentrate Disposal Area
- Pipeline Corridors

The primary study area for the siting study is located approximately five miles either side of the St. Johns River between the southern end of Lake Monroe and the City of Deland. This siting study is being conducted using a process that includes three levels of analysis. The Level 1 Analysis included a preliminary screening to determine general site locations. Through this level of analysis 11 potential water treatment plant sites were identified. In the Level 2 Analysis, these 11 sites were evaluated and five sites were short-listed for further evaluation in the Level 3 Analysis. The final results of this study will be the recommendation of three to five potential water treatment plant sites and the associated river intakes, storage options, concentrate disposal areas and pipeline corridors. The location of the 11 potential water treatment plant sites is presented in the attached figure and descriptions of the site location are provided below.

- **Site A** – Located in Sanford, south of Lake Monroe, east of the intersection of US 17/92 and SR46.
- **Site B** – Located in Sanford, north of Celery Avenue just south of Lake Monroe between Cameron Avenue and Beardell Avenue.
- **Site C** – Located in DeBary, between Konomac Lake and the St. Johns River.
- **Site D** – Located in DeBary, between the western portion of Konomac Lake and the St. Johns River.
- **Site E** – Located in DeBary, west of US 17/92, northeast of Konomac Lake.
- **Site F** – Located in DeBary, between US 17/92 and the Blue Springs State Park.
- **Site G** – Located in Volusia County between US 17/92 and Lake Beresford, south of C.R. 4116.
- **Site H** – Located in Volusia County, south of SR 44 and northwest of Lake Beresford.
- **Site I** – Located in Lake County, southwest of the SR 44 bridge on the St. Johns River.
- **Site J** – Located in DeLand, northwest of the intersection of SR 44 and SR 15A.
- **Site K** – Located in Seminole County between S.R. 46 and the St. Johns River, west of Orange Boulevard (C.R. 431).

## Summary of Workshop

The public workshop began with an open house, which included displays depicting the purpose of the project and the methodology utilized in the siting process. In addition, aerial maps of the potential water treatment plant sites, intake locations and pipeline corridors were also displayed.

Following the open house, the project team conducted a brief presentation regarding the key components of the St. Johns River Water Supply Project. In general the information in this presentation included a general overview of the water supply studies currently being conducted by the St. Johns River Water Management District to meet the needs of East-Central Florida through the year 2020 and studies being conducted to evaluate the feasibility of utilizing the St. Johns River as one of these future sources. As stated in the presentation, this evaluation includes a determination of the cost of utilizing the St. Johns River as compared to the alternative sources, the end use of the water and the need for multiple surface water treatment plants as compared to a single regional facility.

An overview of the Water Treatment Siting Study was then provided. The components of the water treatment plant were presented along with an overview of each of the levels of analysis which are being conducted as a part of the siting study, which include:

- Level 1 – identification of 11 potential areas for a water treatment plant
- Level 2 – short-listing five potential sites for further evaluation
- Level 3 – refined analysis of the five potential sites.

The siting criteria being utilized for this study were presented. These criteria include:

- Site Size and Configuration
- Land Use
- Wetlands/Floodplains
- Presence of Hazardous Materials
- Habitat/Endangered Species
- Location Relative to Demand Centers
- Location Relative to Raw Water Intakes
- Concentrate Management Options
- Land Ownership
- Public Acceptance
- Cost

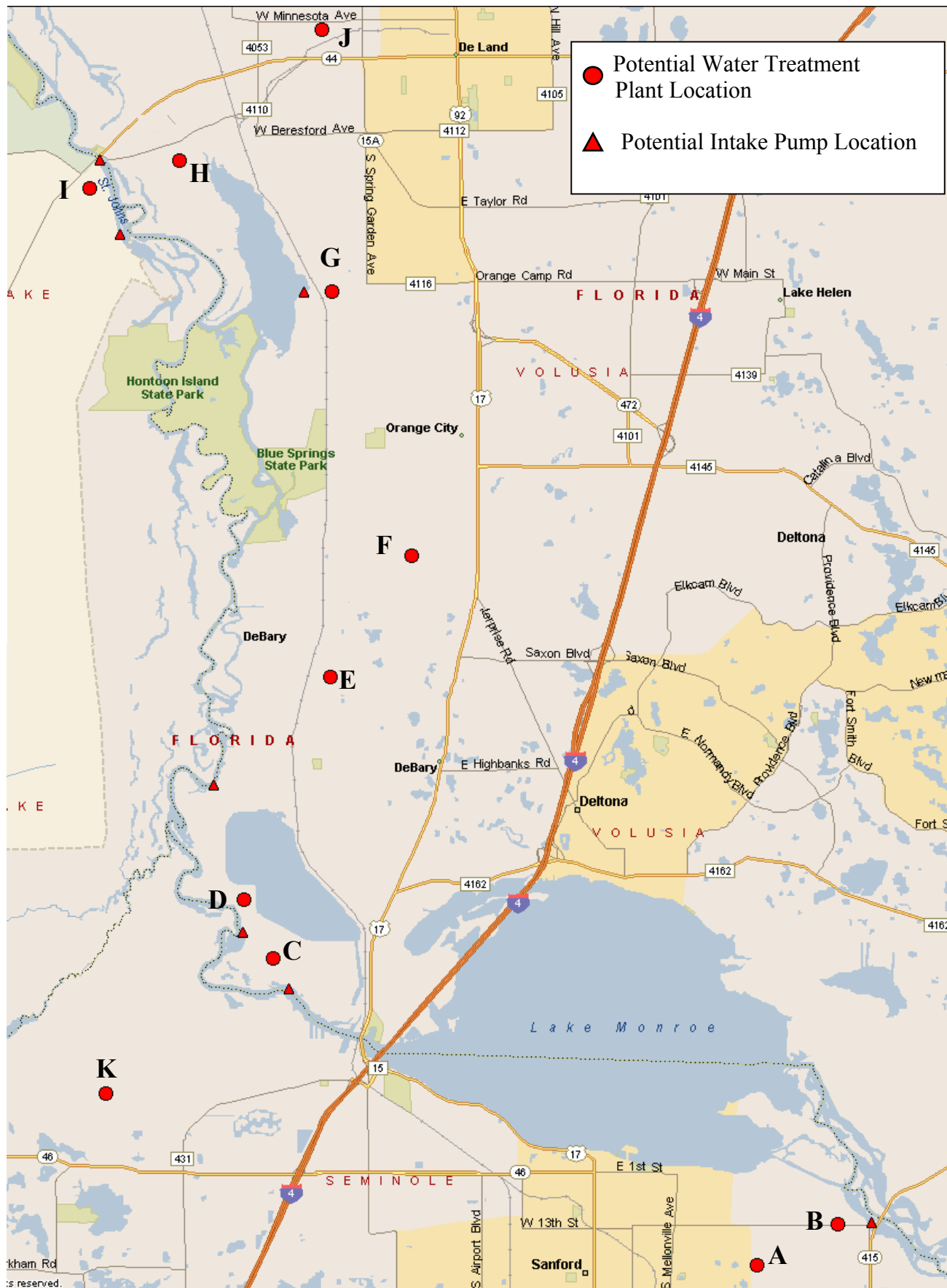
The sites preliminary short-listed at the end of the Level 2 technical analysis were also presented. These sites are:

- Site B
- Site E
- Site G
- Site I
- Site K



Future activities to be completed following the public meeting were presented. Based on the comments received at the public meeting this list of short-listed sites will be reevaluated to reflect the public's input. The final list of the five short-listed sites will be further evaluated in the Level 3 Analysis. This Level 3 Analysis includes field review of the water treatment plant sites, further coordination with utilities, regulatory agencies and property owners, refinement of the pipeline corridors and intake locations and development of preliminary cost estimates for each of the sites.

At the conclusion of the presentation, the project team responded to questions from those attending the meeting. A summary of the questions and the responses is provided below.





## **SUMMARY OF QUESTIONS AND ANSWERS FROM PUBLIC MEETING – JUNE 25, 2003**

### **Question:**

The location of Site J does not appear to be very accurate on the map. We need more exact information on where the sites are located.

### **Answer:**

*It's hard to develop a map that is small enough to send through the mail and has sufficient detail. The team will work to improve maps. We will update the webpage with better mapping information and try to provide maps with more geographic reference points.*

### **Question:**

Why can't we withdraw water from springs?

### **Answer:**

*Springs serve a host of environmental needs and are important recreational resources used by many people. Nevertheless, springs are being considered for water supply, however they are not a part of this study.*

### **Question:**

What about the impact on property values for parcels adjacent to the proposed water treatment plant sites?

### **Answer:**

*As a part of the Level 3 Analysis a land valuation study will be conducted to determine if the potential for impacts to land values exist. We can give examples of water treatment plants in residential areas. They can be designed to blend into the surrounding neighborhoods.*

### **Question:**

Would there be any likelihood of harm to animals at these sites and on surrounding properties?

### **Answer:**

*There are no chemicals that could migrate offsite and cause harm to people or animals. Chemicals on the site will be properly stored and handled. The water treatment plant will be fenced to prevent animals from getting near chemical storage areas.*

**Question:**

What chemicals would be used as a part of the treatment process?

**Answer:**

- *An iron solution, which results in a residue that can be used to make plant food*
- *Caustic to adjust the pH*
- *Chlorine in liquid solution, not the gaseous form*

**Question:**

I noticed that four of the higher ranked sites are clustered at the northern end of project. Would it make more sense to identify the best sites in each part of the study area?

**Answer:**

*None of the sites will be discarded as a result of the study. The study will identify the best sites overall. Consideration will be given to the location of the site within the study area as compared to the other sites.*

**Question:**

What is the current ranking of sites? Did you contact the current landowners?

**Answer:**

*The current ranking at the time of this meeting does not include public input. The final scores and ranking will be developed at the conclusion of the comment period following this meeting. The current ranking is as follows:*

1. *Site B*
2. *Site G*
3. *Sites I & E (tied)*
4. *Site K*

*Property owners were not contacted prior to performing the Level 2 analysis that generated this ranking. Property owners were notified of this meeting and will be contacted by the consultant team as part of the next phase of the study or the Level 3 Analysis.*



**Question:**

Water is shallow near some of the intake sites. Does water depth affect intake location?

**Answer:**

*The intake can be designed to accommodate shallow water depths. Intake design issues will be further evaluated in the next phase of the study.*

**Question:**

What will be done with the residuals from the treatment process? Is there any odor associated with these residuals?

**Answer:**

*The residuals from the treatment process starts as a liquid. It is dewatered, and there is no odor associated with it. Plant food such as Vigaro can be made out of the treatment residuals.*

**Question:**

How do we plan on meeting the water supply needs in the year 2040?

**Answer:**

*Every five years the Water Supply Plan is updated by the St. Johns River Water Management District, and a reassessment is made concerning how to meet the community water needs.*

**Question:**

Water levels in Lake Monroe fluctuate quite a bit. How do withdrawals affect it?

**Answer:**

*Withdrawals of the magnitude being considered for this project may reduce the water level in the river by approximately  $\frac{1}{4}$  inch. We would only make the maximum withdrawals when the river is at higher flows. No withdrawals will be allowed when the river flows are low.*

**Question:**

How will navigation on the river around the intake be affected?

**Answer:**

*Withdrawal quantities being considered for this project will not have any impact on navigation. The builders of the intake will work closely with the US Army Corps of Engineers to develop an intake that does not interfere with navigation.*

**Question:**

The public has no say. Where the plant will be located will be determined by the group that pays for it.

**Answer:**

*The public will have several opportunities to provide input. The permitting process will provide for public notice periods and public hearings.*

**Question:**

Will there be any environmental and recreational impacts on the St. Johns River associated with the intake?

**Answer:**

*No, the intake will be designed with those activities in mind.*

**Question:**

Could eminent domain be used to acquire the site for the water treatment plant?

**Answer:**

*The SJRWMD study process just involves an evaluation of the feasibility of using St. Johns River water to meet water supply needs. Suitable sites will be identified but not acquired as part of the study.*

*If a utility or consortium of utilities decides to build the plant, they may be able to use eminent domain to acquire the site.*

**Question:**

Are there plans for any referenda or voting on the siting decision?

**Answer:**

*There are no plans for referenda or voting as part of the SJRWMD study process.*

*Public input is being gathered during public meetings like this one.*



*A summary of the recent meeting of the Adhoc Committee, a group of citizens, regulatory agency representatives and utility representatives who helped us establish the weights for the site evaluation criteria, is being prepared and will be posted on the project web site.*

**Question:**

Will you make the information on the weighting factors and siting criteria available?

**Answer:**

- *Yes, the information used in developing the weighting factors will be posted on the SJRWMD website. This information includes a summary of the siting criteria.*

**SUMMARY OF WRITTEN COMMENTS ON THE QUESTIONNAIRE HANDED OUT  
AT THE PUBLIC MEETING – JUNE 25, 2003**

**1. Site A – located in Sanford, south of Lake Monroe, east of the intersection of US 17/92 and SR46.**

- *Ok. – Any thought regarding the north shore of Lake Monroe?*
- *Looks like the best location because it is not very populated.*
- *This is a fairly undeveloped area and should be used.*
- *This area would have the least impact of any I see listed in my area. I'm not familiar with the site.*
- *I am unable to provide comments pertinent to development of most of these identified sites. I hope that the residents with local knowledge and concerns will speak out (Sites A, B, C, D, E, F, I, J and K)*
- *Isn't this site already primarily commercial in use?*

**2. Site B – located in Sanford, north of Celery Avenue just south of Lake Monroe.**

- *Good site.*
- *Maybe, but a new development is being built between Melowville & CR 415. Second best site.*
- *New homes being built left and right.*
- *Good choice, if the site is not too residential.*

**3. Site C – located in DeBary, between Konomac Lake and the St. Johns River.**

- *No. Well developed land with 50% seniors*
- *No. 253 homes, 50% elderly near the site – Traffic will cause dangers and accidents. Historic area of DeBary and St. Johns River community (MeadowLea).*
- *Too close to a community of 253 homes/50% senior citizens, 50% families with children. Traffic would cause many dangers to all these residents.*

- *Well-developed community – over 250 homes. All people in area would be endangered with traffic – 50% senior citizens.*
- *This site has many residents on a two-lane road, which has a two-lane bridge.*
- *River intake is much too close to a residential area.*
- *Another good choice – although I am a resident of MeadowLea, as long as there wasn't a traffic/noise issue.*

**4. Site D – located in DeBary, between the western portion of Konomac Lake and the St. Johns River.**

- *No. Well-developed land. .*
- *No. Well-developed land with 50% seniors. Not wanted.*
- *No. Ft. Florida, one of the last remaining “old Florida” sites of beauty and too close to MeadowLea.*
- *To much traffic on Ft. Florida Road. Main entrance to MeadowLea on River. There are 253 homes in this neighborhood.*
- *Would impact the same people as Site C and a newer development on other end of the road. Senior community on Ft. Florida Road would be impacted*
- *This site would impact a community. Very bad which has lots of swamp area.*
- *This is an area soon to be developed.*

**5. Site E – located in DeBary, west of US 17/92, northeast of Konomac Lake.**

- *I believe this to be a good location due to wetlands, industrial areas nearby, low residential areas and a Power Company nearby.*
- *No. Near site of proposed high school.*
- *What are the problems associated with the elementary school and proposed high school located near the site?*
- *Was being considered for new high school. If there is no school, then I would say it is OK.*
- *Too far from water.*
- *This proposed site impacts the proposed extension of Saxon Blvd.*



- *I talked to an FPC employee who was concerned the project would demand too much land and not allow for a proposed Scrub Jay Habitat area.*

**6. Site F – located in DeBary, between US 17/92 and the Blue Springs State Park.**

- *Leave this site alone.*
- *Intermittent development in area.*
- *Mildly developed area. There are other sites less developed.*
- *Too far from water.*
- *This site impacts our Westside Parkway Project, a proposed north-south roadway.*
- *Not familiar with this site, although I understand a new high school may be sited near here.*

**7. Site G – located in Volusia County, between US 17/92 and Lake Beresford, south of CR 4116.**

- *For the northerly end of the project area, this is the ideal spot. Why not put it on the State owned lands of the old Starke tract? You could easily get 50 acres of upland. Won't affect residential areas.*
- *Good Site*
- *Closest to river besides Site A. Think best.*
- *Same as Site F. Less construction then other sites.*
- *This to me looks like best location. East access to major road and close to water.*
- *Regarding Site G & H: All of Lake Beresford is a protected Bird Sanctuary.*
- *This site impacts our Westside Parkway Project, a proposed north-south roadway.*
- *A good choice – very rural.*

**8. Site H – located in Volusia County, south of SR 44 and the northwest of Lake Beresford.**

- *BAD IDEA!! Too much impact on residential area just to the East!!*
- *OK site*
- *Next to development.*
- *Near residential area.*
- *Rural area close to Astor.*
- *Hoontoon Road is part of the Florida Birding Trail. Site H sustains flocks of migratory birds and provides nesting sites for the Sand Hill Cranes and other protected species. It is a refuge for coastal birds during storms and borders on protected wetlands along the St. Johns River.*

**9. Site I – located in Lake County, southwest of the SR 44 bridge on the St. Johns River.**

- *Another good spot for northerly end...won't affect residential areas...Plant would be very close to intake!*
- *OK site*
- *Don't know the area.*
- *Rural area – near Astor?*

**10. Site J – located in DeLand, northwest of the intersection of SR 44 and SR 15A.**

- *What about the old pump property?*
- *OK site*
- *Lightly developed. Duval Home for Mentally Challenged in area.*
- *Near Medical facility. Duval Home for Mentally Challenged.*
- *Commercial location?*

- *As property owners in the proposed site area, we are adamantly opposed to this plant in our neighborhood. There are many single-family residential homes in the area as well as a multi-unit apartment complex. This project would be better suited in a less developed neighborhood. We are concerned about the effect on our property values.*
- *We are against any such development, as this is a residential area and not suited for the project purpose you proposed. We will join forces to fight you with others to stop this project.*

**11. Site K – located in Seminole County, between SR 46 and the St. Johns River, west of Orange Boulevard (CR 431).**

- *OK site*
- *What are the impacts to the wetlands to get to the river from this site?*
- *Undeveloped area because it is a wetland protected area.*
- *Good Choice – very rural.*

**What did you especially like about the meeting?**

- *Staff took time to answer questions*
- *The Staff tried their best to locate the areas. They were very knowledgeable.*
- *Assistants very knowledgeable about locations.*
- *Leaders were very patient and attentive with the audience – did a great job.*
- *The opportunity for citizens to attend and become better informed about matters that concerns them.*
- *Very good presentations. Everyone is knowledgeable and interested.*
- *Very good presentations. Everyone is knowledgeable and interested in helping people understand what is happening.*
- *Initial contact with Joanne McDaniel – very upbeat, positive, honest, sincere, helpful & humorous – put me at ease and made me feel welcome to attend the meeting.*



**What about the meeting could be improved?**

- *Change the hours – 6 to 7 pm would be better*
- *Better air conditioning*
- *Better timing. “Dinner hour” many people not home from work – 5pm and I-4 traffic.*
- *Better timing. I had to leave work early to be here at 5 pm. Then the meeting started at 6:15 pm.*
- *Audibility of speakers. Please use amplification for people, such as me, who might be hearing impaired.*
- *Siting should be somewhere in Northwest Volusia – near to the majority of the fern fields*
- *Have an introduction prior to the workshop – identify persons to approach prior to workshop.*

**If you have additional comments, please use the space below.**

- *Was not on original list for notification...please make sure to inform me of next meeting.*
- *It is intimidating that one authority has overriding control of an issue that smaller local water authorities seem to be relinquishing. Local authority takes into concern matters of the locale. A larger authority irrevocably is self-serving at the expense of local issue matters regardless of information at hand.*
- *We hope to exchange information with you to determine the impact of Sites E, F & G on our 5-year road program.*
- *Alternative water should be used for non-potable uses. In Volusia County it should be made available for horticultural irrigation such as fern, sod, ornamentals. The aquifer water they use for irrigation (somewhere between 21 mgd and 34 mgd, according to District figures) should go to public supply for potable use.*
- *I am an environmental studies major at Rollins College, senior year. Please e-mail me on future workshops and updates.*

**APPENDIX E**  
**LETTER FROM JACKSONVILLE DISTRICT**  
**CORPS OF ENGINEERS**



DEPARTMENT OF THE ARMY  
JACKSONVILLE DISTRICT CORPS OF ENGINEERS  
P. O. BOX 4970  
JACKSONVILLE, FLORIDA 32232-0019  
July 3, 2003

REPLY TO  
ATTENTION OF

Construction-Operations Division  
Operations Technical Support Branch  
Aquatic Plant Control Section

Mr. Ed Copeland  
HDR Engineering  
Suite 250  
2202 North Westshore Blvd.  
Tampa, Florida 33607

Dear Mr. Copeland:

Thank you for inviting Ms. Catherine Johnson of my staff to participate in the potable water treatment plant and water intake site study meeting held June 13, 2003. This letter is a follow up to the conversation you and Ms. Johnson had regarding aquatic herbicide labels and navigation channel information.

Review of the proposed locations in the St. Johns River suggests two items that my staff recommends be considered during the site location process. The first is that any intake structure should be located 100 feet outside of the Federal Channel if possible. For permitting requirements, you will need to contact Mr. Osvaldo Collazo, Chief, North Permits Branch, Regulatory Division, U.S. Army Corps of Engineers P.O. Box 4970, Jacksonville, FL 32232-0019.

The second consideration is that the U.S. Army Corps of Engineers routinely conducts aquatic plant control management operations for water hyacinth and waterlettuce in Lake Monroe, a possible intake location. These treatments prevent floating vegetation mats from interfering with navigation in the Federal Navigation Channel. These mats would collect around a water intake structure and threaten its stability. For this reason, my staff suggests that the intake structure be placed outside of coves, which can accumulate significant amounts of floating plants.

Additionally, the submersed plant hydrilla is becoming established in Lake Monroe. This invasive plant has the capacity to clog intake pipes or grates. The grates should be designed so that debris and plant material can be easily removed. On a



positive note, hydrilla treatments have been successfully conducted on Lake Washington by the St. Johns River Water Management District in cooperation of the City of Cocoa Beach water treatment facility.

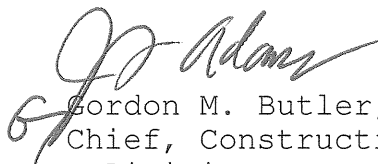
When the facility goes into operation, please notify the following agency contacts so that aquatic plant management operations in the intake area can be properly coordinated:

Mr. Chance Dubose, U.S. Army Corps of Engineers, 602 North Palm Avenue, Palatka, FL 32177 (386-328-2737).

Mr. Dean Barber, Florida Department of Environmental Protection, 5882 South Semoran Blvd., Orlando, FL 32822 (407-275-4004).

Enclosed for your information is a list of the aquatic herbicides currently used to treat floating and submersed plants in the St. Johns River. If you need additional information, please contact Ms. Catherine Johnson of our Orlando office at 407-380-2024.

Sincerely,



Enclosure

Gordon M. Butler, Jr.  
Chief, Construction-Operations  
Division

Copy Furnished:

Mr. Dean Barber, Florida Department of Environmental Protection

<u>Trade Name</u>	<u>Brand Name</u>	<u>Manufacturer</u>	<u>Target Plant</u>
Diquat	Reward	Syngenta	Waterlettuce/Water hyacinth
Endothall	Aquathol	Cerexagri	Hydrilla
Fluridone	Avast Sonar	Griffin SePRO	Hydrilla
Glyphosate	Aqua Neat Rodeo	Riverdale Monsanto	Water hyacinth/Waterlettuce
2, 4-D amine	2,4-D	Nufarm Riverdale	Water hyacinth