

January 15, 2021

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Re: Summary of Sand Survey

Dear Ms. Boshek,

Gahagan and Bryant (GBA) was subcontracted by Edgewater Resources (ER) to perform a sand mining survey off the coast of Illinois Beach State Park. The objective was to find a potential borrow source of sand that could be used for beach nourishment as part of the proposed shoreline protection design at Illinois Beach State Park (IBSP). Generally, the location of the survey took place along the shoreline of Areas 1-3, from 100 feet off the beach to a water depth of approximately 60-65 feet. The areas of survey coverage are shown in Figure 1. The detailed location of all collected data can be found in Appendix A of GBA's report behind this cover letter. GBA used a sub bottom profiler, collected surficial grab samples, and advanced vibracore samples to accomplish the following goals:

- Estimate the thickness and volume of available sand layers
- Determine the grain size and percent fines for suitability as a borrow source

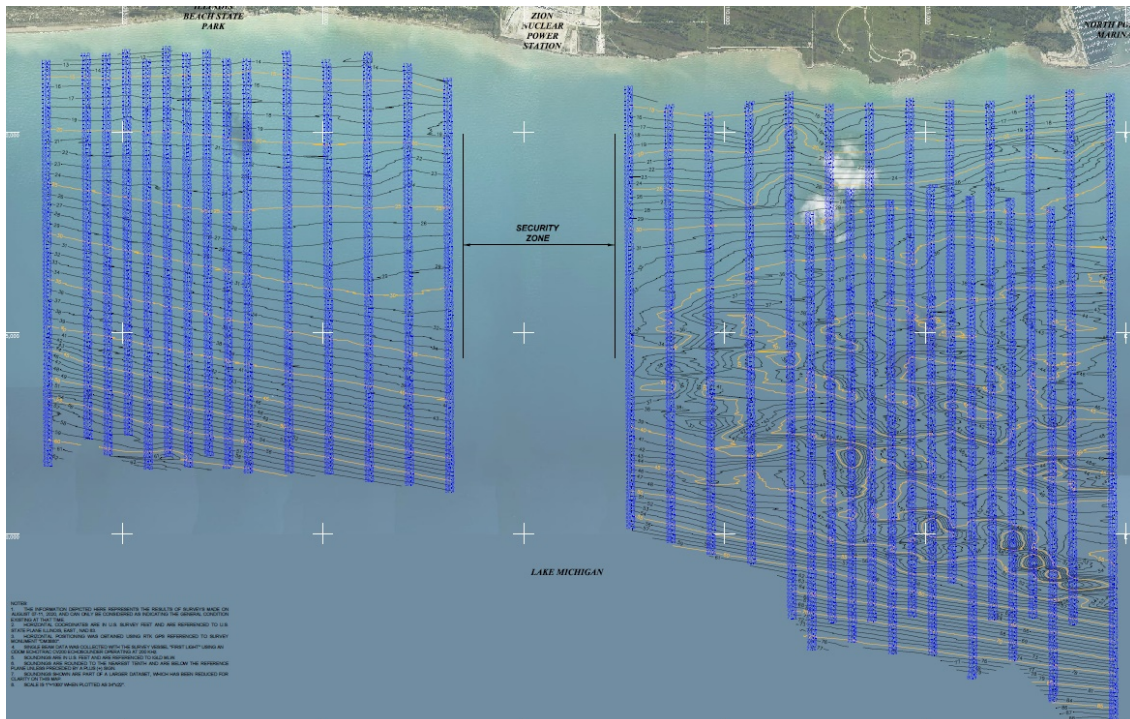


Figure 1: Location of sand survey



GBA identified three potential borrow source areas based on the sub bottom profile and surface grab samples, Figure 2. Twenty vibratory samples were advanced in these three areas. The suitability of the borrow source material was evaluated by comparing the grain size distribution (GSD) data between the borrow source and the native beach sand at the areas where beach nourishment will be required. GBA's full data report with the collected data has been attached to the end of this memorandum.

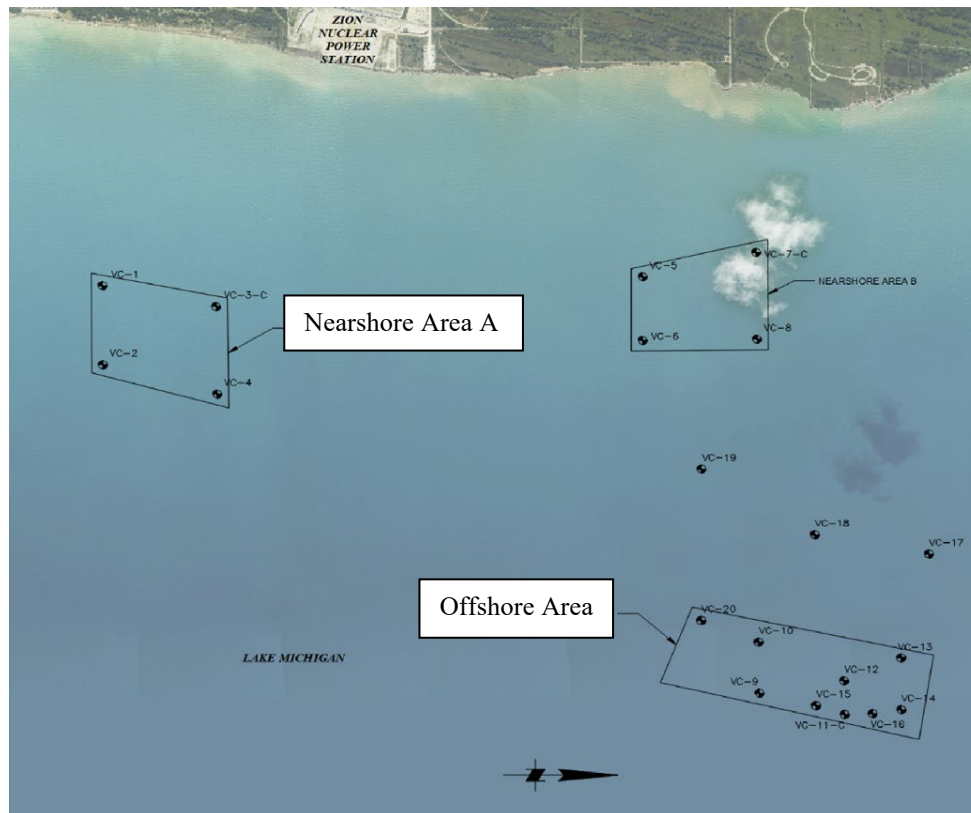


Figure 2: Potential borrow source areas

Characterization of the two nearshore sand samples by GBA suggest the submerged fore beach areas have a mean grain size ranging from 0.10 to 0.12 mm. The offshore potential borrow areas had a mean grain size range from 0.13 to 0.40 mm. Seven sand samples collected from the dry beach at the mid berm yielded a mean grain size from 0.30 to 0.52 mm. ER collected supplemental samples across the dry beach in January of 2021. The mean grain size of the collected samples was between 0.36 and 0.48 mm with sorting statistics and fines percentages very similar to the GBA mid berm samples. The results did not substantially change the overall grain size statistics.

GBA used the Dean (1974) method to calculate an overfill factor using the grain size data between the borrow source and the beach to receive nourishment. In this method, the overfill factor accounts for the smaller grain size material in the borrow source that will be lost after placement as compared to the native beach sand. By this method, an ideal overfill factor would be 1.0 to 1.3. Meaning at worst, the required beach nourishment volume would increase by 30% from the design prism.

Of the three potential borrow source areas identified during the sand survey, only the offshore area yielded grain sizes comparable to the existing beach. The overfill factor was calculated to be 1.62 by GBA using the Dean Method. The offshore area was preliminary estimated to be 3-5 feet thick and



approximately 45 acres, yielding approximately 294,000 cubic yards of potential beach nourishment sand. Preliminary, we would estimate that the depth of the burrow source to be 45-50 feet deep and the distance from the beach to be 2 miles offshore.

The USACE's Coastal Engineering Manual (CEM) (2003) computes an overfill factor by a different procedure, which is more heavily biased toward the fine sand portion in the burrow source. This method typically yields higher overfill factors than the Dean Method. Following the method in the CEM, a different overfill factor is found to be 2.75. A summary of this calculation can be found at the end of the memorandum. Note the $\phi 90$ and $\phi 10$ were used in lieu of $\phi 95$ and $\phi 5$ for the CEM calculation since those were the grain size distribution statistics available.

Regardless of which method is applied, the overfill factor is larger than desired assuming the beach alone will stabilize against the waves.

However, there are options for where mined sand from the nearshore A, nearshore B, or offshore burrow areas could still be used:

- The sand at either of the three burrow sources could be used in areas where general fill is required but will not be directly affected by waves. One such area is behind breakwater BW 1.1. The fill behind much of that structure will not be interacting with waves and therefore suitable for beach nourishment at that location.

- Another factor to consider is the reduction in wave energy hitting the beach due to the addition of the offshore breakwaters. The breakwaters will reduce the magnitude of sediment transport potential after construction. It is reasonable to suppose that the new beach may not need as coarse of sand as was measured during the sand survey. This would have to be checked in a shoreline morphology model that considers grain size.

- The other option is to consider a veneer approach, with coarse upland sourced sand placed over the finer offshore mined sand. ER ran some SBEACH profile simulations with typical storms in this area to determine if this approach was viable. This is illustrated in Figure 3 which suggests for a nearshore wave height of 6 ft in 10 feet of water at a period of 9 seconds, the maximum anticipated profile shift is 4 feet. We would therefore recommend that a coarse sand layer, capping the finer sand, be at least 6 feet in thickness. Again this is best recommended for use in Area 1 since that area is designed to be more of a closed littoral cell.

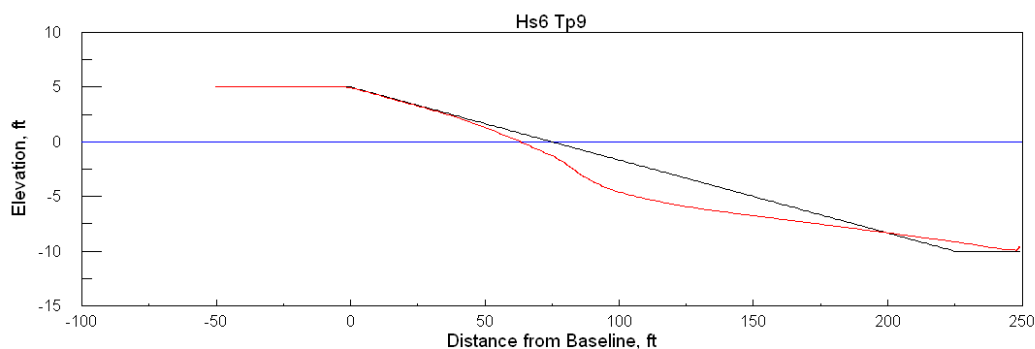
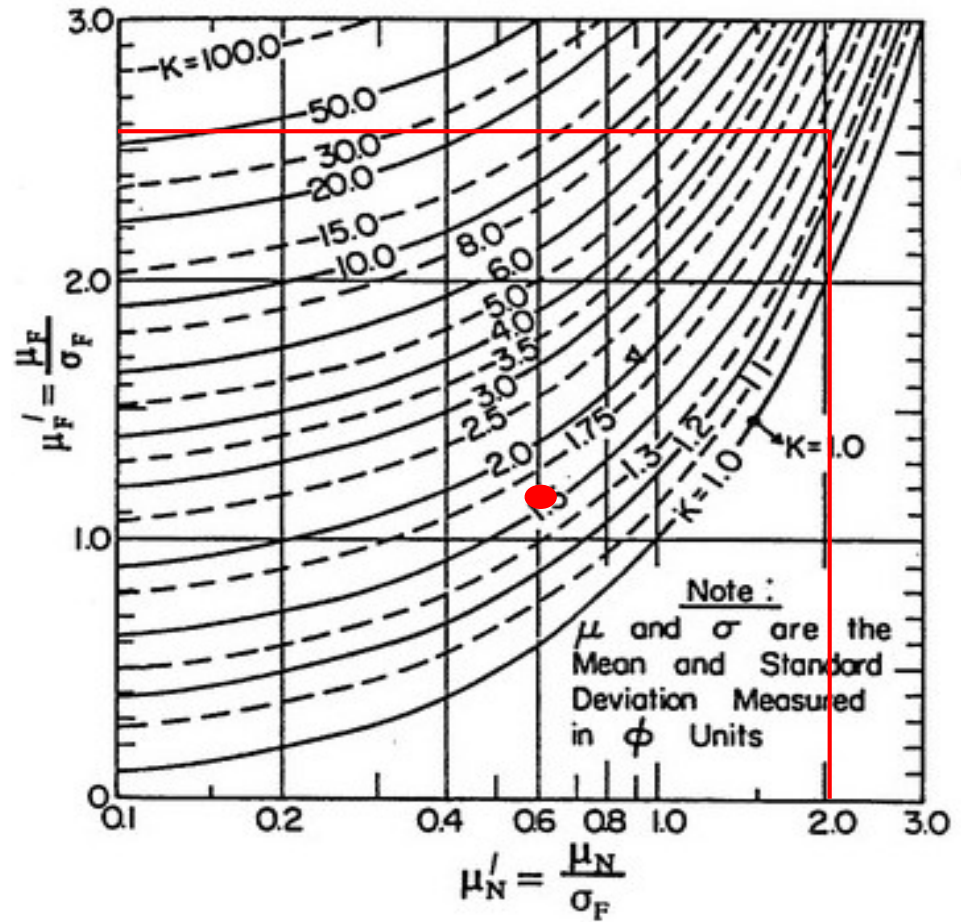


Figure 3: SBEACH model results

$$\sigma\phi = (\phi_{84} - \phi_{16})/2$$

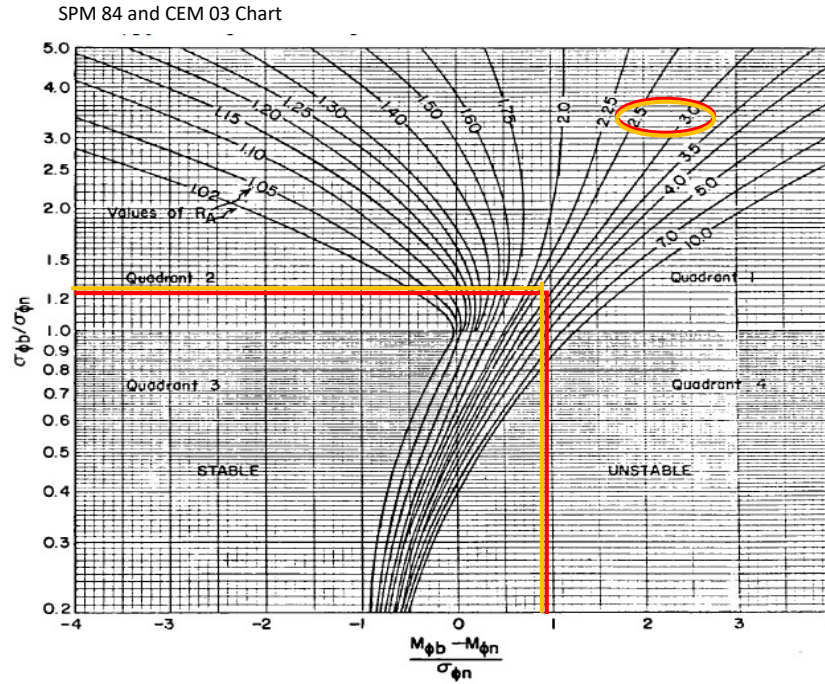
$$M\phi = (\phi_{84} + \phi_{16})/2$$

Percentile	16th	84th	16th	84th
Percent Passing	d85	d15	d85	d15
unit	mm	mm	ϕ	ϕ
Native GSD Data	0.63	0.27	0.67	1.89
Borrow GSD Data	0.46	0.17	1.12	2.56
$\sigma\phi$ native	0.61			
$\sigma\phi$ borrow	0.72			
$M\phi$ native	1.28			
$M\phi$ borrow	1.84			
x axis	2.09			
y axis	2.56			
Ra Value	1.6			



SPM 84 and CEM 03 Ovefill Factor

Percentile	16th	84th	90th	10th	50th	16th	84th	90th	10th	50th
Percent Passing	d85	d15	d10	d90	d50	d85	d15	d10	d90	d50
unit	mm	mm	mm	mm	mm	φ	φ	φ	φ	φ
Native GSD Data	0.59	0.27	0.23	0.68	0.39	0.77	1.91	2.13	0.55	1.36
Borrow GSD Data	0.46	0.17	0.15	0.57	0.27	1.11	2.59	2.78	0.82	1.91
SPM 84 σφ native	0.57									
SPM 84 σφ borrow	0.74									
SPM 84 Mφ native	1.34									
SPM 84 Mφ borrow	1.85									
SPM 84 x axis	0.90									
SPM 84 y axis	1.30									
CEM 03 Mφ native	1.35									
CEM 03 Mφ borrow	1.87									
CEM 03 σφ native	0.55									
CEM 03 σφ borrow	0.70									
CEM 03 x axis	0.96									
CEM 03 y axis	1.27									
CEM 03	2.75									



SPM 84

$$\sigma\phi = (\phi_{84} - \phi_{16})/2$$

SPM 84

$$M\phi = (\phi_{84} + \phi_{16})/2$$

CEM 03 x axis (using 90 and 10 instead of 95 and 5)

$$\frac{M_{\phi b} - M_{\phi n}}{\sigma_{\phi n}} = \frac{\left[\frac{(\phi_{16} + \phi_{50} + \phi_{84})}{3} \right]_b - \left[\frac{(\phi_{16} + \phi_{50} + \phi_{84})}{3} \right]_n}{\left[\frac{(\phi_{84} - \phi_{16})}{4} + \frac{(\phi_{95} - \phi_5)}{6} \right]_n}$$

CEM 03 y axis (using 90 and 10 instead of 95 and 5)

$$\frac{\sigma_{\phi b}}{\sigma_{\phi n}} = \frac{\left[\frac{(\phi_{84} - \phi_{16})}{4} + \frac{(\phi_{95} - \phi_5)}{6} \right]_b}{\left[\frac{(\phi_{84} - \phi_{16})}{4} + \frac{(\phi_{95} - \phi_5)}{6} \right]_n}$$

Illinois Beach State Park

Sand Source Survey

Waukegan, IL

December 2020

Prepared For:

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Prepared By:



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1 Introduction

Edgewater Resources tasked Gahagan and Bryant Associates, Inc. (GBA) with performing a reconnaissance level offshore investigation of potential sand sources for use as beach nourishment material offshore of the Illinois State Park Beach, located in Zion, Illinois (Figure 1). The sand search sought to identify areas where the compatible, surficial sand thickness was sufficient to economically mine, and the material is suitable for beach nourishment. The study area was limited to a 10 square mile region offshore of the Illinois Beach State Park in Zion, Illinois (Figure 2).

The initial phase of the sand investigation involved the performance of a single beam hydrographic survey to obtain the regional bathymetry, and a Compressed High Intensity Radar Pulse (CHIRP) sub-bottom survey to identify subsurface material layers within 3-5 miles of the potential beach nourishment site at the Illinois Beach State Park. Both surveys were run along transect lines with 1,000-foot spacing and tighter 500-foot spacing in areas of interest to map the thickness of the potential surficial sand layer.

Grab samples were collected and vibracoring was performed to ground truth the geophysical surveys. Sediment lab analyses were performed on the grab samples, vibracore samples, as well as native beach samples collected from the existing park beach. Samples from three vibracores were also tested for metals at a chemical laboratory. Volumes of the beach quality material were developed from the survey, sampling and vibracore data. Field work was performed from July 31, 2020 to August 16, 2020. Sediment laboratory analyses, data processing, and drawing preparation took place from August 17, 2020 to November 5, 2020.

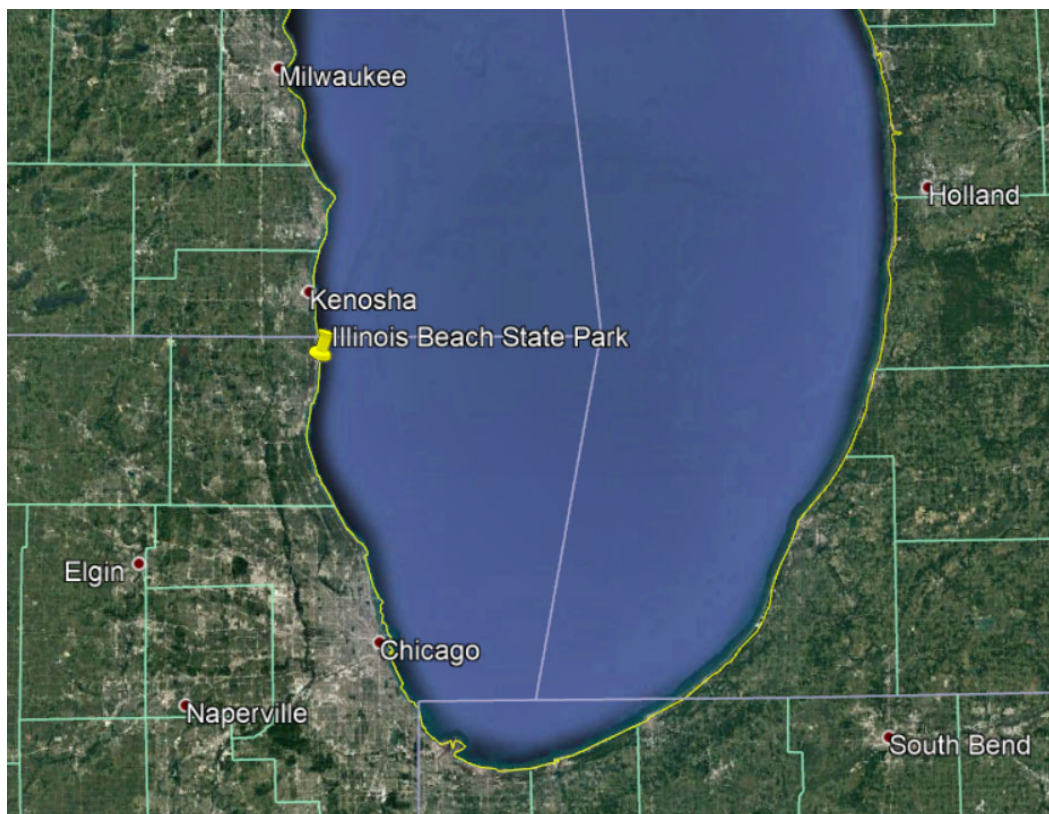


Figure 1. Project location

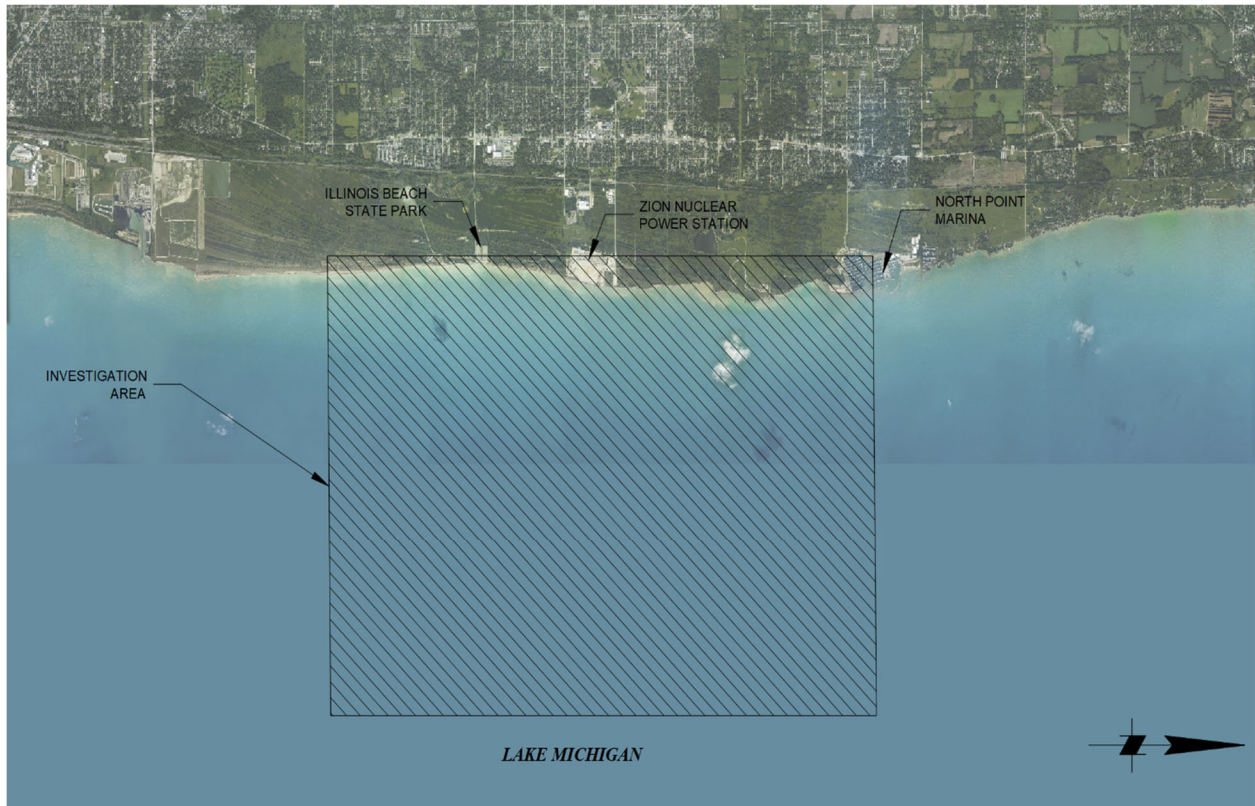


Figure 2. Investigation area map

2 Investigation Tasks

2.1 Control Survey

Initial control recon surveys were performed to recover and verify published coordinates of NGS survey monuments near the project area. Initial recovery work was performed using the Illinois virtual Real Time Kinematic (RTK) GPS network with connection to station Gurnee. NGS monument DM 3880 and NG 0221 were recovered, but due to a dense vegetation canopy, NG 0221 was unsuitable for survey control use. Once control checks had been performed on DM 3880, the survey crew established a fixed project RTK base station on the rooftop of Illinois Beach Hotel using the Illinois virtual RTK network. A Trimble SPS 852 receiver was connected to a Trimble Zephyr antenna. Radio corrections were broadcast through a Trimble Trimmark 3 radio. After base station setup, the crew performed additional control checks on DM 3880 to verify that base station coordinates were within survey error tolerances.

2.2 Single Beam Hydrographic Survey

Single beam hydrographic surveys were performed along both 500-foot and 1000-foot stations within the project area. The hydrographic survey was performed using a Trimble SPS 461 RTK GPS with positioning and real time tide corrections received from the GBA project base station. Depths were obtained using an ODOM CV 200 echo sounder operating at 200khz/33khz nominally. Survey cross-sections extended approximately 3-4 miles offshore. After collection, the hydrographic data was processed in GBA's proprietary software ODP for preparation of deliverables. The survey data was collected in the NAVD88 vertical datum and was later corrected to the IGLD MLW datum using a correction factor of 577.5'.

2.3 CHIRP Sub-bottom Survey

CHIRP sub-bottom profiling data was collected using a swept frequency sub-bottom acoustic profiler. An EdgeTech ET3400 towfish operating at a linear frequency sweep over full spectrum frequency range within the 2 to 10 kHz bandwidth was used. Acoustic reflecting boundaries occur at interfaces between different geologic materials and can be used to interpret sub-bottom structure and stratigraphy. Sub-bottom data was collected simultaneously with single beam bathymetric data at 1,000-foot spacing. After ground truthing of the data by collecting surface grab samples, additional survey lines were run at 500-foot spacing in areas of interest.



Figure 3. EdgeTech ET3400 sub-bottom profiler

After collection, the data was processed and reviewed using Chesapeake Technology SonarWiz software. Grab samples were correlated with surficial sub-bottom layers and vibracore locations were selected for further investigation.

2.4 Grab Sample Collection

Surface sediment samples were collected from GBA's survey vessel with a ponar grab sampler. Samples were collected at various depths, as well as at bathymetric features, such as shoals and steeper grade slopes. When beach quality material was found, additional samples were taken to help determine the spatial extents of the beach quality material. A total of 66 surface samples were collected. Sieve analyses were performed only on samples that contained potential beach quality material.

2.5 Native Beach Sample Collection

Native beach samples of the existing berm sediments were collected at six locations along the Illinois State Park Beach berm, as shown in Figure 4. Sieve analyses were performed on all the samples. The physical properties of the native beach sediments were used as the basis to determine which potential offshore borrow areas had the most compatibility with the existing resident beach sand.

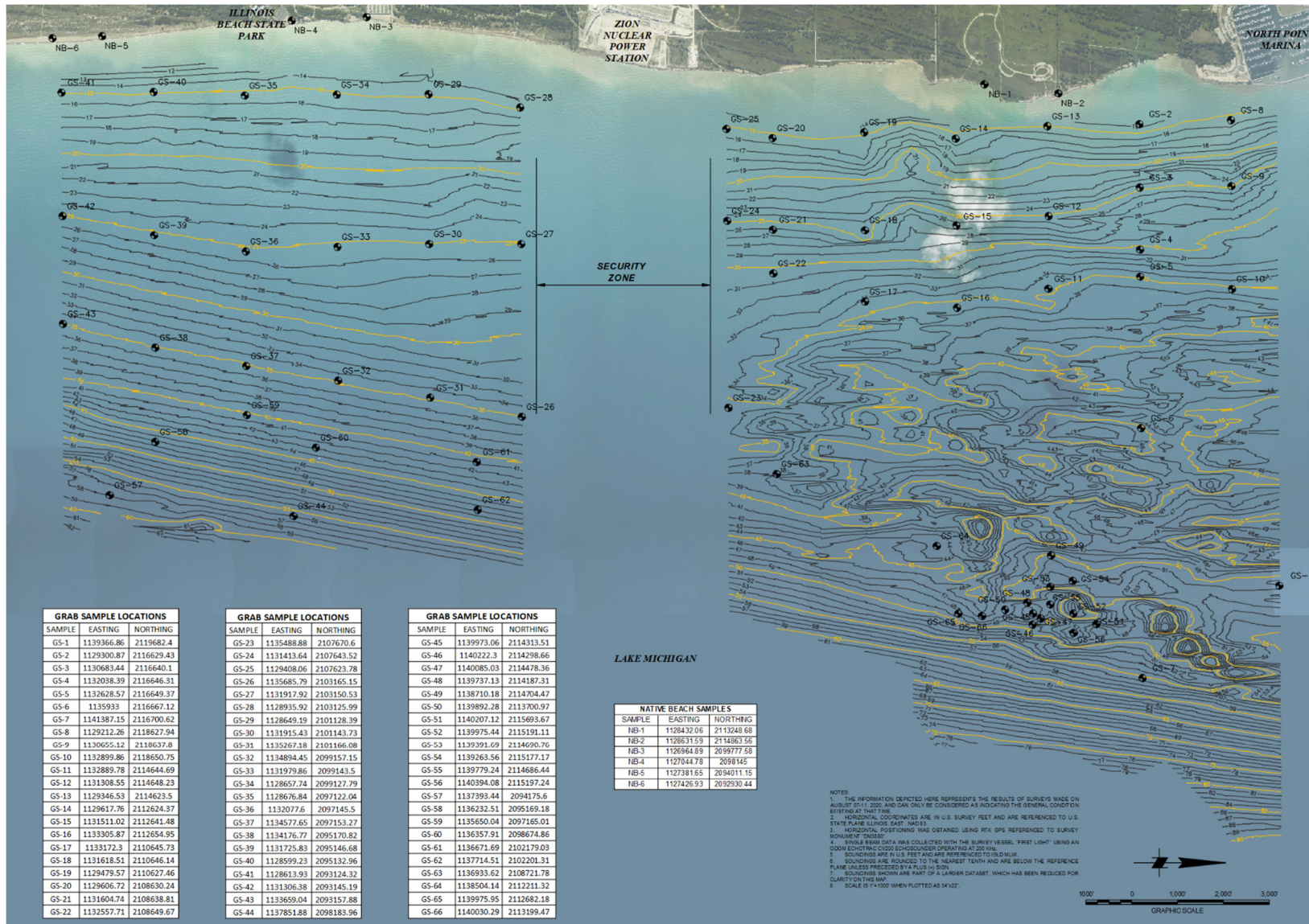


Figure 4. Grab and native beach sample location map

2.6 Vibracore Collection

Core locations were selected based on data collected during the bathymetric survey, sub-bottom survey, and grab sample collection. Core locations were selected in areas that showed correlation between beach quality grab samples, bathymetric features and sub bottom layer thickness. Athena Technologies from McClellanville, South Carolina collected the vibracores using the 35-foot vessel “Artemis”, shown in Figure 5. A total of 20 vibracores were collected on August 13th and 14th and their locations are shown in Figure 6. Of the total vibracores, 17 were collected with 25-foot sections of 3-inch diameter aluminumized steel core barrels and 3 cores were collected for chemical sampling with 25-foot sections of 3-inch diameter stainless steel core barrel. These cores were extruded onto a tarp on deck and logged and sampled for chemical analysis. An extruded core is shown in Figure 7.



Figure 5. Athena’s vibracore vessel “Artemis”

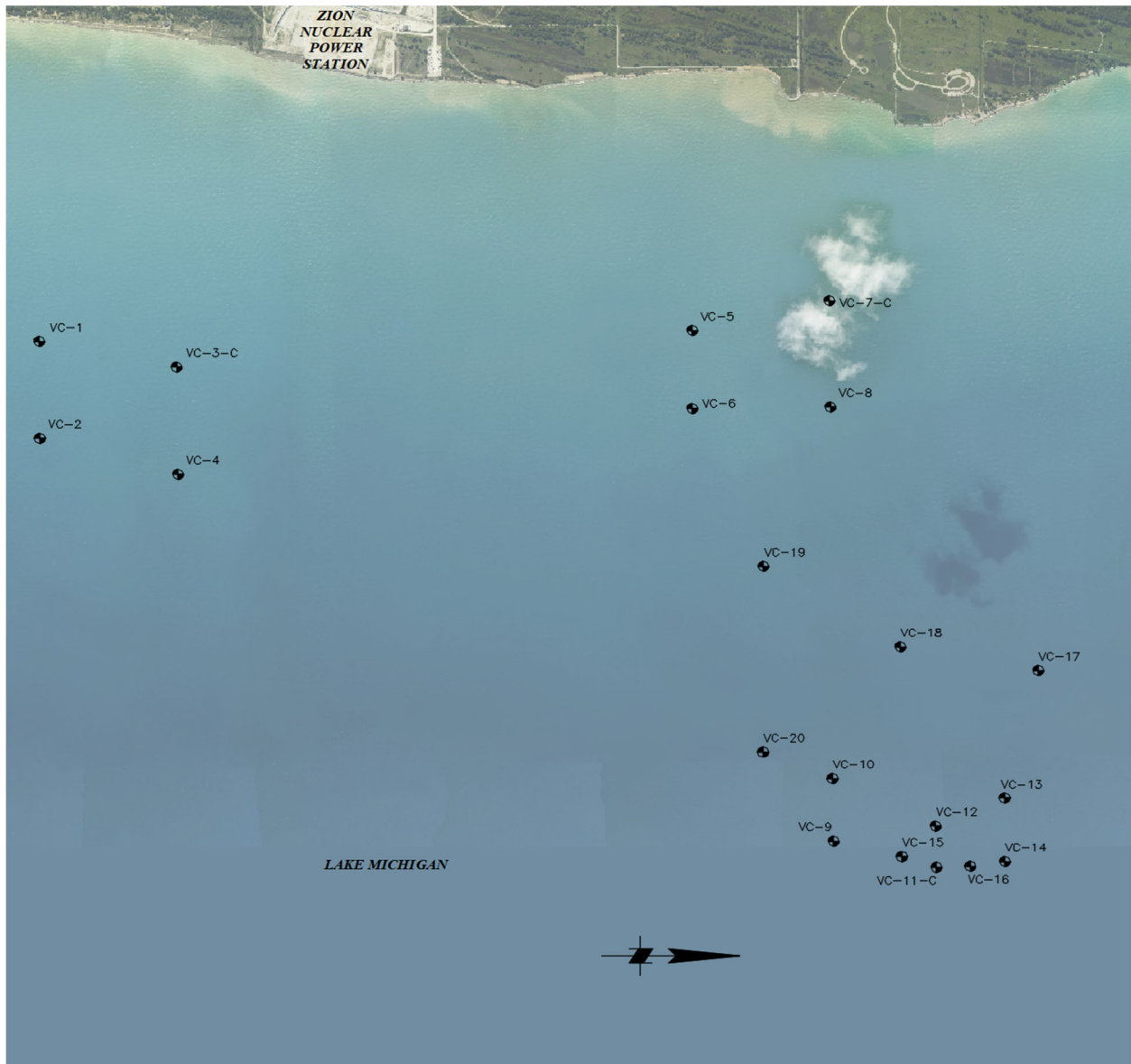


Figure 6. Vibracore location map

The remaining 17 cores were transported to Athena’s laboratory, where they were cut into 5-foot sections, split, and photographed. Half of each core was wrapped in plastic wrap to be logged and sampled, and the archive half was transferred to a PVC sleeve, wrapped in plastic, and placed in lay flat tubing. The cores were logged and sampled at GBA’s sediment lab in Tampa, FL.



Figure 7. Vibracore extruded on deck for chemical sampling

2.7 Chemical Testing

Chemical testing was performed on the three extruded samples to determine if metal contaminants were present, at the request of Illinois State DEP staff. The samples were transported to Eurofins Xenco, LLC laboratories in Tampa for analysis. The two analytical methods used to test were ICP-MS Metals by SW 6020A, and Mercury by SW-846 7470A. The samples were tested using prep method SW 3010A creating an elutriate matrix.

2.8 Physical Testing

Physical testing was performed on six native beach samples, 26 grab samples, and 36 vibracore samples. Samples were taken from the distinct layers of sandy sediments within each core. Dry Munsell color was determined in accordance with American Society for Testing and Materials Standard Materials Designation D2488-00 (ASTM 2009) and noted in the logs.

Grain size analysis was conducted in accordance with American Society for Testing and Materials Standard Materials Designation D422-63 for particle size analysis of soils (ASTM, 2007). The samples were oven dried, wet sieved through a #230 sieve prior to dry sieving, and mechanically sieved through a stack of 18 sieves from $\frac{3}{4}$ -in to #230. The sieve analysis data were entered into Bentley gIINT[®] software, which performs a statistical analysis of the data using the moment method.

2.9 Data Analysis and Investigation area Selection

Following the collection of the bathymetric and sub-bottom survey data and grab samples, three areas were delineated for further investigation with vibracores. All of the data components (bathymetry, sub bottom, grab samples) were analyzed for potential areas of beach compatible sand, and those areas were outlined within each data set. Two areas were in the 25-30-foot depth range, one towards the north of the project area and the other towards the south of the project area. A third area was located farther offshore in the 45-50-foot depth range as shown in Figure 8.

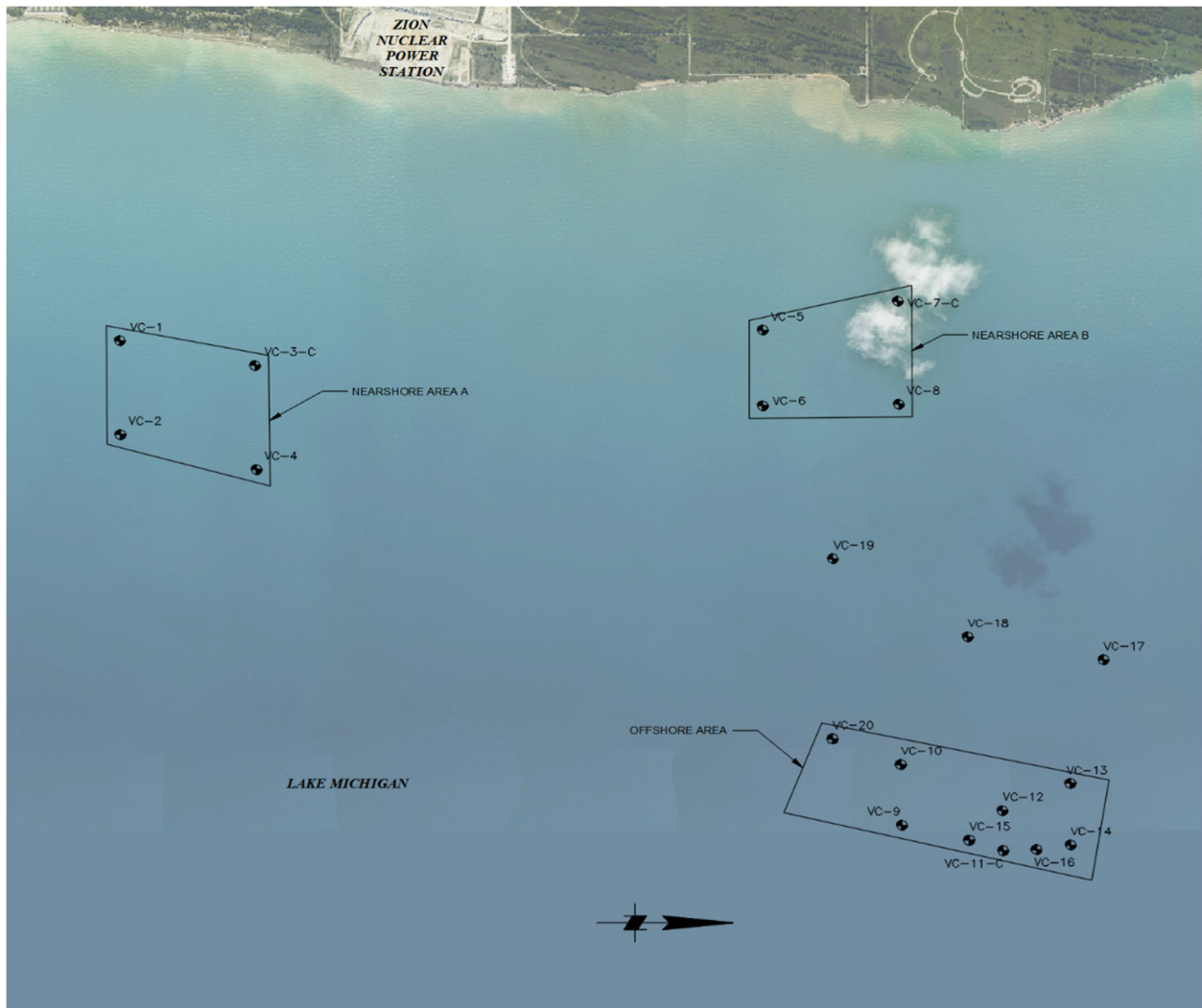


Figure 8. Vibracore investigation areas.

Grab samples in the selected areas contained medium to very fine sand, with minor amounts of silty material. Grab samples in the nearshore areas consisted of fine sand but did contain some silty material. Sub-bottom data in the two nearshore areas indicated a surface layer approximately 6-14 feet thick. Figure 9 shows the sub-bottom profile at the location of VC-02.

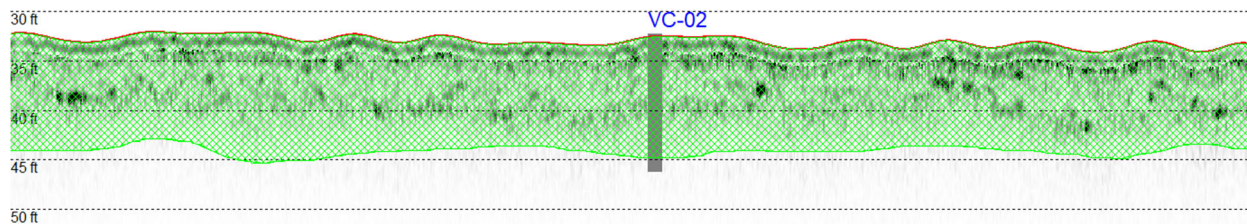


Figure 9. Sub-bottom profile at VC-02

The bathymetry in these two areas was gently sloping. Grab samples in the offshore area were coarser than the nearshore areas and contained medium to fine sand, with very little silty material. The sub-bottom data within the offshore investigation area indicated a surficial layer 15-20 feet thick. Figure 10 shows the sub-bottom profile at the location of VC-12 and GS-48 within the Offshore Area.

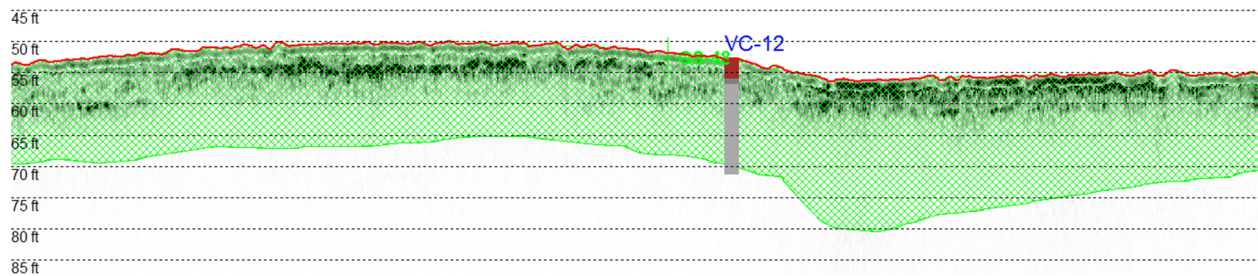


Figure 10. Sub-bottom profile at VC-12 and GS-48

The bathymetry in the Offshore Area showed a ridge punctuated with shoal mounds, with a steep slope on the eastern side. Four vibracore locations were selected in Nearshore Area A and four locations were selected in Nearshore Area B. Nine locations were selected in the Offshore Area of interest.

In order to perform chemical testing on samples taken at depth, one vibracore from each area of interest was collected with a stainless-steel core barrel and extruded on the deck of the boat. Samples were collected for chemical analysis and site water was also collected to prepare an elutriate matrix in the lab. The three cores collected for chemical analysis were core VC—3-C in Nearshore Area A, VC-7-C in Nearshore Area B, and VC-11-C in the Offshore Area.

Three cores were also collected in between the nearshore areas and Offshore Area. VC-17, VC-18, and VC-19 were collected on a ridge in approximately 40 feet of water. Location selection for these cores were based upon the ridge feature and the surficial layer in the sub-bottom data.

3 Results

3.1 Native Beach Sample Laboratory Analysis

Six native beach samples collected from the beach berm were analyzed. Mean grain sizes ranged from 0.30 mm to 0.52 mm. Percent fines (passing @230 sieve) ranged from .01 to .16%. Dry Munsell color for all native beach samples was 10YR 7/3, very pale brown. Table 1 contains the significant native beach sample statistics. Sieve reports for each individual sample are located in Appendix D.

Native Beach Sample Statistics					
Sample	Easting	Northing	Elev. (NAVD 88)	Mean (mm)	% fines (#230)
NB-1	1128432.06	2113248.68	584.526	0.33	0.08
NB-2	1128631.59	2114863.56	587.212	0.49	0.01
NB-3	1126964.89	2099777.58	585.518	0.44	0.12
NB-4	1127044.78	2098145.00	589.426	0.44	0.16
NB-5	1127381.65	2094011.15	585.791	0.30	0.11
NB-6	1127426.93	2092930.44	587.661	0.52	0.04

Table 1. Native beach sample statistics

3.2 Chemical Testing

Samples VC-3-C, VC-7-C and VC-11-C were collected for chemical testing. Sample VC-3-C was collected from a depth of 6 feet, sample VC-7-C was collected from a depth of 4.5 feet, and sample VC-11-C was collected from a depth of 3.5 feet. Metals found present in the samples are presented in Table 2. The Eurofins Xenco Laboratory report is attached in Appendix C.

Metal	Sample Results Elutriate Matrix (mg/L)		
	VC-3-C (Nearshore Area A)	VC-7-C (Nearshore Area B)	VC-11-C (Offshore Area)
Aluminum	0.712	0.601	2.18
Arsenic	0.000747	0.00078	0.00157
Barium	0.0204	0.0272	0.0295
Beryllium			0.000491
Cadmium			0.000259
Chromium	0.00154	0.00104	0.00404
Copper	0.00134	0.00118	0.00243
Lead	0.000664	0.00063	0.00194
Mercury		0.000032	
Nickel	0.00101	0.00107	0.00247
Selenium			0.000467
Thallium			0.000442
Tin	0.00177	0.00133	0.0029
Zinc	0.00416	0.00447	0.0447

Table 2. Chemical testing results

3.3 Nearshore Areas A and B

Vibracores VC-1 through VC-8 were collected in the two nearshore areas. The mean grain size for samples collected in these two areas ranged from 0.1 to 0.12 mm, indicating a very fine sand. Percent fines (passing #230 sieve) ranged from 1.94% to 17.47%. Significant sample statistics for the vibracores collected in the two nearshore areas are contained in Table 3. Individual sieve reports for each sample are contained in Appendix F. Vibracore logs are attached in Appendix B.

Nearshore Areas Sample Statistics				
Core	Sample #	Depth (ft.)	Mean (mm)	% fines (#230)
VC-1	1	1	0.11	2.55
VC-1	2	5.5	0.11	6.5
VC-2	1	1	0.12	1.94
VC-2	2	6.5	0.11	4.88
VC-3	1	6	0.12	17.47
VC-4	1	1.5	0.12	1.96
VC-4	2	8	0.12	6.86
VC-6	1	2	0.1	7.09
VC-7	1	4.5	0.11	13.95
VC-8	1	1.5	0.12	4.24

Table 3. Nearshore area sample statistics

While the two areas contained sandy material, lab results revealed that the mean grain size was much smaller than the native beach material. Also, some of the samples contained a higher percentage of silt, some up to 17%. The material from these two areas is not compatible with the native beach material and would erode quickly if placed within the beach berm.

3.4 Offshore Area

Vibracores VC-9 through VC-17 were collected in the Offshore Area of interest, which lies approximately 2.2 miles offshore. This area is in the northeast corner of the project area in approximately 45-50 feet of water. Within this potential offshore borrow area, the vibracores and laboratory analysis revealed an area containing a surficial layer of beach quality sand approximately 3-5 feet in thickness. Vibracores located in this area were VC-9, VC-12, VC-14, VC-15, and VC-16. The mean grain size for samples collected in the offshore area ranged from 0.13 to 0.40 mm. Percent fines (passing #230 sieve) ranged from 0.25% to 3.47%. Sample statistics for the surficial layer of sand are displayed in Table 4. Below the surficial beach quality sands reside finer sands with silt contents ranging from 2.56-20.06%.

Offshore Area Sample Statistics				
Core	Sample #	Depth (ft.)	Mean (mm)	% fines (#230)
VC-9	1	1	0.22	1.04
VC-12	1	0.5	0.32	0.62
VC-14	1	1	0.37	0.25
VC-14	2	4.2	0.16	2.56
VC-15	1	0.5	0.22	1.13
VC-16	1	0.5	0.40	1.24
VC-16	2	2	0.31	0.29
VC-16	3	5.5	0.13	3.47

Table 4. Offshore area sample statistics

4 Discussion

The three areas of interest that were further investigated with vibracores all contained layers of sandy material. The two nearshore areas contained very fine sand, with some silty fine sand. The mean grain sizes of these two areas were much finer than the native material on the State park beach. Additionally, they contained higher percentages of silty material.

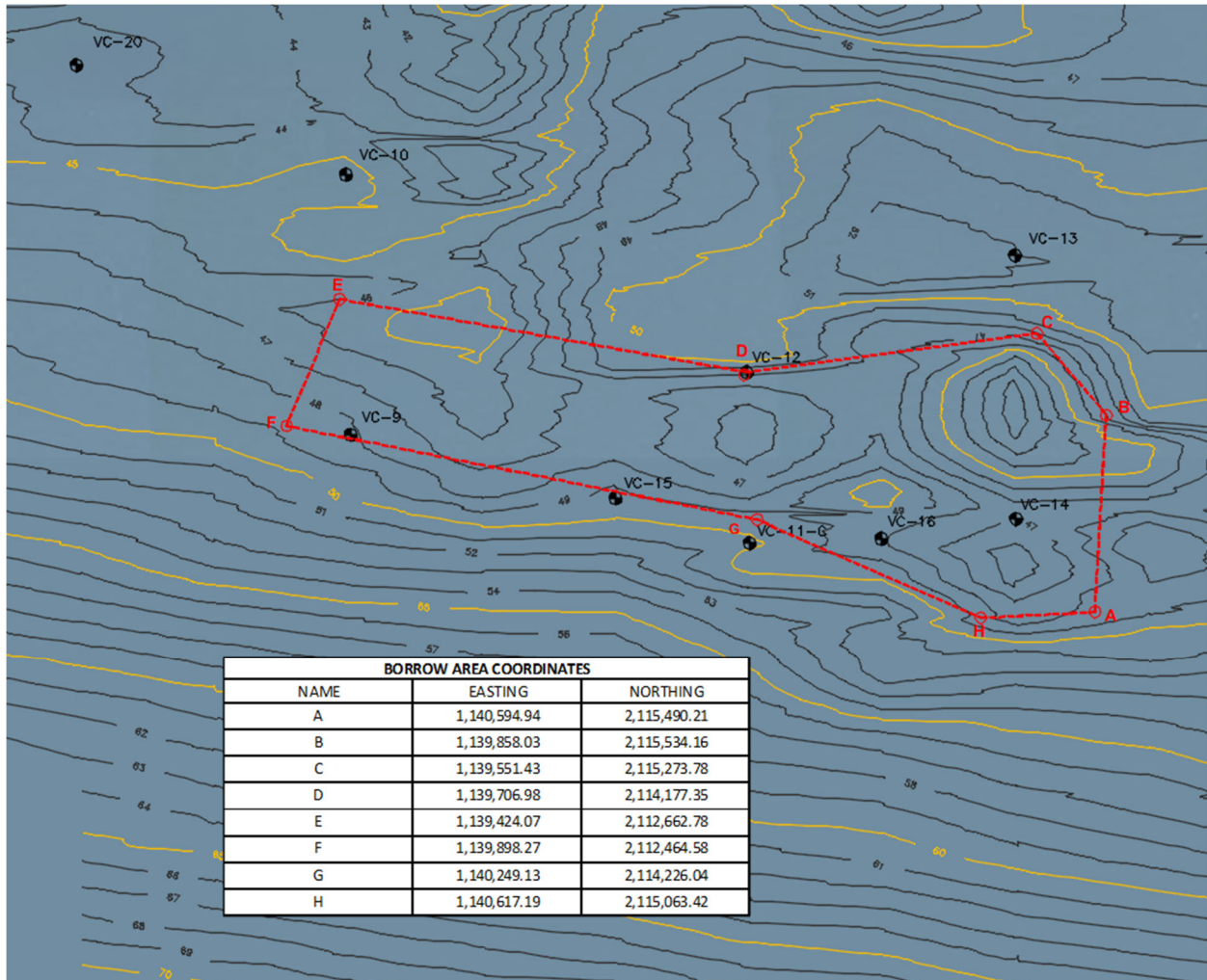


Figure 11. Potential offshore borrow area

The Area Offshore in the vicinity of vibracores VC-9, VC-12, VC-14, VC-15, and VC-16 was found to have a 3-5-foot-thick layer of beach quality sand. Sieve analysis showed sample statistics were compatible with the native material on the beach. Figure 11 shows an outline of this area and the vibracores and samples performed within it.

This offshore area is approximately 45.5 acres in size with an average sand thickness of 4 feet which would provide a suitable bank for excavation. The area contains approximately 294,000 cubic yards of beach compatible sand. Further investigation to the north and south may expand this area and include more beach quality material. It is recommended that additional vibracores be taken in this area to expand and further delineate the potential borrow site and quantity of beach compatible sands.

5 Compatibility Analysis Overview

A limited sand compatibility analysis was completed in order to analyze and compare native sands found on Illinois State Park Beach with the potential offshore borrow site, located approximately 2 miles NE of ISPB. Attributes such as grain size, distribution of fine and coarse material, sediment color, and sediment composition should be used to compare the borrow material with the native beach sand. The borrow sand and native sand should be nearly synonymous as grain size can be directly correlated to the stability of the beach, the steepness of the beach slope, and the overall longevity or erosion rates of the shoreline.

5.1 Composite Methodology

Utilizing the results obtained from the sediment testing and analysis, the stratigraphic components of individual cores were determined, and individual layers were analyzed separately. For this reconnaissance level sand search a simple average of sediment grain size characteristics of the samples from the selected borrow region was determined.

5.2 Native Beach Grain Size

To determine compatibility between the borrow site and the dune restoration area, native sand samples must be analyzed as well. Ideally, the native sample will be completely natural, and void of any artificially placed sediment from prior beach renourishment projects. Typically, sediment samples are obtained along differing elevations across the entire active beach profile, from the dune area out to depth of closure. In this reconnaissance level analysis, only native beach mid-berm samples were available to provide insight into native beach characteristics.

The collected native beach mid-berm sands were determined to have an average mean grain size of approx. of 0.42mm. If additional sediment samples were obtained across the entire active beach profile, a more accurate representative of the native beach composite grain size may be determined.

5.3 Borrow Site Comparison to Native Sand

Upon evaluation of the sedimentological statistics, it appears that the offshore borrow material could be a suitable match to renourish the Illinois State Park Beach, however, additional sampling of the entire beach active beach profile should be accomplished.

Sediment sizes are generally expressed by the grain diameter (mm) or using phi (ϕ) units, both of which can be related by the expression: $\phi = -\log_2(mm)$. Standard US sieves were used to classify grain size for the vibracores samples collected. The sieve sizes used for the analysis were: 3/4", 5/8", 11/16", 5/16", #3.5 (5.66 mm), #4 (4.76 mm), #5 (4.00 mm), #7 (2.82 mm), #10 (2.00 mm), #14 (1.41 mm), #18 (1.00 mm), #25 (0.71 mm), #35 (0.50 mm), #45 (0.35 mm), #60 (0.25 mm), #80 (0.18 mm), #120 (0.13 mm), #170 (0.09 mm), #200 (0.07 mm), and #230 (0.06 mm). Simple grain size statistics can then be determined based upon the amount of material retained on each sieve.

Another important component of the borrow site material is the visual color of the sediment to be placed on the beach. It is important from an aesthetic point of view to closely match the native sand color with the borrow material. Using the Munsell Color palate, the average color for the offshore borrow material was 10YR 7/3, or verbally, a very pale brown.

The most important statistic to match between the native sand sample and the borrow material is the overall grain size and range of size throughout the borrow site. The native sand found on the beach will indicate the type of material that will allow the beach to gain equilibrium. Applying a finer grain sediment

to the beach will result in increased erosion and a flatter beach profile, as material is removed from the beach face and transported to the nearshore regime. A coarser material will reduce erosion, as it requires more wave energy to move larger, heavier grains. However, if the sediment is too coarse, a steeper beach profile will occur. Ideally, an identical grain size distribution would be used for nourishment of all beaches, however, the sorting that occurs while sediment is transported greatly limits the probability of finding a viable borrow site with these exact characteristics. Generally, using a slightly coarser material for replenishment is the best option as the larger grain size increases the longevity of the project while diminishing the amount of overfill material needed on the beach.

The borrow site sediment consisted of a mean grain size 1.70 phi(0.31mm), with a standard deviation of 0.71. In addition to overall grain size average, a grain size distribution plot can be used to quantify grain size percentiles throughout the samples. Results of the reconnaissance level borrow site statistics, along with native mid-berm beach characteristics can be found in the table below.

Percentile	Mid-Berm Native Beach 2020 (phi)	Offshore Borrow Composite 2020
D84	1.88(0.27mm)	2.53(0.17mm)
Mean Dia.	1.26 (0.42mm)	1.70 (0.31mm)
D16	0.66(0.63mm)	1.12(0.46mm)

Table 5. Sedimentological Statistics for Native Beach and Borrow Site

Based upon the information found in the table above, the sediment currently found in the offshore borrow area could be an acceptable replacement for the native sand found on Illinois State Park Beach. In the case of beach nourishment, a slightly larger grain size is desirable due to the extended longevity of the placed material. The offshore borrow site contains material finer than the mid-berm native sands. However, as stated earlier, a typical sampling of the entire active profile would be used to determine overall sediment compatibility, which would include finer grained sands in the nearshore portion of the active beach profile. This would result in a relatively smaller composite native beach grain size for comparison purposes.

5.4 Overfill Factor

The quantitative compatibility of the offshore borrow site sediments with the existing beach material can be expressed in terms of an adjustment or overfill factor. The overfill ratio indicates the volume of fill required to produce a unit volume of stable beach with the same grain size distribution as the existing (or native) beach. Differences in grain size between the borrow material and the native sand can result in rapid transport of fine particles moved alongshore and offshore. The volume of material required to compensate for this initial sorting of the beach can be estimated by an overfill factor.

The Dean method provides equations to calculate the overfill ratio based on beach fill and existing beach characteristics. Application of the sediment characteristics from Table 1 resulted in an overfill ratio of 1.62 by the Dean method for the potential borrow site.

Overfill criteria was determined by the relationship between where:

$$M_{\phi} = \frac{(\phi_{84} + \phi_{16})}{2} \quad \text{and} \quad \sigma_{\phi} = \frac{(\phi_{84} - \phi_{16})}{2}$$

σ_{ϕ} = the standard deviation and is a measure of sorting

M_{ϕ} = the phi mean diameter of grain size distribution

subscript b refers to borrow material

subscript n refers to natural sand on beach

ϕ_{84} = 84th percentile in phi units

ϕ_{16} = 16th percentile in phi units

The overfill factor can be used to estimate the amount of borrow material needed to replace the volume of native sand lost. This ratio suggests that to gain the same beach width as 1 CY of existing beach sand would require 1.62 CY of borrow material. The sediment data indicates that the borrow material is somewhat finer and more poorly sorted than the mid-berm native material. However, the native beach grain size is artificially biased toward a coarser grain size by the exclusion of finer profile sediments lying in the nearshore region of the active beach profile, making the overfill factor artificially high. Additional sampling and inclusion of finer nearshore sediments should be included in the native beach composite calculation to properly refine the overfill calculation. A similar mid-berm grain size of 0.42mm on a Florida east coast beach yielded a profile composite average grain size of 0.29mm. If a similar composite was developed at ISPB over the active beach profile, the resulting overfill factor could be much closer to 1.0.

APPENDIX A

PROJECT DRAWINGS

ILLINOIS BEACH STATE PARK SAND SOURCE SURVEY

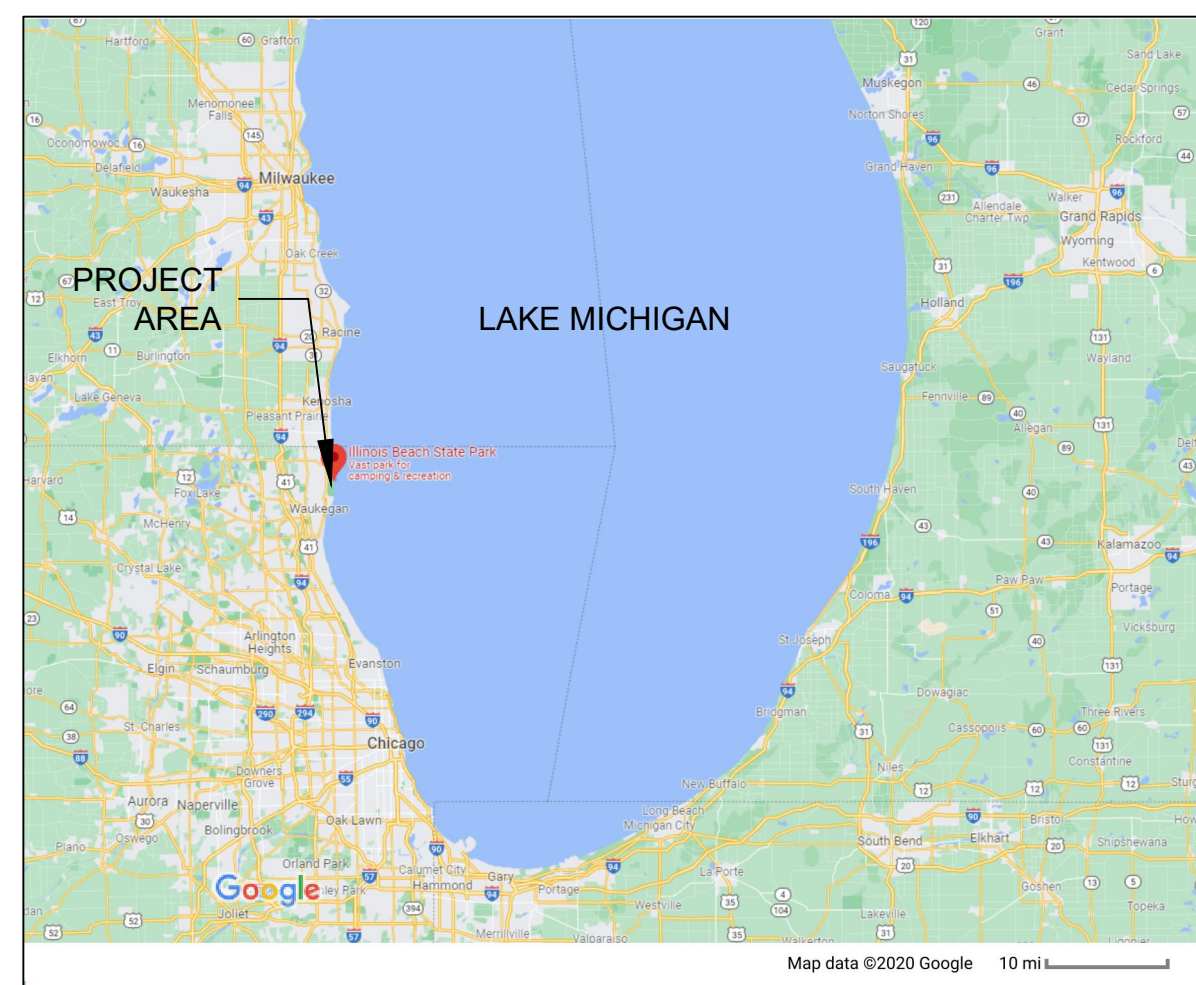


ZION, IL



SHEET INDEX	
DESCRIPTION	SHEET NO.
COVER	1
BATHYMETRY AND SOUNDINGS	2
VIBRACORE LOCATIONS	3
GRAB & BEACH SAMPLE LOCATIONS	4
BORROW SITE OVERVIEW	5
POTENTIAL BORROW SITE	6
SECTION VIEWS	7

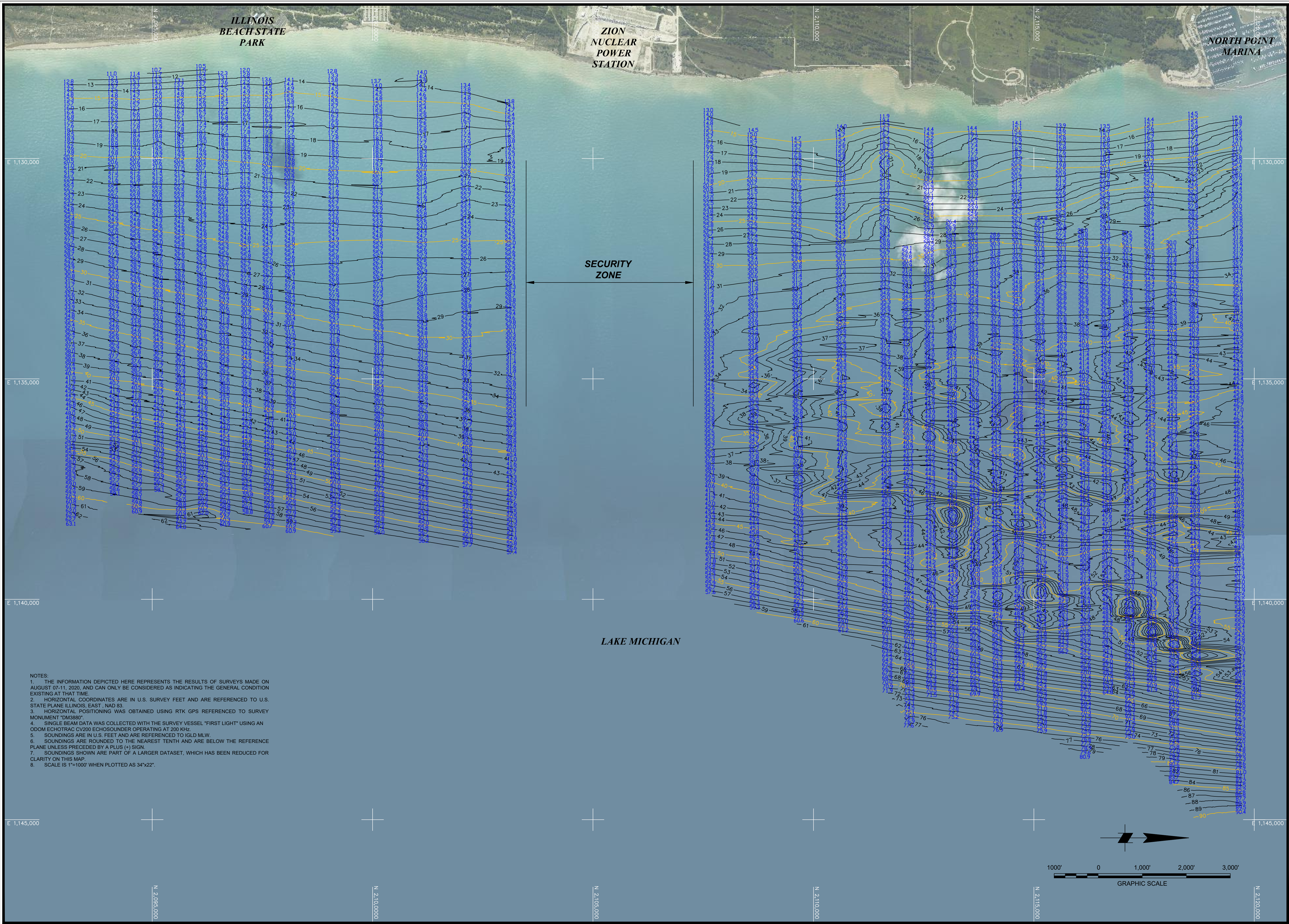
VICINITY MAP



NOT TO SCALE

AUGUST 2020

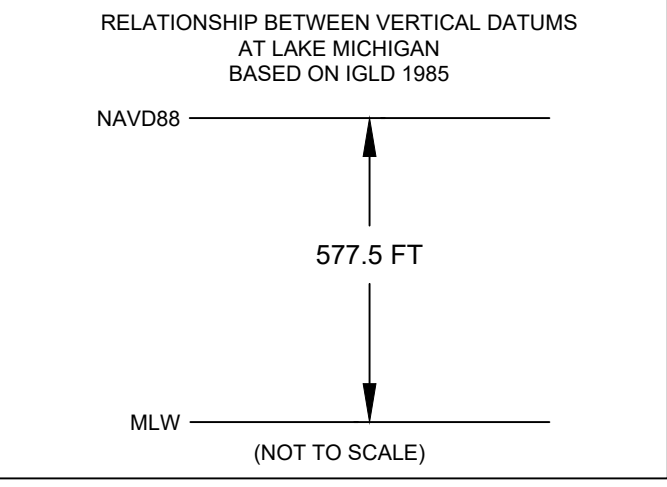
GBA
ENGINEERS ★ SURVEYORS
GAHAGAN & BRYANT ASSOCIATES, INC.
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TAMPA, FLORIDA 33629-6826
TEL: 813.831.4408 FAX: 813.831.4216
WWW.GBA-INC.COM



NOTES:

1. THE INFORMATION DEPICTED HERE REPRESENTS THE RESULTS OF SURVEYS MADE ON AUGUST 07-11, 2020, AND CAN ONLY BE CONSIDERED AS INDICATING THE GENERAL CONDITION EXISTING AT THAT TIME.
2. HORIZONTAL COORDINATES ARE IN U.S. SURVEY FEET AND ARE REFERENCED TO U.S. STATE PLANE ILLINOIS, EAST, NAD 83.
3. HORIZONTAL POSITIONING WAS OBTAINED USING RTK GPS REFERENCED TO SURVEY MONUMENT "0MS3880".
4. SINGLE BEAM DATA WAS COLLECTED WITH THE SURVEY VESSEL "FIRST LIGHT" USING AN ODOM ECHOTRAC CV200 ECHOSOUNDER OPERATING AT 200 KHz.
5. SOUNDINGS ARE IN U.S. FEET AND ARE REFERENCED TO IGLD MLW.
6. SOUNDINGS ARE ROUNDED TO THE NEAREST TENTH AND ARE BELOW THE REFERENCE PLANE UNLESS PRECEDED BY A PLUS (+) SIGN.
7. SOUNDINGS SHOWN ARE PART OF A LARGER DATASET, WHICH HAS BEEN REDUCED FOR CLARITY ON THIS MAP.
8. SCALE IS 1"=1000' WHEN PLOTTED AS 34"X22".

REV	REVISIONS	DATE	APP



LEGEND

	1- FOOT CONTOURS
	5- FOOT CONTOURS

CONDITION SURVEY

SURVEY DATE:	7-11 AUGUST 2020
HORIZ. PROJECTION:	U.S. STATE PLANE, NAD 83
ZONE:	ILLINOIS - EAST
VERT. REFERENCE:	IGLD MLW
SURVEY UNITS:	U.S. SURVEY FEET
VESSEL:	FIRST LIGHT
SOUNDER:	ODOM ECHOTRAC CV200
SOUNDER FREQ.:	200KHz
POSITIONING:	TRIMBLE SPS 461

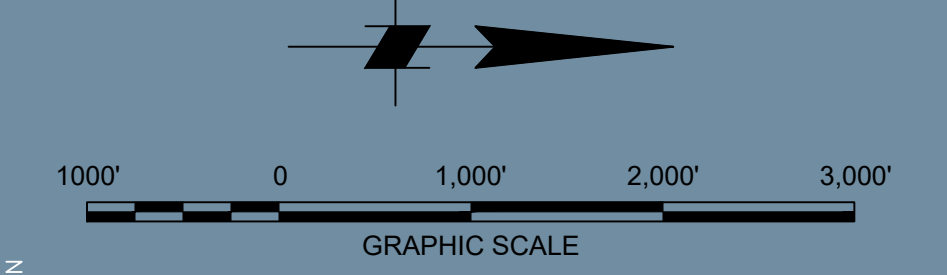
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TAMPA, FLORIDA 33629-6826
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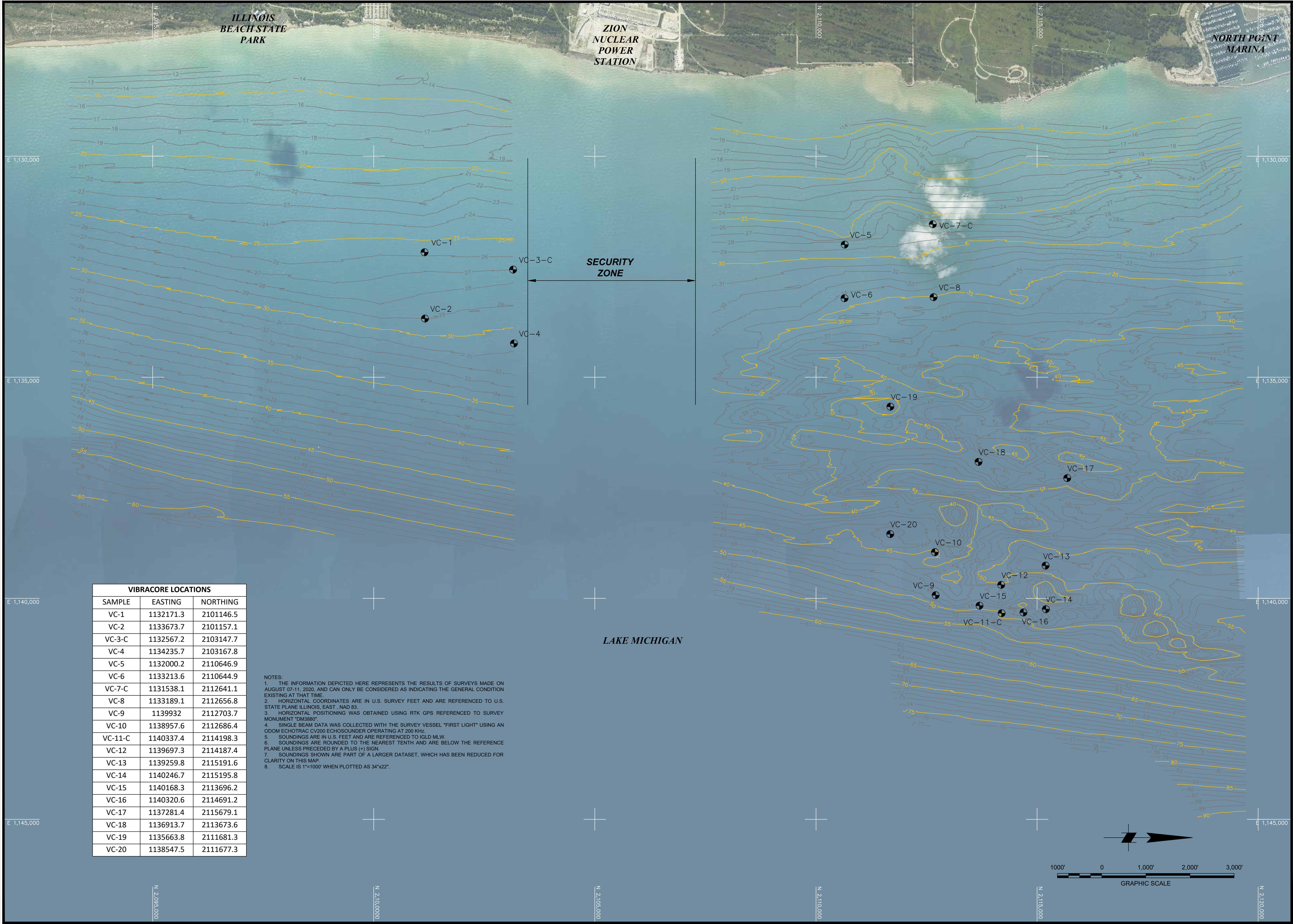
Edgewater resources
434 S Yellowstone Drive Suite 203
Madison, WI 53719
608-716-3128
www.edgewaterresources.com

ILLINOIS BEACH STATE PARK SAND SOURCE SURVEY

BATHYMETRY

DWG DATE:	11 NOVEMBER 2020
DWG NAME:	IL Beach State Park - Sand Survey.dwg
DRAWN BY:	T. LITTLEFIELD
CHECKED BY:	J. BARKER
ENGINEER:	C. BRYANT
SCALE:	AS SHOWN
SHEET NO.	2 OF 7
REVISION NO.	0



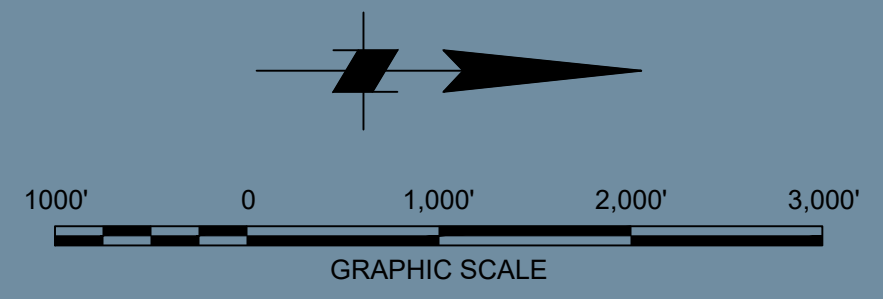


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E 1,135,000
E 1,140,000
E 1,145,000

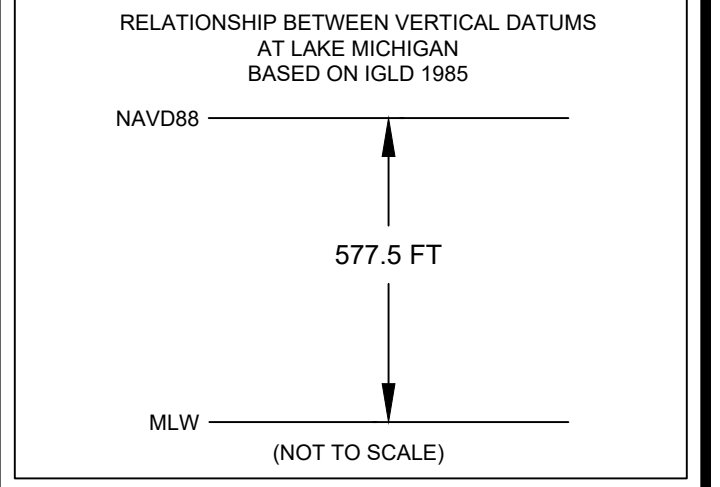
N 2,105,000
N 2,110,000
N 2,115,000
N 2,120,000

VIBRACORE LOCATIONS		
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VC-2	1133673.7	2101157.1
VC-3-C	1132567.2	2103147.7
VC-4	1134235.7	2103167.8
VC-5	1132000.2	2110646.9
VC-6	1133213.6	2110644.9
VC-7-C	1131538.1	2112641.1
VC-8	1133189.1	2112656.8
VC-9	1139932	2112703.7
VC-10	1138957.6	2112686.4
VC-11-C	1140374	2114198.3
VC-12	1139697.3	2114187.4
VC-13	1139259.8	2115191.6
VC-14	1140246.7	2115195.8
VC-15	1140168.3	2113696.2
VC-16	1140320.6	2114691.2
VC-17	1137281.4	2115679.1
VC-18	1136913.7	2113673.6
VC-19	1135663.8	2111681.3
VC-20	1138547.5	2111677.3

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 3. HORIZONTAL POSITIONING WAS OBTAINED USING RTK GPS REFERENCED TO SURVEY MONUMENT "DM3880".
 4. SINGLE BEAM DATA WAS COLLECTED WITH THE SURVEY VESSEL "FIRST LIGHT" USING AN ODOM ECHOTRAC CV200 ECHOSOUNDER OPERATING AT 200 KHZ.
 5. SOUNDINGS ARE IN U.S. FEET AND ARE REFERENCED TO IGLD MLW.
 6. SOUNDINGS ARE ROUNDED TO THE NEAREST TENTH AND ARE BELOW THE REFERENCE PLANE UNLESS PRECEDED BY A PLUS (+) SIGN.
 7. SOUNDINGS SHOWN ARE PART OF A LARGER DATASET, WHICH HAS BEEN REDUCED FOR CLARITY ON THIS MAP.
 8. SCALE IS 1"=1000' WHEN PLOTTED AS 34"x22".



REV	REVISIONS	DATE	APP



LEGEND

- 94 1- FOOT CONTOURS
- 95 5- FOOT CONTOURS
- ⊕ SAMPLE LOCATION

CONDITION SURVEY

SURVEY DATE:	7-11 AUGUST 2020
HORIZ. PROJECTION:	U.S. STATE PLANE, NAD 83
ZONE:	ILLINOIS - EAST
VERT. REFERENCE:	IGLD MLW
SURVEY UNITS:	U.S. SURVEY FEET
VESSEL:	FIRST LIGHT
SOUNDER:	ODOM ECHOTRAC CV200
SOUNDER FREQ.:	200KHz
POSITIONING:	TRIMBLE SPS 461

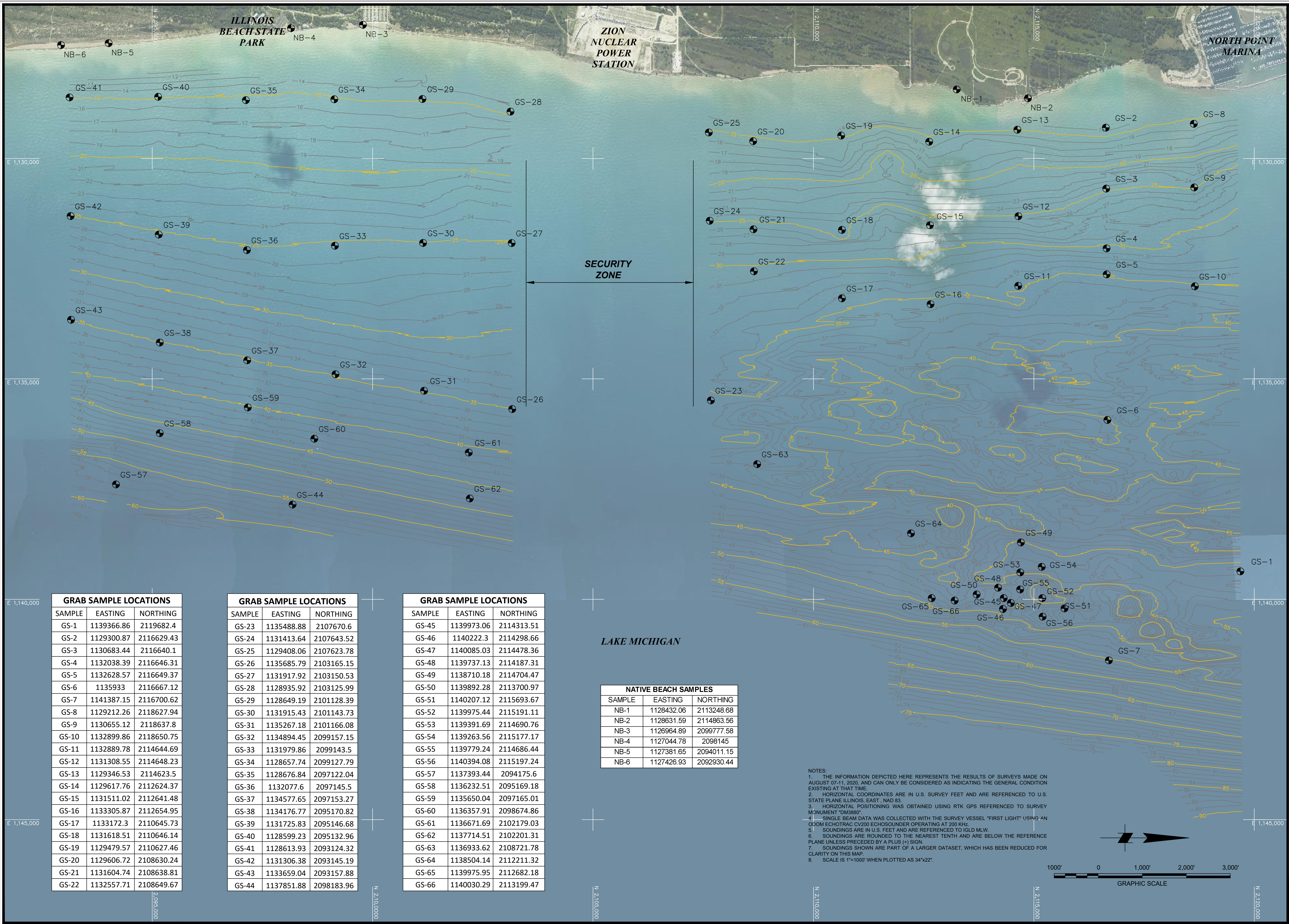
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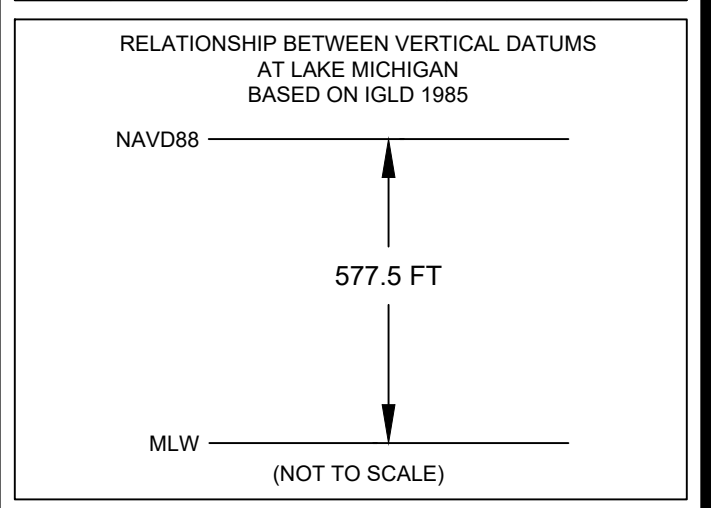
ILLINOIS BEACH STATE PARK SAND SOURCE SURVEY

VIBRACORE LOCATIONS

DWG DATE:	11 NOVEMBER 2020
DWG NAME:	IL Beach State Park - Sand Survey.dwg
DRAWN BY:	T. LITTLEFIELD
CHECKED BY:	J. BARKER
ENGINEER:	C. BRYANT
SCALE:	AS SHOWN
SHEET NO.	3 OF 7
REVISION NO.	0



REV	REVISIONS	DATE	APP



LEGEND

94 1- FOOT CONTOURS
95 5- FOOT CONTOURS

● SAMPLE LOCATION

CONDITION SURVEY

SURVEY DATE:	7-11 AUGUST 2020
HORIZ. PROJECTION:	U.S. STATE PLANE, NAD 83
ZONE:	ILLINOIS - EAST
VERT. REFERENCE:	IGLD MLW
SURVEY UNITS:	U.S. SURVEY FEET
VESSEL:	FIRST LIGHT
SOUNDER:	ODOM ECHOTRAC CV200
SOUNDER FREQ.:	200KHz
POSITIONING:	TRIMBLE SPS 461



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**ILLINOIS BEACH STATE
PARK
SAND SOURCE SURVEY**

GRAB & BEACH SAMPLE LOCATIONS

DWG DATE:	11 NOVEMBER 2020
DWG NAME:	IL Beach State Park - Sand Survey.dwg
DRAWN BY:	T. LITTLEFIELD
CHECKED BY:	J. BARKER
ENGINEER:	C. BRYANT
SCALE:	AS SHOWN
SHEET NO.:	4 OF 7
REVISION NO.:	0

GRAB SAMPLE LOCATIONS

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GS-7	1141387.15	2116700.62
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GS-17	1133172.3	2110645.73
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GS-19	1129479.57	2110627.46
GS-20	1129606.72	2108630.24
GS-21	1131604.74	2108638.81
GS-22	1132557.71	2108649.67

GRAB SAMPLE LOCATIONS

SAMPLE	EASTING	NORTHING
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GS-25	1129408.06	2107623.78
GS-26	1135685.79	2103165.15
GS-27	1131917.92	2103150.53
GS-28	1128935.92	2103125.99
GS-29	1128649.19	2101128.39
GS-30	1131915.43	2101143.73
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GS-37	1134577.65	2097153.27
GS-38	1134176.77	2095170.82
GS-39	1131725.83	2095146.68
GS-40	1128599.23	2095132.96
GS-41	1128613.93	2093124.32
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GRAB SAMPLE LOCATIONS

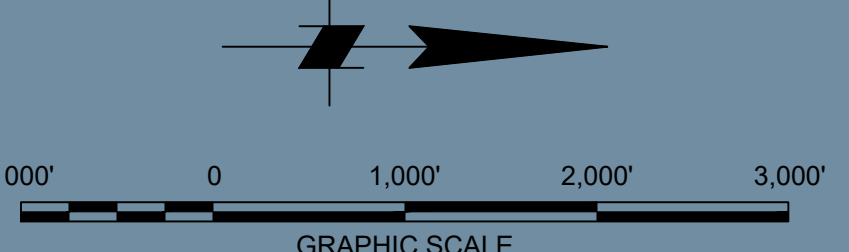
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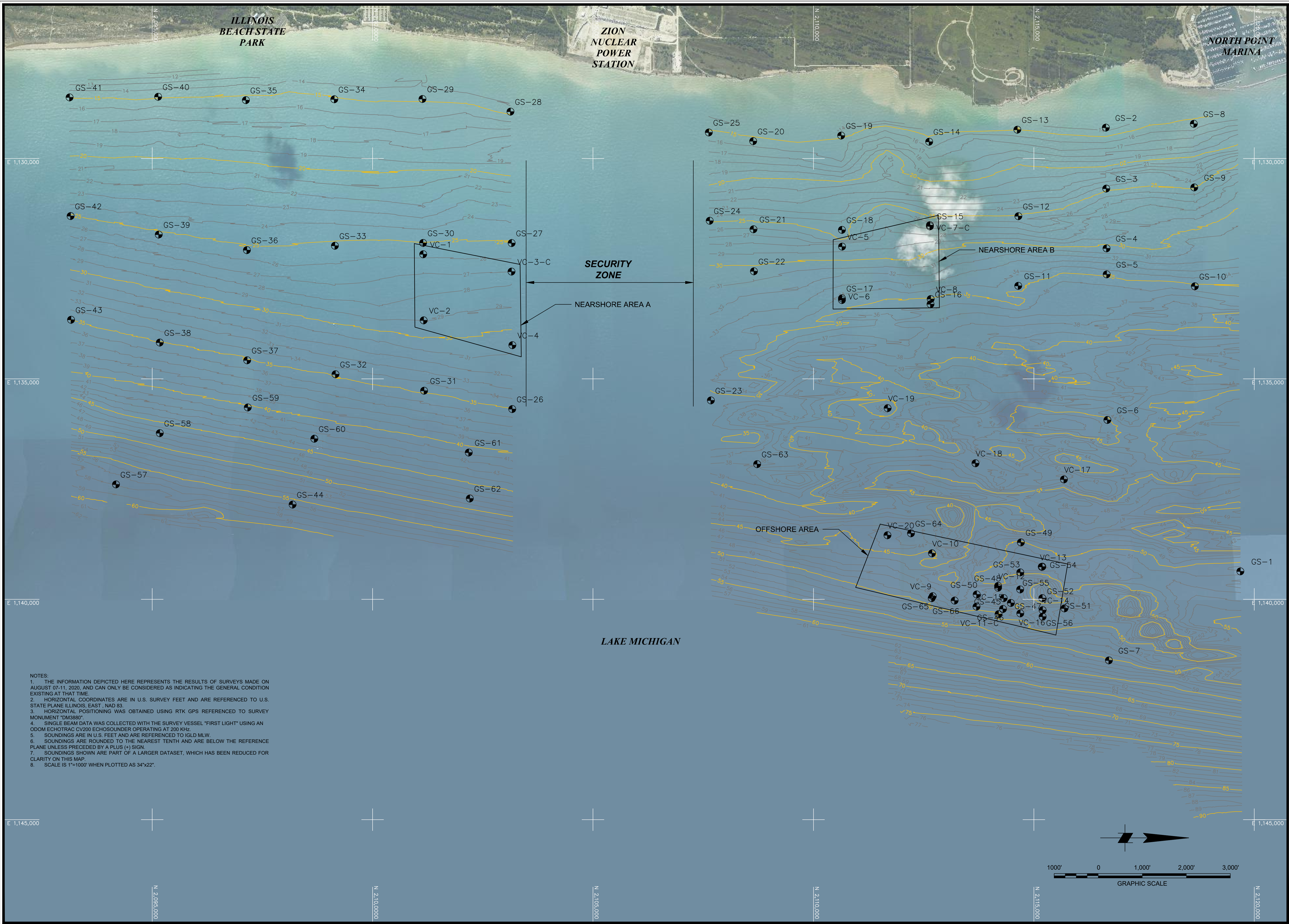
LAKE MICHIGAN

NATIVE BEACH SAMPLES

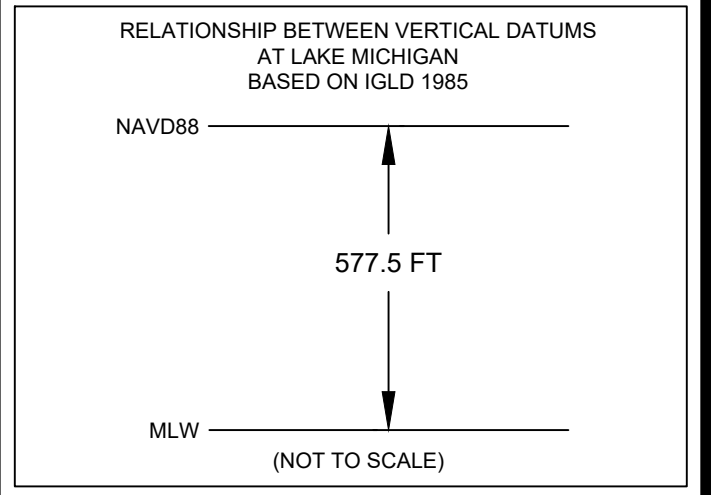
SAMPLE	EASTING	NORTHING
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NB-3	1126964.89	2099777.58
NB-4	1127044.78	2098145
NB-5	1127381.65	2094011.15
NB-6	1127426.93	2092930.44

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REV	REVISIONS	DATE	APP



LEGEND

- 94 1- FOOT CONTOURS
- 95 5- FOOT CONTOURS
- SAMPLE LOCATION

CONDITION SURVEY

SURVEY DATE:	7-11 AUGUST 2020
HORIZ. PROJECTION:	U.S. STATE PLANE, NAD 83
ZONE:	ILLINOIS - EAST
VERT. REFERENCE:	IGLD MLW
SURVEY UNITS:	U.S. SURVEY FEET
VESSEL:	FIRST LIGHT
SOUNDER:	ODOM ECHOTRAC CV200
SOUNDER FREQ.:	200KHz
POSITIONING:	TRIMBLE SPS 461

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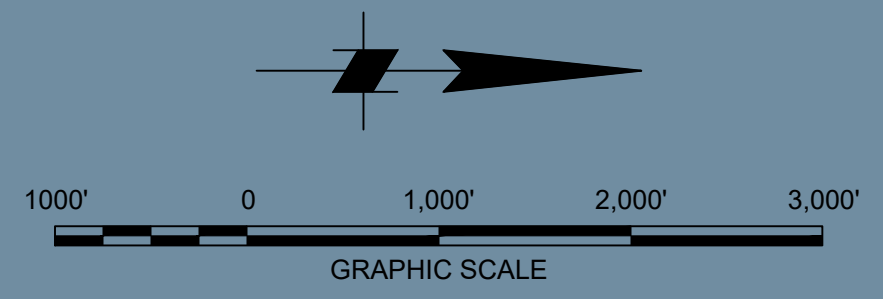
Edgewater resources
434 S Yellowstone Drive Suite 203
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608-716-3128
www.edgewaterresources.com

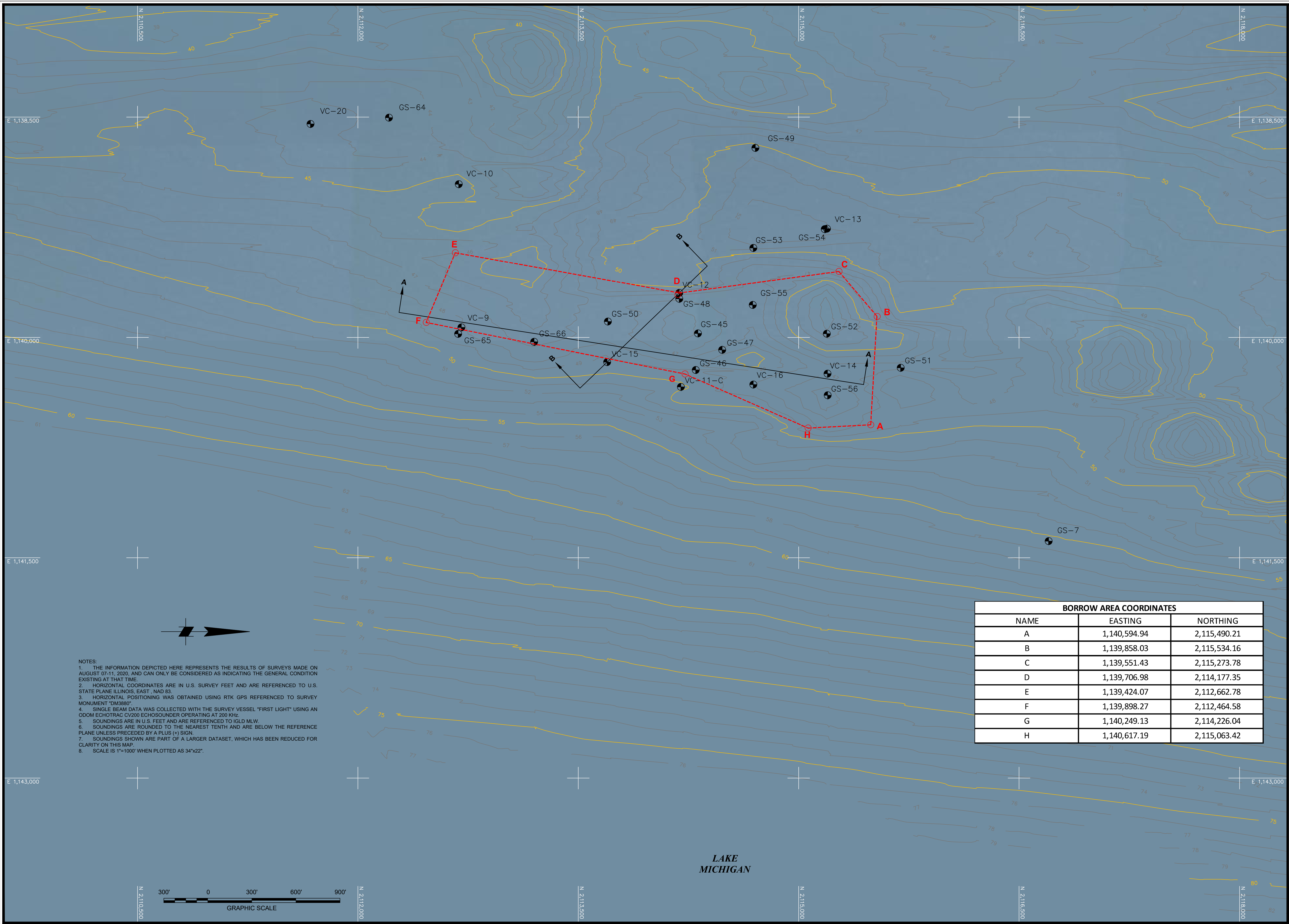
**ILLINOIS BEACH STATE PARK
SAND SOURCE SURVEY**

BORROW SITE OVERVIEW

DWG DATE:	11 NOVEMBER 2020
DWG NAME:	IL Beach State Park - Sand Survey.dwg
DRAWN BY:	T. LITTLEFIELD
CHECKED BY:	J. BARKER
ENGINEER:	C. BRYANT
SCALE:	AS SHOWN
SHEET NO.	5 OF 7
REVISION NO.	0

- NOTES:**
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 4. SINGLE BEAM DATA WAS COLLECTED WITH THE SURVEY VESSEL "FIRST LIGHT" USING AN ODOM ECHOTRAC CV200 ECHOSOUNDER OPERATING AT 200 KHz.
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 8. SCALE IS 1"=1000' WHEN PLOTTED AS 34"x22".

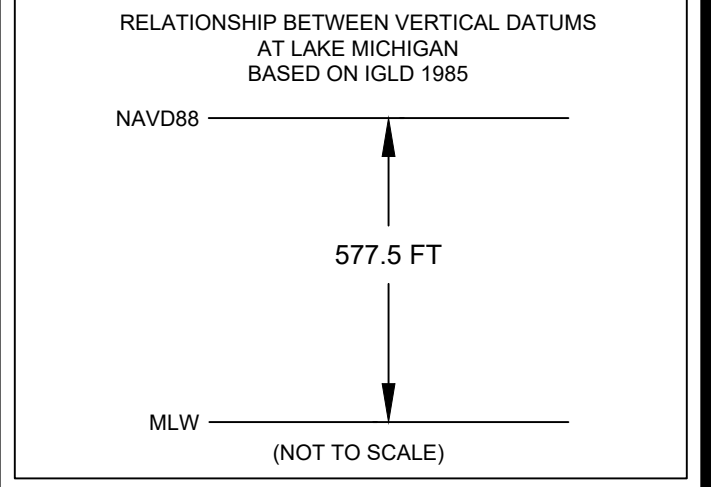




BORROW AREA COORDINATES		
NAME	EASTING	NORTHING
A	1,140,594.94	2,115,490.21
B	1,139,858.03	2,115,534.16
C	1,139,551.43	2,115,273.78
D	1,139,706.98	2,114,177.35
E	1,139,424.07	2,112,662.78
F	1,139,898.27	2,112,464.58
G	1,140,249.13	2,114,226.04
H	1,140,617.19	2,115,063.42

- NOTES:
1. THE INFORMATION DEPICTED HERE REPRESENTS THE RESULTS OF SURVEYS MADE ON AUGUST 07-11, 2020, AND CAN ONLY BE CONSIDERED AS INDICATING THE GENERAL CONDITION EXISTING AT THAT TIME.
 2. HORIZONTAL COORDINATES ARE IN U.S. SURVEY FEET AND ARE REFERENCED TO U.S. STATE PLANE ILLINOIS, EAST, NAD 83.
 3. HORIZONTAL POSITIONING WAS OBTAINED USING RTK GPS REFERENCED TO SURVEY MONUMENT "DM9880".
 4. SINGLE BEAM DATA WAS COLLECTED WITH THE SURVEY VESSEL "FIRST LIGHT" USING AN ODOM ECHOTRAC CV200 ECHOSOUNDER OPERATING AT 200 KHz.
 5. SOUNDINGS ARE IN U.S. FEET AND ARE REFERENCED TO IGLD MLW.
 6. SOUNDINGS ARE ROUNDED TO THE NEAREST TENTH AND ARE BELOW THE REFERENCE PLANE UNLESS PRECEDED BY A PLUS (+) SIGN.
 7. SOUNDINGS SHOWN ARE PART OF A LARGER DATASET, WHICH HAS BEEN REDUCED FOR CLARITY ON THIS MAP.
 8. SCALE IS 1"=1000' WHEN PLOTTED AS 34"x22".

REV	REVISIONS	DATE	APP



LEGEND

- 94 1- FOOT CONTOURS
- 95 5- FOOT CONTOURS
- SAMPLE LOCATION
- - - - - POTENTIAL BORROW AREA

CONDITION SURVEY

SURVEY DATE:	7-11 AUGUST 2020
HORIZ. PROJECTION:	U.S. STATE PLANE, NAD 83
ZONE:	ILLINOIS - EAST
VERT. REFERENCE:	IGLD MLW
SURVEY UNITS:	U.S. SURVEY FEET
VESSEL:	FIRST LIGHT
SOUNDER:	ODOM ECHOTRAC CV200
SOUNDER FREQ.:	200KHz
POSITIONING:	TRIMBLE SPS 461

GBA
ENGINEERS ★ SURVEYORS

GAHAGAN & BRYANT ASSOCIATES, INC.
3802 WEST BAY TO BAY BLVD., STE. B-22
TAMPA, FLORIDA 33629-6826
TEL: 813.831.4408 FAX: 813.831.4216
WWW.GBA-INC.COM

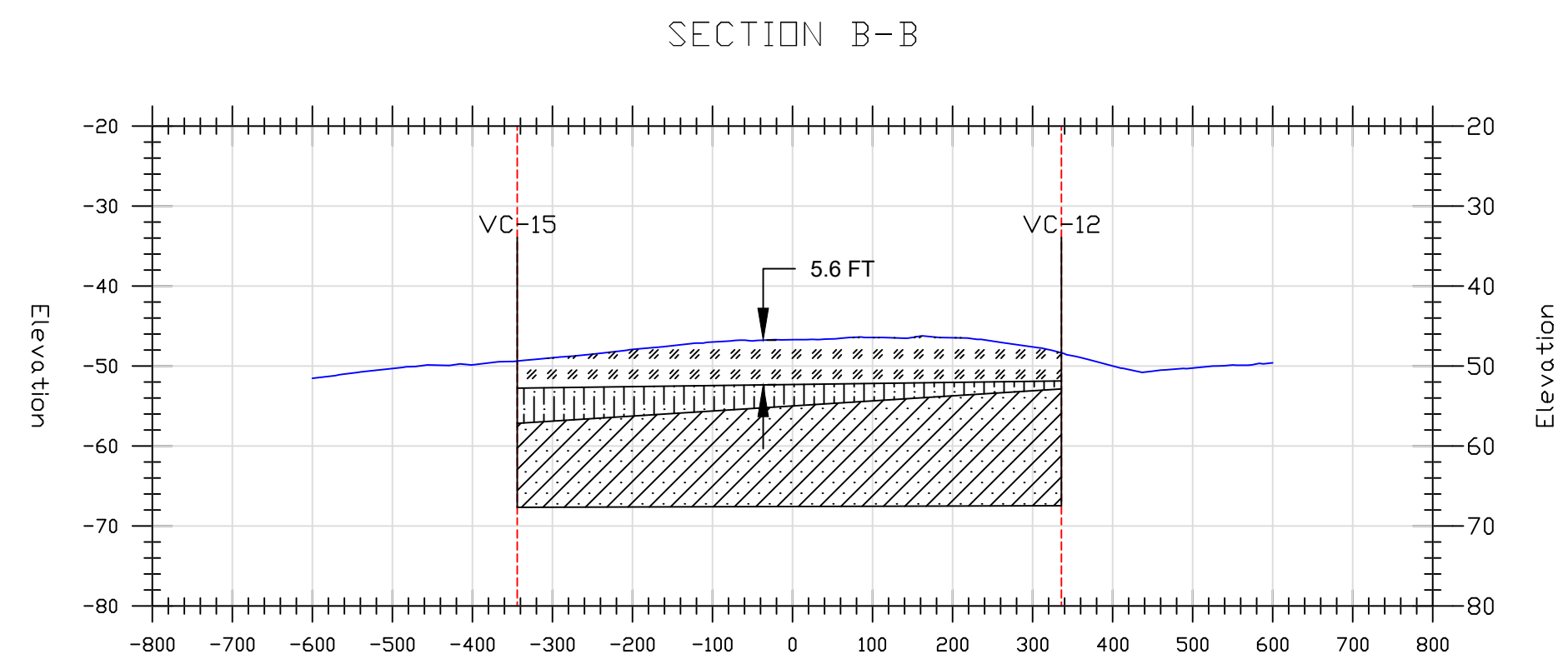
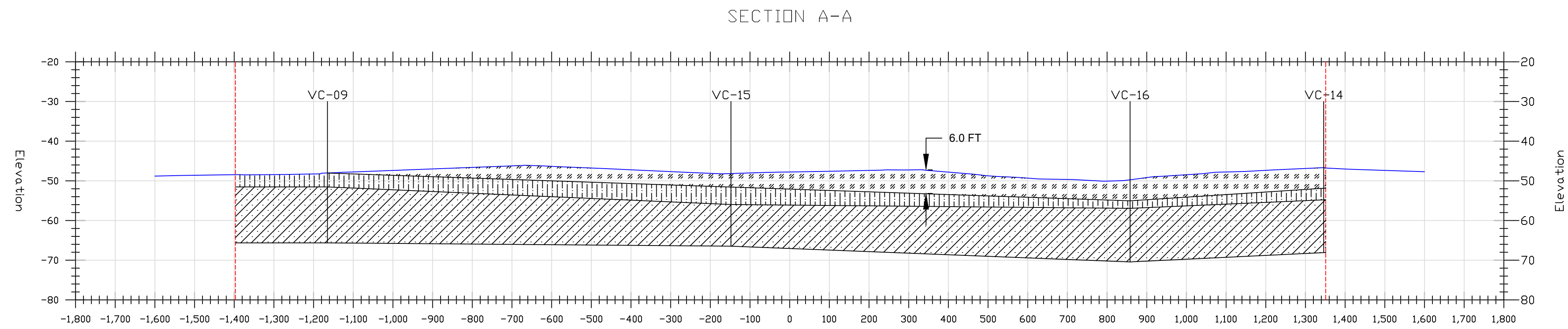
Edgewater resources

434 S Yellowstone Drive Suite 203
Madison, WI 53719
608-716-3128
www.edgewaterresources.com

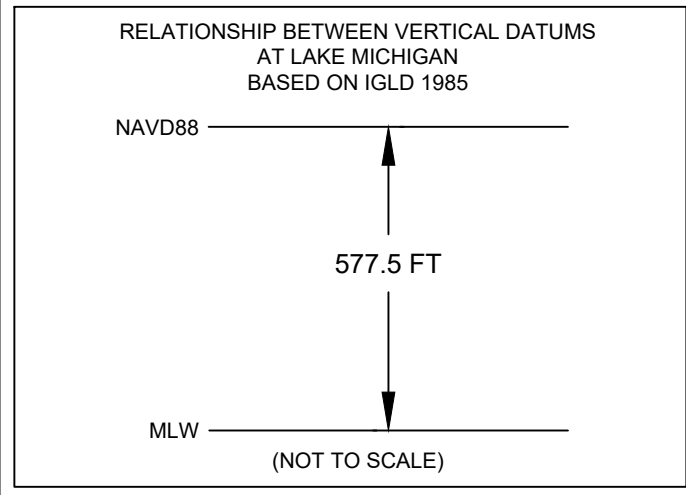
**ILLINOIS BEACH STATE
PARK
SAND SOURCE SURVEY**

POTENTIAL BORROW SITE

DWG DATE:	11 NOVEMBER 2020
DWG NAME:	IL Beach State Park - Sand Survey.dwg
DRAWN BY:	T. LITTLEFIELD
CHECKED BY:	J. BARKER
ENGINEER:	C. BRYANT
SCALE:	AS SHOWN
SHEET NO.	6 OF 7
REVISION NO.	0



REV	REVISIONS	DATE	APP



LEGEND

	SAND SOURCE BOUNDARY
	EXISTING BOTTOM
	MEDIUM SAND (SP)
	SILTY FINE SAND (SM)
	FINE SAND WITH INTERBEDDED CLAY (SC)

CONDITION SURVEY

SURVEY DATE:	7-11 AUGUST 2020
HORIZ. PROJECTION:	U.S. STATE PLANE, NAD 83
ZONE:	ILLINOIS - EAST
VERT. REFERENCE:	IGLD MLW
SURVEY UNITS:	U.S. SURVEY FEET
VESSEL:	FIRST LIGHT
SOUNDER:	ODOM ECHOTRAC CV200
SOUNDER FREQ.:	200KHz
POSITIONING:	TRIMBLE SPS 461

GAHAGAN & BRYANT ASSOCIATES, INC.
3802 WEST BAY TO BAY BLVD., STE. B-22
TAMPA, FLORIDA 33629-6826
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WWW.GBA-INC.COM

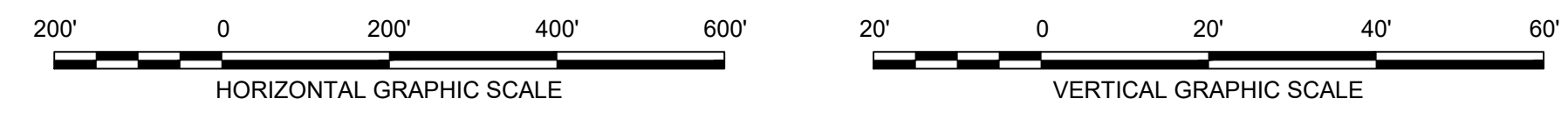
434 S Yellowstone Drive Suite 203
Madison, WI 53719
608-716-3128
www.edgewaterresources.com

**ILLINOIS BEACH STATE
PARK
SAND SOURCE SURVEY**

SECTION VIEWS

DWG DATE:	11 NOVEMBER 2020
DWG NAME:	IL Beach State Park - Sand Survey.dwg
DRAWN BY:	T. LITTLEFIELD
CHECKED BY:	J. BARKER
ENGINEER:	C. BRYANT
SCALE:	AS SHOWN
SHEET NO.	7 OF 7
REVISION NO.	0

- NOTES:
- THE INFORMATION DEPICTED HERE REPRESENTS THE RESULTS OF SURVEYS MADE ON AUGUST 07-11, 2020, AND CAN ONLY BE CONSIDERED AS INDICATING THE GENERAL CONDITION EXISTING AT THAT TIME.
 - HORIZONTAL COORDINATES ARE IN U.S. SURVEY FEET AND ARE REFERENCED TO U.S. STATE PLANE ILLINOIS, EAST, NAD 83.
 - HORIZONTAL POSITIONING WAS OBTAINED USING RTK GPS REFERENCED TO SURVEY MONUMENT "DM3880".
 - SINGLE BEAM DATA WAS COLLECTED WITH THE SURVEY VESSEL "FIRST LIGHT" USING AN ODOM ECHOTRAC CV200 ECHOSOUNDER OPERATING AT 200 KHz.
 - SOUNDINGS ARE IN U.S. FEET AND ARE REFERENCED TO IGLD MLW.
 - SOUNDINGS ARE ROUNDED TO THE NEAREST TENTH AND ARE BELOW THE REFERENCE PLANE UNLESS PRECEDED BY A PLUS (+) SIGN.
 - SOUNDINGS SHOWN ARE PART OF A LARGER DATASET, WHICH HAS BEEN REDUCED FOR CLARITY ON THIS MAP.
 - SCALE IS 1"=200' WHEN PLOTTED AS 34"x22".



APPENDIX B

VIBRACORE LOGS

Boring Designation VC-01

DRILLING LOG		DIVISION	INSTALLATION	SHEET 1 OF 1 SHEETS
1. PROJECT IBSP Sand Source Survey Zion, Illinois			9. SIZE AND TYPE OF BIT 3.0 In.	
2. BORING DESIGNATION VC-01			10. COORDINATE SYSTEM/DATUM State Plane	
LOCATION COORDINATES X = 1,132,171 Y = 2,101,147			HORIZONTAL NAD 1983	
3. DRILLING AGENCY Athena Technologies			VERTICAL IGLD MLW	
4. NAME OF DRILLER Palmer McClellan			11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore	
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED			<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER	
6. THICKNESS OF OVERBURDEN 0.0 Ft.			12. TOTAL SAMPLES 2	
7. DEPTH DRILLED INTO ROCK 0.0 Ft.			DISTURBED 2	
8. TOTAL DEPTH OF BORING 9.8 Ft.			UNDISTURBED (UD)	
			13. TOTAL NUMBER CORE BOXES	
			14. ELEVATION GROUND WATER	
			15. DATE BORING 08-14-20	
			STARTED 08-14-20	
			COMPLETED 08-14-20	
			16. ELEVATION TOP OF BORING -25.8 Ft.	
			17. TOTAL RECOVERY FOR BORING 7.9 Ft.	
			18. SIGNATURE AND TITLE OF INSPECTOR Jonathan Barker P.G.	

ELEV. (ft)	DEPTH (ft)	LEGEND	CLASSIFICATION OF MATERIALS Depths and elevations based on measured values	% REC.	BOX OR SAMPLE	REMARKS
-25.8	0.0					
			Silty Sand, clay lenses at 2.2', 3.6', and 4.8', (SP-SM).		1	Sample #1, Depth = 1.0' Mean (mm): 0.11, Phi Sorting: 0.47 Fines (230): 2.55% (SP-SM)
-31.1	5.3		Silty Sand, clay lenses at 5.6', and 6.5', (SM).		2	Sample #2, Depth = 5.5' Mean (mm): 0.11, Phi Sorting: 0.50 Fines (230): 6.50% (SM)
-33.8	8.0		End of Boring			

FLORIDA DEP ROSS IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Boring Designation VC-02

DRILLING LOG		DIVISION	INSTALLATION	SHEET 1
1. PROJECT IBSP Sand Source Survey Zion, Illinois		9. SIZE AND TYPE OF BIT 3.0 In.		
2. BORING DESIGNATION VC-02		10. COORDINATE SYSTEM/DATUM State Plane		
LOCATION COORDINATES X = 1,139,697 Y = 2,114,187		HORIZONTAL NAD 1983	VERTICAL IGLD MLW	
3. DRILLING AGENCY Athena Technologies		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		
CONTRACTOR FILE NO.		<input type="checkbox"/> AUTO HAMMER	<input type="checkbox"/> MANUAL HAMMER	
4. NAME OF DRILLER Palmer McClellan		12. TOTAL SAMPLES	DISTURBED 2	UNDISTURBED (UD)
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES	14. ELEVATION GROUND WATER	
DEG. FROM VERTICAL		15. DATE BORING	STARTED 08-14-20	COMPLETED 08-14-20
BEARING		16. ELEVATION TOP OF BORING -29.0 Ft.		
6. THICKNESS OF OVERBURDEN 0.0 Ft.		17. TOTAL RECOVERY FOR BORING 14 Ft.		
7. DEPTH DRILLED INTO ROCK 0.0 Ft.		18. SIGNATURE AND TITLE OF INSPECTOR Jonathan Barker P.G.		
8. TOTAL DEPTH OF BORING 15.0 Ft.				

ELEV. (ft)	DEPTH (ft)	LEGEND	CLASSIFICATION OF MATERIALS Depths and elevations based on measured values	% REC.	BOX OR SAMPLE	REMARKS
-29.0	0.0					
		•••••	Silty Sand, clay lenses at 2.3', and 6.7', (SP-SM).		1	Sample #1, Depth = 1.0' Mean (mm): 0.12, Phi Sorting: 0.50 Fines (230): 1.94% (SP-SM)
		•••••			2	Sample #2, Depth = 6.5' Mean (mm): 0.11, Phi Sorting: 0.58 Fines (230): 4.88% (SP-SM)
-37.8	8.8	/ / / / /	Clay, (CL).			
-38.0	9.0	•••••	Fine sand, (SP).			
-41.0	12.0	•••••	Fine sand with clay, (SC).			
-41.3	12.3	/ / / / /	Fine sand, (SP).			
-43.0	14.0	•••••	End of Boring			

FLORIDA DEP ROSS IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Boring Designation VC-03-C

DRILLING LOG		DIVISION	INSTALLATION	SHEET 1 OF 1 SHEETS
1. PROJECT IBSP Sand Source Survey Zion, Illinois			9. SIZE AND TYPE OF BIT 3.0 In.	
2. BORING DESIGNATION VC-03-C			10. COORDINATE SYSTEM/DATUM State Plane	
LOCATION COORDINATES X = 1,140,247 Y = 2,115,196			HORIZONTAL NAD 1983	
3. DRILLING AGENCY Athena Technologies			CONTRACTOR FILE NO.	
4. NAME OF DRILLER Palmer McClellan			11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore	
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED			12. TOTAL SAMPLES 1	
6. THICKNESS OF OVERBURDEN 0.0 Ft.			13. TOTAL NUMBER CORE BOXES	
7. DEPTH DRILLED INTO ROCK 0.0 Ft.			14. ELEVATION GROUND WATER	
8. TOTAL DEPTH OF BORING 12.0 Ft.			15. DATE BORING 08-14-20	
			STARTED 08-14-20	
			COMPLETED 08-14-20	
			16. ELEVATION TOP OF BORING -27.0 Ft.	
			17. TOTAL RECOVERY FOR BORING 12 Ft.	
			18. SIGNATURE AND TITLE OF INSPECTOR Jonathan Barker P.G.	

ELEV. (ft)	DEPTH (ft)	LEGEND	CLASSIFICATION OF MATERIALS Depths and elevations based on measured values	% REC.	BOX OR SAMPLE	REMARKS
-27.0	0.0					
		↑↑↑↑↑	Silty Sand, (SM).		1	Sample #1, Depth = 6.0' Mean (mm): 0.12, Phi Sorting: 0.64 Fines (230): 17.47% (SM)
-39.0	12.0		End of Boring			

FLORIDA DEP ROSS IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Boring Designation VC-04

DRILLING LOG		DIVISION	INSTALLATION	SHEET 1 OF 1 SHEETS
1. PROJECT IBSP Sand Source Survey Zion, Illinois			9. SIZE AND TYPE OF BIT 3.0 In.	
2. BORING DESIGNATION VC-04			10. COORDINATE SYSTEM/DATUM State Plane	
LOCATION COORDINATES X = 1,140,168 Y = 2,113,696			HORIZONTAL NAD 1983	
3. DRILLING AGENCY Athena Technologies			VERTICAL IGLD MLW	
4. NAME OF DRILLER Palmer McClellan			11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore	
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED			<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER	
6. THICKNESS OF OVERBURDEN 0.0 Ft.			12. TOTAL SAMPLES 2	
7. DEPTH DRILLED INTO ROCK 0.0 Ft.			DISTURBED 2	
8. TOTAL DEPTH OF BORING 16.0 Ft.			UNDISTURBED (UD)	
			13. TOTAL NUMBER CORE BOXES	
			14. ELEVATION GROUND WATER	
			15. DATE BORING 08-14-20	
			STARTED 08-14-20	
			COMPLETED 08-14-20	
			16. ELEVATION TOP OF BORING -30.6 Ft.	
			17. TOTAL RECOVERY FOR BORING 14.2 Ft.	
			18. SIGNATURE AND TITLE OF INSPECTOR Jonathan Barker P.G.	

ELEV. (ft)	DEPTH (ft)	LEGEND	CLASSIFICATION OF MATERIALS Depths and elevations based on measured values	% REC.	BOX OR SAMPLE	REMARKS
-30.6	0.0					
		•••••	Silty sand , clay lenses at 0.5', 5.7', (SP-SM).		1	Sample #1, Depth = 1.5' Mean (mm): 0.12, Phi Sorting: 0.45 Fines (230): 1.96% (SP-SM)
-38.4	7.8	•••••	Silty sand, clay lens at 7.9', trace clay from 8-9', (SM).		2	Sample #2, Depth = 8.0' Mean (mm): 0.12, Phi Sorting: 0.65 Fines (230): 6.86% (SM)
-41.1	10.5	•••••	Fine sand with interbedded clay layers, (SC).			
-44.8	14.2	•••••	End of Boring			

FLORIDA DEP ROSS IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Boring Designation VC-05

DRILLING LOG		DIVISION	INSTALLATION	SHEET 1 OF 1 SHEETS
1. PROJECT IBSP Sand Source Survey Zion, Illinois			9. SIZE AND TYPE OF BIT 3.0 In.	
2. BORING DESIGNATION VC-05			10. COORDINATE SYSTEM/DATUM State Plane	
LOCATION COORDINATES X = 1,140,321 Y = 2,114,691			HORIZONTAL NAD 1983	
3. DRILLING AGENCY Athena Technologies			VERTICAL IGLD MLW	
4. NAME OF DRILLER Palmer McClellan			11. MANUFACTURER'S DESIGNATION OF DRILL <input type="checkbox"/> AUTO HAMMER Vibracore <input type="checkbox"/> MANUAL HAMMER	
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED			12. TOTAL SAMPLES 2	
6. THICKNESS OF OVERBURDEN 0.0 Ft.			DISTURBED 2	
7. DEPTH DRILLED INTO ROCK 0.0 Ft.			UNDISTURBED (UD)	
8. TOTAL DEPTH OF BORING 8.8 Ft.			13. TOTAL NUMBER CORE BOXES	
			14. ELEVATION GROUND WATER	
			15. DATE BORING 08-14-20	
			STARTED 08-14-20	
			COMPLETED 08-14-20	
			16. ELEVATION TOP OF BORING -28.8 Ft.	
			17. TOTAL RECOVERY FOR BORING 7.4 Ft.	
			18. SIGNATURE AND TITLE OF INSPECTOR Jonathan Barker P.G.	

ELEV. (ft)	DEPTH (ft)	LEGEND	CLASSIFICATION OF MATERIALS Depths and elevations based on measured values	% REC.	BOX OR SAMPLE	REMARKS
-28.8	0.0	○				
		○	Silty sand, clay lenses at 0.7', 2.7', 3.1', (SW-SM).		1	Sample #1, Depth = 0.5' Mean (mm): 0.12, Phi Sorting: 0.89 Fines (230): 4.33% (SW-SM)
-33.1	4.3	○				
		○	Silty Sand, clay lens at 6.0', (SM).		2	Sample #2, Depth = 5.0' Mean (mm): 0.10, Phi Sorting: 0.23 Fines (230): 10.31% (SM)
-36.2	7.4	○				
		○	End of Boring			

FLORIDA DEP ROSS IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Boring Designation VC-06

DRILLING LOG		DIVISION	INSTALLATION	SHEET 1 OF 1 SHEETS
1. PROJECT IBSP Sand Source Survey Zion, Illinois			9. SIZE AND TYPE OF BIT 3.0 In.	
2. BORING DESIGNATION VC-06			10. COORDINATE SYSTEM/DATUM State Plane	
LOCATION COORDINATES X = 1,137,281 Y = 2,115,679			HORIZONTAL NAD 1983	
3. DRILLING AGENCY Athena Technologies			VERTICAL IGLD MLW	
4. NAME OF DRILLER Palmer McClellan			11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore	
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED			<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER	
6. THICKNESS OF OVERBURDEN 0.0 Ft.			12. TOTAL SAMPLES 2	
7. DEPTH DRILLED INTO ROCK 0.0 Ft.			DISTURBED 2	
8. TOTAL DEPTH OF BORING 8.5 Ft.			UNDISTURBED (UD)	
			13. TOTAL NUMBER CORE BOXES	
			14. ELEVATION GROUND WATER	
			15. DATE BORING 08-14-20	
			STARTED 08-14-20	
			COMPLETED 08-14-20	
			16. ELEVATION TOP OF BORING -34.3 Ft.	
			17. TOTAL RECOVERY FOR BORING 7.4 Ft.	
			18. SIGNATURE AND TITLE OF INSPECTOR Jonathan Barker P.G.	

ELEV. (ft)	DEPTH (ft)	LEGEND	CLASSIFICATION OF MATERIALS Depths and elevations based on measured values	% REC.	BOX OR SAMPLE	REMARKS
-34.3	0.0					
			Silty sand, trace clay at 0.9', (SM).		1	Sample #1, Depth = 2.0' Mean (mm): 0.10, Phi Sorting: 0.33 Fines (230): 7.09% (SM)
-37.5	3.2					
-37.7	3.4		Clay, (CL).			
			Fine sand, (SP).			
-38.9	4.6					
			Fine sand with interbedded clay layers, (SC).			
-41.7	7.4					
			End of Boring			

FLORIDA DEP ROSS IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Boring Designation VC-07-C

DRILLING LOG		DIVISION	INSTALLATION	SHEET 1 OF 1 SHEETS
1. PROJECT IBSP Sand Source Survey Zion, Illinois			9. SIZE AND TYPE OF BIT 3.0 In.	
2. BORING DESIGNATION VC-07-C			10. COORDINATE SYSTEM/DATUM State Plane	
LOCATION COORDINATES X = 1,136,914 Y = 2,113,674			HORIZONTAL NAD 1983	
3. DRILLING AGENCY Athena Technologies			VERTICAL IGLD MLW	
4. NAME OF DRILLER Palmer McClellan			11. MANUFACTURER'S DESIGNATION OF DRILL <input type="checkbox"/> AUTO HAMMER Vibracore <input type="checkbox"/> MANUAL HAMMER	
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED			12. TOTAL SAMPLES 1	
6. THICKNESS OF OVERBURDEN 0.0 Ft.			DISTURBED	
7. DEPTH DRILLED INTO ROCK 0.0 Ft.			UNDISTURBED (UD)	
8. TOTAL DEPTH OF BORING 11.0 Ft.			13. TOTAL NUMBER CORE BOXES	
			14. ELEVATION GROUND WATER	
			15. DATE BORING 08-14-20	
			STARTED 08-14-20	
			COMPLETED 08-14-20	
			16. ELEVATION TOP OF BORING -26.6 Ft.	
			17. TOTAL RECOVERY FOR BORING 9.3 Ft.	
			18. SIGNATURE AND TITLE OF INSPECTOR Jonathan Barker P.G.	

ELEV. (ft)	DEPTH (ft)	LEGEND	CLASSIFICATION OF MATERIALS Depths and elevations based on measured values	% REC.	BOX OR SAMPLE	REMARKS
-26.6	0.0					
			Silty sand, (SM).		1	Sample #1, Depth = 4.5' Mean (mm): 0.11, Phi Sorting: 0.41 Fines (230): 13.95% (SM)
-35.9	9.3		End of Boring			

FLORIDA DEP ROSS IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Boring Designation VC-08

DRILLING LOG		DIVISION	INSTALLATION	SHEET 1 OF 1 SHEETS
1. PROJECT IBSP Sand Source Survey Zion, Illinois			9. SIZE AND TYPE OF BIT 3.0 In.	
2. BORING DESIGNATION VC-08			10. COORDINATE SYSTEM/DATUM State Plane	
LOCATION COORDINATES X = 1,135,664 Y = 2,111,681			HORIZONTAL NAD 1983	
3. DRILLING AGENCY Athena Technologies			VERTICAL IGLD MLW	
4. NAME OF DRILLER Palmer McClellan			11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore	
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED			<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER	
6. THICKNESS OF OVERBURDEN 0.0 Ft.			12. TOTAL SAMPLES 1	
7. DEPTH DRILLED INTO ROCK 0.0 Ft.			DISTURBED 1	
8. TOTAL DEPTH OF BORING 9.8 Ft.			UNDISTURBED (UD)	
			13. TOTAL NUMBER CORE BOXES	
			14. ELEVATION GROUND WATER	
			15. DATE BORING 08-14-20	
			STARTED 08-14-20	
			COMPLETED 08-14-20	
			16. ELEVATION TOP OF BORING -35.1 Ft.	
			17. TOTAL RECOVERY FOR BORING 7.4 Ft.	
			18. SIGNATURE AND TITLE OF INSPECTOR Jonathan Barker P.G.	

ELEV. (ft)	DEPTH (ft)	LEGEND	CLASSIFICATION OF MATERIALS Depths and elevations based on measured values	% REC.	BOX OR SAMPLE	REMARKS
-35.1	0.0					
-35.5	0.4		Fine sand, (SP).			
-35.7	0.6		Clay, (CL).			
			Silty sand clay lenses at 1.2', 1.9', and 2.3', (SW-SM).		1	Sample #1, Depth = 1.5' Mean (mm): 0.12, Phi Sorting: 1.11 Fines (230): 4.24% (SW-SM)
-40.3	5.2					
-40.7	5.6		Clay, (CL).			
			Fine sand, (SP).			
-42.5	7.4					
			End of Boring			

FLORIDA DEP ROSS IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Boring Designation VC-09

DRILLING LOG		DIVISION	INSTALLATION	SHEET 1 OF 1 SHEETS
1. PROJECT IBSP Sand Source Survey Zion, Illinois			9. SIZE AND TYPE OF BIT 3.0 In.	
2. BORING DESIGNATION VC-09			10. COORDINATE SYSTEM/DATUM State Plane	
LOCATION COORDINATES X = 1,138,547 Y = 2,111,677			HORIZONTAL NAD 1983	
3. DRILLING AGENCY Athena Technologies			CONTRACTOR FILE NO.	
4. NAME OF DRILLER Palmer McClellan			11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore	
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED			12. TOTAL SAMPLES 1	
6. THICKNESS OF OVERBURDEN 0.0 Ft.			13. TOTAL NUMBER CORE BOXES	
7. DEPTH DRILLED INTO ROCK 0.0 Ft.			14. ELEVATION GROUND WATER	
8. TOTAL DEPTH OF BORING 22.0 Ft.			15. DATE BORING 08-14-20	
			STARTED 08-14-20	
			COMPLETED 08-14-20	
			16. ELEVATION TOP OF BORING -48.1 Ft.	
			17. TOTAL RECOVERY FOR BORING 17.6 Ft.	
			18. SIGNATURE AND TITLE OF INSPECTOR Jonathan Barker P.G.	

ELEV. (ft)	DEPTH (ft)	LEGEND	CLASSIFICATION OF MATERIALS Depths and elevations based on measured values	% REC.	BOX OR SAMPLE	REMARKS
-48.1	0.0					
		•••••	Fine sand, (SP).		1	Sample #1, Depth = 1.0' Mean (mm): 0.22, Phi Sorting: 0.77 Fines (230): 1.04% (SP)
-51.6	3.5	•••••				
		▨▨▨▨▨	Fine sand with interbedded clay layers, (SC).			
-60.6	12.5	▨▨▨▨▨				
		▨▨▨▨▨	Fine sand with interbedded clay layers, (SC).			
-65.6	17.5	▨▨▨▨▨				

FLORIDA DEP ROSS IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Boring Designation VC-10

DRILLING LOG		DIVISION	INSTALLATION	SHEET 1 OF 1 SHEETS
1. PROJECT IBSP Sand Source Survey Zion, Illinois			9. SIZE AND TYPE OF BIT 3.0 In.	
2. BORING DESIGNATION VC-10			10. COORDINATE SYSTEM/DATUM State Plane	
LOCATION COORDINATES X = 1,133,674 Y = 2,101,157			HORIZONTAL NAD 1983	
3. DRILLING AGENCY Athena Technologies			CONTRACTOR FILE NO.	
4. NAME OF DRILLER Palmer McClellan			11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore	
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED			12. TOTAL SAMPLES 2	
6. THICKNESS OF OVERBURDEN 0.0 Ft.			13. TOTAL NUMBER CORE BOXES	
7. DEPTH DRILLED INTO ROCK 0.0 Ft.			14. ELEVATION GROUND WATER	
8. TOTAL DEPTH OF BORING 22.0 Ft.			15. DATE BORING 08-14-20	
			STARTED 08-14-20	
			COMPLETED 08-14-20	
			16. ELEVATION TOP OF BORING -45.6 Ft.	
			17. TOTAL RECOVERY FOR BORING 16 Ft.	
			18. SIGNATURE AND TITLE OF INSPECTOR Jonathan Barker P.G.	

ELEV. (ft)	DEPTH (ft)	LEGEND	CLASSIFICATION OF MATERIALS Depths and elevations based on measured values	% REC.	BOX OR SAMPLE	REMARKS
-45.6	0.0					
-47.5	1.9		Silty Sand, (SP-SM).		1	Sample #1, Depth = 1.0' Mean (mm): 0.13, Phi Sorting: 0.50 Fines (230): 7.62% (SP-SM)
-51.3	5.7		Silty sand with numerous clay lenses, (SM).		2	Sample #2, Depth = 4.2' Mean (mm): 0.12, Phi Sorting: 0.59 Fines (230): 10.21% (SM)
-61.6	16.0		Fine sand with interbedded clay layers, (SC).			

FLORIDA DEP ROSS IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Boring Designation VC-11-C

DRILLING LOG		DIVISION	INSTALLATION	SHEET 1 OF 1 SHEETS
1. PROJECT IBSP Sand Source Survey Zion, Illinois			9. SIZE AND TYPE OF BIT 3.0 In.	
2. BORING DESIGNATION VC-11-C			10. COORDINATE SYSTEM/DATUM State Plane	
LOCATION COORDINATES X = 1,132,567 Y = 2,103,148			HORIZONTAL NAD 1983	
3. DRILLING AGENCY Athena Technologies			VERTICAL IGLD MLW	
4. NAME OF DRILLER Palmer McClellan			11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore	
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED			<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER	
6. THICKNESS OF OVERBURDEN 0.0 Ft.			12. TOTAL SAMPLES 1	
7. DEPTH DRILLED INTO ROCK 0.0 Ft.			DISTURBED 1	
8. TOTAL DEPTH OF BORING 12.0 Ft.			UNDISTURBED (UD)	
			13. TOTAL NUMBER CORE BOXES	
			14. ELEVATION GROUND WATER	
			15. DATE BORING 08-14-20	
			STARTED 08-14-20	
			COMPLETED 08-14-20	
			16. ELEVATION TOP OF BORING -50.2 Ft.	
			17. TOTAL RECOVERY FOR BORING 11.3 Ft.	
			18. SIGNATURE AND TITLE OF INSPECTOR Jonathan Barker P.G.	

ELEV. (ft)	DEPTH (ft)	LEGEND	CLASSIFICATION OF MATERIALS Depths and elevations based on measured values	% REC.	BOX OR SAMPLE	REMARKS
-50.2	0.0	↑↑↑↑↑				
			Silty sand, (SM).		1	Sample #1, Depth = 3.5' Mean (mm): 0.16, Phi Sorting: 0.67 Fines (230): 15.55% (SM)
-61.5	11.3		End of Boring			

FLORIDA DEP ROSS IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Boring Designation VC-12

DRILLING LOG		DIVISION	INSTALLATION	SHEET 1 OF 1 SHEETS	
1. PROJECT IBSP Sand Source Survey Zion, Illinois			9. SIZE AND TYPE OF BIT 3.0 In.		
2. BORING DESIGNATION VC-12			10. COORDINATE SYSTEM/DATUM State Plane		HORIZONTAL NAD 1983
3. DRILLING AGENCY Athena Technologies			11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		
4. NAME OF DRILLER Palmer McClellan			12. TOTAL SAMPLES 2		
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED			13. TOTAL NUMBER CORE BOXES		
6. THICKNESS OF OVERBURDEN 0.0 Ft.			14. ELEVATION GROUND WATER		
7. DEPTH DRILLED INTO ROCK 0.0 Ft.			15. DATE BORING 08-14-20		
8. TOTAL DEPTH OF BORING 22.0 Ft.			16. ELEVATION TOP OF BORING -48.4 Ft.		
			17. TOTAL RECOVERY FOR BORING 19.1 Ft.		
			18. SIGNATURE AND TITLE OF INSPECTOR Jonathan Barker P.G.		

ELEV. (ft)	DEPTH (ft)	LEGEND	CLASSIFICATION OF MATERIALS Depths and elevations based on measured values	% REC.	BOX OR SAMPLE	REMARKS
-48.4	0.0	○	Fine sand, clay lenses at 2.0', and 2.7', (SW).		1	Sample #1, Depth = 0.5' Mean (mm): 0.32, Phi Sorting: 0.89 Fines (230): 0.62% (SW)
-52.9	4.5	○	Silty sand, (SM).		2	Sample #2, Depth = 3.7' Mean (mm): 0.13, Phi Sorting: 0.45 Fines (230): 14.49% (SM)
		▨	Fine sand with interbedded clay layers, (SC).			
-67.5	19.1	○				

FLORIDA DEP ROSS IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Boring Designation VC-13

DRILLING LOG		DIVISION	INSTALLATION	SHEET 1 OF 1 SHEETS
1. PROJECT IBSP Sand Source Survey Zion, Illinois			9. SIZE AND TYPE OF BIT 3.0 In.	
2. BORING DESIGNATION VC-13			10. COORDINATE SYSTEM/DATUM State Plane	
LOCATION COORDINATES X = 1,132,000 Y = 2,110,647			HORIZONTAL NAD 1983	
3. DRILLING AGENCY Athena Technologies			CONTRACTOR FILE NO.	
4. NAME OF DRILLER Palmer McClellan			11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore	
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED			12. TOTAL SAMPLES 2	
6. THICKNESS OF OVERBURDEN 0.0 Ft.			13. TOTAL NUMBER CORE BOXES	
7. DEPTH DRILLED INTO ROCK 0.0 Ft.			14. ELEVATION GROUND WATER	
8. TOTAL DEPTH OF BORING 22.0 Ft.			15. DATE BORING 08-13-20	
			STARTED 08-13-20	
			COMPLETED 08-13-20	
			16. ELEVATION TOP OF BORING -52.0 Ft.	
			17. TOTAL RECOVERY FOR BORING 18.7 Ft.	
			18. SIGNATURE AND TITLE OF INSPECTOR Jonathan Barker P.G.	

ELEV. (ft)	DEPTH (ft)	LEGEND	CLASSIFICATION OF MATERIALS Depths and elevations based on measured values	% REC.	BOX OR SAMPLE	REMARKS
-52.0	0.0					
-52.7	0.7		Silty sand, (SM).		1	Sample #1, Depth = 0.5' Mean (mm): 0.21, Phi Sorting: 1.38 Fines (230): 24.12% (SM)
			Fine sand with interbedded clay layers, (SC).		2	Sample #2, Depth = 3.0' Mean (mm): 0.12, Phi Sorting: 0.87 Fines (230): 28.71% (SM)
-70.7	18.7					

FLORIDA DEP ROSS IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Boring Designation VC-14

DRILLING LOG		DIVISION	INSTALLATION	SHEET 1 OF 1 SHEETS
1. PROJECT IBSP Sand Source Survey Zion, Illinois			9. SIZE AND TYPE OF BIT 3.0 In.	
2. BORING DESIGNATION VC-14			10. COORDINATE SYSTEM/DATUM State Plane	
LOCATION COORDINATES X = 1,133,214 Y = 2,110,645			HORIZONTAL NAD 1983	
3. DRILLING AGENCY Athena Technologies			VERTICAL IGLD MLW	
4. NAME OF DRILLER Palmer McClellan			11. MANUFACTURER'S DESIGNATION OF DRILL <input type="checkbox"/> AUTO HAMMER Vibracore <input type="checkbox"/> MANUAL HAMMER	
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED			12. TOTAL SAMPLES 3	
6. THICKNESS OF OVERBURDEN 0.0 Ft.			DISTURBED	
7. DEPTH DRILLED INTO ROCK 0.0 Ft.			UNDISTURBED (UD)	
8. TOTAL DEPTH OF BORING 22.0 Ft.			13. TOTAL NUMBER CORE BOXES	
			14. ELEVATION GROUND WATER	
			15. DATE BORING STARTED COMPLETED 08-13-20 08-13-20	
			16. ELEVATION TOP OF BORING -47.0 Ft.	
			17. TOTAL RECOVERY FOR BORING 21.4 Ft.	
			18. SIGNATURE AND TITLE OF INSPECTOR Jonathan Barker P.G.	

ELEV. (ft)	DEPTH (ft)	LEGEND	CLASSIFICATION OF MATERIALS Depths and elevations based on measured values	% REC.	BOX OR SAMPLE	REMARKS
-47.0	0.0					
		•••••	Fine sand, (SP).		1	Sample #1, Depth = 1.0' Mean (mm): 0.37, Phi Sorting: 0.84 Fines (230): 0.25% (SP)
-52.2	5.2	↑↑↑↑↑	Silty Sand with trace clay, (SM).		2	Sample #2, Depth = 4.2' Mean (mm): 0.16, Phi Sorting: 0.58 Fines (230): 2.56% (SP)
-55.1	8.1	▨▨▨▨▨	Fine sand with interbedded clay layers, (SC).		3	Sample #3, Depth = 6.0' Mean (mm): 0.13, Phi Sorting: 0.45 Fines (230): 11.07% (SM)
-68.4	21.4					

FLORIDA DEP ROSS IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Boring Designation VC-15

DRILLING LOG		DIVISION	INSTALLATION	SHEET 1 OF 1 SHEETS
1. PROJECT IBSP Sand Source Survey Zion, Illinois			9. SIZE AND TYPE OF BIT 3.0 In.	
2. BORING DESIGNATION VC-15			10. COORDINATE SYSTEM/DATUM State Plane	
LOCATION COORDINATES X = 1,131,538 Y = 2,112,641			HORIZONTAL NAD 1983	
3. DRILLING AGENCY Athena Technologies			VERTICAL IGLD MLW	
4. NAME OF DRILLER Palmer McClellan			11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore	
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED			<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER	
6. THICKNESS OF OVERBURDEN 0.0 Ft.			12. TOTAL SAMPLES 3	
7. DEPTH DRILLED INTO ROCK 0.0 Ft.			DISTURBED 3	
8. TOTAL DEPTH OF BORING 22.0 Ft.			UNDISTURBED (UD)	
			13. TOTAL NUMBER CORE BOXES	
			14. ELEVATION GROUND WATER	
			15. DATE BORING 08-14-20	
			STARTED 08-14-20	
			COMPLETED 08-14-20	
			16. ELEVATION TOP OF BORING -49.4 Ft.	
			17. TOTAL RECOVERY FOR BORING 18.3 Ft.	
			18. SIGNATURE AND TITLE OF INSPECTOR Jonathan Barker P.G.	

ELEV. (ft)	DEPTH (ft)	LEGEND	CLASSIFICATION OF MATERIALS Depths and elevations based on measured values	% REC.	BOX OR SAMPLE	REMARKS
-49.4	0.0					
			Fine sand, (SP).		1	Sample #1, Depth = 0.5' Mean (mm): 0.22, Phi Sorting: 0.76 Fines (230): 1.13% (SP)
-52.8	3.4		Silty sand with some clay lenses, (SM).		2	Sample #2, Depth = 4.5' Mean (mm): 0.11, Phi Sorting: 0.44 Fines (230): 17.96% (SM)
-57.2	7.8		Fine sand with interbedded clay layers, (SC).		3	Sample #3, Depth = 7.5' Mean (mm): 0.11, Phi Sorting: 0.48 Fines (230): 20.06% (SM)
-67.7	18.3					

FLORIDA DEP ROSS IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Boring Designation VC-16

DRILLING LOG		DIVISION	INSTALLATION	SHEET 1 OF 1 SHEETS
1. PROJECT IBSP Sand Source Survey Zion, Illinois			9. SIZE AND TYPE OF BIT 3.0 In.	
2. BORING DESIGNATION VC-16			10. COORDINATE SYSTEM/DATUM State Plane	
LOCATION COORDINATES X = 1,133,189 Y = 2,112,657			HORIZONTAL NAD 1983	
3. DRILLING AGENCY Athena Technologies			VERTICAL IGLD MLW	
4. NAME OF DRILLER Palmer McClellan			11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore	
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED			<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER	
6. THICKNESS OF OVERBURDEN 0.0 Ft.			12. TOTAL SAMPLES 3	
7. DEPTH DRILLED INTO ROCK 0.0 Ft.			DISTURBED 3	
8. TOTAL DEPTH OF BORING 22.0 Ft.			UNDISTURBED (UD)	
			13. TOTAL NUMBER CORE BOXES	
			14. ELEVATION GROUND WATER	
			15. DATE BORING 08-13-20	
			STARTED 08-13-20	
			COMPLETED 08-13-20	
			16. ELEVATION TOP OF BORING -48.1 Ft.	
			17. TOTAL RECOVERY FOR BORING 20.7 Ft.	
			18. SIGNATURE AND TITLE OF INSPECTOR Jonathan Barker P.G.	

ELEV. (ft)	DEPTH (ft)	LEGEND	CLASSIFICATION OF MATERIALS Depths and elevations based on measured values	% REC.	BOX OR SAMPLE	REMARKS
-48.1	0.0					
-49.9	1.8		Fine Sand, (SW).		1	Sample #1, Depth = 0.5' Mean (mm): 0.40, Phi Sorting: 1.05 Fines (230): 1.24% (SW)
-53.4	5.3		Fine sand, clay lens at 3.2', (SP).		2	Sample #2, Depth = 2.0' Mean (mm): 0.31, Phi Sorting: 0.84 Fines (230): 0.29% (SP)
-55.3	7.2		Silty sand, (SP-SM).		3	Sample #3, Depth = 5.5' Mean (mm): 0.13, Phi Sorting: 0.36 Fines (230): 3.47% (SP-SM)
-68.8	20.7		Fine sand with interbedded clay layers, (SC).			

FLORIDA DEP ROSS IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Boring Designation VC-17

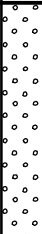


DRILLING LOG		DIVISION	INSTALLATION	SHEET 1 OF 1 SHEETS
1. PROJECT IBSP Sand Source Survey Zion, Illinois			9. SIZE AND TYPE OF BIT 3.0 In.	
2. BORING DESIGNATION VC-17			10. COORDINATE SYSTEM/DATUM State Plane	
3. DRILLING AGENCY Athena Technologies			11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore	
4. NAME OF DRILLER Palmer McClellan			12. TOTAL SAMPLES 2	
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED			13. TOTAL NUMBER CORE BOXES	
6. THICKNESS OF OVERBURDEN 0.0 Ft.			14. ELEVATION GROUND WATER	
7. DEPTH DRILLED INTO ROCK 0.0 Ft.			15. DATE BORING 08-13-20	
8. TOTAL DEPTH OF BORING 21.0 Ft.			16. ELEVATION TOP OF BORING -42.1 Ft.	
			17. TOTAL RECOVERY FOR BORING 16.4 Ft.	
			18. SIGNATURE AND TITLE OF INSPECTOR Jonathan Barker P.G.	

ELEV. (ft)	DEPTH (ft)	LEGEND	CLASSIFICATION OF MATERIALS Depths and elevations based on measured values	% REC.	BOX OR SAMPLE	REMARKS
-42.1	0.0					
		•••••	Fine sand, (SP).		1	Sample #1, Depth = 0.5' Mean (mm): 0.20, Phi Sorting: 0.63 Fines (230): 0.70% (SP)
-44.2	2.1				2	Sample #2, Depth = 2.1' Mean (mm): 0.11, Phi Sorting: 0.47 Fines (230): 5.08% (SP-SM)
-44.4	2.3	•••••	Silty sand, (SP-SM).			
		/ / / / /	Fine sand with interbedded clay layers, (SC).			
-58.5	16.4		End of Boring			

FLORIDA DEP ROSS IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Boring Designation VC-18





DRILLING LOG		DIVISION	INSTALLATION	SHEET 1 OF 1 SHEETS
1. PROJECT IBSP Sand Source Survey Zion, Illinois			9. SIZE AND TYPE OF BIT 3.0 In.	
2. BORING DESIGNATION VC-18			10. COORDINATE SYSTEM/DATUM State Plane	
LOCATION COORDINATES X = 1,138,958 Y = 2,112,686			HORIZONTAL NAD 1983	
3. DRILLING AGENCY Athena Technologies			VERTICAL IGLD MLW	
4. NAME OF DRILLER Palmer McClellan			11. MANUFACTURER'S DESIGNATION OF DRILL <input type="checkbox"/> AUTO HAMMER Vibracore <input type="checkbox"/> MANUAL HAMMER	
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED			12. TOTAL SAMPLES 3	
6. THICKNESS OF OVERBURDEN 0.0 Ft.			DISTURBED	
7. DEPTH DRILLED INTO ROCK 0.0 Ft.			UNDISTURBED (UD)	
8. TOTAL DEPTH OF BORING 22.0 Ft.			13. TOTAL NUMBER CORE BOXES	
			14. ELEVATION GROUND WATER	
			15. DATE BORING STARTED COMPLETED 08-14-20 08-14-20	
			16. ELEVATION TOP OF BORING -40.8 Ft.	
			17. TOTAL RECOVERY FOR BORING 20.3 Ft.	
			18. SIGNATURE AND TITLE OF INSPECTOR Jonathan Barker P.G.	

ELEV. (ft)	DEPTH (ft)	LEGEND	CLASSIFICATION OF MATERIALS Depths and elevations based on measured values	% REC.	BOX OR SAMPLE	REMARKS
-40.8	0.0					
			Fine sand, (SW).		1	Sample #1, Depth = 1.0' Mean (mm): 0.40, Phi Sorting: 0.98 Fines (230): 0.28% (SW)
-45.6	4.8				2	Sample #2, Depth = 4.5' Mean (mm): 0.33, Phi Sorting: 1.07 Fines (230): 1.94% (SW)
-45.8	5.0		Silty sand, (SM).		3	Sample #3, Depth = 4.9' Mean (mm): 0.12, Phi Sorting: 0.94 Fines (230): 17.12% (SM)
			Fine sand with interbedded clay layers, (SC).			
-61.1	20.3					

FLORIDA DEP ROSS IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Boring Designation VC-19

DRILLING LOG		DIVISION	INSTALLATION	SHEET 1 OF 1 SHEETS
1. PROJECT IBSP Sand Source Survey Zion, Illinois			9. SIZE AND TYPE OF BIT 3.0 In.	
2. BORING DESIGNATION VC-19			10. COORDINATE SYSTEM/DATUM State Plane	
LOCATION COORDINATES X = 1,140,337 Y = 2,114,198			HORIZONTAL NAD 1983	
3. DRILLING AGENCY Athena Technologies			VERTICAL IGLD MLW	
4. NAME OF DRILLER Palmer McClellan			11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore	
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED			<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER	
6. THICKNESS OF OVERBURDEN 0.0 Ft.			12. TOTAL SAMPLES 2	
7. DEPTH DRILLED INTO ROCK 0.0 Ft.			DISTURBED 2	
8. TOTAL DEPTH OF BORING 17.0 Ft.			UNDISTURBED (UD)	
			13. TOTAL NUMBER CORE BOXES	
			14. ELEVATION GROUND WATER	
			15. DATE BORING 08-14-20	
			STARTED 08-14-20	
			COMPLETED 08-14-20	
			16. ELEVATION TOP OF BORING -38.5 Ft.	
			17. TOTAL RECOVERY FOR BORING 10 Ft.	
			18. SIGNATURE AND TITLE OF INSPECTOR Jonathan Barker P.G.	

ELEV. (ft)	DEPTH (ft)	LEGEND	CLASSIFICATION OF MATERIALS Depths and elevations based on measured values	% REC.	BOX OR SAMPLE	REMARKS
-38.5	0.0					
-39.7	1.2		Fine sand, (SW).		1	Sample #1, Depth = 0.5' Mean (mm): 0.27, Phi Sorting: 0.97 Fines (230): 3.24% (SW)
-40.4	1.9		Fine sand with interbedded clay layers, (SC).			
-41.5	3.0		Silty sand, (SP-SM).		2	Sample #2, Depth = 2.5' Mean (mm): 0.11, Phi Sorting: 0.62 Fines (230): 6.54% (SP-SM)
			Fine sand with interbedded clay layers, (SC).			
-48.5	10.0					
			End of Boring			

FLORIDA DEP ROSS IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Boring Designation VC-20

DRILLING LOG		DIVISION	INSTALLATION	SHEET 1 OF 1 SHEETS
1. PROJECT IBSP Sand Source Survey Zion, Illinois			9. SIZE AND TYPE OF BIT 3.0 In.	
2. BORING DESIGNATION VC-20			10. COORDINATE SYSTEM/DATUM State Plane	
LOCATION COORDINATES X = 1,139,260 Y = 2,115,192			HORIZONTAL NAD 1983	
3. DRILLING AGENCY Athena Technologies			CONTRACTOR FILE NO.	
4. NAME OF DRILLER Palmer McClellan			11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore	
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED			12. TOTAL SAMPLES 2	
6. THICKNESS OF OVERBURDEN 0.0 Ft.			13. TOTAL NUMBER CORE BOXES	
7. DEPTH DRILLED INTO ROCK 0.0 Ft.			14. ELEVATION GROUND WATER	
8. TOTAL DEPTH OF BORING 21.0 Ft.			15. DATE BORING 08-14-20	
			STARTED 08-14-20	
			COMPLETED 08-14-20	
			16. ELEVATION TOP OF BORING -42.9 Ft.	
			17. TOTAL RECOVERY FOR BORING 19.8 Ft.	
			18. SIGNATURE AND TITLE OF INSPECTOR Jonathan Barker P.G.	

ELEV. (ft)	DEPTH (ft)	LEGEND	CLASSIFICATION OF MATERIALS Depths and elevations based on measured values	% REC.	BOX OR SAMPLE	REMARKS
-42.9	0.0					
			Fine sand, clay lenses at 3.3' and 3.4', (SP).		1	Sample #1, Depth = 1.0' Mean (mm): 0.16, Phi Sorting: 0.54 Fines (230): 3.91% (SP)
-46.5	3.6					
-46.8	3.9		Silty sand, (SM).		2	Sample #2, Depth = 3.7' Mean (mm): 0.13, Phi Sorting: 0.77 Fines (230): 11.01% (SM)
			Fine sand with interbedded clay layers, (SC).			
-61.9	19.0					
-62.7	19.8		Fine sand, (SP).			
			End of Boring			

FLORIDA DEP ROSS IBSP.GPJ FL DEP ROSS.GDT 11/10/20

APPENDIX C

XENCO CHEMICAL TESTING LABORATORY REPORT

Analytical Report 673082

for

Gahagan & Bryant Associates, Inc.

Project Manager: Jonathan R. Barker

Dredged Material Chemical Testing

09.29.2020



**4147 Greenbriar Dr.
Stafford, TX 77477**

Xenco-Houston (EPA Lab Code: TX00122):
Texas (T104704215-20-38), Arizona (AZ0765), Florida (E871002-33), Louisiana (03054)
Oklahoma (2020-014), North Carolina (681), Arkansas (20-035-0)

Xenco-Dallas (EPA Lab Code: TX01468):
Texas (T104704295-20-26), Arizona (AZ0809)

Xenco-El Paso (EPA Lab Code: TX00127): Texas (T104704221-20-18)
Xenco-Lubbock (EPA Lab Code: TX00139): Texas (T104704219-20-23)
Xenco-Midland (EPA Lab Code: TX00158): Texas (T104704400-19-21)
Xenco-Carlsbad (LELAP): Louisiana (05092)
Xenco-San Antonio (EPA Lab Code: TNI02385): Texas (T104704534-20-8)
Xenco-Tampa: Florida (E87429), North Carolina (483)

09.29.2020

Project Manager: **Jonathan R. Barker**
Gahagan & Bryant Associates, Inc.
3802 W. Bay to Bay Blvd. Suite B-22
Tampa, FL 33629

Reference: Eurofins Xenco, LLC Report No(s): **673082**
Dredged Material Chemical Testing
Project Address:

Jonathan R. Barker:

We are reporting to you the results of the analyses performed on the samples received under the project name referenced above and identified with the Eurofins Xenco, LLC Report Number(s) 673082. All results being reported under this Report Number apply to the samples analyzed and properly identified with a Laboratory ID number. Subcontracted analyses are identified in this report with either the NELAC certification number of the subcontract lab in the analyst ID field, or the complete subcontracted report attached to this report.

Unless otherwise noted in a Case Narrative, all data reported in this Analytical Report are in compliance with NELAC standards. The uncertainty of measurement associated with the results of analysis reported is available upon request. Should insufficient sample be provided to the laboratory to meet the method and NELAC Matrix Duplicate and Matrix Spike requirements, then the data will be analyzed, evaluated and reported using all other available quality control measures.

The validity and integrity of this report will remain intact as long as it is accompanied by this letter and reproduced in full, unless written approval is granted by Eurofins Xenco, LLC. This report will be filed for at least 5 years in our archives after which time it will be destroyed without further notice, unless otherwise arranged with you. The samples received, and described as recorded in Report No. 673082 will be filed for 45 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

We thank you for selecting Eurofins Xenco, LLC to serve your analytical needs. If you have any questions concerning this report, please feel free to contact us at any time.

Respectfully,



Matthew Jones
Project Manager

A Small Business and Minority Company

Houston - Dallas - Midland - Tampa - Phoenix - Lubbock - San Antonio - El Paso - Atlanta - New Mexico

Sample Cross Reference 673082

Gahagan & Bryant Associates, Inc., Tampa, FL

Dredged Material Chemical Testing

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
VC-3-C	W	09.14.2020 13:15	5 - 6 ft	673082-001
VC-7-C	W	09.14.2020 15:41	4 - 5 ft	673082-002
VC-11-C	W	09.14.2020 11:08	3 - 4 ft	673082-003

CASE NARRATIVE

Client Name: Gahagan & Bryant Associates, Inc.

Project Name: Dredged Material Chemical Testing

Project ID:
Work Order Number(s): 673082

Report Date: 09.29.2020
Date Received: 09.18.2020

Sample receipt non conformances and comments:

Sample receipt non conformances and comments per sample:

None

Hits Summary 673082

Gahagan & Bryant Associates, Inc., Tampa, FL

Dredged Material Chemical Testing

Below is a summary of the analytes which were found to be present in the samples associated with this work order. This should only be used in conjunction with the included analytical results.

Sample ID: VC-3-C		Sample ID: 673082-001		Date/Time Sampled: 09.14.2020 13:15			Matrix: Water		
Analyte Name	Method	CAS No.	Dil.	Result	RL/PQL	MDL	Units	Qual	
Aluminum	SW6020A	7429-90-5	1	0.712	0.0200	0.00252	mg/L		
Arsenic	SW6020A	7440-38-2	1	0.000747	0.00400	0.000246	mg/L	I	
Barium	SW6020A	7440-39-3	1	0.0204	0.00400	0.000484	mg/L		
Chromium	SW6020A	7440-47-3	1	0.00154	0.00400	0.000525	mg/L	I	
Copper	SW6020A	7440-50-8	1	0.00134	0.00400	0.000747	mg/L	I	
Lead	SW6020A	7439-92-1	1	0.000664	0.00200	0.000152	mg/L	I	
Nickel	SW6020A	7440-02-0	1	0.00101	0.00200	0.000292	mg/L	I	
Tin	SW6020A	7440-31-5	1	0.00177	0.00200	0.000158	mg/L	I	
Zinc	SW6020A	7440-66-6	1	0.00416	0.00400	0.000802	mg/L		

Sample ID: VC-7-C		Sample ID: 673082-002		Date/Time Sampled: 09.14.2020 15:41			Matrix: Water		
Analyte Name	Method	CAS No.	Dil.	Result	RL/PQL	MDL	Units	Qual	
Aluminum	SW6020A	7429-90-5	1	0.601	0.0200	0.00252	mg/L		
Arsenic	SW6020A	7440-38-2	1	0.000780	0.00400	0.000246	mg/L	I	
Barium	SW6020A	7440-39-3	1	0.0272	0.00400	0.000484	mg/L		
Chromium	SW6020A	7440-47-3	1	0.00104	0.00400	0.000525	mg/L	I	
Copper	SW6020A	7440-50-8	1	0.00118	0.00400	0.000747	mg/L	I	
Lead	SW6020A	7439-92-1	1	0.000630	0.00200	0.000152	mg/L	I	
Nickel	SW6020A	7440-02-0	1	0.00107	0.00200	0.000292	mg/L	I	
Tin	SW6020A	7440-31-5	1	0.00133	0.00200	0.000158	mg/L	I	
Zinc	SW6020A	7440-66-6	1	0.00447	0.00400	0.000802	mg/L		

Sample ID: VC-7-C		Sample ID: 673082-002		Date/Time Sampled: 09.14.2020 15:41			Matrix: Water		
Analyte Name	Method	CAS No.	Dil.	Result	RL/PQL	MDL	Units	Qual	
Mercury	SW7470A	7439-97-6	1	0.0000320	0.000200	0.0000263	mg/L	I	

Sample ID: VC-11-C		Sample ID: 673082-003		Date/Time Sampled: 09.14.2020 11:08			Matrix: Water		
Analyte Name	Method	CAS No.	Dil.	Result	RL/PQL	MDL	Units	Qual	
Aluminum	SW6020A	7429-90-5	1	2.18	0.0200	0.00252	mg/L		
Arsenic	SW6020A	7440-38-2	1	0.00157	0.00400	0.000246	mg/L	I	
Barium	SW6020A	7440-39-3	1	0.0295	0.00400	0.000484	mg/L		
Beryllium	SW6020A	7440-41-7	1	0.000491	0.00200	0.000131	mg/L	I	
Cadmium	SW6020A	7440-43-9	1	0.000259	0.00200	0.000147	mg/L	I	
Chromium	SW6020A	7440-47-3	1	0.00404	0.00400	0.000525	mg/L		
Copper	SW6020A	7440-50-8	1	0.00243	0.00400	0.000747	mg/L	I	
Lead	SW6020A	7439-92-1	1	0.00194	0.00200	0.000152	mg/L	I	

Hits Summary 673082

Gahagan & Bryant Associates, Inc., Tampa, FL

Dredged Material Chemical Testing

Sample ID: 673082-003

Date/Time Sampled: 09.14.2020 11:08

Matrix: Water

Nickel	SW6020A	7440-02-0	1	0.00247	0.00200	0.000292	mg/L	
Selenium	SW6020A	7782-49-2	1	0.000467	0.00200	0.000454	mg/L	I
Thallium	SW6020A	7440-28-0	1	0.000442	0.00200	0.000332	mg/L	I
Tin	SW6020A	7440-31-5	1	0.00290	0.00200	0.000158	mg/L	
Zinc	SW6020A	7440-66-6	1	0.0447	0.00400	0.000802	mg/L	

Certificate of Analytical Results 673082

Gahagan & Bryant Associates, Inc., Tampa, FL

Dredged Material Chemical Testing

Sample Id: **VC-3-C** Matrix: Water Date Received: 09.18.2020 10:00
 Lab Sample Id: 673082-001 Date Collected: 09.14.2020 13:15 Sample Depth: 5 - 6 ft
 Analytical Method: Mercury by SW-846 7470A Prep Method: SW7470P
 Tech: VID % Moisture:
 Analyst: ANJ Date Prep: 09.24.2020 08:10
 Seq Number: 3138046 SUB: T104704215-20-38

Parameter	Cas Number	Result	PQL	MDL	Flag	Units	Analysis Date	Dil
Mercury	7439-97-6	<0.0000263	0.000200	0.0000263	U	mg/L	09.24.2020 13:39	1

Analytical Method: Total Metals by SW6020A Prep Method: SW3010A
 Tech: MLI % Moisture:
 Analyst: DEP Date Prep: 09.23.2020 10:35
 Seq Number: 3137947 SUB: T104704215-20-38

Parameter	Cas Number	Result	PQL	MDL	Flag	Units	Analysis Date	Dil
Aluminum	7429-90-5	0.712	0.0200	0.00252		mg/L	09.23.2020 17:59	1
Arsenic	7440-38-2	0.000747	0.00400	0.000246	I	mg/L	09.23.2020 17:59	1
Barium	7440-39-3	0.0204	0.00400	0.000484		mg/L	09.23.2020 17:59	1
Beryllium	7440-41-7	<0.000131	0.00200	0.000131	U	mg/L	09.23.2020 17:59	1
Cadmium	7440-43-9	<0.000147	0.00200	0.000147	U	mg/L	09.23.2020 17:59	1
Chromium	7440-47-3	0.00154	0.00400	0.000525	I	mg/L	09.23.2020 17:59	1
Copper	7440-50-8	0.00134	0.00400	0.000747	I	mg/L	09.23.2020 17:59	1
Lead	7439-92-1	0.000664	0.00200	0.000152	I	mg/L	09.23.2020 17:59	1
Nickel	7440-02-0	0.00101	0.00200	0.000292	I	mg/L	09.23.2020 17:59	1
Selenium	7782-49-2	<0.000454	0.00200	0.000454	U	mg/L	09.23.2020 17:59	1
Silver	7440-22-4	<0.000251	0.00200	0.000251	U	mg/L	09.23.2020 17:59	1
Thallium	7440-28-0	<0.000332	0.00200	0.000332	U	mg/L	09.23.2020 17:59	1
Tin	7440-31-5	0.00177	0.00200	0.000158	I	mg/L	09.23.2020 17:59	1
Zinc	7440-66-6	0.00416	0.00400	0.000802		mg/L	09.23.2020 17:59	1

Certificate of Analytical Results 673082

Gahagan & Bryant Associates, Inc., Tampa, FL

Dredged Material Chemical Testing

Sample Id: **VC-7-C** Matrix: Water Date Received: 09.18.2020 10:00
 Lab Sample Id: 673082-002 Date Collected: 09.14.2020 15:41 Sample Depth: 4 - 5 ft
 Analytical Method: Mercury by SW-846 7470A Prep Method: SW7470P
 Tech: VID % Moisture:
 Analyst: ANJ Date Prep: 09.24.2020 08:10
 Seq Number: 3138046 SUB: T104704215-20-38

Parameter	Cas Number	Result	PQL	MDL	Flag	Units	Analysis Date	Dil
Mercury	7439-97-6	0.0000320	0.000200	0.0000263	I	mg/L	09.24.2020 13:41	1

Analytical Method: Total Metals by SW6020A Prep Method: SW3010A
 Tech: MLI % Moisture:
 Analyst: DEP Date Prep: 09.23.2020 10:35
 Seq Number: 3137947 SUB: T104704215-20-38

Parameter	Cas Number	Result	PQL	MDL	Flag	Units	Analysis Date	Dil
Aluminum	7429-90-5	0.601	0.0200	0.00252		mg/L	09.23.2020 18:01	1
Arsenic	7440-38-2	0.000780	0.00400	0.000246	I	mg/L	09.23.2020 18:01	1
Barium	7440-39-3	0.0272	0.00400	0.000484		mg/L	09.23.2020 18:01	1
Beryllium	7440-41-7	<0.000131	0.00200	0.000131	U	mg/L	09.23.2020 18:01	1
Cadmium	7440-43-9	<0.000147	0.00200	0.000147	U	mg/L	09.23.2020 18:01	1
Chromium	7440-47-3	0.00104	0.00400	0.000525	I	mg/L	09.23.2020 18:01	1
Copper	7440-50-8	0.00118	0.00400	0.000747	I	mg/L	09.23.2020 18:01	1
Lead	7439-92-1	0.000630	0.00200	0.000152	I	mg/L	09.23.2020 18:01	1
Nickel	7440-02-0	0.00107	0.00200	0.000292	I	mg/L	09.23.2020 18:01	1
Selenium	7782-49-2	<0.000454	0.00200	0.000454	U	mg/L	09.23.2020 18:01	1
Silver	7440-22-4	<0.000251	0.00200	0.000251	U	mg/L	09.23.2020 18:01	1
Thallium	7440-28-0	<0.000332	0.00200	0.000332	U	mg/L	09.23.2020 18:01	1
Tin	7440-31-5	0.00133	0.00200	0.000158	I	mg/L	09.23.2020 18:01	1
Zinc	7440-66-6	0.00447	0.00400	0.000802		mg/L	09.23.2020 18:01	1

Certificate of Analytical Results 673082

Gahagan & Bryant Associates, Inc., Tampa, FL

Dredged Material Chemical Testing

Sample Id: **VC-11-C** Matrix: Water Date Received: 09.18.2020 10:00
 Lab Sample Id: 673082-003 Date Collected: 09.14.2020 11:08 Sample Depth: 3 - 4 ft
 Analytical Method: Mercury by SW-846 7470A Prep Method: SW7470P
 Tech: VID % Moisture:
 Analyst: ANJ Date Prep: 09.24.2020 08:10
 Seq Number: 3138046 SUB: T104704215-20-38

Parameter	Cas Number	Result	PQL	MDL	Flag	Units	Analysis Date	Dil
Mercury	7439-97-6	<0.0000263	0.000200	0.0000263	U	mg/L	09.24.2020 13:43	1

Analytical Method: Total Metals by SW6020A Prep Method: SW3010A
 Tech: MLI % Moisture:
 Analyst: DEP Date Prep: 09.23.2020 10:35
 Seq Number: 3137947 SUB: T104704215-20-38

Parameter	Cas Number	Result	PQL	MDL	Flag	Units	Analysis Date	Dil
Aluminum	7429-90-5	2.18	0.0200	0.00252		mg/L	09.23.2020 18:04	1
Arsenic	7440-38-2	0.00157	0.00400	0.000246	I	mg/L	09.23.2020 18:04	1
Barium	7440-39-3	0.0295	0.00400	0.000484		mg/L	09.23.2020 18:04	1
Beryllium	7440-41-7	0.000491	0.00200	0.000131	I	mg/L	09.23.2020 18:04	1
Cadmium	7440-43-9	0.000259	0.00200	0.000147	I	mg/L	09.23.2020 18:04	1
Chromium	7440-47-3	0.00404	0.00400	0.000525		mg/L	09.23.2020 18:04	1
Copper	7440-50-8	0.00243	0.00400	0.000747	I	mg/L	09.23.2020 18:04	1
Lead	7439-92-1	0.00194	0.00200	0.000152	I	mg/L	09.23.2020 18:04	1
Nickel	7440-02-0	0.00247	0.00200	0.000292		mg/L	09.23.2020 18:04	1
Selenium	7782-49-2	0.000467	0.00200	0.000454	I	mg/L	09.23.2020 18:04	1
Silver	7440-22-4	<0.000251	0.00200	0.000251	U	mg/L	09.23.2020 18:04	1
Thallium	7440-28-0	0.000442	0.00200	0.000332	I	mg/L	09.23.2020 18:04	1
Tin	7440-31-5	0.00290	0.00200	0.000158		mg/L	09.23.2020 18:04	1
Zinc	7440-66-6	0.0447	0.00400	0.000802		mg/L	09.23.2020 18:04	1

Florida Flagging Criteria

Data were reviewed by the
Department Supervisor and QA Director

- A** Value reported is the mean (average) of two or more determinations.
- B** Results based upon colony counts outside the acceptable range.
- J** Estimated value; value may not be accurate. All results with a "J" qualifier require comment.
- Q** Sample held beyond the accepted holding time
- T** Value reported is less than the laboratory method detection limit. The value is reported for informational purposes, only and shall not be used in statistical analysis.
- U** Compound was analyzed for but not detected at the MDL Level.
- V** Indicates that the analyte was detected at or above the method detection limit in both the sample and the associated method blank and the value of 10 times the blank value was equal to or greater than the associated sample value. Note: unless specified by the method, the value in the blank shall not be subtracted from associated samples.
- Y** Laboratory analysis was from an unpreserved or improperly preserved sample. The data may not be accurate.
- I** The reported value is between the laboratory MDL and the laboratory PQL.
- R** Significant rain in the past 48 hours.
- +** NELAC certification not offered for this compound.
- *** (Next to analyte name or method description) = Outside XENCO's scope of NELAC accreditation

Gahagan & Bryant Associates, Inc.
Dredged Material Chemical Testing

Analytical Method: Mercury by SW-846 7470A
Seq Number: 3138046
MB Sample Id: 7711966-1-BLK

Matrix: Water
LCS Sample Id: 7711966-1-BKS

Prep Method: SW7470P
Date Prep: 09.24.2020
LCSD Sample Id: 7711966-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Mercury	<0.0000263	0.00200	0.00193	97	0.00163	82	80-120	17	20	mg/L	09.24.2020 12:53	

Analytical Method: Mercury by SW-846 7470A
Seq Number: 3138046
Parent Sample Id: 673156-001

Matrix: Storm Water
MS Sample Id: 673156-001 S

Prep Method: SW7470P
Date Prep: 09.24.2020
MSD Sample Id: 673156-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Mercury	<0.0000263	0.00200	0.00185	93	0.00191	96	75-125	3	20	mg/L	09.24.2020 12:59	

Analytical Method: Total Metals by SW6020A
Seq Number: 3137947
MB Sample Id: 7711918-1-BLK

Matrix: Water
LCS Sample Id: 7711918-1-BKS

Prep Method: SW3010A
Date Prep: 09.23.2020
LCSD Sample Id: 7711918-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Aluminum	<0.00252	0.500	0.519	104	0.522	104	80-120	1	20	mg/L	09.23.2020 15:57	
Arsenic	<0.000246	0.100	0.102	102	0.103	103	80-120	1	20	mg/L	09.23.2020 15:57	
Barium	<0.000484	0.100	0.101	101	0.102	102	80-120	1	20	mg/L	09.23.2020 15:57	
Beryllium	<0.000131	0.100	0.0986	99	0.100	100	80-120	1	20	mg/L	09.23.2020 15:57	
Cadmium	<0.000147	0.100	0.102	102	0.103	103	80-120	1	20	mg/L	09.23.2020 15:57	
Chromium	<0.000525	0.100	0.101	101	0.103	103	80-120	2	20	mg/L	09.23.2020 15:57	
Copper	<0.000747	0.100	0.102	102	0.104	104	80-120	2	20	mg/L	09.23.2020 15:57	
Lead	<0.000152	0.100	0.101	101	0.103	103	80-120	2	20	mg/L	09.23.2020 15:57	
Nickel	<0.000292	0.100	0.102	102	0.103	103	80-120	1	20	mg/L	09.23.2020 15:57	
Selenium	<0.000454	0.100	0.103	103	0.105	105	80-120	2	20	mg/L	09.23.2020 15:57	
Silver	<0.000251	0.0500	0.0508	102	0.0515	103	80-120	1	20	mg/L	09.23.2020 15:57	
Thallium	<0.000332	0.100	0.103	103	0.103	103	80-120	0	20	mg/L	09.23.2020 15:57	
Tin	<0.000158	0.100	0.102	102	0.103	103	80-120	1	20	mg/L	09.23.2020 15:57	
Zinc	<0.000802	0.100	0.103	103	0.104	104	80-120	1	20	mg/L	09.23.2020 15:57	

MS/MSD Percent Recovery
Relative Percent Difference
LCS/LCSD Recovery
Log Difference

$[D] = 100 * (C - A) / B$
 $RPD = 200 * |(C - E) / (C + E)|$
 $[D] = 100 * (C) / [B]$
 Log Diff. = $\text{Log}(\text{Sample Duplicate}) - \text{Log}(\text{Original Sample})$

LCS = Laboratory Control Sample
A = Parent Result
C = MS/LCS Result
E = MSD/LCSD Result

MS = Matrix Spike
B = Spike Added
D = MSD/LCSD % Rec

Gahagan & Bryant Associates, Inc.
Dredged Material Chemical Testing

Analytical Method: Total Metals by SW6020A
Seq Number: 3137947
Parent Sample Id: 673137-004

Matrix: Water
MS Sample Id: 673137-004 S

Prep Method: SW3010A
Date Prep: 09.23.2020
MSD Sample Id: 673137-004 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Aluminum	0.0188	0.500	0.488	94	0.493	95	75-125	1	20	mg/L	09.23.2020 16:09	
Arsenic	0.0284	0.100	0.124	96	0.123	95	75-125	1	20	mg/L	09.23.2020 16:09	
Barium	1.12	0.100	1.16	40	1.16	40	75-125	0	20	mg/L	09.23.2020 16:09	J
Beryllium	<0.000131	0.100	0.0938	94	0.0935	94	75-125	0	20	mg/L	09.23.2020 16:09	
Cadmium	<0.000147	0.100	0.0949	95	0.0954	95	75-125	1	20	mg/L	09.23.2020 16:09	
Chromium	<0.000525	0.100	0.0950	95	0.0949	95	75-125	0	20	mg/L	09.23.2020 16:09	
Copper	0.0257	0.100	0.121	95	0.122	96	75-125	1	20	mg/L	09.23.2020 16:09	
Lead	0.0347	0.100	0.130	95	0.131	96	75-125	1	20	mg/L	09.23.2020 16:09	
Nickel	0.00389	0.100	0.0958	92	0.0972	93	75-125	1	20	mg/L	09.23.2020 16:09	
Selenium	0.000940	0.100	0.0951	94	0.0945	94	75-125	1	20	mg/L	09.23.2020 16:09	
Silver	<0.000251	0.0500	0.0480	96	0.0484	97	75-125	1	20	mg/L	09.23.2020 16:09	
Thallium	<0.000332	0.100	0.0972	97	0.0984	98	75-125	1	20	mg/L	09.23.2020 16:09	
Tin	0.000803	0.100	0.0984	98	0.0986	98	75-125	0	20	mg/L	09.23.2020 16:09	
Zinc	0.0299	0.100	0.126	96	0.123	93	75-125	2	20	mg/L	09.23.2020 16:09	

MS/MSD Percent Recovery
Relative Percent Difference
LCS/LCSD Recovery
Log Difference

$[D] = 100 * (C - A) / B$
 $RPD = 200 * |(C - E) / (C + E)|$
 $[D] = 100 * (C) / [B]$
 Log Diff. = Log(Sample Duplicate) - Log(Original Sample)

LCS = Laboratory Control Sample
 A = Parent Result
 C = MS/LCS Result
 E = MSD/LCSD Result

MS = Matrix Spike
 B = Spike Added
 D = MSD/LCSD % Rec



Chain of Custody

Work Order No: 673082

Houston, TX (281) 240-4200, Dallas, TX (214) 902-0300, San Antonio, TX (210) 509-3334
 Midland, TX (432) 704-5440, EL Paso, TX (915) 535-3443, Lubbock, TX (806) 794-1296
 Hobbs, NM (575) 392-7650, Carlsbad, NM (575) 988-3199, Phoenix, AZ (480) 355-0900
 Tampa, FL (813) 620-2000, Tallahassee, FL (850) 756-0747, Delray Beach, FL (561) 689-6701
 Atlanta, GA (770) 449-6600

www.xenco.com Page 2 of 2

Project Manager:	Jonathan R. Barker	Bill to: (if different)	
Company Name:	Gahagan & Bryant Associates, Inc.	Company Name:	
Address:	3802 W. Bay to Bay Blvd, Suite B-22	Address:	
City, State ZIP:	Tampa, FL 33629	City, State ZIP:	
Phone:	727-776-4153	Email:	rbarker@gba-inc.com

Project Name:	Dredged Material Chemical Testing	Turn Around	
Project Number:		Routine:	<input checked="" type="checkbox"/>
Project Location:		Rush:	<input type="checkbox"/>
Sampler's Name:		Due Date:	
PO #:			

Sample Identification	Matrix	Date Sampled	Time Sampled	Depth	Temp Blank:		Wet Ice:		Thermometer ID	Correction Factor:	Total Containers:	Number of Containers/Preservative	ANALYSIS REQUEST		Preservative Codes
					Yes	No	Yes	No					Code	Code	
VC-3-C		8/14/20	13:15	5-6'								6020 - Al, As, Ba, Be, Cd, Cr, Cu, Pb, Ni, Se, Ag, Ti, Zn	7470 - Hg		HNO3: HN H2SO4: H2 HCL: HL None: NO NaOH: Na MeOH: Me Zn Acetate+ NaOH: Zn
VC-7-C		8/14/20	15:41	4-5'								8270 - SVOC			TAT starts the day received by the lab, if received by 4:30pm
VC-11-C		8/14/20	11:08	3-4'											

Total 200.7 / 6010 200.8 / 6020: 8RCRA 13PPM Texas 11 Al Sb As Ba Be B Cd Ca Cr Co Cu Fe Pb Mg Mn Mo Ni K Se Ag SiO2 Na Sr Ti Sn U V Zn
 Circle Method(s) and Metal(s) to be analyzed TCLP / SPLP 6010: 8RCRA Sb As Ba Be Cd Cr Co Cu Pb Mn Mo Ni Se Ag Ti U 1631 / 245.1 / 7470 / 7471 : Hg

Notice: Signature of this document and relinquishment of samples constitutes a valid purchase order from client company to Xenco, its affiliates and subcontractors. It assigns standard terms and conditions of service. Xenco will be liable only for the cost of samples and shall not assume any responsibility for any losses or expenses incurred by the client if such losses are due to circumstances beyond the control of Xenco. A minimum charge of \$75.00 will be applied to each project and a charge of \$5 for each sample submitted to Xenco, but not analyzed. These terms will be enforced unless previously negotiated.

Relinquished by: (Signature)	Received by: (Signature)	Date/Time	Relinquished by: (Signature)	Received by: (Signature)	Date/Time
<i>[Signature]</i>	<i>[Signature]</i>	9/16/20 9:53	<i>[Signature]</i>	<i>[Signature]</i>	9/16/20 14:30
<i>[Signature]</i>	<i>[Signature]</i>	9/17/20 17:00	<i>[Signature]</i>	<i>[Signature]</i>	
<i>[Signature]</i>	<i>[Signature]</i>	7-18-20 10:00			

FRI - 18 SEP 10:30A
PRIORITY OVERNIGHT

2 of 2

MPS# 7715 6011 8223

0263

Mstr# 7715 6011 8039

77071

NH SGRA

IAH

TX-US



Part # 159409-434 RT12 EXP 09/21

FRI - 18 SEP 10:30A
PRIORITY OVERNIGHT

1 of 2

TRK# 7715 6011 8039

0291

MASTER

77071

NH SGRA

IAH

TX-US



Part # 159469-434 RT12 EXP 09/21

Eurofins Xenco, LLC
Prelogin/Nonconformance Report- Sample Log-In

Client: Gahagan & Bryant Associates, Inc.

Date/ Time Received: 09.18.2020 10.00.00 AM

Work Order #: 673082

Acceptable Temperature Range: 0 - 6 degC
Air and Metal samples Acceptable Range: Ambient


Temperature Measuring device used : HOU-203

Sample Receipt Checklist	Comments
#1 *Temperature of cooler(s)?	20
#2 *Shipping container in good condition?	Yes
#3 *Samples received on ice?	No
#4 *Custody Seals intact on shipping container/ cooler?	N/A
#5 Custody Seals intact on sample bottles?	N/A
#6*Custody Seals Signed and dated?	N/A
#7 *Chain of Custody present?	Yes
#8 Any missing/extra samples?	No
#9 Chain of Custody signed when relinquished/ received?	Yes
#10 Chain of Custody agrees with sample labels/matrix?	Yes
#11 Container label(s) legible and intact?	Yes
#12 Samples in proper container/ bottle?	Yes
#13 Samples properly preserved?	Yes
#14 Sample container(s) intact?	Yes
#15 Sufficient sample amount for indicated test(s)?	Yes
#16 All samples received within hold time?	Yes
#17 Subcontract of sample(s)?	No
#18 Water VOC samples have zero headspace?	N/A

*** Must be completed for after-hours delivery of samples prior to placing in the refrigerator**


Analyst: MDB

PH Device/Lot#: 10BDH4091

Checklist completed by: 

Monica Benavides

Date: 09.21.2020

Checklist reviewed by: 

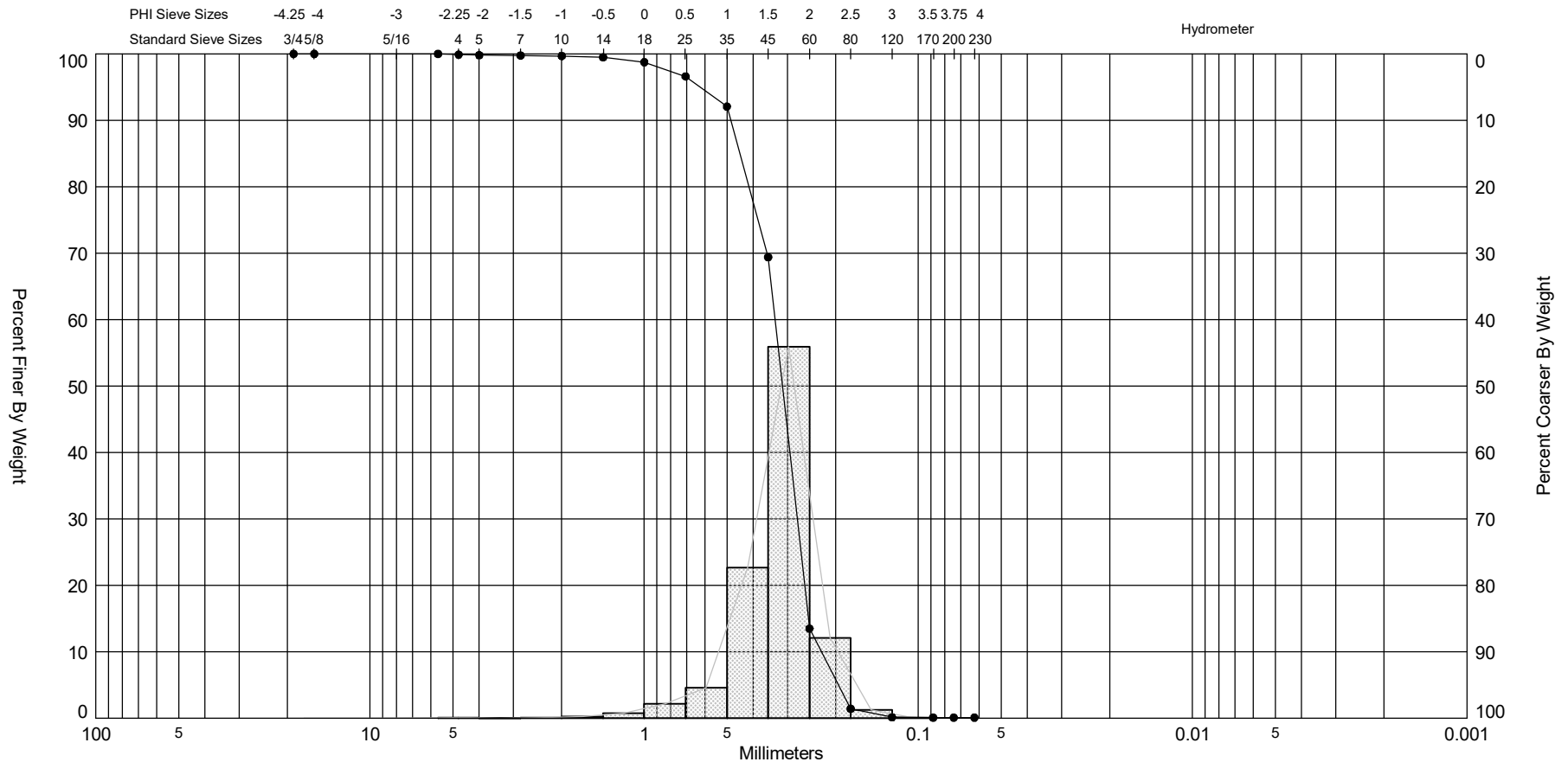
Matthew Jones

Date: 09.21.2020


APPENDIX D

NATIVE BEACH SAMPLE SIEVE ANALYSIS REPORTS

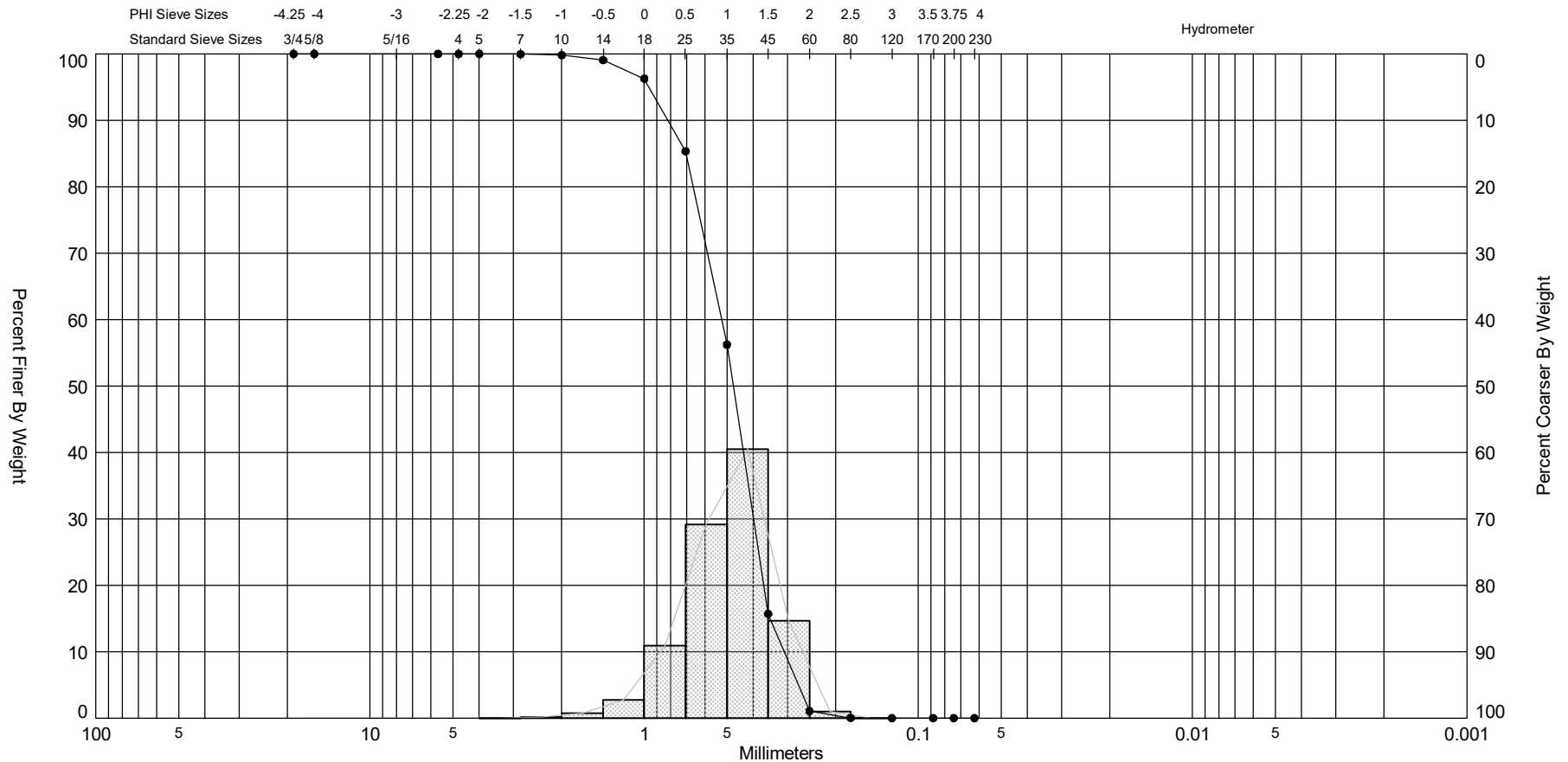
SIEVE ANALYSIS IBSP.GPJ FL DEP ROSS.GDT 11/10/20




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	
NB-1	—●—		SP	#200 - 0.08 #230 - 0.08			1.67	1.6	-1.94	12.61	0.51	Project Name:	IBSP Sand Source Survey
Comments:												Analysis Date:	
Depths and elevations based on measured values												Analyzed By:	DCJ
							Gahagan and Bryant Associates 3802 W Bay to Bay Blvd. Suite B-22 Tampa, FL 33629 Telephone: 813-831-4408 Fax: 813-831-4216					Easting (X, ft):	1,128,432
												Northing (Y, ft):	2,113,249
												Horizontal System:	NAD 1983
												Vertical System:	IGLD MLW

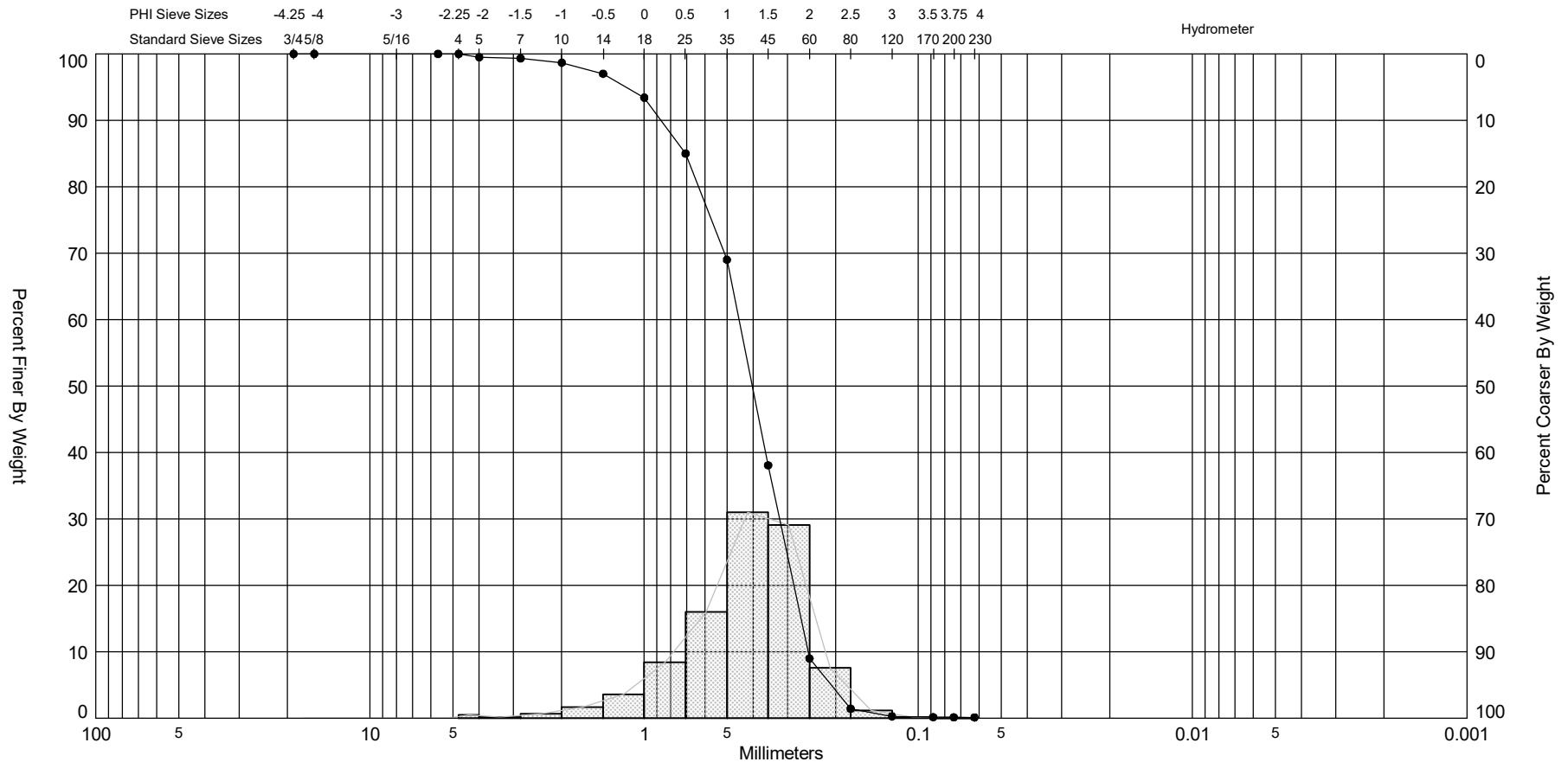
SIEVE ANALYSIS IBSP.GPJ FL DEP ROSS.GDT 11/10/20




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	
NB-2	—●—		SP	#200 - 0.01 #230 - 0.01			1.08	1.02	-0.64	4.01	0.53	Project Name:	IBSP Sand Source Survey
Comments:												Analysis Date:	08-21-20
Depths and elevations based on measured values												Analyzed By:	DCJ
							Gahagan and Bryant Associates 3802 W Bay to Bay Blvd. Suite B-22 Tampa, FL 33629 Telephone: 813-831-4408 Fax: 813-831-4216					Easting (X, ft):	1,128,632
												Northing (Y, ft):	2,114,864
												Horizontal System:	NAD 1983
												Vertical System:	IGLD MLW

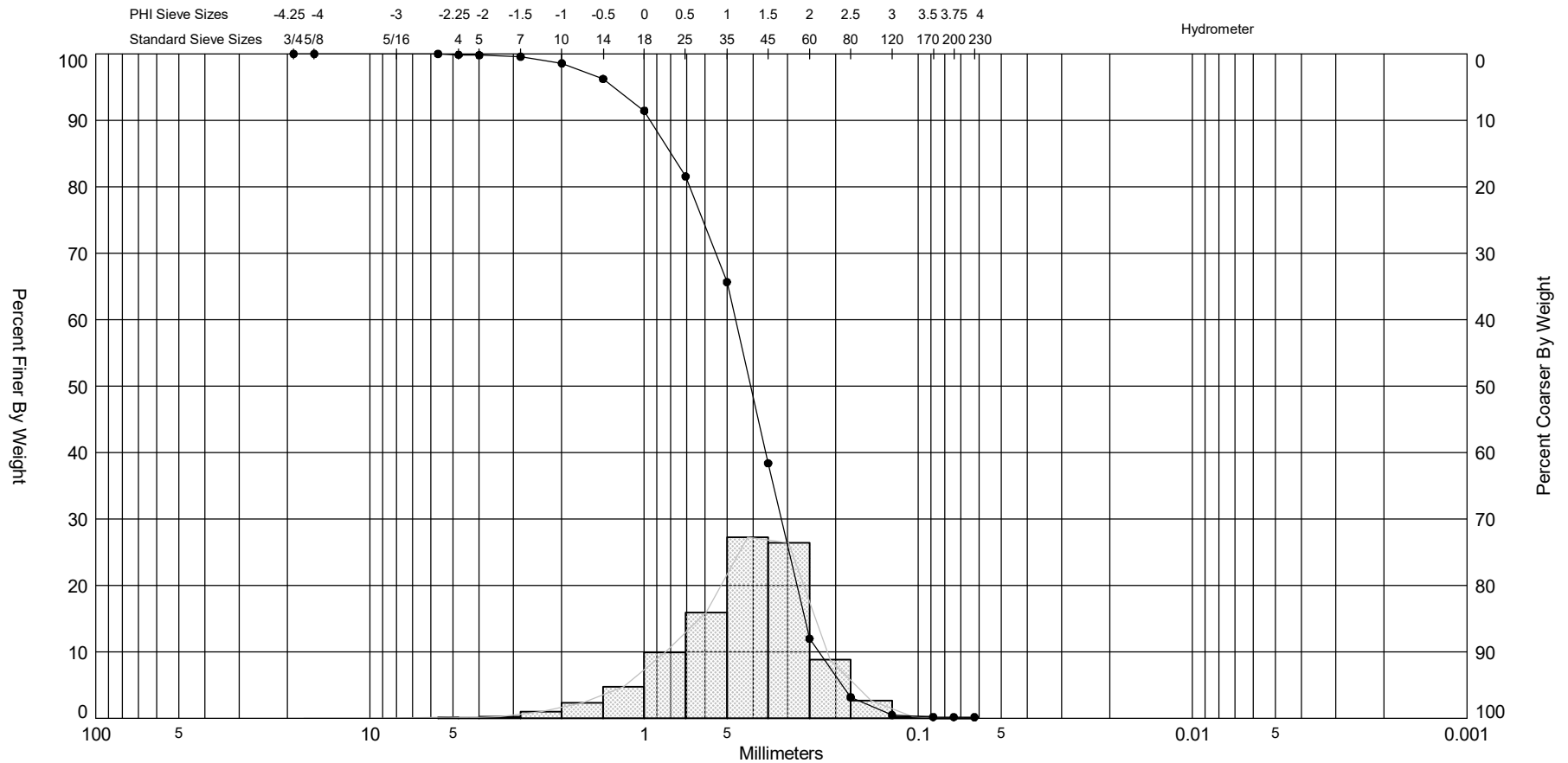
SIEVE ANALYSIS IBSP.GPJ FL DEP ROSS.GDT 11/10/20




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	
NB-3	—●—		SP	#200 - 0.13 #230 - 0.12			1.31	1.2	-1.07	5.25	0.75	Project Name:	IBSP Sand Source Survey
Comments:												Analysis Date:	08-21-20
Depths and elevations based on measured values												Analyzed By:	DCJ
							Gahagan and Bryant Associates 3802 W Bay to Bay Blvd. Suite B-22 Tampa, FL 33629 Telephone: 813-831-4408 Fax: 813-831-4216					Easting (X, ft):	1,126,965
												Northing (Y, ft):	2,099,778
												Horizontal System:	NAD 1983
												Vertical System:	IGLD MLW

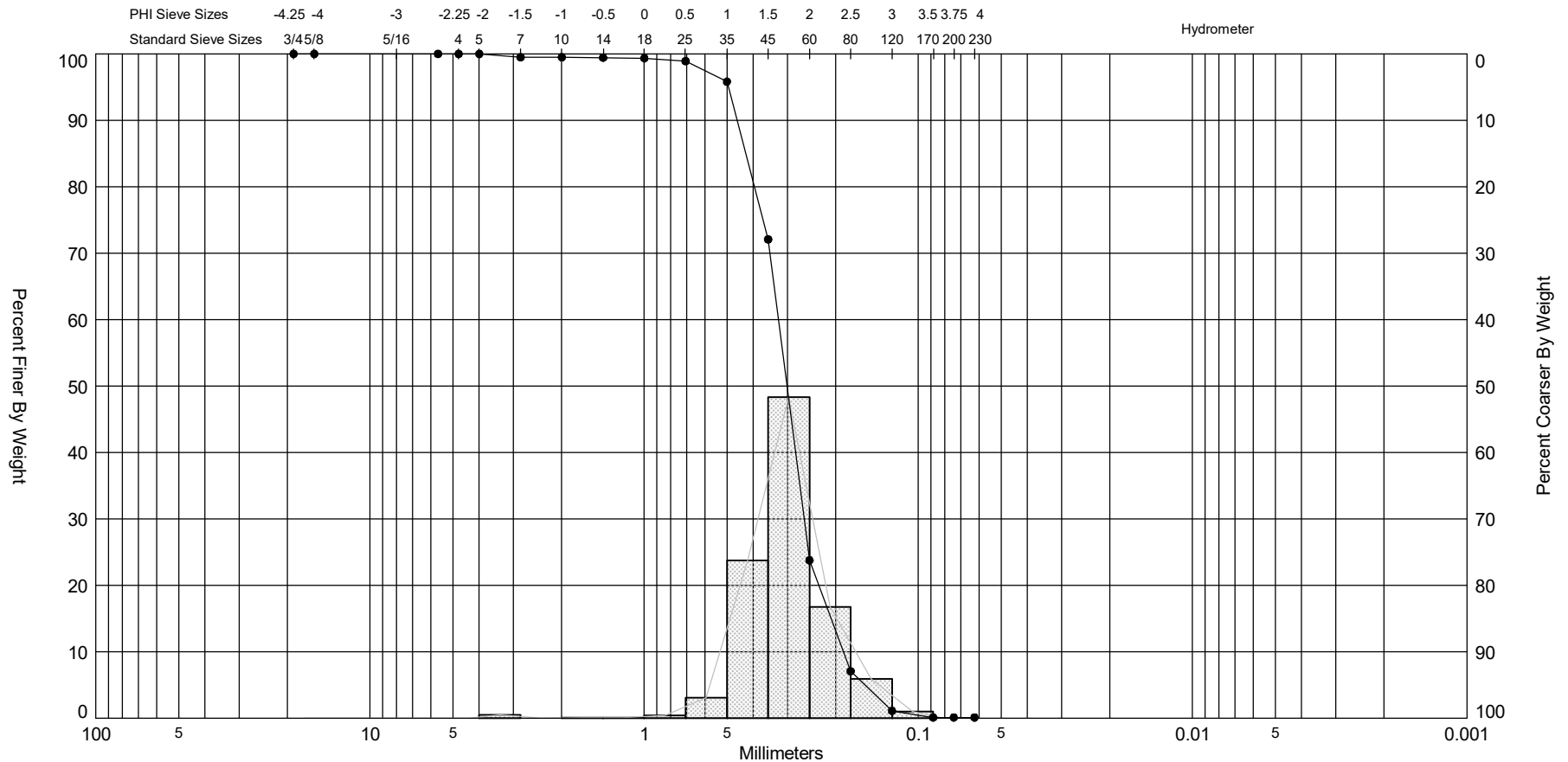
SIEVE ANALYSIS IBSP.GPJ FL DEP ROSS.GDT 11/10/20




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	
NB-4	—●—		SP	#200 - 0.18 #230 - 0.16			1.29	1.18	-0.71	3.95	0.82	Project Name:	IBSP Sand Source Survey
Comments:												Analysis Date:	08-21-20
Depths and elevations based on measured values												Analyzed By:	DCJ
							Gahagan and Bryant Associates 3802 W Bay to Bay Blvd. Suite B-22 Tampa, FL 33629 Telephone: 813-831-4408 Fax: 813-831-4216					Easting (X, ft):	1,127,045
												Northing (Y, ft):	2,098,145
												Horizontal System:	NAD 1983
												Vertical System:	IGLD MLW

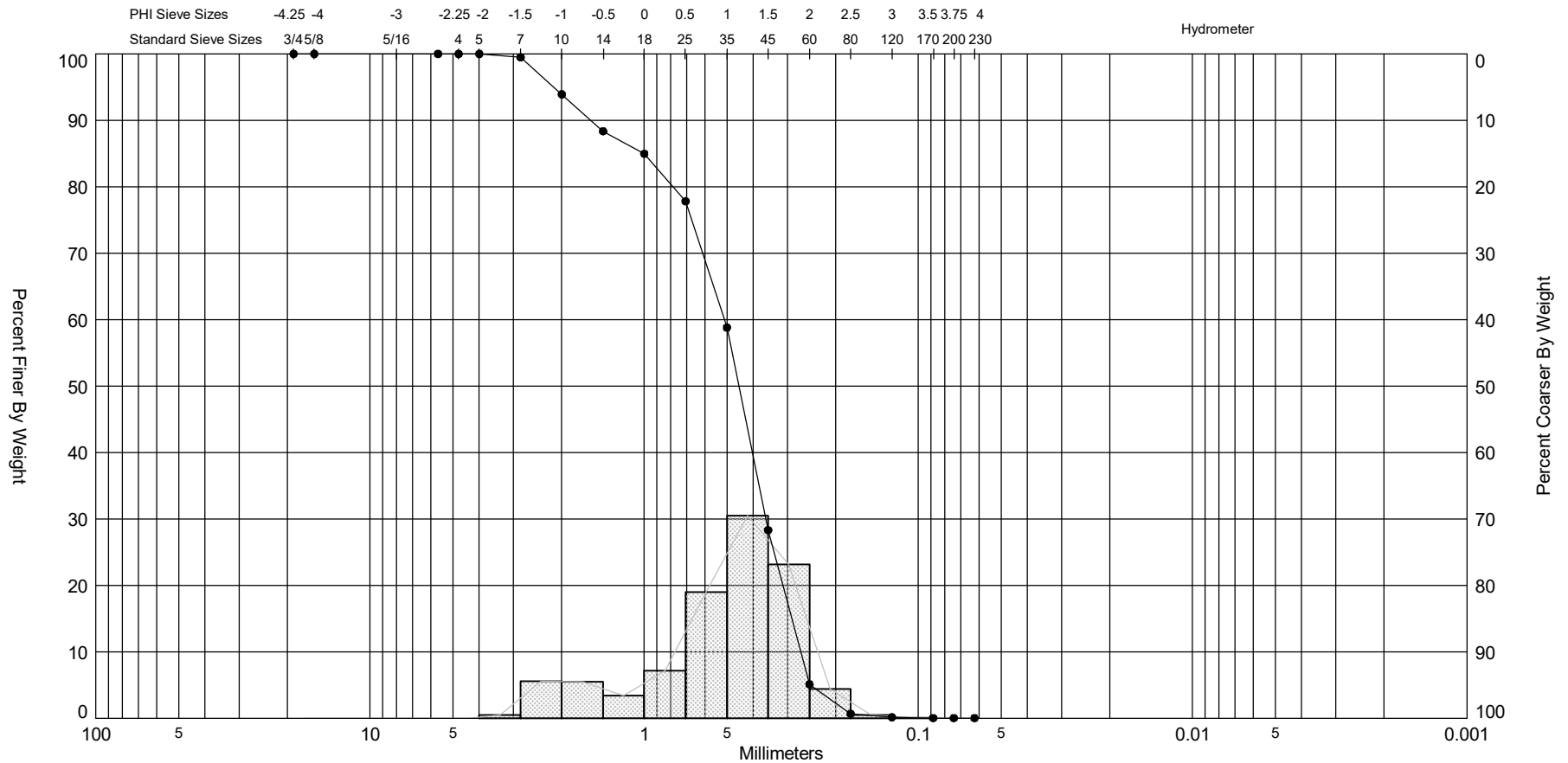
SIEVE ANALYSIS IBSP.GPJ FL DEP ROSS.GDT 11/10/20




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	
NB-5	—●—		SP	#200 - 0.11 #230 - 0.11			1.73	1.73	-1.11	11.24	0.54	Project Name:	IBSP Sand Source Survey
Comments:												Analysis Date:	08-21-20
Depths and elevations based on measured values												Analyzed By:	DCJ
							Gahagan and Bryant Associates 3802 W Bay to Bay Blvd. Suite B-22 Tampa, FL 33629 Telephone: 813-831-4408 Fax: 813-831-4216					Easting (X, ft):	1,127,382
												Northing (Y, ft):	2,094,011
												Horizontal System:	NAD 1983
												Vertical System:	IGLD MLW

SIEVE ANALYSIS IBSP.GPJ FL DEP ROSS.GDT 11/10/20



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	
NB-6	—●—		SW	#200 - 0.04 #230 - 0.04			1.14	0.94	-0.99	3.46	0.91	Project Name:	IBSP Sand Source Survey
Comments:												Analysis Date:	08-21-20
Depths and elevations based on measured values												Analyzed By:	DCJ
							Gahagan and Bryant Associates 3802 W Bay to Bay Blvd. Suite B-22 Tampa, FL 33629 Telephone: 813-831-4408 Fax: 813-831-4216					Easting (X, ft):	1,127,427
												Northing (Y, ft):	2,092,930
												Horizontal System:	NAD 1983
												Vertical System:	IGLD MLW

Granularmetric Report

Depths and elevations based on measured values



Gahagan and Bryant Associates
3802 W Bay to Bay Blvd. Suite B-22
Tampa, FL 33629
Telephone: 813-831-4408
Fax: 813-831-4216

Project Name: IBSP Sand Source Survey

Sample Name: NB-1

Analysis Date:

Analyzed By: DCJ

Easting (ft):	Northing (ft):	Coordinate System:	Elevation (ft):
1,128,432	2,113,249	State Plane	

USCS:	Munsell:	Comments:
SP	Dry - 10YR-7/3	

Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%):	Organics (%):	Carbonates (%):	Shells (%):
151.44	151.44	0.00	0.08	#200 - 0.08 #230 - 0.08			

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
3.5	-2.50	5.66	0.00	0.00	0.00	0.00
4	-2.25	4.76	0.16	0.11	0.16	0.11
5	-2.00	4.00	0.15	0.10	0.31	0.20
7	-1.50	2.83	0.05	0.03	0.36	0.24
10	-1.00	2.00	0.10	0.07	0.46	0.30
14	-0.50	1.41	0.33	0.22	0.79	0.52
18	0.00	1.00	1.10	0.73	1.89	1.25
25	0.50	0.71	3.23	2.13	5.12	3.38
35	1.00	0.50	6.89	4.55	12.01	7.93
45	1.50	0.35	34.34	22.68	46.35	30.61
60	2.00	0.25	84.67	55.91	131.02	86.52
80	2.50	0.18	18.28	12.07	149.30	98.59
120	3.00	0.13	1.95	1.29	151.25	99.87
170	3.50	0.09	0.07	0.05	151.32	99.92
200	3.75	0.07	0.00	0.00	151.32	99.92
230	4.00	0.06	0.00	0.00	151.32	99.92

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Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.35	1.98	1.90	1.67	1.38	1.18	0.68
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	1.6	0.33	0.51	-1.94	12.61	

GRANULARMETRIC REPORT IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Granularmetric Report

Depths and elevations based on measured values



Gahagan and Bryant Associates
 3802 W Bay to Bay Blvd. Suite B-22
 Tampa, FL 33629
 Telephone: 813-831-4408
 Fax: 813-831-4216

Project Name: IBSP Sand Source Survey

Sample Name: NB-2

Analysis Date: 08-21-20

Analyzed By: DCJ

Easting (ft): 1,128,632	Northing (ft): 2,114,864	Coordinate System: State Plane	Elevation (ft):
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USCS: SP	Munsell: Dry - 10 YR-7/3	Comments:
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Dry Weight (g): 179.71	Wash Weight (g): 179.71	Pan Retained (g): 0.00	Sieve Loss (%): 0.01	Fines (%): #200 - 0.01 #230 - 0.01	Organics (%):	Carbonates (%):	Shells (%):
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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
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	0.07	0.04	0.07	0.04
10	-1.00	2.00	0.27	0.15	0.34	0.19
14	-0.50	1.41	1.35	0.75	1.69	0.94
18	0.00	1.00	4.99	2.78	6.68	3.72
25	0.50	0.71	19.64	10.93	26.32	14.65
35	1.00	0.50	52.35	29.13	78.67	43.78
45	1.50	0.35	72.82	40.52	151.49	84.30
60	2.00	0.25	26.29	14.63	177.78	98.93
80	2.50	0.18	1.85	1.03	179.63	99.96
120	3.00	0.13	0.07	0.04	179.70	99.99
170	3.50	0.09	0.00	0.00	179.70	99.99
200	3.75	0.07	0.00	0.00	179.70	99.99
230	4.00	0.06	0.00	0.00	179.70	99.99

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Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
1.87	1.50	1.39	1.08	0.68	0.52	0.06

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	1.02	0.49	0.53	-0.64	4.01

GRANULARMETRIC REPORT IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Granularmetric Report

Depths and elevations based on measured values



Gahagan and Bryant Associates
 3802 W Bay to Bay Blvd. Suite B-22
 Tampa, FL 33629
 Telephone: 813-831-4408
 Fax: 813-831-4216

Project Name: IBSP Sand Source Survey
 Sample Name: NB-3
 Analysis Date: 08-21-20
 Analyzed By: DCJ

Easting (ft): 1,126,965	Northing (ft): 2,099,778	Coordinate System: State Plane	Elevation (ft):
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USCS: SP	Munsell: Dry - 10YR-7/3	Comments:
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Dry Weight (g): 162.99	Wash Weight (g): 162.99	Pan Retained (g): 0.11	Sieve Loss (%): 0.06	Fines (%): #200 - 0.13 #230 - 0.12	Organics (%):	Carbonates (%):	Shells (%):
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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
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	0.80	0.49	0.80	0.49
7	-1.50	2.83	0.29	0.18	1.09	0.67
10	-1.00	2.00	1.06	0.65	2.15	1.32
14	-0.50	1.41	2.71	1.66	4.86	2.98
18	0.00	1.00	5.88	3.61	10.74	6.59
25	0.50	0.71	13.71	8.41	24.45	15.00
35	1.00	0.50	26.05	15.98	50.50	30.98
45	1.50	0.35	50.46	30.96	100.96	61.94
60	2.00	0.25	47.39	29.08	148.35	91.02
80	2.50	0.18	12.34	7.57	160.69	98.59
120	3.00	0.13	1.84	1.13	162.53	99.72
170	3.50	0.09	0.21	0.13	162.74	99.85
200	3.75	0.07	0.03	0.02	162.77	99.87
230	4.00	0.06	0.02	0.01	162.79	99.88

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Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.26	1.88	1.72	1.31	0.81	0.53	-0.22

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	1.2	0.44	0.75	-1.07	5.25

GRANULARMETRIC REPORT IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Granularmetric Report

Depths and elevations based on measured values



Gahagan and Bryant Associates
3802 W Bay to Bay Blvd. Suite B-22
Tampa, FL 33629
Telephone: 813-831-4408
Fax: 813-831-4216

Project Name: IBSP Sand Source Survey

Sample Name: NB-4

Analysis Date: 08-21-20

Analyzed By: DCJ

Easting (ft): 1,127,045	Northing (ft): 2,098,145
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Coordinate System: State Plane	Elevation (ft):
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USCS: SP	Munsell: Dry - 10YR-7/3	Comments:
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Dry Weight (g): 153.14	Wash Weight (g): 153.14	Pan Retained (g): 0.20	Sieve Loss (%): 0.03	Fines (%): #200 - 0.18 #230 - 0.16	Organics (%):	Carbonates (%):	Shells (%):
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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
3.5	-2.50	5.66	0.00	0.00	0.00	0.00
4	-2.25	4.76	0.20	0.13	0.20	0.13
5	-2.00	4.00	0.11	0.07	0.31	0.20
7	-1.50	2.83	0.32	0.21	0.63	0.41
10	-1.00	2.00	1.53	1.00	2.16	1.41
14	-0.50	1.41	3.62	2.36	5.78	3.77
18	0.00	1.00	7.32	4.78	13.10	8.55
25	0.50	0.71	15.15	9.89	28.25	18.45
35	1.00	0.50	24.36	15.91	52.61	34.35
45	1.50	0.35	41.75	27.26	94.36	61.62
60	2.00	0.25	40.44	26.41	134.80	88.02
80	2.50	0.18	13.50	8.82	148.30	96.84
120	3.00	0.13	4.09	2.67	152.39	99.51
170	3.50	0.09	0.44	0.29	152.83	99.80
200	3.75	0.07	0.03	0.02	152.86	99.82
230	4.00	0.06	0.04	0.03	152.90	99.84

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Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.40	1.92	1.75	1.29	0.71	0.38	-0.37

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	1.18	0.44	0.82	-0.71	3.95

GRANULARMETRIC REPORT IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Granularmetric Report

Depths and elevations based on measured values



Gahagan and Bryant Associates
 3802 W Bay to Bay Blvd. Suite B-22
 Tampa, FL 33629
 Telephone: 813-831-4408
 Fax: 813-831-4216

Project Name: IBSP Sand Source Survey

Sample Name: NB-5

Analysis Date: 08-21-20

Analyzed By: DCJ

Easting (ft): 1,127,382	Northing (ft): 2,094,011	Coordinate System: State Plane	Elevation (ft):
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USCS: SP	Munsell: Dry - 10YR-7/3	Comments:
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Dry Weight (g): 180.90	Wash Weight (g): 180.90	Pan Retained (g): 0.00	Sieve Loss (%): 0.11	Fines (%): #200 - 0.11 #230 - 0.11	Organics (%):	Carbonates (%):	Shells (%):
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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
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	0.90	0.50	0.90	0.50
10	-1.00	2.00	0.00	0.00	0.90	0.50
14	-0.50	1.41	0.11	0.06	1.01	0.56
18	0.00	1.00	0.15	0.08	1.16	0.64
25	0.50	0.71	0.82	0.45	1.98	1.09
35	1.00	0.50	5.58	3.08	7.56	4.18
45	1.50	0.35	42.94	23.74	50.50	27.92
60	2.00	0.25	87.39	48.31	137.89	76.22
80	2.50	0.18	30.24	16.72	168.13	92.94
120	3.00	0.13	10.76	5.95	178.89	98.89
170	3.50	0.09	1.81	1.00	180.70	99.89
200	3.75	0.07	0.00	0.00	180.70	99.89
230	4.00	0.06	0.00	0.00	180.70	99.89

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Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.67	2.23	1.99	1.73	1.44	1.25	1.02

Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
	1.73	0.30	0.54	-1.11	11.24

GRANULARMETRIC REPORT IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Granularmetric Report

Depths and elevations based on measured values



Gahagan and Bryant Associates
3802 W Bay to Bay Blvd. Suite B-22
Tampa, FL 33629
Telephone: 813-831-4408
Fax: 813-831-4216

Project Name: IBSP Sand Source Survey

Sample Name: NB-6

Analysis Date: 08-21-20

Analyzed By: DCJ

Easting (ft): 1,127,427	Northing (ft): 2,092,930	Coordinate System: State Plane	Elevation (ft):
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USCS: SW	Munsell: Dry - 10YR-7/3	Comments:
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Dry Weight (g): 188.00	Wash Weight (g): 188.00	Pan Retained (g): 0.00	Sieve Loss (%): 0.04	Fines (%): #200 - 0.04 #230 - 0.04	Organics (%):	Carbonates (%):	Shells (%):
----------------------------------	-----------------------------------	----------------------------------	--------------------------------	--	---------------	-----------------	-------------

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
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	0.97	0.52	0.97	0.52
10	-1.00	2.00	10.48	5.57	11.45	6.09
14	-0.50	1.41	10.42	5.54	21.87	11.63
18	0.00	1.00	6.40	3.40	28.27	15.04
25	0.50	0.71	13.42	7.14	41.69	22.18
35	1.00	0.50	35.76	19.02	77.45	41.20
45	1.50	0.35	57.32	30.49	134.77	71.69
60	2.00	0.25	43.62	23.20	178.39	94.89
80	2.50	0.18	8.32	4.43	186.71	99.31
120	3.00	0.13	1.00	0.53	187.71	99.85
170	3.50	0.09	0.22	0.12	187.93	99.96
200	3.75	0.07	0.00	0.00	187.93	99.96
230	4.00	0.06	0.00	0.00	187.93	99.96

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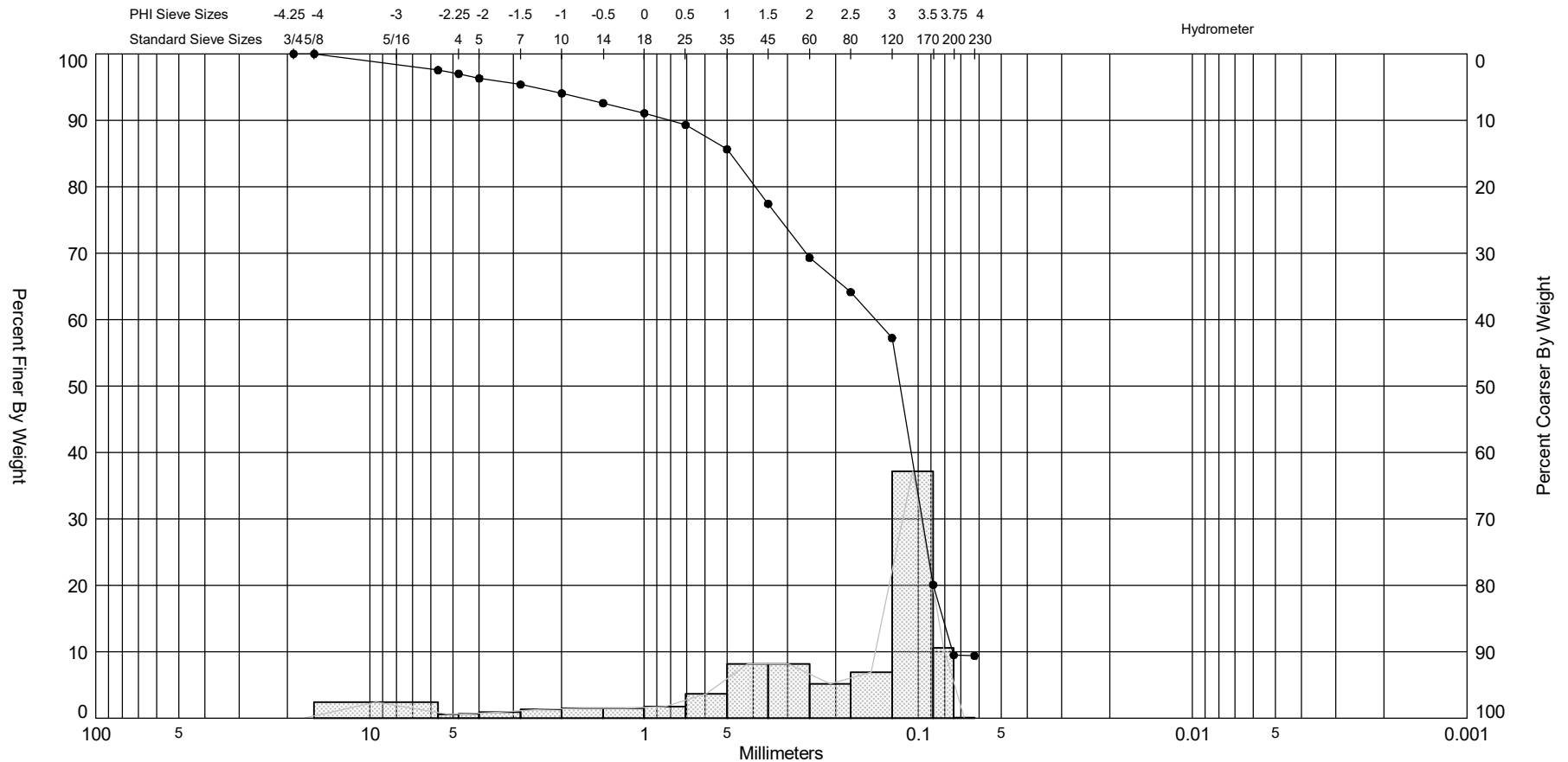
Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.01	1.77	1.57	1.14	0.57	0.07	-1.10
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	0.94	0.52	0.91	-0.99	3.46	

GRANULARMETRIC REPORT IBSP.GPJ FL DEP ROSS.GDT 11/10/20


APPENDIX E

GRAB SAMPLE SIEVE ANALYSIS REPORTS

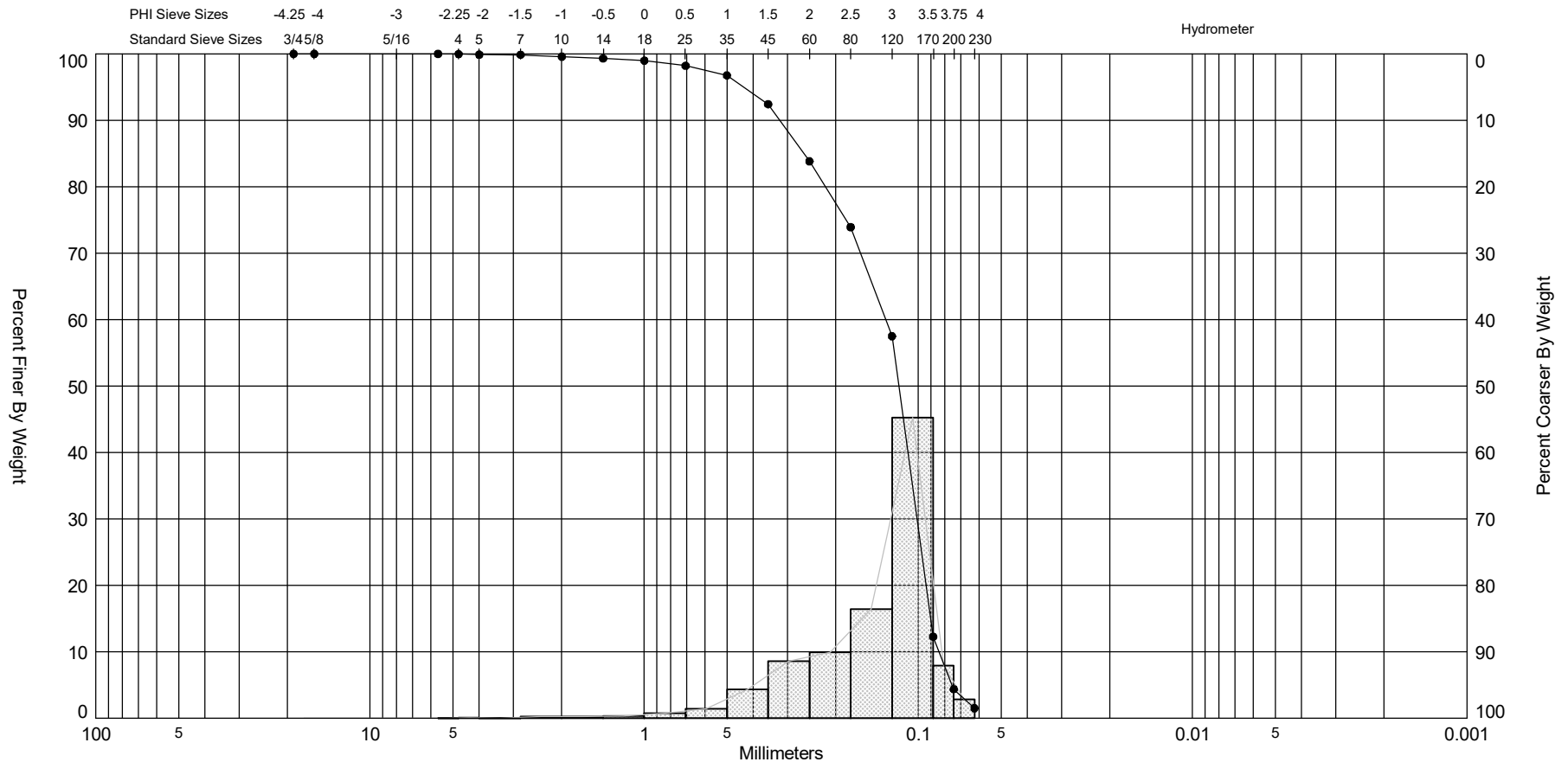
SIEVE ANALYSIS IBSP.GPJ FL DEP ROSS.GDT 11/10/20




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	
GS-11	—●—		SW-SM	#200 - 9.48 #230 - 9.39			3.1	2.23	-1.71	5.53	1.62	Project Name:	IBSP Sand Source Survey
Comments:												Analysis Date:	08-31-20
Depths and elevations based on measured values												Analyzed By:	DCJ
						Gahagan and Bryant Associates 3802 W Bay to Bay Blvd. Suite B-22 Tampa, FL 33629 Telephone: 813-831-4408 Fax: 813-831-4216						Easting (X, ft):	1,132,890
												Northing (Y, ft):	2,114,645
												Horizontal System:	NAD 1983
												Vertical System:	IGLD MLW

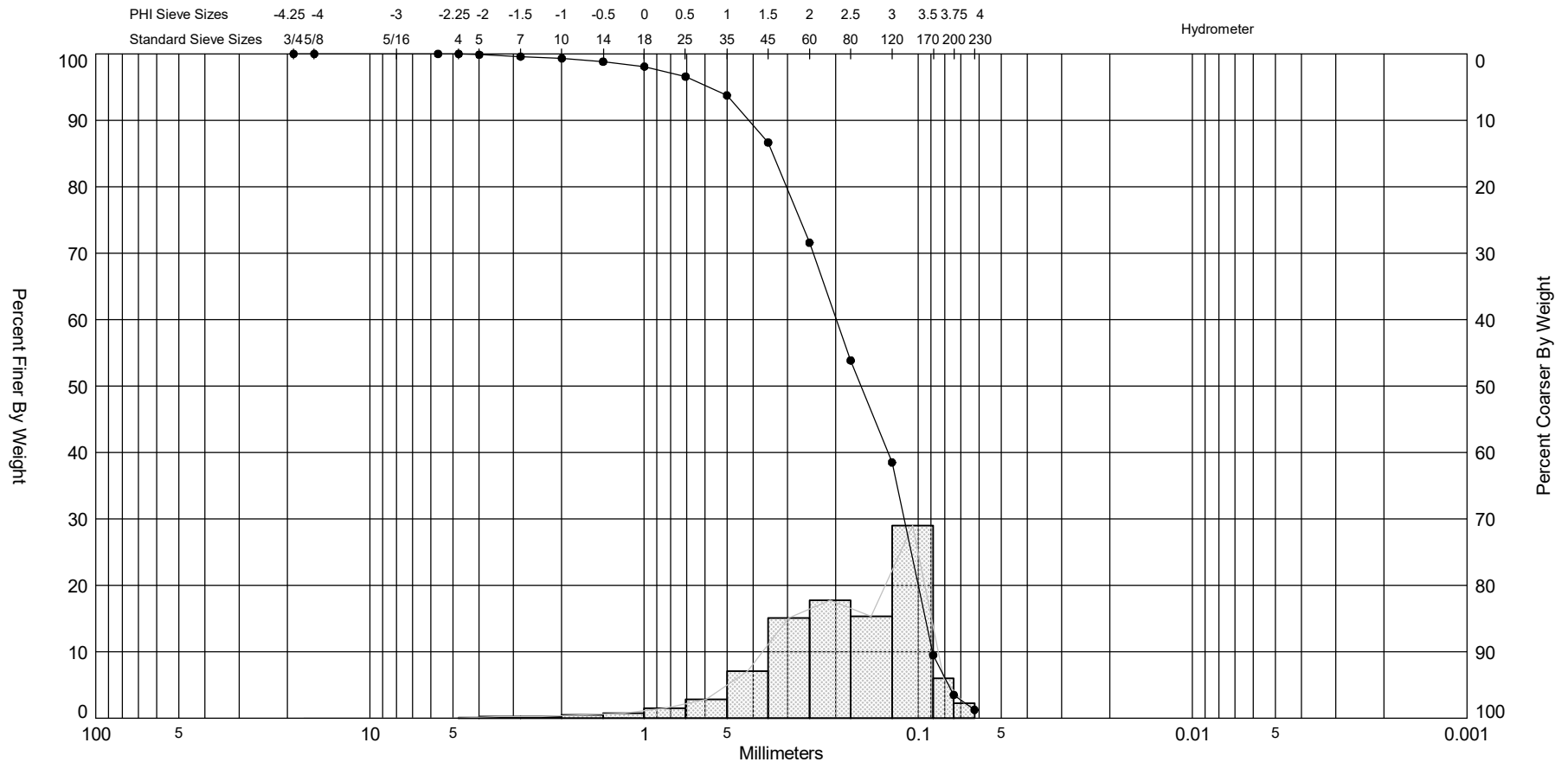
SIEVE ANALYSIS IBSP.GPJ FL DEP ROSS.GDT 11/10/20




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	
GS-15	—●—		SP	#200 - 4.37 #230 - 1.50			3.08	2.79	-1.76	7.33	0.82	Project Name:	IBSP Sand Source Survey
Comments:												Analysis Date:	08-24-20
Depths and elevations based on measured values												Analyzed By:	DCJ
							Gahagan and Bryant Associates 3802 W Bay to Bay Blvd. Suite B-22 Tampa, FL 33629 Telephone: 813-831-4408 Fax: 813-831-4216					Easting (X, ft):	1,131,511
												Northing (Y, ft):	2,112,641
												Horizontal System:	NAD 1983
												Vertical System:	IGLD MLW

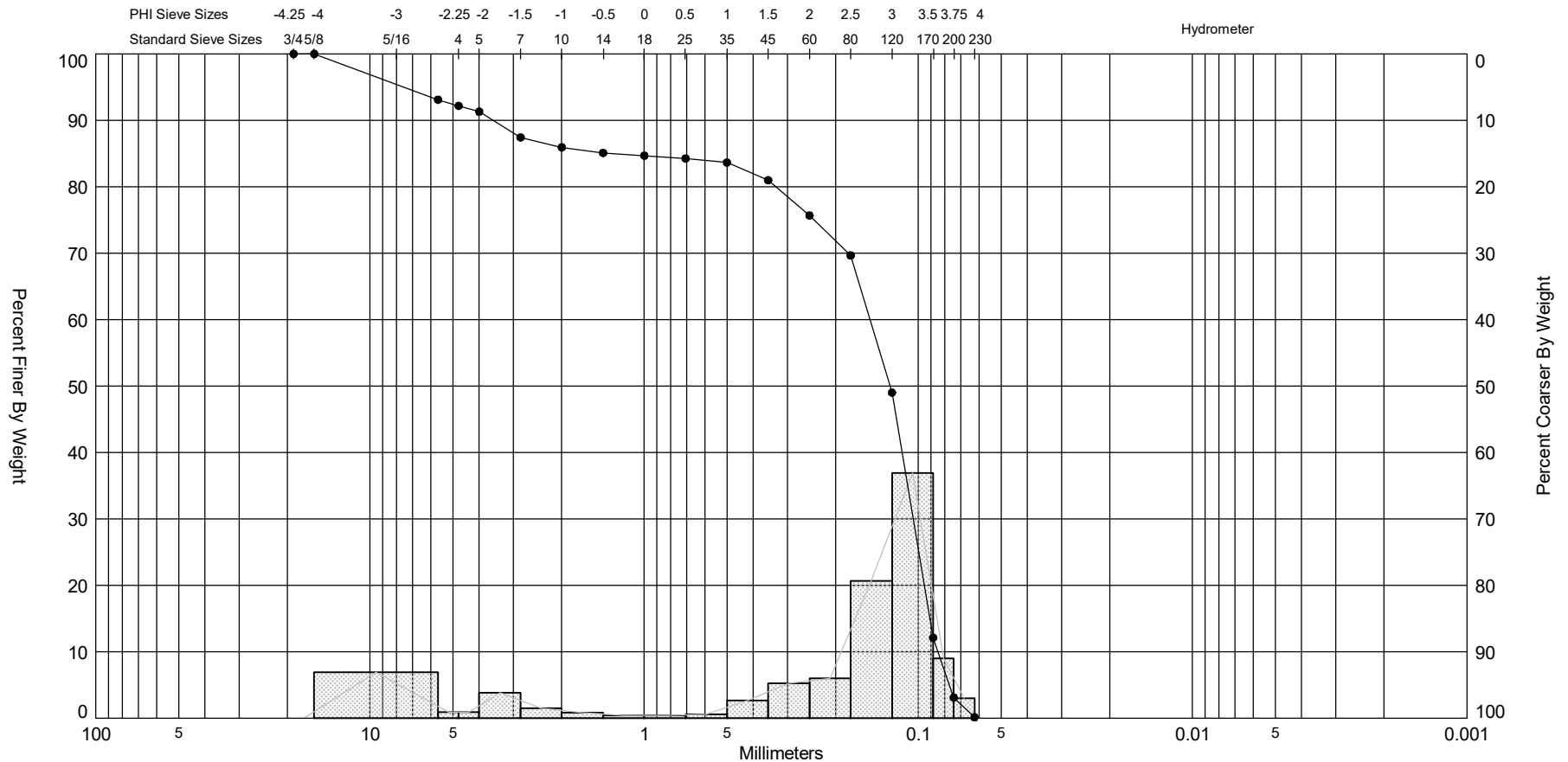
SIEVE ANALYSIS IBSP.GPJ FL DEP ROSS.GDT 11/10/20




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	
GS-16	—●—		SW	#200 - 3.50 #230 - 1.26			2.63	2.46	-1.15	5.02	0.94	Project Name:	IBSP Sand Source Survey
Comments:												Analysis Date:	08-24-20
Depths and elevations based on measured values												Analyzed By:	DCJ
							Gahagan and Bryant Associates 3802 W Bay to Bay Blvd. Suite B-22 Tampa, FL 33629 Telephone: 813-831-4408 Fax: 813-831-4216					Easting (X, ft):	1,133,306
												Northing (Y, ft):	2,112,655
												Horizontal System:	NAD 1983
												Vertical System:	IGLD MLW

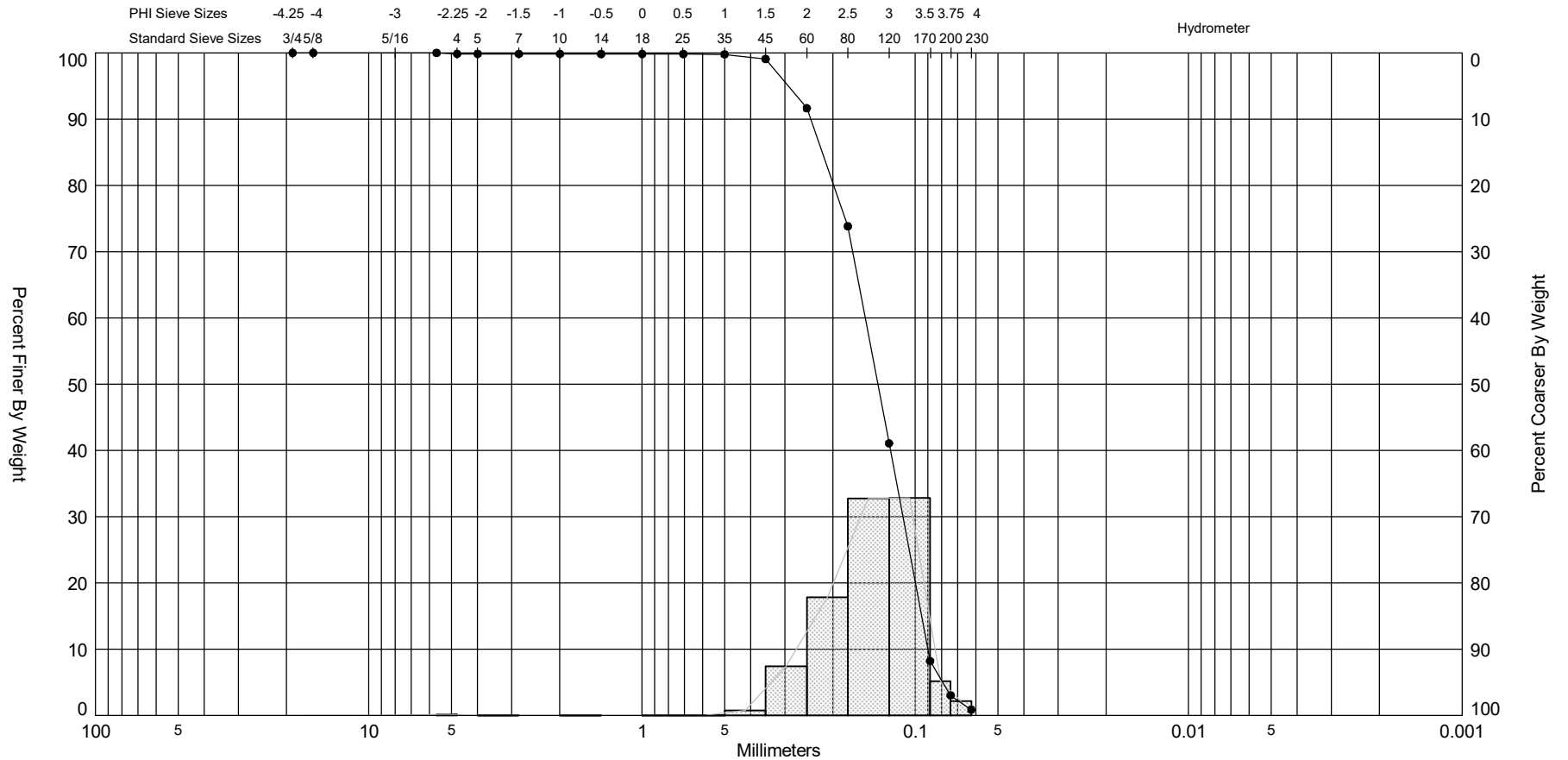
SIEVE ANALYSIS IBSP.GPJ FL DEP ROSS.GDT 11/10/20



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	
GS-17	—●—		SW	#200 - 3.11 #230 - 0.14			2.98	2.12	-1.73	4.61	2.02	Project Name:	IBSP Sand Source Survey
Comments:												Analysis Date:	08-24-20
Depths and elevations based on measured values												Analyzed By:	DCJ
							Gahagan and Bryant Associates 3802 W Bay to Bay Blvd. Suite B-22 Tampa, FL 33629 Telephone: 813-831-4408 Fax: 813-831-4216					Easting (X, ft):	1,133,172
												Northing (Y, ft):	2,110,646
												Horizontal System:	NAD 1983
												Vertical System:	IGLD MLW

SIEVE ANALYSIS IBSP.GPJ FL DEP ROSS.GDT 11/10/20




Gravel		Sand			Silt and Clay
Coarse	Fine	Coarse	Medium	Fine	

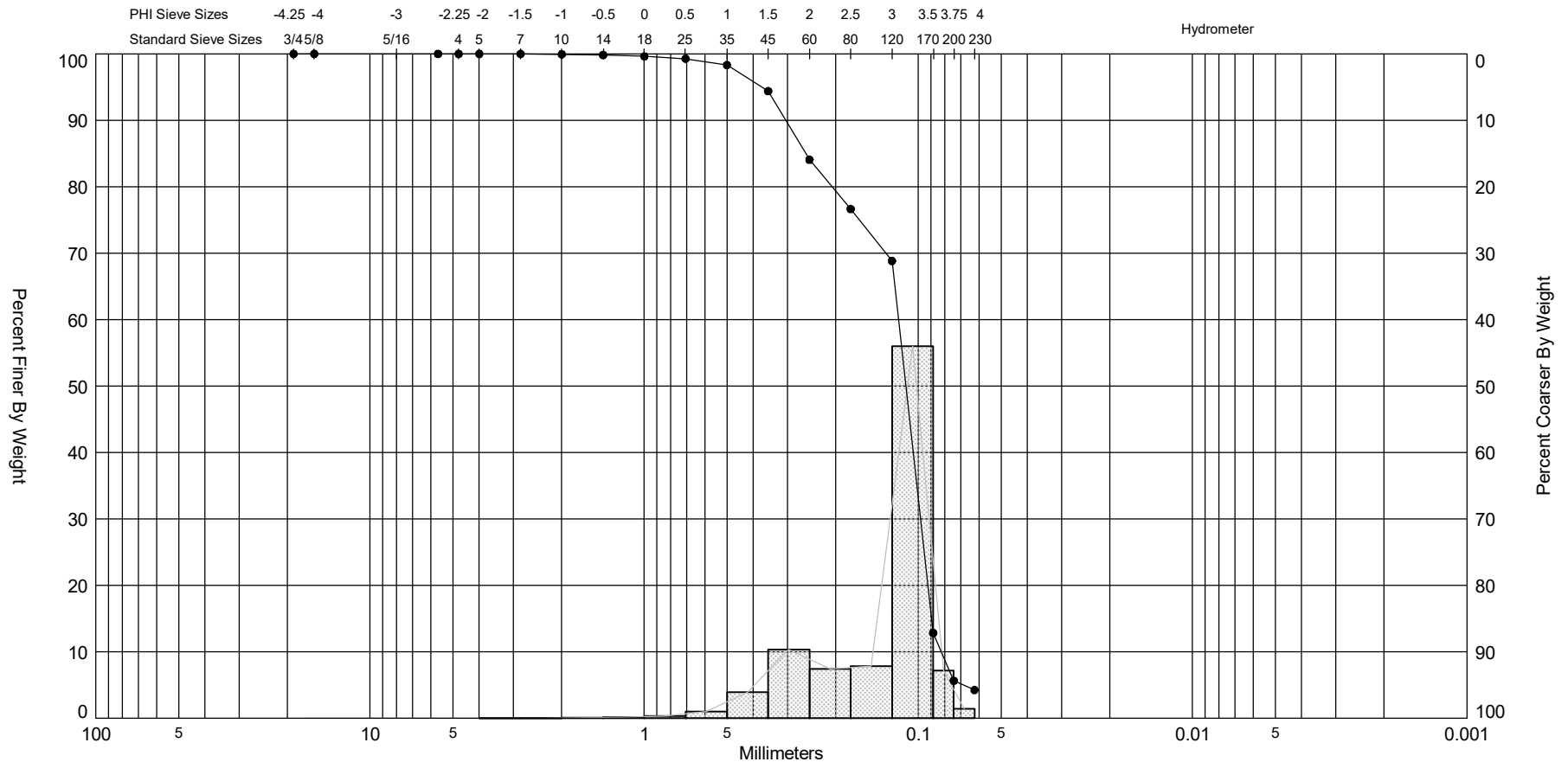
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GS-18	—●—		SP	#200 - 3.04 #230 - 0.87			2.86	2.8	-1.45	12.07	0.57	Project Name:	IBSP Sand Source Survey

Comments:	Analysis Date: 08-24-20
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Depths and elevations based on measured values	Analyzed By: DCJ
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	Gahagan and Bryant Associates 3802 W Bay to Bay Blvd. Suite B-22 Tampa, FL 33629 Telephone: 813-831-4408 Fax: 813-831-4216	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>Easting (X, ft):</td><td>1,131,619</td></tr> <tr><td>Northing (Y, ft):</td><td>2,110,646</td></tr> <tr><td>Horizontal System:</td><td>NAD 1983</td></tr> <tr><td>Vertical System:</td><td>IGLD MLW</td></tr> </table>	Easting (X, ft):	1,131,619	Northing (Y, ft):	2,110,646	Horizontal System:	NAD 1983	Vertical System:	IGLD MLW
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Northing (Y, ft):	2,110,646									
Horizontal System:	NAD 1983									
Vertical System:	IGLD MLW									

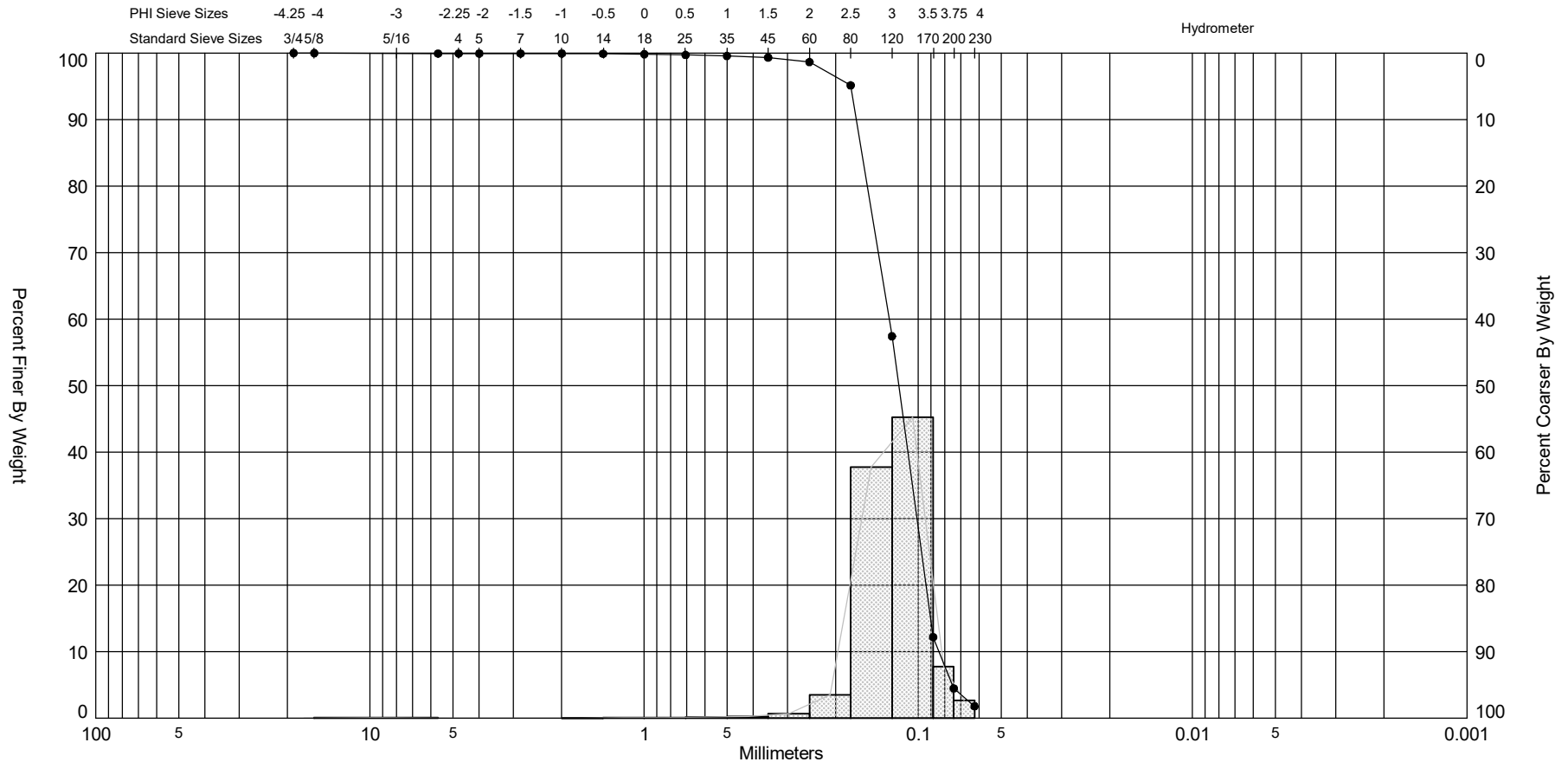
SIEVE ANALYSIS IBSP.GPJ FL DEP ROSS.GDT 11/10/20




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	
GS-21	—●—		SP-SM	#200 - 5.63 #230 - 4.23			3.17	2.87	-1.54	5.25	0.73	Project Name:	IBSP Sand Source Survey
Comments:												Analysis Date:	08-31-20
Depths and elevations based on measured values												Analyzed By:	DCJ
							Gahagan and Bryant Associates 3802 W Bay to Bay Blvd. Suite B-22 Tampa, FL 33629 Telephone: 813-831-4408 Fax: 813-831-4216					Easting (X, ft):	1,131,605
												Northing (Y, ft):	2,108,639
												Horizontal System:	NAD 1983
												Vertical System:	IGLD MLW

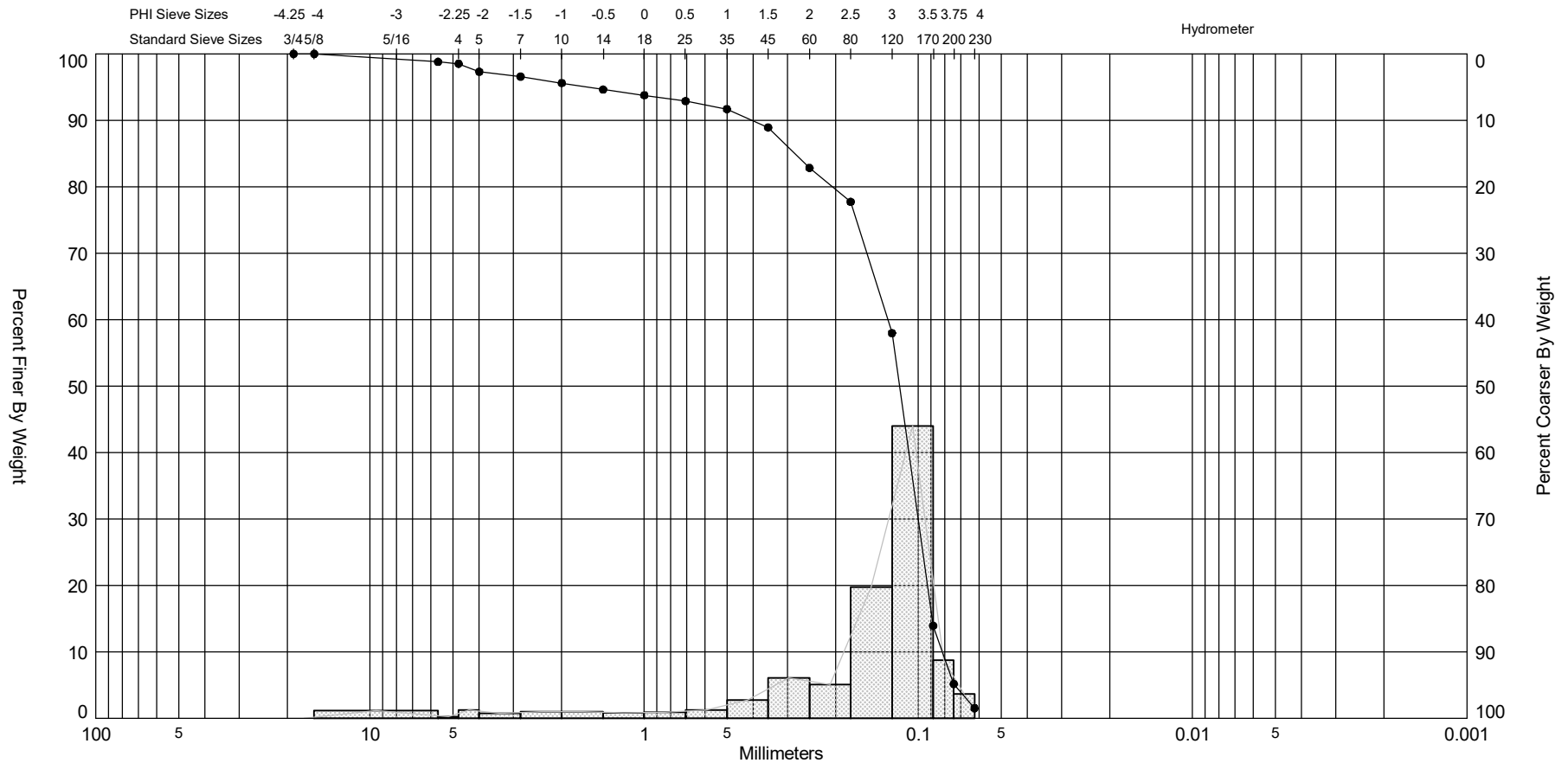
SIEVE ANALYSIS IBSP.GPJ FL DEP ROSS.GDT 11/10/20




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	
GS-26	—●—		SP	#200 - 4.46 #230 - 1.79			3.08	3.04	-3.06	35.13	0.44	Project Name:	IBSP Sand Source Survey
Comments:												Analysis Date:	08-24-20
Depths and elevations based on measured values												Analyzed By:	DCJ
							Gahagan and Bryant Associates 3802 W Bay to Bay Blvd. Suite B-22 Tampa, FL 33629 Telephone: 813-831-4408 Fax: 813-831-4216					Easting (X, ft):	1,135,686
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												Vertical System:	IGLD MLW

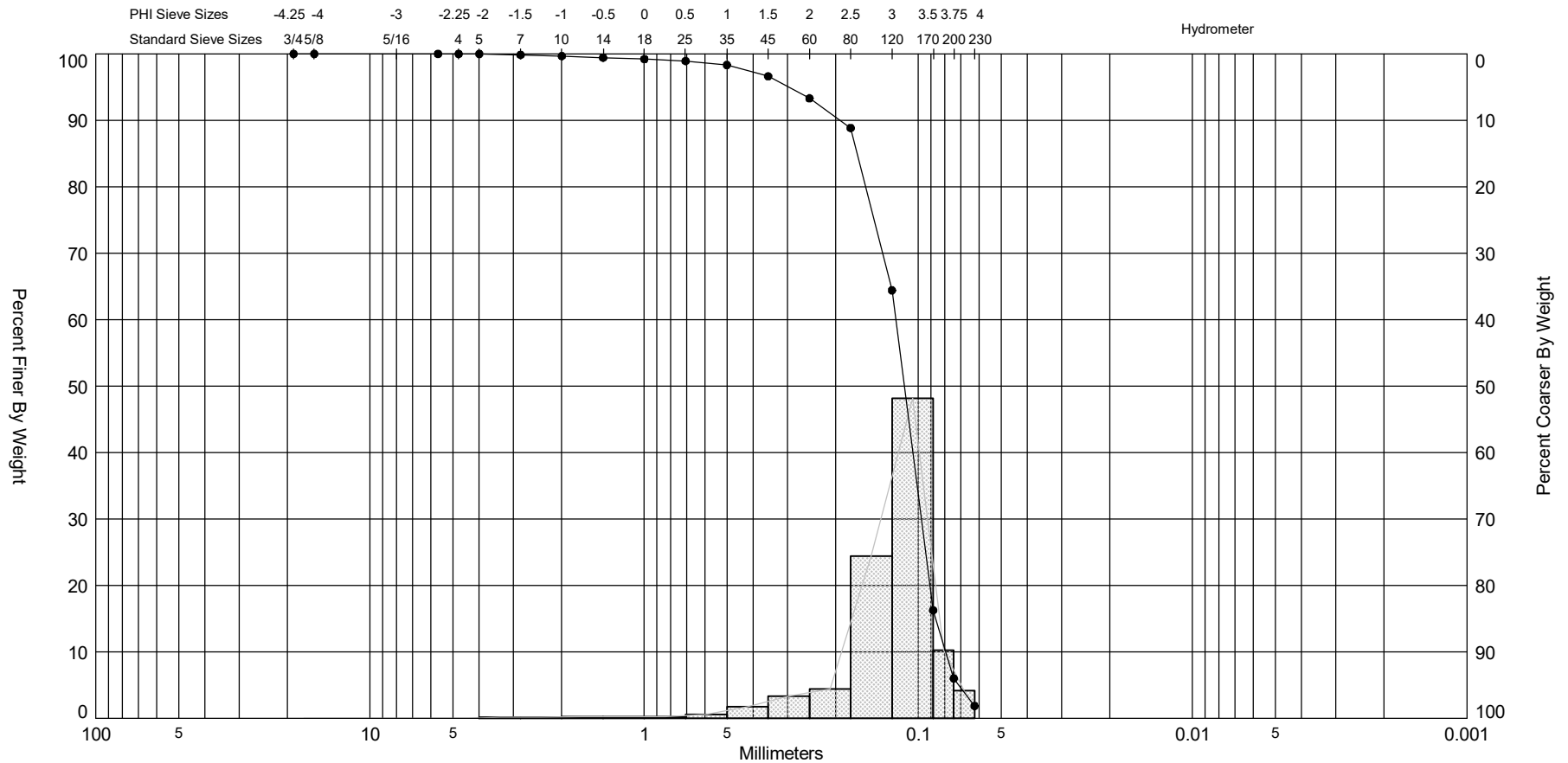
SIEVE ANALYSIS IBSP.GPJ FL DEP ROSS.GDT 11/10/20




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	
GS-27	—●—		SW-SM	#200 - 5.16 #230 - 1.53			3.09	2.64	-2.56	9.73	1.33	Project Name:	IBSP Sand Source Survey
Comments:												Analysis Date:	08-24-20
Depths and elevations based on measured values												Analyzed By:	DCJ
							Gahagan and Bryant Associates 3802 W Bay to Bay Blvd. Suite B-22 Tampa, FL 33629 Telephone: 813-831-4408 Fax: 813-831-4216					Easting (X, ft):	1,131,918
												Northing (Y, ft):	2,103,151
												Horizontal System:	NAD 1983
												Vertical System:	IGLD MLW

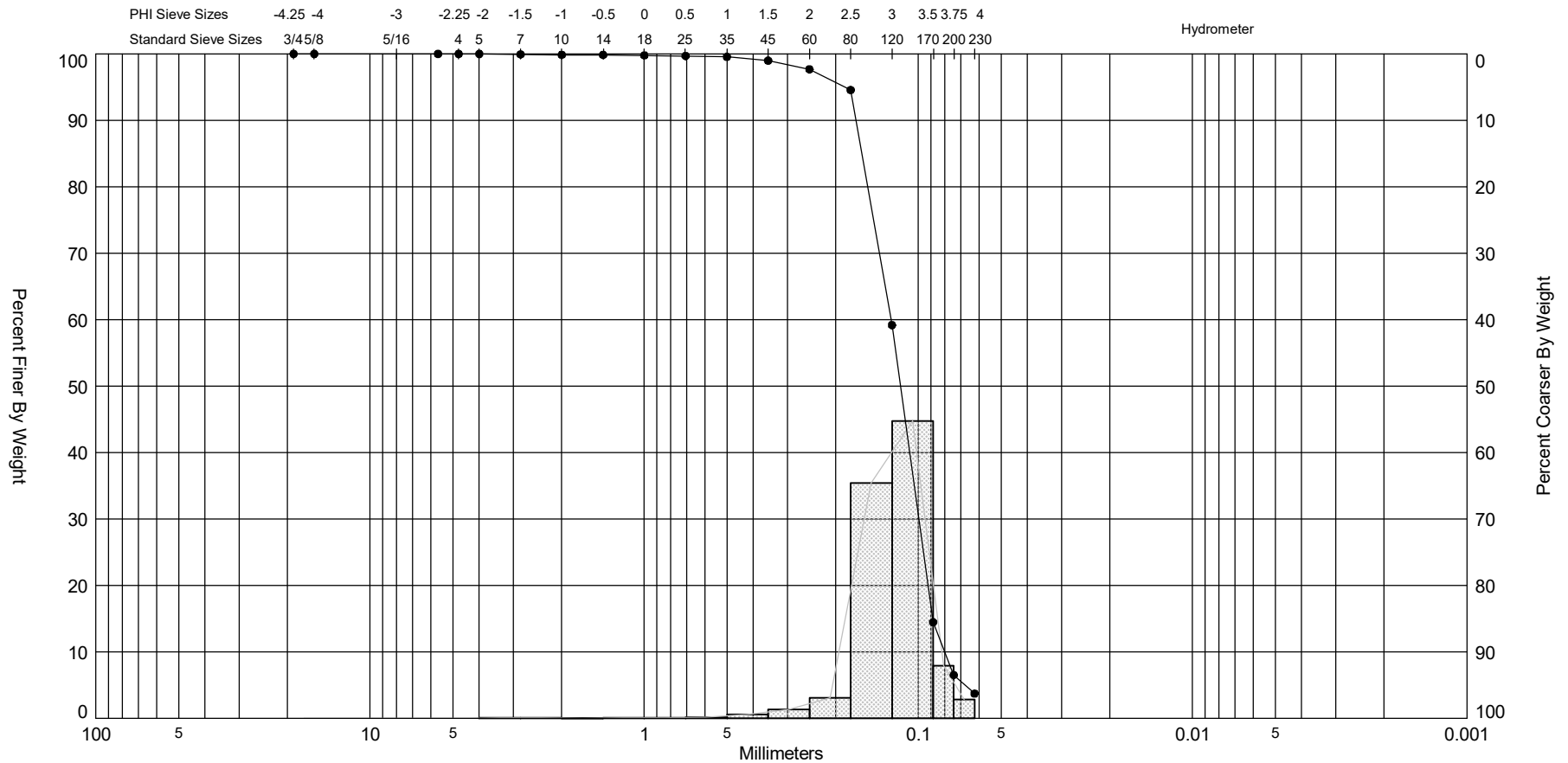
SIEVE ANALYSIS IBSP.GPJ FL DEP ROSS.GDT 11/10/20




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	
GS-30	—●—		SP-SM	#200 - 6.00 #230 - 1.86			3.15	3	-2.7	14.76	0.65	Project Name:	IBSP Sand Source Survey
Comments:												Analysis Date:	08-24-20
Depths and elevations based on measured values												Analyzed By:	DCJ
							Gahagan and Bryant Associates 3802 W Bay to Bay Blvd. Suite B-22 Tampa, FL 33629 Telephone: 813-831-4408 Fax: 813-831-4216					Easting (X, ft):	1,131,915
												Northing (Y, ft):	2,101,144
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												Vertical System:	IGLD MLW

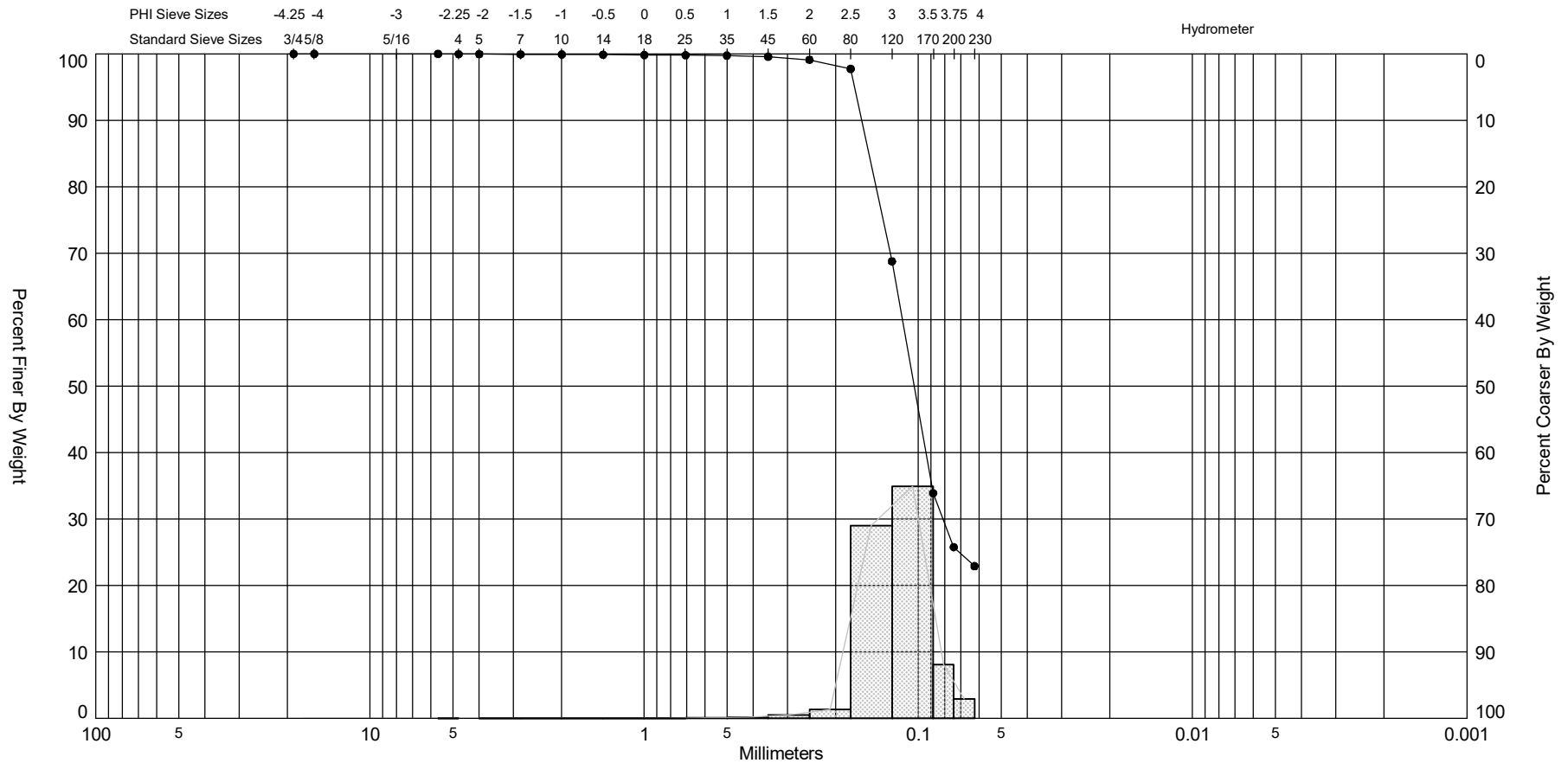
SIEVE ANALYSIS IBSP.GPJ FL DEP ROSS.GDT 11/10/20




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	
GS-31	—●—		SP-SM	#200 - 6.52 #230 - 3.71			3.1	3.04	-2.45	19.89	0.46	Project Name:	IBSP Sand Source Survey
Comments:												Analysis Date:	08-31-20
Depths and elevations based on measured values												Analyzed By:	DCJ
							Gahagan and Bryant Associates 3802 W Bay to Bay Blvd. Suite B-22 Tampa, FL 33629 Telephone: 813-831-4408 Fax: 813-831-4216					Easting (X, ft):	1,135,267
												Northing (Y, ft):	2,101,166
												Horizontal System:	NAD 1983
												Vertical System:	IGLD MLW

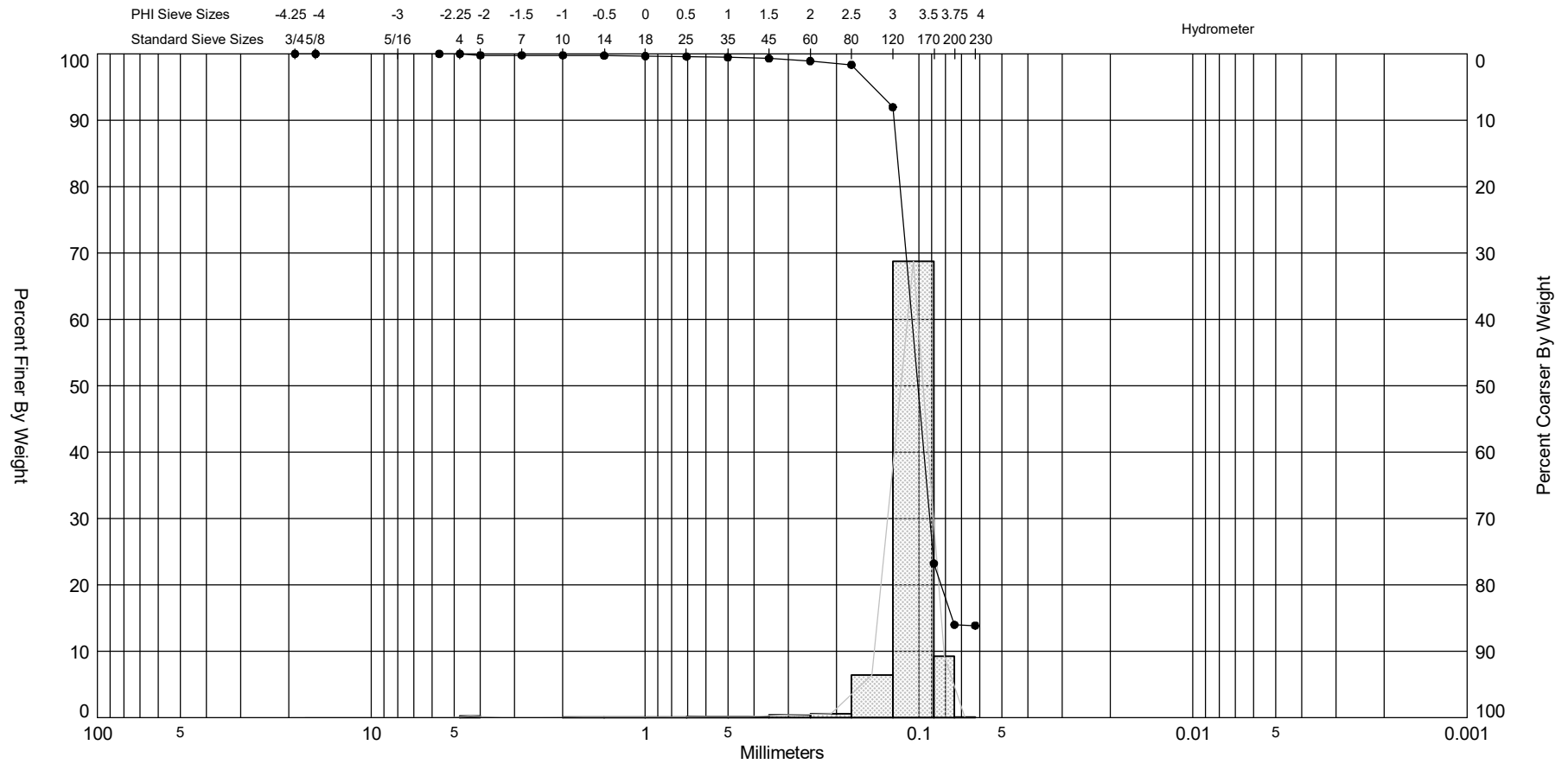
SIEVE ANALYSIS IBSP.GPJ FL DEP ROSS.GDT 11/10/20




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	
GS-36	—●—		SM	#200 - 25.77 #230 - 22.89			3.27	3.08	-2.77	29.86	0.43	Project Name:	IBSP Sand Source Survey
Comments:												Analysis Date:	08-31-20
Depths and elevations based on measured values												Analyzed By:	DCJ
							Gahagan and Bryant Associates 3802 W Bay to Bay Blvd. Suite B-22 Tampa, FL 33629 Telephone: 813-831-4408 Fax: 813-831-4216					Easting (X, ft):	1,132,078
												Northing (Y, ft):	2,097,146
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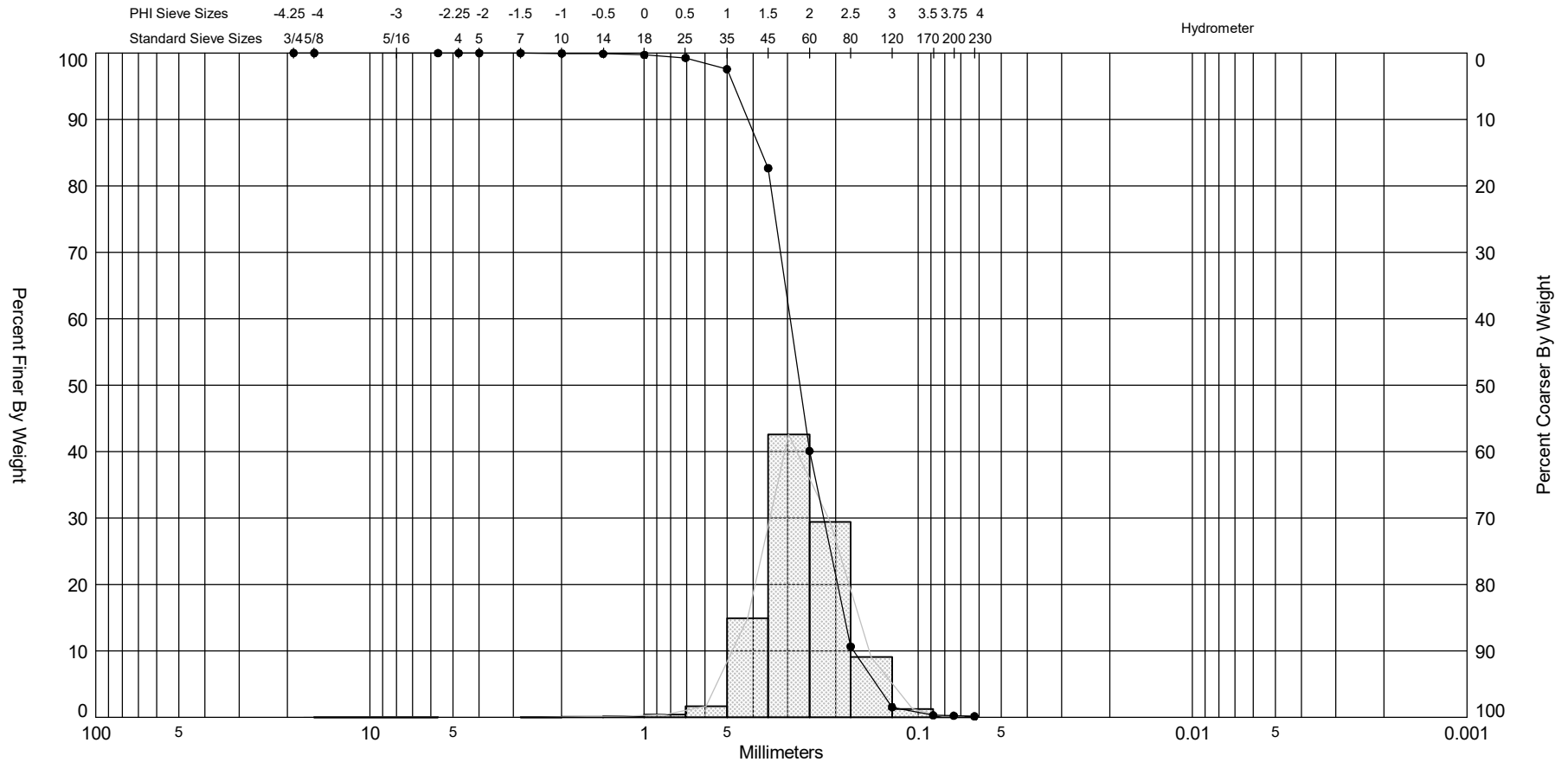
SIEVE ANALYSIS IBSP.GPJ FL DEP ROSS.GDT 11/10/20




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	
GS-38	—●—		SM	#200 - 13.98 #230 - 13.87			3.31	3.21	-7.82	90.14	0.4	Project Name:	IBSP Sand Source Survey
Comments:												Analysis Date:	08-31-20
Depths and elevations based on measured values												Analyzed By:	DCJ
							Gahagan and Bryant Associates 3802 W Bay to Bay Blvd. Suite B-22 Tampa, FL 33629 Telephone: 813-831-4408 Fax: 813-831-4216					Easting (X, ft):	1,134,177
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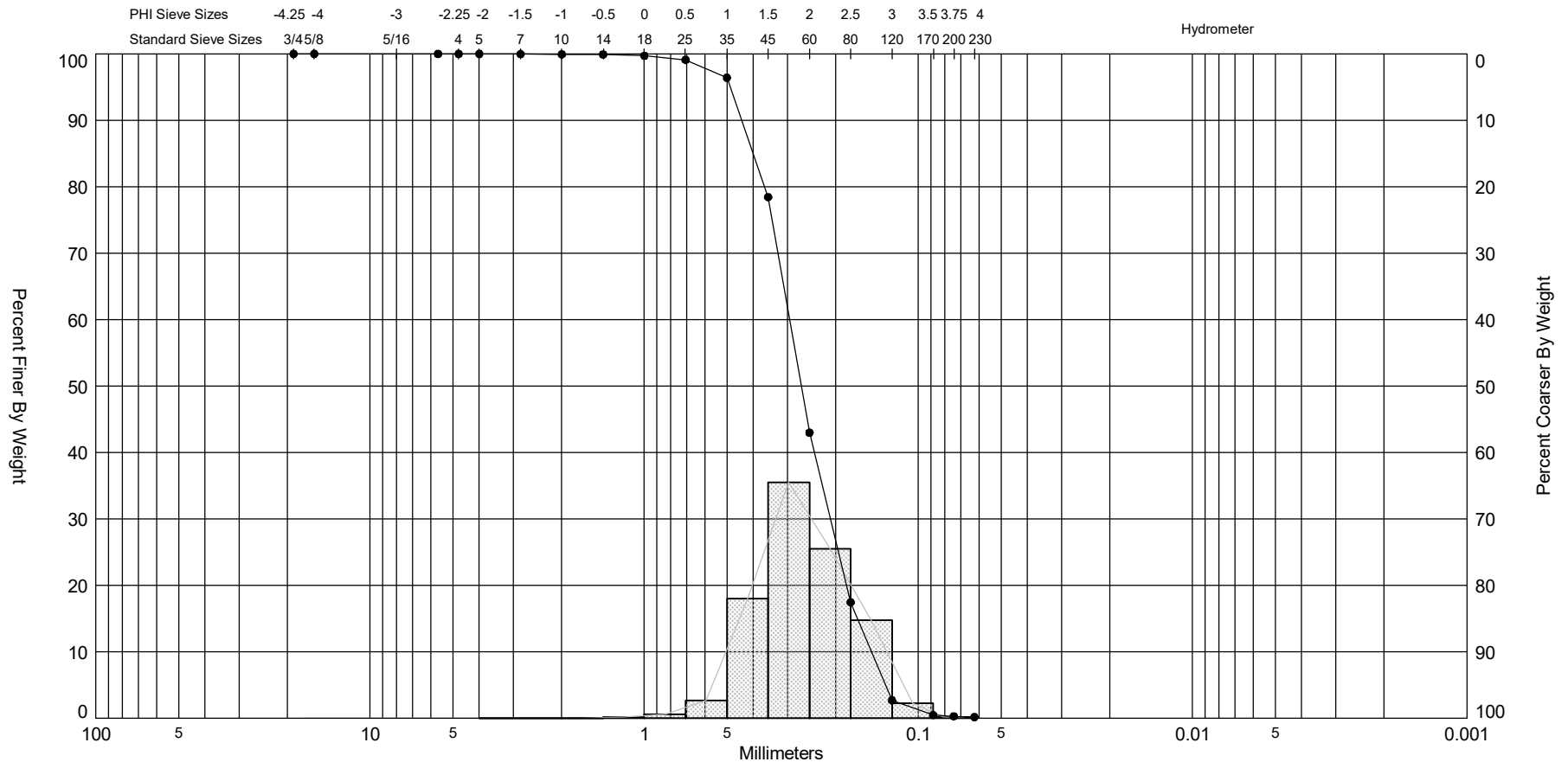
SIEVE ANALYSIS IBSP.GPJ FL DEP ROSS.GDT 11/10/20




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	
GS-45	—●—		SP	#200 - 0.23 #230 - 0.14			1.88	1.91	-0.38	6.67	0.51	Project Name:	IBSP Sand Source Survey
Comments:												Analysis Date:	08-21-20
Depths and elevations based on measured values												Analyzed By:	DCJ
							Gahagan and Bryant Associates 3802 W Bay to Bay Blvd. Suite B-22 Tampa, FL 33629 Telephone: 813-831-4408 Fax: 813-831-4216					Easting (X, ft):	1,139,973
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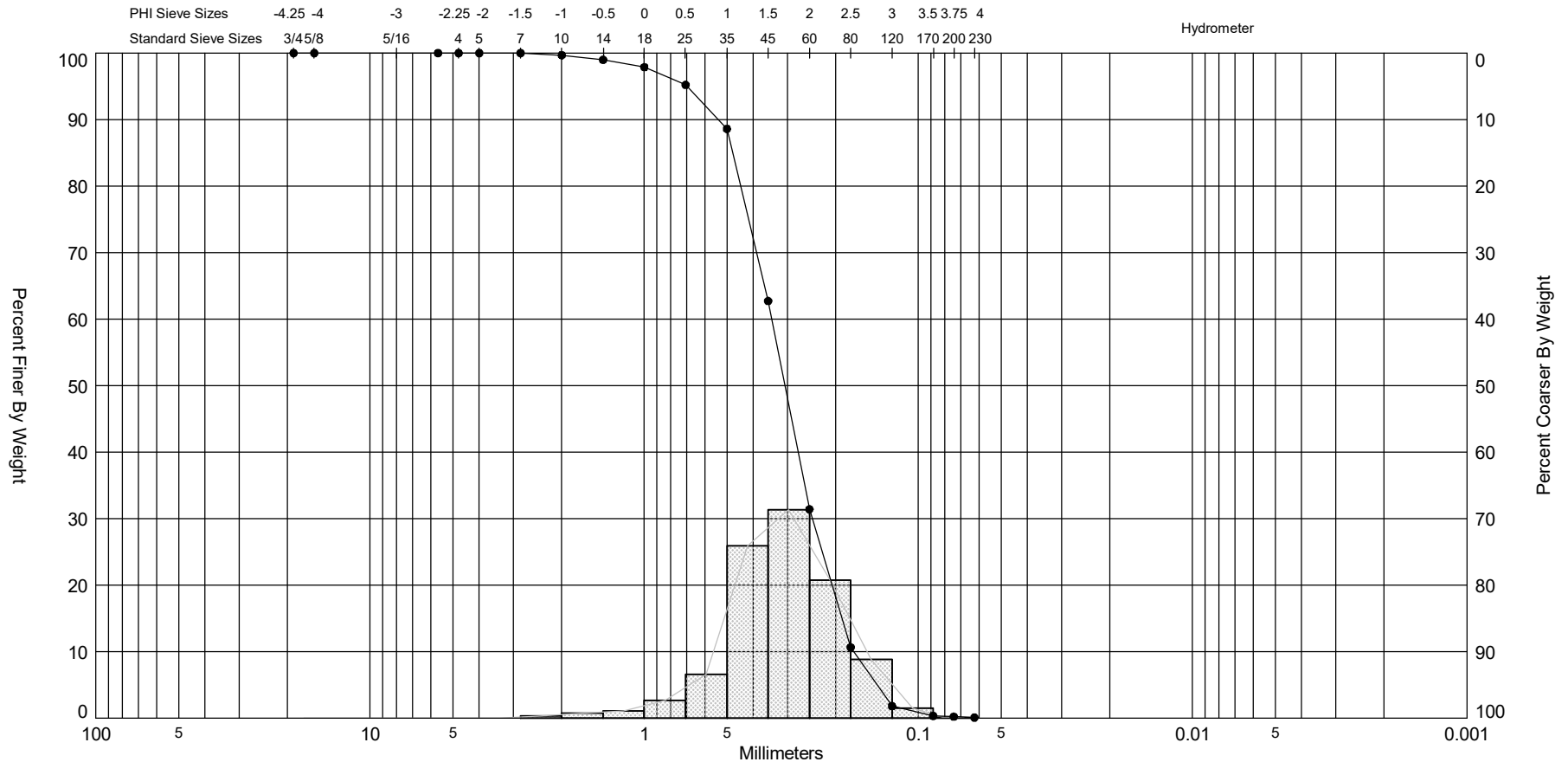
SIEVE ANALYSIS IBSP.GPJ FL DEP ROSS.GDT 11/10/20




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	
GS-46	—●—		SP	#200 - 0.29 #230 - 0.16			1.9	1.93	-0.13	3.86	0.59	Project Name:	IBSP Sand Source Survey
Comments:												Analysis Date:	08-21-20
Depths and elevations based on measured values												Analyzed By:	DCJ
							Gahagan and Bryant Associates 3802 W Bay to Bay Blvd. Suite B-22 Tampa, FL 33629 Telephone: 813-831-4408 Fax: 813-831-4216					Easting (X, ft):	1,140,222
												Northing (Y, ft):	2,114,299
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												Vertical System:	IGLD MLW

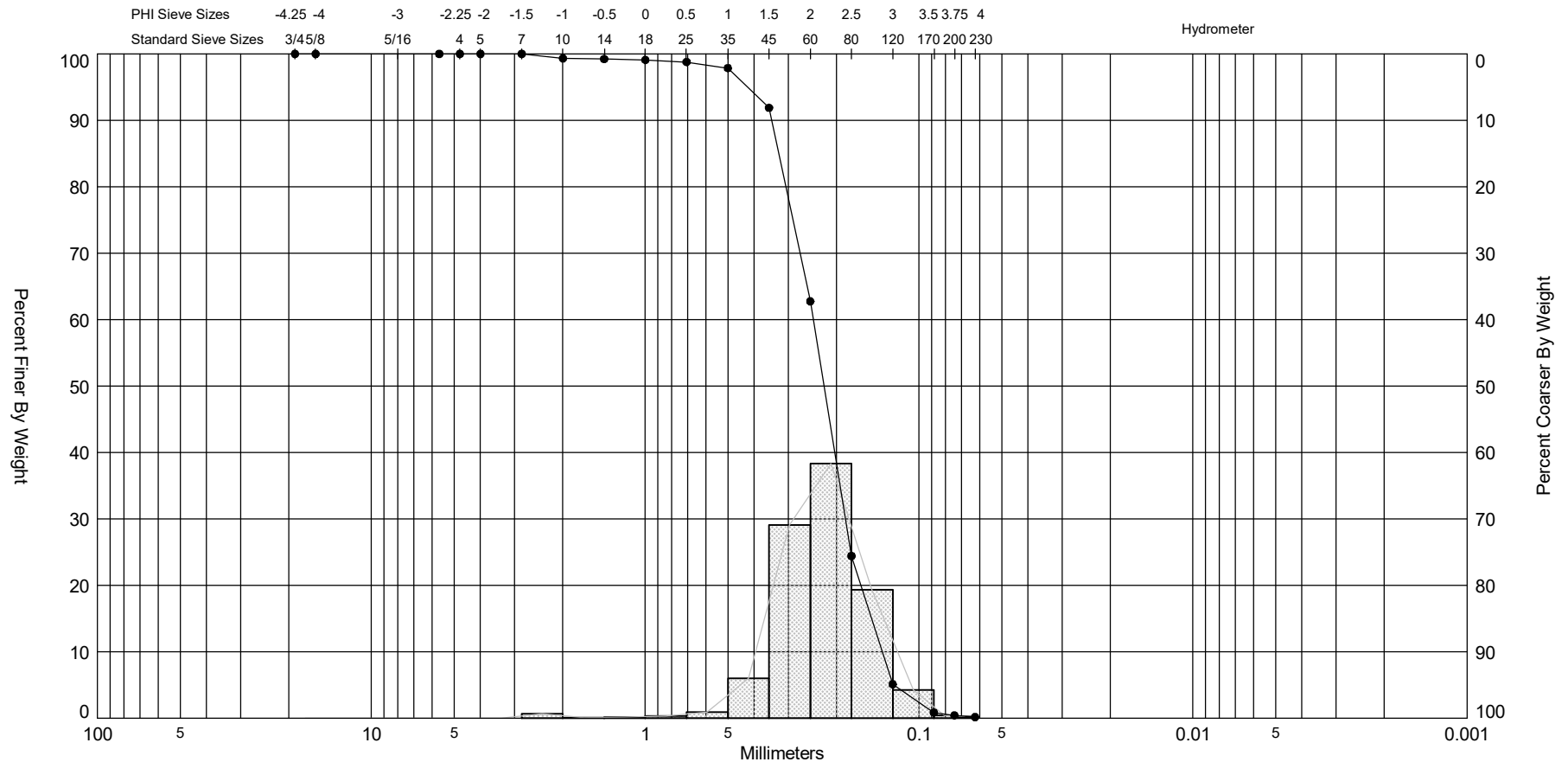
SIEVE ANALYSIS IBSP.GPJ FL DEP ROSS.GDT 11/10/20




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	
GS-47	—●—		SP	#200 - 0.21 #230 - 0.09			1.7	1.68	-0.56	4.54	0.7	Project Name:	IBSP Sand Source Survey
Comments:												Analysis Date:	08-21-20
Depths and elevations based on measured values												Analyzed By:	DCJ
							Gahagan and Bryant Associates 3802 W Bay to Bay Blvd. Suite B-22 Tampa, FL 33629 Telephone: 813-831-4408 Fax: 813-831-4216					Easting (X, ft):	1,140,085
												Northing (Y, ft):	2,114,478
												Horizontal System:	NAD 1983
												Vertical System:	IGLD MLW

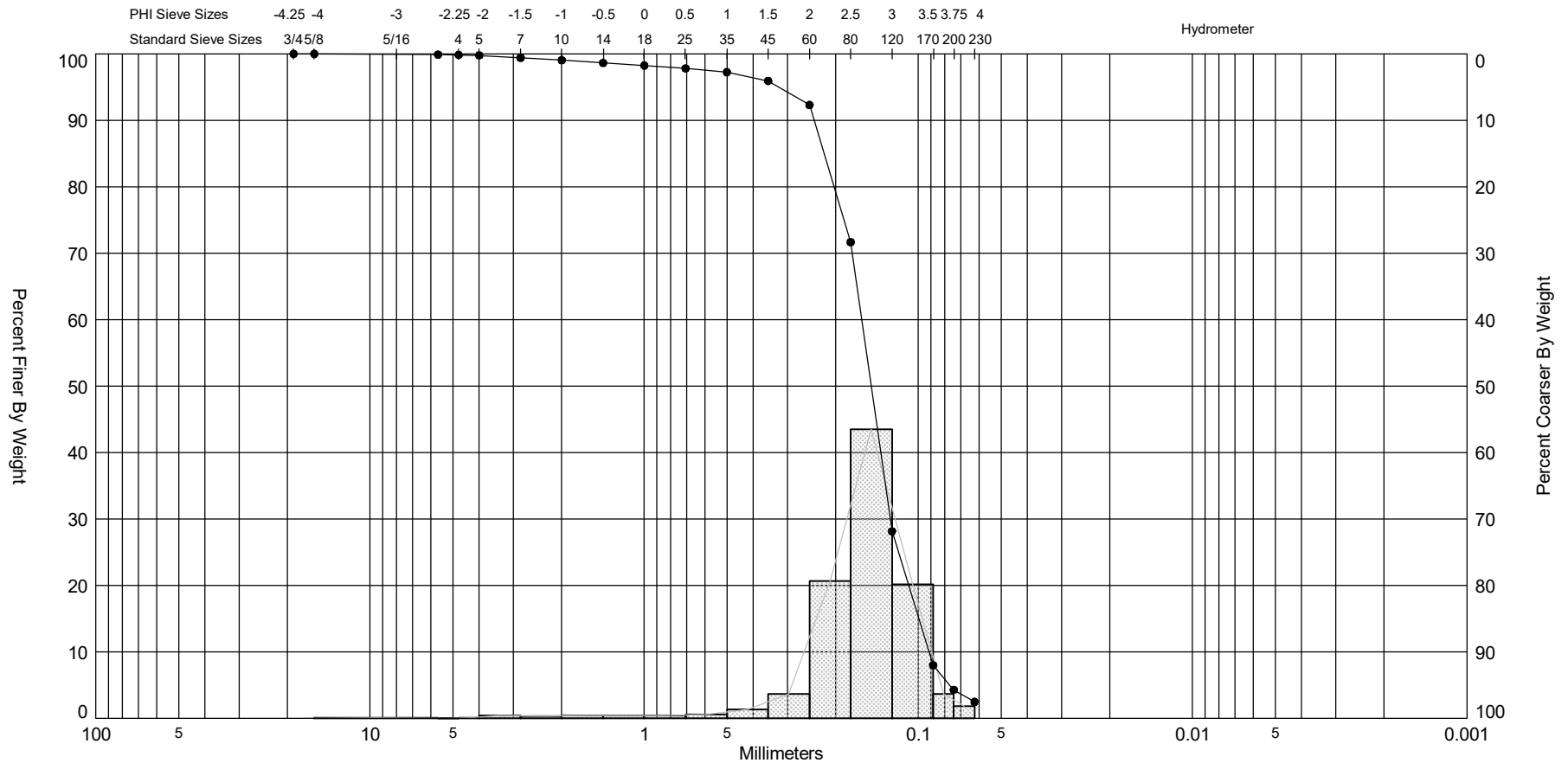
SIEVE ANALYSIS IBSP.GPJ FL DEP ROSS.GDT 11/10/20




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	
GS-48	—●—		SP	#200 - 0.43 #230 - 0.16			2.17	2.14	-1.3	9.65	0.6	Project Name:	IBSP Sand Source Survey
Comments:												Analysis Date:	08-21-20
Depths and elevations based on measured values												Analyzed By:	DCJ
							Gahagan and Bryant Associates 3802 W Bay to Bay Blvd. Suite B-22 Tampa, FL 33629 Telephone: 813-831-4408 Fax: 813-831-4216					Easting (X, ft):	1,139,737
												Northing (Y, ft):	2,114,187
												Horizontal System:	NAD 1983
												Vertical System:	IGLD MLW

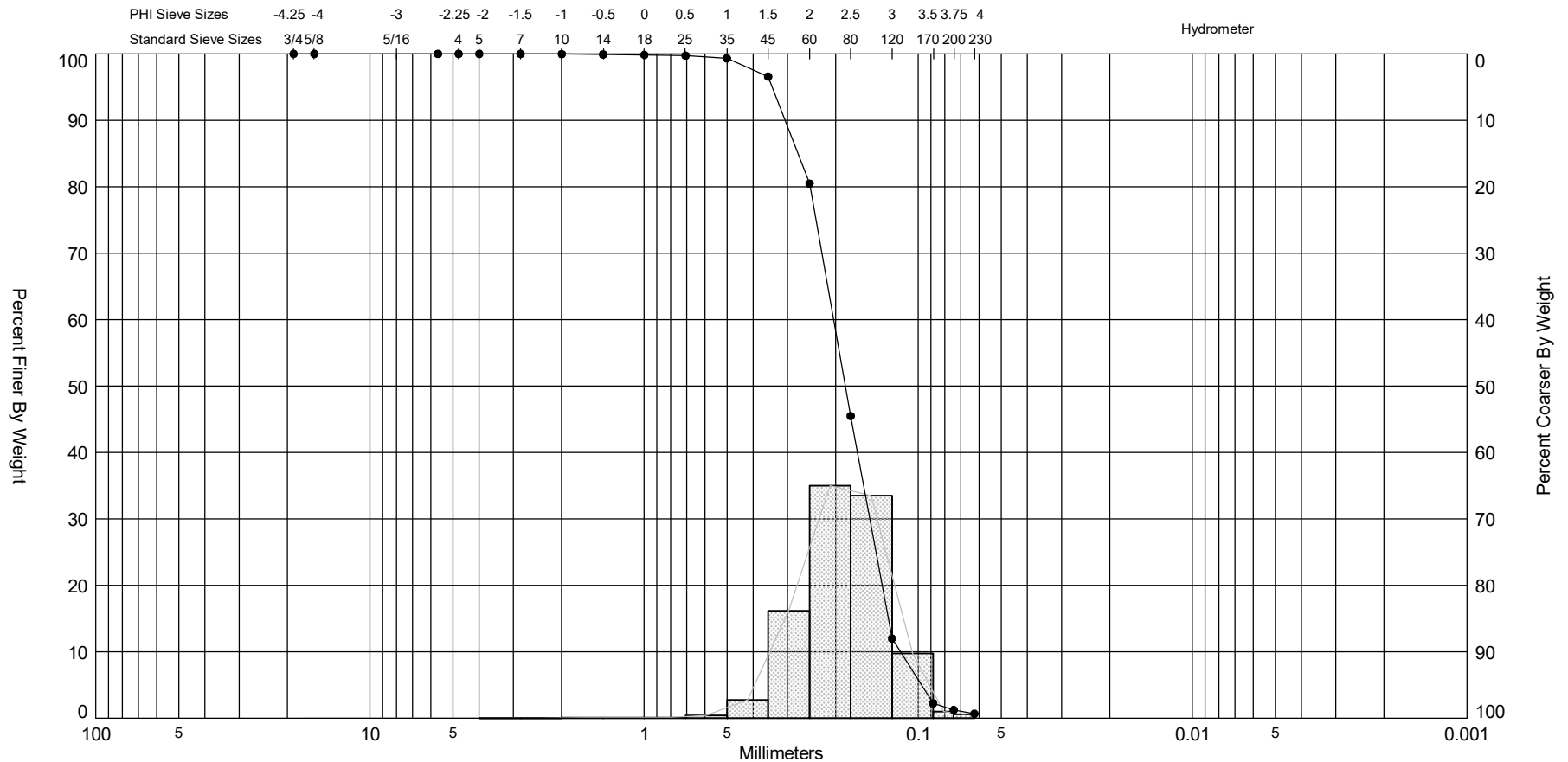
SIEVE ANALYSIS IBSP.GPJ FL DEP ROSS.GDT 11/10/20




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	
GS-49	—●—		SP	#200 - 4.29 #230 - 2.47			2.75	2.65	-2.96	17.79	0.75	Project Name:	IBSP Sand Source Survey
Comments:												Analysis Date:	08-21-20
Depths and elevations based on measured values												Analyzed By:	DCJ
							Gahagan and Bryant Associates 3802 W Bay to Bay Blvd. Suite B-22 Tampa, FL 33629 Telephone: 813-831-4408 Fax: 813-831-4216					Easting (X, ft):	1,138,710
												Northing (Y, ft):	2,114,704
												Horizontal System:	NAD 1983
												Vertical System:	IGLD MLW

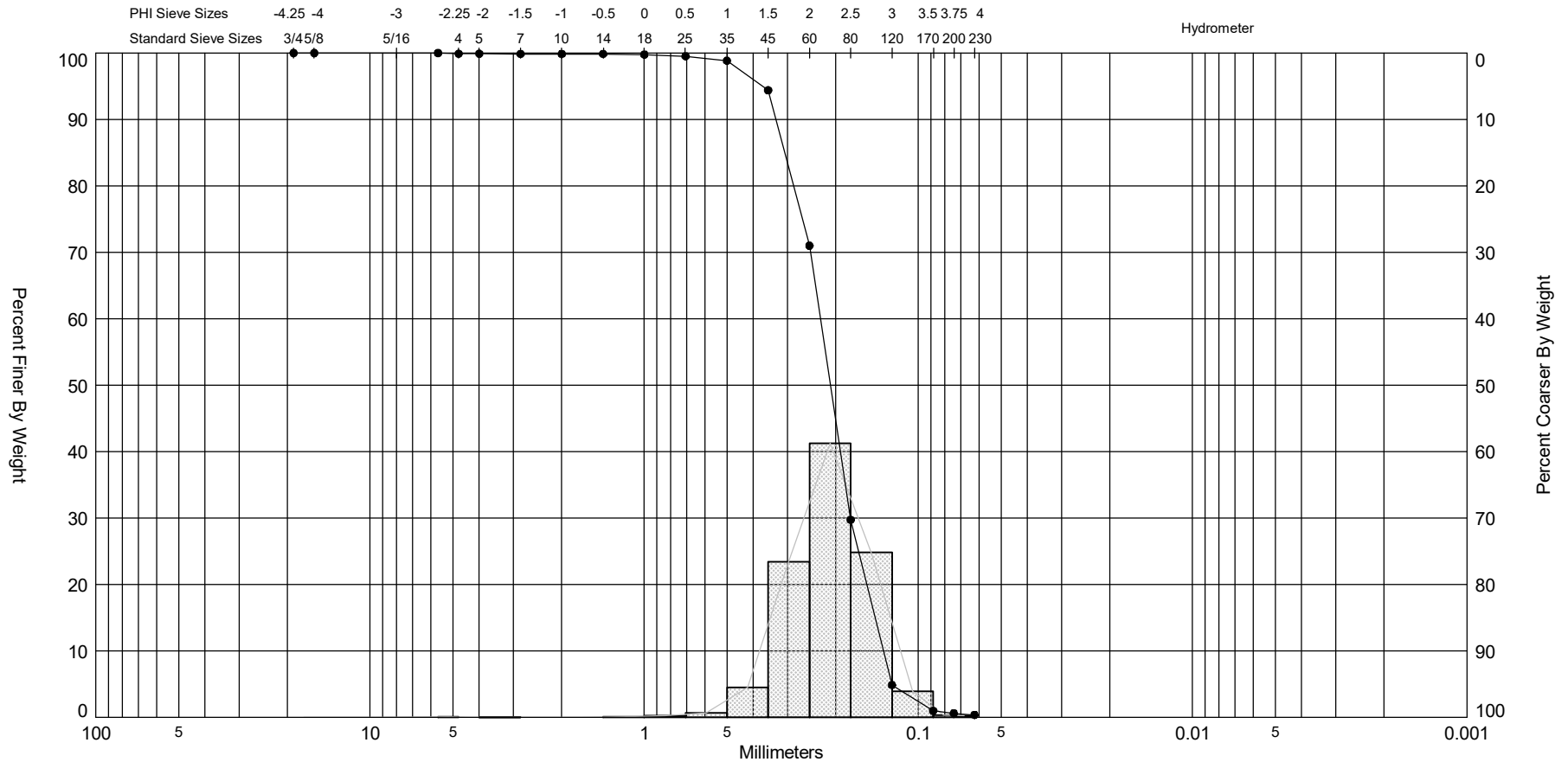
SIEVE ANALYSIS IBSP.GPJ FL DEP ROSS.GDT 11/10/20




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	
GS-50	—●—		SP	#200 - 1.24 #230 - 0.66			2.44	2.42	-0.46	5	0.53	Project Name:	IBSP Sand Source Survey
Comments:												Analysis Date:	08-21-20
Depths and elevations based on measured values												Analyzed By:	DCJ
							Gahagan and Bryant Associates 3802 W Bay to Bay Blvd. Suite B-22 Tampa, FL 33629 Telephone: 813-831-4408 Fax: 813-831-4216					Easting (X, ft):	1,139,892
												Northing (Y, ft):	2,113,701
												Horizontal System:	NAD 1983
												Vertical System:	IGLD MLW

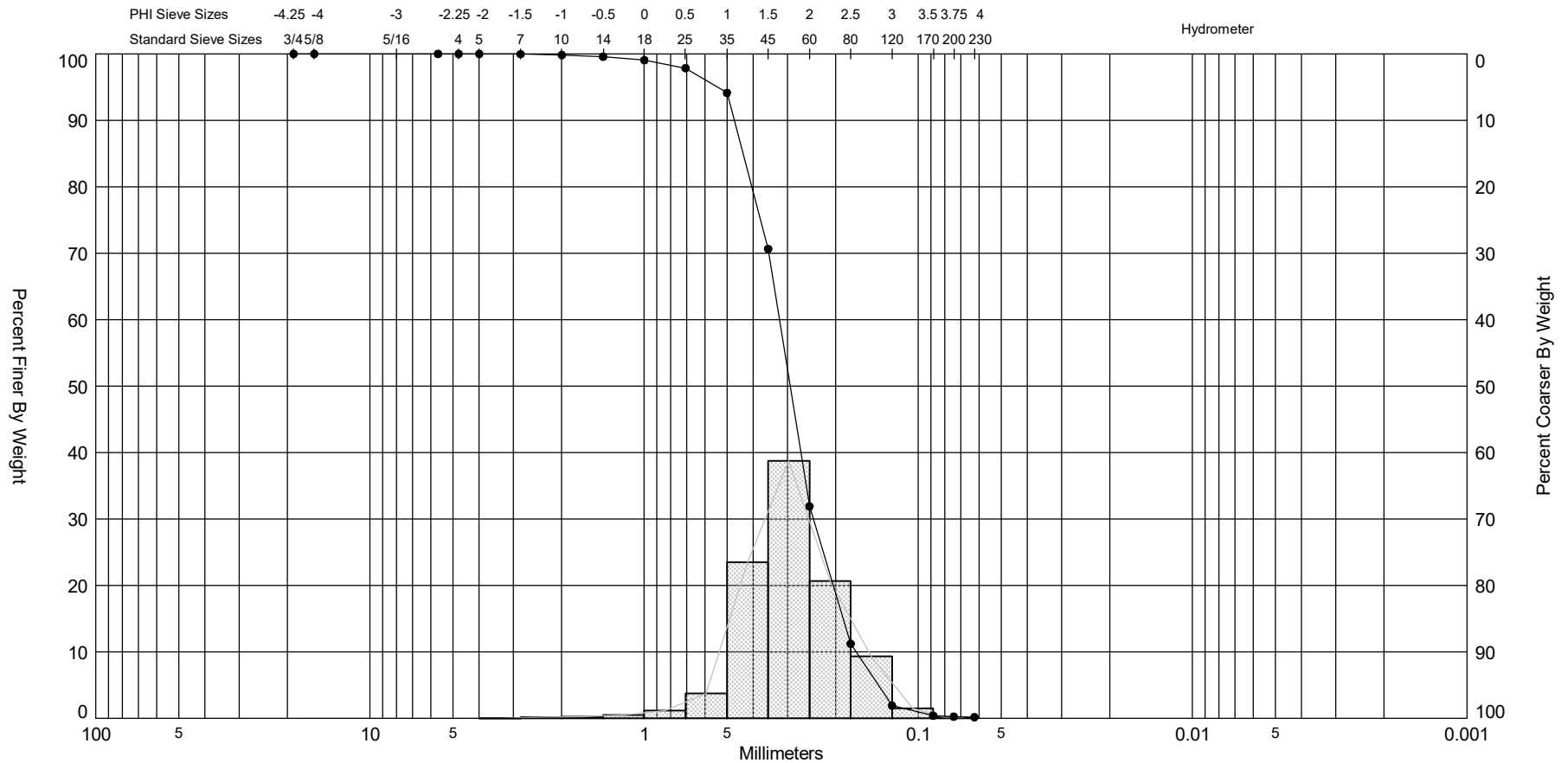
SIEVE ANALYSIS IBSP.GPJ FL DEP ROSS.GDT 11/10/20




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	
GS-51	—●—		SP	#200 - 0.61 #230 - 0.37			2.25	2.24	-1.05	10.43	0.53	Project Name:	IBSP Sand Source Survey
Comments:												Analysis Date:	08-21-20
Depths and elevations based on measured values												Analyzed By:	DCJ
							Gahagan and Bryant Associates 3802 W Bay to Bay Blvd. Suite B-22 Tampa, FL 33629 Telephone: 813-831-4408 Fax: 813-831-4216					Easting (X, ft):	1,140,207
												Northing (Y, ft):	2,115,694
												Horizontal System:	NAD 1983
												Vertical System:	IGLD MLW

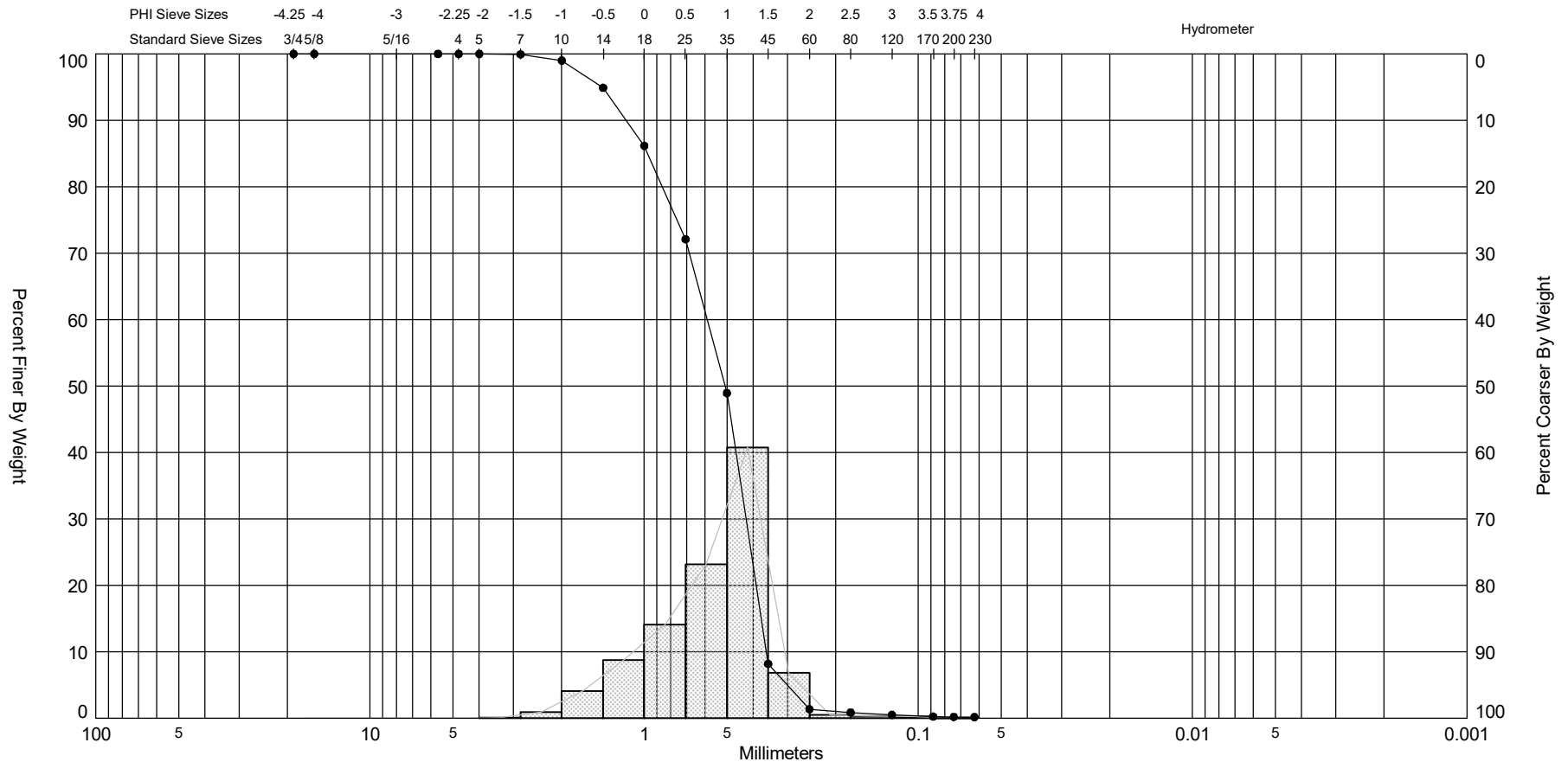
SIEVE ANALYSIS IBSP.GPJ FL DEP ROSS.GDT 11/10/20




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	
GS-52	—●—		SP	#200 - 0.25 #230 - 0.16			1.77	1.78	-0.38	5.19	0.6	Project Name:	IBSP Sand Source Survey
Comments:												Analysis Date:	08-21-20
Depths and elevations based on measured values												Analyzed By:	DCJ
							Gahagan and Bryant Associates 3802 W Bay to Bay Blvd. Suite B-22 Tampa, FL 33629 Telephone: 813-831-4408 Fax: 813-831-4216					Easting (X, ft):	1,139,975
												Northing (Y, ft):	2,115,191
												Horizontal System:	NAD 1983
												Vertical System:	IGLD MLW

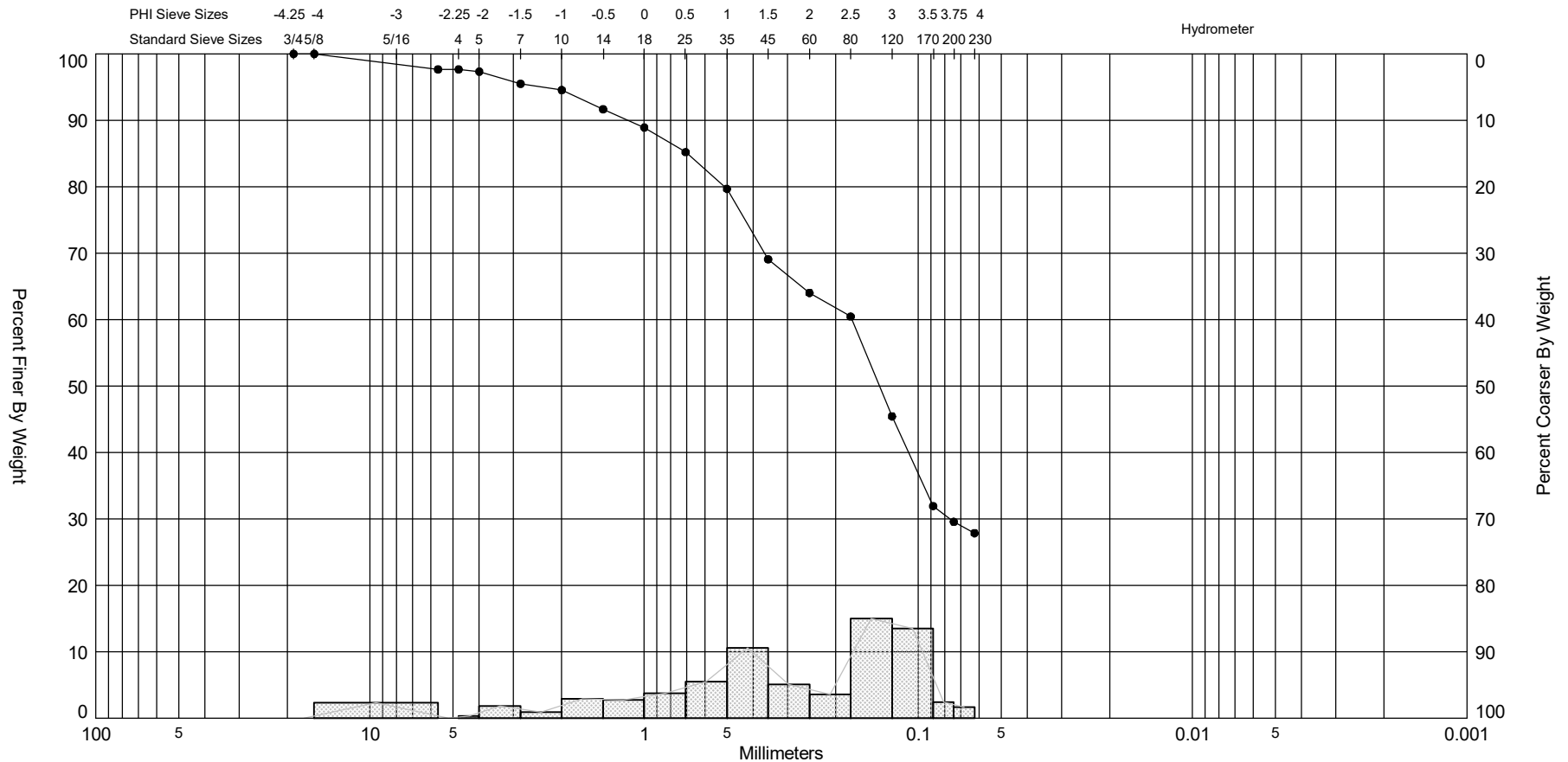
SIEVE ANALYSIS IBSP.GPJ FL DEP ROSS.GDT 11/10/20




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	
GS-53	—●—		SP	#200 - 0.20 #230 - 0.17			0.98	0.81	-0.58	3.77	0.69	Project Name:	IBSP Sand Source Survey
Comments:												Analysis Date:	08-21-20
Depths and elevations based on measured values												Analyzed By:	DCJ
							Gahagan and Bryant Associates 3802 W Bay to Bay Blvd. Suite B-22 Tampa, FL 33629 Telephone: 813-831-4408 Fax: 813-831-4216					Easting (X, ft):	1,139,392
												Northing (Y, ft):	2,114,691
												Horizontal System:	NAD 1983
												Vertical System:	IGLD MLW

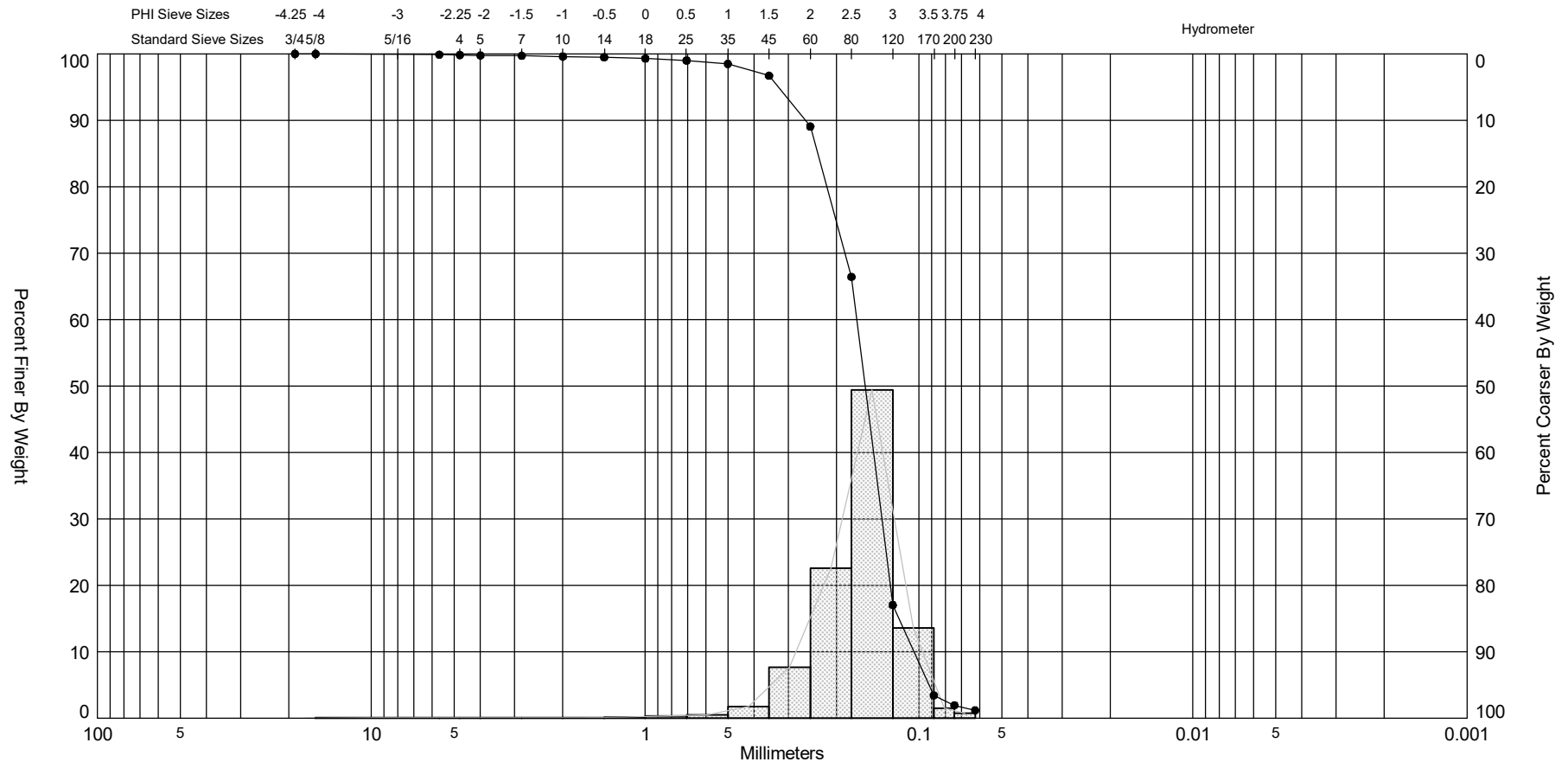
SIEVE ANALYSIS IBSP.GPJ FL DEP ROSS.GDT 11/10/20




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	
GS-54	—●—		SM	#200 - 29.55 #230 - 27.86			2.85	1.66	-1.06	3.7	1.67	Project Name:	IBSP Sand Source Survey
Comments:												Analysis Date:	08-31-20
Depths and elevations based on measured values												Analyzed By:	DCJ
							Gahagan and Bryant Associates 3802 W Bay to Bay Blvd. Suite B-22 Tampa, FL 33629 Telephone: 813-831-4408 Fax: 813-831-4216					Easting (X, ft):	1,139,264
												Northing (Y, ft):	2,115,177
												Horizontal System:	NAD 1983
												Vertical System:	IGLD MLW

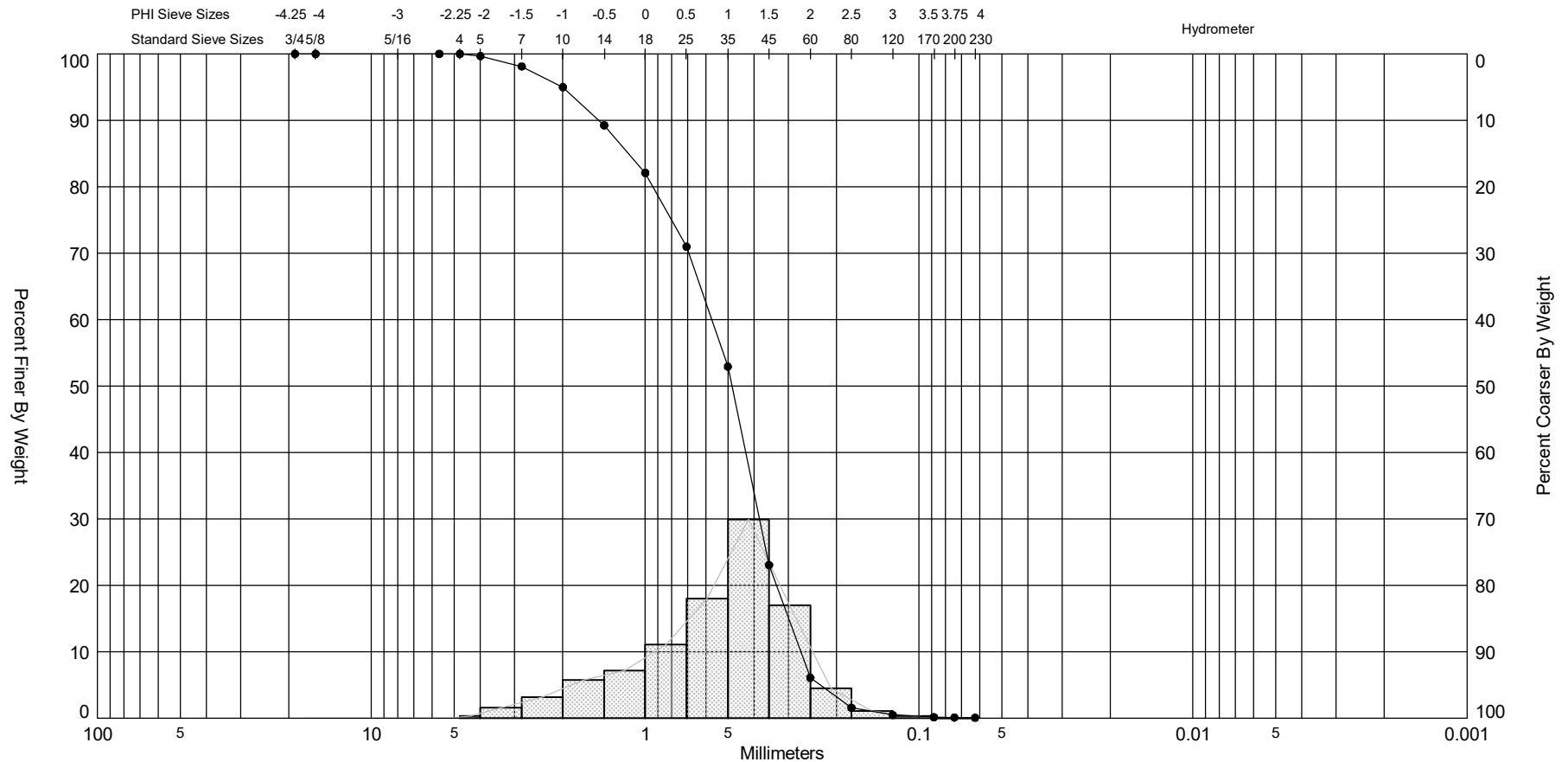
SIEVE ANALYSIS IBSP.GPJ FL DEP ROSS.GDT 11/10/20




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	
GS-55	—●—		SP	#200 - 1.94 #230 - 1.18			2.67	2.57	-2.82	21.68	0.61	Project Name:	IBSP Sand Source Survey
Comments:												Analysis Date:	08-21-20
Depths and elevations based on measured values												Analyzed By:	DCJ
							Gahagan and Bryant Associates 3802 W Bay to Bay Blvd. Suite B-22 Tampa, FL 33629 Telephone: 813-831-4408 Fax: 813-831-4216					Easting (X, ft):	1,139,779
												Northing (Y, ft):	2,114,686
												Horizontal System:	NAD 1983
												Vertical System:	IGLD MLW

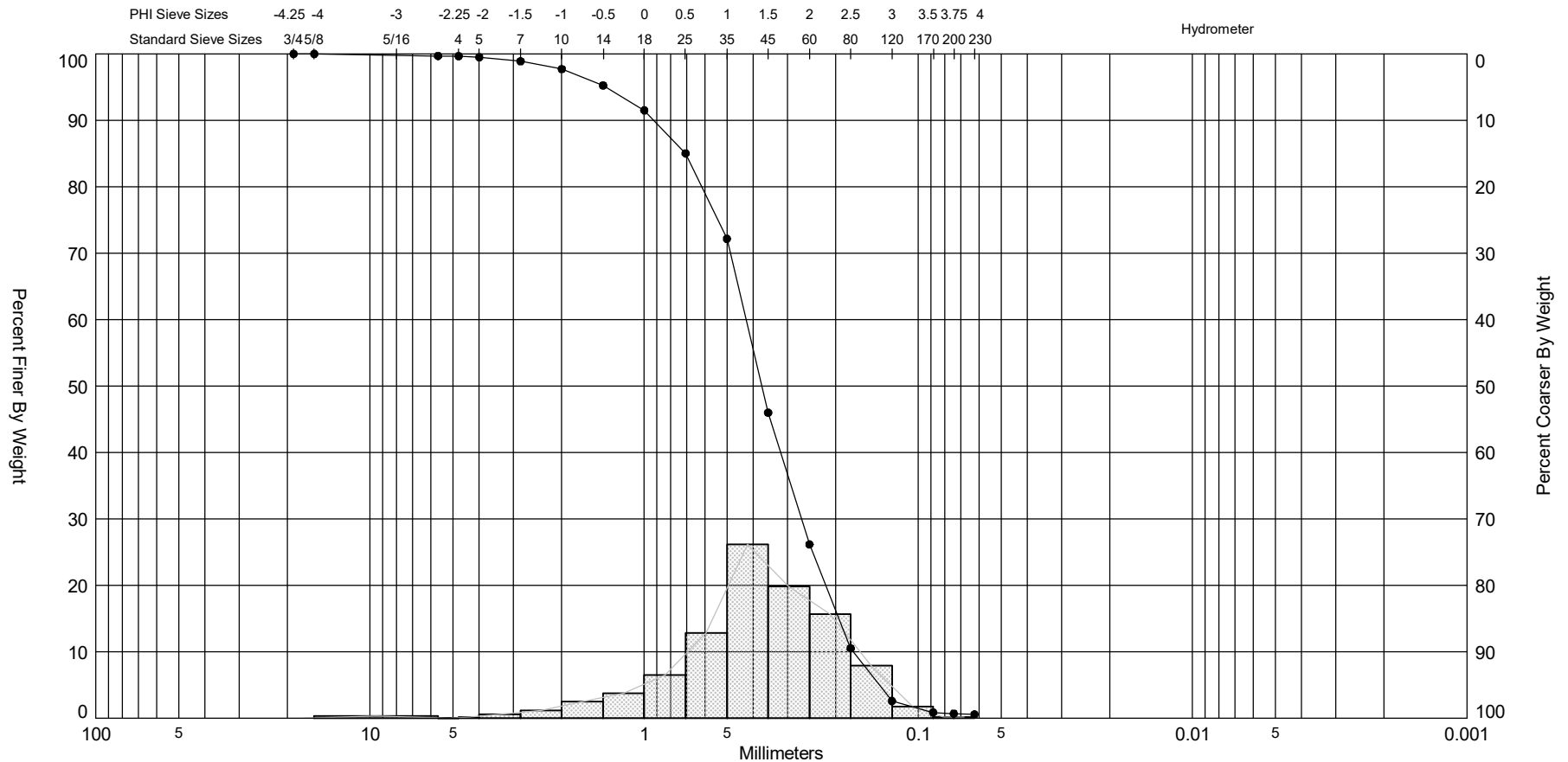
SIEVE ANALYSIS IBSP.GPJ FL DEP ROSS.GDT 11/10/20




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	
GS-56	—●—		SW	#200 - 0.10 #230 - 0.06			1.05	0.85	-0.7	3.38	0.94	Project Name:	IBSP Sand Source Survey
Comments:												Analysis Date:	08-21-20
Depths and elevations based on measured values												Analyzed By:	DCJ
							Gahagan and Bryant Associates 3802 W Bay to Bay Blvd. Suite B-22 Tampa, FL 33629 Telephone: 813-831-4408 Fax: 813-831-4216					Easting (X, ft):	1,140,394
												Northing (Y, ft):	2,115,197
												Horizontal System:	NAD 1983
												Vertical System:	IGLD MLW

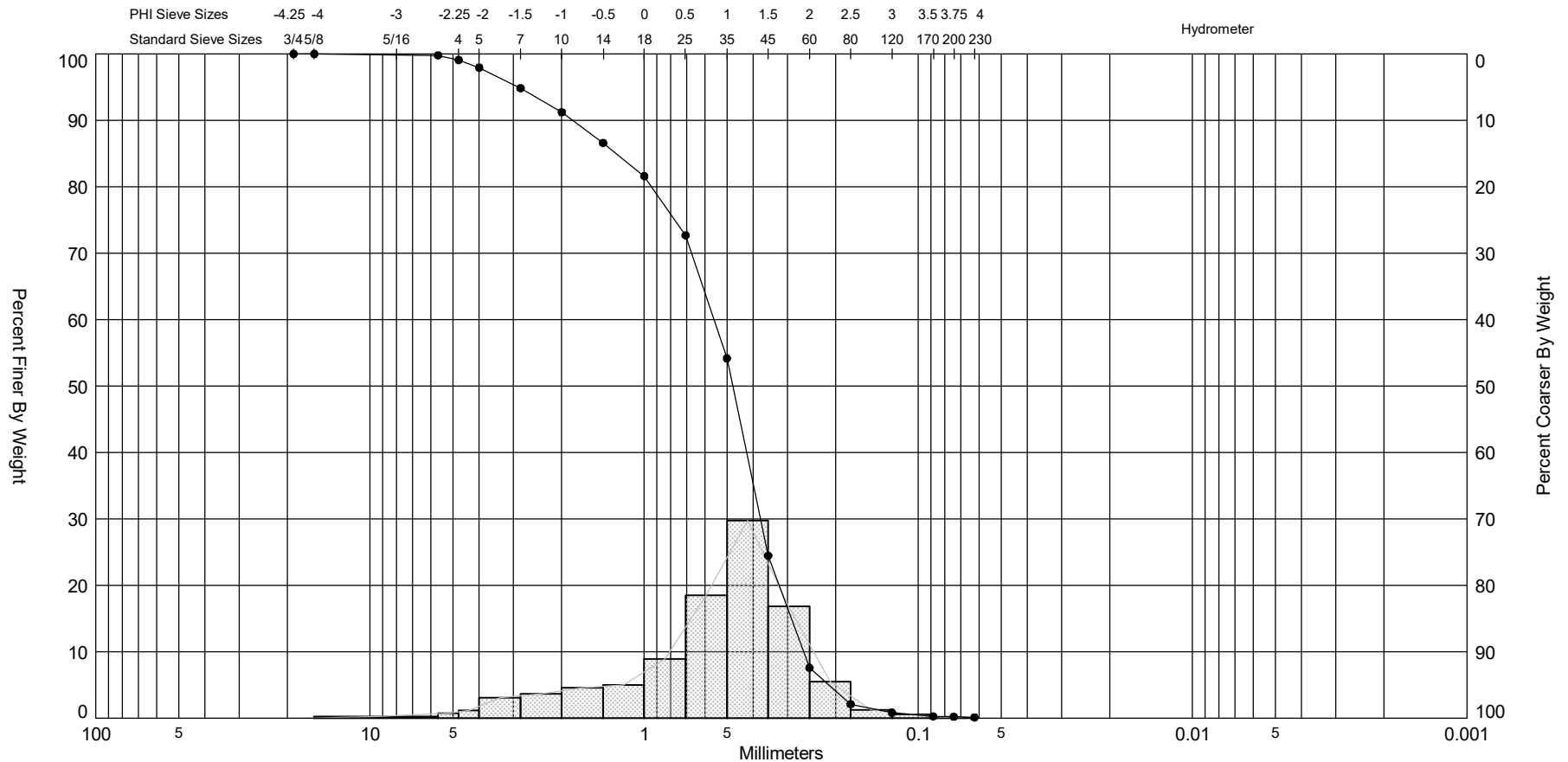
SIEVE ANALYSIS IBSP.GPJ FL DEP ROSS.GDT 11/10/20




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	
GS-65	—●—		SW	#200 - 0.70 #230 - 0.56			1.42	1.36	-0.86	4.81	0.98	Project Name:	IBSP Sand Source Survey
Comments:												Analysis Date:	08-21-20
Depths and elevations based on measured values												Analyzed By:	DCJ
							Gahagan and Bryant Associates 3802 W Bay to Bay Blvd. Suite B-22 Tampa, FL 33629 Telephone: 813-831-4408 Fax: 813-831-4216					Easting (X, ft):	1,139,976
												Northing (Y, ft):	2,112,682
												Horizontal System:	NAD 1983
												Vertical System:	IGLD MLW

SIEVE ANALYSIS IBSP.GPJ FL DEP ROSS.GDT 11/10/20



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	
GS-66	—●—		SW	#200 - 0.21 #230 - 0.12			1.07	0.82	-0.96	3.9	1.08	Project Name:	IBSP Sand Source Survey
Comments:												Analysis Date:	08-21-20
Depths and elevations based on measured values												Analyzed By:	DCJ
						Gahagan and Bryant Associates 3802 W Bay to Bay Blvd. Suite B-22 Tampa, FL 33629 Telephone: 813-831-4408 Fax: 813-831-4216						Easting (X, ft):	1,140,030
												Northing (Y, ft):	2,113,199
												Horizontal System:	NAD 1983
												Vertical System:	IGLD MLW

Granularmetric Report

Depths and elevations based on measured values



Gahagan and Bryant Associates
3802 W Bay to Bay Blvd. Suite B-22
Tampa, FL 33629
Telephone: 813-831-4408
Fax: 813-831-4216

Project Name: IBSP Sand Source Survey

Sample Name: GS-11

Analysis Date: 08-31-20

Analyzed By: DCJ

Easting (ft): 1,132,890	Northing (ft): 2,114,645	Coordinate System: State Plane	Elevation (ft):
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USCS: SW-SM	Munsell: Dry - 10YR-6/3	Comments:
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Dry Weight (g): 142.31	Wash Weight (g): 135.35	Pan Retained (g): 6.40	Sieve Loss (%): 0.01	Fines (%): #200 - 9.48 #230 - 9.39	Organics (%):	Carbonates (%):	Shells (%):
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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
3.5	-2.50	5.66	3.48	2.45	3.48	2.45
4	-2.25	4.76	0.79	0.56	4.27	3.00
5	-2.00	4.00	1.00	0.70	5.27	3.70
7	-1.50	2.83	1.31	0.92	6.58	4.62
10	-1.00	2.00	1.87	1.31	8.45	5.94
14	-0.50	1.41	2.09	1.47	10.54	7.41
18	0.00	1.00	2.17	1.52	12.71	8.93
25	0.50	0.71	2.52	1.77	15.23	10.70
35	1.00	0.50	5.22	3.67	20.45	14.37
45	1.50	0.35	11.66	8.19	32.11	22.56
60	2.00	0.25	11.58	8.14	43.69	30.70
80	2.50	0.18	7.35	5.16	51.04	35.87
120	3.00	0.13	9.84	6.91	60.88	42.78
170	3.50	0.09	52.87	37.15	113.75	79.93
200	3.75	0.07	15.07	10.59	128.82	90.52
230	4.00	0.06	0.12	0.08	128.94	90.61

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
	3.60	3.43	3.10	1.65	1.10	-1.36
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	2.23	0.21	1.62	-1.71	5.53	

GRANULARMETRIC REPORT IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Granularmetric Report

Depths and elevations based on measured values



Gahagan and Bryant Associates
 3802 W Bay to Bay Blvd. Suite B-22
 Tampa, FL 33629
 Telephone: 813-831-4408
 Fax: 813-831-4216

Project Name: IBSP Sand Source Survey

Sample Name: GS-15

Analysis Date: 08-24-20

Analyzed By: DCJ

Easting (ft): 1,131,511	Northing (ft): 2,112,641	Coordinate System: State Plane	Elevation (ft):
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USCS: SP	Munsell: Dry - 10YR-6/2	Comments:
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Dry Weight (g): 149.69	Wash Weight (g): 149.69	Pan Retained (g): 2.24	Sieve Loss (%): 0.01	Fines (%): #200 - 4.37 #230 - 1.50	Organics (%):	Carbonates (%):	Shells (%):
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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
3.5	-2.50	5.66	0.00	0.00	0.00	0.00
4	-2.25	4.76	0.04	0.03	0.04	0.03
5	-2.00	4.00	0.12	0.08	0.16	0.11
7	-1.50	2.83	0.04	0.03	0.20	0.13
10	-1.00	2.00	0.41	0.27	0.61	0.41
14	-0.50	1.41	0.42	0.28	1.03	0.69
18	0.00	1.00	0.50	0.33	1.53	1.02
25	0.50	0.71	1.15	0.77	2.68	1.79
35	1.00	0.50	2.16	1.44	4.84	3.23
45	1.50	0.35	6.47	4.32	11.31	7.56
60	2.00	0.25	12.88	8.60	24.19	16.16
80	2.50	0.18	14.86	9.93	39.05	26.09
120	3.00	0.13	24.56	16.41	63.61	42.49
170	3.50	0.09	67.72	45.24	131.33	87.73
200	3.75	0.07	11.82	7.90	143.15	95.63
230	4.00	0.06	4.29	2.87	147.44	98.50

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Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.73	3.46	3.36	3.08	2.45	1.99	1.20

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	2.79	0.14	0.82	-1.76	7.33

GRANULARMETRIC REPORT IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Granularmetric Report

Depths and elevations based on measured values



Gahagan and Bryant Associates
 3802 W Bay to Bay Blvd. Suite B-22
 Tampa, FL 33629
 Telephone: 813-831-4408
 Fax: 813-831-4216

Project Name: IBSP Sand Source Survey

Sample Name: GS-16

Analysis Date: 08-24-20

Analyzed By: DCJ

Easting (ft): 1,133,306	Northing (ft): 2,112,655	Coordinate System: State Plane	Elevation (ft):
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USCS: SW	Munsell: Dry - 10YR-7/2	Comments:
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Dry Weight (g): 138.75	Wash Weight (g): 138.75	Pan Retained (g): 1.72	Sieve Loss (%): 0.02	Fines (%): #200 - 3.50 #230 - 1.26	Organics (%):	Carbonates (%):	Shells (%):
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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
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	0.17	0.12	0.17	0.12
7	-1.50	2.83	0.38	0.27	0.55	0.40
10	-1.00	2.00	0.38	0.27	0.93	0.67
14	-0.50	1.41	0.69	0.50	1.62	1.17
18	0.00	1.00	1.01	0.73	2.63	1.90
25	0.50	0.71	2.10	1.51	4.73	3.41
35	1.00	0.50	3.93	2.83	8.66	6.24
45	1.50	0.35	9.83	7.08	18.49	13.33
60	2.00	0.25	20.94	15.09	39.43	28.42
80	2.50	0.18	24.59	17.72	64.02	46.14
120	3.00	0.13	21.30	15.35	85.32	61.49
170	3.50	0.09	40.26	29.02	125.58	90.51
200	3.75	0.07	8.32	6.00	133.90	96.50
230	4.00	0.06	3.10	2.23	137.00	98.74

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Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.69	3.39	3.23	2.63	1.89	1.59	0.78

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	2.46	0.18	0.94	-1.15	5.02

GRANULARMETRIC REPORT IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Granularmetric Report

Depths and elevations based on measured values



Gahagan and Bryant Associates
3802 W Bay to Bay Blvd. Suite B-22
Tampa, FL 33629
Telephone: 813-831-4408
Fax: 813-831-4216

Project Name: IBSP Sand Source Survey

Sample Name: GS-17

Analysis Date: 08-24-20

Analyzed By: DCJ

Easting (ft): 1,133,172	Northing (ft): 2,110,646	Coordinate System: State Plane	Elevation (ft):
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USCS: SW	Munsell: Dry - 10YR-7/2	Comments:
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Dry Weight (g): 145.83	Wash Weight (g): 145.83	Pan Retained (g): 3.07	Sieve Loss (%): -1.97	Fines (%): #200 - 3.11 #230 - 0.14	Organics (%):	Carbonates (%):	Shells (%):
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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
3.5	-2.50	5.66	10.05	6.89	10.05	6.89
4	-2.25	4.76	1.35	0.93	11.40	7.82
5	-2.00	4.00	1.29	0.88	12.69	8.70
7	-1.50	2.83	5.62	3.85	18.31	12.56
10	-1.00	2.00	2.19	1.50	20.50	14.06
14	-0.50	1.41	1.23	0.84	21.73	14.90
18	0.00	1.00	0.60	0.41	22.33	15.31
25	0.50	0.71	0.62	0.43	22.95	15.74
35	1.00	0.50	0.90	0.62	23.85	16.35
45	1.50	0.35	3.88	2.66	27.73	19.02
60	2.00	0.25	7.72	5.29	35.45	24.31
80	2.50	0.18	8.79	6.03	44.24	30.34
120	3.00	0.13	30.10	20.64	74.34	50.98
170	3.50	0.09	53.82	36.91	128.16	87.88
200	3.75	0.07	13.14	9.01	141.30	96.89
230	4.00	0.06	4.33	2.97	145.63	99.86

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Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.70	3.45	3.33	2.98	2.06	0.71	-2.98

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	2.12	0.23	2.02	-1.73	4.61

GRANULARMETRIC REPORT IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Granularmetric Report

Depths and elevations based on measured values



Gahagan and Bryant Associates
3802 W Bay to Bay Blvd. Suite B-22
Tampa, FL 33629
Telephone: 813-831-4408
Fax: 813-831-4216

Project Name: IBSP Sand Source Survey

Sample Name: GS-18

Analysis Date: 08-24-20

Analyzed By: DCJ

Easting (ft): 1,131,619	Northing (ft): 2,110,646	Coordinate System: State Plane	Elevation (ft):
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USCS: SP	Munsell: Dry - 10YR-7/2	Comments:
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Dry Weight (g): 158.43	Wash Weight (g): 158.43	Pan Retained (g): 1.32	Sieve Loss (%): 0.04	Fines (%): #200 - 3.04 #230 - 0.87	Organics (%):	Carbonates (%):	Shells (%):
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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
3.5	-2.50	5.66	0.00	0.00	0.00	0.00
4	-2.25	4.76	0.22	0.14	0.22	0.14
5	-2.00	4.00	0.00	0.00	0.22	0.14
7	-1.50	2.83	0.01	0.01	0.23	0.15
10	-1.00	2.00	0.00	0.00	0.23	0.15
14	-0.50	1.41	0.02	0.01	0.25	0.16
18	0.00	1.00	0.00	0.00	0.25	0.16
25	0.50	0.71	0.02	0.01	0.27	0.17
35	1.00	0.50	0.07	0.04	0.34	0.21
45	1.50	0.35	1.11	0.70	1.45	0.92
60	2.00	0.25	11.79	7.44	13.24	8.36
80	2.50	0.18	28.22	17.81	41.46	26.17
120	3.00	0.13	51.90	32.76	93.36	58.93
170	3.50	0.09	52.06	32.86	145.42	91.79
200	3.75	0.07	8.20	5.18	153.62	96.96
230	4.00	0.06	3.43	2.16	157.05	99.13

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Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.66	3.38	3.24	2.86	2.47	2.21	1.77

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	2.8	0.14	0.57	-1.45	12.07

GRANULARMETRIC REPORT IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Granularmetric Report

Depths and elevations based on measured values



Gahagan and Bryant Associates
3802 W Bay to Bay Blvd. Suite B-22
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Fax: 813-831-4216

Project Name: IBSP Sand Source Survey

Sample Name: GS-21

Analysis Date: 08-31-20

Analyzed By: DCJ

Easting (ft): 1,131,605	Northing (ft): 2,108,639	Coordinate System: State Plane	Elevation (ft):
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USCS: SP-SM	Munsell: Dry - 10YR-6/2	Comments:
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Dry Weight (g): 97.27	Wash Weight (g): 94.97	Pan Retained (g): 1.79	Sieve Loss (%): 0.02	Fines (%): #200 - 5.63 #230 - 4.23	Organics (%):	Carbonates (%):	Shells (%):
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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
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	0.01	0.01	0.01	0.01
10	-1.00	2.00	0.04	0.04	0.05	0.05
14	-0.50	1.41	0.12	0.12	0.17	0.17
18	0.00	1.00	0.19	0.20	0.36	0.37
25	0.50	0.71	0.34	0.35	0.70	0.72
35	1.00	0.50	0.93	0.96	1.63	1.68
45	1.50	0.35	3.83	3.94	5.46	5.61
60	2.00	0.25	10.05	10.33	15.51	15.95
80	2.50	0.18	7.21	7.41	22.72	23.36
120	3.00	0.13	7.59	7.80	30.31	31.16
170	3.50	0.09	54.48	56.01	84.79	87.17
200	3.75	0.07	7.00	7.20	91.79	94.37
230	4.00	0.06	1.37	1.41	93.16	95.77

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Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.86	3.47	3.39	3.17	2.61	2.00	1.42

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	2.87	0.14	0.73	-1.54	5.25

GRANULARMETRIC REPORT IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Granularmetric Report

Depths and elevations based on measured values



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Fax: 813-831-4216

Project Name: IBSP Sand Source Survey

Sample Name: GS-26

Analysis Date: 08-24-20

Analyzed By: DCJ

Easting (ft): 1,135,686	Northing (ft): 2,103,165	Coordinate System: State Plane	Elevation (ft):
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USCS: SP	Munsell: Dry - 10YR-7/3	Comments:
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Dry Weight (g): 130.38	Wash Weight (g): 130.38	Pan Retained (g): 2.11	Sieve Loss (%): 0.18	Fines (%): #200 - 4.46 #230 - 1.79	Organics (%):	Carbonates (%):	Shells (%):
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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
3.5	-2.50	5.66	0.08	0.06	0.08	0.06
4	-2.25	4.76	0.00	0.00	0.08	0.06
5	-2.00	4.00	0.00	0.00	0.08	0.06
7	-1.50	2.83	0.00	0.00	0.08	0.06
10	-1.00	2.00	0.00	0.00	0.08	0.06
14	-0.50	1.41	0.05	0.04	0.13	0.10
18	0.00	1.00	0.09	0.07	0.22	0.17
25	0.50	0.71	0.14	0.11	0.36	0.28
35	1.00	0.50	0.20	0.15	0.56	0.43
45	1.50	0.35	0.32	0.25	0.88	0.67
60	2.00	0.25	0.88	0.67	1.76	1.35
80	2.50	0.18	4.57	3.51	6.33	4.86
120	3.00	0.13	49.18	37.72	55.51	42.58
170	3.50	0.09	58.99	45.24	114.50	87.82
200	3.75	0.07	10.07	7.72	124.57	95.54
230	4.00	0.06	3.47	2.66	128.04	98.21

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Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.73	3.46	3.36	3.08	2.77	2.65	2.50

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	3.04	0.12	0.44	-3.06	35.13

GRANULARMETRIC REPORT IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Granularmetric Report

Depths and elevations based on measured values



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 Fax: 813-831-4216

Project Name: IBSP Sand Source Survey

Sample Name: GS-27

Analysis Date: 08-24-20

Analyzed By: DCJ

Easting (ft): 1,131,918	Northing (ft): 2,103,151	Coordinate System: State Plane	Elevation (ft):
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USCS: SW-SM	Munsell: Dry - 10YR-6/3	Comments:
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Dry Weight (g): 133.60	Wash Weight (g): 133.60	Pan Retained (g): 1.98	Sieve Loss (%): 0.05	Fines (%): #200 - 5.16 #230 - 1.53	Organics (%):	Carbonates (%):	Shells (%):
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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
3.5	-2.50	5.66	1.60	1.20	1.60	1.20
4	-2.25	4.76	0.36	0.27	1.96	1.47
5	-2.00	4.00	1.63	1.22	3.59	2.69
7	-1.50	2.83	0.97	0.73	4.56	3.41
10	-1.00	2.00	1.29	0.97	5.85	4.38
14	-0.50	1.41	1.33	1.00	7.18	5.37
18	0.00	1.00	1.11	0.83	8.29	6.21
25	0.50	0.71	1.20	0.90	9.49	7.10
35	1.00	0.50	1.61	1.21	11.10	8.31
45	1.50	0.35	3.68	2.75	14.78	11.06
60	2.00	0.25	8.13	6.09	22.91	17.15
80	2.50	0.18	6.84	5.12	29.75	22.27
120	3.00	0.13	26.41	19.77	56.16	42.04
170	3.50	0.09	58.83	44.03	114.99	86.07
200	3.75	0.07	11.72	8.77	126.71	94.84
230	4.00	0.06	4.84	3.62	131.55	98.47

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Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.76	3.48	3.37	3.09	2.57	1.91	-0.69

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	2.64	0.16	1.33	-2.56	9.73

GRANULARMETRIC REPORT IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Granularmetric Report

Depths and elevations based on measured values



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Telephone: 813-831-4408
Fax: 813-831-4216

Project Name: IBSP Sand Source Survey

Sample Name: GS-30

Analysis Date: 08-24-20

Analyzed By: DCJ

Easting (ft): 1,131,915	Northing (ft): 2,101,144	Coordinate System: State Plane	Elevation (ft):
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USCS: SP-SM	Munsell: Dry - 10YR-7/2	Comments:
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Dry Weight (g): 145.11	Wash Weight (g): 145.11	Pan Retained (g): 2.59	Sieve Loss (%): 0.08	Fines (%): #200 - 6.00 #230 - 1.86	Organics (%):	Carbonates (%):	Shells (%):
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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
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	0.20	0.14	0.20	0.14
10	-1.00	2.00	0.27	0.19	0.47	0.32
14	-0.50	1.41	0.34	0.23	0.81	0.56
18	0.00	1.00	0.33	0.23	1.14	0.79
25	0.50	0.71	0.40	0.28	1.54	1.06
35	1.00	0.50	0.87	0.60	2.41	1.66
45	1.50	0.35	2.48	1.71	4.89	3.37
60	2.00	0.25	4.82	3.32	9.71	6.69
80	2.50	0.18	6.46	4.45	16.17	11.14
120	3.00	0.13	35.48	24.45	51.65	35.59
170	3.50	0.09	69.87	48.15	121.52	83.74
200	3.75	0.07	14.88	10.25	136.40	94.00
230	4.00	0.06	6.01	4.14	142.41	98.14

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Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.81	3.51	3.41	3.15	2.78	2.60	1.75

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	3	0.13	0.65	-2.7	14.76

GRANULARMETRIC REPORT IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Granularmetric Report

Depths and elevations based on measured values



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Fax: 813-831-4216

Project Name: IBSP Sand Source Survey

Sample Name: GS-31

Analysis Date: 08-31-20

Analyzed By: DCJ

Easting (ft): 1,135,267	Northing (ft): 2,101,166	Coordinate System: State Plane	Elevation (ft):
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USCS: SP-SM	Munsell: Dry - 10YR-7/3	Comments:
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Dry Weight (g): 124.17	Wash Weight (g): 120.49	Pan Retained (g): 0.91	Sieve Loss (%): 0.02	Fines (%): #200 - 6.52 #230 - 3.71	Organics (%):	Carbonates (%):	Shells (%):
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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
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	0.07	0.06	0.07	0.06
10	-1.00	2.00	0.09	0.07	0.16	0.13
14	-0.50	1.41	0.02	0.02	0.18	0.14
18	0.00	1.00	0.08	0.06	0.26	0.21
25	0.50	0.71	0.11	0.09	0.37	0.30
35	1.00	0.50	0.18	0.14	0.55	0.44
45	1.50	0.35	0.70	0.56	1.25	1.01
60	2.00	0.25	1.62	1.30	2.87	2.31
80	2.50	0.18	3.87	3.12	6.74	5.43
120	3.00	0.13	43.93	35.38	50.67	40.81
170	3.50	0.09	55.53	44.72	106.20	85.53
200	3.75	0.07	9.88	7.96	116.08	93.48
230	4.00	0.06	3.48	2.80	119.56	96.29

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Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.89	3.48	3.38	3.10	2.78	2.65	2.43

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	3.04	0.12	0.46	-2.45	19.89

GRANULARMETRIC REPORT IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Granularmetric Report

Depths and elevations based on measured values



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 Fax: 813-831-4216

Project Name: IBSP Sand Source Survey

Sample Name: GS-36

Analysis Date: 08-31-20

Analyzed By: DCJ

Easting (ft): 1,132,078	Northing (ft): 2,097,146	Coordinate System: State Plane	Elevation (ft):
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USCS: SM	Munsell: Dry - 10YR-7/3	Comments:
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Dry Weight (g): 169.47	Wash Weight (g): 132.37	Pan Retained (g): 1.68	Sieve Loss (%): 0.01	Fines (%): #200 - 25.77 #230 - 22.89	Organics (%):	Carbonates (%):	Shells (%):
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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
3.5	-2.50	5.66	0.00	0.00	0.00	0.00
4	-2.25	4.76	0.07	0.04	0.07	0.04
5	-2.00	4.00	0.00	0.00	0.07	0.04
7	-1.50	2.83	0.05	0.03	0.12	0.07
10	-1.00	2.00	0.03	0.02	0.15	0.09
14	-0.50	1.41	0.06	0.04	0.21	0.12
18	0.00	1.00	0.06	0.04	0.27	0.16
25	0.50	0.71	0.07	0.04	0.34	0.20
35	1.00	0.50	0.09	0.05	0.43	0.25
45	1.50	0.35	0.29	0.17	0.72	0.42
60	2.00	0.25	0.77	0.45	1.49	0.88
80	2.50	0.18	2.33	1.37	3.82	2.25
120	3.00	0.13	49.09	28.97	52.91	31.22
170	3.50	0.09	59.14	34.90	112.05	66.12
200	3.75	0.07	13.75	8.11	125.80	74.23
230	4.00	0.06	4.87	2.87	130.67	77.11

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Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
		3.82	3.27	2.89	2.74	2.55

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	3.08	0.12	0.43	-2.77	29.86

GRANULARMETRIC REPORT IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Granularmetric Report

Depths and elevations based on measured values



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Project Name: IBSP Sand Source Survey

Sample Name: GS-38

Analysis Date: 08-31-20

Analyzed By: DCJ

Easting (ft): 1,134,177	Northing (ft): 2,095,171	Coordinate System: State Plane	Elevation (ft):
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USCS: SM	Munsell: Dry - 10YR-6/2	Comments:
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Dry Weight (g): 146.10	Wash Weight (g): 132.70	Pan Retained (g): 7.08	Sieve Loss (%): -0.15	Fines (%): #200 - 13.98 #230 - 13.87	Organics (%):	Carbonates (%):	Shells (%):
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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
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	0.30	0.21	0.30	0.21
7	-1.50	2.83	0.00	0.00	0.30	0.21
10	-1.00	2.00	0.00	0.00	0.30	0.21
14	-0.50	1.41	0.08	0.05	0.38	0.26
18	0.00	1.00	0.10	0.07	0.48	0.33
25	0.50	0.71	0.11	0.08	0.59	0.40
35	1.00	0.50	0.18	0.12	0.77	0.53
45	1.50	0.35	0.25	0.17	1.02	0.70
60	2.00	0.25	0.56	0.38	1.58	1.08
80	2.50	0.18	0.81	0.55	2.39	1.64
120	3.00	0.13	9.35	6.40	11.74	8.04
170	3.50	0.09	100.44	68.75	112.18	76.78
200	3.75	0.07	13.49	9.23	125.67	86.02
230	4.00	0.06	0.17	0.12	125.84	86.13

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Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
	3.70	3.49	3.31	3.12	3.06	2.76

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	3.21	0.11	0.4	-7.82	90.14

GRANULARMETRIC REPORT IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Granularmetric Report

Depths and elevations based on measured values



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Project Name: IBSP Sand Source Survey

Sample Name: GS-45

Analysis Date: 08-21-20

Analyzed By: DCJ

Easting (ft): 1,139,973
 Northing (ft): 2,114,314

Coordinate System: State Plane
 Elevation (ft):

USCS: SP
 Munsell: Dry - 10YR-7/3
 Comments:

Dry Weight (g): 153.31
 Wash Weight (g): 153.31
 Pan Retained (g): 0.14
 Sieve Loss (%): 0.05
 Fines (%): #200 - 0.23, #230 - 0.14
 Organics (%):
 Carbonates (%):
 Shells (%):

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
3.5	-2.50	5.66	0.03	0.02	0.03	0.02
4	-2.25	4.76	0.00	0.00	0.03	0.02
5	-2.00	4.00	0.00	0.00	0.03	0.02
7	-1.50	2.83	0.00	0.00	0.03	0.02
10	-1.00	2.00	0.06	0.04	0.09	0.06
14	-0.50	1.41	0.09	0.06	0.18	0.12
18	0.00	1.00	0.27	0.18	0.45	0.29
25	0.50	0.71	0.67	0.44	1.12	0.73
35	1.00	0.50	2.61	1.70	3.73	2.43
45	1.50	0.35	22.84	14.90	26.57	17.33
60	2.00	0.25	65.26	42.57	91.83	59.90
80	2.50	0.18	45.15	29.45	136.98	89.35
120	3.00	0.13	13.98	9.12	150.96	98.47
170	3.50	0.09	1.89	1.23	152.85	99.70
200	3.75	0.07	0.11	0.07	152.96	99.77
230	4.00	0.06	0.14	0.09	153.10	99.86

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Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.81	2.41	2.26	1.88	1.59	1.46	1.09

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	1.91	0.27	0.51	-0.38	6.67

GRANULARMETRIC REPORT IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Granularmetric Report

Depths and elevations based on measured values



Gahagan and Bryant Associates
 3802 W Bay to Bay Blvd. Suite B-22
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 Telephone: 813-831-4408
 Fax: 813-831-4216

Project Name: IBSP Sand Source Survey

Sample Name: GS-46

Analysis Date: 08-21-20

Analyzed By: DCJ

Easting (ft): 1,140,222	Northing (ft): 2,114,299	Coordinate System: State Plane	Elevation (ft):
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USCS: SP	Munsell: Dry - 10YR-7/3	Comments:
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Dry Weight (g): 158.06	Wash Weight (g): 158.06	Pan Retained (g): 0.19	Sieve Loss (%): 0.04	Fines (%): #200 - 0.29 #230 - 0.16	Organics (%):	Carbonates (%):	Shells (%):
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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
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	0.04	0.03	0.04	0.03
10	-1.00	2.00	0.05	0.03	0.09	0.06
14	-0.50	1.41	0.06	0.04	0.15	0.09
18	0.00	1.00	0.31	0.20	0.46	0.29
25	0.50	0.71	0.95	0.60	1.41	0.89
35	1.00	0.50	4.26	2.70	5.67	3.59
45	1.50	0.35	28.39	17.96	34.06	21.55
60	2.00	0.25	56.08	35.48	90.14	57.03
80	2.50	0.18	40.34	25.52	130.48	82.55
120	3.00	0.13	23.32	14.75	153.80	97.30
170	3.50	0.09	3.52	2.23	157.32	99.53
200	3.75	0.07	0.28	0.18	157.60	99.71
230	4.00	0.06	0.20	0.13	157.80	99.84

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Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.92	2.55	2.35	1.90	1.55	1.35	1.04

Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
	1.93	0.26	0.59	-0.13	3.86

GRANULARMETRIC REPORT IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Granularmetric Report

Depths and elevations based on measured values



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Fax: 813-831-4216

Project Name: IBSP Sand Source Survey

Sample Name: GS-47

Analysis Date: 08-21-20

Analyzed By: DCJ

Easting (ft): 1,140,085	Northing (ft): 2,114,478	Coordinate System: State Plane	Elevation (ft):
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USCS: SP	Munsell: Dry - 10YR-7/3	Comments:
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Dry Weight (g): 154.86	Wash Weight (g): 154.86	Pan Retained (g): 0.11	Sieve Loss (%): 0.02	Fines (%): #200 - 0.21 #230 - 0.09	Organics (%):	Carbonates (%):	Shells (%):
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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
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	0.47	0.30	0.47	0.30
14	-0.50	1.41	1.10	0.71	1.57	1.01
18	0.00	1.00	1.71	1.10	3.28	2.12
25	0.50	0.71	4.13	2.67	7.41	4.78
35	1.00	0.50	10.23	6.61	17.64	11.39
45	1.50	0.35	40.09	25.89	57.73	37.28
60	2.00	0.25	48.50	31.32	106.23	68.60
80	2.50	0.18	32.16	20.77	138.39	89.36
120	3.00	0.13	13.69	8.84	152.08	98.20
170	3.50	0.09	2.27	1.47	154.35	99.67
200	3.75	0.07	0.19	0.12	154.54	99.79
230	4.00	0.06	0.18	0.12	154.72	99.91

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Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.82	2.37	2.15	1.70	1.26	1.09	0.52

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	1.68	0.31	0.7	-0.56	4.54

GRANULARMETRIC REPORT IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Granularmetric Report

Depths and elevations based on measured values



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Fax: 813-831-4216

Project Name: IBSP Sand Source Survey

Sample Name: GS-48

Analysis Date: 08-21-20

Analyzed By: DCJ

Easting (ft): 1,139,737	Northing (ft): 2,114,187	Coordinate System: State Plane	Elevation (ft):
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USCS: SP	Munsell: Dry - 10YR-7/3	Comments:
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Dry Weight (g): 136.88	Wash Weight (g): 136.88	Pan Retained (g): 0.19	Sieve Loss (%): 0.02	Fines (%): #200 - 0.43 #230 - 0.16	Organics (%):	Carbonates (%):	Shells (%):
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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
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	0.90	0.66	0.90	0.66
14	-0.50	1.41	0.15	0.11	1.05	0.77
18	0.00	1.00	0.18	0.13	1.23	0.90
25	0.50	0.71	0.43	0.31	1.66	1.21
35	1.00	0.50	1.25	0.91	2.91	2.13
45	1.50	0.35	8.20	5.99	11.11	8.12
60	2.00	0.25	39.87	29.13	50.98	37.24
80	2.50	0.18	52.47	38.33	103.45	75.58
120	3.00	0.13	26.44	19.32	129.89	94.89
170	3.50	0.09	5.83	4.26	135.72	99.15
200	3.75	0.07	0.57	0.42	136.29	99.57
230	4.00	0.06	0.37	0.27	136.66	99.84

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Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.01	2.72	2.49	2.17	1.79	1.64	1.24

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	2.14	0.23	0.6	-1.3	9.65

GRANULARMETRIC REPORT IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Granularmetric Report

Depths and elevations based on measured values



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 Fax: 813-831-4216

Project Name: IBSP Sand Source Survey

Sample Name: GS-49

Analysis Date: 08-21-20

Analyzed By: DCJ

Easting (ft): 1,138,710	Northing (ft): 2,114,704	Coordinate System: State Plane	Elevation (ft):
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USCS: SP	Munsell: Dry - 10YR-6/3	Comments:
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Dry Weight (g): 151.06	Wash Weight (g): 151.06	Pan Retained (g): 3.54	Sieve Loss (%): 0.13	Fines (%): #200 - 4.29 #230 - 2.47	Organics (%):	Carbonates (%):	Shells (%):
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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
3.5	-2.50	5.66	0.17	0.11	0.17	0.11
4	-2.25	4.76	0.04	0.03	0.21	0.14
5	-2.00	4.00	0.11	0.07	0.32	0.21
7	-1.50	2.83	0.57	0.38	0.89	0.59
10	-1.00	2.00	0.54	0.36	1.43	0.95
14	-0.50	1.41	0.62	0.41	2.05	1.36
18	0.00	1.00	0.58	0.38	2.63	1.74
25	0.50	0.71	0.66	0.44	3.29	2.18
35	1.00	0.50	0.87	0.58	4.16	2.75
45	1.50	0.35	1.96	1.30	6.12	4.05
60	2.00	0.25	5.51	3.65	11.63	7.70
80	2.50	0.18	31.18	20.64	42.81	28.34
120	3.00	0.13	65.75	43.53	108.56	71.87
170	3.50	0.09	30.45	20.16	139.01	92.02
200	3.75	0.07	5.57	3.69	144.58	95.71
230	4.00	0.06	2.75	1.82	147.33	97.53

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Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.70	3.30	3.08	2.75	2.42	2.20	1.63

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	2.65	0.16	0.75	-2.96	17.79

GRANULARMETRIC REPORT IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Granularmetric Report

Depths and elevations based on measured values



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Project Name: IBSP Sand Source Survey

Sample Name: GS-50

Analysis Date: 08-21-20

Analyzed By: DCJ

Easting (ft): 1,139,892	Northing (ft): 2,113,701	Coordinate System: State Plane	Elevation (ft):
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USCS: SP	Munsell: Dry - 10YR-7/3	Comments:
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Dry Weight (g): 123.40	Wash Weight (g): 123.40	Pan Retained (g): 0.72	Sieve Loss (%): 0.08	Fines (%): #200 - 1.24 #230 - 0.66	Organics (%):	Carbonates (%):	Shells (%):
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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
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	0.01	0.01	0.01	0.01
10	-1.00	2.00	0.04	0.03	0.05	0.04
14	-0.50	1.41	0.06	0.05	0.11	0.09
18	0.00	1.00	0.07	0.06	0.18	0.15
25	0.50	0.71	0.15	0.12	0.33	0.27
35	1.00	0.50	0.50	0.41	0.83	0.67
45	1.50	0.35	3.37	2.73	4.20	3.40
60	2.00	0.25	19.91	16.13	24.11	19.54
80	2.50	0.18	43.17	34.98	67.28	54.52
120	3.00	0.13	41.34	33.50	108.62	88.02
170	3.50	0.09	12.00	9.72	120.62	97.75
200	3.75	0.07	1.25	1.01	121.87	98.76
230	4.00	0.06	0.71	0.58	122.58	99.34

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Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.36	2.94	2.81	2.44	2.08	1.89	1.55

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	2.42	0.19	0.53	-0.46	5

GRANULARMETRIC REPORT IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Granularmetric Report

Depths and elevations based on measured values



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Project Name: IBSP Sand Source Survey

Sample Name: GS-51

Analysis Date: 08-21-20

Analyzed By: DCJ

Easting (ft): 1,140,207	Northing (ft): 2,115,694	Coordinate System: State Plane	Elevation (ft):
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USCS: SP	Munsell: Dry - 10YR-7/3	Comments:
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Dry Weight (g): 148.56	Wash Weight (g): 148.56	Pan Retained (g): 0.36	Sieve Loss (%): 0.13	Fines (%): #200 - 0.61 #230 - 0.37	Organics (%):	Carbonates (%):	Shells (%):
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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
3.5	-2.50	5.66	0.00	0.00	0.00	0.00
4	-2.25	4.76	0.15	0.10	0.15	0.10
5	-2.00	4.00	0.00	0.00	0.15	0.10
7	-1.50	2.83	0.05	0.03	0.20	0.13
10	-1.00	2.00	0.00	0.00	0.20	0.13
14	-0.50	1.41	0.00	0.00	0.20	0.13
18	0.00	1.00	0.12	0.08	0.32	0.22
25	0.50	0.71	0.38	0.26	0.70	0.47
35	1.00	0.50	1.01	0.68	1.71	1.15
45	1.50	0.35	6.63	4.46	8.34	5.61
60	2.00	0.25	34.74	23.38	43.08	29.00
80	2.50	0.18	61.31	41.27	104.39	70.27
120	3.00	0.13	36.94	24.87	141.33	95.13
170	3.50	0.09	5.77	3.88	147.10	99.02
200	3.75	0.07	0.56	0.38	147.66	99.39
230	4.00	0.06	0.35	0.24	148.01	99.63

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Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.00	2.78	2.60	2.25	1.91	1.72	1.43

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	2.24	0.21	0.53	-1.05	10.43

GRANULARMETRIC REPORT IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Granularmetric Report

Depths and elevations based on measured values



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Project Name: IBSP Sand Source Survey

Sample Name: GS-52

Analysis Date: 08-21-20

Analyzed By: DCJ

Easting (ft): 1,139,975	Northing (ft): 2,115,191	Coordinate System: State Plane	Elevation (ft):
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USCS: SP	Munsell: Dry - 10YR-7/3	Comments:
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Dry Weight (g): 137.35	Wash Weight (g): 137.35	Pan Retained (g): 0.14	Sieve Loss (%): 0.06	Fines (%): #200 - 0.25 #230 - 0.16	Organics (%):	Carbonates (%):	Shells (%):
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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
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	0.06	0.04	0.06	0.04
10	-1.00	2.00	0.17	0.12	0.23	0.17
14	-0.50	1.41	0.33	0.24	0.56	0.41
18	0.00	1.00	0.75	0.55	1.31	0.95
25	0.50	0.71	1.63	1.19	2.94	2.14
35	1.00	0.50	5.12	3.73	8.06	5.87
45	1.50	0.35	32.25	23.48	40.31	29.35
60	2.00	0.25	53.24	38.76	93.55	68.11
80	2.50	0.18	28.39	20.67	121.94	88.78
120	3.00	0.13	12.78	9.30	134.72	98.09
170	3.50	0.09	2.09	1.52	136.81	99.61
200	3.75	0.07	0.19	0.14	137.00	99.75
230	4.00	0.06	0.13	0.09	137.13	99.84

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Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.83	2.38	2.17	1.77	1.41	1.22	0.88

Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
	1.78	0.29	0.6	-0.38	5.19

GRANULARMETRIC REPORT IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Granularmetric Report

Depths and elevations based on measured values



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Project Name: IBSP Sand Source Survey
Sample Name: GS-53
Analysis Date: 08-21-20
Analyzed By: DCJ

Easting (ft): 1,139,392	Northing (ft): 2,114,691	Coordinate System: State Plane	Elevation (ft):
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USCS: SP	Munsell: Dry - 10YR-6/3	Comments:
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Dry Weight (g): 108.59	Wash Weight (g): 108.59	Pan Retained (g): 0.12	Sieve Loss (%): 0.06	Fines (%): #200 - 0.20 #230 - 0.17	Organics (%):	Carbonates (%):	Shells (%):
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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
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	0.08	0.07	0.08	0.07
10	-1.00	2.00	0.99	0.91	1.07	0.99
14	-0.50	1.41	4.48	4.13	5.55	5.11
18	0.00	1.00	9.49	8.74	15.04	13.85
25	0.50	0.71	15.26	14.05	30.30	27.90
35	1.00	0.50	25.15	23.16	55.45	51.06
45	1.50	0.35	44.25	40.75	99.70	91.81
60	2.00	0.25	7.42	6.83	107.12	98.65
80	2.50	0.18	0.54	0.50	107.66	99.14
120	3.00	0.13	0.40	0.37	108.06	99.51
170	3.50	0.09	0.28	0.26	108.34	99.77
200	3.75	0.07	0.03	0.03	108.37	99.80
230	4.00	0.06	0.03	0.03	108.40	99.83

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
1.73	1.40	1.29	0.98	0.40	0.08	-0.51

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	0.81	0.57	0.69	-0.58	3.77

GRANULARMETRIC REPORT IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Granularmetric Report

Depths and elevations based on measured values



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Project Name: IBSP Sand Source Survey

Sample Name: GS-54

Analysis Date: 08-31-20

Analyzed By: DCJ

Easting (ft): 1,139,264	Northing (ft): 2,115,177	Coordinate System: State Plane	Elevation (ft):
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USCS: SM	Munsell:	Comments:
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Dry Weight (g): 43.15	Wash Weight (g): 31.54	Pan Retained (g): 0.39	Sieve Loss (%): 0.05	Fines (%): #200 - 29.55 #230 - 27.86	Organics (%):	Carbonates (%):	Shells (%):
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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
3.5	-2.50	5.66	1.01	2.34	1.01	2.34
4	-2.25	4.76	0.00	0.00	1.01	2.34
5	-2.00	4.00	0.14	0.32	1.15	2.67
7	-1.50	2.83	0.79	1.83	1.94	4.50
10	-1.00	2.00	0.41	0.95	2.35	5.45
14	-0.50	1.41	1.25	2.90	3.60	8.34
18	0.00	1.00	1.18	2.73	4.78	11.08
25	0.50	0.71	1.60	3.71	6.38	14.79
35	1.00	0.50	2.39	5.54	8.77	20.32
45	1.50	0.35	4.57	10.59	13.34	30.92
60	2.00	0.25	2.18	5.05	15.52	35.97
80	2.50	0.18	1.54	3.57	17.06	39.54
120	3.00	0.13	6.48	15.02	23.54	54.55
170	3.50	0.09	5.83	13.51	29.37	68.06
200	3.75	0.07	1.03	2.39	30.40	70.45
230	4.00	0.06	0.73	1.69	31.13	72.14

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Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
			2.85	1.22	0.61	-1.24

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	1.66	0.32	1.67	-1.06	3.7

GRANULARMETRIC REPORT IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Granularmetric Report

Depths and elevations based on measured values



Gahagan and Bryant Associates
 3802 W Bay to Bay Blvd. Suite B-22
 Tampa, FL 33629
 Telephone: 813-831-4408
 Fax: 813-831-4216

Project Name: IBSP Sand Source Survey

Sample Name: GS-55

Analysis Date: 08-21-20

Analyzed By: DCJ

Easting (ft): 1,139,779	Northing (ft): 2,114,686	Coordinate System: State Plane	Elevation (ft):
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USCS: SP	Munsell: Dry - 10YR-7/3	Comments:
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Dry Weight (g): 149.27	Wash Weight (g): 149.27	Pan Retained (g): 1.45	Sieve Loss (%): 0.21	Fines (%): #200 - 1.94 #230 - 1.18	Organics (%):	Carbonates (%):	Shells (%):
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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
3.5	-2.50	5.66	0.18	0.12	0.18	0.12
4	-2.25	4.76	0.07	0.05	0.25	0.17
5	-2.00	4.00	0.09	0.06	0.34	0.23
7	-1.50	2.83	0.08	0.05	0.42	0.28
10	-1.00	2.00	0.16	0.11	0.58	0.39
14	-0.50	1.41	0.17	0.11	0.75	0.50
18	0.00	1.00	0.29	0.19	1.04	0.70
25	0.50	0.71	0.45	0.30	1.49	1.00
35	1.00	0.50	0.76	0.51	2.25	1.51
45	1.50	0.35	2.66	1.78	4.91	3.29
60	2.00	0.25	11.44	7.66	16.35	10.95
80	2.50	0.18	33.74	22.60	50.09	33.56
120	3.00	0.13	73.74	49.40	123.83	82.96
170	3.50	0.09	20.30	13.60	144.13	96.56
200	3.75	0.07	2.24	1.50	146.37	98.06
230	4.00	0.06	1.14	0.76	147.51	98.82

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Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.44	3.04	2.92	2.67	2.31	2.11	1.61

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	2.57	0.17	0.61	-2.82	21.68

GRANULARMETRIC REPORT IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Granularmetric Report

Depths and elevations based on measured values



Gahagan and Bryant Associates
 3802 W Bay to Bay Blvd. Suite B-22
 Tampa, FL 33629
 Telephone: 813-831-4408
 Fax: 813-831-4216

Project Name: IBSP Sand Source Survey

Sample Name: GS-56

Analysis Date: 08-21-20

Analyzed By: DCJ

Easting (ft): 1,140,394	Northing (ft): 2,115,197	Coordinate System: State Plane	Elevation (ft):
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USCS: SW	Munsell: Dry - 10YR-7/3	Comments:
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Dry Weight (g): 154.48	Wash Weight (g): 154.48	Pan Retained (g): 0.09	Sieve Loss (%): 0.01	Fines (%): #200 - 0.10 #230 - 0.06	Organics (%):	Carbonates (%):	Shells (%):
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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
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	0.50	0.32	0.50	0.32
7	-1.50	2.83	2.41	1.56	2.91	1.88
10	-1.00	2.00	4.83	3.13	7.74	5.01
14	-0.50	1.41	8.85	5.73	16.59	10.74
18	0.00	1.00	11.10	7.19	27.69	17.92
25	0.50	0.71	17.16	11.11	44.85	29.03
35	1.00	0.50	27.87	18.04	72.72	47.07
45	1.50	0.35	46.15	29.87	118.87	76.95
60	2.00	0.25	26.21	16.97	145.08	93.92
80	2.50	0.18	6.98	4.52	152.06	98.43
120	3.00	0.13	1.71	1.11	153.77	99.54
170	3.50	0.09	0.50	0.32	154.27	99.86
200	3.75	0.07	0.05	0.03	154.32	99.90
230	4.00	0.06	0.06	0.04	154.38	99.94

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Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.12	1.71	1.47	1.05	0.32	-0.13	-1.00

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	0.85	0.55	0.94	-0.7	3.38

GRANULARMETRIC REPORT IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Granularmetric Report

Depths and elevations based on measured values



Gahagan and Bryant Associates
 3802 W Bay to Bay Blvd. Suite B-22
 Tampa, FL 33629
 Telephone: 813-831-4408
 Fax: 813-831-4216

Project Name: IBSP Sand Source Survey

Sample Name: GS-65

Analysis Date: 08-21-20

Analyzed By: DCJ

Easting (ft): 1,139,976
 Northing (ft): 2,112,682

Coordinate System: State Plane
 Elevation (ft):

USCS: SW
 Munsell: Dry - 10YR-7/3
 Comments:

Dry Weight (g): 159.22
 Wash Weight (g): 159.22
 Pan Retained (g): 0.39
 Sieve Loss (%): 0.31
 Fines (%): #200 - 0.70, #230 - 0.56
 Organics (%):
 Carbonates (%):
 Shells (%):

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
3.5	-2.50	5.66	0.48	0.30	0.48	0.30
4	-2.25	4.76	0.06	0.04	0.54	0.34
5	-2.00	4.00	0.26	0.16	0.80	0.50
7	-1.50	2.83	0.96	0.60	1.76	1.11
10	-1.00	2.00	1.89	1.19	3.65	2.29
14	-0.50	1.41	3.91	2.46	7.56	4.75
18	0.00	1.00	5.96	3.74	13.52	8.49
25	0.50	0.71	10.31	6.48	23.83	14.97
35	1.00	0.50	20.48	12.86	44.31	27.83
45	1.50	0.35	41.69	26.18	86.00	54.01
60	2.00	0.25	31.58	19.83	117.58	73.85
80	2.50	0.18	24.89	15.63	142.47	89.48
120	3.00	0.13	12.63	7.93	155.10	97.41
170	3.50	0.09	2.73	1.71	157.83	99.13
200	3.75	0.07	0.28	0.18	158.11	99.30
230	4.00	0.06	0.22	0.14	158.33	99.44

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Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.85	2.32	2.04	1.42	0.89	0.54	-0.47

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	1.36	0.39	0.98	-0.86	4.81

GRANULARMETRIC REPORT IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Granularmetric Report

Depths and elevations based on measured values



Gahagan and Bryant Associates
 3802 W Bay to Bay Blvd. Suite B-22
 Tampa, FL 33629
 Telephone: 813-831-4408
 Fax: 813-831-4216

Project Name: IBSP Sand Source Survey

Sample Name: GS-66

Analysis Date: 08-21-20

Analyzed By: DCJ

Easting (ft): 1,140,030	Northing (ft): 2,113,199	Coordinate System: State Plane	Elevation (ft):
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USCS: SW	Munsell: Dry - 10YR-7/3	Comments:
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Dry Weight (g): 146.00	Wash Weight (g): 146.00	Pan Retained (g): 0.16	Sieve Loss (%): 0.01	Fines (%): #200 - 0.21 #230 - 0.12	Organics (%):	Carbonates (%):	Shells (%):
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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
3.5	-2.50	5.66	0.31	0.21	0.31	0.21
4	-2.25	4.76	1.04	0.71	1.35	0.92
5	-2.00	4.00	1.65	1.13	3.00	2.05
7	-1.50	2.83	4.52	3.10	7.52	5.15
10	-1.00	2.00	5.32	3.64	12.84	8.79
14	-0.50	1.41	6.72	4.60	19.56	13.40
18	0.00	1.00	7.31	5.01	26.87	18.40
25	0.50	0.71	12.99	8.90	39.86	27.30
35	1.00	0.50	27.05	18.53	66.91	45.83
45	1.50	0.35	43.38	29.71	110.29	75.54
60	2.00	0.25	24.61	16.86	134.90	92.40
80	2.50	0.18	8.03	5.50	142.93	97.90
120	3.00	0.13	1.86	1.27	144.79	99.17
170	3.50	0.09	0.81	0.55	145.60	99.73
200	3.75	0.07	0.10	0.07	145.70	99.79
230	4.00	0.06	0.13	0.09	145.83	99.88

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Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.24	1.75	1.49	1.07	0.37	-0.24	-1.52

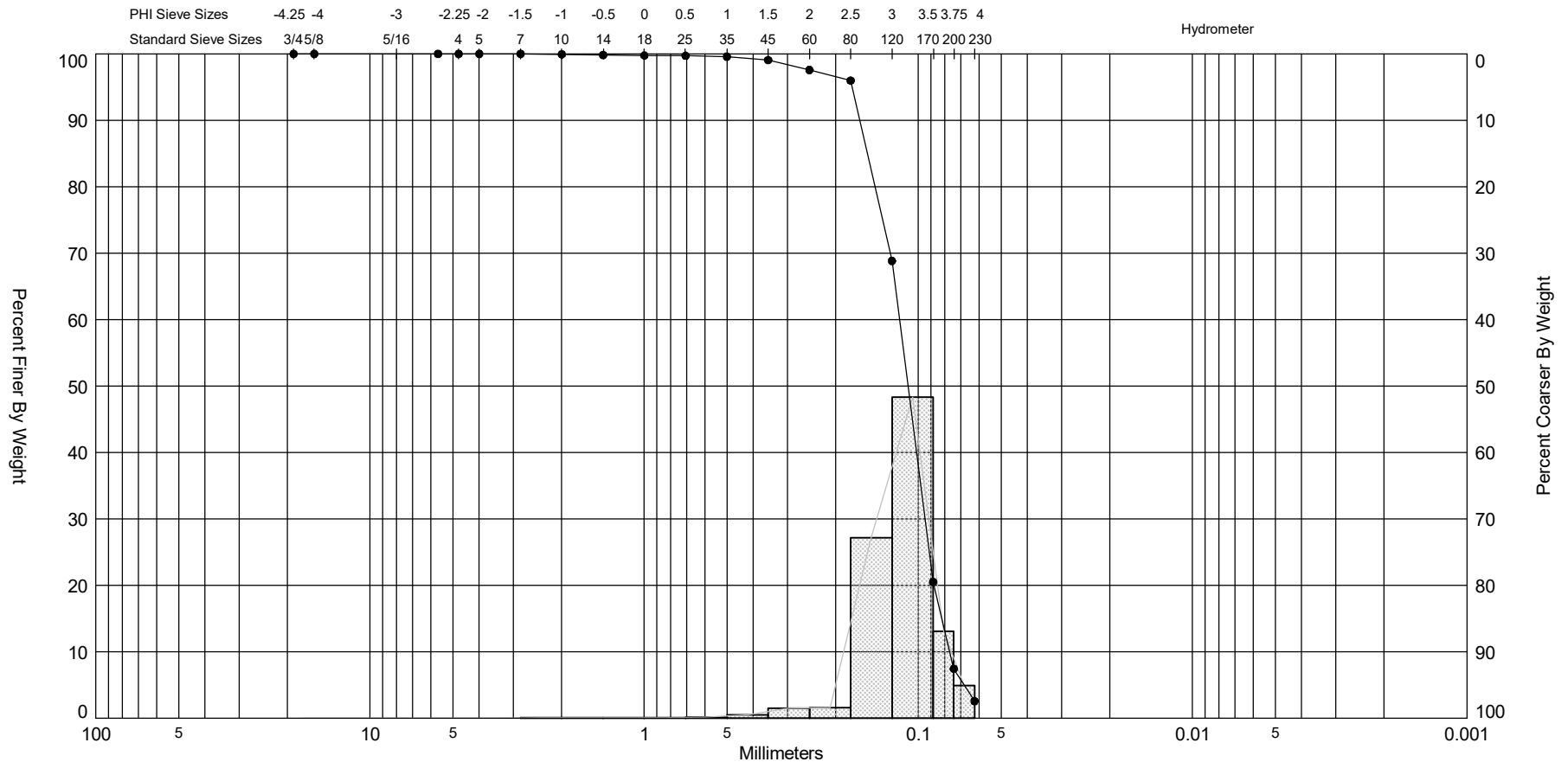
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	0.82	0.57	1.08	-0.96	3.9

GRANULARMETRIC REPORT IBSP.GPJ FL DEP ROSS.GDT 11/10/20


APPENDIX F

VIBRACORE SAMPLE SIEVE ANALYSIS REPORTS

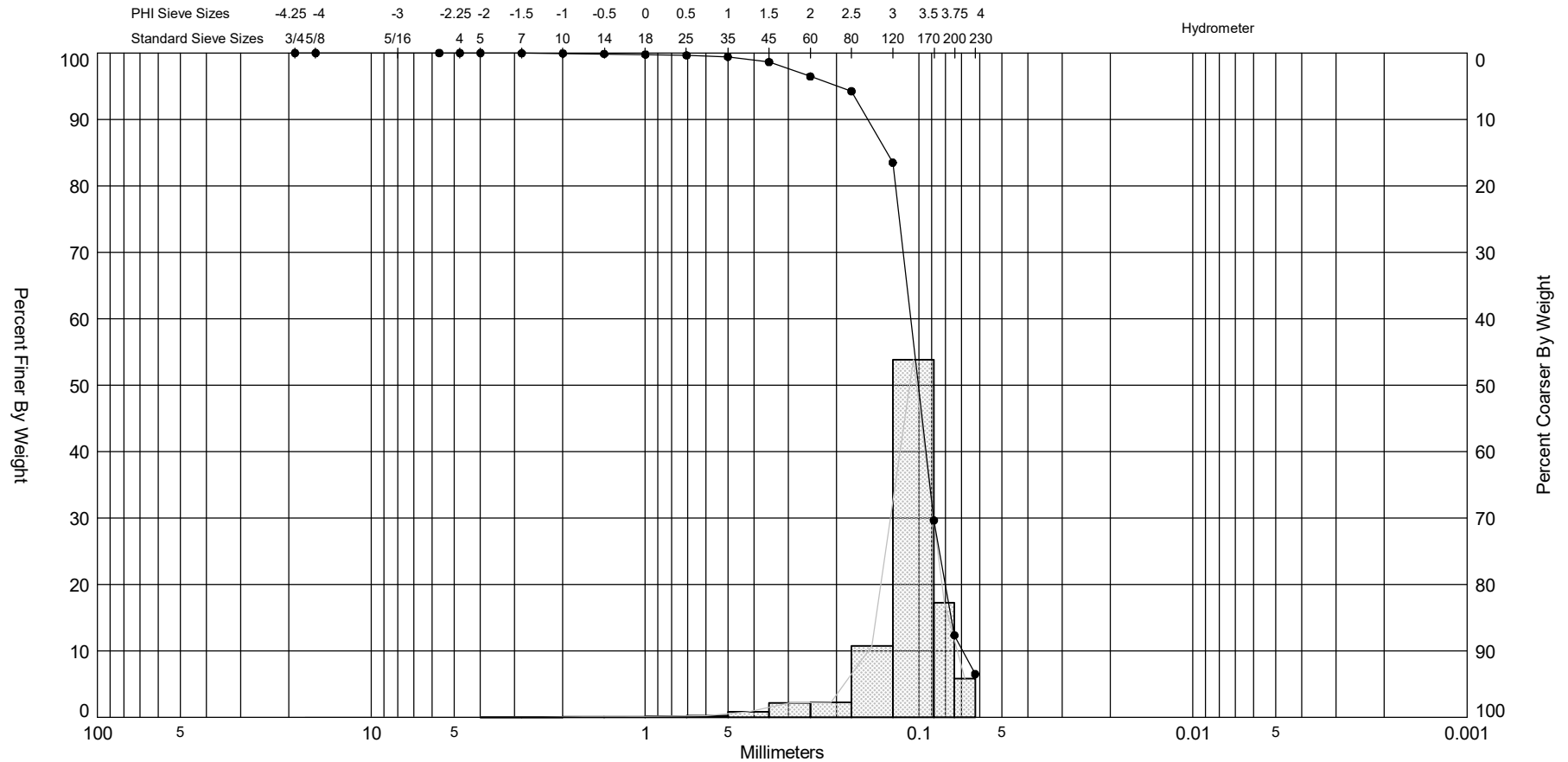
SIEVE ANALYSIS IBSP.GPJ FL DEP ROSS.GDT 11/10/20




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	
VC-01 #1	—●—	-26.8	SP-SM	#200 - 7.44 #230 - 2.55			3.19	3.13	-2.35	17.26	0.47	Project Name:	IBSP Sand Source Survey
Comments:												Analysis Date:	09-24-20
Depths and elevations based on measured values												Analyzed By:	DCJ
							Gahagan and Bryant Associates 3802 W Bay to Bay Blvd. Suite B-22 Tampa, FL 33629 Telephone: 813-831-4408 Fax: 813-831-4216					Easting (X, ft):	1,132,171
												Northing (Y, ft):	2,101,147
												Horizontal System:	NAD 1983
												Vertical System:	IGLD MLW

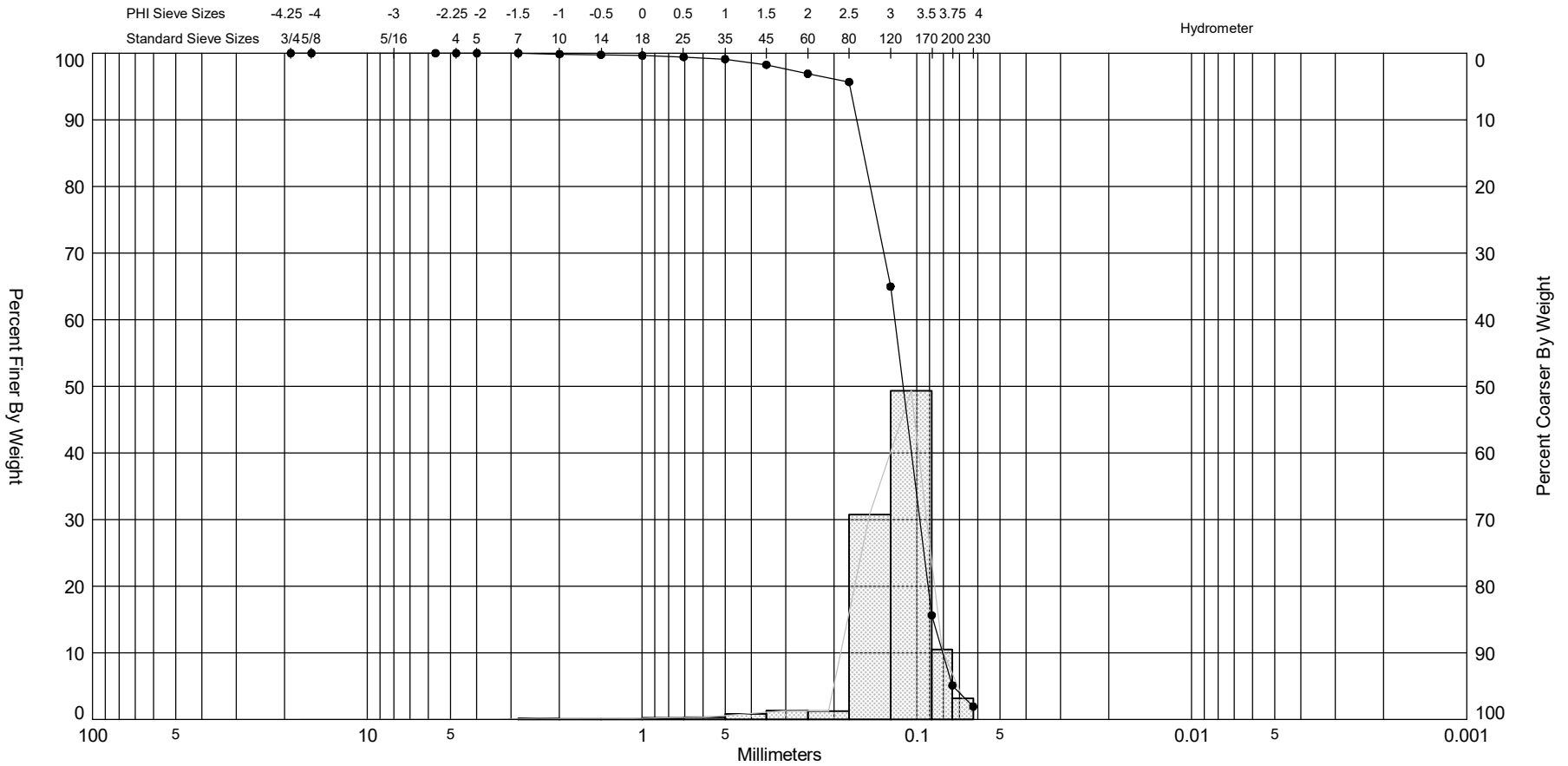
SIEVE ANALYSIS IBSP.GPJ FL DEP ROSS.GDT 11/10/20



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	
VC-01 #2	—●—	-31.3	SM	#200 - 12.35 #230 - 6.50			3.31	3.21	-2.82	17.23	0.5	Project Name:	IBSP Sand Source Survey
Comments:												Analysis Date:	09-24-20
Depths and elevations based on measured values												Analyzed By:	DCJ
						Gahagan and Bryant Associates 3802 W Bay to Bay Blvd. Suite B-22 Tampa, FL 33629 Telephone: 813-831-4408 Fax: 813-831-4216						Easting (X, ft):	1,132,171
												Northing (Y, ft):	2,101,147
												Horizontal System:	NAD 1983
												Vertical System:	IGLD MLW

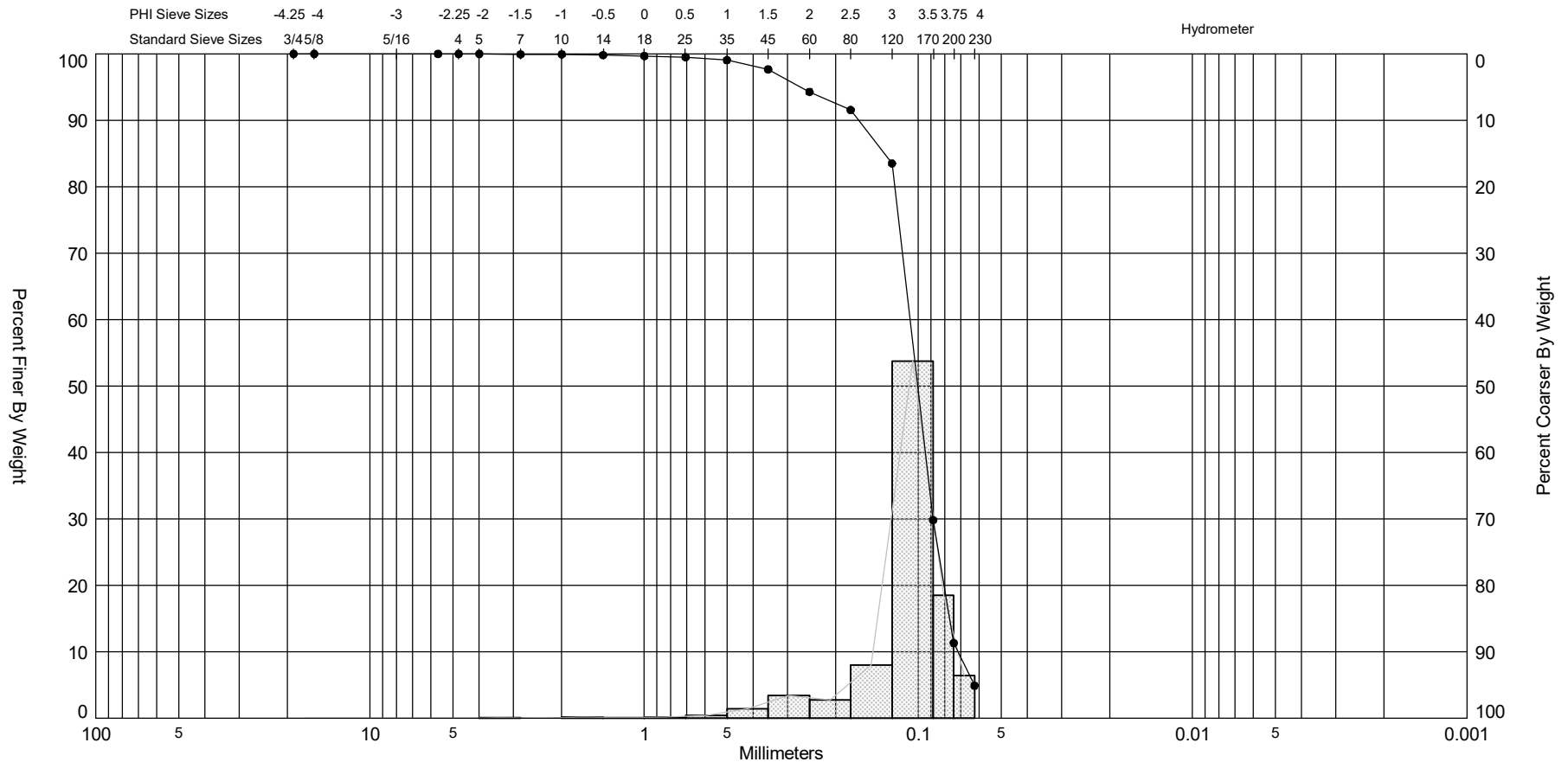
SIEVE ANALYSIS IBSP.GPJ FL DEP ROSS.GDT 11/10/20




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	
VC-02 #1	—●—	-30.0	SP-SM	#200 - 5.11 #230 - 1.94			3.15	3.07	-2.91	19.75	0.5	Project Name:	IBSP Sand Source Survey
Comments:												Analysis Date:	09-24-20
Depths and elevations based on measured values												Analyzed By:	DCJ
						Gahagan and Bryant Associates 3802 W Bay to Bay Blvd. Suite B-22 Tampa, FL 33629 Telephone: 813-831-4408 Fax: 813-831-4216						Easting (X, ft):	1,139,697
												Northing (Y, ft):	2,114,187
												Horizontal System:	NAD 1983
												Vertical System:	IGLD MLW

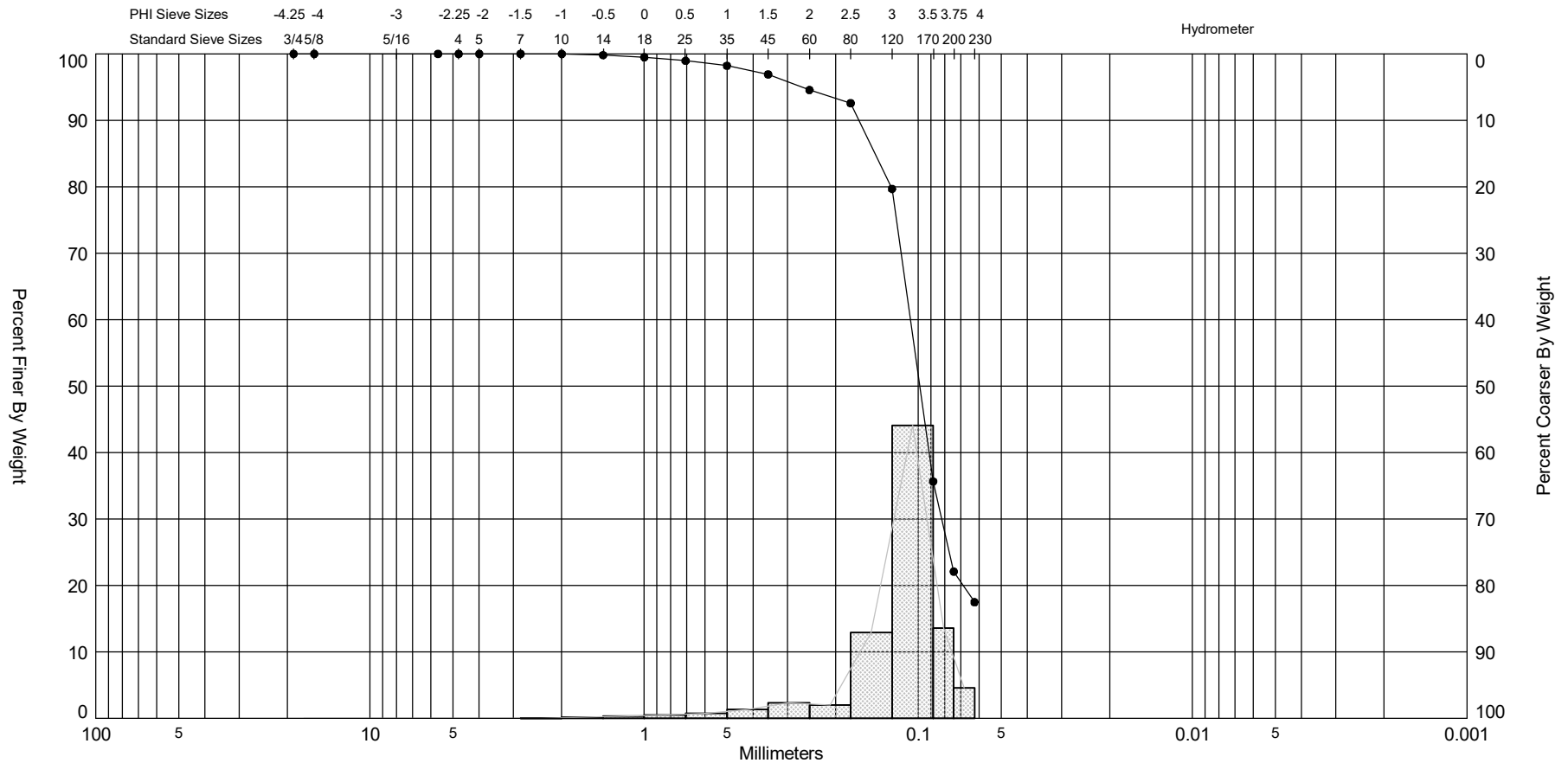
SIEVE ANALYSIS IBSP.GPJ FL DEP ROSS.GDT 11/10/20




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	
VC-02 #2	—●—	-35.5	SP-SM	#200 - 11.30 #230 - 4.88			3.31	3.18	-2.68	13.87	0.58	Project Name:	IBSP Sand Source Survey
Comments:												Analysis Date:	09-24-20
Depths and elevations based on measured values												Analyzed By:	DCJ
						Gahagan and Bryant Associates 3802 W Bay to Bay Blvd. Suite B-22 Tampa, FL 33629 Telephone: 813-831-4408 Fax: 813-831-4216						Easting (X, ft):	1,139,697
												Northing (Y, ft):	2,114,187
												Horizontal System:	NAD 1983
												Vertical System:	IGLD MLW

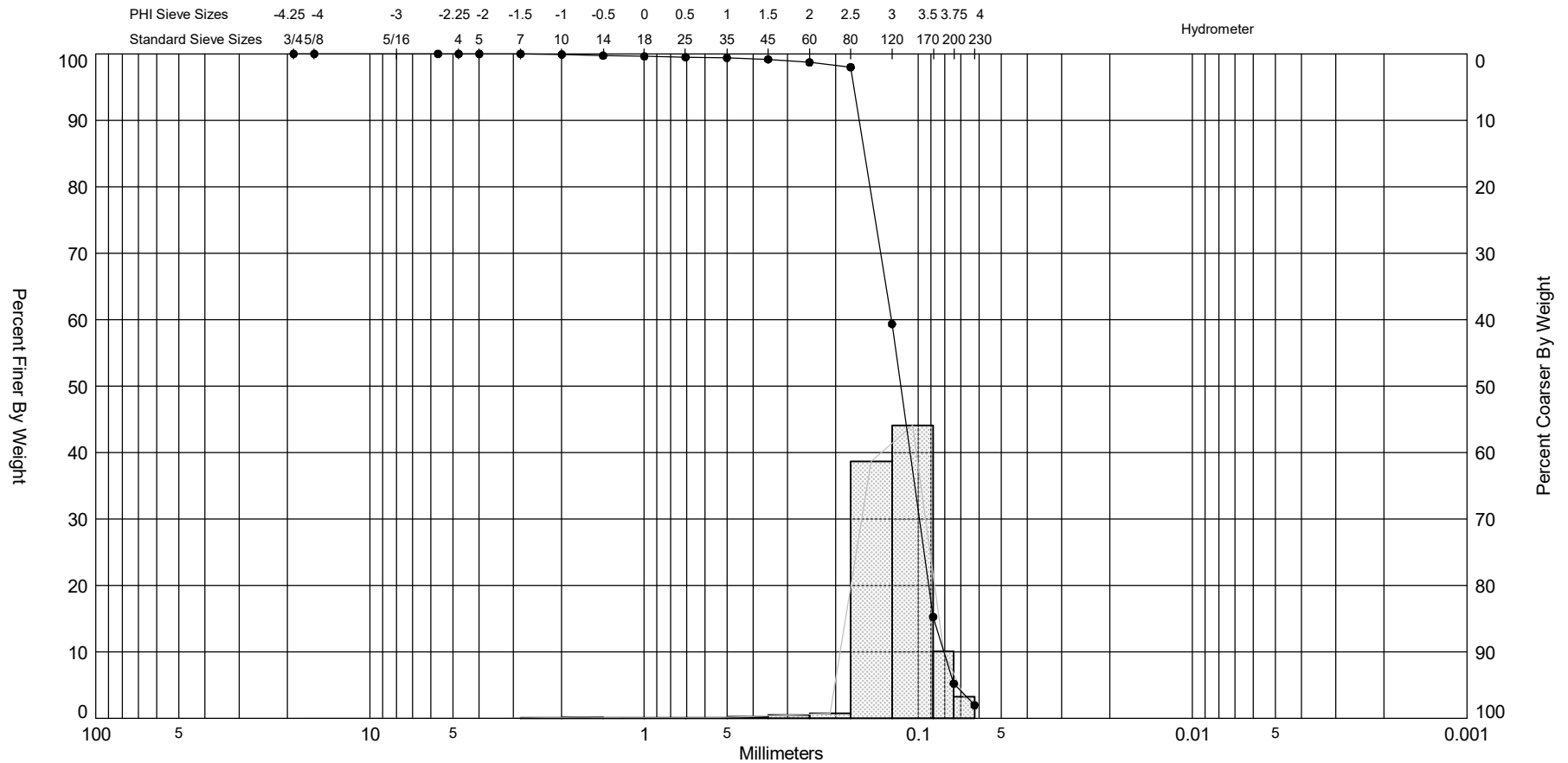
SIEVE ANALYSIS IBSP.GPJ FL DEP ROSS.GDT 11/10/20




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	
VC-03-C #1	—●—	-33.0	SM	#200 - 22.08 #230 - 17.47			3.34	3.11	-2.61	12.03	0.64	Project Name:	IBSP Sand Source Survey
Comments:												Analysis Date:	
Depths and elevations based on measured values												Analyzed By:	DCJ
												Easting (X, ft):	1,140,247
												Northing (Y, ft):	2,115,196
												Horizontal System:	NAD 1983
												Vertical System:	IGLD MLW
Gahagan and Bryant Associates 3802 W Bay to Bay Blvd. Suite B-22 Tampa, FL 33629 Telephone: 813-831-4408 Fax: 813-831-4216													

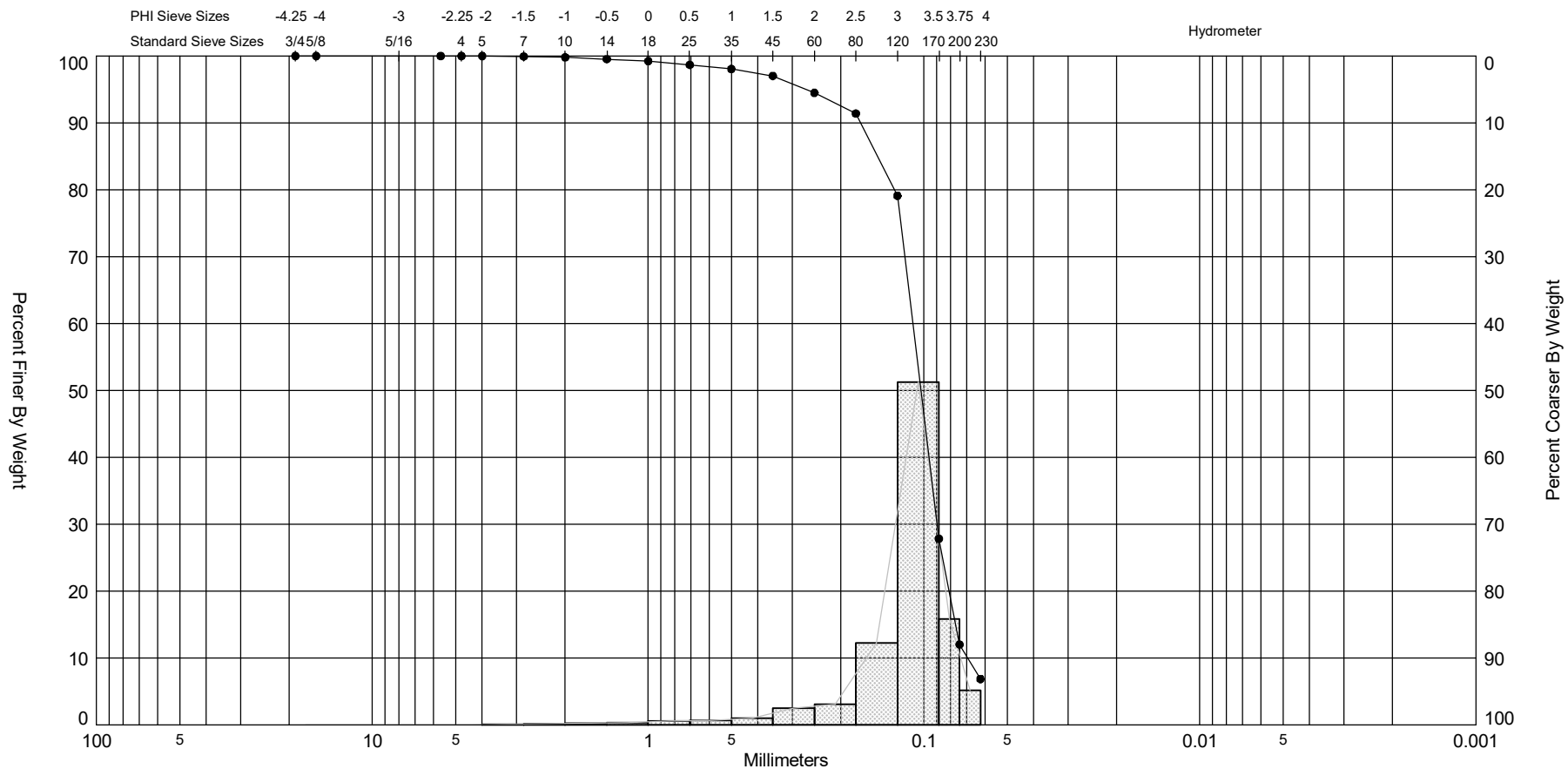
SIEVE ANALYSIS IBSP.GPJ FL DEP ROSS.GDT 11/10/20




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	
VC-04 #1	—●—	-32.1	SP-SM	#200 - 5.21 #230 - 1.96			3.11	3.07	-2.88	25.18	0.45	Project Name:	IBSP Sand Source Survey
Comments:												Analysis Date:	09-24-20
Depths and elevations based on measured values												Analyzed By:	DCJ
						Gahagan and Bryant Associates 3802 W Bay to Bay Blvd. Suite B-22 Tampa, FL 33629 Telephone: 813-831-4408 Fax: 813-831-4216						Easting (X, ft):	1,140,168
												Northing (Y, ft):	2,113,696
												Horizontal System:	NAD 1983
												Vertical System:	IGLD MLW

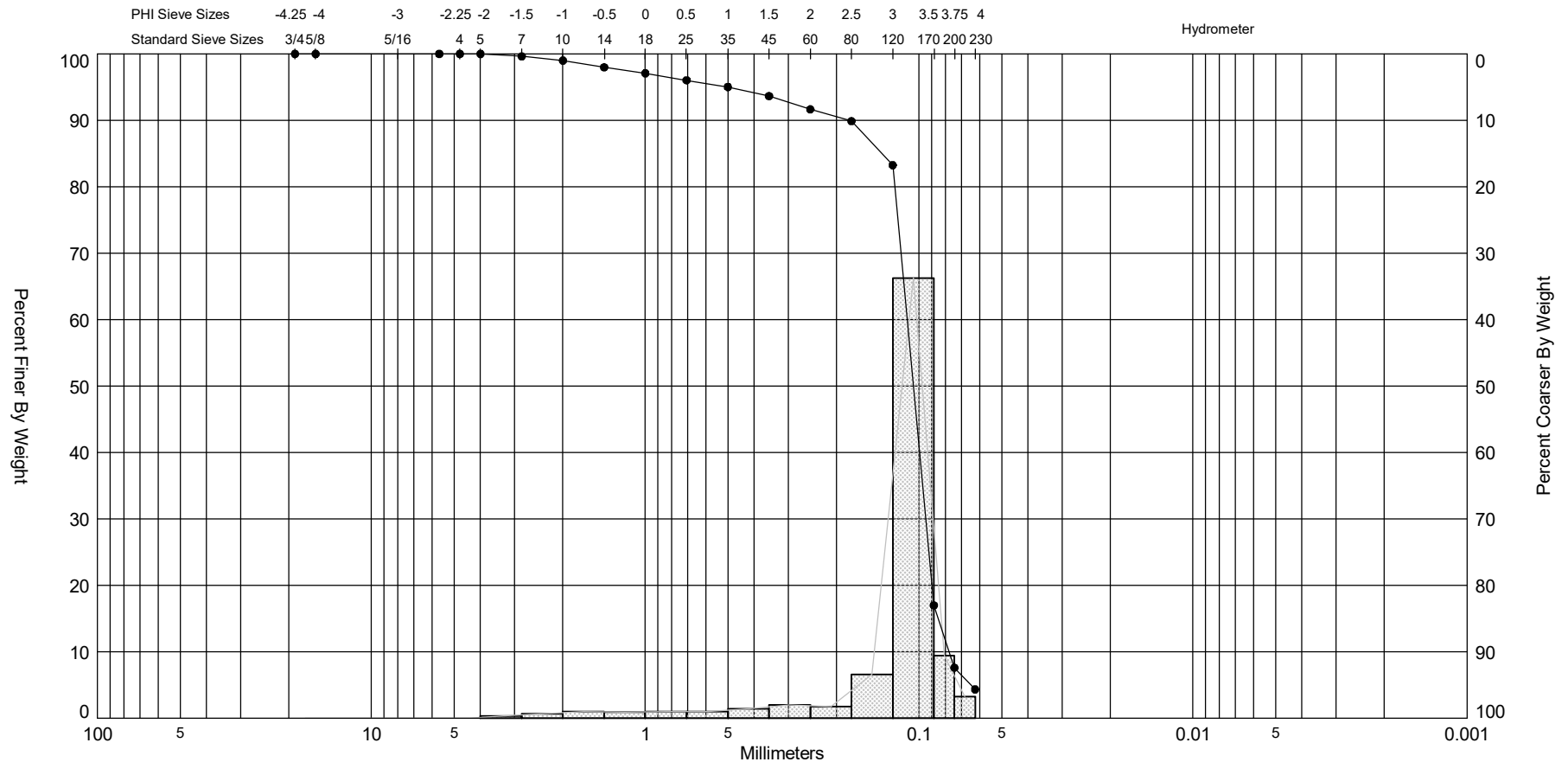
SIEVE ANALYSIS IBSP.GPJ FL DEP ROSS.GDT 11/10/20




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	
VC-04 #2	—●—	-38.6	SM	#200 - 12.02 #230 - 6.86			3.28	3.12	-3.01	15.72	0.65	Project Name:	IBSP Sand Source Survey
Comments:												Analysis Date:	09-24-20
Depths and elevations based on measured values												Analyzed By:	DCJ
							Gahagan and Bryant Associates 3802 W Bay to Bay Blvd. Suite B-22 Tampa, FL 33629 Telephone: 813-831-4408 Fax: 813-831-4216					Easting (X, ft):	1,140,168
												Northing (Y, ft):	2,113,696
												Horizontal System:	NAD 1983
												Vertical System:	IGLD MLW

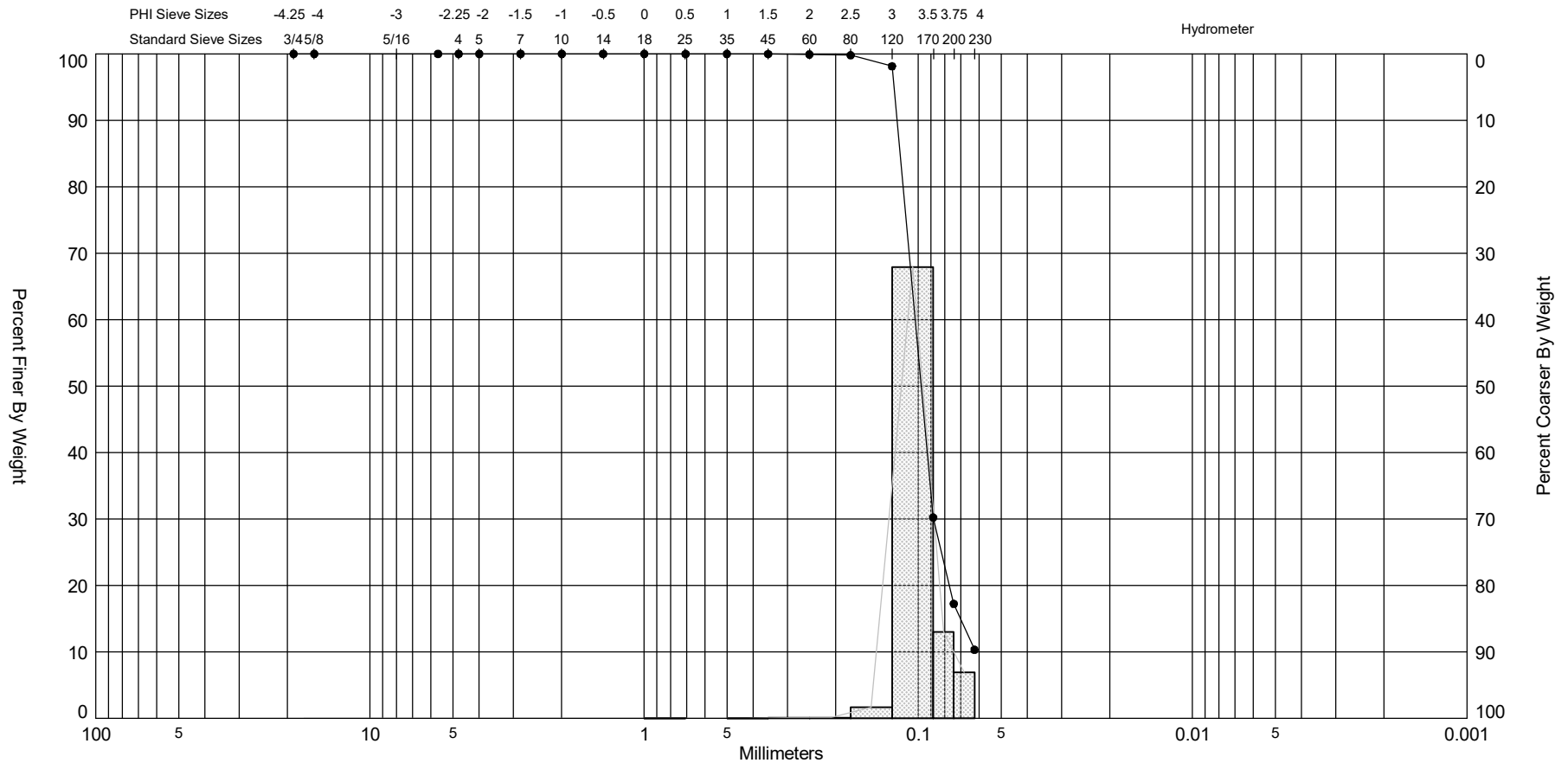
SIEVE ANALYSIS IBSP.GPJ FL DEP ROSS.GDT 11/10/20




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	
VC-05 #1	—●—	-29.3	SW-SM	#200 - 7.60 #230 - 4.33			3.25	3.01	-3.2	13.6	0.89	Project Name:	IBSP Sand Source Survey
Comments:												Analysis Date:	10-05-20
Depths and elevations based on measured values												Analyzed By:	DCJ
						Gahagan and Bryant Associates 3802 W Bay to Bay Blvd, Suite B-22 Tampa, FL 33629 Telephone: 813-831-4408 Fax: 813-831-4216						Easting (X, ft):	1,140,321
												Northing (Y, ft):	2,114,691
												Horizontal System:	NAD 1983
												Vertical System:	IGLD MLW

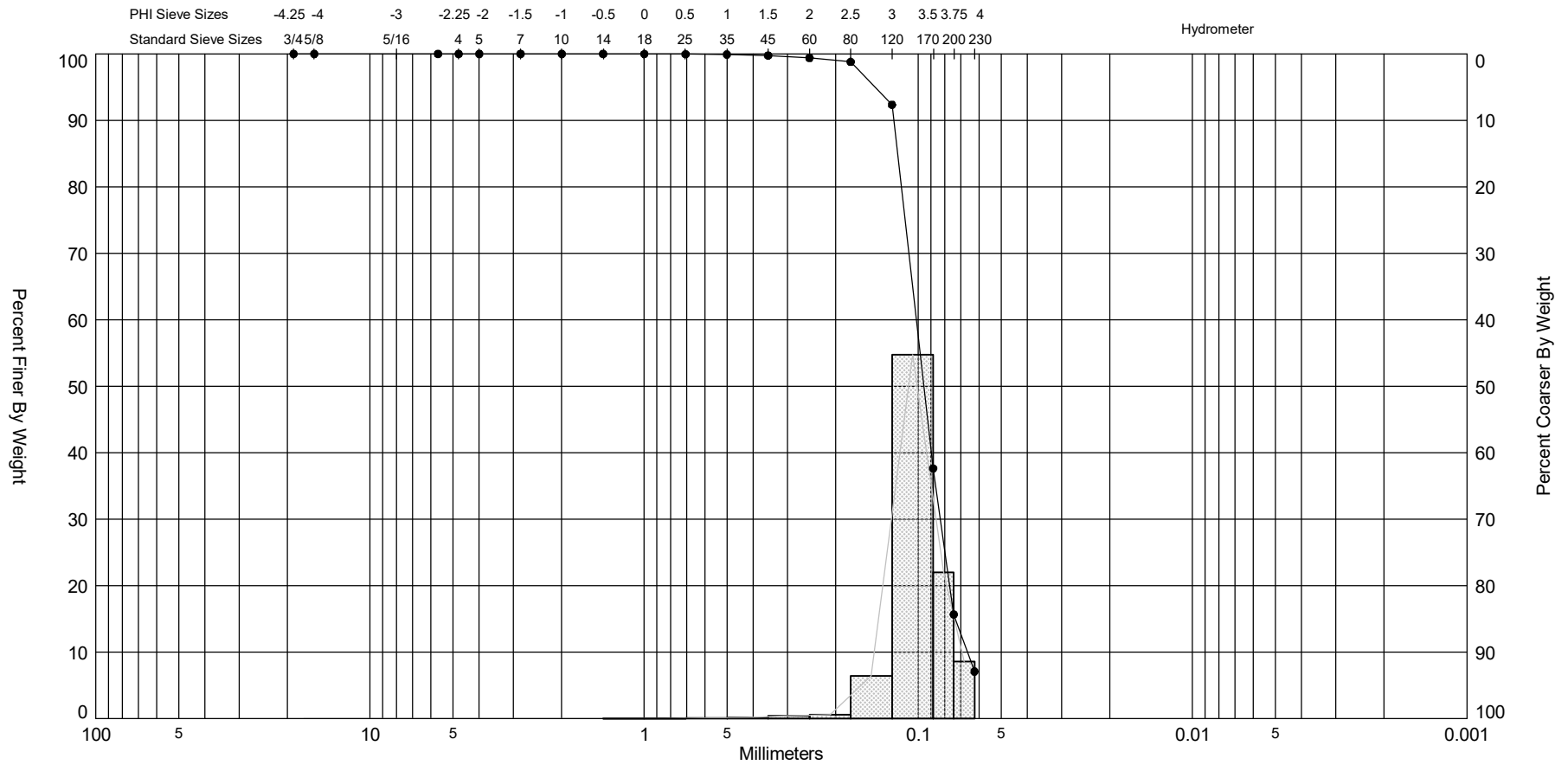
SIEVE ANALYSIS IBSP.GPJ FL DEP ROSS.GDT 11/10/20



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	
VC-05 #2	—●—	-33.8	SM	#200 - 17.22 #230 - 10.31			3.35	3.34	0.08	11.92	0.23	Project Name:	IBSP Sand Source Survey
Comments:												Analysis Date:	10-05-20
Depths and elevations based on measured values												Analyzed By:	DCJ
						Gahagan and Bryant Associates 3802 W Bay to Bay Blvd. Suite B-22 Tampa, FL 33629 Telephone: 813-831-4408 Fax: 813-831-4216						Easting (X, ft):	1,140,321
												Northing (Y, ft):	2,114,691
												Horizontal System:	NAD 1983
												Vertical System:	IGLD MLW

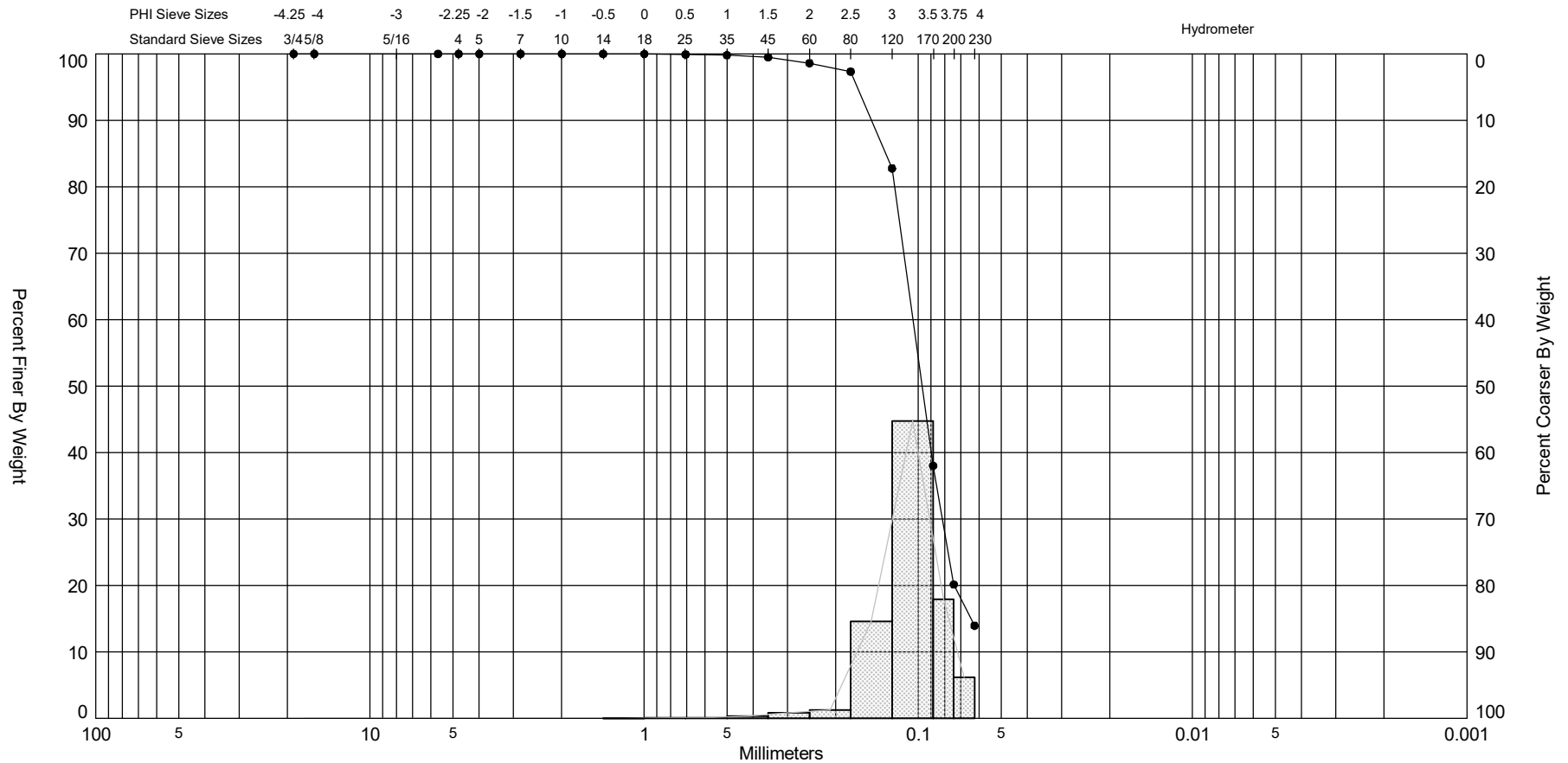
SIEVE ANALYSIS IBSP.GPJ FL DEP ROSS.GDT 11/10/20




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	
VC-06 #1	—●—	-36.3	SM	#200 - 15.67 #230 - 7.09			3.39	3.34	-1.71	13.94	0.33	Project Name:	IBSP Sand Source Survey
Comments:												Analysis Date:	09-24-20
Depths and elevations based on measured values												Analyzed By:	DCJ
							Gahagan and Bryant Associates 3802 W Bay to Bay Blvd. Suite B-22 Tampa, FL 33629 Telephone: 813-831-4408 Fax: 813-831-4216					Easting (X, ft):	1,137,281
												Northing (Y, ft):	2,115,679
												Horizontal System:	NAD 1983
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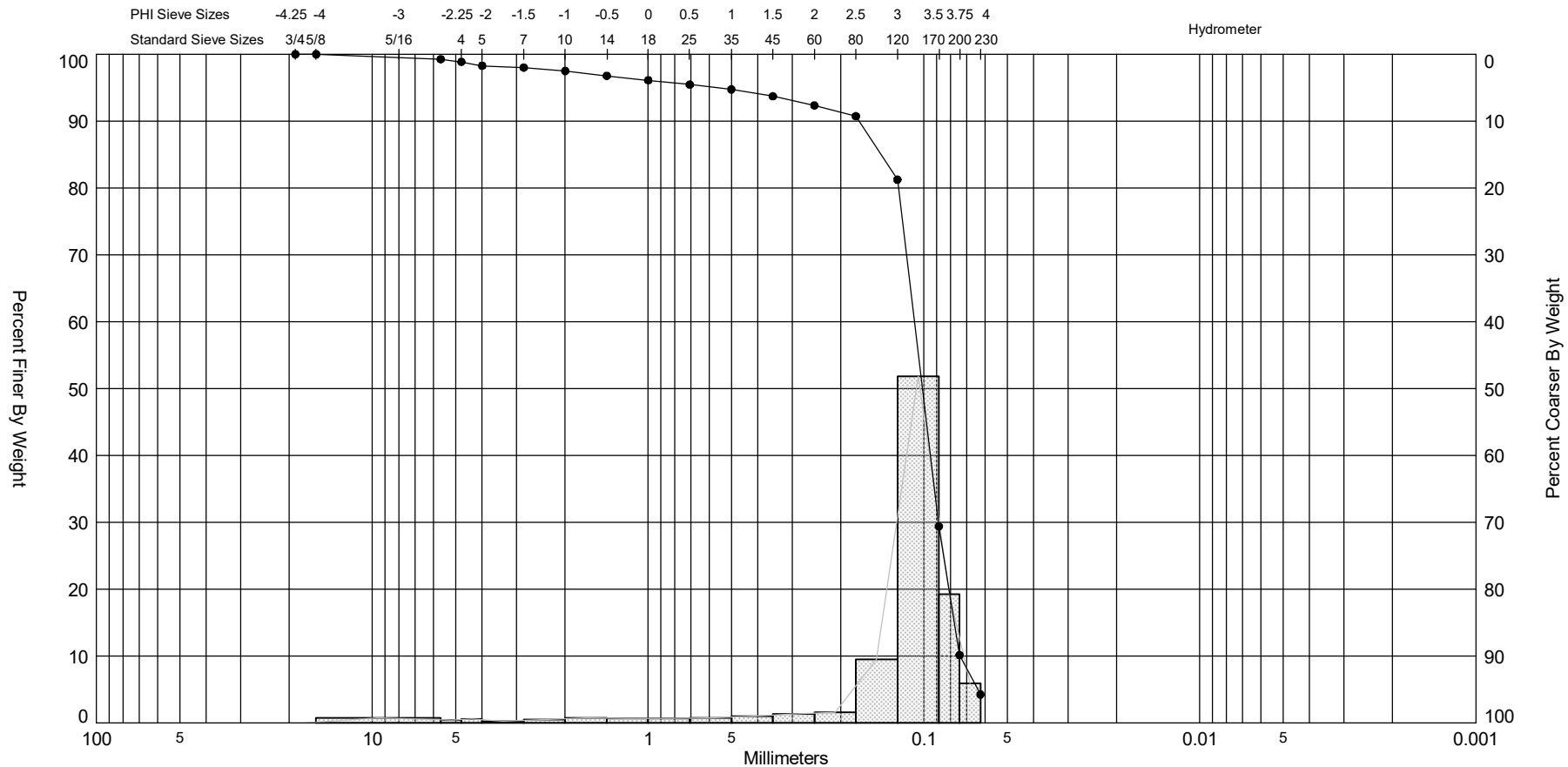
SIEVE ANALYSIS IBSP.GPJ FL DEP ROSS.GDT 11/10/20




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	
VC-07-C #1	—●—	-31.1	SM	#200 - 20.13 #230 - 13.95			3.37	3.24	-1.71	10.26	0.41	Project Name:	IBSP Sand Source Survey
Comments:												Analysis Date:	09-24-20
Depths and elevations based on measured values												Analyzed By:	DCJ
							Gahagan and Bryant Associates 3802 W Bay to Bay Blvd. Suite B-22 Tampa, FL 33629 Telephone: 813-831-4408 Fax: 813-831-4216					Easting (X, ft):	1,136,914
												Northing (Y, ft):	2,113,674
												Horizontal System:	NAD 1983
												Vertical System:	IGLD MLW

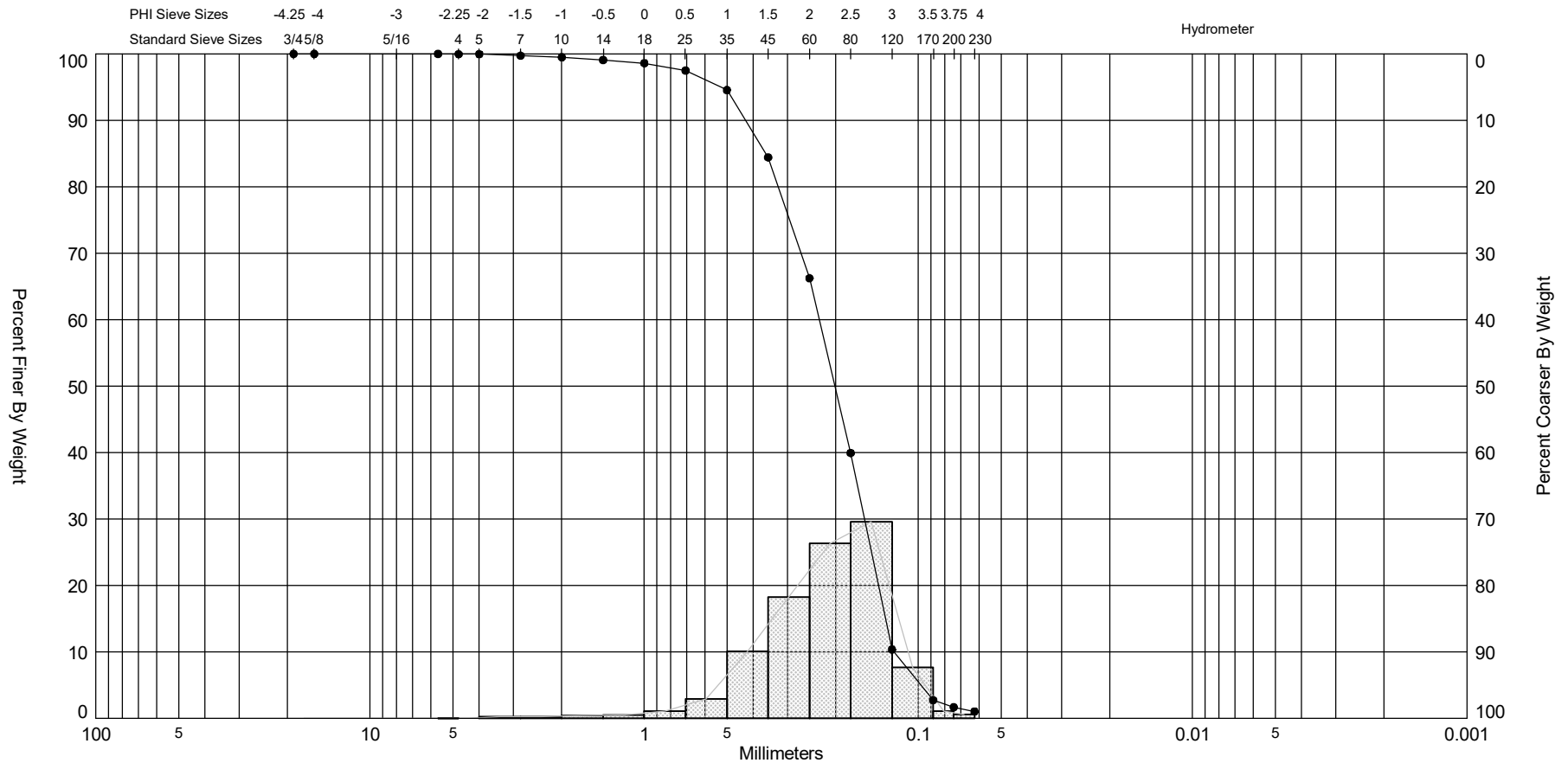
SIEVE ANALYSIS IBSP.GPJ FL DEP ROSS.GDT 11/10/20




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	
VC-08 #1	—●—	-36.6	SW-SM	#200 - 10.14 #230 - 4.24			3.3	3.02	-3.6	16.89	1.11	Project Name:	IBSP Sand Source Survey
Comments:												Analysis Date:	09-24-20
Depths and elevations based on measured values												Analyzed By:	DCJ
							Gahagan and Bryant Associates 3802 W Bay to Bay Blvd. Suite B-22 Tampa, FL 33629 Telephone: 813-831-4408 Fax: 813-831-4216					Easting (X, ft):	1,135,664
												Northing (Y, ft):	2,111,681
												Horizontal System:	NAD 1983
												Vertical System:	IGLD MLW

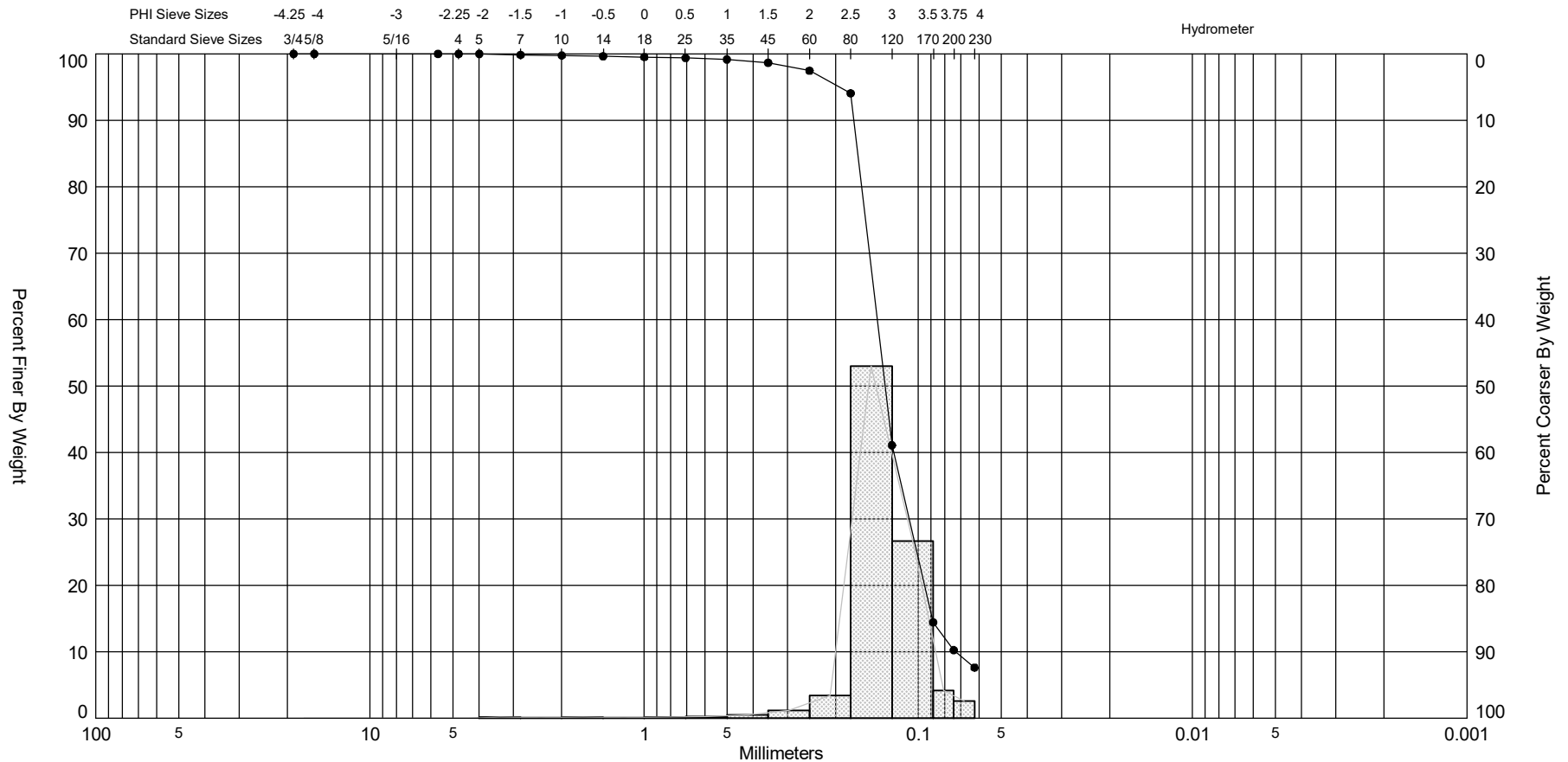
SIEVE ANALYSIS IBSP.GPJ FL DEP ROSS.GDT 11/10/20




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	
VC-09 #1	—●—	-49.1	SP	#200 - 1.66 #230 - 1.04			2.31	2.2	-1.17	6.24	0.77	Project Name:	IBSP Sand Source Survey
Comments:												Analysis Date:	09-24-20
Depths and elevations based on measured values												Analyzed By:	DCJ
							Gahagan and Bryant Associates 3802 W Bay to Bay Blvd. Suite B-22 Tampa, FL 33629 Telephone: 813-831-4408 Fax: 813-831-4216					Easting (X, ft):	1,138,547
												Northing (Y, ft):	2,111,677
												Horizontal System:	NAD 1983
												Vertical System:	IGLD MLW

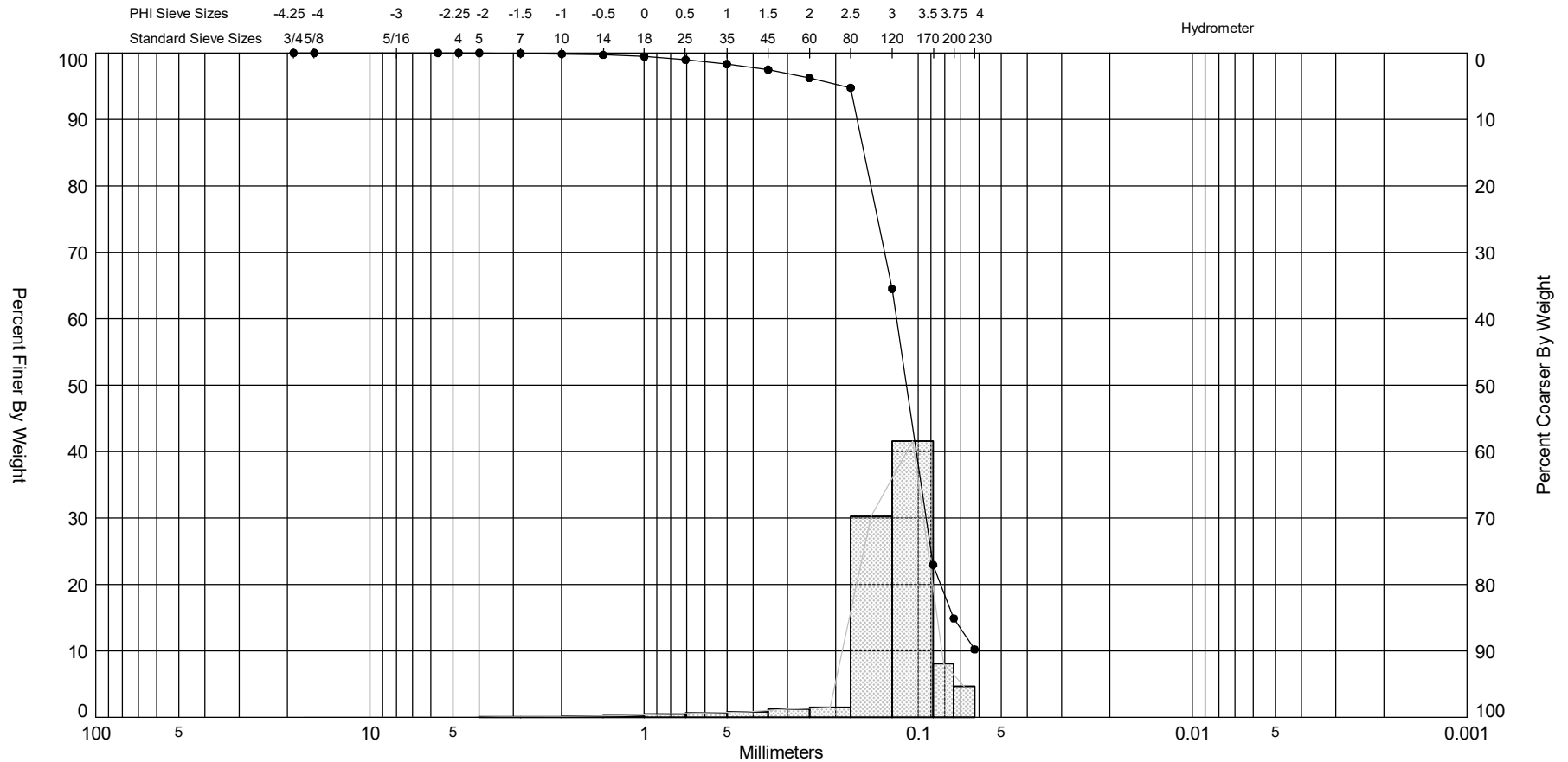
SIEVE ANALYSIS IBSP.GPJ FL DEP ROSS.GDT 11/10/20




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	
VC-10 #1	—●—	-46.6	SP-SM	#200 - 10.24 #230 - 7.62			2.92	2.9	-3.07	26	0.5	Project Name:	IBSP Sand Source Survey
Comments:												Analysis Date:	09-24-20
Depths and elevations based on measured values												Analyzed By:	DCJ
							Gahagan and Bryant Associates 3802 W Bay to Bay Blvd. Suite B-22 Tampa, FL 33629 Telephone: 813-831-4408 Fax: 813-831-4216					Easting (X, ft):	1,133,674
												Northing (Y, ft):	2,101,157
												Horizontal System:	NAD 1983
												Vertical System:	IGLD MLW

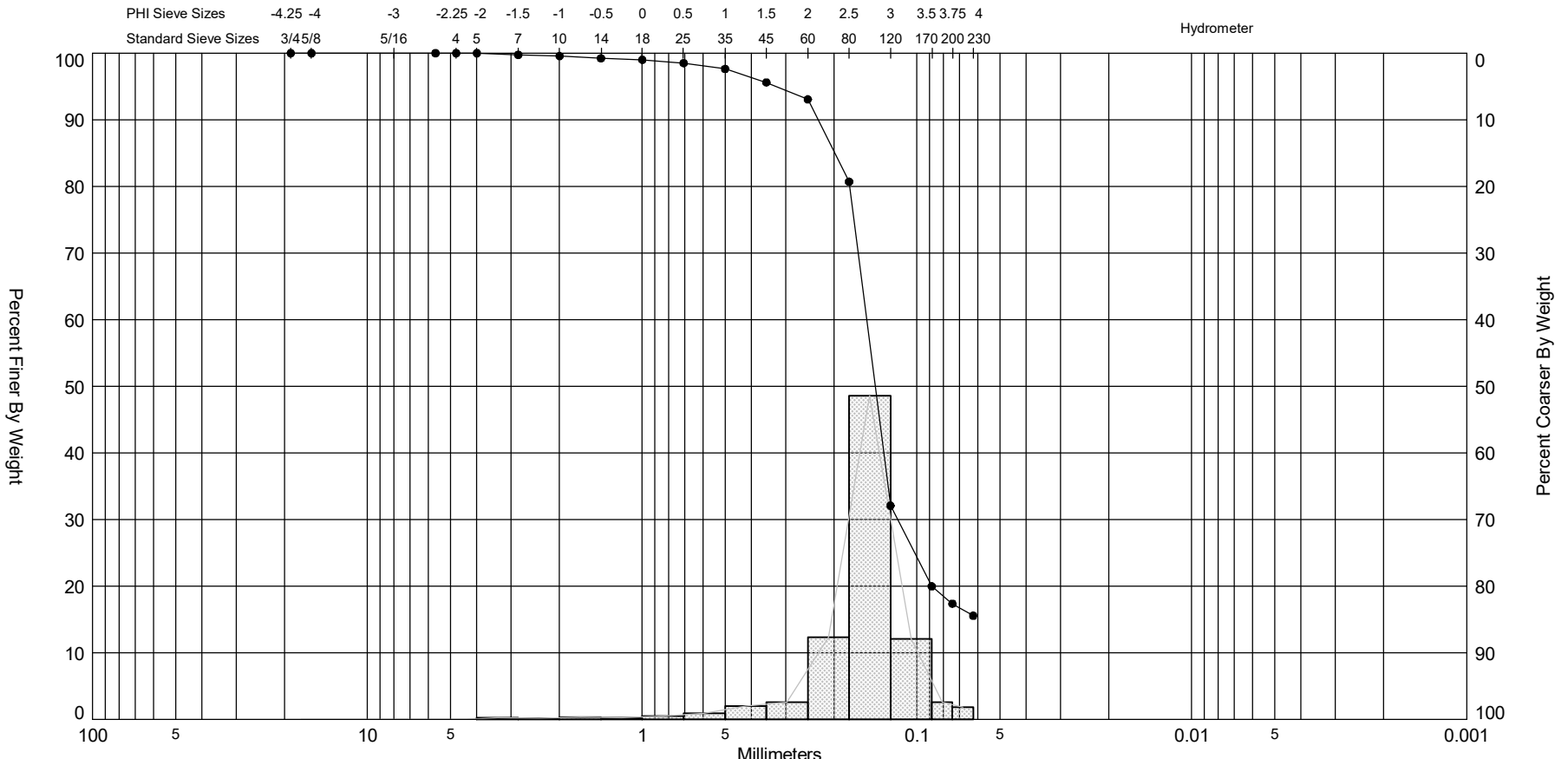
SIEVE ANALYSIS IBSP.GPJ FL DEP ROSS.GDT 11/10/20




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	
VC-10 #2	—●—	-49.8	SM	#200 - 14.88 #230 - 10.21			3.17	3.03	-2.87	17.08	0.59	Project Name:	IBSP Sand Source Survey
Comments:												Analysis Date:	09-25-20
Depths and elevations based on measured values												Analyzed By:	DCJ
							Gahagan and Bryant Associates 3802 W Bay to Bay Blvd. Suite B-22 Tampa, FL 33629 Telephone: 813-831-4408 Fax: 813-831-4216					Easting (X, ft):	1,133,674
												Northing (Y, ft):	2,101,157
												Horizontal System:	NAD 1983
												Vertical System:	IGLD MLW

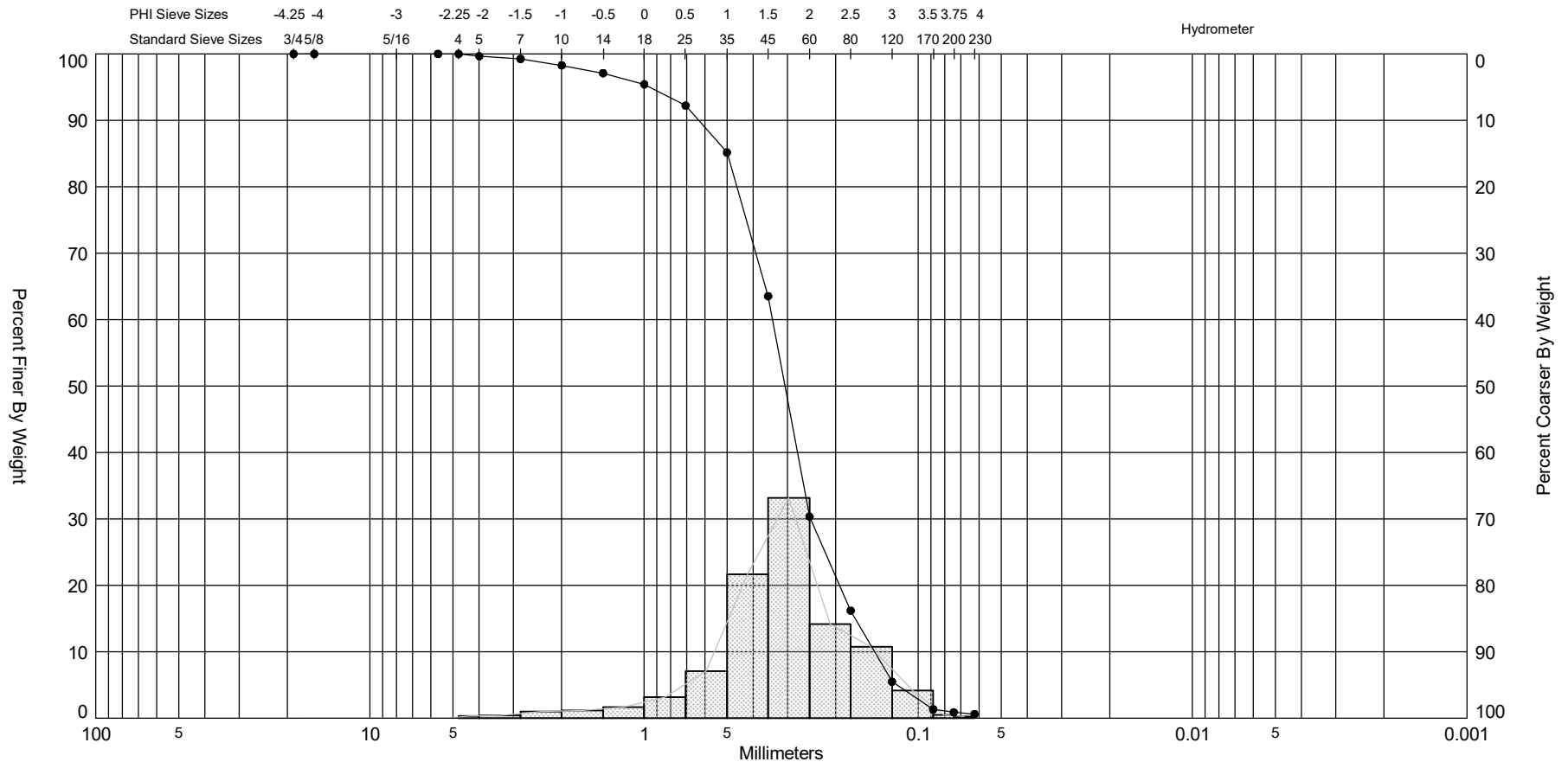
SIEVE ANALYSIS IBSP.GPJ FL DEP ROSS.GDT 11/10/20




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	
VC-11-C #1	—●—	-53.7	SM	#200 - 17.37 #230 - 15.55			2.82	2.65	-2.56	14.64	0.67	Project Name:	IBSP Sand Source Survey
Comments:												Analysis Date:	09-24-20
Depths and elevations based on measured values												Analyzed By:	DCJ
							Gahagan and Bryant Associates 3802 W Bay to Bay Blvd. Suite B-22 Tampa, FL 33629 Telephone: 813-831-4408 Fax: 813-831-4216					Easting (X, ft):	1,132,567
												Northing (Y, ft):	2,103,148
												Horizontal System:	NAD 1983
												Vertical System:	IGLD MLW

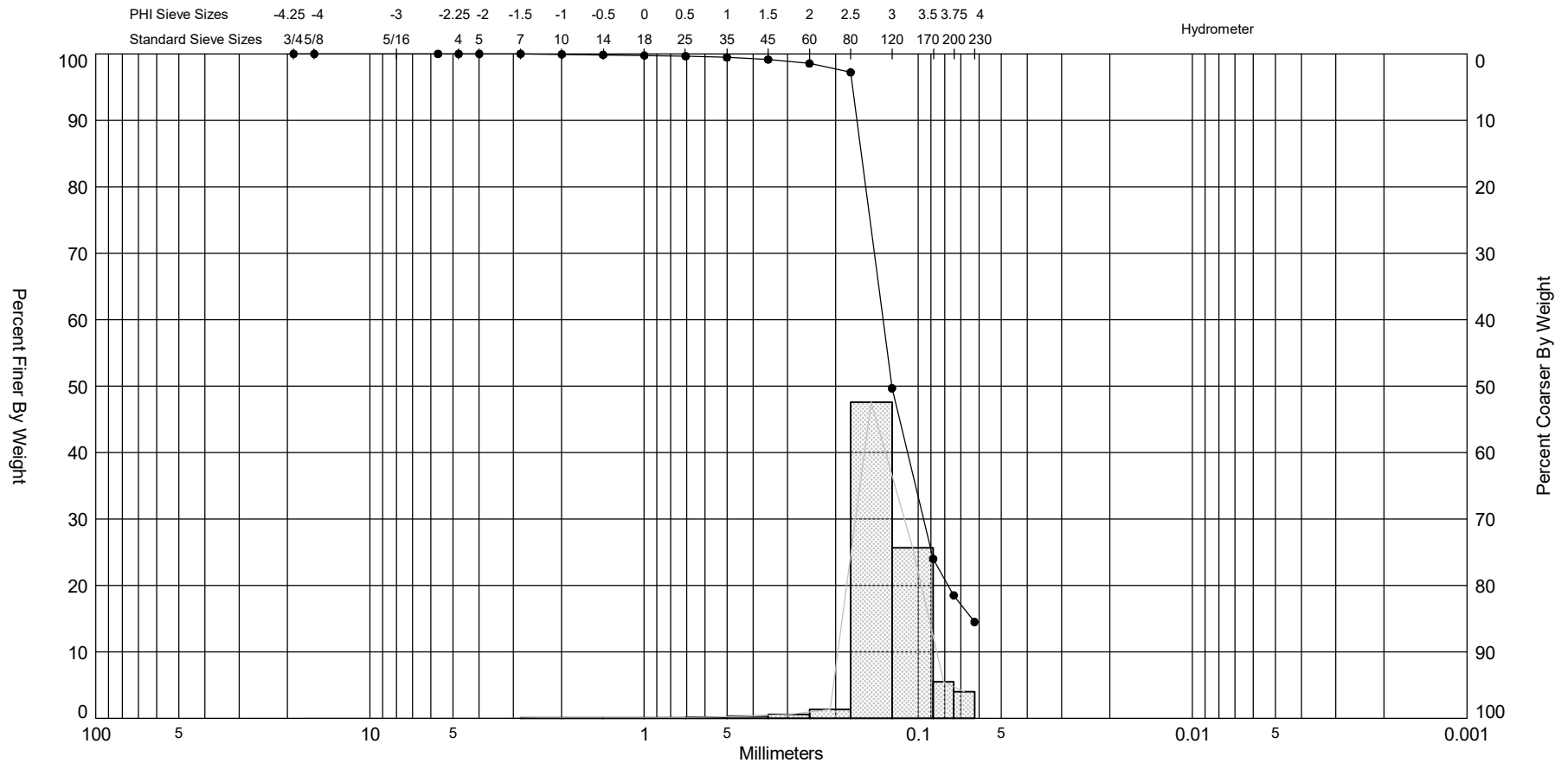
SIEVE ANALYSIS IBSP.GPJ FL DEP ROSS.GDT 11/10/20




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	
VC-12 #1	—●—	-48.9	SW	#200 - 0.88 #230 - 0.62			1.7	1.66	-0.9	5.39	0.89	Project Name:	IBSP Sand Source Survey
Comments:												Analysis Date:	09-24-20
Depths and elevations based on measured values												Analyzed By:	DCJ
							Gahagan and Bryant Associates 3802 W Bay to Bay Blvd. Suite B-22 Tampa, FL 33629 Telephone: 813-831-4408 Fax: 813-831-4216					Easting (X, ft):	1,134,236
												Northing (Y, ft):	2,103,168
												Horizontal System:	NAD 1983
												Vertical System:	IGLD MLW

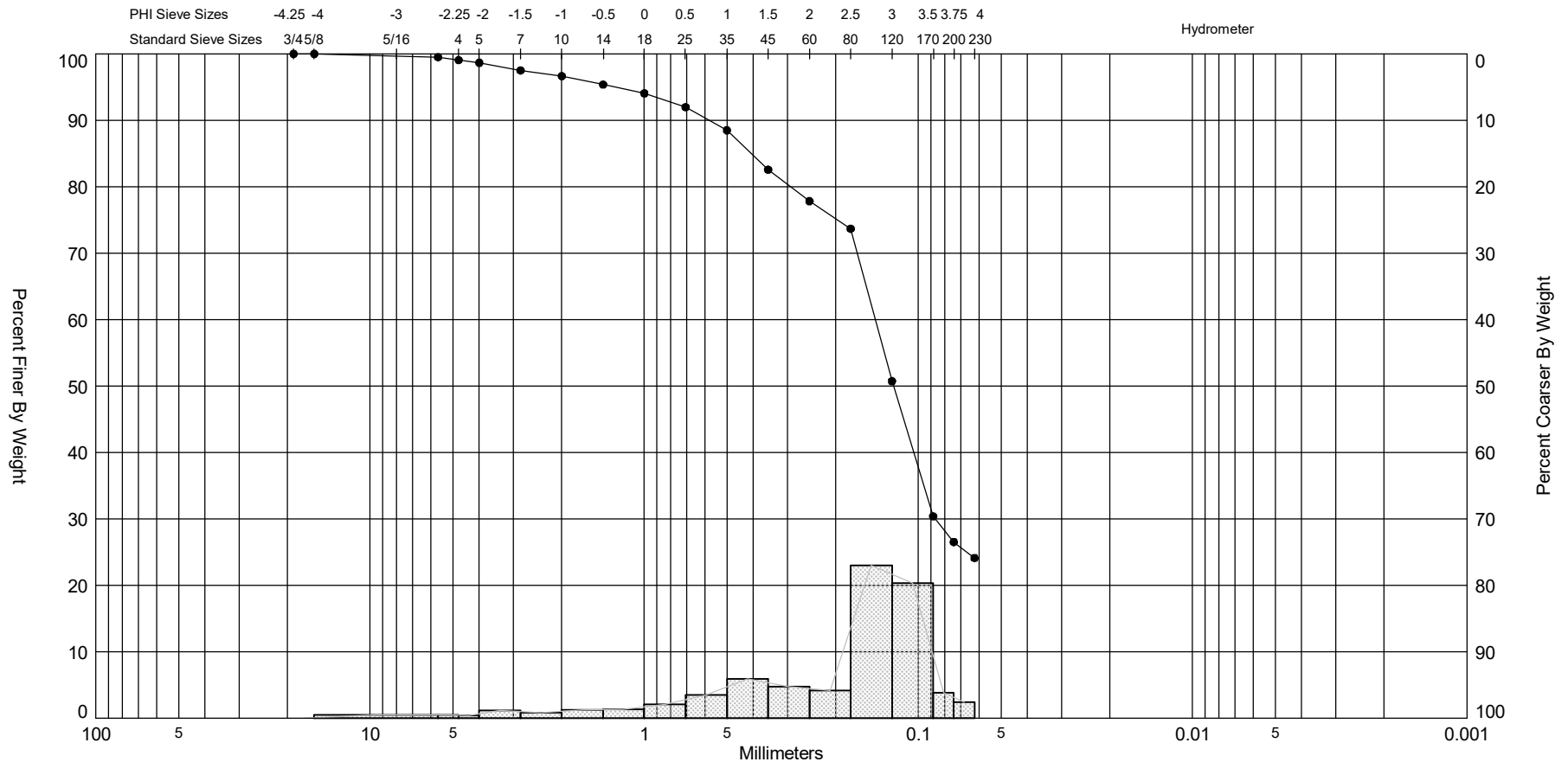
SIEVE ANALYSIS IBSP.GPJ FL DEP ROSS.GDT 11/10/20




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	
VC-12 #2	—●—	-52.1	SM	#200 - 18.51 #230 - 14.49			3	2.97	-1.88	18.07	0.45	Project Name:	IBSP Sand Source Survey
Comments:												Analysis Date:	09-25-20
Depths and elevations based on measured values												Analyzed By:	DCJ
							Gahagan and Bryant Associates 3802 W Bay to Bay Blvd. Suite B-22 Tampa, FL 33629 Telephone: 813-831-4408 Fax: 813-831-4216					Easting (X, ft):	1,134,236
												Northing (Y, ft):	2,103,168
												Horizontal System:	NAD 1983
												Vertical System:	IGLD MLW

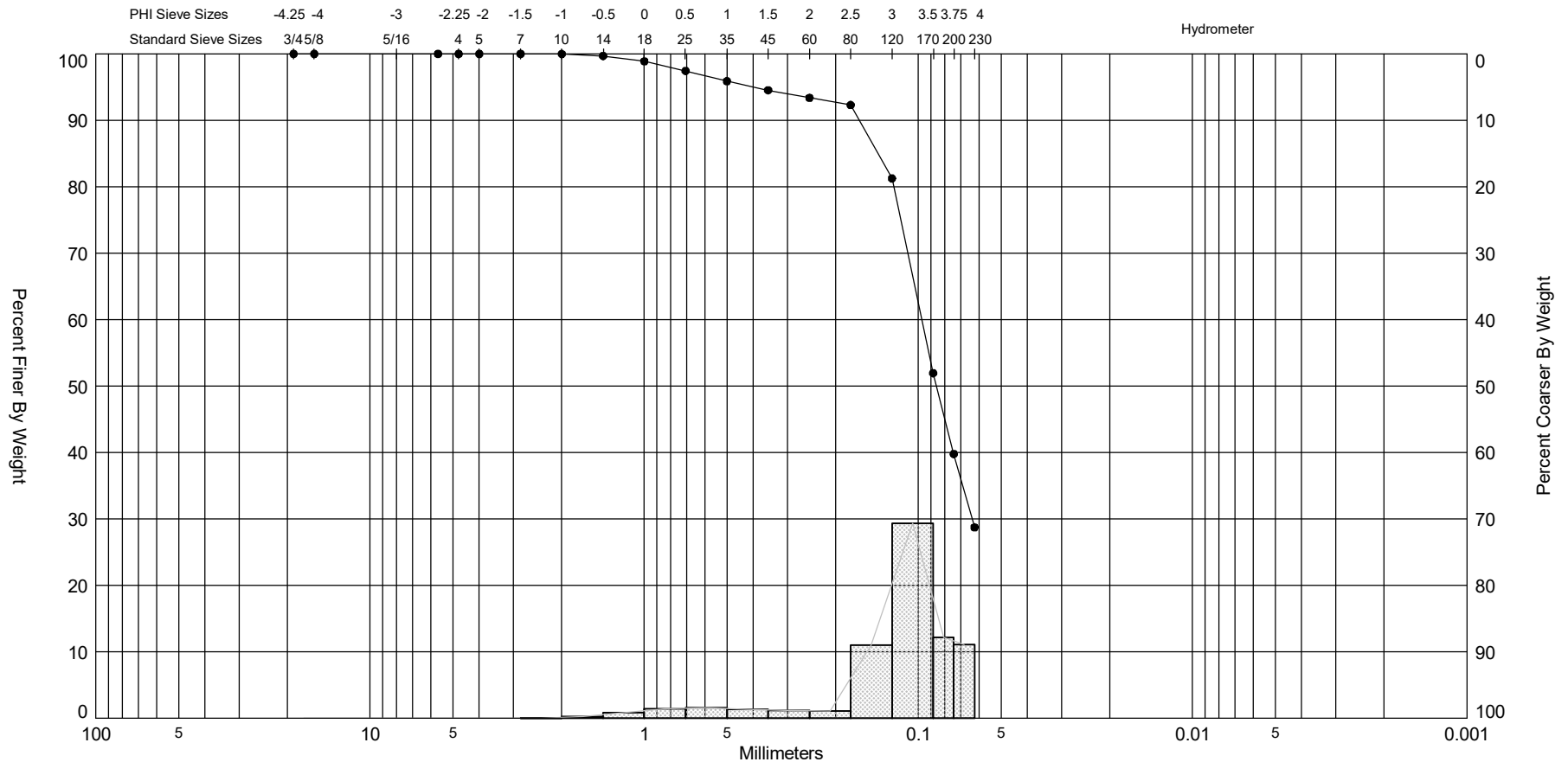
SIEVE ANALYSIS IBSP.GPJ FL DEP ROSS.GDT 11/10/20




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	
VC-13 #1	—●—	-52.5	SM	#200 - 26.53 #230 - 24.12			3.02	2.28	-1.66	5.6	1.38	Project Name:	IBSP Sand Source Survey
Comments:												Analysis Date:	09-25-20
Depths and elevations based on measured values												Analyzed By:	DCJ
							Gahagan and Bryant Associates 3802 W Bay to Bay Blvd. Suite B-22 Tampa, FL 33629 Telephone: 813-831-4408 Fax: 813-831-4216					Easting (X, ft):	1,132,000
												Northing (Y, ft):	2,110,647
												Horizontal System:	NAD 1983
												Vertical System:	IGLD MLW

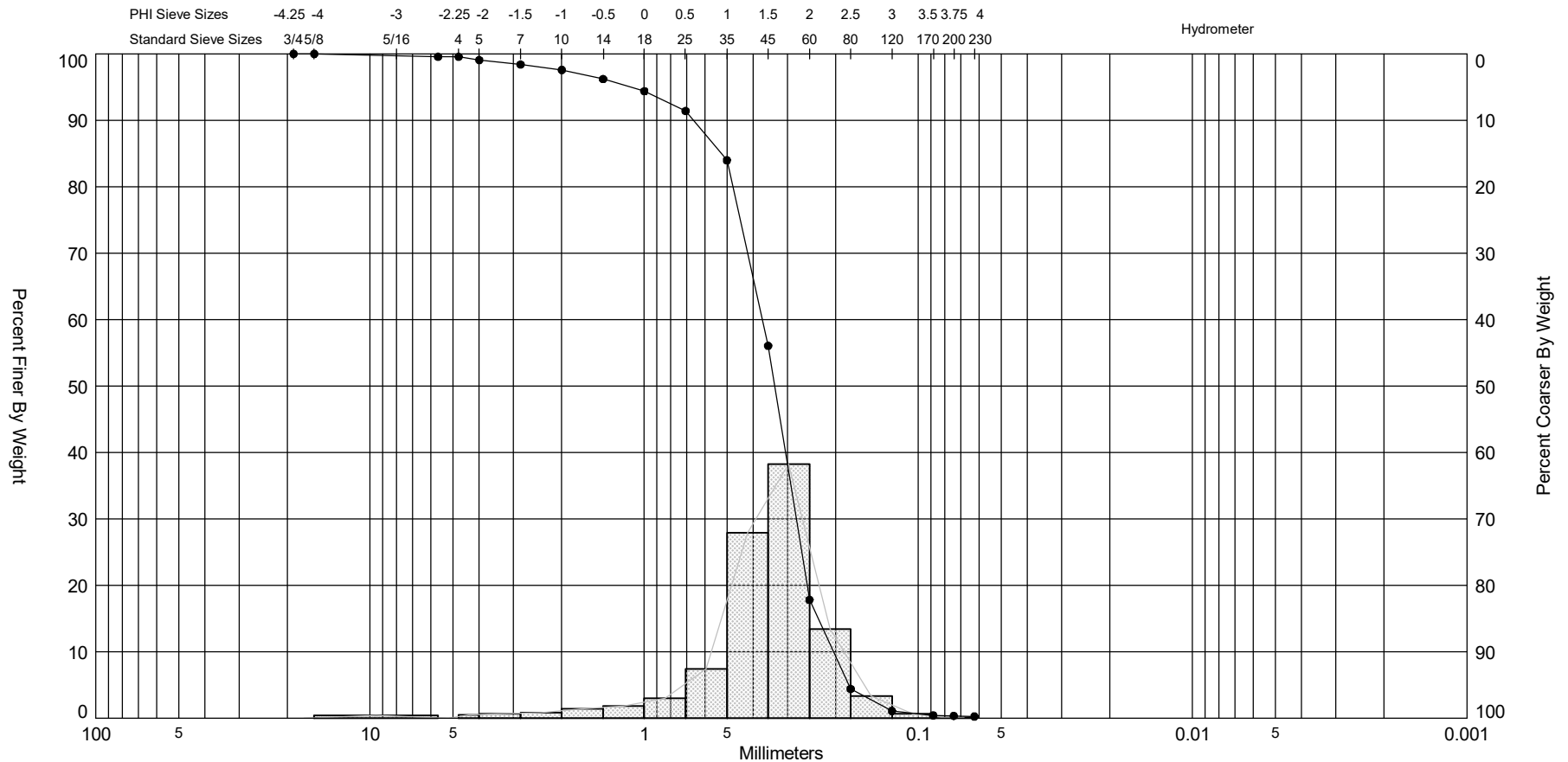
SIEVE ANALYSIS IBSP.GPJ FL DEP ROSS.GDT 11/10/20




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	
VC-13 #2	—●—	-55.0	SM	#200 - 39.78 #230 - 28.71			3.54	3.08	-2.26	8.3	0.87	Project Name:	IBSP Sand Source Survey
Comments:												Analysis Date:	09-25-20
Depths and elevations based on measured values												Analyzed By:	DCJ
							Gahagan and Bryant Associates 3802 W Bay to Bay Blvd. Suite B-22 Tampa, FL 33629 Telephone: 813-831-4408 Fax: 813-831-4216					Easting (X, ft):	1,132,000
												Northing (Y, ft):	2,110,647
												Horizontal System:	NAD 1983
												Vertical System:	IGLD MLW

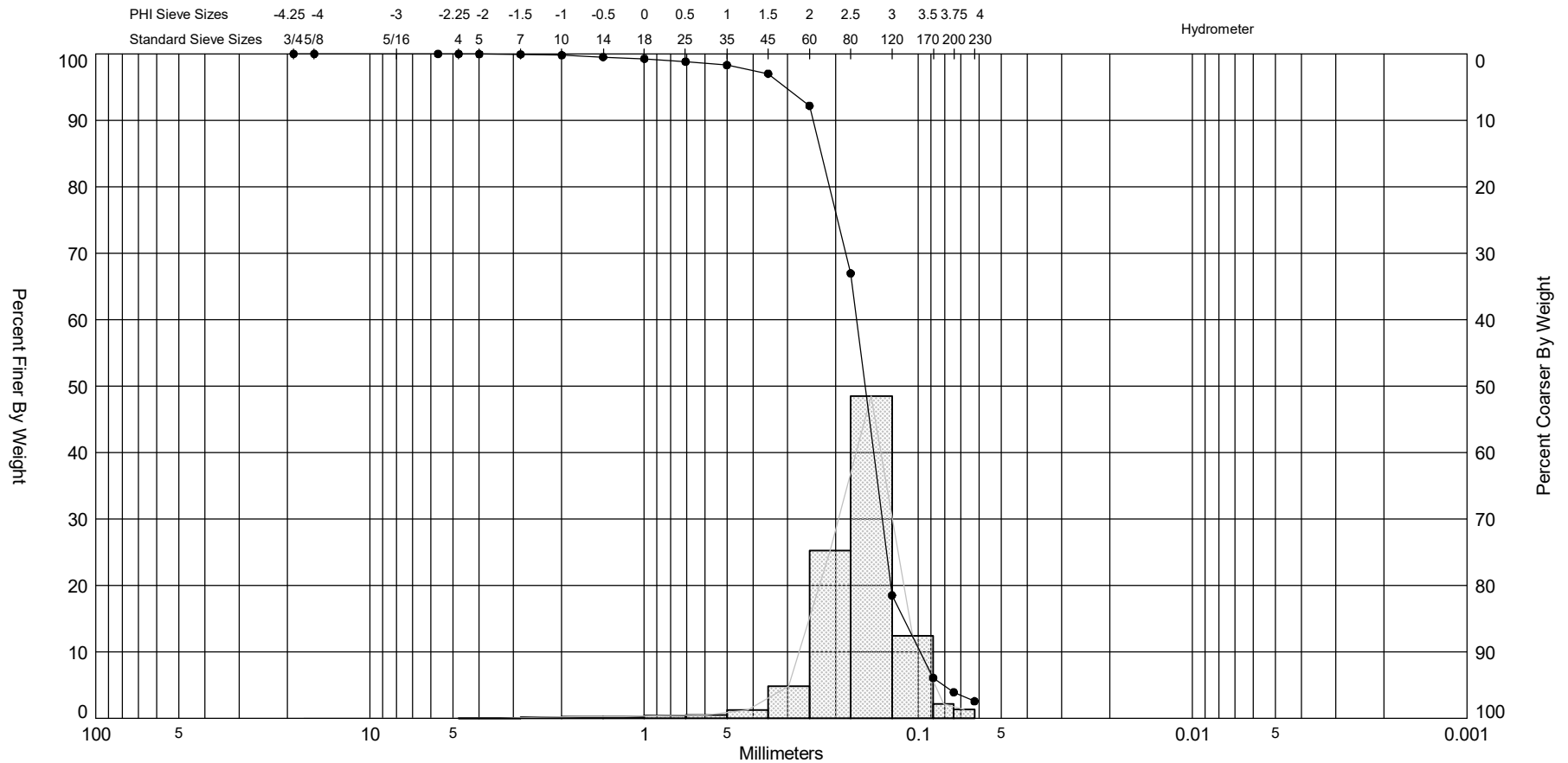
SIEVE ANALYSIS IBSP.GPJ FL DEP ROSS.GDT 11/10/20




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	
VC-14 #1	—●—	-48.0	SP	#200 - 0.35 #230 - 0.25			1.58	1.44	-1.95	9.82	0.84	Project Name:	IBSP Sand Source Survey
Comments:												Analysis Date:	09-25-20
Depths and elevations based on measured values												Analyzed By:	DCJ
							Gahagan and Bryant Associates 3802 W Bay to Bay Blvd. Suite B-22 Tampa, FL 33629 Telephone: 813-831-4408 Fax: 813-831-4216					Easting (X, ft):	1,133,214
												Northing (Y, ft):	2,110,645
												Horizontal System:	NAD 1983
												Vertical System:	IGLD MLW

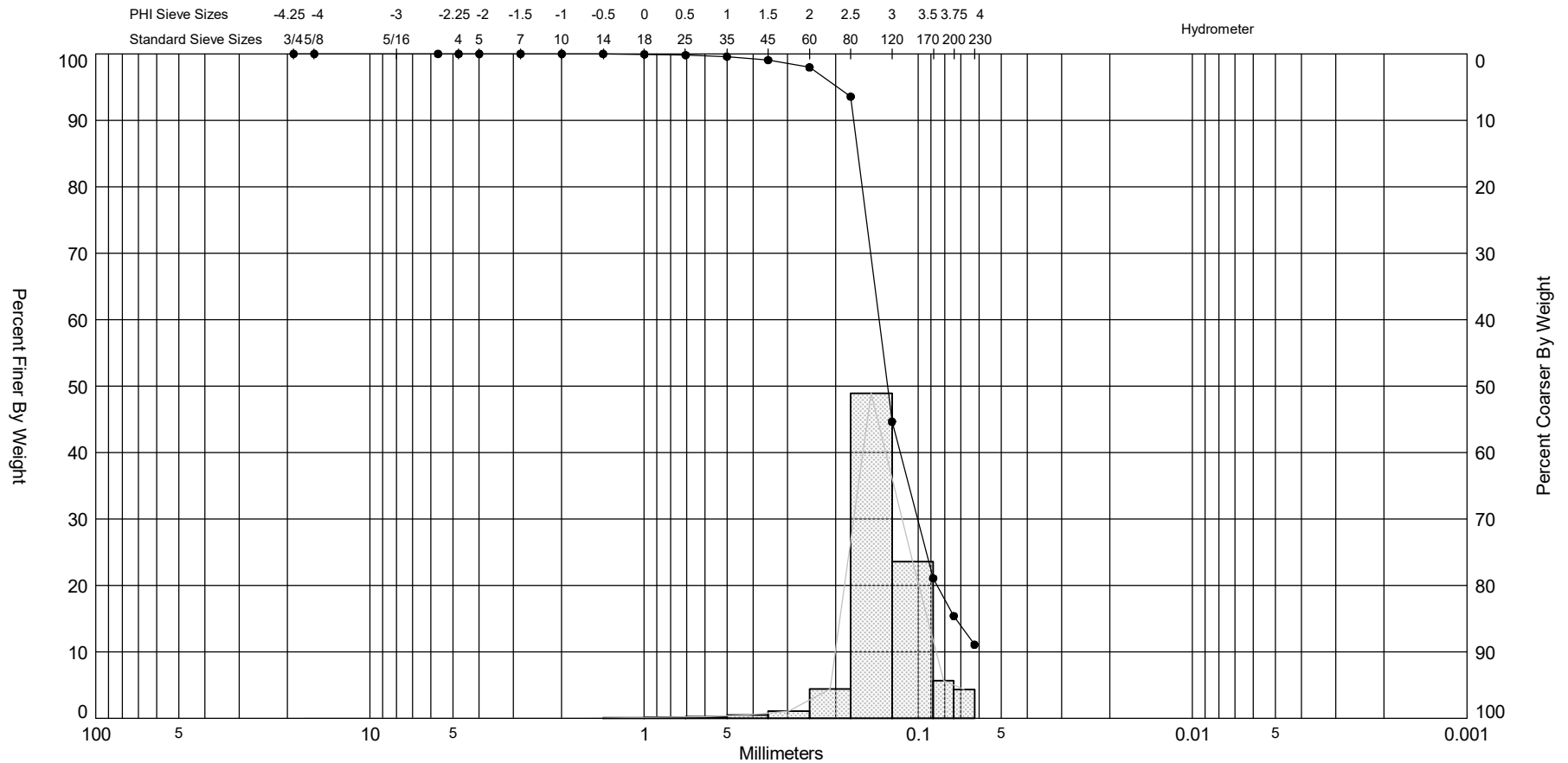
SIEVE ANALYSIS IBSP.GPJ FL DEP ROSS.GDT 11/10/20




Gravel		Sand			Silt and Clay
Coarse	Fine	Coarse	Medium	Fine	

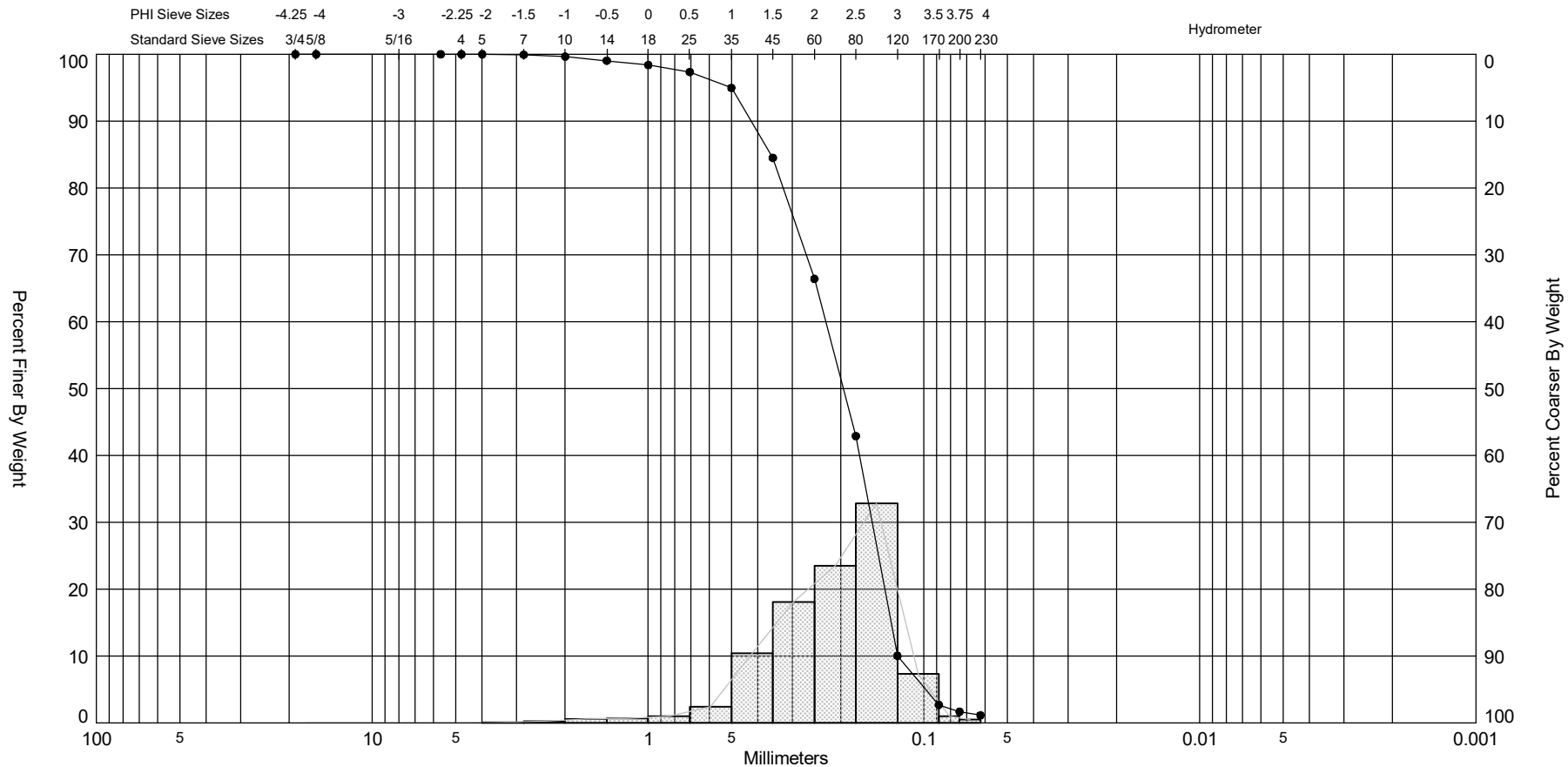
Sample	Symbol	Elev. (ft)	USCS	% Fines	% Organics	% Carbonates	Median	Mean	Skew	Kurt	Sort	Sample Information	
VC-14 #2	—●—	-51.2	SP	#200 - 3.91 #230 - 2.56			2.68	2.6	-2.01	13.28	0.58	Project Name:	IBSP Sand Source Survey
Comments:												Analysis Date:	09-25-20
Depths and elevations based on measured values												Analyzed By:	DCJ
							Gahagan and Bryant Associates 3802 W Bay to Bay Blvd. Suite B-22 Tampa, FL 33629 Telephone: 813-831-4408 Fax: 813-831-4216					Easting (X, ft):	1,133,214
												Northing (Y, ft):	2,110,645
												Horizontal System:	NAD 1983
												Vertical System:	IGLD MLW

SIEVE ANALYSIS IBSP.GPJ FL DEP ROSS.GDT 11/10/20




Gravel		Sand			Silt and Clay
Coarse	Fine	Coarse	Medium	Fine	

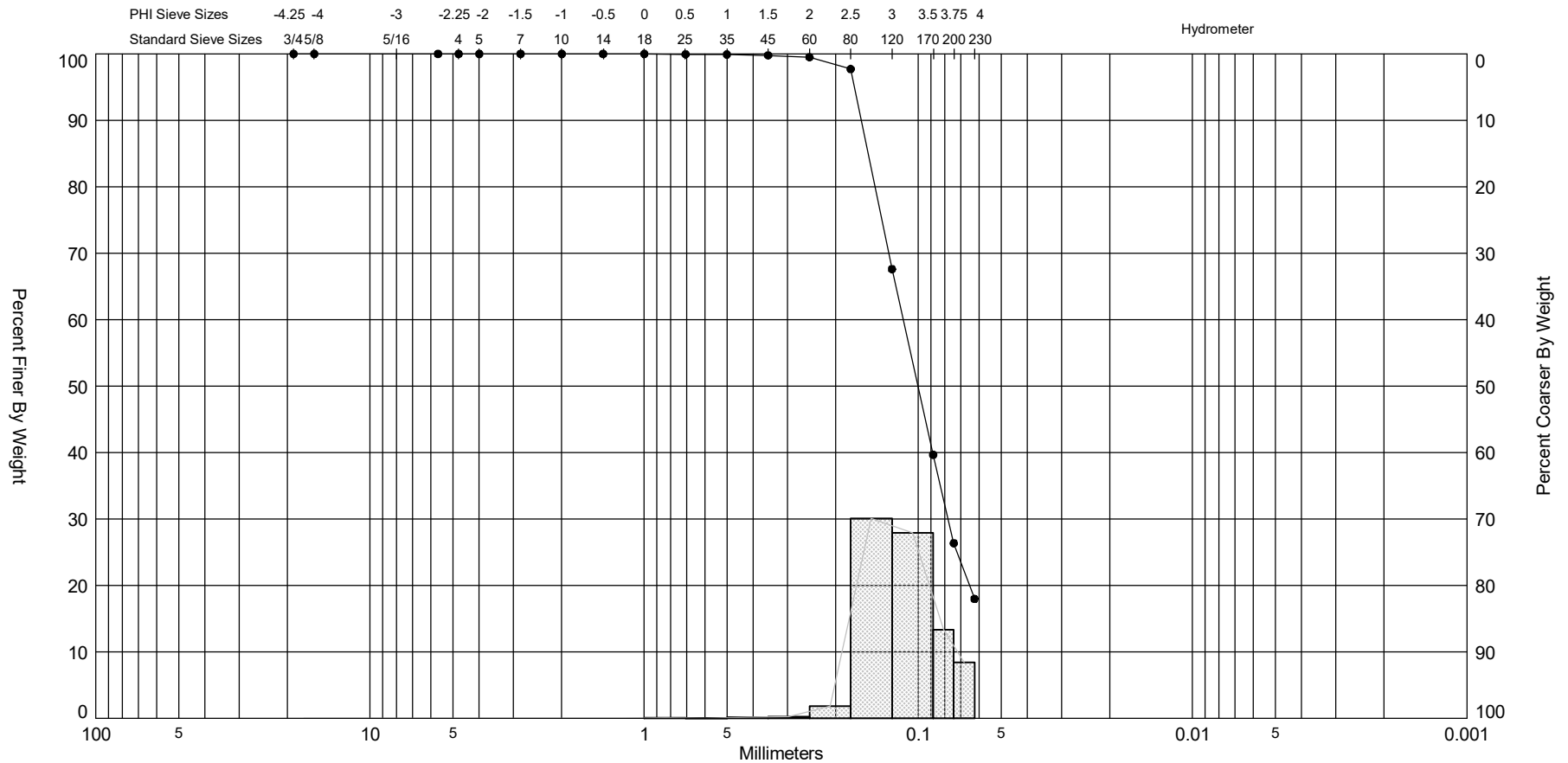
Sample	Symbol	Elev. (ft)	USCS	% Fines	% Organics	% Carbonates	Median	Mean	Skew	Kurt	Sort	Sample Information	
VC-14 #3	—●—	-53.0	SM	#200 - 15.38 #230 - 11.07			2.95	2.94	-0.81	8.1	0.45	Project Name:	IBSP Sand Source Survey
Comments:												Analysis Date:	09-25-20
Depths and elevations based on measured values												Analyzed By:	DCJ
						Gahagan and Bryant Associates 3802 W Bay to Bay Blvd. Suite B-22 Tampa, FL 33629 Telephone: 813-831-4408 Fax: 813-831-4216						Easting (X, ft):	1,133,214
												Northing (Y, ft):	2,110,645
												Horizontal System:	NAD 1983
												Vertical System:	IGLD MLW




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	
VC-15 #1	—●—	-49.9	SP	#200 - 1.67 #230 - 1.13			2.35	2.21	-1.12	5.5	0.76	Project Name:	IBSP Sand Source Survey
Comments:												Analysis Date:	10-05-20
Depths and elevations based on measured values												Analyzed By:	DCJ
						Gahagan and Bryant Associates 3802 W Bay to Bay Blvd. Suite B-22 Tampa, FL 33629 Telephone: 813-831-4408 Fax: 813-831-4216						Easting (X, ft):	1,131,538
												Northing (Y, ft):	2,112,641
												Horizontal System:	NAD 1983
												Vertical System:	IGLD MLW

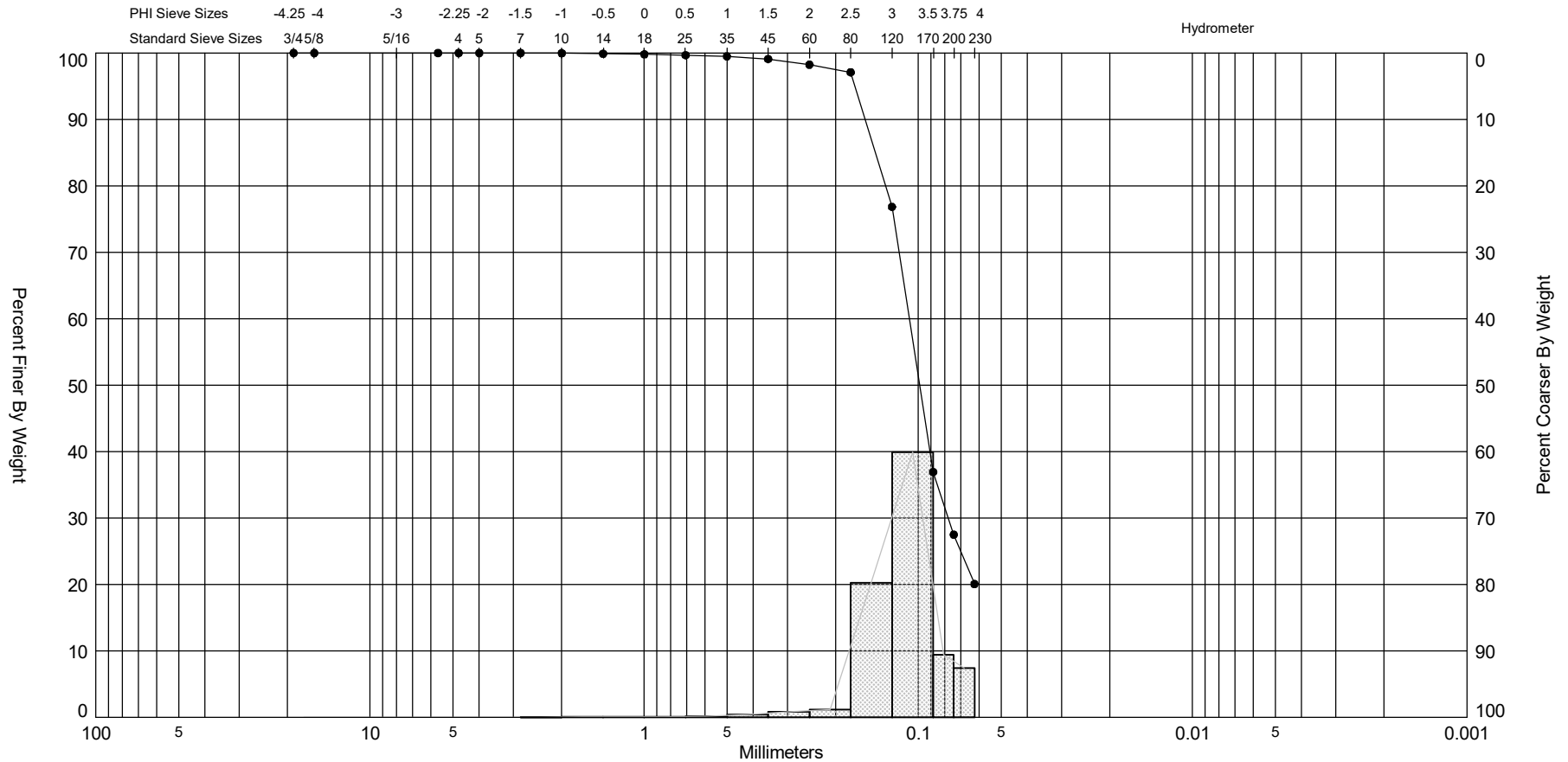
SIEVE ANALYSIS IBSP.GPJ FL DEP ROSS.GDT 11/10/20




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	
VC-15 #2	—●—	-53.9	SM	#200 - 26.36 #230 - 17.96			3.32	3.16	-0.33	4.12	0.44	Project Name:	IBSP Sand Source Survey
Comments:												Analysis Date:	10-05-20
Depths and elevations based on measured values												Analyzed By:	DCJ
							Gahagan and Bryant Associates 3802 W Bay to Bay Blvd. Suite B-22 Tampa, FL 33629 Telephone: 813-831-4408 Fax: 813-831-4216					Easting (X, ft):	1,131,538
												Northing (Y, ft):	2,112,641
												Horizontal System:	NAD 1983
												Vertical System:	IGLD MLW

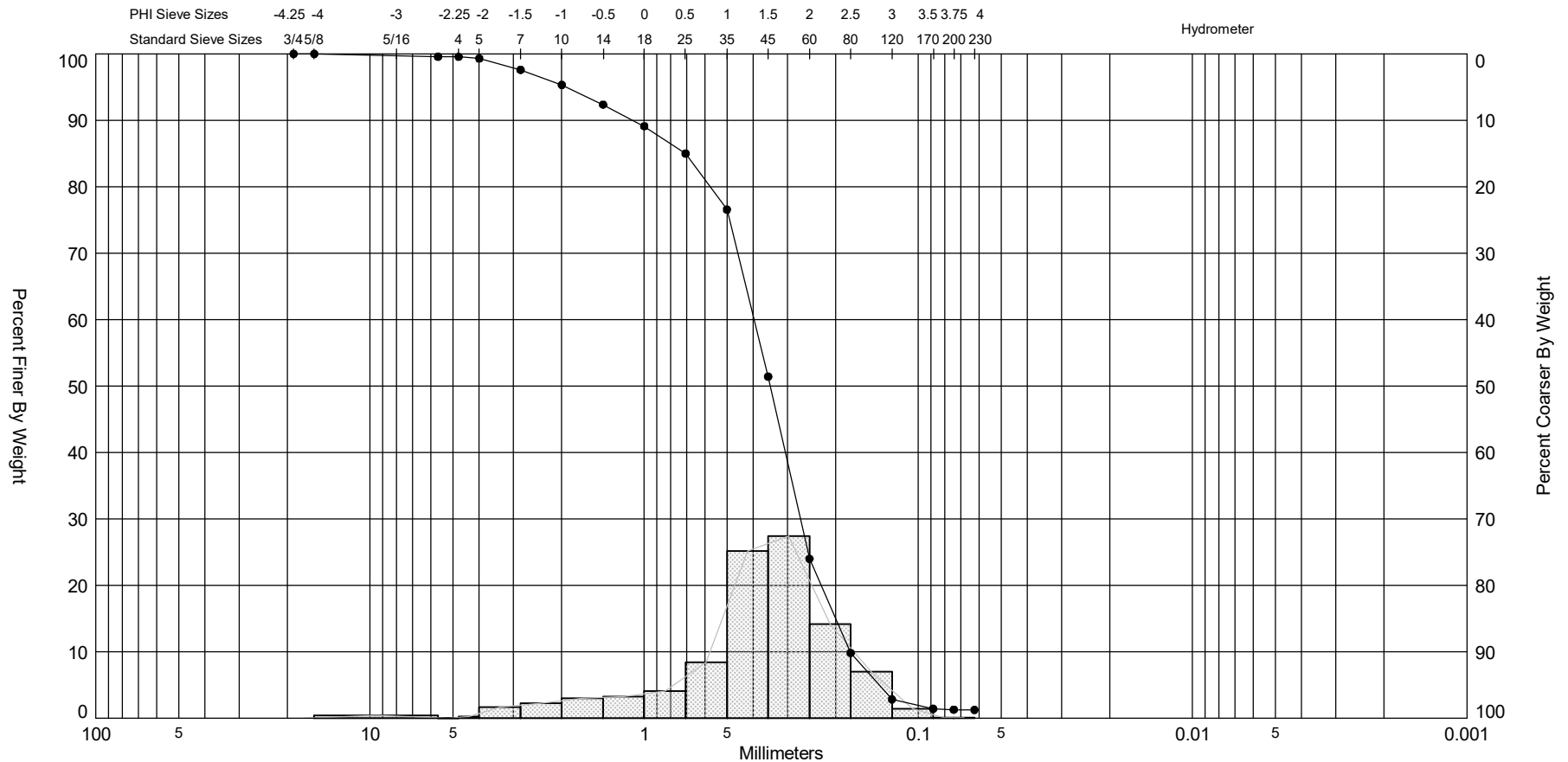
SIEVE ANALYSIS IBSP.GPJ FL DEP ROSS.GDT 11/10/20




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	
VC-15 #3	—●—	-56.9	SM	#200 - 27.50 #230 - 20.06			3.34	3.17	-2.29	16.26	0.48	Project Name:	IBSP Sand Source Survey
Comments:												Analysis Date:	10-05-20
Depths and elevations based on measured values												Analyzed By:	DCJ
						Gahagan and Bryant Associates 3802 W Bay to Bay Blvd. Suite B-22 Tampa, FL 33629 Telephone: 813-831-4408 Fax: 813-831-4216						Easting (X, ft):	1,131,538
												Northing (Y, ft):	2,112,641
												Horizontal System:	NAD 1983
												Vertical System:	IGLD MLW

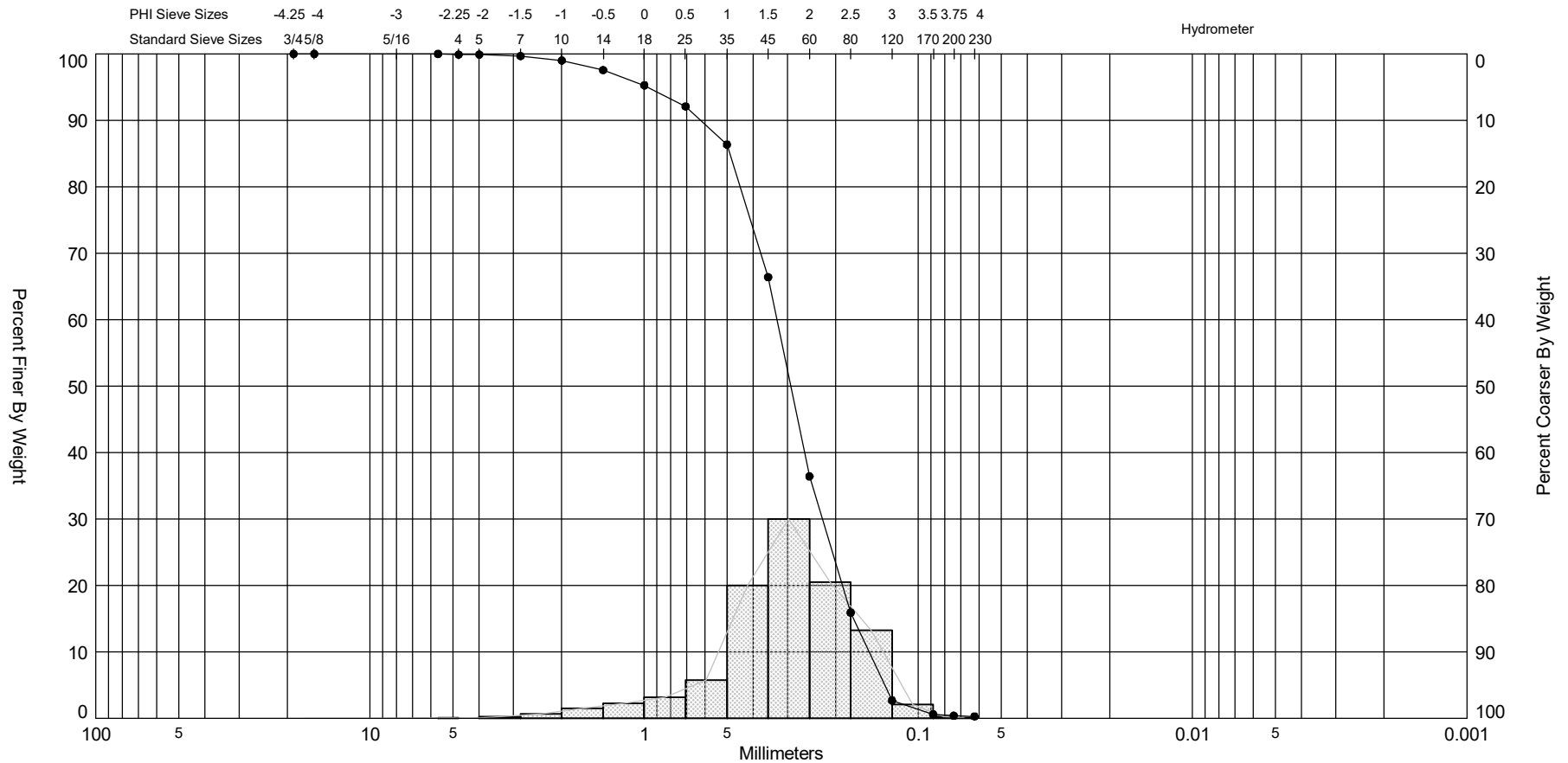
SIEVE ANALYSIS IBSP.GPJ FL DEP ROSS.GDT 11/10/20




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	
VC-16 #1	—●—	-48.6	SW	#200 - 1.29 #230 - 1.24			1.53	1.34	-1.26	5.2	1.05	Project Name:	IBSP Sand Source Survey
Comments:												Analysis Date:	10-05-20
Depths and elevations based on measured values												Analyzed By:	DCJ
							Gahagan and Bryant Associates 3802 W Bay to Bay Blvd. Suite B-22 Tampa, FL 33629 Telephone: 813-831-4408 Fax: 813-831-4216					Easting (X, ft):	1,133,189
												Northing (Y, ft):	2,112,657
												Horizontal System:	NAD 1983
												Vertical System:	IGLD MLW

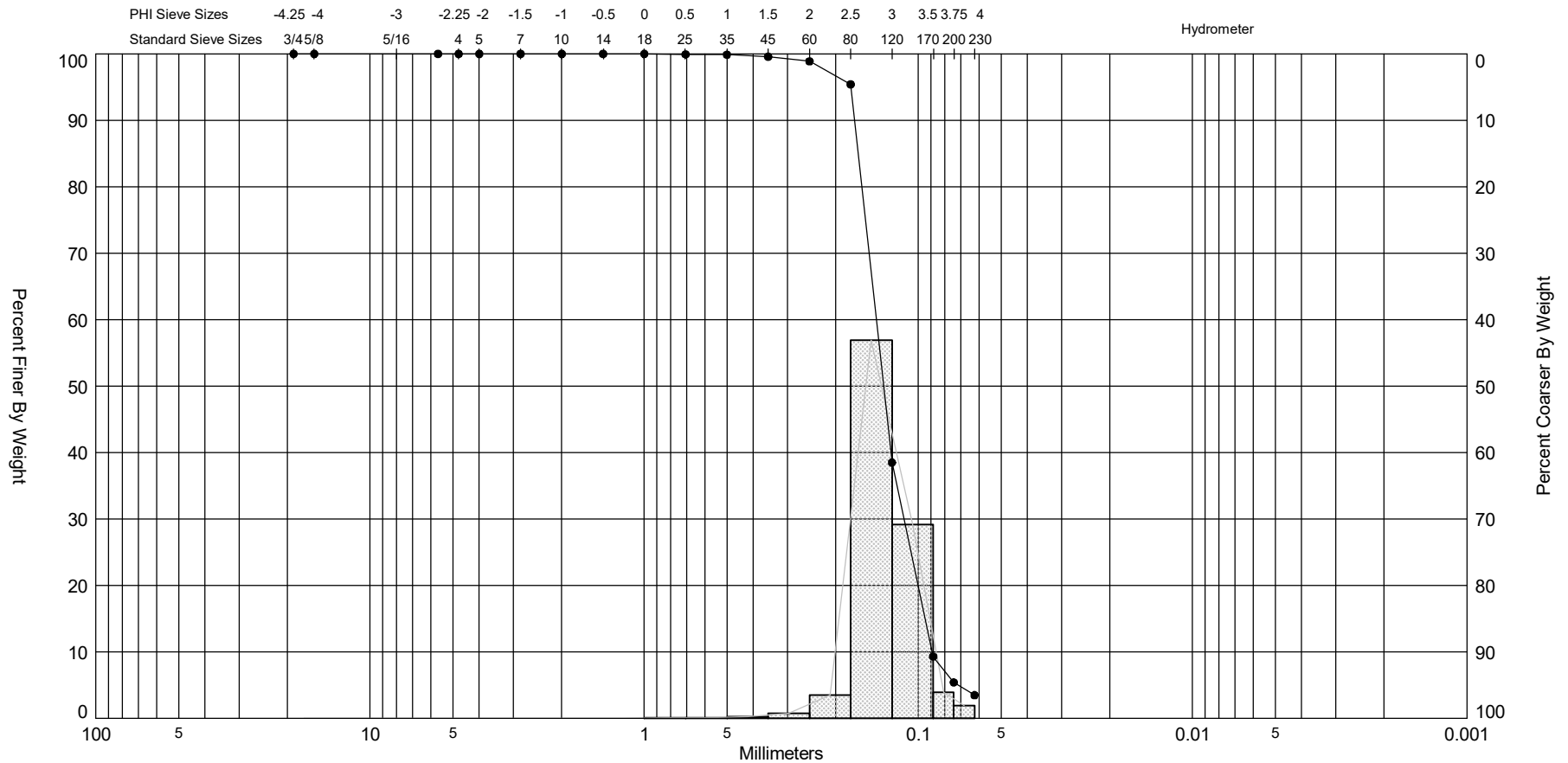
SIEVE ANALYSIS IBSP.GPJ FL DEP ROSS.GDT 11/10/20




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	
VC-16 #2	—●—	-50.1	SP	#200 - 0.39 #230 - 0.29			1.77	1.7	-1	5.01	0.84	Project Name:	IBSP Sand Source Survey
Comments:												Analysis Date:	10-05-20
Depths and elevations based on measured values												Analyzed By:	DCJ
							Gahagan and Bryant Associates 3802 W Bay to Bay Blvd. Suite B-22 Tampa, FL 33629 Telephone: 813-831-4408 Fax: 813-831-4216					Easting (X, ft):	1,133,189
												Northing (Y, ft):	2,112,657
												Horizontal System:	NAD 1983
												Vertical System:	IGLD MLW

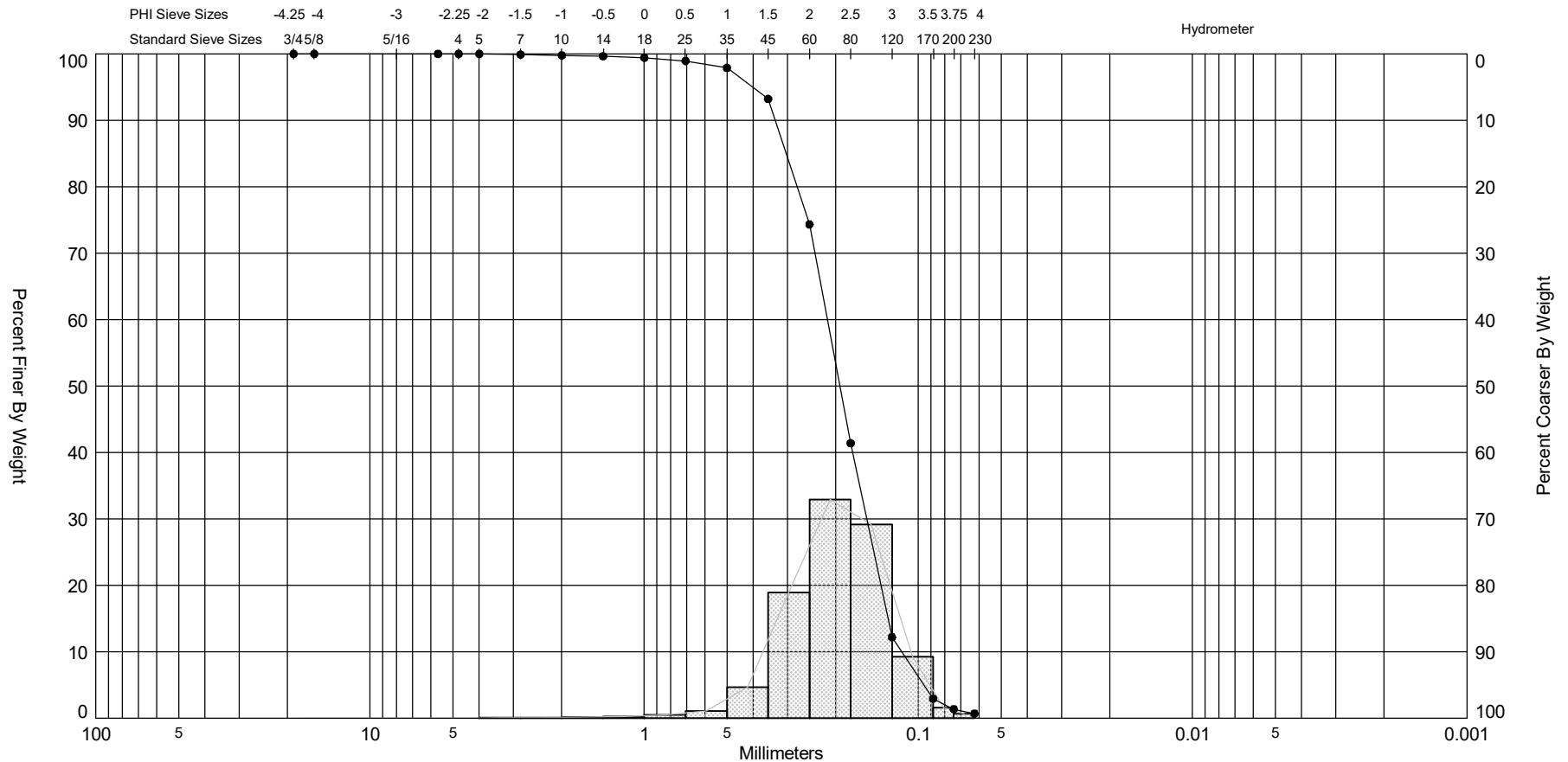
SIEVE ANALYSIS IBSP.GPJ FL DEP ROSS.GDT 11/10/20




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	
VC-16 #3	—●—	-53.6	SP-SM	#200 - 5.40 #230 - 3.47			2.9	2.93	-0.38	7.14	0.36	Project Name:	IBSP Sand Source Survey
Comments:												Analysis Date:	10-05-20
Depths and elevations based on measured values												Analyzed By:	DCJ
							Gahagan and Bryant Associates 3802 W Bay to Bay Blvd. Suite B-22 Tampa, FL 33629 Telephone: 813-831-4408 Fax: 813-831-4216					Easting (X, ft):	1,133,189
												Northing (Y, ft):	2,112,657
												Horizontal System:	NAD 1983
												Vertical System:	IGLD MLW

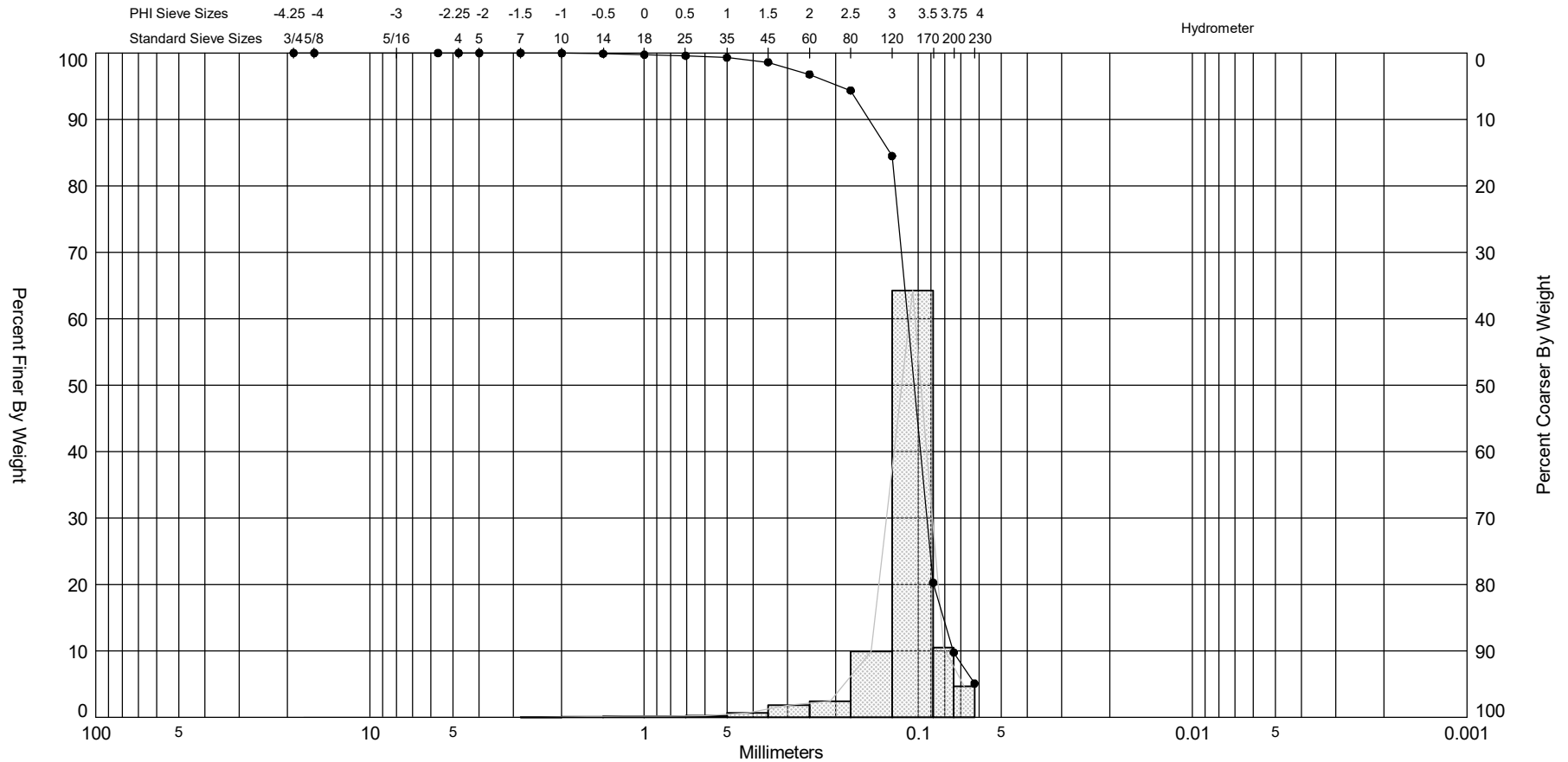
SIEVE ANALYSIS IBSP.GPJ FL DEP ROSS.GDT 11/10/20




Gravel		Sand			Silt and Clay
Coarse	Fine	Coarse	Medium	Fine	

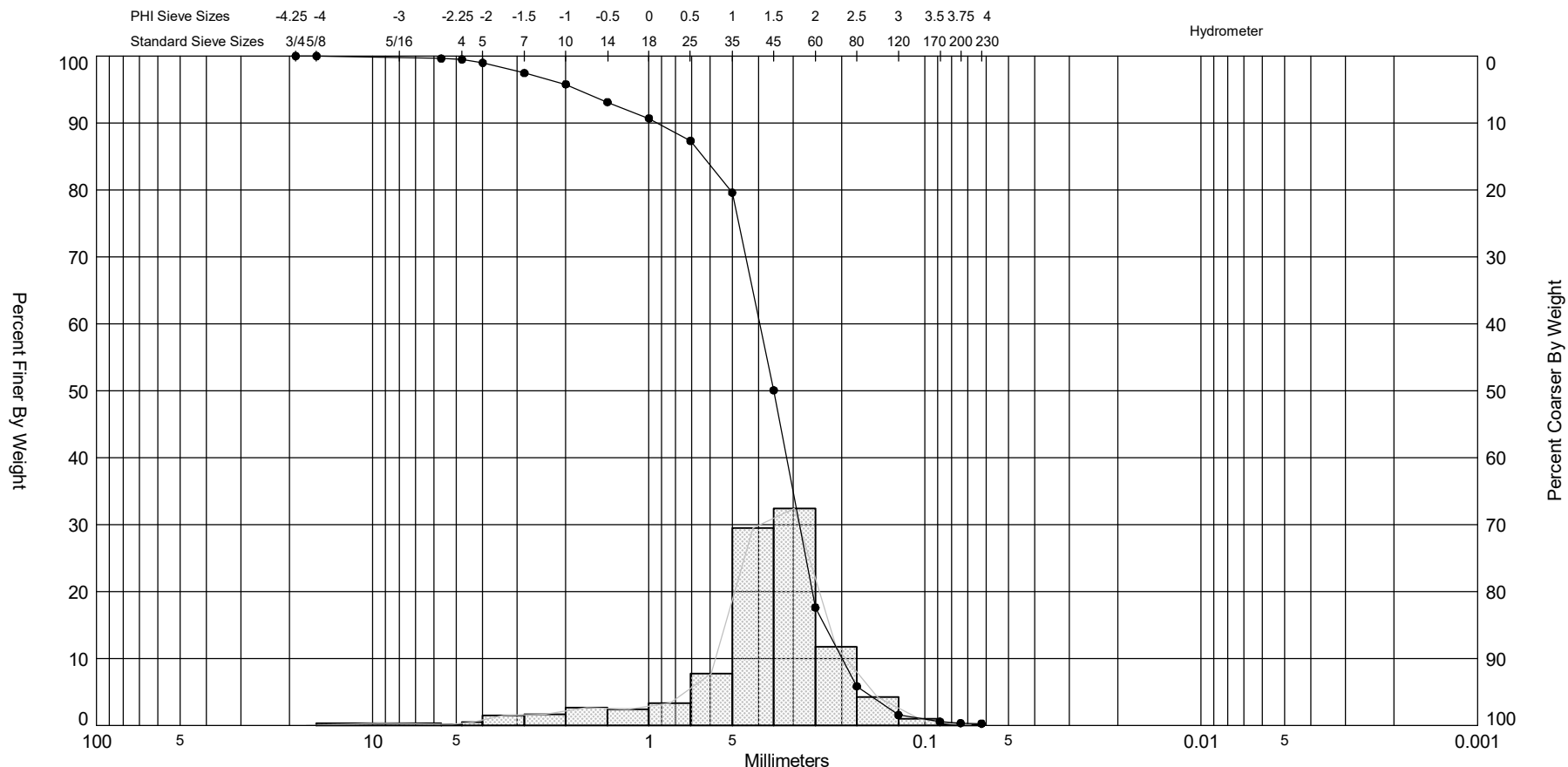
Sample	Symbol	Elev. (ft)	USCS	% Fines	% Organics	% Carbonates	Median	Mean	Skew	Kurt	Sort	Sample Information	
VC-17 #1	—●—	-42.6	SP	#200 - 1.37 #230 - 0.70			2.37	2.34	-0.93	6.84	0.63	Project Name:	IBSP Sand Source Survey
Comments:												Analysis Date:	10-05-20
Depths and elevations based on measured values												Analyzed By:	DCJ
							Gahagan and Bryant Associates 3802 W Bay to Bay Blvd, Suite B-22 Tampa, FL 33629 Telephone: 813-831-4408 Fax: 813-831-4216					Easting (X, ft):	1,139,932
												Northing (Y, ft):	2,112,704
												Horizontal System:	NAD 1983
												Vertical System:	IGLD MLW

SIEVE ANALYSIS IBSP.GPJ FL DEP ROSS.GDT 11/10/20



Gravel		Sand			Silt and Clay
Coarse	Fine	Coarse	Medium	Fine	

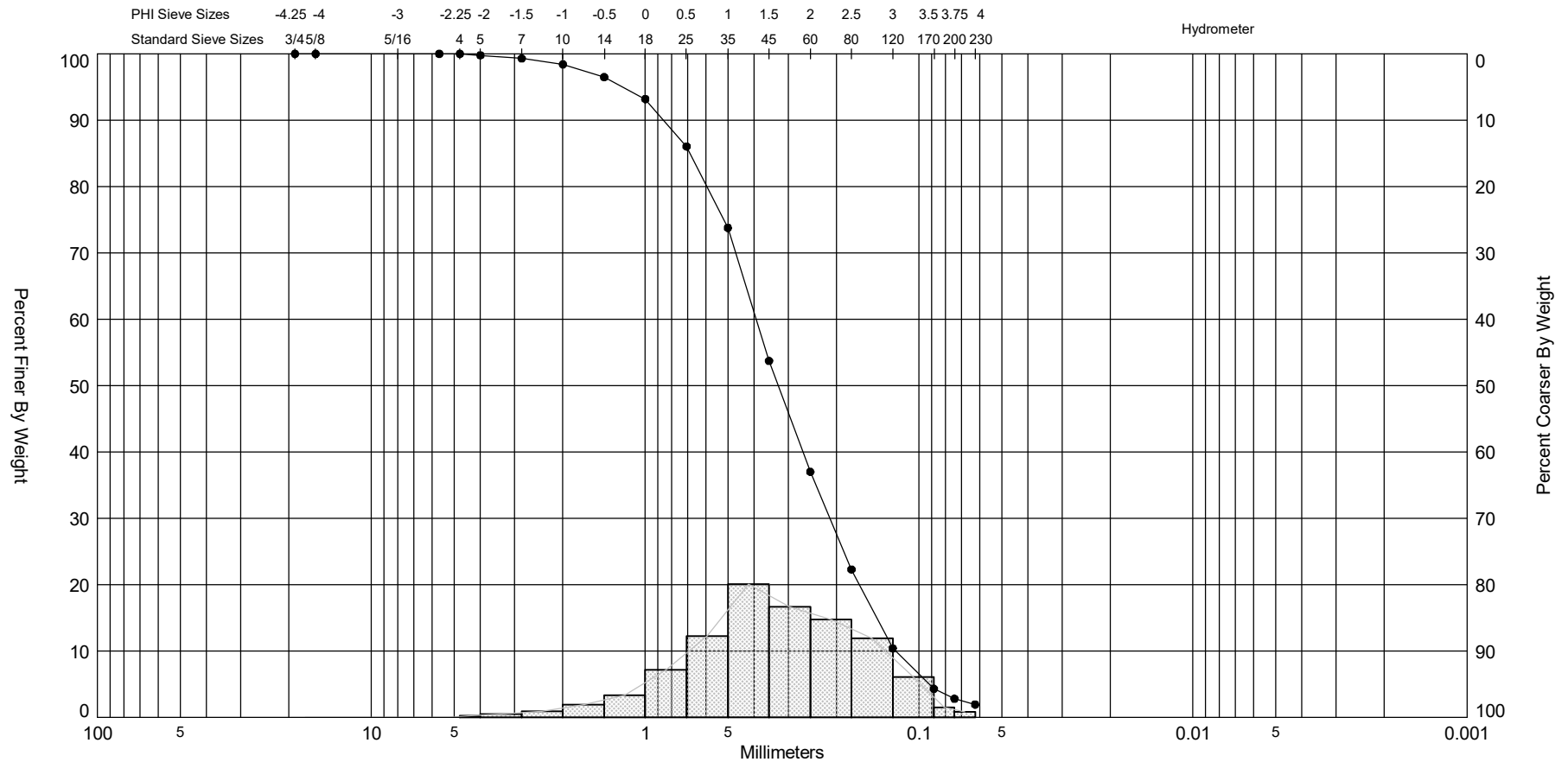
Sample	Symbol	Elev. (ft)	USCS	% Fines	% Organics	% Carbonates	Median	Mean	Skew	Kurt	Sort	Sample Information	
VC-17 #2	—●—	-44.2	SP-SM	#200 - 9.77 #230 - 5.08			3.27	3.18	-3.1	19.03	0.47	Project Name:	IBSP Sand Source Survey
Comments:												Analysis Date:	10-05-20
Depths and elevations based on measured values												Analyzed By:	DCJ
						Gahagan and Bryant Associates 3802 W Bay to Bay Blvd. Suite B-22 Tampa, FL 33629 Telephone: 813-831-4408 Fax: 813-831-4216						Easting (X, ft):	1,139,932
												Northing (Y, ft):	2,112,704
												Horizontal System:	NAD 1983
												Vertical System:	IGLD MLW




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	
VC-18 #1	—●—	-41.8	SW	#200 - 0.35 #230 - 0.28			1.5	1.33	-1.53	6.54	0.98	Project Name:	IBSP Sand Source Survey
Comments:												Analysis Date:	10-05-20
Depths and elevations based on measured values												Analyzed By:	DCJ
							Gahagan and Bryant Associates 3802 W Bay to Bay Blvd. Suite B-22 Tampa, FL 33629 Telephone: 813-831-4408 Fax: 813-831-4216					Easting (X, ft):	1,138,958
												Northing (Y, ft):	2,112,686
												Horizontal System:	NAD 1983
												Vertical System:	IGLD MLW

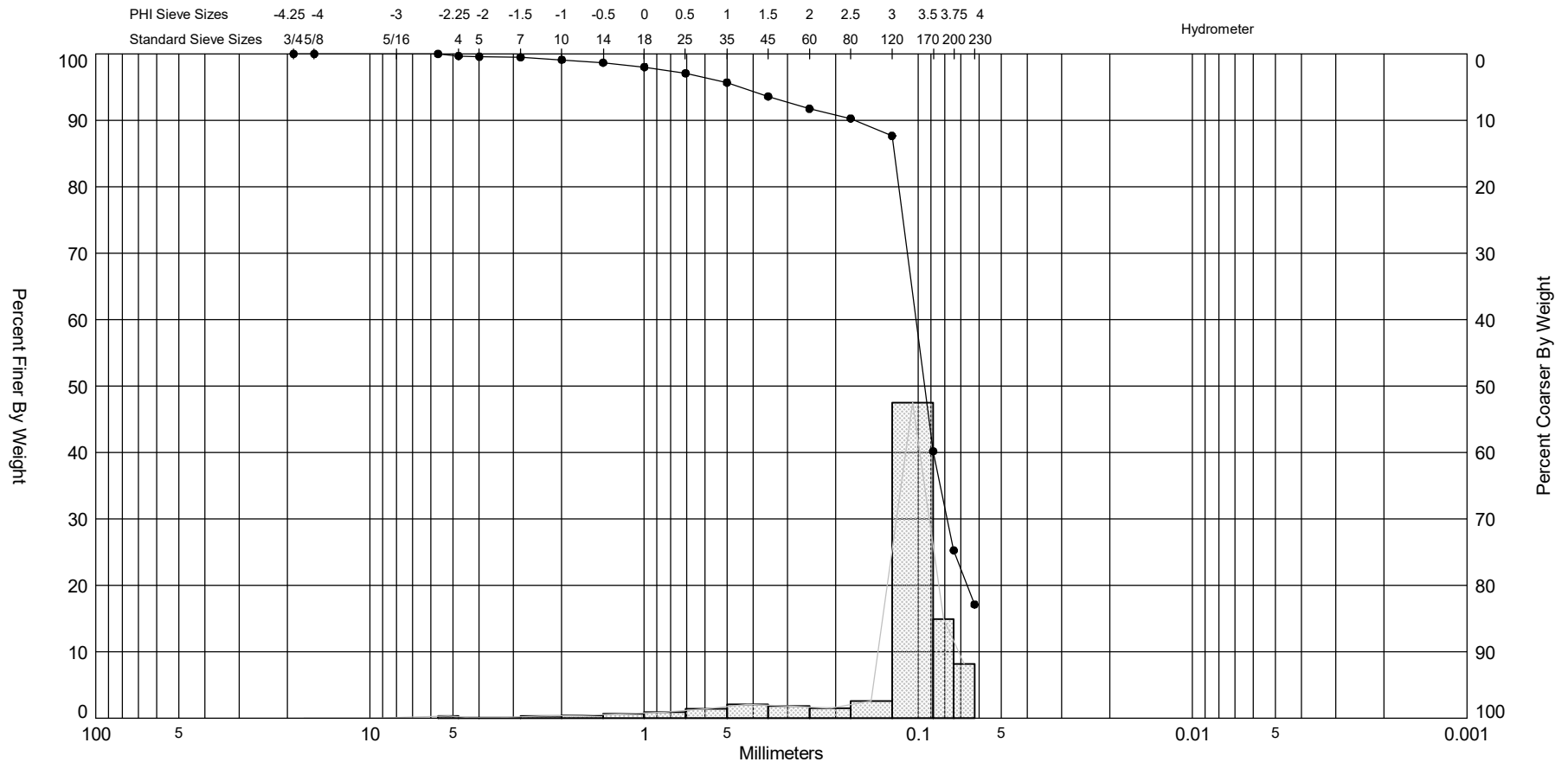
SIEVE ANALYSIS IBSP.GPJ FL DEP ROSS.GDT 11/10/20




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	
VC-18 #2	—●—	-45.3	SW	#200 - 2.80 #230 - 1.94			1.61	1.58	-0.36	3.18	1.07	Project Name:	IBSP Sand Source Survey
Comments:												Analysis Date:	10-05-20
Depths and elevations based on measured values												Analyzed By:	DCJ
						Gahagan and Bryant Associates 3802 W Bay to Bay Blvd. Suite B-22 Tampa, FL 33629 Telephone: 813-831-4408 Fax: 813-831-4216						Easting (X, ft):	1,138,958
												Northing (Y, ft):	2,112,686
												Horizontal System:	NAD 1983
												Vertical System:	IGLD MLW

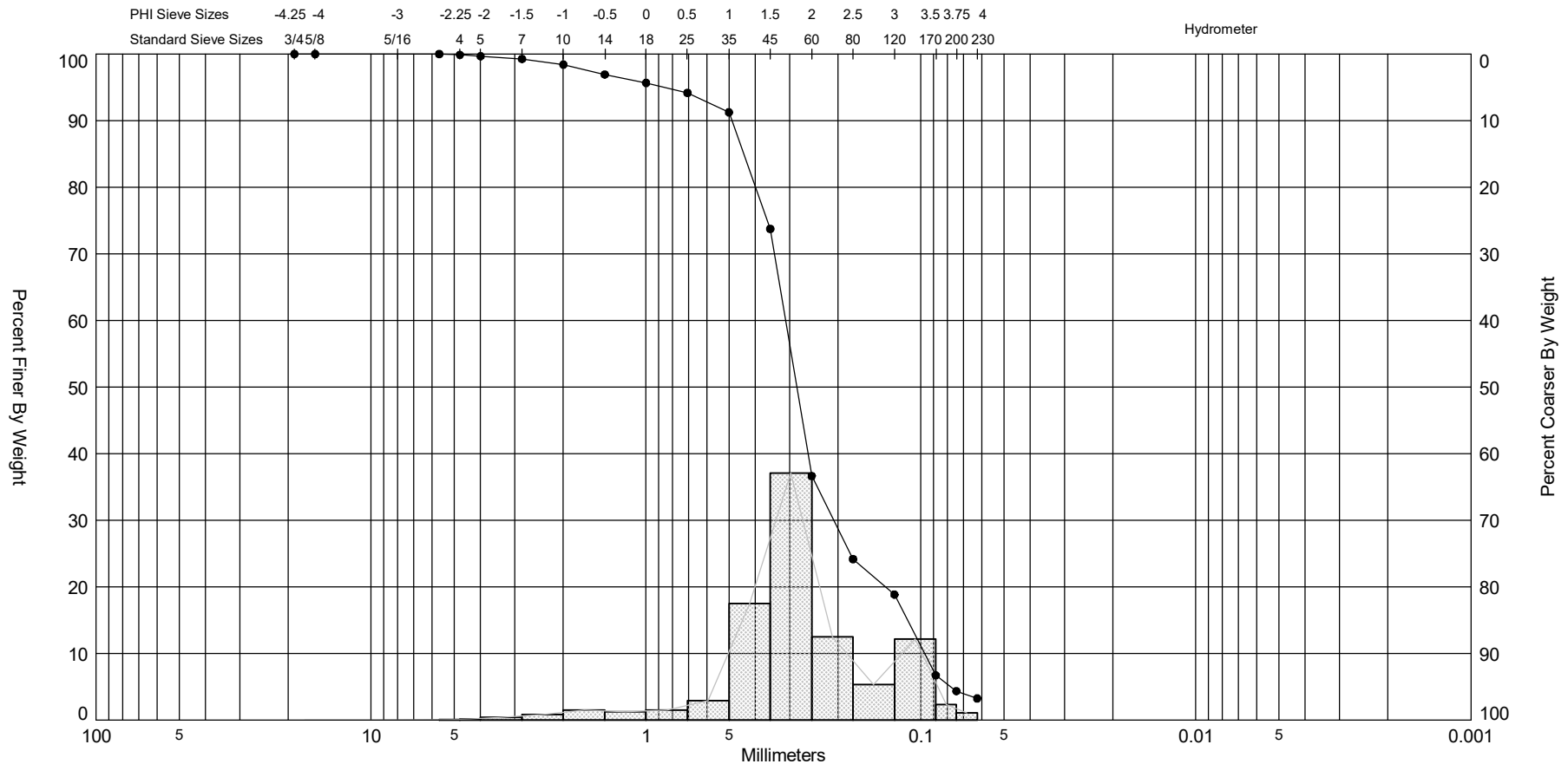
SIEVE ANALYSIS IBSP.GPJ FL DEP ROSS.GDT 11/10/20




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	
VC-18 #3	—●—	-45.7	SM	#200 - 25.27 #230 - 17.12			3.4	3.08	-3.03	13.32	0.94	Project Name:	IBSP Sand Source Survey
Comments:												Analysis Date:	10-05-20
Depths and elevations based on measured values												Analyzed By:	DCJ
						Gahagan and Bryant Associates 3802 W Bay to Bay Blvd. Suite B-22 Tampa, FL 33629 Telephone: 813-831-4408 Fax: 813-831-4216						Easting (X, ft):	1,138,958
												Northing (Y, ft):	2,112,686
												Horizontal System:	NAD 1983
												Vertical System:	IGLD MLW

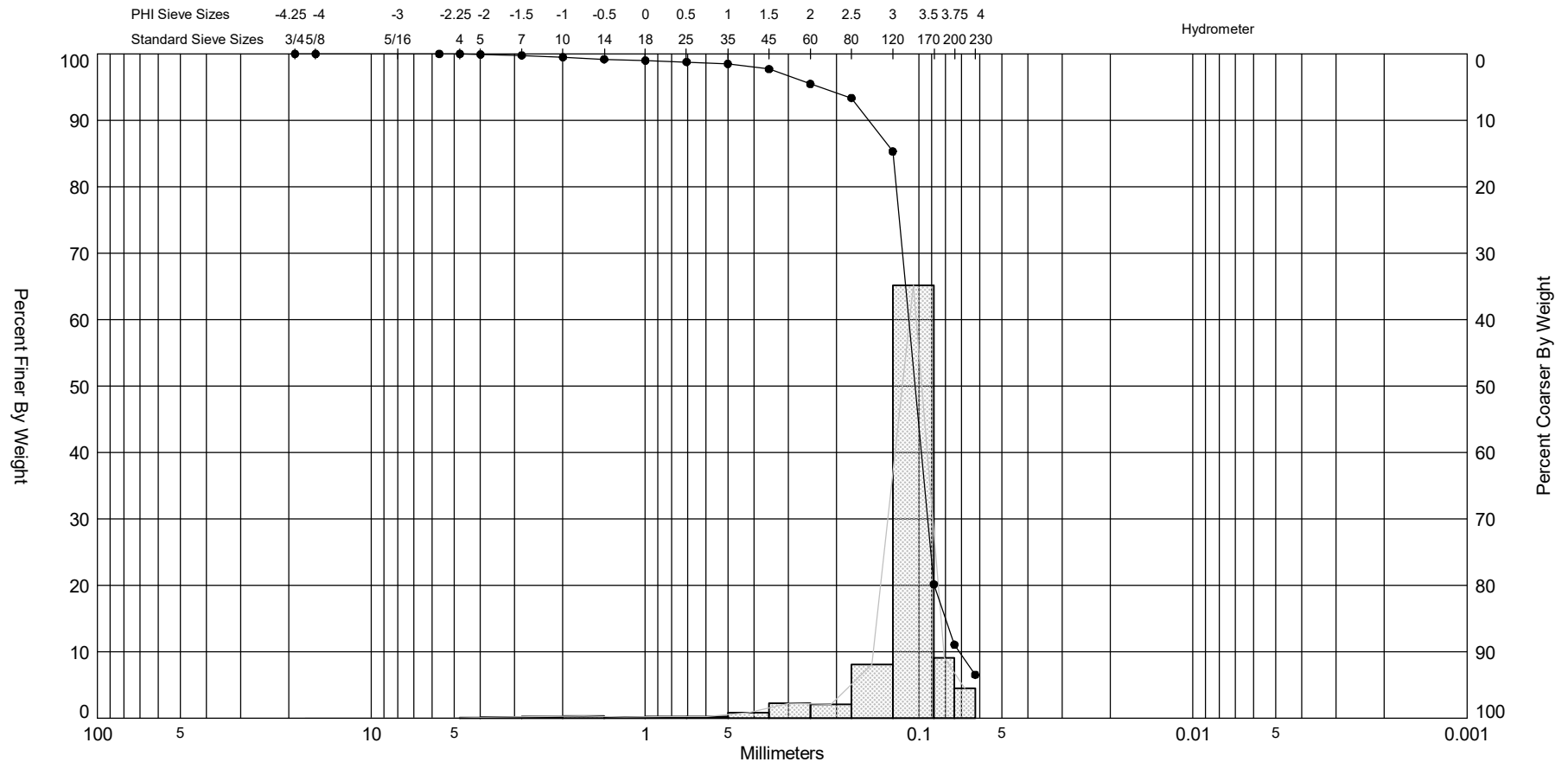
SIEVE ANALYSIS IBSP.GPJ FL DEP ROSS.GDT 11/10/20




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	
VC-19 #1	—●—	-39.0	SW	#200 - 4.35 #230 - 3.24			1.82	1.87	-0.7	5.2	0.97	Project Name:	IBSP Sand Source Survey
Comments:												Analysis Date:	10-05-20
Depths and elevations based on measured values												Analyzed By:	DCJ
							Gahagan and Bryant Associates 3802 W Bay to Bay Blvd. Suite B-22 Tampa, FL 33629 Telephone: 813-831-4408 Fax: 813-831-4216					Easting (X, ft):	1,140,337
												Northing (Y, ft):	2,114,198
												Horizontal System:	NAD 1983
												Vertical System:	IGLD MLW

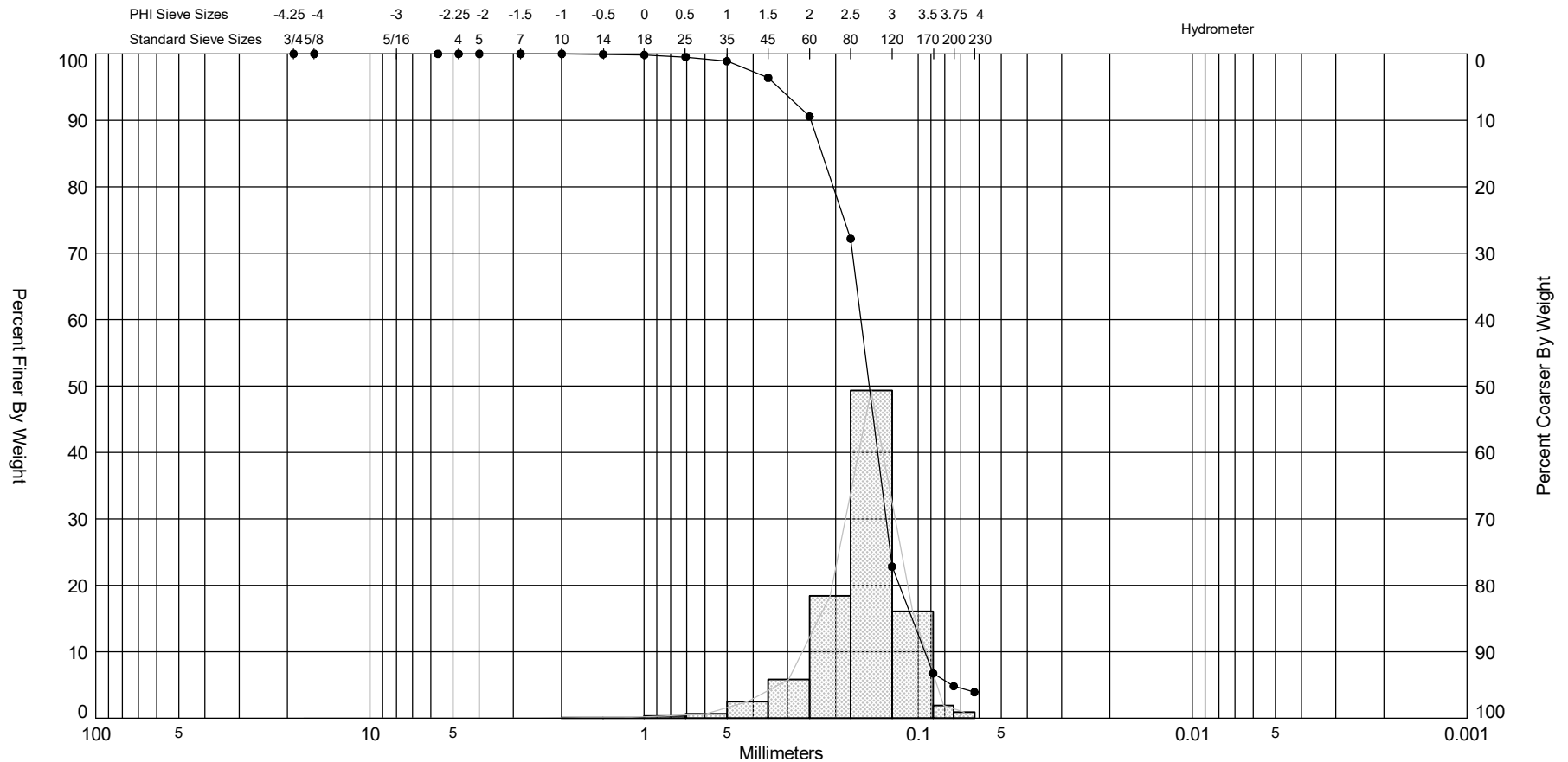
SIEVE ANALYSIS IBSP.GPJ FL DEP ROSS.GDT 11/10/20




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	
VC-19 #2	—●—	-41.0	SP-SM	#200 - 11.05 #230 - 6.54			3.27	3.14	-4.2	26.83	0.62	Project Name:	IBSP Sand Source Survey
Comments:												Analysis Date:	10-05-20
Depths and elevations based on measured values												Analyzed By:	DCJ
							Gahagan and Bryant Associates 3802 W Bay to Bay Blvd. Suite B-22 Tampa, FL 33629 Telephone: 813-831-4408 Fax: 813-831-4216					Easting (X, ft):	1,140,337
												Northing (Y, ft):	2,114,198
												Horizontal System:	NAD 1983
												Vertical System:	IGLD MLW

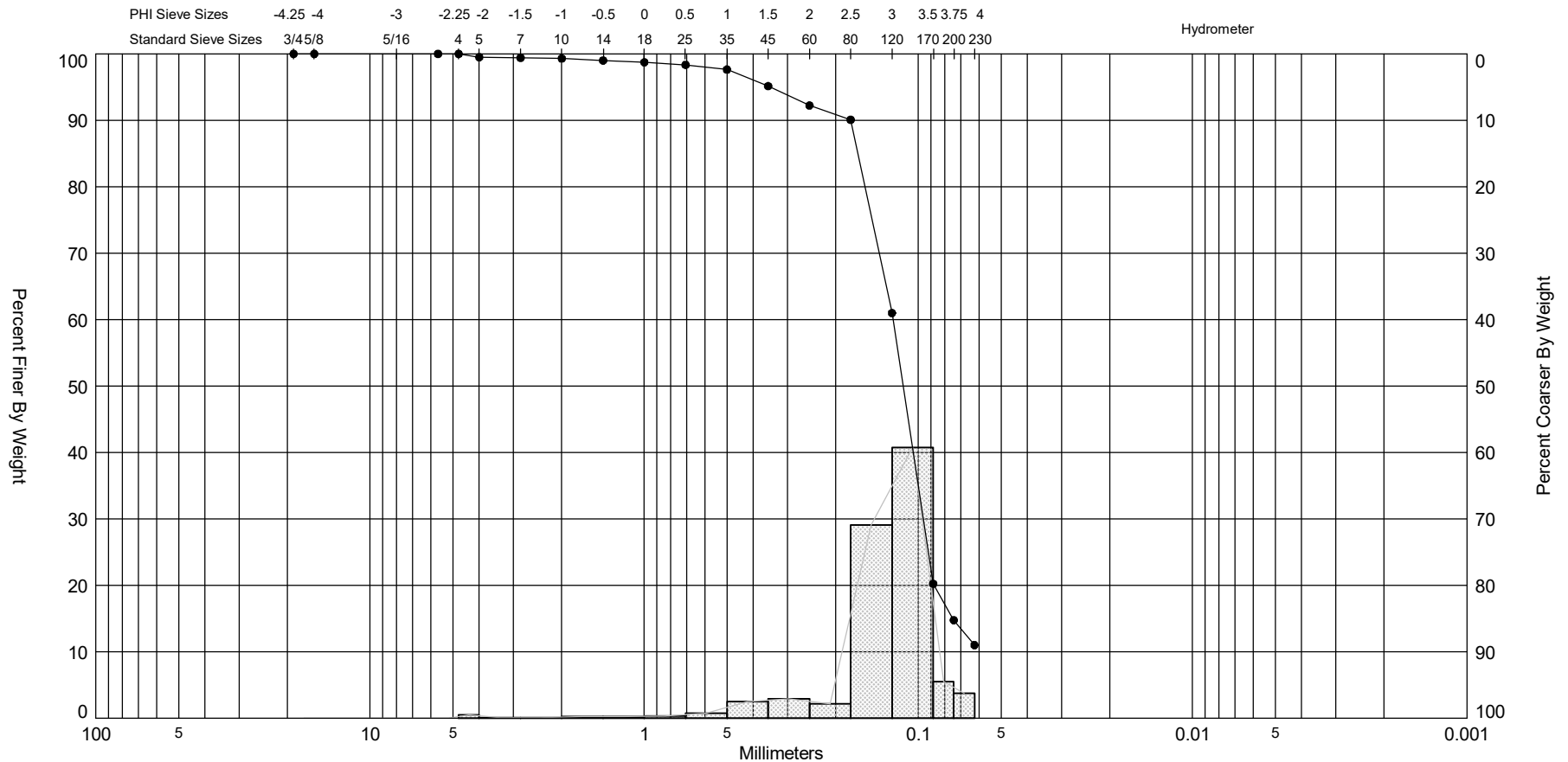
SIEVE ANALYSIS IBSP.GPJ FL DEP ROSS.GDT 11/10/20




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	
VC-20 #1	—●—	-43.9	SP	#200 - 4.82 #230 - 3.91			2.72	2.64	-1.2	6.6	0.54	Project Name:	IBSP Sand Source Survey
Comments:												Analysis Date:	10-05-20
Depths and elevations based on measured values												Analyzed By:	DCJ
							Gahagan and Bryant Associates 3802 W Bay to Bay Blvd. Suite B-22 Tampa, FL 33629 Telephone: 813-831-4408 Fax: 813-831-4216					Easting (X, ft):	1,139,260
												Northing (Y, ft):	2,115,192
												Horizontal System:	NAD 1983
												Vertical System:	IGLD MLW

SIEVE ANALYSIS IBSP.GPJ FL DEP ROSS.GDT 11/10/20



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	
VC-20 #2	—●—	-46.6	SM	#200 - 14.76 #230 - 11.01			3.13	2.91	-3.15	17.28	0.77	Project Name:	IBSP Sand Source Survey
Comments:												Analysis Date:	10-05-20
Depths and elevations based on measured values												Analyzed By:	DCJ
							Gahagan and Bryant Associates 3802 W Bay to Bay Blvd. Suite B-22 Tampa, FL 33629 Telephone: 813-831-4408 Fax: 813-831-4216					Easting (X, ft):	1,139,260
												Northing (Y, ft):	2,115,192
												Horizontal System:	NAD 1983
												Vertical System:	IGLD MLW

Granularmetric Report

Depths and elevations based on measured values



Gahagan and Bryant Associates
 3802 W Bay to Bay Blvd. Suite B-22
 Tampa, FL 33629
 Telephone: 813-831-4408
 Fax: 813-831-4216

Project Name: IBSP Sand Source Survey

Sample Name: VC-01 #1

Analysis Date: 09-24-20

Analyzed By: DCJ

Easting (ft): 1,132,171	Northing (ft): 2,101,147	Coordinate System: State Plane	Elevation (ft): -26.8 IGLD MLW
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USCS: SP-SM	Munsell: Dry - 10YR-7/2	Comments:
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Dry Weight (g): 123.52	Wash Weight (g): 123.42	Pan Retained (g): 3.00	Sieve Loss (%): 0.04	Fines (%): #200 - 7.44 #230 - 2.55	Organics (%):	Carbonates (%):	Shells (%):
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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
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	0.08	0.06	0.08	0.06
14	-0.50	1.41	0.13	0.11	0.21	0.17
18	0.00	1.00	0.08	0.06	0.29	0.23
25	0.50	0.71	0.06	0.05	0.35	0.28
35	1.00	0.50	0.17	0.14	0.52	0.42
45	1.50	0.35	0.63	0.51	1.15	0.93
60	2.00	0.25	1.84	1.49	2.99	2.42
80	2.50	0.18	1.98	1.60	4.97	4.02
120	3.00	0.13	33.53	27.15	38.50	31.17
170	3.50	0.09	59.70	48.33	98.20	79.50
200	3.75	0.07	16.13	13.06	114.33	92.56
230	4.00	0.06	6.04	4.89	120.37	97.45

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Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.87	3.59	3.45	3.19	2.89	2.72	2.52

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	3.13	0.11	0.47	-2.35	17.26

GRANULARMETRIC REPORT IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Granularmetric Report

Depths and elevations based on measured values



Gahagan and Bryant Associates
3802 W Bay to Bay Blvd. Suite B-22
Tampa, FL 33629
Telephone: 813-831-4408
Fax: 813-831-4216

Project Name: IBSP Sand Source Survey

Sample Name: VC-01 #2

Analysis Date: 09-24-20

Analyzed By: DCJ

Easting (ft): 1,132,171	Northing (ft): 2,101,147	Coordinate System: State Plane	Elevation (ft): -31.3 IGLD MLW
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USCS: SM	Munsell: Dry - 10YR-7/2	Comments:
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Dry Weight (g): 121.14	Wash Weight (g): 118.16	Pan Retained (g): 4.79	Sieve Loss (%): 0.08	Fines (%): #200 - 12.35 #230 - 6.50	Organics (%):	Carbonates (%):	Shells (%):
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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
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	0.04	0.03	0.04	0.03
10	-1.00	2.00	0.02	0.02	0.06	0.05
14	-0.50	1.41	0.10	0.08	0.16	0.13
18	0.00	1.00	0.11	0.09	0.27	0.22
25	0.50	0.71	0.16	0.13	0.43	0.35
35	1.00	0.50	0.25	0.21	0.68	0.56
45	1.50	0.35	0.97	0.80	1.65	1.36
60	2.00	0.25	2.64	2.18	4.29	3.54
80	2.50	0.18	2.68	2.21	6.97	5.75
120	3.00	0.13	13.01	10.74	19.98	16.49
170	3.50	0.09	65.26	53.87	85.24	70.36
200	3.75	0.07	20.94	17.29	106.18	87.65
230	4.00	0.06	7.09	5.85	113.27	93.50

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Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
	3.70	3.57	3.31	3.08	2.98	2.33

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	3.21	0.11	0.5	-2.82	17.23

GRANULARMETRIC REPORT IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Granularmetric Report

Depths and elevations based on measured values



Gahagan and Bryant Associates
 3802 W Bay to Bay Blvd. Suite B-22
 Tampa, FL 33629
 Telephone: 813-831-4408
 Fax: 813-831-4216

Project Name: IBSP Sand Source Survey

Sample Name: VC-02 #1

Analysis Date: 09-24-20

Analyzed By: DCJ

Easting (ft): 1,139,697	Northing (ft): 2,114,187	Coordinate System: State Plane	Elevation (ft): -30.0 IGLD MLW
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USCS: SP-SM	Munsell: Dry - 10YR-7/2	Comments:
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Dry Weight (g): 120.31	Wash Weight (g): 120.20	Pan Retained (g): 2.06	Sieve Loss (%): 0.14	Fines (%): #200 - 5.11 #230 - 1.94	Organics (%):	Carbonates (%):	Shells (%):
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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
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	0.16	0.13	0.16	0.13
14	-0.50	1.41	0.13	0.11	0.29	0.24
18	0.00	1.00	0.14	0.12	0.43	0.36
25	0.50	0.71	0.25	0.21	0.68	0.57
35	1.00	0.50	0.39	0.32	1.07	0.89
45	1.50	0.35	1.01	0.84	2.08	1.73
60	2.00	0.25	1.62	1.35	3.70	3.08
80	2.50	0.18	1.48	1.23	5.18	4.31
120	3.00	0.13	36.98	30.74	42.16	35.04
170	3.50	0.09	59.35	49.33	101.51	84.37
200	3.75	0.07	12.65	10.51	114.16	94.89
230	4.00	0.06	3.81	3.17	117.97	98.06

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Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.76	3.50	3.41	3.15	2.84	2.69	2.51

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	3.07	0.12	0.5	-2.91	19.75

GRANULARMETRIC REPORT IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Granularmetric Report

Depths and elevations based on measured values



Gahagan and Bryant Associates
3802 W Bay to Bay Blvd. Suite B-22
Tampa, FL 33629
Telephone: 813-831-4408
Fax: 813-831-4216

Project Name: IBSP Sand Source Survey

Sample Name: VC-02 #2

Analysis Date: 09-24-20

Analyzed By: DCJ

Easting (ft): 1,139,697	Northing (ft): 2,114,187	Coordinate System: State Plane	Elevation (ft): -35.5 IGLD MLW
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USCS: SP-SM	Munsell: Dry - 10YR-7/2	Comments:
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Dry Weight (g): 126.37	Wash Weight (g): 126.02	Pan Retained (g): 5.70	Sieve Loss (%): 0.09	Fines (%): #200 - 11.30 #230 - 4.88	Organics (%):	Carbonates (%):	Shells (%):
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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
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	0.07	0.06	0.07	0.06
10	-1.00	2.00	0.01	0.01	0.08	0.06
14	-0.50	1.41	0.16	0.13	0.24	0.19
18	0.00	1.00	0.15	0.12	0.39	0.31
25	0.50	0.71	0.23	0.18	0.62	0.49
35	1.00	0.50	0.57	0.45	1.19	0.94
45	1.50	0.35	1.76	1.39	2.95	2.33
60	2.00	0.25	4.26	3.37	7.21	5.71
80	2.50	0.18	3.47	2.75	10.68	8.45
120	3.00	0.13	10.14	8.02	20.82	16.48
170	3.50	0.09	67.88	53.72	88.70	70.19
200	3.75	0.07	23.39	18.51	112.09	88.70
230	4.00	0.06	8.11	6.42	120.20	95.12

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Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
4.00	3.69	3.56	3.31	3.08	2.97	1.89

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	3.18	0.11	0.58	-2.68	13.87

GRANULARMETRIC REPORT IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Granularmetric Report

Depths and elevations based on measured values



Gahagan and Bryant Associates
3802 W Bay to Bay Blvd. Suite B-22
Tampa, FL 33629
Telephone: 813-831-4408
Fax: 813-831-4216

Project Name: IBSP Sand Source Survey

Sample Name: VC-03-C #1

Analysis Date:

Analyzed By: DCJ

Easting (ft):	Northing (ft):	Coordinate System:	Elevation (ft):
1,140,247	2,115,196	State Plane	-33.0 IGLD MLW

USCS:	Munsell:	Comments:
SM	Dry - 10YR-7/2	

Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%):	Organics (%):	Carbonates (%):	Shells (%):
159.21	138.62	6.73	0.31	#200 - 22.08 #230 - 17.47			

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
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	0.02	0.01	0.02	0.01
14	-0.50	1.41	0.28	0.18	0.30	0.19
18	0.00	1.00	0.51	0.32	0.81	0.51
25	0.50	0.71	0.85	0.53	1.66	1.04
35	1.00	0.50	1.19	0.75	2.85	1.79
45	1.50	0.35	2.07	1.30	4.92	3.09
60	2.00	0.25	3.73	2.34	8.65	5.43
80	2.50	0.18	3.15	1.98	11.80	7.41
120	3.00	0.13	20.53	12.89	32.33	20.31
170	3.50	0.09	70.13	44.05	102.46	64.36
200	3.75	0.07	21.60	13.57	124.06	77.92
230	4.00	0.06	7.33	4.60	131.39	82.53

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Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
		3.70	3.34	3.05	2.83	1.91

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	3.11	0.12	0.64	-2.61	12.03

GRANULARMETRIC REPORT IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Granularmetric Report

Depths and elevations based on measured values



Gahagan and Bryant Associates
 3802 W Bay to Bay Blvd. Suite B-22
 Tampa, FL 33629
 Telephone: 813-831-4408
 Fax: 813-831-4216

Project Name: IBSP Sand Source Survey

Sample Name: VC-04 #1

Analysis Date: 09-24-20

Analyzed By: DCJ

Easting (ft): 1,140,168	Northing (ft): 2,113,696	Coordinate System: State Plane	Elevation (ft): -32.1 IGLD MLW
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USCS: SP-SM	Munsell: Dry - 10YR-7/2	Comments:
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Dry Weight (g): 124.22	Wash Weight (g): 124.08	Pan Retained (g): 2.22	Sieve Loss (%): 0.06	Fines (%): #200 - 5.21 #230 - 1.96	Organics (%):	Carbonates (%):	Shells (%):
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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
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	0.10	0.08	0.10	0.08
14	-0.50	1.41	0.22	0.18	0.32	0.26
18	0.00	1.00	0.14	0.11	0.46	0.37
25	0.50	0.71	0.15	0.12	0.61	0.49
35	1.00	0.50	0.13	0.10	0.74	0.60
45	1.50	0.35	0.27	0.22	1.01	0.81
60	2.00	0.25	0.58	0.47	1.59	1.28
80	2.50	0.18	0.89	0.72	2.48	2.00
120	3.00	0.13	48.02	38.66	50.50	40.65
170	3.50	0.09	54.77	44.09	105.27	84.74
200	3.75	0.07	12.48	10.05	117.75	94.79
230	4.00	0.06	4.03	3.24	121.78	98.04

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Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.77	3.49	3.39	3.11	2.80	2.68	2.54

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	3.07	0.12	0.45	-2.88	25.18

GRANULARMETRIC REPORT IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Granularmetric Report

Depths and elevations based on measured values



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 3802 W Bay to Bay Blvd. Suite B-22
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 Telephone: 813-831-4408
 Fax: 813-831-4216

Project Name: IBSP Sand Source Survey

Sample Name: VC-04 #2

Analysis Date: 09-24-20

Analyzed By: DCJ

Easting (ft): 1,140,168
 Northing (ft): 2,113,696

Coordinate System: State Plane
 Elevation (ft): -38.6 IGLD MLW

USCS: SM
 Munsell: Dry - 10YR-7/2
 Comments:

Dry Weight (g): 119.82
 Wash Weight (g): 119.34
 Pan Retained (g): 7.60
 Sieve Loss (%): 0.12
 Finer (%): #200 - 12.02
 #230 - 6.86
 Organics (%):
 Carbonates (%):
 Shells (%):

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
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	0.08	0.07	0.08	0.07
10	-1.00	2.00	0.16	0.13	0.24	0.20
14	-0.50	1.41	0.31	0.26	0.55	0.46
18	0.00	1.00	0.36	0.30	0.91	0.76
25	0.50	0.71	0.66	0.55	1.57	1.31
35	1.00	0.50	0.75	0.63	2.32	1.94
45	1.50	0.35	1.24	1.03	3.56	2.97
60	2.00	0.25	3.04	2.54	6.60	5.51
80	2.50	0.18	3.70	3.09	10.30	8.60
120	3.00	0.13	14.73	12.29	25.03	20.89
170	3.50	0.09	61.44	51.28	86.47	72.17
200	3.75	0.07	18.95	15.82	105.42	87.98
230	4.00	0.06	6.18	5.16	111.60	93.14

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Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
	3.69	3.54	3.28	3.04	2.80	1.90

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	3.12	0.12	0.65	-3.01	15.72

GRANULARMETRIC REPORT IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Granularmetric Report

Depths and elevations based on measured values



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Project Name: IBSP Sand Source Survey

Sample Name: VC-05 #1

Analysis Date: 10-05-20

Analyzed By: DCJ

Easting (ft): 1,140,321	Northing (ft): 2,114,691	Coordinate System: State Plane	Elevation (ft): -29.3 IGLD MLW
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USCS: SW-SM	Munsell: Dry - 10YR-6/4	Comments:
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Dry Weight (g): 150.43	Wash Weight (g): 144.77	Pan Retained (g): 0.83	Sieve Loss (%): 0.01	Fines (%): #200 - 7.60 #230 - 4.33	Organics (%):	Carbonates (%):	Shells (%):
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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
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	0.55	0.37	0.55	0.37
10	-1.00	2.00	0.96	0.64	1.51	1.00
14	-0.50	1.41	1.53	1.02	3.04	2.02
18	0.00	1.00	1.36	0.90	4.40	2.92
25	0.50	0.71	1.55	1.03	5.95	3.96
35	1.00	0.50	1.52	1.01	7.47	4.97
45	1.50	0.35	2.08	1.38	9.55	6.35
60	2.00	0.25	3.01	2.00	12.56	8.35
80	2.50	0.18	2.67	1.77	15.23	10.12
120	3.00	0.13	9.95	6.61	25.18	16.74
170	3.50	0.09	99.71	66.28	124.89	83.02
200	3.75	0.07	14.11	9.38	139.00	92.40
230	4.00	0.06	4.92	3.27	143.92	95.67

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Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.95	3.53	3.44	3.25	3.06	2.94	1.01

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	3.01	0.12	0.89	-3.2	13.6

GRANULARMETRIC REPORT IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Granularmetric Report

Depths and elevations based on measured values



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Fax: 813-831-4216

Project Name: IBSP Sand Source Survey

Sample Name: VC-05 #2

Analysis Date: 10-05-20

Analyzed By: DCJ

Easting (ft): 1,140,321	Northing (ft): 2,114,691	Coordinate System: State Plane	Elevation (ft): -33.8 IGLD MLW
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USCS: SM	Munsell: Dry - 10YR-6/4	Comments:
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Dry Weight (g): 139.82	Wash Weight (g): 127.30	Pan Retained (g): 1.88	Sieve Loss (%): 0.01	Fines (%): #200 - 17.22 #230 - 10.31	Organics (%):	Carbonates (%):	Shells (%):
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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
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	0.00	0.00	0.00	0.00
14	-0.50	1.41	0.00	0.00	0.00	0.00
18	0.00	1.00	0.00	0.00	0.00	0.00
25	0.50	0.71	0.02	0.01	0.02	0.01
35	1.00	0.50	0.00	0.00	0.02	0.01
45	1.50	0.35	0.01	0.01	0.03	0.02
60	2.00	0.25	0.08	0.06	0.11	0.08
80	2.50	0.18	0.17	0.12	0.28	0.20
120	3.00	0.13	2.33	1.67	2.61	1.87
170	3.50	0.09	94.96	67.92	97.57	69.78
200	3.75	0.07	18.17	13.00	115.74	82.78
230	4.00	0.06	9.66	6.91	125.40	89.69

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
	3.79	3.60	3.35	3.17	3.10	3.02
Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
	3.34	0.10	0.23	0.08	11.92	

GRANULARMETRIC REPORT IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Granularmetric Report

Depths and elevations based on measured values



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Project Name: IBSP Sand Source Survey

Sample Name: VC-06 #1

Analysis Date: 09-24-20

Analyzed By: DCJ

Easting (ft): 1,137,281	Northing (ft): 2,115,679	Coordinate System: State Plane	Elevation (ft): -36.3 IGLD MLW
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USCS: SM	Munsell: Dry - 10YR-7/2	Comments:
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Dry Weight (g): 121.22	Wash Weight (g): 121.04	Pan Retained (g): 8.36	Sieve Loss (%): 0.05	Fines (%): #200 - 15.67 #230 - 7.09	Organics (%):	Carbonates (%):	Shells (%):
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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
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	0.00	0.00	0.00	0.00
14	-0.50	1.41	0.00	0.00	0.00	0.00
18	0.00	1.00	0.02	0.02	0.02	0.02
25	0.50	0.71	0.03	0.02	0.05	0.04
35	1.00	0.50	0.06	0.05	0.11	0.09
45	1.50	0.35	0.18	0.15	0.29	0.24
60	2.00	0.25	0.46	0.38	0.75	0.62
80	2.50	0.18	0.70	0.58	1.45	1.20
120	3.00	0.13	7.81	6.44	9.26	7.64
170	3.50	0.09	66.35	54.74	75.61	62.37
200	3.75	0.07	26.61	21.95	102.22	84.33
230	4.00	0.06	10.40	8.58	112.62	92.91

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Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
	3.75	3.64	3.39	3.16	3.08	2.80

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	3.34	0.10	0.33	-1.71	13.94

GRANULARMETRIC REPORT IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Granularmetric Report

Depths and elevations based on measured values



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Project Name: IBSP Sand Source Survey

Sample Name: VC-07-C #1

Analysis Date: 09-24-20

Analyzed By: DCJ

Easting (ft): 1,136,914
 Northing (ft): 2,113,674

Coordinate System: State Plane
 Elevation (ft): -31.1 IGLD MLW

USCS: SM
 Munsell: Dry - 10YR-7/2
 Comments:

Dry Weight (g): 158.40
 Wash Weight (g): 142.78
 Pan Retained (g): 6.46
 Sieve Loss (%): 0.01
 Fines (%): #200 - 20.13, #230 - 13.95
 Organics (%):
 Carbonates (%):
 Shells (%):

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
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	0.00	0.00	0.00	0.00
14	-0.50	1.41	0.00	0.00	0.00	0.00
18	0.00	1.00	0.03	0.02	0.03	0.02
25	0.50	0.71	0.11	0.07	0.14	0.09
35	1.00	0.50	0.17	0.11	0.31	0.20
45	1.50	0.35	0.51	0.32	0.82	0.52
60	2.00	0.25	1.38	0.87	2.20	1.39
80	2.50	0.18	2.01	1.27	4.21	2.66
120	3.00	0.13	23.07	14.56	27.28	17.22
170	3.50	0.09	70.92	44.77	98.20	61.99
200	3.75	0.07	28.31	17.87	126.51	79.87
230	4.00	0.06	9.80	6.19	136.31	86.05

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Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
	3.92	3.68	3.37	3.09	2.96	2.58

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	3.24	0.11	0.41	-1.71	10.26

GRANULARMETRIC REPORT IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Granularmetric Report

Depths and elevations based on measured values



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Project Name: IBSP Sand Source Survey

Sample Name: VC-08 #1

Analysis Date: 09-24-20

Analyzed By: DCJ

Easting (ft): 1,135,664	Northing (ft): 2,111,681	Coordinate System: State Plane	Elevation (ft): -36.6 IGLD MLW
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USCS: SW-SM	Munsell: Dry - 10YR-7/2	Comments:
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Dry Weight (g): 123.47	Wash Weight (g): 123.12	Pan Retained (g): 4.88	Sieve Loss (%): 0.01	Fines (%): #200 - 10.14 #230 - 4.24	Organics (%):	Carbonates (%):	Shells (%):
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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
3.5	-2.50	5.66	0.90	0.73	0.90	0.73
4	-2.25	4.76	0.50	0.40	1.40	1.13
5	-2.00	4.00	0.71	0.58	2.11	1.71
7	-1.50	2.83	0.33	0.27	2.44	1.98
10	-1.00	2.00	0.63	0.51	3.07	2.49
14	-0.50	1.41	0.90	0.73	3.97	3.22
18	0.00	1.00	0.82	0.66	4.79	3.88
25	0.50	0.71	0.81	0.66	5.60	4.54
35	1.00	0.50	0.90	0.73	6.50	5.26
45	1.50	0.35	1.27	1.03	7.77	6.29
60	2.00	0.25	1.68	1.36	9.45	7.65
80	2.50	0.18	1.99	1.61	11.44	9.27
120	3.00	0.13	11.74	9.51	23.18	18.77
170	3.50	0.09	64.02	51.85	87.20	70.62
200	3.75	0.07	23.75	19.24	110.95	89.86
230	4.00	0.06	7.28	5.90	118.23	95.76

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Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.97	3.67	3.56	3.30	3.06	2.85	0.82

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	3.02	0.12	1.11	-3.6	16.89

GRANULARMETRIC REPORT IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Granularmetric Report

Depths and elevations based on measured values



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Project Name: IBSP Sand Source Survey

Sample Name: VC-09 #1

Analysis Date: 09-24-20

Analyzed By: DCJ

Easting (ft): 1,138,547	Northing (ft): 2,111,677	Coordinate System: State Plane	Elevation (ft): -49.1 IGLD MLW
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USCS: SP	Munsell: Dry - 10YR-7/3	Comments:
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Dry Weight (g): 122.60	Wash Weight (g): 122.23	Pan Retained (g): 0.73	Sieve Loss (%): 0.15	Fines (%): #200 - 1.66 #230 - 1.04	Organics (%):	Carbonates (%):	Shells (%):
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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
3.5	-2.50	5.66	0.00	0.00	0.00	0.00
4	-2.25	4.76	0.05	0.04	0.05	0.04
5	-2.00	4.00	0.00	0.00	0.05	0.04
7	-1.50	2.83	0.28	0.23	0.33	0.27
10	-1.00	2.00	0.29	0.24	0.62	0.51
14	-0.50	1.41	0.50	0.41	1.12	0.91
18	0.00	1.00	0.59	0.48	1.71	1.39
25	0.50	0.71	1.36	1.11	3.07	2.50
35	1.00	0.50	3.61	2.94	6.68	5.45
45	1.50	0.35	12.40	10.11	19.08	15.56
60	2.00	0.25	22.32	18.21	41.40	33.77
80	2.50	0.18	32.25	26.31	73.65	60.07
120	3.00	0.13	36.25	29.57	109.90	89.64
170	3.50	0.09	9.35	7.63	119.25	97.27
200	3.75	0.07	1.32	1.08	120.57	98.34
230	4.00	0.06	0.75	0.61	121.32	98.96

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Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.35	2.90	2.75	2.31	1.76	1.51	0.92

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	2.2	0.22	0.77	-1.17	6.24

GRANULARMETRIC REPORT IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Granularmetric Report

Depths and elevations based on measured values



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Project Name: IBSP Sand Source Survey

Sample Name: VC-10 #1

Analysis Date: 09-24-20

Analyzed By: DCJ

Easting (ft): 1,133,674	Northing (ft): 2,101,157	Coordinate System: State Plane	Elevation (ft): -46.6 IGLD MLW
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USCS: SP-SM	Munsell: Dry - 10YR-7/2	Comments:
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Dry Weight (g): 123.30	Wash Weight (g): 122.86	Pan Retained (g): 8.59	Sieve Loss (%): 0.30	Fines (%): #200 - 10.24 #230 - 7.62	Organics (%):	Carbonates (%):	Shells (%):
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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
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	0.18	0.15	0.18	0.15
10	-1.00	2.00	0.10	0.08	0.28	0.23
14	-0.50	1.41	0.17	0.14	0.45	0.36
18	0.00	1.00	0.12	0.10	0.57	0.46
25	0.50	0.71	0.20	0.16	0.77	0.62
35	1.00	0.50	0.25	0.20	1.02	0.83
45	1.50	0.35	0.63	0.51	1.65	1.34
60	2.00	0.25	1.48	1.20	3.13	2.54
80	2.50	0.18	4.19	3.40	7.32	5.94
120	3.00	0.13	65.31	52.97	72.63	58.91
170	3.50	0.09	32.86	26.65	105.49	85.56
200	3.75	0.07	5.18	4.20	110.67	89.76
230	4.00	0.06	3.23	2.62	113.90	92.38

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Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
	3.47	3.30	2.92	2.68	2.59	2.36

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	2.9	0.13	0.5	-3.07	26

GRANULARMETRIC REPORT IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Granularmetric Report

Depths and elevations based on measured values



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Project Name: IBSP Sand Source Survey

Sample Name: VC-10 #2

Analysis Date: 09-25-20

Analyzed By: DCJ

Easting (ft): 1,133,674	Northing (ft): 2,101,157	Coordinate System: State Plane	Elevation (ft): -49.8 IGLD MLW
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USCS: SM	Munsell: Dry - 10YR-7/2	Comments:
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Dry Weight (g): 123.86	Wash Weight (g): 123.43	Pan Retained (g): 12.01	Sieve Loss (%): 0.17	Fines (%): #200 - 14.88 #230 - 10.21	Organics (%):	Carbonates (%):	Shells (%):
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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
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	0.08	0.06	0.08	0.06
10	-1.00	2.00	0.10	0.08	0.18	0.15
14	-0.50	1.41	0.18	0.15	0.36	0.29
18	0.00	1.00	0.31	0.25	0.67	0.54
25	0.50	0.71	0.61	0.49	1.28	1.03
35	1.00	0.50	0.78	0.63	2.06	1.66
45	1.50	0.35	1.05	0.85	3.11	2.51
60	2.00	0.25	1.53	1.24	4.64	3.75
80	2.50	0.18	1.84	1.49	6.48	5.23
120	3.00	0.13	37.48	30.26	43.96	35.49
170	3.50	0.09	51.48	41.56	95.44	77.05
200	3.75	0.07	9.99	8.07	105.43	85.12
230	4.00	0.06	5.78	4.67	111.21	89.79

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Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
	3.72	3.48	3.17	2.83	2.68	2.42

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	3.03	0.12	0.59	-2.87	17.08

GRANULARMETRIC REPORT IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Granularmetric Report

Depths and elevations based on measured values



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Project Name: IBSP Sand Source Survey

Sample Name: VC-11-C #1

Analysis Date: 09-24-20

Analyzed By: DCJ

Easting (ft):	Northing (ft):
1,132,567	2,103,148

Coordinate System:	Elevation (ft):
State Plane	-53.7 IGLD MLW

USCS:	Munsell:	Comments:
SM	Dry - 10YR-7/3	

Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%):	Organics (%):	Carbonates (%):	Shells (%):
161.92	138.06	1.28	0.02	#200 - 17.37 #230 - 15.55			

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
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	0.40	0.25	0.40	0.25
10	-1.00	2.00	0.30	0.19	0.70	0.43
14	-0.50	1.41	0.54	0.33	1.24	0.77
18	0.00	1.00	0.35	0.22	1.59	0.98
25	0.50	0.71	0.80	0.49	2.39	1.48
35	1.00	0.50	1.45	0.90	3.84	2.37
45	1.50	0.35	3.25	2.01	7.09	4.38
60	2.00	0.25	4.13	2.55	11.22	6.93
80	2.50	0.18	20.01	12.36	31.23	19.29
120	3.00	0.13	78.73	48.62	109.96	67.91
170	3.50	0.09	19.62	12.12	129.58	80.03
200	3.75	0.07	4.21	2.60	133.79	82.63
230	4.00	0.06	2.95	1.82	136.74	84.45

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Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
	3.94	3.29	2.82	2.56	2.37	1.62

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	2.65	0.16	0.67	-2.56	14.64

GRANULARMETRIC REPORT IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Granularmetric Report

Depths and elevations based on measured values



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Project Name: IBSP Sand Source Survey

Sample Name: VC-12 #1

Analysis Date: 09-24-20

Analyzed By: DCJ

Easting (ft): 1,134,236	Northing (ft): 2,103,168	Coordinate System: State Plane	Elevation (ft): -48.9 IGLD MLW
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USCS: SW	Munsell: Dry - 10YR-7/3	Comments:
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Dry Weight (g): 123.08	Wash Weight (g): 122.61	Pan Retained (g): 0.22	Sieve Loss (%): 0.06	Fines (%): #200 - 0.88 #230 - 0.62	Organics (%):	Carbonates (%):	Shells (%):
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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
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	0.43	0.35	0.43	0.35
7	-1.50	2.83	0.49	0.40	0.92	0.75
10	-1.00	2.00	1.18	0.96	2.10	1.71
14	-0.50	1.41	1.46	1.19	3.56	2.89
18	0.00	1.00	2.08	1.69	5.64	4.58
25	0.50	0.71	3.93	3.19	9.57	7.78
35	1.00	0.50	8.69	7.06	18.26	14.84
45	1.50	0.35	26.63	21.64	44.89	36.47
60	2.00	0.25	40.83	33.17	85.72	69.65
80	2.50	0.18	17.42	14.15	103.14	83.80
120	3.00	0.13	13.20	10.72	116.34	94.52
170	3.50	0.09	5.09	4.14	121.43	98.66
200	3.75	0.07	0.57	0.46	122.00	99.12
230	4.00	0.06	0.32	0.26	122.32	99.38

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.06	2.51	2.19	1.70	1.23	1.03	0.07

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	1.66	0.32	0.89	-0.9	5.39

GRANULARMETRIC REPORT IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Granularmetric Report

Depths and elevations based on measured values



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Project Name: IBSP Sand Source Survey

Sample Name: VC-12 #2

Analysis Date: 09-25-20

Analyzed By: DCJ

Easting (ft): 1,134,236	Northing (ft): 2,103,168	Coordinate System: State Plane	Elevation (ft): -52.1 IGLD MLW
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USCS: SM	Munsell: Dry - 10YR-7/3	Comments:
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Dry Weight (g): 123.09	Wash Weight (g): 110.66	Pan Retained (g): 5.40	Sieve Loss (%): 0.00	Fines (%): #200 - 18.51 #230 - 14.49	Organics (%):	Carbonates (%):	Shells (%):
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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
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	0.08	0.06	0.08	0.06
14	-0.50	1.41	0.09	0.07	0.17	0.14
18	0.00	1.00	0.11	0.09	0.28	0.23
25	0.50	0.71	0.14	0.11	0.42	0.34
35	1.00	0.50	0.24	0.19	0.66	0.54
45	1.50	0.35	0.39	0.32	1.05	0.85
60	2.00	0.25	0.72	0.58	1.77	1.44
80	2.50	0.18	1.65	1.34	3.42	2.78
120	3.00	0.13	58.54	47.56	61.96	50.34
170	3.50	0.09	31.60	25.67	93.56	76.01
200	3.75	0.07	6.75	5.48	100.31	81.49
230	4.00	0.06	4.95	4.02	105.26	85.51

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Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
	3.91	3.48	3.00	2.73	2.64	2.52

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	2.97	0.13	0.45	-1.88	18.07

GRANULARMETRIC REPORT IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Granularmetric Report

Depths and elevations based on measured values



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Project Name: IBSP Sand Source Survey

Sample Name: VC-13 #1

Analysis Date: 09-25-20

Analyzed By: DCJ

Easting (ft): 1,132,000	Northing (ft): 2,110,647	Coordinate System: State Plane	Elevation (ft): -52.5 IGLD MLW
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USCS: SM	Munsell: Dry - 10YR-7/2	Comments:
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Dry Weight (g): 123.93	Wash Weight (g): 95.14	Pan Retained (g): 1.10	Sieve Loss (%): 0.00	Fines (%): #200 - 26.53 #230 - 24.12	Organics (%):	Carbonates (%):	Shells (%):
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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
3.5	-2.50	5.66	0.60	0.48	0.60	0.48
4	-2.25	4.76	0.56	0.45	1.16	0.94
5	-2.00	4.00	0.50	0.40	1.66	1.34
7	-1.50	2.83	1.41	1.14	3.07	2.48
10	-1.00	2.00	1.08	0.87	4.15	3.35
14	-0.50	1.41	1.57	1.27	5.72	4.62
18	0.00	1.00	1.66	1.34	7.38	5.95
25	0.50	0.71	2.56	2.07	9.94	8.02
35	1.00	0.50	4.30	3.47	14.24	11.49
45	1.50	0.35	7.36	5.94	21.60	17.43
60	2.00	0.25	5.86	4.73	27.46	22.16
80	2.50	0.18	5.14	4.15	32.60	26.31
120	3.00	0.13	28.47	22.97	61.07	49.28
170	3.50	0.09	25.21	20.34	86.28	69.62
200	3.75	0.07	4.77	3.85	91.05	73.47
230	4.00	0.06	2.99	2.41	94.04	75.88

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
		3.91	3.02	2.34	1.38	-0.36
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	2.28	0.21	1.38	-1.66	5.6	

GRANULARMETRIC REPORT IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Granularmetric Report

Depths and elevations based on measured values



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Project Name: IBSP Sand Source Survey

Sample Name: VC-13 #2

Analysis Date: 09-25-20

Analyzed By: DCJ

Easting (ft): 1,132,000	Northing (ft): 2,110,647	Coordinate System: State Plane	Elevation (ft): -55.0 IGLD MLW
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USCS: SM	Munsell: Dry - 10YR-7/2	Comments:
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Dry Weight (g): 122.84	Wash Weight (g): 119.98	Pan Retained (g): 31.76	Sieve Loss (%): 0.53	Fines (%): #200 - 39.78 #230 - 28.71	Organics (%):	Carbonates (%):	Shells (%):
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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
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	0.03	0.02	0.03	0.02
14	-0.50	1.41	0.34	0.28	0.37	0.30
18	0.00	1.00	1.00	0.81	1.37	1.12
25	0.50	0.71	1.76	1.43	3.13	2.55
35	1.00	0.50	1.92	1.56	5.05	4.11
45	1.50	0.35	1.66	1.35	6.71	5.46
60	2.00	0.25	1.42	1.16	8.13	6.62
80	2.50	0.18	1.33	1.08	9.46	7.70
120	3.00	0.13	13.56	11.04	23.02	18.74
170	3.50	0.09	36.00	29.31	59.02	48.05
200	3.75	0.07	14.96	12.18	73.98	60.22
230	4.00	0.06	13.59	11.06	87.57	71.29

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Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
			3.54	3.11	2.88	1.33

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	3.08	0.12	0.87	-2.26	8.3

GRANULARMETRIC REPORT IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Granularmetric Report

Depths and elevations based on measured values



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Project Name: IBSP Sand Source Survey

Sample Name: VC-14 #1

Analysis Date: 09-25-20

Analyzed By: DCJ

Easting (ft): 1,133,214	Northing (ft): 2,110,645	Coordinate System: State Plane	Elevation (ft): -48.0 IGLD MLW
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USCS: SP	Munsell: Dry - 10YR-8/3	Comments:
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Dry Weight (g): 122.15	Wash Weight (g): 121.99	Pan Retained (g): 0.12	Sieve Loss (%): 0.02	Fines (%): #200 - 0.35 #230 - 0.25	Organics (%):	Carbonates (%):	Shells (%):
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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
3.5	-2.50	5.66	0.54	0.44	0.54	0.44
4	-2.25	4.76	0.00	0.00	0.54	0.44
5	-2.00	4.00	0.60	0.49	1.14	0.93
7	-1.50	2.83	0.82	0.67	1.96	1.60
10	-1.00	2.00	0.98	0.80	2.94	2.41
14	-0.50	1.41	1.69	1.38	4.63	3.79
18	0.00	1.00	2.24	1.83	6.87	5.62
25	0.50	0.71	3.64	2.98	10.51	8.60
35	1.00	0.50	9.07	7.43	19.58	16.03
45	1.50	0.35	34.10	27.92	53.68	43.95
60	2.00	0.25	46.72	38.25	100.40	82.19
80	2.50	0.18	16.38	13.41	116.78	95.60
120	3.00	0.13	4.05	3.32	120.83	98.92
170	3.50	0.09	0.81	0.66	121.64	99.58
200	3.75	0.07	0.08	0.07	121.72	99.65
230	4.00	0.06	0.12	0.10	121.84	99.75

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Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.48	2.07	1.91	1.58	1.16	1.00	-0.17

Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
	1.44	0.37	0.84	-1.95	9.82

GRANULARMETRIC REPORT IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Granularmetric Report

Depths and elevations based on measured values



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Project Name: IBSP Sand Source Survey

Sample Name: VC-14 #2

Analysis Date: 09-25-20

Analyzed By: DCJ

Easting (ft): 1,133,214	Northing (ft): 2,110,645	Coordinate System: State Plane	Elevation (ft): -51.2 IGLD MLW
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USCS: SP	Munsell: Dry - 10YR-7/2	Comments:
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Dry Weight (g): 122.42	Wash Weight (g): 121.89	Pan Retained (g): 2.31	Sieve Loss (%): 0.25	Fines (%): #200 - 3.91 #230 - 2.56	Organics (%):	Carbonates (%):	Shells (%):
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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
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	0.04	0.03	0.04	0.03
7	-1.50	2.83	0.03	0.02	0.07	0.06
10	-1.00	2.00	0.18	0.15	0.25	0.20
14	-0.50	1.41	0.33	0.27	0.58	0.47
18	0.00	1.00	0.30	0.25	0.88	0.72
25	0.50	0.71	0.54	0.44	1.42	1.16
35	1.00	0.50	0.65	0.53	2.07	1.69
45	1.50	0.35	1.57	1.28	3.64	2.97
60	2.00	0.25	5.92	4.84	9.56	7.81
80	2.50	0.18	30.88	25.22	40.44	33.03
120	3.00	0.13	59.35	48.48	99.79	81.51
170	3.50	0.09	15.18	12.40	114.97	93.91
200	3.75	0.07	2.66	2.17	117.63	96.09
230	4.00	0.06	1.65	1.35	119.28	97.44

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Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.63	3.10	2.93	2.68	2.34	2.16	1.71

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	2.6	0.16	0.58	-2.01	13.28

GRANULARMETRIC REPORT IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Granularmetric Report

Depths and elevations based on measured values



Gahagan and Bryant Associates
 3802 W Bay to Bay Blvd. Suite B-22
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Project Name: IBSP Sand Source Survey

Sample Name: VC-14 #3

Analysis Date: 09-25-20

Analyzed By: DCJ

Easting (ft): 1,133,214	Northing (ft): 2,110,645	Coordinate System: State Plane	Elevation (ft): -53.0 IGLD MLW
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USCS: SM	Munsell: Dry - 10YR-7/2	Comments:
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Dry Weight (g): 115.55	Wash Weight (g): 113.79	Pan Retained (g): 10.30	Sieve Loss (%): 0.63	Fines (%): #200 - 15.38 #230 - 11.07	Organics (%):	Carbonates (%):	Shells (%):
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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
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	0.00	0.00	0.00	0.00
14	-0.50	1.41	0.00	0.00	0.00	0.00
18	0.00	1.00	0.07	0.06	0.07	0.06
25	0.50	0.71	0.15	0.13	0.22	0.19
35	1.00	0.50	0.24	0.21	0.46	0.40
45	1.50	0.35	0.63	0.55	1.09	0.94
60	2.00	0.25	1.26	1.09	2.35	2.03
80	2.50	0.18	5.08	4.40	7.43	6.43
120	3.00	0.13	56.54	48.93	63.97	55.36
170	3.50	0.09	27.25	23.58	91.22	78.94
200	3.75	0.07	6.56	5.68	97.78	84.62
230	4.00	0.06	4.98	4.31	102.76	88.93

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Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
	3.72	3.42	2.95	2.69	2.60	2.34

Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
	2.94	0.13	0.45	-0.81	8.1

GRANULARMETRIC REPORT IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Granularmetric Report

Depths and elevations based on measured values



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Project Name: IBSP Sand Source Survey

Sample Name: VC-15 #1

Analysis Date: 10-05-20

Analyzed By: DCJ

Easting (ft): 1,131,538	Northing (ft): 2,112,641	Coordinate System: State Plane	Elevation (ft): -49.9 IGLD MLW
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USCS: SP	Munsell: Dry - 10YR-7/3	Comments:
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Dry Weight (g): 126.80	Wash Weight (g): 125.68	Pan Retained (g): 0.30	Sieve Loss (%): 0.01	Fines (%): #200 - 1.67 #230 - 1.13	Organics (%):	Carbonates (%):	Shells (%):
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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
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	0.08	0.06	0.08	0.06
10	-1.00	2.00	0.36	0.28	0.44	0.35
14	-0.50	1.41	0.78	0.62	1.22	0.96
18	0.00	1.00	0.82	0.65	2.04	1.61
25	0.50	0.71	1.32	1.04	3.36	2.65
35	1.00	0.50	3.03	2.39	6.39	5.04
45	1.50	0.35	13.25	10.45	19.64	15.49
60	2.00	0.25	22.96	18.11	42.60	33.60
80	2.50	0.18	29.82	23.52	72.42	57.11
120	3.00	0.13	41.66	32.85	114.08	89.97
170	3.50	0.09	9.30	7.33	123.38	97.30
200	3.75	0.07	1.30	1.03	124.68	98.33
230	4.00	0.06	0.69	0.54	125.37	98.87

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Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.34	2.91	2.77	2.35	1.76	1.51	0.99

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	2.21	0.22	0.76	-1.12	5.5

GRANULARMETRIC REPORT IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Granularmetric Report

Depths and elevations based on measured values



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Project Name: IBSP Sand Source Survey

Sample Name: VC-15 #2

Analysis Date: 10-05-20

Analyzed By: DCJ

Easting (ft): 1,131,538	Northing (ft): 2,112,641	Coordinate System: State Plane	Elevation (ft): -53.9 IGLD MLW
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USCS: SM	Munsell: Dry - 10YR-7/2	Comments:
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Dry Weight (g): 127.90	Wash Weight (g): 114.86	Pan Retained (g): 9.92	Sieve Loss (%): 0.01	Fines (%): #200 - 26.36 #230 - 17.96	Organics (%):	Carbonates (%):	Shells (%):
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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
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	0.00	0.00	0.00	0.00
14	-0.50	1.41	0.00	0.00	0.00	0.00
18	0.00	1.00	0.00	0.00	0.00	0.00
25	0.50	0.71	0.06	0.05	0.06	0.05
35	1.00	0.50	0.04	0.03	0.10	0.08
45	1.50	0.35	0.17	0.13	0.27	0.21
60	2.00	0.25	0.34	0.27	0.61	0.48
80	2.50	0.18	2.31	1.81	2.92	2.28
120	3.00	0.13	38.51	30.11	41.43	32.39
170	3.50	0.09	35.74	27.94	77.17	60.34
200	3.75	0.07	17.02	13.31	94.19	73.64
230	4.00	0.06	10.74	8.40	104.93	82.04

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
		3.79	3.32	2.88	2.73	2.55
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	3.16	0.11	0.44	-0.33	4.12	

GRANULARMETRIC REPORT IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Granularmetric Report

Depths and elevations based on measured values



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Project Name: IBSP Sand Source Survey

Sample Name: VC-15 #3

Analysis Date: 10-05-20

Analyzed By: DCJ

Easting (ft): 1,131,538	Northing (ft): 2,112,641	Coordinate System: State Plane	Elevation (ft): -56.9 IGLD MLW
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USCS: SM	Munsell: Dry - 10YR-7/2	Comments:
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Dry Weight (g): 122.73	Wash Weight (g): 104.27	Pan Retained (g): 6.12	Sieve Loss (%): 0.03	Fines (%): #200 - 27.50 #230 - 20.06	Organics (%):	Carbonates (%):	Shells (%):
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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
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	0.04	0.03	0.04	0.03
14	-0.50	1.41	0.10	0.08	0.14	0.11
18	0.00	1.00	0.11	0.09	0.25	0.20
25	0.50	0.71	0.13	0.11	0.38	0.31
35	1.00	0.50	0.22	0.18	0.60	0.49
45	1.50	0.35	0.50	0.41	1.10	0.90
60	2.00	0.25	1.06	0.86	2.16	1.76
80	2.50	0.18	1.39	1.13	3.55	2.89
120	3.00	0.13	24.86	20.26	28.41	23.15
170	3.50	0.09	48.98	39.91	77.39	63.06
200	3.75	0.07	11.59	9.44	88.98	72.50
230	4.00	0.06	9.13	7.44	98.11	79.94

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Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
		3.83	3.34	3.02	2.82	2.55

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	3.17	0.11	0.48	-2.29	16.26

GRANULARMETRIC REPORT IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Granularmetric Report

Depths and elevations based on measured values



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Project Name: IBSP Sand Source Survey

Sample Name: VC-16 #1

Analysis Date: 10-05-20

Analyzed By: DCJ

Easting (ft): 1,133,189	Northing (ft): 2,112,657	Coordinate System: State Plane	Elevation (ft): -48.6 IGLD MLW
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USCS: SW	Munsell: Dry - 10YR-7/2	Comments:
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Dry Weight (g): 127.75	Wash Weight (g): 126.28	Pan Retained (g): 0.06	Sieve Loss (%): 0.05	Fines (%): #200 - 1.29 #230 - 1.24	Organics (%):	Carbonates (%):	Shells (%):
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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
3.5	-2.50	5.66	0.52	0.41	0.52	0.41
4	-2.25	4.76	0.04	0.03	0.56	0.44
5	-2.00	4.00	0.33	0.26	0.89	0.70
7	-1.50	2.83	2.16	1.69	3.05	2.39
10	-1.00	2.00	2.92	2.29	5.97	4.67
14	-0.50	1.41	3.78	2.96	9.75	7.63
18	0.00	1.00	4.15	3.25	13.90	10.88
25	0.50	0.71	5.26	4.12	19.16	15.00
35	1.00	0.50	10.80	8.45	29.96	23.45
45	1.50	0.35	32.11	25.14	62.07	48.59
60	2.00	0.25	35.04	27.43	97.11	76.02
80	2.50	0.18	18.11	14.18	115.22	90.19
120	3.00	0.13	8.92	6.98	124.14	97.17
170	3.50	0.09	1.81	1.42	125.95	98.59
200	3.75	0.07	0.15	0.12	126.10	98.71
230	4.00	0.06	0.06	0.05	126.16	98.76

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Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.84	2.28	1.98	1.53	1.03	0.56	-0.94

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	1.34	0.40	1.05	-1.26	5.2

GRANULARMETRIC REPORT IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Granularmetric Report

Depths and elevations based on measured values



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Project Name: IBSP Sand Source Survey

Sample Name: VC-16 #2

Analysis Date: 10-05-20

Analyzed By: DCJ

Easting (ft): 1,133,189	Northing (ft): 2,112,657	Coordinate System: State Plane	Elevation (ft): -50.1 IGLD MLW
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USCS: SP	Munsell: Dry - 10YR-7/3	Comments:
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Dry Weight (g): 125.60	Wash Weight (g): 125.52	Pan Retained (g): 0.11	Sieve Loss (%): 0.14	Fines (%): #200 - 0.39 #230 - 0.29	Organics (%):	Carbonates (%):	Shells (%):
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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
3.5	-2.50	5.66	0.00	0.00	0.00	0.00
4	-2.25	4.76	0.13	0.10	0.13	0.10
5	-2.00	4.00	0.00	0.00	0.13	0.10
7	-1.50	2.83	0.26	0.21	0.39	0.31
10	-1.00	2.00	0.84	0.67	1.23	0.98
14	-0.50	1.41	1.84	1.46	3.07	2.44
18	0.00	1.00	2.86	2.28	5.93	4.72
25	0.50	0.71	3.99	3.18	9.92	7.90
35	1.00	0.50	7.21	5.74	17.13	13.64
45	1.50	0.35	25.08	19.97	42.21	33.61
60	2.00	0.25	37.65	29.98	79.86	63.58
80	2.50	0.18	25.76	20.51	105.62	84.09
120	3.00	0.13	16.59	13.21	122.21	97.30
170	3.50	0.09	2.62	2.09	124.83	99.39
200	3.75	0.07	0.28	0.22	125.11	99.61
230	4.00	0.06	0.12	0.10	125.23	99.71

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Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.91	2.50	2.28	1.77	1.28	1.06	0.04

Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
	1.7	0.31	0.84	-1	5.01

GRANULARMETRIC REPORT IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Granularmetric Report

Depths and elevations based on measured values



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Project Name: IBSP Sand Source Survey

Sample Name: VC-16 #3

Analysis Date: 10-05-20

Analyzed By: DCJ

Easting (ft): 1,133,189	Northing (ft): 2,112,657	Coordinate System: State Plane	Elevation (ft): -53.6 IGLD MLW
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USCS: SP-SM	Munsell: Dry - 10YR-7/2	Comments:
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Dry Weight (g): 120.09	Wash Weight (g): 117.11	Pan Retained (g): 1.16	Sieve Loss (%): 0.02	Fines (%): #200 - 5.40 #230 - 3.47	Organics (%):	Carbonates (%):	Shells (%):
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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
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	0.00	0.00	0.00	0.00
14	-0.50	1.41	0.00	0.00	0.00	0.00
18	0.00	1.00	0.00	0.00	0.00	0.00
25	0.50	0.71	0.07	0.06	0.07	0.06
35	1.00	0.50	0.08	0.07	0.15	0.12
45	1.50	0.35	0.34	0.28	0.49	0.41
60	2.00	0.25	0.86	0.72	1.35	1.12
80	2.50	0.18	4.16	3.46	5.51	4.59
120	3.00	0.13	68.36	56.92	73.87	61.51
170	3.50	0.09	35.06	29.19	108.93	90.71
200	3.75	0.07	4.67	3.89	113.60	94.60
230	4.00	0.06	2.32	1.93	115.92	96.53

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Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.80	3.39	3.23	2.90	2.68	2.60	2.50

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	2.93	0.13	0.36	-0.38	7.14

GRANULARMETRIC REPORT IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Granularmetric Report

Depths and elevations based on measured values



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Project Name: IBSP Sand Source Survey

Sample Name: VC-17 #1

Analysis Date: 10-05-20

Analyzed By: DCJ

Easting (ft): 1,139,932	Northing (ft): 2,112,704	Coordinate System: State Plane	Elevation (ft): -42.6 IGLD MLW
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USCS: SP	Munsell: Dry - 10YR-7/3	Comments:
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Dry Weight (g): 121.61	Wash Weight (g): 121.45	Pan Retained (g): 0.65	Sieve Loss (%): 0.03	Fines (%): #200 - 1.37 #230 - 0.70	Organics (%):	Carbonates (%):	Shells (%):
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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
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	0.12	0.10	0.12	0.10
10	-1.00	2.00	0.15	0.12	0.27	0.22
14	-0.50	1.41	0.16	0.13	0.43	0.35
18	0.00	1.00	0.25	0.21	0.68	0.56
25	0.50	0.71	0.60	0.49	1.28	1.05
35	1.00	0.50	1.28	1.05	2.56	2.11
45	1.50	0.35	5.68	4.67	8.24	6.78
60	2.00	0.25	22.98	18.90	31.22	25.67
80	2.50	0.18	40.06	32.94	71.28	58.61
120	3.00	0.13	35.49	29.18	106.77	87.80
170	3.50	0.09	11.28	9.28	118.05	97.07
200	3.75	0.07	1.90	1.56	119.95	98.63
230	4.00	0.06	0.81	0.67	120.76	99.30

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Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.39	2.93	2.78	2.37	1.98	1.74	1.31

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	2.34	0.20	0.63	-0.93	6.84

GRANULARMETRIC REPORT IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Granularmetric Report

Depths and elevations based on measured values



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Project Name: IBSP Sand Source Survey

Sample Name: VC-17 #2

Analysis Date: 10-05-20

Analyzed By: DCJ

Easting (ft): 1,139,932	Northing (ft): 2,112,704	Coordinate System: State Plane	Elevation (ft): -44.2 IGLD MLW
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USCS: SP-SM	Munsell: Dry - 10YR-7/2	Comments:
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Dry Weight (g): 124.23	Wash Weight (g): 121.47	Pan Retained (g): 3.54	Sieve Loss (%): 0.01	Fines (%): #200 - 9.77 #230 - 5.08	Organics (%):	Carbonates (%):	Shells (%):
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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
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	0.04	0.03	0.04	0.03
14	-0.50	1.41	0.09	0.07	0.13	0.10
18	0.00	1.00	0.17	0.14	0.30	0.24
25	0.50	0.71	0.20	0.16	0.50	0.40
35	1.00	0.50	0.34	0.27	0.84	0.68
45	1.50	0.35	0.87	0.70	1.71	1.38
60	2.00	0.25	2.28	1.84	3.99	3.21
80	2.50	0.18	3.01	2.42	7.00	5.63
120	3.00	0.13	12.28	9.88	19.28	15.52
170	3.50	0.09	79.78	64.22	99.06	79.74
200	3.75	0.07	13.03	10.49	112.09	90.23
230	4.00	0.06	5.83	4.69	117.92	94.92

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Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
	3.60	3.46	3.27	3.07	3.00	2.37

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	3.18	0.11	0.47	-3.1	19.03

GRANULARMETRIC REPORT IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Granularmetric Report

Depths and elevations based on measured values



Gahagan and Bryant Associates
3802 W Bay to Bay Blvd. Suite B-22
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Telephone: 813-831-4408
Fax: 813-831-4216

Project Name: IBSP Sand Source Survey

Sample Name: VC-18 #1

Analysis Date: 10-05-20

Analyzed By: DCJ

Easting (ft): 1,138,958	Northing (ft): 2,112,686	Coordinate System: State Plane	Elevation (ft): -41.8 IGLD MLW
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USCS: SW	Munsell: Dry - 10YR-7/3	Comments:
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Dry Weight (g): 120.16	Wash Weight (g): 120.03	Pan Retained (g): 0.08	Sieve Loss (%): 0.11	Fines (%): #200 - 0.35 #230 - 0.28	Organics (%):	Carbonates (%):	Shells (%):
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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
3.5	-2.50	5.66	0.45	0.37	0.45	0.37
4	-2.25	4.76	0.15	0.12	0.60	0.50
5	-2.00	4.00	0.62	0.52	1.22	1.02
7	-1.50	2.83	1.83	1.52	3.05	2.54
10	-1.00	2.00	2.01	1.67	5.06	4.21
14	-0.50	1.41	3.21	2.67	8.27	6.88
18	0.00	1.00	2.92	2.43	11.19	9.31
25	0.50	0.71	4.02	3.35	15.21	12.66
35	1.00	0.50	9.30	7.74	24.51	20.40
45	1.50	0.35	35.50	29.54	60.01	49.94
60	2.00	0.25	38.98	32.44	98.99	82.38
80	2.50	0.18	14.14	11.77	113.13	94.15
120	3.00	0.13	5.15	4.29	118.28	98.44
170	3.50	0.09	1.20	1.00	119.48	99.43
200	3.75	0.07	0.26	0.22	119.74	99.65
230	4.00	0.06	0.08	0.07	119.82	99.72

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Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.60	2.07	1.89	1.50	1.08	0.72	-0.85

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	1.33	0.40	0.98	-1.53	6.54

GRANULARMETRIC REPORT IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Granularmetric Report

Depths and elevations based on measured values



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 3802 W Bay to Bay Blvd. Suite B-22
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 Telephone: 813-831-4408
 Fax: 813-831-4216

Project Name: IBSP Sand Source Survey

Sample Name: VC-18 #2

Analysis Date: 10-05-20

Analyzed By: DCJ

Easting (ft): 1,138,958	Northing (ft): 2,112,686	Coordinate System: State Plane	Elevation (ft): -45.3 IGLD MLW
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USCS: SW	Munsell: Dry - 10YR-7/3	Comments:
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Dry Weight (g): 124.34	Wash Weight (g): 122.38	Pan Retained (g): 0.43	Sieve Loss (%): 0.02	Fines (%): #200 - 2.80 #230 - 1.94	Organics (%):	Carbonates (%):	Shells (%):
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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
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	0.26	0.21	0.26	0.21
7	-1.50	2.83	0.61	0.49	0.87	0.70
10	-1.00	2.00	1.10	0.88	1.97	1.58
14	-0.50	1.41	2.40	1.93	4.37	3.51
18	0.00	1.00	4.10	3.30	8.47	6.81
25	0.50	0.71	8.89	7.15	17.36	13.96
35	1.00	0.50	15.24	12.26	32.60	26.22
45	1.50	0.35	24.95	20.07	57.55	46.28
60	2.00	0.25	20.76	16.70	78.31	62.98
80	2.50	0.18	18.32	14.73	96.63	77.71
120	3.00	0.13	14.80	11.90	111.43	89.62
170	3.50	0.09	7.56	6.08	118.99	95.70
200	3.75	0.07	1.87	1.50	120.86	97.20
230	4.00	0.06	1.07	0.86	121.93	98.06

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Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.44	2.76	2.41	1.61	0.95	0.58	-0.27

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	1.58	0.33	1.07	-0.36	3.18

GRANULARMETRIC REPORT IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Granularmetric Report

Depths and elevations based on measured values



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 3802 W Bay to Bay Blvd. Suite B-22
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 Telephone: 813-831-4408
 Fax: 813-831-4216

Project Name: IBSP Sand Source Survey

Sample Name: VC-18 #3

Analysis Date: 10-05-20

Analyzed By: DCJ

Easting (ft): 1,138,958	Northing (ft): 2,112,686	Coordinate System: State Plane	Elevation (ft): -45.7 IGLD MLW
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USCS: SM	Munsell: Dry - 10YR-7/2	Comments:
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Dry Weight (g): 119.66	Wash Weight (g): 106.10	Pan Retained (g): 6.62	Sieve Loss (%): 0.26	Fines (%): #200 - 25.27 #230 - 17.12	Organics (%):	Carbonates (%):	Shells (%):
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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
3.5	-2.50	5.66	0.00	0.00	0.00	0.00
4	-2.25	4.76	0.36	0.30	0.36	0.30
5	-2.00	4.00	0.13	0.11	0.49	0.41
7	-1.50	2.83	0.13	0.11	0.62	0.52
10	-1.00	2.00	0.43	0.36	1.05	0.88
14	-0.50	1.41	0.52	0.43	1.57	1.31
18	0.00	1.00	0.79	0.66	2.36	1.97
25	0.50	0.71	1.14	0.95	3.50	2.92
35	1.00	0.50	1.64	1.37	5.14	4.30
45	1.50	0.35	2.52	2.11	7.66	6.40
60	2.00	0.25	2.21	1.85	9.87	8.25
80	2.50	0.18	1.76	1.47	11.63	9.72
120	3.00	0.13	3.13	2.62	14.76	12.33
170	3.50	0.09	56.81	47.48	71.57	59.81
200	3.75	0.07	17.85	14.92	89.42	74.73
230	4.00	0.06	9.75	8.15	99.17	82.88

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Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
		3.76	3.40	3.13	3.04	1.17

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	3.08	0.12	0.94	-3.03	13.32

GRANULARMETRIC REPORT IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Granularmetric Report

Depths and elevations based on measured values



Gahagan and Bryant Associates
3802 W Bay to Bay Blvd. Suite B-22
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Telephone: 813-831-4408
Fax: 813-831-4216

Project Name: IBSP Sand Source Survey

Sample Name: VC-19 #1

Analysis Date: 10-05-20

Analyzed By: DCJ

Easting (ft): 1,140,337	Northing (ft): 2,114,198	Coordinate System: State Plane	Elevation (ft): -39.0 IGLD MLW
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USCS: SW	Munsell: Dry - 10YR-7/3	Comments:
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Dry Weight (g): 120.23	Wash Weight (g): 116.76	Pan Retained (g): 0.39	Sieve Loss (%): 0.02	Fines (%): #200 - 4.35 #230 - 3.24	Organics (%):	Carbonates (%):	Shells (%):
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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
3.5	-2.50	5.66	0.00	0.00	0.00	0.00
4	-2.25	4.76	0.15	0.12	0.15	0.12
5	-2.00	4.00	0.23	0.19	0.38	0.32
7	-1.50	2.83	0.50	0.42	0.88	0.73
10	-1.00	2.00	1.03	0.86	1.91	1.59
14	-0.50	1.41	1.77	1.47	3.68	3.06
18	0.00	1.00	1.54	1.28	5.22	4.34
25	0.50	0.71	1.79	1.49	7.01	5.83
35	1.00	0.50	3.50	2.91	10.51	8.74
45	1.50	0.35	21.05	17.51	31.56	26.25
60	2.00	0.25	44.63	37.12	76.19	63.37
80	2.50	0.18	14.98	12.46	91.17	75.83
120	3.00	0.13	6.40	5.32	97.57	81.15
170	3.50	0.09	14.58	12.13	112.15	93.28
200	3.75	0.07	2.85	2.37	115.00	95.65
230	4.00	0.06	1.34	1.11	116.34	96.76

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Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.68	3.12	2.47	1.82	1.46	1.21	0.22

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	1.87	0.27	0.97	-0.7	5.2

GRANULARMETRIC REPORT IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Granularmetric Report

Depths and elevations based on measured values



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Fax: 813-831-4216

Project Name: IBSP Sand Source Survey

Sample Name: VC-19 #2

Analysis Date: 10-05-20

Analyzed By: DCJ

Easting (ft): 1,140,337	Northing (ft): 2,114,198	Coordinate System: State Plane	Elevation (ft): -41.0 IGLD MLW
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USCS: SP-SM	Munsell: Dry - 10YR-7/2	Comments:
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Dry Weight (g): 125.30	Wash Weight (g): 120.40	Pan Retained (g): 3.25	Sieve Loss (%): 0.04	Fines (%): #200 - 11.05 #230 - 6.54	Organics (%):	Carbonates (%):	Shells (%):
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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
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	0.10	0.08	0.10	0.08
7	-1.50	2.83	0.17	0.14	0.27	0.22
10	-1.00	2.00	0.34	0.27	0.61	0.49
14	-0.50	1.41	0.39	0.31	1.00	0.80
18	0.00	1.00	0.24	0.19	1.24	0.99
25	0.50	0.71	0.27	0.22	1.51	1.21
35	1.00	0.50	0.36	0.29	1.87	1.49
45	1.50	0.35	1.00	0.80	2.87	2.29
60	2.00	0.25	2.80	2.23	5.67	4.53
80	2.50	0.18	2.64	2.11	8.31	6.63
120	3.00	0.13	10.11	8.07	18.42	14.70
170	3.50	0.09	81.64	65.16	100.06	79.86
200	3.75	0.07	11.40	9.10	111.46	88.95
230	4.00	0.06	5.64	4.50	117.10	93.46

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Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
	3.61	3.46	3.27	3.08	3.01	2.11

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	3.14	0.11	0.62	-4.2	26.83

GRANULARMETRIC REPORT IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Granularmetric Report

Depths and elevations based on measured values



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Project Name: IBSP Sand Source Survey

Sample Name: VC-20 #1

Analysis Date: 10-05-20

Analyzed By: DCJ

Easting (ft):	Northing (ft):
1,139,260	2,115,192

Coordinate System:	Elevation (ft):
State Plane	-43.9 IGLD MLW

USCS:	Munsell:	Comments:
SP	Dry - 10YR-7/2	

Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%):	Organics (%):	Carbonates (%):	Shells (%):
122.24	117.95	0.45	0.03	#200 - 4.82 #230 - 3.91			

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
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	0.00	0.00	0.00	0.00
14	-0.50	1.41	0.08	0.07	0.08	0.07
18	0.00	1.00	0.10	0.08	0.18	0.15
25	0.50	0.71	0.38	0.31	0.56	0.46
35	1.00	0.50	0.79	0.65	1.35	1.10
45	1.50	0.35	3.06	2.50	4.41	3.61
60	2.00	0.25	7.12	5.82	11.53	9.43
80	2.50	0.18	22.48	18.39	34.01	27.82
120	3.00	0.13	60.35	49.37	94.36	77.19
170	3.50	0.09	19.65	16.07	114.01	93.27
200	3.75	0.07	2.34	1.91	116.35	95.18
230	4.00	0.06	1.11	0.91	117.46	96.09

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Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.73	3.21	2.98	2.72	2.42	2.18	1.62
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	2.64	0.16	0.54	-1.2	6.6	

GRANULARMETRIC REPORT IBSP.GPJ FL DEP ROSS.GDT 11/10/20

Granularmetric Report

Depths and elevations based on measured values



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Project Name: IBSP Sand Source Survey

Sample Name: VC-20 #2

Analysis Date: 10-05-20

Analyzed By: DCJ

Easting (ft): 1,139,260	Northing (ft): 2,115,192	Coordinate System: State Plane	Elevation (ft): -46.6 IGLD MLW
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USCS: SM	Munsell: Dry - 10YR-7/2	Comments:
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Dry Weight (g): 121.64	Wash Weight (g): 110.98	Pan Retained (g): 3.17	Sieve Loss (%): -0.36	Fines (%): #200 - 14.76 #230 - 11.01	Organics (%):	Carbonates (%):	Shells (%):
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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
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	0.60	0.49	0.60	0.49
7	-1.50	2.83	0.10	0.08	0.70	0.58
10	-1.00	2.00	0.15	0.12	0.85	0.70
14	-0.50	1.41	0.36	0.30	1.21	0.99
18	0.00	1.00	0.33	0.27	1.54	1.27
25	0.50	0.71	0.46	0.38	2.00	1.64
35	1.00	0.50	0.87	0.72	2.87	2.36
45	1.50	0.35	3.03	2.49	5.90	4.85
60	2.00	0.25	3.55	2.92	9.45	7.77
80	2.50	0.18	2.60	2.14	12.05	9.91
120	3.00	0.13	35.42	29.12	47.47	39.02
170	3.50	0.09	49.56	40.74	97.03	79.77
200	3.75	0.07	6.66	5.48	103.69	85.24
230	4.00	0.06	4.56	3.75	108.25	88.99

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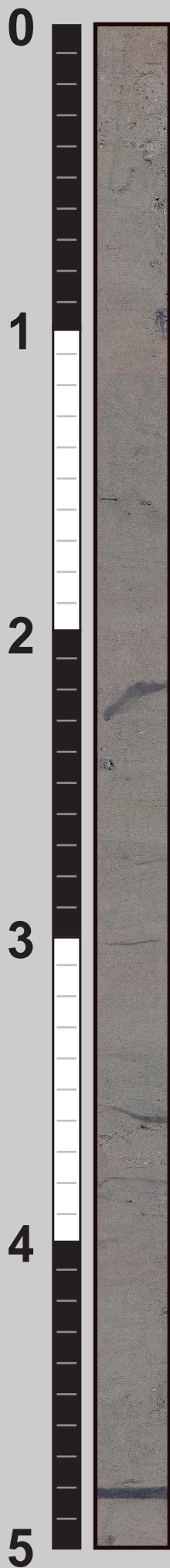
Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
	3.69	3.44	3.13	2.76	2.60	1.53

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	2.91	0.13	0.77	-3.15	17.28

GRANULARMETRIC REPORT IBSP.GPJ FL DEP ROSS.GDT 11/10/20

APPENDIX G

VIBRACORE PHOTO



**Gahagan & Bryant
Associates, Inc.**

**Geotechnical Vibracore Investigation
IL Beach State Park, Lake Michigan
Waukegan, IL**

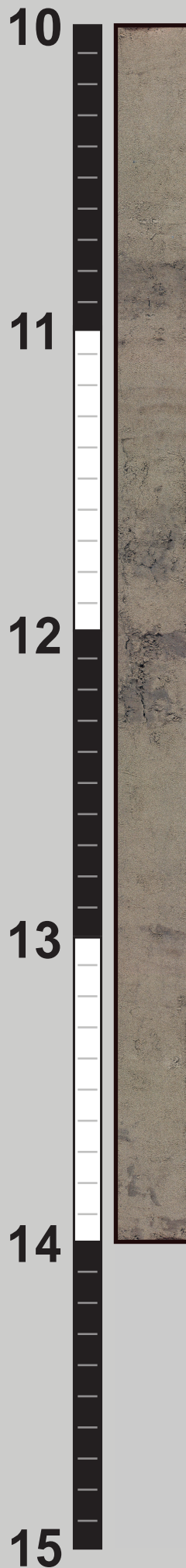
VC-01

Notes:

- Photo Mosaic Image
- Photo Scale in Feet



Athena Technologies, Inc.
1293 Graham Farm Road
McClellanville, SC 29458
www.athenatechnologies.com
(843) 887-3800



**Gahagan & Bryant
Associates, Inc.**

**Geotechnical Vibracore Investigation
IL Beach State Park, Lake Michigan
Waukegan, IL**

VC-02

Notes:

- Photo Mosaic Image
- Photo Scale in Feet



Athena Technologies, Inc.
1293 Graham Farm Road
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**Gahagan & Bryant
Associates, Inc.**

**Geotechnical Vibracore Investigation
IL Beach State Park, Lake Michigan
Waukegan, IL**

VC-04

Notes:

- Photo Mosaic Image
- Photo Scale in Feet



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McClellanville, SC 29458
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**Gahagan & Bryant
Associates, Inc.**

**Geotechnical Vibracore Investigation
IL Beach State Park, Lake Michigan
Waukegan, IL**

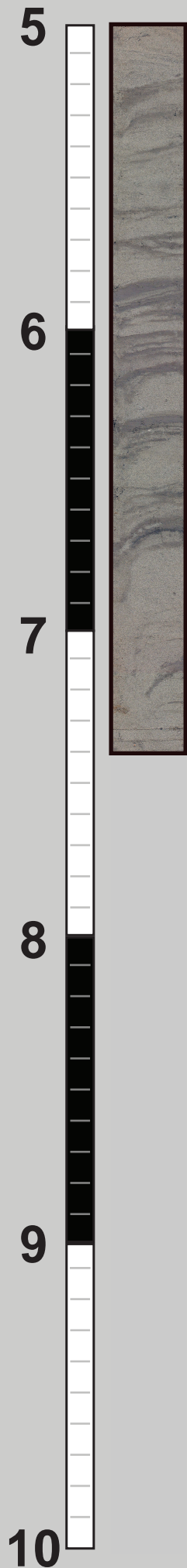
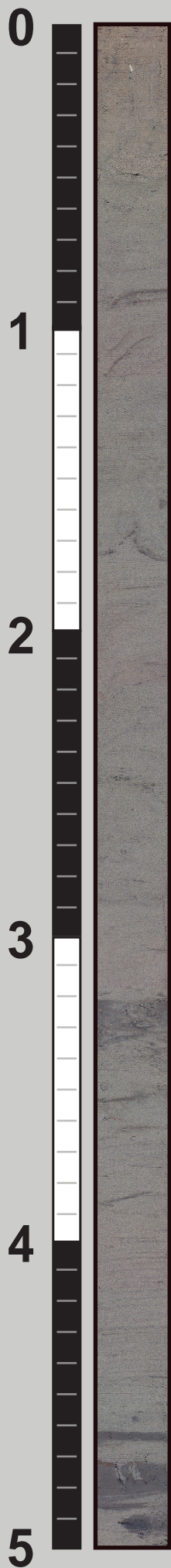
VC-05

Notes:

- Photo Mosaic Image
- Photo Scale in Feet



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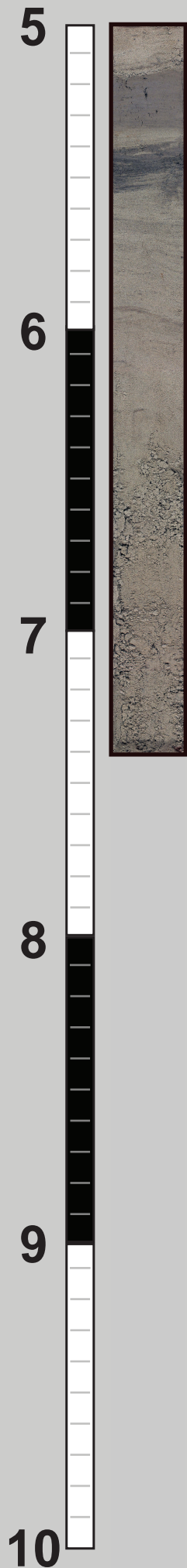
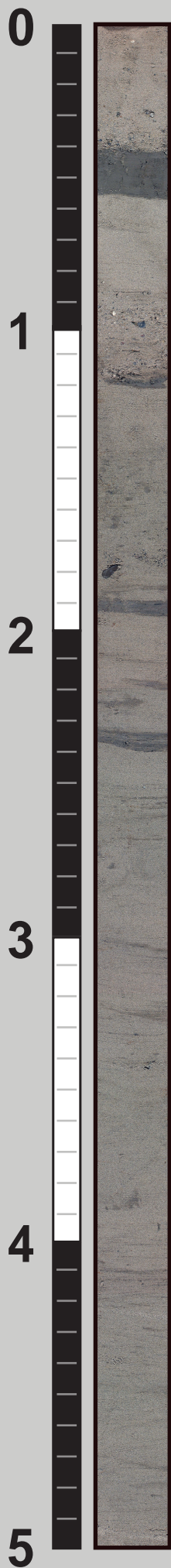
VC-06

Notes:

- Photo Mosaic Image
- Photo Scale in Feet



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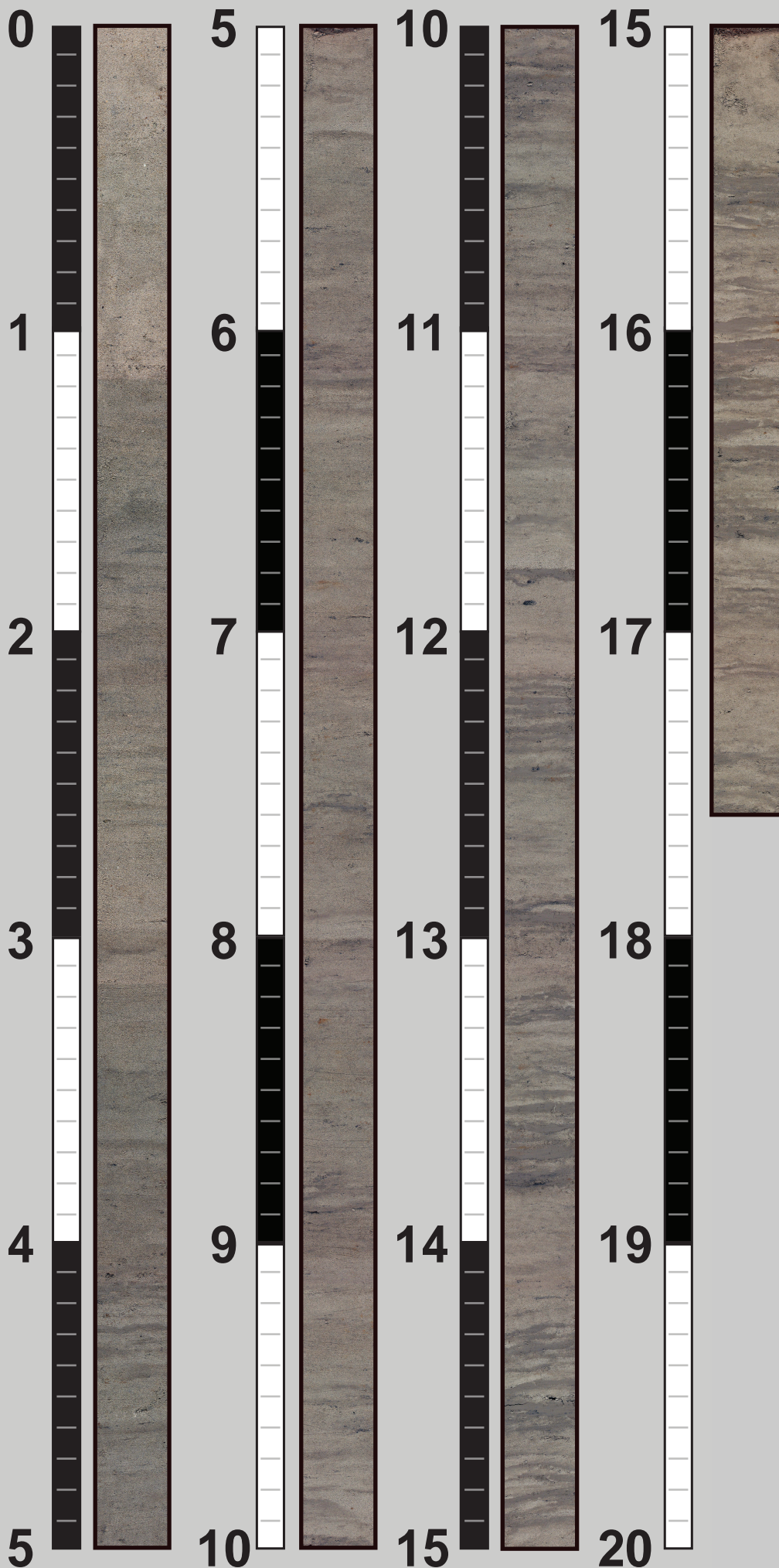
VC-08

Notes:

- Photo Mosaic Image
- Photo Scale in Feet



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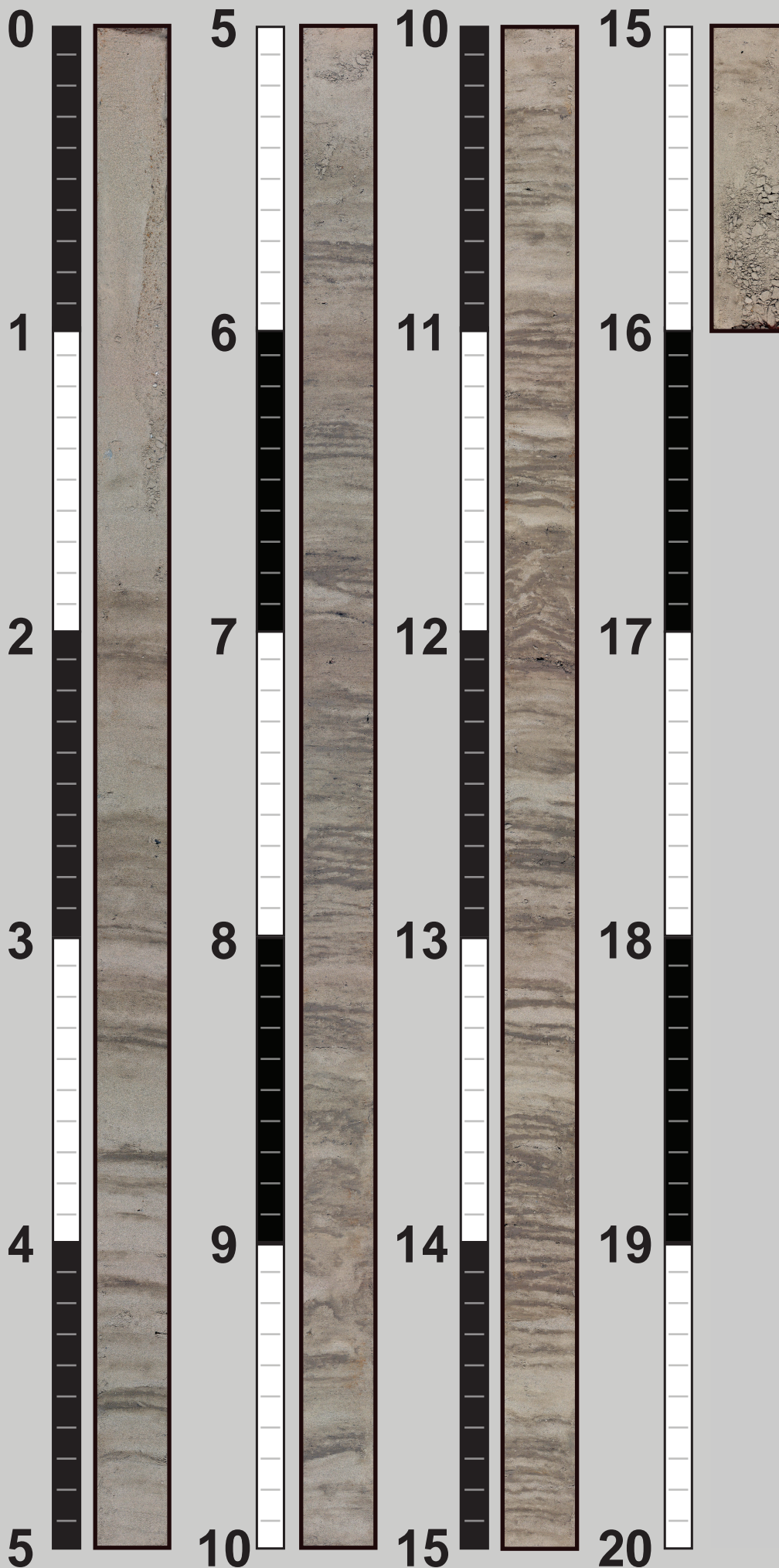
VC-09

Notes:

- Photo Mosaic Image
- Photo Scale in Feet



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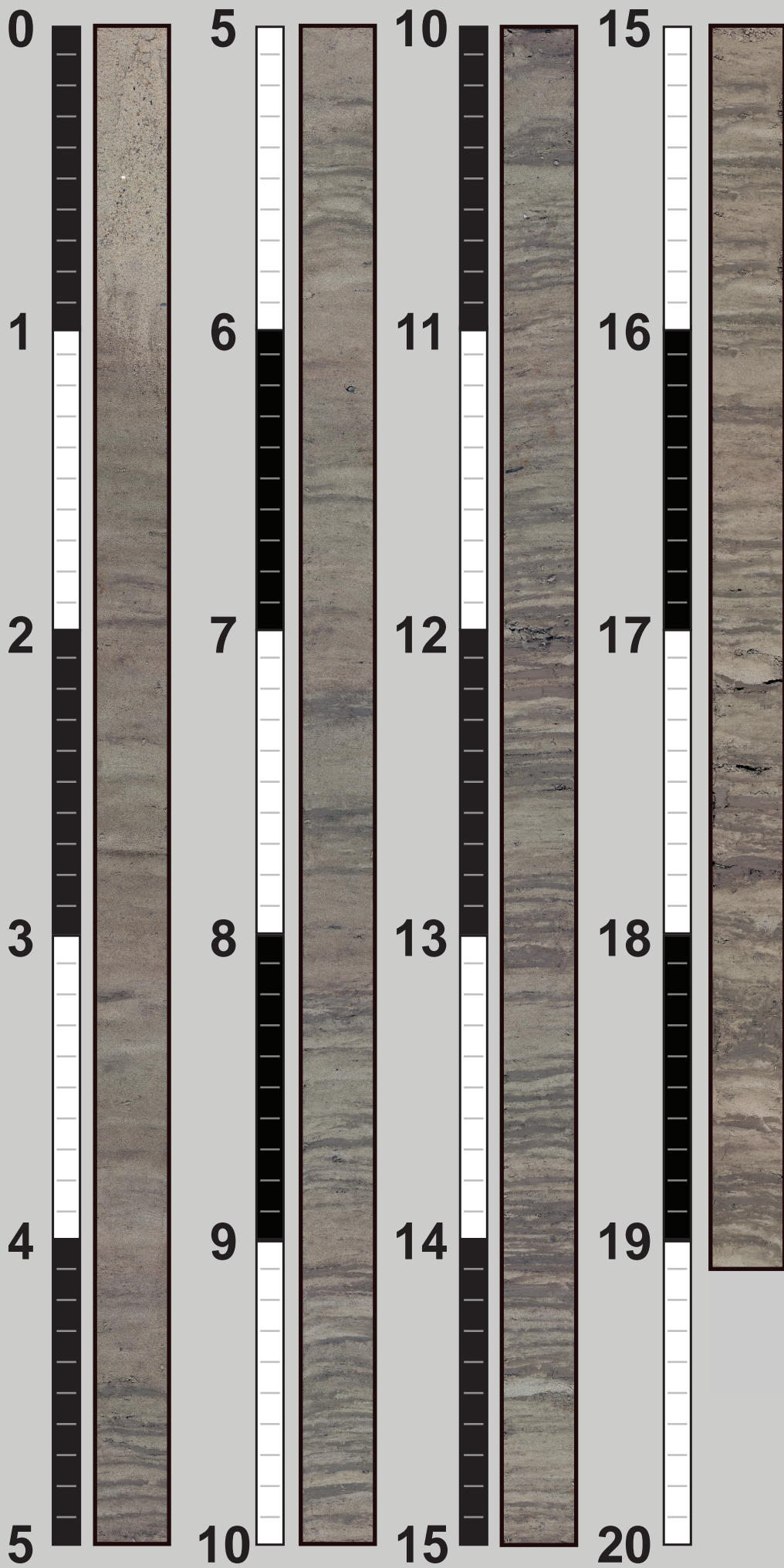
VC-10

Notes:

- Photo Mosaic Image
- Photo Scale in Feet



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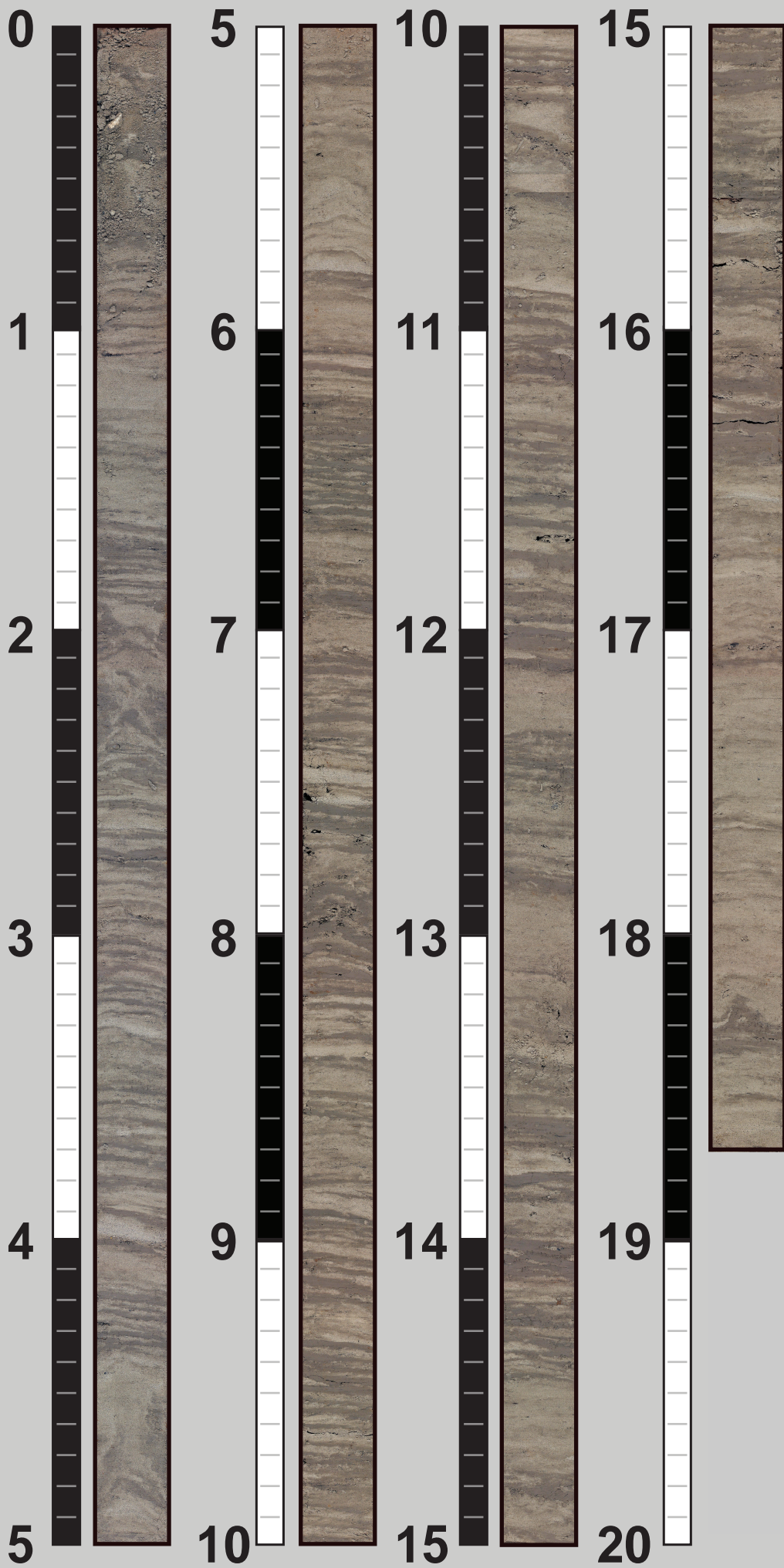
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VC-12

Notes:
- Photo Mosaic Image
- Photo Scale in Feet



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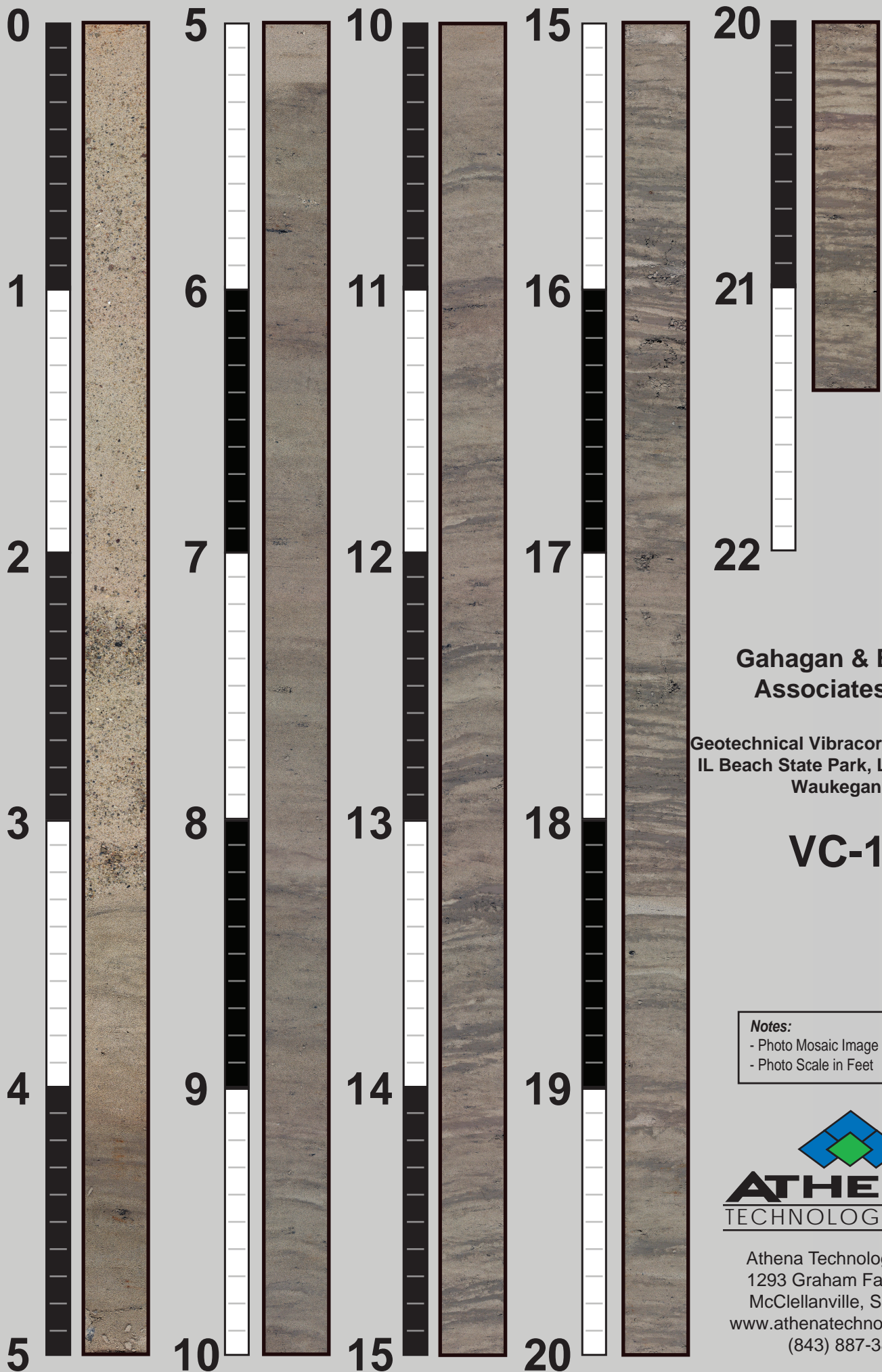
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VC-13

Notes:
- Photo Mosaic Image
- Photo Scale in Feet



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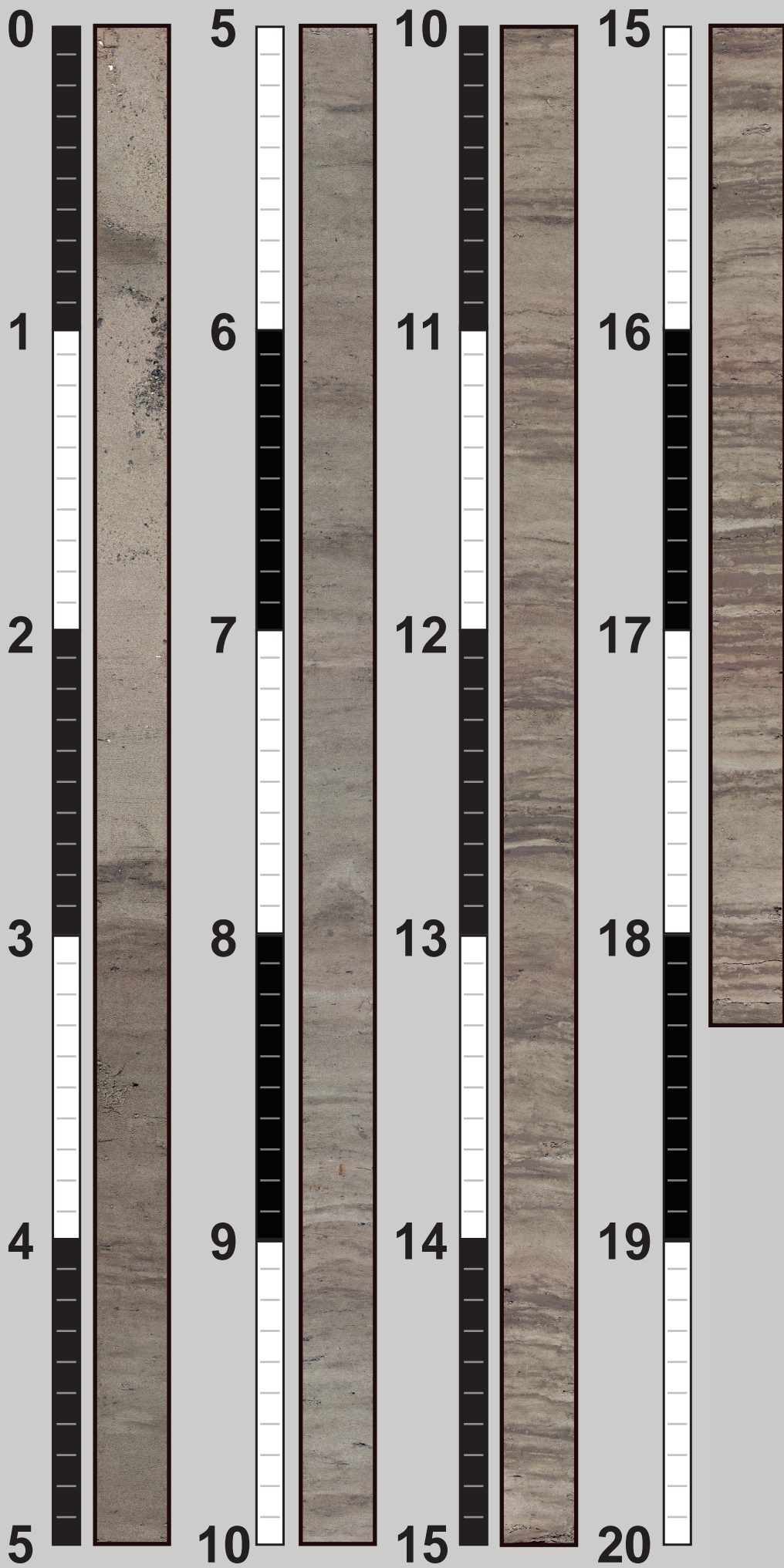
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VC-14

Notes:
- Photo Mosaic Image
- Photo Scale in Feet



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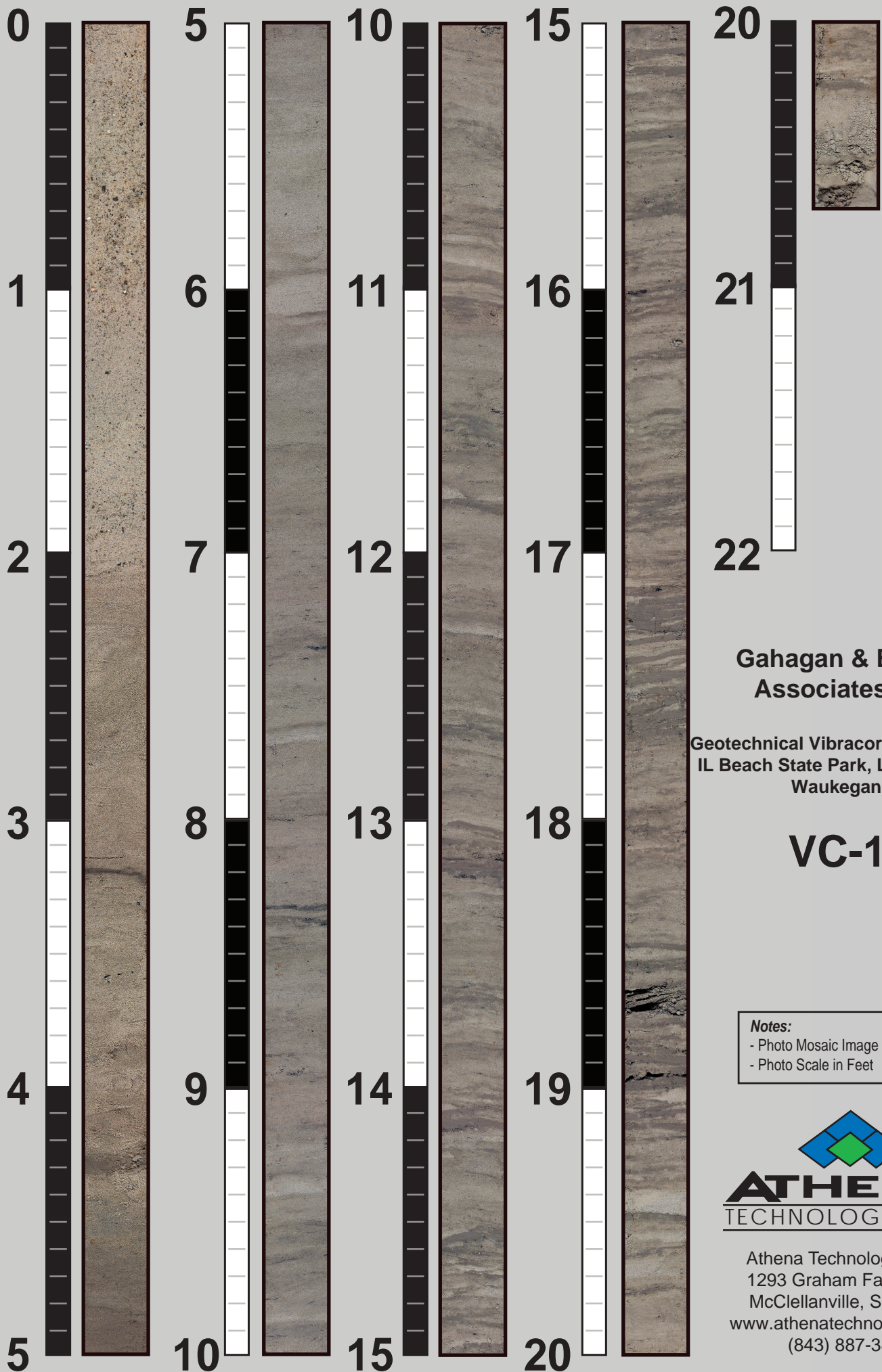
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VC-15

Notes:
- Photo Mosaic Image
- Photo Scale in Feet



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VC-16

- Notes:**
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 - Photo Scale in Feet



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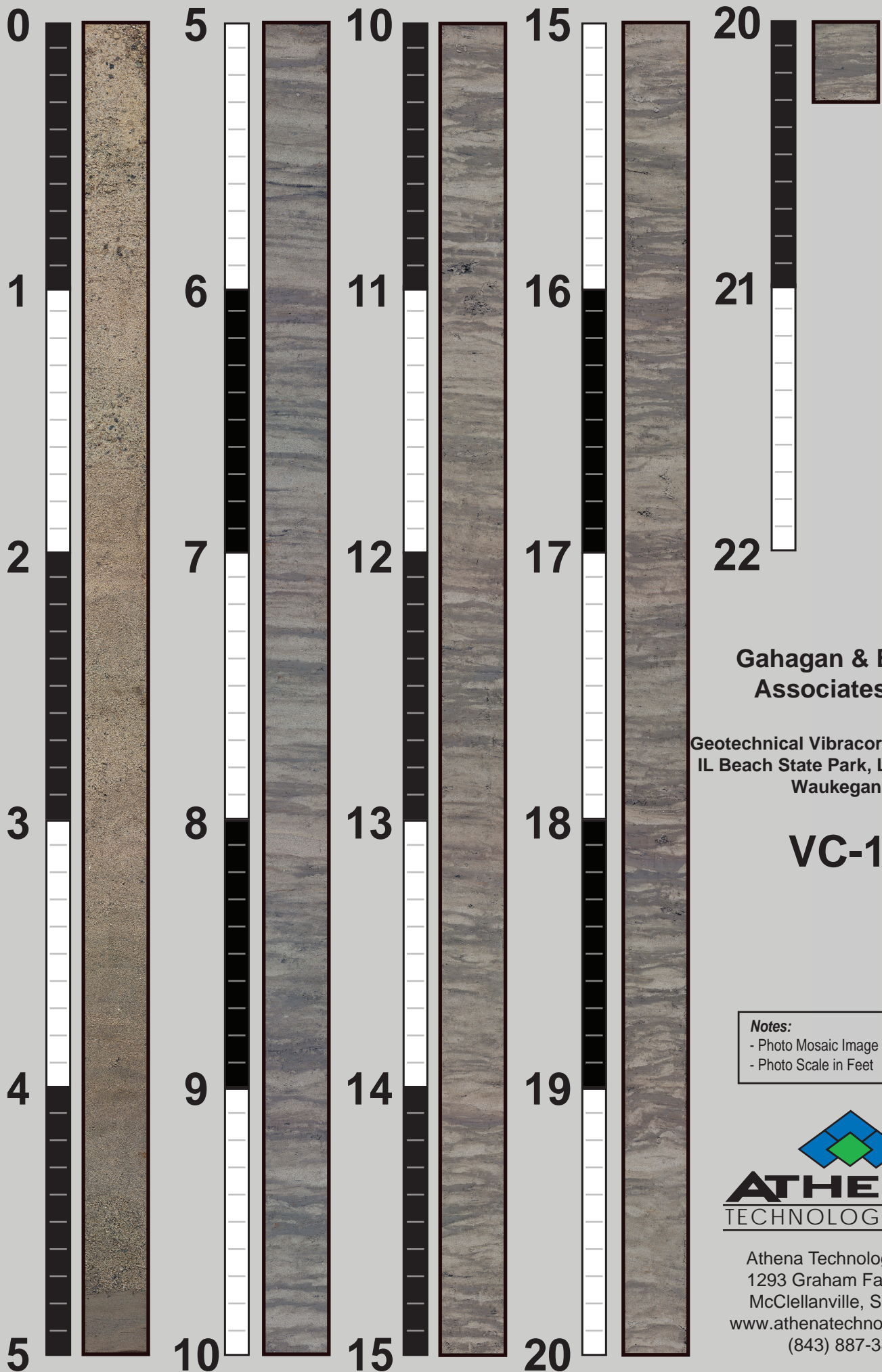
VC-17

Notes:

- Photo Mosaic Image
- Photo Scale in Feet



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VC-18

- Notes:**
- Photo Mosaic Image
 - Photo Scale in Feet



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VC-19

Notes:

- Photo Mosaic Image
- Photo Scale in Feet



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VC-20

Notes:

- Photo Mosaic Image
- Photo Scale in Feet



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