

**INDIAN RIVER COUNTY, FLORIDA
MEMORANDUM**

TO: Jason E. Brown, County Administrator

THROUGH: Richard B. Szyrka P.E., Public Works Director

FROM: Keith McCully, P.E., Stormwater Engineer 

SUBJECT: Recommendation Regarding Construction Bids for Moorhen Marsh Low Energy Aquatic Plant System (Bid #2020030)

DATE: August 11, 2020

DESCRIPTION AND CONDITIONS

In early 2016, the Board of County Commissioners authorized staff to conduct a yearlong pilot plant study in the Indian River Farms Water Control District's North Relief Canal, to determine if it was feasible to construct a regional stormwater and canal water pollution removal system adjacent to the canal, west of 58th Avenue. The completed pilot plant study indicated that a pollutant removal system incorporating water lettuce plants as its main treatment mechanism could remove a notable amount of dissolved nitrogen and phosphorus from the canal water, aiding the County's efforts to meet upcoming pollutant loading criteria to be established by Florida Department of Environmental Protection (FDEP) regarding flows into the Indian River Lagoon.

Subsequently, the County purchased approximately eighteen acres abutting the North Relief Canal at the northeast corner of the intersection of 53rd Street and 66th Avenue. Stormwater Division staff then proceeded to design the Moorhen Marsh Low Energy Aquatic Plant System (Moorhen Marsh). The Moorhen Marsh design represents a realistic utilization of the County's 18.03-acre project site and maximizes yearly nitrogen and phosphorus removal on a per square foot of available property basis. Final design is complete and all major permits secured. The project was bid for construction on June 1, 2020. Bids were received on July 14, 2020. Four bids were received and all four had math errors in the bid form although none of the errors affected mathematical ranking. Bid totals with corrected amounts are:

<u>Bidder</u>	<u>Corrected Bid Amount</u>
Prime Construction Group, Inc.	\$11,966,000.00 – apparent low bid
Allen Concrete & Masonry, Inc.	\$12,455,633.86
WPC Industrial Contractors, LLC	\$13,969,291.39
West Construction, Inc.	\$15,484,093.56

A bid protest was filed on July 21, 2020, by Allen Concrete & Masonry, Inc., claiming Prime Construction Group, Inc. (PRIME) is not a qualified bidder. A copy of the protest letter and the Purchasing Manager's response are included as Attachments A and B, respectfully.

The Engineer's Estimate of Probable Construction Cost was \$10,000,000 which was believed to be conservative. Unfortunately, the construction bids were much higher than anticipated, with the low bid being twenty percent greater than the conservative estimate. This prompted Stormwater Division staff to investigate if other water treatment options or a combination of options, are available that might yield nutrient removal results similar to Moorhen Marsh. Three alternatives were compared to Moorhen Marsh and the analysis is presented in Attachment C and summarized below.

Summary of Moorhen Marsh Alternatives Analysis

Three alternatives (options) were compared to Moorhen Marsh:

- Option 1 – Use a super long reach excavator to harvest water lettuce directly from specific locations in the North and South Relief Canals.
- Option 2 – Construct a basic water lettuce scrubber system on the Moorhen Marsh property.
- Option 3 – Combine Options 1 and 2.

Table 1 ranks Moorhen Marsh and the options with respect to estimated yearly total nitrogen (TN) and total phosphorus (TP) removal and Table 2 ranks them with respect to yearly estimated costs to remove the nutrients.

Table 1 – Nutrient Removal Rankings

	Yearly Nutrient Removal Ranking	
	Total Nitrogen	Total Phosphorus
#1 (Greatest Removal)	Option 3 <i>10,700 pounds/year</i>	Option 3 <i>1,530 pounds/year</i>
#2	Moorhen Marsh <i>7,600 pounds/year</i>	Moorhen Marsh <i>1,200 pounds/year</i>
#3	Option 1 <i>6,000 pounds/year</i>	Option 2 <i>800 pounds/year</i>
#4 (Lowest Removal)	Option 2 <i>4,700 pounds/year</i>	Option 1 <i>730 pounds/year</i>

Table 2 – Nutrient Removal Cost Rankings

	Yearly Nutrient Removal Cost Ranking	
	Total Nitrogen	Total Phosphorus
#1 (Lowest Cost)	Option 1 <i>\$22.13</i>	Option 1 <i>\$181.91</i>
#2	Option 3 <i>\$34.82</i>	Option 3 <i>\$243.52</i>
#3	Option 2 <i>\$46.91</i>	Option 2 <i>\$275.57</i>
#4 (Highest Cost)	Moorhen Marsh <i>\$51.66</i>	Moorhen Marsh <i>\$327.21</i>

Note that using a super long reach excavator (long reach) to harvest water lettuce directly from the North and South Relief Canals only considered the locations listed in Attachment C. It is likely that discussions with IRFWCD can result in identification of additional locations where the long reach excavators could be used in conjunction with IRFWCD's current dragline-oriented canal water lettuce harvesting program. If so, long reach nutrient removal quantities will increase and long reach nutrient costs per pound removed will decrease.

FUNDING

Funding in the amount of \$10,200,000 for Moorhen Marsh is allocated in FY 19/20 and FY 20/21 of the Capital Improvement Element in Acct #31524338-066510-16018, Optional Sales Tax/Public Works/Moorhen Marsh-PC North as allocated in the following:

Funding Source	Amount
Optional Sales Tax/Public Works/CIP-Moorhen Marsh-PC North	\$8,050,000
Legislative Grant	\$ 650,000
SJRWMD-Cost Share Grant	\$1,500,000

Additional funding of \$2,255,633.86 will be required to fund the Moorhen Marsh project if the Board so desires.

The preliminary estimate for the construction of the Basic Water Lettuce Scrubber is \$5,500,000. There is currently sufficient funding allocated in FY 19/20 and FY 20/21 of the Capital Improvement Element to fund construction if the Board so desires.

Funding for purchasing a super long reach excavator (\$280,000) and dump truck (\$180,600) is not currently budgeted. These expenditures can be funded by a budget amendment from Transportation Fund/Cash Forward-Oct 1st to Transportation Fund/Stormwater/Heavy Equipment-Wheel Track, Acct# 11128138-066430 and Transportation Fund/Stormwater/Other Machinery & Equipment, Acct#11128138-066490.

RECOMMENDATION

Reject all bids and implement Option 3: (1) Purchase a super long reach excavator and dump truck funded by stormwater and begin in situ canal water lettuce harvesting with the excavator (Option 1), and (2) authorize design by staff of a basic water lettuce treatment system on the Moorhen Marsh site, followed by its construction (Option 2). Staff also requests authorization to terminate the existing SJRWMD Grant for the project as requested by SJRWMD staff and apply for a new IRL Grant.

This recommendation is based on the following considerations:

- The Moorhen Marsh construction bids are 20 to 25 percent (\$2 million to \$2.5 million dollars) higher than anticipated and staff cannot justify expenditure of such a large amount of capital funds for the project.
- The super long reach excavator can be utilized by IRC Road and Bridge Division when not being used for nutrient removal. This will result in a reduction of nutrient removal

related operation and maintenance costs and therefore, lower the cost per pound of nutrients removed.

- IRC staff discussed with SJRWMD the reallocation of the existing \$1.5 million SJRWMD Cost-Share Grant to the Basic Water Lettuce Scrubber project. SJRWMD staff responded that they would not be able to modify the exist Grant Scope and reallocate the funding for the redesigned project. They requested that the County request to terminate the existing Grant with the District and apply for a new Grant under the IRL Grant Program for the redesign of the project.

- Staff is currently preparing an IRL Grant Program application for submission to SRJWMD under the currently open Grant application process. We believe that due to the higher estimated yearly nutrient removals and lower capital costs provided by Option 3 we will rank high in the Grant application review process.
- By implementing Option 2 as part of Option 3, the 18.03-acre Moorhen Marsh site will still be utilized in a very beneficial manner.
- The estimated Option 3 nitrogen and phosphorus removals exceed the anticipated Moorhen Marsh nutrient removals.
- The capital costs for Option 3 will be significantly lower than the Moorhen Marsh capital costs.
- The existing Moorhen Marsh headworks structure and North Relief Canal discharge designs along with other portions of the existing design can be utilized for a basic water lettuce system, reducing the basic system’s total design time.

ATTACHMENTS

1. Attachment A – Allen Concrete & Masonry, Inc. Protest Letter
2. Attachment B – County Purchasing Manager Letter
3. Attachment C – Alternatives Analysis

DISTRIBUTION

Public Works Stormwater Division
County Attorney Office
Purchasing Division

APPROVED AGENDA ITEM FOR AUGUST 18, 2020