

TOWN OF SUNSET BEACH  
2016 SHORELINE MANAGEMENT AND PRE-DREDGE ANALYSIS  
PHASE 2 - DESIGN

PROGRESS REPORT DATE  
DECEMBER 9, 2016

**Report Period: November 01 thru November 30, 2016**

The items below provide a description of key elements related to the current progress, including outstanding items and anticipated resolutions, for completing the work known as Town of Sunset Beach, 2016 Shoreline Management and Pre-Dredge Analysis, Phase 2 - Design.

**Acronyms:** M&N – Moffatt & Nichol  
NCDEQ – North Carolina Department of Environmental Quality  
NOAA – National Oceanic & Atmospheric Administration  
USACE – US Army Corps of Engineers (Wilmington District)  
USFWS – U.S. Fish & Wildlife Service.

**Phase 1 – Feasibility Analysis** (100% complete)

**Items Previously Completed:** (100%)

The Town of Sunset Beach (Town) and M&N initiated a contract on February 19<sup>th</sup> to study the feasibility of conducting approximately 3.5 miles of navigation dredging within the Town limits. The work areas include Mary's Creek, Turtle Creek, Jinks Creek, the North Shore Drive feeder and adjoining finger canals and the Canal Drive bay area. The results of the analysis were positive and the Town elected to move forward with the design and modeling of the proposed work on June 7<sup>th</sup>. The design work was authorized to begin July 1, 2016.

**Phase 2 –Design** (83.58 % complete)

**Items Previously Completed** (78.40 %)

**1.0 Project Coordination**

- The Town of Sunset Beach authorized M&N to begin the design work on July 1, 2016. The first priority was to secure a Water Resource Development Grant through the State's Shallow Draft Navigation Fund. The grant was secured on August 1 and reimburses the Town 2/3's of the project cost up to \$2,779,327.
  
- The Town is considering available alternatives for beneficial reuse of any dredge material. This includes beach placement for cost share potential with Ocean Isle or dune restoration adjacent to Bird Island for storm protection and habitat restoration. In addition, the dredge material may also be used for a possible living shorelines project to restore marsh or intertidal habitat for invertebrates and shorebirds. Figure 1 below shows potential sites for a marsh restoration project between Mary's and Turtle Creek and along the causeway entering the island of Sunset Beach. The potential to use the dredge spoil for a marsh restoration project option will be discussed at the next agency coordination meeting and then with the Town to decide a path forward.

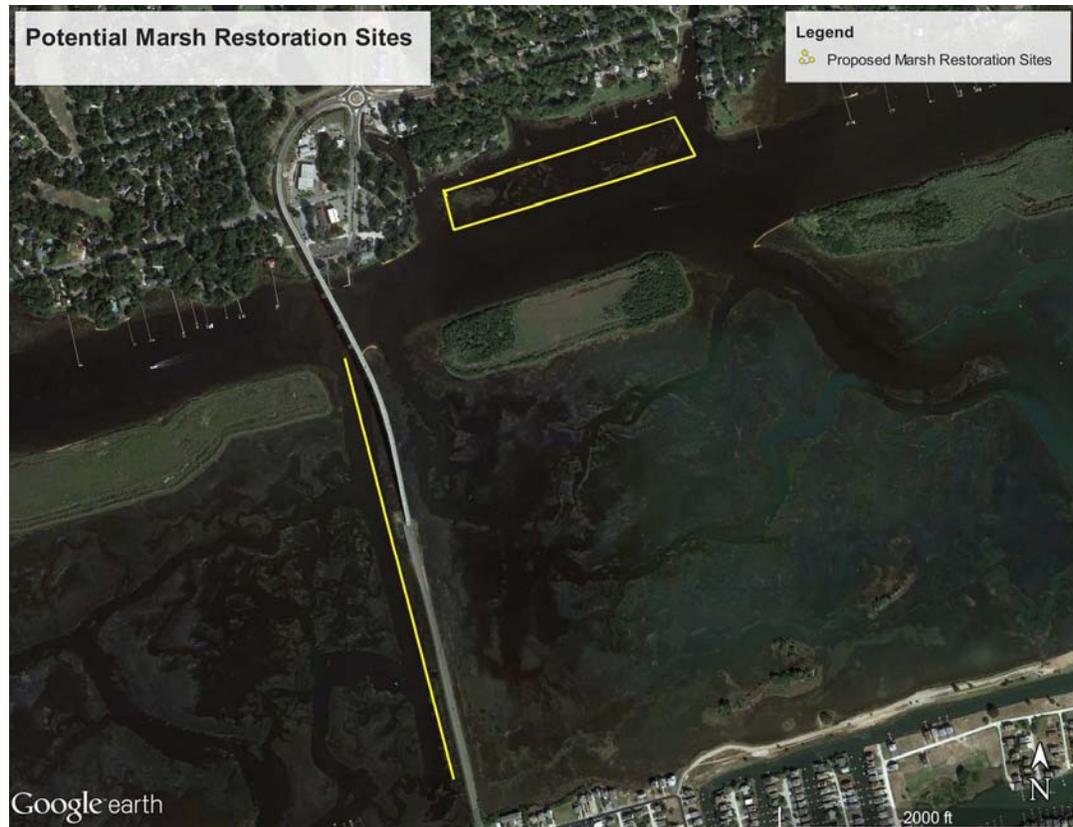


Figure 1. Proposed Marsh Restoration Sites

## 2.0 Refined Design

- M&N provided a proposed channel alignment for each work area within the project along with a dredge volume estimate on October 24<sup>th</sup>. The list below identifies the work areas and the necessary volume of material that would need to be dredged from each, based on the proposed alignments.
  - Jinks Creek: 115,000 CY
  - Bay Area: 26,000 CY
  - Feeder Channel & Finger Canals: 35,000 CY
  - Mary's Creek: 8,000 CY\*
  - Turtle Creek: 8,000 CY\*(The volume estimate for Mary's & Turtle Creek comes from a revised alignment provided to the Town on October 31<sup>st</sup>.)

The alignments concentrate on providing adequate navigation access for the residents of Sunset Beach while also minimizing potential impacts to environmentally sensitive lands. The alignments also focus on maintaining a 5 ~ 10 ft clearance from any existing piling or seawall. The clearance will help the Town establish a pier head alignment for future development (where applicable) and also help avoid any potential damage to the structures as a result of the construction process.

- The alignments were developed with the assistance of a modeling analysis to identify potential impacts that may occur as part of the dredging activity. The modeling analysis assumed a worst case or maximum dredge footprint of 100 ft. wide a 7 ft deep throughout Jinks Creek and evaluated the project's potential to alter the existing tidal velocities and sediment transport trends. The analysis concentrates on the trends expected near the AIWW confluence with Jinks Creek, the 'S' curve within Jinks Creek, and Tubbs Inlet. . The results indicated no significant change should occur in the tidal velocities, or sediment transport as

a result of the worst case dredging scenario. A final analysis will be conducted to show the recommended alignment after the Town and residents review the proposed alternative. A modeling report will then be prepared to summarize the results for the Town and resource agencies.

### 3.0 Sediment Testing

- Catlin Engineers provided an initial report on the sediment analysis required to help define ‘compatible’ and ‘non-compatible’ material on October 3<sup>rd</sup>. The report will be used to classify the sediment characteristics of the dredge material and help determine how to best handle the dredge material.

Review of the report suggested that additional sediment samples would be necessary to complete the analysis. As a result, Catlin reinitiated efforts to collect the samples and completed the additional field work on October 26<sup>th</sup>. A laboratory analysis must still be conducted on the samples, and is expected to be completed by late November.

Based on initial review of the sediment data approximately half of the dredge material classifies as non-compatible material. The table below shows the compatible and non-compatible material for each dredge area. The results may be revised base on the additional sediment analysis currently being conducted.

<b>Dredge Area</b>	<b>Compatible (CY)</b>	<b>Non-Compatible (CY)</b>	<b>Total (CY)</b>
Jinks Creek	100,000	15,000	115,000
Bay Area	-	26,000	26,000
Feeder Channel & Finger Canals	-	35,000	35,000
Mary’s Creek	-	8,000	8,000
Turtle Creek	-	8,000	8,000

### 5.0 Oyster Survey

- M&N completed the field work required for the Oyster Survey of Mary’s & Turtle Creek on October 19<sup>th</sup>. The initial results indicate minimum presence of oysters within the ‘proposed’ dredge alignments for both creeks. However, significant resources are present outside of the dredge alignment within the intertidal areas of each creek. Once the data has been reviewed a final report will be provided to the Town and resource agencies for additional discussion. The Town may be required to relocate any oyster resource identified within the dredge alignment.

**Progress this Period:** (5.18 % of total task)

#### 1.0 Project Coordination

- The Town held a Public Meeting on Saturday, November 12<sup>th</sup> for M&N to present the channel design details to the property owners and interested parties of Sunset Beach. Information was provided regarding the dredge depth’s and dimensions for each project area. The next step is to provide the same details to the permitting agencies to determine an equitable design for the project. An agency coordination meeting should occur in January to discuss the project options.

#### 2.0 Refined Design

- M&N completed an assessment of the refined design in early November. The design may be revised based on comments received from property owners or the permitting agencies after their review. The design may also be revised based on the final results of the sediment analysis expected in December.

### 3.0 Sediment Testing

- Catlin Engineers completed the analysis of the additional sediment samples of December 9<sup>th</sup>. A final report of the samples acquired will be provided to the Town in December. The report will include photographs of the sediment samples along with grain size analyzes for each sample. M&N will incorporate the additional sample results into the project analysis to quantify the ‘compatible’ and ‘non-compatible’ material within the proposed channel alignments.

### 4.0 USACE Disposal Locations

- M&N initiated efforts to designate a USACE material placement island along the AIWW. Most likely the USACE, the Town, and M&N will need to conduct a site visit to identify which island provides the most economical option based on the islands current condition and the sediment volume required for placement. Based on the initial assessment 3 potential disposal islands may be suitable for the project. Figure 2 shows the designated islands as site 308, 310, & 312. The designations were provided by the USACE as a labeling system for each disposal island.



Figure 2. Potential USACE Material Placement Islands

### 5.0 Oyster Survey

- Worked continued to complete the report for the oyster survey. Efforts concentrated on QA/QC reviews and methodologies to estimate the quantity of oysters that may be present in the dredge footprint, as opposed to within the respective creek (Mary’s or Turtle).

### 7.0 Conceptual Cost Estimate

- M&N initiated efforts to further develop the construction cost estimate for the project. M&N contacted multiple dredge contractors to discuss the project and to confirm construction techniques / assumptions and theoretical costs. A more definitive estimate will be provided once all of the design details have been resolved. This not expected until after the next agency coordination meeting.

## **Outstanding Items and Anticipated Completion Dates:**

### 1.0 Project Coordination

- The feasibility and permitting constraints of constructing a marsh restoration project along the island between Mary's & Turtle Creek will be discussed with the Town and the resource agencies. Based on the resulting comments, the marsh restoration project may be incorporated into the sediment management plan. A conceptual marsh restoration project will be discussed at the next agency coordination meeting.

### 2.0 Refined Design

- After the Town and residents have an opportunity to review and discuss the proposed dredge alignments M&N will revise the alignments as appropriate and provide them for review by the resource agencies. The Jinks Creek modeling analysis report will also be provided for review to the Town and resource agencies. The information will be discussed at the next agency coordination meeting anticipated in January 2017.

### 3.0 Sediment Testing

- The additional sediment data provided by Catlin Engineers must be reviewed and incorporated into the sediment analysis to determine the 'compatible' and 'non-compatible' material. The design may then be adjusted based on comments from the Town in efforts to minimize the dredging of non-compatible material to help reduce construction costs.

### 4.0 USACE Disposal Locations

- The inspection of the USACE material confinement islands has been delayed to review the volume of non-compatible material requiring placement. Inspection of the potential placement islands will occur after review of the sediment analysis report. The inspection results are anticipated to be provided to the Town in January 2017.

### 5.0 Oyster Survey

- The oyster survey report will be finalized in December 2016 and circulated for discussion to the Town and resource agencies. The information will also be discussed at the next agency coordination meeting anticipated in January 2017.

### 6.0 Agency Coordination Meeting

- M&N will request a second Agency Coordination Meeting to present and discuss the dredge alignments, modeling results, and any potential mitigation requirements with the state and federal agencies. The meeting is anticipated to occur in January 2017. Based in-part on the results of this meeting, the Town will determine if moving forward with the project is appropriate.

### 7.0 Conceptual Cost Estimate

- M&N will provide an updated construction cost estimate for the proposed dredging based on the accepted design of the project. The cost estimate will be provided as the final task for the design phase and is anticipated in February 2017.

**TOWN OF SUNSET BEACH  
2016 SHORELINE MANAGEMENT & PRE-DREDGE ANALYSIS - DESIGN PHASE**

**PROGRESS REPORT  
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**Progress Schedule**

Tasks	2016												2017												2018								
	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept						
Pre-Dredge Analysis Design Phase																																	
Project Coordination					→																												
Public Meeting					●																												
Refined Design					→																												
Modeling Analysis					→																												
Sediment Testing					→																												
Hydrographic Survey					●																												
USACE Disposal Locations					→																												
Oyster Survey					→																												
Agency Coordination Meeting																																	
Conceptual Cost Estimate					→																												

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