Appendix 4

Geotechnical Survey of North Myrtle Beach Borrow Area

GEOTECHNICAL APPENDIX 4 INPUT
FINAL ENVIRONMENTAL ASSESSMENT
STORM DAMAGE REDUCTION PROJECT
MYRTLE BEACH REACH 1

In September 2016, USACE began a reassessment of the sand resources available within the Little River borrow area in support of the second renourishment of the Myrtle Beach Storm Damage Reduction Project, Reach 1. The Little River borrow area lies approximately 1.7 miles southeast of the town of North Myrtle Beach, and 2.0 miles southwest of Little River Inlet. The borrow area primarily lies within SC-State jurisdictional waters, landward of the Federal 3-mile line (Figure 4-1). The Little River borrow area is the designated project borrow site, which was used during the initial project construction in 1997. The seaward edge of the site was used again during the 2008 nourishment cycle. The purpose of the 2016-2017 investigation is to re-evaluate the quality and volume of beach compatible material within the Little River borrow area to verify the quality and quantity of beach-fill material for construction as the project prepares for its second renourishment cycle.

USACE re-evaluated the existing 2006 vibracore, lab and subsurface data to identify trends in the spatial distribution of sand and to identify data gaps. The distribution of lab-verified beach compatible material along with the location of protected hard grounds and archeological sites were re-evaluated using ArcGIS software. A single-beam condition survey dated August 25, 2016 was used for the bathymetric baseline for all subsequent mapping and modelling products. Data from the 2006 borrow site evaluation were then utilized to generate an isopach thickness map of suitable material for in-house use to determine spatial relationship of sandy deposits for the upcoming nourishment effort. It was determined that additional vibracores were required in order to address the ten year time span had passed since the last nourishment activity. Forty-eight vibracores were drilled to complement the existing 2006 data.

AVS mobilized the vessel *MV Thunderforce* as the working platform for vibracoring operations on December 26, 2016 from Charleston, SC. Vibracoring began on December 28, 2016 and was completed by January 3, 2017 with all 48 vibracores drilled within 20 feet of the USACE predetermined target locations. Figure 1 shows the final boring location of the 2016 and 2006 vibracores. All vibracores were advanced to a maximum depth of 20 feet or until vibracore refusal was met. Vibracore refusal is defined as penetration of less than 0.1 feet per 10 seconds interval. However, all the cores met refusal at depths ranging from 4 to 8 feet below ocean bottom. The drilling was conducting using a submersible pneumatic vibracore machine equipped with a 4-inch diameter, 20-foot long steel sampling barrel that was lowered to the seafloor by the shipboard winch system. A penetrometer was used to determine depth advancement into the seafloor and the penetration rates were recorded. Vibracore locations were surveyed utilizing Real Time Kinematic (RTK) Global Positioning System (GPS) to accuracies within 0.2 feet, both in horizontal and vertical dimension. All boring elevations are referenced to Mean Lower Low Water (MLLW).

The vibracores were split open, photographed, logged and visually classified in accordance with the Unified Soil Classification System. Draft logs were provided to USACE for test sample interval selection. Visually classified granular sediments that lie within the possible dredging prism were selected for gradation testing. A total of 120 samples were selected for gradation testing to verify field classification (American Society for Testing and Materials [ASTM] D2487), determine particle size distribution (ASTM 6913), and percent shell, limestone and fines

passing the #200 sieve. A limited number of silty or clayey sand samples were designated for additional hydrometer analysis (ASTM D422-63). Gradation summaries from the 2006 and 2016 vibracores are provided in Attachment 4-1. Drilling logs and lab data from the 2016 and previous 2006 investigations are available upon request.

The 2006 and 2016 subsurface data were reconsolidated into ArcGIS and gINT databases for in-house evaluation by USACE to determine the vertical and horizontal extents of suitable beach-fill material. This material was defined as being composed predominantly of granular sediment (such as poorly graded sands or poorly graded sands with silt or clay) that have a fines content of less than 10% passing the #200 sieve. Figure 4-2 shows the distribution of suitable beach-fill material in the borrow area. Generally, this distribution was found to be representative of a fairly thin surficial layer of sand on the ocean bottom. A relatively thick and laterally continuous layer of stiff to hard[1] clay lies below the surficial sand stratum. The thickness of suitable beach-fill material is shown for each boring (see Figure 4-2)[2]. The thickness of suitable beach fill material was then contoured using ArcGIS software in order to produce an isopach "thickness" map (Figure 4-3). Figure 4-3 shows that much of the available sand deposits are constrained to relatively small, 3 to 4 foot thick pockets, which are found in the center and along the western side of the borrow area. A 1 to 3 foot thick veneer of sand is more widespread, but it thins significantly to the east-northeast.

Figure 4-4 shows areas (Zones 1 through 3) that have thicker sequences of sand within the Little River borrow area. These areas were examined in cross-section to verify their thickness and the quality of sand present. The gradation and sedimentological characteristics of these areas is provided in Attachment 4-2.

[1] "Stiff" and "Hard" consistency descriptors are used only in a descriptive manner, informed by the penetrometer records.

[2] The top of boring for the 2006 vibracores were adjusted to the 2016 bathymetric survey by removing soil information that lies above the bathymetric surface.

FIGURES

2006 and 2016 Little River Vibracores

Year Drilled

- 2006-USACE Drilled *LR-06-V-##*
- 2016-AVS Drilled **LR-16-V-##**
- Federal 3-Mile Line Coastal Waters
- Little River Hardbottom Areas
- Little River Renourishment Borrow 2008
- Little River Initial Construction Borrow 1997

Little River Single-Beam Condition Survey Aug 2016

Bathymetry (Ft-MLLW)

- -28 to -27
- -29 to -28
- -30 to -29
- -31 to -30
- -32 to -31
- -33 to -32
- -34 to -33
- -35 to -34
- -36 to -35
- -36.61 to -36

Initial Construction Borrow Area
Completed 1997

First Renourishment Borrow Zones
Completed 2008

LR-06-V-1 **LR-16-V-32** *LR-06-V-2* **LR-16-V-33** **LR-16-V-34** *LR-06-V-3* *LR-06-V-4* *LR-06-V-5* *LR-06-V-6* *LR-06-V-7* *LR-06-V-8* *LR-06-V-9* **LR-16-V-03** **LR-16-V-01** *LR-06-V-18* **LR-16-V-02** *LR-06-V-17* **LR-16-V-06** **LR-16-V-05** **LR-16-V-04** *LR-06-V-27* *LR-06-V-16* *LR-06-V-15* **LR-16-V-17** **LR-16-V-16** *LR-06-V-26* **LR-16-V-08** **LR-16-V-07** *LR-06-V-25* *LR-06-V-37* **LR-16-V-11** *LR-06-V-14* *LR-06-V-36* **LR-16-V-09** **LR-16-V-14** **LR-16-V-10** *LR-06-V-24* **LR-16-V-21** **LR-16-V-18** *LR-06-V-13* *LR-06-V-23* *LR-06-V-35* *LR-06-V-47* **LR-16-V-12** *LR-06-V-12* **LR-16-V-36** *LR-06-V-11* **LR-16-V-35** *LR-06-V-10* **LR-16-V-39** **LR-16-V-38** *LR-06-V-21* **LR-16-V-22** **LR-16-V-20** *LR-06-V-22* *LR-06-V-34* **LR-16-V-13** *LR-06-V-46* *LR-06-V-33* **LR-16-V-19** **LR-16-V-24** *LR-06-V-45* *LR-06-V-32* **LR-16-V-23** *LR-06-V-44* **LR-16-V-27** **LR-16-V-37** *LR-06-V-20* **LR-16-V-42** **LR-16-V-25** *LR-06-V-43* *LR-06-V-31* *LR-06-V-19* **LR-16-V-41** **LR-16-V-29** *LR-06-V-42* *LR-06-V-30* **LR-16-V-40** **LR-16-V-28** **LR-16-V-26** *LR-06-V-41* *LR-06-V-29* **LR-16-V-46** **LR-16-V-30** *LR-06-V-28* **LR-16-V-47** *LR-06-V-40* **LR-16-V-31** **LR-16-V-48** *LR-06-V-39* **LR-16-V-45** *LR-06-V-38* **LR-16-V-44** **LR-16-V-43**

ATLANTIC OCEAN

2715000 2720000 2725000 2730000 2735000 2740000 2745000

735000 730000 725000 720000 715000

0 0.5 1 2 Miles

FIGURE 4-1: 2006 and 2016 Vibracore Location Map Little River Offshore Borrow Area Myrtle Beach Coastal Storm Damage Reduction Project

2006 to 2016 Little River Vibracores

Sampled Sediment Quality

- Green 0-5% Fines
- Yellow 5-10% Fines
- Red > 10% Clay, Silt, or Rock

Thickness of Suitable Beach Fill Relative to Seafloor is Shown Below Each Boring Location

- Federal 3-Mile Line Coastal Waters
- Little River Hardbottom Areas

Little River Single-Beam Condition Survey Aug 2016

Bathymetry (Ft-MLLW)

- -28 to -27
- -29 to -28
- -30 to -29
- -31 to -30
- -32 to -31
- -33 to -32
- -34 to -33
- -35 to -34
- -36 to -35
- -36.61 to -36

N

LR-06-V-9 1.9-ft
LR-06-V-8 2.5-ft
LR-16-V-03 0.5-ft
LR-06-V-7 -0.1-ft
LR-16-V-02 1.6-ft
LR-06-V-18 3-ft
LR-06-V-17 3.2-ft
LR-16-V-06 1.2-ft
LR-06-V-6 2.2-ft
LR-16-V-05 0-ft
LR-06-V-16 2.5-ft
LR-16-V-04 1.7-ft
LR-06-V-27 1.7-ft
LR-06-V-5 1.5-ft
LR-16-V-17 0.4-ft
LR-06-V-15 2.4-ft
LR-06-V-26 0.6-ft
LR-16-V-08 2-ft
LR-06-V-4 1.4-ft
LR-06-V-25 0.9-ft
LR-06-V-37 2-ft
LR-16-V-11 3-ft
LR-06-V-14 3.4-ft
LR-06-V-36 1.9-ft
LR-16-V-09 3.2-ft
LR-06-V-3 2.9-ft
LR-16-V-15 2.9-ft
LR-06-V-24 1-ft
LR-16-V-21 3-ft
LR-16-V-14 1.6-ft
LR-06-V-47 1.9-ft
LR-06-V-2 2.2-ft
LR-16-V-34 3.8-ft
LR-06-V-13 0-ft
LR-06-V-35 2.6-ft
LR-16-V-10 2-ft
LR-06-V-1 2.3-ft
LR-06-V-12 1.4-ft
LR-16-V-36 2.1-ft
3-ft
LR-06-V-23 3.1-ft
LR-16-V-12 0-ft
LR-06-V-46 1.6-ft
LR-16-V-32 1-ft
LR-16-V-22 2-ft
LR-06-V-34 1.5-ft
LR-16-V-13 1.9-ft
LR-06-V-11 2.4-ft
LR-16-V-35 1.6-ft
2.6-ft
LR-06-V-22 1.3-ft
1.7-ft
LR-06-V-33 2.9-ft
LR-06-V-45 2.2-ft
LR-06-V-10 0.3-ft
LR-16-V-39 2.8-ft
LR-06-V-21 1-ft
1.9-ft
LR-16-V-24 2-ft
LR-16-V-38 1.8-ft
LR-06-V-32 1.5-ft
LR-16-V-23 1.7-ft
LR-06-V-44 0.4-ft
LR-16-V-37 2.7-ft
LR-06-V-20 2.2-ft
LR-16-V-42 1.2-ft
LR-16-V-27 1.5-ft
LR-16-V-25 2-ft
LR-06-V-43 1.3-ft
LR-06-V-19 3.5-ft
LR-16-V-41 3.2-ft
LR-06-V-31 1.7-ft
LR-16-V-29 1-ft
LR-06-V-42 0.8-ft
LR-16-V-40 1.5-ft
LR-06-V-30 2.6-ft
LR-16-V-28 2-ft
LR-16-V-26 2-ft
LR-06-V-29 1.2-ft
LR-06-V-41 2.3-ft
LR-16-V-30 1.3-ft
LR-06-V-28 3-ft
LR-16-V-46 2.4-ft
LR-16-V-47 2.5-ft
LR-06-V-40 3-ft
LR-16-V-31 1.5-ft
LR-16-V-48 3.5-ft
LR-06-V-39 3.7-ft
2-ft
LR-06-V-38 1.3-ft
LR-16-V-44 0.4-ft
LR-16-V-43 0-ft

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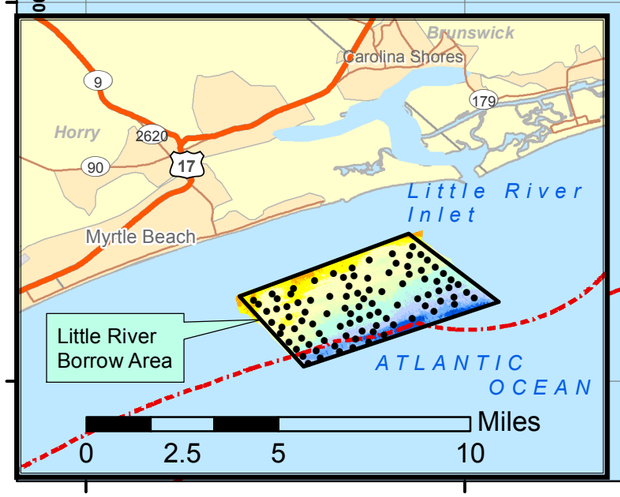


2715000 2720000 2725000 2730000 2735000 2740000 2745000

730000 725000 720000 715000

0 0.5 1 2 Miles

FIGURE 4-2: Material Quality and Thickness from Vibracores Little River Offshore Borrow Area Myrtle Beach Coastal Storm Damage Reduction Project

2006 to 2016 Little River Vibracores

Sampled Sediment Quality

- Green 0-5% Fines
- Yellow 5-10% Fines
- Red > 12% Clay, Silt, and Rock

Thickness of Suitable Beach Fill Relative to Seafloor Shown Below Boring Location

- Federal 3-Mile Line Coastal Waters
- Little River Hardbottom Areas

Little River Offshore Borrow Sand Isopach (thickness)

Contoured Thickness (ft)

- 4 - 5
- 3 - 4
- 2 - 3
- 1 - 2
- 0 - 1
- -0.8 - 0

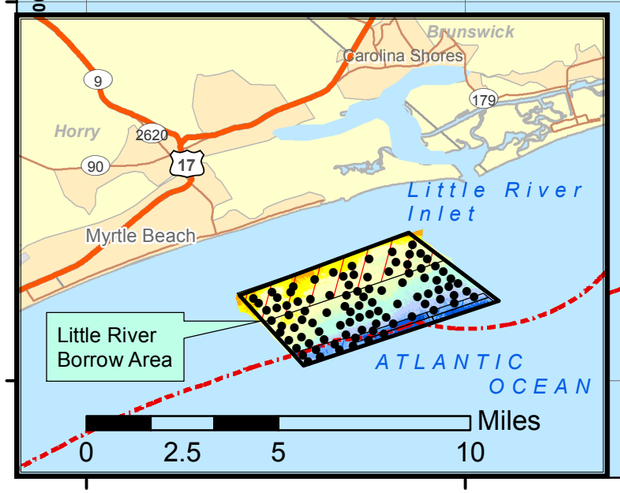
N

2715000 2720000 2725000 2730000 2735000 2740000 2745000

730000 725000 720000 715000

LR-06-V-9 1.9-ft
LR-06-V-8 2.5-ft
LR-16-V-03 0.5-ft
LR-06-V-18 3-ft
LR-06-V-7 -0.1-ft
LR-16-V-02 1.6-ft
LR-06-V-17 3.2-ft
LR-16-V-06 1.2-ft
LR-06-V-6 2.2-ft
LR-16-V-05 0-ft
LR-06-V-16 2.5-ft
LR-16-V-04 1.7-ft
LR-06-V-27 1.7-ft
LR-06-V-5 1.5-ft
LR-16-V-17 0.3-ft 0.4-ft
LR-06-V-15 2.4-ft
LR-06-V-26 0.6-ft
LR-16-V-08 2-ft
LR-06-V-4 1.4-ft
LR-06-V-25 0.9-ft
LR-06-V-37 2-ft
LR-06-V-14 3.4-ft
LR-16-V-11 3-ft
LR-06-V-3 2.9-ft
LR-16-V-15 2.9-ft
LR-06-V-24 1-ft
LR-06-V-36
LR-16-V-09 3.2-ft
LR-16-V-21 3-ft
LR-16-V-14 1.9-ft 1.6-ft
LR-06-V-2 2.2-ft
LR-16-V-34 3.8-ft
LR-06-V-13 0-ft
LR-06-V-23 3.1-ft
LR-06-V-35 2.6-ft
LR-16-V-10 2-ft
LR-06-V-47 1.9-ft
LR-16-V-12 2-ft
LR-06-V-1 2.3-ft
LR-16-V-36 2.4-ft
LR-06-V-12 2.1-ft
LR-16-V-22 2-ft
LR-06-V-34 1.5-ft
LR-16-V-13 0-ft
LR-06-V-46 1.6-ft
LR-16-V-32 1-ft
LR-06-V-11 2.6-ft
LR-06-V-22 1.3-ft 1.7-ft
LR-06-V-33
LR-06-V-45 2.2-ft
LR-16-V-35 1.6-ft
LR-16-V-39 2.8-ft
LR-06-V-10 0.3-ft
LR-06-V-21 1-ft
LR-16-V-24 2.9-ft 1.9-ft
LR-06-V-32 2-ft
LR-16-V-23 1.7-ft
LR-06-V-44 0.4-ft
LR-16-V-38 1.8-ft
LR-16-V-27 1.5-ft
LR-06-V-20 2.2-ft
LR-16-V-37 2.7-ft
LR-16-V-42 1.2-ft
LR-16-V-25 2-ft
LR-06-V-43 1.3-ft
LR-06-V-31 1.7-ft 1.5-ft
LR-06-V-19 3.5-ft
LR-16-V-41 3.2-ft
LR-16-V-29 1-ft
LR-06-V-42 0.8-ft
LR-16-V-40 1.5-ft
LR-06-V-30 2.6-ft
LR-16-V-28 2-ft
LR-16-V-26 2-ft
LR-06-V-29 1.2-ft
LR-06-V-41 2.3-ft
LR-16-V-46 2.4-ft
LR-16-V-30 1.3-ft
LR-06-V-28 3-ft
LR-16-V-47 2.5-ft
LR-06-V-40 3-ft
LR-16-V-31 1.5-ft
LR-16-V-48 3.5-ft
LR-06-V-39 3.7-ft
2-ft
LR-06-V-38 1.3-ft
LR-16-V-44 0.4-ft
LR-16-V-43 0-ft

ATLANTIC OCEAN



0 0.5 1 2 Miles

FIGURE 4-3: Sand Isopach and Material Quality, Little River Offshore Borrow Area Myrtle Beach Coastal Storm Damage Reduction Project

2006 and 2016 Little River Vibracores

Year Drilled

- 2006-USACE Drilled *LR-06-V-XX*
- 2016-AVS Drilled **LR-16-V-XX**
- Zones of Thick Suitable Material
- Federal 3-Mile Line Coastal Waters
- Little River Hardbottom Areas

Thickness of Suitable Beach Fill Relative to Seafloor Shown Below Boring Location.

Little River Offshore Borrow Sand Isopach (thickness)

Contoured Thickness (ft)

- 4 - 5
- 3 - 4
- 2 - 3
- 1 - 2
- 0 - 1
- -0.8 - 0

N

Zone 1

Zone 2

Zone 3

LR-06-V-1 2.3-ft
LR-16-V-32 1-ft
LR-06-V-2 2.2-ft
LR-06-V-3 2.9-ft
LR-16-V-34 3.8-ft
1.4-ft
LR-16-V-35 1.6-ft
LR-06-V-10 0.3-ft
LR-06-V-11 2.6-ft
LR-16-V-36 2.4-ft
2.1-ft
LR-06-V-12 0-ft
LR-16-V-37 2.7-ft
LR-16-V-38 1.8-ft
LR-16-V-39 2.8-ft
LR-06-V-4 1.4-ft
LR-06-V-5 1.5-ft
LR-06-V-6 2.2-ft
LR-06-V-7
LR-06-V-8 2.5-ft
LR-06-V-9 1.9-ft
LR-16-V-03 0.5-ft
LR-06-V-18 3-ft
LR-16-V-02 1.6-ft
LR-06-V-17 3.2-ft
LR-16-V-06 1.2-ft
LR-16-V-05 0-ft
LR-16-V-04 1.7-ft
LR-06-V-27 1.7-ft
LR-16-V-08 2-ft
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LR-16-V-11 2-ft
LR-06-V-36 3-ft
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LR-06-V-47 1.9-ft
LR-16-V-10 2-ft
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LR-06-V-46 1.6-ft
LR-16-V-13 1.9-ft
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LR-06-V-44 0.4-ft
LR-16-V-23 1.7-ft
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LR-16-V-30 1.3-ft
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LR-06-V-42 0.8-ft
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LR-16-V-28 2-ft
LR-16-V-25 2-ft
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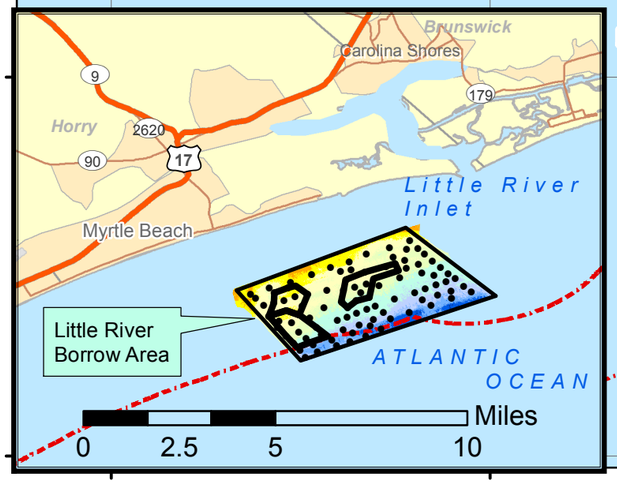
LR-06-V-32 2-ft
LR-06-V-34 1.5-ft
LR-06-V-35 2.6-ft
LR-16-V-14 1.6-ft
LR-06-V-24
LR-16-V-15 1-ft
LR-06-V-25 0.9-ft
LR-06-V-26 0.6-ft
LR-06-V-16 2.5-ft
LR-06-V-15 2.4-ft
LR-06-V-14 3.4-ft
LR-16-V-21 2.9-ft
LR-06-V-23 3.1-ft
LR-16-V-22 2-ft
LR-06-V-22 1.7-ft
1.3-ft
1.9-ft
LR-06-V-21 1-ft
LR-06-V-13 3-ft
LR-06-V-20 2.2-ft
LR-16-V-42 1.2-ft
LR-06-V-31 1.7-ft
LR-16-V-27 1.5-ft
LR-06-V-30
LR-06-V-29 2.6-ft
LR-06-V-28 1.2-ft
LR-16-V-46 2.4-ft
LR-16-V-47 2.5-ft
LR-06-V-40 3-ft
LR-06-V-39 3.7-ft
LR-16-V-44 0.4-ft
LR-06-V-38 1.3-ft
LR-16-V-43 0-ft
LR-06-V-19 3.5-ft
LR-16-V-41 3.2-ft
LR-16-V-40 1.5-ft

ATLANTIC OCEAN



0 0.5 1 2 Miles

FIGURE 4-4: Zone 1-3 Evaluation Little River Offshore Borrow Area Myrtle Beach Coastal Storm Damage Reduction Project

ATTACHMENT 4-1: 2006-2016 LAB GRADATION TABLES

SUMMARY OF LABORATORY TESTING RESULTS
FOR GRAIN SIZE ANALYSIS

2006 SUBSURFACE INVESTIGATION LITTLE RIVER BORROW AREA

BORING NUMBER	SAMPLE #	ELEV TOP MLLW (ft)	ELEV BOT MLLW (ft)	% SHELL	% LS	USCS	3/4	3/8	#4	#7	#10	#14	#18	#25	#35	#45	#60	#80	#120	#170	#200	#230
LR-06-V-1	1	-29.2	-31			SP	100.0	100.0	99.7	99.6	99.0	97.7	95.2	90.3	79.4	66.0	48.8	26.8	6.7	3.6	3.3	3.1
	2	-31	-32.8			SP-SM	100.0	100.0	98.6	96.6	92.9	86.6	79.6	74.3	68.3	61.5	52.8	37.7	12.8	8.4	7.8	7.3
	3	-32.8	-34.7			CH	100.0	100.0	100.0	99.3	98.7	98.2	97.8	97.4	96.8	96.3	95.1	91.9	82.1	69.1	63.4	56.9
LR-06-V-2	1	-30.7	-32.2			SP-SM	100.0	100.0	99.8	98.9	97.2	93.5	89.3	85.9	80.7	72.9	61.1	39.6	12.8	7.1	6.3	5.9
	2	-32.2	-33.5			SP-SM	100	100.0	97.8	95.8	92.1	84.7	77.5	71.7	65.6	59.1	48.7	33.2	17.5	12.8	12.1	11.7
	3	-33.5	-34.7			MH	100	100.0	98.4	96.8	96.3	95.4	94.3	93.4	91.9	90.2	87.0	80.6	70.0	61.7	56.6	52.2
LR-06-V-3	1	-29.2	-30.7			SP	100.0	100.0	99.5	99.1	98.3	97.2	96.1	93.1	83.2	68.7	49.2	26.8	6.8	2.9	2.6	2.4
	2	-30.7	-32.2			SP-SM	100.0	100.0	99.9	99.1	98.7	98.0	97.0	95.0	88.8	79.0	65.7	44.5	12.6	6.7	6.2	5.9
	3	-32.2	-34.1			CH	100.0	100.0	99.1	98.4	97.8	97.3	96.7	95.8	94.4	92.8	89.2	82.2	72.2	64.1	60.7	57.0
LR-06-V-4	1	-29.2	-31			SP-SM	100.0	100.0	98.8	97.4	95.4	92.2	87.9	83.1	73.8	64.3	52.9	35.1	13.2	8.3	7.7	7.3
	2	-31	-32.8			SC	100.0	100.0	99.4	98.2	97.8	97.6	97.5	97.2	97.0	96.7	96.2	94.7	78.2	54.3	47.7	42.8
	3	-32.8	-34.9			CH	100.0	100.0	99.1	97.6	97.3	97.2	97.1	97.1	96.9	96.8	96.6	95.7	84.4	61.7	51.9	46.0
	4	-34.9	-35.4			CH	100	100.0	99.2	98.0	97.6	97.5	97.4	97.4	97.2	97.1	97.0	96.6	91.2	67.2	55.9	47.5
LR-06-V-5	1	-29.9	-31.7			SP	100.0	100.0	99.2	98.6	97.5	95.8	93.7	90.5	83.0	73.0	60.1	39.7	11.5	4.8	4.1	3.7
	2	-31.7	-33.1			CH	100.0	100.0	99.0	98.5	97.9	97.4	96.9	96.6	96.1	95.4	94.2	91.6	86.0	76.2	72.6	69.8
	3	-33.1	-36.4			CH	100.0	100.0	98.2	96.9	96.8	96.7	96.4	96.3	96.2	96.0	95.6	94.4	88.6	74.2	63.0	52.9
LR-06-V-6	1	-30	-32			SP	100.0	100.0	100.0	99.9	99.7	99.0	97.0	92.4	82.1	65.6	40.7	22.5	8.2	4.0	3.5	3.1
	2	-32	-32.6			CH	100.0	100.0	98.2	96.2	95.9	95.7	95.6	95.4	95.3	95.3	95.2	94.4	89.3	75.5	63.5	53.4
LR-06-V-7	1	-30	-31.4			SP-SM	100.0	96.4	94.9	91.7	88.7	84.0	79.4	74.1	66.4	57.8	45.7	29.7	15.8	10.8	10.1	9.7
	2	-31.4	-34.1			CH	100.0	100.0	97.2	95.0	93.9	92.4	91.5	90.8	90.0	88.6	86.4	81.9	74.4	64.7	56.1	48.1
	3	-34.1	-37.3			CH	100.0	100.0	98.3	97.7	97.4	97.2	97.1	96.9	96.8	96.7	96.6	96.1	91.4	74.8	64.4	54.4
LR-06-V-8	1	-30.4	-32.5			SP	100.0	98.5	97.9	96.0	94.5	92.4	89.7	85.5	74.4	60.2	43.4	27.1	11.6	6.1	4.8	4.5
	2	-32.5	-33.2			SP-SM	100.0	100.0	96.0	93.8	92.3	90.2	88.3	85.5	80.0	70.9	54.9	34.8	18.6	12.1	11.3	10.8
	3	-33.2	-35.5			CH	100.0	100.0	98.4	97.5	97.2	96.8	96.6	96.5	96.0	95.4	94.3	91.5	76.8	59.1	50.3	44.6
	4	-35.5	-39			CH	100.0	100.0	96.7	94.7	94.0	93.6	93.6	93.4	93.3	93.0	92.3	90.4	84.5	72.2	64.9	57.6
	5	-39	-39.5			CH	100.0	100.0	97.9	97.1	96.9	96.8	96.7	96.6	96.5	96.3	96.1	95.5	89.7	75.7	65.2	55.9
LR-06-V-9	1	-30.1	-31.6			SP-SM	100.0	100.0	99.4	98.6	97.5	95.3	92.2	86.4	75.7	63.5	46.7	28.9	14.0	9.4	8.7	8.3
	2	-31.6	-32.6			SP-SM	95.1	93.9	93.2	91.4	89.5	85.5	80.5	76.2	70.4	62.0	48.3	30.4	16.5	12.8	12.2	11.8
	3	-32.6	-35.6			CH	100.0	100.0	97.0	95.6	95.2	94.7	94.4	94.1	93.8	93.1	91.7	89.9	86.8	79.4	71.9	61.9
	4	-35.6	-36.7			CH	100.0	100.0	98.3	97.2	96.8	96.6	96.4	96.3	96.1	95.9	95.6	94.2	90.1	81.8	72.5	61.5
LR-06-V-10	1	-30.4	-31.5			SP-SM	100.0	94.7	90.4	87.0	84.9	83.0	81.3	79.2	74.2	69.1	54.4	35.0	11.6	6.7	6.0	5.7
	2	-31.5	-33.7			CH	100.0	100.0	100.0	99.4	98.6	97.9	97.1	96.6	96.1	95.4	93.7	87.2	68.4	58.7	54.0	49.9
	3	-33.7	-34.6			CH	100.0	100.0	98.3	96.6	95.4	94.3	93.5	93.0	92.5	91.7	90.0	85.0	71.4	60.9	57.7	53.7
LR-06-V-11	1	-32.2	-33.2			SP	100	100.0	99.7	97.9	96.3	94.1	91.7	88.6	81.9	73.1	59.9	37.4	9.8	4.5	3.9	3.6
	2	-33.2	-35.2			SP-SM	100	100.0	99.3	96.7	93.6	87.5	81.1	75.4	68.6	60.7	49.2	31.6	17.9	12.2	11.5	11.0
	3	-35.2	-36.2			CH	100	100	100.0	99.2	98.3	97.5	96.8	96.2	95.7	94.4	92.3	88.4	78.9	69.9	66.7	62.4
LR-06-V-12	1	-31.2	-33.7			SP-SM	100	100.0	99.5	99.0	98.6	97.8	96.9	94.8	88.6	76.7	55.8	32.6	13.2	8.2	7.5	7.0
	2	-33.7	-35.8			CL	100	100.0	99.5	98.3	97.4	96.6	96.0	95.5	94.7	93.8	92.6	89.0	74.9	63.6	56.1	49.2
	3	-35.8	-36.3			CL	100	100.0	100.0	98.7	97.7	97.1	96.7	96.5	96.0	95.5	94.8	91.9	81.9	71.7	65.3	58.8
LR-06-V-13	1	-30.2	-32.4			SM	100.0	100.0	100.0	99.4	98.9	97.9	95.4	91.8	83.5	73.2	59.7	39.3	25.4	21.3	20.0	19.0
	2	-32.4	-34.4			SM	100.0	100.0	99.9	99.5	98.9	96.7	93.3	87.9	79.3	68.8	55.1	37.3	24.8	20.3	19.2	18.1
	3	-34.4	-36.1			SP-SM	100.0	100.0	99.4	97.7	96.0	93.2	89.3	84.2	73.9	61.9	47.8	31.1	14.7	9.9	9.1	8.6
	4	-36.1	-36.8			CL	100.0	100.0	98.9	98.2	97.5	96.9	96.4	95.9	95.0	93.9	91.7	87.8	79.1	70.2	63.9	57.5
LR-06-V-14	1	-30.2	-31.8			SP	100.0	100.0	100.0	99.9	99.7	99.4	98.6	96.8	90.2	76.7	53.1	25.7	7.0	3.6	3.1	2.9
	2	-31.8	-33.7			SP	100.0	100.0	100.0	99.6	99.3	98.7	97.9	96.1	90.9	80.2	59.1	30.4	7.8	3.2	2.8	2.6
	3	-33.7	-34.9			CL	100.0	100.0	99.2	98.1	97.3	96.4	95.5	94.2	92.5	89.8	84.5	74.5	63.2	56.5	53.9	51.2
LR-06-V-15	1	-30.6	-33.1			SP	100.0	100.0	99.4	98.6	98.0	96.7	95.0	91.9	84.5	72.7	54.7	29.8	9.9	5.5	4.9	4.5
	2	-33.1	-34.3			CL	100.0	98.4	98.2	98.1	97.7	97.1	96.2	94.9	93.4	91.5	87.6	80.4	72.0	64.8	61.4	57.8
	3	-34.3	-34.8			CH	100.0	100.0	99.3	98.9	98.3	97.6	96.6	94.9	93.7	91.5	87.4	79.9	72.1	66.0	63.2	60.4
LR-06-V-16	1	-31	-32.5			SP-SM	100.0	100.0	100.0	99.8	99.6	98.5	96.3	91.5	79.6	63.7	44.4	25.7	12.9	9.3	8.4	7.9
	2	-32.5	-33.4			SP	100.0	100.0	99.1	98.9	98.0	96.2	93.1	86.0	71.6	53.1	30.7	14.2	5.4	2.9	2.6	2.4
	3	-33.4	-34.2			CL	100.0	100.0	99.6	98.9	98.3	96.9	95.5	93.9	92.1	89.9	85.6	78.4	68.9	61.1	57.5	53.8
LR-06-V-17	1	-30.8	-32.8			SP	100.0	100.0	100.0	99.9	99.7	99.4	98.6	96.1	87.5	71.2	46.8	20.6	6.6	3.2	2.7	2.4
	2	-32.8	-34			SP-SM	100.0	100.0	99.7	99.3	98.6	97.6	95.6	90.8	80.8	65.4	43.6	22.9	9.4	6.1	5.7	5.4
	3	-34	-35.6			CL	100.0	100.0	100.0	99.8	99.5	99.1	98.9	98.7	98.5	98.3	98.1	97.7	92.9	78.8	66.7	56.9
LR-06-V-18	1	-30.7	-32.5			SP	100.0	100.0	99.6	99.0	98.5	97.4	95.6	91.1	77.3	58.2	35.0	14.4	4.2	2.1	1.8	1.7
	2	-32.5	-34.3			SP	100.0	100.0	99.9	99.0	97.9	95.7	91.9	83.7	67.3	47.0	24.4	9.8	3.9	2.5	2.3	2.1
	3	-34.3	-36.5			CL	100.0	100.0	100.0	97.5	95.8	95.2	94.9	94.7	94.5	94.3	93.9	92.2	86.9	78.8	72.2	66.0
	4	-36.5	-39.5			CL	100.0	100.0	100.0	98.8	97.8	97.1	96.9	96.7	96.6	96.4	96.2	95.7	91.1	76.3	67.2	58.8
	5	-39.5	-40.2			CL	100.0	100.0	99.9	98.8	97.8	97.2	96.9	96.7	96.5	96.2	95.8	95.0	88.9	73.4	64.0	57.3

Not Tested

SUMMARY OF LABORATORY TESTING RESULTS
FOR GRAIN SIZE ANALYSIS

2006 SUBSURFACE INVESTIGATION LITTLE RIVER BORROW AREA

BORING NUMBER	SAMPLE #	ELEV TOP MLLW (ft)	ELEV BOT MLLW (ft)	% SHELL	% LS	USCS	3/4	3/8	#4	#7	#10	#14	#18	#25	#35	#45	#60	#80	#120	#170	#200	#230
LR-06-V-19	1	-29.9	-31.4			SM	100.0	100.0	99.9	99.5	99.0	98.0	96.2	92.5	82.9	70.2	50.2	25.0	9.6	6.9	6.5	6.3
	2	-31.4	-33.1			SP	100.0	100.0	99.4	98.9	98.2	96.7	94.6	91.1	82.7	70.9	50.1	24.0	8.0	4.9	4.5	4.2
	3	-33.1	-34.4			SP-SM	100.0	98.4	98.3	96.7	95.0	92.4	87.9	82.0	72.4	62.3	50.3	33.7	13.2	7.7	7.1	6.7
LR-06-V-20	1	-29.9	-31.8			SP	100.0	100.0	100.0	99.9	99.8	99.3	98.0	93.5	80.8	59.6	30.3	11.5	3.6	2.0	1.8	1.7
	2	-31.8	-32.9			SP-SM	100.0	100.0	98.3	96.6	95.1	92.7	87.1	77.6	61.5	45.0	26.9	13.6	5.5	4.0	3.7	3.5
	3	-32.9	-35.3			CL	100.0	100.0	99.8	99.7	99.4	99.1	98.8	98.5	97.9	97.2	95.5	90.1	78.6	69.1	64.7	60.9
	4	-35.3	-36.7			CL	82.5	82.3	81.5	80.7	80.3	80.0	79.7	79.3	78.7	77.7	75.9	71.4	62.1	54.6	51.4	48.2
LR-06-V-21	1	-31.1	-32.9			SP	100.0	100.0	99.9	99.4	99.2	98.5	96.1	89.6	72.9	52.7	29.9	13.0	3.3	1.4	1.1	1.0
	2	-32.9	-35			CL	100.0	100.0	100.0	99.9	99.7	99.4	99.1	98.8	98.4	97.9	96.6	91.9	81.0	71.8	67.7	64.6
	3	-35	-36			CL	100.0	100.0	98.9	98.5	98.1	97.7	97.4	97.1	96.7	96.2	94.9	90.7	80.7	71.6	67.5	64.1
LR-06-V-22	1	-31.4	-33.2			SP-SM	100.0	100.0	99.9	98.5	97.0	94.3	89.3	81.4	66.4	50.8	34.6	18.6	8.4	5.6	5.1	4.8
	2	-33.2	-34.4			SP-SM	100.0	99.7	98.3	95.1	92.3	87.7	81.6	74.9	67.1	59.4	49.1	31.9	15.4	9.3	8.1	7.6
LR-06-V-23	1	-31.6	-33.6			SP	100.0	99.8	99.3	98.7	98.0	97.1	95.3	90.7	78.4	61.0	37.3	16.3	4.2	2.1	1.8	1.8
	2	-33.6	-34.7			SP	100.0	99.0	97.0	95.1	92.9	90.4	86.2	78.7	63.5	46.2	27.9	12.3	4.1	2.6	2.4	2.3
	3	-34.7	-36			CL	100.0	100.0	99.8	99.4	99.2	99.0	98.9	98.6	98.2	97.7	96.6	93.9	86.9	78.3	72.2	65.3
LR-06-V-24	1	-30.8	-32.5			SP	100.0	100.0	99.6	98.9	98.0	96.6	94.3	89.1	76.9	59.9	36.8	15.0	4.1	2.2	2.0	1.9
	2	-32.5	-34.3			CL	100.0	99.6	99.3	98.0	96.2	94.3	92.7	91.3	89.4	86.1	80.6	72.5	63.6	56.7	52.2	47.3
	3	-34.3	-35.8			CL	100.0	100.0	99.3	98.6	98.2	97.9	97.6	97.2	96.6	95.8	94.5	90.9	83.3	74.4	68.2	61.6
	4	-35.8	-36.3			CL	100.0	100.0	99.8	98.8	98.3	97.9	97.4	96.8	96.1	95.2	93.7	90.4	83.5	75.4	69.3	62.7
LR-06-V-25	1	-31.1	-32.7			SP	100.0	100.0	99.5	99.2	98.6	97.6	95.6	91.4	79.9	61.4	38.3	16.8	5.2	3.0	2.8	2.6
	2	-32.7	-33.5			SM	100.0	100.0	99.3	97.2	94.3	89.8	83.7	77.1	68.2	59.5	48.2	35.1	25.0	21.3	20.2	19.4
	3	-33.5	-34.4			SM	100.0	91.4	80.8	77.5	76.0	74.3	72.0	69.4	65.5	59.7	51.4	41.1	32.9	29.7	28.3	27.2
LR-06-V-26	1	-31.5	-32.7			SP-SM	100.0	100.0	99.8	99.5	99.2	98.3	96.0	90.4	76.5	59.8	39.9	20.6	8.9	6.6	6.2	5.9
	2	-32.7	-33.7			CL	100.0	100.0	98.8	97.8	97.2	96.1	94.8	93.5	91.6	89.1	85.0	77.7	68.4	61.6	57.6	54.3
LR-06-V-27	1	-31.7	-33.9			SP	100.0	100.0	100.0	99.8	99.7	99.3	98.5	95.9	86.6	69.4	43.4	18.5	4.8	2.8	2.5	2.4
	2	-33.9	-36.4			CH	100.0	96.9	94.5	93.3	92.4	91.5	90.7	90.1	89.5	88.4	86.5	83.5	79.4	74.6	70.5	66.3
	3	-36.4	-37.6			CH	100.0	100.0	99.3	98.8	98.7	98.6	98.6	98.5	98.5	98.4	98.1	97.8	92.4	77.4	67.3	59.0
LR-06-V-28	1	-31.1	-32.9			SP	100.0	100.0	99.1	98.5	97.4	95.5	89.7	76.2	53.0	33.7	16.0	6.5	2.6	2.0	1.9	1.8
	2	-32.9	-34.1			SP	100.0	100.0	99.2	98.5	97.8	96.5	93.7	86.6	71.3	54.6	35.0	17.2	4.9	2.5	2.2	2.0
	3	-34.1	-35.6	Not Tested		SM	100.0	97.5	96.3	95.4	94.8	93.7	91.7	88.9	83.5	76.0	64.5	48.5	27.6	20.7	19.2	18.5
	4	-35.6	-38.4			CL	100.0	100.0	99.2	98.3	98.0	97.5	97.2	96.9	96.5	96.1	94.6	88.0	71.1	60.1	55.9	52.9
	5	-38.4	-39.2			CL	100.0	100.0	99.7	98.9	98.6	98.3	98.2	97.9	97.6	97.2	96.0	91.0	75.5	64.7	60.2	56.8
LR-06-V-29	1	-30.9	-32.6			SP	100.0	100.0	99.6	99.0	98.3	96.9	93.0	84.9	69.0	50.8	30.4	13.3	4.0	2.3	2.1	1.9
	2	-32.6	-33.7			SP-SM	100.0	99.3	96.5	90.9	86.4	80.4	73.4	66.5	58.1	49.1	36.5	20.4	9.6	7.2	6.8	6.5
LR-06-V-30	1	-32.3	-33.8			SP	100.0	99.8	99.8	99.3	99.0	97.8	94.8	87.0	71.3	52.2	28.7	12.2	3.2	1.8	1.6	1.6
	2	-33.8	-34.7			SM	100.0	96.8	96.7	96.1	95.3	92.8	86.1	77.4	65.4	53.5	41.2	27.8	12.7	8.5	8.0	7.7
	3	-34.7	-36.8			CL	100.0	100.0	99.4	98.4	97.6	97.1	96.7	96.3	95.7	94.7	92.3	85.5	68.6	57.4	52.2	48.0
	4	-36.8	-38			CL	100.0	100.0	99.2	98.2	97.8	97.6	97.4	97.3	97.0	96.5	95.2	89.2	73.2	61.1	55.5	50.8
LR-06-V-31	1	-32.4	-34.2			SP	100.0	97.6	97.2	96.7	96.3	95.5	93.0	86.2	72.5	56.0	34.3	16.9	4.0	1.7	1.5	1.3
	2	-34.2	-34.7			SM	100.0	100.0	98.3	96.7	95.7	93.9	90.3	86.5	81.0	74.6	66.4	54.0	41.2	36.2	33.6	31.6
LR-06-V-32	1	-32.2	-33.5			SP	100.0	100.0	99.8	99.6	99.2	98.4	96.7	93.2	85.4	72.8	52.2	27.2	6.5	2.5	2.0	1.8
	2	-33.5	-34.7			SP-SM	100.0	100.0	97.9	95.8	94.0	91.0	86.3	79.8	68.6	56.3	40.6	20.8	10.2	7.9	7.4	7.0
	3	-34.7	-35.5			CL	100.0	100.0	99.4	99.0	98.8	98.7	98.6	98.4	97.9	97.4	96.2	91.7	79.6	70.5	66.7	64.1
LR-06-V-33	1	-32.4	-34.4			SP	100.0	100.0	99.7	99.5	99.1	98.3	96.6	92.0	80.9	63.6	41.1	19.2	5.5	2.9	2.6	2.4
	2	-34.4	-35.1			SP-SM	100.0	100.0	99.8	99.0	97.7	94.9	90.1	83.7	74.9	65.1	51.0	25.8	11.1	8.1	7.4	7.1
	3	-35.1	-37.4			CL	100.0	100.0	99.5	99.1	98.9	98.9	98.8	98.6	98.5	98.2	97.6	95.0	87.0	78.2	73.1	68.4
LR-06-V-34	1	-32.6	-34.3			SP	100.0	99.7	99.0	98.5	97.6	95.8	92.6	85.4	70.2	50.4	28.2	11.3	3.3	2.0	1.9	1.8
	2	-34.3	-35			CL	100.0	100.0	99.4	98.9	98.7	98.5	98.0	97.4	96.2	94.9	93.4	89.1	79.7	69.7	62.9	55.7
LR-06-V-35	1	-32.7	-34.2			SP	100.0	100.0	100.0	99.7	99.5	98.9	97.8	94.1	82.0	63.2	37.8	16.1	4.4	2.4	2.2	2.2
	2	-34.2	-35.3			SP	100.0	98.3	97.3	95.7	93.8	90.5	85.2	76.9	62.5	47.4	30.5	15.4	5.9	4.0	3.6	3.6
	3	-35.3	-37.7			SM	100.0	100.0	99.1	97.1	95.9	94.4	92.6	90.3	85.1	76.3	63.9	47.2	34.8	31.9	31.1	30.9
LR-06-V-36	1	-32.9	-34.9			SP	100.0	99.4	99.0	98.7	98.3	98.0	97.3	95.4	89.0	74.5	50.3	21.7	6.9	4.5	4.2	4.2
	2	-34.9	-36.8			CH	100.0	100.0	99.1	98.6	98.3	97.9	97.4	96.8	95.9	94.7	92.1	86.7	78.0	71.2	68.0	67.5
	3	-36.8	-38.6			CH	100.0	100.0	99.2	99.2	99.0	98.9	98.7	98.4	98.1	97.6	96.6	93.1	85.3	77.9	74.1	73.7
LR-06-V-37	1	-32.8	-34.7			SP	100.0	100.0	100.0	99.8	99.2	98.4	96.1	90.4	73.6	49.5	26.0	10.1	2.9	1.8	1.7	1.7
	2	-34.7	-35.4			SP-SM	100.0	90.9	88.9	84.4	81.2	76.8	71.8	67.0	59.5	49.9	37.8	25.4	13.0	8.9	8.4	8.2
LR-06-V-38	1	-32.6	-34			SP	100.0	100.0	99.9	99.8	99.6	99.1	97.0	91.1	75.4	52.3	28.9	11.9	3.7	2.3	2.1	2.1
	2	-34	-35.2			SM	100.0	100.0	99.5	99.0	98.4	96.1	90.0	83.1	73.6	63.8	49.7	32.1	21.1	17.7	17.0	16.9
	3	-35.2	-36.9			CL	100.0	100.0	99.5	99.5	99.4	99.3	99.2	99.0	98.6	98.0	95.9	90.4	79.0	71.9	69.3	69.1

SUMMARY OF LABORATORY TESTING RESULTS
FOR GRAIN SIZE ANALYSIS

2006 SUBSURFACE INVESTIGATION LITTLE RIVER BORROW AREA

BORING NUMBER	SAMPLE #	ELEV TOP MLLW (ft)	ELEV BOT MLLW (ft)	% SHELL	% LS	USCS	3/4	3/8	#4	#7	#10	#14	#18	#25	#35	#45	#60	#80	#120	#170	#200	#230
LR-06-V-39	1	-34.5	-36.5	Not Tested		SP	100.0	100.0	100.0	99.9	99.6	99.1	97.5	93.7	82.7	62.5	34.1	14.0	3.9	2.5	2.4	2.3
	2	-36.5	-37.8			SP	100.0	100.0	99.2	97.8	96.6	93.1	86.3	77.5	63.5	47.7	29.5	16.2	6.6	4.5	4.2	4.1
	3	-37.8	-39.5			CL	100.0	100.0	100.0	99.9	99.9	99.9	99.8	99.7	99.4	99.0	97.5	91.0	77.1	68.1	65.2	64.8
	4	-39.5	-40			CL	100.0	100.0	100.0	99.9	99.8	99.5	99.1	98.7	98.2	97.3	95.3	89.0	74.5	65.2	62.5	62.4
LR-06-V-40	1	-35.1	-36.5			SP	100.0	100.0	99.2	98.8	98.5	97.7	95.9	90.8	71.8	48.2	24.8	10.1	2.8	1.8	1.7	1.6
	2	-36.5	-37.5			SP	100.0	100.0	97.9	96.7	95.7	93.7	90.0	83.5	67.5	49.3	30.5	13.7	3.3	1.5	1.3	1.3
	3	-37.5	-40.1			CH	100.0	100.0	100.0	99.9	99.8	99.6	99.3	99.0	98.5	98.0	97.2	94.4	86.8	79.1	75.3	74.8
LR-06-V-41	1	-33.8	-35.6			SP	100.0	100.0	99.3	98.7	98.5	97.6	94.0	87.1	68.8	45.7	24.6	13.0	5.0	3.6	3.5	3.5
	2	-35.6	-36.8			SP-SM	100.0	100.0	98.2	97.4	96.8	95.5	91.5	86.7	78.2	67.2	53.9	35.3	20.1	12.6	11.5	11.4
	3	-36.8	-38.1			SP-SM	100.0	99.3	98.1	94.9	92.4	89.7	85.1	78.9	66.3	52.3	39.1	23.1	14.6	12.6	12.3	12.2
	4	-38.1	-39.1			CL	100.0	100.0	100.0	100.0	100.0	99.9	99.8	99.7	99.5	99.2	98.1	91.4	72.3	60.3	56.2	55.7
LR-06-V-42	1	-33.3	-35.2			SP	100.0	100.0	99.6	98.6	98.3	97.2	93.5	85.8	69.4	46.8	26.2	11.4	3.1	1.8	1.6	1.6
	2	-35.2	-37.3			CL	100.0	100.0	99.8	99.6	99.4	99.2	98.8	98.2	97.2	95.7	93.1	86.9	74.9	66.1	62.4	61.8
	3	-37.3	-37.8			CL	100.0	100.0	99.8	99.6	99.4	99.2	98.8	98.2	97.2	95.7	93.1	86.9	74.9	66.1	62.4	61.8
LR-06-V-43	1	-33.7	-35.2			SP	100.0	100.0	100.0	99.7	99.4	98.5	96.8	92.3	81.7	63.4	42.0	19.2	4.9	2.3	2.1	2.0
	2	-35.2	-35.7			SP	100.0	100.0	97.8	95.9	93.8	90.6	84.1	73.6	58.1	41.7	27.5	14.1	4.8	3.0	2.7	2.7
	3	-35.7	-37.2			CL	100.0	96.1	93.1	92.0	91.6	91.0	89.8	88.5	86.8	84.6	81.2	75.7	66.0	58.8	55.7	55.2
LR-06-V-44	1	-33.9	-35.2			SP	100.0	100.0	99.6	99.2	98.5	96.9	94.7	90.9	81.3	66.6	45.2	22.2	6.6	4.2	4.0	3.9
	2	-35.2	-37.9			CL	100.0	98.0	98.0	97.7	97.3	96.8	96.1	95.3	94.5	93.6	91.7	85.9	74.6	66.6	63.9	63.4
	3	-37.9	-38.4			CL	100.0	100.0	99.6	99.6	99.5	99.3	99.2	98.9	98.5	97.9	96.1	90.2	78.6	70.1	67.2	66.6
LR-06-V-45	1	-33.6	-35.5			SP	100.0	100.0	99.7	98.9	98.4	97.0	94.7	89.7	75.3	57.0	33.4	13.2	3.1	1.8	1.6	1.5
	2	-35.5	-36.8			SP	100.0	100.0	99.2	98.3	97.1	94.8	90.7	82.5	64.7	46.0	26.0	11.0	3.1	1.9	1.8	1.7
	3	-36.8	-38			CL	100.0	100.0	99.8	99.3	99.0	98.5	97.6	96.7	95.8	94.6	92.8	88.8	81.7	74.3	69.3	68.0
LR-06-V-46	1	-34	-35.9			SP-SM	100.0	98.6	97.9	97.5	96.7	95.1	93.2	90.7	84.7	76.5	64.3	44.5	19.2	12.5	10.7	10.5
	2	-35.9	-36.7			SP-SM	100.0	96.9	92.1	88.1	84.6	80.4	76.9	73.8	67.6	59.6	49.1	33.2	13.6	8.7	7.9	7.7
	3	-36.7	-38.1			CL	100.0	100.0	100.0	100.0	99.9	99.8	99.5	99.4	99.1	98.8	98.3	97.1	86.1	65.9	56.9	55.1
	4	-38.1	-40.5			CL	100	100.0	100.0	99.7	99.5	99.4	99.2	99.0	98.9	98.6	98.1	96.9	92.0	80.2	68.2	63.4
LR-06-V-47	1	-33	-34.5			SP	100.0	100.0	100.0	99.9	99.8	99.4	98.6	95.2	81.0	58.7	33.3	13.0	3.4	2.2	2.0	2.0
	2	-34.5	-36			SP	100.0	100.0	99.3	98.7	98.0	96.9	94.6	89.2	74.1	55.5	34.5	15.5	3.7	1.9	1.6	1.6
	3	-36	-36.3			SM	100.0	94.4	93.2	92.7	91.8	89.7	86.2	82.1	76.7	70.4	62.5	52.9	41.2	36.3	34.6	34.3

SUMMARY OF LABORATORY TESTING RESULTS
FOR GRAIN SIZE ANALYSIS

Subsurface Investigation and Geotechnical Laboratory Testing, North Myrtle Beach, SC
Coastal Storm Damage Reduction Project, Little River Borrow Sit Investigation

BORING NUMBER	SAMPLE No.	DEPTH (ft)	% SHELL	% LS	USCS	3/4	3/8	#4	#7	#10	#14	#18	#25	#35	#45	#60	#80	#120	#170	#200	#230
LR-16-V-1	1	0.0-0.5	3.15	0.00	SP-SC	100.00	98.40	96.85	93.49	89.09	82.44	76.57	71.68	67.07	60.49	47.34	36.84	24.78	13.82	7.05	2.60
LR-16-V-2	1	0.0-0.5	3.44	0.00	SP	100.00	99.51	96.56	94.20	92.52	90.29	87.63	82.27	72.07	56.99	35.30	20.56	6.69	2.89	1.56	0.55
LR-16-V-2	2	1.2-1.6	0.54	25.50	SP	74.50	74.50	73.96	72.65	71.51	69.80	68.20	66.54	64.06	59.78	51.60	40.59	23.30	9.30	5.31	2.12
LR-16-V-3	1	0.0-0.5	1.44	0.00	SP	100.00	100.00	98.56	96.91	95.79	93.93	91.42	86.31	77.31	61.78	33.27	13.24	3.10	0.79	0.53	0.34
LR-16-V-3	2	1.4-1.9	27.45	0.00	SW	93.92	83.55	72.55	65.79	61.33	56.97	53.38	50.11	46.53	40.65	28.10	15.38	4.00	1.18	0.67	0.27
LR-16-V-3	3	1.9-2.4	4.22	0.27	SP-SC	100.00	98.22	95.51	93.13	90.06	86.12	83.59	82.14	80.69	77.53	67.81	58.10	44.33	20.98	10.13	4.00
LR-16-V-4	1	0.0-0.5	1.12	0.00	SP	100.00	99.50	98.88	97.77	96.86	95.36	93.32	88.69	80.35	64.09	38.05	20.66	10.33	4.72	2.05	0.54
LR-16-V-4	2	1.2-1.7	11.62	0.67	SP	100.00	91.07	87.71	80.66	74.32	67.42	61.81	57.19	53.15	48.01	38.82	27.03	14.00	6.71	3.46	0.77
LR-16-V-5	1	0.0-0.2	0.37	0.00	CL	100.00	100.00	99.63	99.56	99.35	99.03	98.37	96.98	93.06	84.07	66.49	53.53	43.00	31.24	16.28	5.52
LR-16-V-5	2	0.2-0.7	0.30	0.55	SP	100.00	99.63	99.15	98.62	98.09	97.01	95.11	90.46	79.98	60.56	29.96	12.40	2.19	0.42	0.25	0.16
LR-16-V-6	1	0.0-0.5	0.75	0.00	SP	100.00	99.83	99.25	98.63	97.91	96.65	94.56	88.71	75.87	57.23	31.82	14.75	3.17	1.03	0.63	0.34
LR-16-V-6	2	0.7-1.2	7.69	0.00	SP	100.00	98.29	92.31	85.69	80.43	73.85	67.14	58.06	47.19	36.21	22.86	11.96	2.35	0.68	0.44	0.26
LR-16-V-6	3	1.5-2.0	3.29	0.00	SC	100.00	97.03	96.71	92.79	89.63	85.71	83.27	81.50	80.06	77.88	73.24	67.76	58.36	34.33	17.70	4.85
LR-16-V-7	1	0.5-1.0	1.58	0.00	SP	100.00	99.50	98.42	97.11	96.04	94.25	91.86	86.73	76.72	57.98	28.03	10.28	1.65	0.40	0.27	0.20
LR-16-V-7	2	1.2-1.7	7.58	0.00	SP-SC	100.00	93.52	92.42	90.98	89.23	86.97	84.97	82.16	78.18	73.16	65.13	53.74	32.83	16.03	8.71	2.41
LR-16-V-8	1	0.5-1.0	7.86	0.00	SP	98.25	96.56	92.14	88.50	85.67	82.42	77.63	69.19	58.44	48.34	33.27	19.58	5.31	1.21	0.73	0.43

USACE; Master Gradation Table
AVS Project No. 16-0128

SUMMARY OF LABORATORY TESTING RESULTS
FOR GRAIN SIZE ANALYSIS

Subsurface Investigation and Geotechnical Laboratory Testing, North Myrtle Beach, SC
Coastal Storm Damage Reduction Project, Little River Borrow Sit Investigation

BORING NUMBER	SAMPLE No.	DEPTH (ft)	% SHELL	% LS	USCS	3/4	3/8	#4	#7	#10	#14	#18	#25	#35	#45	#60	#80	#120	#170	#200	#230
LR-16-V-8	2	1.0-1.5	0.12	0.00	SP	100.00	100.00	99.88	99.74	99.51	99.05	98.41	96.94	92.31	79.81	48.62	19.86	2.23	0.34	0.13	0.04
LR-16-V-8	3	1.5-2.0	2.34	0.18	SP	100.00	98.66	97.48	96.03	94.46	91.45	87.71	81.96	72.36	56.07	30.82	13.42	2.14	0.54	0.33	0.22
LR-16-V-9	1	0.5-1.0	0.17	0.00	SP	100.00	100.00	99.83	99.13	98.51	97.48	95.87	92.77	84.71	68.33	40.97	19.15	3.16	0.72	0.42	0.27
LR-16-V-9	2	2.0-2.5	31.75	0.00	SW	87.01	76.93	68.25	62.38	58.66	54.00	49.73	45.68	40.87	33.80	24.31	15.96	4.49	0.90	0.50	0.25
LR-16-V-9	3	2.7-3.2	0.75	1.10	SP	100.00	99.62	98.15	97.23	96.47	95.37	93.64	90.37	83.00	69.09	45.63	25.49	7.53	2.87	1.43	0.45
LR-16-V-10	1	0.0-0.5	2.23	0.00	SP	100.00	99.22	97.77	96.08	94.58	92.13	88.45	80.55	66.29	46.88	24.82	11.95	2.07	0.47	0.31	0.25
LR-16-V-10	2	0.7-1.2	1.43	0.00	SP-SC	100.00	99.40	98.57	97.86	97.34	96.18	94.48	90.83	84.22	73.62	58.44	43.10	20.22	11.04	6.17	2.74
LR-16-V-10	3	1.5-2.0	1.39	0.00	SP	100.00	99.23	98.61	98.30	98.06	97.32	95.97	91.50	77.56	54.20	27.58	12.12	2.13	0.46	0.27	0.18
LR-16-V-11	1	0.5-1.0	0.16	0.00	SP	100.00	100.00	99.84	99.32	98.28	96.35	92.66	82.53	8.08	5.36	1.43	0.67	0.23	0.17	0.15	0.15
LR-16-V-11	2	1.9-2.3	1.81	0.13	SP	100.00	99.69	98.06	96.03	93.98	90.88	86.69	79.45	67.03	50.14	29.69	15.55	4.61	1.53	0.94	0.50
LR-16-V-11	3	2.5-3.0	0.46	0.47	SP-SC	100.00	100.00	99.07	97.94	97.33	95.97	94.47	92.16	89.97	84.96	77.85	67.55	43.10	20.38	10.71	3.27
LR-16-V-13	1	0.5-1.0	0.38	0.02	SP	100.00	100.00	99.60	99.05	98.45	97.45	96.03	92.27	80.20	57.73	27.91	10.74	1.51	0.33	0.26	0.19
LR-16-V-13	2	1.4-1.9	5.44	0.00	SP	100.00	97.35	94.56	91.00	87.69	83.00	77.34	69.47	56.82	41.98	23.94	12.41	2.73	0.88	0.57	0.35
LR-16-V-13	3	2.0-2.5	4.76	0.25	SP-SC	100.00	99.39	94.99	91.53	89.15	85.95	81.92	77.41	72.23	65.45	53.40	41.68	27.12	15.10	7.60	1.74
LR-16-V-14	1	0.0-0.5	0.96	0.00	SP	100.00	99.59	99.04	98.15	97.21	95.70	93.84	89.23	76.90	54.26	25.43	10.18	1.48	0.36	0.26	0.22
LR-16-V-14	2	1.1-1.6	2.56	0.00	SP	100.00	98.95	97.44	95.94	94.66	92.70	89.50	83.97	76.62	66.21	49.47	35.55	16.99	3.40	1.55	0.64

USACE; Master Gradation Table
AVS Project No. 16-0128

SUMMARY OF LABORATORY TESTING RESULTS
FOR GRAIN SIZE ANALYSIS

Subsurface Investigation and Geotechnical Laboratory Testing, North Myrtle Beach, SC
Coastal Storm Damage Reduction Project, Little River Borrow Sit Investigation

BORING NUMBER	SAMPLE No.	DEPTH (ft)	% SHELL	% LS	USCS	3/4	3/8	#4	#7	#10	#14	#18	#25	#35	#45	#60	#80	#120	#170	#200	#230
LR-16-V-15	1	0.5-1.0	3.37	0.00	SP	100.00	99.95	96.63	92.06	88.69	85.53	82.15	75.28	64.38	50.19	29.84	15.71	5.37	2.22	1.27	0.51
LR-16-V-15	2	1.5-2.0	9.70	0.00	SP	100.00	95.37	90.30	83.88	79.68	75.56	71.07	63.27	53.19	41.37	24.85	12.58	2.95	0.72	0.42	0.24
LR-16-V-15	3	2.4-2.9	0.64	2.56	SP	100.00	100.00	96.79	93.85	91.53	88.78	85.43	79.51	70.87	59.18	41.34	26.66	13.78	7.20	4.29	1.84
LR-16-V-16	1	0.0-0.4	2.80	16.44	SP	86.97	85.83	80.76	74.20	85.03	64.19	60.95	58.29	55.10	50.24	39.42	21.33	4.98	1.83	0.97	0.39
LR-16-V-16	2	0.4-1.0	0.08	0.08	SC	100.00	100.00	99.84	98.81	97.65	96.55	95.41	93.82	90.75	86.45	79.22	71.24	58.79	33.51	16.71	5.98
LR-16-V-17	1	0.0-1.0	0.80	0.00	SP	100.00	100.00	99.20	97.95	95.64	92.75	89.66	86.22	82.59	77.76	68.07	51.82	21.81	13.43	7.07	1.78
LR-16-V-18	1	0.5-1.0	1.22	0.00	SP	100.00	99.90	98.78	97.72	96.91	95.99	94.64	91.38	83.28	68.60	42.90	17.22	2.76	0.73	0.47	0.34
LR-16-V-18	2	1.5-2.0	1.92	0.00	SP	100.00	99.26	98.08	97.05	96.18	95.01	93.16	87.57	73.61	53.43	29.58	13.60	2.28	0.50	0.29	0.18
LR-16-V-18	3	2.5-3.0	1.02	0.00	SP	100.00	99.82	98.98	97.78	96.95	95.78	93.93	89.94	82.22	70.68	50.73	23.00	3.53	0.72	0.35	0.21
LR-16-V-19	1	0.0-0.5	0.23	0.69	SP	100.00	100.00	99.07	96.10	94.78	92.40	88.28	82.98	76.54	64.39	31.43	7.98	2.84	1.50	0.52	0.35
LR-16-V-19	2	0.9-1.4	2.10	0.00	SP	100.00	99.83	97.90	96.54	95.61	94.11	90.93	82.71	68.82	49.79	25.51	10.92	2.13	0.49	0.31	0.24
LR-16-V-19	3	1.4-1.9	0.39	3.46	SP	100.00	100.00	96.15	93.84	92.32	90.72	88.52	84.39	79.04	72.45	58.86	27.51	7.58	3.22	1.99	0.94
LR-16-V-20	1	0.5-1.0	0.20	0.60	SP	100.00	99.82	99.21	98.55	97.96	97.27	95.98	91.79	81.61	63.29	35.06	15.84	2.67	0.59	0.37	0.28
LR-16-V-20	2	1.2-1.7	0.19	0.00	SP-SC	100.00	100.00	99.81	99.21	98.48	98.00	97.45	96.53	95.05	92.69	86.00	68.99	36.71	16.29	9.17	2.97
LR-16-V-21	1	0.0-0.5	2.56	0.00	SP	100.00	99.42	97.44	94.66	92.71	90.84	88.98	85.79	79.73	71.54	56.53	31.19	5.38	1.14	0.53	0.23
LR-16-V-21	2	1.0-1.5	4.06	0.02	SP	100.00	99.10	95.92	92.13	89.59	87.06	84.52	79.77	71.59	61.08	44.90	23.57	3.99	0.82	0.39	0.19

SUMMARY OF LABORATORY TESTING RESULTS
FOR GRAIN SIZE ANALYSIS

Subsurface Investigation and Geotechnical Laboratory Testing, North Myrtle Beach, SC
Coastal Storm Damage Reduction Project, Little River Borrow Sit Investigation

BORING NUMBER	SAMPLE No.	DEPTH (ft)	% SHELL	% LS	USCS	3/4	3/8	#4	#7	#10	#14	#18	#25	#35	#45	#60	#80	#120	#170	#200	#230
LR-16-V-21	3	2.5-3.0	15.78	0.00	SP	93.69	88.40	84.22	80.57	78.24	76.07	74.11	71.65	67.85	62.25	50.12	19.14	3.47	0.83	0.42	0.21
LR-16-V-22	1	0.5-1.0	2.37	2.31	SP	97.89	97.35	95.32	93.09	91.92	90.22	87.49	80.75	69.39	51.41	26.00	10.43	1.94	0.45	0.26	0.20
LR-16-V-22	2	1.5-2.0	0.25	2.82	SP	97.43	97.43	96.92	95.86	94.95	93.81	92.39	89.32	84.13	75.89	57.31	20.09	4.31	1.59	1.01	0.66
LR-16-V-22	3	2.5-3.0	0.00	0.16	SC	100.00	100.00	99.84	99.50	99.24	98.75	98.15	96.97	94.51	90.88	84.10	72.88	48.35	26.44	14.31	4.19
LR-16-V-23	1	0.0-0.2	0.51	0.00	SP	100.00	99.53	99.49	98.97	98.51	97.70	96.17	92.19	84.88	72.50	55.00	39.70	20.26	14.89	4.69	1.30
LR-16-V-23	2	0.2-1.2	3.47	0.00	SP	100.00	98.98	96.53	93.91	91.97	89.02	83.72	73.56	59.92	39.80	19.51	7.99	1.55	0.39	0.25	0.24
LR-16-V-23	3	1.2-1.7	0.69	0.18	SP	100.00	100.00	99.13	97.58	96.00	93.57	90.03	83.86	74.57	59.39	34.95	15.54	3.42	0.95	0.53	0.27
LR-16-V-24	1	0.5-1.0	0.72	0.00	SP	100.00	99.84	99.28	98.48	97.89	96.86	94.60	88.10	76.47	59.98	35.05	17.04	3.35	0.73	0.44	0.29
LR-16-V-24	2	1.5-2.0	0.00	3.54	SP-SC	100.00	100.00	96.46	93.22	90.78	88.11	85.44	82.85	79.97	75.17	66.08	53.14	26.70	10.78	5.19	1.02
LR-16-V-25	1	0.0-0.5	0.95	0.00	SP	100.00	99.92	99.05	98.08	97.40	95.95	92.00	83.81	71.23	51.17	27.40	11.82	2.14	0.52	0.42	0.35
LR-16-V-25	2	0.9-1.4	5.98	0.00	SP	100.00	97.35	94.02	87.89	82.73	76.79	70.67	63.10	55.22	46.05	30.62	13.54	3.57	1.21	0.73	0.36
LR-16-V-25	3	1.5-2.0	0.30	0.80	SP-SC	100.00	100.00	98.90	97.46	96.54	95.33	93.82	92.14	89.88	86.07	76.90	60.85	32.53	15.27	8.01	1.99
LR-16-V-26	1	0.0-0.2	0.62	2.48	SP-SC	100.00	100.00	96.89	93.66	91.49	88.69	84.39	76.26	66.56	55.05	44.29	35.68	23.78	13.82	7.55	1.60
LR-16-V-26	2	0.2-0.5	7.73	0.00	SP	100.00	94.32	92.27	90.43	89.12	86.68	81.88	70.71	57.84	39.16	21.60	9.69	1.82	0.46	0.29	0.20
LR-16-V-26	3	0.5-1.3	0.71	0.13	SP	100.00	99.65	99.16	98.45	98.12	97.26	95.60	90.98	82.88	63.69	38.46	19.03	4.22	1.27	0.70	0.29
LR-16-V-26	4	1.5-2.0	0.00	0.82	SP-SC	100.00	100.00	99.18	96.66	94.52	92.67	90.75	87.90	84.03	78.58	68.92	55.03	30.20	13.74	6.73	1.20

USACE; Master Gradation Table
AVS Project No. 16-0128

SUMMARY OF LABORATORY TESTING RESULTS
FOR GRAIN SIZE ANALYSIS

Subsurface Investigation and Geotechnical Laboratory Testing, North Myrtle Beach, SC
Coastal Storm Damage Reduction Project, Little River Borrow Sit Investigation

BORING NUMBER	SAMPLE No.	DEPTH (ft)	% SHELL	% LS	USCS	3/4	3/8	#4	#7	#10	#14	#18	#25	#35	#45	#60	#80	#120	#170	#200	#230
LR-16-V-27	1	0.0-0.5	2.81	0.00	SP	100.00	99.88	97.19	95.39	93.96	91.90	87.69	76.99	60.71	41.43	20.64	9.80	1.96	0.65	0.48	0.38
LR-16-V-27	2	1.0-1.5	8.70	2.16	SP	100.00	96.35	89.14	83.60	80.15	75.68	69.16	60.14	48.82	35.14	19.27	9.41	3.94	0.84	0.51	0.28
LR-16-V-28	1	0.0-0.5	1.95	0.66	SP	100.00	99.55	97.39	96.00	95.07	93.13	89.05	82.02	70.08	50.86	25.22	12.86	2.85	0.78	0.37	0.10
LR-16-V-28	2	1.5-2.0	0.00	0.00	SP	100.00	100.00	100.00	90.19	80.78	70.99	61.03	52.98	44.11	32.14	23.60	13.15	8.05	4.94	4.55	2.03
LR-16-V-29	1	0.0-1.0	2.39	0.00	SP	98.82	98.04	97.61	96.84	96.25	95.11	92.78	86.13	71.51	51.63	28.61	13.92	2.68	0.73	0.46	0.32
LR-16-V-30	1	0.0-0.5	0.68	0.08	SP	100.00	100.00	99.24	98.73	98.26	97.29	94.65	85.97	69.80	47.41	28.05	12.79	2.56	0.47	0.22	0.16
LE-16-V-30	2	0.8-1.3	8.08	2.70	SP	100.00	93.37	89.22	82.04	76.54	70.03	63.72	57.19	50.31	41.74	28.92	15.90	4.93	1.35	0.69	0.32
LR-16-V-31	1	0.0-0.5	0.62	0.00	SP	100.00	99.71	99.38	99.06	98.77	97.74	94.37	82.96	61.29	33.19	14.61	7.20	1.41	0.32	0.21	0.18
LR-16-V-31	2	1.0-1.5	4.53	0.00	SP	100.00	99.20	95.47	88.10	81.71	73.14	62.78	52.44	42.20	31.80	19.23	10.35	3.94	1.47	0.84	0.37
LR-16-V-32	1	0.5-1.0	18.19	0.00	SW	96.79	87.20	81.81	73.75	66.34	58.13	52.39	48.07	43.81	39.00	30.67	18.70	3.60	1.03	0.48	0.13
LR-16-V-33	1	0.0-0.5	4.47	0.00	SP	100.00	99.36	95.53	89.16	84.44	78.93	74.50	70.11	63.49	53.41	36.50	18.75	3.84	1.10	0.61	0.30
LR-16-V-33	2	0.9-1.4	5.51	0.00	SP	100.00	97.99	94.49	86.54	78.75	70.11	64.37	60.78	57.29	52.03	39.81	16.09	3.02	0.86	0.50	0.27
LR-16-V-34	1	0.0-0.5	1.03	0.00	SP	100.00	99.60	98.97	97.77	96.93	95.71	93.93	87.84	70.57	51.99	30.38	14.63	2.18	0.47	0.32	0.21
LR-16-V-34	2	1.5-2.0	3.35	0.00	SP	100.00	98.77	96.65	94.66	93.27	91.47	89.12	83.00	68.09	51.51	31.42	15.59	2.16	0.41	0.28	0.19
LR-16-V-34	3	2.9-3.4	4.75	1.19	SP	100.00	96.99	94.07	91.37	89.82	88.25	86.60	84.02	78.88	69.92	52.38	28.58	4.59	0.61	0.28	0.15
LR-16-V-34	4	3.4-3.8	7.11	0.00	SP	100.00	97.69	92.89	87.53	81.90	75.06	69.16	63.52	56.76	48.10	33.28	18.41	4.19	1.05	0.55	0.29

USACE; Master Gradation Table
AVS Project No. 16-0128

SUMMARY OF LABORATORY TESTING RESULTS
FOR GRAIN SIZE ANALYSIS

Subsurface Investigation and Geotechnical Laboratory Testing, North Myrtle Beach, SC
Coastal Storm Damage Reduction Project, Little River Borrow Sit Investigation

BORING NUMBER	SAMPLE No.	DEPTH (ft)	% SHELL	% LS	USCS	3/4	3/8	#4	#7	#10	#14	#18	#25	#35	#45	#60	#80	#120	#170	#200	#230
LR-16-V-35	1	0.5-1.0	5.21	0.00	SP	98.93	96.90	94.79	92.42	91.10	89.58	87.50	82.90	73.96	60.95	42.85	24.27	4.05	0.59	0.26	0.11
LR-16-V-35	2	1.1-1.6	19.66	0.00	SP	94.89	86.19	80.34	77.24	75.44	73.27	70.70	66.47	58.83	48.57	35.93	23.66	4.34	0.72	0.27	0.13
LR-16-V-36	1	0.2-0.4	12.34	0.00	SW	100.00	96.89	87.66	76.57	67.20	58.22	52.80	48.80	43.52	36.65	25.04	13.86	3.07	1.01	0.56	0.23
LR-16-V-36	2	2.4-2.9	0.00	0.58	SP-SC	100.00	100.00	99.42	98.67	98.11	97.17	95.92	94.18	91.35	88.20	82.18	73.33	45.11	20.09	11.95	2.27
LR-16-V-37	1	0.0-0.5	0.20	0.00	SP	100.00	100.00	99.80	99.59	99.25	98.44	97.37	95.34	89.36	76.47	48.10	21.09	2.61	0.47	0.25	0.13
LR-16-V-37	2	0.5-1.0	3.15	0.00	SP	100.00	97.93	96.85	95.50	94.68	93.38	91.66	87.29	75.84	58.88	36.19	18.13	2.77	0.49	0.27	0.17
LR-16-V-37	3	1.5-2.0	10.08	0.00	SP	100.00	99.39	89.92	77.04	68.34	59.52	54.33	50.84	46.46	40.29	26.76	10.32	2.24	0.96	0.63	0.39
LR-16-V-37	4	2.2-2.7	16.02	0.90	SP	95.33	92.58	83.08	67.58	55.13	42.97	35.67	31.43	27.45	23.20	16.19	5.68	1.27	0.63	0.44	0.28
LR-16-V-38	1	0.0-0.4	0.54	0.00	SP	100.00	99.59	99.46	99.10	98.85	98.25	96.64	89.99	72.94	52.67	25.27	9.53	1.30	0.31	0.23	0.19
LR-16-V-38	2	0.8-1.3	2.57	0.00	SP	100.00	99.47	97.43	95.78	94.54	92.62	89.27	80.64	64.69	48.96	27.92	13.46	1.78	0.32	0.20	0.14
LR-16-V-38	3	1.3-1.8	25.00	0.00	SW	96.83	86.47	75.00	69.42	65.53	60.29	55.01	47.45	35.46	24.44	16.88	12.10	7.21	2.52	1.10	0.45
LR-16-V-39	1	0.0-0.5	1.39	0.00	SP	100.00	100.00	98.61	98.22	97.86	97.04	95.35	89.42	75.56	55.30	27.69	11.79	1.71	0.25	0.12	0.09
LR-16-V-39	2	1.4-1.9	1.60	0.00	SP	100.00	99.88	98.40	96.64	95.51	93.51	89.86	80.67	64.72	46.28	22.85	9.80	1.39	0.20	0.11	0.06
LR-16-V-39	3	1.9-2.3	0.07	0.00	SP	100.00	100.00	99.93	99.46	98.92	97.71	94.70	88.41	78.31	64.04	41.38	21.88	6.48	1.55	0.90	0.43
LR-16-V-39	4	2.3-2.8	5.59	0.00	SP	100.00	99.88	94.41	84.07	76.71	68.53	62.87	58.42	53.25	46.15	31.89	14.36	3.44	1.03	0.53	0.18
LR-16-V-40	1	0.0-0.6	0.33	0.00	SP	100.00	100.00	99.67	99.15	98.67	97.41	93.50	80.76	59.81	39.62	20.55	10.41	3.09	1.16	0.65	0.38

USACE; Master Gradation Table
AVS Project No. 16-0128

SUMMARY OF LABORATORY TESTING RESULTS
FOR GRAIN SIZE ANALYSIS

Subsurface Investigation and Geotechnical Laboratory Testing, North Myrtle Beach, SC
Coastal Storm Damage Reduction Project, Little River Borrow Sit Investigation

BORING NUMBER	SAMPLE No.	DEPTH (ft)	% SHELL	% LS	USCS	3/4	3/8	#4	#7	#10	#14	#18	#25	#35	#45	#60	#80	#120	#170	#200	#230
LR-16-V-40	2	0.6-0.9	14.57	0.00	SP	93.97	89.49	85.43	82.19	79.93	76.67	71.66	60.30	43.95	28.80	14.14	6.52	1.33	0.40	0.28	0.21
LR-16-V-40	3	1.0-1.5	15.75	0.00	SP	97.58	88.36	84.25	80.99	78.91	76.55	72.36	66.58	60.21	52.16	37.11	20.14	4.52	1.19	0.63	0.36
LR-16-V-41	1	0.0-1.6	1.25	0.00	SP	100.00	99.19	98.74	97.97	97.21	95.77	92.45	83.24	68.05	48.80	23.85	10.19	1.69	0.35	0.18	0.15
LR-16-V-41	2	1.6-2.1	4.16	0.00	SP	100.00	98.84	95.84	92.18	89.32	85.24	79.15	71.61	62.85	52.52	37.48	22.62	4.38	0.94	0.61	0.40
LR-16-V-41	3	2.7-3.2	24.55	0.00	SP	89.06	81.59	75.45	64.45	57.05	49.80	44.87	41.31	36.94	31.62	20.91	8.16	2.02	0.69	0.46	0.26
LR-16-V-42	1	0.0-0.5	1.16	0.00	SP	100.00	99.58	98.84	98.44	98.13	97.55	96.15	91.00	78.43	59.86	32.61	16.33	4.44	1.55	0.87	0.35
LR-16-V-42	2	0.7-1.2	3.41	0.00	SP	100.00	99.24	96.59	94.53	93.17	91.24	88.09	81.05	68.28	50.37	26.52	12.77	2.57	0.58	0.37	0.29
LR-16-V-42	3	1.2-1.7	10.74	0.59	SP-SC	100.00	89.85	88.67	87.46	86.11	84.39	81.57	78.03	73.05	66.96	56.91	43.79	23.77	11.42	6.39	1.95
LR-16-V-44	1	0.0-0.4	2.10	0.15	SP	100.00	100.00	97.75	96.09	95.26	93.86	90.99	83.20	68.04	45.92	20.35	9.56	2.93	1.16	0.70	0.33
LR-16-V-44	2	1.5-2.0	1.17	0.00	SP	100.00	99.31	98.83	98.44	97.90	95.91	91.40	80.88	63.34	41.77	19.17	9.20	2.18	0.64	0.43	0.33
LR-16-V-44	3	2.0-2.5	14.84	4.95	SP	90.11	85.19	80.21	75.79	73.45	68.86	62.62	55.33	46.75	36.64	24.35	15.58	6.14	2.80	1.66	0.65
LR-16-V-45	1	0.5-1.0	9.64	0.00	SP	98.56	94.43	90.36	87.17	84.87	80.52	72.90	62.34	49.40	35.22	18.92	10.00	2.58	0.78	0.49	0.30
LR-16-V-45	2	1.5-2.0	0.00	0.00	SP-SC	100.00	100.00	100.00	99.72	99.25	98.78	97.96	96.45	93.74	89.25	79.10	62.08	30.44	13.22	7.33	2.37
LR-16-V-46	1	0.5-1.0	0.59	0.00	SP	100.00	99.90	99.41	98.59	97.89	95.82	90.40	79.34	64.30	43.63	22.47	12.37	4.58	2.01	1.14	0.52
LR-16-V-46	2	1.0-1.6	4.81	0.00	SP	97.56	96.35	95.19	93.83	92.65	89.63	83.38	72.32	58.71	41.32	21.51	10.84	2.37	0.61	0.35	0.28
LR-16-V-46	3	1.6-1.8	6.72	1.05	SP	98.31	95.17	92.23	88.89	85.53	81.16	75.42	68.55	60.04	49.39	33.00	18.17	6.23	2.44	1.27	0.50

USACE; Master Gradation Table
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SUMMARY OF LABORATORY TESTING RESULTS
FOR GRAIN SIZE ANALYSIS

Subsurface Investigation and Geotechnical Laboratory Testing, North Myrtle Beach, SC
Coastal Storm Damage Reduction Project, Little River Borrow Sit Investigation

BORING NUMBER	SAMPLE No.	DEPTH (ft)	% SHELL	% LS	USCS	3/4	3/8	#4	#7	#10	#14	#18	#25	#35	#45	#60	#80	#120	#170	#200	#230
LR-16-V-46	4	1.8-2.4	0.02	0.00	SP-SC	100.00	100.00	99.98	99.06	98.31	96.90	94.68	91.11	85.03	76.59	62.28	46.01	23.49	10.50	5.60	1.77
LR-16-V-47	1	0.0-0.8	1.80	0.00	SP	100.00	99.48	98.20	97.66	97.16	95.93	92.83	83.38	69.51	50.43	26.05	12.46	2.40	0.54	0.35	0.25
LR-16-V-47	2	0.8-1.1	5.20	0.00	SP	98.61	98.04	94.80	93.21	92.06	90.03	85.61	76.42	63.62	46.60	24.39	11.64	2.37	0.61	0.42	0.33
LR-16-V-47	3	1.1-1.8	4.10	0.00	SP	100.00	98.96	95.90	90.77	86.21	80.21	73.64	65.82	58.85	49.53	33.17	15.60	3.74	0.91	0.56	0.30
LR-16-V-47	4	2.0-2.5	1.55	0.00	SP-SC	100.00	99.10	98.45	96.81	95.20	93.27	91.84	90.45	88.90	86.45	79.20	63.71	29.40	11.95	5.93	1.57
LR-16-V-48	1	0.0-0.5	4.12	0.76	SP	96.89	96.43	95.12	94.50	94.09	92.91	90.10	82.45	69.64	49.89	23.80	10.47	2.34	0.73	0.52	0.38
LR-16-V-48	2	1.9-2.4	7.90	0.00	SP	97.73	95.64	92.10	87.93	84.33	78.82	72.14	64.16	55.48	44.81	29.72	17.41	5.14	1.70	0.99	0.39
LR-16-V-48	3	3.0-3.5	0.00	0.00	SP-SC	100.00	100.00	100.00	100.00	100.00	99.59	99.36	98.93	98.45	97.72	94.31	79.75	39.06	15.62	7.53	1.37

ATTACHMENT 4-2: LITTLE RIVER BORROW AREA

ZONE 1-3 GRADATION AND SEDIMENTOLOGICAL TABLES

Little River Borrow Area Zone 1 Sedimentological Summary											
Boring	Usable Depth	Mean	Std Dev	% Silt	% Shell	% #10	Wtd Mean	Wtd Std De	Wtd % Silt	Wtd % She	Wtd % #10
LR-16-V-48	3.5	1.18	1.36	0.75	6.01	89.21	4.12	4.77	2.64	21.04	312.23
LR-16-V-47	2.5	1.53	1.32	1.64	2.89	92.74	3.84	3.30	4.09	7.22	231.84
LR-16-V-46	2.4	1.49	1.27	2.31	2.39	95.07	3.56	3.04	5.55	5.73	228.16
LR-16-V-40	1.5	1.09	1.35	0.56	8.89	87.60	1.64	2.02	0.85	13.33	131.40
LR-16-V-41	3.2	1.11	1.38	0.32	6.29	87.97	3.57	4.40	1.01	20.13	281.50
LR-16-V-37	2.7	0.84	1.93	0.40	7.36	79.35	2.26	5.21	1.07	19.88	214.24
LR-16-V-38	1.8	0.93	1.53	0.53	10.00	85.41	1.67	2.75	0.95	18.00	153.74
LR-06-V-29	1.2	1.36	1.21	3.97	0.00	93.62	1.64	1.45	4.76	0.00	112.34
LR-06-V-28	3.0	1.30	0.98	2.02	0.00	97.57	3.91	2.95	6.06	0.00	292.70
LR-06-V-19	3.5	1.87	1.03	5.94	0.00	97.51	6.53	3.60	20.79	0.00	341.30
LR-06-V-20	2.2	1.54	0.88	2.52	0.00	98.06	3.38	1.93	5.55	0.00	215.74
	27.5						36.1	35.4	53.3	105.3	2515.2

Little River Borrow Area Zone 1	
MEAN =	1.31
STD DEV =	1.29
% SILT #200=	1.9
% VISUAL SHELL =	3.8
USABLE DEPTH =	0.6
%PASSING #10 =	91.5

Little River Borrow Area Zone 2 Sedimentological Summary											
Boring	Usable Depth	Mean	Std Dev	% Silt	% Shell	% #10	Wtd Mean	Wtd Std De	Wtd % Silt	Wtd % She	Wtd % #10
LR-16-V-37	2.7	0.84	1.93	0.40	3.36	79.35	2.26	5.21	1.07	9.07	214.24
LR-16-V-38	1.8	0.80	1.53	0.53	10.00	85.41	1.44	2.75	0.95	18.00	153.74
LR-16-V-39	2.8	1.36	1.17	0.39	2.27	91.90	3.82	3.29	1.09	6.36	257.32
LR-16-V-35	1.6	1.04	1.97	0.27	12.44	83.27	1.66	3.15	0.43	19.90	133.23
LR-V-16-36	2.4	2.01	1.77	8.70	3.53	89.28	4.81	4.25	20.87	8.46	214.27
LR-16-V-33	1.4	0.98	1.87	0.55	4.99	81.60	1.38	2.62	0.78	6.99	114.23
LR-16-V-34	3.8	1.47	1.23	0.35	3.90	90.93	5.58	4.66	1.32	14.82	345.54
LR-06-V-11	2.6	1.71	1.46	8.96	0.00	94.50	4.43	3.78	23.29	0.00	245.69
LR-06-V-12	2.1	2.08	0.87	7.52	0.00	98.59	4.37	1.82	15.79	0.00	207.04
LR-06-V-20	2.2	1.54	0.88	2.52	0.00	98.06	3.38	1.93	5.55	0.00	215.74
	23.4						33.1	33.5	71.1	83.6	2101.0

Little River Borrow Area Zone 2	
MEAN =	1.42
STD DEV =	1.43
% SILT #200=	3.0
% VISUAL SHELL =	3.6
USABLE DEPTH =	0.5
%PASSING #10 =	89.8

Little River Borrow Area Zone 3 Sedimentological Summary											
Boring	Usable Depth	Mean	Std Dev	% Silt	% Shell	% #10	Wtd Mean	Wtd Std De	Wtd % Silt	Wtd % She	Wtd % #10
LR-16-V-18	3.0	1.72	0.89	0.37	1.39	96.68	5.16	2.67	1.12	4.16	290.04
LR-16-V-19	1.9	1.56	1.02	0.94	0.91	94.24	2.97	1.94	1.79	1.72	179.05
LR-16-V-20	1.7	2.22	0.98	4.77	0.20	98.22	3.78	1.66	8.11	0.33	166.98
LR-16-V-21	3.0	1.46	1.53	0.45	7.47	86.84	4.38	4.59	1.34	22.40	260.53
LR-16-V-22	2.0	1.62	0.96	0.63	3.31	93.43	3.24	1.92	1.27	6.62	186.87
LR-16-V-15	2.9	1.44	1.38	2.78	2.01	90.11	4.17	3.99	8.06	5.81	261.33
LR-06-V-14	3.1	2.06	0.76	2.95	0.00	99.48	6.39	2.35	9.15	0.00	308.39
LR-06-V-15	2.4	1.99	0.91	4.87	0.00	98.01	4.77	2.19	11.70	0.00	235.24
LR-06-V-16	2.5	1.73	1.01	6.22	0.00	98.97	4.32	2.53	15.55	0.00	247.43
LR-06-V-22	1.3	1.54	1.33	6.33	0.00	95.12	2.00	1.73	8.23	0.00	123.66
LR-06-V-23	3.1	1.56	0.94	2.05	0.00	96.23	4.85	2.91	6.34	0.00	298.31
LR-06-V-24	1.0	1.63	0.88	2.01	0.00	97.98	1.63	0.88	2.01	0.00	97.98
LR-06-V-25	0.9	1.70	0.86	2.80	0.00	98.65	1.53	0.77	2.52	0.00	88.78
	28.8						49.2	30.2	77.2	41.0	2744.6

Little River Borrow Area Zone 3	
MEAN =	1.71
STD DEV =	1.05
% SILT #200=	2.7
% VISUAL SHELL =	1.4
USABLE DEPTH =	0.6
%PASSING #10 =	95.3