TOWN OF DUCK, SOUTHERN SHORES,
KITTY HAWK, AND KILL DEVIL HILLS, NORTH CAROLINA
BORROW AREA INVESTIGATION AND SEDIMENT COMPATIBILITY ANALYSIS
ADDENDUM B – BORROW AREA INFILLING ASSESSMENT

This document is an addendum to the *Borrow Area Investigation and Sediment Compatibility Analysis Report: Town of Duck, Southern Shores, Kitty Hawk, and Kill Devil Hills, North Carolina*, prepared by Coastal Protection Engineering of North Carolina, Inc. (CPE). The original report was prepared for the four (4) northern Dare County Towns and submitted on April 26, 2021. An assessment of the amount and type of sediments that has infilled Borrow Area A since the 2017 nourishment project was requested for submittal by the North Carolina Division of Coastal Management (NC DCM).

In May and June of 2021, the Towns of Duck, Southern Shores, Kitty Hawk, and Kill Devil Hills authorized CPE to conduct supplemental field data collection and assessment to determine whether infilling of the Borrow Area occurred and, if so, to determine the quality and volume of the sediment.

This addendum represents additional data and analysis for the *Borrow Area Investigation and Sediment Compatibility Analysis Report: Town of Duck, Southern Shores, Kitty Hawk, and Kill Devil Hills, North Carolina* (CPE, 2021). Addendum B includes the following appendices:

- Appendix 1 --- 2021 Vibracore Logs
- Appendix 2 --- 2021 Vibracore Photo Mosaics
- Appendix 3 --- Infilling Borrow Area A Composite Summary Tables
- Appendix 4 --- 2021 Vibracore Grain Size Distribution Curves and Histograms (Digital Copy Only)
- Appendix 5 --- 2021 Vibracore Granularmetric Reports (Digital Copy Only)
- Appendix 6 --- 2021 Grab Sample Grain Size Distribution Curves and Histograms (Digital Copy Only)
- Appendix 7 --- 2021 Grab Sample Granularmetric Reports (Digital Copy Only)
- Appendix 8 --- Infilling Composite Grain Size Distribution Curves and Histograms (Digital Copy Only)
- Appendix 9 --- Infilling Composite Granularmetric Reports (Digital Copy Only)

Introduction:

In April 2021, after submission of permit applications to use Borrow Area A for a proposed multi-town beach nourishment project, NC DCM expressed concern over the potential infilling of sediments in portions of the borrow area since the area was dredged in 2017. If infilling had occurred, NC DCM wanted to know the volume and type of infilled sediments. In response, CPE

collected three types of data during field operations in May and June 2021. These field operations included the collection of multibeam bathymetry, grab samples, and vibracores.

Methodology:

Multibeam data were collected to identify locations and amounts of sediment where potential infilling may have occurred in Borrow Area A. Multibeam bathymetry, also known as swath bathymetry, measures the elevation of the seafloor at point spacings less than five feet in water depths less than 70 feet. These high-resolution data sets provide the information necessary to pinpoint changes on the seafloor. Multibeam data of Borrow Area A were collected following completion of dredging for the 2017 beach nourishment project. These 2017 data were the basis for detecting changes in Borrow Area A between 2017 and 2021. McKim & Creed collected multibeam data on the survey vessel "SV Clock" on May 19-22, 2021. The multibeam data were signed and sealed by McKim & Creed's Professional Land Surveyor, David L. Jones Jr., License Number L-3672, on June 8, 2021. The XYZ points were placed on a McKim & Creed server where CPE downloaded the data for processing.

Along with the multibeam survey, grab samples were collected to determine the types of sediments at the surface of Borrow Area A. A total of 51 grab samples were collected in Borrow Area A on May 22nd and 27th of 2021 by McKim & Creed. Sediments were collected using a Wildco petite ponar grab at the same locations that vibracores were collected in 2014. Those vibracores were initially used to establish the compatibility of the entire borrow area in accordance with the NC Technical Standards for Beach Fill Projects. Each grab sample was photographed and placed in a Ziploc bag. The samples were transported to CPE's office in Wilmington, North Carolina for processing.

Subsequent to the multibeam survey and grab sample collection, five vibracores were collected by Athena on research vessel "R/V Artemis" on June 16, 2021 to determine the type of sediments at and below the surface. These additional vibracores were collected in locations identified from the multibeam data as potential areas of infilling since the 2017 dredging of Borrow Area A. Athena utilized their custom-designed and fabricated vibracore system that consisted of a generator with a mechanical vibrator attached via cable to a three-inch diameter galvanized barrel. The completed cores were opened longitudinally, transferred to PVC sleeves, wrapped in plastic wrap, placed in 6 mil poly tubing, and transported to CPE's office in Wilmington, North Carolina for processing.

Results:

CPE downloaded McKim & Creed's multibeam data that were provided as XYZ points in 3-foot grid spacing, State Plane North Carolina US Survey Feet, NAVD88 feet. The ~1.7 million points

were interpolated to a 5-foot resolution digital elevation model (DEM, Figure 1). Volumes were calculated based on the 2015 permitted design cuts using a CPE custom Python tool in ArcGIS Pro (Figure 1). Total available volume above the 2015 permitted cuts based on the 2021 bathymetry was 12,563,700 cubic yards (cy). The 2021 total available volume is approximately 236,000 cy less than the total available volume calculated from the 2017 post-construction bathymetry (CPE, 2021). The decrease in total available volume indicates that the material within Borrow Area A are dynamic and that the net change of sediments have migrated beyond the limits of the borrow area polygons.

During the 2017 project, portions of areas A1, A2, A6, and A7 were dredged while areas A3 and A4 were not utilized. While one load of material was dredged from A5 during the project, effectively it remained unused. The difference in elevation between the 2017 post-construction data and the 2021 multibeam data shows flattening of the dredged portions of the borrow area as well as the migration of sand ridges moving to the southeast (Figure 2). The corduroy texture in A2 shows that the tracks and ridges caused by the dredging in 2017 have flattened. The largest changes were observed in A1, A3, A4, A5, and A7. The natural sand ridges are oriented northeast to southwest.

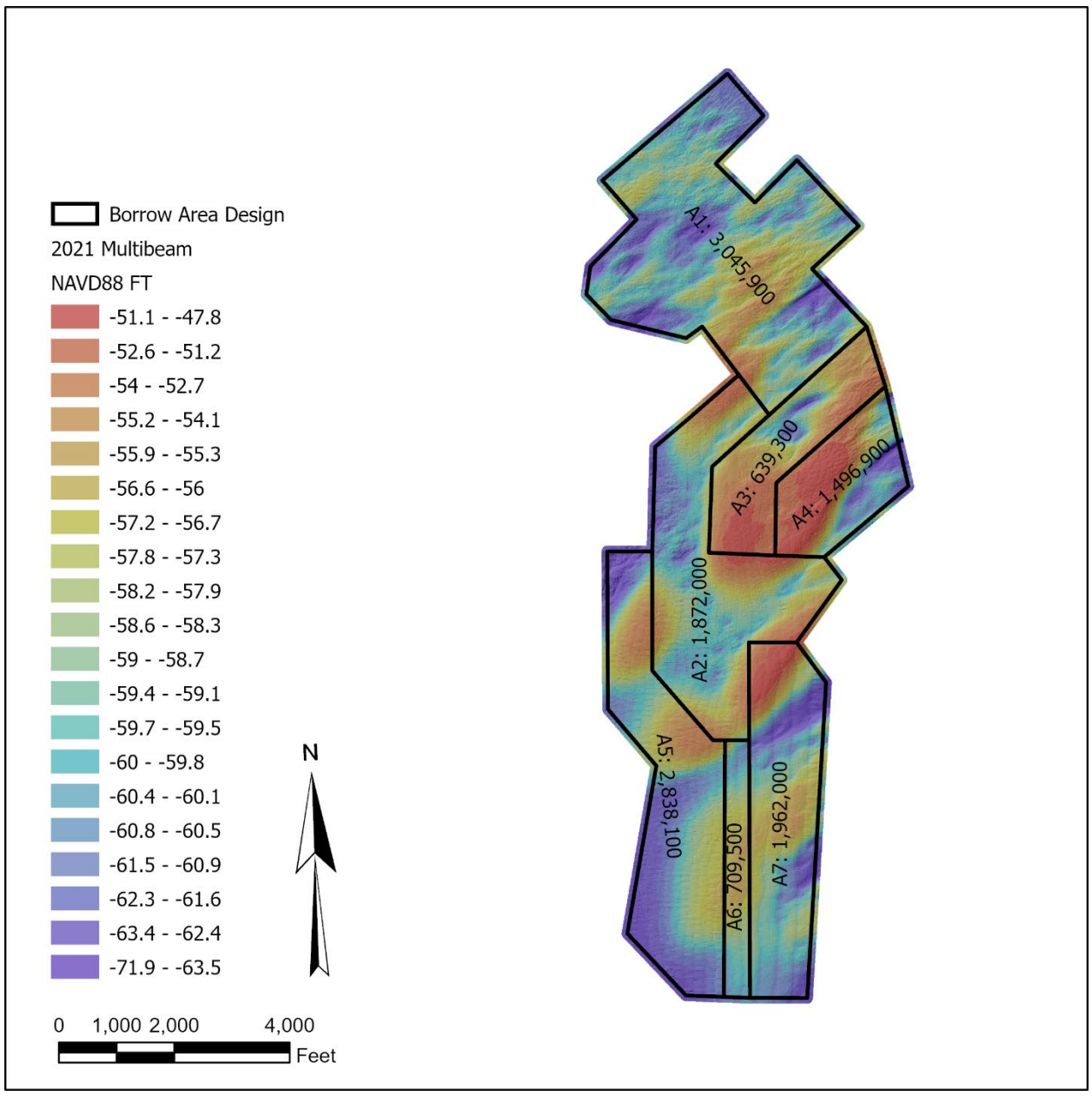

Figure 1. Color shaded relief image of 2021 multibeam bathymetry. Sub areas are labeled by number and amount of volume available above the previously permitted cut elevation in cubic yards.

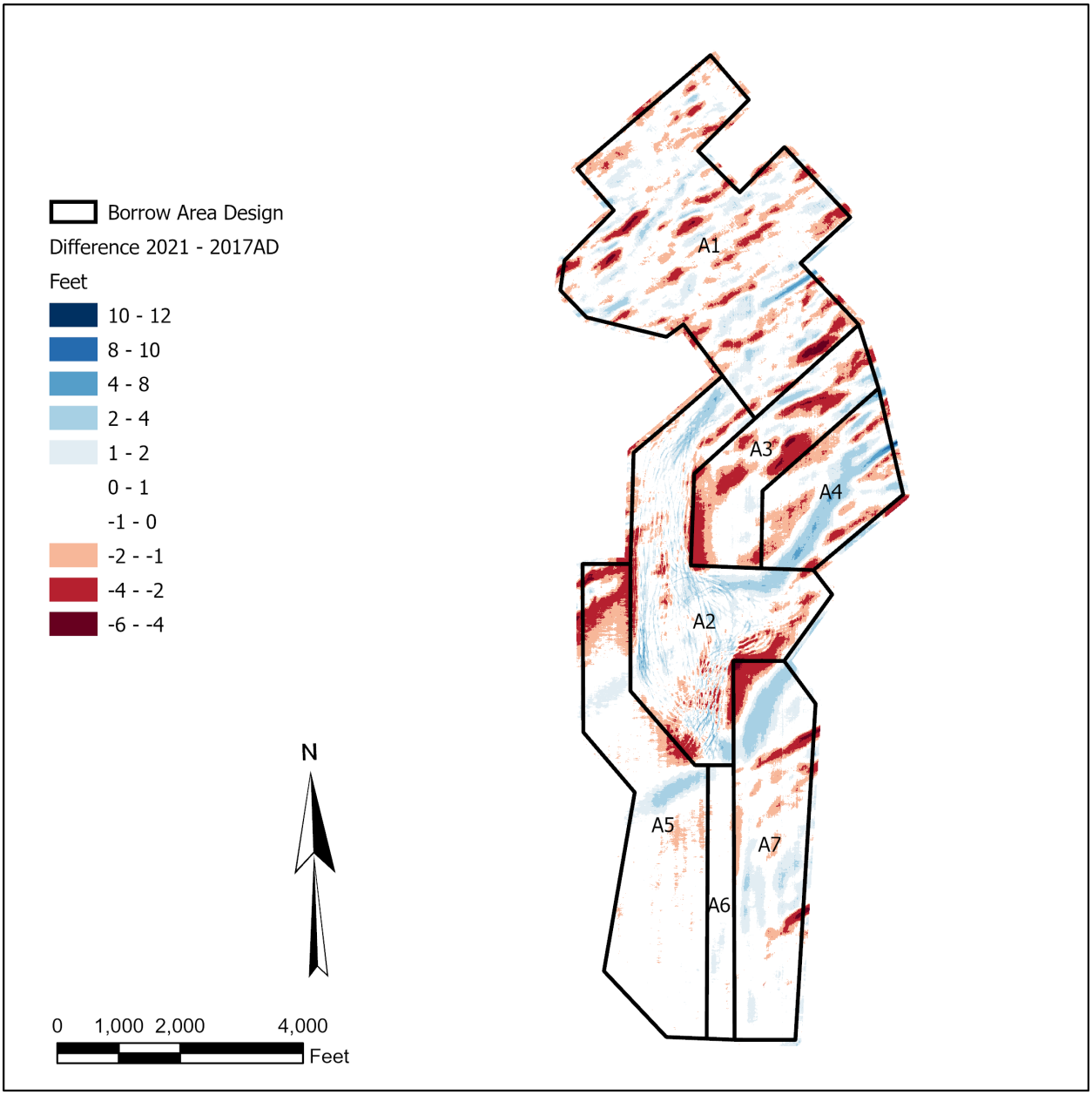

Figure 2. Elevation change in Borrow Area A between 2021 and 2017 after dredge multibeam data.

All fifty-one grab samples, collected at locations in which vibracores were collected in 2014 (Figure 3, Table 1), were visually inspected to determine whether incompatible material were recovered from the surface of the borrow area. Visually, all fifty-one samples were clean quartz sand with trace (<5%) fines. Ten samples were processed to determine grain size due to their proximity to locations where an increase in elevation greater than 2 feet was measured since dredging of portions of Borrow Area A in 2017. The range of mean grain size for these ten grab samples was 0.31 to 0.67 mm (Table 2). Silt percentages ranged from 0.86 to 1.13 with wet

Munsell values in the 5 to 6 range. These values are in line with the composite for Borrow Area A, where the mean grain size was 0.36 mm with a silt % of 0.83 and a wet Munsell value of 5 (CPE, 2021). The remaining samples were stored should additional processing become necessary.

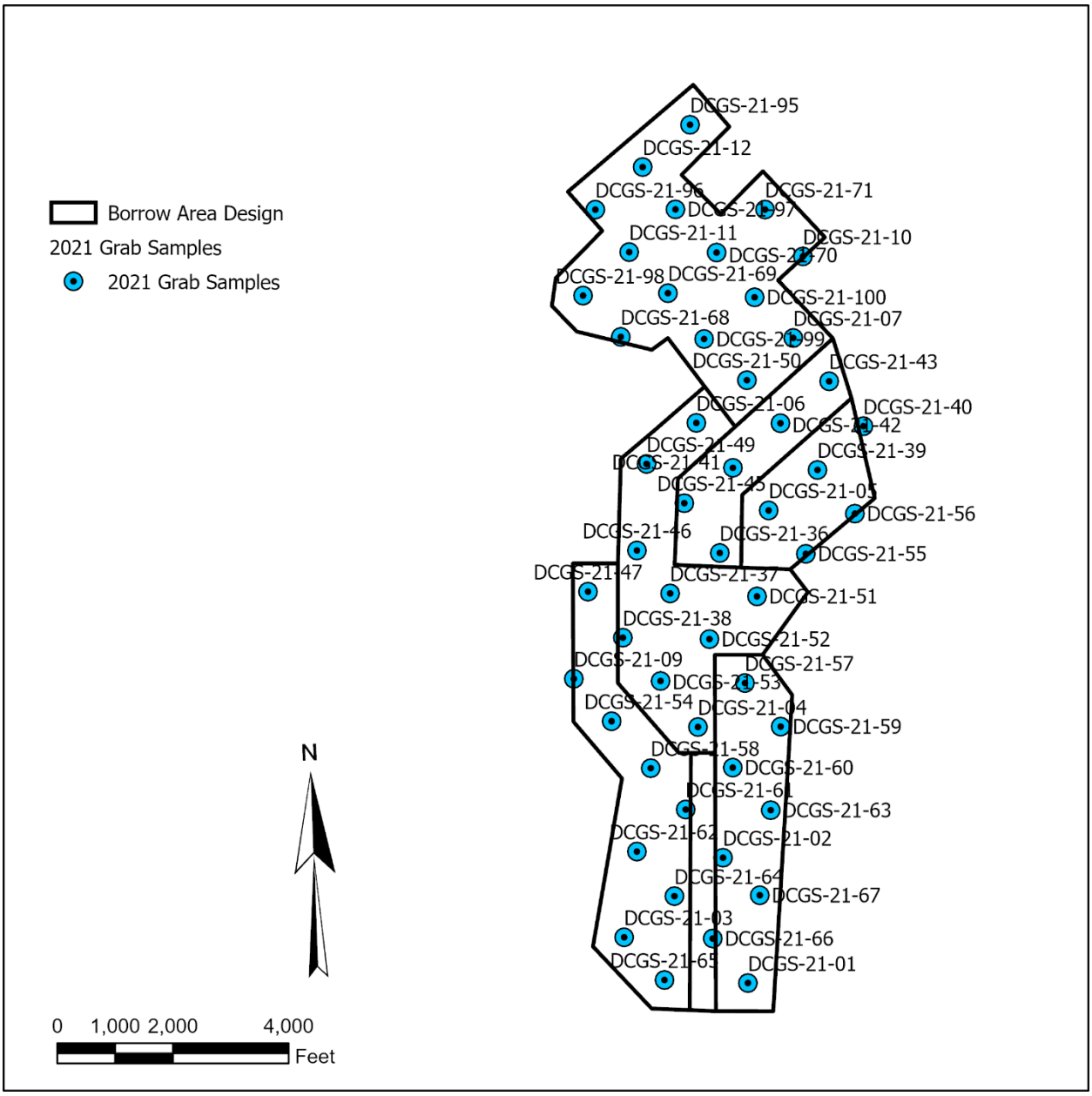

Figure 3. Grab samples collected in 2021.

Table 1. Grab Samples

Grab Sample	Sample Date	Easting	Northing	Depth
DCGS-21-01	5/27/2021	3020315.68	839453.7	-60.6
DCGS-21-02	5/27/2021	3019885.2	841618.45	-56.1
DCGS-21-03	5/27/2021	3018176.51	840243.92	-62.3
DCGS-21-04	5/27/2021	3019452.21	843876.74	-55.8
DCGS-21-05	5/27/2021	3020674.25	847617.97	-51.1
DCGS-21-06	5/27/2021	3019424.65	849130.05	-55.9
DCGS-21-07	5/22/2021	3021099.23	850597.33	-60.4
DCGS-21-09	5/27/2021	3017307.32	844709.69	-57.3
DCGS-21-10	5/22/2021	3021266.45	852006.4	-57.3
DCGS-21-11	5/22/2021	3018263.76	852081.03	-59.5
DCGS-21-12	5/22/2021	3018497.02	853550.2	-60.2
DCGS-21-36	5/27/2021	3019829.8	846883.38	-51.1
DCGS-21-37	5/27/2021	3018971.63	846184.06	-58.5
DCGS-21-38	5/27/2021	3018154.69	845419.88	-54.1
DCGS-21-39	5/27/2021	3021518.19	848316.84	-51.5
DCGS-21-40	5/27/2021	3022313.1	849073.22	-58.3
DCGS-21-41	5/27/2021	3020056.41	848354.3	-56.3
DCGS-21-42	5/27/2021	3020877.91	849124.52	-57.8
DCGS-21-43	5/22/2021	3021719.87	849849.22	-54.9
DCGS-21-45	5/27/2021	3019216.92	847743.09	-55.1
DCGS-21-46	5/27/2021	3018397.72	846926.3	-60.3
DCGS-21-47	5/27/2021	3017551.93	846215.08	-64.5
DCGS-21-49	5/27/2021	3018564.24	848421	-58.6
DCGS-21-50	5/22/2021	3020298.48	849867.8	-59.2
DCGS-21-51	5/27/2021	3020473.01	846132.81	-60.2
DCGS-21-52	5/27/2021	3019651.06	845395.34	-59.5
DCGS-21-53	5/27/2021	3018806.07	844671.32	-60.4
DCGS-21-54	5/27/2021	3017960.04	843976.44	-59.1
DCGS-21-55	5/27/2021	3021316.85	846868.23	-58.8
DCGS-21-56	5/27/2021	3022164.54	847562.63	-60
DCGS-21-57	5/27/2021	3020264.25	844636.17	-50.1
DCGS-21-58	5/27/2021	3018636.5	843165.42	-55.1
DCGS-21-59	5/27/2021	3020882.13	843883.81	-66.9
DCGS-21-60	5/27/2021	3020054.13	843175.32	-60.4
DCGS-21-61	5/27/2021	3019239.9	842451.47	-59.1
DCGS-21-62	5/27/2021	3018397.19	841724.98	-61.1
DCGS-21-63	5/27/2021	3020710.15	842439.89	-55.7
DCGS-21-64	5/27/2021	3019045.52	840955.17	-56.9
DCGS-21-65	5/27/2021	3018873.81	839506.35	-62.2
DCGS-21-66	5/27/2021	3019707.83	840223.26	-58.2
DCGS-21-67	5/27/2021	3020520.89	840970.01	-61.4

DCGS-21-68	5/22/2021	3018118.6	850615.88	-61.9
DCGS-21-69	5/22/2021	3018933.3	851371.45	-58.6
DCGS-21-70	5/22/2021	3019774.75	852073.06	-56.9
DCGS-21-71	5/22/2021	3020612.04	852816.42	-61.1
DCGS-21-95	5/22/2021	3019315.8	854280.43	-60.5
DCGS-21-96	5/22/2021	3017678.63	852814.51	-57.4
DCGS-21-97	5/22/2021	3019063.12	852819.11	-59.9
DCGS-21-98	5/22/2021	3017466.41	851329.17	-60.5
DCGS-21-99	5/22/2021	3019558.65	850579.6	-55.3
DCGS-21-100	5/22/2021	3020431.64	851300.08	-56.5

Table 2. Grab Sample Sediment Analysis Results

Grab Sample	Mean Grain Size		Sorting	Silt	Wet Munsell	USCS Classification
	(mm)	(phi)	(phi)	(%)	Color Value	
DCGS-21-02	0.47	1.09	0.78	0.98	6	SP
DCGS-21-06	0.58	0.78	0.91	1.12	6	SW
DCGS-21-11	0.34	1.55	0.75	1.10	5	SP
DCGS-21-37	0.51	0.97	0.84	0.98	6	SP
DCGS-21-39	0.33	1.61	0.59	0.86	6	SP
DCGS-21-49	0.42	1.26	0.71	1.13	6	SP
DCGS-21-57	0.41	1.30	0.65	0.94	5	SP
DCGS-21-58	0.67	0.58	0.95	0.97	6	SW
DCGS-21-96	0.42	1.26	1.17	0.88	5	SW
DCGS-21-99	0.31	1.71	0.51	0.93	6	SP

The locations of the vibracores collected in June 2021, to confirm the similarity of sediment characteristics in areas where an increase in elevation greater than 2 feet was measured between 2017 and 2021 and borrow area composites generated during the investigation of Borrow Area A in 2014, are shown on Figure 4. Four of the five vibracores collected in June 2021 were from within A2 which was dredged in 2017. The other core, DCVC-21-01, was collected in A1 away from where dredging occurred in 2017 and where a 4 to 6 ft. increase in elevation was measured between 2017 and 2021, as a sand ridge migrated to the southeast. Large elevation changes were also observed within portions ofA4 and A5 which were also areas that were not dredged in 2017 (Figure 4). The fact that significant elevation changes were observed between 2017 and 2021 from areas that were not dredged strongly suggest that the material in Borrow Area A are dynamic and are naturally migrating in a northwest to southeast direction.

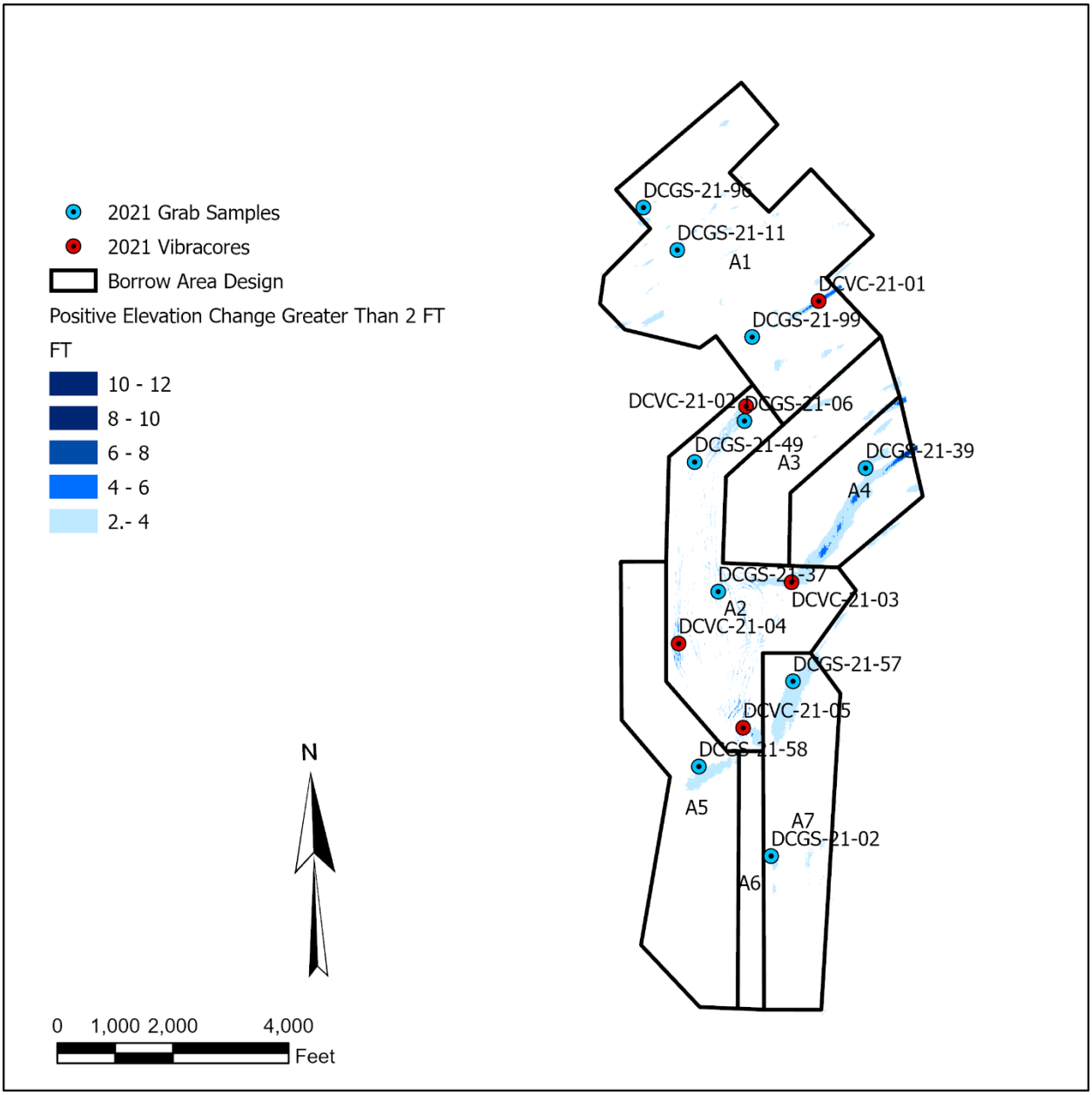

Figure 4. Positive Sediment elevation changes greater than two feet with 2021 vibracore locations and ten select grab samples.

For each of the five vibracores collected in A1 and A2, top of core elevations were calculated based on vibracore location and the depth from the 2021 multibeam data (Table 3). Recovered depth is the recovered thickness minus the top of core elevation. In order to characterize the in-situ sediments above the 2017 post-construction seafloor surface, composites were calculated above the 2017 post-construction surface elevation. Vibracores DCVC-21-03 and DCVC-21-05 penetrated beyond the additional sediments, thus the composite depth was based on the thickness of sediment above the 2017 post-construction seafloor surface at that location.

Table 3. Vibracore Depths and Thicknesses

Vibracore	Penetration	Recovery	Top of Core	Sediment Thickness	Recovered Depth	Composite Depth
	(ft)	(ft)	(NAVD88 ft)	(ft)	(NAVD88 ft)	(NAVD88 ft)
DCVC-21-01	5.0	4.6	-60.0	5.4	-64.6	-64.6
DCVC-21-02	5.0	4.3	-52.0	4.5	-56.3	-56.3
DCVC-21-03	5.0	4.7	-54.4	4.2	-59.1	-58.6
DCVC-21-04	7.0	6.4	-55.5	6.7	-61.9	-61.9
DCVC-21-05	8.0	7.0	-56.0	6.6	-63.0	-62.6

The grain size of the vibracore composites ranged from a mean of 0.26 to 0.58 mm (Table 4). Silt ranged from 0.60 to 0.97%. Table 5 shows the composite sediment data for A1 and A2 based on the sediment remaining in the borrow area in 2017. DCVC-21-01 was collected in an area that was not dredged during the 2017 project. The shoal appears to have naturally migrated southeast into this area not previously dredged as shown in Figure 5. The relatively lower mean grain size of 0.26 mm matches well with the composite of A1 provided in Table 5 (0.29 mm). Vibracores DCVC-21-02 through DCVC-21-05 were located in subarea A2 and were at locations that were previously dredged in 2017. Mean grain size for material sampled above the 2017 surface ranged from 0.32 to 0.58 mm with a composite grain size of 0.41 mm. This compared well to the composite grain size of A2 provided in Table 5 (0.43 mm).

Table 4. Vibracore Composite Sediment Characteristics

Core ID	Effective Length	Mean		Fines	Granular	Gravel	Wet Munsell
	ft	mm	PHI	%	%	%	Value
DCVC-21-01	4.6	0.26	1.97	0.71	1.13	0.75	5
DCVC-21-02	4.3	0.32	1.63	0.97	0.83	0.63	6
DCVC-21-03	4.2	0.36	1.49	0.72	0.64	0.05	6
DCVC-21-04	6.4	0.58	0.78	0.6	10.53	4.06	7
DCVC-21-05	6.6	0.38	1.39	0.8	0.51	0.04	6

Table 5. Subarea Composites

Core ID	Effective Length	Mean		Fines	Granular	Gravel	Wet Munsell
	ft	mm	PHI	%	%	%	Value
Borrow Area A1	4.6	0.26	1.97	0.71	1.13	0.75	5
Borrow Area A2	21.5	0.41	1.28	0.77	3.59	1.35	6

Discussion:

The supplemental data collection and analysis described herein were aimed at first determining whether infilling had occurred in the borrow area and, if so, to determine the quantity. Grab sample and vibracore collection and analysis were then conducted to verify the quality of the material and confirm the material matched previously established composite values determined in 2014 in accordance with the NC Technical Standards for Beach Fill Projects.

Comparison of the 2017 post-construction bathymetry and the 2021 bathymetry show a net reduction in the volume within the previously permitted borrow area. However, a closer examination of the changes indicate portions of the borrow area have gained sediment while other areas have lost sediment. The changes, which resulted in a net decrease in volume within the previously permitted borrow area, can be characterized as either a flattening of dredged tracks and/or the migration of shoals within the limits of the borrow area. Figure 5 shows a color shaded relief image of the 2017 bathymetric data illustrating these dredged tracks. Comparison of A2 as seen in Figure 5 to the surface based on 2021 conditions shown in Figure 1 illustrates the observed flattening of the surface.

A cursory evaluation of difference plots such as the one shown in Figure 2 may suggest considerable infilling of depressions; however, a closer examination tells a different story. Many of the positive changes in elevation within the borrow area are not likely due to infilling of depressions with sand from sources unassociated with the overall shoal system that comprises Borrow Area A. As shown in Figure 6, these positive changes are highly likely due to the migration of shoals within the limits of the borrow area. The upper panels in Figure 6 show the bathymetry within Cut A1 in the vicinity of vibracore DCVC-21-01. The image on the left represents after-dredge conditions in 2017. The image on the right represents conditions in 2021. Orange and yellow colors indicate higher elevations, whereas blue colors indicate lower elevations. The profile drawn on each image represents the location of the cross section shown below the two map images in the figure. This cross section demonstrates how the shoal appears to have migrated to the southeast. The differential between the 2021 bathymetric surface (pink) and the 2017 surface (green) as shown on the cross section represents a difference of 5.4 feet.

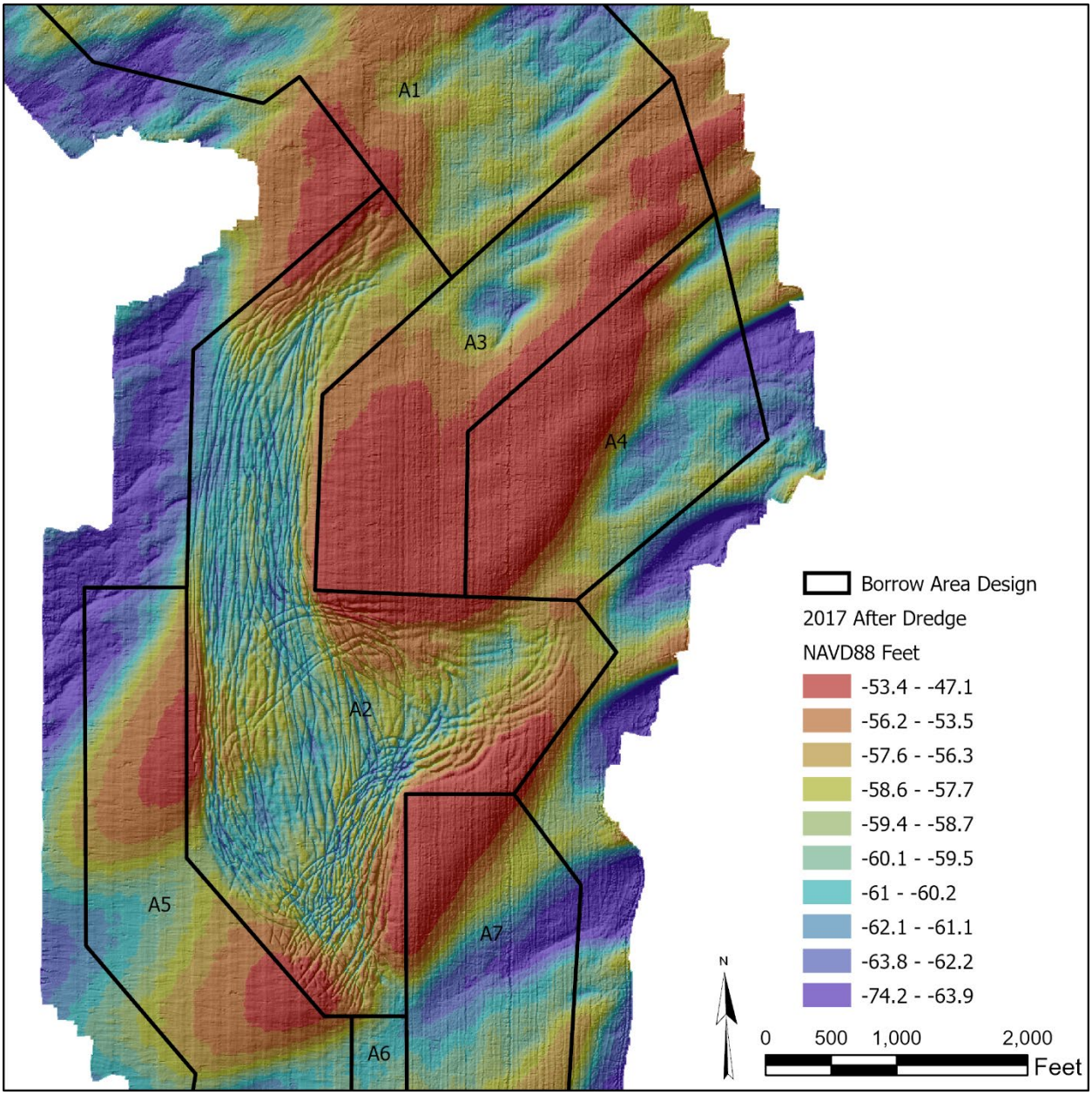

Figure 5. Color shaded relief image of 2017 post-construction multibeam bathymetry showing dredged tracks through portions of A2.

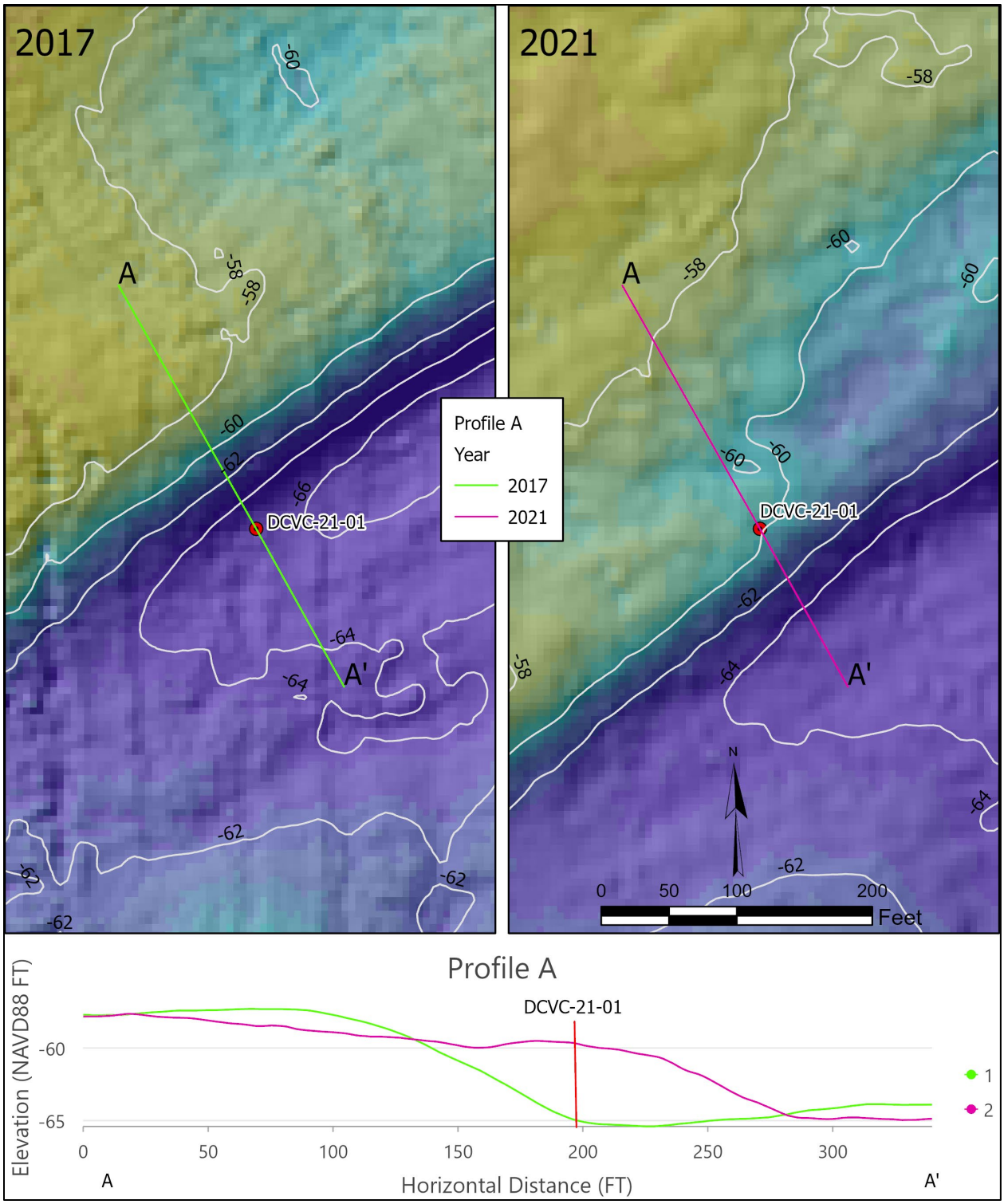

Figure 6. Area A1 where the hill of sandy material moved southeast. Oranges and yellows are high and blues are low. Year 2017 is number 1 and year 2021 is number 2 in the profile legend.

The shoal system on which Borrow Area A is located extends beyond the limits of the designed borrow area. The shoal system is a much larger regional feature. Figure 7 shows a map of the initial investigation area targeted in 2014 during the design and permitting of Borrow Area A. While the highest portions of the shoal are what were targeted in designing Borrow Area A, the shoals can be seen to extend to the northeast and northwest outside the permitted boundaries. However, the assertion that the shoal only extends to the northeast and northwest is a function of the relative comparison of elevations inside the borrow area with elevations outside the borrow area. Figure 8 provides additional prospective on the size of the overall shoal system on which Borrow Area A is located.

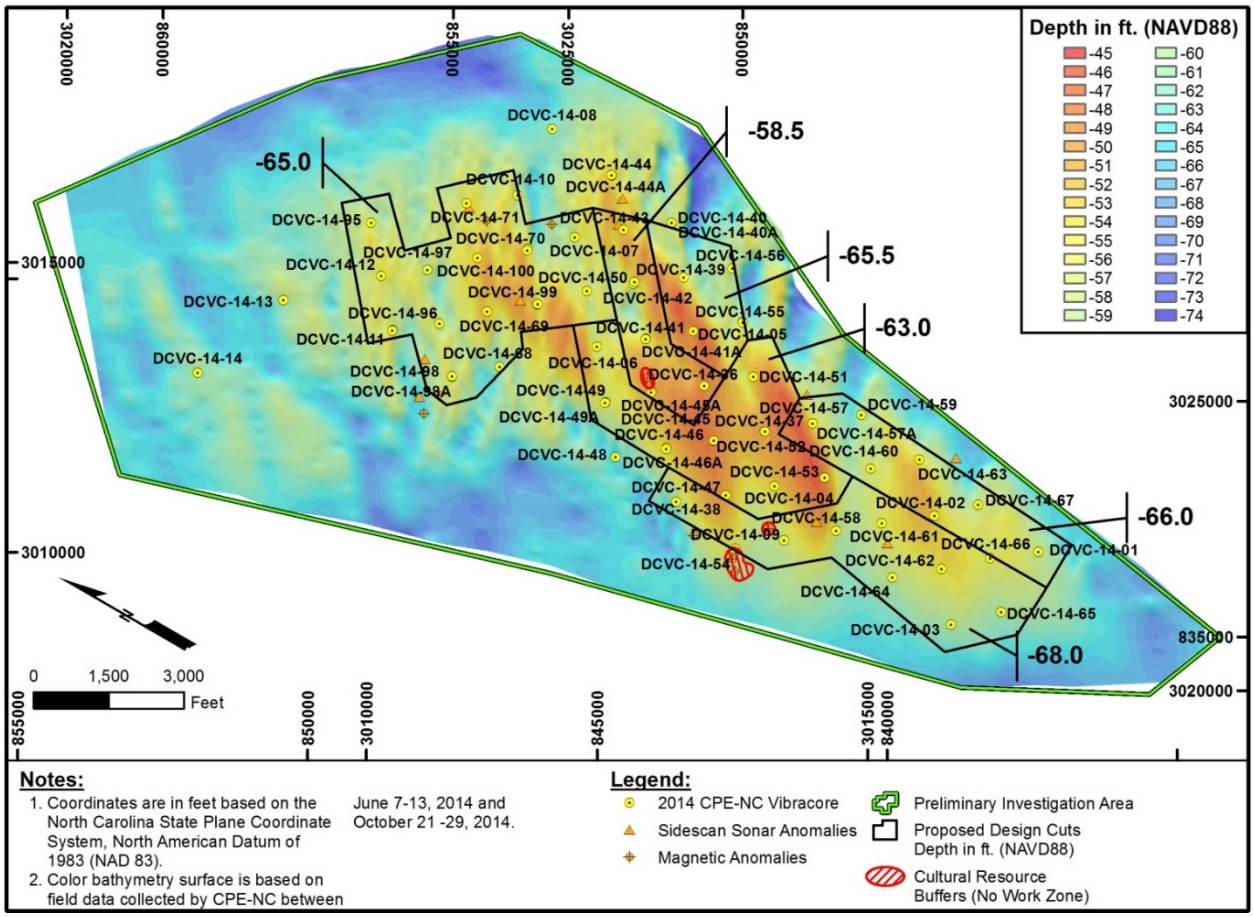

Figure 7. Map showing the initial investigation area that resulted in the design and permitting of Borrow Area A.

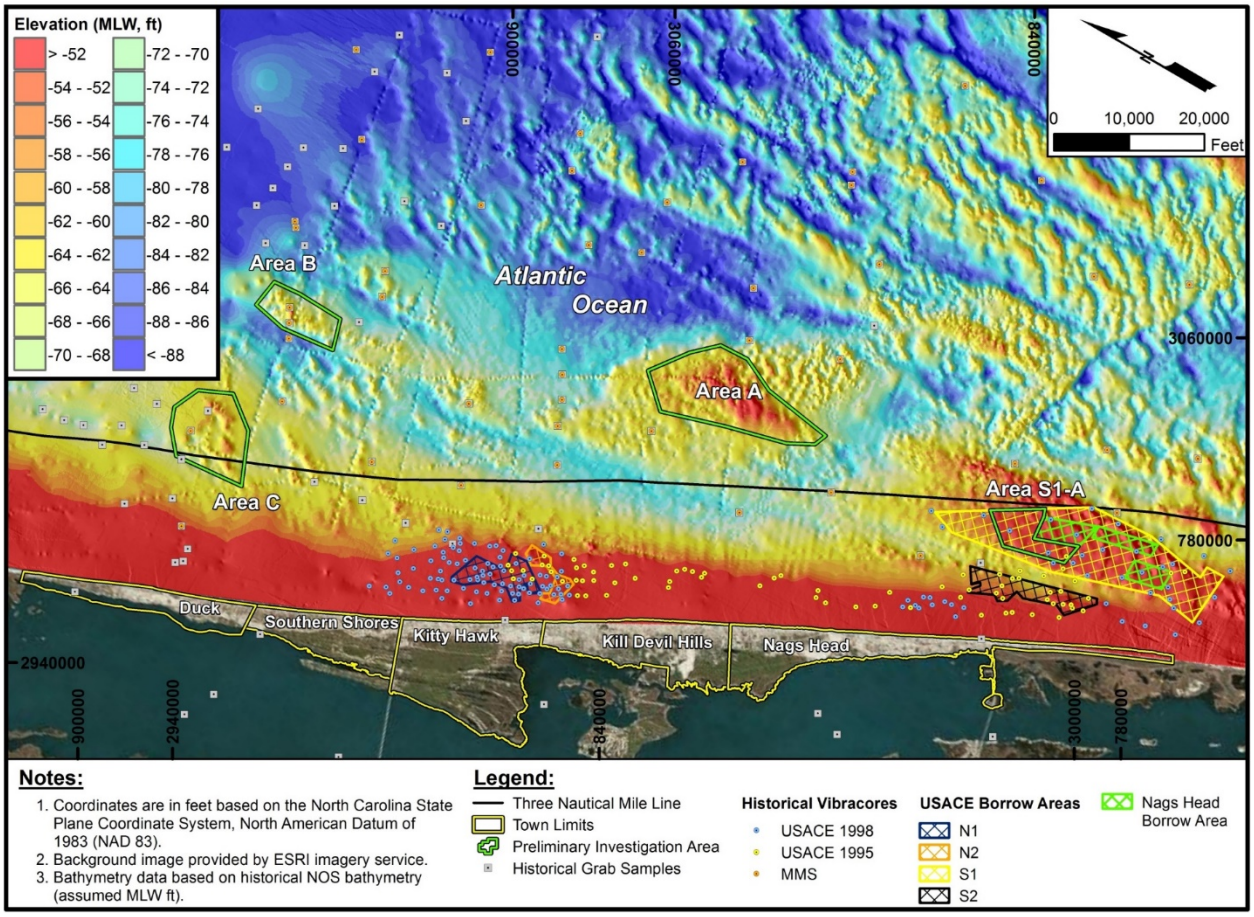

Figure 8. Map showing the investigation area shown in Figure 7 overlaid on historical NOS bathymetry.

Sub-Item (2)(e) of the NC Technical Standards for Beach Fill Projects states that:

Two sets of sampling data (with at least one dredging event in between) from maintained navigation channels or sediment deposition basins within the active nearshore, beach or inlet shoal system, or offshore dredged material disposal site (ODMDS) may be used to characterize material for subsequent nourishment events from those areas if the sampling results are found to be compatible with Sub-Item (3)(a) of this Rule.

The language in the Technical Standards dealing with a second set of sampling data following dredging specifically refers to navigation channels, sediment deposition basins within the active nearshore, beach or inlet shoal system, or offshore dredged material disposal sites. Borrow Area A does not fall into those categories. During the interagency meeting held on April 29, 2020, during which the plan to re-use Borrow Area A was discussed, neither regulatory nor resource agencies mentioned the need to re-sample the previously permitted borrow area. While the need to collect post-dredging data to verify compatibility of borrow sites located in areas where

material is expected to fill dredged depressions (i.e. navigation channels or sediment deposition basins), or where new sediment from outside the area is expected to be mechanically placed into a site (i.e. ODMDS) is understandable, the nature of this particular borrow area does not fall into these categories. The borrow area is not designed to cut into a flat seafloor surface and excavate a depression in the seafloor, but rather to excavate the upper portions of a shoal system situated upon basal Pleistocene sediments.

The applicant acknowledges that the sediments comprising the shoal system are not stationary and that wave action offshore of the Outer Banks causes the shoals to shift position and orientation. However, it is the position of the applicant and its engineering consultant that changes in elevation as described herein are due to the natural movement of sand that has previously been verified to be beach compatible in accordance with the NC Technical Standards. To further verify this position, a series of vibracores were collected in targeted areas where elevation changes measured between 2017 and 2021 exceeded 2 feet. As described in the Results section of this Addendum, the vibracore data verifies the position that shifting sediments within the borrow area resulting in flattening of dredged tracks and migration of shoals are compatible with the recipient beach. The data does not support the notion of infilling of depressions with sediments unlike those contained within the borrow area and surrounding shoal system.

Conclusions:

Multibeam bathymetry, grab samples, and vibracores were collected and analyzed to determine the type of sediments that resulted in increases in elevation within Borrow Area A. The updated bathymetry showed that the northeast to southwest oriented sand ridges are dynamically moving to the southeast. The grab samples and vibracore results indicate that the sediments in areas of positive elevation change are compatible with the borrow area design sediments below the 2017 post-construction seafloor surface. The similar sediment types and migration of the shoals support the applicant's position that the material resulting in positive changes in elevation are from within the borrow area that was previously confirmed to adhere to the NC Technical Standards for Beach Fill Projects.

The ~1.7 million points that were interpolated to a 5-foot resolution DEM indicated that 12,563,700 cubic yards (cy) existed above the borrow area design cut depths. The decrease in the 2021 total available volume suggests that the net change of sediments have moved out of the borrow area polygons when compared to the after dredge 2017 bathymetry.

Fifty-one grab samples were collected; ten of which were analyzed at locations of positive elevation change to determine sediment quality at the surface. The range of mean grain size for

the surface sediments of 0.31 to 0.67 mm matches well with the initial composite mean grain size for Borrow Area A at 0.36 mm.

Five vibracores were collected to confirm sediments in locations where positive elevation changes were observed meet the NC Technical Standards. DCVC-21-01 was collected in subarea A1 that was not dredged in 2017 but showed a significant elevation increase in 2021 as the sand ridge has migrated to the southeast. The mean grain size of 0.26 mm matches well with the initial composite mean grain size of Borrow Area A1 at 0.29 mm

Four vibracores (DCVC-21-02 through DCVC-21-05) were located in subarea A2 and were at locations that were previously dredged in 2017. Mean grain size for infilled sediments in subarea A2 ranged from 0.32 to 0.58 mm with a composite grain size of 0.41 mm. The range and mean grain size compared well to the initial composite grain size of subarea A2 at 0.43 mm.

The applicant and their engineering consultant have coordinated extensively with NC DCM both during the scoping process and through the permitting review process. Sub-Item (2)(b) of the NC Technical Standards for Beach Fill Projects allows for the characterization of borrow sites to include "…historical sediment characterization data where available and collected using methods consistent with Sub-Items (2)(c) through (2)(g) of this Rule, and in coordination with the Division of Coastal Management." It is the position of the applicant and its consultant that the borrow area has been thoroughly evaluated in accordance with the NC Technical Standards. This assertion is based on the extensive investigations documented in the 2015 borrow area report (CPE-NC, 2015), the re-assessment of the borrow area described in the *Borrow Area Investigation and Sediment Compatibility Analysis Report: Towns of Duck, Southern Shores, Kitty Hawk, and Kill Devil Hills, North Carolina* (CPE, 2021), and the assessment presented herein which conclude that the changes in elevation are due to the movement of sand that has previously been verified to be beach compatible in accordance with the NC Technical Standards.

References:

APTIM, 2018 – Aptim Coastal Planning & Engineering of North Carolina, Inc., 2017 Dare County Beach Nourishment Project, Project Completion Report. Wilmington, NC: 34 p.

CPE-NC, 2015 – Coastal Planning & Engineering of North Carolina, Inc., Comprehensive Marine Sand Search and Borrow Area Design Report: Towns of Duck, Kitty Hawk, and Kill Devil Hills, Dare County, North Carolina. Wilmington, NC: 49 p.

CPE, 2021 - Coastal Protection Engineering of North Carolina (CPE), 2021. Borrow Area Investigation and Sediment Compatibility Analysis Report: Towns of Duck, Southern Shores, Kitty Hawk, and Kill Devil Hills, North Carolina. Report prepared for Towns of Duck, Southern Shores, Kitty Hawk, and Kill Devil Hills. Wilmington, NC: 20 p.