

## **Inventory of Potential Beach Nourishment and Coastal Restoration Sand Sources on the Atlantic Outer Continental Shelf**

The Geophysical and Geological Data Acquisition: Inventory of Potential Beach Nourishment and Coastal Restoration Sand Sources on the Atlantic Outer Continental Shelf is an ongoing project being conducted by CB&I under contract with the Bureau of Ocean and Energy Management (BOEM). The purpose of this project is to identify, characterize and delineate potential sand resources on the Atlantic Outer Continental Shelf (OCS) for use in future coastal restoration, beach nourishment, and/or wetland restoration efforts. The eastern coast of the United States was severely damaged by strong winds, waves, and currents that were caused by Hurricane Sandy in October 2012. Since then, east coast beaches in several areas have been in need of coastal restoration. Upon the completion of this two-year project there will be an inventory of potential sand sources for future beach nourishment and coastal restoration efforts for the U.S. states adjacent to the Atlantic OCS. The project area extends from 5.6 kilometers (three nautical miles) to 14.8 kilometers (eight nautical miles) offshore on the Atlantic OCS within water depths up to approximately 30 meters from Maine to Miami, Florida. 5,600 kilometers (km) of geophysical data and 350 geological samples (250 vibracores and 100 surface grab samples) are planned. The data acquisition effort was divided between each of the 13 coastal states with an Atlantic OCS based on their length of coastline, historical need for OCS sand resources, potential future need for OCS sand resources, and historical geophysical and geological data density, among other criteria. As part of the Hurricane Sandy Disaster Relief Appropriations Act, the extent of damages caused by Hurricane Sandy was also a controlling factor, and thus required that New Jersey and New York together benefit from at least 40% of the overall project effort. Potential study areas were presented to BOEM, other federal agencies, and state and local stakeholders during State coordination meetings held between January and March 2015. Based on the criteria described above and specific input from these meetings, the study areas were refined and finalized and field investigations commenced April 19, 2015.

These data represent the sediment analysis results of the reconnaissance geologic survey samples collected using an Alpine Pneumatic vibracore for all vibracores and a Petite Ponar Grab for surface grab samples. These data were collected September 18, 2015 to September 19, 2015 and analyzed for sediment grain size and sample composition. These data are presented in the NAD 1983 Universal Transverse Mercator (UTM) Zone 18N projection.

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## CORING

Reconnaissance geologic samples were collected within a 50 foot buffer of the planned sample location which was approved by a qualified marine archaeologist.

This dataset is from one field activity with consistent instrument calibrations.

Navigation and horizontal positioning for the Odom Hydrotrac Sounder was provided by a Trimble SPS GPS utilizing dual frequency rover antennas with DGPS Beacon corrections. GPS measurements were offset to represent the center point of the vibracore or ponar location. GPS antennas were rigidly affixed to the vessel via a pole mount on the starboard side of the vessel. Starboard pole mount offsets were measured (to within 5 cm) in relation to the reference point (top of core or ponar capstan). The positioning of the vessel and the sample location were corrected during data collection utilizing HYPACK 2015 to account for instrument offset. DGPS in combination with beacon corrections is accurate to within 1 to 5 meters. Data were collected in UTM Zone 18N, units in meters. (NAD 1983 UTM Zone 18N)

All vertical measurements are referenced to datum NAVD88 (Geoid Model 12A). Top of core elevations were derived using soundings collected during the geophysical operations and verified using an Odom single beam sounder at the time of core collection. Sounding data has been corrected for tidal fluctuations. The Odom single beam sounder was calibrated using an Odom Digibar Pro sound velocity probe with sound velocity measurements taken before sampling began. The sounder calibration was verified using bar checks at 5 foot intervals down to 30 foot depths.

The vibracores were collected using a 271B Alpine Pneumatic vibracore, configured to collect undisturbed sediment cores up to 20 ft. in length. This self-contained, freestanding pneumatic vibracore unit contains an air-driven vibratory hammer assembly, an aluminum H-beam which acts as the vertical beam upright on the seafloor, 20 ft. long steel tubes measuring 4" in diameter (with a plastic core liner), and a drilling bit with a cutting edge. An air hose array provides compressed air from the compressor on deck to drive the vibracore. The vibracore unit was A-frame deployed from AVS's vessel, the M/V Thunderforce.

The desired penetration depth was 20 feet. It is recognized, however, that maximum penetration may not be achieved at all sample locations. A minimum of 80 percent of the expected penetration was required through the unconsolidated strata. When located over a boring site, AVS made every reasonable effort to reach the required depth or to reach penetration refusal. Penetration refusal was completed when less than 1 ft of advance was accomplished after 5 minutes of vibration. When refusal was met at less than 80 percent of the desired depth of penetration, AVS removed the sampled portion and a new core pipe was set up. A jet pump hose was attached to the tip of the core pipe just below the vibrator. The rig was lowered to the bottom and jetted down to a depth 2 ft above where the first attempt met refusal. The jet was then turned off and the vibrator turned on, taking the additional part of the core and 2 ft of overlap. Retries were accomplished until penetration had reached the required depth, refusal or until three (3) retries were attempted, whichever occurred first. The jetted cores were labeled with an "A" for the first jetted section and a "B" for the second jetted section after the core name.

The vibracores were then removed from the vibracore unit. They were measured, marked and cut into 5 ft. sections. The total length of recovery was measured and compared to the measured depth of penetration to calculate percent recovery. Penetration was determined with the use of a penetrometer and chart recorder. Depth of penetration beneath the surface of the bottom was known to be within plus or minus 0.5 ft of actual penetration. Each vibracore was labeled onboard the vessel.

CB&I utilized a Ponar petite grab sampler for collection of unconsolidated surface samples. The Ponar was lowered by hand over the side to the seafloor at pre-determined and pre-approved sample locations. Once near the seafloor, the Ponar was allowed to free-fall, triggering the sampling device to penetrate

and close into the seafloor, collecting a surface sediment sample. The Ponar was then retrieved to the deck of the vessel, and the sample collected into secure sample bags for transport back to CB&I's geotechnical laboratory for visual description, photographing and sediment analysis.

## **SAMPLING and ANALYSIS**

Upon completion of field operations, all vibracores were transported to CB&I's office in Boca Raton. The vibracores were split lengthwise and logged in detail by describing sedimentary properties by layer in terms of layer thickness, color, texture (grain size), composition and presence of clay, silt, gravel, or any other identifying features in accordance with American Society for Testing and Materials (ASTM) standard procedure D 2488-09a. The vibracores were photographed in 2.0 ft intervals using an Olympus C-765 digital camera that was mounted on a frame directly above the vibracores. The photographs were taken using full spectrum overhead lighting and an 18% gray background, which provides a known reference color and is the standard reference value against which all camera light meters are calibrated. Sediment samples were extracted from the vibracores at irregular intervals based on distinct stratigraphic layers in the sediment sequence. The vibracores were then wrapped and boxed for transfer to a BOEM-designated archive facility according to that facility's requirements (the Lamont-Doherty Core Repository). Sedimentary properties of the grab samples were also described. Each grab sample was split into two representative sub-samples, one sub-sample was used to conduct the laboratory analysis and the other sub-sample was provided to the BOEM approved archive facility.

The sediment samples were analyzed to determine color and grain size distribution. During sieve analysis, the wet, dry and washed Munsell colors were recorded. Grain size was determined through sieve analysis in accordance with ASTM Standard Materials Designation D422-63 for particle size analysis of soils. This method covers the quantitative determination of the distribution of sand particles. Sediment finer than the No. 230 sieve (4.0 phi) was analyzed following ASTM Standard Test Method, Designation D1140-00. Mechanical sieving was conducted using calibrated sieves with a gradation of half phi intervals. Additional sieves representing key ASTM sediment classification boundaries were also included to meet appropriate beach-compatible mineral characterization. Weights retained on each sieve were recorded cumulatively. Grain size results were entered into the gINT® software program, which computes the mean and median grain size, sorting, silt/clay percentages for each sample using the moment method.

The sediment samples extracted from the vibracores and the grab samples were prepared for processing in CB&I's accredited geotechnical laboratory. This laboratory is accredited by the Construction Materials Engineering Council, Inc. (CMEC) for (ASTM) D422/T88 Sieve Analysis, D1140, D4648, and CPE-HAT-09. Geological samples were analyzed to determine texture (grain size and sorting); percent carbonate, and color.

Data were collected by CB&I under BOEM contract number M14PC00006.

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APPENDIX 1  
VIBRACORE LOGS



**Legend for Geotechnical Data**

(SP), (SM), etc.

Refers to the Army Corps of Engineers Unified Soils Classification System. Class types are defined primarily by grain size, sorting and percent of material passing the 200 sieve. Classification of materials on the core logs based on visual field examinations are identified on the core logs under the Classification of Materials Description. Classifications based on laboratory sieve analyses are identified on the core logs in the Legend and under Remarks.

**Grain Size Terms**

- Cobble – retained on the 3.0” sieve
- Gravel – greater than the #4 sieve and less than the 3.0” sieve
  - Coarse: greater than the 3/4” sieve and less than the 3.0” sieve
  - Fine – greater than the #4 sieve and less than the 3/4” sieve
- Sand - greater than the #200 sieve and less than the #4 sieve
  - Coarse - greater than the #10 sieve and less than the #4 sieve
  - Medium - greater than the #40 sieve and less than the #10 sieve
  - Fine - greater than the #230 sieve and less than the #40 sieve
- Fines – (silt or clay) passing the #230 sieve

**Proportional definition of descriptive terms**

<u>Descriptive Term</u>	<u>Range of Proportions</u>
Sandy, gravelly, etc.	35 % to 50 %
Some	20 % to 35 %
Little	10 % to 20 %
Trace	1 % to 10 %



**Legend for Geotechnical Data**

GW		Well graded gravels or gravel-sand mixtures, little or no fines	ML		Inorganic silts and very fine sands, rock flour, sandy silts or clayey silts with slight plasticity
GP		Poorly graded gravels or gravel-sand mixtures, w/ little or no fines	MH		Inorganic silts, micaceous or diatomaceous fine sandy or silty soil, elastic silts
GM		Silty gravels, gravel-sand-silt mixtures	OL		Organic silts and organic silt-clays of low plasticity
GC		Clayey gravels, gravel-sand-clay mixtures	OH		Organic clays of medium to high plasticity, organic silts
SW		Well graded sands or gravelly sands, little or no fines	CL		Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
SP		Poorly graded sands or gravelly sands, little or no fines	CH		Inorganic clays of high plasticity, fat clays
SM		Silty sands, sand-silt mixtures	PT		Peat and other highly organic soils
SC		Clayey sands, sand-clay mixtures	SP-SM		Poorly-graded silty sand
SW-SM		Well-graded silty sand	SM-SC		Silty clayey sand
GW-GM		Well-graded silty gravel	ML-CL		Inorganic silty lean clay
GM-GC		Clayey silty gravel			

Note: Information is after ACOE Atlantic Division Manual # 1110-1-1 titled *Engineering and Design Geotechnical Manual for Surface and Subsurface Investigations*



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### Legend for Geotechnical Data

The naming convention used by CB&I incorporates key information about the item in the title. The naming format uses the following information:


- **Abbreviated area name (two letters that will be used throughout the project)**
- **Abbreviated data type: vibracore (VC) or surface sample (SS)**
- **Collection year (YY)**
- **Identification number**
- **Sample identification number in the case vibracores.**

#### Format examples:

- A) **DE-BOEM-2015-VC05**  
B) **DE-BOEM-2015-VC05 S#1**

Example A is vibracore number 05, collected offshore of Delaware in the year 2015.

Example B refers to sample number 1 taken from vibracore number 05, which was collected offshore of Delaware in 2015.

<b>DRILLING LOG</b>		<b>DIVISION</b>	<b>INSTALLATION</b>	<b>SHEET 1</b> OF 1 SHEETS
<b>1. PROJECT</b> Inventory of Potential Beach Nourishment and Coastal Restoration Sand Sources on the Atlantic OCS <div style="float: right; text-align: center;"></div>			<b>9. SIZE AND TYPE OF BIT</b> 3.0 In.	
<b>2. BORING DESIGNATION</b> DE-BOEM-2015-VC01			<b>10. COORDINATE SYSTEM/DATUM</b> UTM 18	
<b>3. DRILLING AGENCY</b> American Vibracore Services, Inc.			<b>11. MANUFACTURER'S DESIGNATION OF DRILL</b> <input type="checkbox"/> AUTO HAMMER Alpine Pneumatic Vibracore <input type="checkbox"/> MANUAL HAMMER	
<b>4. NAME OF DRILLER</b> Justin Robertson			<b>12. TOTAL SAMPLES</b> <b>DISTURBED</b> <b>UNDISTURBED (UD)</b>	
<b>5. DIRECTION OF BORING</b> <input checked="" type="checkbox"/> VERTICAL <b>DEG. FROM VERTICAL</b> <b>BEARING</b> <input type="checkbox"/> INCLINED			<b>13. TOTAL NUMBER CORE BOXES</b>	
<b>6. THICKNESS OF OVERBURDEN</b> 0.0 Ft.			<b>14. ELEVATION GROUND WATER</b>	
<b>7. DEPTH DRILLED INTO ROCK</b> 0.0 Ft.			<b>15. DATE BORING</b> <b>STARTED</b> <b>COMPLETED</b> 09-18-15 15:27      09-18-15 15:35	
<b>8. TOTAL DEPTH OF BORING</b> 15.3 Ft.			<b>16. ELEVATION TOP OF BORING</b> -39.4 Ft.	
			<b>17. TOTAL RECOVERY FOR BORING</b> 16.9 Ft.	
			<b>18. SIGNATURE AND TITLE OF INSPECTOR</b> SMT	

ELEV. (ft)	DEPTH (ft)	LEGEND	CLASSIFICATION OF MATERIALS Depths and elevations based on measured values	% REC.	BOX OR SAMPLE	REMARKS
-39.4	0.0					
-42.4	3.0	○	SAND, medium grained, quartz, trace coarse grains, trace shell hash, trace silt, (0.5" x 1.0") silty pocket @ 1.3', (2.0" x 1.25") shell fragment @ 1.3', light olive brown (2.5Y-5/4), (SW).		1	Sample #1, Depth = 1.7' Mean (mm): 0.66, Phi Sorting: 0.87 Fines (230): 1.29% (SW)
-45.1	5.7	○	SAND, medium grained, quartz, trace coarse grains, trace shell hash, trace silt, light olive brown (2.5Y-5/4), (SP).		2	Sample #2, Depth = 4.2' Mean (mm): 0.54, Phi Sorting: 0.75 Fines (230): 0.77% (SP)
-48.5	9.1	○	SAND, medium grained, quartz, trace coarse grains, trace shell hash, trace silt, light olive brown (2.5Y-5/4), (SW).		3	Sample #3, Depth = 7.2' Mean (mm): 0.67, Phi Sorting: 0.90 Fines (230): 0.69% (SW)
-51.7	12.3	○	SAND, fine to medium grained, quartz, trace shell hash, trace silt, dark grayish brown (2.5Y-4/2), (SP).		4	Sample #4, Depth = 10.5' Mean (mm): 0.43, Phi Sorting: 0.70 Fines (230): 1.15% (SP)
-54.3	14.9	○	SAND, fine to medium grained, quartz, trace shell hash, trace silt, 0.75" shell fragment @ 13.8', grayish brown (2.5Y-5/2), (SP).		5	Sample #5, Depth = 13.5' Mean (mm): 0.38, Phi Sorting: 0.58 Fines (230): 1.14% (SP)
-56.3	16.9	○	SAND, medium grained, quartz, trace coarse grains, trace shell hash, trace silt, olive yellow (2.5Y-6/6), (SP).		6	Sample #6, Depth = 16.0' Mean (mm): 0.66, Phi Sorting: 0.80 Fines (230): 0.77% (SP)
			End of Boring			

LOUISIANA DE BOEM 2015 VC.GPJ JPBRAZIL.GDT 9/12/16




<b>DRILLING LOG</b>		<b>DIVISION</b>	<b>INSTALLATION</b>	<b>SHEET 1</b> OF 1 SHEETS
<b>1. PROJECT</b> Inventory of Potential Beach Nourishment and Coastal Restoration Sand Sources on the Atlantic OCS			<b>9. SIZE AND TYPE OF BIT</b> 3.0 In.	
<b>2. BORING DESIGNATION</b> DE-BOEM-2015-VC03			<b>10. COORDINATE SYSTEM/DATUM</b> UTM 18	
<b>3. DRILLING AGENCY</b> American Vibracore Services, Inc.			<b>11. MANUFACTURER'S DESIGNATION OF DRILL</b> Alpine Pneumatic Vibracore	
<b>4. NAME OF DRILLER</b> Justin Robertson			<input type="checkbox"/> <b>AUTO HAMMER</b> <input type="checkbox"/> <b>MANUAL HAMMER</b>	
<b>5. DIRECTION OF BORING</b> <input checked="" type="checkbox"/> <b>VERTICAL</b> <input type="checkbox"/> <b>INCLINED</b>			<b>12. TOTAL SAMPLES</b> DISTURBED: _____ UNDISTURBED (UD): _____	
<b>6. THICKNESS OF OVERBURDEN</b> 0.0 Ft.			<b>13. TOTAL NUMBER CORE BOXES</b>	
<b>7. DEPTH DRILLED INTO ROCK</b> 0.0 Ft.			<b>14. ELEVATION GROUND WATER</b>	
<b>8. TOTAL DEPTH OF BORING</b> 20.0 Ft.			<b>15. DATE BORING</b> STARTED: 09-19-15 09:27 COMPLETED: 09-19-15 09:28	
			<b>16. ELEVATION TOP OF BORING</b> -51.0 Ft.	
			<b>17. TOTAL RECOVERY FOR BORING</b> 12.7 Ft.	
			<b>18. SIGNATURE AND TITLE OF INSPECTOR</b> KM	


ELEV. (ft)	DEPTH (ft)	LEGEND	CLASSIFICATION OF MATERIALS Depths and elevations based on measured values	% REC.	BOX OR SAMPLE	REMARKS
-51.0	0.0					
-52.6	1.6		SAND, fine grained, quartz, trace shell hash, trace silt, very dark gray (5Y-3/1), (SP).		1	Sample #1, Depth = 0.8' Mean (mm): 0.18, Phi Sorting: 0.67 Fines (230): 2.20% (SP)
-53.5	2.5		SAND, fine to medium grained, quartz, trace shell hash, trace silt, dark gray (2.5Y-4/1), (SP).		2	Sample #2, Depth = 2.1' Mean (mm): 0.39, Phi Sorting: 0.83 Fines (230): 1.12% (SP)
-53.9	2.9		SAND, fine to medium grained, quartz, trace shell fragments, trace shell hash, trace silt, shell fragments up to (1.0" x 0.5"), (1.25" x 0.75") whole shell @ 2.9', dark grayish brown (2.5Y-4/2), (SW).		3	Sample #3, Depth = 2.7' Mean (mm): 0.41, Phi Sorting: 0.99 Fines (230): 1.68% (SW)
-59.9	8.9		SAND, fine grained, quartz, trace shell hash, trace silt, 1.0" silty pockets @ 3.2' and 5.6', 0.5" whole shell @ 5.3', (1.25" x 0.75") wood fragment @ 8.7', dark gray (5Y-4/1), (SP-SM).		4	Sample #4, Depth = 5.9' Mean (mm): 0.15, Phi Sorting: 0.35 Fines (230): 5.06% (SP-SM)
-63.7	12.7		SAND, fine grained, quartz, trace shell fragments, trace shell hash, trace silt, shell fragments up to (1.0" x 0.75"), (1.5" x 1.0") shell fragment @ 9.0', 2.0" clayey pocket @ 12.6', very dark gray (5Y-3/1), (SP-SM).		5	Sample #5, Depth = 10.8' Mean (mm): 0.15, Phi Sorting: 0.46 Fines (230): 8.89% (SP-SM)
-71.0	20.0		No Recovery.			
			End of Boring			

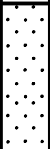
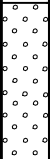
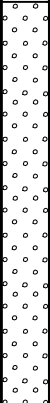


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<b>DRILLING LOG</b>		<b>DIVISION</b>	<b>INSTALLATION</b>	<b>SHEET 1</b> <b>OF 1 SHEETS</b>
<b>1. PROJECT</b> Inventory of Potential Beach Nourishment and Coastal Restoration Sand Sources on the Atlantic OCS			<b>9. SIZE AND TYPE OF BIT</b> 3.0 In.	
<b>2. BORING DESIGNATION</b> DE-BOEM-2015-VC03A			<b>10. COORDINATE SYSTEM/DATUM</b>	
			<b>HORIZONTAL</b> UTM 18	<b>VERTICAL</b> NAD 1983 NAVD88
<b>3. DRILLING AGENCY</b> American Vibracore Services, Inc.			<b>11. MANUFACTURER'S DESIGNATION OF DRILL</b> <input type="checkbox"/> <b>AUTO HAMMER</b> Alpine Pneumatic Vibracore <input type="checkbox"/> <b>MANUAL HAMMER</b>	
<b>4. NAME OF DRILLER</b> Justin Robertson			<b>12. TOTAL SAMPLES</b>	
<b>5. DIRECTION OF BORING</b> <input checked="" type="checkbox"/> <b>VERTICAL</b> <input type="checkbox"/> <b>INCLINED</b>			<b>13. TOTAL NUMBER CORE BOXES</b>	
<b>6. THICKNESS OF OVERBURDEN</b> 0.0 Ft.			<b>14. ELEVATION GROUND WATER</b>	
<b>7. DEPTH DRILLED INTO ROCK</b> 0.0 Ft.			<b>15. DATE BORING</b>	
<b>8. TOTAL DEPTH OF BORING</b> 20.2 Ft.			<b>16. ELEVATION TOP OF BORING</b> -51.0 Ft.	
			<b>17. TOTAL RECOVERY FOR BORING</b> 4.9 Ft.	
			<b>18. SIGNATURE AND TITLE OF INSPECTOR</b> KM	

ELEV. (ft)	DEPTH (ft)	LEGEND	CLASSIFICATION OF MATERIALS Depths and elevations based on measured values	% REC.	BOX OR SAMPLE	REMARKS
-51.0	0.0					
			Jetted to 10.5'			
-61.5	10.5					
-66.4	15.4		SAND, fine grained, quartz, little silt, trace clay, trace shell fragments, trace shell hash, shell fragments up to (1.25" x 0.75"), clay distributed in clayey pockets up to 0.5", (2.5" x 3.0") shell fragment pocket @ 11.6'- shell fragments up to (2.5" x 0.5"), (2.5" x 1.5") shell fragment @ 14.7', very dark gray (5Y-3/1), (SP-SM).		1	Sample #1, Depth = 13.0' Mean (mm): 0.16, Phi Sorting: 0.53 Fines (230): 10.96% (SP-SM)
-71.2	20.2		No Recovery.			
			End of Boring			

LOUISIANA DE BOEM 2015 VC.GPJ JPBRAZIL.GDT 9/12/16

<b>DRILLING LOG</b>		<b>DIVISION</b>	<b>INSTALLATION</b>	<b>SHEET 1</b> OF 1 SHEETS
<b>1. PROJECT</b> Inventory of Potential Beach Nourishment and Coastal Restoration Sand Sources on the Atlantic OCS			<b>9. SIZE AND TYPE OF BIT</b> 3.0 In.	
			<b>10. COORDINATE SYSTEM/DATUM</b> UTM 18      HORIZONTAL: NAD 1983      VERTICAL: NAVD88	
<b>2. BORING DESIGNATION</b> DE-BOEM-2015-VC05		<b>LOCATION COORDINATES (m)</b> X = 505,360    Y = 4,267,280		<b>11. MANUFACTURER'S DESIGNATION OF DRILL</b> <input type="checkbox"/> AUTO HAMMER Alpine Pneumatic Vibracore <input type="checkbox"/> MANUAL HAMMER
<b>3. DRILLING AGENCY</b> American Vibracore Services, Inc.		<b>CONTRACTOR FILE NO.</b>		
<b>4. NAME OF DRILLER</b> Justin Robertson			<b>12. TOTAL SAMPLES</b> <b>DISTURBED</b> <b>UNDISTURBED (UD)</b>	
<b>5. DIRECTION OF BORING</b> <input checked="" type="checkbox"/> VERTICAL <b>DEG. FROM VERTICAL</b> <b>BEARING</b> <input type="checkbox"/> INCLINED			<b>13. TOTAL NUMBER CORE BOXES</b>	
<b>6. THICKNESS OF OVERBURDEN</b> 0.0 Ft.			<b>14. ELEVATION GROUND WATER</b>	
<b>7. DEPTH DRILLED INTO ROCK</b> 0.0 Ft.			<b>15. DATE BORING</b> <b>STARTED</b> <b>COMPLETED</b> 09-18-15 17:06      09-18-15 17:16	
<b>8. TOTAL DEPTH OF BORING</b> 18.4 Ft.			<b>16. ELEVATION TOP OF BORING</b> -60.5 Ft.	
			<b>17. TOTAL RECOVERY FOR BORING</b> 20 Ft.	
			<b>18. SIGNATURE AND TITLE OF INSPECTOR</b> KM	

ELEV. (ft)	DEPTH (ft)	LEGEND	CLASSIFICATION OF MATERIALS Depths and elevations based on measured values	% REC.	BOX OR SAMPLE	REMARKS
-60.5	0.0					
-63.8	3.3		SAND, fine to medium grained, quartz, trace rock, trace shell fragments, trace shell hash, trace silt, rock up to (0.5" x 0.25"), shell fragments up to 0.75", (1.25" x 0.75") shell fragment @ 1.8', 0.75" whole shell @ 2.1', grayish brown (2.5Y-5/2), (SP).		1	Sample #1, Depth = 1.6' Mean (mm): 0.43, Phi Sorting: 0.85 Fines (230): 1.35% (SP)
-67.3	6.8		SAND, fine grained, quartz, trace rock, trace shell hash, trace silt, trace wood fragments, rock up to 0.5", wood fragments up to (0.75" x 0.25"), (1.0" x 0.75") shell fragment @ 3.8', 2.0" medium grained (2.5Y-5/2) pocket @ 3.6', (3.0" x 2.0") rock pocket @ 4.5'- rocks up to 1.25", dark gray (5Y-4/1), (SW).		2	Sample #2, Depth = 5.1' Mean (mm): 0.29, Phi Sorting: 0.89 Fines (230): 3.25% (SW)
-75.9	15.4		SAND, medium grained, quartz, trace clay, trace coarse grains, trace rock, trace silt, rock up to (0.75" x 0.5"), clay distributed in clayey pockets up to (1.0" x 0.5"), (1.0" x 0.75") rocks @ 8.3' and 10.1', gray (5Y-5/1), (SW).		3	Sample #3, Depth = 11.1' Mean (mm): 0.70, Phi Sorting: 1.09 Fines (230): 1.10% (SW)
-77.5	17.0		SAND, medium to coarse grained, quartz, some rock, trace clay, rock up to 0.75", dark gray (5Y-4/1), (GW).		4	Sample #4, Depth = 16.2' Mean (mm): 2.00, Phi Sorting: 1.98 Fines (230): 1.52% (SW)
-80.5	20.0		CLAY, hard, 1.5" sandy pocket with rock up to 0.25" @ 17.3', Note: Too hard to Torvane, greenish black (10Y-2.5/1), (CL).			
			End of Boring			

LOUISIANA DE BOEM 2015 VC.GPJ JPBRAZIL.GDT 9/12/16

<b>DRILLING LOG</b>		<b>DIVISION</b>	<b>INSTALLATION</b>	<b>SHEET 1</b> OF 1 SHEETS
<b>1. PROJECT</b> Inventory of Potential Beach Nourishment and Coastal Restoration Sand Sources on the Atlantic OCS			<b>9. SIZE AND TYPE OF BIT</b> 3.0 In.	
<b>2. BORING DESIGNATION</b> DE-BOEM-2015-VC07			<b>10. COORDINATE SYSTEM/DATUM</b> UTM 18	
<b>3. DRILLING AGENCY</b> American Vibracore Services, Inc.			<b>11. MANUFACTURER'S DESIGNATION OF DRILL</b> Alpine Pneumatic Vibracore	
<b>4. NAME OF DRILLER</b> Justin Robertson			<input type="checkbox"/> <b>AUTO HAMMER</b> <input type="checkbox"/> <b>MANUAL HAMMER</b>	
<b>5. DIRECTION OF BORING</b> <input checked="" type="checkbox"/> <b>VERTICAL</b> <input type="checkbox"/> <b>INCLINED</b>			<b>12. TOTAL SAMPLES</b> DISTURBED: _____ UNDISTURBED (UD): _____	
<b>6. THICKNESS OF OVERBURDEN</b> 0.0 Ft.			<b>13. TOTAL NUMBER CORE BOXES</b>	
<b>7. DEPTH DRILLED INTO ROCK</b> 0.0 Ft.			<b>14. ELEVATION GROUND WATER</b>	
<b>8. TOTAL DEPTH OF BORING</b> 20.0 Ft.			<b>15. DATE BORING</b> STARTED: 09-18-15 19:12 COMPLETED: 09-18-15 19:13	
			<b>16. ELEVATION TOP OF BORING</b> -62.4 Ft.	
			<b>17. TOTAL RECOVERY FOR BORING</b> 13.7 Ft.	
			<b>18. SIGNATURE AND TITLE OF INSPECTOR</b> KM	

ELEV. (ft)	DEPTH (ft)	LEGEND	CLASSIFICATION OF MATERIALS Depths and elevations based on measured values	% REC.	BOX OR SAMPLE	REMARKS
-62.4	0.0					
-63.0	0.6		Clayey SAND, medium to coarse grained, quartz, some rock, rock up to 1.25", (2.0" x 3.0") (2.5Y-5/2) trace clay pocket @ 0.2', greenish black (5GY-2.5/1), (SC).		1	Sample #1, Depth = 1.6' Mean (mm): 0.57, Phi Sorting: 1.22 Fines (230): 6.30% (SW-SM)
-64.9	2.5		SAND, medium grained, quartz, trace coarse grains, trace rock, trace silt, rock up to 1.25", light gray (5Y-7/1), (SW-SM).		2	Sample #2, Depth = 3.0' Mean (mm): 0.39, Phi Sorting: 0.90 Fines (230): 7.32% (SW-SM)
-65.9	3.5		SAND, fine to medium grained, quartz, trace rock, trace silt, rock up to 0.75", (1.0" x 0.75") rock @ 3.2', light gray (5Y-7/1), (SW-SM).		3	Sample #3, Depth = 4.0' Mean (mm): 0.50, Phi Sorting: 1.21 Fines (230): 8.99% (SW-SM)
-66.9	4.5		SAND, medium grained, quartz, trace clay, trace silt, clay distributed in clayey pockets up to 0.75", (1.0" x 0.75") rock @ 3.9', 1.25" rock @ 4.2', light gray (5Y-7/2), (SW-SM).		4	Sample #4, Depth = 5.2' Mean (mm): 2.33, Phi Sorting: 2.18 Fines (230): 4.83% (SW)
-68.2	5.8		SAND, medium to coarse grained, quartz, little rock, trace clay, rock up to 1.0", color is mottled (2.5Y-6/4) and, dark gray (N-4/0), (SW).		5	Sample #5, Depth = 6.4' Mean (mm): 4.79, Phi Sorting: 2.08 Fines (230): 1.60% (GW)
-69.4	7.0		Rocky SAND, medium to coarse grained, quartz, trace silt, rock up to (1.5" x 1.25"), light olive brown (2.5Y-5/3), (GW).		6	Sample #6, Depth = 7.6' Mean (mm): 0.93, Phi Sorting: 1.41 Fines (230): 4.28% (SW)
-70.7	8.3		SAND, medium grained, quartz, trace coarse grains, trace rock, trace silt, rock up to 0.75", (1.25" x 1.0") rock @ 7.3', gray (5Y-6/1), (SW).		7	Sample #7, Depth = 8.9' Mean (mm): 3.25, Phi Sorting: 1.84 Fines (230): 2.12% (GW)
-71.9	9.5		SANDY ROCK, trace silt, rock up to (1.5" x 1.0"), gray (5Y-6/1), (GW).		8	Sample #8, Depth = 12.5' Mean (mm): 0.29, Phi Sorting: 0.55 Fines (230): 10.07% (SP-SM)
-73.5	11.1		SAND, medium grained, quartz, trace coarse grains, trace rock, trace silt, rock up to 0.75", 1.0" rock @ 11.1', gray (5Y-6/1), (SW).			
-76.1	13.7		SAND, fine grained, quartz, little silt, Bit Sample from 13.5' to 13.7', light gray (5Y-7/1), (SP-SM).			
			No Recovery.			
-82.4	20.0		End of Boring			

LOUISIANA DE BOEM 2015 VC.GPJ JPBRAZIL.GDT 9/12/16

<b>DRILLING LOG</b>		<b>DIVISION</b>	<b>INSTALLATION</b>	<b>SHEET 1</b> OF 1 SHEETS
<b>1. PROJECT</b> Inventory of Potential Beach Nourishment and Coastal Restoration Sand Sources on the Atlantic OCS			<b>9. SIZE AND TYPE OF BIT</b> 3.0 In.	
<b>2. BORING DESIGNATION</b> DE-BOEM-2015-VC08			<b>10. COORDINATE SYSTEM/DATUM</b> UTM 18	
<b>3. DRILLING AGENCY</b> American Vibracore Services, Inc.			<b>11. MANUFACTURER'S DESIGNATION OF DRILL</b> Alpine Pneumatic Vibracore	
<b>4. NAME OF DRILLER</b> Justin Robertson			<input type="checkbox"/> <b>AUTO HAMMER</b> <input type="checkbox"/> <b>MANUAL HAMMER</b>	
<b>5. DIRECTION OF BORING</b> <input checked="" type="checkbox"/> <b>VERTICAL</b> <input type="checkbox"/> <b>INCLINED</b>			<b>12. TOTAL SAMPLES</b> DISTURBED: _____ UNDISTURBED (UD): _____	
<b>6. THICKNESS OF OVERBURDEN</b> 0.0 Ft.			<b>13. TOTAL NUMBER CORE BOXES</b>	
<b>7. DEPTH DRILLED INTO ROCK</b> 0.0 Ft.			<b>14. ELEVATION GROUND WATER</b>	
<b>8. TOTAL DEPTH OF BORING</b> 20.0 Ft.			<b>15. DATE BORING</b> STARTED: 09-19-15 07:32 COMPLETED: 09-19-15 07:37	
			<b>16. ELEVATION TOP OF BORING</b> -64.9 Ft.	
			<b>17. TOTAL RECOVERY FOR BORING</b> 12.6 Ft.	
			<b>18. SIGNATURE AND TITLE OF INSPECTOR</b> KM	

ELEV. (ft)	DEPTH (ft)	LEGEND	CLASSIFICATION OF MATERIALS Depths and elevations based on measured values	% REC.	BOX OR SAMPLE	REMARKS
-64.9	0.0					
-65.8	0.9		SAND, medium to coarse grained, quartz, little rock, trace clay, trace shell hash, rock up to 0.5", (1.25" x 0.75") shell fragment @ 0.8', dark grayish brown (2.5Y-4/2), (SW).		1	Sample #1, Depth = 0.4' Mean (mm): 1.39, Phi Sorting: 1.81 Fines (230): 3.87% (SW)
-67.2	2.3		SAND, medium to coarse grained, quartz, little rock, trace clay, rock up to (2.0" x 1.0"), (2.0" x 1.5") rock @ 1.4', 2 (3.0" x 2.0") rocks @ 2.3', dark greenish gray (10Y-4/1), (SW-SC).		2	Sample #2, Depth = 1.6' Mean (mm): 1.44, Phi Sorting: 2.13 Fines (230): 7.85% (SW-SC)
-68.7	3.8		SAND, medium grained, quartz, little clay, trace rock, rock up to (0.75" x 0.5"), greenish gray (10Y-5/1), (SC).		3	Sample #3, Depth = 3.0' Mean (mm): 0.62, Phi Sorting: 1.56 Fines (230): 14.75% (SC)
-70.5	5.6		SAND, medium to coarse grained, quartz, some rock, trace silt, rock up to 1.25", (1.75" x 1.0") rocks @ 4.1' and 4.2', (2.25" x 1.5") rock @ 4.3', (1.0" x 3.0") clayey pockets @ 4.4', 5.4' and 5.6', light brownish gray (2.5Y-6/2), (GW).		4	Sample #4, Depth = 4.7' Mean (mm): 1.46, Phi Sorting: 1.73 Fines (230): 3.33% (SW)
-71.3	6.4		ROCK, little sand, trace clay, rock up to (1.25" x 0.75"), light olive brown (2.5Y-5/4), (GW).		5	Sample #5, Depth = 6.0' Mean (mm): 2.64, Phi Sorting: 1.43 Fines (230): 3.98% (SW)
-73.0	8.1		SAND, medium to coarse grained, quartz, trace clay, trace rock, rock up to (1.0" x 0.75"), 1.25" rock @ 8.0', light yellowish brown (2.5Y-6/4), (SW).		6	Sample #6, Depth = 7.2' Mean (mm): 1.30, Phi Sorting: 1.57 Fines (230): 3.38% (SW)
-75.7	10.8		SAND, fine to medium grained, quartz, trace rock, trace silt, rock up to 0.75", light brownish gray (2.5Y-6/2), (SP-SM).		7	Sample #7, Depth = 9.4' Mean (mm): 0.39, Phi Sorting: 0.71 Fines (230): 8.38% (SP-SM)
-77.1	12.2		SAND, medium to coarse grained, quartz, trace clay, trace rock, rock up to (1.0" x 0.75"), light yellowish brown (2.5Y-6/4), (SW).		6	
-77.5	12.6		Sandy CLAY, soft, trace rock, rock up to 0.75", Bit Sample from 12.5' to 12.6', light olive brown (2.5Y-5/6), (CL). No Recovery.			
-84.9	20.0		End of Boring			

LOUISIANA DE BOEM 2015 VC.GPJ JPBRAZIL.GDT 9/12/16

APPENDIX 2  
VIBRACORE PHOTOGRAPHS



INVENTORY OF  
POTENTIAL SAND  
RESOURCES ON THE  
ATLANTIC OCS

DE-BOEM-2015-VC01  
0.0' - 2.0'



INVENTORY OF  
POTENTIAL SAND  
RESOURCES ON THE  
ATLANTIC OCS

DE-BOEM-2015-VC01  
2.0' - 4.0'



INVENTORY OF  
POTENTIAL SAND  
RESOURCES ON THE  
ATLANTIC OCS

DE-BOEM-2015-VC01  
4.0' - 6.0'



INVENTORY OF  
POTENTIAL SAND  
RESOURCES ON THE  
ATLANTIC OCS

DE-BOEM-2015-VC01  
6.0' - 8.0'





INVENTORY OF  
POTENTIAL SAND  
RESOURCES ON THE  
ATLANTIC OCS

DE-BOEM-2015-VC01  
8.0'-10.0'



INVENTORY OF  
POTENTIAL SAND  
RESOURCES ON THE  
ATLANTIC OCS

DE-BOEM-2015-VC01  
10.0'-12.0'



INVENTORY OF  
POTENTIAL SAND  
RESOURCES ON THE  
ATLANTIC OCS

DE-BOEM-2015-VC01  
12.0'-14.0'



INVENTORY OF  
POTENTIAL SAND  
RESOURCES ON THE  
ATLANTIC OCS

DE-BOEM-2015-VC01  
14.0'-16.0'



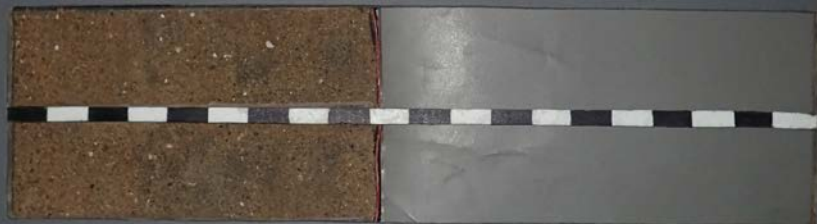




INVENTORY OF  
POTENTIAL SAND  
RESOURCES ON THE  
ATLANTIC OCS

DE-BOEM-2015-VC01

16.0' - 16.9'





INVENTORY OF  
POTENTIAL SAND  
RESOURCES ON THE  
ATLANTIC OCS

DE-BOEM-2015-VC03

0.0' - 2.0'



INVENTORY OF  
POTENTIAL SAND  
RESOURCES ON THE  
ATLANTIC OCS

DE-BOEM-2015-VC03

2.0' - 4.0'



INVENTORY OF  
POTENTIAL SAND  
RESOURCES ON THE  
ATLANTIC OCS

DE-BOEM-2015-VC03

4.0' - 6.0'



INVENTORY OF  
POTENTIAL SAND  
RESOURCES ON THE  
ATLANTIC OCS

DE-BOEM-2015-VC03

6.0' - 8.0'





INVENTORY OF  
POTENTIAL SAND  
RESOURCES ON THE  
ATLANTIC OCS

DE-BOEM-2015-VC03

8.0'-10.0'



INVENTORY OF  
POTENTIAL SAND  
RESOURCES ON THE  
ATLANTIC OCS

DE-BOEM-2015-VC03

10.0'-12.0'



INVENTORY OF  
POTENTIAL SAND  
RESOURCES ON THE  
ATLANTIC OCS

DE-BOEM-2015-VC03

12.0'-12.7'





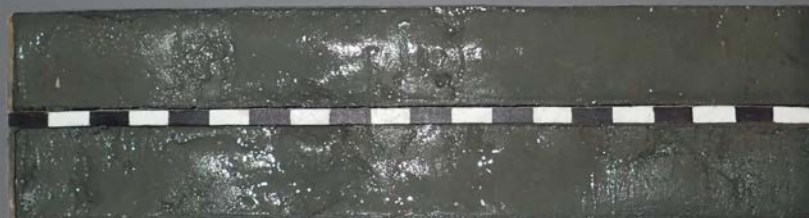
INVENTORY OF  
POTENTIAL SAND  
RESOURCES ON THE  
ATLANTIC OCS

DE-BOEM-2015-VC03A  
JET 10.5' - 12.5'



INVENTORY OF  
POTENTIAL SAND  
RESOURCES ON THE  
ATLANTIC OCS

DE-BOEM-2015-VC03A  
JET 12.5' - 14.5'



INVENTORY OF  
POTENTIAL SAND  
RESOURCES ON THE  
ATLANTIC OCS

DE-BOEM-2015-VC03A  
JET 14.5' - 15.4'





INVENTORY OF  
POTENTIAL SAND  
RESOURCES ON THE  
ATLANTIC OCS

DE-BOEM-2015-VC05  
0.0' - 2.0'



INVENTORY OF  
POTENTIAL SAND  
RESOURCES ON THE  
ATLANTIC OCS

DE-BOEM-2015-VC05  
2.0' - 4.0'



INVENTORY OF  
POTENTIAL SAND  
RESOURCES ON THE  
ATLANTIC OCS

DE-BOEM-2015-VC05  
4.0' - 6.0'



INVENTORY OF  
POTENTIAL SAND  
RESOURCES ON THE  
ATLANTIC OCS

DE-BOEM-2015-VC05  
6.0' - 8.0'





INVENTORY OF  
POTENTIAL SAND  
RESOURCES ON THE  
ATLANTIC OCS

DE-BOEM-2015-VC05

8.0'-10.0'



INVENTORY OF  
POTENTIAL SAND  
RESOURCES ON THE  
ATLANTIC OCS

DE-BOEM-2015-VC05

10.0'-12.0'



INVENTORY OF  
POTENTIAL SAND  
RESOURCES ON THE  
ATLANTIC OCS

DE-BOEM-2015-VC05

12.0'-14.0'



INVENTORY OF  
POTENTIAL SAND  
RESOURCES ON THE  
ATLANTIC OCS

DE-BOEM-2015-VC05

14.0'-16.0'





INVENTORY OF  
POTENTIAL SAND  
RESOURCES ON THE  
ATLANTIC OCS

DE-BOEM-2015-VC05  
16.0'-18.0'



INVENTORY OF  
POTENTIAL SAND  
RESOURCES ON THE  
ATLANTIC OCS

DE-BOEM-2015-VC05  
18.0'-20.0'





INVENTORY OF  
POTENTIAL SAND  
RESOURCES ON THE  
ATLANTIC OCS

DE-BOEM-2015-VC07  
0.0' - 2.0'



INVENTORY OF  
POTENTIAL SAND  
RESOURCES ON THE  
ATLANTIC OCS

DE-BOEM-2015-VC07  
2.0' - 4.0'



INVENTORY OF  
POTENTIAL SAND  
RESOURCES ON THE  
ATLANTIC OCS

DE-BOEM-2015-VC07  
4.0' - 6.0'



INVENTORY OF  
POTENTIAL SAND  
RESOURCES ON THE  
ATLANTIC OCS

DE-BOEM-2015-VC07  
6.0' - 8.0'







INVENTORY OF  
POTENTIAL SAND  
RESOURCES ON THE  
ATLANTIC OCS

DE-BOEM-2015-VC07

8.0'-10.0'



INVENTORY OF  
POTENTIAL SAND  
RESOURCES ON THE  
ATLANTIC OCS

DE-BOEM-2015-VC07

10.0'-12.0'



INVENTORY OF  
POTENTIAL SAND  
RESOURCES ON THE  
ATLANTIC OCS

DE-BOEM-2015-VC07

12.0'-13.7'





INVENTORY OF  
POTENTIAL SAND  
RESOURCES ON THE  
ATLANTIC OCS

DE-BOEM-2015-VC08

0.0' - 2.0'



INVENTORY OF  
POTENTIAL SAND  
RESOURCES ON THE  
ATLANTIC OCS

DE-BOEM-2015-VC08

2.0' - 4.0'



INVENTORY OF  
POTENTIAL SAND  
RESOURCES ON THE  
ATLANTIC OCS

DE-BOEM-2015-VC08

4.0' - 6.0'



INVENTORY OF  
POTENTIAL SAND  
RESOURCES ON THE  
ATLANTIC OCS

DE-BOEM-2015-VC08

6.0' - 8.0'





INVENTORY OF  
POTENTIAL SAND  
RESOURCES ON THE  
ATLANTIC OCS

DE-BOEM-2015-VC08  
8.0' - 10.0'



INVENTORY OF  
POTENTIAL SAND  
RESOURCES ON THE  
ATLANTIC OCS

DE-BOEM-2015-VC08  
10.0' - 12.0'



INVENTORY OF  
POTENTIAL SAND  
RESOURCES ON THE  
ATLANTIC OCS

DE-BOEM-2015-VC08  
12.0' - 12.6'



APPENDIX 3

INDIVIDUAL VIBRACORE GRANULARMETRIC REPORTS

# Granularmetric Report

Depths and elevations based on measured values



**CB&I**  
 Coastal Planning & Engineering, Inc.  
 2481 NW Boca Raton Blvd.  
 Boca Raton, FL 33431  
 ph (561) 391 8102

Project Name: Inventory of Potential Beach Nourishment and Coastal Restoration

Sand Sources on the Atlantic OCS

Sample Name: DE-BOEM-2015-VC01 #1

Analysis Date: 04-08-16

Analyzed By: CS

Easting (m):  
**506,587**

Northing (m):  
**4,258,538**

Coordinate System:  
**UTM 18**

Elevation (ft):  
**-41.1 NAVD88**

USCS: **SW**

Munsell: Wet - 2.5Y-5/4  
Dry - 2.5Y-7/3  
Washed - 2.5Y-7/3

Comments:

Dry Weight (g): <b>89.39</b>	Wash Weight (g): <b>88.33</b>	Pan Retained (g): <b>0.00</b>	Sieve Loss (%): <b>0.11</b>	Fines (%): #200 - 1.30 #230 - 1.29	Organics (%):	Carbonates (%): <b>0</b>	Shell Hash (%):
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.00	0.00	0.00	0.00
4	-2.25	4.76	0.55	0.62	0.55	0.62
5	-2.00	4.00	0.42	0.47	0.97	1.09
7	-1.50	2.83	1.36	1.52	2.33	2.61
10	-1.00	2.00	2.87	3.21	5.20	5.82
14	-0.50	1.41	4.05	4.53	9.25	10.35
18	0.00	1.00	8.20	9.17	17.45	19.52
25	0.50	0.71	18.39	20.57	35.84	40.09
35	1.00	0.50	20.32	22.73	56.16	62.82
45	1.50	0.35	22.71	25.41	78.87	88.23
60	2.00	0.25	7.64	8.55	86.51	96.78
80	2.50	0.18	1.40	1.57	87.91	98.35
120	3.00	0.13	0.25	0.28	88.16	98.63
170	3.50	0.09	0.05	0.06	88.21	98.69
200	3.75	0.07	0.01	0.01	88.22	98.70
230	4.00	0.06	0.01	0.01	88.23	98.71

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
1.90	1.42	1.24	0.72	0.13	-0.19	-1.13
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	0.59	0.66	0.87	-0.78	3.9	

GRANULARMETRIC REPORT DE\_BOEM\_2015\_VC.GPJ\_JPBRAZIL\_GDT 9/12/16

# Granularmetric Report

Depths and elevations based on measured values



**CB&I**  
 Coastal Planning & Engineering, Inc.  
 2481 NW Boca Raton Blvd.  
 Boca Raton, FL 33431  
 ph (561) 391 8102

Project Name: Inventory of Potential Beach Nourishment and Coastal Restoration

Sand Sources on the Atlantic OCS

Sample Name: DE-BOEM-2015-VC01 #2

Analysis Date: 04-08-16

Analyzed By: CS

Easting (m):  
**506,587**

Northing (m):  
**4,258,538**

Coordinate System:  
**UTM 18**

Elevation (ft):  
**-43.6 NAVD88**

USCS: **SP**

Munsell: Wet - 2.5Y-5/4  
Dry - 2.5Y-7/3  
Washed - 2.5Y-7/3

Comments:

Dry Weight (g): <b>89.68</b>	Wash Weight (g): <b>89.02</b>	Pan Retained (g): <b>0.00</b>	Sieve Loss (%): <b>0.03</b>	Fines (%): #200 - 0.80 #230 - 0.77	Organics (%):	Carbonates (%): <b>0</b>	Shell Hash (%):
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.00	0.00	0.00	0.00
4	-2.25	4.76	0.00	0.00	0.00	0.00
5	-2.00	4.00	0.00	0.00	0.00	0.00
7	-1.50	2.83	0.58	0.65	0.58	0.65
10	-1.00	2.00	1.45	1.62	2.03	2.27
14	-0.50	1.41	2.63	2.93	4.66	5.20
18	0.00	1.00	4.60	5.13	9.26	10.33
25	0.50	0.71	13.47	15.02	22.73	25.35
35	1.00	0.50	24.76	27.61	47.49	52.96
45	1.50	0.35	25.03	27.91	72.52	80.87
60	2.00	0.25	12.83	14.31	85.35	95.18
80	2.50	0.18	2.98	3.32	88.33	98.50
120	3.00	0.13	0.59	0.66	88.92	99.16
170	3.50	0.09	0.02	0.02	88.94	99.18
200	3.75	0.07	0.02	0.02	88.96	99.20
230	4.00	0.06	0.03	0.03	88.99	99.23

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
1.99	1.61	1.39	0.95	0.49	0.19	-0.53
Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
	0.88	0.54	0.75	-0.61	4.02	

GRANULARMETRIC REPORT DE\_BOEM\_2015\_VC.GPJ\_JPBRAZIL\_GDT 9/12/16

# Granularmetric Report

Depths and elevations based on measured values



**CB&I**  
 Coastal Planning & Engineering, Inc.  
 2481 NW Boca Raton Blvd.  
 Boca Raton, FL 33431  
 ph (561) 391 8102

Project Name: Inventory of Potential Beach Nourishment and Coastal Restoration

Sand Sources on the Atlantic OCS

Sample Name: DE-BOEM-2015-VC01 #3

Analysis Date: 04-08-16

Analyzed By: NYF

Easting (m):  
**506,587**

Northing (m):  
**4,258,538**

Coordinate System:  
**UTM 18**

Elevation (ft):  
**-46.6 NAVD88**

USCS: **SW**

Munsell: Wet - 2.5Y-5/4  
Dry - 2.5Y-7/3  
Washed - 2.5Y-7/3

Comments:

Dry Weight (g): <b>89.76</b>	Wash Weight (g): <b>89.18</b>	Pan Retained (g): <b>0.00</b>	Sieve Loss (%): <b>0.04</b>	Fines (%): #200 - 0.69 #230 - 0.69	Organics (%):	Carbonates (%): <b>1</b>	Shell Hash (%):
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.00	0.00	0.00	0.00
4	-2.25	4.76	0.00	0.00	0.00	0.00
5	-2.00	4.00	0.00	0.00	0.00	0.00
7	-1.50	2.83	0.72	0.80	0.72	0.80
10	-1.00	2.00	3.90	4.34	4.62	5.14
14	-0.50	1.41	7.57	8.43	12.19	13.57
18	0.00	1.00	11.92	13.28	24.11	26.85
25	0.50	0.71	15.15	16.88	39.26	43.73
35	1.00	0.50	16.62	18.52	55.88	62.25
45	1.50	0.35	21.04	23.44	76.92	85.69
60	2.00	0.25	8.76	9.76	85.68	95.45
80	2.50	0.18	2.96	3.30	88.64	98.75
120	3.00	0.13	0.44	0.49	89.08	99.24
170	3.50	0.09	0.06	0.07	89.14	99.31
200	3.75	0.07	0.00	0.00	89.14	99.31
230	4.00	0.06	0.00	0.00	89.14	99.31

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
1.98	1.46	1.27	0.67	-0.07	-0.41	-1.02
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	0.57	0.67	0.9	-0.26	2.53	

GRANULARMETRIC REPORT DE\_BOEM\_2015\_VC.GPJ\_JPBRAZIL\_GDT 9/12/16

**Granularmetric Report**  
 Depths and elevations based on measured values



CB&I  
 Coastal Planning & Engineering, Inc.  
 2481 NW Boca Raton Blvd.  
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 ph (561) 391 8102

Project Name: Inventory of Potential Beach Nourishment and Coastal Restoration

Sand Sources on the Atlantic OCS

Sample Name: DE-BOEM-2015-VC01 #4

Analysis Date: 04-07-16

Analyzed By: SMT

Easting (m):  
 506,587

Northing (m):  
 4,258,538

Coordinate System:  
 UTM 18

Elevation (ft):  
 -49.9 NAVD88

USCS: SP  
 Munsell: Wet - 2.5Y-4/2  
 Dry - 2.5Y-6/2  
 Washed - 2.5Y-7/2  
 Comments:

Dry Weight (g): 87.02  
 Wash Weight (g): 86.03  
 Pan Retained (g): 0.00  
 Sieve Loss (%): 0.00  
 Fines (%): #200 - 1.20, #230 - 1.15  
 Organics (%):  
 Carbonates (%): 0  
 Shell Hash (%):

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.00	0.00	0.00	0.00
4	-2.25	4.76	0.00	0.00	0.00	0.00
5	-2.00	4.00	0.14	0.16	0.14	0.16
7	-1.50	2.83	0.23	0.26	0.37	0.42
10	-1.00	2.00	0.64	0.74	1.01	1.16
14	-0.50	1.41	1.44	1.65	2.45	2.81
18	0.00	1.00	2.68	3.08	5.13	5.89
25	0.50	0.71	4.09	4.70	9.22	10.59
35	1.00	0.50	13.76	15.81	22.98	26.40
45	1.50	0.35	35.11	40.35	58.09	66.75
60	2.00	0.25	20.40	23.44	78.49	90.19
80	2.50	0.18	6.10	7.01	84.59	97.20
120	3.00	0.13	1.09	1.25	85.68	98.45
170	3.50	0.09	0.21	0.24	85.89	98.69
200	3.75	0.07	0.10	0.11	85.99	98.80
230	4.00	0.06	0.04	0.05	86.03	98.85

Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
	2.34	1.68	1.29	0.67	-0.14
	1.23	0.43	0.7	-0.98	5.87

GRANULARMETRIC REPORT DE\_BOEM\_2015\_VC.GPJ\_JPBRAZIL\_GDT 9/12/16



**Granularmetric Report**  
 Depths and elevations based on measured values



CB&I  
 Coastal Planning & Engineering, Inc.  
 2481 NW Boca Raton Blvd.  
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 ph (561) 391 8102

Project Name: Inventory of Potential Beach Nourishment and Coastal Restoration

Sand Sources on the Atlantic OCS

Sample Name: DE-BOEM-2015-VC01 #5

Analysis Date: 04-07-16

Analyzed By: DA

Easting (m):  
 506,587

Northing (m):  
 4,258,538

Coordinate System:  
 UTM 18

Elevation (ft):  
 -52.9 NAVD88

USCS: SP  
 Munsell: Wet - 2.5Y-5/2  
 Dry - 2.5Y-6/2  
 Washed - 2.5Y-7/3  
 Comments:

Dry Weight (g): 85.49	Wash Weight (g): 84.60	Pan Retained (g): 0.00	Sieve Loss (%): 0.11	Fines (%): #200 - 1.21 #230 - 1.14	Organics (%):	Carbonates (%): 0	Shell Hash (%):
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.00	0.00	0.00	0.00
4	-2.25	4.76	0.00	0.00	0.00	0.00
5	-2.00	4.00	0.00	0.00	0.00	0.00
7	-1.50	2.83	0.15	0.18	0.15	0.18
10	-1.00	2.00	0.19	0.22	0.34	0.40
14	-0.50	1.41	0.37	0.43	0.71	0.83
18	0.00	1.00	0.90	1.05	1.61	1.88
25	0.50	0.71	1.93	2.26	3.54	4.14
35	1.00	0.50	10.98	12.84	14.52	16.98
45	1.50	0.35	36.75	42.99	51.27	59.97
60	2.00	0.25	23.08	27.00	74.35	86.97
80	2.50	0.18	7.95	9.30	82.30	96.27
120	3.00	0.13	1.68	1.97	83.98	98.24
170	3.50	0.09	0.38	0.44	84.36	98.68
200	3.75	0.07	0.09	0.11	84.45	98.79
230	4.00	0.06	0.06	0.07	84.51	98.86

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.43	1.94	1.78	1.38	1.09	0.96	0.53
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	1.4	0.38	0.58	-0.46	6.45	

GRANULARMETRIC REPORT DE\_BOEM\_2015\_VC.GPJ\_JPBRAZIL\_GDT 9/12/16

# Granularmetric Report

Depths and elevations based on measured values



**CB&I**  
 Coastal Planning & Engineering, Inc.  
 2481 NW Boca Raton Blvd.  
 Boca Raton, FL 33431  
 ph (561) 391 8102

Project Name: Inventory of Potential Beach Nourishment and Coastal Restoration

Sand Sources on the Atlantic OCS

Sample Name: DE-BOEM-2015-VC01 #6

Analysis Date: 04-08-16

Analyzed By: NYF

Easting (m):  
**506,587**

Northing (m):  
**4,258,538**

Coordinate System:  
**UTM 18**

Elevation (ft):  
**-55.4 NAVD88**

USCS: **SP**

Munsell: Wet - 2.5Y-6/6  
Dry - 2.5Y-7/3  
Washed - 2.5Y-7/2

Comments:

Dry Weight (g): <b>95.77</b>	Wash Weight (g): <b>95.14</b>	Pan Retained (g): <b>0.00</b>	Sieve Loss (%): <b>0.11</b>	Fines (%): #200 - 0.80 #230 - 0.77	Organics (%):	Carbonates (%): <b>1</b>	Shell Hash (%):
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.17	0.18	0.17	0.18
3.5	-2.50	5.66	0.19	0.20	0.36	0.38
4	-2.25	4.76	0.00	0.00	0.36	0.38
5	-2.00	4.00	0.09	0.09	0.45	0.47
7	-1.50	2.83	0.40	0.42	0.85	0.89
10	-1.00	2.00	1.93	2.02	2.78	2.91
14	-0.50	1.41	6.34	6.62	9.12	9.53
18	0.00	1.00	10.47	10.93	19.59	20.46
25	0.50	0.71	15.72	16.41	35.31	36.87
35	1.00	0.50	28.91	30.19	64.22	67.06
45	1.50	0.35	22.18	23.16	86.40	90.22
60	2.00	0.25	6.55	6.84	92.95	97.06
80	2.50	0.18	1.74	1.82	94.69	98.88
120	3.00	0.13	0.22	0.23	94.91	99.11
170	3.50	0.09	0.07	0.07	94.98	99.18
200	3.75	0.07	0.02	0.02	95.00	99.20
230	4.00	0.06	0.03	0.03	95.03	99.23

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
1.85	1.37	1.17	0.72	0.14	-0.20	-0.84
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	0.61	0.66	0.8	-0.65	4.42	

GRANULARMETRIC REPORT DE\_BOEM\_2015\_VC.GPJ\_JPBRAZIL\_GDT 9/12/16

# Granularmetric Report

Depths and elevations based on measured values



**CB&I**  
 Coastal Planning & Engineering, Inc.  
 2481 NW Boca Raton Blvd.  
 Boca Raton, FL 33431  
 ph (561) 391 8102

Project Name: Inventory of Potential Beach Nourishment and Coastal Restoration

Sand Sources on the Atlantic OCS

Sample Name: DE-BOEM-2015-VC03 #1

Analysis Date: 04-07-16

Analyzed By: SMT

Easting (m):  
**502,629**

Northing (m):  
**4,280,130**

Coordinate System:  
**UTM 18**

Elevation (ft):  
**-51.8 NAVD88**

USCS:

**SP**

Munsell: Wet - 5Y-3/1  
Dry - 5Y-6/1  
Washed - 5Y-7/1

Comments:

Dry Weight (g): <b>82.91</b>	Wash Weight (g): <b>81.19</b>	Pan Retained (g): <b>0.09</b>	Sieve Loss (%): <b>0.01</b>	Fines (%): #200 - 2.78 #230 - 2.20	Organics (%):	Carbonates (%): <b>5</b>	Shell Hash (%):
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.08	0.10	0.08	0.10
4	-2.25	4.76	0.00	0.00	0.08	0.10
5	-2.00	4.00	0.00	0.00	0.08	0.10
7	-1.50	2.83	0.02	0.02	0.10	0.12
10	-1.00	2.00	0.02	0.02	0.12	0.14
14	-0.50	1.41	0.03	0.04	0.15	0.18
18	0.00	1.00	0.04	0.05	0.19	0.23
25	0.50	0.71	0.18	0.22	0.37	0.45
35	1.00	0.50	4.00	4.82	4.37	5.27
45	1.50	0.35	6.28	7.57	10.65	12.84
60	2.00	0.25	1.36	1.64	12.01	14.48
80	2.50	0.18	8.10	9.77	20.11	24.25
120	3.00	0.13	52.52	63.35	72.63	87.60
170	3.50	0.09	7.28	8.78	79.91	96.38
200	3.75	0.07	0.70	0.84	80.61	97.22
230	4.00	0.06	0.48	0.58	81.09	97.80

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.42	2.97	2.90	2.70	2.51	2.08	0.97
Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
	2.51	0.18	0.67	-1.92	8.49	

GRANULARMETRIC REPORT DE\_BOEM\_2015\_VC.GPJ\_JPBRAZIL\_GDT 9/12/16

**Granularmetric Report**  
 Depths and elevations based on measured values



**CB&I**  
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 2481 NW Boca Raton Blvd.  
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Project Name: Inventory of Potential Beach Nourishment and Coastal Restoration

Sand Sources on the Atlantic OCS

Sample Name: DE-BOEM-2015-VC03 #2

Analysis Date: 04-08-16

Analyzed By: NYF

Easting (m):  
 502,629

Northing (m):  
 4,280,130

Coordinate System:  
 UTM 18

Elevation (ft):  
 -53.1 NAVD88

USCS: SP  
 Munsell: Wet - 2.5Y-4/1  
 Dry - 2.5Y-6/1  
 Washed - 2.5Y-7/2  
 Comments:

Dry Weight (g): 87.47	Wash Weight (g): 86.57	Pan Retained (g): 0.01	Sieve Loss (%): 0.07	Fines (%): #200 - 1.26 #230 - 1.12	Organics (%):	Carbonates (%): 1	Shell Hash (%):
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.04	0.05	0.04	0.05
3.5	-2.50	5.66	0.06	0.07	0.10	0.12
4	-2.25	4.76	0.00	0.00	0.10	0.12
5	-2.00	4.00	0.03	0.03	0.13	0.15
7	-1.50	2.83	0.08	0.09	0.21	0.24
10	-1.00	2.00	0.01	0.01	0.22	0.25
14	-0.50	1.41	0.03	0.03	0.25	0.28
18	0.00	1.00	0.09	0.10	0.34	0.38
25	0.50	0.71	1.17	1.34	1.51	1.72
35	1.00	0.50	41.18	47.08	42.69	48.80
45	1.50	0.35	18.04	20.62	60.73	69.42
60	2.00	0.25	1.78	2.03	62.51	71.45
80	2.50	0.18	10.12	11.57	72.63	83.02
120	3.00	0.13	12.16	13.90	84.79	96.92
170	3.50	0.09	1.39	1.59	86.18	98.51
200	3.75	0.07	0.20	0.23	86.38	98.74
230	4.00	0.06	0.12	0.14	86.50	98.88

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.93	2.54	2.15	1.03	0.75	0.65	0.53
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	1.37	0.39	0.83	0.59	3.36	

GRANULARMETRIC REPORT DE\_BOEM\_2015\_VC.GPJ\_JPBRAZIL\_GDT 9/12/16

# Granularmetric Report

Depths and elevations based on measured values



**CB&I**  
 Coastal Planning & Engineering, Inc.  
 2481 NW Boca Raton Blvd.  
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 ph (561) 391 8102

Project Name: Inventory of Potential Beach Nourishment and Coastal Restoration

Sand Sources on the Atlantic OCS

Sample Name: DE-BOEM-2015-VC03 #3

Analysis Date: 04-08-16

Analyzed By: CS

Easting (m):  
**502,629**

Northing (m):  
**4,280,130**

Coordinate System:  
**UTM 18**

Elevation (ft):  
**-53.7 NAVD88**

USCS: **SW**      Munsell: Wet - 2.5Y-4/2  
 Dry - 5Y-6/2  
 Washed - 5Y-7/2      Comments:

Dry Weight (g): <b>89.19</b>	Wash Weight (g): <b>87.84</b>	Pan Retained (g): <b>0.05</b>	Sieve Loss (%): <b>0.10</b>	Fines (%): #200 - 1.81 #230 - 1.68	Organics (%):	Carbonates (%): <b>2</b>	Shell Hash (%):
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.91	1.02	0.91	1.02
4	-2.25	4.76	0.35	0.39	1.26	1.41
5	-2.00	4.00	0.11	0.12	1.37	1.53
7	-1.50	2.83	0.30	0.34	1.67	1.87
10	-1.00	2.00	0.12	0.13	1.79	2.00
14	-0.50	1.41	0.16	0.18	1.95	2.18
18	0.00	1.00	0.26	0.29	2.21	2.47
25	0.50	0.71	3.51	3.94	5.72	6.41
35	1.00	0.50	39.42	44.20	45.14	50.61
45	1.50	0.35	15.45	17.32	60.59	67.93
60	2.00	0.25	1.35	1.51	61.94	69.44
80	2.50	0.18	11.89	13.33	73.83	82.77
120	3.00	0.13	12.01	13.47	85.84	96.24
170	3.50	0.09	1.51	1.69	87.35	97.93
200	3.75	0.07	0.23	0.26	87.58	98.19
230	4.00	0.06	0.12	0.13	87.70	98.32

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.95	2.55	2.21	0.99	0.71	0.61	0.32
Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
	1.3	0.41	0.99	-0.49	5.53	

GRANULARMETRIC REPORT DE\_BOEM\_2015\_VC.GPJ\_JPBRAZIL\_GDT 9/12/16

**Granularmetric Report**  
 Depths and elevations based on measured values



CB&I  
 Coastal Planning & Engineering, Inc.  
 2481 NW Boca Raton Blvd.  
 Boca Raton, FL 33431  
 ph (561) 391 8102

Project Name: Inventory of Potential Beach Nourishment and Coastal Restoration

Sand Sources on the Atlantic OCS

Sample Name: DE-BOEM-2015-VC03 #4

Analysis Date: 04-07-16

Analyzed By: SMT

Easting (m):  
 502,629

Northing (m):  
 4,280,130

Coordinate System:  
 UTM 18

Elevation (ft):  
 -56.9 NAVD88

USCS: SP-SM  
 Munsell: Wet - 5Y-4/1  
 Dry - 5Y-6/1  
 Washed - 5Y-7/1  
 Comments:

Dry Weight (g): 84.85	Wash Weight (g): 80.72	Pan Retained (g): 0.17	Sieve Loss (%): 0.00	Fines (%): #200 - 5.97 #230 - 5.06	Organics (%):	Carbonates (%): 1	Shell Hash (%):
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.00	0.00	0.00	0.00
4	-2.25	4.76	0.00	0.00	0.00	0.00
5	-2.00	4.00	0.00	0.00	0.00	0.00
7	-1.50	2.83	0.03	0.04	0.03	0.04
10	-1.00	2.00	0.02	0.02	0.05	0.06
14	-0.50	1.41	0.03	0.04	0.08	0.10
18	0.00	1.00	0.01	0.01	0.09	0.11
25	0.50	0.71	0.02	0.02	0.11	0.13
35	1.00	0.50	0.05	0.06	0.16	0.19
45	1.50	0.35	0.19	0.22	0.35	0.41
60	2.00	0.25	0.22	0.26	0.57	0.67
80	2.50	0.18	17.35	20.45	17.92	21.12
120	3.00	0.13	54.40	64.11	72.32	85.23
170	3.50	0.09	6.42	7.57	78.74	92.80
200	3.75	0.07	1.04	1.23	79.78	94.03
230	4.00	0.06	0.77	0.91	80.55	94.94

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
	2.99	2.92	2.73	2.53	2.37	2.11
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	2.69	0.15	0.35	-1.46	23.05	

GRANULARMETRIC REPORT DE\_BOEM\_2015\_VC.GPJ\_JPBRAZIL\_GDT 9/12/16

**Granularmetric Report**  
 Depths and elevations based on measured values



**CB&I**  
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Project Name: Inventory of Potential Beach Nourishment and Coastal Restoration

Sand Sources on the Atlantic OCS

Sample Name: DE-BOEM-2015-VC03 #5

Analysis Date: 04-08-16

Analyzed By: NYF

Easting (m):  
 502,629

Northing (m):  
 4,280,130

Coordinate System:  
 UTM 18

Elevation (ft):  
 -61.8 NAVD88

USCS: **SP-SM**  
 Munsell: Wet - 5Y-3/1  
 Dry - 5Y-6/1  
 Washed - 5Y-7/2  
 Comments:

Dry Weight (g): 81.85	Wash Weight (g): 74.63	Pan Retained (g): 0.03	Sieve Loss (%): 0.04	Fines (%): #200 - 9.53 #230 - 8.89	Organics (%):	Carbonates (%): 2	Shell Hash (%)
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.25	0.31	0.25	0.31
4	-2.25	4.76	0.00	0.00	0.25	0.31
5	-2.00	4.00	0.00	0.00	0.25	0.31
7	-1.50	2.83	0.02	0.02	0.27	0.33
10	-1.00	2.00	0.04	0.05	0.31	0.38
14	-0.50	1.41	0.03	0.04	0.34	0.42
18	0.00	1.00	0.03	0.04	0.37	0.46
25	0.50	0.71	0.04	0.05	0.41	0.51
35	1.00	0.50	0.06	0.07	0.47	0.58
45	1.50	0.35	0.06	0.07	0.53	0.65
60	2.00	0.25	0.13	0.16	0.66	0.81
80	2.50	0.18	9.20	11.24	9.86	12.05
120	3.00	0.13	54.52	66.61	64.38	78.66
170	3.50	0.09	8.35	10.20	72.73	88.86
200	3.75	0.07	1.32	1.61	74.05	90.47
230	4.00	0.06	0.52	0.64	74.57	91.11

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
	3.26	2.97	2.78	2.60	2.53	2.19
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	2.74	0.15	0.46	-6.37	74.56	

GRANULARMETRIC REPORT DE\_BOEM\_2015\_VC.GPJ\_JPBRAZIL\_GDT 9/12/16

**Granularmetric Report**  
 Depths and elevations based on measured values



**CB&I**  
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Project Name: Inventory of Potential Beach Nourishment and Coastal Restoration

Sand Sources on the Atlantic OCS

Sample Name: DE-BOEM-2015-VC03A #1

Analysis Date: 04-08-16

Analyzed By: CS

Easting (m):  
 502,629

Northing (m):  
 4,280,133

Coordinate System:  
 UTM 18

Elevation (ft):  
 -64.0 NAVD88

USCS: **SP-SM**  
 Munsell: Wet - 5Y-3/1  
 Dry - 5Y-6/1  
 Washed - 5Y-7/1  
 Comments:

Dry Weight (g): 83.61	Wash Weight (g): 74.61	Pan Retained (g): 0.04	Sieve Loss (%): 0.16	Fines (%): #200 - 11.86 #230 - 10.96	Organics (%):	Carbonates (%): 2	Shell Hash (%):
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.34	0.41	0.34	0.41
4	-2.25	4.76	0.00	0.00	0.34	0.41
5	-2.00	4.00	0.00	0.00	0.34	0.41
7	-1.50	2.83	0.05	0.06	0.39	0.47
10	-1.00	2.00	0.02	0.02	0.41	0.49
14	-0.50	1.41	0.02	0.02	0.43	0.51
18	0.00	1.00	0.03	0.04	0.46	0.55
25	0.50	0.71	0.04	0.05	0.50	0.60
35	1.00	0.50	0.06	0.07	0.56	0.67
45	1.50	0.35	0.10	0.12	0.66	0.79
60	2.00	0.25	1.26	1.51	1.92	2.30
80	2.50	0.18	15.47	18.50	17.39	20.80
120	3.00	0.13	48.34	57.82	65.73	78.62
170	3.50	0.09	6.86	8.20	72.59	86.82
200	3.75	0.07	1.10	1.32	73.69	88.14
230	4.00	0.06	0.75	0.90	74.44	89.04

Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
	2.66	0.16	0.53	-5.46	55.74

GRANULARMETRIC REPORT DE\_BOEM\_2015\_VC.GPJ\_JPBRAZIL\_GDT 9/12/16



**Granularmetric Report**  
 Depths and elevations based on measured values



CB&I  
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Project Name: Inventory of Potential Beach Nourishment and Coastal Restoration

Sand Sources on the Atlantic OCS

Sample Name: DE-BOEM-2015-VC05 #1

Analysis Date: 04-07-16

Analyzed By: AV

Easting (m):  
 505,360

Northing (m):  
 4,267,280

Coordinate System:  
 UTM 18

Elevation (ft):  
 -62.1 NAVD88

USCS: SP  
 Munsell: Wet - 2.5Y-5/2  
 Dry - 2.5Y-6/2  
 Washed - 2.5Y-7/1  
 Comments:

Dry Weight (g): 94.23	Wash Weight (g): 93.20	Pan Retained (g): 0.01	Sieve Loss (%): 0.22	Fines (%): #200 - 1.46 #230 - 1.35	Organics (%):	Carbonates (%): 1	Shell Hash (%):
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.00	0.00	0.00	0.00
4	-2.25	4.76	0.00	0.00	0.00	0.00
5	-2.00	4.00	0.68	0.72	0.68	0.72
7	-1.50	2.83	0.89	0.94	1.57	1.66
10	-1.00	2.00	1.18	1.25	2.75	2.91
14	-0.50	1.41	2.02	2.14	4.77	5.05
18	0.00	1.00	2.97	3.15	7.74	8.20
25	0.50	0.71	5.46	5.79	13.20	13.99
35	1.00	0.50	13.09	13.89	26.29	27.88
45	1.50	0.35	28.63	30.38	54.92	58.26
60	2.00	0.25	28.67	30.43	83.59	88.69
80	2.50	0.18	7.74	8.21	91.33	96.90
120	3.00	0.13	0.88	0.93	92.21	97.83
170	3.50	0.09	0.50	0.53	92.71	98.36
200	3.75	0.07	0.17	0.18	92.88	98.54
230	4.00	0.06	0.10	0.11	92.98	98.65

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.38	1.92	1.78	1.36	0.90	0.57	-0.51
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	1.21	0.43	0.85	-1.27	5.82	

GRANULARMETRIC REPORT DE\_BOEM\_2015\_VC.GPJ\_JPBRAZIL\_GDT 9/12/16

**Granularmetric Report**  
 Depths and elevations based on measured values



**CB&I**  
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Project Name: Inventory of Potential Beach Nourishment and Coastal Restoration

Sand Sources on the Atlantic OCS

Sample Name: DE-BOEM-2015-VC05 #2

Analysis Date: 04-08-16

Analyzed By: CS

Easting (m):  
 505,360

Northing (m):  
 4,267,280

Coordinate System:  
 UTM 18

Elevation (ft):  
 -65.6 NAVD88

USCS: SW  
 Munsell: Wet - 5Y-4/1  
 Dry - 5Y-6/1  
 Washed - 5Y-7/1  
 Comments:

Dry Weight (g): 86.46	Wash Weight (g): 83.72	Pan Retained (g): 0.01	Sieve Loss (%): 0.08	Fines (%): #200 - 3.42 #230 - 3.25	Organics (%):	Carbonates (%): 0	Shell Hash (%):
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.76	0.88	0.76	0.88
4	-2.25	4.76	0.27	0.31	1.03	1.19
5	-2.00	4.00	0.00	0.00	1.03	1.19
7	-1.50	2.83	0.35	0.40	1.38	1.59
10	-1.00	2.00	0.50	0.58	1.88	2.17
14	-0.50	1.41	0.48	0.56	2.36	2.73
18	0.00	1.00	0.89	1.03	3.25	3.76
25	0.50	0.71	2.08	2.41	5.33	6.17
35	1.00	0.50	4.72	5.46	10.05	11.63
45	1.50	0.35	6.94	8.03	16.99	19.66
60	2.00	0.25	34.01	39.34	51.00	59.00
80	2.50	0.18	21.89	25.32	72.89	84.32
120	3.00	0.13	8.37	9.68	81.26	94.00
170	3.50	0.09	1.91	2.21	83.17	96.21
200	3.75	0.07	0.32	0.37	83.49	96.58
230	4.00	0.06	0.15	0.17	83.64	96.75

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.23	2.49	2.32	1.89	1.57	1.27	0.26
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	1.77	0.29	0.89	-2.14	10.77	

GRANULARMETRIC REPORT DE\_BOEM\_2015\_VC.GPJ\_JPBRAZIL\_GDT 9/12/16

**Granularmetric Report**  
 Depths and elevations based on measured values



CB&I  
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Project Name: Inventory of Potential Beach Nourishment and Coastal Restoration

Sand Sources on the Atlantic OCS

Sample Name: DE-BOEM-2015-VC05 #3

Analysis Date: 04-08-16

Analyzed By: CS

Easting (m):  
 505,360

Northing (m):  
 4,267,280

Coordinate System:  
 UTM 18

Elevation (ft):  
 -71.6 NAVD88

USCS: SW  
 Munsell: Wet - 5Y-5/1  
 Dry - 5Y-7/1  
 Washed - 5Y-7/1  
 Comments:

Dry Weight (g): 94.17  
 Wash Weight (g): 93.23  
 Pan Retained (g): 0.02  
 Sieve Loss (%): 0.10  
 Finest (%): #200 - 1.15  
 #230 - 1.10  
 Organics (%):  
 Carbonates (%): 0  
 Shell Hash (%):

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	1.76	1.87	1.76	1.87
3.5	-2.50	5.66	0.89	0.95	2.65	2.82
4	-2.25	4.76	0.00	0.00	2.65	2.82
5	-2.00	4.00	0.11	0.12	2.76	2.94
7	-1.50	2.83	1.29	1.37	4.05	4.31
10	-1.00	2.00	1.93	2.05	5.98	6.36
14	-0.50	1.41	6.73	7.15	12.71	13.51
18	0.00	1.00	12.49	13.26	25.20	26.77
25	0.50	0.71	18.70	19.86	43.90	46.63
35	1.00	0.50	17.28	18.35	61.18	64.98
45	1.50	0.35	15.27	16.22	76.45	81.20
60	2.00	0.25	13.15	13.96	89.60	95.16
80	2.50	0.18	2.60	2.76	92.20	97.92
120	3.00	0.13	0.59	0.63	92.79	98.55
170	3.50	0.09	0.16	0.17	92.95	98.72
200	3.75	0.07	0.12	0.13	93.07	98.85
230	4.00	0.06	0.05	0.05	93.12	98.90

Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
	0.51	0.70	1.09	-0.91	4.84

GRANULARMETRIC REPORT DE\_BOEM\_2015\_VC.GPJ\_JPBRAZIL\_GDT 9/12/16

**Granularmetric Report**  
 Depths and elevations based on measured values



CB&I  
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Project Name: Inventory of Potential Beach Nourishment and Coastal Restoration

Sand Sources on the Atlantic OCS

Sample Name: DE-BOEM-2015-VC05 #4

Analysis Date: 04-08-16

Analyzed By: CS

Easting (m):  
 505,360

Northing (m):  
 4,267,280

Coordinate System:  
 UTM 18

Elevation (ft):  
 -76.7 NAVD88

USCS: SW  
 Munsell: Wet - 5Y-4/1  
 Dry - 5Y-6/1  
 Washed - 5Y-7/1  
 Comments:

Dry Weight (g): 99.39	Wash Weight (g): 98.05	Pan Retained (g): 0.02	Sieve Loss (%): 0.14	Fines (%): #200 - 1.58 #230 - 1.52	Organics (%):	Carbonates (%): 0	Shell Hash (%):
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	6.89	6.93	6.89	6.93
7/16"	-3.50	11.31	16.48	16.58	23.37	23.51
5/16"	-3.00	8.00	1.37	1.38	24.74	24.89
3.5	-2.50	5.66	2.46	2.48	27.20	27.37
4	-2.25	4.76	1.91	1.92	29.11	29.29
5	-2.00	4.00	1.37	1.38	30.48	30.67
7	-1.50	2.83	4.71	4.74	35.19	35.41
10	-1.00	2.00	5.37	5.40	40.56	40.81
14	-0.50	1.41	8.37	8.42	48.93	49.23
18	0.00	1.00	11.05	11.12	59.98	60.35
25	0.50	0.71	14.35	14.44	74.33	74.79
35	1.00	0.50	9.67	9.73	84.00	84.52
45	1.50	0.35	5.30	5.33	89.30	89.85
60	2.00	0.25	4.96	4.99	94.26	94.84
80	2.50	0.18	2.43	2.44	96.69	97.28
120	3.00	0.13	0.72	0.72	97.41	98.00
170	3.50	0.09	0.28	0.28	97.69	98.28
200	3.75	0.07	0.14	0.14	97.83	98.42
230	4.00	0.06	0.06	0.06	97.89	98.48

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.03	0.97	0.51	-0.47	-2.98	-3.73	-4.07
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	-1	2.00	1.98	-0.24	1.88	

GRANULARMETRIC REPORT DE\_BOEM\_2015\_VC.GPJ\_JPBRAZIL\_GDT 9/12/16

**Granularmetric Report**  
 Depths and elevations based on measured values



**CB&I**  
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Project Name: Inventory of Potential Beach Nourishment and Coastal Restoration

Sand Sources on the Atlantic OCS

Sample Name: DE-BOEM-2015-VC07 #1

Analysis Date: 04-20-16

Analyzed By: AV

Easting (m):  
 505,335

Northing (m):  
 4,271,819

Coordinate System:  
 UTM 18

Elevation (ft):  
 -64.0 NAVD88

USCS: SW-SM  
 Munsell: Wet - 5Y-7/1  
 Dry - 5Y-7/1  
 Washed - 5Y-7/1  
 Comments:

Dry Weight (g): 91.09	Wash Weight (g): 85.54	Pan Retained (g): 0.13	Sieve Loss (%): 0.05	Fines (%): #200 - 6.66 #230 - 6.30	Organics (%):	Carbonates (%): 0	Shell Hash (%):
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.84	0.92	0.84	0.92
3.5	-2.50	5.66	1.59	1.75	2.43	2.67
4	-2.25	4.76	0.59	0.65	3.02	3.32
5	-2.00	4.00	0.55	0.60	3.57	3.92
7	-1.50	2.83	1.14	1.25	4.71	5.17
10	-1.00	2.00	1.47	1.61	6.18	6.78
14	-0.50	1.41	3.48	3.82	9.66	10.60
18	0.00	1.00	5.04	5.53	14.70	16.13
25	0.50	0.71	11.52	12.65	26.22	28.78
35	1.00	0.50	22.11	24.27	48.33	53.05
45	1.50	0.35	18.89	20.74	67.22	73.79
60	2.00	0.25	5.53	6.07	72.75	79.86
80	2.50	0.18	6.53	7.17	79.28	87.03
120	3.00	0.13	4.34	4.76	83.62	91.79
170	3.50	0.09	1.11	1.22	84.73	93.01
200	3.75	0.07	0.30	0.33	85.03	93.34
230	4.00	0.06	0.33	0.36	85.36	93.70

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
	2.29	1.60	0.94	0.35	-0.01	-1.57
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	0.8	0.57	1.22	-0.77	4.59	

GRANULARMETRIC REPORT DE\_BOEM\_2015\_VC.GPJ\_JPBRAZIL\_GDT 9/12/16

# Granularmetric Report

Depths and elevations based on measured values



**CB&I**  
 Coastal Planning & Engineering, Inc.  
 2481 NW Boca Raton Blvd.  
 Boca Raton, FL 33431  
 ph (561) 391 8102

Project Name: Inventory of Potential Beach Nourishment and Coastal Restoration

Sand Sources on the Atlantic OCS

Sample Name: DE-BOEM-2015-VC07 #2

Analysis Date: 04-11-16

Analyzed By: SMT

Easting (m):  
**505,335**

Northing (m):  
**4,271,819**

Coordinate System:  
**UTM 18**

Elevation (ft):  
**-65.4 NAVD88**

USCS: **SW-SM**      Munsell: **Wet - 5Y-7/1  
Dry - 5Y-8/1  
Washed - 5Y-8/1**      Comments:

Dry Weight (g): <b>88.59</b>	Wash Weight (g): <b>82.22</b>	Pan Retained (g): <b>0.07</b>	Sieve Loss (%): <b>0.05</b>	Fines (%): <b>#200 - 7.82 #230 - 7.32</b>	Organics (%):	Carbonates (%): <b>0</b>	Shell Hash (%):
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.81	0.91	0.81	0.91
4	-2.25	4.76	0.00	0.00	0.81	0.91
5	-2.00	4.00	0.31	0.35	1.12	1.26
7	-1.50	2.83	0.30	0.34	1.42	1.60
10	-1.00	2.00	0.23	0.26	1.65	1.86
14	-0.50	1.41	0.60	0.68	2.25	2.54
18	0.00	1.00	0.95	1.07	3.20	3.61
25	0.50	0.71	2.80	3.16	6.00	6.77
35	1.00	0.50	18.25	20.60	24.25	27.37
45	1.50	0.35	28.84	32.55	53.09	59.92
60	2.00	0.25	11.91	13.44	65.00	73.36
80	2.50	0.18	9.98	11.27	74.98	84.63
120	3.00	0.13	4.67	5.27	79.65	89.90
170	3.50	0.09	1.63	1.84	81.28	91.74
200	3.75	0.07	0.39	0.44	81.67	92.18
230	4.00	0.06	0.44	0.50	82.11	92.68

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
	2.47	2.07	1.35	0.94	0.72	0.22
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	1.35	0.39	0.9	-0.9	7.51	

GRANULARMETRIC REPORT DE\_BOEM\_2015\_VC.GPJ\_JPBRAZIL\_GDT 9/12/16

# Granularmetric Report

Depths and elevations based on measured values



**CB&I**  
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 2481 NW Boca Raton Blvd.  
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Project Name: Inventory of Potential Beach Nourishment and Coastal Restoration

Sand Sources on the Atlantic OCS

Sample Name: DE-BOEM-2015-VC07 #3

Analysis Date: 04-08-16

Analyzed By: CS

Easting (m):  
**505,335**

Northing (m):  
**4,271,819**

Coordinate System:  
**UTM 18**

Elevation (ft):  
**-66.4 NAVD88**

USCS: **SW-SM**      Munsell: **Wet - 5Y-7/2  
Dry - 5Y-8/1  
Washed - 5Y-8/1**      Comments:

Dry Weight (g): <b>91.94</b>	Wash Weight (g): <b>83.86</b>	Pan Retained (g): <b>0.03</b>	Sieve Loss (%): <b>0.18</b>	Fines (%): <b>#200 - 9.33 #230 - 8.99</b>	Organics (%):	Carbonates (%): <b>0</b>	Shell Hash (%):
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	1.73	1.88	1.73	1.88
3.5	-2.50	5.66	0.00	0.00	1.73	1.88
4	-2.25	4.76	0.34	0.37	2.07	2.25
5	-2.00	4.00	0.32	0.35	2.39	2.60
7	-1.50	2.83	1.17	1.27	3.56	3.87
10	-1.00	2.00	1.54	1.68	5.10	5.55
14	-0.50	1.41	2.48	2.70	7.58	8.25
18	0.00	1.00	3.64	3.96	11.22	12.21
25	0.50	0.71	7.25	7.89	18.47	20.10
35	1.00	0.50	24.18	26.30	42.65	46.40
45	1.50	0.35	17.86	19.43	60.51	65.83
60	2.00	0.25	6.70	7.29	67.21	73.12
80	2.50	0.18	9.28	10.09	76.49	83.21
120	3.00	0.13	4.68	5.09	81.17	88.30
170	3.50	0.09	1.58	1.72	82.75	90.02
200	3.75	0.07	0.60	0.65	83.35	90.67
230	4.00	0.06	0.31	0.34	83.66	91.01

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
	2.58	2.09	1.09	0.59	0.24	-1.16
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	0.99	0.50	1.21	-0.9	5.22	

GRANULARMETRIC REPORT DE\_BOEM\_2015\_VC.GPJ\_JPBRAZIL\_GDT 9/12/16

**Granularmetric Report**  
 Depths and elevations based on measured values



CB&I  
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Project Name: Inventory of Potential Beach Nourishment and Coastal Restoration

Sand Sources on the Atlantic OCS

Sample Name: DE-BOEM-2015-VC07 #4

Analysis Date: 04-08-16

Analyzed By: NYF

Easting (m):  
 505,335

Northing (m):  
 4,271,819

Coordinate System:  
 UTM 18

Elevation (ft):  
 -67.6 NAVD88

USCS: SW  
 Munsell: Wet - N-4/0  
 Dry - 2.5Y-7/3  
 Washed - 2.5Y-7/2

Comments:

Dry Weight (g): 102.48  
 Wash Weight (g): 97.57  
 Pan Retained (g): 0.00  
 Sieve Loss (%): 0.03  
 Fines (%): #200 - 4.98, #230 - 4.83  
 Organics (%):  
 Carbonates (%): 0  
 Shell Hash (%):

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	10.23	9.98	10.23	9.98
7/16"	-3.50	11.31	14.93	14.57	25.16	24.55
5/16"	-3.00	8.00	7.00	6.83	32.16	31.38
3.5	-2.50	5.66	3.94	3.84	36.10	35.22
4	-2.25	4.76	2.53	2.47	38.63	37.69
5	-2.00	4.00	2.84	2.77	41.47	40.46
7	-1.50	2.83	3.70	3.61	45.17	44.07
10	-1.00	2.00	4.37	4.26	49.54	48.33
14	-0.50	1.41	5.50	5.37	55.04	53.70
18	0.00	1.00	6.19	6.04	61.23	59.74
25	0.50	0.71	6.09	5.94	67.32	65.68
35	1.00	0.50	10.38	10.13	77.70	75.81
45	1.50	0.35	11.06	10.79	88.76	86.60
60	2.00	0.25	3.93	3.83	92.69	90.43
80	2.50	0.18	2.51	2.45	95.20	92.88
120	3.00	0.13	1.37	1.34	96.57	94.22
170	3.50	0.09	0.58	0.57	97.15	94.79
200	3.75	0.07	0.24	0.23	97.39	95.02
230	4.00	0.06	0.15	0.15	97.54	95.17

Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis		
	Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
	3.73	1.38	0.96	-0.84	-3.47	-3.79	-4.12
	-1.22	2.33	2.18	0.09	1.63		

GRANULARMETRIC REPORT DE\_BOEM\_2015\_VC.GPJ\_JPBRAZIL\_GDT 9/12/16



**Granularmetric Report**  
 Depths and elevations based on measured values



CB&I  
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Project Name: Inventory of Potential Beach Nourishment and Coastal Restoration

Sand Sources on the Atlantic OCS

Sample Name: DE-BOEM-2015-VC07 #5

Analysis Date: 04-11-16

Analyzed By: SMT

Easting (m):  
 505,335

Northing (m):  
 4,271,819

Coordinate System:  
 UTM 18

Elevation (ft):  
 -68.8 NAVD88

USCS: GW  
 Munsell: Wet - 2.5Y-5/3  
 Dry - 2.5Y-7/2  
 Washed - 2.5Y-8/1

Comments:

Dry Weight (g): 108.94	Wash Weight (g): 107.32	Pan Retained (g): 0.05	Sieve Loss (%): 0.06	Fines (%): #200 - 1.68 #230 - 1.60	Organics (%):	Carbonates (%): 0	Shell Hash (%):
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
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1"	-4.75	26.91	0.00	0.00	0.00	0.00
3/4"	-4.25	19.03	12.24	11.24	12.24	11.24
5/8"	-4.00	16.00	0.00	0.00	12.24	11.24
7/16"	-3.50	11.31	40.71	37.37	52.95	48.61
5/16"	-3.00	8.00	6.60	6.06	59.55	54.67
3.5	-2.50	5.66	6.28	5.76	65.83	60.43
4	-2.25	4.76	1.79	1.64	67.62	62.07
5	-2.00	4.00	1.29	1.18	68.91	63.25
7	-1.50	2.83	3.70	3.40	72.61	66.65
10	-1.00	2.00	3.12	2.86	75.73	69.51
14	-0.50	1.41	3.56	3.27	79.29	72.78
18	0.00	1.00	3.64	3.34	82.93	76.12
25	0.50	0.71	5.79	5.31	88.72	81.43
35	1.00	0.50	7.32	6.72	96.04	88.15
45	1.50	0.35	6.43	5.90	102.47	94.05
60	2.00	0.25	2.73	2.51	105.20	96.56
80	2.50	0.18	1.06	0.97	106.26	97.53
120	3.00	0.13	0.48	0.44	106.74	97.97
170	3.50	0.09	0.28	0.26	107.02	98.23
200	3.75	0.07	0.10	0.09	107.12	98.32
230	4.00	0.06	0.09	0.08	107.21	98.40

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
1.69	0.69	-0.17	-3.39	-3.97	-4.15	-4.42

Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
	-2.26	4.79	2.08	0.79	2.19

GRANULARMETRIC REPORT DE\_BOEM\_2015\_VC.GPJ\_JPBRAZIL\_GDT 9/12/16

**Granularmetric Report**  
 Depths and elevations based on measured values



CB&I  
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 2481 NW Boca Raton Blvd.  
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 ph (561) 391 8102

Project Name: Inventory of Potential Beach Nourishment and Coastal Restoration

Sand Sources on the Atlantic OCS

Sample Name: DE-BOEM-2015-VC07 #6

Analysis Date: 04-08-16

Analyzed By: CS

Easting (m):  
 505,335

Northing (m):  
 4,271,819

Coordinate System:  
 UTM 18

Elevation (ft):  
 -70.0 NAVD88

USCS: SW  
 Munsell: Wet - 5Y-6/1  
 Dry - 5Y-8/1  
 Washed - 5Y-8/1  
 Comments:

Dry Weight (g): 97.07  
 Wash Weight (g): 93.05  
 Pan Retained (g): 0.04  
 Sieve Loss (%): 0.09  
 Fines (%): #200 - 4.46, #230 - 4.28  
 Organics (%):  
 Carbonates (%): 0  
 Shell Hash (%):

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	5.16	5.32	5.16	5.32
5/16"	-3.00	8.00	0.85	0.88	6.01	6.20
3.5	-2.50	5.66	1.41	1.45	7.42	7.65
4	-2.25	4.76	1.10	1.13	8.52	8.78
5	-2.00	4.00	0.98	1.01	9.50	9.79
7	-1.50	2.83	1.75	1.80	11.25	11.59
10	-1.00	2.00	2.49	2.57	13.74	14.16
14	-0.50	1.41	4.99	5.14	18.73	19.30
18	0.00	1.00	10.37	10.68	29.10	29.98
25	0.50	0.71	21.52	22.17	50.62	52.15
35	1.00	0.50	22.32	22.99	72.94	75.14
45	1.50	0.35	12.43	12.81	85.37	87.95
60	2.00	0.25	4.38	4.51	89.75	92.46
80	2.50	0.18	1.57	1.62	91.32	94.08
120	3.00	0.13	0.78	0.80	92.10	94.88
170	3.50	0.09	0.49	0.50	92.59	95.38
200	3.75	0.07	0.16	0.16	92.75	95.54
230	4.00	0.06	0.17	0.18	92.92	95.72

Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
	0.11	0.93	1.41	-1.19	4.59

GRANULARMETRIC REPORT DE\_BOEM\_2015\_VC.GPJ\_JPBRAZIL\_GDT 9/12/16

# Granularmetric Report

Depths and elevations based on measured values



**CB&I**  
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 2481 NW Boca Raton Blvd.  
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 ph (561) 391 8102

Project Name: Inventory of Potential Beach Nourishment and Coastal Restoration

Sand Sources on the Atlantic OCS

Sample Name: DE-BOEM-2015-VC07 #7

Analysis Date: 04-11-16

Analyzed By: SMT

Easting (m):  
**505,335**

Northing (m):  
**4,271,819**

Coordinate System:  
**UTM 18**

Elevation (ft):  
**-71.3 NAVD88**

USCS: **GW**      Munsell: **Wet - 5Y-6/1  
Dry - 5Y-8/1  
Washed - 5Y-8/1**      Comments:

Dry Weight (g): <b>99.50</b>	Wash Weight (g): <b>97.47</b>	Pan Retained (g): <b>0.02</b>	Sieve Loss (%): <b>0.04</b>	Fines (%): <b>#200 - 2.29 #230 - 2.12</b>	Organics (%):	Carbonates (%): <b>0</b>	Shell Hash (%):
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	13.13	13.20	13.13	13.20
5/16"	-3.00	8.00	16.84	16.92	29.97	30.12
3.5	-2.50	5.66	18.72	18.81	48.69	48.93
4	-2.25	4.76	2.82	2.83	51.51	51.76
5	-2.00	4.00	4.04	4.06	55.55	55.82
7	-1.50	2.83	5.89	5.92	61.44	61.74
10	-1.00	2.00	4.28	4.30	65.72	66.04
14	-0.50	1.41	4.42	4.44	70.14	70.48
18	0.00	1.00	4.92	4.94	75.06	75.42
25	0.50	0.71	5.25	5.28	80.31	80.70
35	1.00	0.50	6.02	6.05	86.33	86.75
45	1.50	0.35	5.21	5.24	91.54	91.99
60	2.00	0.25	2.70	2.71	94.24	94.70
80	2.50	0.18	1.51	1.52	95.75	96.22
120	3.00	0.13	0.80	0.80	96.55	97.02
170	3.50	0.09	0.48	0.48	97.03	97.50
200	3.75	0.07	0.21	0.21	97.24	97.71
230	4.00	0.06	0.17	0.17	97.41	97.88

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.10	0.77	-0.04	-2.41	-3.15	-3.42	-3.97
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	-1.7	3.25	1.84	0.78	2.46	

GRANULARMETRIC REPORT DE\_BOEM\_2015\_VC.GPJ\_JPBRAZIL\_GDT 9/12/16

**Granularmetric Report**  
 Depths and elevations based on measured values



**CB&I**  
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Project Name: Inventory of Potential Beach Nourishment and Coastal Restoration

Sand Sources on the Atlantic OCS

Sample Name: DE-BOEM-2015-VC07 #8

Analysis Date: 04-11-16

Analyzed By: AV

Easting (m):  
 505,335

Northing (m):  
 4,271,819

Coordinate System:  
 UTM 18

Elevation (ft):  
 -74.9 NAVD88

USCS: **SP-SM**  
 Munsell: Wet - 5Y-7/1  
 Dry - 5Y-8/1  
 Washed - 5Y-8/1  
 Comments:

Dry Weight (g): 87.58	Wash Weight (g): 78.93	Pan Retained (g): 0.09	Sieve Loss (%): 0.10	Fines (%): #200 - 10.76 #230 - 10.07	Organics (%):	Carbonates (%): 0	Shell Hash (%)
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.00	0.00	0.00	0.00
4	-2.25	4.76	0.00	0.00	0.00	0.00
5	-2.00	4.00	0.00	0.00	0.00	0.00
7	-1.50	2.83	0.00	0.00	0.00	0.00
10	-1.00	2.00	0.09	0.10	0.09	0.10
14	-0.50	1.41	0.12	0.14	0.21	0.24
18	0.00	1.00	0.23	0.26	0.44	0.50
25	0.50	0.71	0.61	0.70	1.05	1.20
35	1.00	0.50	2.17	2.48	3.22	3.68
45	1.50	0.35	16.51	18.85	19.73	22.53
60	2.00	0.25	41.51	47.40	61.24	69.93
80	2.50	0.18	11.39	13.01	72.63	82.94
120	3.00	0.13	3.69	4.21	76.32	87.15
170	3.50	0.09	1.39	1.59	77.71	88.74
200	3.75	0.07	0.44	0.50	78.15	89.24
230	4.00	0.06	0.60	0.69	78.75	89.93

Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
	1.77	0.29	0.55	0.37	6.9

GRANULARMETRIC REPORT DE\_BOEM\_2015\_VC.GPJ\_JPBRAZIL\_GDT 9/12/16

# Granularmetric Report

Depths and elevations based on measured values



**CB&I**  
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 Boca Raton, FL 33431  
 ph (561) 391 8102

Project Name: Inventory of Potential Beach Nourishment and Coastal Restoration

Sand Sources on the Atlantic OCS

Sample Name: DE-BOEM-2015-VC08 #1

Analysis Date: 04-11-16

Analyzed By: SMT

Easting (m):  
**507,425**

Northing (m):  
**4,274,002**

Coordinate System:  
**UTM 18**

Elevation (ft):  
**-65.3 NAVD88**

USCS:

**SW**

Munsell: Wet - 2.5Y-4/2  
Dry - 2.5Y-6/1  
Washed - 2.5Y-7/1

Comments:

Dry Weight (g): <b>97.89</b>	Wash Weight (g): <b>94.14</b>	Pan Retained (g): <b>0.03</b>	Sieve Loss (%): <b>0.00</b>	Fines (%): #200 - 3.95 #230 - 3.87	Organics (%):	Carbonates (%): <b>2</b>	Shell Hash (%):
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	7.29	7.45	7.29	7.45
5/16"	-3.00	8.00	6.12	6.25	13.41	13.70
3.5	-2.50	5.66	5.77	5.89	19.18	19.59
4	-2.25	4.76	2.29	2.34	21.47	21.93
5	-2.00	4.00	1.70	1.74	23.17	23.67
7	-1.50	2.83	4.69	4.79	27.86	28.46
10	-1.00	2.00	5.83	5.96	33.69	34.42
14	-0.50	1.41	6.03	6.16	39.72	40.58
18	0.00	1.00	6.10	6.23	45.82	46.81
25	0.50	0.71	11.82	12.07	57.64	58.88
35	1.00	0.50	14.59	14.90	72.23	73.78
45	1.50	0.35	12.91	13.19	85.14	86.97
60	2.00	0.25	5.53	5.65	90.67	92.62
80	2.50	0.18	1.89	1.93	92.56	94.55
120	3.00	0.13	0.86	0.88	93.42	95.43
170	3.50	0.09	0.40	0.41	93.82	95.84
200	3.75	0.07	0.21	0.21	94.03	96.05
230	4.00	0.06	0.08	0.08	94.11	96.13

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.76	1.39	1.05	0.13	-1.86	-2.80	-3.75
Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
	-0.48	1.39	1.81	-0.4	2.05	

GRANULARMETRIC REPORT DE\_BOEM\_2015\_VC.GPJ\_JPBRAZIL\_GDT 9/12/16

**Granularmetric Report**  
 Depths and elevations based on measured values



CB&I  
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 2481 NW Boca Raton Blvd.  
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Project Name: Inventory of Potential Beach Nourishment and Coastal Restoration

Sand Sources on the Atlantic OCS

Sample Name: DE-BOEM-2015-VC08 #2

Analysis Date: 04-11-16

Analyzed By: SMT

Easting (m):  
 507,425

Northing (m):  
 4,274,002

Coordinate System:  
 UTM 18

Elevation (ft):  
 -66.5 NAVD88

USCS: SW-SC  
 Munsell: Wet - 10Y-4/1  
 Dry - 10Y-6/1  
 Washed - 5Y-7/1  
 Comments:

Dry Weight (g): 105.01  
 Wash Weight (g): 96.87  
 Pan Retained (g): 0.01  
 Sieve Loss (%): 0.08  
 Finest (%): #200 - 8.02  
 #230 - 7.85  
 Organics (%):  
 Carbonates (%): 0  
 Shell Hash (%):

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	15.48	14.74	15.48	14.74
5/16"	-3.00	8.00	9.45	9.00	24.93	23.74
3.5	-2.50	5.66	2.06	1.96	26.99	25.70
4	-2.25	4.76	1.64	1.56	28.63	27.26
5	-2.00	4.00	1.66	1.58	30.29	28.84
7	-1.50	2.83	2.22	2.11	32.51	30.95
10	-1.00	2.00	2.77	2.64	35.28	33.59
14	-0.50	1.41	3.73	3.55	39.01	37.14
18	0.00	1.00	4.69	4.47	43.70	41.61
25	0.50	0.71	10.90	10.38	54.60	51.99
35	1.00	0.50	13.77	13.11	68.37	65.10
45	1.50	0.35	13.82	13.16	82.19	78.26
60	2.00	0.25	7.45	7.09	89.64	85.35
80	2.50	0.18	3.91	3.72	93.55	89.07
120	3.00	0.13	2.09	1.99	95.64	91.06
170	3.50	0.09	0.72	0.69	96.36	91.75
200	3.75	0.07	0.24	0.23	96.60	91.98
230	4.00	0.06	0.18	0.17	96.78	92.15

Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis		
	Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
		1.90	1.38	0.40	-2.68	-3.43	-4.00
	-0.53	1.44	2.13	-0.34	1.72		

GRANULARMETRIC REPORT DE\_BOEM\_2015\_VC.GPJ\_JPBRAZIL\_GDT 9/12/16

# Granularmetric Report

Depths and elevations based on measured values



**CB&I**  
 Coastal Planning & Engineering, Inc.  
 2481 NW Boca Raton Blvd.  
 Boca Raton, FL 33431  
 ph (561) 391 8102

Project Name: Inventory of Potential Beach Nourishment and Coastal Restoration

Sand Sources on the Atlantic OCS

Sample Name: DE-BOEM-2015-VC08 #3

Analysis Date: 04-12-16

Analyzed By: SMT

Easting (m):  
**507,425**

Northing (m):  
**4,274,002**

Coordinate System:  
**UTM 18**

Elevation (ft):  
**-67.9 NAVD88**

USCS: **SC**      Munsell: **Wet - 10Y-5/1  
Dry - 10Y-7/1  
Washed - 5Y-7/1**      Comments:

Dry Weight (g): <b>92.63</b>	Wash Weight (g): <b>79.09</b>	Pan Retained (g): <b>0.08</b>	Sieve Loss (%): <b>0.02</b>	Fines (%): <b>#200 - 15.05 #230 - 14.75</b>	Organics (%):	Carbonates (%): <b>0</b>	Shell Hash (%):
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	4.20	4.53	4.20	4.53
3.5	-2.50	5.66	0.91	0.98	5.11	5.51
4	-2.25	4.76	0.93	1.00	6.04	6.51
5	-2.00	4.00	0.90	0.97	6.94	7.48
7	-1.50	2.83	1.99	2.15	8.93	9.63
10	-1.00	2.00	2.62	2.83	11.55	12.46
14	-0.50	1.41	3.70	3.99	15.25	16.45
18	0.00	1.00	4.03	4.35	19.28	20.80
25	0.50	0.71	7.33	7.91	26.61	28.71
35	1.00	0.50	10.61	11.45	37.22	40.16
45	1.50	0.35	15.06	16.26	52.28	56.42
60	2.00	0.25	14.45	15.60	66.73	72.02
80	2.50	0.18	7.37	7.96	74.10	79.98
120	3.00	0.13	3.27	3.53	77.37	83.51
170	3.50	0.09	0.92	0.99	78.29	84.50
200	3.75	0.07	0.42	0.45	78.71	84.95
230	4.00	0.06	0.28	0.30	78.99	85.25

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
	3.25	2.19	1.30	0.27	-0.56	-2.76
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	0.69	0.62	1.56	-0.97	3.5	

GRANULARMETRIC REPORT DE\_BOEM\_2015\_VC.GPJ\_JPBRAZIL\_GDT 9/12/16

**Granularmetric Report**  
 Depths and elevations based on measured values



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Project Name: Inventory of Potential Beach Nourishment and Coastal Restoration

Sand Sources on the Atlantic OCS

Sample Name: DE-BOEM-2015-VC08 #4

Analysis Date: 04-11-16

Analyzed By: SMT

Easting (m):  
 507,425

Northing (m):  
 4,274,002

Coordinate System:  
 UTM 18

Elevation (ft):  
 -69.6 NAVD88

USCS: SW  
 Munsell: Wet - 2.5Y-6/2  
 Dry - 2.5Y-7/1  
 Washed - 2.5Y-7/1  
 Comments:

Dry Weight (g): 95.75  
 Wash Weight (g): 92.62  
 Pan Retained (g): 0.01  
 Sieve Loss (%): 0.03  
 Fines (%): #200 - 3.44, #230 - 3.33  
 Organics (%):  
 Carbonates (%): 0  
 Shell Hash (%):

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	7.21	7.53	7.21	7.53
5/16"	-3.00	8.00	9.15	9.56	16.36	17.09
3.5	-2.50	5.66	2.52	2.63	18.88	19.72
4	-2.25	4.76	0.50	0.52	19.38	20.24
5	-2.00	4.00	1.83	1.91	21.21	22.15
7	-1.50	2.83	3.04	3.17	24.25	25.32
10	-1.00	2.00	5.06	5.28	29.31	30.60
14	-0.50	1.41	8.30	8.67	37.61	39.27
18	0.00	1.00	12.20	12.74	49.81	52.01
25	0.50	0.71	14.97	15.63	64.78	67.64
35	1.00	0.50	12.86	13.43	77.64	81.07
45	1.50	0.35	6.87	7.17	84.51	88.24
60	2.00	0.25	5.44	5.68	89.95	93.92
80	2.50	0.18	1.44	1.50	91.39	95.42
120	3.00	0.13	0.58	0.61	91.97	96.03
170	3.50	0.09	0.34	0.36	92.31	96.39
200	3.75	0.07	0.16	0.17	92.47	96.56
230	4.00	0.06	0.11	0.11	92.58	96.67

Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis		
	Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
	2.36	1.20	0.77	-0.08	-1.55	-3.06	-3.75
	-0.55	1.46	1.73	-0.46	2.3		

GRANULARMETRIC REPORT DE\_BOEM\_2015\_VC.GPJ\_JPBRAZIL\_GDT 9/12/16



**Granularmetric Report**  
 Depths and elevations based on measured values



CB&I  
 Coastal Planning & Engineering, Inc.  
 2481 NW Boca Raton Blvd.  
 Boca Raton, FL 33431  
 ph (561) 391 8102

Project Name: Inventory of Potential Beach Nourishment and Coastal Restoration

Sand Sources on the Atlantic OCS

Sample Name: DE-BOEM-2015-VC08 #5

Analysis Date: 04-11-16

Analyzed By: AV

Easting (m):  
 507,425

Northing (m):  
 4,274,002

Coordinate System:  
 UTM 18

Elevation (ft):  
 -70.9 NAVD88

USCS: SW  
 Munsell: Wet - 2.5Y-5/4  
 Dry - 2.5Y-6/3  
 Washed - 2.5Y-7/3  
 Comments:

Dry Weight (g): 100.96	Wash Weight (g): 97.20	Pan Retained (g): 0.03	Sieve Loss (%): 0.24	Fines (%): #200 - 4.13 #230 - 3.98	Organics (%):	Carbonates (%): 0	Shell Hash (%):
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	13.37	13.24	13.37	13.24
3.5	-2.50	5.66	14.03	13.90	27.40	27.14
4	-2.25	4.76	5.82	5.76	33.22	32.90
5	-2.00	4.00	5.36	5.31	38.58	38.21
7	-1.50	2.83	8.73	8.65	47.31	46.86
10	-1.00	2.00	13.32	13.19	60.63	60.05
14	-0.50	1.41	12.09	11.98	72.72	72.03
18	0.00	1.00	9.90	9.81	82.62	81.84
25	0.50	0.71	5.46	5.41	88.08	87.25
35	1.00	0.50	3.34	3.31	91.42	90.56
45	1.50	0.35	2.09	2.07	93.51	92.63
60	2.00	0.25	1.18	1.17	94.69	93.80
80	2.50	0.18	0.75	0.74	95.44	94.54
120	3.00	0.13	0.64	0.63	96.08	95.17
170	3.50	0.09	0.48	0.48	96.56	95.65
200	3.75	0.07	0.22	0.22	96.78	95.87
230	4.00	0.06	0.15	0.15	96.93	96.02

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.87	0.20	-0.35	-1.38	-2.58	-2.90	-3.78
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	-1.4	2.64	1.43	0.73	3.41	

GRANULARMETRIC REPORT DE\_BOEM\_2015\_VC.GPJ\_JPBRAZIL\_GDT 9/12/16

**Granularmetric Report**  
 Depths and elevations based on measured values



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Project Name: Inventory of Potential Beach Nourishment and Coastal Restoration

Sand Sources on the Atlantic OCS

Sample Name: DE-BOEM-2015-VC08 #6

Analysis Date: 04-11-16

Analyzed By: AV

Easting (m):  
 507,425

Northing (m):  
 4,274,002

Coordinate System:  
 UTM 18

Elevation (ft):  
 -72.1 NAVD88

USCS: SW  
 Munsell: Wet - 2.5Y-6/4  
 Dry - 2.5Y-7/3  
 Washed - 2.5Y-7/2  
 Comments:

Dry Weight (g): 94.19	Wash Weight (g): 91.15	Pan Retained (g): 0.01	Sieve Loss (%): 0.14	Fines (%): #200 - 3.53 #230 - 3.38	Organics (%):	Carbonates (%): 0	Shell Hash (%):
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	7.63	8.10	7.63	8.10
5/16"	-3.00	8.00	2.20	2.34	9.83	10.44
3.5	-2.50	5.66	2.63	2.79	12.46	13.23
4	-2.25	4.76	2.46	2.61	14.92	15.84
5	-2.00	4.00	1.74	1.85	16.66	17.69
7	-1.50	2.83	2.63	2.79	19.29	20.48
10	-1.00	2.00	4.14	4.40	23.43	24.88
14	-0.50	1.41	7.33	7.78	30.76	32.66
18	0.00	1.00	12.67	13.45	43.43	46.11
25	0.50	0.71	19.20	20.38	62.63	66.49
35	1.00	0.50	17.18	18.24	79.81	84.73
45	1.50	0.35	6.82	7.24	86.63	91.97
60	2.00	0.25	2.10	2.23	88.73	94.20
80	2.50	0.18	0.94	1.00	89.67	95.20
120	3.00	0.13	0.65	0.69	90.32	95.89
170	3.50	0.09	0.35	0.37	90.67	96.26
200	3.75	0.07	0.20	0.21	90.87	96.47
230	4.00	0.06	0.14	0.15	91.01	96.62

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.40	0.98	0.73	0.10	-0.99	-2.23	-3.79
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	-0.38	1.30	1.57	-0.74	3.02	

GRANULARMETRIC REPORT DE\_BOEM\_2015\_VC.GPJ\_JPBRAZIL\_GDT 9/12/16

**Granularmetric Report**  
 Depths and elevations based on measured values



**CB&I**  
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Project Name: Inventory of Potential Beach Nourishment and Coastal Restoration

Sand Sources on the Atlantic OCS

Sample Name: DE-BOEM-2015-VC08 #7

Analysis Date: 04-11-16

Analyzed By: AV

Easting (m):  
 507,425

Northing (m):  
 4,274,002

Coordinate System:  
 UTM 18

Elevation (ft):  
 -74.3 NAVD88

USCS: **SP-SM**  
 Munsell: Wet - 2.5Y-6/2  
 Dry - 2.5Y-8/1  
 Washed - 2.5Y-8/1  
 Comments:

Dry Weight (g): 90.92	Wash Weight (g): 83.49	Pan Retained (g): 0.05	Sieve Loss (%): 0.13	Fines (%): #200 - 9.03 #230 - 8.38	Organics (%):	Carbonates (%): 0	Shell Hash (%):
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.38	0.42	0.38	0.42
4	-2.25	4.76	0.00	0.00	0.38	0.42
5	-2.00	4.00	0.00	0.00	0.38	0.42
7	-1.50	2.83	0.03	0.03	0.41	0.45
10	-1.00	2.00	0.24	0.26	0.65	0.71
14	-0.50	1.41	0.25	0.27	0.90	0.98
18	0.00	1.00	0.58	0.64	1.48	1.62
25	0.50	0.71	2.33	2.56	3.81	4.18
35	1.00	0.50	16.93	18.62	20.74	22.80
45	1.50	0.35	33.48	36.82	54.22	59.62
60	2.00	0.25	19.45	21.39	73.67	81.01
80	2.50	0.18	5.21	5.73	78.88	86.74
120	3.00	0.13	2.12	2.33	81.00	89.07
170	3.50	0.09	1.29	1.42	82.29	90.49
200	3.75	0.07	0.44	0.48	82.73	90.97
230	4.00	0.06	0.59	0.65	83.32	91.62

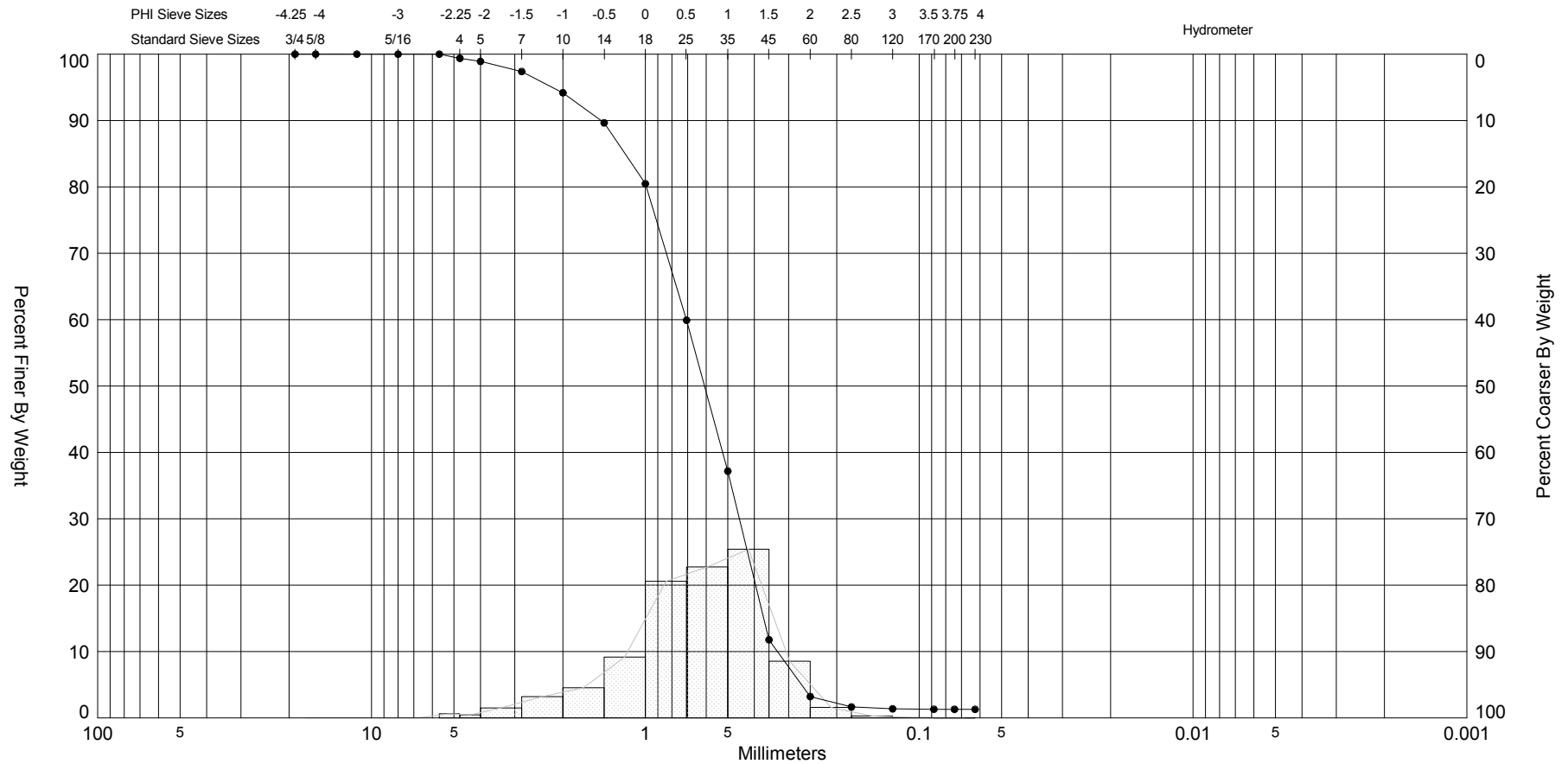
Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
	2.26	1.86	1.37	1.03	0.82	0.52
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	1.36	0.39	0.71	-0.31	9.32	

GRANULARMETRIC REPORT DE\_BOEM\_2015\_VC.GPJ\_JPBRAZIL\_GDT 9/12/16


## APPENDIX 4

### INDIVIDUAL VIBRACORE GRAIN SIZE DISTRIBUTION CURVES/HISTOGRAMS

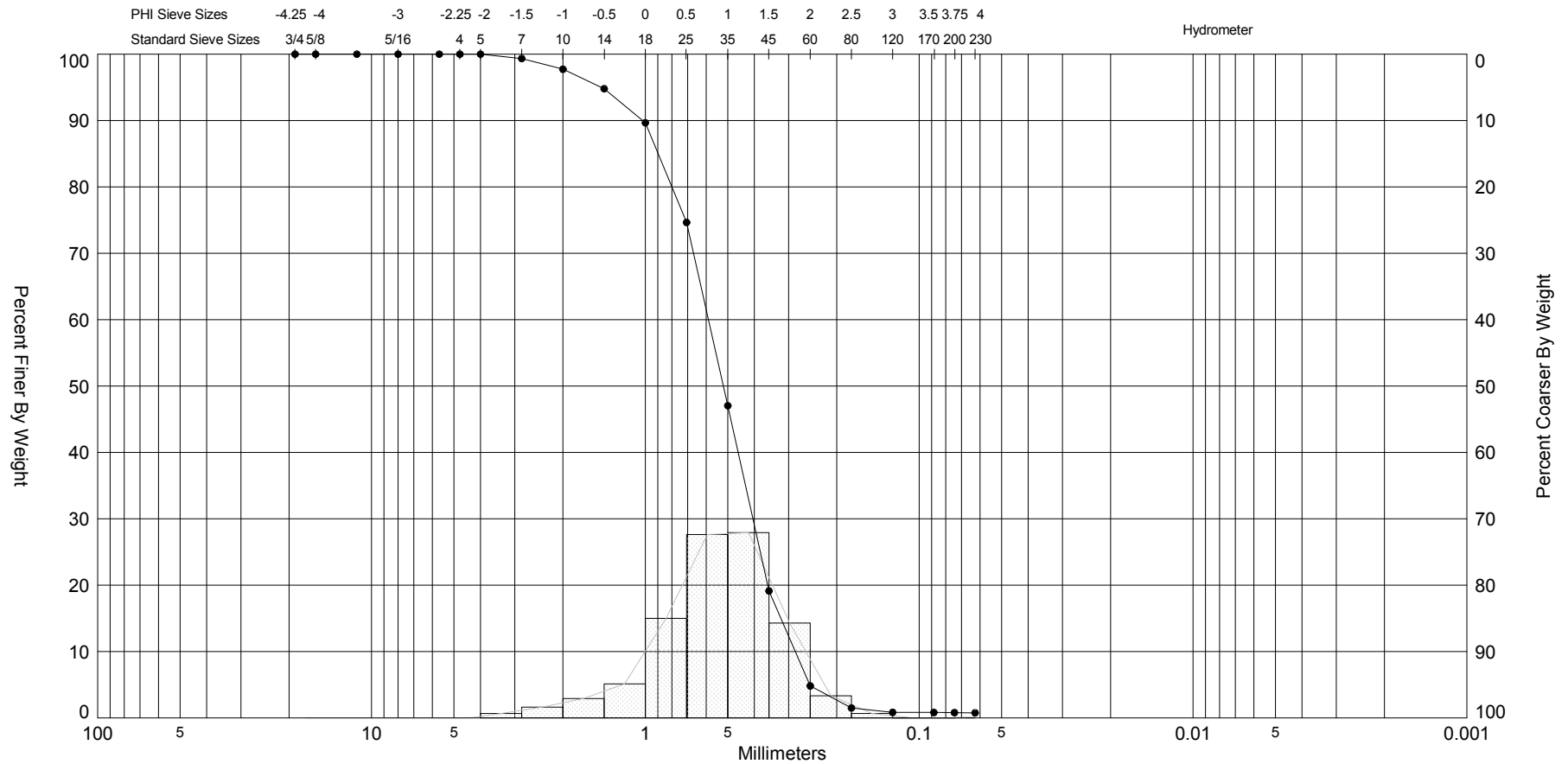
SIEVE ANALYSIS DE\_BOEM\_2015\_VC.GPJ\_JPBRAZIL.GDT 9/12/16




Gravel		Sand			Silt and Clay
Coarse	Fine	Coarse	Medium	Fine	

Sample	Symbol	Elev. (ft)	USCS	% Fines	% Organics	% Carbonates	Median	Mean	Skew	Kurt	Sort	Sample Information	
DE-BOEM-2015-VC01 #1	—●—	-41.1	SW	#200 - 1.30 #230 - 1.29		0	0.72	0.59	-0.78	3.9	0.87	Project Name:	Inventory of Potential Beach Nourishment and Coastal
Comments:												Analysis Date:	Restoration Sand Sources on the Atlantic OCS
Depths and elevations based on measured values												Analyzed By:	CS
												Easting (X, m):	506.587
												Northing (Y, m):	4,258,538
												Horizontal System:	NAD 1983
												Vertical System:	NAVD88
CB&I Coastal Planning & Engineering, Inc. 2481 NW Boca Raton Blvd. Boca Raton, FL 33431 ph (561) 391 8102													

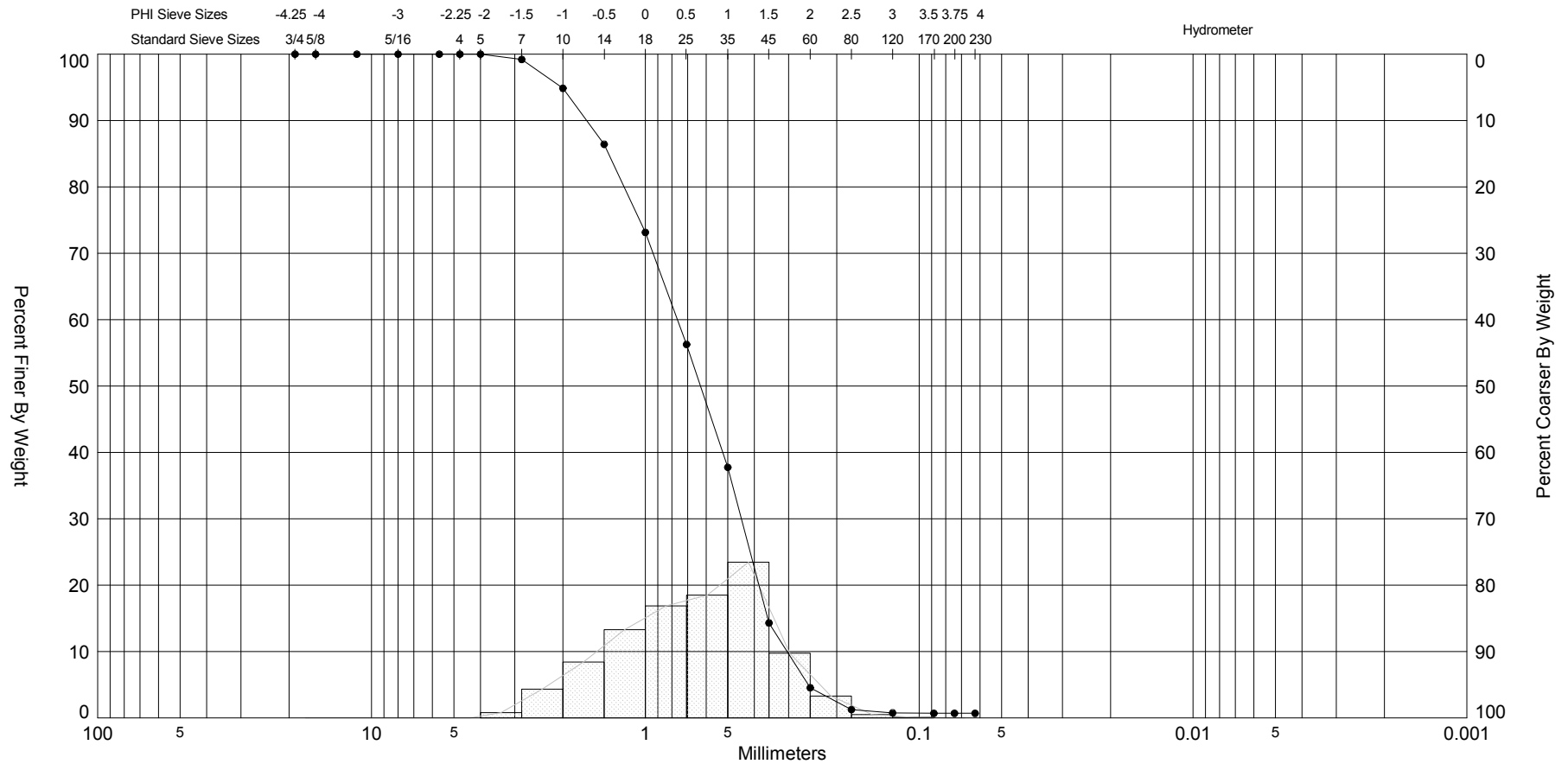
SIEVE ANALYSIS DE\_BOEM\_2015\_VC.GPJ\_JPBRAZIL.GDT 9/12/16




Gravel		Sand			Silt and Clay
Coarse	Fine	Coarse	Medium	Fine	

Sample	Symbol	Elev. (ft)	USCS	% Fines	% Organics	% Carbonates	Median	Mean	Skew	Kurt	Sort	Sample Information	
DE-BOEM-2015-VC01 #2	—●—	-43.6	SP	#200 - 0.80 #230 - 0.77		0	0.95	0.88	-0.61	4.02	0.75	Project Name:	Inventory of Potential Beach Nourishment and Coastal
Comments:												Analysis Date:	Restoration Sand Sources on the Atlantic OCS
Depths and elevations based on measured values												Analyzed By:	CS
												Easting (X, m):	506.587
												Northing (Y, m):	4,258,538
												Horizontal System:	NAD 1983
												Vertical System:	NAVD88
CB&I Coastal Planning & Engineering, Inc. 2481 NW Boca Raton Blvd. Boca Raton, FL 33431 ph (561) 391 8102													

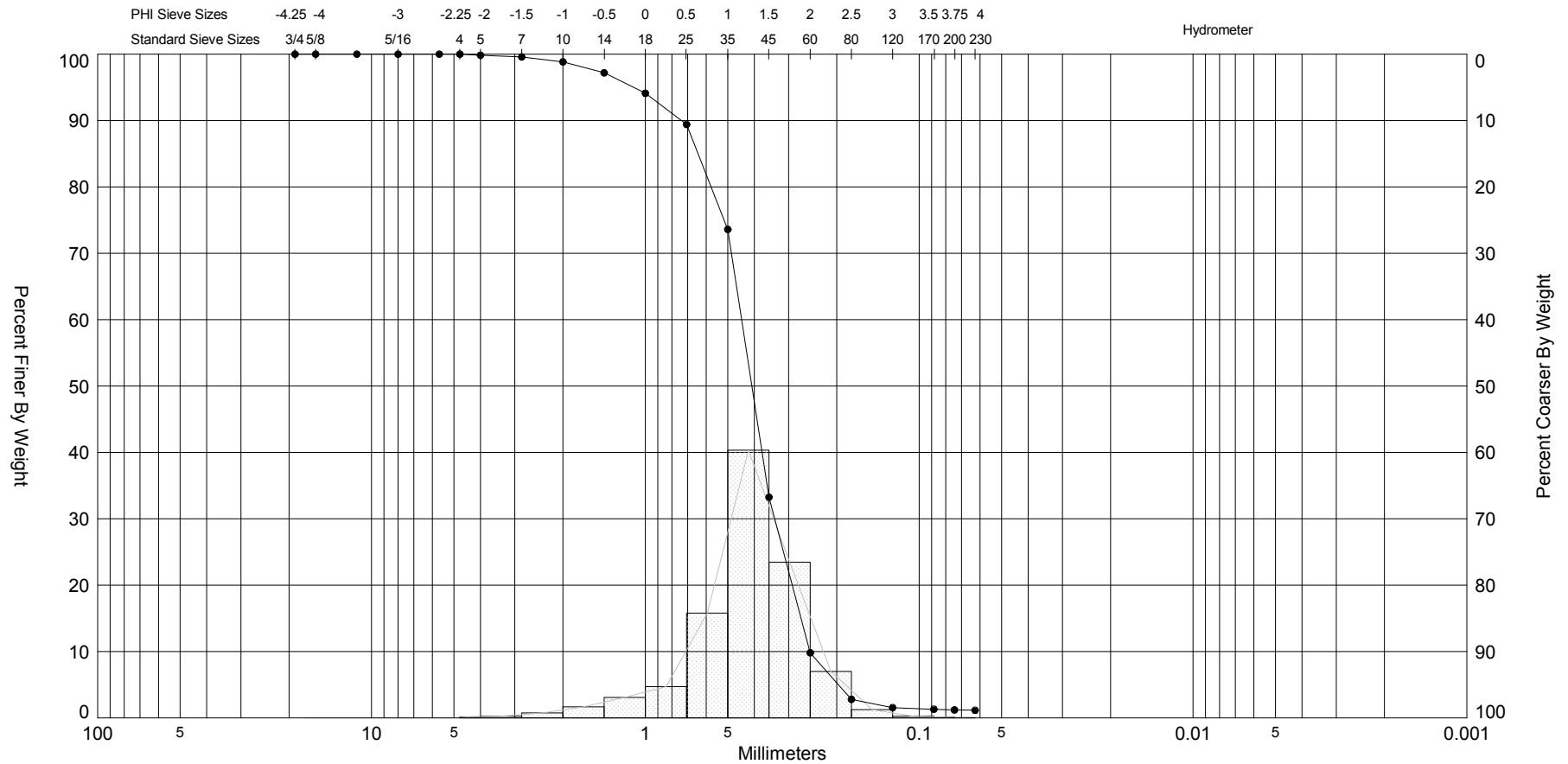
SIEVE ANALYSIS DE\_BOEM\_2015\_VC.GPJ\_JPBRAZIL.GDT 9/12/16



Gravel		Sand			Silt and Clay
Coarse	Fine	Coarse	Medium	Fine	

Sample	Symbol	Elev. (ft)	USCS	% Fines	% Organics	% Carbonates	Median	Mean	Skew	Kurt	Sort	Sample Information	
DE-BOEM-2015-VC01 #3	—●—	-46.6	SW	#200 - 0.69 #230 - 0.69		1	0.67	0.57	-0.26	2.53	0.9	Project Name:	Inventory of Potential Beach Nourishment and Coastal
Comments:												Analysis Date:	Restoration Sand Sources on the Atlantic OCS
Depths and elevations based on measured values												Analyzed By:	NYF
												Easting (X, m):	506.587
												Northing (Y, m):	4,258,538
												Horizontal System:	NAD 1983
												Vertical System:	NAVD88
CB&I Coastal Planning & Engineering, Inc. 2481 NW Boca Raton Blvd. Boca Raton, FL 33431 ph (561) 391 8102													

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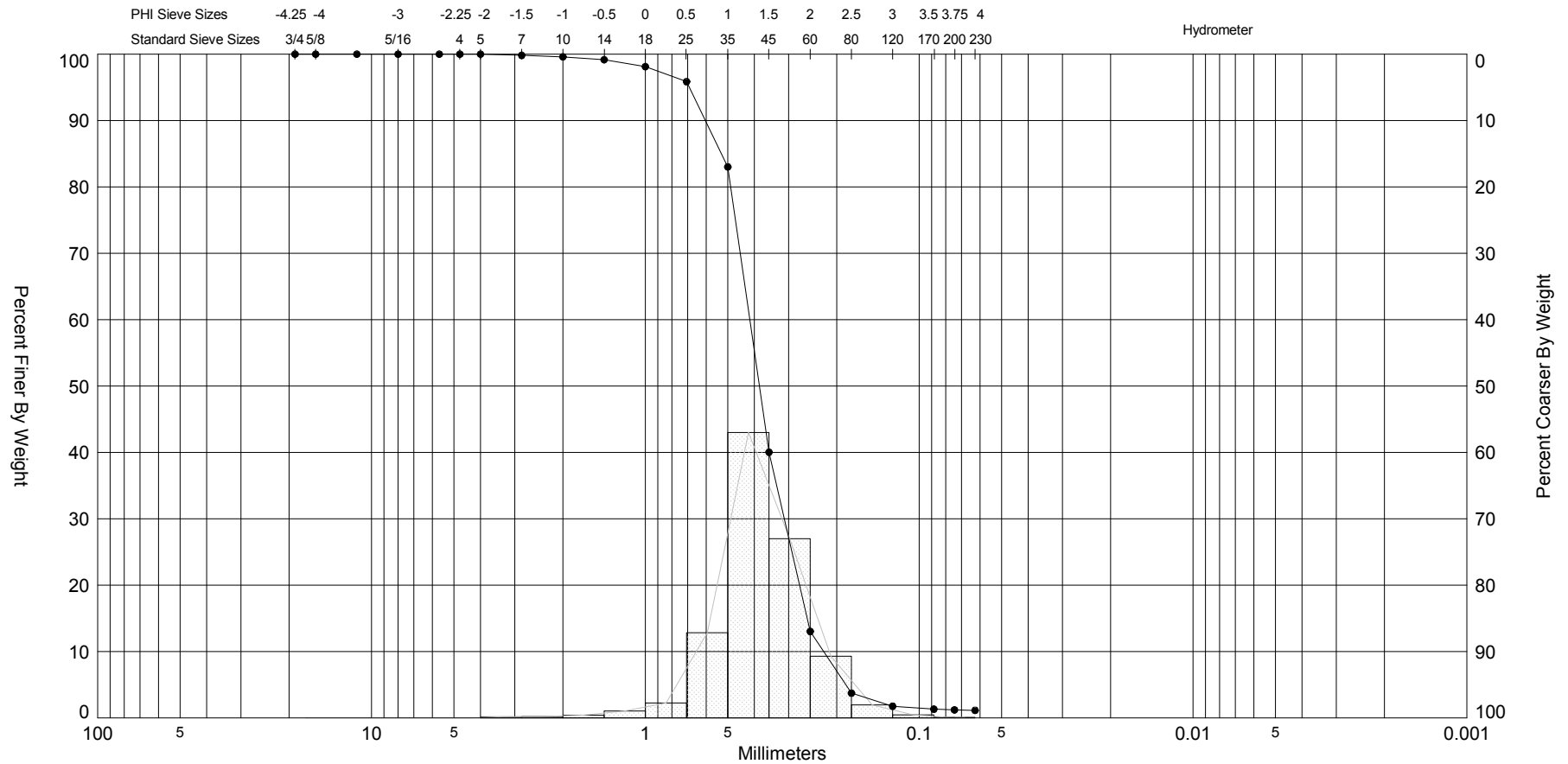


Gravel		Sand			Silt and Clay
Coarse	Fine	Coarse	Medium	Fine	

Sample	Symbol	Elev. (ft)	USCS	% Fines	% Organics	% Carbonates	Median	Mean	Skew	Kurt	Sort	Sample Information	
DE-BOEM-2015-VC01 #4	—●—	-49.9	SP	#200 - 1.20 #230 - 1.15		0	1.29	1.23	-0.98	5.87	0.7	Project Name:	Inventory of Potential Beach Nourishment and Coastal
Comments:												Analysis Date:	Restoration Sand Sources on the Atlantic OCS
Depths and elevations based on measured values												Analyzed By:	04-07-16 SMT
												Easting (X, m):	506.587
												Northing (Y, m):	4,258,538
												Horizontal System:	NAD 1983
												Vertical System:	NAVD88
<b>CB&amp;I</b> Coastal Planning & Engineering, Inc. 2481 NW Boca Raton Blvd. Boca Raton, FL 33431 ph (561) 391 8102													



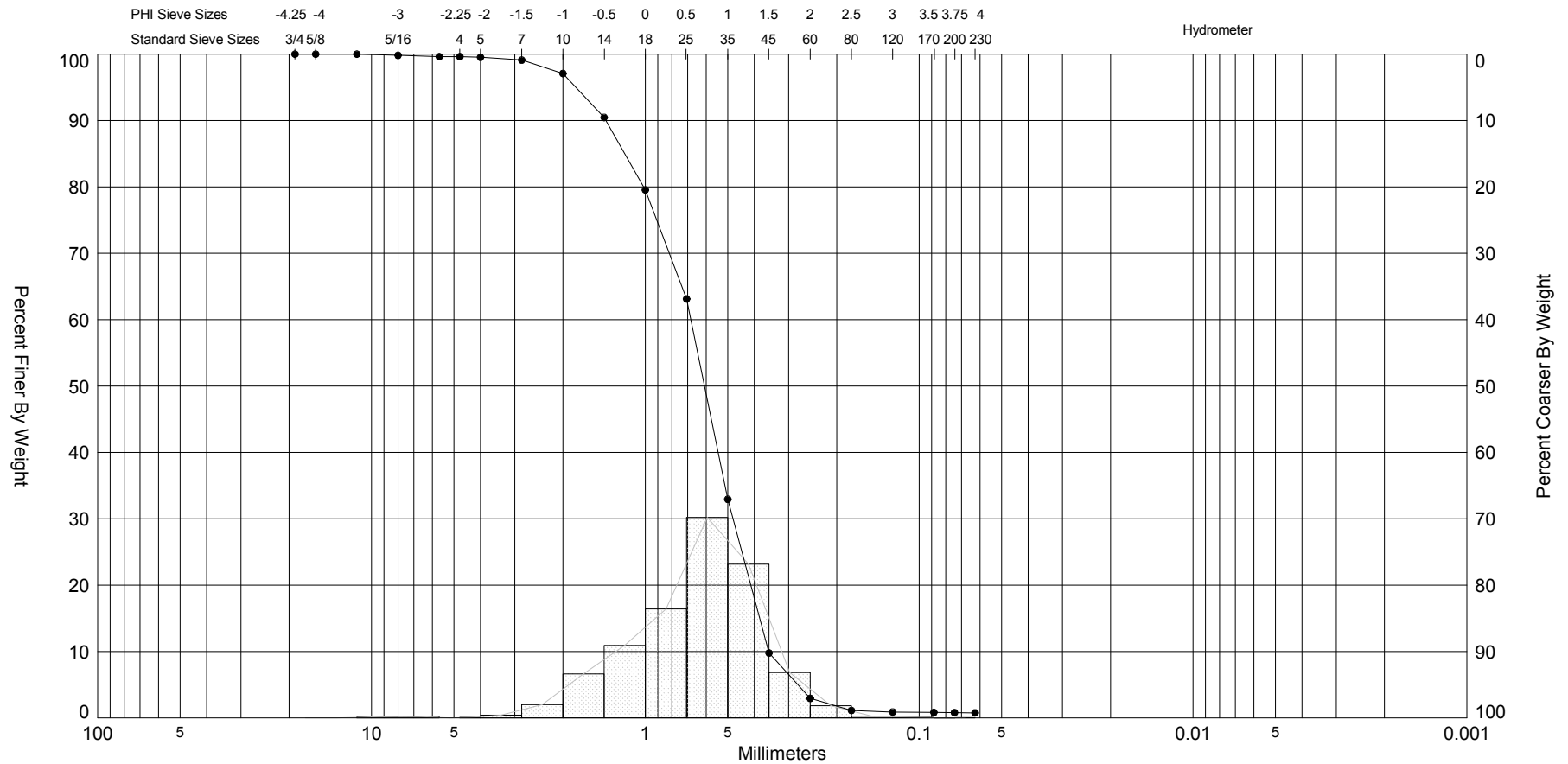
SIEVE ANALYSIS DE\_BOEM\_2015\_VC.GPJ\_JPBRAZIL.GDT 9/12/16




Gravel		Sand			Silt and Clay
Coarse	Fine	Coarse	Medium	Fine	

Sample	Symbol	Elev. (ft)	USCS	% Fines	% Organics	% Carbonates	Median	Mean	Skew	Kurt	Sort	Sample Information	
DE-BOEM-2015-VC01 #5	—●—	-52.9	SP	#200 - 1.21 #230 - 1.14		0	1.38	1.4	-0.46	6.45	0.58	Project Name:	Inventory of Potential Beach Nourishment and Coastal
Comments:												Analysis Date:	Restoration Sand Sources on the Atlantic OCS
Depths and elevations based on measured values												Analyzed By:	04-07-16 DA
 <b>CB&amp;I</b> Coastal Planning & Engineering, Inc. 2481 NW Boca Raton Blvd. Boca Raton, FL 33431 ph (561) 391 8102												Easting (X, m):	506.587
												Northing (Y, m):	4,258,538
												Horizontal System:	NAD 1983
												Vertical System:	NAVD88

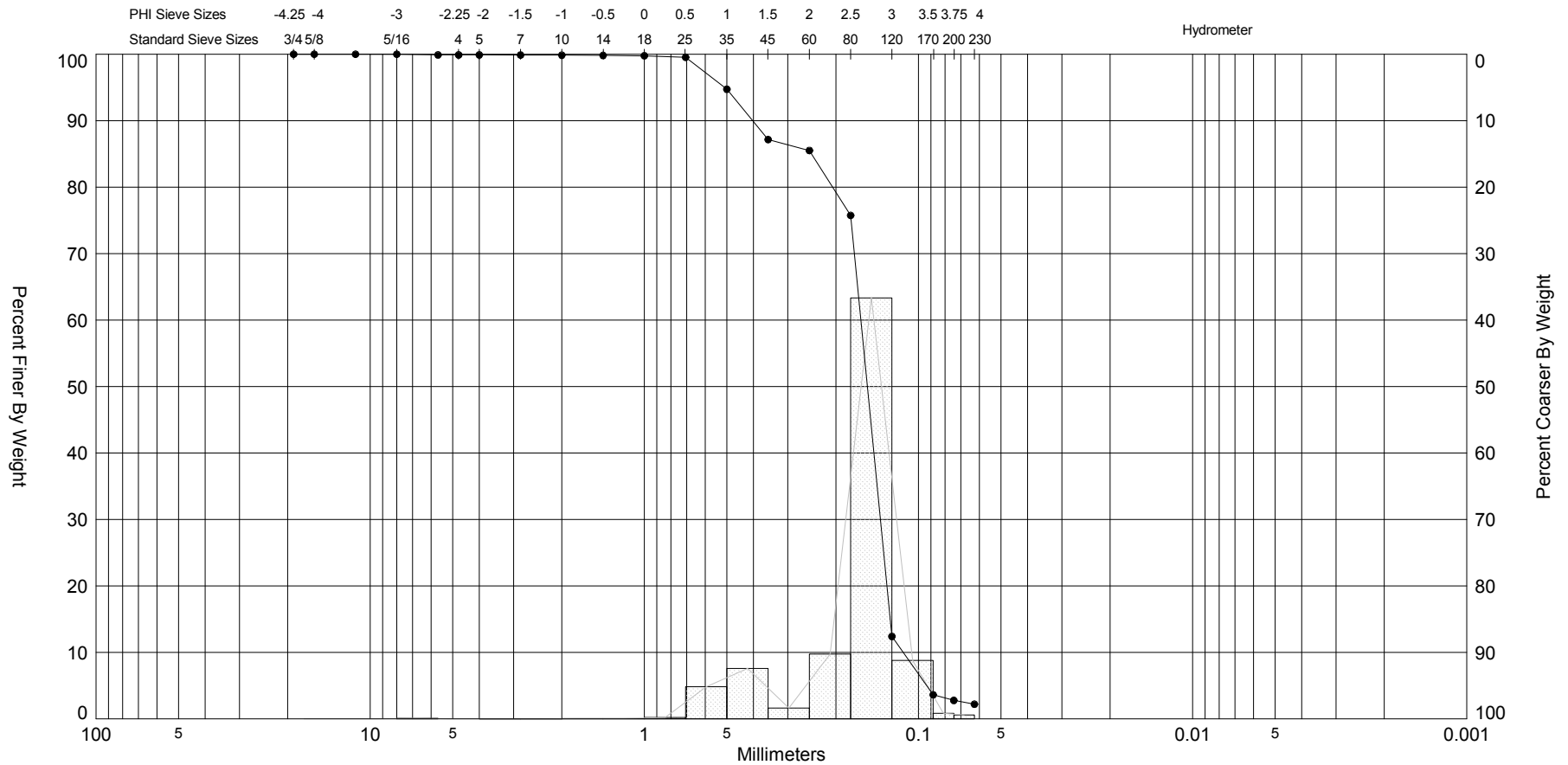
SIEVE ANALYSIS DE\_BOEM\_2015\_VC.GPJ\_JPBRAZIL.GDT 9/12/16




Gravel		Sand			Silt and Clay
Coarse	Fine	Coarse	Medium	Fine	

Sample	Symbol	Elev. (ft)	USCS	% Fines	% Organics	% Carbonates	Median	Mean	Skew	Kurt	Sort	Sample Information	
DE-BOEM-2015-VC01 #6	—●—	-55.4	SP	#200 - 0.80 #230 - 0.77		1	0.72	0.61	-0.65	4.42	0.8	Project Name:	Inventory of Potential Beach Nourishment and Coastal
Comments:												Analysis Date:	Restoration Sand Sources on the Atlantic OCS
Depths and elevations based on measured values												Analyzed By:	NYF
												Easting (X, m):	506.587
												Northing (Y, m):	4,258,538
												Horizontal System:	NAD 1983
												Vertical System:	NAVD88
CB&I Coastal Planning & Engineering, Inc. 2481 NW Boca Raton Blvd. Boca Raton, FL 33431 ph (561) 391 8102													

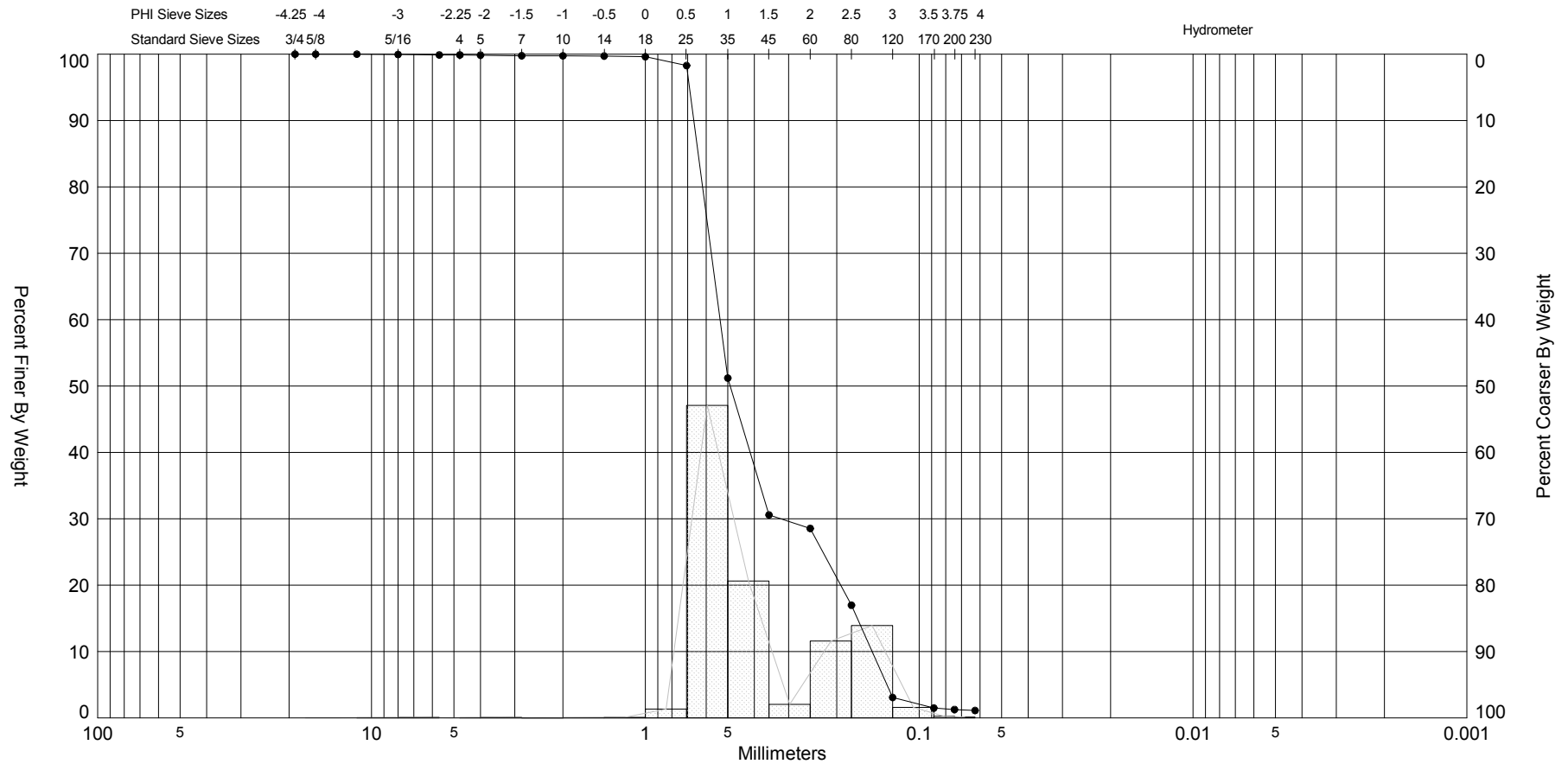
SIEVE ANALYSIS DE\_BOEM\_2015\_VC.GPJ\_JPBRAZIL.GDT 9/12/16




Gravel		Sand			Silt and Clay
Coarse	Fine	Coarse	Medium	Fine	

Sample	Symbol	Elev. (ft)	USCS	% Fines	% Organics	% Carbonates	Median	Mean	Skew	Kurt	Sort	Sample Information	
DE-BOEM-2015-VC03 #1	—●—	-51.8	SP	#200 - 2.78 #230 - 2.20		5	2.7	2.51	-1.92	8.49	0.67	Project Name:	Inventory of Potential Beach Nourishment and Coastal
Comments:												Analysis Date:	Restoration Sand Sources on the Atlantic OCS
Depths and elevations based on measured values												Analyzed By:	04-07-16 SMT
												Easting (X, m):	502.629
												Northing (Y, m):	4,280,130
												Horizontal System:	NAD 1983
												Vertical System:	NAVD88
CB&I Coastal Planning & Engineering, Inc. 2481 NW Boca Raton Blvd. Boca Raton, FL 33431 ph (561) 391 8102													

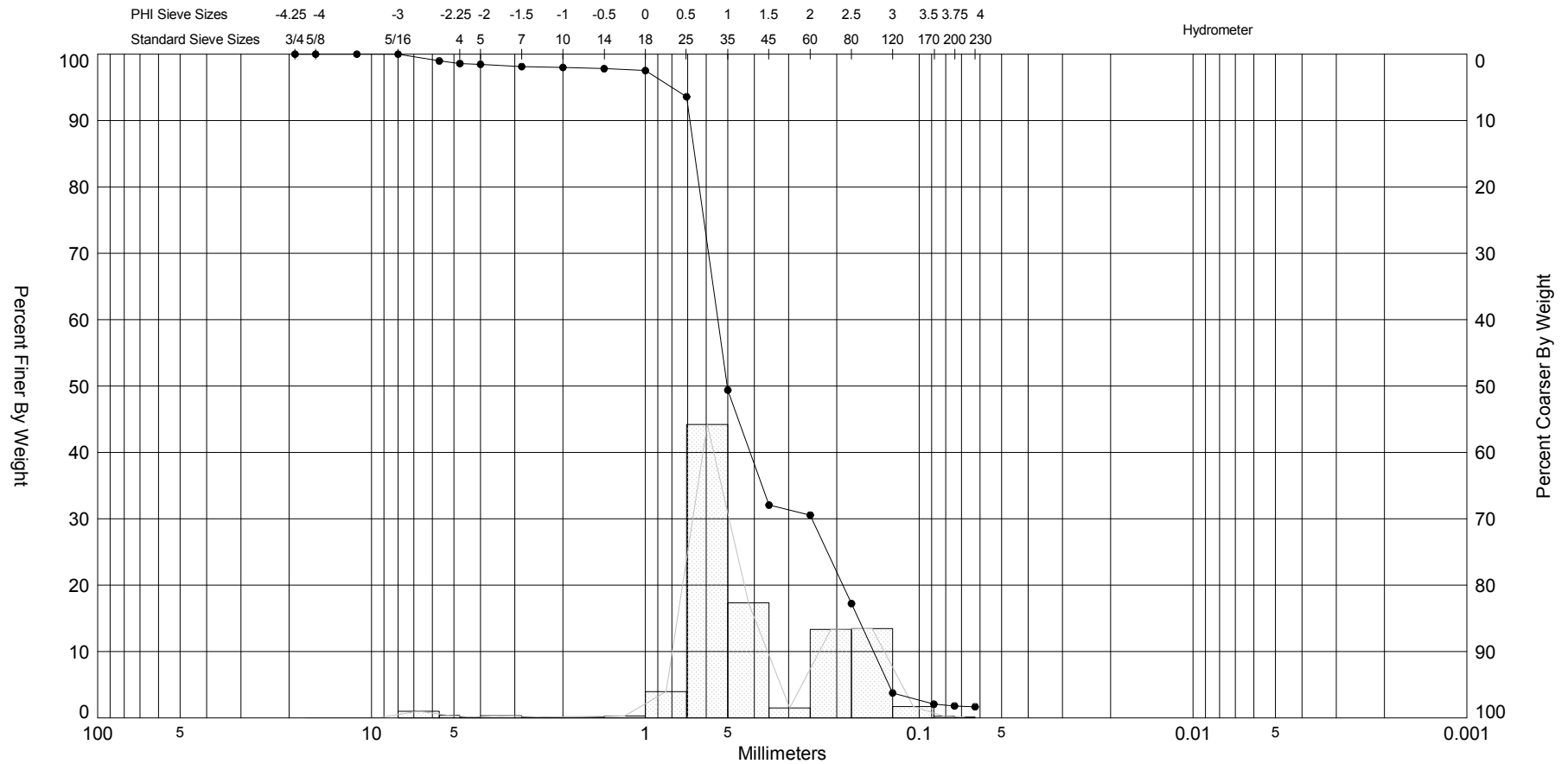
SIEVE ANALYSIS DE\_BOEM\_2015\_VC.GPJ\_JPBRAZIL.GDT 9/12/16




Gravel		Sand			Silt and Clay
Coarse	Fine	Coarse	Medium	Fine	

Sample	Symbol	Elev. (ft)	USCS	% Fines	% Organics	% Carbonates	Median	Mean	Skew	Kurt	Sort	Sample Information	
DE-BOEM-2015-VC03 #2	—●—	-53.1	SP	#200 - 1.26 #230 - 1.12		1	1.03	1.37	0.59	3.36	0.83	Project Name:	Inventory of Potential Beach Nourishment and Coastal
Comments:												Analysis Date:	Restoration Sand Sources on the Atlantic OCS
Depths and elevations based on measured values												Analyzed By:	04-08-16 NYF
												Easting (X, m):	502.629
												Northing (Y, m):	4,280,130
												Horizontal System:	NAD 1983
												Vertical System:	NAVD88
CB&I Coastal Planning & Engineering, Inc. 2481 NW Boca Raton Blvd. Boca Raton, FL 33431 ph (561) 391 8102													

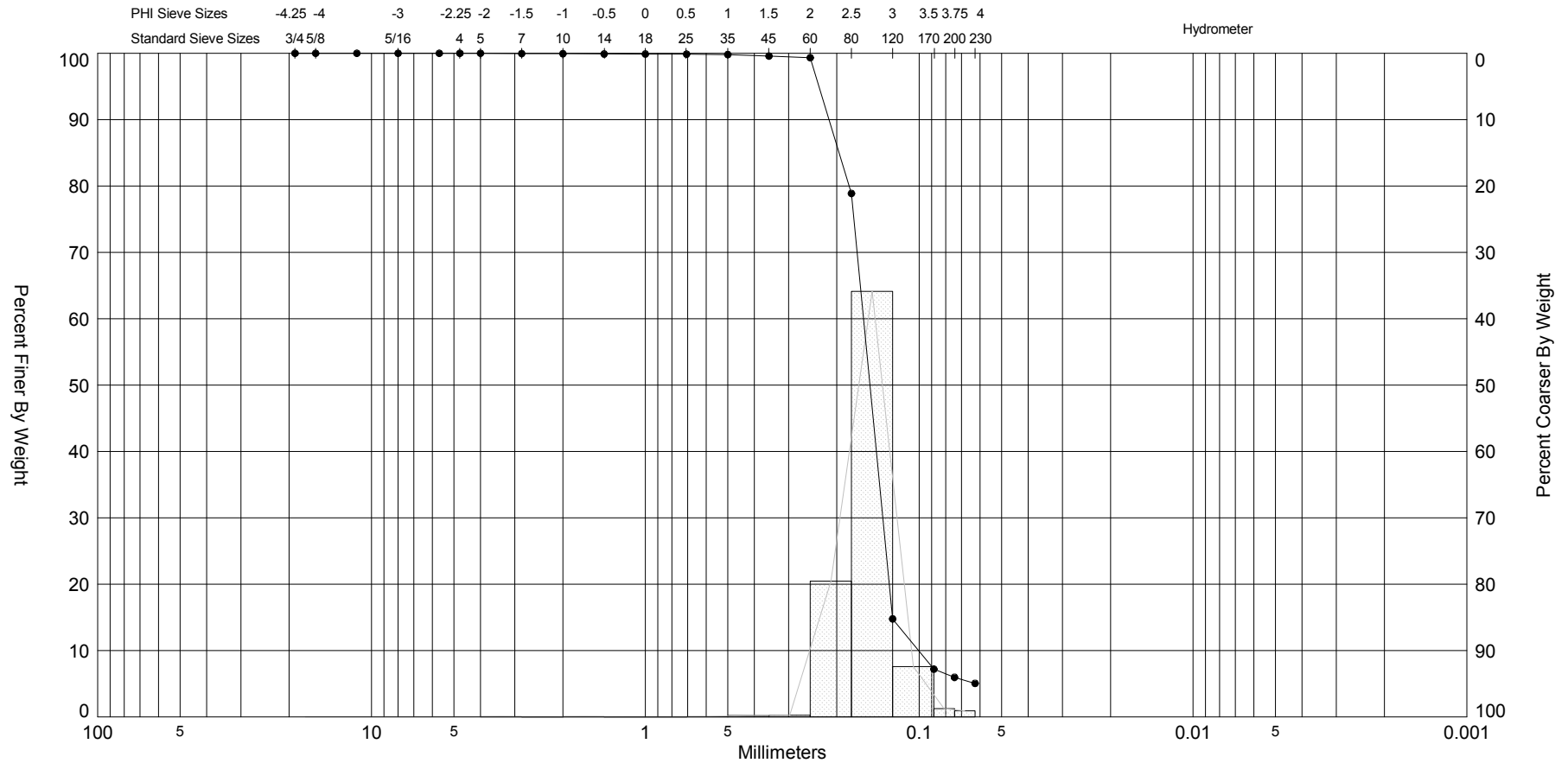
SIEVE ANALYSIS DE\_BOEM\_2015\_VC.GPJ\_JPBRAZIL.GDT 9/12/16




Gravel		Sand			Silt and Clay
Coarse	Fine	Coarse	Medium	Fine	

Sample	Symbol	Elev. (ft)	USCS	% Fines	% Organics	% Carbonates	Median	Mean	Skew	Kurt	Sort	Sample Information	
DE-BOEM-2015-VC03 #3	—●—	-53.7	SW	#200 - 1.81 #230 - 1.68		2	0.99	1.3	-0.49	5.53	0.99	Project Name:	Inventory of Potential Beach Nourishment and Coastal
Comments:												Analysis Date:	Restoration Sand Sources on the Atlantic OCS
Depths and elevations based on measured values												Analyzed By:	CS
												Easting (X, m):	502.629
												Northing (Y, m):	4,280,130
												Horizontal System:	NAD 1983
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CB&I Coastal Planning & Engineering, Inc. 2481 NW Boca Raton Blvd. Boca Raton, FL 33431 ph (561) 391 8102													

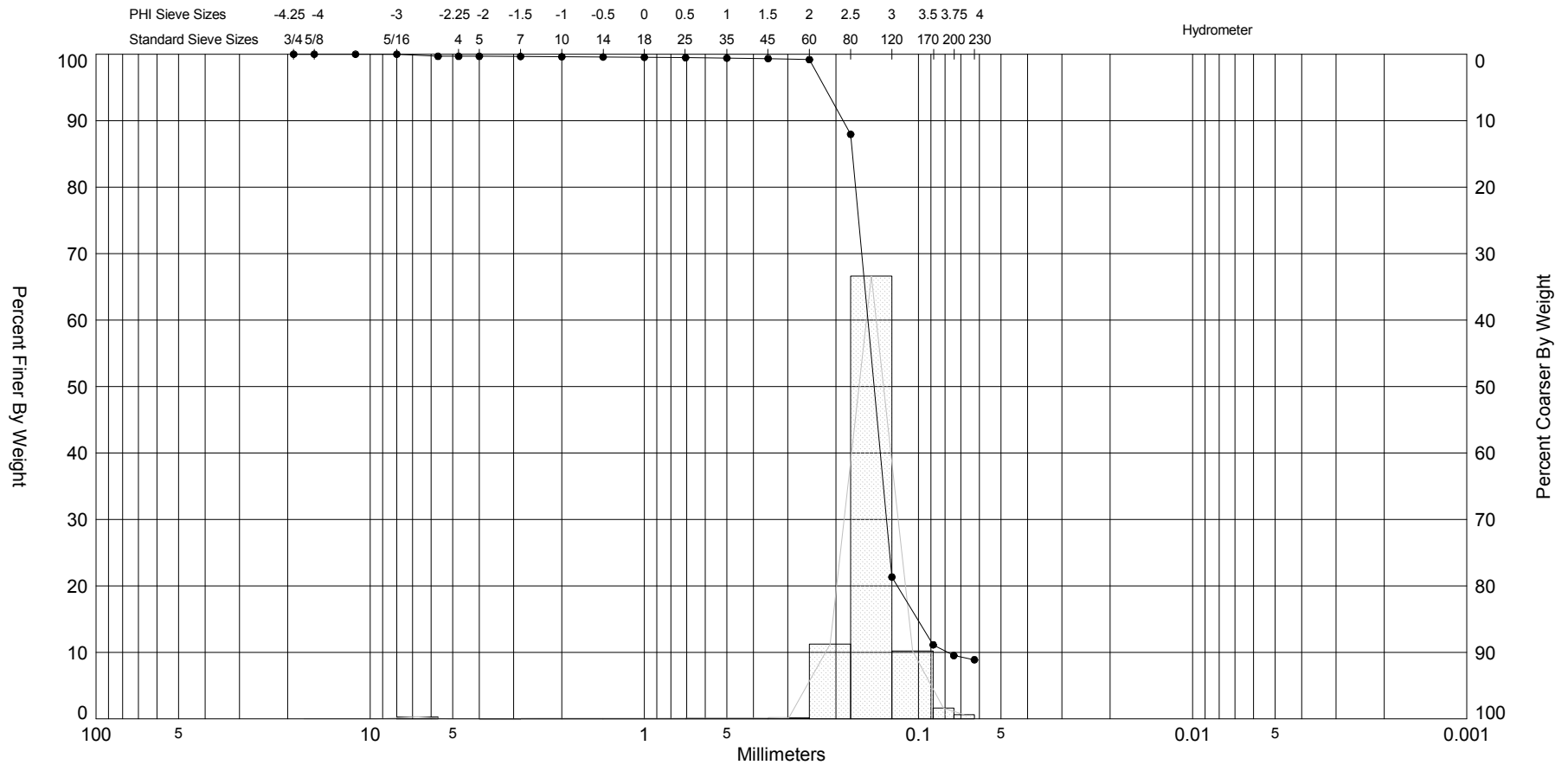
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Gravel		Sand			Silt and Clay
Coarse	Fine	Coarse	Medium	Fine	

Sample	Symbol	Elev. (ft)	USCS	% Fines	% Organics	% Carbonates	Median	Mean	Skew	Kurt	Sort	Sample Information	
DE-BOEM-2015-VC03 #4	—●—	-56.9	SP-SM	#200 - 5.97 #230 - 5.06		1	2.73	2.69	-1.46	23.05	0.35	Project Name:	Inventory of Potential Beach Nourishment and Coastal
Comments:												Analysis Date:	Restoration Sand Sources on the Atlantic OCS
Depths and elevations based on measured values												Analyzed By:	04-07-16 SMT
												Easting (X, m):	502.629
												Northing (Y, m):	4,280,130
												Horizontal System:	NAD 1983
												Vertical System:	NAVD88
												<b>CB&amp;I</b> Coastal Planning & Engineering, Inc. 2481 NW Boca Raton Blvd. Boca Raton, FL 33431 ph (561) 391 8102	

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Gravel		Sand			Silt and Clay
Coarse	Fine	Coarse	Medium	Fine	

Sample	Symbol	Elev. (ft)	USCS	% Fines	% Organics	% Carbonates	Median	Mean	Skew	Kurt	Sort	Sample Information	
DE-BOEM-2015-VC03 #5	—●—	-61.8	SP-SM	#200 - 9.53 #230 - 8.89		2	2.78	2.74	-6.37	74.56	0.46	Project Name:	Inventory of Potential Beach Nourishment and Coastal

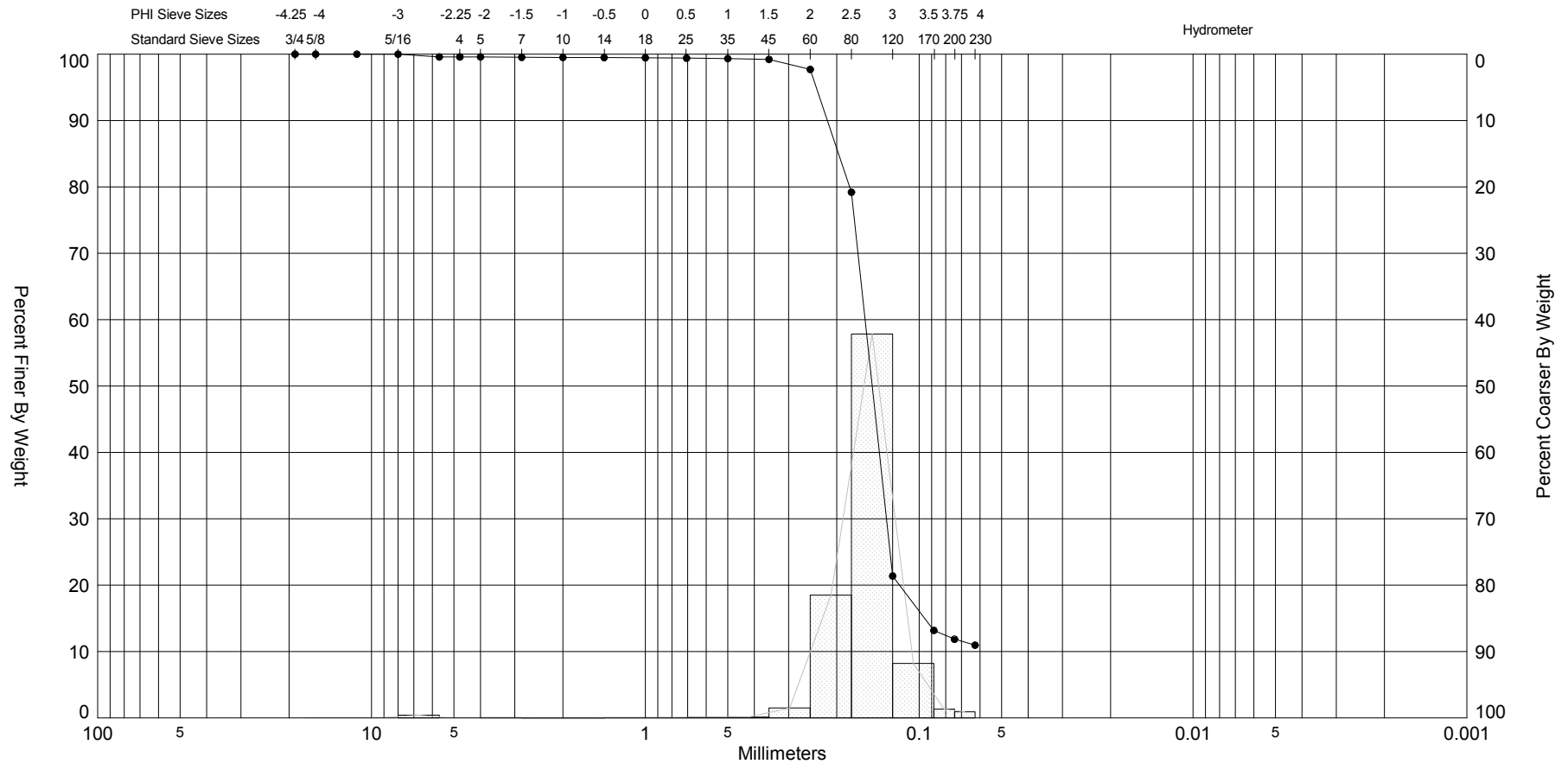
Comments:  
 Depths and elevations based on measured values

Analysis Date:	Restoration Sand Sources on the Atlantic OCS
Analyzed By:	04-08-16
Easting (X, m):	NYF
Northing (Y, m):	502.629
Horizontal System:	4,280,130
Vertical System:	NAD 1983
	NAVD88




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 Boca Raton, FL 33431  
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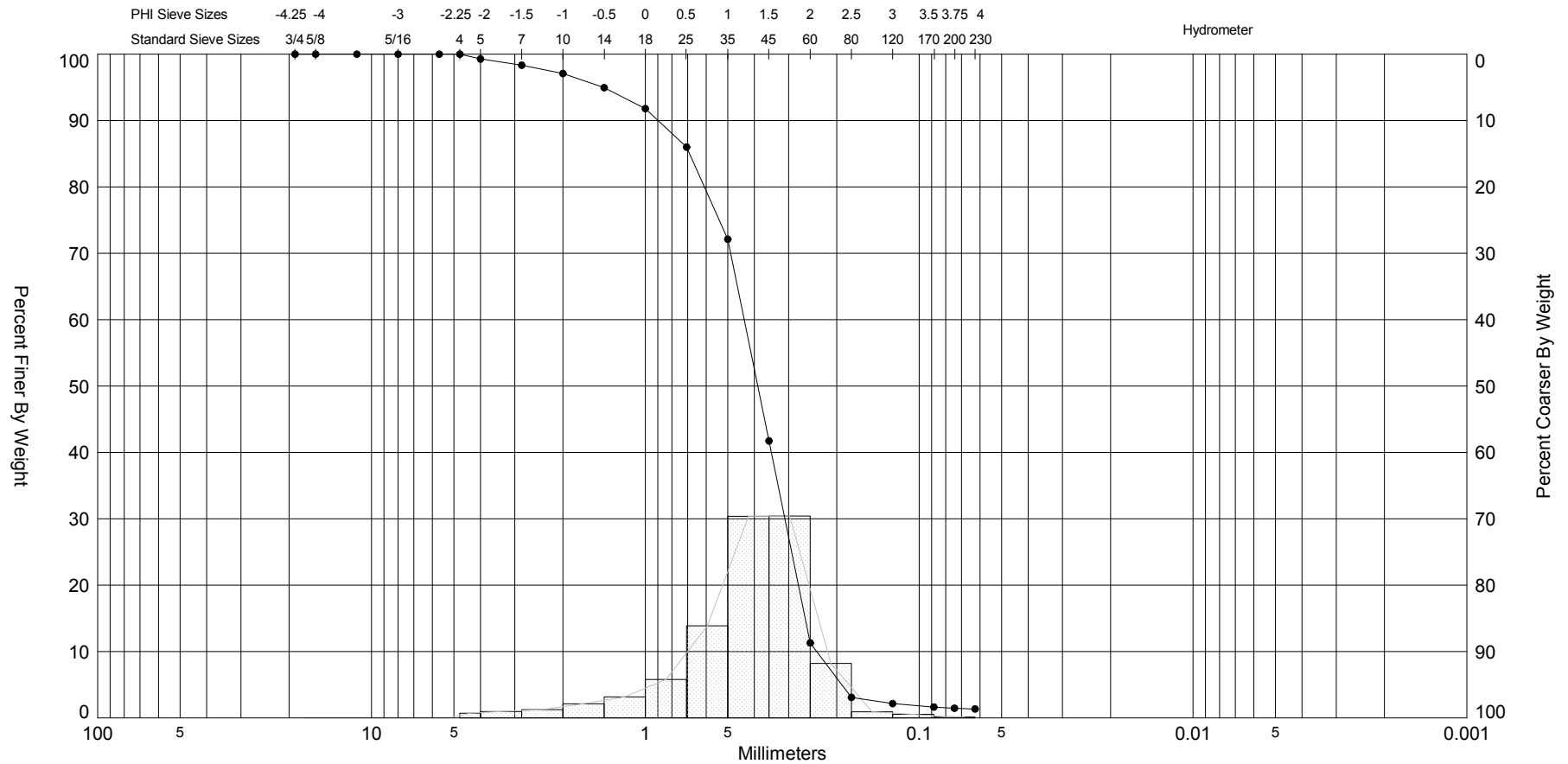


Gravel		Sand			Silt and Clay
Coarse	Fine	Coarse	Medium	Fine	


Sample	Symbol	Elev. (ft)	USCS	% Fines	% Organics	% Carbonates	Median	Mean	Skew	Kurt	Sort	Sample Information	
DE-BOEM-2015-VC03A #1	—●—	-64.0	SP-SM	#200 - 11.86 #230 - 10.96		2	2.75	2.66	-5.46	55.74	0.53	Project Name:	Inventory of Potential Beach Nourishment and Coastal
Comments:												Analysis Date:	Restoration Sand Sources on the Atlantic OCS
Depths and elevations based on measured values												Analyzed By:	CS
												Easting (X, m):	502.629
												Northing (Y, m):	4,280,133
												Horizontal System:	NAD 1983
												Vertical System:	NAVD88
<p style="text-align: center;"> <b>CB&amp;I</b>            Coastal Planning &amp; Engineering, Inc.            2481 NW Boca Raton Blvd.            Boca Raton, FL 33431            ph (561) 391 8102         </p>													



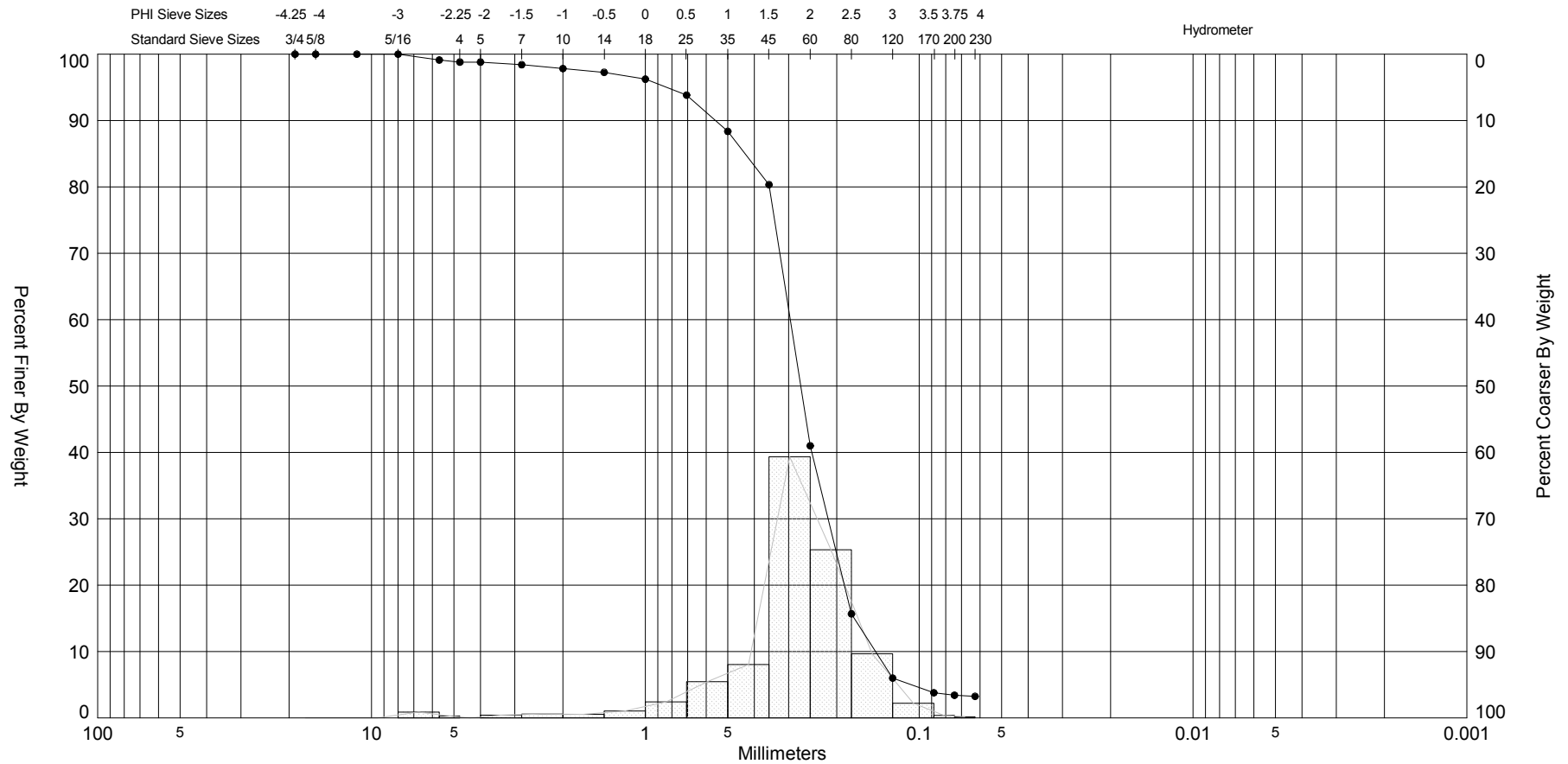
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Gravel		Sand			Silt and Clay
Coarse	Fine	Coarse	Medium	Fine	

Sample	Symbol	Elev. (ft)	USCS	% Fines	% Organics	% Carbonates	Median	Mean	Skew	Kurt	Sort	Sample Information	
DE-BOEM-2015-VC05 #1	—●—	-62.1	SP	#200 - 1.46 #230 - 1.35		1	1.36	1.21	-1.27	5.82	0.85	Project Name:	Inventory of Potential Beach Nourishment and Coastal
Comments:												Analysis Date:	Restoration Sand Sources on the Atlantic OCS
Depths and elevations based on measured values												Analyzed By:	04-07-16 AV
												Easting (X, m):	505.360
												Northing (Y, m):	4,267,280
												Horizontal System:	NAD 1983
												Vertical System:	NAVD88
CB&I Coastal Planning & Engineering, Inc. 2481 NW Boca Raton Blvd. Boca Raton, FL 33431 ph (561) 391 8102													

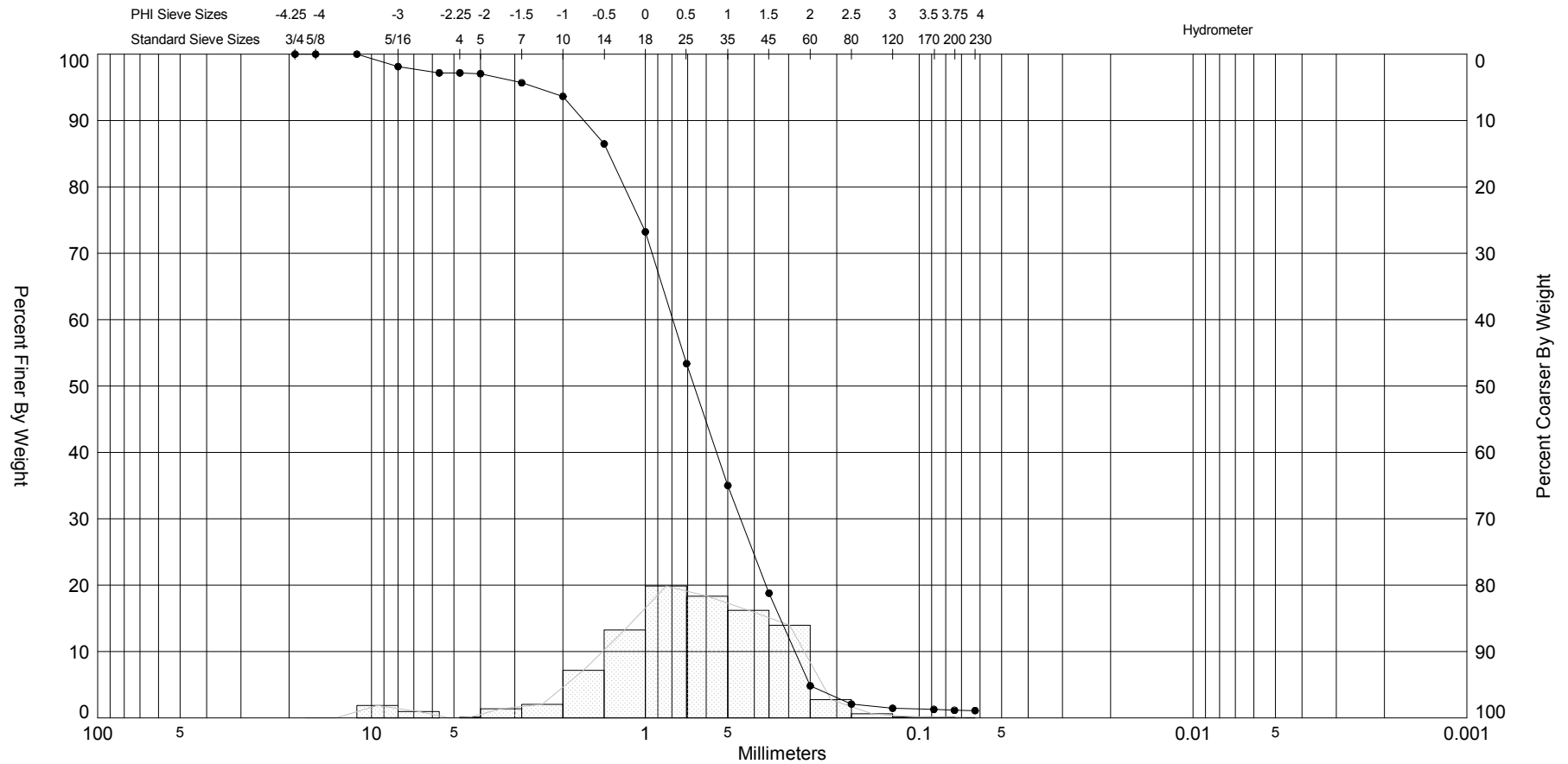
SIEVE ANALYSIS DE\_BOEM\_2015\_VC.GPJ\_JPBRAZIL.GDT 9/12/16




Gravel		Sand			Silt and Clay
Coarse	Fine	Coarse	Medium	Fine	

Sample	Symbol	Elev. (ft)	USCS	% Fines	% Organics	% Carbonates	Median	Mean	Skew	Kurt	Sort	Sample Information	
DE-BOEM-2015-VC05 #2	—●—	-65.6	SW	#200 - 3.42 #230 - 3.25		0	1.89	1.77	-2.14	10.77	0.89	Project Name:	Inventory of Potential Beach Nourishment and Coastal
Comments:												Analysis Date:	Restoration Sand Sources on the Atlantic OCS
Depths and elevations based on measured values												Analyzed By:	CS
												Easting (X, m):	505,360
												Northing (Y, m):	4,267,280
												Horizontal System:	NAD 1983
												Vertical System:	NAVD88
<p style="text-align: center;"> <b>CB&amp;I</b>            Coastal Planning &amp; Engineering, Inc.            2481 NW Boca Raton Blvd.            Boca Raton, FL 33431            ph (561) 391 8102         </p>													

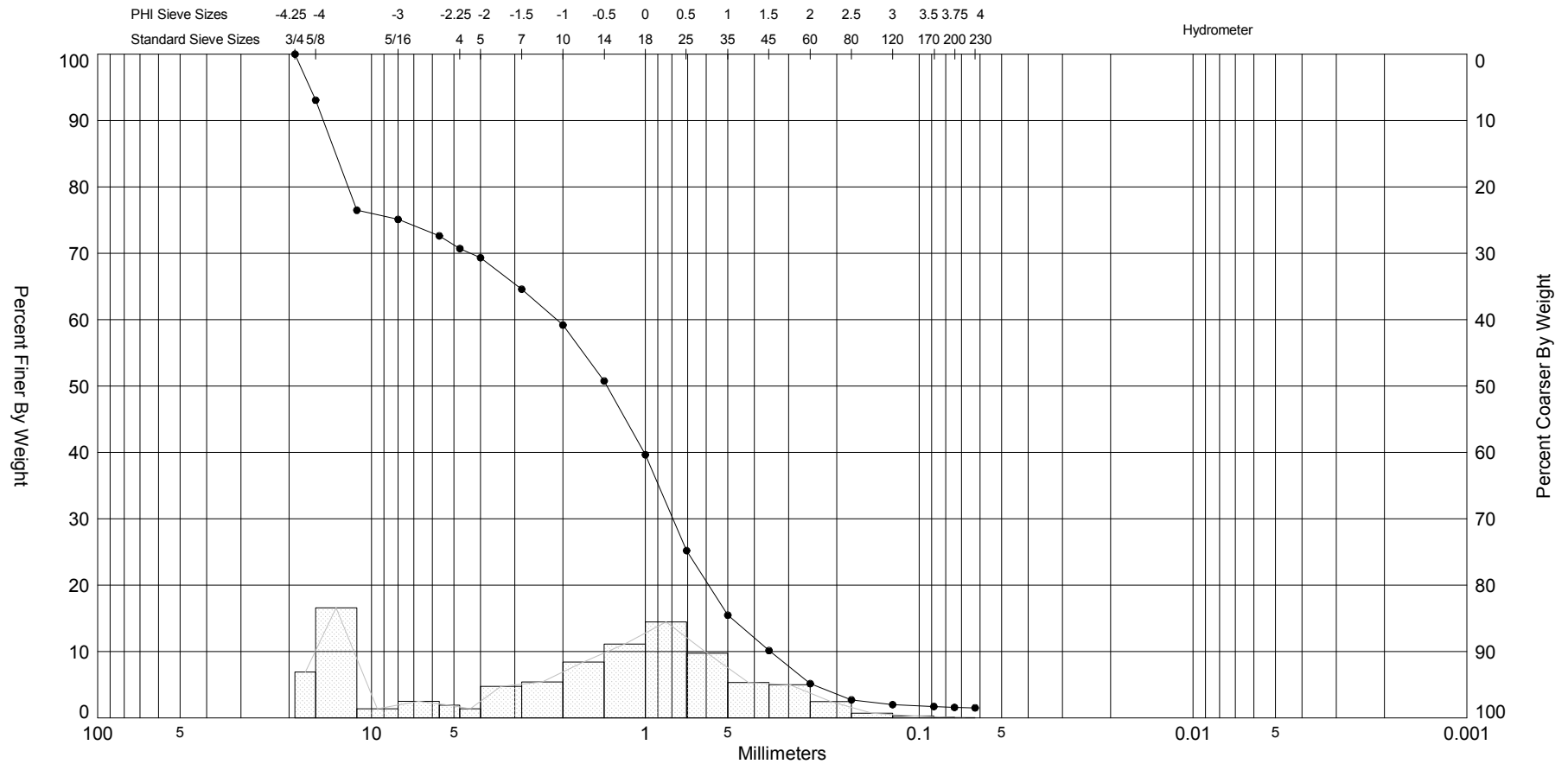
SIEVE ANALYSIS DE\_BOEM\_2015\_VC.GPJ\_JPBRAZIL.GDT 9/12/16




Gravel		Sand			Silt and Clay
Coarse	Fine	Coarse	Medium	Fine	

Sample	Symbol	Elev. (ft)	USCS	% Fines	% Organics	% Carbonates	Median	Mean	Skew	Kurt	Sort	Sample Information	
DE-BOEM-2015-VC05 #3	—●—	-71.6	SW	#200 - 1.15 #230 - 1.10		0	0.59	0.51	-0.91	4.84	1.09	Project Name:	Inventory of Potential Beach Nourishment and Coastal
Comments:												Analysis Date:	Restoration Sand Sources on the Atlantic OCS
Depths and elevations based on measured values												Analyzed By:	CS
												Easting (X, m):	505,360
												Northing (Y, m):	4,267,280
												Horizontal System:	NAD 1983
												Vertical System:	NAVD88
CB&I Coastal Planning & Engineering, Inc. 2481 NW Boca Raton Blvd. Boca Raton, FL 33431 ph (561) 391 8102													

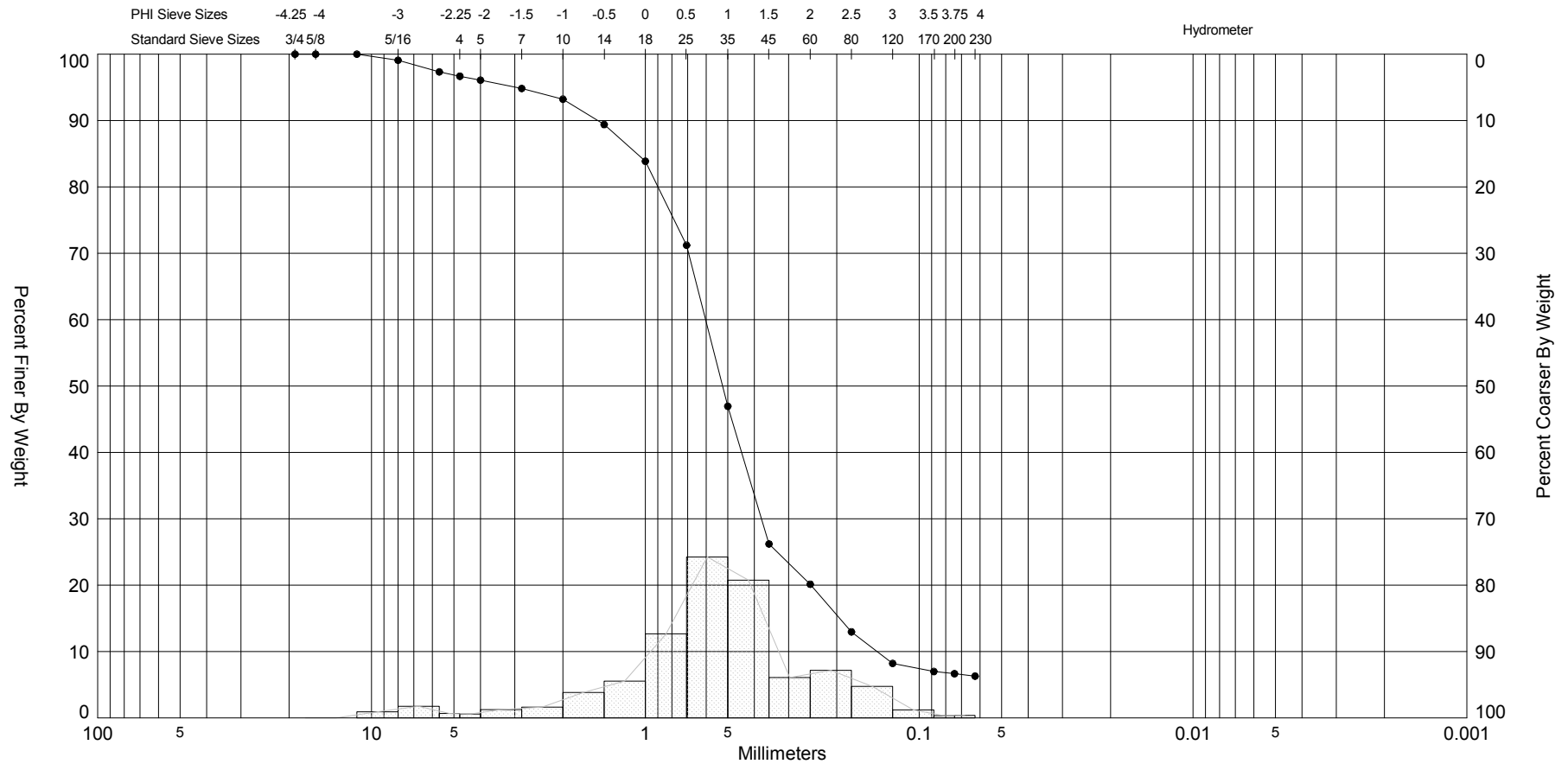
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Gravel		Sand			Silt and Clay
Coarse	Fine	Coarse	Medium	Fine	

Sample	Symbol	Elev. (ft)	USCS	% Fines	% Organics	% Carbonates	Median	Mean	Skew	Kurt	Sort	Sample Information	
DE-BOEM-2015-VC05 #4	—●—	-76.7	SW	#200 - 1.58 #230 - 1.52		0		-1	-0.24	1.88	1.98	Project Name:	Inventory of Potential Beach Nourishment and Coastal
Comments:												Analysis Date:	Restoration Sand Sources on the Atlantic OCS
Depths and elevations based on measured values												Analyzed By:	CS
												Easting (X, m):	505,360
												Northing (Y, m):	4,267,280
												Horizontal System:	NAD 1983
												Vertical System:	NAVD88
												CB&I Coastal Planning & Engineering, Inc. 2481 NW Boca Raton Blvd. Boca Raton, FL 33431 ph (561) 391 8102	

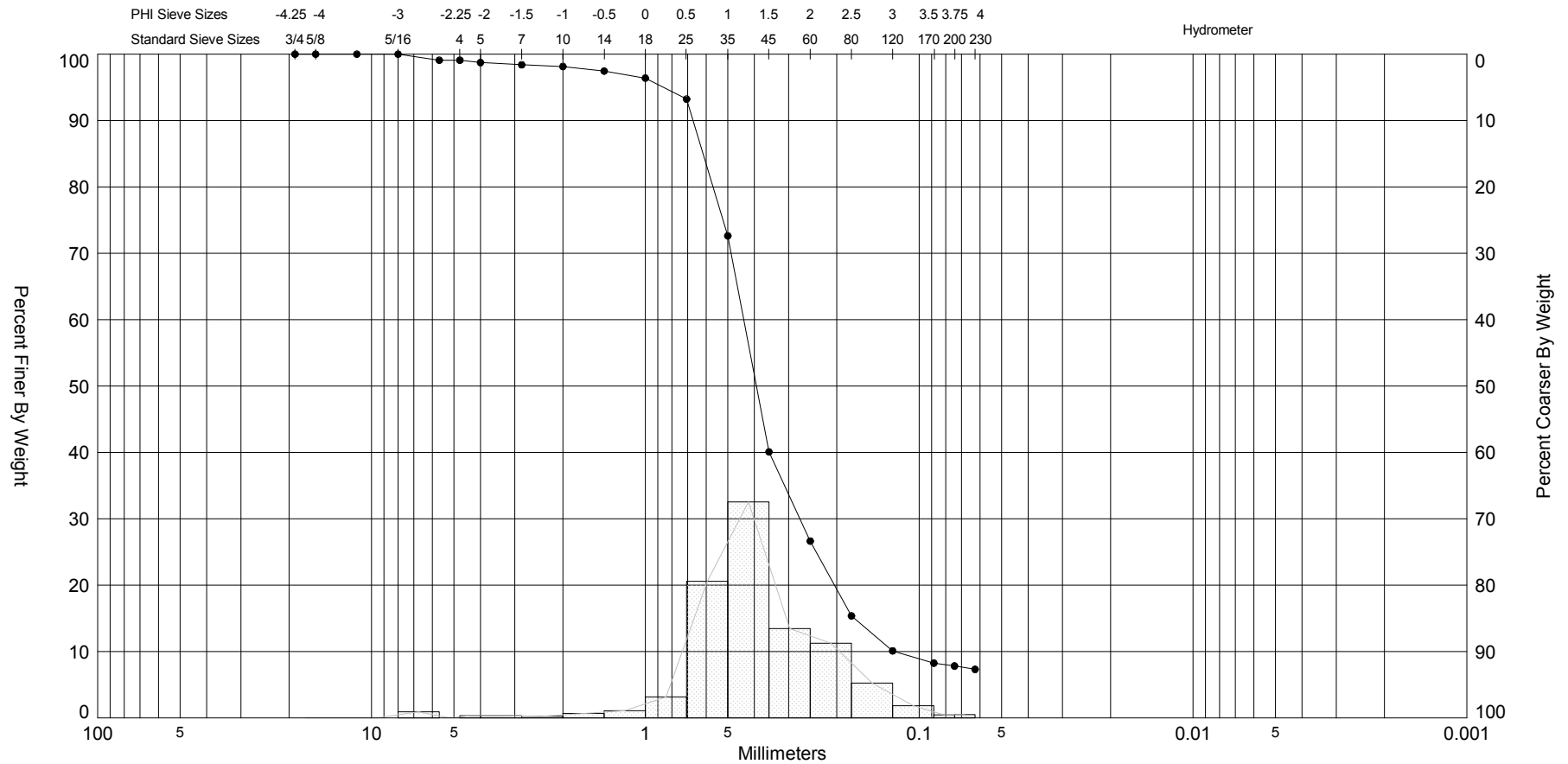
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Gravel		Sand			Silt and Clay
Coarse	Fine	Coarse	Medium	Fine	

Sample	Symbol	Elev. (ft)	USCS	% Fines	% Organics	% Carbonates	Median	Mean	Skew	Kurt	Sort	Sample Information	
DE-BOEM-2015-VC07 #1	—●—	-64.0	SW-SM	#200 - 6.66 #230 - 6.30		0	0.94	0.8	-0.77	4.59	1.22	Project Name:	Inventory of Potential Beach Nourishment and Coastal
Comments:												Analysis Date:	Restoration Sand Sources on the Atlantic OCS
Depths and elevations based on measured values												Analyzed By:	04-20-16 AV
												Easting (X, m):	505,335
												Northing (Y, m):	4,271,819
												Horizontal System:	NAD 1983
												Vertical System:	NAVD88
<p style="text-align: center;"> <b>CB&amp;I</b>            Coastal Planning &amp; Engineering, Inc.            2481 NW Boca Raton Blvd.            Boca Raton, FL 33431            ph (561) 391 8102         </p>													

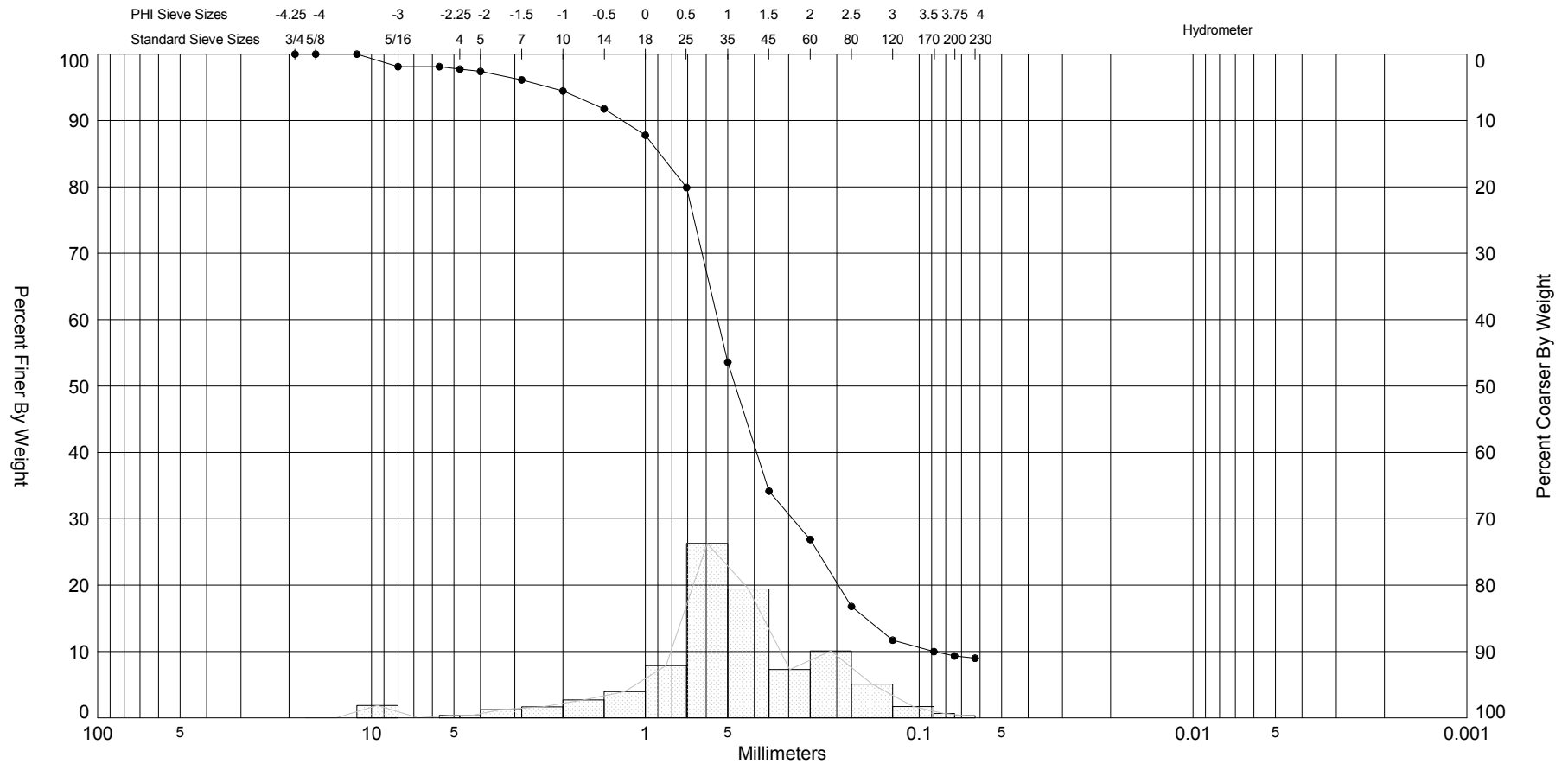
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Gravel		Sand			Silt and Clay
Coarse	Fine	Coarse	Medium	Fine	

Sample	Symbol	Elev. (ft)	USCS	% Fines	% Organics	% Carbonates	Median	Mean	Skew	Kurt	Sort	Sample Information	
DE-BOEM-2015-VC07 #2	—●—	-65.4	SW-SM	#200 - 7.82 #230 - 7.32		0	1.35	1.35	-0.9	7.51	0.9	Project Name:	Inventory of Potential Beach Nourishment and Coastal
Comments:												Analysis Date:	Restoration Sand Sources on the Atlantic OCS
Depths and elevations based on measured values												Analyzed By:	04-11-16 SMT
												Easting (X, m):	505,335
												Northing (Y, m):	4,271,819
												Horizontal System:	NAD 1983
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CB&I Coastal Planning & Engineering, Inc. 2481 NW Boca Raton Blvd. Boca Raton, FL 33431 ph (561) 391 8102													

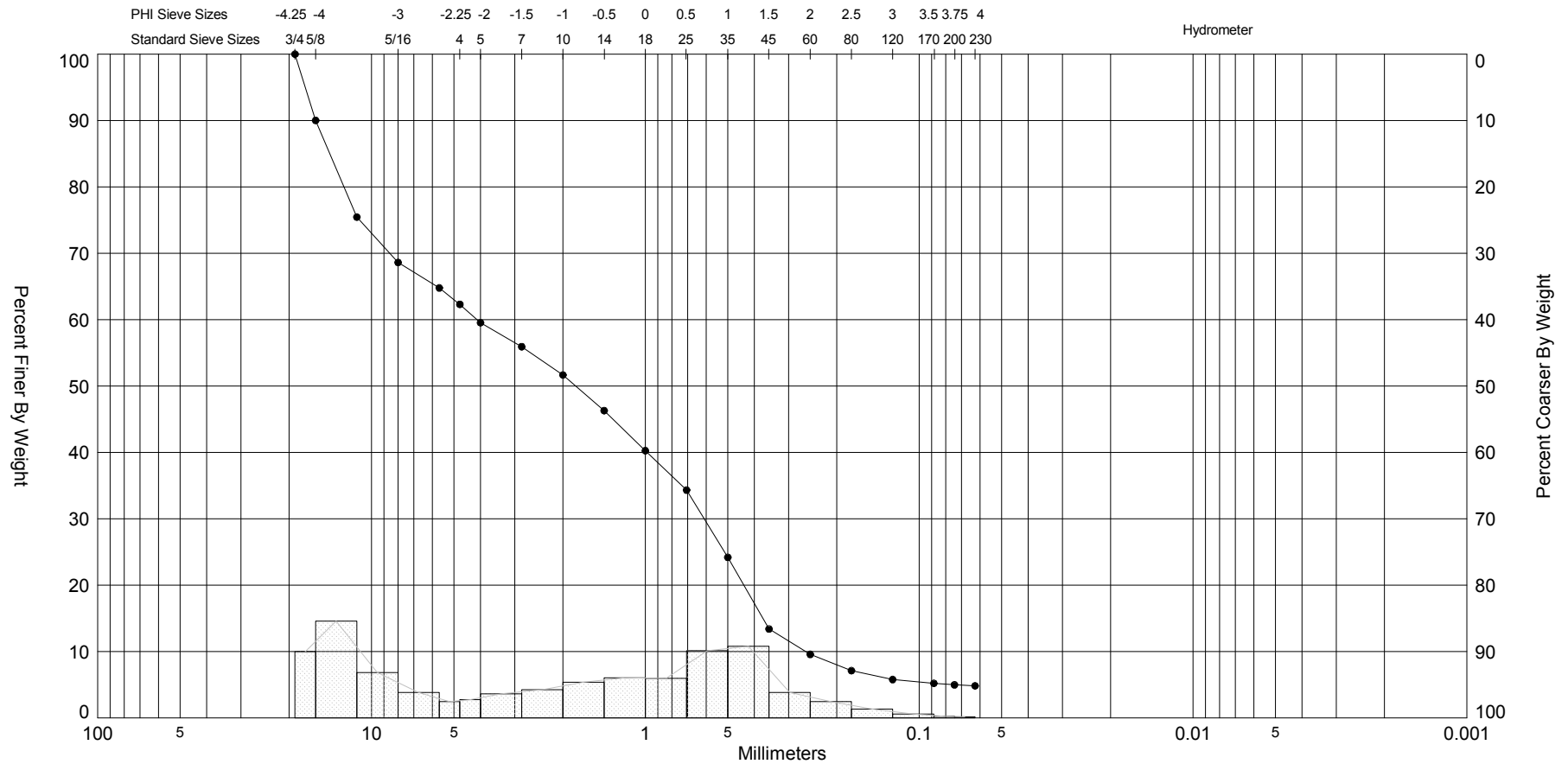
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Gravel		Sand			Silt and Clay
Coarse	Fine	Coarse	Medium	Fine	

Sample	Symbol	Elev. (ft)	USCS	% Fines	% Organics	% Carbonates	Median	Mean	Skew	Kurt	Sort	Sample Information	
DE-BOEM-2015-VC07 #3	—●—	-66.4	SW-SM	#200 - 9.33 #230 - 8.99		0	1.09	0.99	-0.9	5.22	1.21	Project Name:	Inventory of Potential Beach Nourishment and Coastal
Comments:												Analysis Date:	Restoration Sand Sources on the Atlantic OCS
Depths and elevations based on measured values												Analyzed By:	CS
												Easting (X, m):	505,335
												Northing (Y, m):	4,271,819
												Horizontal System:	NAD 1983
												Vertical System:	NAVD88
<p style="text-align: center;"> <b>CB&amp;I</b>            Coastal Planning &amp; Engineering, Inc.            2481 NW Boca Raton Blvd.            Boca Raton, FL 33431            ph (561) 391 8102         </p>													

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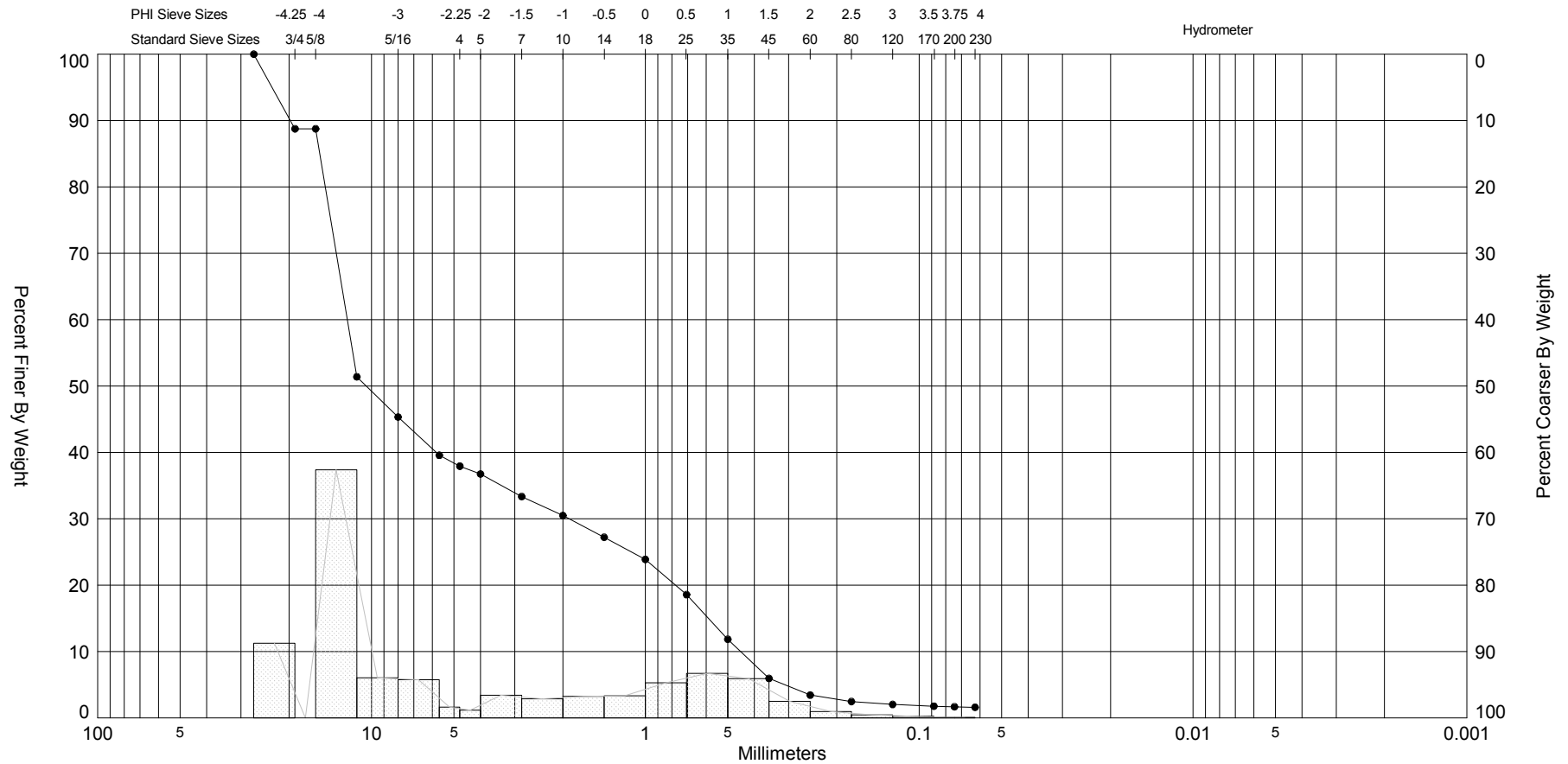


Gravel		Sand			Silt and Clay
Coarse	Fine	Coarse	Medium	Fine	


Sample	Symbol	Elev. (ft)	USCS	% Fines	% Organics	% Carbonates	Median	Mean	Skew	Kurt	Sort	Sample Information	
DE-BOEM-2015-VC07 #4	—●—	-67.6	SW	#200 - 4.98 #230 - 4.83		0		-1.22	0.09	1.63	2.18	Project Name:	Inventory of Potential Beach Nourishment and Coastal
Comments:												Analysis Date:	Restoration Sand Sources on the Atlantic OCS
Depths and elevations based on measured values												Analyzed By:	NYF
												Easting (X, m):	505,335
												Northing (Y, m):	4,271,819
												Horizontal System:	NAD 1983
												Vertical System:	NAVD88
CB&I Coastal Planning & Engineering, Inc. 2481 NW Boca Raton Blvd. Boca Raton, FL 33431 ph (561) 391 8102													



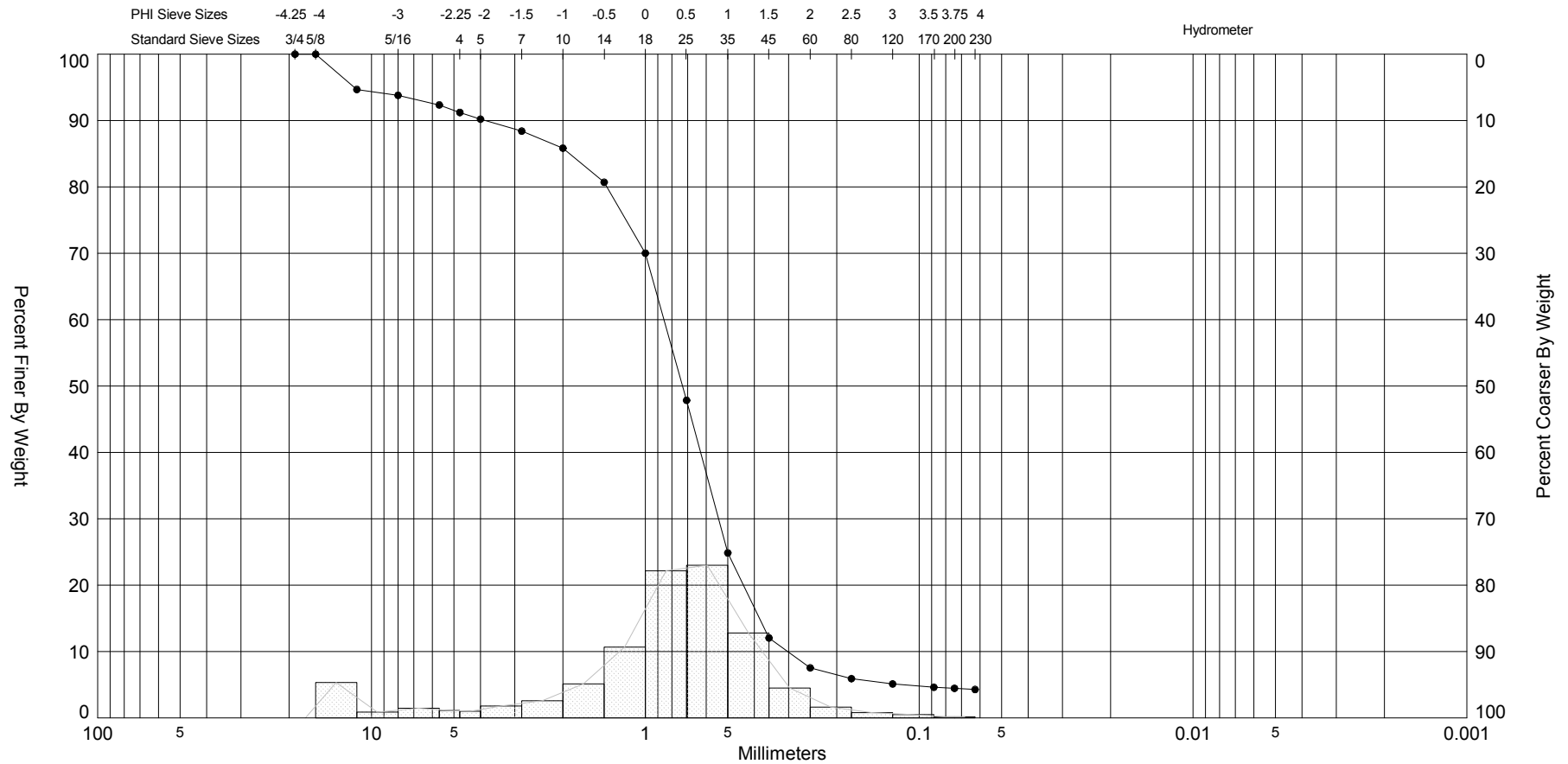
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Gravel		Sand			Silt and Clay
Coarse	Fine	Coarse	Medium	Fine	

Sample	Symbol	Elev. (ft)	USCS	% Fines	% Organics	% Carbonates	Median	Mean	Skew	Kurt	Sort	Sample Information	
DE-BOEM-2015-VC07 #5	—●—	-68.8	GW	#200 - 1.68 #230 - 1.60		0		-2.26	0.79	2.19	2.08	Project Name:	Inventory of Potential Beach Nourishment and Coastal
Comments:												Analysis Date:	Restoration Sand Sources on the Atlantic OCS
Depths and elevations based on measured values												Analyzed By:	04-11-16 SMT
												Easting (X, m):	505,335
												Northing (Y, m):	4,271,819
												Horizontal System:	NAD 1983
												Vertical System:	NAVD88
												<b>CB&amp;I</b> Coastal Planning & Engineering, Inc. 2481 NW Boca Raton Blvd. Boca Raton, FL 33431 ph (561) 391 8102	

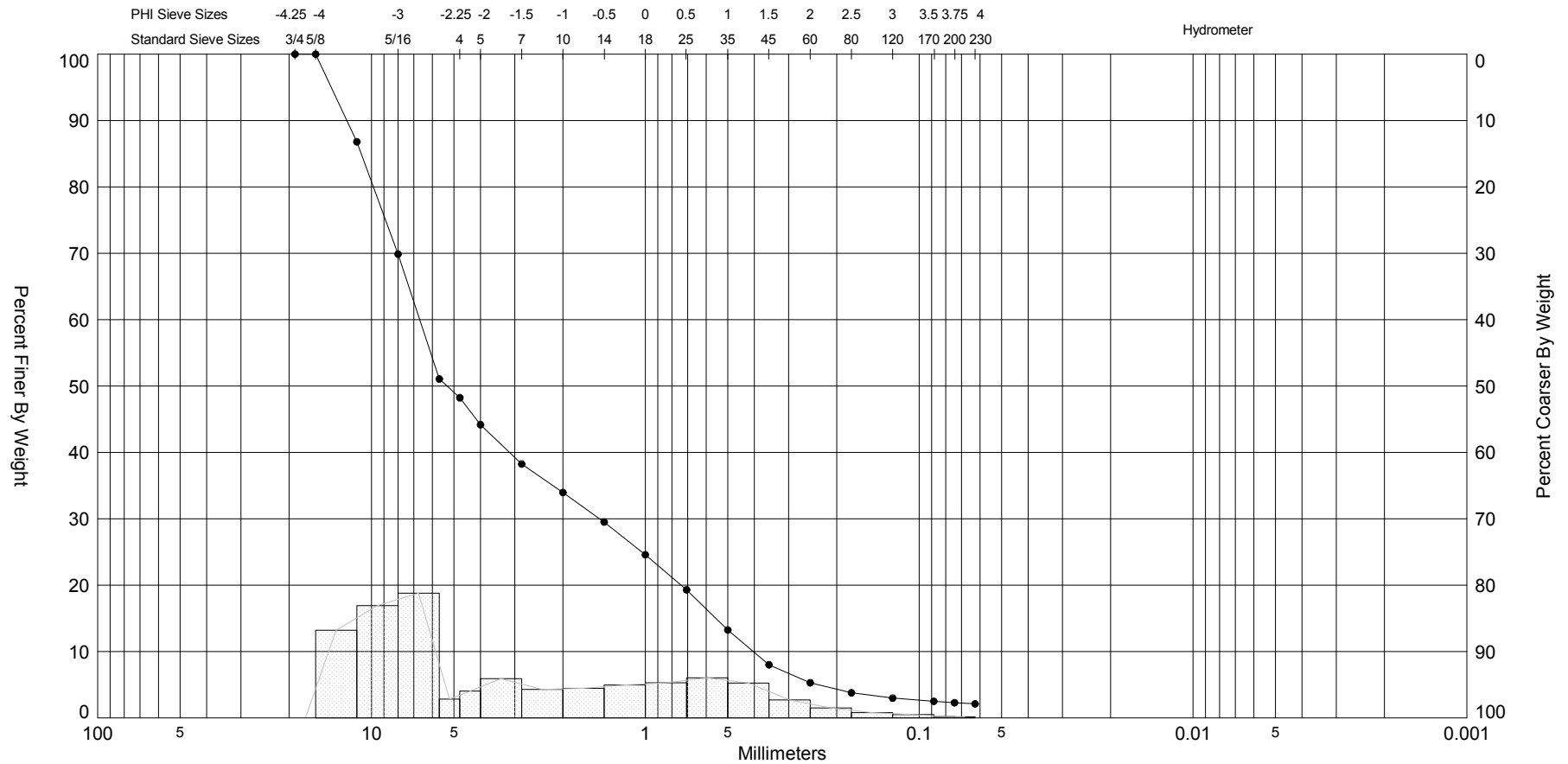
SIEVE ANALYSIS DE\_BOEM\_2015\_VC.GPJ\_JPBRAZIL.GDT 9/12/16




Gravel		Sand			Silt and Clay
Coarse	Fine	Coarse	Medium	Fine	

Sample	Symbol	Elev. (ft)	USCS	% Fines	% Organics	% Carbonates	Median	Mean	Skew	Kurt	Sort	Sample Information	
DE-BOEM-2015-VC07 #6	—●—	-70.0	SW	#200 - 4.46 #230 - 4.28		0	0.45	0.11	-1.19	4.59	1.41	Project Name:	Inventory of Potential Beach Nourishment and Coastal
Comments:												Analysis Date:	Restoration Sand Sources on the Atlantic OCS
Depths and elevations based on measured values												Analyzed By:	CS
												Easting (X, m):	505,335
												Northing (Y, m):	4,271,819
												Horizontal System:	NAD 1983
												Vertical System:	NAVD88
<b>CB&amp;I</b> Coastal Planning & Engineering, Inc. 2481 NW Boca Raton Blvd. Boca Raton, FL 33431 ph (561) 391 8102													

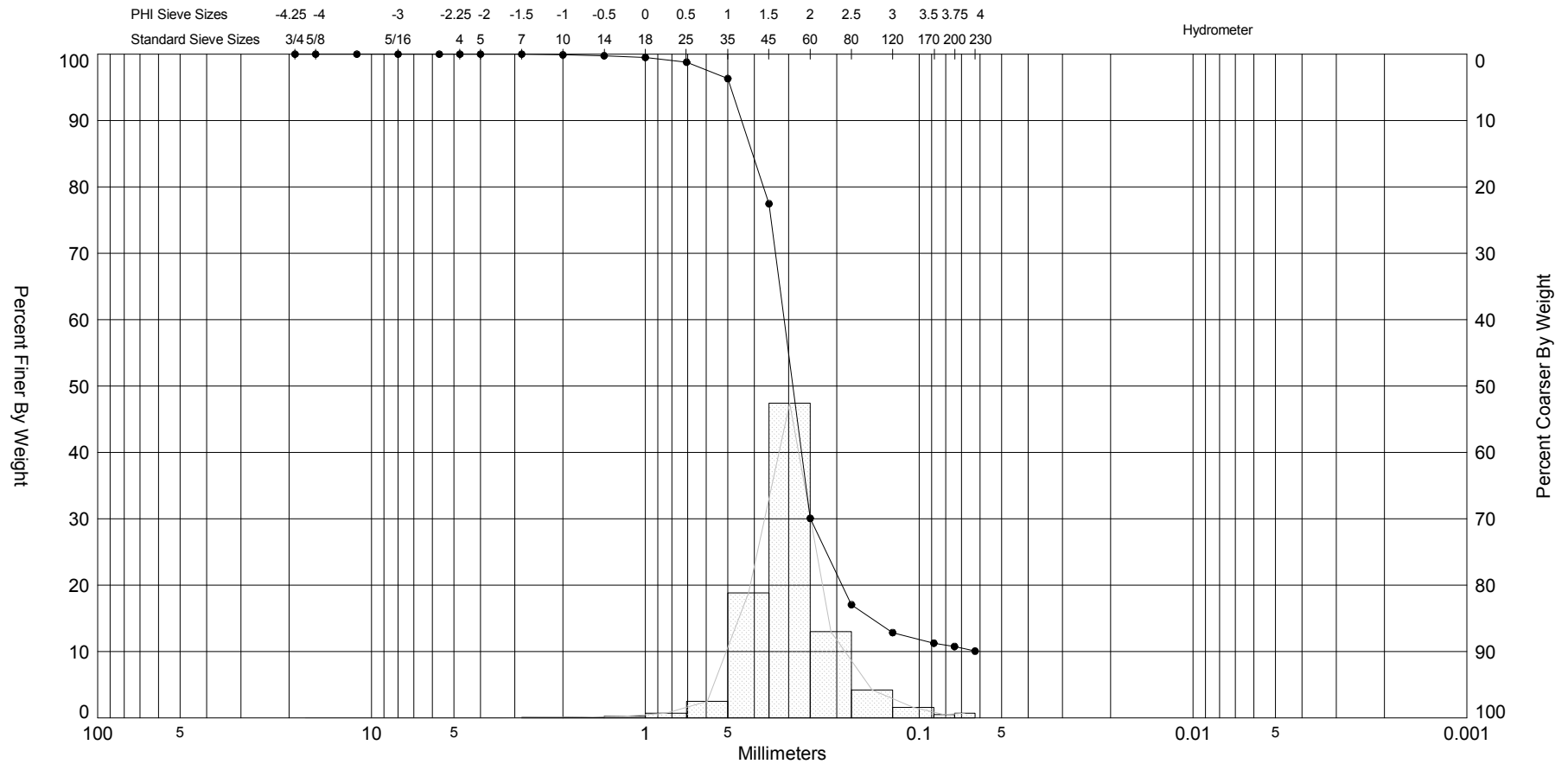
SIEVE ANALYSIS DE\_BOEM\_2015\_VC.GPJ\_JPBRAZIL.GDT 9/12/16




Gravel		Sand			Silt and Clay
Coarse	Fine	Coarse	Medium	Fine	

Sample	Symbol	Elev. (ft)	USCS	% Fines	% Organics	% Carbonates	Median	Mean	Skew	Kurt	Sort	Sample Information	
DE-BOEM-2015-VC07 #7	—●—	-71.3	GW	#200 - 2.29 #230 - 2.12		0		-1.7	0.78	2.46	1.84	Project Name:	Inventory of Potential Beach Nourishment and Coastal
Comments:												Analysis Date:	Restoration Sand Sources on the Atlantic OCS
Depths and elevations based on measured values												Analyzed By:	04-11-16 SMT
												Easting (X, m):	505,335
												Northing (Y, m):	4,271,819
												Horizontal System:	NAD 1983
												Vertical System:	NAVD88
												<b>CB&amp;I</b> Coastal Planning & Engineering, Inc. 2481 NW Boca Raton Blvd. Boca Raton, FL 33431 ph (561) 391 8102	

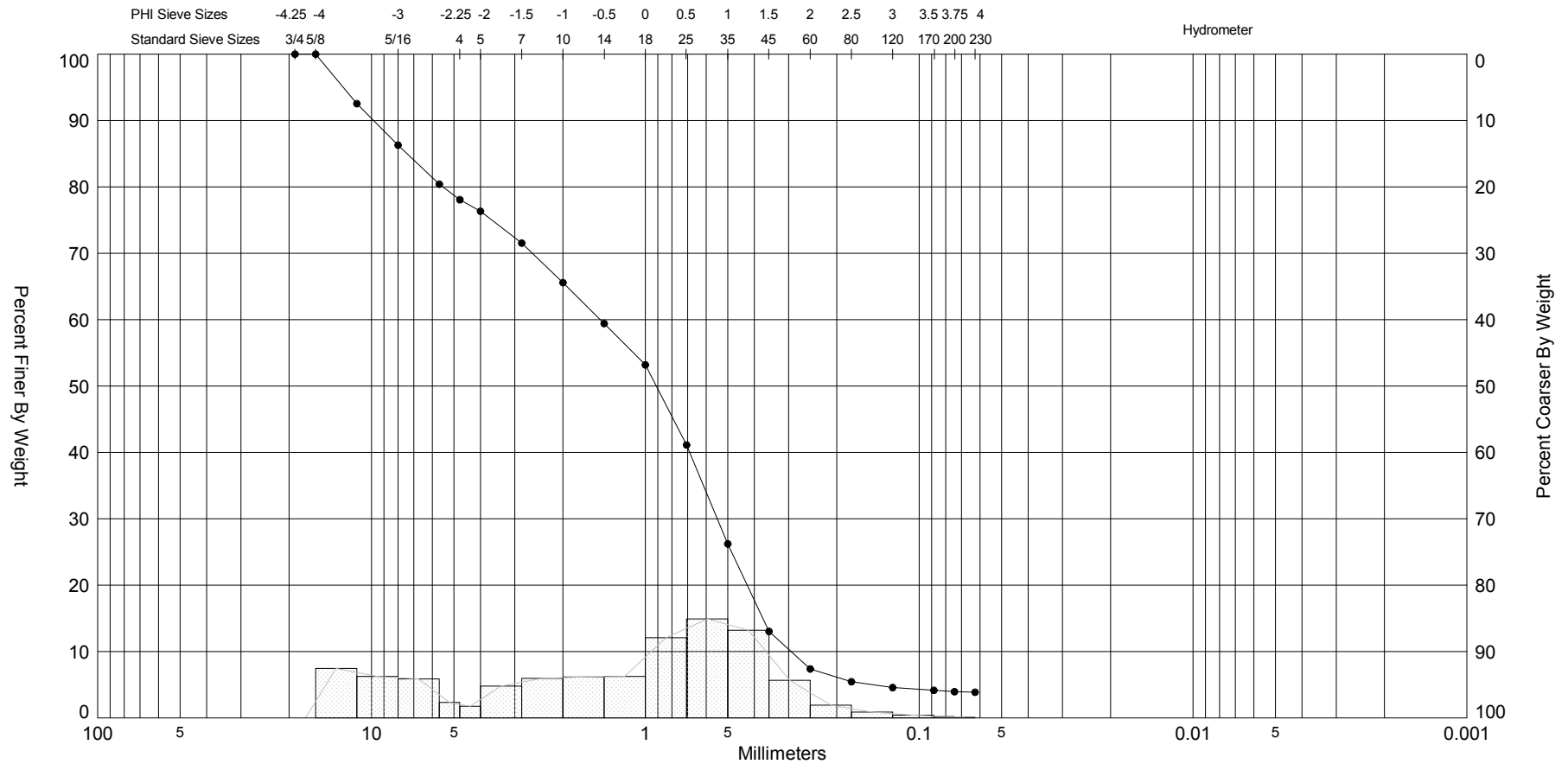
SIEVE ANALYSIS DE\_BOEM\_2015\_VC.GPJ\_JPBRAZIL.GDT 9/12/16



Gravel		Sand			Silt and Clay
Coarse	Fine	Coarse	Medium	Fine	

Sample	Symbol	Elev. (ft)	USCS	% Fines	% Organics	% Carbonates	Median	Mean	Skew	Kurt	Sort	Sample Information	
DE-BOEM-2015-VC07 #8	—●—	-74.9	SP-SM	#200 - 10.76 #230 - 10.07		0	1.79	1.77	0.37	6.9	0.55	Project Name:	Inventory of Potential Beach Nourishment and Coastal
Comments:												Analysis Date:	Restoration Sand Sources on the Atlantic OCS
Depths and elevations based on measured values												Analyzed By:	04-11-16 AV
												Easting (X, m):	505,335
												Northing (Y, m):	4,271,819
												Horizontal System:	NAD 1983
												Vertical System:	NAVD88
CB&I Coastal Planning & Engineering, Inc. 2481 NW Boca Raton Blvd. Boca Raton, FL 33431 ph (561) 391 8102													

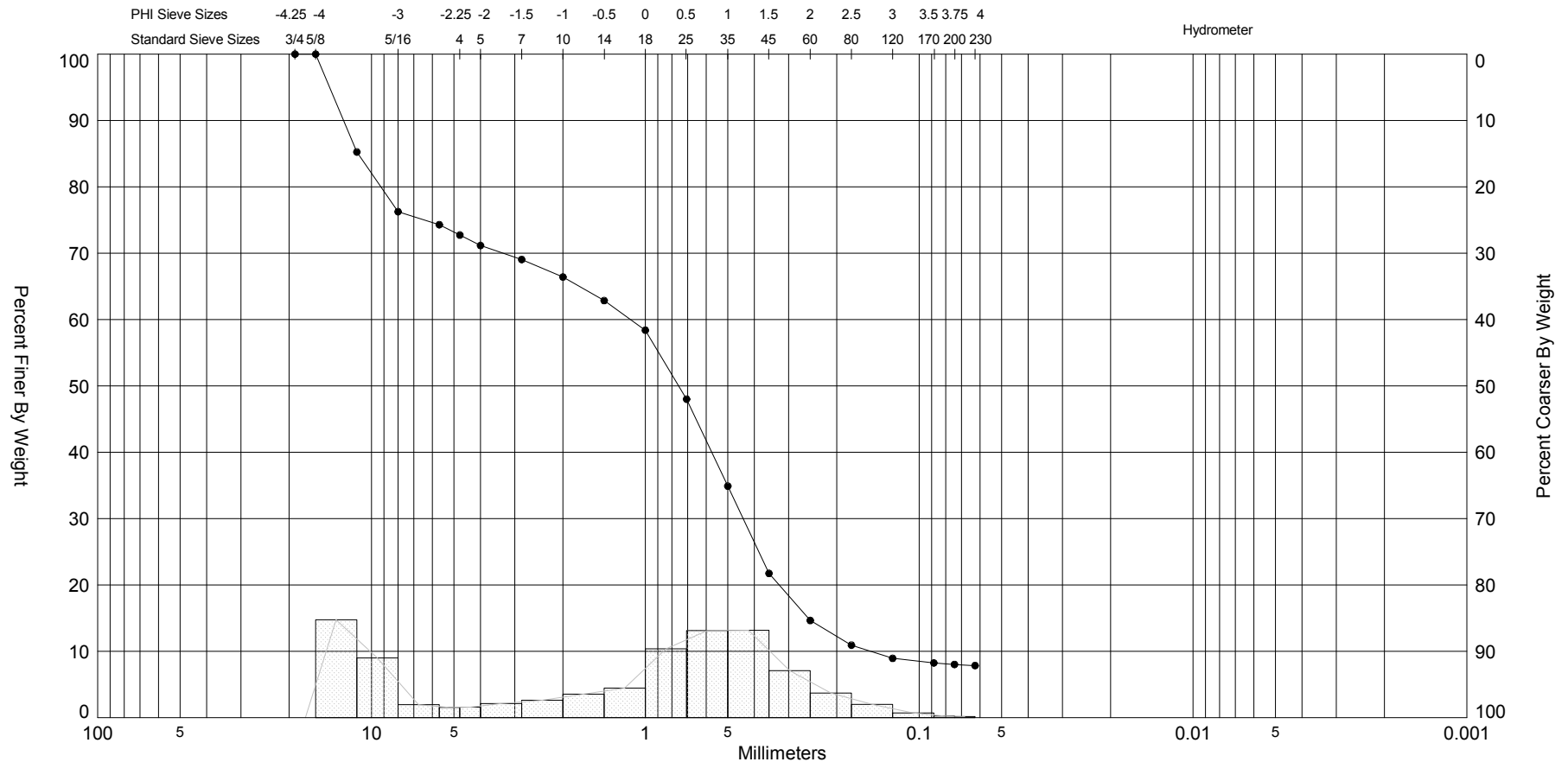
SIEVE ANALYSIS DE\_BOEM\_2015\_VC.GPJ\_JPBRAZIL.GDT 9/12/16




Gravel		Sand			Silt and Clay
Coarse	Fine	Coarse	Medium	Fine	

Sample	Symbol	Elev. (ft)	USCS	% Fines	% Organics	% Carbonates	Median	Mean	Skew	Kurt	Sort	Sample Information	
DE-BOEM-2015-VC08 #1	—●—	-65.3	SW	#200 - 3.95 #230 - 3.87		2	0.13	-0.48	-0.4	2.05	1.81	Project Name:	Inventory of Potential Beach Nourishment and Coastal
Comments:												Analysis Date:	Restoration Sand Sources on the Atlantic OCS
Depths and elevations based on measured values												Analyzed By:	04-11-16 SMT
 <b>CB&amp;I</b> Coastal Planning & Engineering, Inc. 2481 NW Boca Raton Blvd. Boca Raton, FL 33431 ph (561) 391 8102												Easting (X, m):	507.425
												Northing (Y, m):	4,274,002
												Horizontal System:	NAD 1983
												Vertical System:	NAVD88

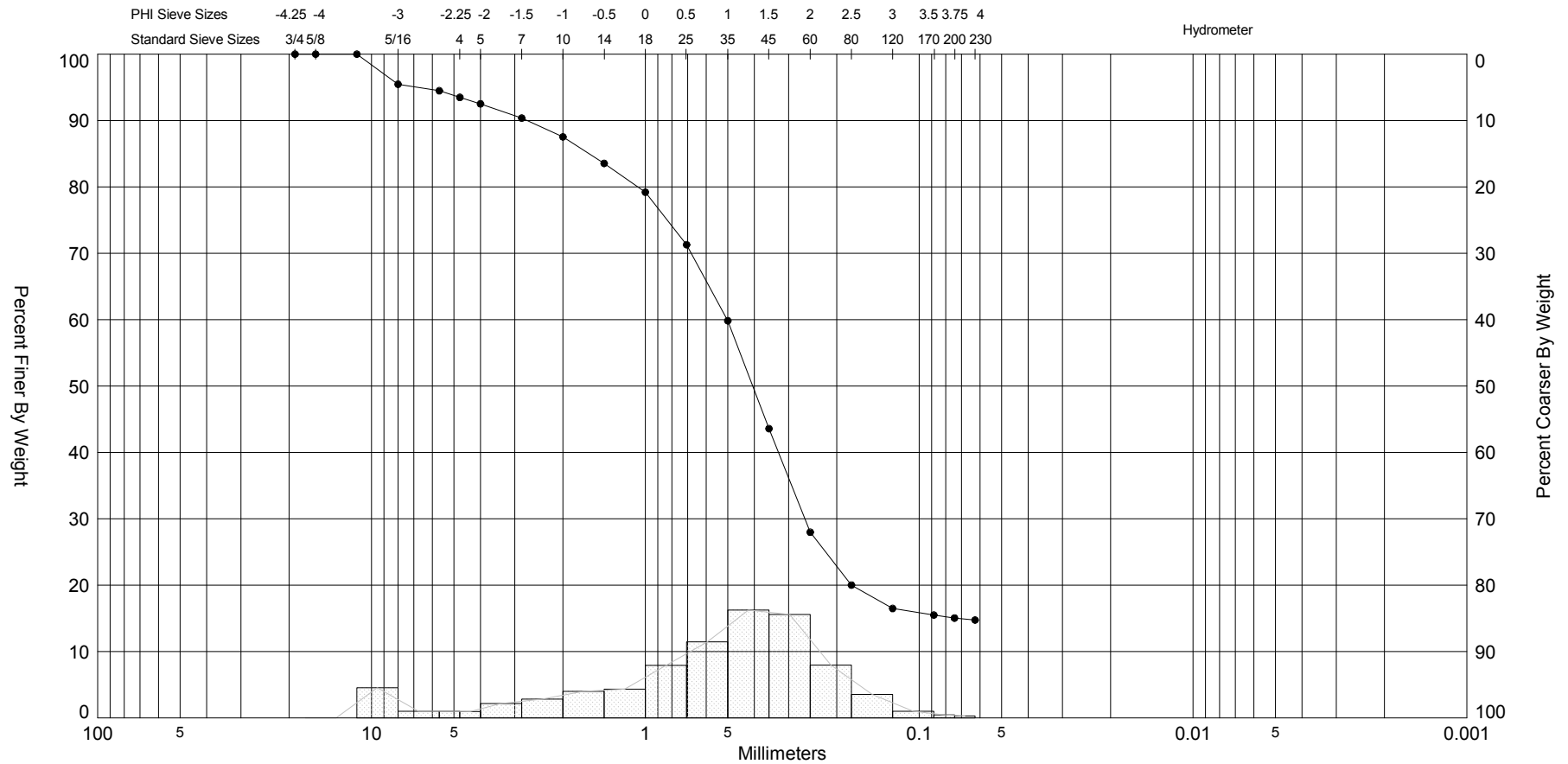
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Gravel		Sand			Silt and Clay
Coarse	Fine	Coarse	Medium	Fine	

Sample	Symbol	Elev. (ft)	USCS	% Fines	% Organics	% Carbonates	Median	Mean	Skew	Kurt	Sort	Sample Information	
DE-BOEM-2015-VC08 #2	—●—	-66.5	SW-SC	#200 - 8.02 #230 - 7.85		0	0.4	-0.53	-0.34	1.72	2.13	Project Name:	Inventory of Potential Beach Nourishment and Coastal
Comments:												Analysis Date:	Restoration Sand Sources on the Atlantic OCS
Depths and elevations based on measured values												Analyzed By:	04-11-16 SMT
												Easting (X, m):	507.425
												Northing (Y, m):	4,274,002
												Horizontal System:	NAD 1983
												Vertical System:	NAVD88
<b>CB&amp;I</b> Coastal Planning & Engineering, Inc. 2481 NW Boca Raton Blvd. Boca Raton, FL 33431 ph (561) 391 8102													

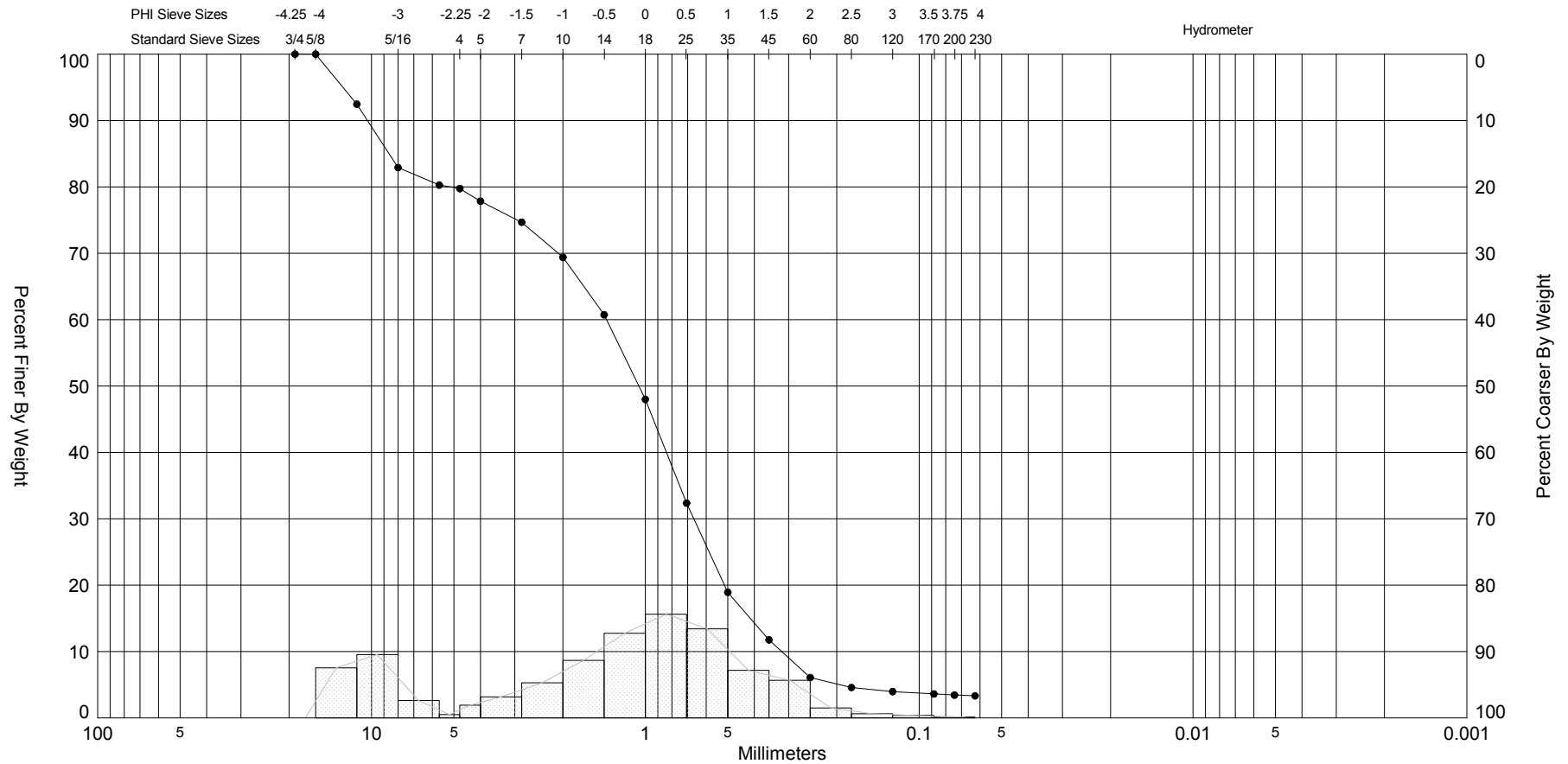
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Gravel		Sand			Silt and Clay
Coarse	Fine	Coarse	Medium	Fine	

Sample	Symbol	Elev. (ft)	USCS	% Fines	% Organics	% Carbonates	Median	Mean	Skew	Kurt	Sort	Sample Information	
DE-BOEM-2015-VC08 #3	—●—	-67.9	SC	#200 - 15.05 #230 - 14.75		0	1.3	0.69	-0.97	3.5	1.56	Project Name:	Inventory of Potential Beach Nourishment and Coastal
Comments:												Analysis Date:	Restoration Sand Sources on the Atlantic OCS
Depths and elevations based on measured values												Analyzed By:	SMT
 <b>CB&amp;I</b> Coastal Planning & Engineering, Inc. 2481 NW Boca Raton Blvd. Boca Raton, FL 33431 ph (561) 391 8102												Easting (X, m):	507.425
												Northing (Y, m):	4,274,002
												Horizontal System:	NAD 1983
												Vertical System:	NAVD88

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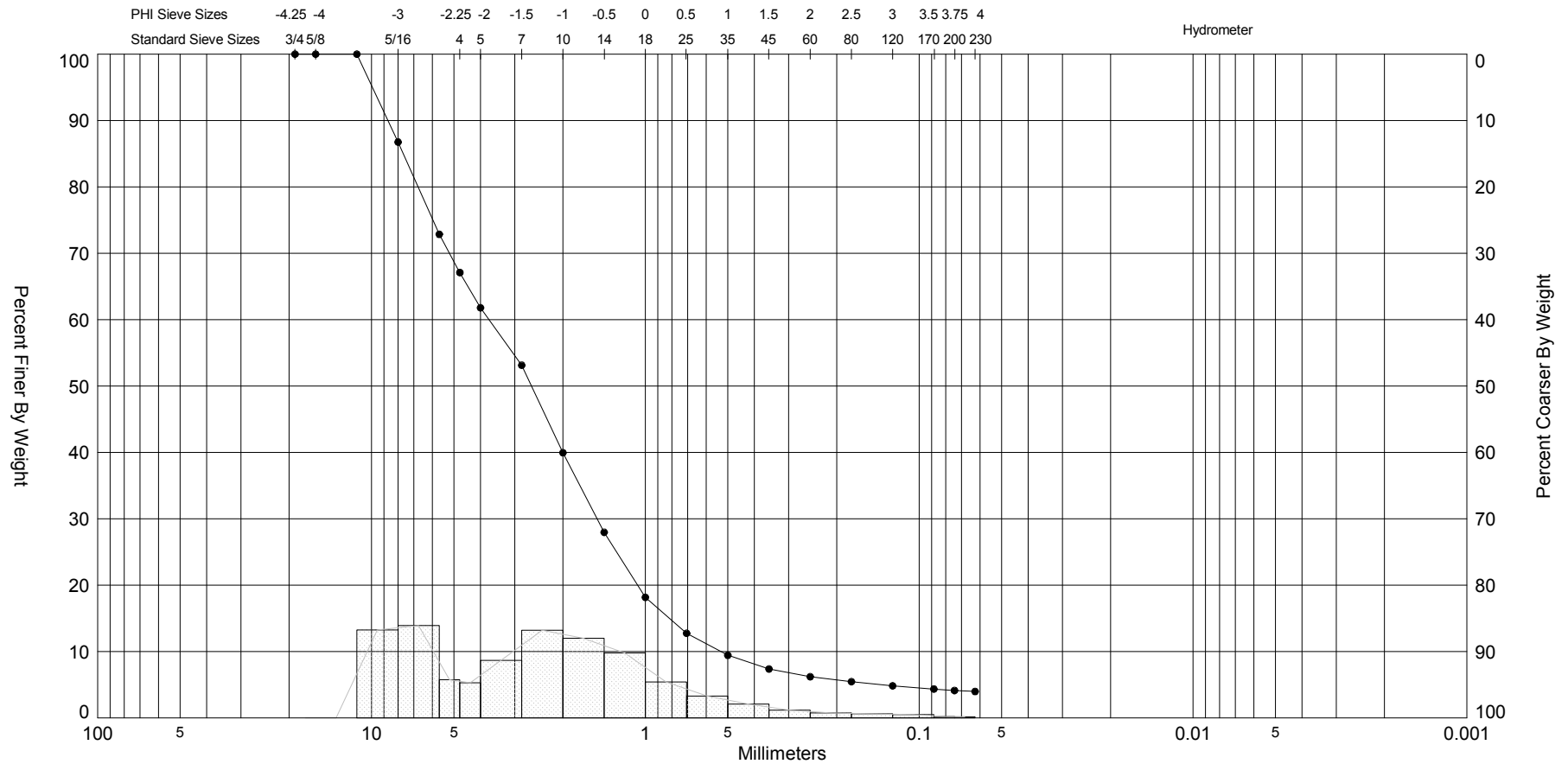


Gravel		Sand			Silt and Clay
Coarse	Fine	Coarse	Medium	Fine	


Sample	Symbol	Elev. (ft)	USCS	% Fines	% Organics	% Carbonates	Median	Mean	Skew	Kurt	Sort	Sample Information	
DE-BOEM-2015-VC08 #4	—●—	-69.6	SW	#200 - 3.44 #230 - 3.33		0		-0.55	-0.46	2.3	1.73	Project Name:	Inventory of Potential Beach Nourishment and Coastal
Comments:												Analysis Date:	Restoration Sand Sources on the Atlantic OCS
Depths and elevations based on measured values												Analyzed By:	04-11-16 SMT
												Easting (X, m):	507.425
												Northing (Y, m):	4,274,002
												Horizontal System:	NAD 1983
												Vertical System:	NAVD88
CB&I Coastal Planning & Engineering, Inc. 2481 NW Boca Raton Blvd. Boca Raton, FL 33431 ph (561) 391 8102													



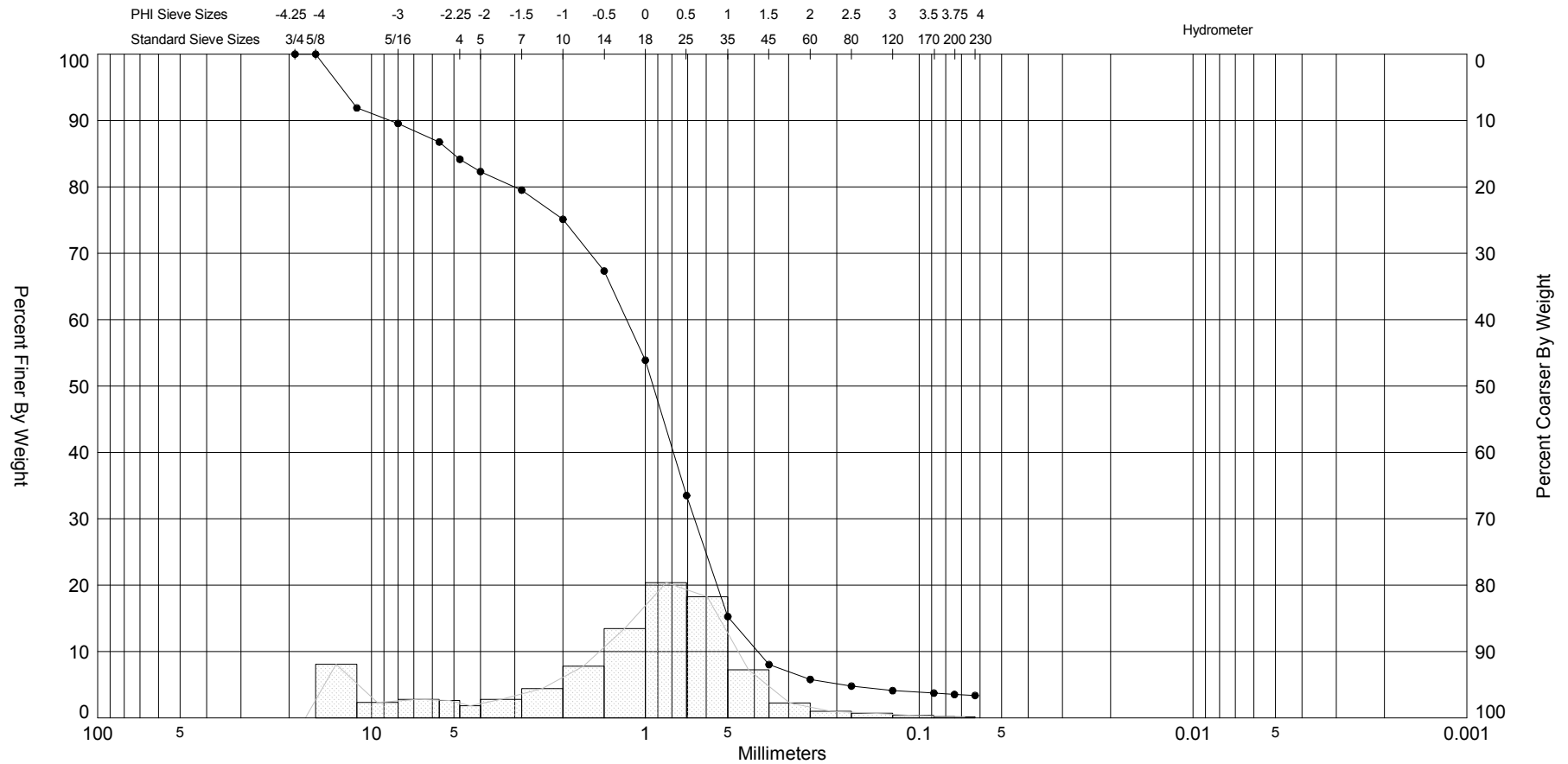
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Gravel		Sand			Silt and Clay
Coarse	Fine	Coarse	Medium	Fine	

Sample	Symbol	Elev. (ft)	USCS	% Fines	% Organics	% Carbonates	Median	Mean	Skew	Kurt	Sort	Sample Information	
DE-BOEM-2015-VC08 #5	—●—	-70.9	SW	#200 - 4.13 #230 - 3.98		0		-1.4	0.73	3.41	1.43	Project Name:	Inventory of Potential Beach Nourishment and Coastal
Comments:												Analysis Date:	Restoration Sand Sources on the Atlantic OCS
Depths and elevations based on measured values												Analyzed By:	04-11-16 AV
												Easting (X, m):	507.425
												Northing (Y, m):	4,274,002
												Horizontal System:	NAD 1983
												Vertical System:	NAVD88
CB&I Coastal Planning & Engineering, Inc. 2481 NW Boca Raton Blvd. Boca Raton, FL 33431 ph (561) 391 8102													

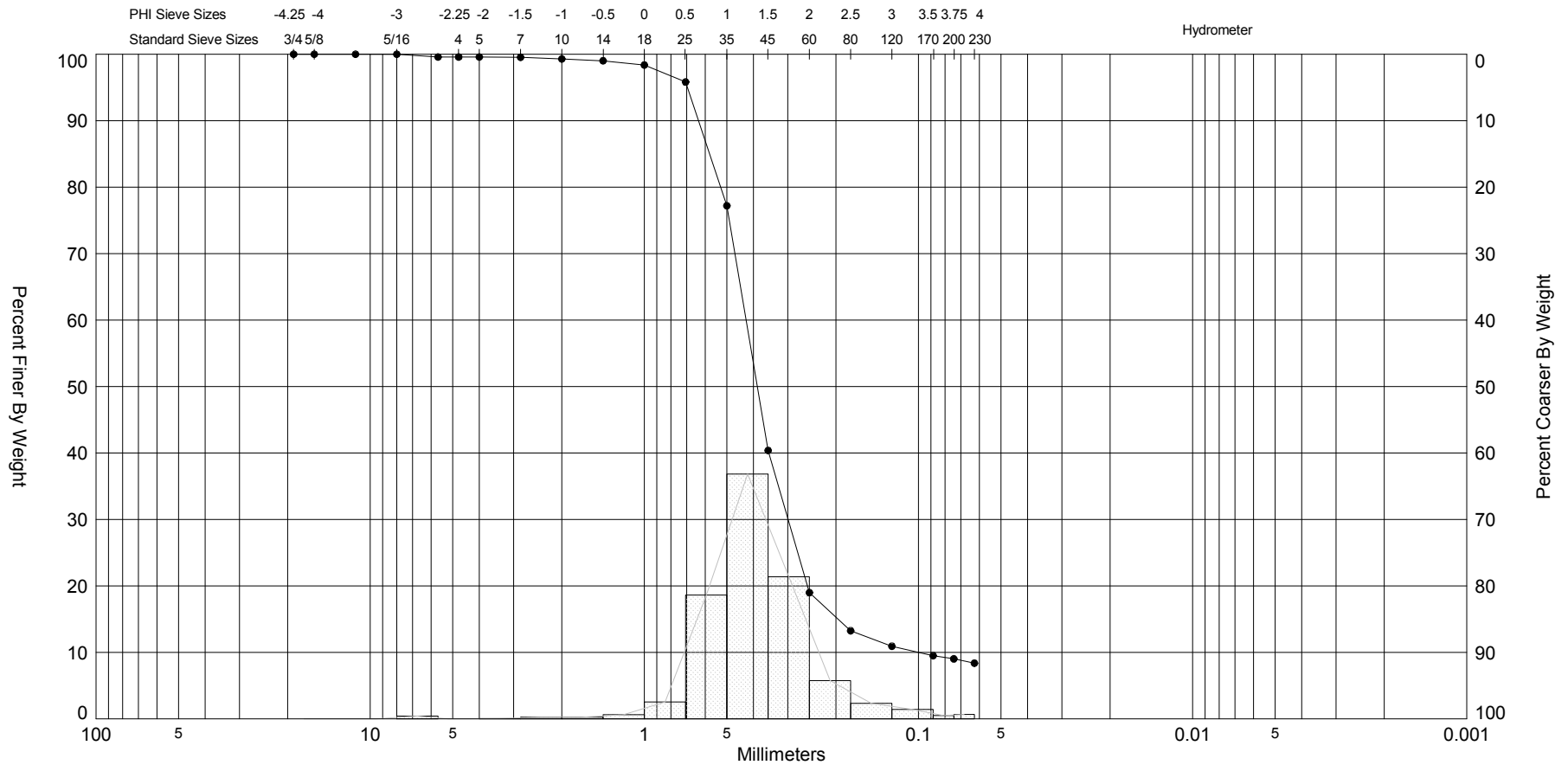
SIEVE ANALYSIS DE\_BOEM\_2015\_VC.GPJ\_JPBRAZIL.GDT 9/12/16



Gravel		Sand			Silt and Clay
Coarse	Fine	Coarse	Medium	Fine	

Sample	Symbol	Elev. (ft)	USCS	% Fines	% Organics	% Carbonates	Median	Mean	Skew	Kurt	Sort	Sample Information	
DE-BOEM-2015-VC08 #6	—●—	-72.1	SW	#200 - 3.53 #230 - 3.38		0	0.1	-0.38	-0.74	3.02	1.57	Project Name:	Inventory of Potential Beach Nourishment and Coastal
Comments:												Analysis Date:	Restoration Sand Sources on the Atlantic OCS
Depths and elevations based on measured values												Analyzed By:	04-11-16 AV
												Easting (X, m):	507.425
												Northing (Y, m):	4,274,002
												Horizontal System:	NAD 1983
												Vertical System:	NAVD88
CB&I Coastal Planning & Engineering, Inc. 2481 NW Boca Raton Blvd. Boca Raton, FL 33431 ph (561) 391 8102													

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Gravel		Sand			Silt and Clay
Coarse	Fine	Coarse	Medium	Fine	

Sample	Symbol	Elev. (ft)	USCS	% Fines	% Organics	% Carbonates	Median	Mean	Skew	Kurt	Sort	Sample Information	
DE-BOEM-2015-VC08 #7	—●—	-74.3	SP-SM	#200 - 9.03 #230 - 8.38		0	1.37	1.36	-0.31	9.32	0.71	Project Name:	Inventory of Potential Beach Nourishment and Coastal

Comments:	Analysis Date:	Restoration Sand Sources on the Atlantic OCS
Depths and elevations based on measured values	Analyzed By:	04-11-16 AV



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2481 NW Boca Raton Blvd.  
Boca Raton, FL 33431  
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Easting (X, m):	507.425
Northing (Y, m):	4,274,002
Horizontal System:	NAD 1983
Vertical System:	NAVD88