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Water Quality Monitoring Project for Demonstration of Canal Remediation Methods Florida Keys

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**WATER QUALITY MONITORING PROJECT FOR
DEMONSTRATION OF CANAL REMEDIATION METHODS
FLORIDA KEYS**

**Report #3: Canal Water Characterization Before Remediation
and Monitoring After Remediation**



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WATER QUALITY MONITORING PROJECT FOR DEMONSTRATION OF CANAL REMEDIATION METHODS FLORIDA KEYS

Report #3: Canal Water Characterization Before Remediation and Monitoring After Remediation

EXECUTIVE SUMMARY

This report serves to transmit a summary of our efforts in the execution of the Water Quality Monitoring Project for Demonstration of Canal Remediation Methods, as per our US EPA Agreement #X7 00D02412. This report consists of this summary along with corresponding datasets generated during field and laboratory measurements. The period of record for this report is September 2015 to March 2016 and includes data from sampling conducted until February 2016. Data from March 2014 to September 2015 are included for comparison and they were presented in a previous report (Briceno and Serna, 2015).

The objective of the project is to provide data needed to make unbiased, statistically rigorous statements about the status and temporal trends of water quality parameters in the remediated canals. The selected restoration technologies and canals for demonstration are as follows:

| Backfilling | Weed Barrier | | | Weed Barrier & Organic Removal | Organic Removal | Pumping | Culvert Installation | | |
|---|-------------------------------------|--|-------------------------------------|--|---------------------------------|--|--|---|--------------------------------------|
| #29 Key Largo Sexton Cove Estates Subdivision | #137 Plantation Key Treasure Harbor | #148 Lower Matecumbe Key Mate-Lido Beach | #287 Big Pine Hollerich Subdivision | #266 Big Pine Doctor's Arm subdivision | #290 Big Pine between Ave I & J | #278 Big Pine. Eden Pines Colony Subdivision | #277 Big Pine Tropical Bay Subdivision | #459 Geiger Boca Chica Ocean Shores Subdivision | #472 Geiger Mobile Homes Subdivision |
| | | | | | | | | #460 Geiger Key | #470 Geiger Key |
| #28 Key Largo | #132 Plantation Key | #147 Matecumbe Key | #293 Big Pine | | | #282 Big Pine | | #458 Geiger Key | |

The remediated canals are paired and compared to another canal (non-remediated canal), which is referred to as the control or reference canal (highlighted in yellow above).

The execution of the project includes two phases: 1) characterization of canal waters before remediation; and 2) monitoring water quality changes after remediation. We have completed the phase of data collection for the characterization stage with two measuring/sampling campaigns. Monitoring stage after remediation in this report consists of several measuring/sampling campaigns. Two new stations were incorporated to the monitoring program, one in canal #460 and one in canal #470 in Geiger Key. As of February 2016, one canal was backfilled (canal #29), a weed barrier was installed on another (canal #137), and a culvert was excavated in another one (canal #472).

Data was gathered using vertical profiles, continuous 24-hour recording (diel) of physical-chemical properties, and water sampling and analysis for nutrients. We deployed multi-sensor, water quality monitoring instruments to measure physicochemical parameter of at least two profiles throughout the water column at each canal, to generate depth profiles of each parameter. We also deployed pairs of YSI sondes to continuously measure physical-chemical variables of water quality during 24-hours. Finally, we collected and analyzed surface and bottom water samples.

Data were made available in the SERC Water Quality Monitoring Network in April 2016 <http://serc.fiu.edu/wqmnetwork/Canals/index.htm> in files as follows:

Diel Tests: DIEL FKC05

Water Quality: Water_Quality_Data_01_02_03_04

Submission of this Report and dataset satisfies all deliverables for the Canal Sub-project required under contract, and therefore this task is complete.