

Restoration of an Urban Waterway Design Build Services for Wagner Creek/Seybold Canal, Miami, Florida

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Background/Objectives. Sevenson Environmental Services (SES), in conjunction with AECOM, provided design-build services to the City of Miami to remove contaminated (dioxin) sediment from arguably the most polluted water body in the State of Florida and a habitat for threatened manatees, Wagner Creek and restore the navigational depth of the Seybold Canal. The total project costs were \$18.4M and over 35,000 CY of sediment was removed. This waterway drains directly into the Miami River. The project's primary objectives were to remove dioxin-contaminated sediments and restore the stormwater capacity to mitigate the decades long flooding impacts from sea level rise, hurricanes, significant rain events, etc., and reduce the risk from spreading contamination in this densely populated historic neighborhood and improve vessel navigation. To focus on protecting public safety and the natural environment of this urban waterway, it was divided into six unique operational sections (OSs), which allowed for sustaining the economy of this thriving mixed-use area along the Miami River District to be maintained during the dredging operations.

Approach/Activities. An innovative approach was needed to allow for a mechanical dredge solution (required by the permit) to comply with the strict environmental and logistical challenges added by time constraints associated with this project. An innovative dredging approach, using custom-built dredge equipment that would minimize impact to the surrounding residential neighborhoods and traverse the limited upland access points, was needed. Our team designed the specialized dredge and marine equipment and built to work in these conditions. Some of the biggest challenges in Wagner Creek, are low water volumes (less than 2-ft in OS-1 and OS-2) and narrow channel widths (less than 30ft). To counter these issues, our team designed a light weight excavator with a 360-degree swing radius to allow for custom-built sediment scows to be utilized in the narrower sections of the creek. Our design team engineered a custom dredge barge (18-ft wide by 18-ft long) and a standard Komatsu PC120 excavator that can be stripped of its undercarriage to reduce weight. The reduced weight allowed the dredge barge to operate in less than 2-ft of water. Also, a 1 CY environmental level cut bucket was built and attached to the PC120. To further improve the production rates, specialized sediment scows with a width of 10-ft (25-CY capacity) were custom built. Similar specialized dredge equipment was custom-built for the wider navigational dredging sections located on OS-6. Our design team engineered a custom dredge barge (30-ft by 40-ft) and a standard Komatsu PC240 excavator with a 3 CY environmental level cut bucket. To comply with the strict turbidity requirements, several techniques, such as multiple turbidity curtains, hydro barriers, and a sheetpile barrier (where the turbidity could not be 0 NTUs above background at the confluence of the Seybold Canal and Miami River) were used. A team of expert biologists was used to mitigate the potential impacts to the endangered manatees for which this water body has been a habitat for decades.

Results/Lessons Learned. The project required frequent interaction with local, state and federal permitting agencies before each OS was started. Involving the agencies early on, prior to starting each OS, was instrumental and critical. Two examples include switching from working days to night in the vicinity of Jackson Hospital/Level 1 Trauma Center (addressing

concerns related to manatees) and developing an approach in Seybold Canal to maintain 0 NTUs above background for turbidity monitoring. The specifications also called for dredging, and processing/stabilization of sediment along the shoreline adjacent to the Creek/Canal. The Team's approach moved the processing/stabilization activities to an offsite staging area located away from houses and in an industrial area minimizing the impact to the local community.