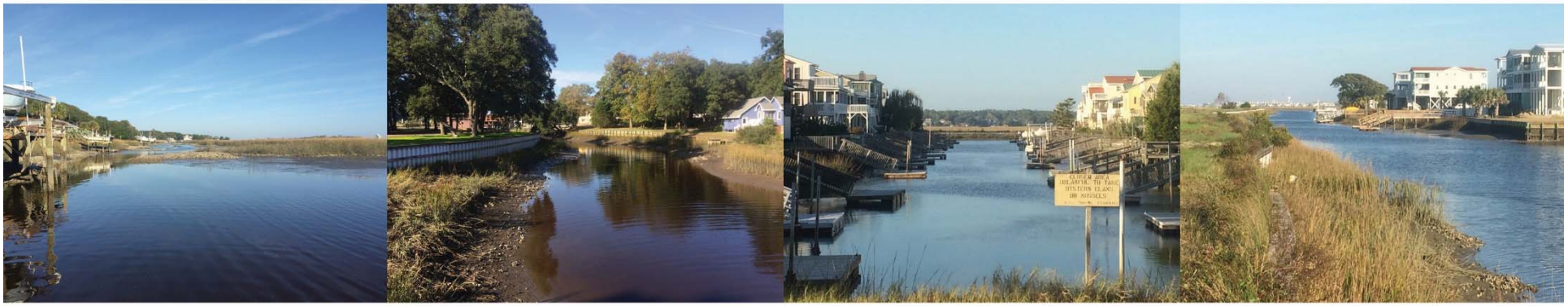
Sunset Beach North Carolina

Shoreline Management and Pre-dredge Analysis

Public Meeting Update
November 12, 2016



moffatt & nichol

Objective

Provide the Residents of Sunset Beach an Opportunity to Review & Comment on Scope / Design of Dredging Initiative

Discussion Outline

- Project Goals
- Project Overview & Previous Maintenance Efforts
- Agency Concerns
- Proposed Design, Volume Estimate, Disposal Locations & Possible Marsh Restoration Sites
- Path Forward Estimate & Schedule for Permitting & Construction
- FAQ's
- Open Discussion

Maintenance Dredging Purpose

Primary Goal:

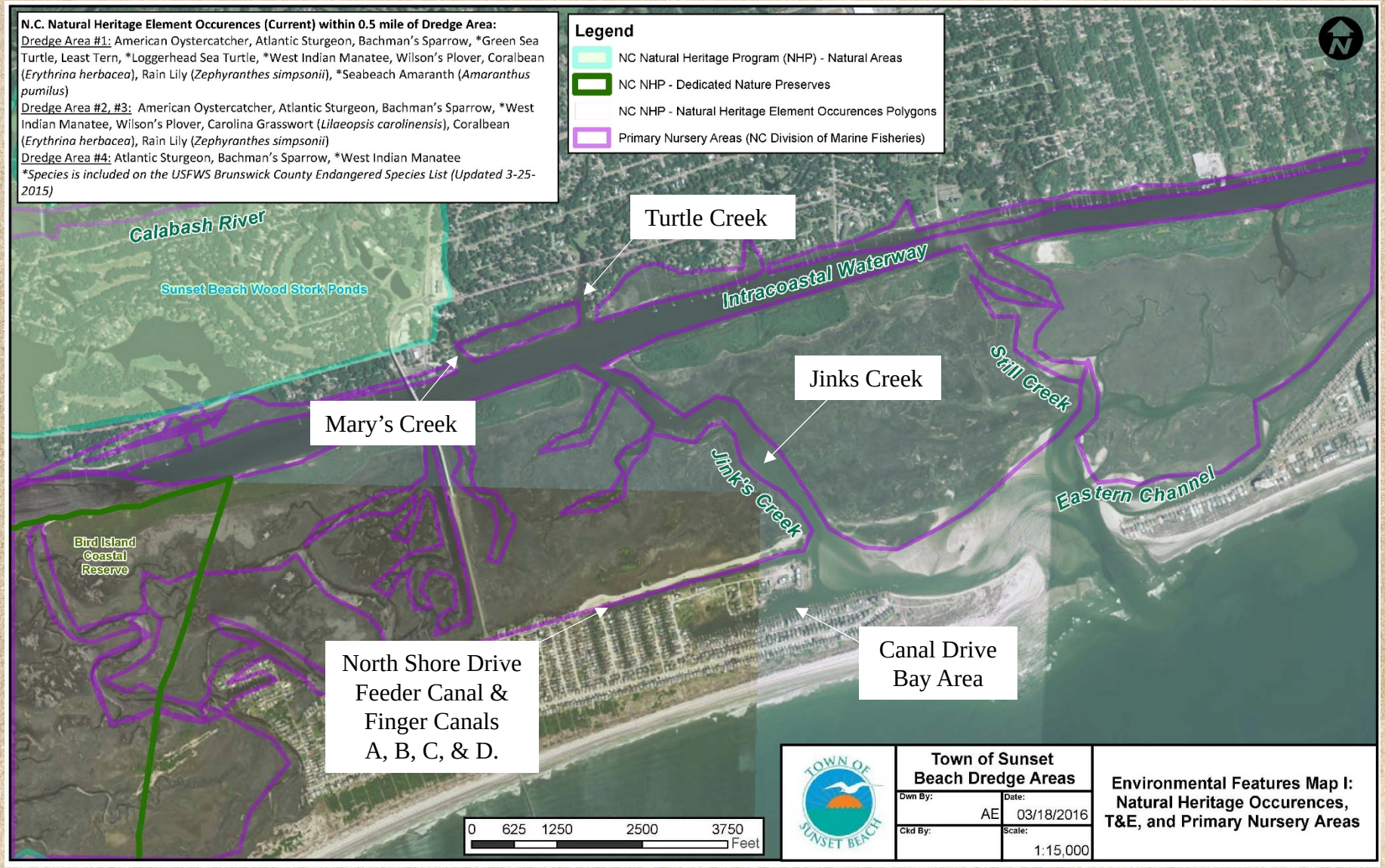
- Provide Long-term Management Template For Maintaining Navigation Access Throughout the Town of Sunset Beach (Approx. 3.5 Miles).
- Document a Pier Head Alignment for Future Upland Development within North Shore Drive Feeder Canal.

Secondary Goal:

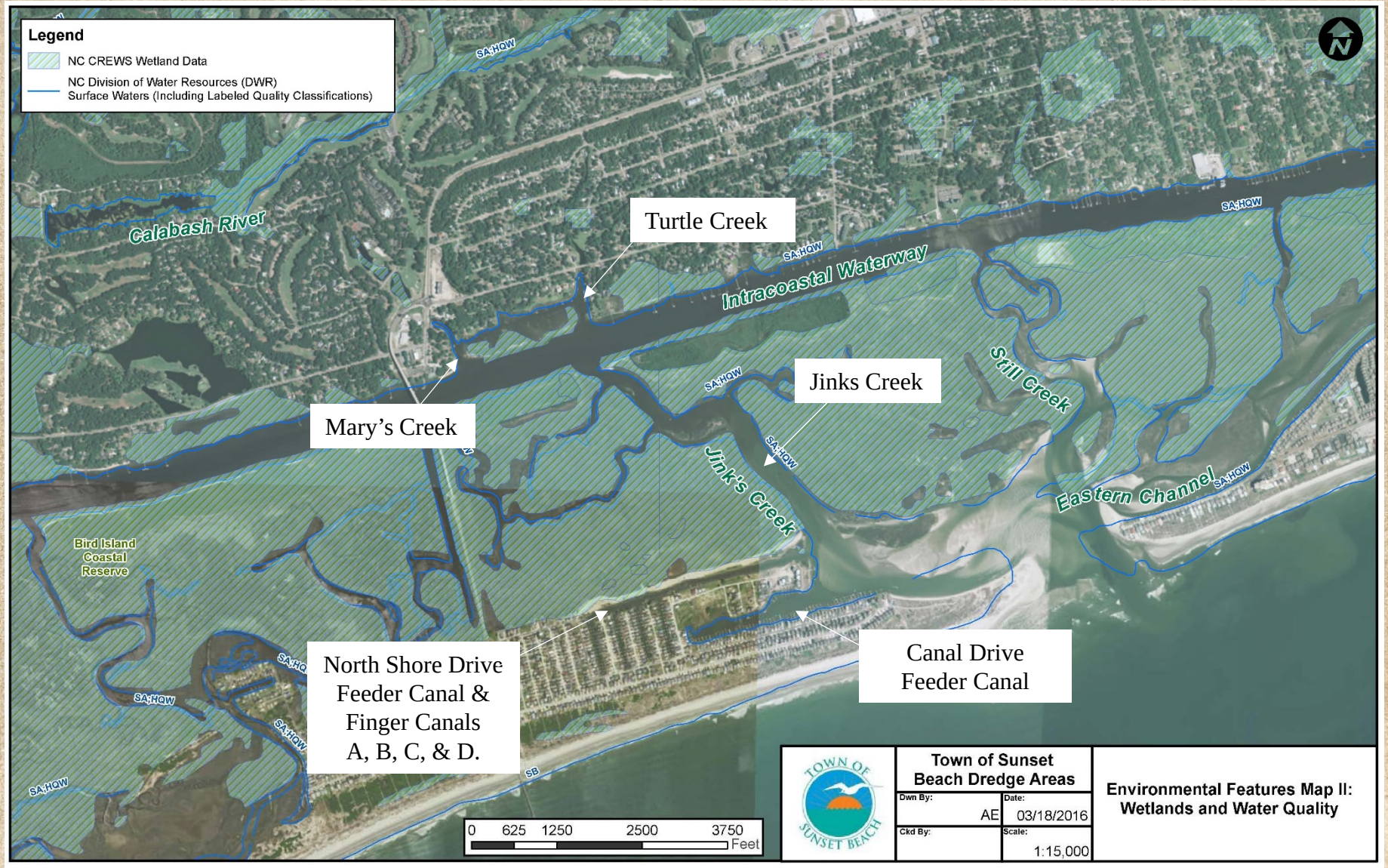
- Provide Beneficial Use Material Where Available for Use on Ocean Isle Beach for Cost Sharing Potential.

Project Overview

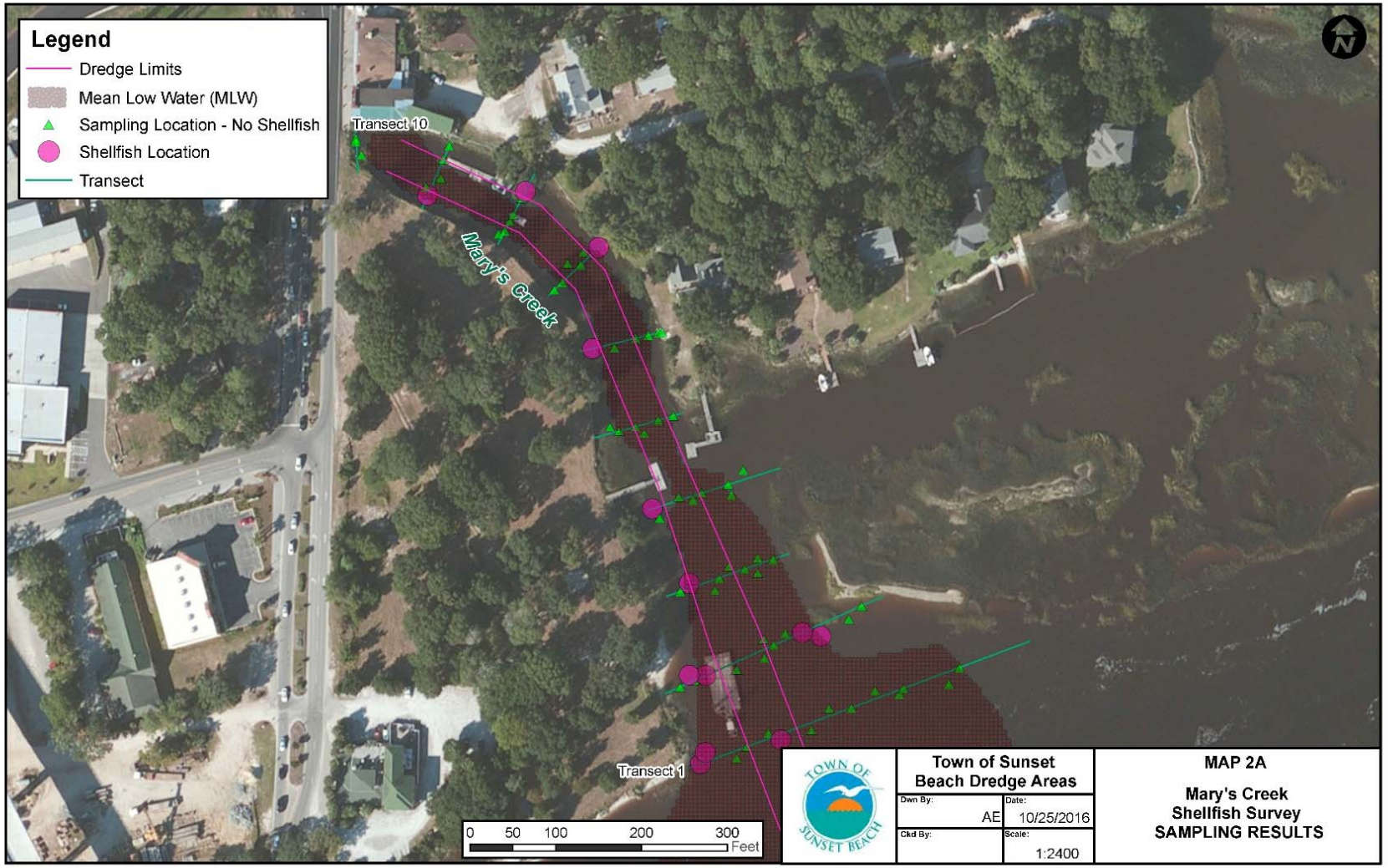
Agency Concerns



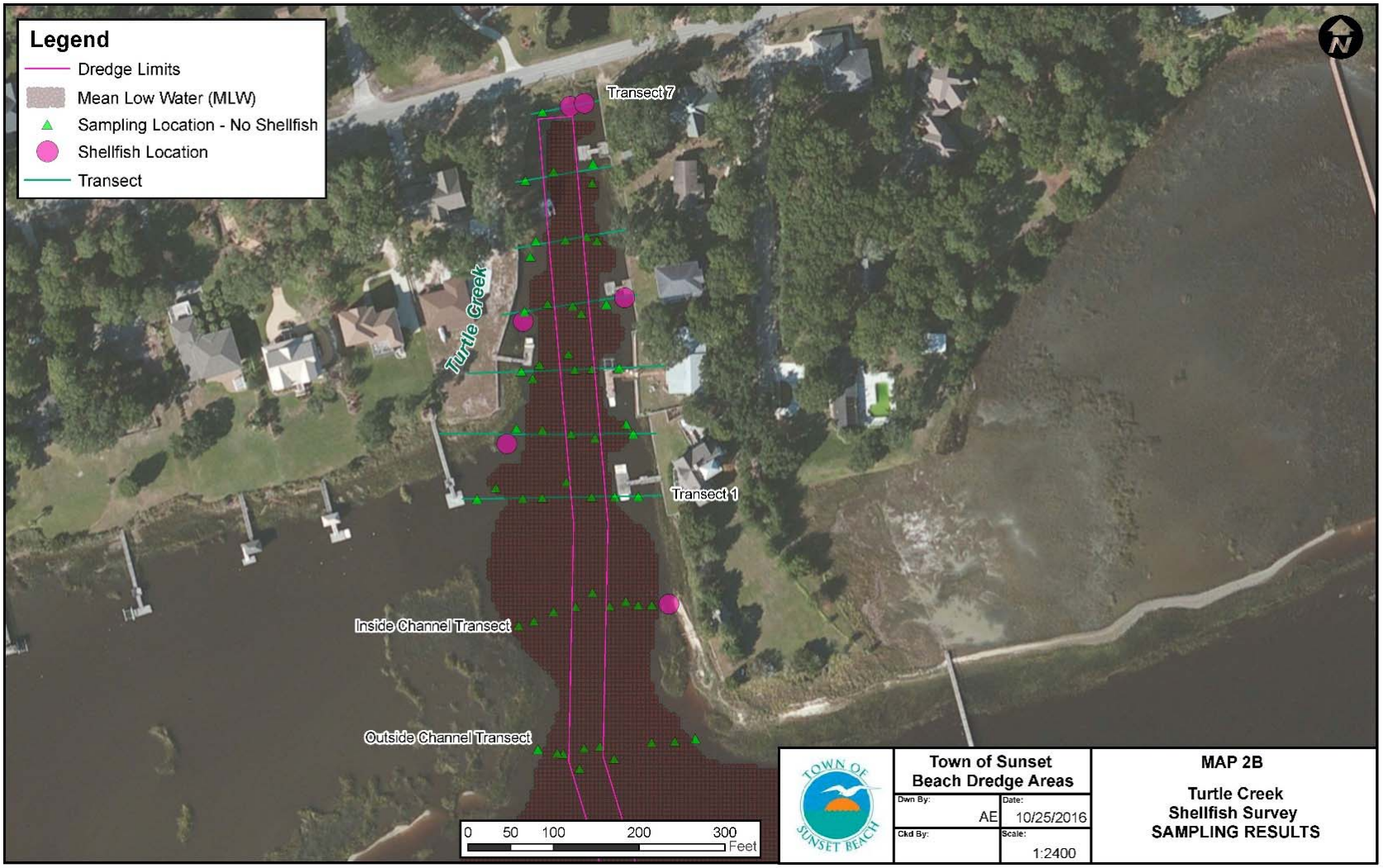
Agency Concerns



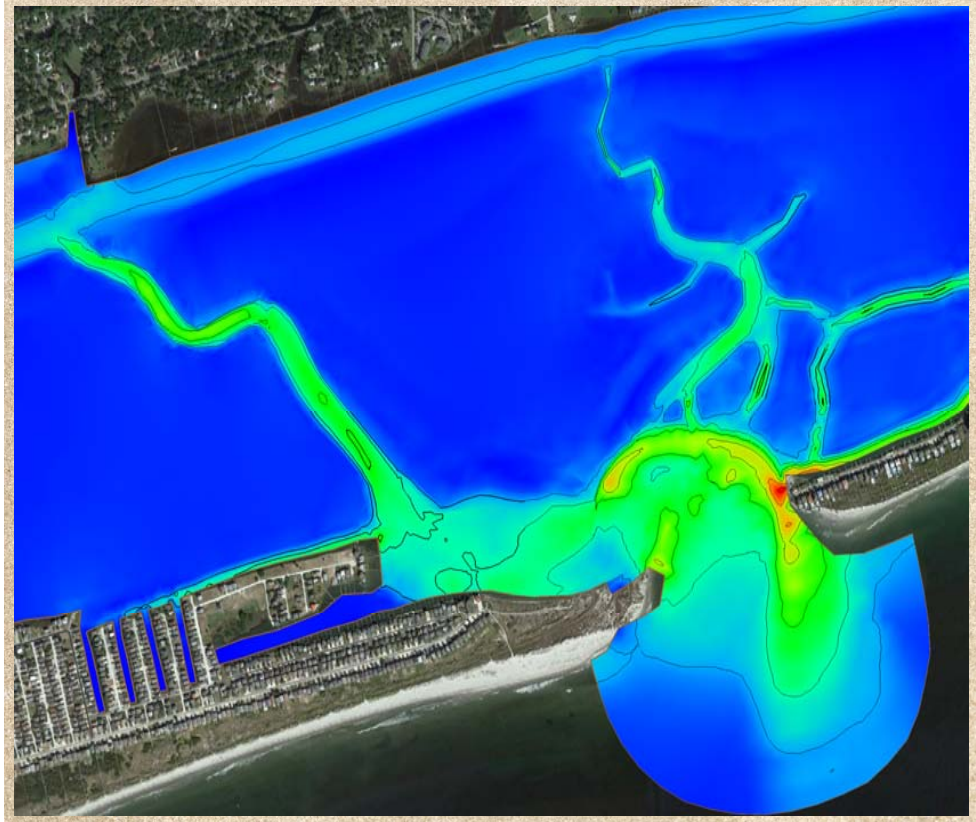
Shellfish Survey – Mary's Creek



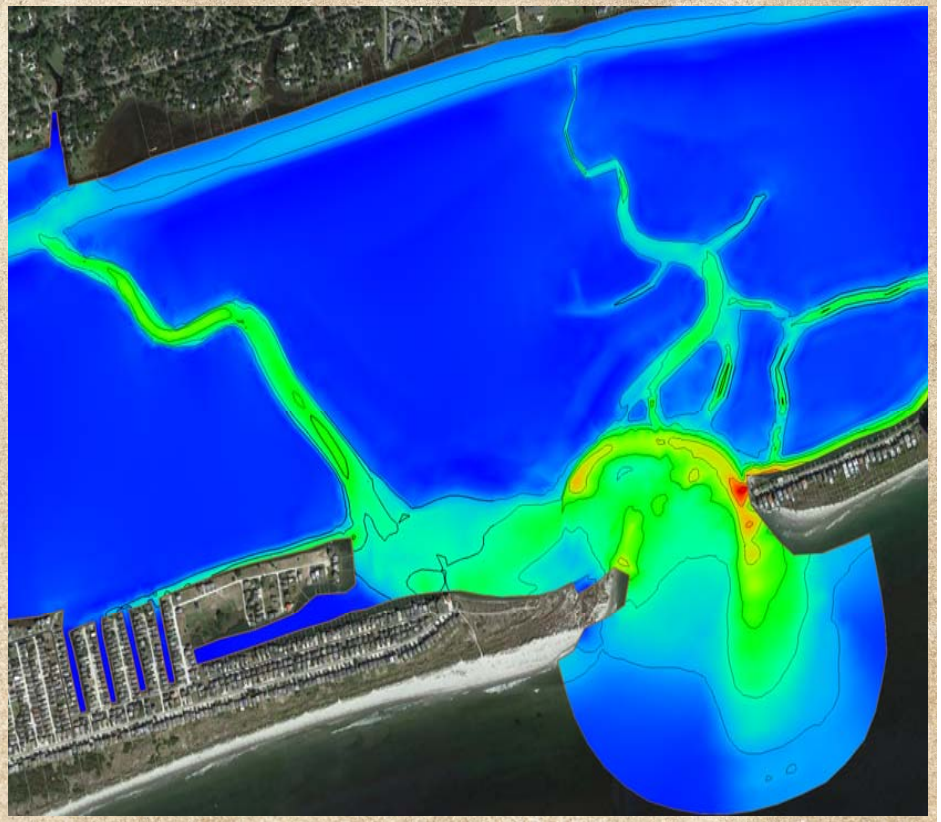
Shellfish Survey – Turtle Creek



Potential Shoaling Impacts to AIWW, 'S' Curve, & Tubbs Inlet

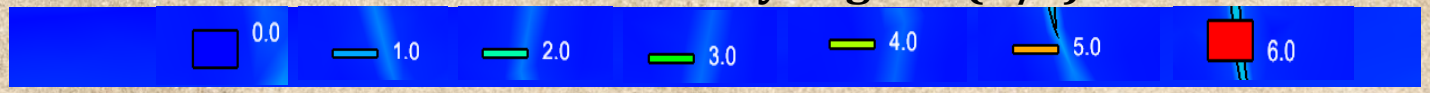


Existing Condition



Maximum Project Condition

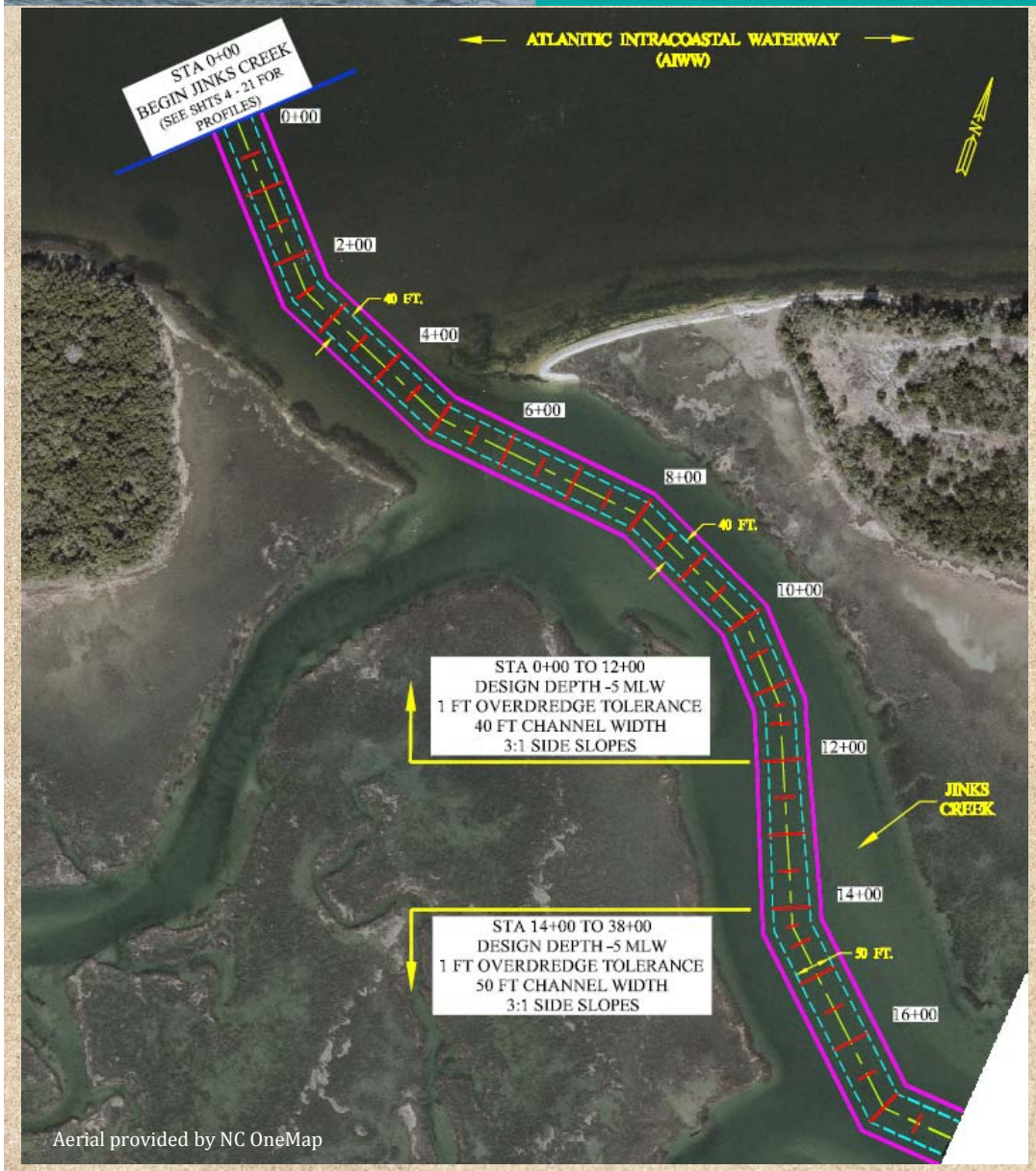
Current Velocity Legend (ft/s)



Design Considerations

- Follow Deep Water Conduits Where Feasible to Reduce Dredge Quantities & Potential Impacts.
- Maintain Adequate Width for Vessel Clearance - Minimum of Twice the Expected Beam Width for # of Vessels (Where Conditions Allow).
- Allow Sufficient Design Depth for Vessel Navigation Where Available
  - -6 MLW Where Space Allows.
  - -3 ~ -5 MLW When Space Limited.
- Provide Appropriate Side Slopes to Prevent Sloughing (Typ. 3H:1V).
- Maintain Minimum Construction Clearance of 5 Ft from any Pier, Dock, Piling, or Bulkhead.
- Maintain Consistency with Previous Permits (CAMA 22-02 & 45-02)
- Anticipated Dredge Volume ~ 192,000 CY.
  - 100,000 CY for Beneficial Reuse
  - 92,000 CY for Upland Disposal

"Proposed" Project



Jinks Creek

Station 0+00 to 18+00

- Design Depth: -5 MLW
- OD Tolerance: 1 ft
- Base Width: 40 ~ 50 ft
- Slope: 3H : 1V
- Compatible: 7,400 CY
- Non-Compatible: 3,800 CY

Existing Conditions

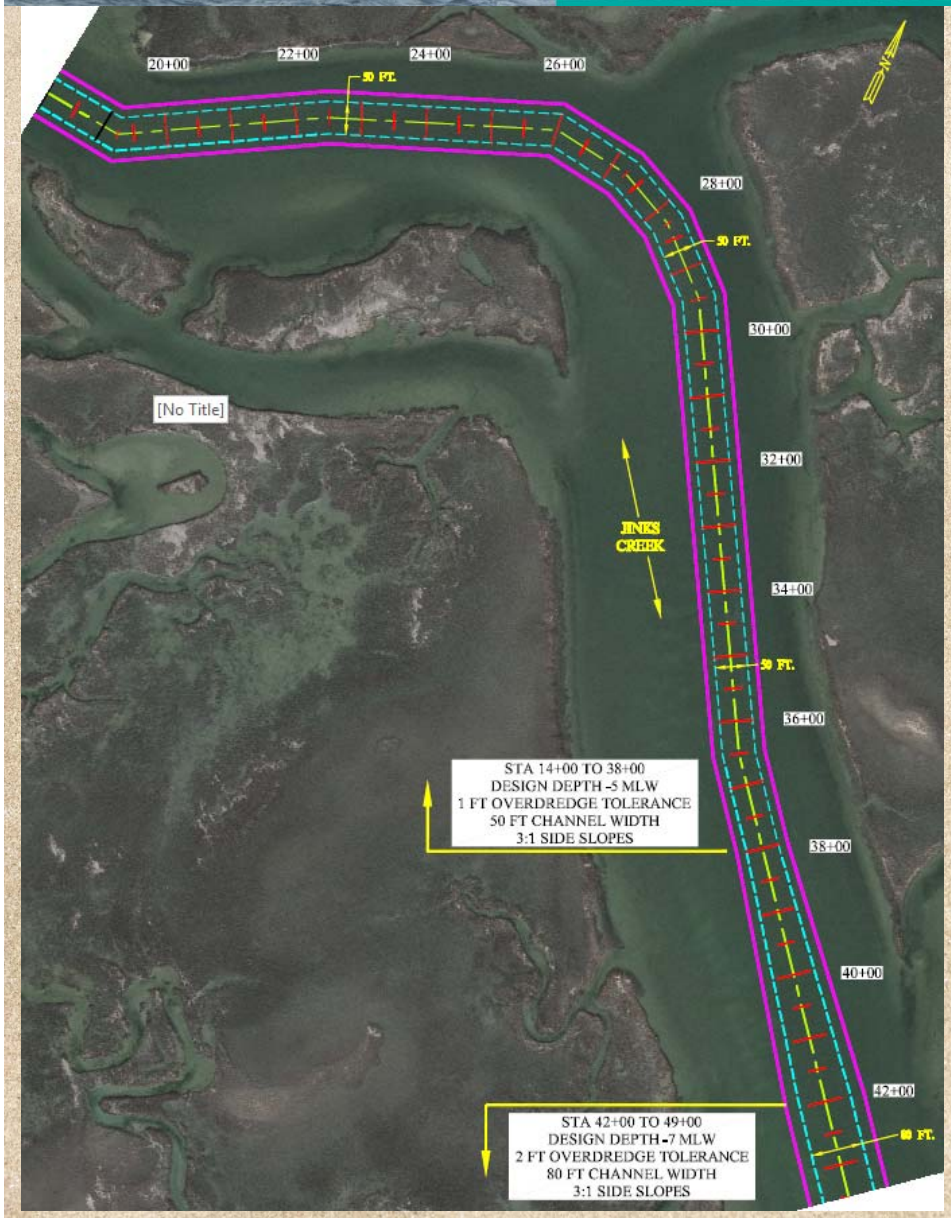
- Depth Range: 0 ~ -6 MLW
- Avg. Depth: -2 MLW

Between Station 0+00 & 25+00 compatible material exists above -5 MLW. However, separating the non-compatible material may be cumbersome and add additional costs. This may be a viable source of material for a marsh restoration initiative.

LEGEND
PROPROSED CHANNEL CENTERLINE
PROPOSED CHANNEL BASE (WIDTH)
PROPOSED CHANNEL TOP @ MLW

NOTES:
1. DREDGE ACTIVITIES SHALL MAINTAIN A MIN. 10 FT CLEARANCE FROM ALL EXISTING PILINGS, SEAWALLS, OR SUPPORT STRUCTURES.

"Proposed" Project



Jinks Creek

Station 18+00 to 43+50

- Design Depth: -5 ~ -7 MLW
- OD Tolerance (ft): 1 ~ 2 ft
- Base Width: 50 ~ 80 ft
- Side Slope: 3H : 1V
- Compatible: 16,000 CY
- Non-Compatible: 1,600 CY

Existing Conditions

- Depth Range: -2 ~ -6 MLW
- Avg. Depth: -4 MLW

Between Station 0+00 & 25+00 compatible material exists above -5 MLW. However, separating the non-compatible material may be cumbersome and add additional costs. This may be a viable source of material for a marsh restoration initiative.

LEGEND
PROPROSED CHANNEL CENTERLINE
PROPOSED CHANNEL BASE (WIDTH)
PROPOSED CHANNEL TOP @ MLW

NOTES:
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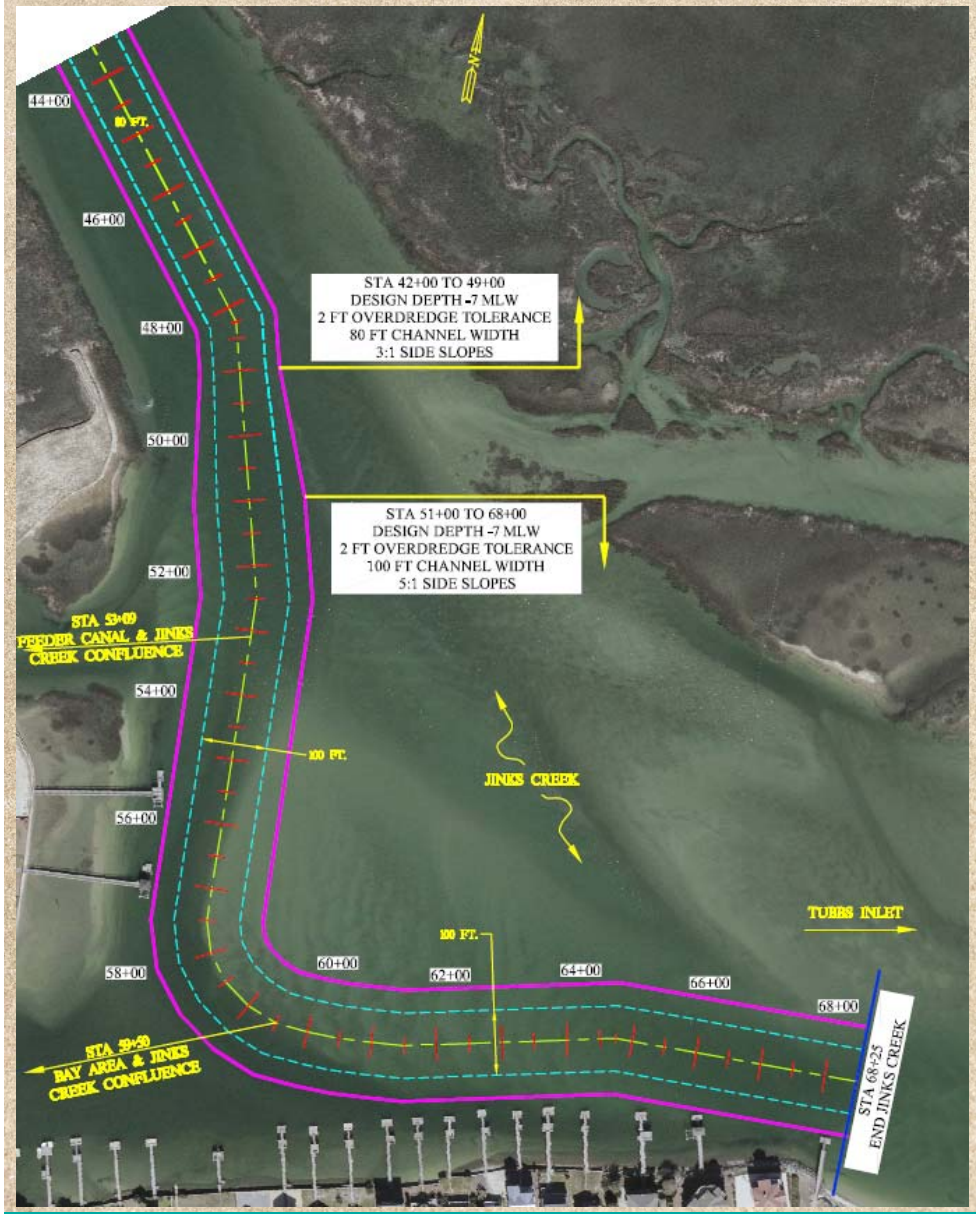
"Proposed" Project



Jinks Creek

Station 43+50 to 68+25

- Design Depth: -7 MLW
- OD Tolerance: 2 ft
- Base Width: 80 ~ 100 ft
- Side Slope: 3H : 1V to 5H :1 V
- Compatible: 85,300 CY
- Non-Compatible: 0 CY

Existing Conditions

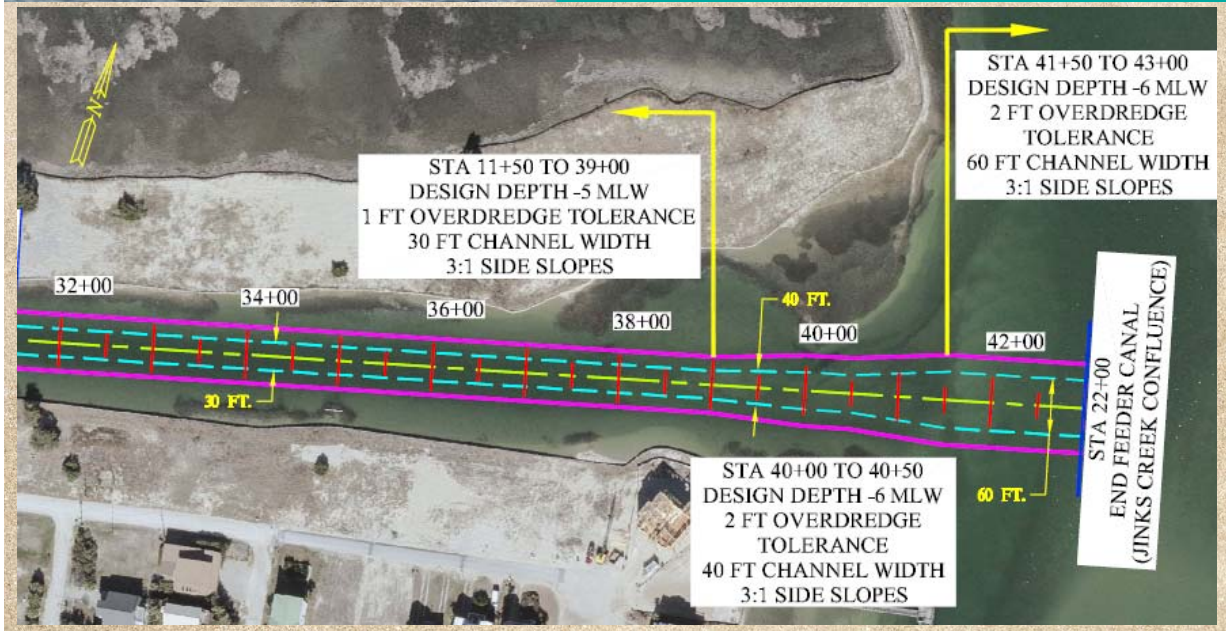
- Depth Range: -2 ~ -10 MLW
- Avg. Depth: -5

The 'proposed' template increases to 100 ft wide at -7 MLW to compensate for sediment shoaling within the Tubbs Inlet complex. The shoaling rate and volume are unknown as no studies have been conducted to determine these values.

LEGEND
PROPROSED CHANNEL CENTERLINE
PROPOSED CHANNEL BASE (WIDTH)
PROPOSED CHANNEL TOP @ MLW

NOTES:
1. DREDGE ACTIVITIES SHALL MAINTAIN A MIN. 10 FT CLEARANCE FROM ALL EXISTING PILINGS, SEAWALLS, OR SUPPORT STRUCTURES.

"Proposed" Project



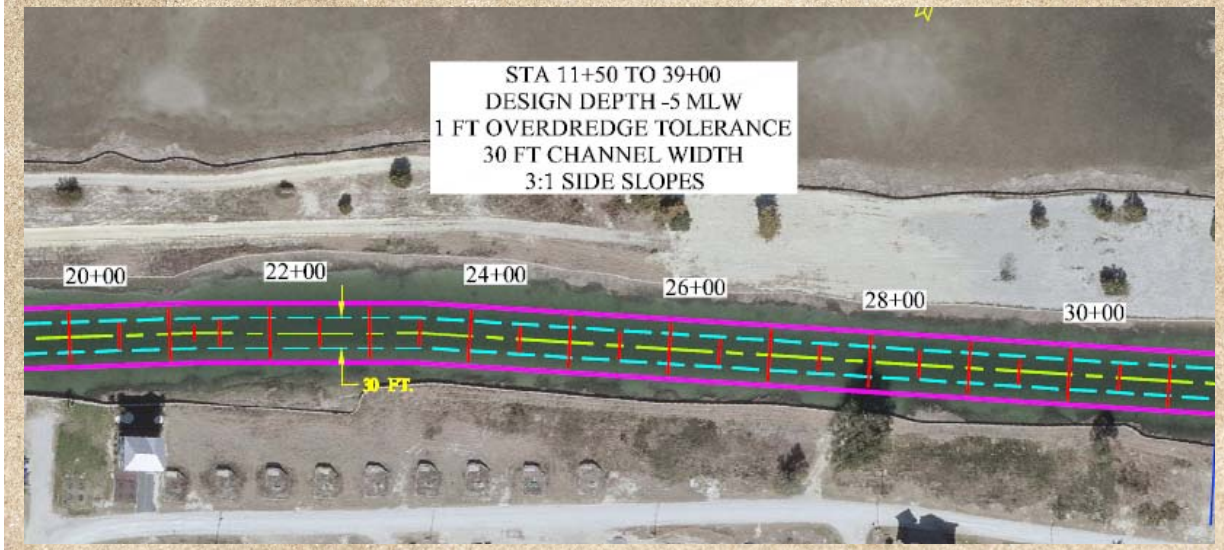
Feeder Canal

Station 20+00 to 43+00

- Design Depth: -5 to – 6 MLW
- OD Tolerance: 1 ~ 2 ft
- Base Width: 30 to 60 ft
- Side Slope: 3H : 1V
- Compatible: 0 CY
- Non-Compatible: 19,400 CY

Existing Conditions

- Depth Range : -2 ~ -4 MLW
- Avg. Depth: -3 MLW

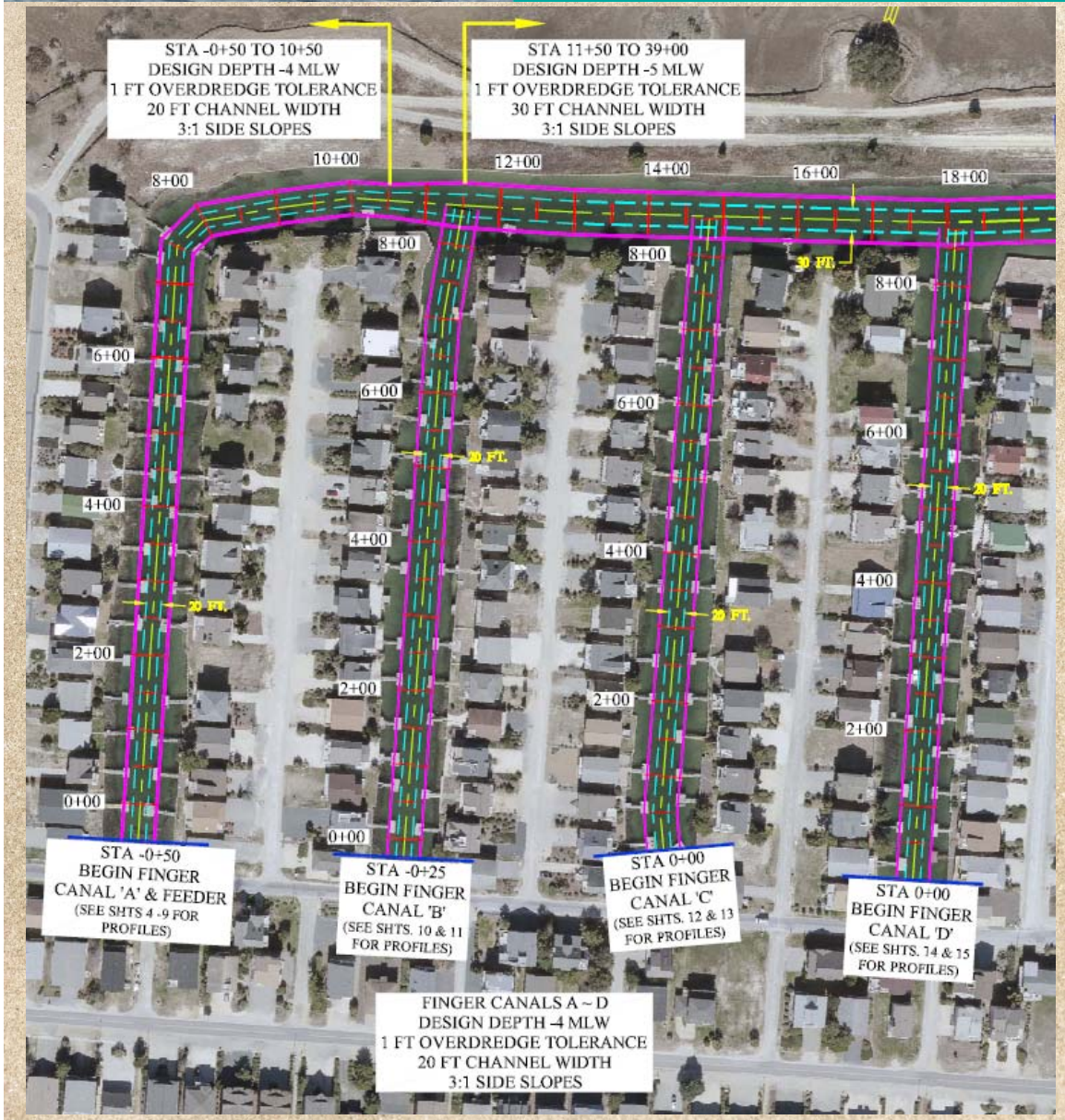


The channel alignment will help to establish a pier head alignment within the feeder canal and finger canals, in the event of future development.

LEGEND
PROPROSED CHANNEL CENTERLINE
PROPOSED CHANNEL BASE (WIDTH)
PROPOSED CHANNEL TOP @ MLW

NOTES:
1. DREDGE ACTIVITIES SHALL MAINTAIN A MIN. 10 FT CLEARANCE FROM ALL EXISTING PILINGS, SEAWALLS, OR SUPPORT STRUCTURES.

"Proposed" Project



Feeder Canal & Finger Canals A,B,C, & D

- Design Depth: -4 ~ -5 MLW
- OD Tolerance: 1 ft
- Base Width: 20 ~ 30 ft
- Side Slope: 3H : 1V
- Compatible: 0 CY
- Non-Compatible: 15,600 CY

Existing Conditions

- Depth Range: -2 ~ -4 MLW
- Avg. Depth –3 MLW

Property owners could elect to remove the floating pier heads and pilings for access underneath the docks. However, the cost for this work would not be covered in the existing state grant agreement. Otherwise, the dredge equipment should maintain a min. clearance from any pilings.

LEGEND
PROPROSED CHANNEL CENTERLINE
PROPOSED CHANNEL BASE (WIDTH)
PROPOSED CHANNEL TOP @ MLW

NOTES:
1. DREDGE ACTIVITIES SHALL MAINTAIN A MIN. 10 FT CLEARANCE FROM ALL EXISTING PILINGS, SEAWALLS, OR SUPPORT STRUCTURES.

"Proposed" Project

Bay Area

Station -0+50 to 22+00

- Design Depth: -5 ~ -7 MLW
- OD Tolerance: 1 ~ 2 ft
- Base Width: 20 ~ 80 ft
- Side Slope: 3H : 1V
- Compatible: 0 CY
- Non-Compatible: 26,000 CY

Existing Conditions

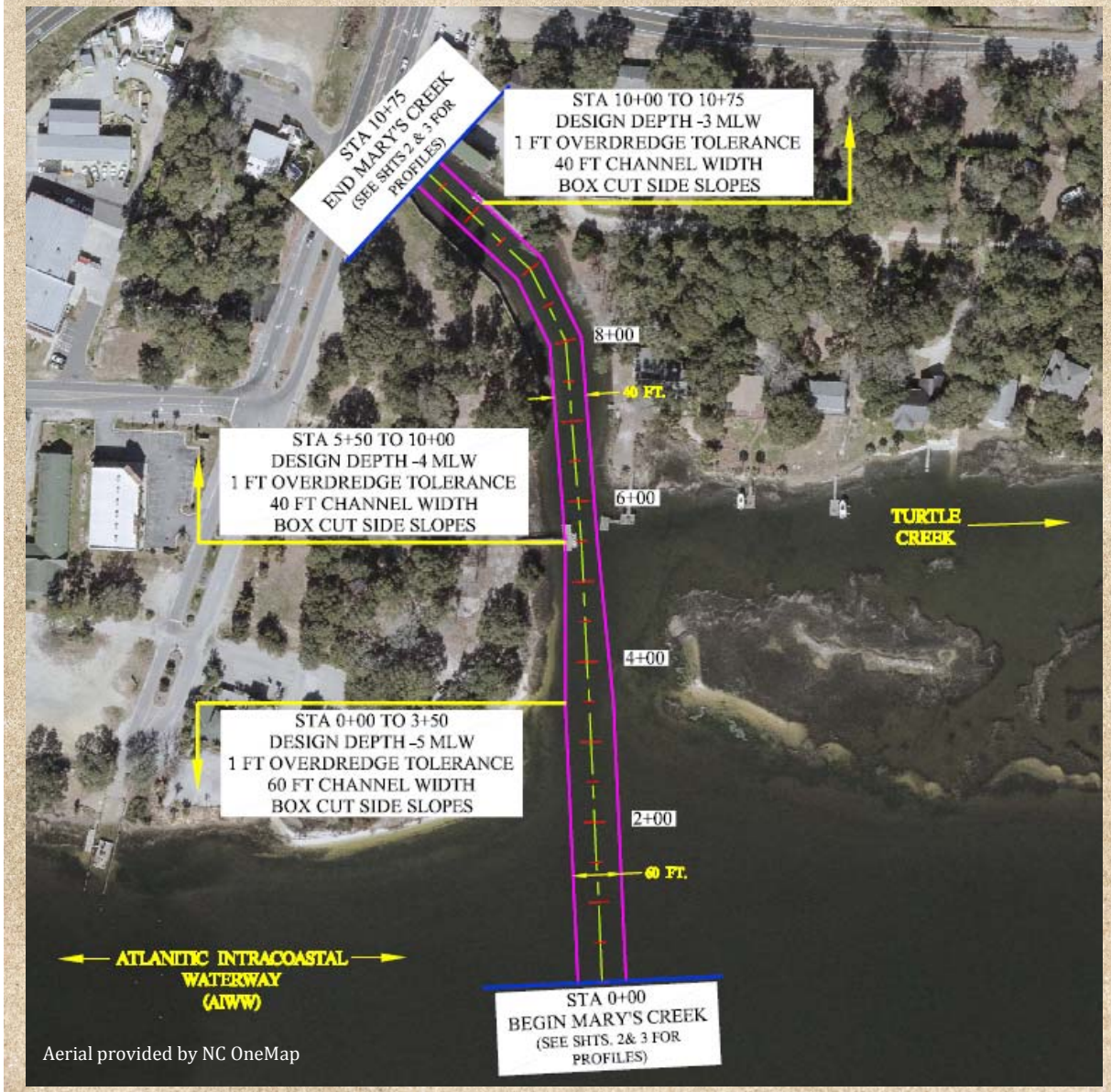
- Depth Range: -2 ~ -3 MLW
- Avg. Depth: -2 MLW

Dredging activities will remain a min. clearance from any pier, piling, or support structure.

LEGEND
PROPROSED CHANNEL CENTERLINE
PROPOSED CHANNEL BASE (WIDTH)
PROPOSED CHANNEL TOP @ MLW

NOTES:
1. DREDGE ACTIVITIES SHALL MAINTAIN A MIN. 10 FT CLEARANCE FROM ALL EXISTING PILINGS, SEAWALLS, OR SUPPORT STRUCTURES.

"Proposed" Project



Aerial provided by NC OneMap

Mary's Creek

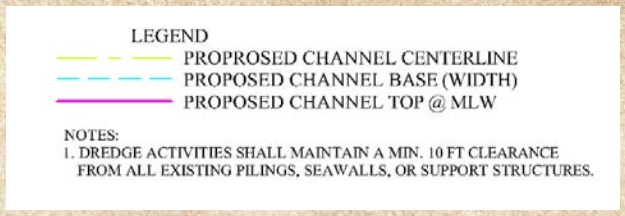
Station 0+00 to 10+75

- Design Depth: -3 ~ -5 MLW
- OD Tolerance: 1 ft
- Base Width: 40 ~ 60 ft
- Side Slope: N/A
- Compatible: 0 CY
- Non-Compatible: 8,000 CY

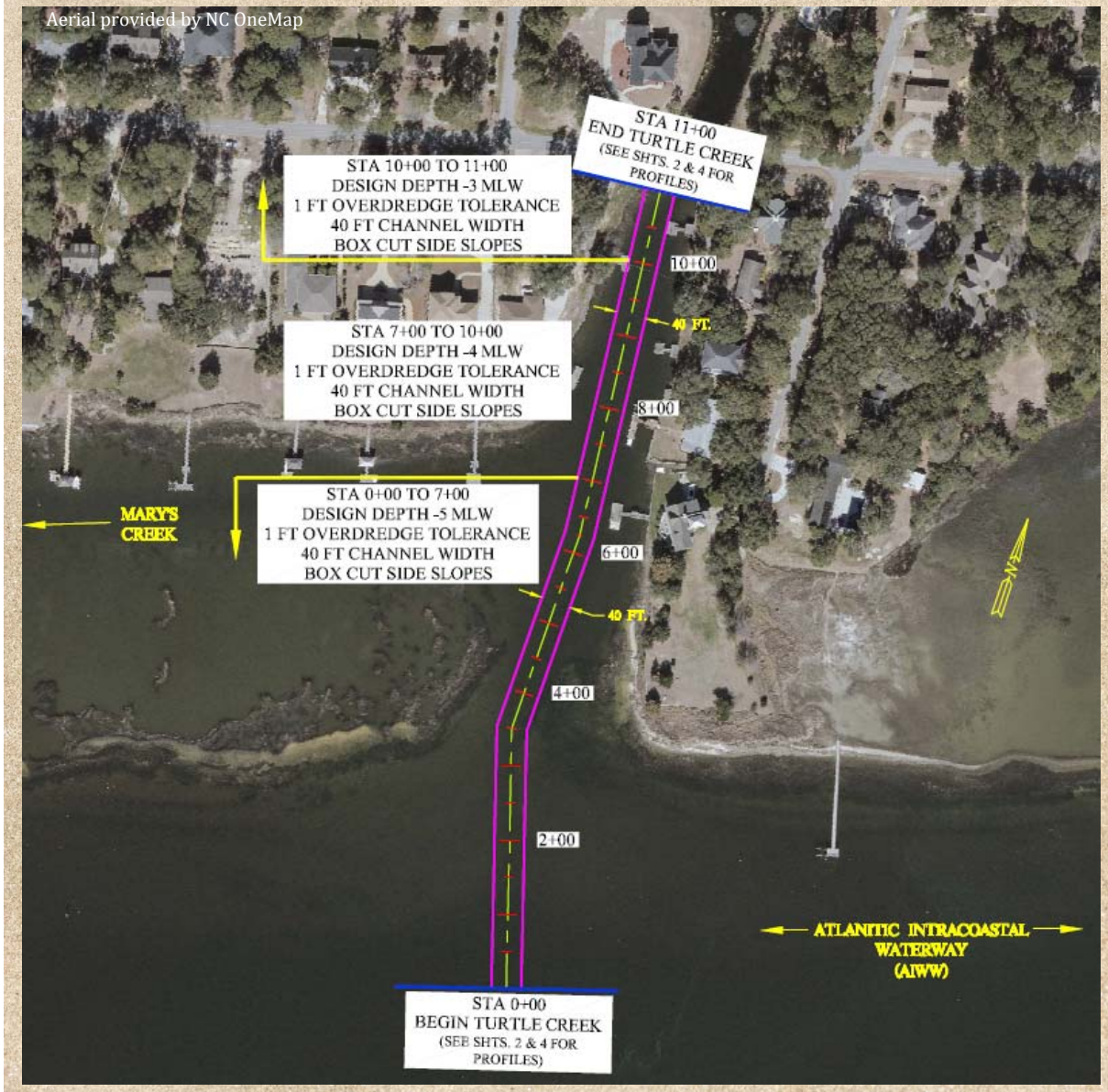
Existing Conditions

- Depth Range: 0 ~ -1 MLW
- Avg. Depth: -1 MLW

Design can not exceed the authorization granted under permit CAMA 22-02 due to PNA classification without some additional permitting requirements.



"Proposed" Project



Turtle Creek

Station 0+00 to 11+00

- Design Depth: -3 ~ -5 MLW
- OD Tolerance: 1 ft
- Base Width: 40 ft
- Side Slope: N/A
- Compatible: 0 CY
- Non-Compatible: 8,000 CY

Existing Conditions

- Depth Range: 0 ~ -1 MLW
- Avg. Depth: -1 MLW

Design can not exceed the authorization granted under permit CAMA 22-02 due to PNA classification without some additional permitting requirements.

LEGEND
PROPROSED CHANNEL CENTERLINE
PROPOSED CHANNEL BASE (WIDTH)
PROPOSED CHANNEL TOP @ MLW

NOTES:
1. DREDGE ACTIVITIES SHALL MAINTAIN A MIN. 10 FT CLEARANCE FROM ALL EXISTING PILINGS, SEAWALLS, OR SUPPORT STRUCTURES.

Volume Estimate

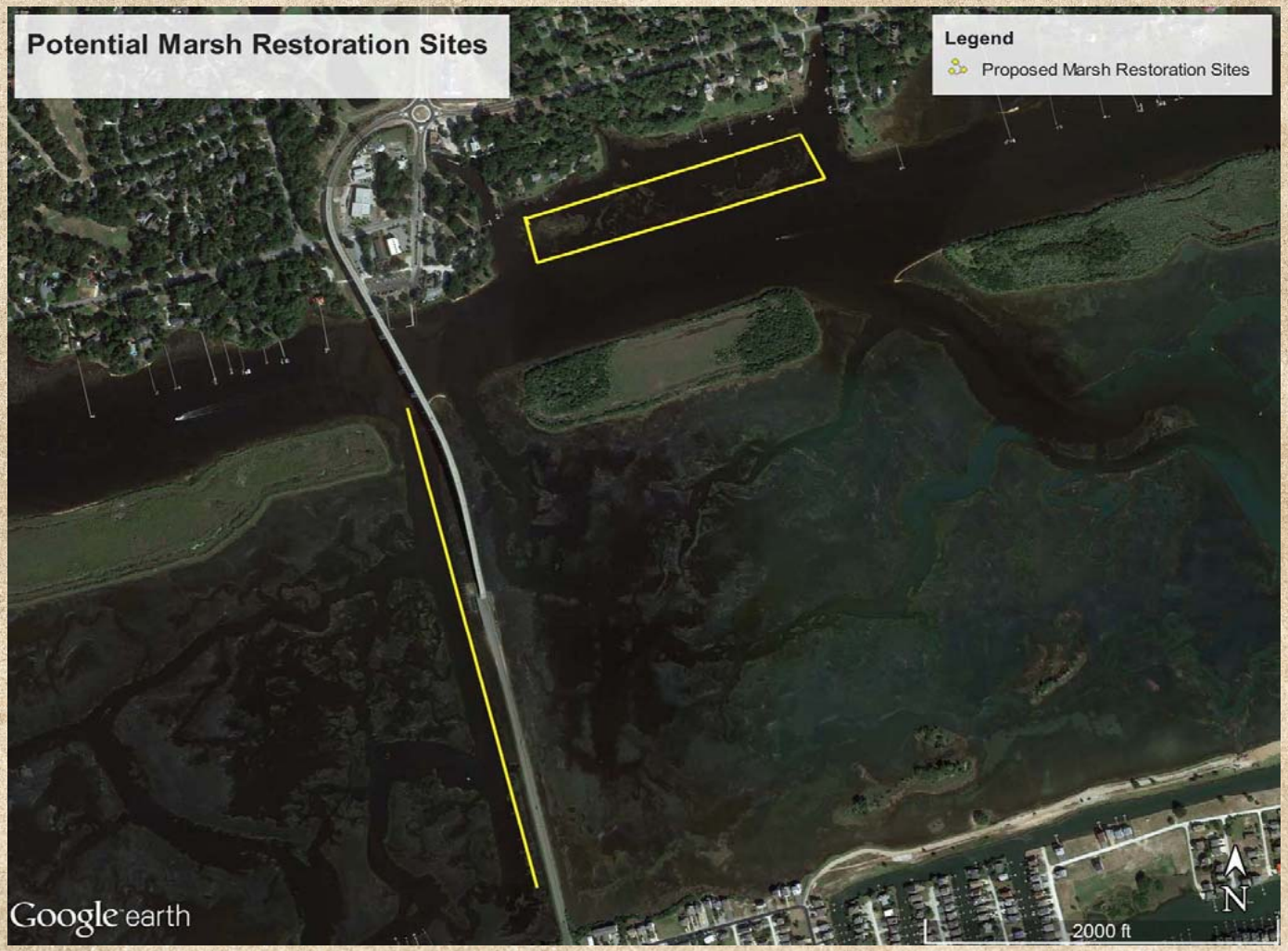
Site	Design Depth (MLW)	Length (ft)	Volume (CY)	
			Compatible	Non-Compatible
Jinks Creek	-5 ~ -7	6,825	100,000	15,000*
North Shore Drive Feeder Canal	-6 ~ -4	3,500	0	24,000
Finger Canals (A, B, C, & D)	- 4	3,200	0	11,000
Canal Drive Bay Area	-7 tapering to -5	2,200	0	26,000
Mary's Creek	-5 tapering to -3	1,075	0	8,000
Turtle Creek	-5 tapering to -3	1,100	0	8,000
Total		**17,900**	**100,00 CY**	**92,00 CY**

* Assumes all material between Sta. 0+00 & 25+00 is considered non-compatible.

Potential USACE Material Disposal Islands

2002 Project Utilized Site 308 to Place an Estimated 80,000 CY

Potential Marsh Restoration Site(s)



Permitting & Construction *'Conceptual'* Cost Estimate

Task	State Grant	Town of Sunset Beach	Total
Permitting	$143,405	$71,595	$215,000
Construction	$2,680,000	$1,320,000	$4,000,000
Total	$2,823,405	$1,391,595	$4,215,000

Schedule

Design:	Complete in January.
Permitting :	Completed by July 2017.
Construction:	Nov. 16, 2017 – March 31, 2018
	Nov. 16, 2018 – March 31, 2019

Note:

1. The permitting estimate assumes a shellfish survey of northern Jinks Creek will be required by NCDCM.
2. The construction estimate does not account for any cost share potential with the Town of Ocean Isle Beach for beneficial use of the beach compatible material.
3. Permitting cost do not account for any improvements to the USACE disposal islands necessary for material placement.
4. Allowing construction to extend over 2 dredge seasons may allow a local 'small contractor' to complete the work at a significant cost savings.
5. The estimate does not account for a potential marsh restoration project or mitigation / relocation efforts potentially required for the existing shellfish in the dredge area.

Questions and Comments Submitted for Clarification

1. The March Scoping Application stated one of the reasons for the proposed dredging was to establish a navigable passageway through the canal.
   a. Once Jinks Creek is -6 to -7 feet below mean low water, what size boat will be able to pass through Jinks Creek?
   b. How will the wakes of these boats (recreational and commercial) change the impact of turbulence to the sediment and the shoreline?
   c. How can we control the impact of these wakes?

Answers:

A. The dredge depths (-5 to -7 MLW) were chose as typical navigation depths based on similar projects within NC. Examples include the following:
   - Eastern Channel: -6 to -12 w. 0 ~ 2 ft OD tolerance (Navigation & Environmental Restoration)
   - Mason Inlet / Mason Creek: -6 MLW w/ 2 ft OD tolerance (Environmental Restoration)

B. This could be a concern and some type of post construction monitoring is anticipated. The project is not proposed to create new navigation access, but rather to restore navigation access. However, a higher concentration of boaters could reasonably be expected. In similar projects the impacts were not observed (Mason Creek).

C. If impacts occur some type of mitigation may be required. Enforcement may be an option but probably not an easy one unless vessels are operating at an unsafe speed.

Questions and Comments Submitted for Clarification

2. Shallow water boats can enter the ICW from Jinks Creek at low tide.
   a) What is the current depth of the proposed channel in North Jinks Creek?
   b) What will be the future depth below mean low tide of the channel in North Jinks Creek?
   c) Usually dredging is used for transportation purposes/economic value unless it is used for environmental purposes (which it is not in this case). If dredging is going to be used to increase the depth in this area, what is the point if it is not a navigational channel for international/national trade purposes? (Moffat and Nichol's Pre Dredge Analysis dated May 2, 2016, PAGE 9, Elevation Legend for Jinks Creek depth at present is -5 to -3 feet at mean low water. The design depth is -6 mean low water.)

Answers:

A. The controlling depth of Jinks Creek is approx. – 2 MLW.
B. -5 MLW; however, shoaling is expected over time.
C. Recreational navigation.

Questions and Comments Submitted for Clarification

3. Jinks Creek was determined not to be a PNA in the 1970s
   a) Should the status of North Jinks Creek as a PNA be reevaluated prior to applying for a dredging permit?

Answers:

A. This question may be better posed if presented to the residents of Sunset Beach or the resource agencies.

Questions and Comments Submitted for Clarification

4. CAMA regulations state that navigational channels, canals and boat basins shall be aligned or located so to avoid PNAs, shellfish beds and beds of submerged aquatic vegetation.
   a) Should North Jinks Creek shellfish beds be mapped prior to applying for a dredging permit?
   b) Should North Jinks Creek submerged aquatic vegetation be mapped prior to applying for a dredging permit?

Answers:

A. The state and federal resource agencies / regulations stipulate what is required for permit approval. NC Fisheries has expressed a potential concern that a shellfish survey will be required for Jinks Creek. This requirement will be discussed at the next agency coordination meeting.

B. SAV has not been expressed as a concern from the resource agencies.

Questions and Comments Submitted for Clarification

5. The shellfish in North Jinks Creek have ingested sufficient concentrations of pollutants to be inedible.
   a) Should the types and concentration of the pollutants on the bottom of the creek be determined prior to applying for a dredging permit?
   b) Are there marine pests that could be transferred from the dredged material to its resting site that may pose an environmental concern?
   c) Are there human health risks to this dredging project? I.e. toxic algal species have a resting state which lies in the sediment. If dredging disturbs this, they can transform to algal bloom which can be harmful to humans.

Answers:

The sediment testing criteria for Jinks creek has been in accordance with State and Federal guidelines.
No known toxic pollutants or toxic algal species have been observed.

Questions and Comments Submitted for Clarification

6. Scientists at the Shoreline Development Project at Western Carolina University are not aware of any data that supports the hypothesis that sediment removal may improve tidal flushing and help improve nursery habitats within the tributary systems. However a document drafted by the NC Department of Environmental Quality, 2015 North Carolina Coastal Habitat Protection Plan, suggests that dredging will have a negative impact on habitats and ecosystems. The document has been approved by Marine Fisheries Commission, Coastal Resource Commission and Environmental Management omission. The report has been forwarded to DENA for submission to the legislature for approval.
   a) Is there scientific evidence that supports sediment removal helps improve tidal flushing and nursery habitats?
   b) Shouldn't North Jinks Creek only be accessible to shallow water boats, canoes and kayaks?

Answers:

A. Tidal flushing in not anticipated to be improved by this project.
B. This question may be better addressed by the residents of Sunset Beach an users of Jinks Creek.

Questions and Comments Submitted for Clarification

7. The Moffat and Nichol report states that the four finger canals, A, B, C, D are presently -3 to -1 foot below mean low water and the design depth is -4 feet below mean low water.
   a) Why is the Moffat & Nichol Proposal to dredge -6 feet below mean low water in Jinks Creek, when the canals can only support -4 feet without danger of bulkhead blow out?

Answers:

Expectations are Jinks Creek will shoal at a faster rate than the canals and additional usage will occur in Jinks Creek as compared to the finger canals. The additional depth is 'proposed' to account for these factors.

Questions and Comments Submitted for Clarification

8. The waters of Jinks Creek are clearly designated SA and HQW by Marine Fisheries.
   a) Why is no shellfish survey required or proposed for Jinks Creek?

Answers:
This question may be better addressed by Marine Fisheries. Subsequent conversation with Marine Fisheries has suggested a shellfish survey will be required prior to permit approval. However, the agencies did not express a concern at the first coordination meeting.

Questions and Comments Submitted for Clarification

9. Regulations prohibit the contamination of waters on State Conservation Reserves such as Bird Island.
   a) How will this dredging project affect the surrounding waters of the Bird Island Conservation Reserve on the west end of the island and Tubbs inlet on the south part of Jinks Creek?

Answers:
The project is not anticipated to significantly change the tidal velocities or shoaling rates at Tubbs Inlet of Bird Island.

10. What happens to the ecology of the small feeder creeks off Jinks Creek when the Creek is dredged to -6 to -7 feet below mean low water?

Answers:
No change is expected with the proposed project.

Questions and Comments Submitted for Clarification

11. The Moffat and Nichol Proposal suggests that any beach quality sand from the dredging project be sold to Ocean Isle Beach to offset the cost of the project. North Carolina Statute 113-229, North Carolina Dredge and Fill Law section (h1) and (h2) directs how beach quality sand is to be handled. The "down drift beach" seems to be in conflict with the proposal.
    a) Is Moffat and Nichol aware of this Law?
    b) How did they consider this Law in their proposal to sell beach quality sand to Ocean Isle Beach?

Answers:

Ocean Isle Beach is an eroding shoreline near Tubbs Inlet while Sunset Beach is generally accreting. Beneficial reuse of compatible material is commonly placed or authorized for placement on neighboring shorelines at inlets in North Carolina.

- Lockwoods Folly Inlet
- Cape Fear River
- Mason Inlet
- Masonboro Inlet

Thank you!

Questions and Comments