



**North Topsail Beach Shoreline Protection Project Plan:
2017 Update and How to Complete the Beach**

December 20, 2017

Goal of Update

Given what we now know, after construction of Phases 1 and 5:

1. What projects should we do next, to complete and maintain the beach (particularly Phases 2-4), and in which sequence?
2. Which sand sources should we use?
3. What will it cost?

Background

- I. NTB has three potential sand sources to complete phases:
1. **New River Inlet:**
 - A. **ocean bar**
 - B. **navigation channel west of the COLREG line**
 2. **DA143 spoil island**
 3. **Offshore**
- Offshore rock adds \$2/CY cost to screen at intake or outfall site; off-island transport of beach rock size >3" also raises costs;
- Insufficient sand to meet coarse grain sand requirements for Phases 2 and 4 hardbottom (has only 350,000 CY coarse sand out of 6,000,000, CY total to meet 715,000 CY needed);
- affected by weather in open ocean during winter dredge window.
- = Offshore sand is cost prohibitive and should not be used except in emergency.**
- II. Phase 2 and 4 hardbottom areas:** permit requires coarse sand for hardbottom in Phase 2 (5,000 LF x 65 CY/LF = 325,000 CY) and Phase 4 (6,000 LF x 65 CY/LF = 390,000 CY).
- III. Beach-compatible sand:** The native beach grain size average is .23mm; DA143 is finer at .22mm; inlet sand is beach compatible grain size (.23mm or higher).
- However, may be able to modify DA143 permit for phases 2-4 to include hardbottom areas, according to one engineering report.

Option 1

- **Phase 2:** modify current New River navigation permit for **expanded Cedar bush cut dredge project**, from current permit dimensions of 8' x 90' to 16' x 300', for navigation channel **west of COLREG line**, to get more channel sand.
- **Phases 3 and 4**—use DA143, requesting permit modification to use 143 in hardbottom area of Phase 4 (Phase 3 has no hardbottom).
- **After hardened structure in place**, use ocean bar for maintenance of entire beach.

Pro:

- Uses coarse inlet sand for one hardbottom area (Phase 2) while avoiding issue about adjacent shoreline erosion near ocean bar;
- Inlet sand qualifies for Shallow Draft fund grant -- 67% of cost;
- Can use the State grant (\$1,500,000) for the DA143 phases.

Con:

- County holds the permit for channel west of COLREG line and would have to agree to modify. However, expanded navigation dimensions would be beneficial to improved navigation, for which County has a strong interest.
- Permitting agencies may not allow DA143 in hardbottom area of Phase 4.

Option 2

1. Use **DA143 for Phases 2-4**, with permit modification to allow finer grain sand in hardbottom areas of phases 2 and 4.
2. Postpone ocean bar sand use until after hardened structure in place, as maintenance for entire beach.

Pro:

- No adjacent shore erosion issues caused by use of ocean bar or inlet sand;
- Possibly one unified project to complete all phases—saves mobilization costs.
- Use the \$1,500,000 State grant; also the new State Beach fund 50% grant.
- No ocean dredge weather delays from ocean bar or offshore.
- No rocks!

Con:

- Uses lower 50% State grant, not higher 67% Shallow Draft fund grant \$\$;
- requires permit modification to overcome hardbottom issue in Phases 2 & 4 to use finer grain DA143 sand— may be able to do only Phase 3 and half of Phases 2 & 4.
- Inlet sand is preferred sand, due to coarser grain, for beach **longevity**.

Option 3

If DA143 permit not allowed to be modified for fine grain sand:

- Phase 2: **expanded Cedar Bush cut dredge project** sand;
- Phase 3: use **DA143 in Phase 3 and fine grain area of Phase 4**;
- after hardened structure in, complete 4 and maintain beach with **ocean bar coarse sand**.

Pro:

- Two phases use higher Shallow draft 67% grant, reducing costs.
- Uses the State beach grant of \$1.5 million to offset DA143 cost;
- Avoids ocean bar channel erosion debate.

Con:

- **Complexity** -- will require three separate mobilizations due to different sand sources and times, increasing costs (however, this cost is offset by the higher 67% Shallow Draft grant for two inlet projects, keeping it affordable).

Option 4

- If **expanded Cedar Bush cut permit** not allowed, and **DA143 permit hard bottom exemption not allowed**, then construct hardened structure while pursuing DA143 for Phase 3 and half of the Phase 4 non-hard bottom area; after hardened structure installed, use ocean bar for phase 2 and complete Phase 4.

Pro:

- Already have ocean bar permit in hand and State grant of \$5.6 million;
- Can use the \$1.5 million state grant for DA143;
- Avoid ocean bar erosion issue with hardened structure as barrier to shore erosion;
- Low local match, after grant cost.

Con:

- **Longer time period to complete beach**—will be able to do only Phase 3 and part of 4 until hardened structure in place.
- **No Town-wide beach maintenance sand**, once ocean bar used to complete Phases 2 & 4; would need to go offshore or obtain permit modification to go back to ocean bar sooner than current permit allows (every 4 years).

Cost Comparison of Options 1,2,3,4					
	Phase 2	Phase 3	Phase 4	Total to construct	Total After Grant
Option 1	\$14,896,219	\$4,550,000	\$7,475,000	\$26,921,219	\$11,703,252
Option 2	\$7,800,000	\$4,550,000	\$7,475,000	\$19,825,000	\$12,312,500
Option 3	\$14,896,219	\$4,550,000	\$9,324,016	\$28,770,235	\$11,042,678
Option 4	\$9,729,408	\$4,550,000	\$7,475,000	\$17,727,557	\$9,998,205
			Average	\$23,311,003	\$11,264,159

Brief Analysis:

- Option 4 has lowest total project cost but will take the longest time to complete the beach, while awaiting hardened structure completion.
- Option 2 will complete beach fastest, using one source and potentially one project, but has highest local match due to the State Beach fund's lower 50% contribution versus Shallow draft fund 67%.
- **Whichever option is selected will require raising \$11.3 million for the grant local match.**

North Topsail Beach Beach & Shoreline Protection Fund					
		Actual	Forecast		
Revenues		FY16-17	FY17-18	FY18-19	FY19-20
Occupancy Tax		1,009,134	1,311,333	1,350,649	1,418,182
15 Cents dedicated AV		1,288,696	1,290,000	1,290,000	1,290,000
Sales Tax		786,327	770,800	770,800	770,800
Onslow County Tourism Grants:		..	11,700	250,000	250,000
Beach & Beach Access		60,000	150,000	60,000	60,000
Hardened Structure		..	250,000	..	..
FEMA Phase 5 Re-imburement		44,250	7,028,000	..	..
Total Revenues		3,339,151	10,823,033	3,733,449	3,800,982
Expenses		FY16-17	FY17-18	FY18-19	FY19-20
Phase One Debt (Bank) -		587,794	577,883	..	..
Phase Five Project (Storm Repair Project)		..	7,028,000	100,000	..
Phase 5 Federal Project w/Surf city		..	..	..	..
Phase 5 Debt Service		900,112	899,250	899,030	899,420
Revetment Maintenance		6,681	200,000	100,000	100,000
Groin/Hardened Structure		..	500,000	..	..
Annual Operating		213,261	372,900	380,358	387,965
Totals Expenses		2,284,831	9,798,033	1,479,388	1,387,385
Revenues/Expense +--		1,054,320	1,025,000	2,254,061	2,413,597
Fund Balance*		3,989,486	5,014,486	7,268,548	9,682,144
duct for USDA Reserve		-2,788,403	-2,878,328	-2,968,231	-3,058,173
Post USDA Reserve		1,201,083	2,136,158	4,300,316	6,623,971

USDA Reserve is Town's Emergency Storm fund, per USDA agreement.

FY17-18 Post USDA Reserve increase to \$4.3 million by next FY end.

Project Finance

Three ways to pay:

- 1. Apply for grants and seek County/State/Fed contributions** -- to defray local match grant cost (average of \$11,000,000).
- 2. Save and Pay:** in FY18-19 should have \$4.3 million unobligated balance, but will need external infusion of cash or NTB funds totaling \$7,000,000 to reach the \$11M local match needed to complete phases 2-4.

(current \$.1571 dedicated tax = \$1.3 million annually; doubling the rate to \$2.6 million would reach the needed \$7 million in three years).
- 3. Use Debt:** a USDA loan for the grant local match of \$11,264,159 = an annual debt increase of \$642,716 (30 year, 3.25% interest). Added to the current debt of \$900,000, could be sustained under current taxes. However, would require:
 - LGC re-consideration of the Phase 5 USDA eleven year prepayment agreement, which LGC would want protected;
 - Careful financial planning so funds are not siphoned off into non-beach nourishment projects such as the hardened structure, weakening the debt payment structure;
 - Overcoming same USDA issue as Phase 5 debt -- the five payment USDA Reserve \$\$ requirement.

Recommendations Forward

- Pursue Option 1 first, due to need for clean, cheap, beach compatible sand; if County/State say no to permit modification west of COLREG line, use option 2, DA143.
- If neither expanded Cedar Bush cut nor DA143 hard bottom exemption permitted, construct hardened structure, while pursuing DA143 in 3 and part of 4, then use ocean bar in Phase 2 after completion of hardened structure.
- Issue **Request for Plans** for engineer to provide a 2018 Shoreline Protection Plan, with options/costs to complete the beach, and how to finance it. Can be done at no cost.
- **Resolve clearly** who will be the **overall “Town Coastal Engineer,”** coordinating all shoreline work, particularly important as NTB approaches State and USACE on permits, so projects are coordinated by one primary agent.
- Decide on priority of phases—do you agree with Beach Vulnerability Study ranking?
- Once Plan option and engineer chosen, complete design/permitting to anticipate the full **funding of the new State Beach fund, to be shovel ready and first in line.**
- View Hardened Structure as separate project requiring a unique mix of County, State, Federal contributions, with its own strategy to obtain construction funds, using State’s \$2,000,000 as seed money/leverage to pursue aggressively. **Do not let project distract from completion of all phases for sand on the beach, to be maintained in perpetuity.**