January 20, 2012

Mr. Charles Causey, III
President, Florida Keys Environmental Fund, Inc
PO BOX 448
Islamorada, FL 33036

Subject: **UPDATE TO THE GIS DATABASE DEVELOPED IN 2001-2003 MONROE COUNTY CANAL INVENTORY & ASSESSMENT**
AMEC Proposal Number: 12PROPWATR TASK 0000

PURPOSE

To define the scope and costs associated with updating the existing GIS information for the canal inventory and assessment to current standards of GIS mapping. Provide a cost estimate for implementation of identified treatment technologies.

DELIVERABLES

The core deliverable will be an updated series of maps that will be delivered electronically in ArcGIS version 10.0. The GIS layers will conform to the Albers HARN projection referenced to the North American Datum of 1983 (NAD 83). A letter report will be prepared presenting the results of the treatment technology implementation cost estimate.

BACKGROUND

Residential canals in the Florida Keys were excavated to obtain fill material for the creation of land for development with little regard to canal design or water quality within the canals. Canals had good water quality initially, but as development increased canal water quality decreased. Poor water quality in canals is also a function of length, depth, stratification, sinuosity, organic loading, and lack of turnover by tidal flushing. In 2001, AMEC Environment & Infrastructure, Inc. (fka LAW) under contract with Monroe County developed an inventory of the residential canals, and provided a recommended treatment method for each canal based on assessment data that was gathered during the development of the canal inventory. Since the completion of the canal inventory in 2001, numerous water quality improvement measures have been implemented in the Florida Keys including the removal of septic systems and the installation of water quality control structures in the existing storm water system. The 2001-2003 GIS information was prepared in ArcGIS version 8.1; therefore some of the features and referenced data are not valid in the current GIS software, ArcGIS 10.0. Additionally, the 2001-2003 GIS information was developed using aerial imagery that compared to today's standards would be deemed low resolution. Therefore, the spatial accuracy of the information is below current standards.

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UPDATE THE GIS DATABASE

1. Update the 2003 GIS information to provide full functionality in ArcGIS 10.0.
2. Utilize current aerial imagery to increase the spatial accuracy of the existing information.
3. Review the current aerial imagery, and capture any modifications (creation/destruction) to the canal system for further study. This will include creating two new feature sets, one for new canals that have yet to be inventoried, and one for previously inventoried canals that have been destroyed.
4. Incorporate publically available water quality improvement project information into the GIS inventory; including removal of septic systems and storm water quality improvement structures. Information sources that will be reviewed will include RAD's, Monroe County GIS layers, and national data warehouses (STORET & NRCS Data Gateway).
5. Provide a CD with revised GIS.
6. Develop a letter report highlighting the modifications to the GIS inventory, and suggesting areas of further study if necessary. Additionally the report will recommend a series of canals to implement a feasibility study to evaluate the proposed treatment options.

Subtotal Items #1-7: $6,790.00

DEVELOP A COST ESTIMATE FOR TREATMENT TECHNOLOGY IMPLEMENTATION

7. Develop unit costs for each of the recommended treatment technologies. The unit costs will be developed for the installation of weed gates, backfilling over-dredged canals, and the installation of flow improvement culverts. The unit costs will be structured so that they can be applied to the information in the GIS database for the development of full scale implementation costs.
8. Cross reference the spatial and quantity information provided in the GIS database against the estimated unit cost for each treatment technology to develop full scale implementation costs.
9. Develop a letter report that summarizes the methodology utilized in the development of the cost estimate. Key assumptions and areas of uncertainty will be highlighted to provide a general range of costs that could be realized in the case that full scale implementation of the proposed treatment technologies were to be completed.

Subtotal Items #8-10: $3,180.00

TOTAL ITEMS #1-#10: $9,970.00

FEE

We will perform the above scope of services on a time and materials basis for the not-to-exceed fees listed above. The work can be performed under our existing Monroe County On-Call Engineering Services Contract dated February 17, 2010. **Table 1** provides a detailed breakout by professional service category utilizing the rates in the referenced contract for the subtotaled items shown above. We will not exceed our fee without your authorization for an increase in our scope of services. We will be available to discuss the findings of our

investigation with you as they become available. Invoicing will be done monthly. Payment of the invoice is due upon receipt of our invoice.

SCHEDULE

The updated drawings and summary reports for Items #1-6 can be prepared in 5 weeks from the time of written authorization to proceed with these tasks. The summary report for Items #7-9 can be provided 4 weeks following the completion of the GIS database deliverables.

CLOSING

We appreciate the opportunity to assist you with these services. If you have any questions, please feel free to contact us at your convenience at (305) 826-5588.

Sincerely,
AMEC ENVIRONMENT & INFRASTRUCTURE, INC.

Maggie Tanaka

Stephen Hanks, P.E.
Senior Engineer

SIGNED FOR Stephen Hanks
WITH PERMISSION

Wendy C. Leonard, P.G.
Principal Geologist

Attachments: Cost Estimate

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Table 1
Cost Estimate
Monroe County Canal - Update to Existing GIS Information

Items #1-7 Update to Existing GIS Information					Comments
Labor Title	**Labor Category**	**Contract Rate**	**Estimated Hours**	**Total Cost**	
Principal/Project Manager	A	$155.00	8	$1,240.00	
Senior Engineer, PE	A	$109.00	14	$1,526.00	Summary of Findings Report/Treatment Technology Modification
Staff I	A	$71.00	24	$1,704.00	Monitoring Data Gathering/Report Preparation
CADD/Draftsperson I (GIS Specialist)	B	$66.00	32	$2,112.00	
Admin II	B	$52.00	4	$208.00	
Subtotal Items #1-7				**$6,790.00**	
Items #8-10 Develop Cost Estimate For Treatment Technology Implementation					
Labor Title	**Labor Category**	**Contract Rate**	**Estimated Hours**	**Total Cost**	
Principal/Project Manager	A	$155.00	10	$1,550.00	Includes 4 hours for Mike Phelps
Senior Engineer, PE	A	$109.00	14	$1,526.00	Cost Estimate development/Report preparation
Admin II	B	$52.00	2	$104.00	
Subtotal Items #8-10				**$3,180.00**	
TOTAL PROPOSAL COST:				**$9,970.00**	