

Town of Sunset Beach Navigation Project Maintenance Dredging of South Jinks Creek, the Bay Area, & the Feeder Channel Project Narrative

INTRODUCTION

The Town of Sunset Beach (Town) intends to conduct navigational dredging in the water bodies known as south Jinks Creek, the Bay Area, and the Feeder Channel. Sunset Beach lies in Brunswick County, along the southern coastal border of North Carolina, adjacent to Ocean Isle Beach. The proposed project will occur along the eastern border of Sunset Beach, within the interior waters of Tubbs Inlet. Figure 1 shows the proposed project area in relation to Brunswick County.

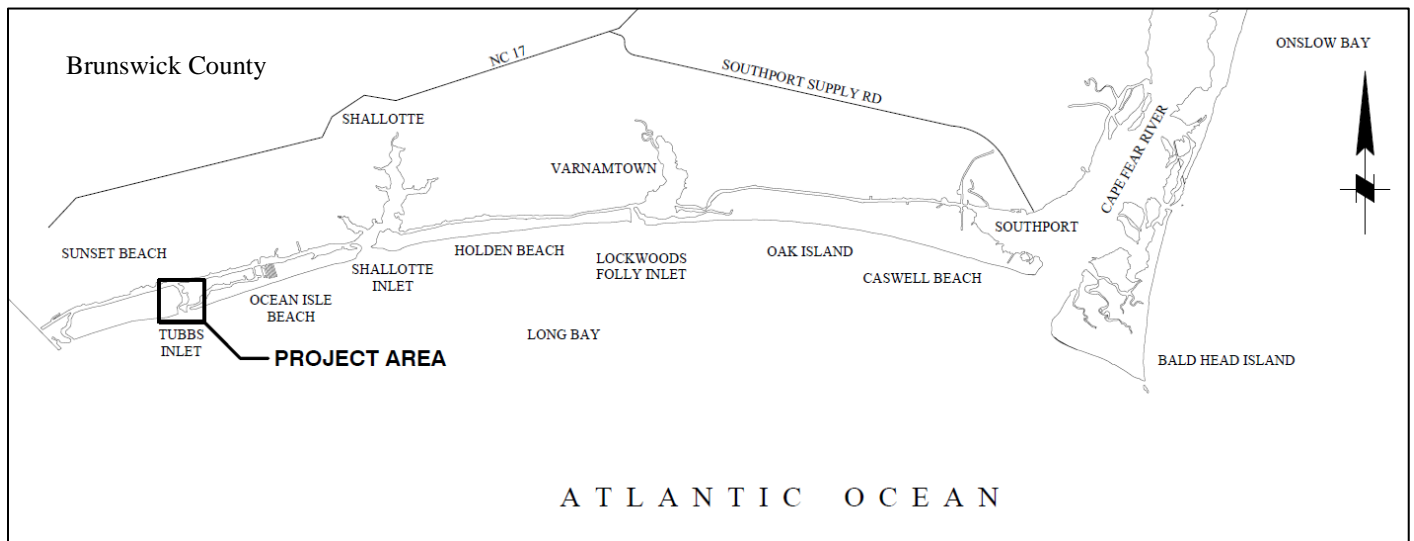


Figure 1. Project Vicinity Map

South Jinks Creek comprises a portion of the Jinks Creek connector channel that extends from the Atlantic Intracoastal Waterway (AIWW) to Tubbs Inlet and the Atlantic Ocean. The navigation project in south Jinks Creek will connect the Bay Area and Feeder Channel systems along the southeast portion of Sunset Beach. The Bay Area entails one (1) residential canal and the Feeder Channel system includes one (1) main channel connected to four (4) residential finger canals referenced as Canals A – D. The project will help restore navigation access within these systems while also helping to restore access along Jinks Creek’s eastern most shoreline within the Town’s jurisdictional limits.

An estimated 40,500 cubic yards (CY) of beach compatible material will be dredged from S. Jinks Creek, and an additional 48,600 CY of non-compatible material will be removed from the Feeder Channel system and Bay Area. The beach compatible material will be hydraulically placed as beneficial reuse along approximately 1,600-ft of shoreline between 5th Street and 12th Street on Sunset Beach. The beneficial reuse material will provide an approximate 275-ft wide average berm with a maximum height of +9.0 MLW (6.1 NAVD). The non-compatible substrate will be mechanically dredged and placed at a permitted upland landfill facility. Figure 2 shows the work areas and estimated dredge volumes along the east end of Sunset Beach.

The average depth in the Feeder Channel and Bay Area systems will be increased from approximately -2 to -3 MLW to -5 (-4+1) and -6 (-5+1) MLW. The Feeder Channel and Bay Area will be dredged to a depth of -6 (-5+1) MLW and finger canals A-D will be dredged to -5 (-4+1) MLW. The Feeder Channel extends approximately 3,500-ft and each of the four (4) finger canals A-D extend approximately 800 feet (3,200-ft

total). The Feeder Channel dredge template varies in width between 30-ft and 40-ft, excluding the 3:1 side slopes. The Feeder Channel commences with a 40-ft width at the confluence with S. Jinks Creek and reduces to a 30-ft width approximately 1,200 feet within the channel. The Feeder Channel maintains the 30-ft width for approximately 2,300 feet, until transitioning into Finger Canal A. Each of the four (4) finger canals maintain a constant width of 20-ft and 3H:1V side slopes. Similar to the Feeder Channel, the Bay Area template maintains a 3H:1V side slope throughout its full 2,200-ft length. The Bay Area template maintains an 80-ft width for approximately 600 ft and then transitions to a 40-ft width over approximately 200 feet. The template continues at the 40-ft width for approximately 300-ft and then transitions to a 20-ft width for the remaining approximate 1,100 feet of the template.

South Jinks Creek will be dredged to a depth of -6 (-5+1) MLW while maintaining a 100-ft base width. The south Jinks Creek template will differ from the Feeder Channel and Bay Area in respect to the side slopes. The S. Jinks Creek template side slopes will maintain a 5H:1V grade throughout its approximate 1,750 ft length. Table 1 provides a summary of the dredge templates for S. Jinks Creek, the Bay Area, and the Feeder Channel system.



Figure 2. South Jinks Creek, the Bay Area, and Feeder Channel Work Areas

The dredging operations will be conducted during the months of November 16th thru April 30th to reduce the potential for environmental impacts. In addition, the dredge footprint will be minimized to provide a minimum 10-ft buffer from any coastal marsh identified at the time of construction. The 6,500-ft hydraulic pipeline carrying the beneficial reuse material dredged from S. Jinks Creek will also be positioned away

from any established dune or beach vegetation. These items are a few of the precautions proposed to help minimize the potential for environmental impacts on this project.

Table 1 – Dredge Template Description

Area	Existing Avg. Depth (MLW-ft)	Proposed Depth (MLW-ft)	Length (ft)	Width (ft)	Side Slope (H:V)	Est. Volume (CY)	Placement Location
Feeder Channel	-3 MLW	-6 (-5+1) MLW	3,500	30 – 40	3:1	22,000	Landfill
Finger Canals A-D	-2 MLW	-5 (-4+1) MLW	3,200	20	3:1	10,700	Landfill
Bay Area	-2 MLW	-6 (-5+1) MLW	2,200	20 – 80	3:1	15,900	Landfill
S. Jinks Creek	- 1.5 MLW	-6 (-5+1) MLW	1,750	100	5:1	40,500	Beneficial Reuse (5 th -12 th St)
TOTAL			10,650	Varies	Varies	89,100	Varies

All of the proposed work areas have previously been dredged. However, only the Feeder Channel and adjoining finger canals have previous identified state and federal permits. The dredging plan for the Feeder Channel system generally maintains consistency with the previous permits. However, the dredge depths have been altered slightly to account for an overdredge tolerance and the template has been shifted to follow the existing deep-water path. The dredge template has also been extended within finger canals A-D to restore access to the complete navigable canal system. Although the proposed plan extends the work area in the finger canals, the final dredging footprint will most likely be reduced due to the established coastal marsh.

Due to some of the precautions taken to help avoid environmental impacts, the maintenance dredging request is not consistent with the North Carolina Administrative Code (NCAC) 15 A 07H.0208 (b) (F). Based on agency feedback, the Town intends to request a variance of the referenced administrative code from the North Carolina Coastal Resources Commission (CRC) with agency support. The variance will request the authorization to maintenance dredge the referenced work areas without providing a connection to the adjacent AIWW or Atlantic Ocean at an equal or greater depth. The Town removed the deep-water connection through north Jinks Creek in efforts to avoid existing shellfish habitat.

PROJECT PURPOSE, NEED & SCOPE

In recent years, south Jinks Creek has incurred significant shoaling perceivably from tidal flows entering Tubbs Inlet. In addition, the Bay Area and Feeder Channel system, which were developed for recreational boating access, have been subject to infilling from adjacent upland run-off and erosion as well as wind and wave action. The shoaling and material infilling experienced by each waterbody has constricted navigable access in regards to the available width and depth. The current governing width of south Jinks Creek for navigation equals approximately 10 feet and the governing depth is above MLW. The Feeder Canal system and Bay Area are generally not constricted by width, but both maintain a governing depth between -2-ft and -3-ft MLW. The current shoaling patterns appear likely to continue and could potentially sever recreational access in each of the referenced work areas.

The maintenance dredging will remove approximately 89,100 CY of mixed beach compatible and non-compatible material. The beach compatible material will be placed as beneficial reuse along approximately

1,600-ft of shoreline between 5th Street and 12th Street to enhance an approximate 275-ft wide berm at elevation +9 MLW (+6.1 NAVD) on Sunset Beach. However, the non-compatible material will be excavated and trucked to an upland permitted landfill facility. Table 2 shows the material quantity estimated for removal from each work area:

Table 2. Estimated Dredge Volumes and Placement Locations

Work Area	Dredge Quantity	Sediment Classification	Placement Location
Feeder Channel & Finger Canals	32,700 CY	Non-Compatible	Upland
Bay Area	15,900 CY	Non-Compatible	Upland
South Jinks Creek	40,500 CY	Beneficial Reuse	Between 5 th & 12 th St on the Sunset Beach shoreline
TOTAL	89,100 CY		

Note: Estimated volumes include the 1-ft tolerance for maneuvering the dredge equipment.

The dredge template provides a 1-ft tolerance below the design depths to maneuver the dredge equipment in a manner sufficient to complete the work. Therefore, the maximum dredge depth for the maintenance operations equals – 6-ft (-5+1) MLW within south Jinks Creek, the Bay Area, and the Feeder Channel. The maximum dredge depth decreases to -5-ft (-4+1) MLW within finger canals A-D, which adjoin to the Feeder Channel. Tab F (Permit Drawings) provides detailed drawings of the proposed work.

CONSTRUCTION METHODS

The construction methodology will vary for each work area based on the dredge material composition. The methods implemented for south Jinks Creek will vary from the methods used for the Feeder Channel system and the Bay Area as described below.

South Jinks Creek

The material within south Jinks Creek will be hydraulically dredged and placed along the shoreline between 5th Street and 12th Street on Sunset Beach. The material will be used to enhance a 1,600-ft long and 275-ft wide beach berm system and will be placed to a maximum elevation of +9.0-ft MLW (+6.1-ft NAVD). The south Jinks Creek material meets the minimum standards required for beneficial reuse in accordance with the NC standards for beach compatibility. A total of 26 sediment samples were collected from the proposed dredge area (borrow area) in efforts to define the beach compatible material. The calculated sediment characteristics from the dredge area were compared with composite characteristics of 65 samples analyzed from the recipient beach. Table 3 below shows the analysis results for the dredge material and recipient beach in accordance with the NCAC 15a 07h.0312. Tab G (Sediment Analysis) shows additional detail for the grain size analysis including the sediment collection sites and individual gain size analyses for each sample.

Table 3. Sediment Comparison (South Jinks Creek & Recipient Beach)

Analysis Area	Gravel (%)	Granular (%)	Sand (%)	Fines (%)	Calcium Carbonate
South Jinks Creek	0.00%	0.00%	96.63%	3.37 %	16%
Recipient Beach	0.07 %	0.55 %	98.15%	1.23%	2%

Note: Sediment classifications determined in accordance with NCAC 15a07h.0312.

The hydraulic dredging work will be conducted on a 24-hr per day schedule by a cutterhead dredge between November 16th and April 30th, in accordance with the USFWS August 2017 Statewide Programmatic Biological Opinion (SPBO). The beneficial reuse material will be transported through an approximate 6,500-ft hydraulic pipeline for beach placement. Floating pipeline will most likely be required immediately behind the hydraulic dredge plant and will have reflectors or lights as recommended by the USCG. Once the floating pipeline traverses landward of the MHW line, it will not be allowed to meander back into navigable waters. However, the shore pipe may be forced to cross navigable waterways at the Bay Area and Feeder Channel confluence with Jinks Creek. The pipeline will be anchored to the channel bottom to avoid a marine hazard at each crossing. The pipeline will also cross the waterways perpendicular to the directions of travel to minimize the pipeline length within the navigation channel. The pipeline will be anchored in the deepest depth available to not block navigation and will have buoys attached approximately every 25-feet along each crossing. Signage will also be provided and visible from both directions of travel to mark the pipeline crossing.

Along the beachfront, the pipeline will be located as close to the dune as reasonable without traversing over beach grass or other established vegetation. Markings shall be installed along the pipe to warn beach goers to use caution around the pipeline and to remain off the equipment. Sand ramps will also be constructed at each designated beach access for pedestrian crossings. The ramps may also be used for emergency beach access by the Town or construction related access for the Contractor.

The beneficial reuse material placement will occur directly on the sandy beach, seaward of the primary dune system. Sand dikes, or berms will be constructed as needed to help limit turbidity. The dikes will be constructed parallel to the beach front to direct the dredge slurry along the beach. This process will allow the beneficial reuse material to settle on the beach instead of entering the Atlantic Ocean. In addition, the project will implement the recommended SPBO conservation measures listed in Tab H (SPBO Conservation Measures).

Feeder Channel, Finger Canals, & Bay Area

Dredging operations in the Feeder Channel, including the adjoining finger canals A-D, and the Bay Area will be conducted by a clamshell or bucket dredge / excavator also between November 16th and April 30th. Dredging activities for the mechanical equipment will extend through day light hours but will not entail night time operations. Material will be dredged from the respective waterbody and placed on a barge or other floating work plant. The material will be transported to an offloading site designated at the end of Cobia Street within the Feeder Channel. The material will then be placed in a truck or carrying apparatus for transportation to the upland landfill facility. A backhoe or excavator will move the material from the barge to the truck or other hauling equipment. The trucks or hauling equipment shall be configured to prohibit spillage during material transport. The roadways or travel ways used for material transport shall be inspected during and after each delivery to the landfill site. Any spillage noted shall be immediately cleaned and removed from the roadways. In addition, any equipment found to be continuously leaking material onto public roadways shall be removed from the project until such time repairs or modifications can be made to facilitate clean and spill fill material transport.

Figure 3 shows the material offloading site on Cobia Street. The material offloading site entails a Town owned road and the Town supports its use for the project. In addition, Tab F (Permit Drawings) shows the final material placement site and permitted landfill on Old Georgetown Road (State Road 1154). Tab I (Consent Agreement) provides a consent of use letter for the landfill site. As indicated in Tab I (Consent Agreement), a formal and legally binding agreement will be negotiated between the Town and the facility

owner prior to project commencement. In addition, DCM representatives will be invited to inspect the landfill facility prior to construction.

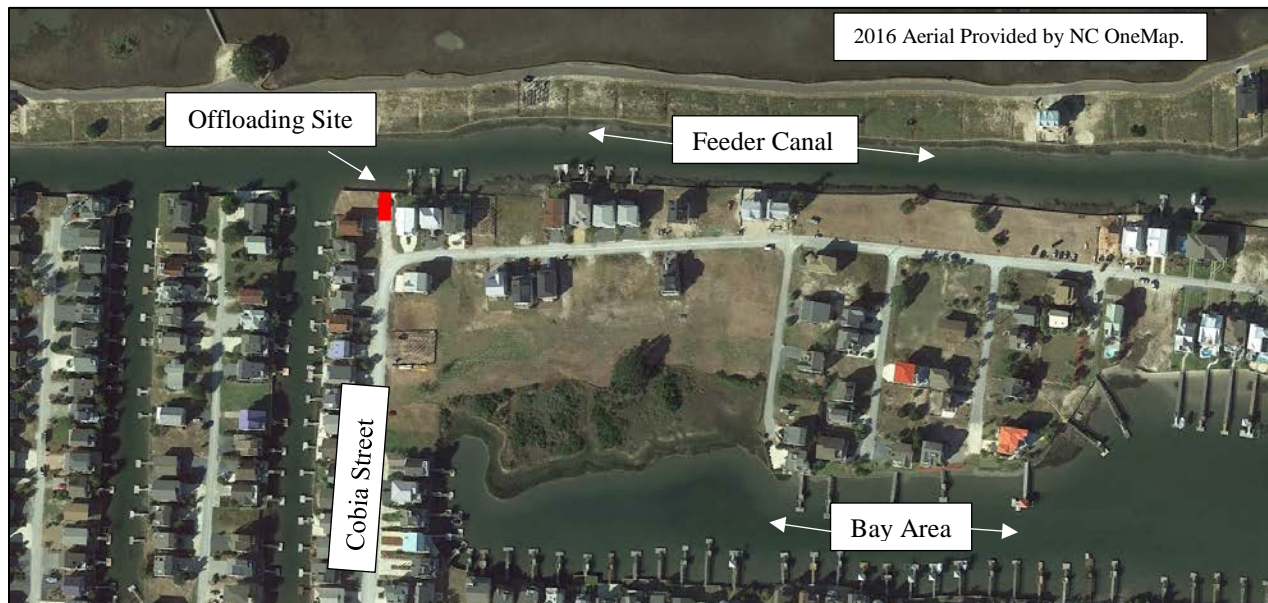


Figure 3. Material Offloading Site

CONSISTENCY WITH PREVIOUS PERMITS

The proposed work generally maintains consistency with previous permits issued for the maintenance dredging of the Feeder Channel. The first maintenance for the feeder system occurred in 1985 under CAMA permit 211-85 and a subsequent maintenance occurred in 2002 under CAMA 45-02. Tab J (Previous Permits) provides a copy of CAMA permit 45-02.

Alterations from the previous 2002 permit include increasing the maximum dredge depth from -5.2-ft MLW to -6-ft (-5+1) MLW in the Feeder Channel system. Permit 45-02 (2002) fails to provide an overdredge tolerance for the dredging equipment to conduct the work and establishes a design depth of -5.2-ft MLW. To compensate for this action, the current plan raises the design depth to -5-ft MLW in the Feeder Channel and provides a 1-foot overdredge tolerance. Thus, the maximum dredge depth (deepest) in the Feeder Channel equals -6-ft (-5+1) MLW.

The dredge alignment within the Feeder Channel and finger canals A-D has also been altered in the current proposal. West of station 20+00, the Feeder Channel dredge alignment deviates from Permit 45-02 in attempts to follow the existing deep water path back to the terminus of Finger Canal A. The change in alignment helps reduce the required dredge volume necessary to complete the project and also helps avoid the existing marsh grass located between stations 20+00 and 13+00, as shown in Tab F (Permit Drawings). East of station 20+00, the Feeder Channel template maintains consistency with permit 45-02 and an existing pier head alignment adopted by the Town. Tab K (Ex. Pier Head Alignment) provides the existing pier head alignment and Tab J (Previous Permits) provides permit 45-02. The pier head alignment mimics the design for the 2002 maintenance event and extends from S. Jinks Creek to approximately Cobia Street (station 20+00).

The template alteration in the finger canals entails reducing the base width down to 20 feet. This represents a reduction from the 2002 permitted template, which provided a varying width between 20-ft & 30-ft. The reduction in width reflects the available clearance between the existing docks. In many instances, the

navigable waterway through canals A-D extends approximately 20-ft due to residential docks encroaching into the navigable channel. Although the docks may be moved by the private homeowners to help facilitate construction, expectations suggest the docks would be returned to their original position after the maintenance event. Therefore, there would be little public benefit in providing more than a 20-ft channel through the residential waterway.

Another alteration from permit 45-02 includes the extension of the dredge footprint approximately 50-ft in each of the four (4) finger canals. The template has been extended to include the complete navigable waterway in each of the finger canals. The channel terminus has experienced significant sediment accumulation due to storm water runoff and minimal tidal flushing. However, to help avoid potential impacts to established marsh grasses, the vegetation boundary will be mapped prior to construction. The boundary will be incorporated into the construction documents and the dredge template will be revised to provide a minimum 10-ft buffer from any marsh. Therefore, the actual dredge template will be dependent on the established grasses at the time of construction.

This will be the first known maintenance event for south Jinks Creek and the Bay Area since the original dredging believed to be in the early 1970's¹. The initial dredging presumable occurred as part of a relocation project for Tubbs Inlet and the development of Sunset Beach. The action occurred prior to 1974 and the establishment of the Coastal Area Management Act (CAMA), so the action did not require a CAMA major permit authorization. Figures 4 and 5 show aerial photographs from 1966 and 1974 depicting before and after conditions of the initial dredging event.



Figure 4. Tubbs Inlet 1966 (Originally printed in Cleary & Marden, 1999)

¹ Cleary, W. J. and Marden, T. P. 1999. *Shifting Shorelines: A Pictorial Atlas of North Carolina Inlets*. North Carolina Sea Grant. Raleigh, North Carolina.



Figure 5. Tubbs Inlet 1974 (Originally printed in Cleary & Marden, 1999)

VARIANCE REQUEST TO RULE 15A NCAC 07H.0208 (B) (F)

The Town of Sunset Beach will be seeking a variance request from 15A NCAC 07H.208 (b)(F) in order to minimize impacts to potential shellfish habitat. The referenced administrative code requires the connecting waterbodies of a maintained navigation channel to be at least as deep as the dredge area. The original intent for this maintenance dredging request included a connection to the AIWW through north Jinks Creek. The governing depth of north Jinks Creek resides at approximately -2 ft MLW and the proposed maintenance operations will dredge to -6 ft (-5+1) MLW. Figure 6 shows the current (2016) water depths (elevations) of Jinks Creek and the surrounding waterbodies.

Due to the shellfish presence in north Jinks Creek, the State resource agencies indicated a permit would be difficult to authorize with the inclusion of the AIWW connection through north Jinks Creek. Therefore, the Town has removed north Jinks Creek from the current plan to avoid the potential impacts. Tab L (Jinks Creek Shellfish Survey) contains results of a shellfish survey sponsored by the Town to document the existing species presence within north Jinks Creek. The Town has also strayed away from attempting to establish a deep water connection through Tubbs Inlet due to the increased potential for environmental impacts associated with inlet maintenance and the increased project costs.

DCM staff have suggested they would support a variance request to the CRC to help satisfy the NCAC requirements. DCM and the Town recognize the need to protect the water quality in south Jinks Creek and understand removing north Jinks Creek from the dredge template creates additional concerns. However, the project has a proven success record with no known occurrence of impacts from the original dredging around 1970 or the 2002 maintenance event. Although the north Jinks Creek water depths in 2002 are not clear, records do not indicate north Jinks Creek has experienced significant changes since this period. Figure 7 below shows an aerial comparison of Jinks Creek between January 2000 and January 2017. The figure generally shows the alignment and width of north Jinks Creek has remained consistent between 2000 and 2017. Therefore, assuming the depths also remained relatively consistent, the maintenance work in 2002 for the Feeder Channel would also have dredged deeper than the connecting waters to the AIWW. Since no known impacts were recorded from that event, indications suggest the current maintenance operations will also not create any adverse impacts.

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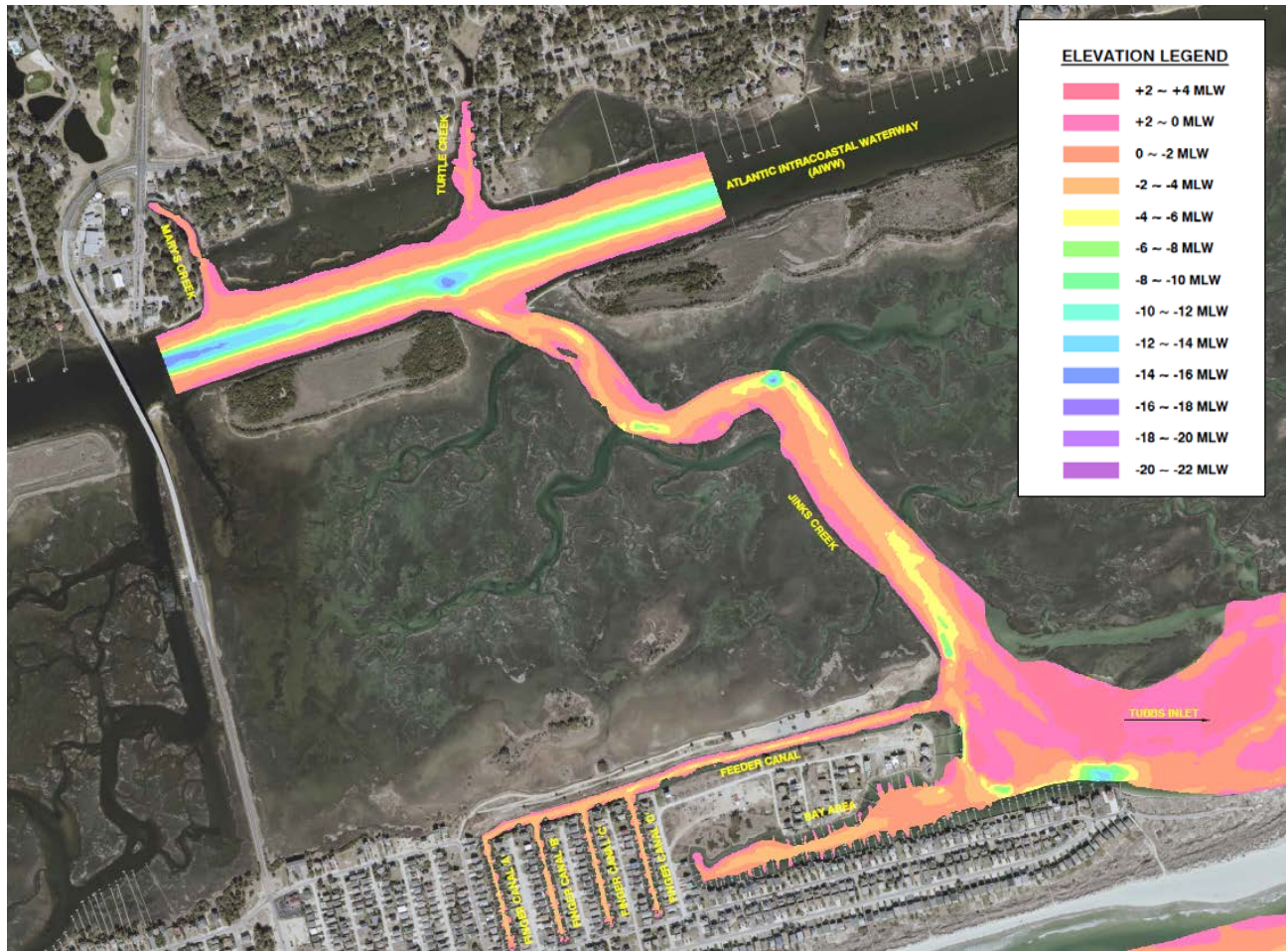


Figure 6. 2016 Elevations for Jinks Creek and Surrounding Waterbodies

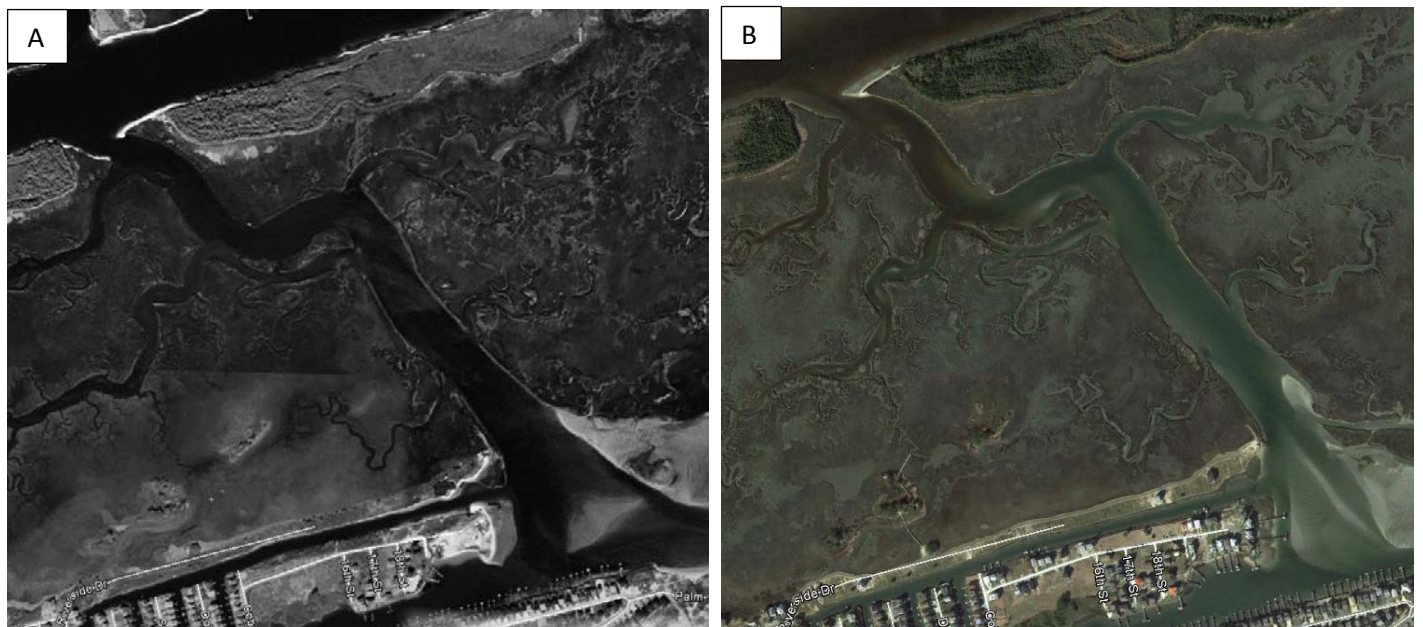


Figure 7. Aerial Comparison of North Jinks Creek (a) January 2000 and (b) January 2017 (Images provided by Google Earth)

The current bathymetry of Jinks Creek also suggests removing north Jinks Creek from the work plan will not create adverse water quality conditions for the surrounding aquaculture. Although the controlling depth in north Jinks Creek equals approximately -2-ft MLW, several deep water crevices exist along the channel. The crevices most likely formed from tidal velocities scouring sediment from the dominant flow way. Figure 8 shows the most prevalent instance in Jinks Creek where the creek bed elevations drop well below the proposed dredge depths for this project. The example shown within the 'S' curve alignment at approximate station 27+00 in north Jinks Creek reaches approximately -14-ft MLW. From visual observations, this location provides a very efficient fishing location as observed during multiple site visits during summer 2018. Tab F (Permit Drawings) shows the existing (2016) creek bed elevations for north Jinks Creek as well as the complete work area.



Figure 8 – Existing Deep Water Crevice in Jinks Creek

ADDITIONAL ENVIRONMENTAL CONCERNS

Strands of *Spartina alterniflora* with scattered locations of *Spartina* exist along the intertidal and supratidal regions of the Feeder Channel and Bay Area. These grasses generally provide suitable habitat for juvenile fish. Tab F (Permit Drawings) provides an aerial view showing the waterward extents of the marsh grasses as identified in September 2017. As shown in Tab F (Permit Drawings), the salt marsh extents have encroached within or close to the anticipated dredge area of the Feeder Channel and Bay Area. To maintain consistency with the previous permits for the Feeder Channel and to minimize the potential for adverse impacts, the current project proposes to maintain a 10-ft dredging buffer from any coastal marsh. (CAMA permit 45-02 originally required the 10-foot buffer as condition #3.)

The 10-ft buffer should allow the channel adequate space to equilibrate without eroding the coastal marshes. The design will maintain the proposed 3H:1V sideslope within the Bay Area and Feeder Channel system to help provide stability to the newly dredged channel. Maintaining the sideslope will help minimize the sloughing area needed for channel equilibration. Therefore, the channel base width will be reduced in areas where the marsh grass encroaches near the maintenance footprint. Prior to construction the marsh boundary will be mapped with a copy provided to DCM designating the 10-ft marsh buffer. During construction the dredge equipment shall be prohibited from entering the buffer zone. Tab F (Permit Drawings) shows the proposed 10-ft buffer based on the marsh conditions as identified in September 2017.

The applicant has also conducted additional studies to evaluate potential impacts to managed or endangered species that may occur as a result of the project. Tab M (EFH Assessment) provides an Essential Fish Habitat (EFH) assessment and Tab N (Biological Assessment) provides a Biological Assessment (BA) for

the project. Generally the referenced reports support the project should not adversely impact any threatened or managed species. Additional precautions proposed for the maintenance project include following FWS recommended guidelines for avoiding impacts to West Indian Manatee. Recommendations provided by NOAA to help protect sea turtles and smalltooth sawfish will also be included as construction conditions. Tab O (Manatee Avoidance Guidelines) shows the manatee guidelines while Tab P (NOAA Recommendations) provides the sea turtle and smalltooth sawfish recommendations

HISTORIC RESOURCES

The applicant has also contacted the State Historic Preservation Office (SHPO) to inquire on any known historic resources in the area such as shipwrecks or archeological artifacts. The inquiry did not identify any known resources with the potential to be impacted by the project. Tab Q (SHPO Resource Review) provides the written response from SHPO.

SUMMARY

The Town of Sunset Beach intends to maintenance dredge south Jinks Creek, the Bay Area, and the Feeder Channel to restore navigational access to the residential canal systems. The project provides a key element for the Town and residents to manage the established navigation corridors on the east end of Sunset Beach. The proposed work follows a similar scope as previously authorized in 2002 for maintenance of the Feeder Channel and will be the first permitted dredging event for south Jinks Creek and the Bay Area. The dredge material will be hydraulically placed as beneficial reuse material or mechanically transported to a nearby upland facility for storage or permanent placement. Approximately 40,500 CY will be placed as beneficial reuse material from south Jinks Creek along a 1,600-ft long by 275-ft wide stretch of oceanfront between 5th Street and 12th Street. In addition, approximately 32,700 CY will be removed from the Feeder Channel system and 15,900 CY from the Bay Area for upland placement. The maintenance of south Jinks Creek will be conducted by a hydraulic pipeline dredge while the Feeder Canal and Bay Area will be dredged by a mechanical excavator.

The project will help restore navigation access to the waterway systems on the east end of Sunset Beach. The maximum dredge depth will range from -5-ft (-4+1) MLW for the finger canals to -6-ft (-5+1) MLW for the Feeder Channel, the Bay Area, and south Jinks Creek. The dredging will provide a buffer zone between the work area and any coastal marsh or wetland habitat to reduce the potential for impacts. The work will also follow additional guidelines and recommendations provided by FWS and NOAA to further minimize the potential for environmental impacts during construction. This includes constructing during the cooler winter period of November 16th through April 30th. Furthermore, the project will follow construction guidelines designed to protect manatee, sea turtle, and smalltooth sawfish.

To conduct the work as proposed, the Town anticipates requesting a variance from the CRC to satisfy the requirements of 15A NCAC 07H.208 (b)(F). The current plan avoids dredging the connecting waters in north Jinks Creek to evade potential impacts to shellfish resources. The Town also does not intend to dredge Tubbs Inlet due to the potential for environmental impacts and increased cost. As such, the current plan will not provide a connection to the AIWW or the Atlantic Ocean at a depth equal to or greater than the propose dredge areas. State resource agencies have indicated support for the variance on a conceptual level but acknowledged a thorough review would be necessary prior to a final decision.