EXHIBIT 1

MEMORANDUM

Lake Jesup Flow-Way Treatment Capability Feasibility

TO: SJRWMD

COPIES: File

FROM: Environmental Consulting & Technology, Inc. (ECT)
Wetland Solutions, Inc. (WSI)

DATE: September 11, 2014

Contents

Introduction

The St Johns River Water Management District (SJRWMD) is evaluating alternatives to reduce nutrient loads in the Middle St Johns River Basin (MSJRB). The SJRWMD through the Middle and Lower St Johns River Initiative have begun developing nutrient reduction projects that in conjunction with nutrient reductions required by the Total Maximum Daily Load (TMDL) are expected to allow the river to meet or exceed applicable water quality standards. Multiple projects will be required, and are being evaluated to meet the TMDL. This feasibility study is evaluating the capture and treatment of stormwater from Chub Creek located in Seminole County, and pumped inflow from Lake Jesup. The project's purpose is to remove primarily phosphorus but also nitrogen from the influent, thereby reducing the mass loading of nutrients to Lake Jesup and treating in-lake nutrients. The proposed project site is located on the northwestern side of Lake Jesup on the Little Cameron Ranch, owned by the SJRWMD. This study includes summarizing existing water quality and flow data, a conceptual project layout, estimates of nutrient reductions and cost-effectiveness, and a discussion of likely permitting considerations.

Project Location and Data

The proposed project site is located on the northwestern edge of Lake Jesup on the Little Cameron Ranch parcel owned by the SJRWMD as shown in Figure 1. The project site and Lake Jesup are located near the middle of Seminole County and approximately 5 miles southeast of the City of Sanford. The available footprint was provided by the SJRWMD and includes 382 contiguous acres, intersected in the north by Chub Creek and across the middle of the site by an unnamed ditch that transports stormwater from west of the project site to Chub Creek and ultimately Lake Jesup. Chub Creek is channelized west of the site and transports stormwater from the vicinity of the Orlando-Sanford International Airport across Little Cameron Ranch to Lake Jesup.

The project site is immediately adjacent to two mitigation parcels. The Futch parcel is directly to the east of the project site. It consists of 1,700 acres that serves as mitigation for the Central Florida Beltway. Chub Creek is a 26 acre parcel NE of the Cameron parcel. It is a SJRWMD-owned parcel that provides mitigation for the Orlando/Sanford International Airport Authority expansion in 2007.

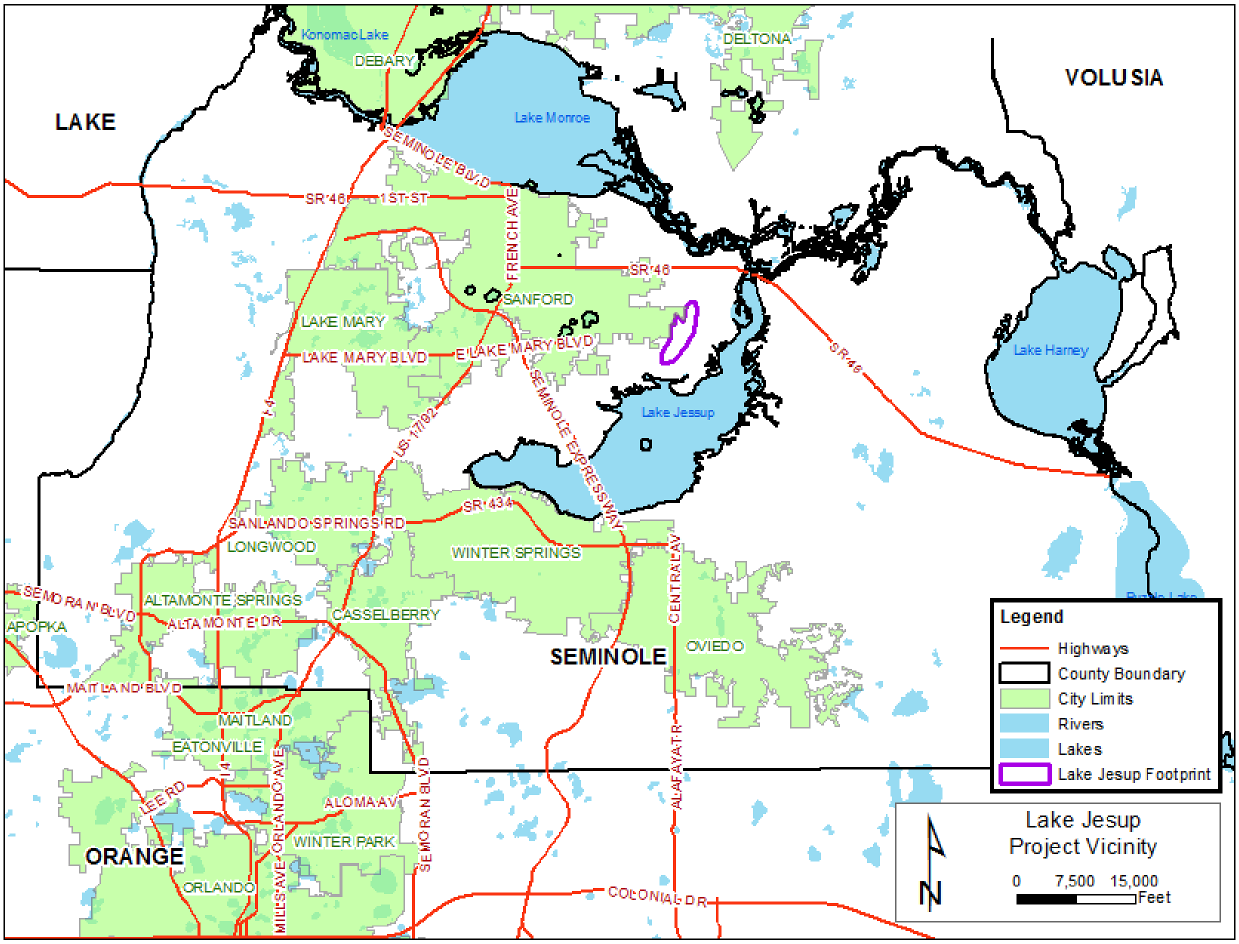


Figure 1. Lake Jesup Project Vicinity Map

Water Quality Data

Available water quality data were collected and summarized for the project site including Lake Jesup stations (in the vicinity of the Chub Creek outlet, expected inflow area) and stations within Chub Creek. Flow data were unavailable for Chub Creek, but some water quality data were available beginning in 1995. Total phosphorus (TP) and total nitrogen (TN) data are shown in Figure 2 for Chub Creek (Station: T-13, ID#44069) and in Figure 3 for Lake Jesup (Station: OW-2, ID#44055). Other water quality parameters were summarized and are shown in the Appendix. Three water quality stations had available data for Chub Creek and the southern stormwater ditch that connects to Chub Creek west of the project site (Figure 4). The station on Chub Creek (T-13) with the most available data had median concentrations of 325 ug/L for TP and 2.29 mg/L for TN. The total Kjeldahl nitrogen (TKN) was 2.28 mg/L for the period-of-record (POR), and ammonia was 0.06 mg/L, indicating that nearly all of the nitrogen is organic. The other two stations show similar data for TP, although the TN in the southern ditch was lower (0.99 mg/L). Available data for Lake Jesup near the project site are available through September 2013 and show a median of 157 ug/L for TP and 2.63 mg/L for TN. The TKN comprised 2.60 mg/L of the TN and ammonia averaged 0.03 mg/L.

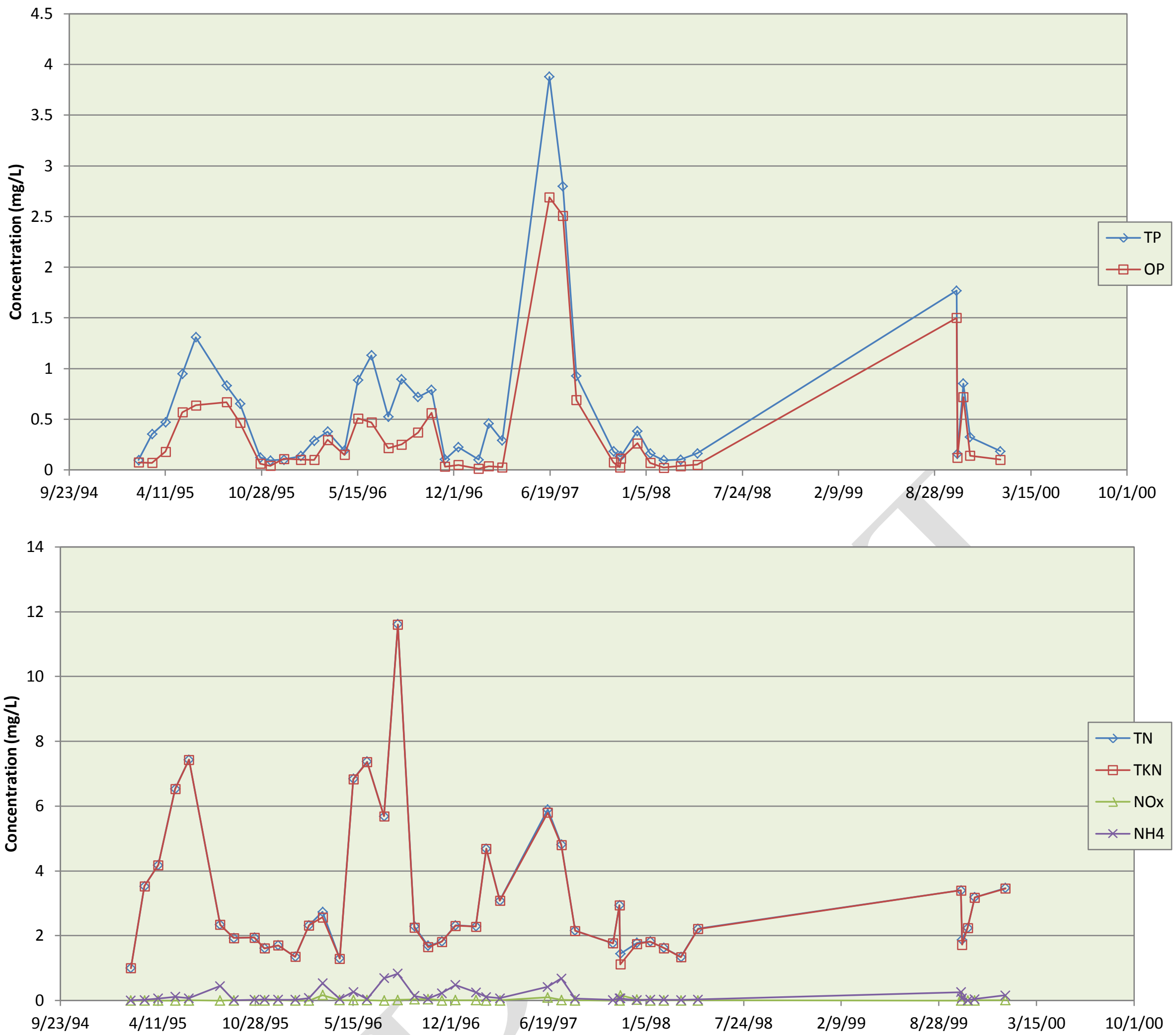


Figure 2. Chub Creek Nitrogen and Phosphorus Period-of-Record Data (Station: T-13, ID#44069, SJRWMD)

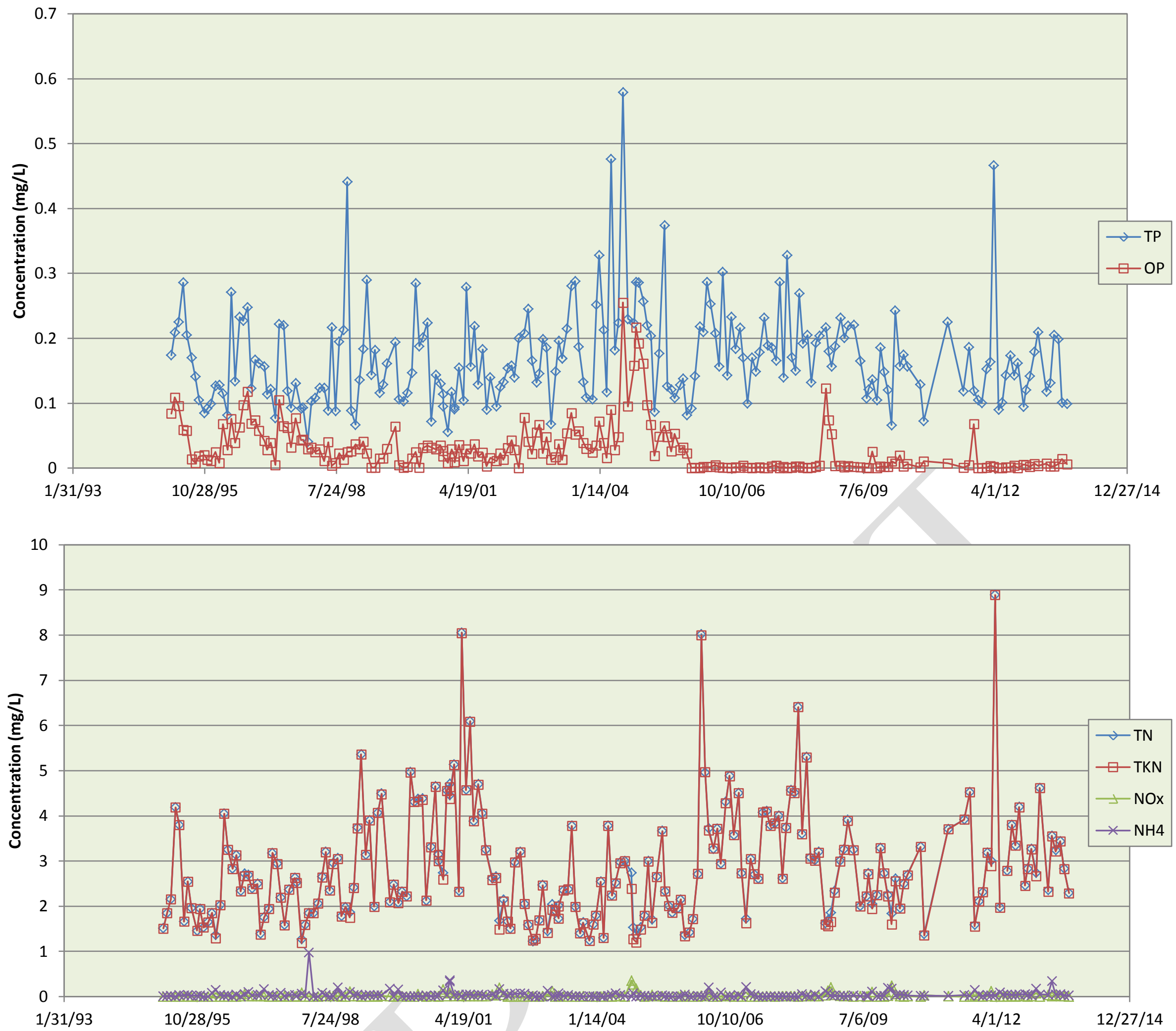


Figure 3. Lake Jesup Nitrogen and Phosphorus Period-of-Record Data (Station: OW-2, ID#44055, Seminole County Water Atlas)

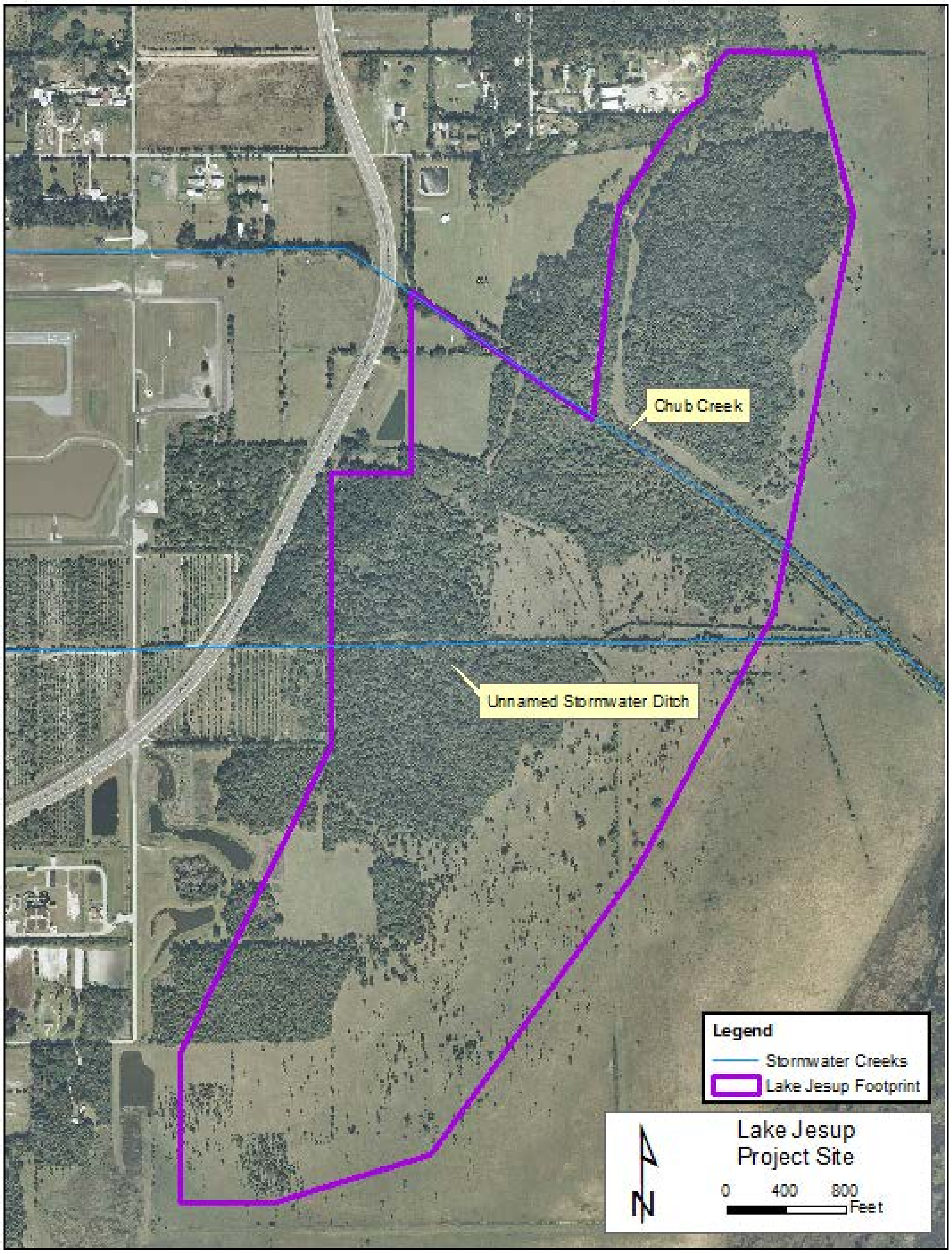
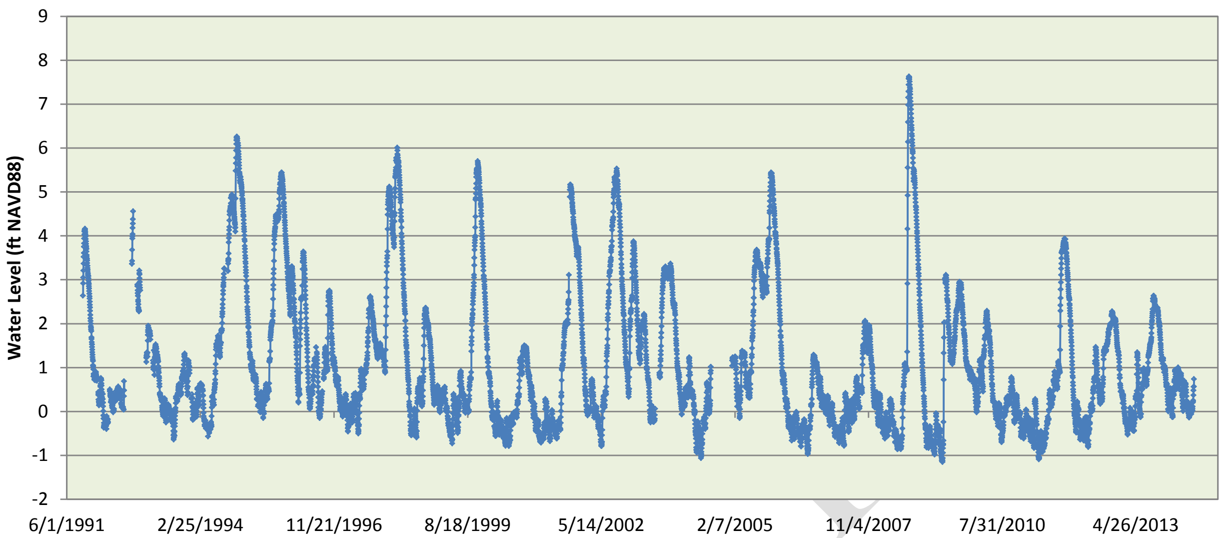
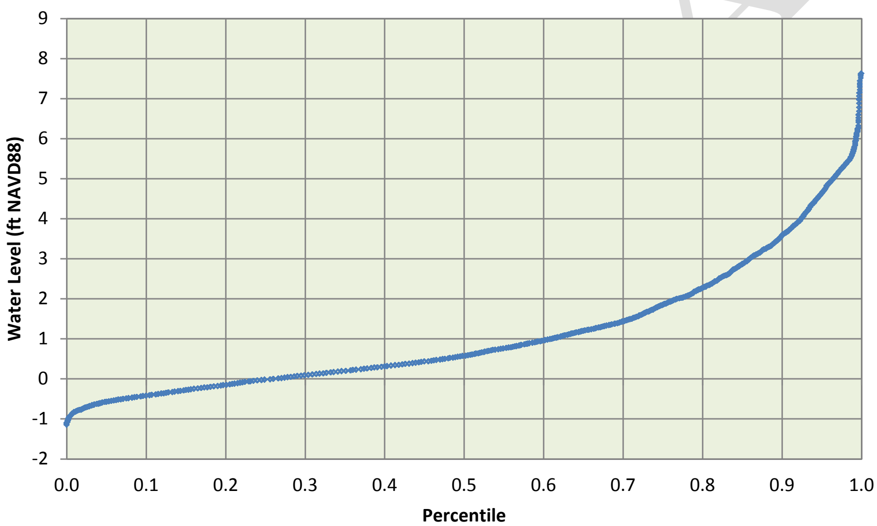


Figure 4. Lake Jesup Project Site Boundary and Stormwater Conveyances

Flow and Water Level Data

No flow data could be located for Chub Creek or the southern stormwater ditch, but an HSPF model (BCI 2005) was previously developed to model water quality and flow within the contributing area to Lake Jesup. Within this model Subbasin 31 represents the Chub Creek watershed. Average simulated flow for this basin in the model was 1.2 cfs with a maximum daily flow of 59 cfs. Flow data for Lake Jesup are irrelevant since flow will be diverted using a pump station. However, water levels on the lake could impact the design and location of the pump station. Water level data were summarized for the Lake Jesup outlet (USGS 02234435). The median level in the lake was 0.57 feet (NAVD88), and the level was above -0.43 feet (NAVD88) 90% of the time. To allow for wetland operation at least 90% of the time it is recommended that a pump inflow be designed to allow for pumping at an elevation as low as -0.5 feet. Figure 5 shows the time series of water levels and the percentile curve and table for Lake Jesup at the outlet near Sanford, Florida.





Water Level (ft NAVD88)	
Percentile	
0.00	-1.15
0.05	-0.58
0.10	-0.43
0.25	-0.02
0.50	0.57
0.75	1.84
0.90	3.56
0.95	4.63
1.00	7.63
Statistics	
Average	1.10
StDev	1.59
N	7,803

> 10/1/13 Provisional data

Figure 5. Lake Jesup Outlet Water Levels (USGS 02234435)

Historic Land Use

To examine historic land uses on the site aerial imagery was collected and geo-referenced for the site for 1940, 1943, 1949, 1952, 1958, 1972, 1977, 1984, 1995, and 1999 in addition to 2012. The site has remained largely unchanged during this period with much of the site operated for livestock production with trees in the higher-elevation portions of the site since 1940. The density of tree cover has increased, but the spatial extents have remained relatively consistent since the 1970s. A mosaic of historic aerials is provided in Figure 6. This time series shows the growth of the forested areas and the portion of the site that has remained open. Land uses on the site as of the 2009 SJRWMD land use classification include unimproved pastures (2120), cabbage palm hammock (6181), mixed wetland hardwoods (6170), improved pastures (2110), and freshwater marshes (6410).

In addition to evaluating the historic aerials the Limited Environmental Assessment completed in July of 2014 by AerostarSES for the SJRWMD was reviewed. This evaluation covered a majority of the site, but was not comprehensive in scope. During the assessment no specific items were located that indicated any former uses of the site that would be of concern for construction of a treatment wetland. The one feature that was not located, but anecdotal evidence suggests may have been present, is a cattle dipping vat on some portion of the project site. It is recommended that during the design a more comprehensive site assessment be completed in the footprint of any construction areas.

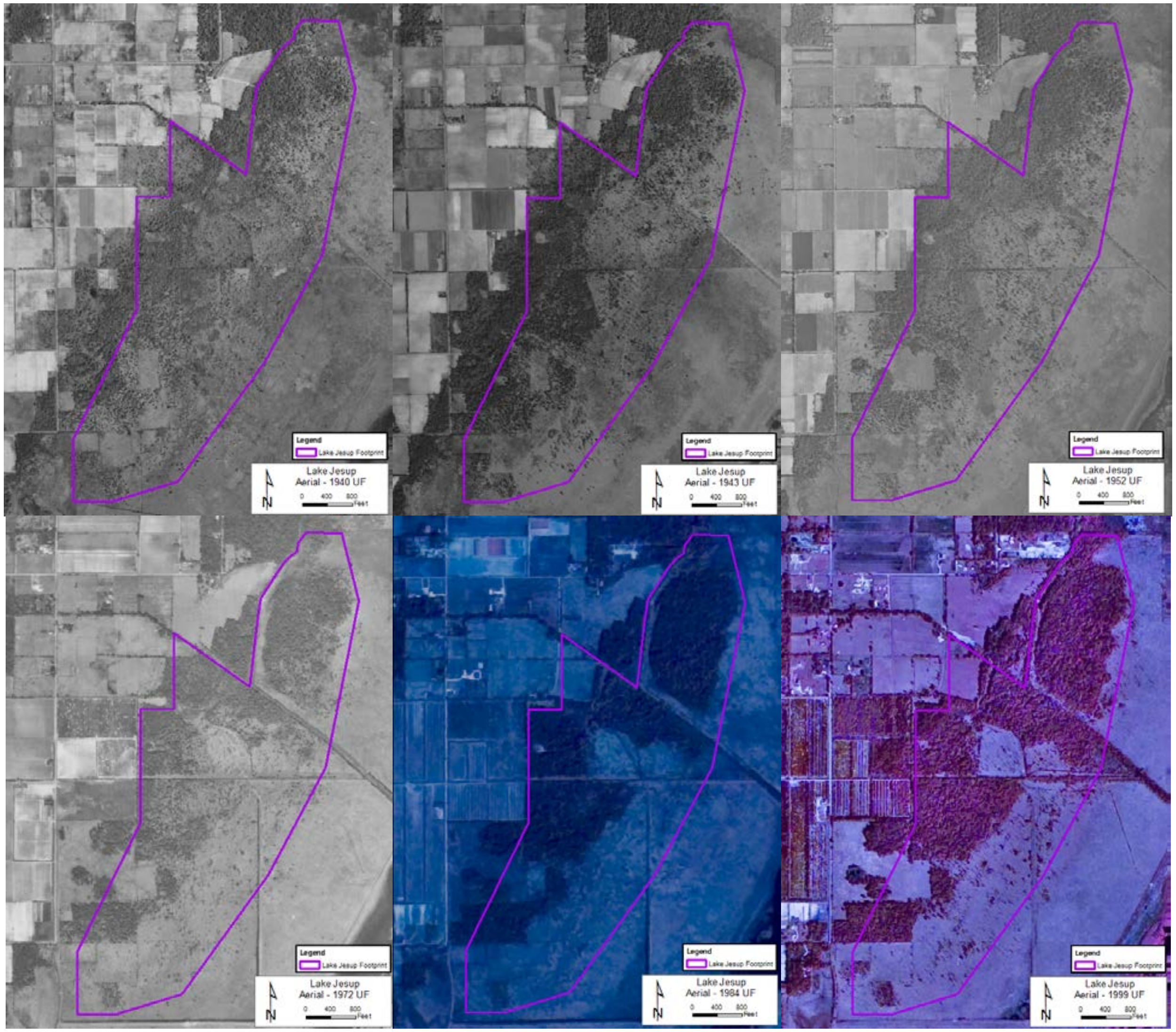


Figure 6. Historic Aerials for the Project Site for 1940, 1943, 1952, 1972, 1984, and 1999 (Source UF and USGS)

Regulatory Considerations

Floodplain Compensation

The proposed project site is located on the shore of Lake Jesup and is situated between the two- and ten-year floodplains (Figure 7). Based on a preliminary meeting with FDEP on August 13, 2014, FDEP will require “cup for cup” compensation within the 10-year floodplain. The use of a wetland with berms could have impacts on storage within the floodplain, although minor in comparison to the scale of the entire lake. To eliminate concerns about removing storage within the floodplain, the wetland will incorporate wide spillways to accept flows from Lake Jesup into the wetland at stages consistent with the 10-year flood stage of 7.06 feet. Under an extreme event it is likely that the wetland will already be at a high stage. All water within the wetland will be either: stormwater that was would have been directed to Lake Jesup, direct rainfall that would have run off to Lake Jesup, or Lake Jesup water that was pumped into the wetland. Because all water within the wetland will be water that was already part of the Lake Jesup storage volume, it is expected that floodplain compensation will be calculated based on the difference between the volume of the as-built wetland and the pre-wetland topography. Flooding events may have temporary impacts on the wetland and recovery from this condition will be part of the operation and maintenance manual developed for a final design package. Construction of a treatment system would also have to comply with standard conditions that limit upstream stage increases.

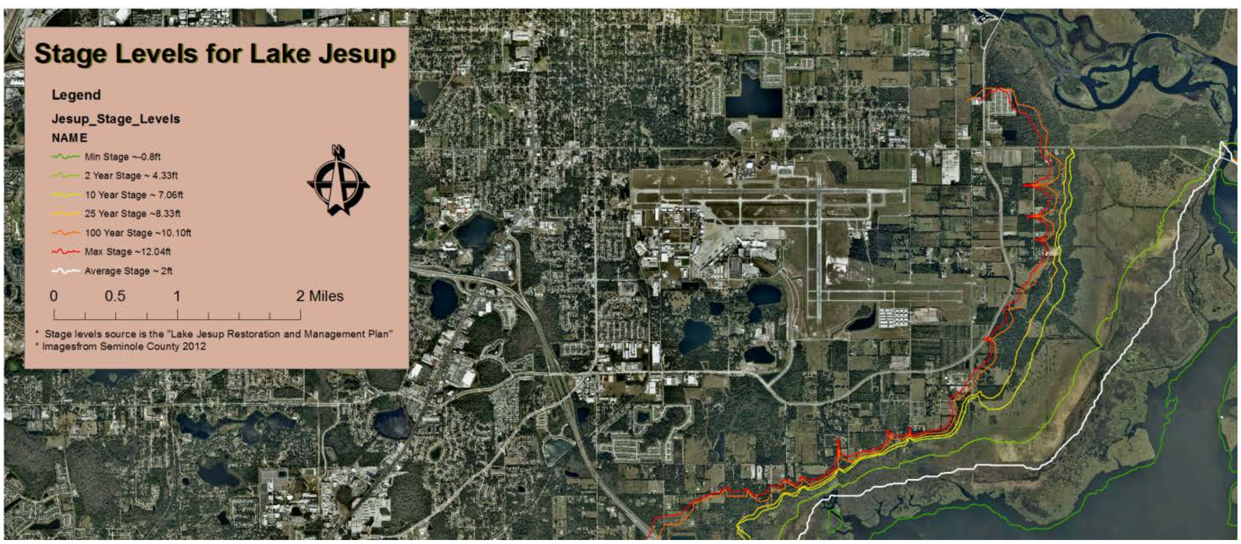


Figure 7. Lake Jesup Floodplain Map in the Vicinity of the Project (SJRWMD 2014)

Wetland Impacts

The entire proposed project area is mapped as wetlands based on a review of National Wetlands Inventory maps. District land use classifies the area lying between the cabbage palm hammocks and lake fringe (both mapped as wetlands by the NWI) as unimproved pasture. From a jurisdictional standpoint, virtually the entire proposed project footprint can conservatively be considered to be existing wetlands. Accordingly, the implementation of a treatment system project will require avoidance and minimization of permanent impacts to the highest quality wetlands and a UMAM analysis to either demonstrate that the project is self-mitigating or determine the amount of mitigation required.

UMAM analyses were not conducted as part of this effort. However the following general concepts can be used as guidance for planning purposes:

- The conversion of cabbage palm hammocks to emergent marsh will likely be considered as a substantial decline in functional value;
- During the design phase, the effects of inundation on the existing cabbage palm hammocks could be evaluated to determine whether those areas could remain as-is within the proposed footprint;
- The conversion of "unimproved pasture" to emergent marsh will likely provide a substantial functional lift; and
- The construction of embankments and the proposed pump station will be viewed as permanent impacts and should to the extent possible, be sited in the lowest quality existing wetlands.

Threatened & Endangered Species

A review of available web-based resources was conducted to evaluate the potential presence of threatened and endangered species within the project area. There have been no documented occurrences of rare species according to the Florida Natural Areas Inventory (FNAI). The FNAI identifies four species that likely occur in the project area including: eastern indigo snake (*Drymarchon couperi*), bald eagle (*Haliaeetus leucocephalus*) Florida sandhill crane (*Grus canadensis pratensis)*, and wood stork (*Mycteria americana*). A eagle nest search was conducted using the Florida Fish and Wildlife Conservation Commission web-based Eagle Nest Locator tool. It identified two eagle nests within one mile of the project site (west and north). Additionally, the FNAI lists the up to 23 additional rare or listed species that have the potential to occur within the project site. A more comprehensive wildlife survey will need to be conducted as the project moves toward implementation.

Conceptual Layout, Treatment Performance, and Estimated Cost

A treatment wetland is being proposed on the project site to improve water quality from both stormwater inflows and pumped inflows from Lake Jesup. Because of the prevalence of trees on the project site and to provide different anticipated treatment volumes, three alternatives were developed. For the purposes of these conceptual designs all treatment cells are proposed to be converted to emergent marsh. This provides the ability to control the finished elevations which will allow for consistent water levels across the cells and improved hydraulic efficiency. In addition, performance data indicates that marsh systems have phosphorus removal rate constants that are approximately 3-4 greater than forested systems (Kadlec and Knight, 1996).

Each of the proposed layouts is discussed in additional detail with a conceptual schematic shown. Estimated treatment performance and costs are provided for each alternative configuration. Removal estimates for TP and TN were based on the P-k-C* Model proposed by Kadlec and Wallace (2009). Hydraulic loading rates of 2, 4, and 6 cm/d were evaluated for both TP and TN with removal rates of 8, 10, 12, 14, and 16 m/yr for TP and 8, 12, and 16 m/yr for TN. The C* concentration for phosphorus was taken as 2 ug/L and as 1.5 mg/L for TN (Kadlec and Wallace 2009). Inflow concentrations were conservatively assumed to be 157 ug/L for TP and 2.63 mg/L for TN, consistent with average concentrations at Lake Jesup station OW-2. This station (OW-2) was considered to be most representative of likely wetland inflows. No effort was made to flow-weight inflows from both Lake Jesup and Chub

Creek. Estimated mass removals and cost effectiveness values were calculated based on the present worth (t=20 yr, I=5%) for each alternative.

The collection of flow data for Chub Creek and the southern stormwater ditch may be important to provide a better understanding of the relative importance of these flow contributions compared to pumped inflows from Lake Jesup. Based on the Seminole County ICPR model and the HSPF model there appears to be significant flow from Chub Creek during rain events but a long term simulation has not been done completed to determine if the Chub Creek annual flow would be a significant contribution to the system. Additional field-collected data for these sites could validate the modeling results. These sites will require additional evaluation during the design phase to determine the most appropriate method for diverting a portion of the stormwater flow to the wetland under some flow conditions.

Maximum Footprint Alternative

Conceptual Layout

The maximum footprint project included the entire project area available with the exception of one small area on the western side of the project that was at higher elevations. This scenario has three treatment flow paths each comprised of two or three cells-in-series (eight cells total). The total wetland area for this alternative is approximately 357 acres with cell areas ranging from 19 to 63 acres each. Flow from the southern stormwater ditch would be routed north to Chub Creek with a portion of this flow captured by the pump station into the wetland and the existing channel backfilled across the footprint of Cell 2. The existing berm along Chub Creek would be improved on both sides of the Creek to form the berms for the wetlands for Cells 2 and 3 (Figure 8). Water from Lake Jesup would be allowed to flow up an improved Chub Creek channel to a pump station located adjacent to Chub Creek west of the wetland. The intent is to dredge Chub Creek from the lake back to the pump station. This will allow lake water to back up Chub Creek to the pump station. Structures would be constructed between adjacent deep zones across Cells 1 and 2 to allow for moving water between cells at any point in the treatment wetland. Outflows from the wetland will discharge to spreader swales east of the wetland cells and be allowed to sheetflow to Lake Jesup.

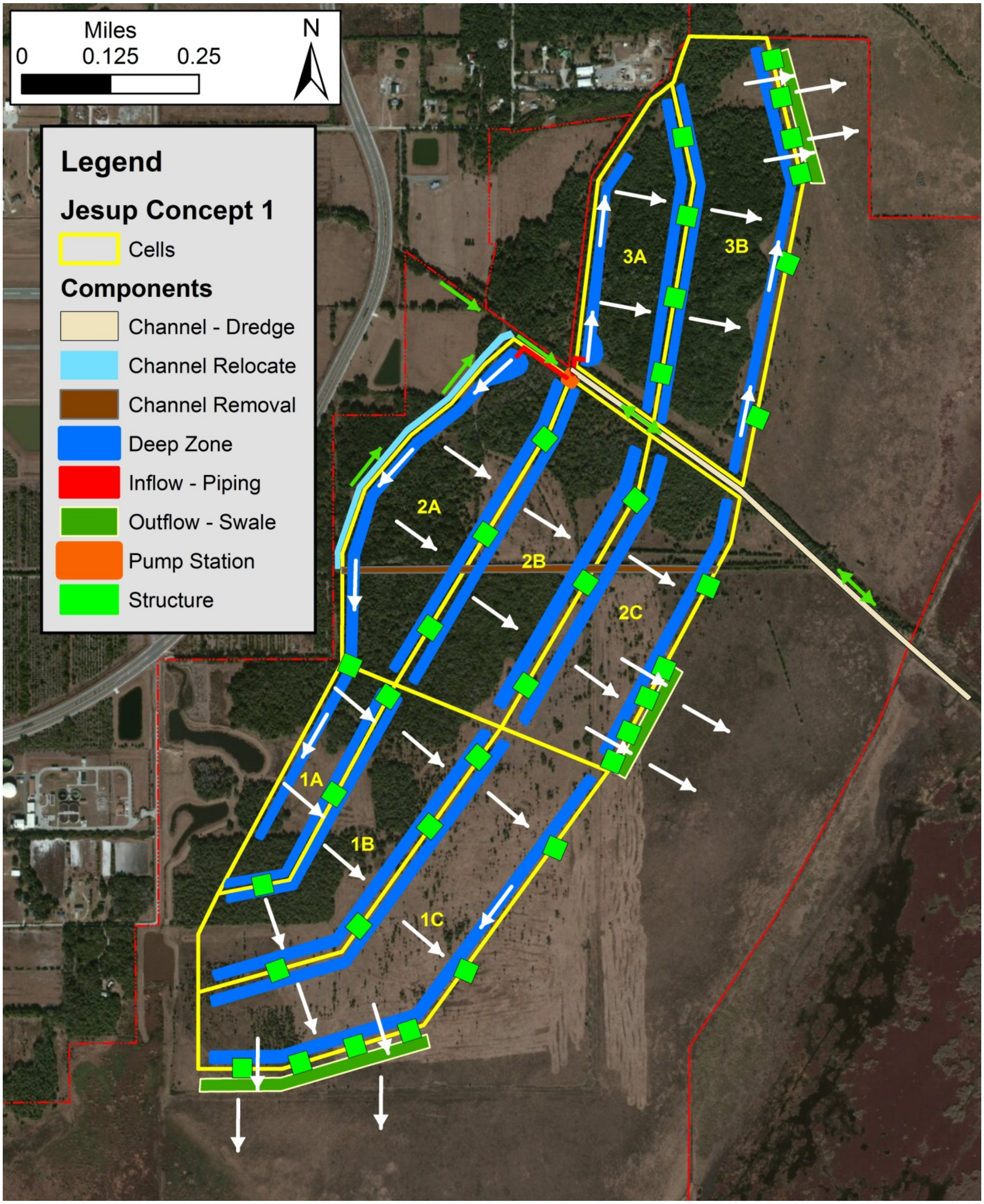


Figure 8. Maximum Footprint Conceptual Wetland Layout

Treatment Performance

Treatment performance was estimated based on the P-k-C* Model for TP and TN using previously discussed values. The treatment area for this alternative was estimated to have a tanks-in-series (P-value) of 3.4 as recommended for untested systems (Kadlec and Wallace 2009). Table 1 shows the estimated TP treatment performance for several hydraulic loading rates and removal rates. The recommended hydraulic loading rate for this project for the goal of maximizing mass removal is 6 cm/d with an estimated removal rate of 10 m/yr yielding an anticipated outlet concentration of 103 ug/L and a mass removal of 1.7 MT/yr.

Table 1. Estimated TP Treatment Performance for the Maximum Footprint Wetland

Q (cfs)	11.8	23.6	35.5
Q (MGD)	7.6	15.3	22.9
HLR (cm/d)	2	4	6
HRT (d)	15.2	7.6	5.1
k (m/yr)	TP Outflow (ug/L)		
8	62	95	112
10	51	85	**103**
12	43	76	95
14	38	69	88
16	31	62	82

Q (cfs)	11.8	23.6	35.5
Q (MGD)	7.6	15.3	22.9
HLR (cm/d)	2	4	6
HRT (d)	15.2	7.6	5.1
k (m/yr)	Mass Removal (MT/yr)		
8	1.00	1.30	1.44
10	1.12	1.52	**1.71**
12	1.21	1.70	1.95
14	1.28	1.86	2.17
16	1.33	2.00	2.37

Performance for TN was calculated for a range of hydraulic loading rates and removal rates as shown in Table 2. In the case of TN the background concentration is assumed to be 1.5 mg/L. At the recommended hydraulic loading rate (6 cm/d) and the median removal rate of 12 m/yr (Kadlec and Wallace 2009) the outflow concentration is expected to be 2.18 mg/L with a mass removal of 14.2 MT/yr.

Table 2. Estimated TN Treatment Performance for the Maximum Footprint Wetland

Q (cfs)	11.8	23.6	35.5
Q (MGD)	7.6	15.3	22.9
HLR (cm/d)	2	4	6
HRT (d)	15.2	7.6	5.1
k (m/yr)	TN Outflow (mg/L)		
8	1.94	2.18	2.30
10	1.86	2.11	2.24
12	1.80	2.04	**2.18**
14	1.75	1.99	2.13
16	1.71	1.94	2.08

Q (cfs)	11.8	23.6	35.5
Q (MGD)	7.6	15.3	22.9
HLR (cm/d)	2	4	6
HRT (d)	15.2	7.6	5.1
k (m/yr)	Mass Removal (MT/yr)		
8	7.3	9.5	10.5
10	8.1	11.1	12.5
12	8.8	12.4	**14.2**
14	9.3	13.6	15.8
16	9.7	14.6	17.3

Cost Estimate

The District's Return on Investment Spreadsheet was used to determine the cost effectiveness of this design, described below. In this spreadsheet the project construction costs were summarized into four categories: structure construction, clearing and excavation, administrative capital costs, and contingency. The structure construction costs include pump station construction, water control structures, and level spreader construction. Administrative capital costs include contractor general conditions, mobilization, insurance, bonding, etc. Table 3 presents a summary of the estimated construction costs for the project.

Table 3. Estimated Construction Costs

Category	Cost ($)
Structure Construction	$953,000
Clearing and Excavation	$4,577,000
Administrative Capital Costs	$589,000
Contingency	$612,000
Total Cost	$6,731,000

Operation and maintenance costs were estimated to include plant and vegetation management, energy costs, District personnel costs, and pump maintenance costs. These items were categorized as labor/contractual cost, supplies and equipment costs, administrative costs, and utilities. Table 4 presents the annual operation and maintenance costs.

Table 4. Estimated Operation and Maintenance Costs

Category	Annual Cost ($)
Labor/contractual cost	$20,000
Supplies and equipment costs	$15,000
Administrative costs	$30,000
Utilities	$31,000
Total Cost	$96,000

Estimated Cost Effectiveness

Cost effectiveness was calculated based on the present worth of the total project cost, including the operation and maintenance for a 20-year period at a discount rate of 5%. This present worth cost was converted to an annual cost based on the 20-year period with the estimated nutrient reductions being used to calculate cost effectiveness in terms of $/lb of nutrient removed. The estimated cost effectiveness for removal of TP and TN are $117 and $15 per pound, respectively. The TP cost effectiveness value is similar in magnitude to the value estimated for Lake Apopka of $257/lb of TP.

Medium Footprint Alternative

A medium footprint alternative was considered because it eliminates the most dense area of trees on the property north of Chub Creek. Cells 1 and 2 would be constructed in the same way as the larger alternative, with all other site considerations the same. Water would still be routed from the southern stormwater ditch to Chub Creek with a pump station located adjacent to Chub Creek to capture both lake water and stormwater inputs. The conceptual layout is shown in Figure 9.

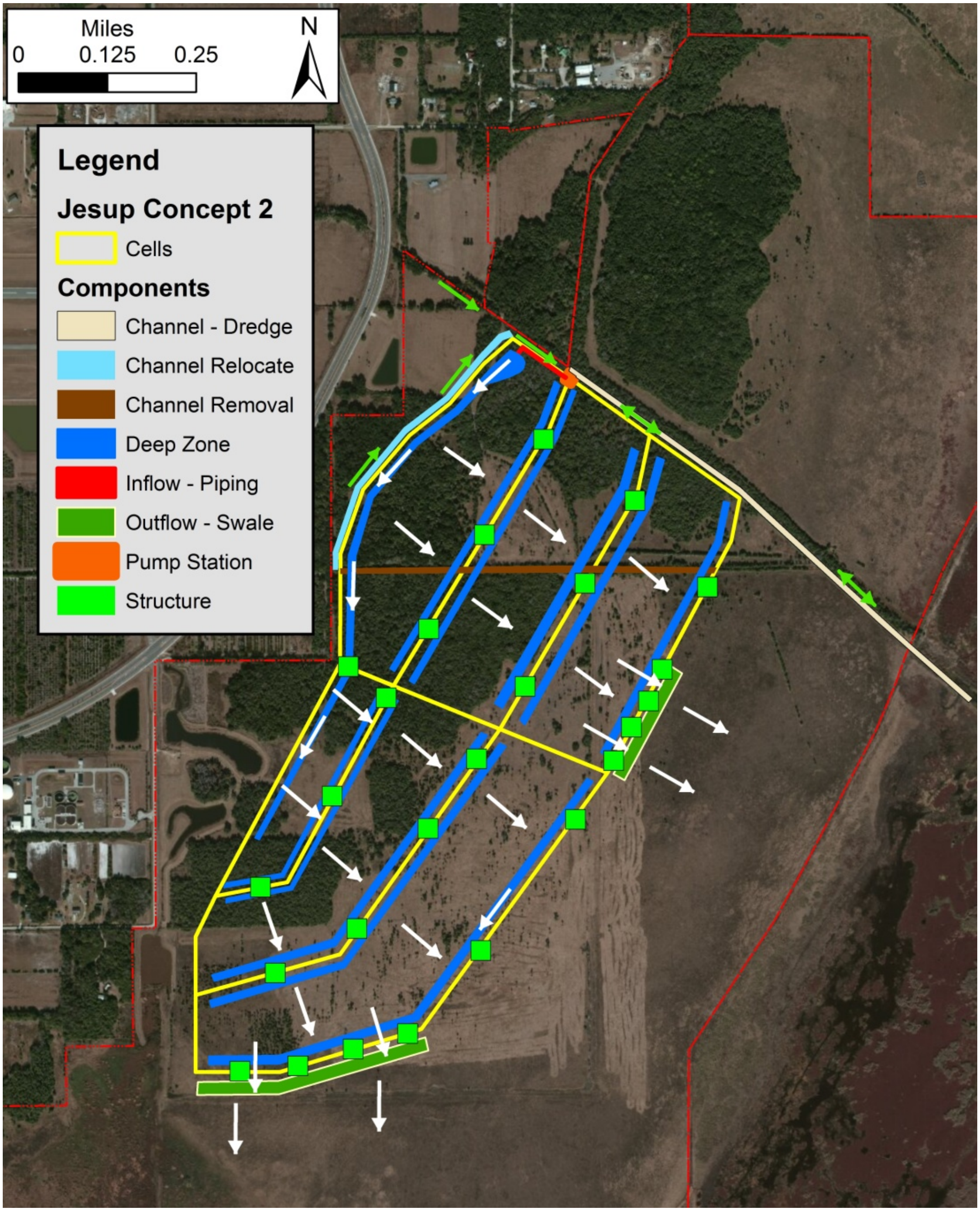


Figure 9. Medium Footprint Conceptual Wetland Layout

Treatment Performance

Treatment performance was estimated based on the P-k-C* Model for TP and TN using previously discussed values. The treatment area for this alternative (271 acres) was estimated to have a P-value of 3.4 as recommended for untested systems (Kadlec and Wallace 2009). Table 5 shows the estimated treatment performance for several hydraulic loading rates and removal rates. The recommended hydraulic loading rate and removal rate were assumed to be the same (6 cm/d and 10 m/yr) yielding an anticipated outlet concentration of 103 ug/L and a mass removal of 1.3 MT/yr.

Table 5. Estimated TP Treatment Performance for the Medium Footprint Wetland

Q (cfs)	9.0	17.9	26.9
Q (MGD)	5.8	11.6	17.4
HLR (cm/d)	2	4	6
HRT (d)	15.2	7.6	5.1
k (m/yr)	TP Outflow (ug/L)		
8	62	95	112
10	51	85	**103**
12	43	76	95
14	36	69	88
16	31	62	82

Q (cfs)	9.0	17.9	26.9
Q (MGD)	5.8	11.6	17.4
HLR (cm/d)	2	4	6
HRT (d)	15.2	7.6	5.1
k (m/yr)	Mass Removal (MT/yr)		
8	0.76	0.99	1.09
10	0.85	1.15	**1.29**
12	0.91	1.29	1.48
14	0.97	1.41	1.65
16	1.01	1.52	1.80

Table 6 shows the expected treatment performance for TN under varying removal rates and hydraulic loading rates. At the recommended hydraulic loading rate (6 cm/d) and the expected removal rate (12 m/yr) the outflow concentration is expected to be 2.18 mg/L with a mass removal of 10.8 MT/yr.

Table 6. Estimated TN Treatment Performance for the Medium Footprint Wetland

Q (cfs)	9.0	17.9	26.9
Q (MGD)	5.8	11.6	17.4
HLR (cm/d)	2	4	6
HRT (d)	15.2	7.6	5.1
k (m/yr)	TN Outflow (mg/L)		
8	1.94	2.18	2.30
10	1.86	2.11	2.24
12	1.80	2.04	**2.18**
14	1.75	1.99	2.13
16	1.71	1.94	2.08

Q (cfs)	9.0	17.9	26.9
Q (MGD)	5.8	11.6	17.4
HLR (cm/d)	2	4	6
HRT (d)	15.2	7.6	5.1
k (m/yr)	Mass Removal (MT/yr)		
8	5.5	7.2	7.9
10	6.2	8.4	9.4
12	6.7	9.4	**10.8**
14	7.1	10.3	12.0
16	7.4	11.1	13.1

Cost Estimate

The cost estimate for the medium footprint alternative was developed based on the same premise as the large footprint alternative. Table 7 below presents a summary of the estimated construction costs for the medium footprint alternative.

Table 7. Estimated Construction Costs

Category	Cost ($)
Structure Construction	$855,000
Clearing and Excavation	$3,225,000
Administrative Capital Costs	$444,000
Contingency	$452,000
Total Cost	$4,976,000

Table 8 presents the annual operation and maintenance costs for the medium footprint alternative.

Table 8. Estimated Operation and Maintenance Costs

Category	Annual Cost ($)
Labor/contractual cost	$15,000
Supplies and equipment costs	$10,000
Administrative costs	$30,000
Utilities	$25,000
Total Cost	$80,000

Estimated Cost Effectiveness

The estimated cost effectiveness for this design is $120 per pound for TP and $15 per pound for TN.

Small Footprint Alternative

The final evaluated alternative was a small footprint alternative that eliminated all areas with dense tree cover. This largely restricted the footprint to the southeast portions of the property. Instead of multiple cells, a single cell would convey water generally southwest from the pumped inflow to the wetland spreader channel located on the northern edge of the project. As before, the southern stormwater channel would be routed around the wetland and to Chub Creek, and a pump station would be located on the unnamed creek to pump both stormwater and lake water to the wetland. The total footprint for this alternative was 110 acres. The conceptual layout is shown in Figure 10.

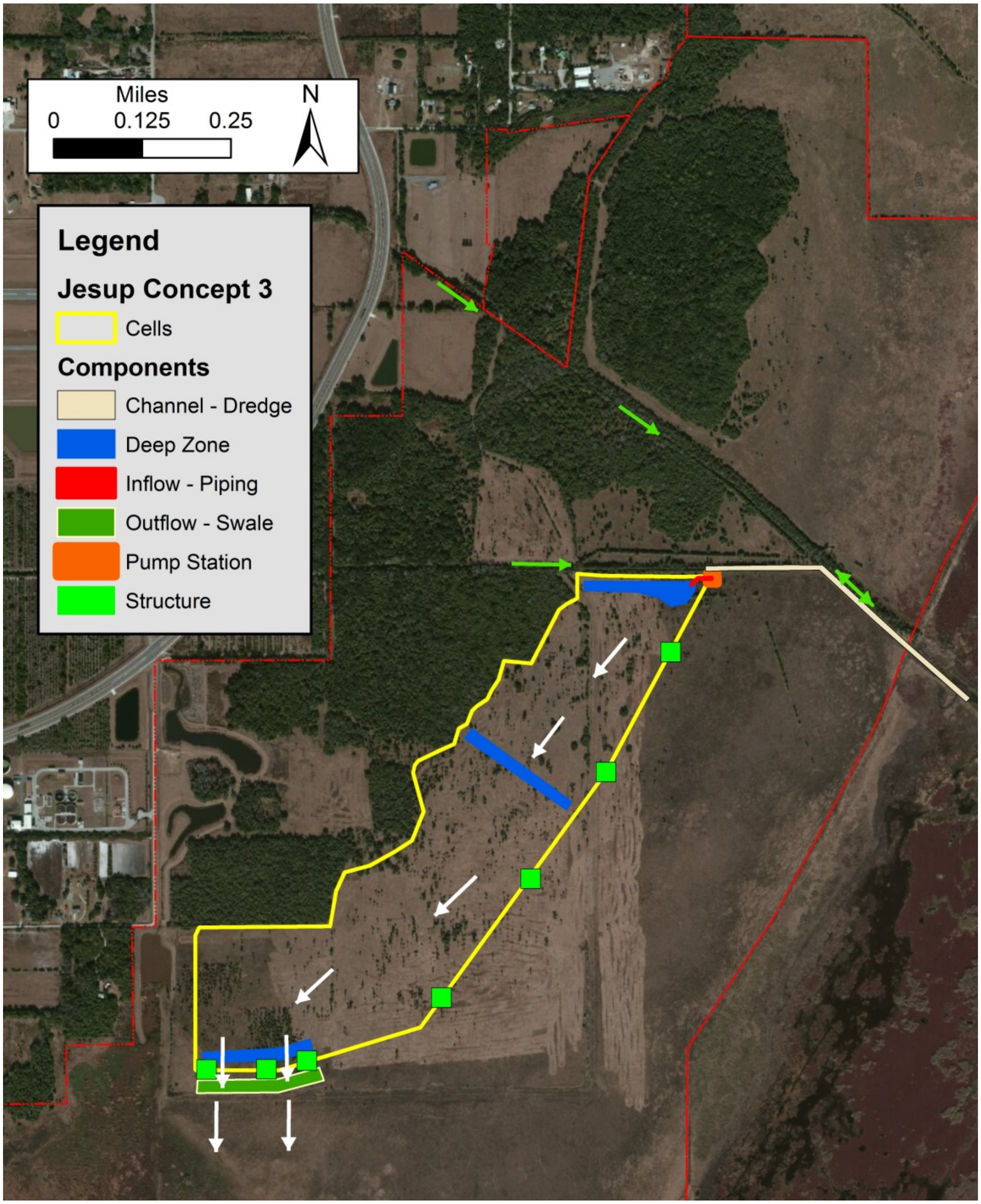


Figure 10. Small Footprint Conceptual Wetland Layout

Treatment Performance

Treatment performance was estimated based on the P-k-C* Model for TP and TN using previously discussed values. The treatment area for this alternative (110 acres) was estimated to have a P-value of 3.4 as recommended for untested systems (Kadlec and Wallace 2009). Table 9 shows the estimated treatment performance for several hydraulic loading rates and removal rates. The recommended hydraulic loading rate and removal rate were assumed to be the same (6 cm/d and 10 m/yr) yielding an anticipated outlet concentration of 103 ug/L and a mass removal of 0.53 MT/yr.

Table 9 Estimated TP Treatment Performance for the Small Footprint Wetland

Q (cfs)	3.6	7.3	10.9
Q (MGD)	2.3	4.7	7.0
HLR (cm/d)	2	4	6
HRT (d)	15.2	7.6	5.1
k (m/yr)	TP Outflow (ug/L)		
8	62	95	112
10	51	85	**103**
12	43	76	95
14	36	69	88
16	31	62	82

Q (cfs)	3.6	7.3	10.9
Q (MGD)	2.3	4.7	7.0
HLR (cm/d)	2	4	6
HRT (d)	15.2	7.6	5.1
k (m/yr)	Mass Removal (MT/yr)		
8	0.31	0.40	0.44
10	0.34	0.47	**0.53**
12	0.37	0.52	0.60
14	0.39	0.57	0.67
16	0.41	0.62	0.73

Table 10 shows the expected treatment performance for TN under varying removal rates and hydraulic loading rates. At the recommended hydraulic loading rate (6 cm/d) and the expected removal rate (12 m/yr) the outflow concentration is expected to be 2.18 mg/L with a mass removal of 4.4 MT/yr.

Table 10. Estimated TN Treatment Performance for the Small Footprint Wetland

Q (cfs)	3.6	7.3	10.9
Q (MGD)	2.3	4.7	7.0
HLR (cm/d)	2	4	6
HRT (d)	15.2	7.6	5.1
k (m/yr)	TN Outflow (mg/L)		
8	1.94	2.18	2.30
10	1.86	2.11	2.24
12	1.80	2.04	**2.18**
14	1.75	1.99	2.13
16	1.71	1.94	2.08

Q (cfs)	3.6	7.3	10.9
Q (MGD)	2.3	4.7	7.0
HLR (cm/d)	2	4	6
HRT (d)	15.2	7.6	5.1
k (m/yr)	Mass Removal (MT/yr)		
8	2.2	2.9	3.2
10	2.5	3.4	3.8
12	2.7	3.8	**4.4**
14	2.9	4.2	4.9
16	3.0	4.5	5.3

Cost Estimate

The cost estimate for the small footprint alternative was developed based on the same premise as the large footprint alternative. Table 11 below presents a summary of the estimated construction costs for the small footprint alternative.

Table 11. Estimated Construction Costs

Category	Cost ($)
Structure Construction	$855,000
Clearing and Excavation	$3,225,000
Administrative Capital Costs	$444,000
Contingency	$452,000
Total Cost	$4,976,000

Table 12 presents the annual operation and maintenance costs for the small footprint alternative.

Table 12. Estimated Operation and Maintenance Costs

Category	Annual Cost ($)
Labor/contractual cost	$15,000
Supplies and equipment costs	$10,000
Administrative costs	$30,000
Utilities	$25,000
Total Cost	$80,000

Estimated Cost Effectiveness

The estimated cost effectiveness for this design is $134 per pound for TP and $15 per pound for TN.

Additional Information Needed

Geotechnical Evaluation

The United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Web Soil Survey (WSS) indicates that the predominate soil types within the project boundary are Felda and Manatee mucky fine sands and Nittaw muck. To further refine the cut fill analysis a geotechnical evaluation would be necessary to provide critical information about the soil morphology. One of the primary objectives of the geotechnical investigation is to determine the suitability of dredge material for use in constructing the treatment cell levees.

Federal Aviation Administration

A preliminary investigation for the feasibility of construction of a proposed wetland flow-way system in regards to Federal Aviation Administration (FAA) and local airport (Orlando-Sanford International Airport [SFB]) requirements and guidelines was conducted.

The FAA Advisory Circular states that proposed projects within a certain radii (separation criteria) of the airport must take into account whether the newly proposed land uses will act as a wildlife attractant, thus increasing the possibility for potential wildlife related hazards to aircraft. The separation criteria are based upon flight patterns, altitudes, proposed land uses, and National Transportation Safety Board (NTSB) recommendations. The radius with least stringent of the criteria is a 5-mile radius from the Airport

Operations Area (AOA) and the most stringent criteria is applied to the 5,000-feet radius. Based on the airport operations a constructed wetland would be evaluated under both radii listed above. The proposed project site is located approximately 4,000-feet east-southeast from the AOA. Because the proposed project site is located within the 5,000-foot radius and the land use (wetlands) is listed in Section 2-4 of the Advisory Circular as one which is typically attractive to many types of wildlife, including many which the FAA considers "hazardous wildlife species", the FAA recommends that the proposed project be analyzed by SFB, the FAA, and a Qualified Airport Wildlife Biologist. A working partnership with the listed entities is recommended by the FAA to develop plans which would not exacerbate existing wildlife hazards.

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