STEVE KRUPA

FINAL REPORT

ISOLATED WETLANDS DRILLING PHASE I

COPY

SUBMITTED TO:

SOUTH FLORIDA WATER MANAGEMENT DISTRICT
3301 GUN CLUB ROAD
WEST PALM BEACH, FL 33406

ENGINEERED ENVIRONMENTAL SOLUTIONS, INC.
1301 NW 4thStreet, Boca Raton, Fl. 33486
Tel/Fax: 561-394- 3969

EXECUTIVE SUMMARY

Engineered Environmental Solutions, Inc. (EESI) was contracted by the South Florida Water Management District (SFWMD) to install twenty (20) surficial groundwater monitoring wells in isolated wetlands throughout the district. Drilling activities included geologic sampling (standard penetration tests (SPTs), split spoons, and Shelby tubes) and monitoring well installations using the Tripod Water Wash Drilling Method. Field activities were conducted in January and February, 1997. Precision Drilling Inc. was subcontracted by EESI for drilling activities.

A total of 187 sieve analyses were performed using No. 10, 20, 30, 40, 50, 60, 80, 100, 140, 170, and 200 sieve sizes on split spoon soil samples. A total of three hydrometer analyses were also performed on Shelby tube samples. The SPT blow counts and percent recoveries, lithology descriptions, well specifications, particle size analysis results, and general notes were entered into the Geotechnical Integrator Software (gINT) package. This reports contains the following:

1. Typed Field Notes.
2. Site Maps.
3. Boring Logs and Well Construction Drawings.
4. Grain Size Distribution Curves.
5. Grain Size Analysis Laboratory Data

The report is organized by the four regions where drilling activities were performed: 1) Jonathan Dickinson State Park 2) Savannas State Preserve 3) Disney Wilderness Preserve 4) Flint Pen Strand.

Kevin Rockett
Sr. Project Hydrogeologist

Joseph Ziegler, P.E.
President

9-11-97

DRILLING METHODOLGY

Mobilization/Demobilization

All equipment and personnel were transported to and from the drilling locations in a flatbed stake truck and 4x4 pickup truck. An upland staging area was designated by the on-site District geologist to support drilling activities in the adjacent wetland. The Tri-Pod drill rig and associated drilling/geologic sampling tools were manually carried into the wetland to the well site. The entire rig was fabricated on-site. Upon completion of drilling activities at each site, the site was restored to its original condition. All excess grout and debris was removed from the site.

Decontamination

All augers, rods, split spoons, core barrels, screens, and well casing were steam cleaned prior to and after drilling activities using alconox soap. Clean "city" water from the stake truck water tank was be used for cleaning purposes. All decontamination was performed at a location within the designated upland staging area. The steam cleaned well screens and casings were be air dried and wrapped in plastic until installation into the borehole. Cleaned augers, rods, spoons, and cores were transported to the drilling site and staged temporarily on a fabricated field table erected adjacent to the drill rig. This prevented the drilling tools from contacting the ground after cleaning. In addition, all cleaned drilling tools and well casings/screens were handled by personnel wearing latex gloves.

Tri-Pod Drilling and Geologic Sampling

The Tri-Pod rig was manually carried to and erected at the drilling site. Carbon steel PW casings (5-inch diameter) were advanced using a 140 pound safety hammer. Each section of PW casing was three feet long. The interior of the casing was washed out using a centrifugal pump at 2-foot intervals followed by geologic sampling for the entire depth of the borehole. SPT's (or Shelby Tubes) were performed and split-spoon samples collected as the casing was advanced every two feet.

Drilling and geologic sampling was performed in two-foot stages. Initially, a split spoon (or Shelby Tube or Rock Core) was collected from zero to two feet below land surface (BLS). The borehole was advanced from zero to two feet BLS followed by the collection of the next split spoon (or Shelby Tube or Rock Core) from two to four feet BLS. The geologic sampling was performed inside the casing. This alternating practice of sampling two feet followed by casing advancement of two feet continued for the entire 20-foot depth of each well.

For each split spoon sample, the Standard Penetration Test (SPT) blow count data was logged. When cohesive soils were encountered, the split spoons were replaced with thin walled Shelby tubes. SPTs and thin walled sampling were performed in compliance with ASTM 1586-84 and 1587-94, respectively.

Prior to each SPT, the split spoon was fitted with an acrylic liner. After the completion of each SPT, the acrylic liner was removed from the split spoon and capped at both ends. To insure expedient drilling and sampling, ten split spoons were utilized. Each spoon was decontaminated according to the procedures described above. Every recovered acrylic liner was logged for lithology and clearly labeled with well number, sample depth, date, time, and orientation (i.e. top and bottom). The liners were stored in reinforced, water resistant, labeled cardboard boxes after inspection by the District's on-site geologist.

Similarly, recovered Shelby tubes were capped and taped closed. The Shelby tubes were labeled with the well number, sample depth, date, and time. All sample depths were measured using a tremie with known length increments installed within the casing. Full boxes of split spoon samples and Shelby Tubes were transported back to EESI's Boca Raton office for sample analyses.

Well Installation Procedures

After the completion of the geologic sampling, the wells screens and casings were installed within the steel casing. All twenty wells were "shallow" wells consisting of 18 feet of 2-inch diameter tri-loc PVC casing and 2 feet of 2-inch diameter, 0.01-inch slotted PVC screen. Once the well was inplace, the space between the well and the steel casing was de-watered using a 2-inch centrifugal pump. Once de-watered, the tremie method was used to install the 20/30 silica sand pack, bentonite seal, and grout were installed. The sand pack was installed from the bottom of the well to two feet above the top of the screen. After the sand pack, a one foot bentonite seal was installed. The remaining annulus was grouted to land surface.

Well Development Procedures

The twenty "shallow" wells were developed using a centrifugal pump. Development water was pumped up to an adjacent upland area specified by the on-site District geologist. Well development continued until all visible particulate matter was removed.

GEOLOGIC ANALYSIS METHODOLOGY

Sieve Analyses

Grain size analyses were performed on 187 split spoon samples according to ASTM Methods 422-63 and 421-85. Sieve analyses utilizing standard sieve numbers 10, 20, 30, 40, 50, 60, 80, 100, 140, 170, and 200 were performed by EESI utilizing an ASTM Standard E-11 approved RoTap shaker, brass sieves, and a digital scale.

EESI's sieve analysis procedure is summarized below:

1. A sample weighing approximately 200 grams (+ or – 20 grams) is taken from the acrylic liner split spoon sample.
2. The sample is washed with de-ionized water.
3. The sample is dried in an oven at 40 degrees Celcius for 1 hour or until dry.
4. The sample is segregated with a mortar and pestle.
5. The sample is weighed and the total weight is recorded.
6. The sample is transferred to the No. 10 sieve assembled on the shaker.
7. The sample is sieved for 15 minutes.
8. After sieving, each tray is carefully removed from the shaker. The contents are transferred to a tarred weighing paper.
9. The mass of each sieved fraction is weighed. The weights are recorded on a tabulation form.
10. The sum of the sieved fractions weights are compared to the original total weight. If the difference exceeds 3-percent, the sample is re-run.
11. Each sieved fraction is transferred into a 6-inch x 6-inch ziplock bag and labeled with well number, SPT number, sample depth, sieve size, and date.
12. The eleven bags are inserted into a larger 12-inch x 12-inch ziplock bag and labeled with well number, SPT number, sample depth, and date.
13. If the amount of material passing the No. 200 sieve exceeds 10-percent or if requested by the District geologist, EESI performs a hydrometer test on the material retained in the pan.

For each well, all the bags were boxed in an individual reinforced cardboard box labeled with the boring/well number, site location, date collected, and contractor information. All boxed samples and the remaining un-used portions of the acrylic liners were returned to the District.

Hydrometer Tests

Three Shelby tubes contained cohesive soils which were analyzed for particle sizes using the Hydrometer method according to ASTM Method D422-63 using standard bouyoucos type 152H hydrometers.

EESI's hydrometer testing procedure is summarized below:

1. A sample weighing from 25 to 50 grams is dried at 40 degrees Celcius.
2. A stock settling solution is prepared by mixing 11.4 grams of sodium hexametaphosphate and 250 milliliters (ml) of distilled water.
3. The working settling solution is then prepared in two 1,000 ml graduated cylinders by mixing 125 ml of stock solution with 875 ml of distilled water in each of the two graduated cylinders.
4. One of the graduated cylinders is a control to store the hydrometer and thermometer between readings.
5. Both graduated cylinders are allowed to equilibrate to room temperature.
6. A portion of the liquid in test cylinder is decanted to a beaker.
7. The sample is then added to the test cylinder and the test cylinder is topped off to 1,000 ml with the decanted liquid.
8. The contents of the test cylinder are mixed for one minute.
9. The hydrometer is inserted into the test cylinder and allowed to equilibrate with the suspension.
10. Hydrometer depths and water temperature is recorded at 1, 2, 4, 8, 15, 30, 60, 120, 240, 420, 1020, 1440, and 2880 minutes. The hydrometer and thermometer are removed from the test cylinder between samples and stored in the control.
11. Hydrometer readings and temperatures are used to determine maximum diameter of particles in suspension according to Stoke's Law.

REPORT AND SUBMITTAL

Field Notes

The on-site District geologist recorded field notes during field drilling activities. Upon completion of drilling activities at each of the four locations, EESI meet with the District's geologist to obtain 1) copies of the District's drilling notes, 2) boxes of the split spoon acrylic liner samples, and 3) Shelby tubes (if any). The samples were transported to EESI's in-house soil testing laboratory for analyses. The field notes were transcribed electronically in Word Perfect Version 7 Format.

Site Maps

EESI prepared a site map for each well site on Autocad Version 13. The maps include dimensions to the nearest landmarks, a north arrow, the location of the well, roads and paths, and key site features.

Spreadsheet Particle Size Analyses

The results of the sieve analyses were input into a Lotus 123 Version 5 spreadsheet provided by the SFWMD. The spreadsheet includes the weight of the sample, the weight recovered per sieve, and the total percentage recovered after weighing. The District geologist will be able to use this spreadsheet to calculate the hydraulic conductivity.

gINT Boring Logs and Grain Size Distribution Curves

EESI entered the following information into the gINT program:

1. Well Completion Specifications – Elevations, Screen Intervals, Casing Lengths, Grout Intervals, and Bentonite Seals.
2. Geologic Sampling – Percent Recovery, Blow Counts, and Type of Sample (i.e. SPT, Shelby Tube, or Core).
3. Lithology – Munsell Field Color, Lithologic Description, Unified Soil Classification, and Field Descriptions.
4. General Notes – Boring Number, Site Location, Contractor Information, Dates, Well Specifications, Sampling Method, Etc.
5. Sieve Analysis and Hydrometer Tests Results

The program prepared Boring Logs and Grain Size Distribution Curves for all twenty wells and 187 sieve samples and the three hydrometer samples. In addition, the program automatically calculated the coefficient of gradation (C_c) and the uniformity coefficient (C_u) from the percent finers (D_{10}, D_{30}, and D_{60}). In addition, gINT automatically classified the soil according to ASTM and Unified Soil Classification standards.

Final Deliverable

The final deliverables include the following:

1. This report.
    - Executive Summary and Methodologies
    - Typed Field Notes
    - Site Maps
    - Boring Logs and Well Completion Reports
    - Grain Size Distribution Curves
    - Raw Sieve Analysis Data
2. Twenty boxes containing the bagged sieve samples.
3. 187 remaining acrylic liner split spoon samples.
4. Electronic files of all data.
5. The entire gINT software package.

J DICKENSON
STATE PARK

TYPED FIELD NOTES

Isolated Wetlands Drilling Program
Jonathan Dickinson State Park
Martin County, Florida

Location: Main Road, Wet Prairie
Township: 40 S, Range: 42 E, Section: 9
Drill Dates: 01/02/97 to 01/14/97
South Florida Water Management District
District Personnel: Steve Krupa
Precision Drilling Staff: Robert Miller
Joe Crisalli

01/02/97 Well #JD6

Time

0800 Drillers arrive at District.
0830 Drove to ESDA to pick up 8" casing and 12" temporary surface casing.
0945 Arrive at Jonathan Dickinson State Park to drill first wetland.
1000 Off loaded truck. Driller left to fill tank with water for pressure steam cleaning decontamination.
1030 Driller returned with city water. Proceeded to de-contaminate all drilling equipment via steam cleaning.
1130 Suspended drilling activities for lunch break.
1145 Transported tripod to drilling location.
1205 Assembled tripod, inspected equipment. Upon engine startup, the pull cord breaks. Engine, hammer weight, and pulley rope in proper operating condition.

	Depth (B.L.S.)	SPT Count	Sample Recovery	Sample Number
1300	0-2 feet	6/6/6/6	44% recovery	S-1
1400	2-4 feet	14/10/12/16	62% recovery	S-2
1430	4-6 feet	10/16/16/10	50% recovery	S-3

1500 Removed casings, the casing was penetrating at an angle. The tripod was not remaining centered. Re-drove three sections of casing. The casing is still angled. The casing diameter is too small (3 inch).
1545 Casing lengths are too long (5ft). Robert Miller phoned Precision to attain five (5) inch diameter casing modified to three (3) foot lengths. Removed the 3 inch casing. The new 5 inch diameter casing will not be ready for one week.
1615 Packed up all drilling equipment to depart site and return to District.

End of Entry 1/2/97

Isolated Wetlands Drilling Program
Jonathan Dickinson State Park
Martin County, Florida

Location: Main Road, Wet Prairie
Township: 40 S, Range: 42 E, Section: 9
Drill Dates: 01/02/97 to 01/14/97
South Florida Water Management District
District Personnel: Steve Krupa
Precision Drilling Staff: Robert Miller
Joe Crisalli

01/14/97 Old Well # JD6C New Well # JD6

Time				
		Depth(B.L.S.)	SPT Count	Sample Recovery	Sample Number
1010	On site, transported pipe, casing, drilling equipment and work table to the drilling site.				
1100	Started driving six feet of casing. Wash out sediment. Drive split spoon. Washed out too much sediment. Next sample 7-9 feet below land surface.				
1130		7-9 feet	12/7/12/12	75% recovery	S-4
1230	Three casings driven.				
1315		9-11 feet	10/10/13/15	50% recovery	S-5
1340		11-13 feet	4/5/5/7	60% recovery	S-6
1400		16-18 feet	15/14/9/6	70% recovery	S-9
1445		18-20 feet	4/5/10/15	60% recovery	S-10
1515	Installing well, 2 ft screen triloc pipe. Well Specifications: Grout - 7 bags Sand - 2 bags Bentonite - 10 lbs. Risers: 10', 5', 2', 2', 2' screen Installed temporary 12" surface casing Installed 10' of 8" casing				
1600	Pulled one section of casing, tagged sand pack and washed out the excess and poured in bentonite. Tagged bentonite.				
1630	Transported all drilling equipment to trucks to depart site. The remaining casing will be pulled on 01/15/97 and grouting will be performed. Discussed using bentonite for grouting. Robert would obtain Material Safety Data Sheet for it. Need new hook, drill for hole saw and another level of plywood for the work table. Rained the entire day				

End of Entry 1/14/97

Isolated Wetlands Drilling Program
Jonathan Dickinson State Park
Martin County, Florida

Location: Main Road, Wet Prairie
Township: 40 S, Range: 42 E, Section: 9
Drill Dates: 01/02/97 to 01/14/97
South Florida Water Management District
District Personnel: Steve Krupa
Precision Drilling Staff: Robert Miller
Joe Crisalli, Willie Thomas

01/15/97 Old Well # JD6C New Well # JD6

Time	
0900	Drillers on site, proceeded with the grouting of the surface casing.
0930	Finished grouting, started pulling the surface casing sections. The well pulled up slightly and was pushed back down.
1030	Finished pulling casing, six (6) sections total, three feet in length each. Mixed grout and topped of between 8" casing and 12' surface casing.
1045	Started removing drilling equipment from drill site to prepare for departure.
1200	Depart for next well location.

End of Entry 1/15/97

Isolated Wetlands Drilling Program
Jonathan Dickinson State Park
Martin County, Florida

Location: Cypress Dome, off horse trail
Township: 40 S, Range: 42 E, Section: 9
Drill Dates: 01/15/97 to 01/16/97
South Florida Water Management District
District Personnel: Steve Krupa
Precision Drilling Staff: Robert Miller
Joe Crisalli, Willie Thomas

01/15/97 Old Well # JD26C New Well # JD26

Time

1200-1300 Moving equipment to drill site. Driller left to fill tank with water for pressure steam cleaning decontamination. Required three trips.

1310 Started steam cleaning all drilling equipment for decontamination in the staging area.

1330 Started loading equipment on plastic to take to the drilling site.

1405 Assembled tripod and continued transporting equipment (casing, pipe and work table) to drill area. All in acrylic liner.

1428 Insertion of the first split spoon.

	Depth (B.L.S.)	SPT Count	Sample Recovery	Sample Number
	0-2 feet	4/5/4/8	38% recovery	S-1
1445	2-4 feet	8/11/8/10	50% recovery	S-2
	Insert one length of casing			
1450	4-6 feet	8/8/8/16	45% recovery	S-3

Last liner for spoon. Started to rain. The driving hammer needs to be welded. The hammer modification will be performed tonight and be ready for tomorrow.

1510 Demobilized all drilling equipment and departed the site to return to the District.

End of Entry 01/15/97

Isolated Wetlands Drilling Program
Jonathan Dickinson State Park
Martin County, Florida

Location: Cypress Dome, off horse trail
Township: 40 S, Range: 42 E, Section: 9
Drill Dates: 01/15/97 to 01/16/97
South Florida Water Management District
District Personnel: Steve Krupa
Precision Drilling Staff: Robert Miller
Joe Crisalli, Willie Thomas

01/16/97 Old Well # JD26C New Well # JD26

Time				
	Depth (B.L.S)	**SPT Count**	**Sample Recovery**	**Sample Number**
0900	Drillers on site with repaired driving hammer.			
0915	6-8 feet	8/10/10/10	50% recovery	S-4
0945	8-10 feet	7/8/7/8	83% recovery	S-5
1000	10-12 feet	7/7/7/7	58% recovery	S-6
1015	12-14 feet	8/10/7/6	95% recovery	S-7
1030	14-16 feet	15/9/5/6	54% recovery	S-8
1045	16-18 feet	6/5/6/10	80% recovery	S-9
	Calibrated the RAD-2 Probe, RAD 1 sensor			
	Ph 4-7, Conductivity 84 uS/cm, Barometric Pressure 30.00 " Hg			
	File: JD26C. sur			
1115	18-20 feet	Blow counts 6/20/15/22	95% recovery	S-10
1145	Well Specifications: Grout - 8 bags			
	Sand - 2 bags			
	Installed 7' of 8" surface casing			
	Risers: 10', 5', 2', 2' screen			
1230	Remove casing from the ground. Break for lunch.			
1410	Remove equipment from drill site and load trucks for next drill area.			
	Depart site and return to the District.			
1530	Arrive at District; paperwork and samples.			

End of Entry 01/16/97

Isolated Wetlands Drilling Program
Jonathan Dickinson State Park
Martin County, Florida

Location: Marsh on Northwest side of JD Park Boundary
Township: 40 S, Range: 42 E, Section: 5
Drill Dates: 01/17/97
South Florida Water Management District
District Personnel: Steve Krupa
Precision Drilling Staff: Robert Miller
Joe Crisalli, Willie Thomas

01/17/97 Old Well # JD12C New Well # JD12

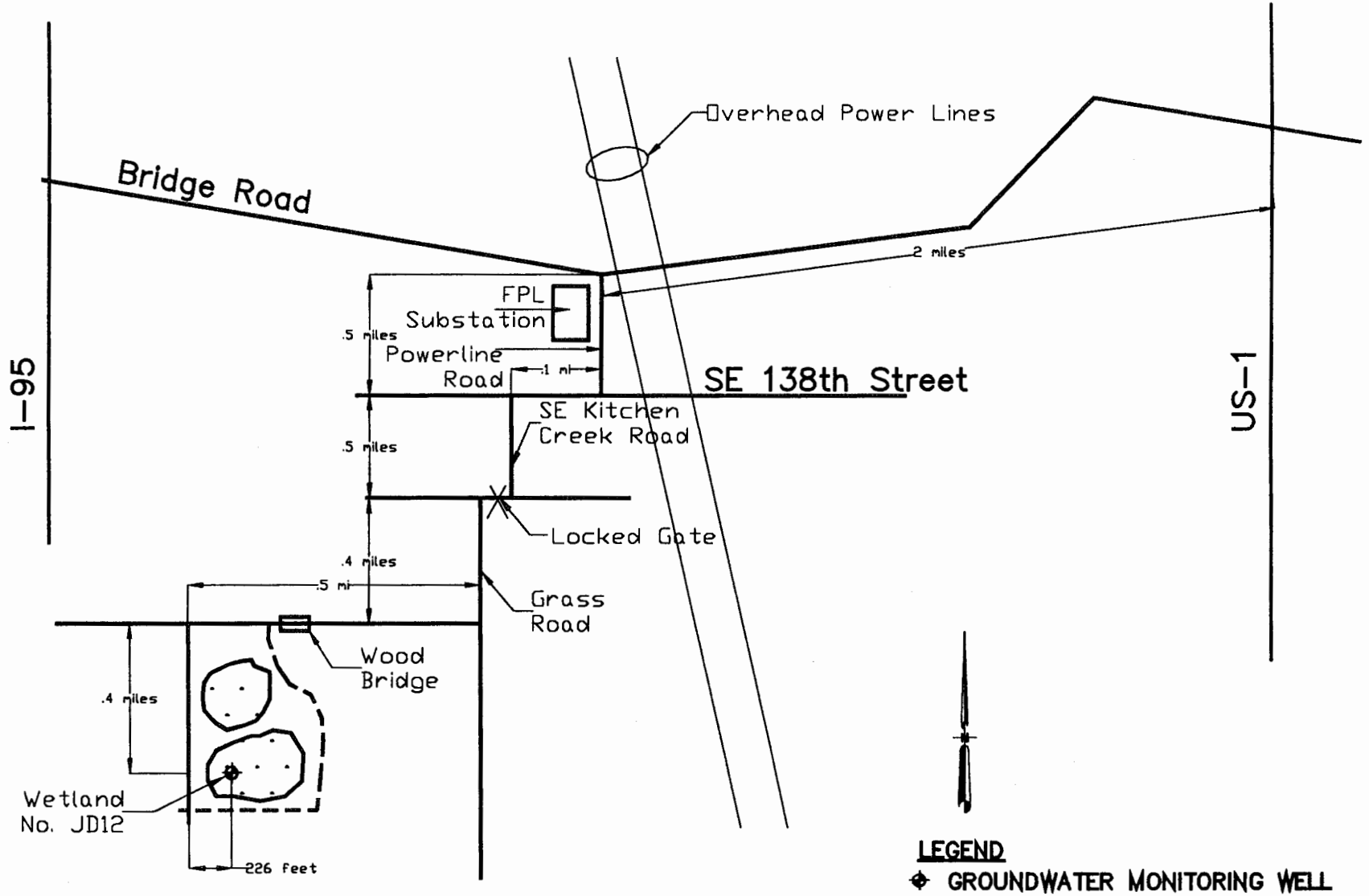
Time				
0800	Set up staging area, decontaminate drilling equipment by steam cleaning and carrying equipment to the drilling site. The road is in very poor shape with many holes and water filled areas. A boat was employed for the completion of this site. Due to excessive rain over the past few days, the water level is at two and one half feet deep.			
	Depth (B.L.S.)	**SPT Count**	**Sample Recovery**	**Sample Number**
1030	0-2 feet	8/6/6/6	81% recovery	S-1
1040	2-4 feet	3/3/5/8	70% recovery	S-2
1053	4-6 feet	6/10/7/8	80% recovery	S-3
1059	6-8 feet	17/9/6/5	88% recovery	S-4
1120	8-10 feet	8/10/10/10	85% recovery	S-5
1145	10-12 feet	4/5/7/4	82% recovery	S-6
1156	12-14 feet	13/18/17/24	50% recovery	S-7
1300	14-16 feet	9/15/31/40	75% recovery	S-8
1320	16-18 feet washed out no sample collected			
1355	18-20 feet	12/19/19/20	95% recovery	S-10
1425	Washed out casings and set well two foot screen Well Specifications: Grout - 8 bags Sand - 2 bags Installed 7' of 8" surface casing Risers: 10', 10', 2-1/2', 2' screen Cemented well and drove the outside casing.			
1800	Transported all drilling equipment to the trucks and departed the drill site.			

End of Entry 1/17/97

Isolated Wetlands Drilling Program
Jonathan Dickinson State Park
Martin County, Florida

0800	Met Loc and Vic (ESDA) at park entrance. Went to JD6C (JD6). Discussed the final completion options. The water level in the well below surface water level.
0845	Went to JD26C (JD26). Water level in the well is still deep and below the surface water level.
0910	Went to JD12C (JD12), the vehicle got stuck and had to be winched out. The water level in the well is below the surface water level. Discussed final completion of the well. Met Hank from the park and he asked that we lock the gate from now on.
1045	Left Jonathan Dickinson State Park for Savannas State Preserve.
1150	Arrive at Savannas well SAV5W (SV5); Driller cleaning up site and hauling tools out.
1210	Went to lunch at Frankenstiens with the drillers and SFWMD.
1250	Back from lunch, the support truck had a flat tire. I took Robert to drop off truck and call for road service; the tire is too flat.
1350	Continued on with the site visit up to Savannas site on Walton Road.
1420	Arrive at site on Walton Road. Discuss completion and other regional wells, weather stations, and local wells for U.E.C. Left for Savannas site. Data Management left for the shop.
1530	Back at Savannas site. Drillers setting up at northern most site on access road.

SITE MAPS



ENGINEERED ENVIRONMENTAL SOLUTIONS, INC.
1301 NW 4th Street, Boca Raton, FL 33486 Tel/Fax 561-394-3969, Beeper 708-0165

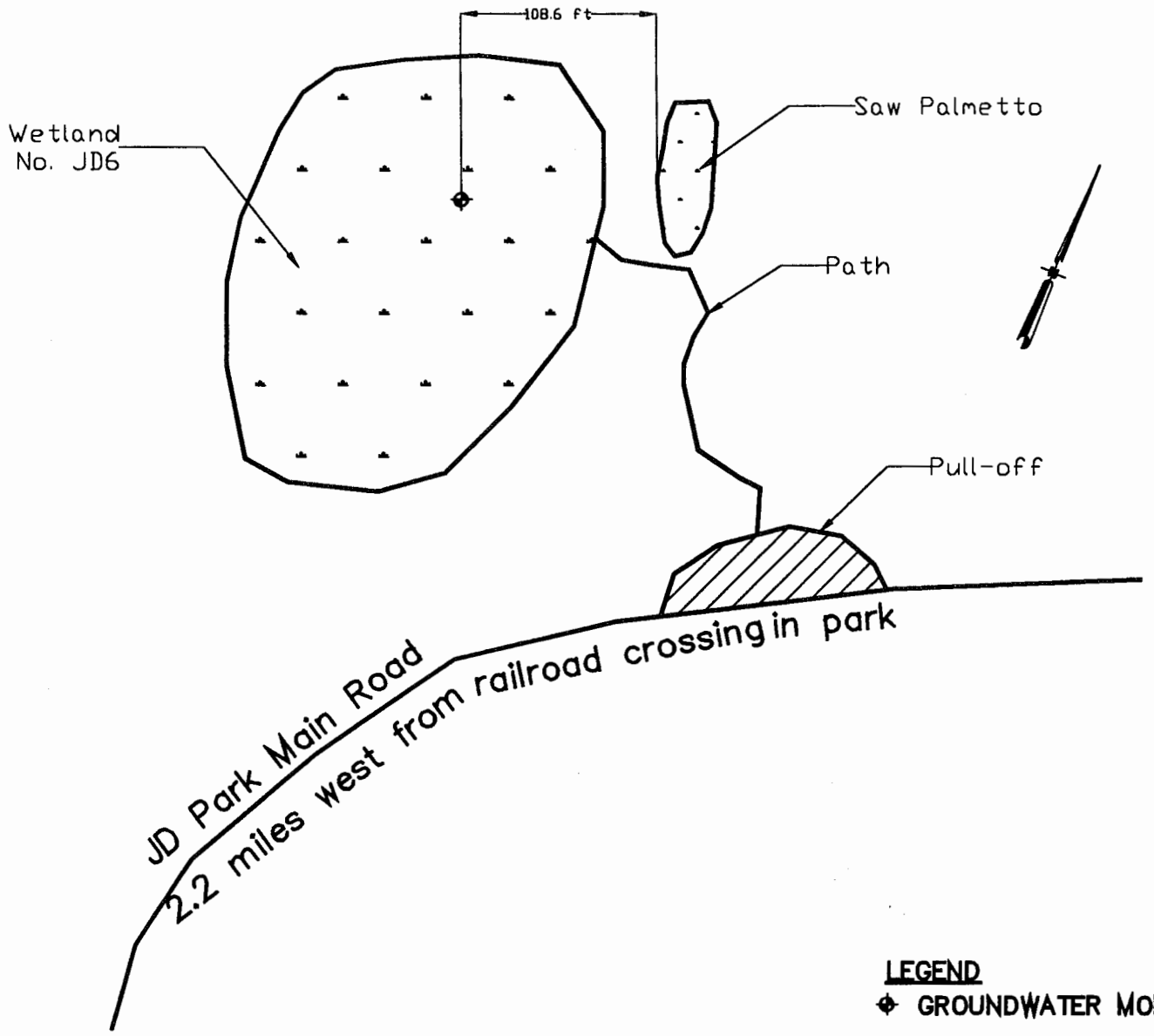
SITE LOCATION MAP – JD12

ISOLATED WETLANDS DRILLING PHASE 1
SOUTH FLORIDA WATER MANAGEMENT DISTRICT

CONTRACT NO.:C-7665	FILENAME: JD12.DWG	DATE: 3/28/97	SCALE: NTS

3

c:\projects\wetlands1\JD12.dwg



LEGEND

⌖ GROUNDWATER MONITORING WELL

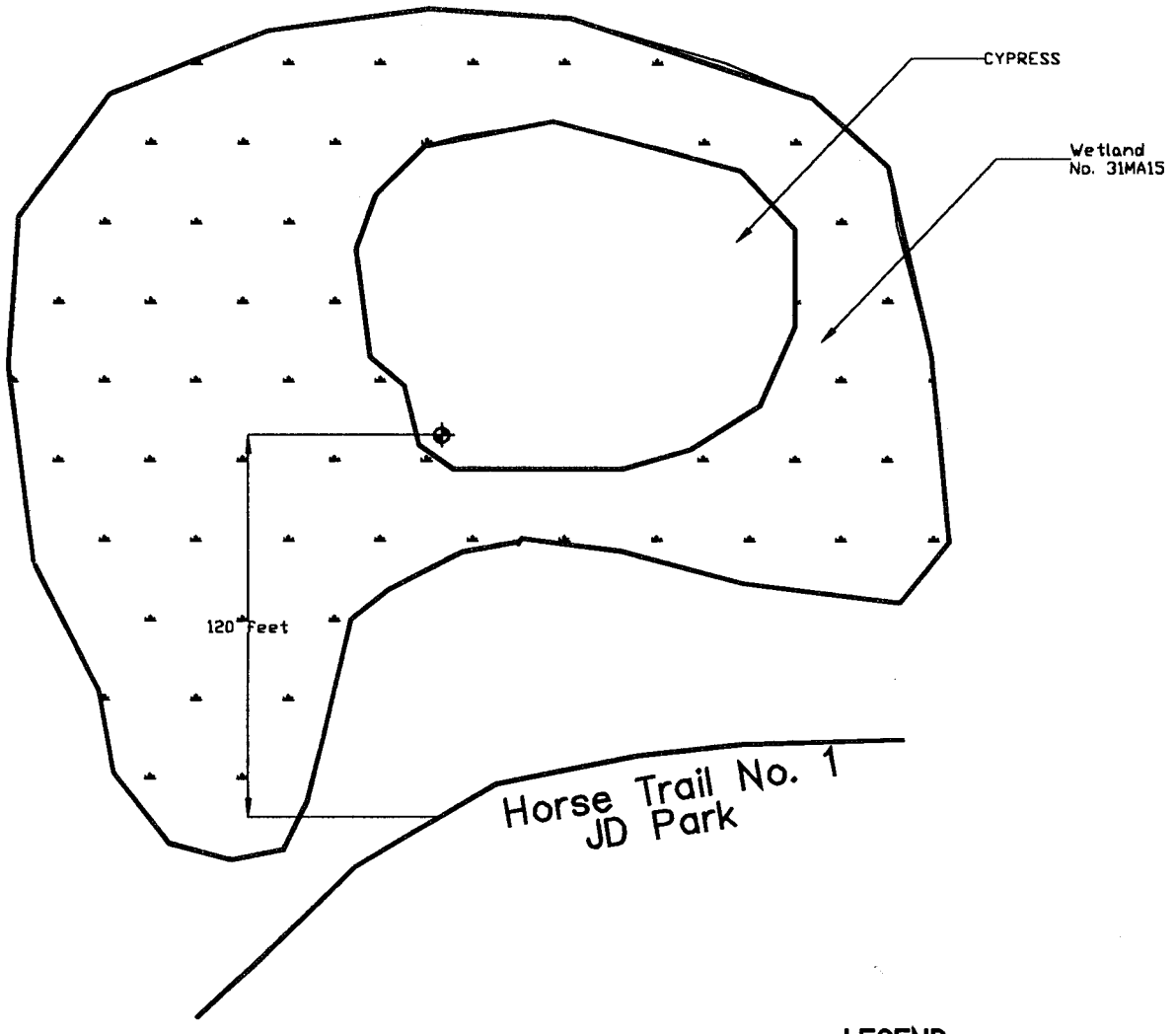
ENGINEERED ENVIRONMENTAL SOLUTIONS, INC.
1301 NW 4th Street, Boca Raton, FL 33486 Tel/Fax 561-394-3969, Beeper 708-0165

SITE LOCATION MAP – JD6

ISOLATED WETLANDS DRILLING PHASE 1
SOUTH FLORIDA WATER MANAGEMENT DISTRICT

CONTRACT NO.:C-7665	FILENAME: JD6.dwg	DATE: 3/28/97	SCALE: NTS

c:\projects\wetlands1\JD6.DWG



LEGEND

⊕ GROUNDWATER MONITORING WELL

ENGINEERED
ENVIRONMENTAL
SOLUTIONS, INC.

1501 NW 4th Street, Boca Raton, FL 33486 Tel/Fax 561-394-3969, Beeper 708-0165

SITE LOCATION MAP – JD26

ISOLATED WETLANDS DRILLING PHASE 1
SOUTH FLORIDA WATER MANAGEMENT DISTRICT

CONTRACT NO.:C-7665	FILENAME: 31MA15.DWG	DATE: 3/28/97	SCALE: NTS

5

c:\projects\wetlands1\JD26.DWG

BORING LOGS AND WELL CONSTRUCTION DRAWINGS

South Florida Water Management District
3301 Gun Club Road
West Palm Beach, Florida 33406
(561) 686-8800 / Fax 687-6442

Engineered Environmental Solutions, Inc.
1301 NW 4th Street
Boca Raton, Florida 33486
Ph/Fax: (561) 394-3969

BORING LOG

BORING/WELL NO.	JD6
PROJECT NO./NAME	1033/Isolated Wetlands Shallow Drilling Program
LOCATION	Jonathan Dickinson State Park, Martin County, Florida
DRILLING CONTRACTOR/DRILLER	Precision Drilling/Robert Miller
GEOLOGIST/OFFICE	Steve Krupa/South Florida Water Management District
DRILLING EQUIPMENT/METHOD	Tripod/SPT
SIZE/TYPE OF BIT	3' - 5" dia.casing, driven and washed
SAMPLING METHOD	Split Spoon
START/FINISH DATE	1/2/97-1/15/97
WELL INSTALLED? YES ☒ NO ☐	
CASING MAT./DIA.	Sch.40 monoflex PVC/2"
SCREEN: TYPE	Slotted
MAT.	PVC
LENGTH	2'
DIA.	2"
SLOT SIZE	.010
ELEVATION OF: (FT. ABOVE M.S.L.)	GROUND SURFACE; TOP OF WELL CASING 1.42 ft; TOP & BOTTOM SCREEN 19.35 ft/21.35 ft; DATE 1/24/97
REMARKS:	

Depth (ft)	Sample Type & Recovery	Sample Number	Penetration Resistance Blows/6" N-Value	Unified Classification	Log of Test Boring: Field Description	Munsell Field Color
		S1	6 6 6 6 12	PT	4 in. muck, 6 in. fine sand	1 2.5/N=7.5 YR 8/1
					2.0	
		S2	14 10 12 16 22	SP	12 in. fine sand, 4 in. black fine sand	7.5 YR 6/3=1 2.5/N
		S3	10 16 16 10 32		12 in. fine sand	
5					6.0	7.5 YR 6/1
		S4	12 7 12 12 19	SP-SW		
		S5	10 10 13 15 23		18 in. medium to fine sand w/ organics	1 2.5/N
					9.0	
10		S6	4 5 5 7 10	SP-SM	12 in. fine sand, silty sand toward bottom of interval	10 YR 4/1
					11.0	
	○	S7			14 in. medium to fine sand No sample	7.5 YR 7/1
	○	S8			No sample	
15						
		S9	15 14 9 6 23		16 in. medium to fine sand	
					18.0	
		S10	4 5 10 15 15	SP	14 in. fine sand	10 YR 7/2
20					22.0	

Penetration Resistance (Blows/Foot): 0, 15, 35, 55, 75, 100

Graphic Litho Log

Well Construction

Fine Sand; Medium Sand; Bentonite Pellets; Cement Grout; Silt/Clay w/ shell

Organic Material; Clay; Split Spoon; Percent Recovery; No Recovery

EVETLA 9/10/97

South Florida Water Management District
3301 Gun Club Road
West Palm Beach, Florida 33406
(561) 686-8800 / Fax 687-6442

Engineered Environmental Solutions, Inc.
1301 NW 4th Street
Boca Raton, Florida 33486
Ph/Fax: (561) 394-3969

BORING LOG

BORING/WELL NO.	
JD12	

PROJECT NO./NAME	LOCATION
1033/Isolated Wetlands Shallow Drilling Program	Jonathan Dickinson State Park, Martin County, Florida

DRILLING CONTRACTOR/DRILLER: **Precision Drilling/Robert Miller**

GEOLOGIST/OFFICE: **Steve Krupa/South Florida Water Management District**

DRILLING EQUIPMENT/METHOD	SIZE/TYPE OF BIT	SAMPLING METHOD	START/FINISH DATE
Tripod/SPT	3'-5"dia casing, driven and washed	Split Spoon	1/17/97-1/17/97

WELL INSTALLED?	CASING MAT./DIA.	SCREEN:				
YES ☒ NO ☐	Sch.40 monoflex PVC/2"	TYPE Slotted	MAT. PVC	LENGTH 2'	DIA. 2"	SLOT SIZE .010

ELEVATION OF:	GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN	DATE
(FT. ABOVE M.S.L.)		3.25 ft	19.95 ft/21.95 ft	1/24/97

REMARKS:

Depth (ft)	Sample Type & Recovery	Sample Number	Penetration Resistance Blows/6" N-Value	Unified Classification	LOG OF TEST BORING — FIELD DESCRIPTION		Munsell Field Color
		S1	8 6 6 6 12	PT	3 in. organic material, 16 in. fine sand	0.8	1 2.5/N
						2.0	
		S2	3 3 5 8 8	SM	4 in. fine sand, 12 in. fine sand w/silt size particles	4.0	10 YR 8/1 = 10 YR 3/1
5		S3	6 10 7 8 17	SP-SW	Medium grading to fine sand	6.0	10 YR 6/1
		S4	17 9 6 5 15		6 in. fine sand grading to 15 in. medium sand	8.0	10 YR 8/1 = 7.5 YR 7/1
		S5	8 10 10 10 20	SM	6 in. fine sand grading to 14 in. fine sand w/ silt size particles	10.0	7.5 YR 8/1 = 5 YR 5/3
10		S6	4 5 7 4 12	SP-SW	8 in. fine sand grading to 11 in. medium to fine sand		7.5 YR 8/1 = 2.5 YR 4/4
		S7	13 18 17 24 35	SP	Fine sand	14.0	10 R 3/1
		S8	9 15 31 40 46	SP-SW	Medium to fine grained sand w/ heavy organic staining	16.0	1 2.5/N
15		S9			No sample, washed casing too deep		
		S10	12 19 19 20 38	SP	Fine sand		1 2.5/N = 10 R 4/1
20						22.0	

Penetration Resistance (Blows/Foot): 0 15 35 55 75 100

Graphic Litho Log

Well Construction

Fine Sand | Medium Sand | Bentonite Pellets | Cement Grout | Silt/Clay w/ shell

Organic Material | Clay | Split Spoon | Percent Recovery | No Recovery

EM ETLA 9/10/97

South Florida Water Management District
3301 Gun Club Road
West Palm Beach, Florida 33406
(561) 686-8800 / Fax 687-6442

Engineered Environmental Solutions, Inc.
1301 NW 4th Street
Boca Raton, Florida 33486
Ph/Fax: (561) 394-3969

BORING LOG

BORING/WELL NO.	
JD26	

PROJECT NO./NAME	LOCATION
1033/Isolated Wetlands Shallow Drilling Program	Jonathan Dickinson State Park, Martin County, Florida

DRILLING CONTRACTOR/DRILLER	
Precision Drilling/Robert Miller	

GEOLOGIST/OFFICE	
Stev Krupa/South Florida Water Management District	

DRILLING EQUIPMENT/METHOD	SIZE/TYPE OF BIT	SAMPLING METHOD	START/FINISH DATE
Tripod/SPT	3'-5"dia. casing, driven and washed	Split Spoon	1/15/97-1/16/97

WELL INSTALLED?	CASING MAT./DIA.	SCREEN:				
YES ☒ NO ☐	Sch.40 monoflex PVC/2"	TYPE Slotted	MAT. PVC	LENGTH 2'	DIA. 2"	SLOT SIZE .010

ELEVATION OF:	GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN	DATE
(FT. ABOVE M.S.L.)	8.50 est.	3.16 ft	17.14 ft/19.14 ft	1/24/97

REMARKS:

Depth (ft)	Sample Type & Recovery	Sample Number	Penetration Resistance Blows/6" N-Value	Unified Classification	LOG OF TEST BORING: FIELD DESCRIPTION	Munsell Field Color
		S1	4 5 4 8 9	PT	Organics/fine sand and roots	1 2.5/N
					2.0	
		S2	8 11 8 10 19	SP	8 in. fine sand, 4 in. organics/sand	10 YR 5/2 = 1 2.5/1
5		S3	8 8 8 16 16		4 in. cypress stump, 6 in. fine sand	10 YR 4/3 = 10 YR 5/1
		S4	8 10 10 10 20			
		S5	7 8 7 8 15		12 in. black fine sand w/ organics	1 2.5/N
10		S6	7 7 7 7 14		Fine sand	10 YR 2/1 = 2.5 Y 7/1
		S7	8 10 7 6 17		2 in. fine sand, 11 in. medium to fine sand	10 YR 2/1 = 10 YR 4/3
		S8	15 9 5 6 14		Fine sand	10 YR 3/1
15						10 YR 5/3
					16.0	
		S9	6 5 6 10 11	SW	Medium to fine grained sand	10 YR 7/1
					18.0	
		S10	6 20 15 22 35	SP-SM	Fine sand w/ silt size particles	
20					20.0	

Penetration Resistance (Blows/Foot) 0 15 35 55 75 100

Graphic Litho Log

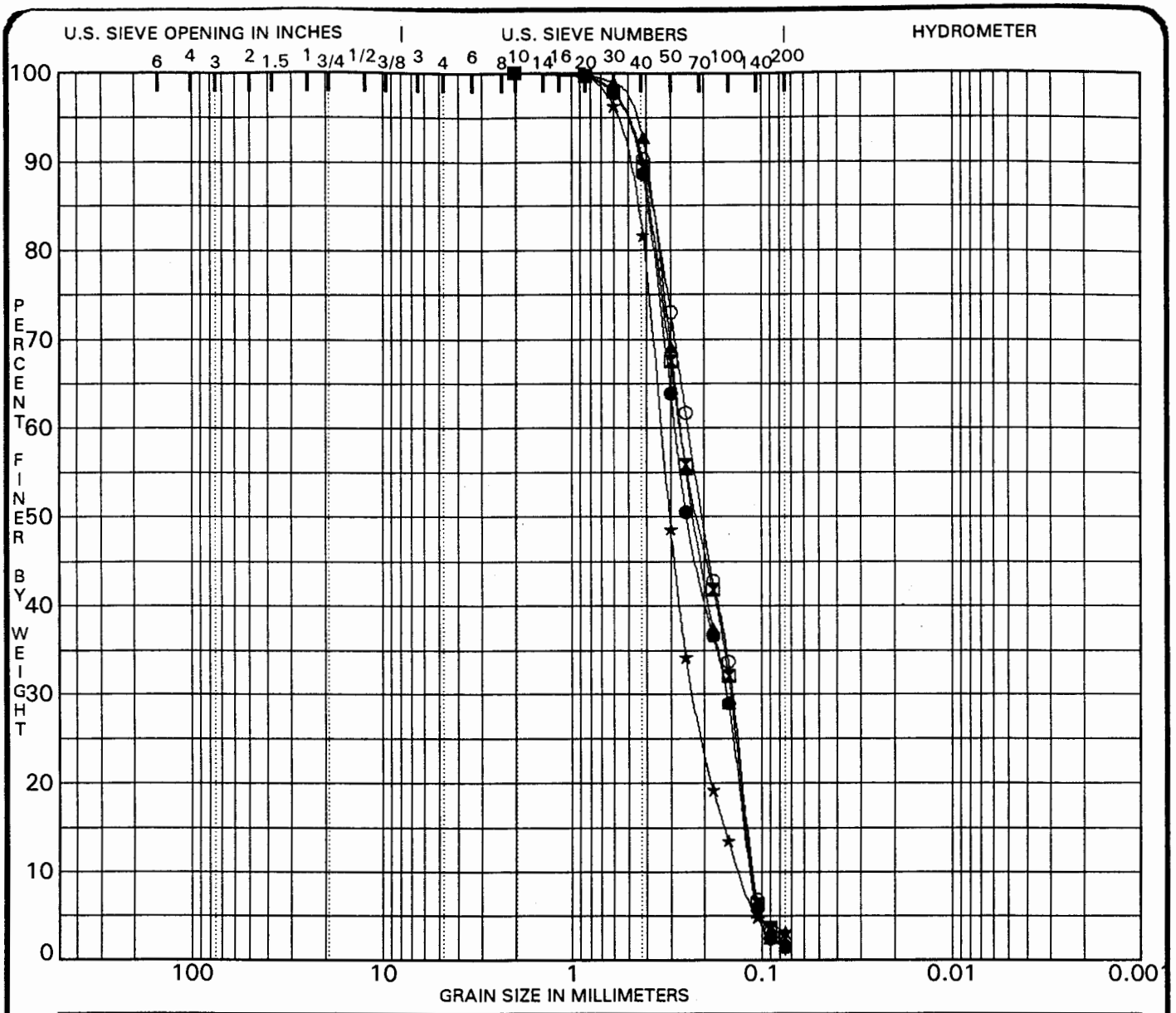
Well Construction

ETLA 9/10/97

Fine Sand | Medium Sand | Bentonite Pellets | Cement Grout | Silt/Clay w/ shell

Organic Material | Clay | Split Spoon | Percent Recovery | No Recovery

GRAIN SIZE DISTRIBUTION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification			Classification	MC%	LL	PL	PI	Cc	Cu
●	JD6	0.0	POORLY GRADED SAND SP					0.74	2.5
⊠	JD6	2.0	POORLY GRADED SAND SP					0.72	2.4
▲	JD6	4.0	POORLY GRADED SAND SP					0.78	2.3
★	JD6	6.0	POORLY GRADED SAND SP					1.18	2.6
○	JD6	8.0	POORLY GRADED SAND SP					0.76	2.2

Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	JD6	0.0	2.00	0.28	0.154	0.1128	0.0	98.5	1.5	
⊠	JD6	2.0	2.00	0.27	0.146	0.1113	0.0	97.3	2.7	
▲	JD6	4.0	2.00	0.27	0.153	0.1133	0.0	98.3	1.7	
★	JD6	6.0	0.85	0.34	0.228	0.1302	0.0	96.7	3.3	
○	JD6	8.0	2.00	0.24	0.143	0.1103	0.0	98.0	2.0	

PROJECT **Isolated Wetlands Shallow Drilling Program - Jonathan Dickinson State Park, Martin County, Florida**

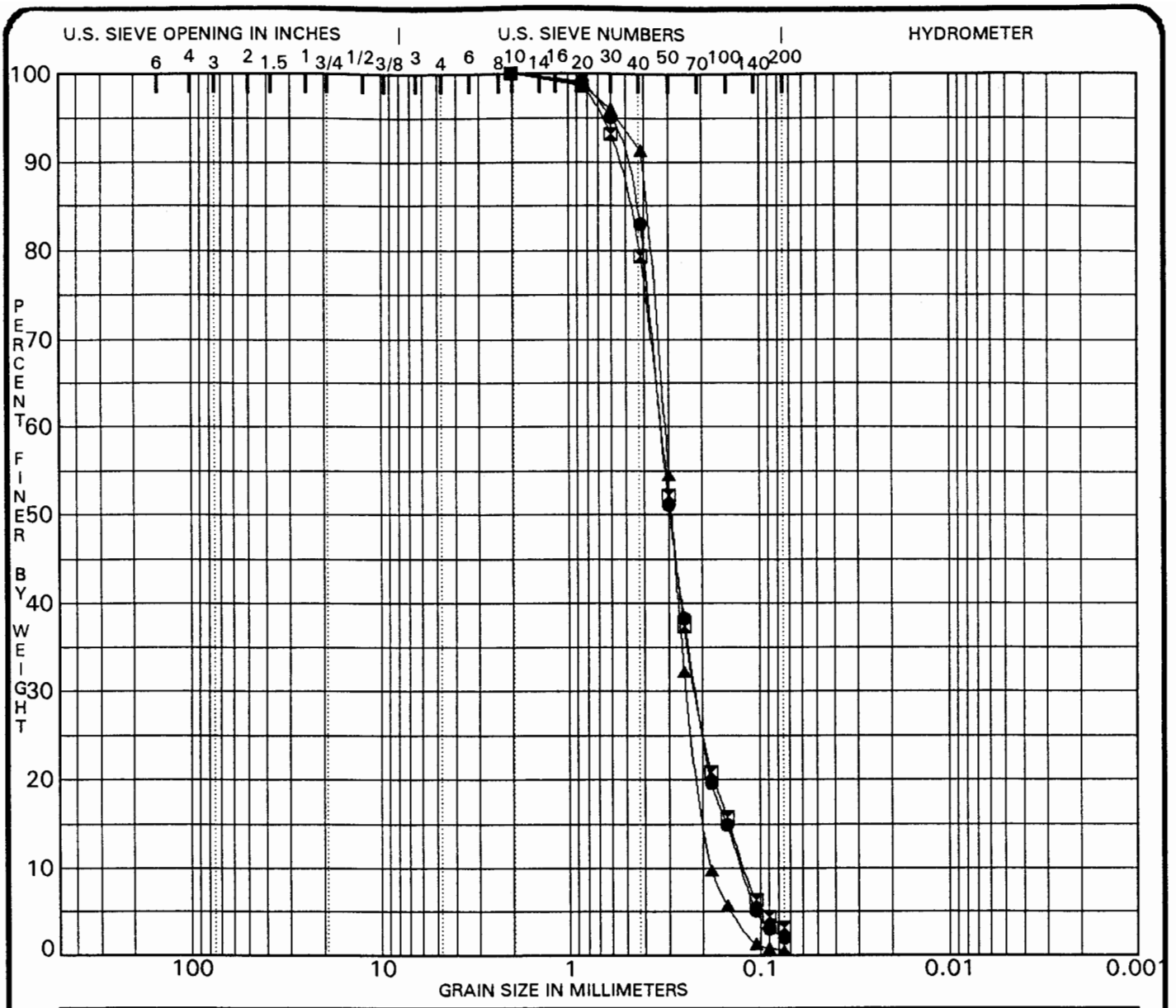
JOB NO. **1033**

DATE **9/10/97**

GRADATION CURVES

Engineered Environmental Solutions, Inc.

1301 NW 4th Street, Boca Raton, FL



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
● JD6	10.0	**POORLY GRADED SAND SP**					**1.13**	**2.6**
⊠ JD6	16.0	**POORLY GRADED SAND SP**					**1.16**	**2.7**
▲ JD6	18.0	**POORLY GRADED SAND SP**					**1.03**	**1.7**

Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● JD6	10.0	**2.00**	**0.33**	**0.216**	**0.1259**	**0.0**	**97.9**	**2.1**	
⊠ JD6	16.0	**2.00**	**0.33**	**0.216**	**0.1211**	**0.0**	**96.7**	**3.3**	
▲ JD6	18.0	**2.00**	**0.32**	**0.242**	**0.1805**	**0.0**	**99.4**	**0.6**	

PROJECT **Isolated Wetlands Shallow Drilling Program - Jonathan Dickinson State Park, Martin County, Florida**

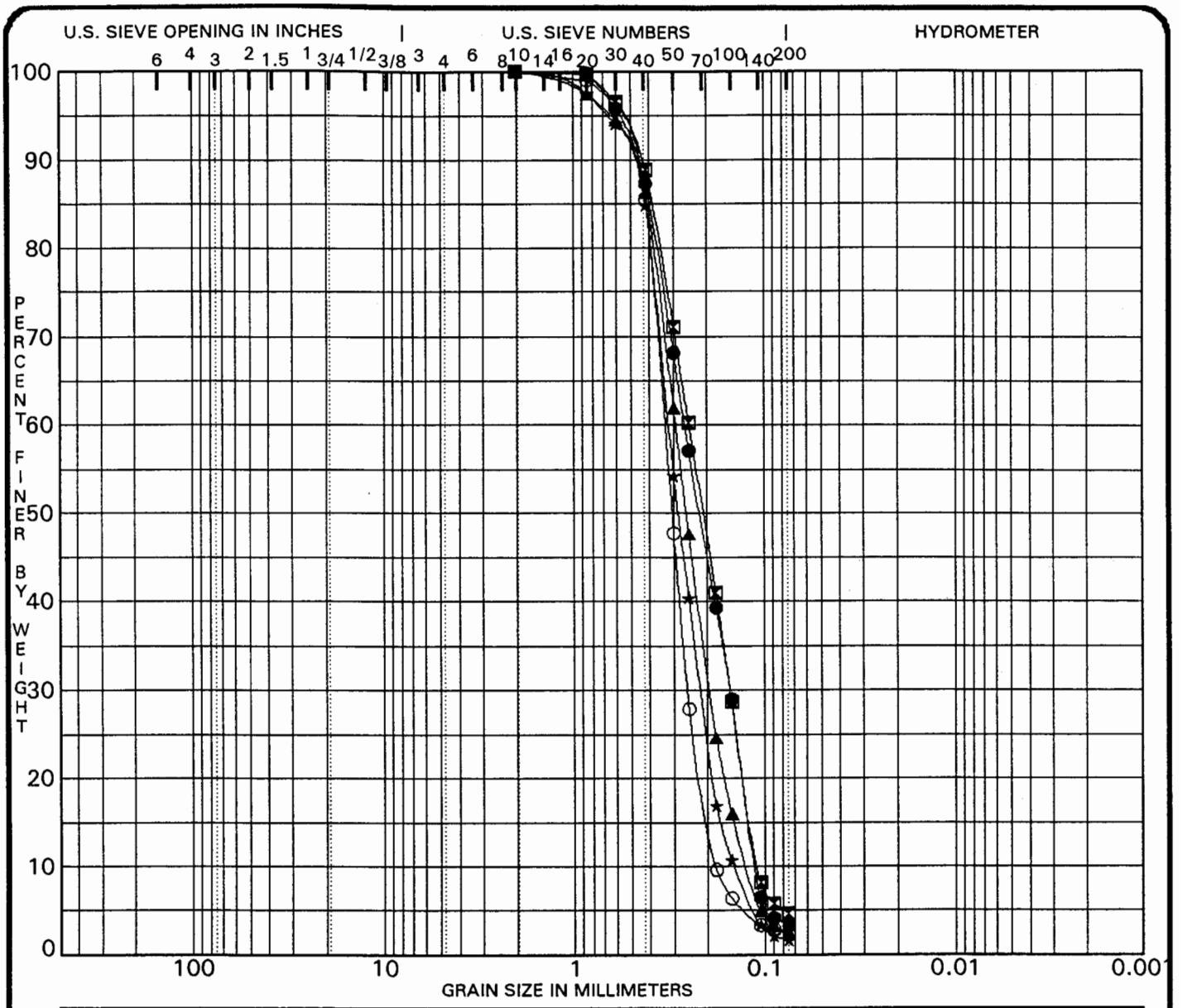
JOB NO. **1033**

DATE **9/10/97**

GRADATION CURVES

Engineered Environmental Solutions, Inc.

1301 NW 4th Street, Boca Raton, FL



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification			Classification	MC%	LL	PL	PI	Cc	Cu
●	JD12	0.0	POORLY GRADED SAND SP					0.79	2.3
⊠	JD12	2.0	POORLY GRADED SAND with SILT SP-SM		NP	NP	NP	0.86	2.3
▲	JD12	4.0	POORLY GRADED SAND SP					1.04	2.4
★	JD12	6.0	POORLY GRADED SAND SP					1.01	2.2
⊙	JD12	8.0	POORLY GRADED SAND SP					1.07	1.8

Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	JD12	0.0	2.00	0.26	0.153	0.1119	0.0	96.7	3.3	
⊠	JD12	2.0	2.00	0.25	0.153	0.1093	0.0	95.3	4.7	
▲	JD12	4.0	2.00	0.29	0.194	0.1241	0.0	97.5	2.5	
★	JD12	6.0	2.00	0.32	0.216	0.1451	0.0	98.3	1.7	
⊙	JD12	8.0	2.00	0.33	0.255	0.1813	0.0	97.5	2.5	

PROJECT **Isolated Wetlands Shallow Drilling Program - Jonathan Dickinson State Park, Martin County, Florida**

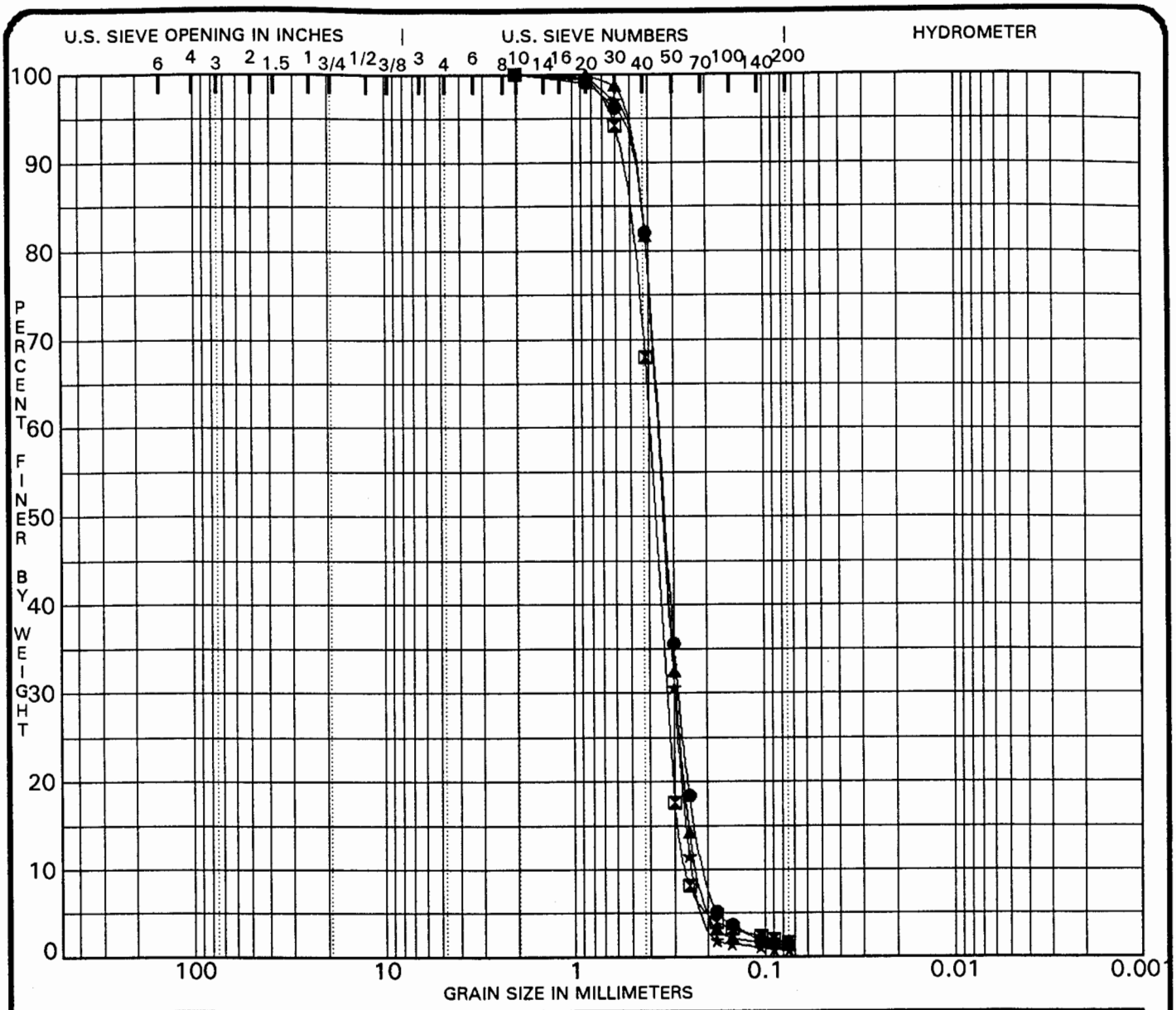
JOB NO. **1033**

DATE **9/10/97**

GRADATION CURVES

Engineered Environmental Solutions, Inc.

1301 NW 4th Street, Boca Raton, FL



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
●	JD12	10.0	POORLY GRADED SAND SP					1.10	1.8
⊠	JD12	12.0	POORLY GRADED SAND SP					1.03	1.5
▲	JD12	14.0	POORLY GRADED SAND SP					1.07	1.6
★	JD12	18.0	POORLY GRADED SAND SP					1.03	1.5

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	JD12	10.0	2.00	0.36	0.283	0.2028	0.0	98.6	1.4	
⊠	JD12	12.0	2.00	0.40	0.326	0.2589	0.0	98.3	1.7	
▲	JD12	14.0	2.00	0.36	0.293	0.2208	0.0	98.7	1.3	
★	JD12	18.0	2.00	0.36	0.298	0.2375	0.0	99.2	0.8	

PROJECT **Isolated Wetlands Shallow Drilling Program - Jonathan Dickinson State Park, Martin County, Florida**

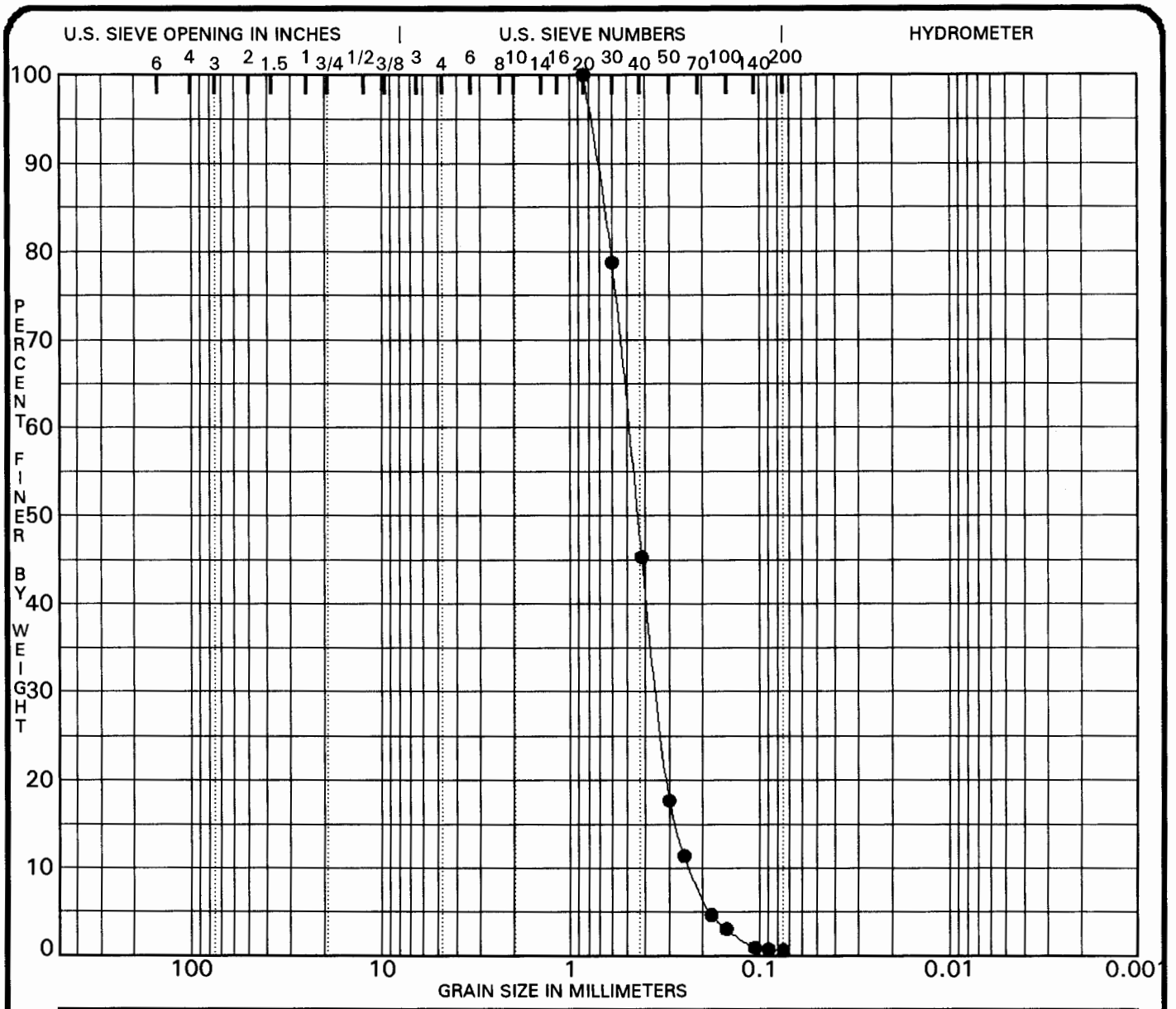
JOB NO. **1033**

DATE **9/10/97**

GRADATION CURVES

Engineered Environmental Solutions, Inc.

1301 NW 4th Street, Boca Raton, FL



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Classification	MC%	LL	PL	PI	Cc	Cu
● JD12SHEL 0.0	**POORLY GRADED SAND SP**		**NP**	**NP**	**NP**	**1.06**	**2.1**

Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● JD12SHEL 0.0	**0.85**	**0.49**	**0.349**	**0.2334**	**0.0**	**99.3**	**0.7**	

PROJECT **Isolated Wetlands Shallow Drilling Program - Jonathan Dickinson State Park, Martin County, Florida**

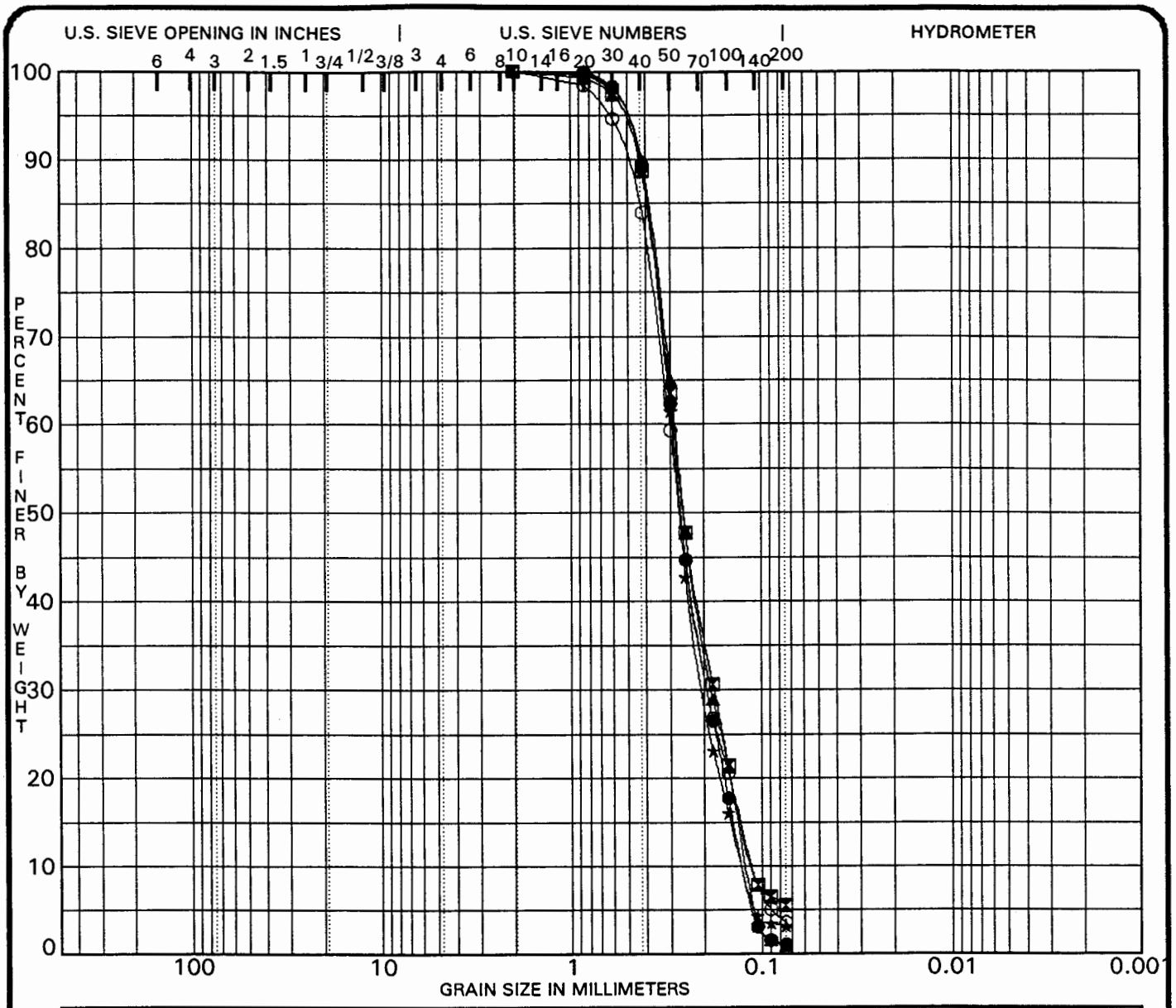
JOB NO. **1033**

DATE **9/13/97**

GRADATION CURVES

Engineered Environmental Solutions, Inc.

1301 NW 4th Street, Boca Raton, FL



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification			Classification	MC%	LL	PL	PI	Cc	Cu
●	JD26	0.0	POORLY GRADED SAND SP					1.00	2.3
⊠	JD26	2.0	POORLY GRADED SAND with SILT SP-SM		NP	NP	NP	0.98	2.6
▲	JD26	4.0	POORLY GRADED SAND SP					0.99	2.4
★	JD26	6.0	POORLY GRADED SAND SP					1.10	2.4
○	JD26	8.0	POORLY GRADED SAND SP					1.07	2.7

Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	JD26	0.0	0.85	0.29	0.192	0.1249	0.0	98.9	1.1	
⊠	JD26	2.0	2.00	0.29	0.178	0.1119	0.0	94.4	5.6	
▲	JD26	4.0	2.00	0.28	0.184	0.1201	0.0	99.0	1.0	
★	JD26	6.0	2.00	0.30	0.202	0.1255	0.0	96.8	3.2	
○	JD26	8.0	2.00	0.30	0.191	0.1123	0.0	96.4	3.6	

PROJECT **Isolated Wetlands Shallow Drilling Program - Jonathan Dickinson State Park, Martin County, Florida**

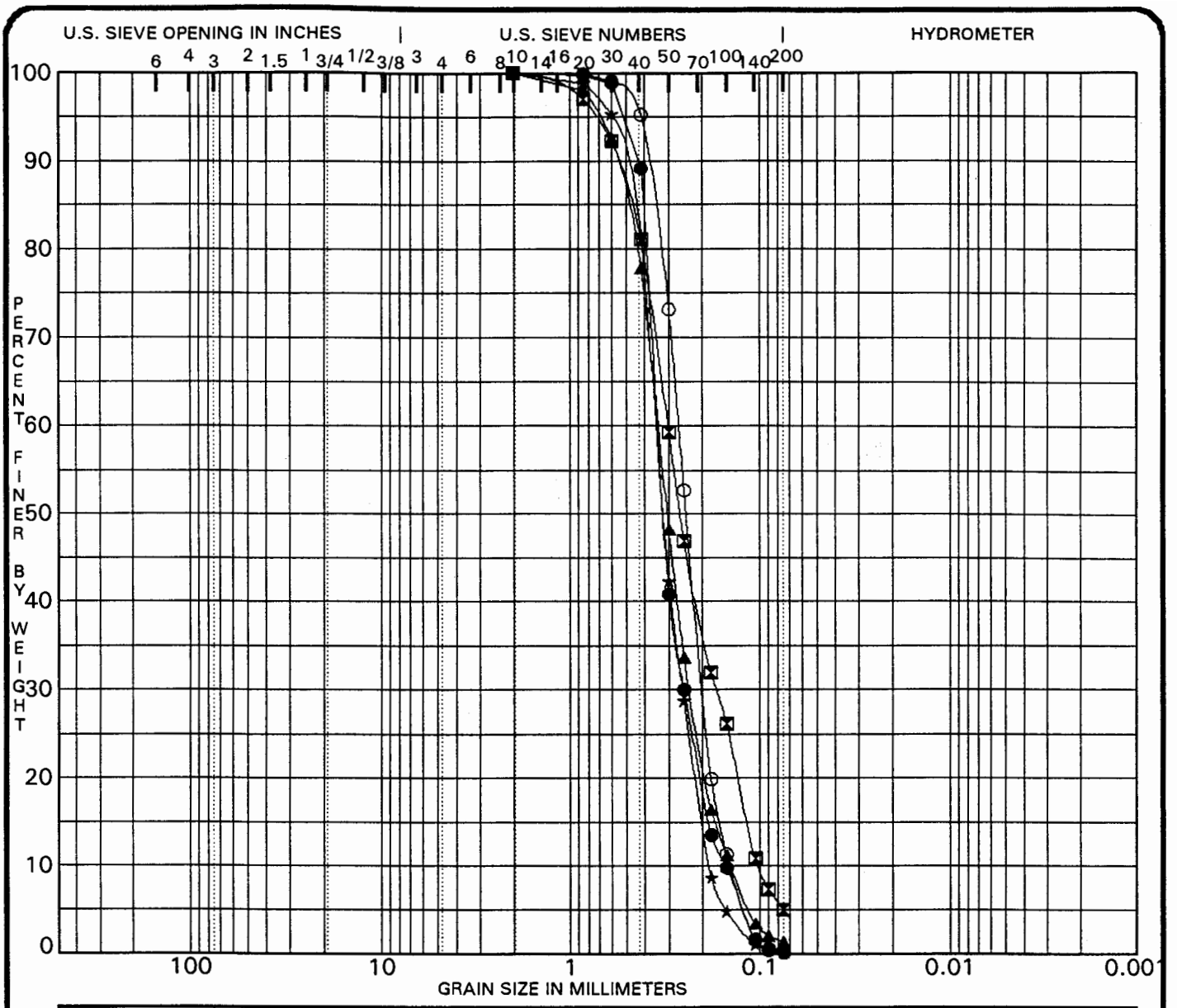
JOB NO. 1033

DATE 9/10/97

GRADATION CURVES

Engineered Environmental Solutions, Inc.

1301 NW 4th Street, Boca Raton, FL



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
●	JD26	10.0	POORLY GRADED SAND SP					1.20	2.3
⊠	JD26	12.0	POORLY GRADED SAND with SILT SP-SM		NP	NP	NP	0.93	3.0
▲	JD26	14.0	POORLY GRADED SAND SP					1.12	2.4
★	JD26	16.0	POORLY GRADED SAND SP					1.01	1.9
⊙	JD26	18.0	POORLY GRADED SAND SP					1.04	1.9

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	JD26	10.0	2.00	0.34	0.250	0.1515	0.0	99.8	0.2	
⊠	JD26	12.0	2.00	0.30	0.169	0.1021	0.0	94.9	5.1	
▲	JD26	14.0	2.00	0.34	0.233	0.1421	0.0	98.6	1.4	
★	JD26	16.0	2.00	0.35	0.254	0.1839	0.0	99.5	0.5	
⊙	JD26	18.0	2.00	0.27	0.199	0.1431	0.0	99.7	0.3	

PROJECT **Isolated Wetlands Shallow Drilling Program - Jonathan Dickinson State Park, Martin County, Florida**

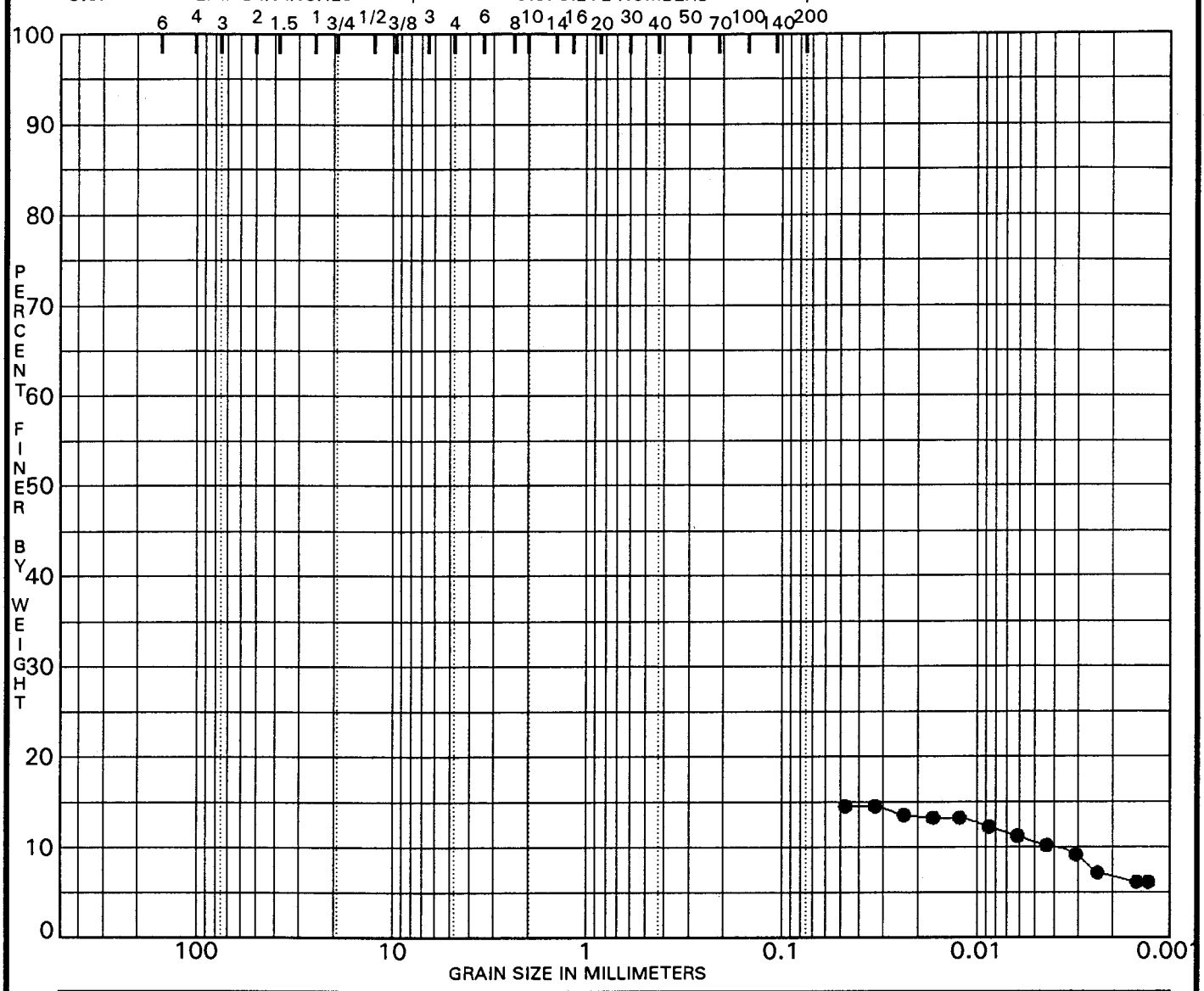
JOB NO. **1033**

DATE **9/10/97**

GRADATION CURVES

Engineered Environmental Solutions, Inc.

1301 NW 4th Street, Boca Raton, FL



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Classification	MC%	LL	PL	PI	Cc	Cu
● JD26SHEL 0.0							

Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● JD26SHEL 0.0				0.0041				10.6

PROJECT **Isolated Wetlands Shallow Drilling Program - Jonathan Dickinson State Park, Martin County, Florida**

JOB NO. **1033**

DATE **9/12/97**

GRADATION CURVES

Engineered Environmental Solutions, Inc.

1301 NW 4th Street, Boca Raton, FL

GRAIN SIZE ANALYSIS LABORATORY DATA

Project ID: Wetla
Point ID: JD26SHEL
Depth: 0.0

Hydrometer Analysis - ADDRESS 2306 gINT

Sample - JD26 Shelby Tube sample 0-2 feet

Dry Test Weight g - 50.0 g
Specific Gravity of particles - 2.7
Hydrometer - Standard Bouyoucos ASTM 152H

Time, Min.	Temp. c.	Hydrometer Reading	Effective Depth cm.	Max. Diameter, mm.
1	27.5	10.0	14.7	0.0472
2	27.5	10.0	14.7	0.0333
4	27.5	9.5	14.75	0.0236
8	27.0	9.5	14.75	0.0168
15	27.0	9.5	14.75	0.0123
30	27.0	9.0	14.8	0.0087
60	27.0	8.5	14.9	0.0062
120	27.0	8.0	15.0	0.0044
240	27.0	7.5	15.1	0.0031
420	27.0	6.5	15.25	0.0024
1020	27.0	6.0	15.3	0.0015
1440	27.0	6.0	15.3	0.0013
2880	27.0	6.0	15.3	0.0009

Maximum diameter of particles in suspension calculated according to Stokes' law.

Engineered Environmental Solutions, Inc.
1301 NW 4th Street, Boca Raton, FL

	DATE	TIME
At printing	SEP1397	14:37
Last update	SEP1397	13:56

PROJECT ID WETLA
POINT ID JD12SHEL
DEPTH 0.00

Sieve Analysis - ADDRESS 2305

'With unsplit specimens use COARSE '
'fields. With splitting supply TOTAL'
'SPC WT or WT PASSING split sieve. '

{01}TOTAL SPECIMEN WEIGHT 286.0
WT PASSING SPLIT SIEVE 2.1
FINE WEIGHT TESTED

' MC OF WTS ABOVE ' ' SV TARE WTs '

	{02} COARSE	{02} FINE	{03}
WT+T			COARSE 0
DY+T			FINE 0
RE		0	NON-PLAST?(X)
MC %			

{04}NORMALIZE TO 3"(X) WT METH(CI) I
SPLIT ON mm SIEVE
SIEVING MC (W/D) Coarse D Fine D

	NAME	SIZE mm	SOIL+TARE	%FINER
{05}	#20	0.850	0	100.0
{06}	#30	0.600	60.8	78.7
{07}	#40	0.420	95.7	45.3
{08}	#50	0.300	78.8	17.7
{09}	#60	0.250	18.1	11.4
{10}	#80	0.180	19.3	4.7
{11}	#100	0.150	4.4	3.1
{12}	#140	0.106	6.1	1.0
{13}	#170	0.090	0.6	0.8
{14}	#200	0.075	0.1	0.7
{15}				
{16}				
{17}				
{18}				
{19}				
{20}				

Well Name: **JD6**

Location: Jonathan Dickinson State Park

Sieve # (U.S. Standard)		#10	#20	#30	#40	#50	#60	#80	#100	#140	#170	#200	Pan	Weight Recovered	% diff.
Sample #	Sample Weight														
S-1	182.7	0.0	0.5	3.3	17.0	45.0	24.5	25.3	14.1	41.9	6.1	1.9	2.7	182.3	0.22
S-2	276.7	0.0	0.9	5.0	23.0	60.6	32.2	38.6	26.6	70.9	7.4	2.6	7.5	275.3	0.51
S-3	263.7	0.0	0.3	2.5	16.4	62.0	36.1	47.0	22.5	61.7	7.6	2.4	4.5	263.0	0.27
S-4	199.2	0.0	0.0	7.4	29.0	65.5	28.5	29.6	11.3	17.1	1.8	1.3	6.6	198.1	0.55
S-5	247.6	0.0	1.0	4.7	18.3	42.7	28.0	46.6	22.5	66.3	8.8	3.3	4.9	247.1	0.20
S-6	198.2	0.0	1.8	7.8	24.1	62.6	25.3	36.9	9.3	19.1	4.1	1.9	4.2	197.1	0.55
S-7	No Recovery														
S-8	No Recovery														
S-9	265.4	0.0	3.8	14.0	36.5	71.2	38.9	43.6	13.2	24.8	5.1	3.1	8.6	262.8	0.98
S-10	210.4	0.0	2.2	6.2	9.8	76.8	46.6	46.9	8.3	9.1	1.2	0.5	1.3	208.9	0.71

* Units=Grams

Well Name: **JD12**

Location: Jonathan Dickinson State Park

Sieve # (U.S. Standard)		#10	#20	#30	#40	#50	#60	#80	#100	#140	#170	#200	Pan	Weight Recovered	% diff.
Sample #	Sample Weight														
S-1	248.5	0.0	0.6	9.8	21.1	47.3	27.3	43.9	25.6	55.5	5.7	2.3	8.1	247.2	0.52
S-2	214.8	0.0	0.6	6.9	16.2	38.3	23.0	41.3	26.3	43.9	5.0	2.5	10.0	214.0	0.37
S-3	236.4	0.0	6.1	6.8	19.6	57.5	33.9	54.3	20.2	26.0	4.2	1.7	6.0	236.3	0.04
S-4	241.7	0.0	6.1	8.1	22.5	73.6	33.7	56.6	15.0	17.6	3.1	1.2	4.0	241.5	0.08
S-5	210.5	0.0	2.2	5.4	22.9	80.3	41.9	38.6	6.8	6.3	1.1	0.9	5.3	211.7	0.57
S-6	259.4	0.0	2.7	7.0	36.7	119.9	44.5	33.9	4.0	4.5	0.8	0.6	3.6	258.2	0.46
S-7	203.8	0.0	1.4	10.7	53.1	102.6	19.1	8.7	1.5	1.8	0.7	0.7	3.4	203.7	0.05
S-8	231.6	0.0	0.2	2.7	39.8	113.9	42.0	25.8	2.0	1.2	0.4	0.5	3.1	231.6	0.00
S-9	No Recovery														
S-10	246.5	0.0	1.1	6.4	36.4	127.2	47.0	23.6	1.1	0.9	0.4	0.4	1.9	246.4	0.04

* Units=Grams

Well Name: **JD26**

Location: Jonathan Dickinson State Park

Sieve # (U.S. Standard)		#10	#20	#30	#40	#50	#60	#80	#100	#140	#170	#200	Pan	Weight Recovered	% diff.
Sample #	Sample Weight														
S-1	141.2	0.0	0.0	2.4	12.6	38.0	24.6	25.6	12.4	20.5	2.1	0.6	1.6	140.4	0.57
S-2	136.8	0.0	0.9	2.7	12.0	34.3	21.6	23.4	12.6	18.4	1.9	1.3	7.6	136.7	0.07
S-3	190.3	0.0	0.4	3.1	15.7	46.7	32.4	35.8	14.5	32.9	4.0	1.1	1.9	188.5	0.95
S-4	218.2	0.0	0.7	4.4	20.1	58.7	40.5	42.6	15.5	25.3	1.7	0.7	7.0	217.2	0.46
S-5	236.4	0.0	3.5	9.1	25.1	57.7	34.2	41.9	14.7	29.7	6.6	3.4	8.5	234.4	0.85
S-6	230.9	0.0	0.3	1.8	22.8	109.9	24.7	37.4	8.5	18.4	2.8	0.7	0.4	227.7	1.39
S-7	247.3	0.0	7.3	12.1	27.5	53.7	30.6	37.2	14.2	37.9	8.7	5.5	12.6	247.3	0.00
S-8	207.5	0.0	4.1	11.2	30.0	60.2	29.8	35.1	10.6	15.6	3.0	1.4	2.8	203.8	1.78
S-9	257.4	0.0	2.8	9.2	35.3	100.0	34.5	51.3	9.9	9.7	1.0	0.4	1.3	255.4	0.78
S-10	240.3	0.0	0.4	2.2	8.7	52.1	48.0	77.2	20.4	22.5	2.7	0.7	0.6	235.5	2.00

* Units=Grams

TYPED FIELD NOTES

Isolated Wetlands Drilling Program
Savannas State Preserve
Martin County, Florida

Location: Marsh on Jensen Beach Boulevard
Township: 37 S, Range: 41 E, Section: 21
Drill Dates: 01/20/97 to 01/21/97
South Florida Water Management District
District Personnel: Steve Krupa
Precision Drilling Staff: Robert Miller
Joe Crisalli, Willie Thomas

01/20/97 Old Well # SAV 4W New Well # SV4

Time		Depth (B.L.S.)	SPT Count	Sample Recovery	Sample Number
0800	Met with drillers at McDonalds, traveled to drill location.				
0830	Arrive at site, Jensen Beach Boulevard.				
0900	Started downloading datalogger at drawdown study area.				
0945	Set up staging and de-con area. Began decontaminating the drilling equipment.				
1000		0-2 feet	0/0/0/4	73% recovery	S-1
	driving casing and washing out sediment.				
1025	second casing in. Used shelby tube.				
1100		2-4 feet	9/8/8/8	83% recovery	S-2
1105		4-6 feet	5/5/9/7	80% recovery	S-3
1110		6-8 feet	7/18/12/12	100% recovery	S-4
1130		8-10 feet	4/4/6/7	84% recovery	S-5
1150		10-12 feet	5/9/9/9	100% recovery	S-6
1200	Suspended drilling to break for lunch and attain water.				
1245	Driller was able to acquire water from the Martin County utility plant.				
1300		12-14 feet	11/14/17/7	88% recovery	S-7
1320		14-16 feet	6/7/8/9	88% recovery	S-8
1345		16-18 feet	6/7/13/24	100% recovery	S-9
1415		18-20 feet	9/7/6/4	88% recovery	S-10
1430	Washed out casings, ran out of water.				
1500	Set well				
	Well Specifications: Grout - 8 bags				
	Sand - 2 bags				
	Installed 6' of 8" surface casing				
	Risers: 10', 5',2', 2', 2' screen				
1530	Completed the grouting of the well and pulled casing. Removed all drill equipment and departed site.				

End of Entry 1/20/97

Isolated Wetlands Drilling Program
Savannas State Preserve
Martin County, Florida

Location: Savannas State Preserve, St. Lucie County, Florida
Township: 36 S, Range: 41 E, Section: 16
Drill Dates: 01/21/97
South Florida Water Management District
District Personnel: Steve Krupa
Precision Drilling Staff: Robert Miller
Joe Crisalli, Willie Thomas

Time	Old Well # SAV6W New Well # SV6
1610	Drove first spoon

Depth (B.L.S.)	SPT Count	Sample Recovery	Sample Number
0-2 feet	3/6/9/7	68% recovery	S-1

1630 Tire repair truck phoned that the support truck was ready. The drillers departed site and did not return this day.
1645 Left site for the District.
1800 Arrive at District.
End of Entry 1/21/97

Isolated Wetlands Drilling Program
Savannas State Preserve
Martin County, Florida

Location: Savannas State Preserve, St. Lucie County, Florida
Township: 36 S, Range: 41 E, Section: 16
Drill Dates: 01/21/97
South Florida Water Management District
District Personnel: Steve Krupa
Precision Drilling Staff: Robert Miller
Joe Crisalli, Willie Thomas

1/22/97 Old Well # SAV6W New Well # SV6

Time

0730 At Hydraline for new fittings and Camlocks. Drillers on site, start SPT's.
0815 Left Hydraline for Jensen Beach.
0920 Arrive at site. Drillers at 16-18 feet BLS. SPT Blow Count summary:

Depth (B.L.S.)	SPT Count	Sample Recovery	Sample Number
0-2 feet	3/6/9/7	68% recovery	S-1
2-4 feet	4/4/7/7	75% recovery	S-2
4-6 feet	8/7/6/6	84% recovery	S-3
6-8 feet	5/9/0/9	79% recovery	S-4
8-10 feet	9/13/6/7	90% recovery	S-5
10-12 feet	10/8/9/14	93% recovery	S-6
12-14 feet	15/15/14/14	95% recovery	S-7
14-16 feet	27/22/37/40	62% recovery	S-8
16-18 feet	15/17/22/24	83% recovery	S-9
18-20 feet	10/13/7/7	63% recovery	S-10

1005 Washing casing out. Six casings have been driven.
1030 Set well
Well Specifications: Sand - 2 bags
Grout - 8 bags
Installed 6' of 8" surface casing
Risers: 10', 10', 2', 2' screen
Pulling casing out and preparing to cement.
1115 Pumped annular space, bentonite pellets, mixed grout and poured into annular space. Pulling casing and placing 8 inch permanent surface casing.
1200 Break for lunch.
1240 Started loading out for next hole. De-con equipment and development hose.

Continued next page.

1340	Started pumping SV6. Pumped for 15 minutes. Clear water at approximately 10 gallons per minute.
1415	De-con hose for next well.
1500	Loaded up equipment and carried to SV5. Carried all equipment out to the site and set up the table.
1530	Loaded up the concrete pump. I will return it to Discount Rental. Left site for the District.
1650	Arrived at Discount Rental.
1710	Left District.

End of Entry 1/22/97

Isolated Wetlands Drilling Program
Savannas State Preserve
Martin County, Florida

Location: Marsh on Southwest corner of
Savannas property, just north of Jensen Beach Boulevard
Township: 37 S, Range: 41 E, Section: 20
Drill Dates: 01/23/97
South Florida Water Management District
District Personnel: Steve Krupa
Precision Drilling Staff: Robert Miller
Joe Crisalli, Willie Thomas

01/23/97 Old Well # SAV 5W New Well # SV5

Time				
0630	Drillers started laying out hoses to pump water.			
0800	I arrived, finished pumping water.			
	Depth (B.L.S.)	**SPT Count**	**Sample Recovery**	**Sample Number**
0815	0-2 feet	1/1/1/1	62% recovery	S-1
	2-4 feet	6/6/8/8	100% recovery	S-2
	4-6 feet	12/14/12/9	100% recovery	S-3
	6-8 feet	8/13/9/9	83% recovery	S-4
	8-10 feet	4/5/5/6	88% recovery	S-5
	10-12 feet	6/6/6/8	76% recovery	S-6
	12-14 feet	12/11/12/18	88% recovery	S-7
	14-16 feet	18/18/16/14	100% recovery	S-8
	16-18 feet	8/8/18/23	100% recovery	S-9
	18-20 feet	5/7/7/8	100% recovery	S-10
1000	Finish SPT's, flushing casing. Out of water, need to go back to water treatment plant for more.			
1030	Break for lunch and get more water.			
1130	Pumped water from truck to trough. Cementing, purging casing annular space.			
	Well Specifications: Sand - 1 bag Grout - 7 bags Bentonite - 5 lbs. Risers: 10', 10', 2', 2' screen Installed 5' of 8" surface casing			
1215-1400	Carried equipment up the trail. Decontaminated the equipment for the next site.			
1500	Left for SV1. North on Patrol Trail in St. Lucie County.			

Continued next page.

Isolated Wetlands Drilling Program
Savannas State Preserve
Martin County, Florida

Location: West side of Patrol Trail, north of Walton Road
Township: 36 S, Range: 41 E, Section: 31
Drill Dates: 01/23/97 to 01/24/97
South Florida Water Management District
District Personnel: Steve Krupa
Precision Drilling Staff: Robert Miller
Joe Crisalli, Willie Thomas

01/23/97 Old Well # SAV 1C New Well # SV1

Time

1530-1600 Set up rig and carried out equipment.
1620 Started casing and spooning

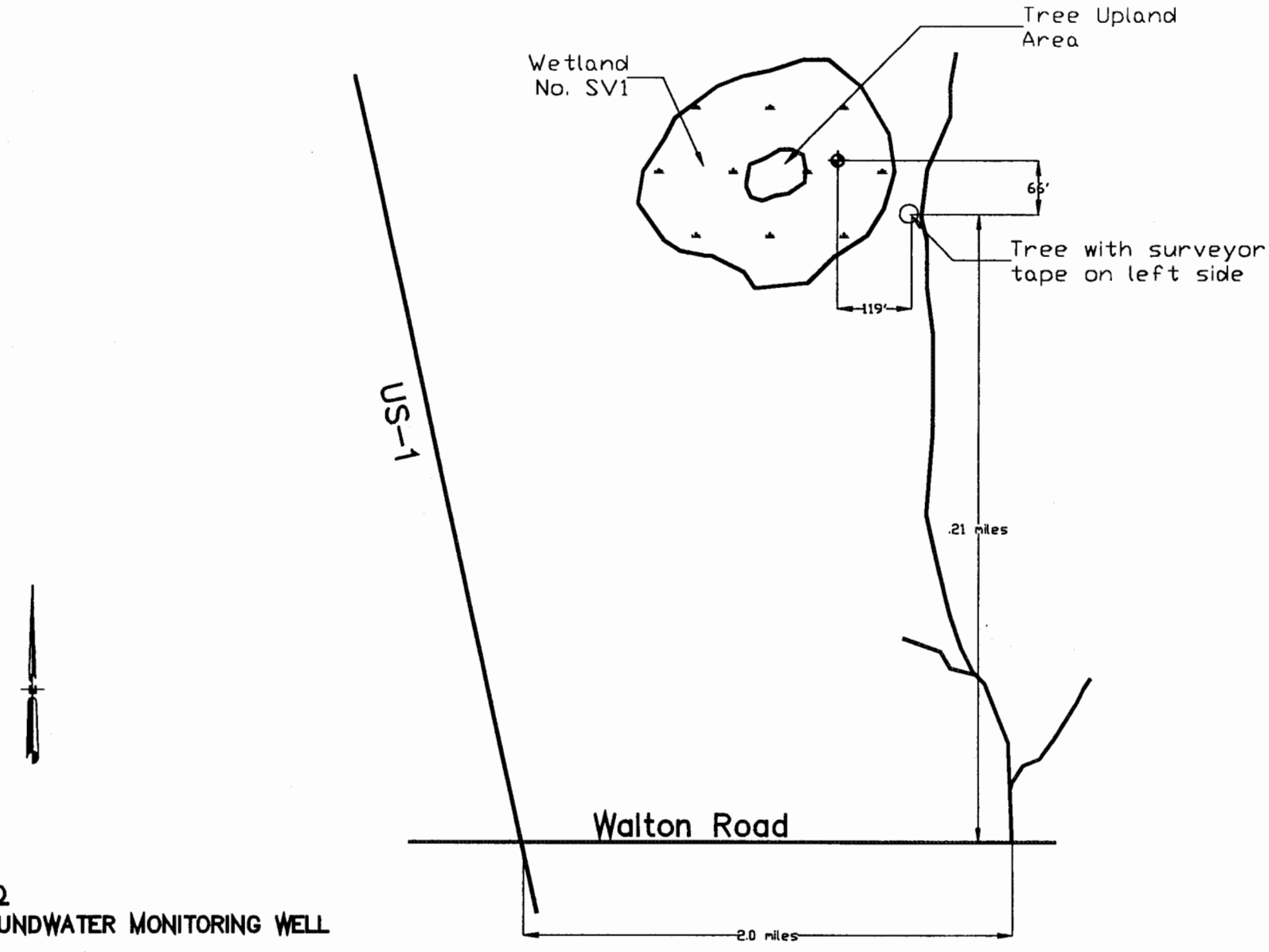
Depth (B.L.S.)	SPT Count	Sample Recovery	Sample Number
0-2 feet	2/2/4/3	66% recovery	S-1
2-4 feet	6/11/5/10	70% recovery	S-2
4-6 feet	10/23/16/10	68% recovery	S-3
6-8 feet	6/8/16/8	87% recovery	S-4
8-10 feet	6/6/6/6	100% recovery	S-5
10-12 feet	14/7/5/7	88% recovery	S-6
12-14 feet	13/16/8/8	80% recovery	S-7
14-16 feet	19/10/19/15	66% recovery	S-8
16-18 feet	24/12/15/15	50% recovery	S-9
18-20 feet	5/3/3/2	54% recovery	S-10

Samples S-7 through S-10 collected on 1/24/97 by Robert Miller and crew.

Well Specifications: Sand - 3 bags
Grout - 7 bags
Bentonite - 5 lbs.
Risers: 10', 10', 2', 2' screen
Installed 7' of 8" surface casing

End of Entry 1/23/97

SITE MAPS



LEGEND

⌖ GROUNDWATER MONITORING WELL

ENGINEERED ENVIRONMENTAL SOLUTIONS, INC.
1301 NW 4th Street, Boca Raton, FL 33486 Tel/Fax 561-394-3969, Beeper 708-0165

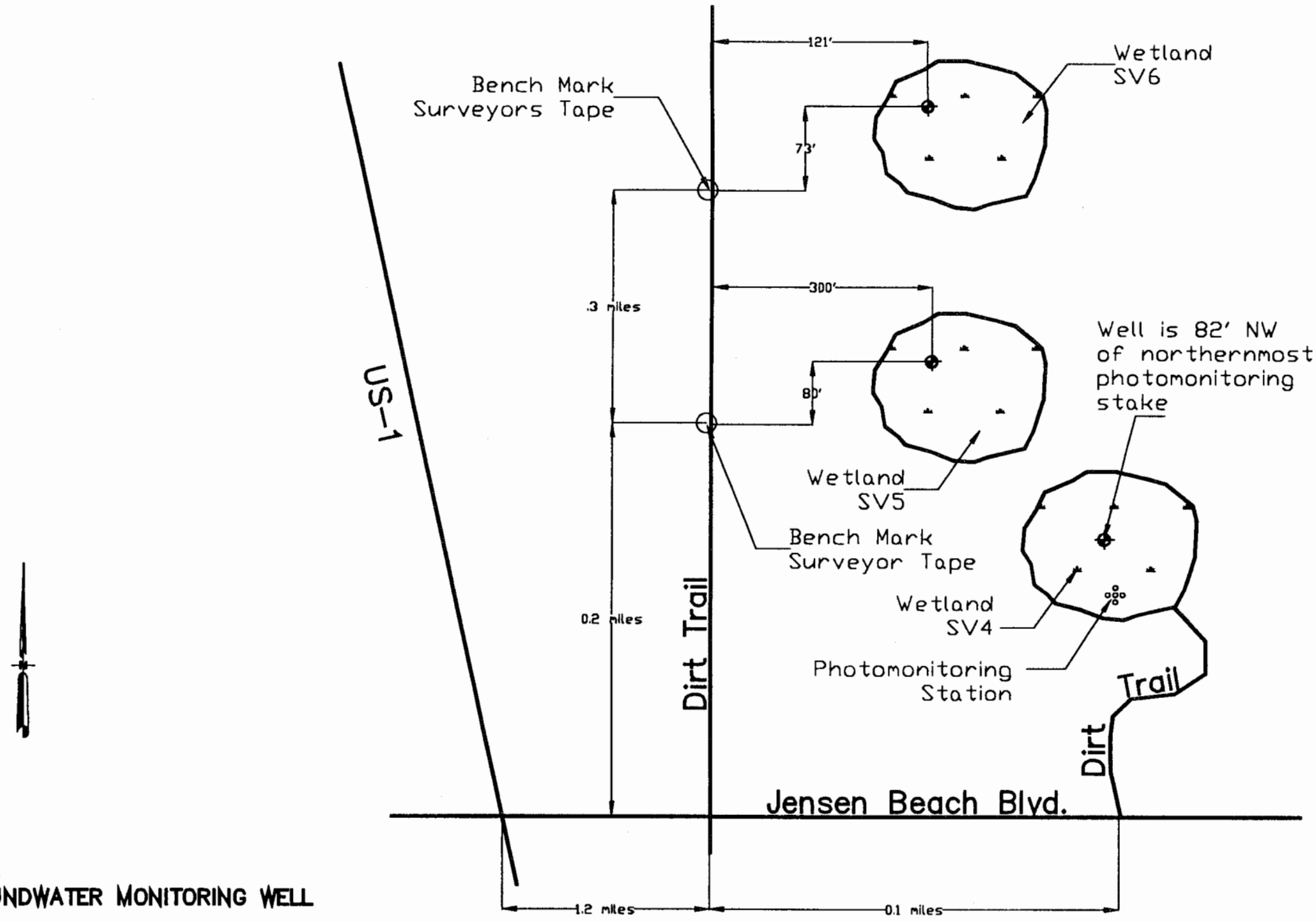
SITE LOCATION MAP – SV1

ISOLATED WETLANDS DRILLING PHASE 1
SOUTH FLORIDA WATER MANAGEMENT DISTRICT

CONTRACT NO.:C-7665	FILENAME:13SL1.DWG	DATE: 3/28/97	SCALE: NTS

1

c:\projects\wetlands1\SV1.DWG



LEGEND

◈ GROUNDWATER MONITORING WELL

ENGINEERED ENVIRONMENTAL SOLUTIONS, INC.

1301 NW 4th Street, Boca Raton, FL 33486 Tel/Fax 561-394-3969, Beeper 708-0165

SITE LOCATION MAP - SV4, SV5, & SV6

ISOLATED WETLANDS DRILLING PHASE 1
SOUTH FLORIDA WATER MANAGEMENT DISTRICT

CONTRACT NO.:C-7665	FILENAME:SV456.dwg	DATE: 3/28/97	SCALE: NTS

2

c:\projects\wetlands1\SV456.DWG

BORING LOGS AND WELL CONSTRUCTION DRAWINGS

South Florida Water Management District
3301 Gun Club Road
West Palm Beach, Florida 33406
(561) 686-8800 / Fax 687-6442

Engineered Environmental Solutions, Inc.
1301 NW 4th Street
Boca Raton, Florida 33486
Ph/Fax: (561) 394-3969

BORING LOG

BORING/WELL NO.: **SV1**

PROJECT NO./NAME: **1033/Isolated Wetlands Shallow Drilling Program**	LOCATION: **Savannas State Preserve, St. Lucie County, Florida**
DRILLING CONTRACTOR/DRILLER: **Precision Drilling/Robert Miller**	
GEOLOGIST/OFFICE: **Steve Krupa/South Florida Water Management District**	

DRILLING EQUIPMENT/METHOD	SIZE/TYPE OF BIT	SAMPLING METHOD	START/FINISH DATE
Tripod/SPT	**3'-5" dia. casing, driven and washed**	**Split Spoon**	**1/23/97-1/24/97**

WELL INSTALLED?	CASING MAT./DIA.	SCREEN:
YES ☒ NO ☐	**Sch.40 monoflex PVC/2"**	TYPE Slotted MAT. PVC LENGTH 2' DIA. 2" SLOT SIZE .010

ELEVATION OF:	GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN	DATE
(FT. ABOVE M.S.L.)	**15.2 est.**	**2.25 ft**	**20.75 ft/22.75 ft**	**1/24/97**

REMARKS:

Depth (ft)	Sample Type & Recovery	Sample Number	Penetration Resistance Blows/6" N-Value	Unified Classification	LOG OF TEST BORING: FIELD DESCRIPTION	Munsell Field Color
		S1	1 1 1 1 2	OL	7 in. organic material grading to 7 in. fine sand	1 2.5/N = 10 YR 6/2
					2.0	
		S2	6 6 8 8 14	SP	8 in. fine sand grading to 8 in. fine sand w/ heavy organic staining	10 YR 8/1 = 1 2.5/N
5		S3	12 14 12 9 26		Fine sand w/ staining	7.5 YR 3/1
		S4	8 13 9 9 22		5 in. fine sand w/ organic staining grading to 15 in. fine sand	7.5 YR 3/1 = 2.5 Y 6/3
		S5	4 5 5 6 10	SP-SW	5 in. medium to fine sand, 1.5 in. (1 2.5/N) fine sand grading to 9 in. (2.5 y 8/1) fine sand	2.5 Y 7/2 = 2.5 Y 8/1
10		S6	6 6 6 8 12		10.0	
		S7	12 11 12 18 23		5 in. medium to fine sand grading to fine sand	2.5 Y 6/2 = 2.5 Y 8/1
					14.0	2.5 Y 7/2
		S8	18 18 16 14 34	SP	Fine sand	2.5 Y 8/1
15		S9	8 8 18 23 26			2.5 Y 6/1
		S10	5 7 7 8 14			
20					23.0	

Penetration Resistance (Blows/Foot): 0, 15, 35, 55, 75, 100

Graphic Litho Log

Well Construction

EMF LA 9/11/97

Fine Sand | Medium Sand | Bentonite Pellets | Cement Grout | Silt/Clay w/ shell

Organic Material | Clay | Split Spoon | Percent Recovery | No Recovery

South Florida Water Management District
3301 Gun Club Road
West Palm Beach, Florida 33406
(561) 686-8800 / Fax 687-6442

Engineered Environmental Solutions, Inc.
1301 NW 4th Street
Boca Raton, Florida 33486
Ph/Fax: (561) 394-3969

BORING LOG

BORING/WELL NO.	PROJECT NO./NAME	LOCATION
SV4	1033/Isolated Wetlands Shallow Drilling Program	Savannas State Preserve, St. Lucie County, Florida

DRILLING CONTRACTOR/DRILLER: Precision Drilling/Robert Miller

GEOLOGIST/OFFICE: Steve Krupa/South Florida Water Management District

DRILLING EQUIPMENT/METHOD	SIZE/TYPE OF BIT	SAMPLING METHOD	START/FINISH DATE
Tripod/SPT	3'-5" dia. casing, driven and washed	Split Spoon	1/20/97-1/20/97

WELL INSTALLED? YES ☒ NO ☐ | CASING MAT./DIA.: Sch.40 monoflex PVC/2" | SCREEN: TYPE Slotted MAT. PVC LENGTH 2' DIA. 2" SLOT SIZE .010

ELEVATION OF:	GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN	DATE
(FT. ABOVE M.S.L.)	12.4 ft	2.55 ft	20.25 ft/22.50 ft	1/24/97

REMARKS:

Depth (ft)	Sample Type & Recovery	Sample Number	Penetration Resistance Blows/6" N-Value	Unified Classification	LOG OF TEST BORING: FIELD DESCRIPTION	Munsell Field Color
		S1	- - - 4	SP-SW	Medium to fine grained sand w/ heavy organic staining	1 2.5/N
		S2	9 8 8 8 16			1 2.5/N
5		S3	5 5 9 7 14	SW	4 in. medium sand grading to 15 in. fine sand	10 YR 8/1 = 10 R 4/2
		S4	7 18 12 12 30	SP-SW	Medium to fine sand	7.5 YR 6/2
					8.0	
		S5	4 4 6 7 10		Fine sand	10 R 5/4
10					10.0	
		S6	5 9 9 9 18		Medium to fine grained sand	2.5 YR 3/2
		S7	11 14 17 7 31			2.5 YR 4/3
		S8	6 7 8 9 15			2.5 YR 3/2
15		S9	6 7 13 24 20			2.5 YR 7/1
					18.0	
		S10	9 7 6 4 13		8 in. fine sand grading to 12 in. of fine sand w/ organics	2.5 YR 3/2 = 1 2.5/N
20						
					22.6	

Penetration Resistance (Blows/Foot): 0 15 35 55 75 100

Graphic Litho Log

Well Construction

EMF LA 9/11/97

Fine Sand | Medium Sand | Bentonite Pellets | Cement Grout | Silt/Clay w/ shell

Organic Material | Clay | Split Spoon | Percent Recovery | No Recovery

South Florida Water Management District
3301 Gun Club Road
West Palm Beach, Florida 33406
(561) 686-8800 / Fax 687-6442

Engineered Environmental Solutions, Inc.
1301 NW 4th Street
Boca Raton, Florida 33486
Ph/Fax: (561) 394-3969

BORING LOG

BORING/WELL NO.	PROJECT NO./NAME	LOCATION
SV5	1033/Isolated Wetlands Shallow Drilling Program	Savannas State Preserve, St. Lucie County, Florida

DRILLING CONTRACTOR/DRILLER: Precision Drilling/Robert Miller

GEOLOGIST/OFFICE: Steve Krupa/South Florida Water Management District

DRILLING EQUIPMENT/METHOD	SIZE/TYPE OF BIT	SAMPLING METHOD	START/FINISH DATE
Tripod/SPT	3'-5" dia. casing, driven and washed	Split Spoon	1/23/97-1/23/97

WELL INSTALLED?	CASING MAT./DIA.	SCREEN:				
YES ☒ NO ☐	Sch.40 monoflex PVC/2"	TYPE Slotted	MAT. PVC	LENGTH 2'	DIA. 2"	SLOT SIZE .010

ELEVATION OF:	GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN	DATE
(FT. ABOVE M.S.L.)	12.4	1.08 ft	21.82/23.82	1/24/97

REMARKS:

Depth (ft)	Sample Type & Recovery	Sample Number	Penetration Resistance Blows/6" N-Value	Unified Classification	LOG OF TEST BORING — FIELD DESCRIPTION	Munsell Field Color
		S1	1/1/1/1 2	PT	Organic material top 4 in. grading to fine sand w/ heavy staining	1 2.5/N
					2.0	
		S2	6/6/8/8 14	SP	Fine sand heavily stained w/ organics grading toward a 5 YR 5/2	
					4.0	
5		S3	12/14/12/9 26	SW	Medium sand grading toward fine sand	7.5 YR 4/1
		S4	8/13/9/9 22		4 in. medium to fine sand grading to 15 in. fine sand	10 YR 4/1 = 10 YR 7/2
					8.0	
		S5	4/5/5/6 10	SP	4 in. (10 YR 8/1) fine sand grading toward marbled (10 YR 8/4) medium to fine sand grading to (10 YR 8/1) fine sand	10 YR 8/1 = 10 YR 8/4
10		S6	6/6/6/8 12		11 in. (10 YR 7/1) fine sand grading toward a marbled (10 YR 5/1) fine sand grading to 5 in. (10 YR 7/1) fine sand	10 YR 7/1 = 10 YR 5/1
		S7	12/11/12/18 23		17 in. (10 YR 6/2) fine sand grading to 10 YR 3/1 fine sand	10 YR 6/2 = 10 YR 3/1
		S8	18/18/16/14 34		Fine sand	5 YR 4/3
15		S9	8/8/18/23 26		13 in. fine sand grading to 10 in. 5 YR 2.5/1 fine sand	5 YR 4/3 = 5 YR 2.5/1
		S10	5/7/7/8 14		6 in. fine sand grading to 16 in. of 1 2.5/N fine sand	5 YR 4/3 = 1 2.5/N
20						
					23.9	

Penetration Resistance (Blows/Foot): 0 15 35 55 75 100

Graphic Litho Log

Well Construction

EMP A 9/11/97

Fine Sand | Medium Sand | Bentonite Pellets | Cement Grout | Silt/Clay w/ shell

Organic Material | Clay | Split Spoon | Percent Recovery | No Recovery

South Florida Water Management District
3301 Gun Club Road
West Palm Beach, Florida 33406
(561) 686-8800 / Fax 687-6442

Engineered Environmental Solutions, Inc.
1301 NW 4th Street
Boca Raton, Florida 33486
Ph/Fax: (561) 394-3969

BORING LOG

BORING/WELL NO.	
SV6	

PROJECT NO./NAME	LOCATION
1033/Isolated Wetlands Shallow Drilling Program	Savannas State Preserve, St. Lucie County, Florida

DRILLING CONTRACTOR/DRILLER
Precision Drilling/Robert Miller

GEOLOGIST/OFFICE
Steve Krupa/South Florida Water Management District

DRILLING EQUIPMENT/METHOD	SIZE/TYPE OF BIT	SAMPLING METHOD	START/FINISH DATE
Tripod/SPT	3'-5"dia. casing, driven and washed	Split Spoon	1/22/97-1/22/97

WELL INSTALLED?	CASING MAT./DIA.	SCREEN:				
YES ☒ NO ☐	Sch.40 monoflex PVC/2"	TYPE Slotted	MAT. PVC	LENGTH 2'	DIA. 2"	SLOT SIZE .010

ELEVATION OF:	GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN	DATE
(FT. ABOVE M.S.L.)	12.7	4.45 ft	21.35/23.35	1/24/97

REMARKS:

Depth (ft)	Sample Type & Recovery	Sample Number	Penetration Resistance Blows/6" N-Value	Unified Classification	LOG OF TEST BORING: FIELD DESCRIPTION	Munsell Field Color
		S1	3 6 9 7 15	PT	2 in. organic material grading to 6 in. 7.5 YR 5/2 grading to 5 in. 7.5 YR 3/1	7.5 YR 3/1 = 7.5 YR 5/2
		S2	4 4 7 7 11	SP	Fine sand w/ heavy staining	1 2.5/N = 7.5 YR 2.5/1
5		S3	8 7 6 6 13			7.5 YR 2.5/1
		S4	5 9 0 9 9		Fine sand	7.5 YR 4/1
		S5	9 13 6 7 18			7.5 YR 3/1
10		S6	10 8 9 14 17			7.5 YR 5/3
		S7	15 15 14 14 29	SP-SW	11 in. medium to fine sand grading to 11 in. fine sand	7.5 YR 7/1 = 7.5 YR 5/3
15		S8	27 22 37 40 59		Medium to fine sand	
		S9	15 17 22 24 39			7.5 YR 7/1
		S10	10 13 7 7 20			
20						

Penetration Resistance (Blows/Foot): 0, 15, 35, 55, 75, 100

Graphic Litho Log

Well Construction

2.0 ft

12.0 ft

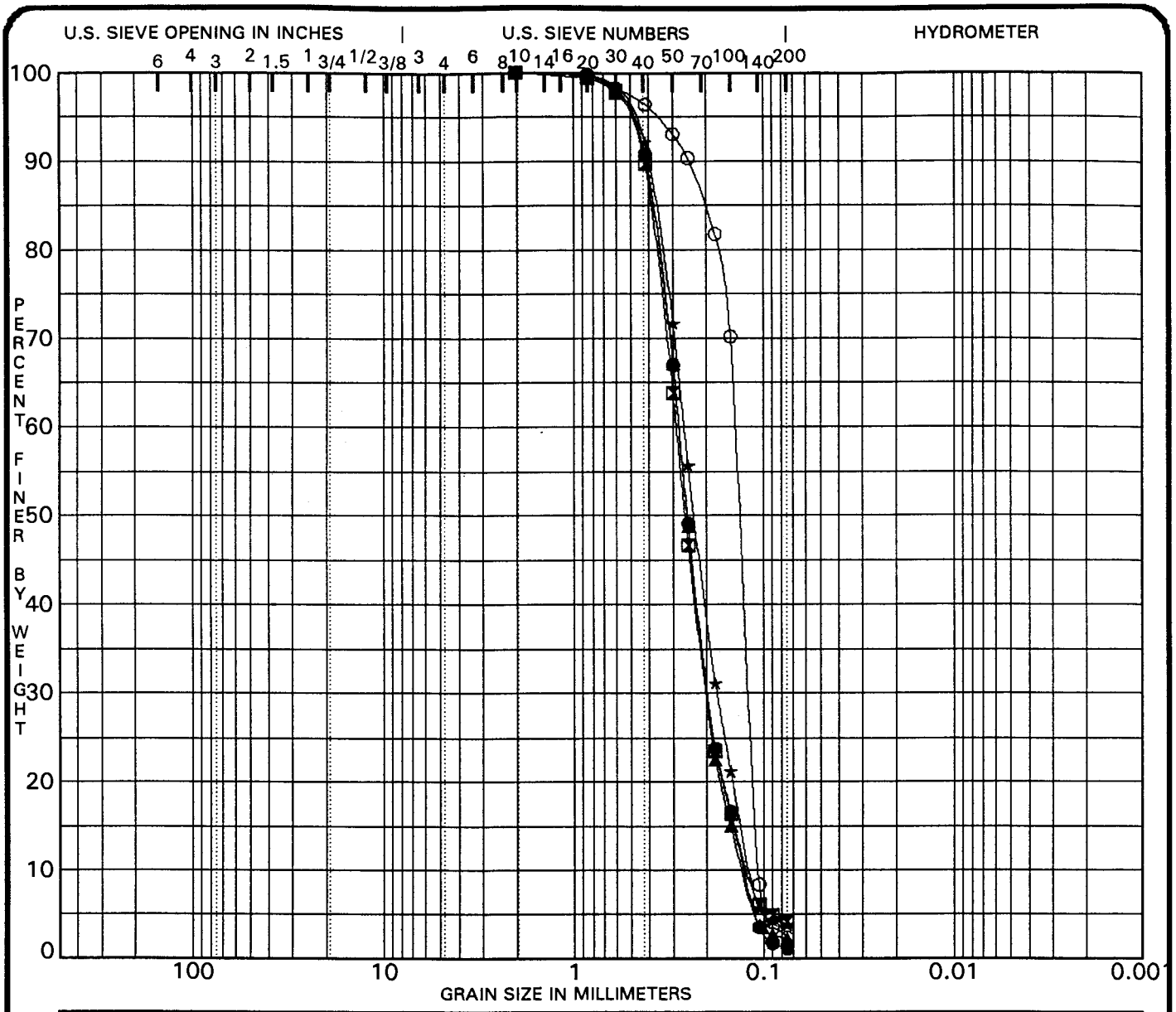
23.6 ft

EMF A 9/11/97

Fine Sand | Medium Sand | Bentonite Pellets | Cement Grout | Silt/Clay w/ shell

Organic Material | Clay | Split Spoon | Percent Recovery | No Recovery

GRAIN SIZE DISTRIBUTION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
●	SV1	0.0	POORLY GRADED SAND SP					1.08	2.2
⊠	SV1	2.0	POORLY GRADED SAND SP					1.12	2.4
▲	SV1	4.0	POORLY GRADED SAND SP					1.09	2.2
★	SV1	6.0	POORLY GRADED SAND SP					1.01	2.3
○	SV1	8.0	POORLY GRADED SAND SP					0.95	1.3

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	SV1	0.0	2.00	0.28	0.195	0.1258	0.0	98.8	1.2	
⊠	SV1	2.0	2.00	0.29	0.197	0.1206	0.0	95.8	4.2	
▲	SV1	4.0	2.00	0.28	0.198	0.1285	0.0	97.7	2.3	
★	SV1	6.0	2.00	0.26	0.176	0.1167	0.0	96.1	3.9	
○	SV1	8.0	2.00	0.14	0.120	0.1070	0.0	97.6	2.4	

PROJECT **Isolated Wetlands Shallow Drilling Program - Savannas State Preserve, St. Lucie County, Florida**

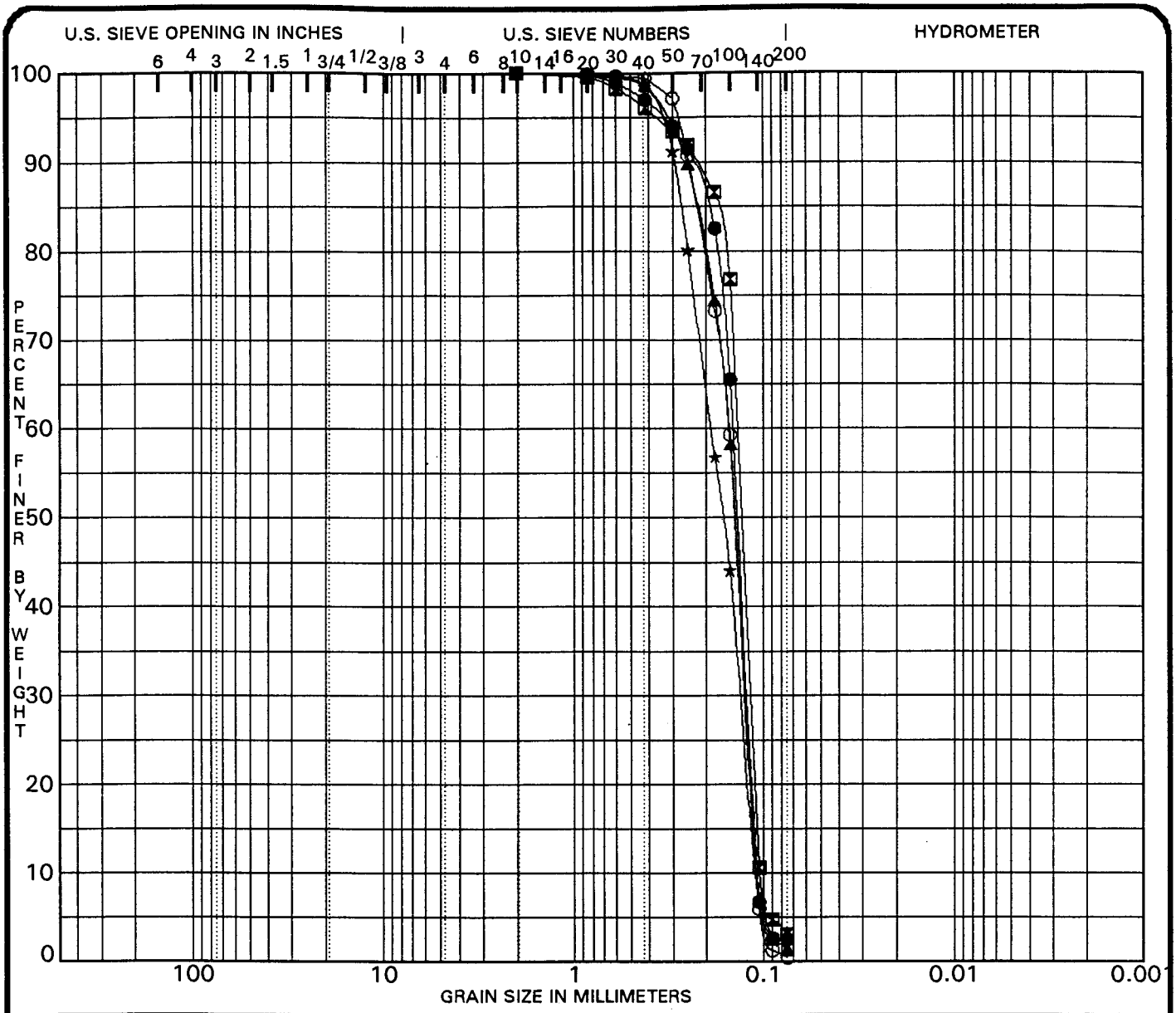
JOB NO. **1033**

DATE **9/11/97**

GRADATION CURVES

Engineered Environmental Solutions, Inc.

1301 NW 4th Street, Boca Raton, FL



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification			Classification	MC%	LL	PL	PI	Cc	Cu
●	SV1	10.0	POORLY GRADED SAND SP					0.94	1.3
⊠	SV1	12.0	POORLY GRADED SAND SP					0.96	1.3
▲	SV1	14.0	POORLY GRADED SAND SP					0.93	1.4
★	SV1	16.0	POORLY GRADED SAND SP					0.84	1.7
⊙	SV1	18.0	POORLY GRADED SAND SP					0.93	1.4

Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	SV1	10.0	2.00	0.15	0.122	0.1080	0.0	97.4	2.6	
⊠	SV1	12.0	2.00	0.14	0.117	0.1042	0.0	96.9	3.1	
▲	SV1	14.0	0.85	0.15	0.124	0.1080	0.0	98.6	1.4	
★	SV1	16.0	2.00	0.19	0.132	0.1092	0.0	98.1	1.9	
⊙	SV1	18.0	2.00	0.15	0.124	0.1088	0.0	99.5	0.5	

PROJECT **Isolated Wetlands Shallow Drilling Program - Savannas State Preserve, St. Lucie County, Florida**

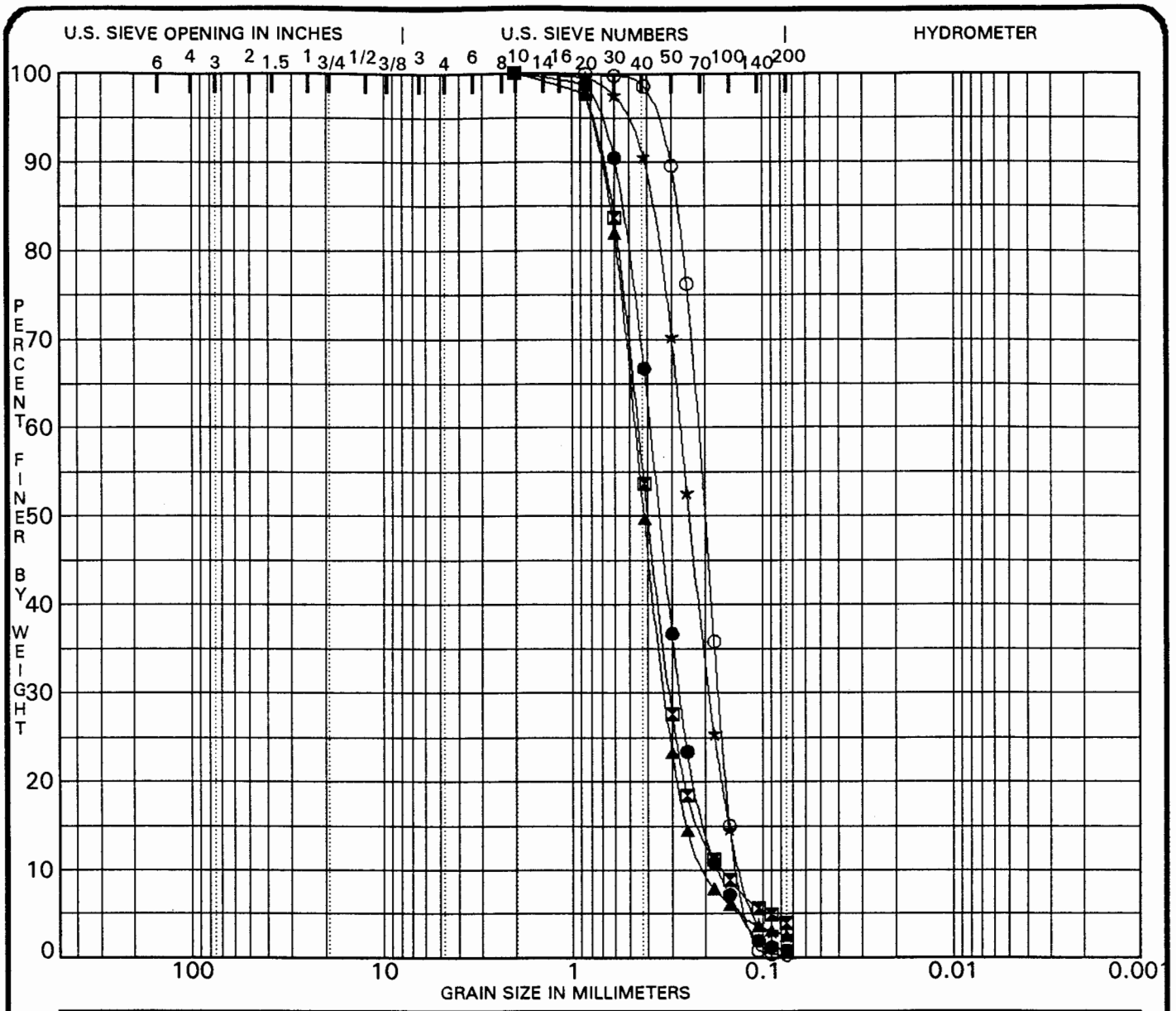
JOB NO. **1033**

DATE **9/11/97**

GRADATION CURVES

Engineered Environmental Solutions, Inc.

1301 NW 4th Street, Boca Raton, FL



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification			Classification	MC%	LL	PL	PI	Cc	Cu
●	SV4	0.0	POORLY GRADED SAND SP					1.11	2.3
⊠	SV4	2.0	POORLY GRADED SAND SP					1.29	2.8
▲	SV4	4.0	POORLY GRADED SAND SP					1.13	2.4
★	SV4	6.0	POORLY GRADED SAND SP					1.04	2.1
⊙	SV4	8.0	POORLY GRADED SAND SP					1.01	1.7

Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	SV4	0.0	2.00	0.39	0.274	0.1729	0.0	99.1	0.9	
⊠	SV4	2.0	2.00	0.45	0.310	0.1637	0.0	96.0	4.0	
▲	SV4	4.0	2.00	0.47	0.327	0.1998	0.0	97.5	2.5	
★	SV4	6.0	2.00	0.27	0.190	0.1294	0.0	97.5	2.5	
⊙	SV4	8.0	0.85	0.22	0.171	0.1326	0.0	99.6	0.4	

PROJECT **Isolated Wetlands Shallow Drilling Program - Savannas State Preserve, St. Lucie County, Florida**

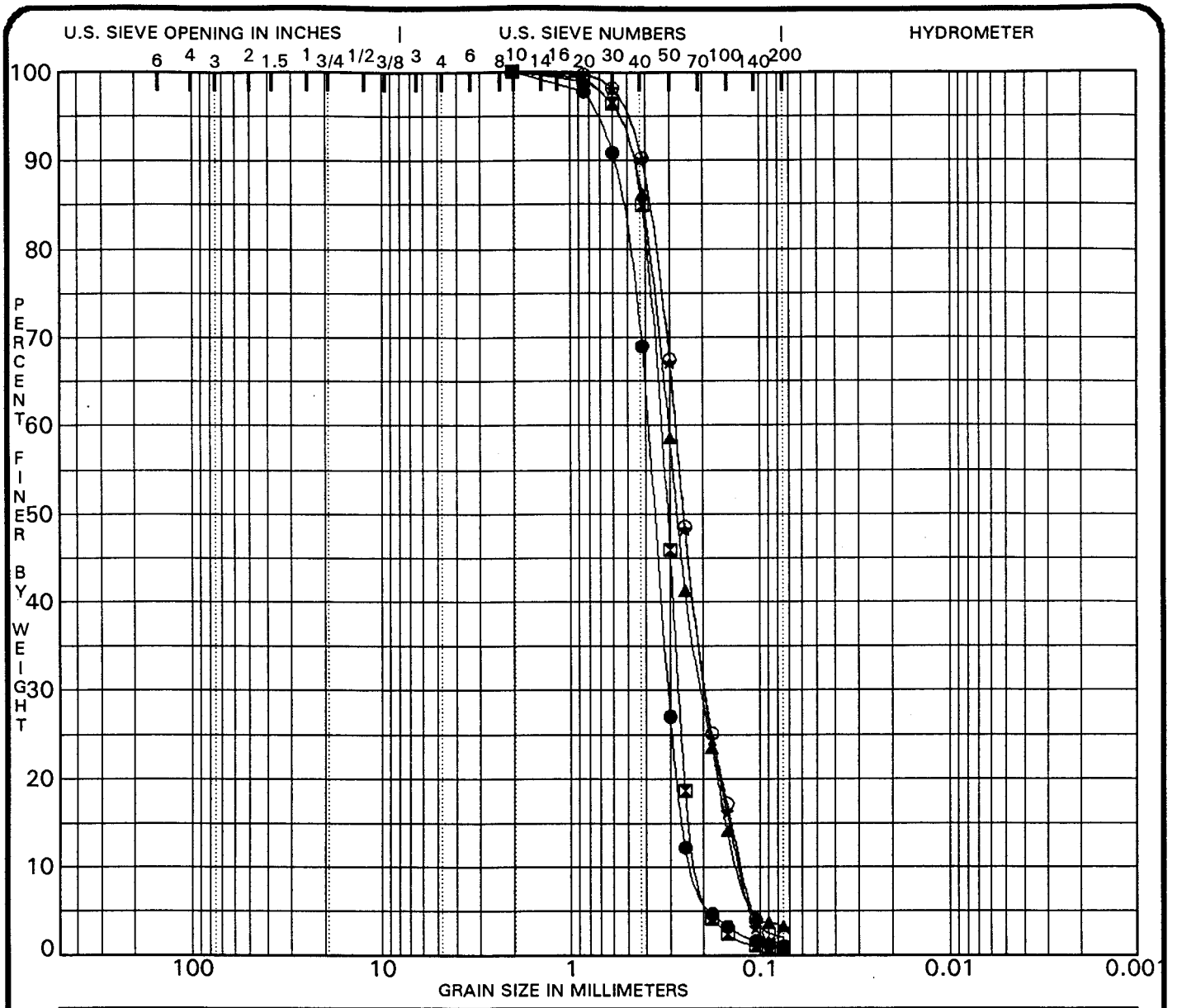
JOB NO. **1033**

DATE **9/11/97**

GRADATION CURVES

Engineered Environmental Solutions, Inc.

1301 NW 4th Street, Boca Raton, FL



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
●	SV4	10.0	POORLY GRADED SAND SP					1.06	1.7
⊠	SV4	12.0	POORLY GRADED SAND SP					1.05	1.7
▲	SV4	14.0	POORLY GRADED SAND SP					1.04	2.4
★	SV4	16.0	POORLY GRADED SAND SP					1.06	2.2
⊙	SV4	18.0	POORLY GRADED SAND SP					1.07	2.3

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	SV4	10.0	2.00	0.39	0.307	0.2270	0.0	98.9	1.1	
⊠	SV4	12.0	2.00	0.34	0.270	0.2053	0.0	99.1	0.9	
▲	SV4	14.0	2.00	0.31	0.203	0.1295	0.0	96.6	3.4	
★	SV4	16.0	2.00	0.28	0.194	0.1271	0.0	98.7	1.3	
⊙	SV4	18.0	2.00	0.28	0.193	0.1239	0.0	97.9	2.1	

PROJECT **Isolated Wetlands Shallow Drilling Program - Savannas State Preserve, St. Lucie County, Florida**

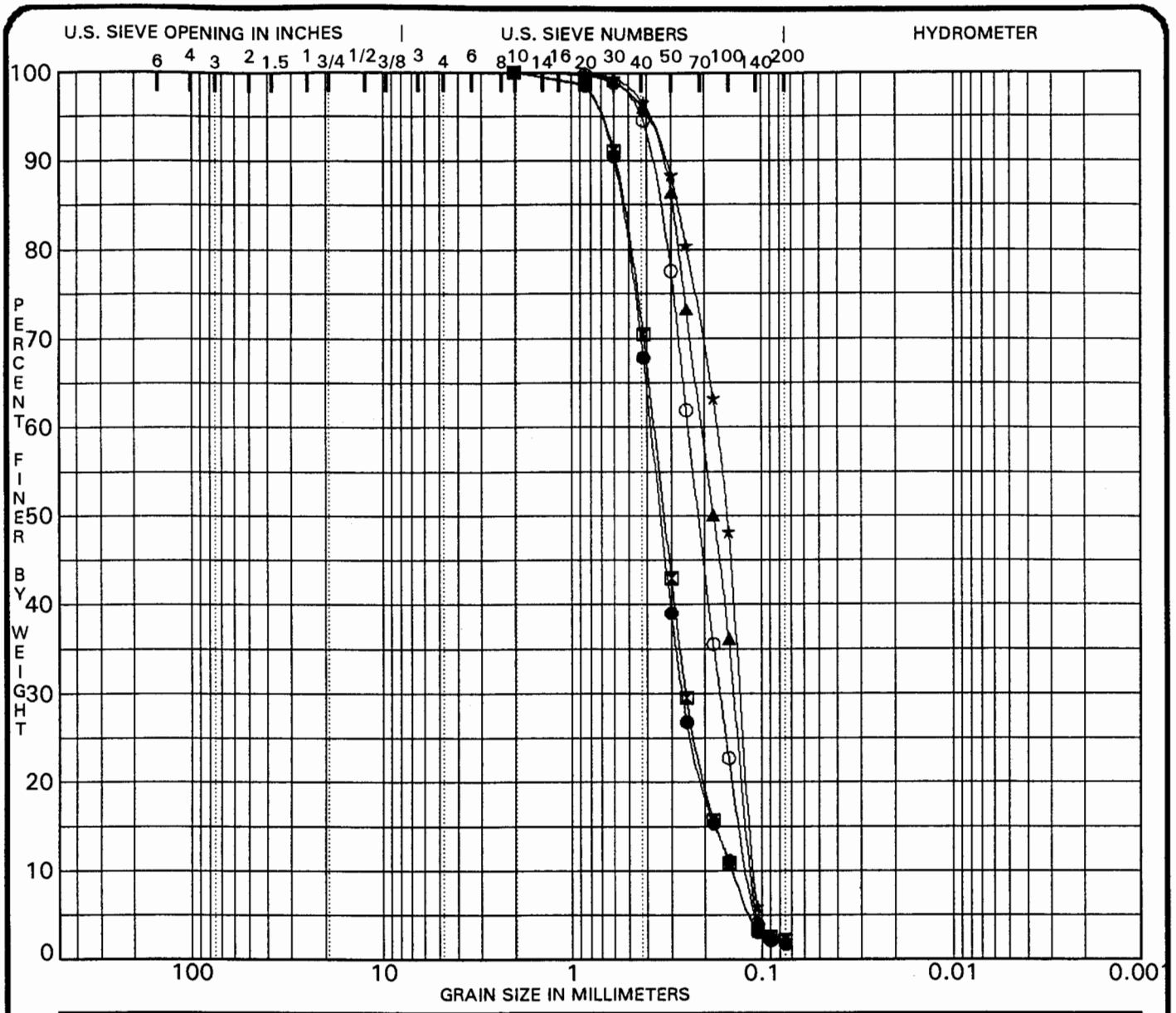
JOB NO. **1033**

DATE **9/11/97**

GRADATION CURVES

Engineered Environmental Solutions, Inc.

1301 NW 4th Street, Boca Raton, FL



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification			Classification	MC%	LL	PL	PI	Cc	Cu
●	SV5	0.0	POORLY GRADED SAND SP					1.25	2.7
⊠	SV5	2.0	POORLY GRADED SAND SP					1.19	2.6
▲	SV5	4.0	POORLY GRADED SAND SP					0.84	1.8
★	SV5	6.0	POORLY GRADED SAND SP					0.88	1.6
⊙	SV5	8.0	POORLY GRADED SAND SP					0.96	2.1

Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	SV5	0.0	2.00	0.38	0.262	0.1430	0.0	98.2	1.8	
⊠	SV5	2.0	2.00	0.37	0.252	0.1438	0.0	97.7	2.3	
▲	SV5	4.0	2.00	0.21	0.140	0.1126	0.0	97.8	2.2	
★	SV5	6.0	0.85	0.17	0.129	0.1095	0.0	97.9	2.1	
⊙	SV5	8.0	2.00	0.24	0.166	0.1183	0.0	98.2	1.8	

PROJECT **Isolated Wetlands Shallow Drilling Program - Savannas State Preserve, St. Lucie County, Florida**

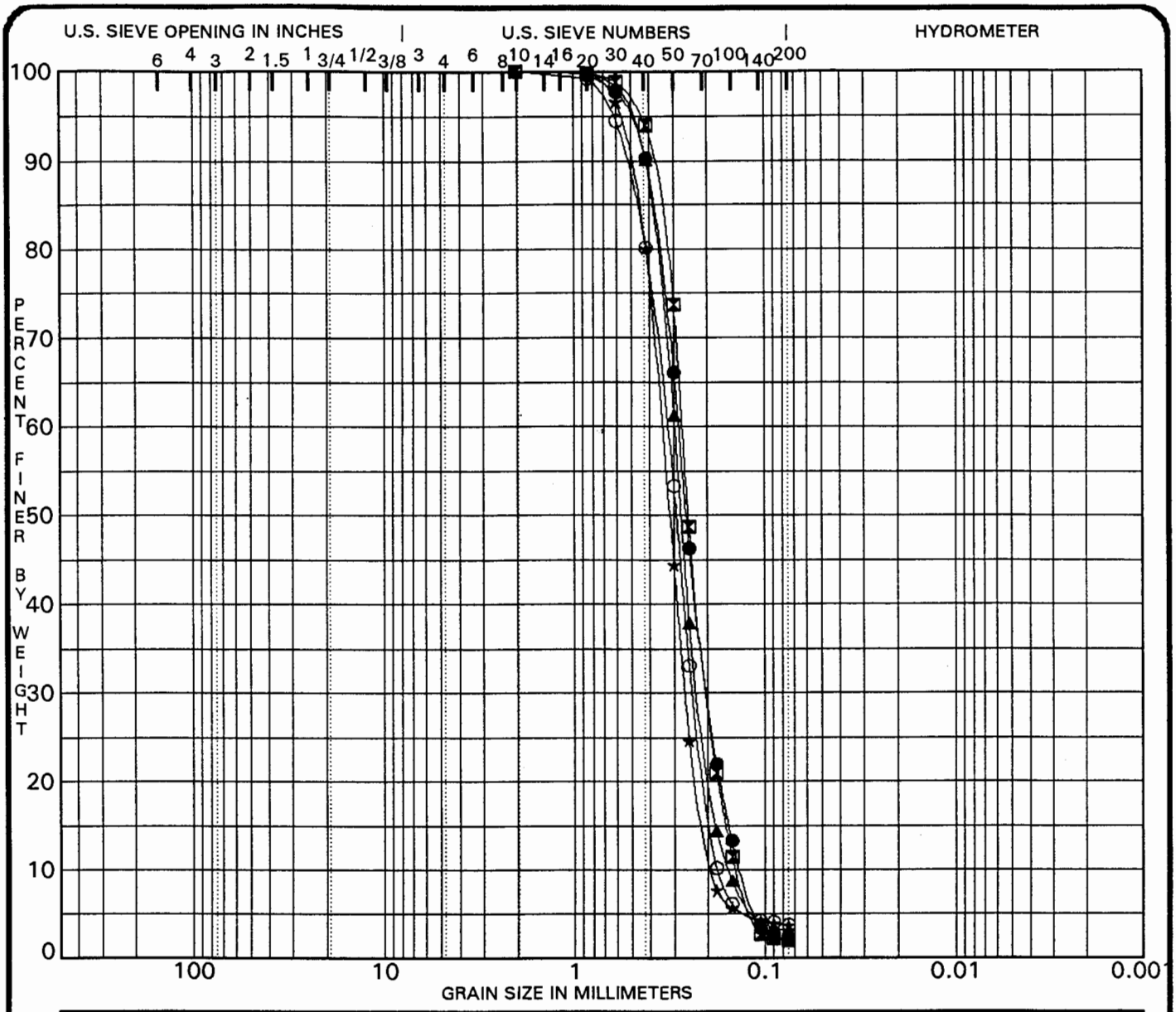
JOB NO. 1033

DATE 9/11/97

GRADATION CURVES

Engineered Environmental Solutions, Inc.

1301 NW 4th Street, Boca Raton, FL



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification			Classification	MC%	LL	PL	PI	Cc	Cu
●	SV5	10.0			NP	NP	NP	1.06	2.1
⊠	SV5	12.0	POORLY GRADED SAND SP					1.05	1.9
▲	SV5	14.0	POORLY GRADED SAND SP					1.08	1.9
★	SV5	16.0	POORLY GRADED SAND SP					1.05	1.8
○	SV5	18.0	POORLY GRADED SAND SP					0.98	1.8

Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	SV5	10.0		0.28	0.201	0.1336			2.1	
⊠	SV5	12.0	2.00	0.27	0.200	0.1413	0.0	98.0	2.0	
▲	SV5	14.0	2.00	0.30	0.224	0.1560	0.0	97.0	3.0	
★	SV5	16.0	2.00	0.35	0.263	0.1882	0.0	96.3	3.7	
○	SV5	18.0	2.00	0.33	0.239	0.1784	0.0	96.2	3.8	

PROJECT **Isolated Wetlands Shallow Drilling Program - Savannas State Preserve, St. Lucie County, Florida**

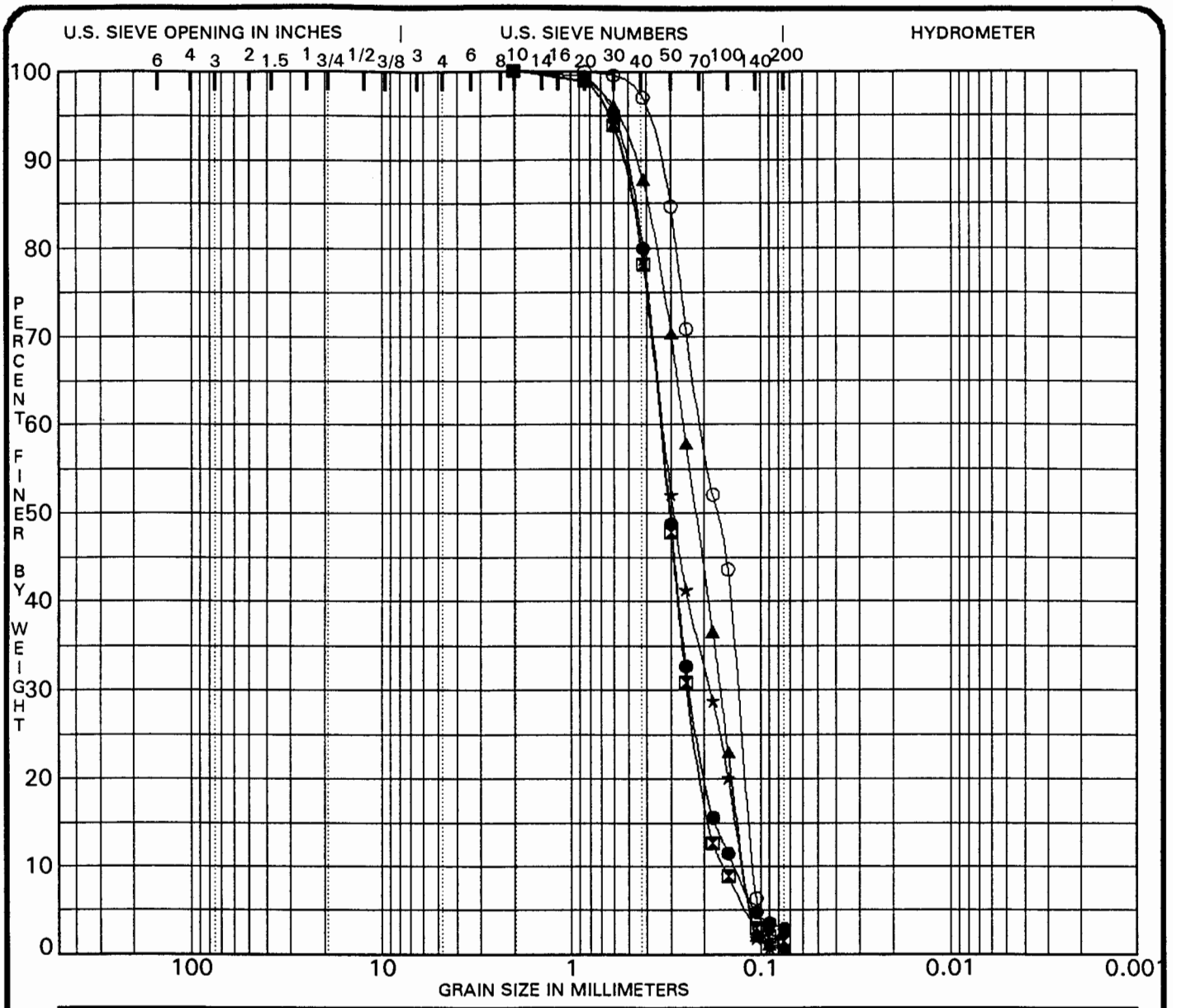
JOB NO. **1033**

DATE **9/11/97**

GRADATION CURVES

Engineered Environmental Solutions, Inc.

1301 NW 4th Street, Boca Raton, FL



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification			Classification	MC%	LL	PL	PI	Cc	Cu
●	SV6	0.0	POORLY GRADED SAND SP					1.20	2.4
⊠	SV6	2.0	POORLY GRADED SAND SP					1.11	2.2
▲	SV6	4.0	POORLY GRADED SAND SP					0.87	2.1
★	SV6	6.0	POORLY GRADED SAND SP					0.84	2.7
○	SV6	8.0	POORLY GRADED SAND SP					0.77	1.9

Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	SV6	0.0	2.00	0.34	0.237	0.1388	0.0	97.1	2.9	
⊠	SV6	2.0	2.00	0.34	0.246	0.1581	0.0	98.4	1.6	
▲	SV6	4.0	2.00	0.26	0.165	0.1207	0.0	99.0	1.0	
★	SV6	6.0	2.00	0.33	0.186	0.1237	0.0	99.3	0.7	
○	SV6	8.0	0.85	0.21	0.132	0.1096	0.0	98.3	1.7	

PROJECT **Isolated Wetlands Shallow Drilling Program - Savannas State Preserve, St. Lucie County, Florida**

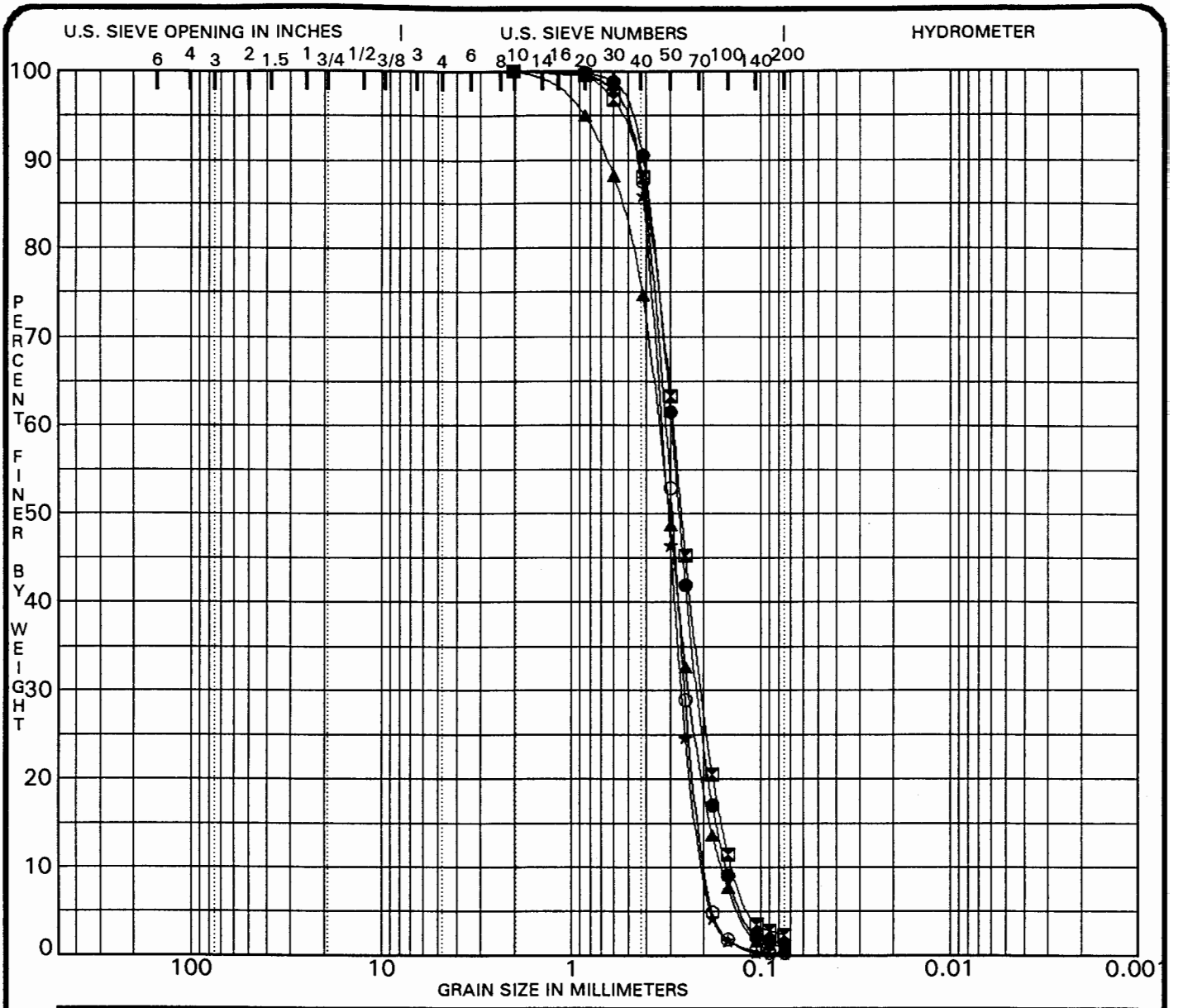
JOB NO. **1033**

DATE **9/11/97**

GRADATION CURVES

Engineered Environmental Solutions, Inc.

1301 NW 4th Street, Boca Raton, FL



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification			Classification	MC%	LL	PL	PI	Cc	Cu
●	SV6	10.0	POORLY GRADED SAND SP					1.01	1.9
⊠	SV6	12.0	POORLY GRADED SAND SP					1.02	2.1
▲	SV6	14.0	POORLY GRADED SAND SP					1.02	2.2
★	SV6	16.0	POORLY GRADED SAND SP					1.03	1.7
○	SV6	18.0	POORLY GRADED SAND SP					1.02	1.7

Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	SV6	10.0	2.00	0.30	0.214	0.1531	0.0	98.6	1.4	
⊠	SV6	12.0	2.00	0.29	0.204	0.1404	0.0	97.6	2.4	
▲	SV6	14.0	2.00	0.35	0.239	0.1610	0.0	98.9	1.1	
★	SV6	16.0	2.00	0.34	0.262	0.1974	0.0	99.7	0.3	
○	SV6	18.0	2.00	0.32	0.252	0.1930	0.0	99.6	0.4	

PROJECT **Isolated Wetlands Shallow Drilling Program - Savannas State Preserve, St. Lucie County, Florida**

JOB NO. **1033**

DATE **9/11/97**

GRADATION CURVES

Engineered Environmental Solutions, Inc.

1301 NW 4th Street, Boca Raton, FL

GRAIN SIZE ANALYSIS LABORATORY DATA

Well Name: **SV1**

Location: Savannas State Preserve

Sieve # (U.S. Standard)		#10	#20	#30	#40	#50	#60	#80	#100	#140	#170	#200	Pan	Weight Recovered	% diff.
Sample #	Sample Weight														
S-1	228.9	0.0	0.5	3.5	17.0	54.3	40.4	57.5	16.2	29.7	4.0	1.4	2.7	227.2	0.74
S-2	223.8	0.0	1.1	3.9	17.9	57.8	38.5	51.5	15.9	22.7	2.7	1.8	9.3	223.1	0.31
S-3	240.2	0.0	0.5	3.9	17.9	56.5	44.0	62.6	18.0	26.9	2.5	1.0	5.5	239.3	0.37
S-4	247.8	0.0	0.4	3.1	15.9	50.2	39.2	60.3	24.2	38.1	3.1	1.3	9.6	245.4	0.97
S-5	220.8	0.0	1.0	2.8	4.1	7.4	5.9	19.0	25.4	135.2	10.8	2.5	5.2	219.3	0.68
S-6	203.4	0.0	0.4	1.9	3.7	6.1	5.3	17.9	34.2	118.1	8.2	0.2	5.2	201.2	1.08
S-7	243.8	0.0	0.9	3.2	5.4	6.5	4.0	12.8	23.7	161.5	14.1	4.2	7.5	243.8	0.00
S-8	214.9	0.0	0.0	0.4	2.7	9.3	9.7	32.7	34.7	109.4	9.9	2.6	2.9	214.3	0.28
S-9	266.0	0.0	0.4	0.8	2.7	19.4	29.5	61.7	33.8	98.7	10.2	2.8	5.1	265.1	0.34
S-10	218.8	0.0	0.2	0.4	0.8	5.0	14.0	38.0	30.3	116.3	10.4	1.8	1.0	218.2	0.27

* Units=Grams

Well Name: **SV4**

Location: Savannas State Preserve

Sieve # (U.S. Standard)		#10	#20	#30	#40	#50	#60	#80	#100	#140	#170	#200	Pan	Weight Recovered	% diff.
Sample #	Sample Weight														
S-1	233.2	0.0	2.8	19.5	55.0	69.4	30.9	29.1	8.3	12.1	1.7	0.8	2.2	231.8	0.60
S-2	256.0	0.0	5.5	36.0	76.0	66.0	23.4	18.2	5.8	8.1	2.1	2.1	10.2	253.4	1.02
S-3	245.8	0.0	5.3	38.6	77.9	63.7	21.3	16.0	4.7	5.7	1.4	1.4	6.0	242.0	1.55
S-4	218.4	0.0	0.8	4.3	15.4	43.9	37.9	58.6	23.3	23.5	1.6	1.0	5.5	215.8	1.19
S-5	194.6	0.0	0.0	0.3	2.4	17.7	25.9	78.6	40.3	27.4	0.9	0.2	0.7	194.4	0.10
S-6	226.0	0.0	4.9	15.7	49.0	93.9	33.2	16.8	3.1	3.7	0.7	0.5	2.5	224.0	0.88
S-7	249.8	0.0	1.7	7.2	28.3	96.6	67.1	35.7	4.4	3.2	0.4	0.3	2.2	247.1	1.08
S-8	253.7	0.0	2.5	6.9	25.6	70.1	43.8	45.2	23.7	24.6	1.6	1.1	8.5	253.6	0.04
S-9	227.2	0.0	0.6	3.7	18.0	51.8	42.4	53.8	18.7	29.3	3.2	1.0	3.0	225.5	0.75
S-10	239.6	0.0	0.6	3.7	19.0	54.1	44.7	55.6	18.8	31.1	3.6	1.2	5.0	237.4	0.92

* Units=Grams

Well Name: **SV5**

Location: Savannas State Preserve

Sieve # (U.S. Standard)		#10	#20	#30	#40	#50	#60	#80	#100	#140	#170	#200	Pan	Weight Recovered	% diff.
Sample #	Sample Weight														
S-1	179.1	0.0	2.4	14.6	40.0	51.0	21.6	20.4	7.4	14.2	1.5	0.8	3.1	177.0	1.17
S-2	242.7	0.0	3.2	18.5	49.5	66.0	32.3	33.2	11.6	17.8	1.7	1.0	5.6	240.4	0.95
S-3	217.4	0.0	0.2	1.7	6.6	21.0	28.0	49.7	30.0	67.9	4.0	0.9	4.7	214.7	1.24
S-4	221.8	0.0	0.1	1.3	6.0	18.2	17.4	37.7	32.7	92.5	7.0	1.5	4.7	219.1	1.22
S-5	220.0	0.0	0.4	2.0	9.7	37.2	34.2	58.0	28.1	40.7	4.0	1.1	4.0	219.4	0.27
S-6	231.6	0.0	1.0	4.3	16.9	55.4	45.2	55.4	19.9	22.7	2.1	0.9	4.8	228.6	1.30
S-7	222.1	0.0	0.5	2.1	10.5	44.8	55.1	60.8	20.9	19.2	1.2	0.6	4.4	220.1	0.90
S-8	218.6	0.0	0.5	3.1	17.8	62.4	50.6	50.8	12.2	10.1	1.4	1.1	6.4	216.4	1.01
S-9	239.2	0.0	0.5	7.5	39.6	84.4	47.0	40.3	4.7	3.2	0.7	0.9	8.7	237.5	0.71
S-10	236.1	0.0	1.8	11.1	33.7	63.0	47.5	53.7	9.3	4.5	0.5	0.6	9.0	234.7	0.59

* Units=Grams

Well Name: **SV6**

Location: Savannas State Preserve

Sieve # (U.S. Standard)		#10	#20	#30	#40	#50	#60	#80	#100	#140	#170	#200	Pan	Weight Recovered	% diff.
Sample #	Sample Weight														
S-1	248.8	0.0	1.6	10.2	38.1	77.4	40.1	42.3	10.2	16.8	2.9	1.7	7.3	248.6	0.08
S-2	236.5	0.0	2.3	12.0	37.5	71.2	40.3	42.8	9.1	13.9	2.3	1.1	3.7	236.2	0.13
S-3	215.5	0.0	2.2	6.1	18.1	37.6	26.6	45.8	29.4	44.6	2.2	0.5	2.1	215.2	0.14
S-4	226.8	0.0	2.5	10.5	35.2	60.0	24.5	28.3	19.5	41.2	2.3	0.4	1.6	226.0	0.35
S-5	197.0	0.0	0.0	0.8	5.2	24.3	27.2	36.9	16.8	73.2	7.9	1.4	3.3	197.0	0.00
S-6	236.7	0.0	0.4	2.5	19.6	68.3	46.2	58.6	18.7	16.3	1.2	0.6	3.4	235.8	0.38
S-7	206.7	0.0	0.8	5.8	18.0	50.9	37.3	50.9	18.4	16.3	1.5	0.9	5.0	205.8	0.44
S-8	213.3	0.0	10.6	14.6	28.8	55.1	34.2	40.5	12.7	12.6	0.9	0.4	2.4	212.8	0.23
S-9	233.3	0.0	0.6	4.3	28.0	92.0	50.8	47.1	5.9	3.2	0.3	0.1	0.6	232.9	0.17
S-10	229.6	0.0	1.2	3.8	23.3	78.7	54.4	54.5	6.7	3.1	0.3	0.2	0.8	227.0	1.13

* Units=Grams

DISNEY WILDNESS
PRESERVE

TYPED FIELD NOTES

Isolated Wetlands Drilling Program
Nature Conservancy, Disney Preserve, Kissimmee, Florida
Osceola County, Florida

Location: Marsh Site 1 on Map
Township: 27 S, Range: 29 E, Section: 28
Drill Dates: 01/27/97
South Florida Water Management District
District Personnel: Steve Krupa
Precision Drilling Staff: Robert Miller
Joe Crisalli, Willie Thomas

01/27/97 Well # WR8

Time

0600 Met drillers at Precision shop to pickup pipe for the Data Management field group.

0615 Data Management shop--drop off keys for Jonathan Dickinson State Park and five foot risers. Loaded up equipment from Hydro's warehouse: calibration fluids, generator, hoses.

0645 Left for Kissimmee.

0945 Arrived at Kissimmee; drillers fueled up.

1030 Arrived at Walker Ranch. Met with Bob to talk about the field conditions and roads.

1115 On site at WR8 steam cleaning, used water from on-site lake for steam cleaning. City water over one-half hour away. The roads are very bumpy.

1230 Started setting up at site.

1305 Started drilling. Willie hurt his hand. Started to perform SPT's, washing and driving casings.

Depth (B.L.S.)	SPT Count	Sample Recovery	Sample Number
0-2 feet	No recovery - No Sample		
2-4 feet	3/4/4/4	88% recovery	S-2
4-6 feet	2/1/5/5	95% recovery	S-3
6-8 feet	5/7/4/6	84% recovery	S-4
8-10 feet	10/4/4/4	95% recovery	S-5
10-12 feet	14/9/4/4	95% recovery	S-6
12-14 feet	15/12/6/6	88% recovery	S-7
14-16 feet	21/10/10/15	95% recovery	S-8
16-18 feet	18/14/14/13	84% recovery	S-9
18-20 feet	14/10/12/18	66% recovery	S-10

1430 Willie's hand in severe pain. Willie asked to be taken to the hospital.

1645 Returned from hospital without Willie. Robert will pick him up later. Well completed upon return.

Continued Next Page

Isolated Wetlands Drilling Program
Nature Conservancy, Disney Preserve, Kissimmee, Florida
Osceola County, Florida

01/27/97 Well # WR8

Time

1725 Broke down equipment and carried out supplies.
Well Specifications: Sand - 2 bags
Grout - 8 bags
Bentonite - 5 lbs.
Risers: 10', 10', 2', 2' screen
Installed 7' of 8" surface casing

End of Entry 01/27/97

Isolated Wetlands Drilling Program
Nature Conservancy, Disney Preserve, Kissimmee, Florida
Osceola County, Florida

Location: Marsh Site 3 on Map
Township: 27 S, Range: 29 E, Section: 28
Drill Dates: 01/28/97
South Florida Water Management District
District Personnel: Steve Krupa
Precision Drilling Staff: Robert Miller
Joe Crisalli, Willie Thomas

01/28/97 Well # WR6

Time

0725 On site, drillers steam cleaning. Went to next site to check on location.
0815 Loaded up truck for WR6. Went to T.N.C. office to fax time sheets and called Doug Shaw at the District.
0845 Arrive at WR6 location.
0915 Started carrying equipment out to the site.
0938 Second load out.
1000 Rigging up site. Met with Bob Nelson spoke about access to the other locations.
1030 Started drilling.

Depth (B.L.S.)	SPT Count	Sample Recovery	Sample Number
0-2 feet	1/1/1/1	50% recovery	S-1
2-4 feet	4/4/3/4	95% recovery	S-2
4-6 feet	2/2/2/2	90% recovery	S-3
6-8 feet	4/4/4/4	95% recovery	S-4
8-10 feet	4/4/4/3	83% recovery	S-5
10-12 feet	6/6/4/4	91% recovery	S-6
12-14 feet	5/5/4/3	95% recovery	S-7
14-16 feet	2/2/2/3	95% recovery	S-8
16-18 feet	12/9/5/6	75% recovery	S-9
18-20 feet	12/12/18/18	95% recovery	S-10

1210 Finished SPT's, finished driving casings, washing out. Started to prepare for the well.
1250 Well in, packed screen and put bentonite in. Pumped well and poured grout.
1320 Pulling casing and grouting.
1350 Finished pouring cement. Started carrying out equipment.
1415 Jetted in casing and grouted 12 inch.

Continued Next Page

Isolated Wetlands Drilling Program
Nature Conservancy, Disney Preserve, Kissimmee, Florida
Osceola County, Florida

01/28/97 Well # WR6

Time

1520 Well Specifications: Grout - 8 bags
Sand - 2 bags, of
Bentonite - 4 lbs.
Risers: 10', 10', 2' screen
Installed 7' of 8" surface casing

End of Entry 1/28/97

Isolated Wetlands Drilling Program
Nature Conservancy, Disney Preserve, Kissimmee, Florida
Osceola County, Florida

Location: Marsh Site 2 on Map
Township: 27 S, Range: 29 E, Section: 28
Drill Dates: 01/29/97
South Florida Water Management District
District Personnel: Steve Krupa
Precision Drilling Staff: Robert Miller
Joe Crisalli, Willie Thomas

01/29/97 Well # WR9

6 inches of standing water --note 2 inch cap grouted in annular space--

Time

0715 On-site, steam cleaning equipment. Willie is back today. Feeling better. Met with Bob about access to site last night.

0800 Loaded up truck and drove to the site.

0845 Set up drill rig, carried equipment, table, and casing to the drill site.

0915 Started SPT's, driving casing and washing out casing.

Depth (B.L.S.)	SPT Count	Sample Recovery	Sample Number
0-2 feet	1/1/1/2	70% recovery	S-1
2-4 feet	3/3/3/4	100% recovery	S-2
4-6 feet	3/4/3/4	68% recovery	S-3
6-8 feet	3/3/3/3	100% recovery	S-4
8-10 feet	5/5/4/6	100% recovery	S-5
10-12 feet	12/10/7/6	100% recovery	S-6
12-14 feet	10/8/10/11	100% recovery	S-7
14-16 feet	13/13/23/24	0% no sample	S-8
16-18 feet	16/30/17/20	88% recovery	S-9
18-20 feet	20/20/28/29	73% recovery	S-10

1215 Finished SPT's, washing out casing. Started carrying out grout, sand, pipe and screen.

1305 Started setting well.

Well specifications: Grout- 7 bags
Sand - 2 bags
Bentonite - 5 lbs.
Risers - 10',5',2' screen
Installed 7' of 8" surface casing

Continued Next Page

Isolated Wetlands Drilling Program
Nature Conservancy, Disney Preserve, Kissimmee, Florida
Osceola County, Florida

01/29/97 Well # WR9

Time	
1408	Finished well. Started pulling casing. Driving 8" casing.
1458	Completed well and casing. Removing equipment for de-con. Take break.
1538	Set up for de-con on 01/30/97; prepared for the next day.
1610	Left site for the Nature Conservancy trailer. Completed paper work and logs.

End of Entry 1/29/97

Isolated Wetlands Drilling Program
Nature Conservancy, Disney Preserve, Kissimmee, Florida
Osceola County, Florida

Location: Cypress Head Site 5 on Map
Township: 28 S, Range: 29 E, Section: 2
Drill Dates: 01/30/97
South Florida Water Management District
District Personnel: Steve Krupa
Precision Drilling Staff: Robert Miller
Joe Crisalli, Willie Thomas

01/30/97 Well # WR11

Time

0730 ESDA site visit today.
On site drillers already de-conning equipment.

0830 Set up on WR11 Cypress head. Started drilling.

0930 Washing casing in. Blow counts summarized below. ESDA passed us. Phoned them to direct them to the WR11 location.

1000 ESDA (Danny and Rick) arrive. We discuss how wells were drilled and about this site. I left this location to show them the other locations.

Depth (B.L.S.)	SPT Count	Sample Recovery	Sample Number
0-2 feet	1/1/1/1 shelby tube	54% recovery	S-1
2-4 feet	3/2/2/2	95% recovery	S-2
4-6 feet	2/2/2/2	74% recovery	S-3
6-8 feet	2/2/2/2	63% recovery	S-4
8-10 feet	5/4/4/4	95% recovery	S-5
10-12 feet	13/9/13/15	60% recovery	S-6
12-14 feet	12/19/13/17	83% recovery	S-7
14-16 feet	11/10/18/18	63% recovery	S-8
16-18 feet	11/15/19/19	68% recovery	S-9
18-20 feet	8/13/21/21	88% recovery	S-10

1030 Traveled to WR16, then to WR15, then WR8,WR9,WR6.

1315 Valorie spoke with me about the drillers removing the T.V. from the cabin. I will return the T.V. and clean the cabin.

1330 Finished up with Data Management. We went to the trailer and I introduced them to Bob Nelson. I left to pick up lunch for the drillers.
Well specifications: Grout- 8 bags
Sand - 2 bags
Bentonite - 5 lbs.
Risers - 10',10',2', 2' screen
Installed 7' of 8" surface casing

Continued Next Page

Isolated Wetlands Drilling Program
Nature Conservancy, Disney Preserve, Kissimmee, Florida
Osceola County, Florida

01/30/97 Well # WR11

Time	
1415	Returned to the site; the drillers were just finishing carrying out the equipment. They had one more load.
1435	Started decontaminating the equipment for the next hole.
1530	Finished cleaning equipment.
1545	Drove back to the cabin to clean up and return the T.V.
1650	Return to the trailer to pick up keys for 1/31/97.
1710	Left Disney for Kissimmee.

End of Entry 1/30/97

Isolated Wetlands Drilling Program
Nature Conservancy, Disney Preserve, Kissimmee, Florida
Osceola County, Florida

Location: Cypress Head Site 6 on Map
Township: 28 S, Range: 29 E, Section: 3
Drill Dates: 01/31/97
South Florida Water Management District
District Personnel: Steve Krupa
Precision Drilling Staff: Robert Miller
Joe Crisalli, Willie Thomas

01/31/97 Well # WR16

Time

0700 On site at gate, pick up mule and proceeded to de-con area #2. Loaded up mule and trucks for well WR16. Drove mule to the edge of the wetlands. Very little water.

0745 Started unloading equipment. Moved in the table, sand, cement and pipe.

0805 Setup tripod, started driving casing. Set up pumps.

0830 Start SPT's.

Depth (B.L.S.)	SPT Count	Sample Recovery	Sample Number
0-2 feet	1/1/1/1	58% recovery	S-1
2-4 feet	1/2/3/4	100% recovery	S-2
4-6 feet	2/3/3/2	83% recovery	S-3
6-8 feet	6/3/2/3	100% recovery	S-4
8-10 feet	4/4/7/14	100% recovery	S-5
10-12 feet	8/11/8/10	87% recovery	S-6
12-14 feet	12/13/11/10	95% recovery	S-7
14-16 feet	6/7/7/8	95% recovery	S-8
16-18 feet	7/9/7/11	95% recovery	S-9
18-20 feet	22/19/16/13	87% recovery	S-10

1200 Break for lunch

1230 Prepare to set well

1320 Start setting well; pump all sediment out of casing.

1405 Set well screen, packed with sand, tagged, poured bentonite seal, and started to grout the well.

Well specifications: Grout- 8 bags
Sand - 2 bags
Bentonite - 5 lbs.
Risers - 10',10',2', 2' screen
Installed 7' of 8" surface casing

Continued Next Page

Isolated Wetlands Drilling Program
Nature Conservancy, Disney Preserve, Kissimmee, Florida
Osceola County, Florida

01/31/97 Well # WR16

Time	
1510	Finished the well; started to carry out the equipment to the mule. Took a break.
1615	Finished carrying out equipment; loaded mule returned to de-con area.
1645	Started de-conning equipment for the next hole.
1700	Finished up and left for lodging.

End of Entry 1/31/97

Isolated Wetlands Drilling Program
Nature Conservancy, Disney Preserve, Kissimmee, Florida
Osceola County, Florida

Location: Cypress Head Site 7 on Map
Township: 28 S, Range: 29 E, Section: 3
Drill Dates: 02/1/97
South Florida Water Management District
District Personnel: Steve Krupa
Precision Drilling Staff: Robert Miller
Joe Crisalli, Willie Thomas

02/1/97 Well # WR15

Time	
	Last hole at Disney
0700	On site pick up mule and go to de-con area.
0730	Arrive at drill location; finish carrying out supplies to the well.
0800	Warming up pumps and engines.
0810	Started drilling.

Depth (B.L.S.)	SPT Count		Sample Recovery	Sample Number
0-2 feet	4/2/2/1	shelby tube	45% recovery	S-1
2-4 feet	4/3/3/2		70% recovery	S-2
4-6 feet	3/4/4/4		45% recovery	S-3
6-8 feet	9/7/6/6		62% recovery	S-4
8-10 feet	6/4/3/4		66% recovery	S-5
10-12 feet	3/3/4/3		55% recovery	S-6
12-14 feet	9/11/8/6		66% recovery	S-7
14-16 feet	7/2/2/5		88% recovery	S-8
16-18 feet	4/4/5/10		95% recovery	S-9
18-20 feet	24/24/21/18		87% recovery	S-10

Samples S-7 through S-10 had problem with casing threads. Pulled casing.

1015	Finished SPT's, started pumping out sand to set well screen.
1030	Started setting well screen.
1150	Well in place. Pour sand pack and bentonite seal.

Well specifications: Grout- 7 bags
Sand - 1 bags
Bentonite - 5 lbs.
Risers - 10',10',2', 2' screen
Installed 7' of 8" surface casing

Continued Next Page

Isolated Wetlands Drilling Program
Nature Conservancy, Disney Preserve, Kissimmee, Florida
Osceola County, Florida

02/1/97 Well # WR15

Time

1215 Pump well annular space, poured in concrete, started banging back out surface casing.

1320 Finished well. Started carrying out equipment to the trucks. Moved equipment back to staging area. Picked up support truck. I went for lunch and returned by 1400. Stacy Hill arrived around 1420.

1445 Packed up mule with the pump, hoses and tremie pipe. Developed the last three wells.

Duration	Well	Rate	Comments
15 min.	WR11	5 GPM	Clear
15 min.	WR16	5 GPM	Clear/Milky
15 min.	WR15	3-4 GPM	Clear

1550 Drillers departed site for West Palm Beach. Stacy Hill and I also left. I logged all samples back at the lodge. Made boxes and cleaned up the field notes.

1650 Finished.

End of Entry 02/01/97

Isolated Wetlands Drilling Program
Nature Conservancy, Disney Preserve, Kissimmee, Florida
Osceola County, Florida

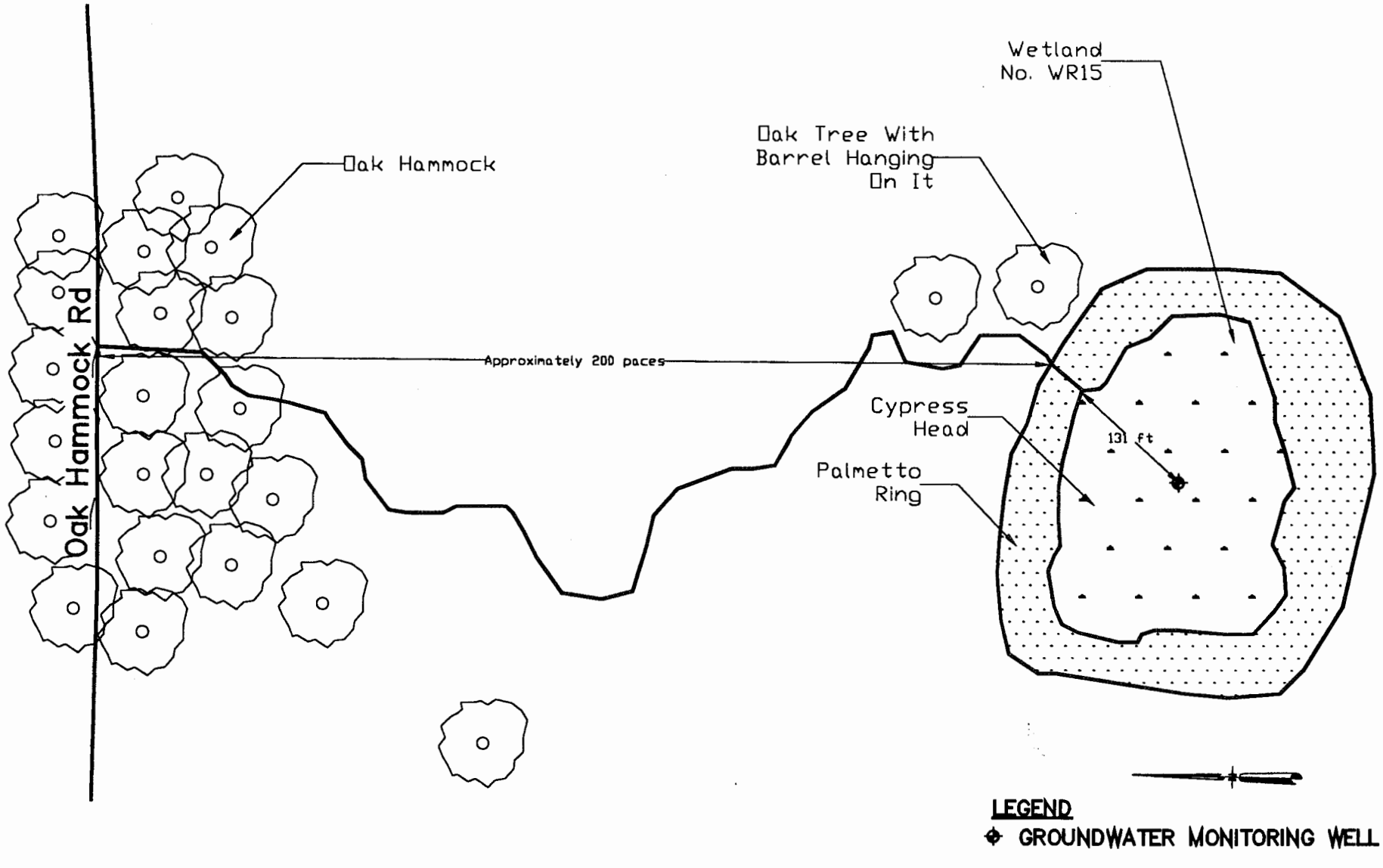
Slug Tests and Photo Monitoring
with Stacy Hill

02/02/97 **Slug Test Information**

Time		
0815	WR15	
	Water level = - 2.3 feet from top of casing	
	Riser is 1.6 feet above grade	Transducer Depth 22.77 feet
	S.W.L. up to T.O.C. +2.3 feet	
	File: Test 0	
1000	Site monitoring for Stacy.	
1015	WR16	
	Water level = -2.1 feet	
	casing 1.63 feet above grade	Transducer Depth 22.61 feet
	S.W.L. - minor amounts - saturated	Total Depth 24.8 feet
	2" pipe 1.9 feet above grade	
	File: Test 1	
1120	WR11	
	Water level = -.75	
	casing 10 inches above grade	Transducer Depth 21.93 feet
	S.W.L. - 5.5 inches	Total Depth 22.55 feet
	2" pipe 1'2" above grade	
	File: Test 2	
1320	WR6	
	Water level = -3.14	
	casing 15 inches above grade	Transducer Depth 19.26 feet
	S.W.L. - 8.5 inches	Total Depth 22.35 feet
	2" pipe 33 inches above grade	
	File: Test 3	

End of entry 2/2/97

SITE MAPS



ENGINEERED
ENVIRONMENTAL
SOLUTIONS, INC.
1301 NW 4th Street, Boca Raton, FL 33486 Tel/Fax 561-394-3969, Beeper 708-0165

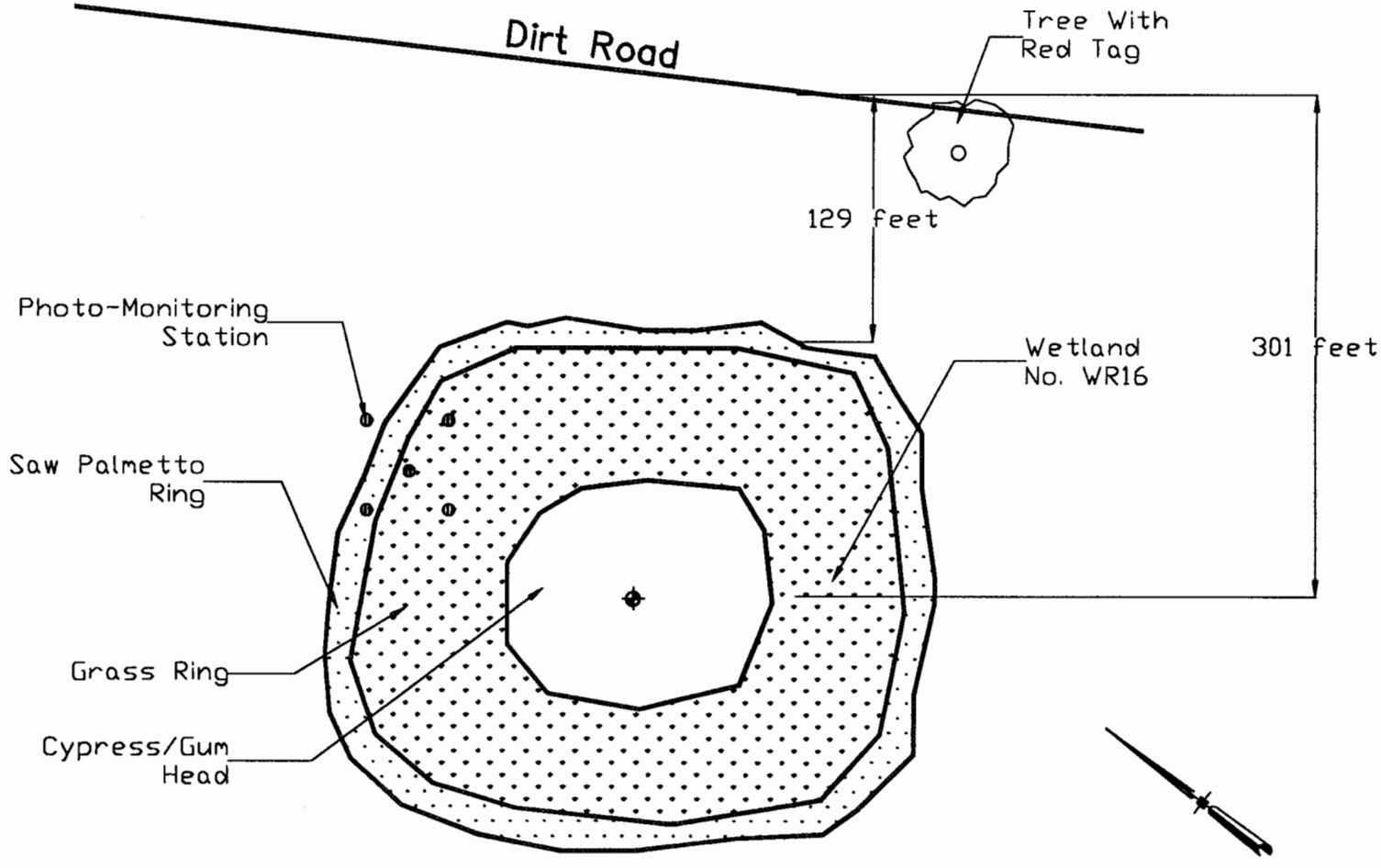
SITE LOCATION MAP – WR15

ISOLATED WETLANDS DRILLING PHASE 1
SOUTH FLORIDA WATER MANAGEMENT DISTRICT

CONTRACT NO.:C-7665	FILENAME: WR15.dwg	DATE: 3/28/97	SCALE: NTS

6

c:\projects\wetlands1\WR15.DWG



LEGEND

⌖ GROUNDWATER MONITORING WELL

ENGINEERED
ENVIRONMENTAL
SOLUTIONS, INC.

1301 NW 4th Street, Boca Raton, FL 33486 Tel/Fax 561-394-3969, Beeper 708-0165

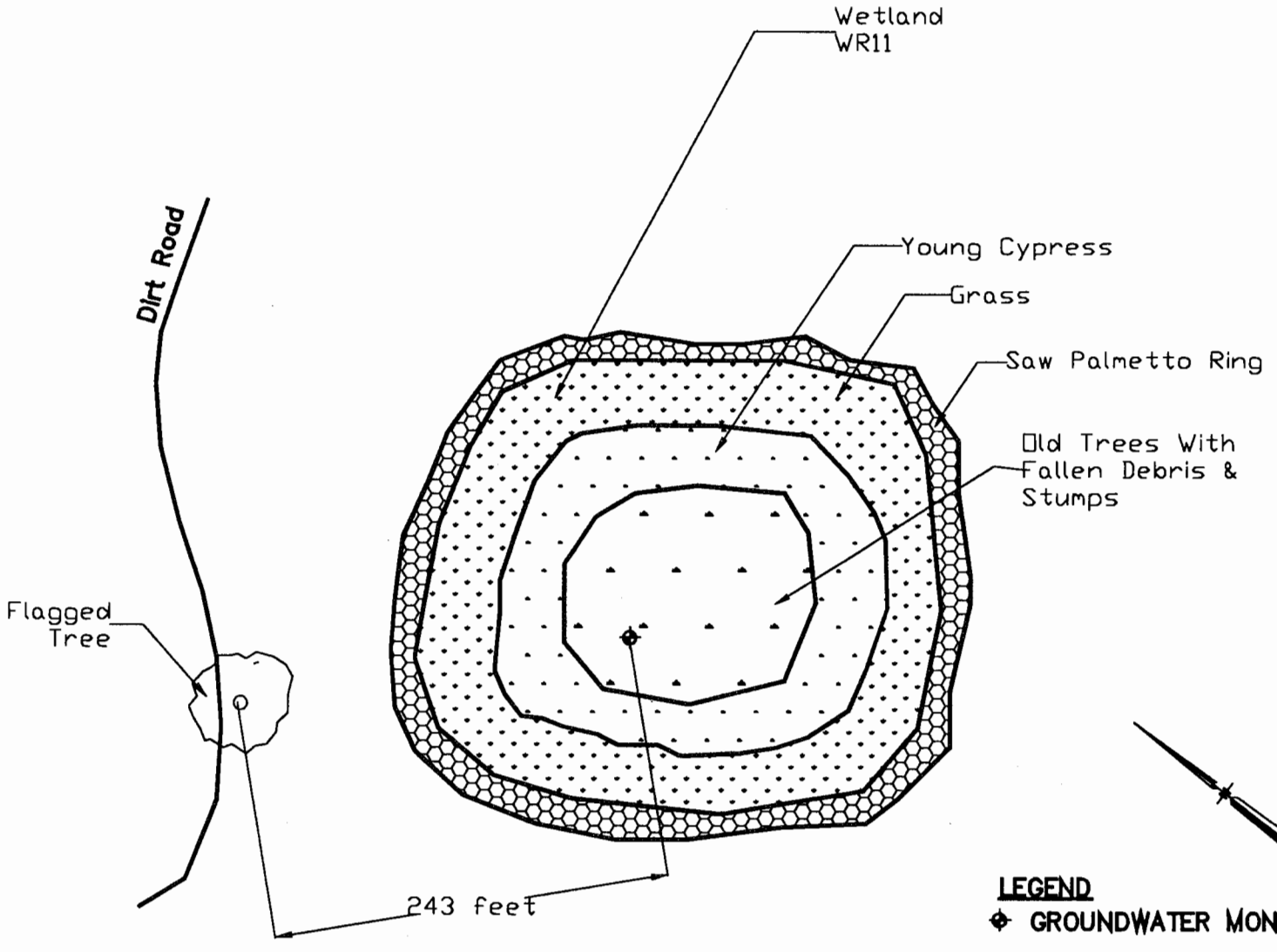
SITE LOCATION MAP – WR16

ISOLATED WETLANDS DRILLING PHASE 1
SOUTH FLORIDA WATER MANAGEMENT DISTRICT

CONTRACT NO.:C-7665	FILENAME: WR16.dwg	DATE: 3/28/97	SCALE: NTS

7

c:\projects\wetlands1\WR16.DWG



ENGINEERED
ENVIRONMENTAL
SOLUTIONS, INC.
1301 NW 4th Street, Boca Raton, FL 33486 Tel/Fax 561-394-3969, Beeper 708-0165

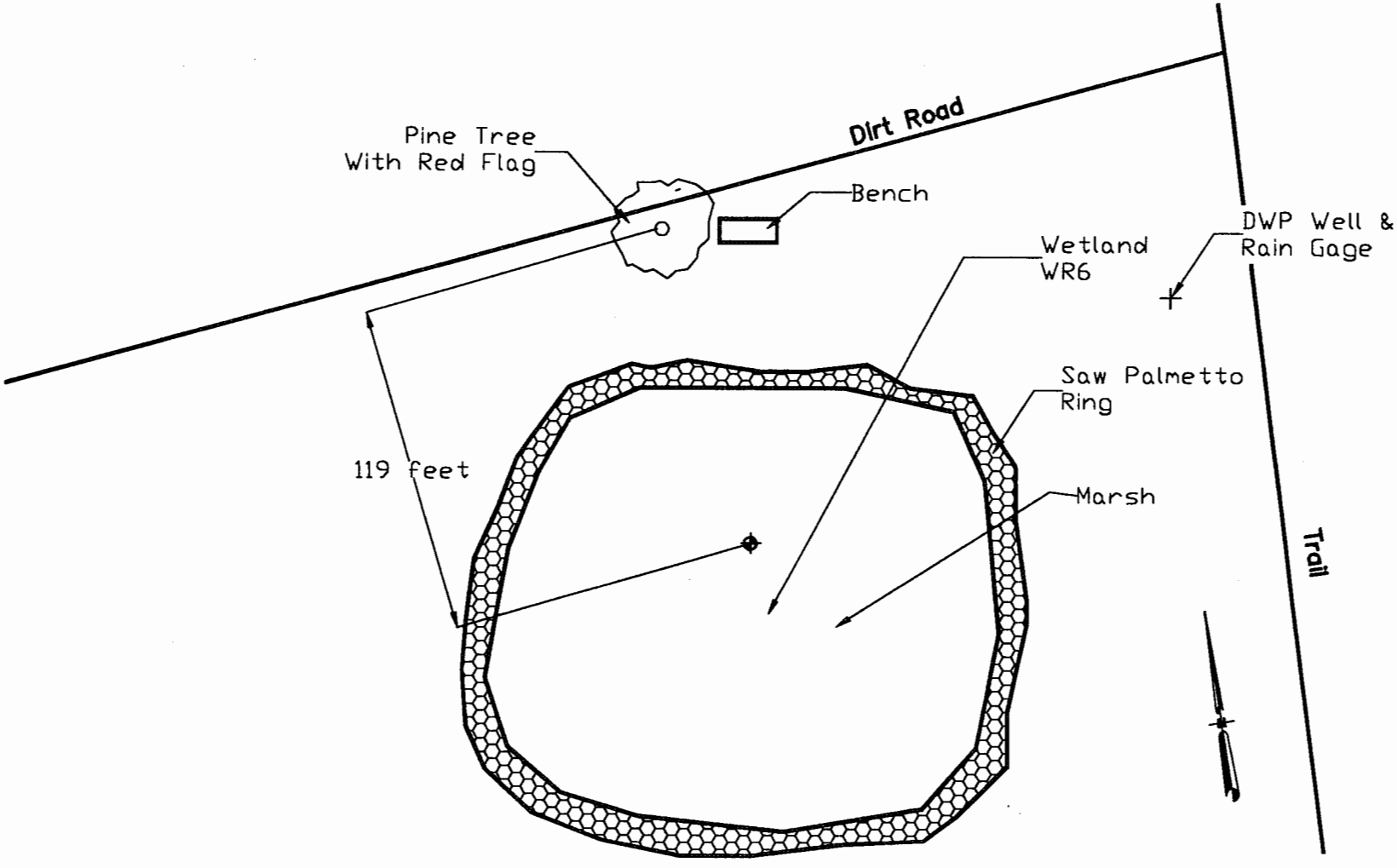
SITE LOCATION MAP – WR11

ISOLATED WETLANDS DRILLING PHASE 1
SOUTH FLORIDA WATER MANAGEMENT DISTRICT

CONTRACT NO.:C-7665	FILENAME: WR11.dwg	DATE: 3/28/97	SCALE: NTS

8

c:\projects\wetlands1\WR11.DWG



LEGEND

◆ GROUNDWATER MONITORING WELL

ENGINEERED
ENVIRONMENTAL
SOLUTIONS, INC.

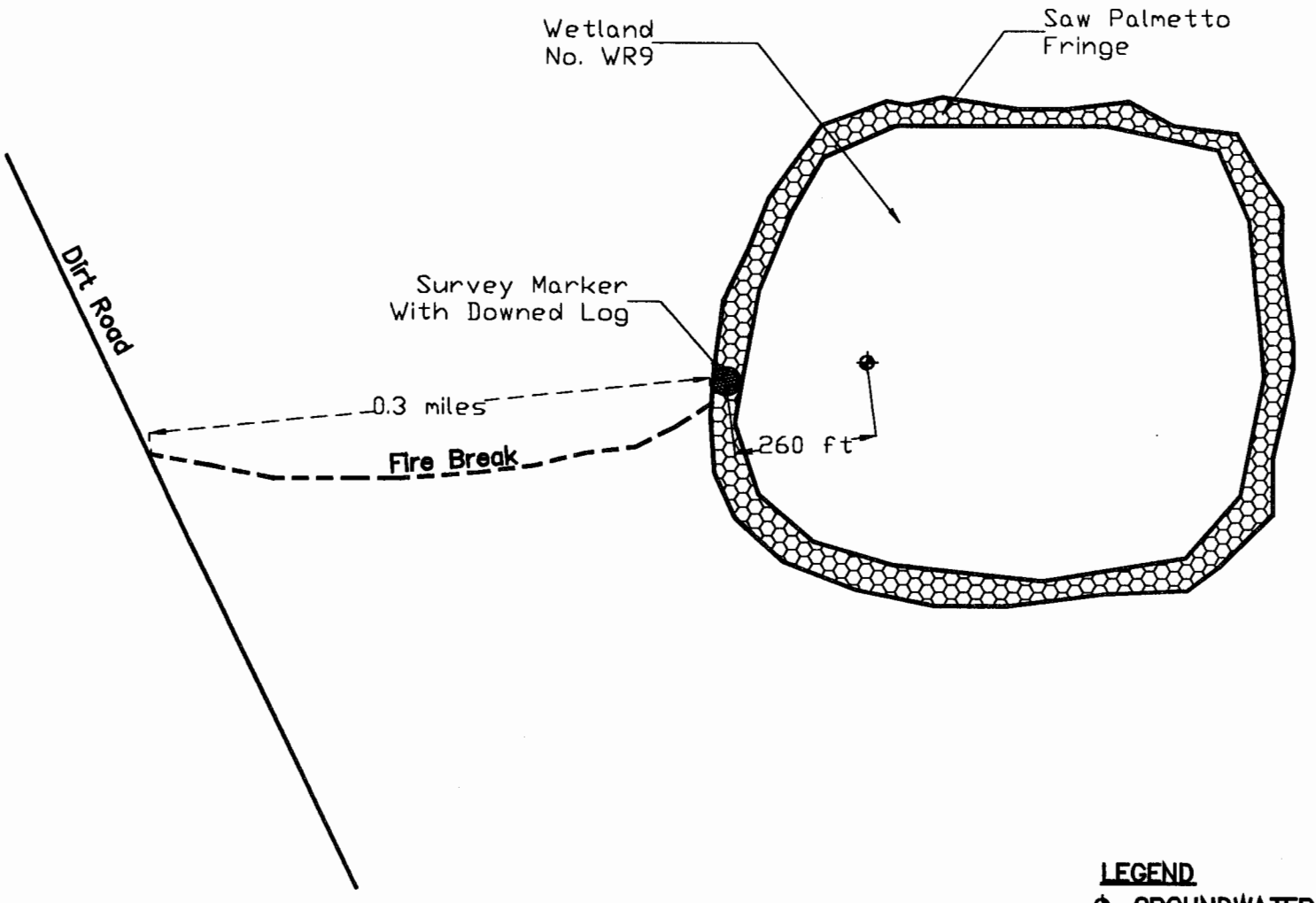
1301 NW 4th Street, Boca Raton, FL 33486 Tel/Fax 561-394-3969, Beeper 708-0165

SITE LOCATION MAP – WR6

ISOLATED WETLANDS DRILLING PHASE 1
SOUTH FLORIDA WATER MANAGEMENT DISTRICT

CONTRACT NO.:C-7665	FILENAME: WR6.dwg	DATE: 3/28/97	SCALE: NTS

c:\projects\wetlands1\WR6.DWG



LEGEND

⌖ GROUNDWATER MONITORING WELL

ENGINEERED
ENVIRONMENTAL
SOLUTIONS, INC.

1301 NW 4th Street, Boca Raton, FL 33486 Tel/Fax 561-394-3969, Beeper 708-0165

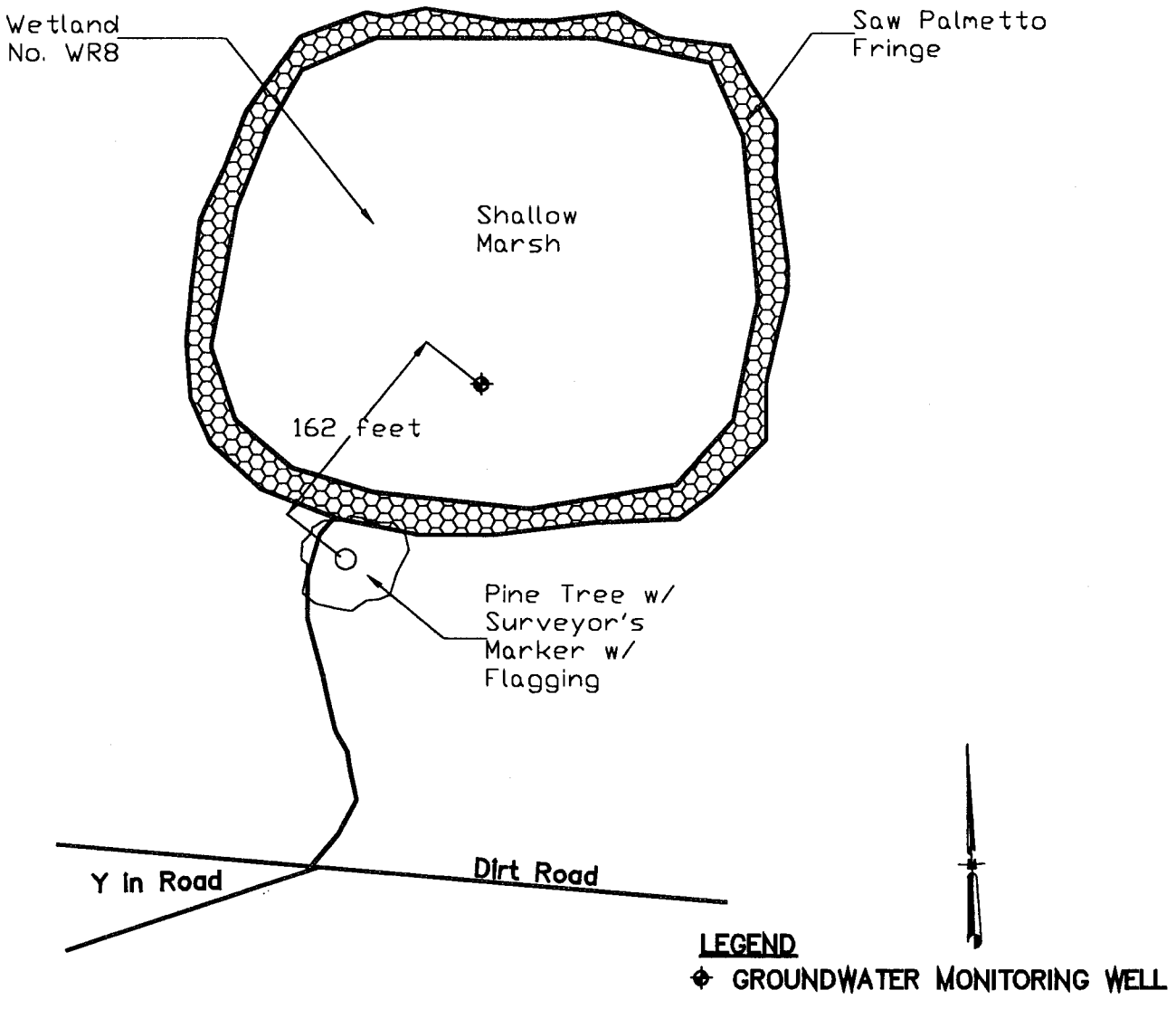
SITE LOCATION MAP – WR9

ISOLATED WETLANDS DRILLING PHASE 1
SOUTH FLORIDA WATER MANAGEMENT DISTRICT

CONTRACT NO.:C-7665	FILENAME: WR9.dwg	DATE: 3/28/97	SCALE: NTS

10

c:\projects\wetlands1\WR9.DWG



ENGINEERED
ENVIRONMENTAL
SOLUTIONS, INC.
1301 NW 4th Street, Boca Raton, FL 33486 Tel/Fax 561-394-3969, Beeper 708-0165

SITE LOCATION MAP – WR8

ISOLATED WETLANDS DRILLING PHASE 1
SOUTH FLORIDA WATER MANAGEMENT DISTRICT

CONTRACT NO.:C-7665	FILENAME: WR8.dwg	DATE: 3/28/97	SCALE: NTS

11

c:\projects\wetlands1\WR8.DWG

BORING LOGS AND WELL CONSTRUCTION DRAWINGS

South Florida Water Management District
3301 Gun Club Road
West Palm Beach, Florida 33406
(561) 686-8800 / Fax 687-6442

Engineered Environmental Solutions, Inc.
1301 NW 4th Street
Boca Raton, Florida 33486
Ph/Fax: (561) 394-3969

BORING LOG

BORING/WELL NO.	
WR6	

PROJECT NO./NAME	LOCATION
1033/Isolated Wetlands Shallow Drilling Program	Nature Conservancy, Disney Preserve, Kissimmee, Florida

DRILLING CONTRACTOR/DRILLER: **Precision Drilling/Robert Miller**

GEOLOGIST/OFFICE: **Steve Krupa/South Florida Water Management District**

DRILLING EQUIPMENT/METHOD	SIZE/TYPE OF BIT	SAMPLING METHOD	START/FINISH DATE
Tripod/SPT	3'- 5"dia. casing, driven and washed	Split Spoon	1/28/97-1/28/97

WELL INSTALLED?	CASING MAT./DIA.	SCREEN:				
YES ☒ NO ☐	Sch.40 monoflex PVC/2"	TYPE Slotted	MAT. PVC	LENGTH 2'	DIA. 2"	SLOT SIZE .010

ELEVATION OF:	GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN	DATE
(FT. ABOVE M.S.L.)	62.6	2.75 ft	17.60 ft/19.60 ft	2/2/97

REMARKS:

Depth (ft)	Sample Type & Recovery	Sample Number	Penetration Resistance Blows/6" N-Value	Unified Classification	LOG OF TEST BORING: FIELD DESCRIPTION	Munsell Field Color
		S1	1 1 1 1 2	PT	Fibrous organic material	1 2.5/N
					2.0	
		S2	4 4 3 4 7	SP	Marbled 10 YR 8/1 (4 in) grading to fine sand 10 YR 3/1	10 YR 4/1
					4.0	
5		S3	2 2 2 2 4	SP-SM	4 in. fine sand grading to fine sand w/ clay size particles	10 YR 4/1 = 10 YR 6/1
					6.0	
		S4	4 4 4 4 8	SP	Fine sand	10 YR 5/2
					8.0	
		S5	4 4 4 3 8	SP-SW	Medium to fine sand	10 YR 7/2
					10.0	
10		S6	6 6 4 4 10		Fine sand grading to clay size sand	10 YR 8/1
		S7	5 5 4 3 9	SP	Fine sand	10 YR 8/1 = 10 YR 5/2
		S8	2 2 2 3 4			10 YR 8/1
15		S9	12 9 5 6 14		Fine Sand	
		S10	12 12 18 18 30			10 YR 8/1 = 10 YR 5/2
					20.0	
20						

Penetration Resistance (Blows/Foot): 0 15 35 55 75 100

Graphic Litho Log

Well Construction

EMP A 9/9/97

Fine Sand | Medium Sand | Bentonite Pellets | Cement Grout | Silt/Clay w/ shell

Organic Material | Clay | Split Spoon | Percent Recovery | No Recovery

South Florida Water Management District
3301 Gun Club Road
West Palm Beach, Florida 33406
(561) 686-8800 / Fax 687-6442

Engineered Environmental Solutions, Inc.
1301 NW 4th Street
Boca Raton, Florida 33486
Ph/Fax: (561) 394-3969

BORING LOG

BORING/WELL NO.	
WR8	

PROJECT NO./NAME	LOCATION
1033/Isolated Wetlands Shallow Drilling Program	Nature Conservancy, Disney Preserve, Kissimmee, Florida

DRILLING CONTRACTOR/DRILLER: Precision Drilling/Robert Miller

GEOLOGIST/OFFICE: Steve Krupa/South Florida Water Management District

DRILLING EQUIPMENT/METHOD	SIZE/TYPE OF BIT	SAMPLING METHOD	START/FINISH DATE
Tripod/SPT	3'- 5"dia. casing, driven and washed	Split Spoon	1/27/97-1/27/97

WELL INSTALLED?	CASING MAT./DIA.	SCREEN:				
YES ☒ NO ☐	Sch.40 monoflex PVC/2"	TYPE Slotted	MAT. PVC	LENGTH 2'	DIA. 2"	SLOT SIZE .010

ELEVATION OF:	GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN	DATE
(FT. ABOVE M.S.L.)	66.24 ft	2.08 ft	21.04 ft/23.04 ft	2/2/97

REMARKS:

Depth (ft)	Sample Type & Recovery	Sample Number	Penetration Resistance Blows/6" N-Value	Unified Classification	LOG OF TEST BORING: FIELD DESCRIPTION	Munsell Field Color
0		S1	1 1 1 1 2	PT	Organic material	1 2.5/N
2.0						
		S2	3 4 4 4 8	SP	Fine sand w/ heavy organic staining	7.5 YR 3/1
5		S3	2 1 5 5 6		12 in. fine organic sand grading to 8 in. fine sand w/ marbled clean white sand	7.5 YR 3/1 = 10 YR 5/2
		S4	5 7 4 6 11		Fine Sand	10 YR 4/2
		S5	10 4 4 4 8	SP	Fine Sand	10 YR 7/2
10		S6	14 9 4 4 13			
12.0						
		S7	15 12 6 6 18	SP-SW	6 in. medium to fine sand grading to fine sand	10 YR 8/1 = 10 YR 6/1
14.0						
		S8	21 10 10 15 20	SP	marbled fine sand	
15		S9	18 14 14 13 28		Fine sand	10 YR 7/2
		S10	14 10 12 18 22			
20						
23.4						

Penetration Resistance (Blows/Foot): 0, 15, 35, 55, 75, 100

Graphic Litho Log

Well Construction

EM LA 9/9/97

Fine Sand; Medium Sand; Bentonite Pellets; Cement Grout; Silt/Clay w/ shell; Organic Material; Clay; Split Spoon; Percent Recovery; No Recovery

South Florida Water Management District
3301 Gun Club Road
West Palm Beach, Florida 33406
(561) 686-8800 / Fax 687-6442

Engineered Environmental Solutions, Inc.
1301 NW 4th Street
Boca Raton, Florida 33486
Ph/Fax: (561) 394-3969

BORING LOG

BORING/WELL NO.: **WR9**

PROJECT NO./NAME: **1033/Isolated Wetlands Shallow Drilling Program**	LOCATION: **Nature Conservancy, Disney Preserve, Kissimmee, Florida**
DRILLING CONTRACTOR/DRILLER: **Precision Drilling/Robert Miller**	
GEOLOGIST/OFFICE: **Steve Krupa/South Florida Water Management District**	

DRILLING EQUIPMENT/METHOD	SIZE/TYPE OF BIT	SAMPLING METHOD	START/FINISH DATE
Tripod/SPT	**3'- 5"dia. casing, driven and washed**	**Split Spoon**	**1/29/97-1/29/97**

WELL INSTALLED?	CASING MAT./DIA.	SCREEN:				
YES ☒ NO ☐	**Sch.40 monoflex PVC/2"**	TYPE Slotted	MAT. PVC	LENGTH 2'	DIA. 2"	SLOT SIZE .010

ELEVATION OF:	GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN	DATE
(FT. ABOVE M.S.L.)	**65.71 ft**	**2.91 ft**	**19.90 ft/21.90 ft**	**2/2/97**

REMARKS:

Depth (ft)	Sample Type & Recovery	Sample Number	Penetration Resistance Blows/6" N-Value	Unified Classification	LOG OF TEST BORING: FIELD DESCRIPTION	Munsell Field Color
		S1	1 1 1 2 2	PT	Fibrous organic material	1 2.5/N
					2.0	
		S2	3 3 3 4 6	SP		10 YR 7/2
		S3	3 4 3 4 7		Fine sand	10 YR 5/2
5					6.0	
		S4	3 3 3 3 6	SW	5 in. medium sand grading to fine sand	10 YR 8/1 = 10 YR 7/2
					8.0	
		S5	5 5 4 6 9	SP	Fine sand	10 YR 7/2
10					10.0	
		S6	12 10 7 6 17	SW	5 in. medium sand grading to fine sand with iron staining	10 YR 8/1 = 10 YR 6/4
					12.0	
		S7	10 8 10 1 18		7 in. fine sand grading to 14 in. 10 YR 5/2	10 YR 8/1 = 10 YR 5/2
		S8	13 13 23 24 36	SP	No sample	10 YR 5/2
15						
		S9	16 30 17 20 47		Fine sand grading toward 10 YR 4/1	10 YR 8/2
		S10	20 20 28 29 48		Fine sand	10 YR 8/1
20					22.0	

Penetration Resistance (Blows/Foot): 0, 15, 35, 55, 75, 100

Graphic Litho Log

Well Construction

EM LA 9/10/97

Fine Sand | Medium Sand | Bentonite Pellets | Cement Grout | Silt/Clay w/ shell

Organic Material | Clay | Split Spoon | Percent Recovery | No Recovery

South Florida Water Management District
3301 Gun Club Road
West Palm Beach, Florida 33406
(561) 686-8800 / Fax 687-6442

Engineered Environmental Solutions, Inc.
1301 NW 4th Street
Boca Raton, Florida 33486
Ph/Fax: (561) 394-3969

BORING LOG

BORING/WELL NO.	PROJECT NO./NAME	LOCATION
WR11	1033/Isolated Wetlands Shallow Drilling Program	Nature Conservancy, Disney Preserve, Kissimmee, Florida

DRILLING CONTRACTOR/DRILLER	GEOLOGIST/OFFICE
Precision Drilling/Robert Miller	Steve Krupa/South Florida Water Management District

DRILLING EQUIPMENT/METHOD	SIZE/TYPE OF BIT	SAMPLING METHOD	START/FINISH DATE
Tripod/SPT	3'- 5"dia. casing, driven and washed	Split Spoon	1/30/97-1/30/97

WELL INSTALLED?	CASING MAT./DIA.	SCREEN:
YES ☒ NO ☐	Sch.40 monoflex PVC/2"	TYPE Slotted MAT. PVC LENGTH 2' DIA. 2" SLOT SIZE .010

ELEVATION OF:	GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN	DATE
(FT. ABOVE M.S.L.)		1.16 ft	19.39 ft/21.39 ft	2/2/97

REMARKS:

Depth (ft)	Sample Type & Recovery	Sample Number	Penetration Resistance Blows/6" N-Value	Unified Classification	LOG OF TEST BORING — FIELD DESCRIPTION	Munsell Field Color
		S1	1 1 1 1 2	PT	Organic material	7.5 YR 2.5/1
		S2	3 2 2 2 4		2.0 5 in. organics grading to fine Sand	7.5 YR 2.5/1 = 7.5 YR 4/2
5		S3	2 2 2 2 4	SP	Fine sand w/ root bits	7.5 YR 6/2
		S4	2 2 2 2 4		Fine sand	10 YR 7/2
		S5	5 4 4 4 8	SP-SW	8.0	
10		S6	13 9 13 15 22		Medium to fine grained sand	
		S7	12 19 13 17 32	SW		10 YR 6/2
15		S8	11 10 18 18 28		16.0	
		S9	11 15 19 19 34	SP	Fine Sand	10 YR 6/3
		S10	8 13 21 21 34			10 YR 4/2
20					22.0	

Penetration Resistance (Blows/Foot): 0 15 35 55 75 100

Graphic Litho Log

Well Construction

EMP A 9/10/97

Fine Sand | Medium Sand | Bentonite Pellets | Cement Grout | Silt/Clay w/ shell

Organic Material | Clay | Split Spoon | Percent Recovery | No Recovery

South Florida Water Management District
3301 Gun Club Road
West Palm Beach, Florida 33406
(561) 686-8800 / Fax 687-6442

Engineered Environmental Solutions, Inc.
1301 NW 4th Street
Boca Raton, Florida 33486
Ph/Fax: (561) 394-3969

BORING LOG

BORING/WELL NO.	
WR15	

PROJECT NO./NAME	LOCATION
1033/Isolated Wetlands Shallow Drilling Program	Nature Conservancy, Disney Preserve, Kissimmee, Florida

DRILLING CONTRACTOR/DRILLER	
Precision Drilling/Robert Miller	

GEOLOGIST/OFFICE	
Steve Krupa/South Florida Water Management District	

DRILLING EQUIPMENT/METHOD	SIZE/TYPE OF BIT	SAMPLING METHOD	START/FINISH DATE
Tripod/SPT	3' - 5"dia. casing, driven and washed	Split Spoon	2/1/97-2/1/97

WELL INSTALLED?	CASING MAT./DIA.	SCREEN:				
YES ☒ NO ☐	Sch.40 monoflex PVC/2"	TYPE Slotted	MAT. PVC	LENGTH 2'	DIA. 2"	SLOT SIZE .010

ELEVATION OF: (FT. ABOVE M.S.L.)	GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN	DATE
		1.50 ft	19.27 ft/21.27 ft	2/2/97

REMARKS:

Depth (ft)	Sample Type & Recovery	Sample Number	Penetration Resistance Blows/6" N-Value	Unified Classification	LOG OF TEST BORING: FIELD DESCRIPTION	Munsell Field Color
0		S1	4 2 2 1 4	PT-SP	Organic material w/ fine sand	1 2.5/N
		S2	4 3 3 2 6		4 in. organic material grading to fine sand	1 2.5/N = 7.5 YR 3/2
4.0						
5		S3	3 4 4 4 8	SP	Fine sand	7.5 YR 3/2
		S4	9 7 6 6 13			10 YR 5/2
8.0						
		S5	6 4 3 4 7	SP-SW	Medium to fine grained sand	
10		S6	3 3 4 3 7			
12.0						
		S7	9 11 8 6 19	SP	Fine sand	10 YR 6/2
15		S8	7 2 2 5 4			10 YR 5/2
16.0						
		S9	4 4 5 10 9	SP-SW	Medium to fine grained sand	
18.0						
20		S10	24 24 21 18 45	SP	Fine Sand	10 YR 6/2
21.8						

Penetration Resistance (Blows/Foot): 0, 15, 35, 55, 75, 100

Graphic Litho Log

Well Construction

EMR LA 9/10/97

Fine Sand | Medium Sand | Bentonite Pellets | Cement Grout | Silt/Clay w/ shell

Organic Material | Clay | Split Spoon | Percent Recovery | No Recovery

South Florida Water Management District
3301 Gun Club Road
West Palm Beach, Florida 33406
(561) 686-8800 / Fax 687-6442

Engineered Environmental Solutions, Inc.
1301 NW 4th Street
Boca Raton, Florida 33486
Ph/Fax: (561) 394-3969

BORING LOG

BORING/WELL NO.	PROJECT NO./NAME	LOCATION
WR16	1033/Isolated Wetlands Shallow Drilling Program	Nature Conservancy, Disney Preserve, Kissimmee, Florida

DRILLING CONTRACTOR/DRILLER: Precision Drilling/Robert Miller

GEOLOGIST/OFFICE: Steve Krupa/South Florida Water Management District

DRILLING EQUIPMENT/METHOD	SIZE/TYPE OF BIT	SAMPLING METHOD	START/FINISH DATE
Tripod/SPT	3'-5" dia. casing, driven and washed	Split Spoon	1/31/97-1/31/97

WELL INSTALLED?	CASING MAT./DIA.	SCREEN:				
YES ☒ NO ☐	Sch.40 monoflex PVC/2"	TYPE Slotted	MAT. PVC	LENGTH 2'	DIA. 2"	SLOT SIZE .010

ELEVATION OF:	GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN	DATE
(FT. ABOVE M.S.L.)	0.0	1.75 ft	21.05 ft/23.05 ft	2/2/97

REMARKS:

Depth (ft)	Sample Type & Recovery	Sample Number	Penetration Resistance Blows/6" N-Value	Unified Classification	LOG OF TEST BORING: FIELD DESCRIPTION	Munsell Field Color
0		S1	1 1 1 1 2	PT	Organic material w/ fine sand	1 2.5/N
					2.0	
		S2	1 2 3 4 5	SP	14 in. of fine sand grading to 10 YR 6/2	1 2.5/N = 10 YR 6/2
5		S3	2 3 3 2 6		11 in. fine sand grading to 7.5 YR 3/1 fine sand	10 YR 6/2 = 7.5 YR 3/1
		S4	6 3 2 3 5		Fine sand	7.5 YR 3/1
		S5	4 4 7 14 11		Fine sand w/ heavy organic staining	7.5 YR /1
10		S6	8 11 8 10 19		13 in. fine sand grading to 7.5 YR /1	10 YR 3/2 = 7.5 YR 3/1
		S7	12 13 11 10 24		Fine sand	10 YR 6/2
		S8	6 7 7 8 14			
15		S9	7 9 7 11 16	SP-SW	Medium to fine Sand	10 YR 5/2
		S10	22 19 16 13 35		18.0	
					Fine sand	10 YR 6/2
20						
					23.2	

Penetration Resistance (Blows/Foot): 0, 15, 35, 55, 75, 100

Graphic Litho Log

Well Construction

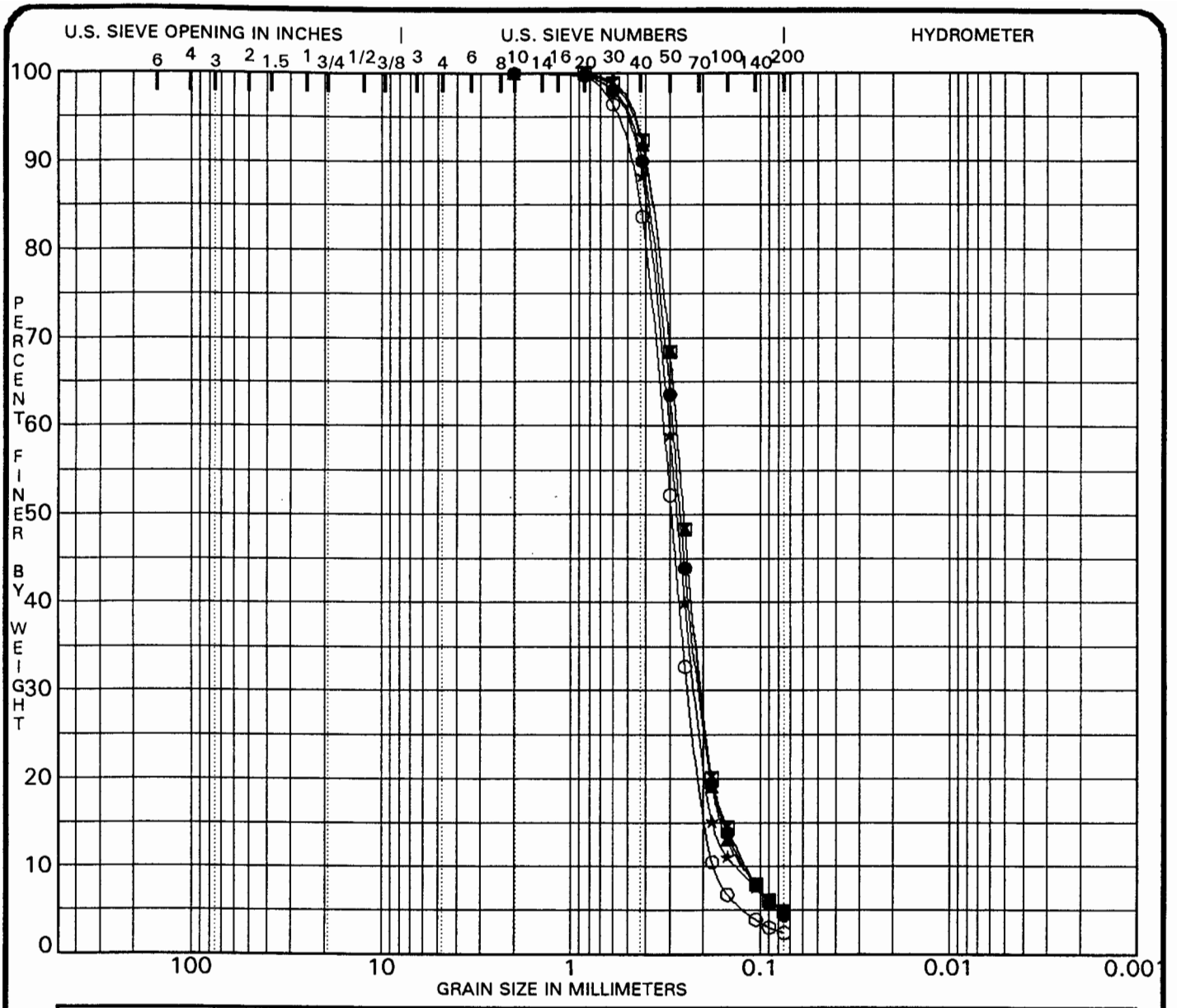
A 9/10/97

EMP

Fine Sand | Medium Sand | Bentonite Pellets | Cement Grout | Silt/Clay w/ shell

Organic Material | Clay | Split Spoon | Percent Recovery | No Recovery

GRAIN SIZE DISTRIBUTION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification			Classification	MC%	LL	PL	PI	Cc	Cu
●	WR6	0.0	POORLY GRADED SAND with SILT SP-SM		NP	NP	NP	1.23	2.4
⊠	WR6	2.0	POORLY GRADED SAND with SILT SP-SM		NP	NP	NP	1.24	2.4
▲	WR6	4.0	POORLY GRADED SAND with SILT SP-SM		NP	NP	NP	1.22	2.3
★	WR6	6.0	POORLY GRADED SAND with SILT SP-SM		NP	NP	NP	1.18	2.3
⊙	WR6	8.0	POORLY GRADED SAND SP					1.01	1.9

Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	WR6	0.0	2.00	0.29	0.207	0.1204	0.0	95.5	4.5	
⊠	WR6	2.0	0.85	0.28	0.202	0.1180	0.0	95.1	4.9	
▲	WR6	4.0	2.00	0.28	0.204	0.1218	0.0	95.2	4.8	
★	WR6	6.0	2.00	0.30	0.219	0.1341	0.0	94.9	5.1	
⊙	WR6	8.0	2.00	0.33	0.240	0.1756	0.0	97.5	2.5	

PROJECT **Isolated Wetlands Shallow Drilling Program - Nature Conservancy, Disney Preserve, Kissimmee, Florida**

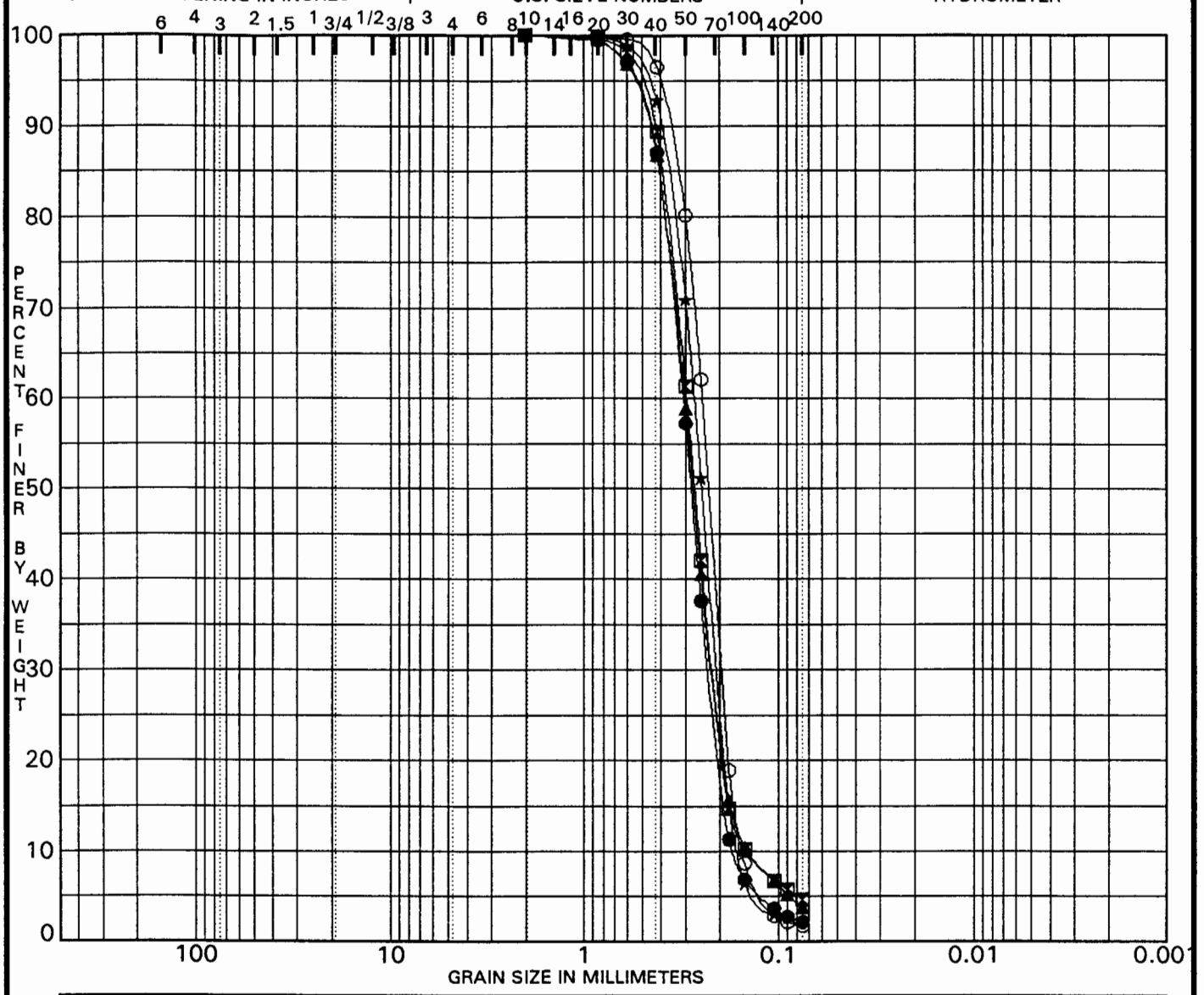
JOB NO. **1033**

DATE **9/10/97**

GRADATION CURVES

Engineered Environmental Solutions, Inc.

1301 NW 4th Street, Boca Raton, FL



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
●	WR6	10.0	POORLY GRADED SAND SP					0.98	1.8
⊠	WR6	12.0	POORLY GRADED SAND with SILT SP-SM		NP	NP	NP	1.07	2.0
▲	WR6	14.0	POORLY GRADED SAND SP					1.09	2.1
★	WR6	16.0	POORLY GRADED SAND SP					0.97	1.7
○	WR6	18.0	POORLY GRADED SAND SP					1.02	1.6

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	WR6	10.0	2.00	0.31	0.227	0.1706	0.0	97.8	2.2	
⊠	WR6	12.0	2.00	0.30	0.216	0.1470	0.0	95.3	4.7	
▲	WR6	14.0	2.00	0.30	0.218	0.1431	0.0	96.2	3.8	
★	WR6	16.0	2.00	0.27	0.206	0.1618	0.0	97.6	2.4	
○	WR6	18.0	2.00	0.25	0.196	0.1535	0.0	98.2	1.8	

PROJECT **Isolated Wetlands Shallow Drilling Program - Nature Conservancy, Disney Preserve, Kissimmee, Florida**

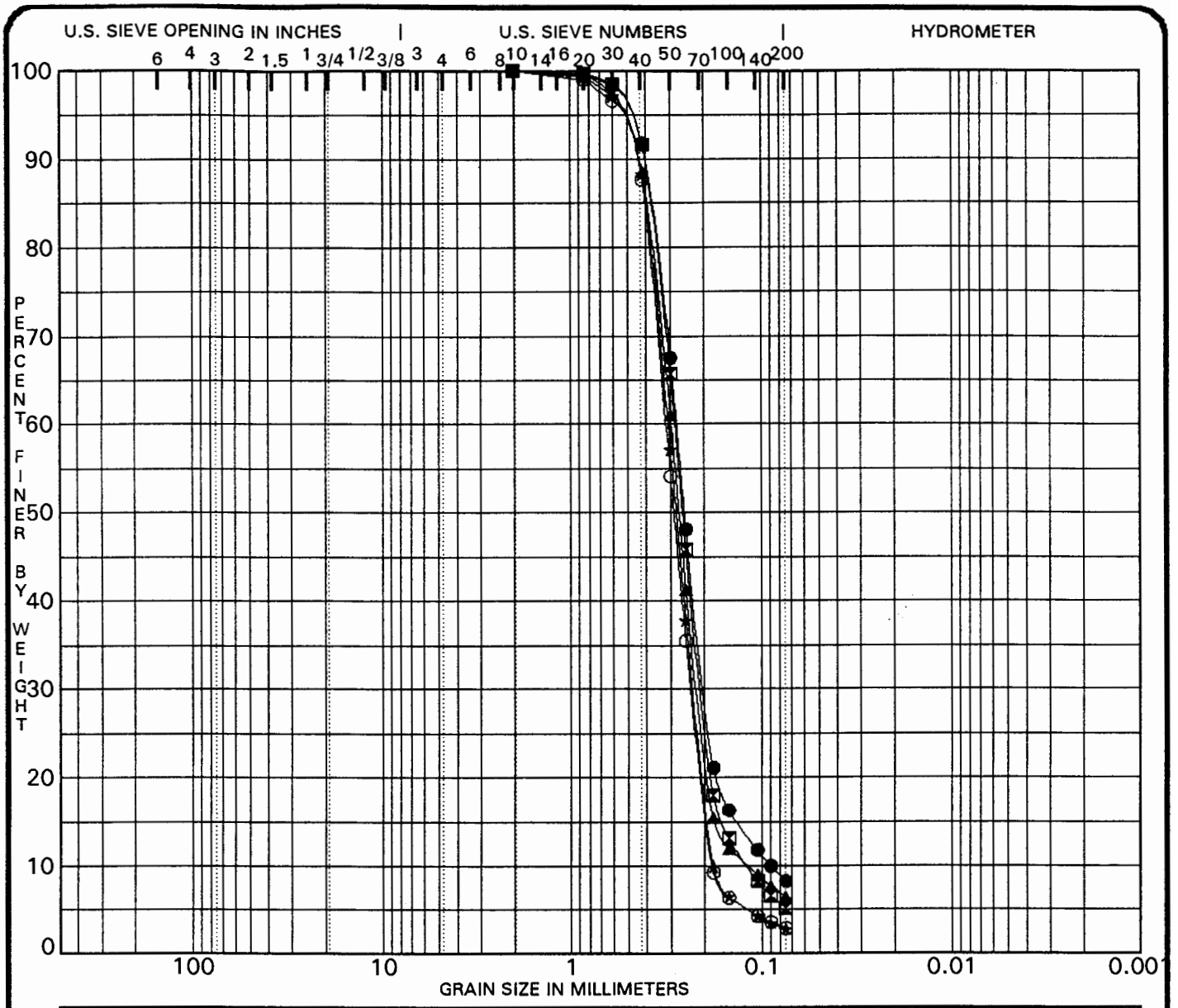
JOB NO. **1033**

DATE **9/10/97**

GRADATION CURVES

Engineered Environmental Solutions, Inc.

1301 NW 4th Street, Boca Raton, FL



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification			Classification	MC%	LL	PL	PI	Cc	Cu
●	WR8	2.0	POORLY GRADED SAND with SILT SP-SM		NP	NP	NP	1.60	3.1
⊠	WR8	4.0	POORLY GRADED SAND with SILT SP-SM		NP	NP	NP	1.26	2.4
▲	WR8	6.0	POORLY GRADED SAND with SILT SP-SM		NP	NP	NP	1.33	2.5
★	WR8	8.0	POORLY GRADED SAND SP					0.93	1.7
○	WR8	10.0	POORLY GRADED SAND SP					0.94	1.8

Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	WR8	2.0	2.00	0.28	0.201	0.0900	0.0	91.7	8.3	
⊠	WR8	4.0	2.00	0.28	0.207	0.1199	0.0	94.8	5.2	
▲	WR8	6.0	2.00	0.30	0.217	0.1190	0.0	93.5	6.5	
★	WR8	8.0	2.00	0.31	0.228	0.1802	0.0	97.2	2.8	
○	WR8	10.0	2.00	0.32	0.233	0.1816	0.0	97.1	2.9	

PROJECT **Isolated Wetlands Shallow Drilling Program - Nature Conservancy, Disney Preserve, Kissimmee, Florida**

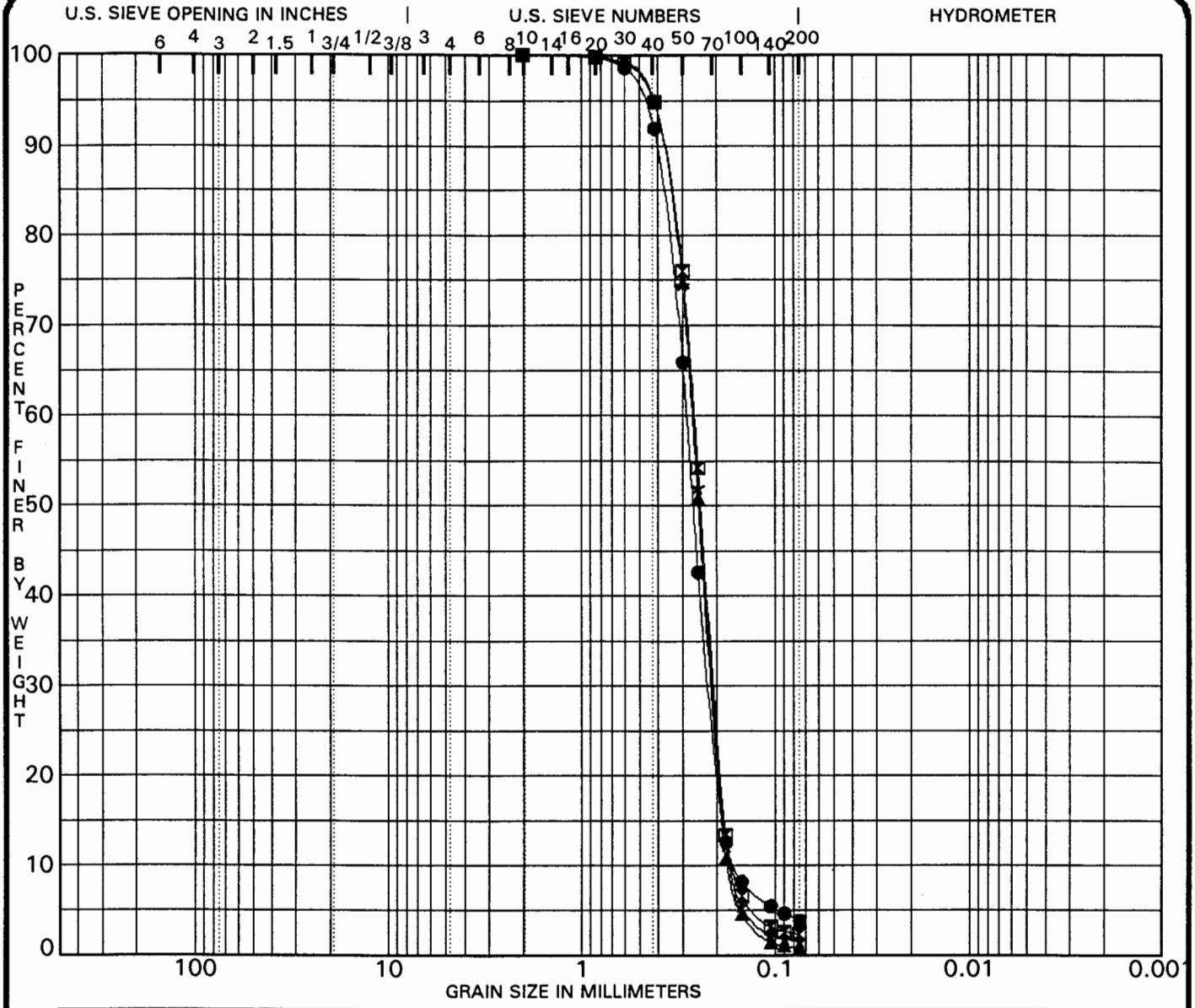
JOB NO. **1033**

DATE **9/10/97**

GRADATION CURVES

Engineered Environmental Solutions, Inc.

1301 NW 4th Street, Boca Raton, FL



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
●	WR8 12.0	POORLY GRADED SAND SP					1.02	1.8
⊠	WR8 14.0	POORLY GRADED SAND SP					0.98	1.6
▲	WR8 16.0	POORLY GRADED SAND SP					0.94	1.5
★	WR8 18.0	POORLY GRADED SAND SP					0.96	1.6

Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	WR8 12.0	2.00	0.29	0.218	0.1616	0.0	96.1	3.9	
⊠	WR8 14.0	2.00	0.26	0.206	0.1643	0.0	97.6	2.4	
▲	WR8 16.0	2.00	0.27	0.211	0.1763	0.0	99.1	0.9	
★	WR8 18.0	2.00	0.27	0.209	0.1695	0.0	98.4	1.6	

PROJECT **Isolated Wetlands Shallow Drilling Program - Nature Conservancy, Disney Preserve, Kissimmee, Florida**

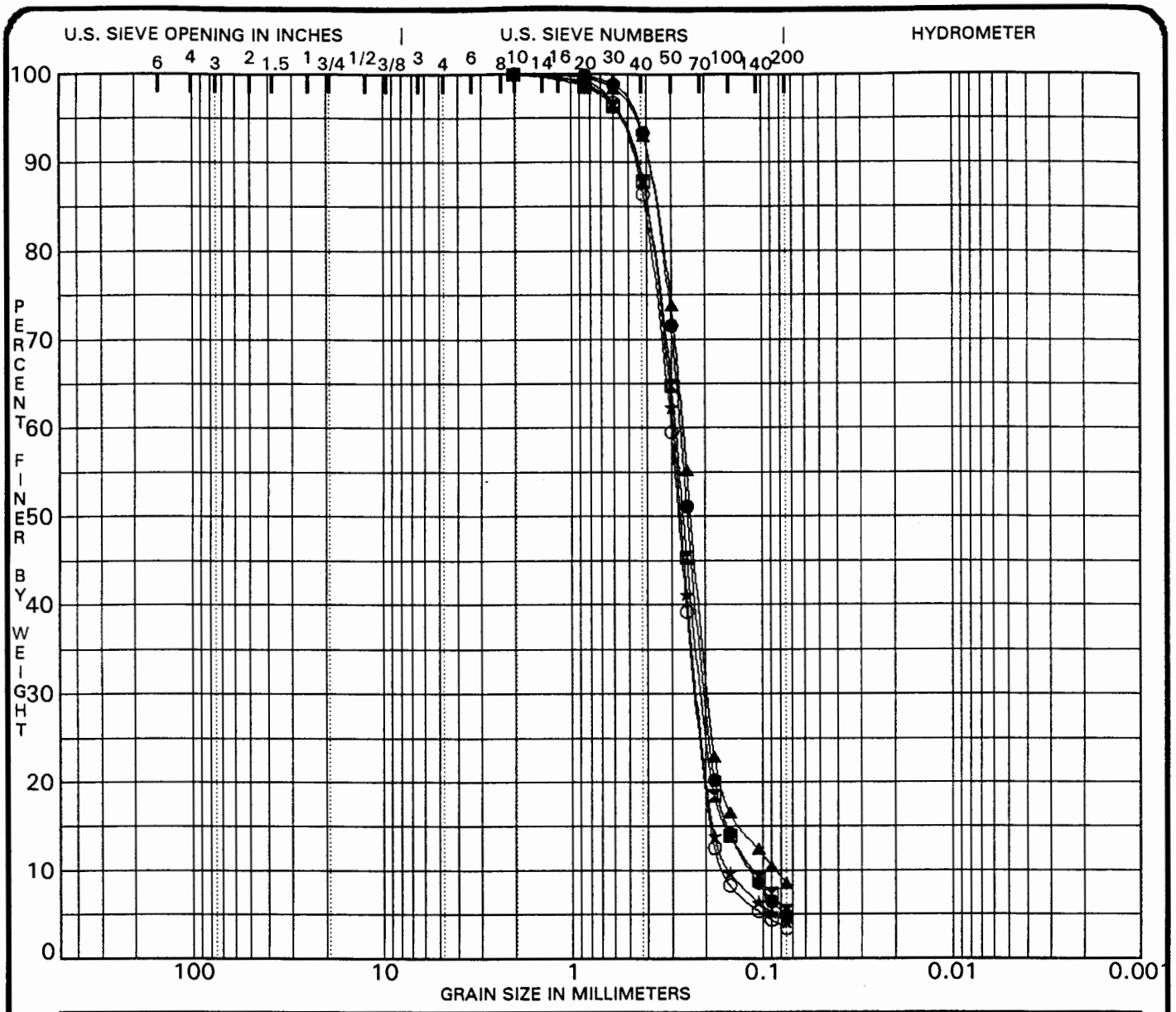
JOB NO. **1033**

DATE **9/10/97**

GRADATION CURVES

Engineered Environmental Solutions, Inc.

1301 NW 4th Street, Boca Raton, FL



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification			Classification	MC%	LL	PL	PI	Cc	Cu
●	WR9	0.0	POORLY GRADED SAND with SILT SP-SM		NP	NP	NP	1.27	2.3
⊠	WR9	2.0			NP	NP	NP	1.33	2.6
▲	WR9	4.0	POORLY GRADED SAND with SILT SP-SM		NP	NP	NP	1.67	3.1
★	WR9	6.0	POORLY GRADED SAND SP					1.07	1.9
○	WR9	8.0			NP	NP	NP	1.02	1.9

Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	WR9	0.0	2.00	0.27	0.200	0.1158	0.0	95.1	4.9	
⊠	WR9	2.0		0.29	0.207	0.1125			5.4	
▲	WR9	4.0	2.00	0.26	0.194	0.0858	0.0	91.4	8.6	
★	WR9	6.0	2.00	0.29	0.219	0.1520	0.0	95.8	4.2	
○	WR9	8.0		0.30	0.223	0.1615			3.5	

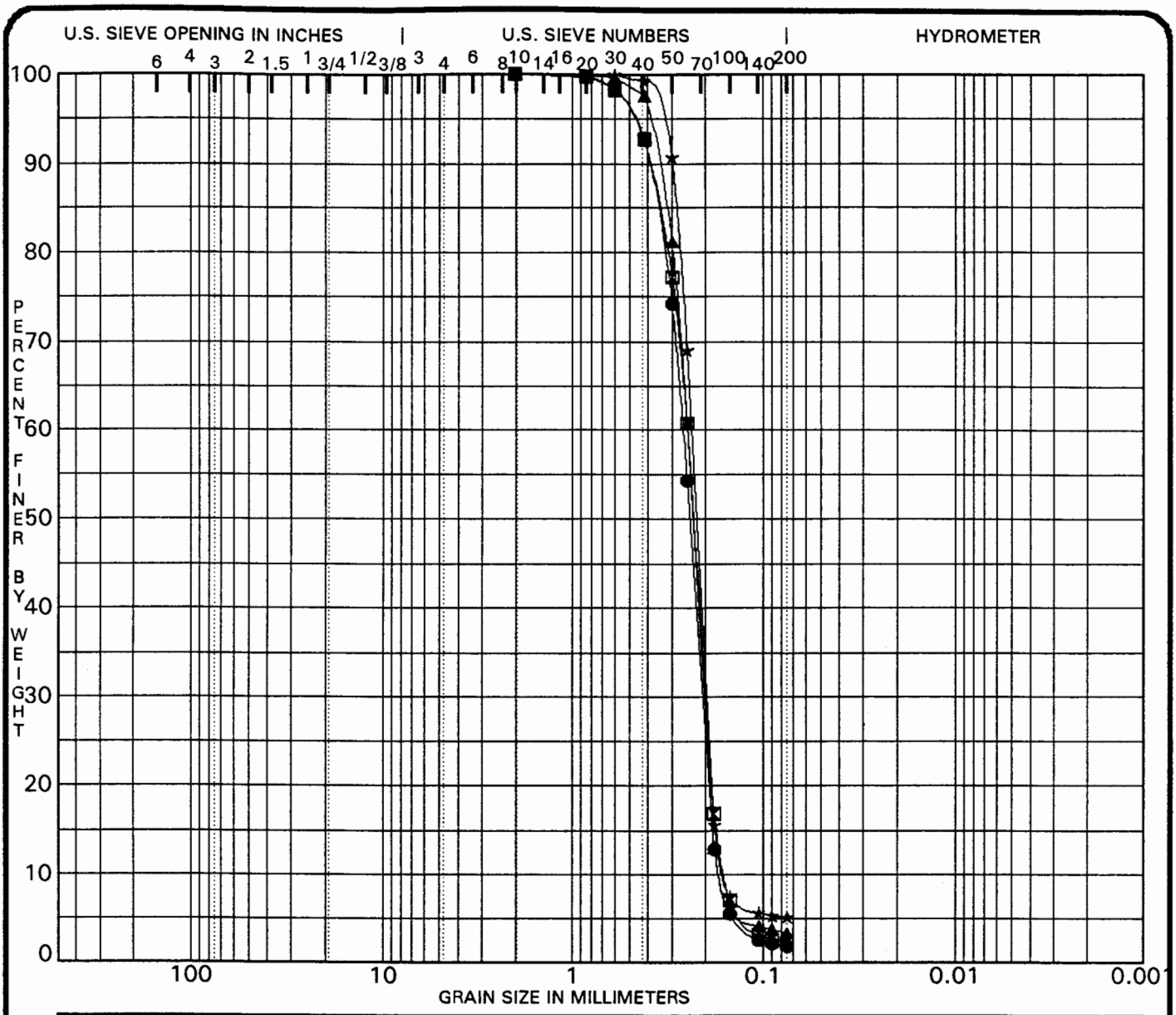
PROJECT **Isolated Wetlands Shallow Drilling Program - Nature Conservancy, Disney Preserve, Kissimmee, Florida**

JOB NO. 1033

DATE 9/10/97

GRADATION CURVES

Engineered Environmental Solutions, Inc.
1301 NW 4th Street, Boca Raton, FL



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
●	WR9	10.0	POORLY GRADED SAND SP					0.96	1.6
⊠	WR9	12.0	POORLY GRADED SAND SP					1.00	1.6
▲	WR9	16.0	POORLY GRADED SAND SP					0.99	1.5
★	WR9	18.0	POORLY GRADED SAND with SILT SP-SM		NP	NP	NP	1.03	1.5

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	WR9	10.0	2.00	0.26	0.206	0.1674	0.0	98.1	1.9	
⊠	WR9	12.0	2.00	0.25	0.199	0.1583	0.0	97.7	2.3	
▲	WR9	16.0	2.00	0.25	0.202	0.1668	0.0	96.6	3.4	
★	WR9	18.0	0.60	0.24	0.197	0.1587	0.0	94.8	5.2	

PROJECT **Isolated Wetlands Shallow Drilling Program - Nature Conservancy, Disney Preserve, Kissimmee, Florida**

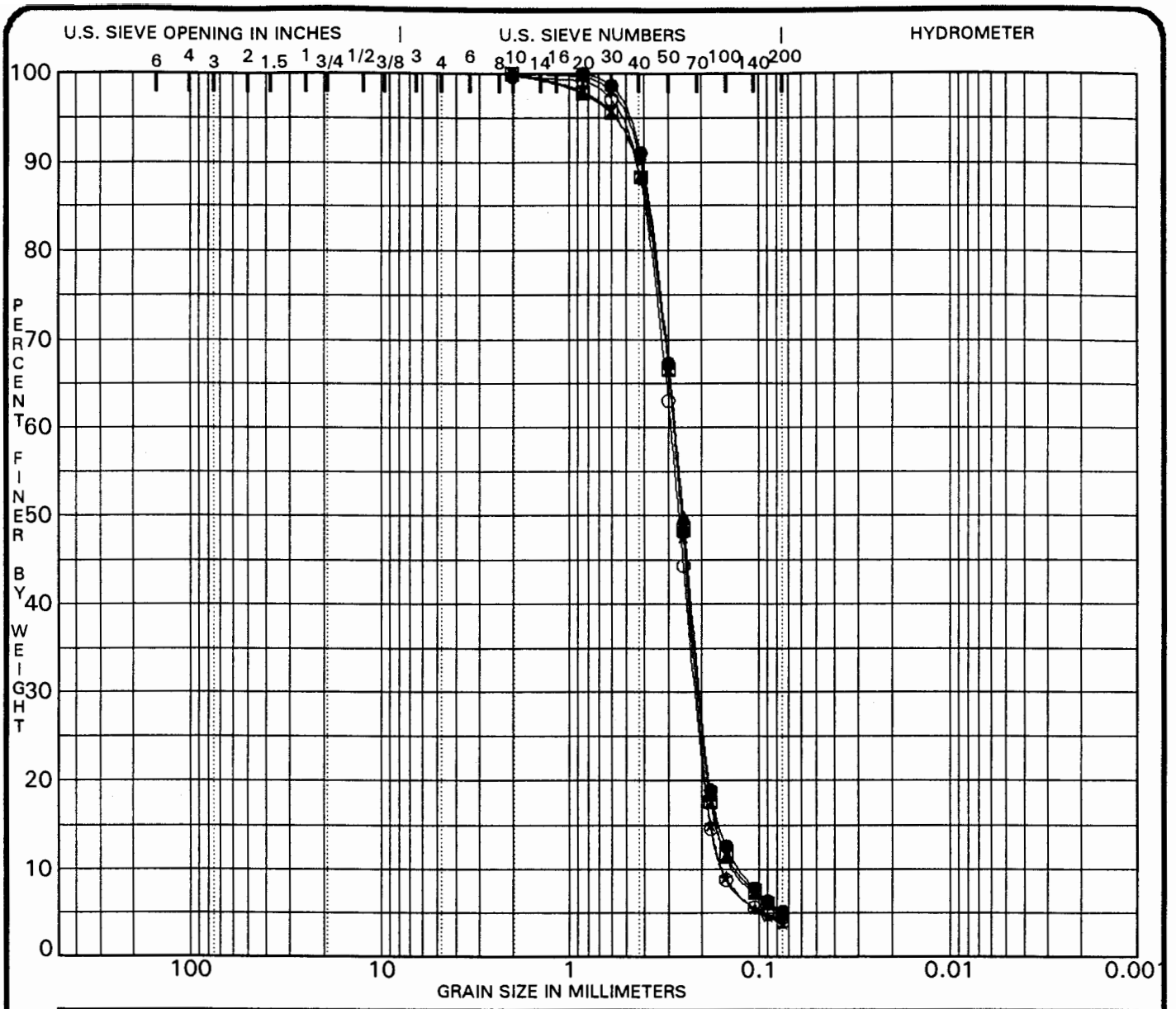
JOB NO. **1033**

DATE **9/10/97**

GRADATION CURVES

Engineered Environmental Solutions, Inc.

1301 NW 4th Street, Boca Raton, FL



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
●	WR11	0.0	POORLY GRADED SAND with SILT SP-SM		NP	NP	NP	1.20	2.3
⊠	WR11	2.0	POORLY GRADED SAND with SILT SP-SM		NP	NP	NP	1.15	2.2
▲	WR11	4.0			NP	NP	NP	1.12	2.1
★	WR11	6.0	POORLY GRADED SAND SP					1.01	1.8
⊙	WR11	8.0			NP	NP	NP	1.00	1.9

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	WR11	0.0	0.85	0.28	0.204	0.1238	0.0	94.8	5.2	
⊠	WR11	2.0	2.00	0.28	0.205	0.1306	0.0	95.0	5.0	
▲	WR11	4.0		0.28	0.203	0.1332			4.8	
★	WR11	6.0	2.00	0.28	0.210	0.1542	0.0	96.1	3.9	
⊙	WR11	8.0		0.29	0.213	0.1558			4.1	

PROJECT **Isolated Wetlands Shallow Drilling Program - Nature Conservancy, Disney Preserve, Kissimmee, Florida**

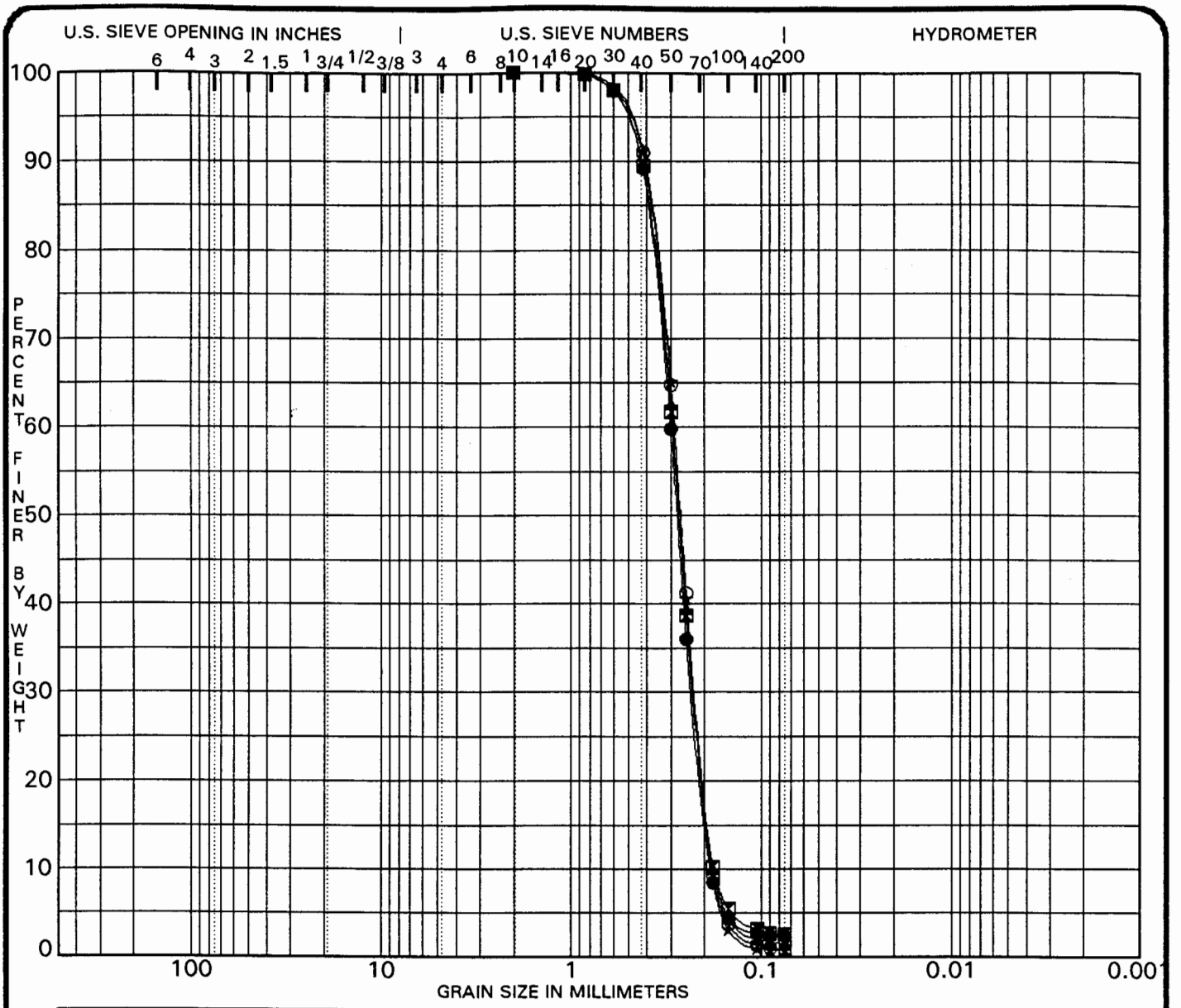
JOB NO. **1033**

DATE **9/10/97**

GRADATION CURVES

Engineered Environmental Solutions, Inc.

1301 NW 4th Street, Boca Raton, FL



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification			Classification	MC%	LL	PL	PI	Cc	Cu
●	WR11	10.0	POORLY GRADED SAND SP					0.98	1.6
⊠	WR11	12.0	POORLY GRADED SAND SP					0.97	1.7
▲	WR11	14.0	POORLY GRADED SAND SP					0.96	1.6
★	WR11	16.0	POORLY GRADED SAND SP					0.95	1.6
○	WR11	18.0	POORLY GRADED SAND SP					0.95	1.6

Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	WR11	10.0	2.00	0.30	0.233	0.1833	0.0	97.6	2.4	
⊠	WR11	12.0	2.00	0.30	0.226	0.1780	0.0	97.4	2.6	
▲	WR11	14.0	2.00	0.29	0.225	0.1800	0.0	98.5	1.5	
★	WR11	16.0	2.00	0.29	0.224	0.1828	0.0	99.2	0.8	
○	WR11	18.0	2.00	0.29	0.223	0.1815	0.0	99.1	0.9	

PROJECT **Isolated Wetlands Shallow Drilling Program - Nature Conservancy, Disney Preserve, Kissimmee, Florida**

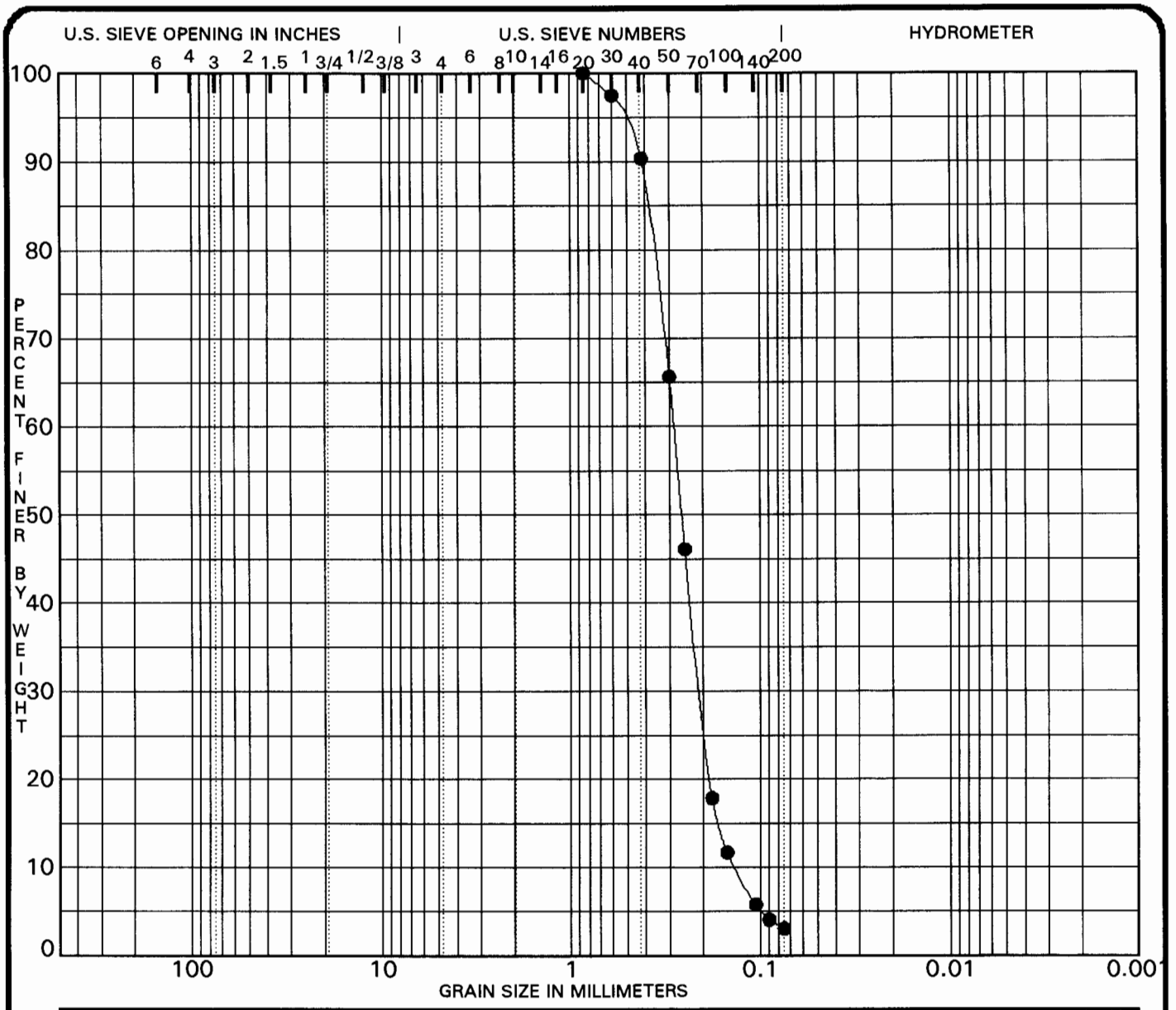
JOB NO. **1033**

DATE **9/10/97**

GRADATION CURVES

Engineered Environmental Solutions, Inc.

1301 NW 4th Street, Boca Raton, FL



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Classification	MC%	LL	PL	PI	Cc	Cu
● WR11SHEL 0.0	POORLY GRADED SAND SP		NP	NP	NP	1.11	2.1

Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● WR11SHEL 0.0	0.85	0.28	0.207	0.1357	0.0	96.9	3.1	

PROJECT **Isolated Wetlands Shallow Drilling Program - Nature Conservancy, Disney Preserve, Kissimmee, Florida**

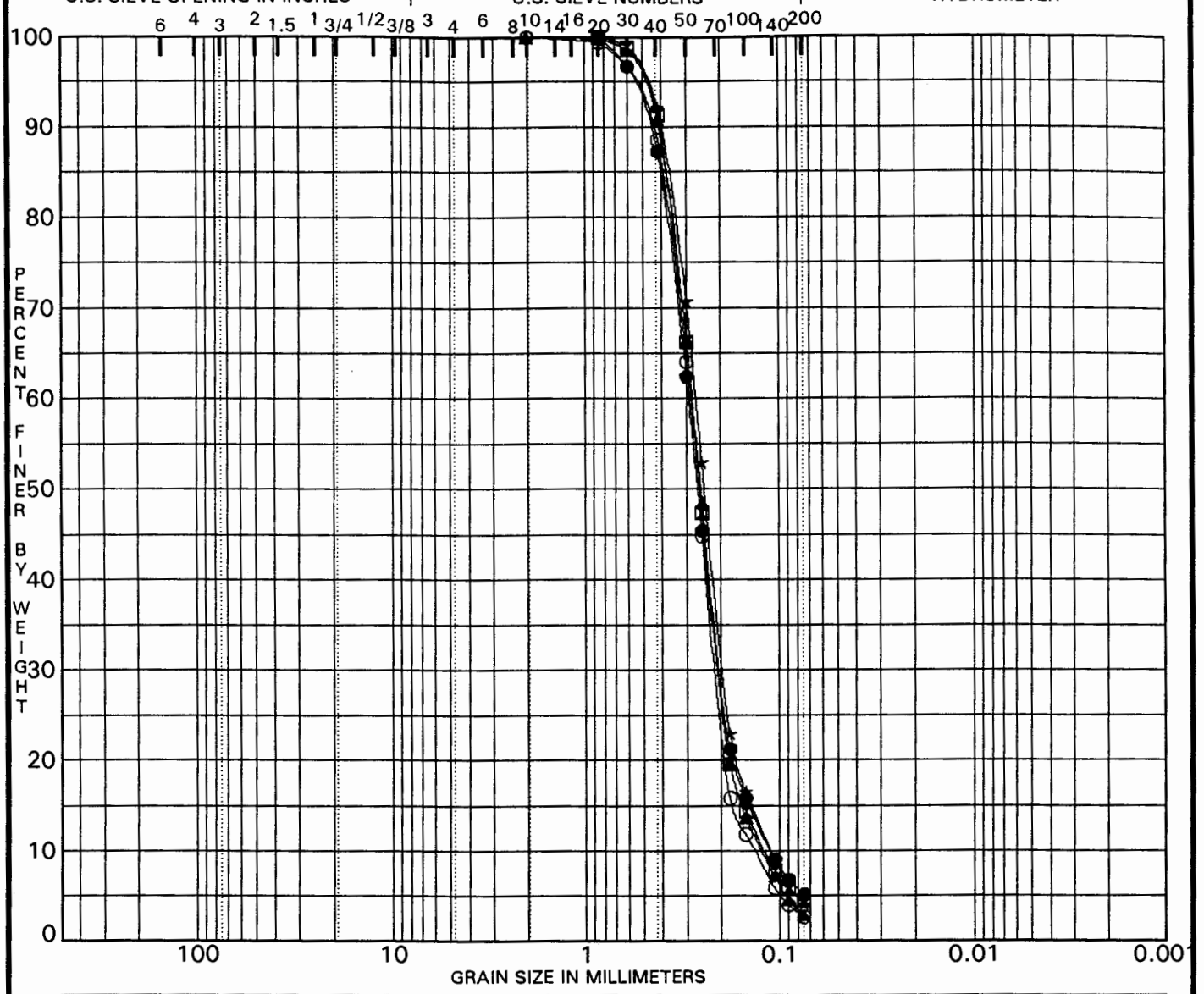
JOB NO. **1033**

DATE **9/13/97**

GRADATION CURVES

Engineered Environmental Solutions, Inc.

1301 NW 4th Street, Boca Raton, FL



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification			Classification	MC%	LL	PL	PI	Cc	Cu
●	WR15	0.0	POORLY GRADED SAND with SILT SP-SM		NP	NP	NP	1.27	2.6
⊠	WR15	2.0	POORLY GRADED SAND with SILT SP-SM		NP	NP	NP	1.23	2.4
▲	WR15	4.0	POORLY GRADED SAND SP					1.18	2.3
★	WR15	6.0	POORLY GRADED SAND SP					1.27	2.4
○	WR15	8.0	POORLY GRADED SAND SP					1.15	2.1

Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	WR15	0.0	0.85	0.29	0.203	0.1111	0.0	94.8	5.2	
⊠	WR15	2.0	0.85	0.28	0.204	0.1192	0.0	95.4	4.6	
▲	WR15	4.0	2.00	0.28	0.202	0.1231	0.0	97.1	2.9	
★	WR15	6.0	2.00	0.27	0.195	0.1106	0.0	95.9	4.1	
○	WR15	8.0	2.00	0.29	0.211	0.1349	0.0	97.3	2.7	

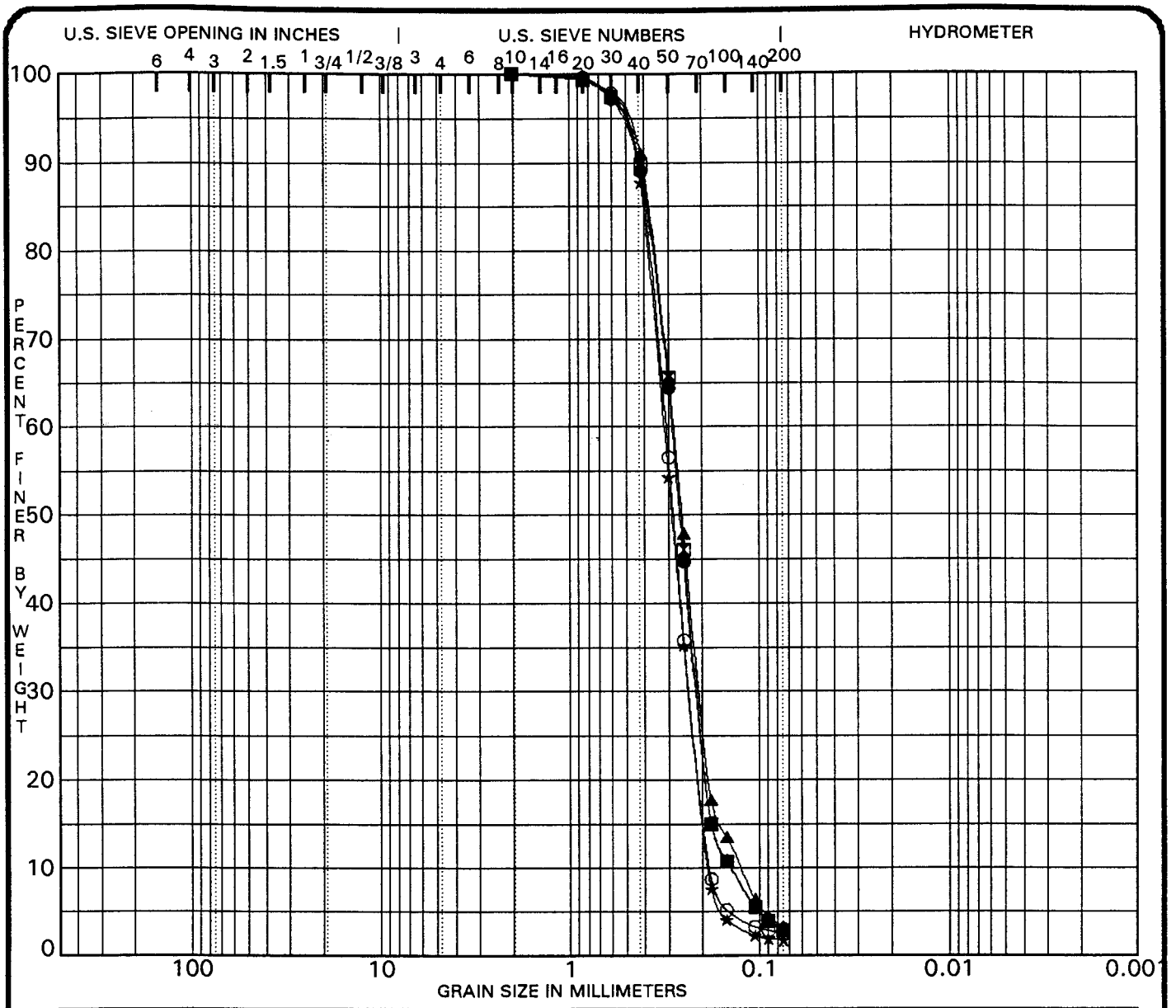
PROJECT **Isolated Wetlands Shallow Drilling Program - Nature Conservancy, Disney Preserve, Kissimmee, Florida**

JOB NO. **1033**

DATE **9/10/97**

GRADATION CURVES

Engineered Environmental Solutions, Inc.
1301 NW 4th Street, Boca Raton, FL



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification			Classification	MC%	LL	PL	PI	Cc	Cu
●	WR15	10.0	POORLY GRADED SAND SP					1.10	2.0
⊠	WR15	12.0	POORLY GRADED SAND SP					1.09	2.0
▲	WR15	14.0	POORLY GRADED SAND SP					1.19	2.2
★	WR15	16.0	POORLY GRADED SAND SP					0.94	1.7
⊙	WR15	18.0	POORLY GRADED SAND SP					0.95	1.7

Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	WR15	10.0	2.00	0.29	0.212	0.1422	0.0	97.0	3.0	
⊠	WR15	12.0	2.00	0.28	0.211	0.1432	0.0	97.1	2.9	
▲	WR15	14.0	2.00	0.28	0.206	0.1261	0.0	96.7	3.3	
★	WR15	16.0	2.00	0.32	0.235	0.1852	0.0	98.2	1.8	
⊙	WR15	18.0	2.00	0.31	0.233	0.1829	0.0	97.5	2.5	

PROJECT **Isolated Wetlands Shallow Drilling Program - Nature Conservancy, Disney Preserve, Kissimmee, Florida**

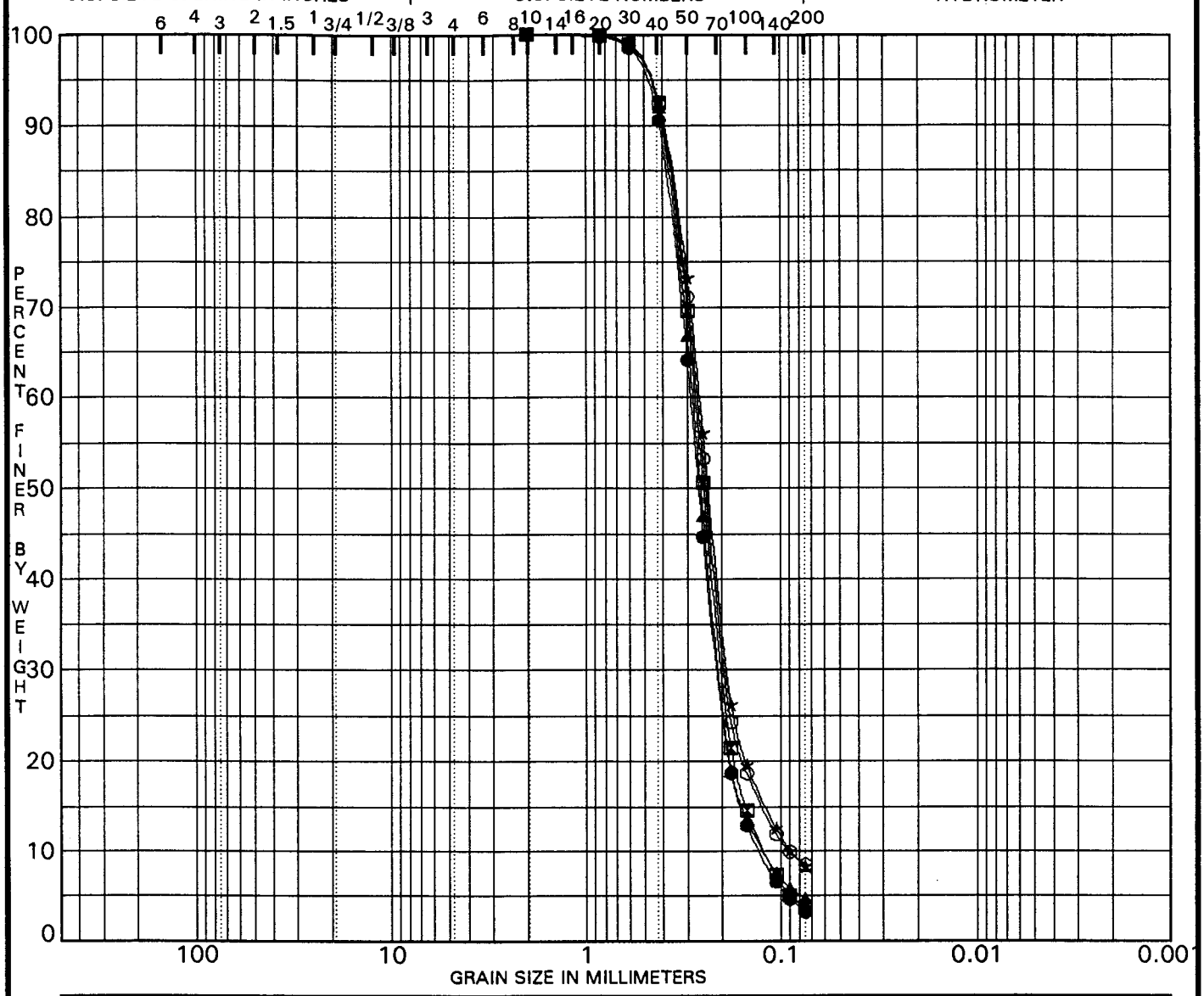
JOB NO. **1033**

DATE **9/10/97**

GRADATION CURVES

Engineered Environmental Solutions, Inc.

1301 NW 4th Street, Boca Raton, FL



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification			Classification	MC%	LL	PL	PI	Cc	Cu
●	WR16	0.0	POORLY GRADED SAND SP					1.17	2.3
⊠	WR16	2.0	POORLY GRADED SAND SP					1.19	2.3
▲	WR16	4.0	POORLY GRADED SAND with SILT SP-SM		NP	NP	NP	1.22	2.3
★	WR16	6.0	POORLY GRADED SAND with SILT SP-SM		NP	NP	NP	1.50	2.9
⊙	WR16	8.0	POORLY GRADED SAND with SILT SP-SM		NP	NP	NP	1.52	3.0

Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	WR16	0.0	2.00	0.29	0.208	0.1278	0.0	96.7	3.3	
⊠	WR16	2.0	2.00	0.27	0.198	0.1205	0.0	96.3	3.7	
▲	WR16	4.0	0.85	0.28	0.205	0.1218	0.0	95.3	4.7	
★	WR16	6.0	2.00	0.26	0.188	0.0900	0.0	91.7	8.3	
⊙	WR16	8.0	2.00	0.27	0.192	0.0907	0.0	91.6	8.4	

PROJECT **Isolated Wetlands Shallow Drilling Program - Nature Conservancy, Disney Preserve, Kissimmee, Florida**

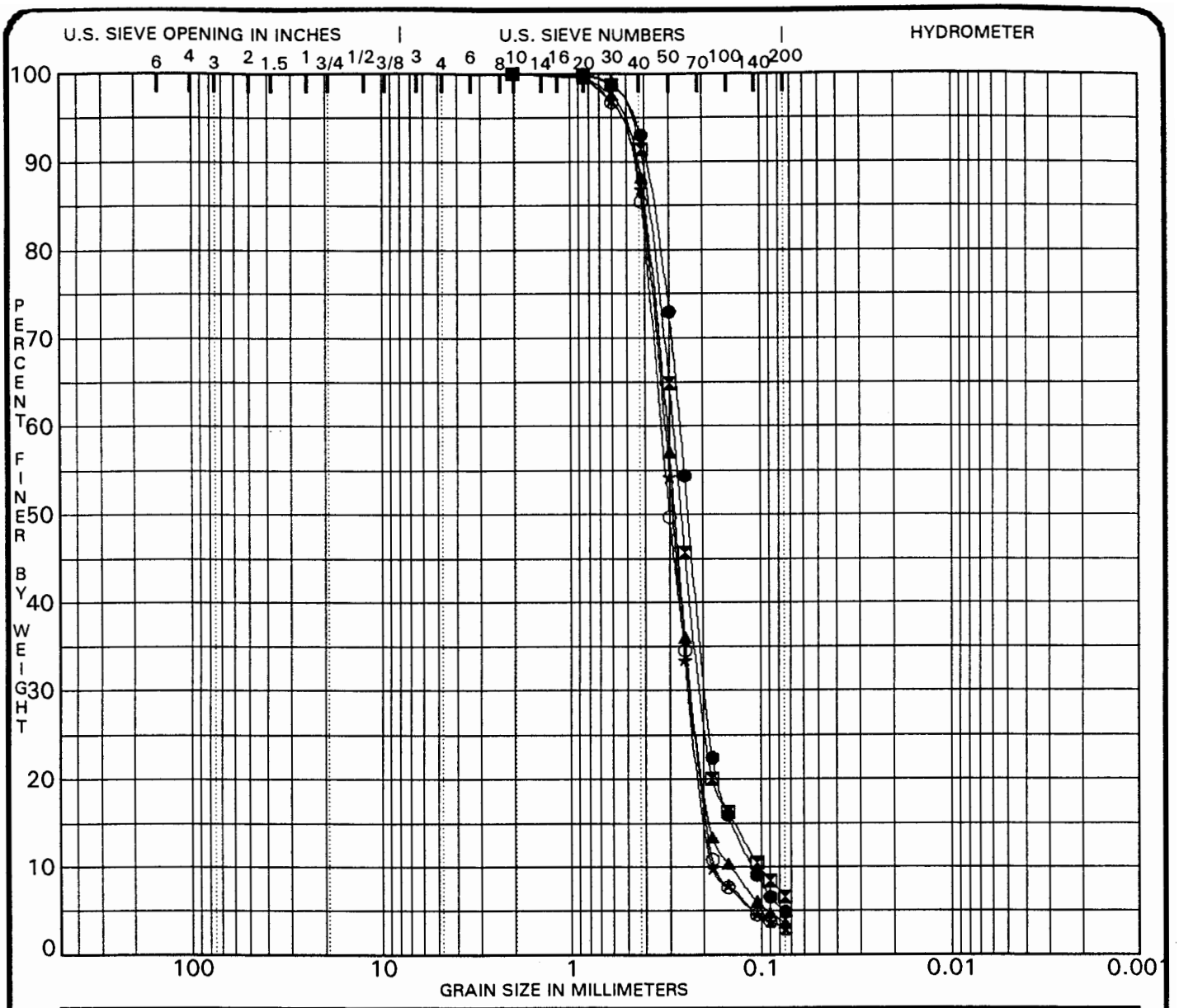
JOB NO. **1033**

DATE **9/10/97**

GRADATION CURVES

Engineered Environmental Solutions, Inc.

1301 NW 4th Street, Boca Raton, FL



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
●	WR16	10.0	POORLY GRADED SAND with SILT SP-SM		NP	NP	NP	1.29	2.4
⊠	WR16	12.0	POORLY GRADED SAND with SILT SP-SM		NP	NP	NP	1.43	2.8
▲	WR16	14.0	POORLY GRADED SAND SP					1.17	2.1
★	WR16	16.0	POORLY GRADED SAND SP					0.99	1.8
○	WR16	18.0	POORLY GRADED SAND SP					0.97	1.9

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	WR16	10.0	2.00	0.26	0.195	0.1110	0.0	95.1	4.9	
⊠	WR16	12.0	2.00	0.29	0.205	0.1018	0.0	93.4	6.6	
▲	WR16	14.0	2.00	0.31	0.229	0.1452	0.0	96.4	3.6	
★	WR16	16.0	2.00	0.32	0.238	0.1805	0.0	97.0	3.0	
○	WR16	18.0	2.00	0.33	0.235	0.1717	0.0	97.0	3.0	

PROJECT **Isolated Wetlands Shallow Drilling Program - Nature Conservancy, Disney Preserve, Kissimmee, Florida**

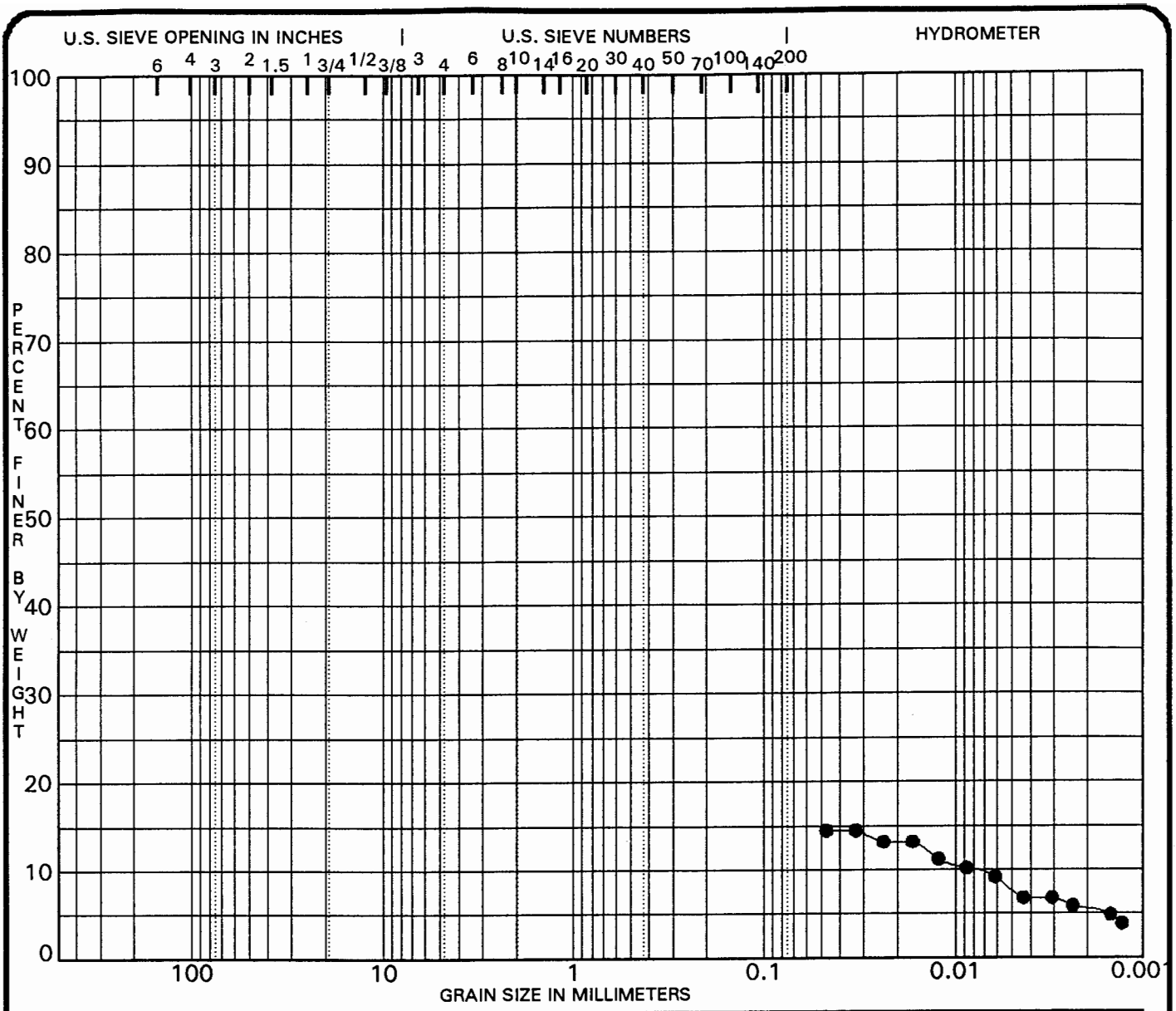
JOB NO. **1033**

DATE **9/10/97**

GRADATION CURVES

Engineered Environmental Solutions, Inc.

1301 NW 4th Street, Boca Raton, FL



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Classification	MC%	LL	PL	PI	Cc	Cu
● WR15SHEL 0.0							

Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● WR15SHEL 0.0				0.0082				7.7

PROJECT **Isolated Wetlands Shallow Drilling Program - Nature Conservancy, Disney Preserve, Kissimme, Florida**

JOB NO. **1033**

DATE **9/12/97**

GRADATION CURVES

Engineered Environmental Solutions, Inc.

1301 NW 4th Street, Boca Raton, FL

GRAIN SIZE ANALYSIS LABORATORY DATA

Project ID: Wetla
Point ID: WR15SHEL
Depth: 0.0

Hydrometer Analysis - ADDRESS 2306 gINT

Sample - WR15 Shelby Tube sample 0-2 feet

Dry Test Weight g - 50.0 g
Specific Gravity of particles - 2.7
Hydrometer - Standard Bouyoucos ASTM 152H

Time, Min.	Temp. C.	Hydrometer Reading	Effective Depth cm.	Max. Diameter, mm.
1	27.5	10.0	14.7	0.0472
2	27.5	10.0	14.7	0.0333
4	27.0	9.5	14.75	0.0238
8	27.0	9.5	14.75	0.0168
15	27.0	8.5	14.9	0.0123
30	27.0	8.0	15.0	0.0088
60	27.0	7.5	15.1	0.0062
120	26.5	6.5	15.25	0.0044
240	26.5	6.5	15.25	0.0031
420	26.5	6.0	15.3	0.0024
1020	26.5	5.5	15.4	0.0015
1440	26.5	5.0	15.5	0.0013
2880	26.5	5.0	15.5	0.0009

Maximum diameter of particles in suspension calculated according to Stokes' law.

Engineered Environmental Solutions, Inc.
1301 NW 4th Street, Boca Raton, FL

	DATE	TIME
At printing	SEP1397	14:36
Last update	SEP1397	13:47

PROJECT ID WETLA
POINT ID WR11SHEL
DEPTH 0.00

Sieve Analysis - ADDRESS 2305

'With unsplit specimens use COARSE '
'fields. With splitting supply TOTAL'
'SPC WT or WT PASSING split sieve. '

{01}TOTAL SPECIMEN WEIGHT 327.2
WT PASSING SPLIT SIEVE 10.2
FINE WEIGHT TESTED

' MC OF WTS ABOVE ' ' SV TARE WTs '

	{02} COARSE	{02} FINE	{03} COARSE	{03} FINE
WT+T			0	0
DY+T			NON-PLAST?(X)	_
RE		0		
MC %				

{04}NORMALIZE TO 3"(X) _ WT METH(CI) I
SPLIT ON mm SIEVE
SIEVING MC (W/D) Coarse D Fine D

	NAME	SIZE mm	SOIL+TARE	%FINER
{05}	#20	0.850	0	100.0
{06}	#30	0.600	8.1	97.5
{07}	#40	0.420	23.7	90.3
{08}	#50	0.300	80.9	65.6
{09}	#60	0.250	63.6	46.1
{10}	#80	0.180	92.5	17.8
{11}	#100	0.150	20.2	11.7
{12}	#140	0.106	19.2	5.8
{13}	#170	0.090	5.5	4.1
{14}	#200	0.075	3.3	3.1
{15}				
{16}				
{17}				
{18}				
{19}				
{20}				

Well Name: **WR6**

Location: Disney Preserve

Sieve # (U.S. Standard)		#10	#20	#30	#40	#50	#60	#80	#100	#140	#170	#200	Pan	Weight Recovered	% diff.
Sample #	Sample Weight														
S-1	152.2	0.0	0.5	2.5	12.3	39.9	29.6	36.9	8.5	9.1	3.0	2.0	6.8	151.1	0.72
S-2	215.5	0.0	0.0	2.3	14.0	51.0	42.3	59.8	11.9	13.7	4.1	2.5	10.4	212.0	1.62
S-3	214.1	0.0	0.4	2.5	14.5	49.4	42.5	61.7	12.9	10.7	3.8	3.0	10.1	211.5	1.21
S-4	244.4	0.0	0.4	4.7	23.2	71.2	46.1	60.4	9.7	8.3	3.4	3.0	12.3	242.7	0.70
S-5	251.4	0.0	0.8	8.2	31.7	78.2	48.4	55.2	9.2	7.0	2.2	1.7	6.1	248.7	1.07
S-6	246.0	0.0	1.2	6.2	24.5	73.2	48.5	64.7	10.8	7.7	2.2	1.7	5.3	246.0	0.00
S-7	238.2	0.0	0.6	3.7	21.2	66.5	45.9	65.0	10.9	8.0	2.4	2.7	11.1	238.0	0.08
S-8	224.8	0.0	0.8	6.3	22.4	62.0	40.9	55.2	11.4	8.3	3.6	3.0	8.5	222.4	1.07
S-9	230.0	0.0	0.2	2.3	13.9	50.3	45.1	83.1	19.3	7.9	0.8	0.7	5.4	229.0	0.43
S-10	178.1	0.0	0.1	0.6	5.5	29.3	32.0	77.0	18.1	10.3	1.3	0.7	3.2	178.1	0.00

* Units=Grams

Well Name: **WR8**
Location: Disney Preserve

Sieve # (U.S. Standard)		#10	#20	#30	#40	#50	#60	#80	#100	#140	#170	#200	Pan	Weight Recovered	% diff.
Sample #	Sample Weight														
S-1	No Recovery														
S-2	255.8	0.0	1.3	3.0	16.8	62.1	49.5	69.2	12.3	11.3	4.7	4.4	21.2	255.8	0.00
S-3	255.5	0.0	0.8	3.0	17.7	65.8	50.8	70.8	12.4	12.3	4.4	3.6	13.2	254.8	0.27
S-4	291.2	0.0	1.3	6.1	25.9	79.9	57.3	74.9	9.9	8.8	3.6	3.6	18.8	290.1	0.38
S-5	247.2	0.0	1.6	5.6	21.8	76.1	47.2	68.4	8.3	5.5	1.9	1.7	6.9	245.0	0.89
S-6	234.8	0.0	2.3	5.6	21.2	78.6	43.8	61.5	6.8	4.9	1.7	1.6	6.8	234.8	0.00
S-7	221.7	0.0	0.5	2.6	14.7	57.3	51.4	66.3	9.6	6.0	1.8	1.6	8.7	220.5	0.54
S-8	237.0	0.0	0.5	1.7	9.9	45.1	51.3	96.8	16.1	8.2	1.0	0.9	5.6	237.1	0.04
S-9	246.3	0.0	0.4	1.8	10.2	50.0	58.6	98.7	15.0	7.7	0.9	0.6	2.2	246.1	0.08
S-10	266.8	0.0	0.3	1.8	11.1	55.1	60.0	106.3	17.8	8.5	1.0	0.8	4.4	267.1	0.11

* Units=Grams

Well Name: **WR9**

Location: Disney Preserve

Sieve # (U.S. Standard)		#10	#20	#30	#40	#50	#60	#80	#100	#140	#170	#200	Pan	Weight Recovered	% diff.
Sample #	Sample Weight														
S-1	216.7	0.0	0.4	2.1	12.1	47.1	44.1	66.8	13.3	11.9	4.5	3.4	10.7	216.4	0.14
S-2	225.0	0.2	3.0	4.8	18.5	50.2	42.3	58.5	9.7	10.2	4.1	4.1	11.8	217.4	3.38
S-3	221.1	0.0	1.0	2.6	11.8	42.6	41.1	71.4	14.1	9.1	4.2	4.1	19.1	221.1	-0.00
S-4	232.4	0.0	2.7	5.2	20.1	59.2	49.1	63.1	9.5	7.6	2.8	2.4	9.7	231.4	0.43
S-5	241.5	0.2	1.7	6.0	25.1	64.5	49.0	64.4	9.9	7.0	2.5	2.2	8.4	240.9	0.25
S-6	200.0	0.0	0.5	2.8	11.1	36.9	39.6	82.3	14.5	5.9	0.8	0.7	3.7	198.8	0.60
S-7	150.9	0.0	0.3	2.2	8.4	23.2	24.6	65.6	14.7	5.8	0.8	0.6	3.4	149.6	0.86
S-8	No Recovery														
S-9	180.0	0.0	0.1	0.4	3.8	29.7	36.7	85.8	12.9	2.9	0.6	0.7	6.2	179.8	0.11
S-10	234.4	0.0	0.0	0.1	1.5	20.2	50.6	124.5	18.9	4.4	0.6	0.5	12.1	233.4	0.43

* Units=Grams

Well Name: **WR11**

Location: Disney Preserve

Sieve # (U.S. Standard)		#10	#20	#30	#40	#50	#60	#80	#100	#140	#170	#200	Pan	Weight Recovered	% diff.
Sample #	Sample Weight														
S-1	224.2	0.0	0.0	3.0	16.9	52.7	42.5	65.1	13.9	10.6	3.3	2.6	11.6	222.2	0.89
S-2	208.3	0.1	4.2	4.6	15.4	44.7	37.4	63.9	12.4	8.3	2.7	2.6	10.3	206.6	0.82
S-3	204.7	0.5	4.2	4.4	14.8	42.9	35.5	64.6	14.1	8.2	2.6	2.6	9.8	204.2	0.24
S-4	240.3	0.0	0.8	4.0	18.7	56.1	45.4	77.6	14.1	8.2	2.1	1.9	9.4	238.3	0.83
S-5	230.4	0.6	1.3	4.7	20.5	56.9	42.5	67.5	13.1	7.2	1.8	1.7	9.4	227.2	1.39
S-6	268.8	0.0	0.5	5.1	23.5	78.3	63.6	73.2	11.0	4.6	0.5	0.4	6.3	267.0	0.67
S-7	244.1	0.0	0.4	4.5	20.9	67.2	55.9	69.1	11.8	5.6	0.8	0.6	6.3	243.1	0.41
S-8	199.9	0.0	0.4	3.8	16.9	53.6	46.5	58.8	10.9	4.8	0.7	0.5	3.0	199.9	0.00
S-9	230.3	0.0	0.3	3.2	16.6	59.8	55.9	73.5	12.0	5.0	0.4	0.2	1.8	228.7	0.69
S-10	254.2	0.0	0.6	4.1	18.4	66.2	59.7	81.0	13.5	6.2	0.8	0.5	2.2	253.2	0.39

* Units=Grams

Well Name: **WR15**

Location: Disney Preserve

Sieve # (U.S. Standard)		#10	#20	#30	#40	#50	#60	#80	#100	#140	#170	#200	Pan	Weight Recovered	% diff.
Sample #	Sample Weight														
S-1	133.8	0.0	0.0	4.3	12.6	32.9	22.5	31.9	7.2	8.9	3.0	2.1	6.9	132.3	1.12
S-2	253.7	0.0	0.1	2.8	19.4	62.9	47.5	70.3	13.1	16.5	4.8	3.3	11.5	252.2	0.59
S-3	252.7	0.0	0.4	3.4	19.9	60.8	45.0	72.4	15.0	16.3	6.5	4.3	7.3	251.3	0.55
S-4	251.0	0.0	0.6	3.1	16.0	53.7	44.1	74.8	15.9	18.3	7.6	5.0	10.2	249.3	0.68
S-5	228.9	0.0	1.4	6.0	18.6	55.5	43.3	65.6	9.0	13.4	4.3	2.9	6.2	226.2	1.18
S-6	212.6	0.0	1.2	4.6	17.3	51.8	41.3	62.1	9.2	10.8	3.3	2.2	6.3	210.1	1.18
S-7	242.0	0.0	1.7	4.5	17.8	57.4	46.3	73.3	10.0	12.5	3.5	2.5	6.9	236.4	2.31
S-8	255.9	0.0	1.7	3.5	17.7	64.8	45.2	77.3	10.7	17.9	5.0	3.1	8.4	255.3	0.23
S-9	241.0	0.0	0.8	4.8	24.0	80.5	45.8	66.4	8.6	4.2	0.7	0.6	4.3	240.7	0.12
S-10	242.2	0.0	0.9	4.4	21.3	78.7	50.1	65.5	8.5	4.7	1.0	0.9	6.0	242.0	0.08

* Units=Grams

Well Name: **WR16**

Location: Disney Preserve

Sieve # (U.S. Standard)		#10	#20	#30	#40	#50	#60	#80	#100	#140	#170	#200	Pan	Weight Recovered	% diff.
Sample #	Sample Weight														
S-1	166.6	0.0	0.3	2.0	13.3	43.5	31.9	42.9	9.4	10.4	3.2	2.3	5.4	164.6	1.20
S-2	266.3	0.0	0.3	2.4	17.1	60.9	50.5	77.6	17.9	19.4	5.8	3.9	9.7	265.5	0.30
S-3	265.4	0.0	0.1	2.5	18.7	66.5	52.6	74.2	14.3	15.8	4.5	3.2	12.4	264.8	0.23
S-4	202.8	0.0	0.2	2.3	12.3	39.5	34.7	60.5	13.4	14.3	5.2	3.5	16.8	202.7	0.05
S-5	230.4	0.0	0.2	2.5	14.7	48.8	40.7	66.4	12.8	15.4	4.6	3.5	19.2	228.8	0.69
S-6	254.7	0.0	0.3	2.8	14.7	51.1	47.0	81.2	16.4	17.4	6.3	4.3	12.4	253.9	0.31
S-7	274.8	0.0	0.5	3.0	20.2	72.8	52.2	70.5	10.3	15.7	5.7	5.2	18.0	274.1	0.25
S-8	251.3	0.0	1.3	5.0	23.1	76.7	52.3	56.1	7.3	10.7	3.3	2.8	9.0	247.6	1.47
S-9	276.2	0.0	1.3	7.1	28.0	89.5	57.2	64.9	5.1	9.1	2.2	2.2	8.2	274.8	0.51
S-10	291.0	0.0	1.2	8.3	32.7	103.5	43.8	68.8	8.9	9.0	2.3	2.4	8.6	289.5	0.52

* Units=Grams

FLINT PEN
STRAND

TYPED FIELD NOTES

Isolated Wetlands Drilling Program
Flint Pen Strand, Fort Myers
Lee County, Florida

Location: Cypress Head at the beginning
of road North of staging area FP-3
Township: 46 S, Range: 26 E, Section 28
Drill Dates: 02/11/97
South Florida Water Management District
District Personnel: Steve Krupa, Stacy Hill
Precision Drilling Staff: Robert Miller
Joe Crisalli, Willie Thomas

02/11/97 Well # FP-3

Time

0600 Met with drillers and Kevin Rockett (EESI) at Precision shop. Picked up table. Fueled up the trucks, cans, drove to LaBelle and ate breakfast at Flora and Ella's.

0910 Left LaBelle and headed for Ft. Myers.

1115 Arrive at site, unload at the staging area, piled sand and grout. Robert left for water at the Lee County Corkscrew plant.

1225 Began carrying in equipment.

1305 Started drilling. The standing water depth is 21 inches above grade.

Depth (B.L.S.)	SPT Count	Sample Recovery	Sample Number
0-2 feet	1/1/1/2	29% recovery	S-1
2-4 feet	1/1/4/6	45% recovery	S-2
4-6 feet	5/4/6/5	70% recovery	S-3
6-8 feet	15/5/6/5	87% recovery	S-4
8-10 feet	5/3/2/1	58% recovery	S-5
10-12 feet	2/2/1/41	80% recovery	S-6
12-14 feet	1/10/27/29	91% recovery	S-7
14-16 feet	8/14/8/6	74% recovery	S-8
16-18 feet	4/5/21/21	83% recovery	S-9
18-20 feet	6/12/10/12	24% recovery	S-10

1445 Driving casing 18-20 feet

1520 20 feet bottom of hole.

1530 Washing out casing. Installing well.
Well specifications: Grout - 5 bags
Sand - 1 bag
Bentonite - 5 lbs.
Risers - 10',10', 2' screen
Installed 7' of 8" surface casing

Continued Next Page

Isolated Wetlands Drilling Program
Flint Pen Strand, Fort Myers
Lee County, Florida

02/11/97 Well # FP-3

Time	
1605	Started pulling casing and grouting. Well = 19 feet deep. Jetted in 8 inch and grouted.
1645	Finished pulling casing, mixed grout for 8 inch casing. Started carrying equipment out.
1720	Finished carrying out equipment with 5 people working. Extra person is a lot of help.
1745	Left site for hotel.

End of Entry 2/11/97

Isolated Wetlands Drilling Program
Flint Pen Strand, Fort Myers
Lee County, Florida

Location: Cypress Head at the end
of road Near staging area FP-5
Township: 46 S, Range: 26 E, Section 28
Drill Dates: 02/12/97
South Florida Water Management District
District Personnel: Steve Krupa
Precision Drilling Staff: Robert Miller
Joe Crisalli, Willie Thomas

02/12/97 Well # FP-5

Time

0700 Drillers on site. Problems with the steam cleaner, water in the fuel.

0915 Started steam cleaning.

0945 Loaded up to perform FP-4 initially, but there was no water in the wetland. Need fittings from Home Depot for water lines. Will do FP-4 on the way out.

1015 Moved to FP-5, started loading equipment to the site, returned to get tripod.

1100 Started pumping water from wells 4th one up and 5th one up. Very slow pumping.

1200 Started spooning.

Depth (B.L.S.)	SPT Count	Sample Recovery	Sample Number
0-2 feet	2/2/2/2	29% recovery	S-1
2-4 feet	2/3/3/4	98% recovery	S-2
4-6 feet	5/4/4/4	75% recovery	S-3
6-8 feet	6/4/4/4	91% recovery	S-4
8-10 feet	9/9/9/9	100% recovery	S-5
10-12 feet	12/11/10/10	79% recovery	S-6
12-14 feet	21/8/4/8	92% recovery	S-7
14-16 feet	13/6/6/4	80% recovery	S-8
16-18 feet	1/1/-/-	95% recovery	S-9
18-20 feet	refusal	0% no recovery	S-10

Will install 18 foot well, bent chisel bit, hard material
Well specifications: Grout - 5 bags
Sand - 1 bag
Bentonite - 5 lbs.
Risers - 10',5',2-1/2',2' screen
Installed 7' of 8" surface casing

Continued next page.

Isolated Wetlands Drilling Program
Flint Pen Strand, Fort Myers
Lee County, Florida

02/12/97 Well # FP-5

Time	
1400	Started pulling casing, pulled two casings and poured grout, drove in 8 inch casing and grouted, pumped well, very slow recharging and dirty water.
1520	Finished well, cleaned up 8 inch and finished pulling the 5 inch casing.
1610	Back at staging area steam cleaning.
1715	Started carrying in to FP-4 site.
1815	Left site for hotel.

End of Entry 2/12/97

Isolated Wetlands Drilling Program
Flint Pen Strand, Fort Myers
Lee County, Florida

Location: Cypress Head at the beginning
of road North of staging area FP-4
Township: 46 S, Range: 26 E, Section 28
Drill Dates: 02/13/97
South Florida Water Management District
District Personnel: Steve Krupa
Precision Drilling Staff: Robert Miller
Joe Crisalli, Willie Thomas

02/13/97 Well # FP-4

Time

0700 Dry site, water was pumped in. Joe is having back pain today. Drillers on site, already picked up water from Lee County Plant. Bought fittings to pump water out to wetlands FP-4 site.

0740 Started SPT's and driving casing.

Depth (B.L.S.)	SPT Count	Sample Recovery	Sample Number
0-2 feet	1/1/1/1	50% recovery	S-1
2-4 feet	1/1/2/5	96% recovery	S-2
4-6 feet	4/3/3/4	95% recovery	S-3
6-8 feet	7/6/5/7	88% recovery	S-4
8-10 feet	6/5/6/8	84% recovery	S-5
10-12 feet	12/11/12/14	95% recovery	S-6
12-14 feet	10/5/4/3	95% recovery	S-7
14-16 feet	11/4/2/2	90% recovery	S-8
16-18 feet	4/3/3/3	70% recovery	S-9
18-20 feet	5/5/3/3	88% recovery	S-10

1035 Prepared to install the well, carried in grout, sand, and pipe. Filling tanks from well casing. Installed well, sand packed well screen.

1130 Break for lunch; pumped out well.

1200 Started to mix grout, poured grout. Very porous, takes 8 ½ bags of grout. Poured in lifts with 45 minutes between lifts.

Well specifications: Grout - 8 ½ bags
Sand - 1 bag
Bentonite - 5 lbs.
Risers - 10',5',2',2' screen
Installed 6' of 8" surface casing

1345 Finish grouting, pull casing. Still taking grout. Begin to carry out equipment.

Continued Next Page

Isolated Wetlands Drilling Program
Flint Pen Strand, Fort Myers
Lee County, Florida

02/13/97 Well # FP-4

Time	
1425	Poured last bag of grout.
1520	Finish carrying out equipment, de-con for next site. I departed site to locate FP-8 site.
1545	Return from FP-8 site. Joe continues to have back problems. He wants to see a doctor or possibly go home. I will run him to the hotel to take a plane home. Robert and Willie will load out for FP-8.
1645	Back from hotel, Robert and Willie could not find the site so they left for the hotel. I will work tonight on the computer and the site maps.

End of Entry 2/13/97

Isolated Wetlands Drilling Program
Flint Pen Strand, Fort Meyers
Lee County, Florida

Location: Cypress Head close to FP-4
Township: 46 S, Range: 26 E, Section 28
Drill Dates: 02/14/97
South Florida Water Management District
District Personnel: Steve Krupa, stacy Hill
Precision Drilling Staff: Robert Miller
Rob Carver, Willie Thomas

02/14/97 Well # FP-8

Stacy (SFWMD) on site, Rob Carver - new help to replace Joe. Joe returned to Ft. Lauderdale due to back problems.

0730 Drillers on site. Robert took Joe home and picked up Rob Carver.

0745 Loaded up all trucks and headed for FP-8.

0805 Arrive at FP-8, look for road to access side of wetland.

0930 Carried out equipment and set up.

0945 Started drilling.

Depth (B.L.S.)	SPT Count	Sample Recovery	Sample Number
0-2 feet	1/1/1/1	35% recovery	S-1
2-4 feet	1/1/2/5	96% recovery	S-2
4-6 feet	4/3/3/4	98% recovery	S-3
6-8 feet	7/6/5/7	72% recovery	S-4
8-10 feet	6/5/6/8	73% recovery	S-5
10-12 feet	12/11/12/14	79% recovery	S-6
12-14 feet	10/5/4/3	70% recovery	S-7
14-16 feet	50/50/50/50	21% recovery	S-8
16-18 feet	No samples collected		Hard Limestone
18-20 feet	No samples collected`		Hard Limestone

Total well depth 14 feet.

1000 Went with Stacy to see FP-6 and FP-7, drillers continue driving spoons.

1145 Return to FP-8, set well.

Well specifications: Grout - 4 bags
Sand - 1 bag
Bentonite - 5lbs.
Risers - 10',2',2' screen
Installed 7' of 8" surface casing

1215 Break for lunch.

1225 Started pumping well to get ready for grout and jetting of 8 inch casing.

End of Entry 2/14/97

Isolated Wetlands Drilling Program
Flint Pen Strand, Fort Meyers
Lee County, Florida

02/15/97 FP-8

Time	
1433	Developed well with Robert. Obtained a water quality sample for well and surface water reading. Pumping at 2-3 gallons per minute. Water is clear.

End of Entry 2/15/97

Isolated Wetlands Drilling Program
Flint Pen Strand, Fort Myers
Lee County, Florida

Location: Back Cypress Head FP-6
Township: 46 S, Range: 26 E, Section 27
Drill Dates: 02/15/97
South Florida Water Management District
District Personnel: Steve Krupa, Stacy Hill
Precision Drilling Staff: Robert Miller
Rob Carver, Willie Thomas

02/15/97 Well # FP-6

Time

0700 Drillers on site. Site already set up to drill.

0745 Started driving spoons and casings.

Depth (B.L.S.)	SPT Count	Sample Recovery	Sample Number
0-2 feet	1/1/1/1	55% recovery	S-1
2-4 feet	1/1/4/4	98% recovery	S-2
4-6 feet	11/7/4/4	74% recovery	S-3
6-8 feet	8/4/4/5	83% recovery	S-4
8-10 feet	22/10/10/10	74% recovery	S-5
10-12 feet	8/11/12/16	91% recovery	S-6
12-14 feet	18/6/6/6	83% recovery	S-7
14-16 feet	20/4/1/1	95% recovery	S-8
16-18 feet	7/7/7/5	91% recovery	S-9
18-20 feet	8/11/-/-	62% recovery	S-10

Hit hard rock at 19 feet.

1020 Well specifications: Grout - 5 bags
Sand - 1 bag
Bentonite - 5 lbs.
Risers - 10',5',2 ½', 2' screen
Installed 7' of 8" surface casing

1115 Break for lunch; pump water for grout.

1145 Started grouting and pulling casing.

1250 Disassembled tripod.

1315 Started de-con for the next site.

1510 Developed well. Took water quality readings. Also took surface water readings. Pumped at an approximate flowrate of 2-3 GPM. Water is clear.

1555 De-contaminated equipment for the next site.

1620 Developed FP-3 and took water quality samples for well and surface water. Pumping at 5 GPM; water is clear.
Equipment is set up at FP-7, ready for tomorrow.

End of Entry 2/15/97

Isolated Wetlands Drilling Program
Flint Pen Strand, Fort Myers
Lee County, Florida

Location: Back Cypress Head FP-7
Township: 46 S, Range: 26 E, Section 27
Drill Dates: 02/16/97
South Florida Water Management District
District Personnel: Steve Krupa, Stacy Hill
Precision Drilling Staff: Robert Miller
Rob Carver, Willie Thomas

02/16/97 Well # FP-7

Time

0700 Carried in the last bit of supplies.

0736 Took shelby tube.

0757 Started driving spoons and casing.

Depth (B.L.S.)	SPT Count	Sample Recovery	Sample Number
0-2 feet	1/1/1/1	53% recovery	S-1
2-4 feet	3/3/5/5	30% recovery	S-2
4-6 feet	7/5/4/5	95% recovery	S-3
6-8 feet	3/3/3/3	74% recovery	S-4
8-10 feet	2/2/2/2	68% recovery	S-5
10-12 feet	7/3/3/3	66% recovery	S-6
12-14 feet	3/2/1/1	80% recovery	S-7
14-16 feet	8/-/-/- refusal	66% recovery	S-8
16-18 feet	No sample	Hard rock	S-9
18-20 feet	No sample	Hard rock	S-10

Hit rock at 15 feet

0904 Finished driving spoons.

0950 Rain started.

1115 Finished well and loaded equipment to be taken for decontamination.
Well specifications: Grout - 5 bags
Sand - 1 bag
Bentonite - 5 lbs.
Riser - 10', 5', 2 ½', 2' screen
Installed 7' of 8" surface casing

1142 Arrive at de-con area, unload and clean equipment.

1221 Finished de-con and loading, headed for supplies area.

1251 Arrive at FP-2. Took a lunch break.

1309 Started setting up equipment at FP-2 site.

1347 Developed FP-7 well and took water quality sample of well and surface water. Pumped at a rate of 2-3 GPM. Clear water.

End Entry

Isolated Wetlands Drilling Program
Flint Pen Strand, Fort Myers
Lee County, Florida

Location: Marsh near water treatment plant
Township: 46 S, Range: 26 E, Section 27
Drill Dates: 02/16/97 to 2/17/97
South Florida Water Management
District Personnel: Steve Krupa, Stacy Hill
Precision Drilling Staff: Robert Miller
Rob Carver, Willie Thomas

02/16/97 Well # FP-2

Time

1400 Started driving spoons and casings at FP-2.

Depth (B.L.S.)	SPT Count	Sample Recovery	Sample Number
0-2 feet	1/1/1/1	0% no recovery	S-1
2-4 feet	2/2/2/3	53% recovery	S-2
4-6 feet	3/5/4/6	85% recovery	S-3
6-8 feet	7/3/4/3	75% recovery	S-4
8-10 feet	12/6/3/3	70% recovery	S-5
10-12 feet	9/8/9/15	92% recovery	S-6
12-14 feet	12/6/5/25	75% recovery	S-7
14-16 feet	18/33/28/13	91% recovery	S-8
16-18 feet	No sample	Hard rock	S-9
18-20 feet	No sample	Hard rock	S-10

Samples S-4 through S-10 completed on 2/17/97

1520 Hammer broke. Going back to hotel until tomorrow. A new hammer will arrive on 2/17/97.
Sample S-1 could not be obtained. The dirt was compacting and would not pass through the spoon. Two attempts were made.

End of Entry 2/16/97

Isolated Wetlands Drilling Program
Flint Pen Strand, Fort Myers
Lee County, Florida

Location: Marsh near water treatment plant
Township: 46 S, Range: 26 E, Section 27
Drill Dates: 02/16/97 to 2/17/97
South Florida Water Management District
District Personnel: Steve Krupa
Precision Drilling Staff: Robert Miller
Rob Carver, Willie Thomas

02/17/97 Well # FP-2

Time

0700 Arrived at site. The new hammer was delivered.
Well specifications: Grout - 4 bags
Sand - 1 bag
Bentonite - 5 lbs.
Risers - 10', 2 ½', 2 ½', 2' screen
5 lbs. of bentonite
Installed 7' of 8" surface casing

1130 FP-4 Slug Test
Surface: dry Water level: -3.55 feet from TOC
Total depth: 22.45 feet Well above grade: 2.55 feet
Surface casing above grade: 1.5 feet
Transducer depth: 18.83 feet
File: Test 0

1230 FP-2 Slug Test
Surface: dry Water level: -9.15 feet from TOC
Total depth: 17.78 feet Well above grade: 4.00 feet
Surface casing above grade: 2.58 feet
Transducer depth: 8.87 feet
File: Test 1

1330 FP-7 Slug Test
Surface: dry at well, water at center Water level: -3.74 feet from TOC
Total depth: 18.8 feet Well above grade: 2.85 feet
Surface casing above grade: 1.72 feet
Transducer depth: 14.17 feet
File: Test 2

2/17/97 Slug tests continued. Ft. Myers

1400 FP-6 Slug Test
Water level: -3.37 feet from TOC
Total depth: 20.32 feet Well above grade: 2.70 feet
Surface casing above grade: 1.60 feet
Transducer depth: 17.05 feet
File: Test 3

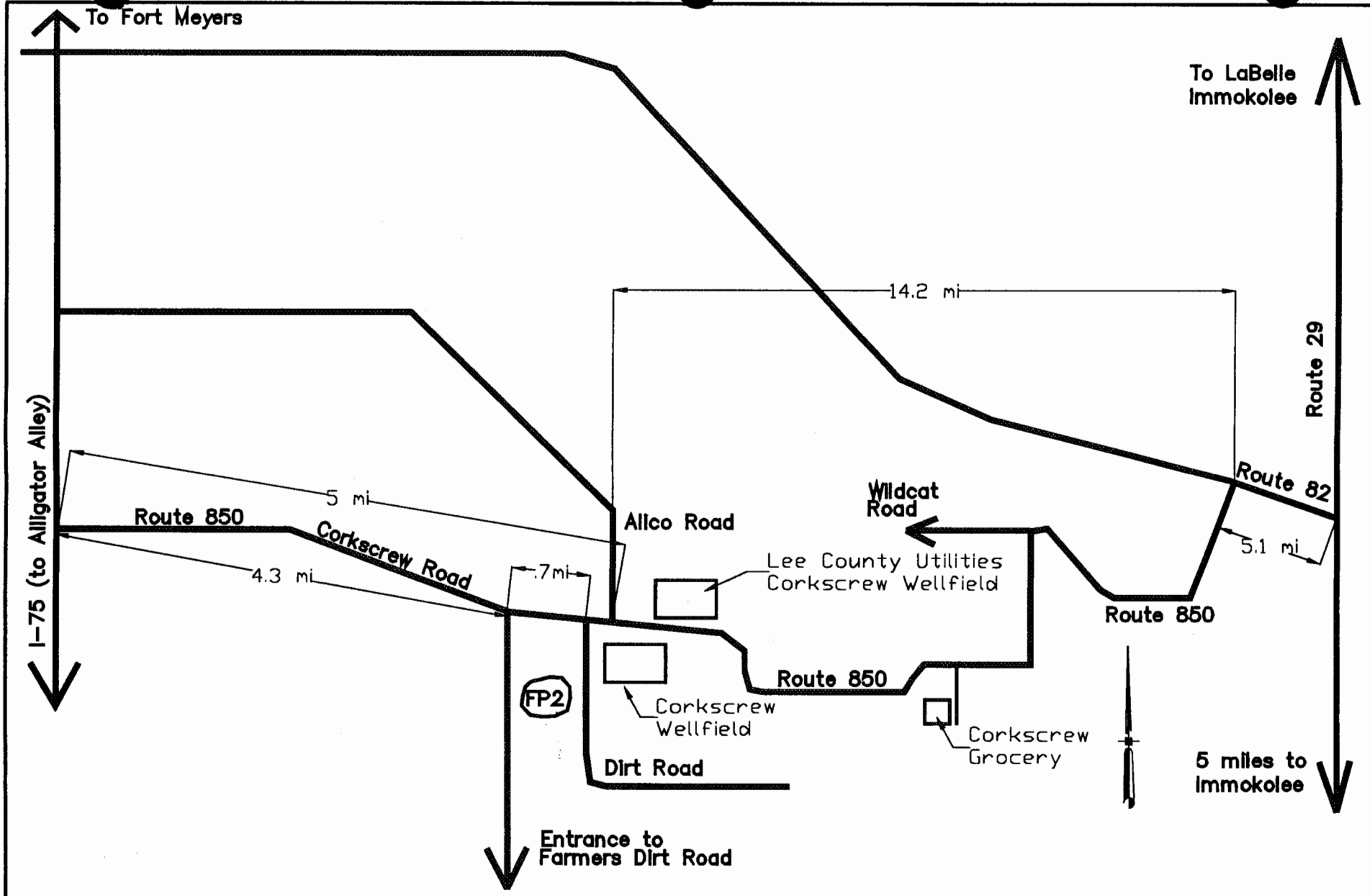
1440 FP-8 Slug Test
Water level: -3.32 feet from TOC
Total depth: 15.26 feet Well above grade: 2.58 feet
Surface casing above grade: 1.60 feet
Transducer depth: 12.18 feet
File: Test 4

1530 FP-5 Slug Test
Water level: -3.01 feet from TOC
Total depth: 20.30 feet Well above grade: 2.30 feet
Surface casing above grade: 0.90 feet
Transducer depth: 17.46 feet
File: Test 5

1750 FP-3 Slug Test
Water level: -3.95 feet from TOC
Total depth: 22.35 feet Well above grade: 3.46 feet
Surface casing above grade: 2.20 feet
Transducer depth: 18.22 feet
File: Test 6 Surface water: 2.10 feet above grade

End of Entry 2/17/97

SITE MAPS



ENGINEERED
ENVIRONMENTAL
SOLUTIONS, INC.
1301 NW 4th Street, Boca Raton, FL 33486 Tel/Fax 561-394-3969, Beeper 708-0165

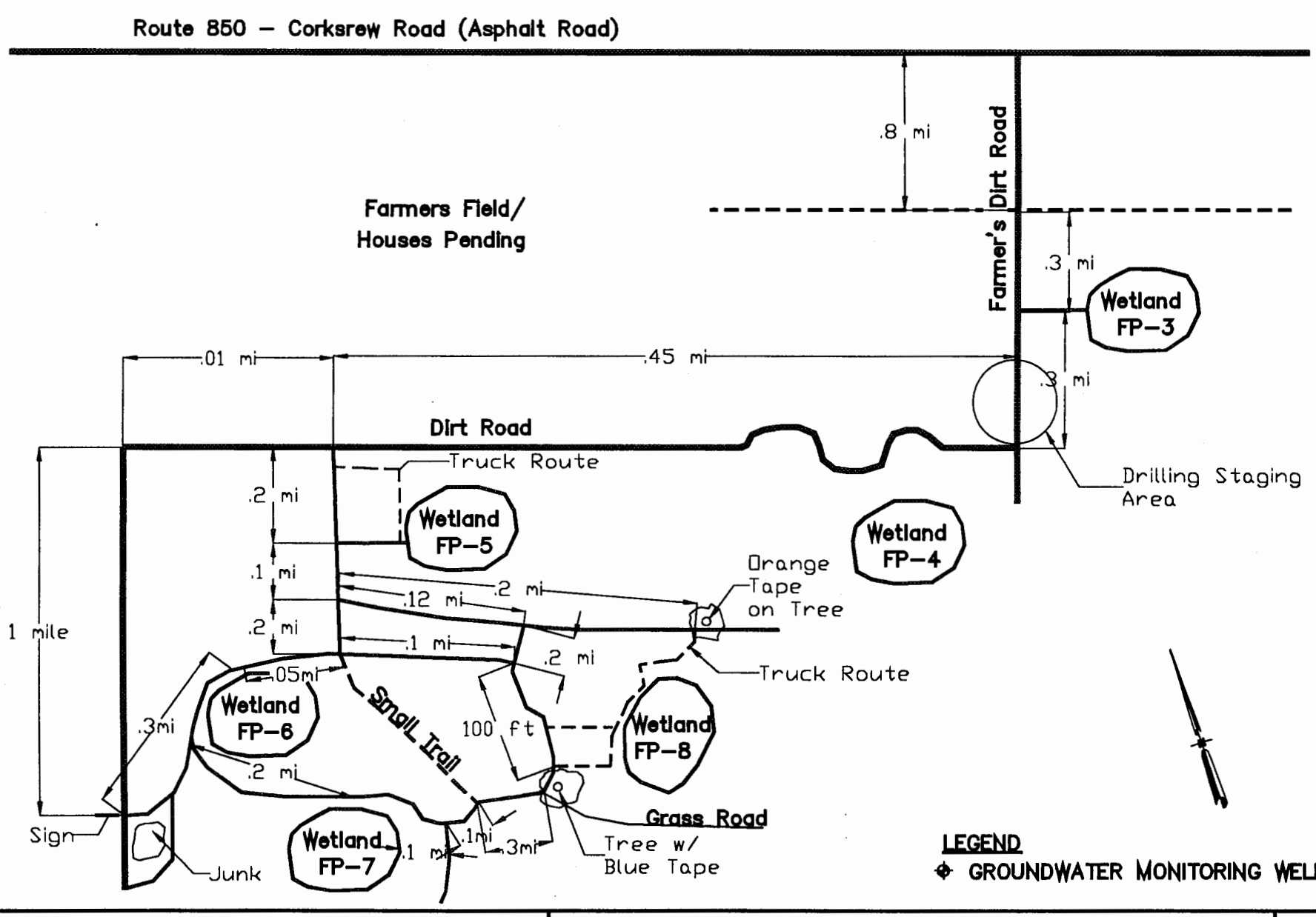
SITE LOCATION MAP – FLINT PEN FP1

ISOLATED WETLANDS DRILLING PHASE 1
SOUTH FLORIDA WATER MANAGEMENT DISTRICT

CONTRACT NO.:C-7665	FILENAME: FPEN2.dwg	DATE: 3/28/97	SCALE: NTS

13

c:\projects\wetlands1\FPEN2.DWG



ENGINEERED ENVIRONMENTAL SOLUTIONS, INC.
1301 NW 4th Street, Boca Raton, FL 33486 Tel/Fax 561-394-3969, Beeper 708-0165

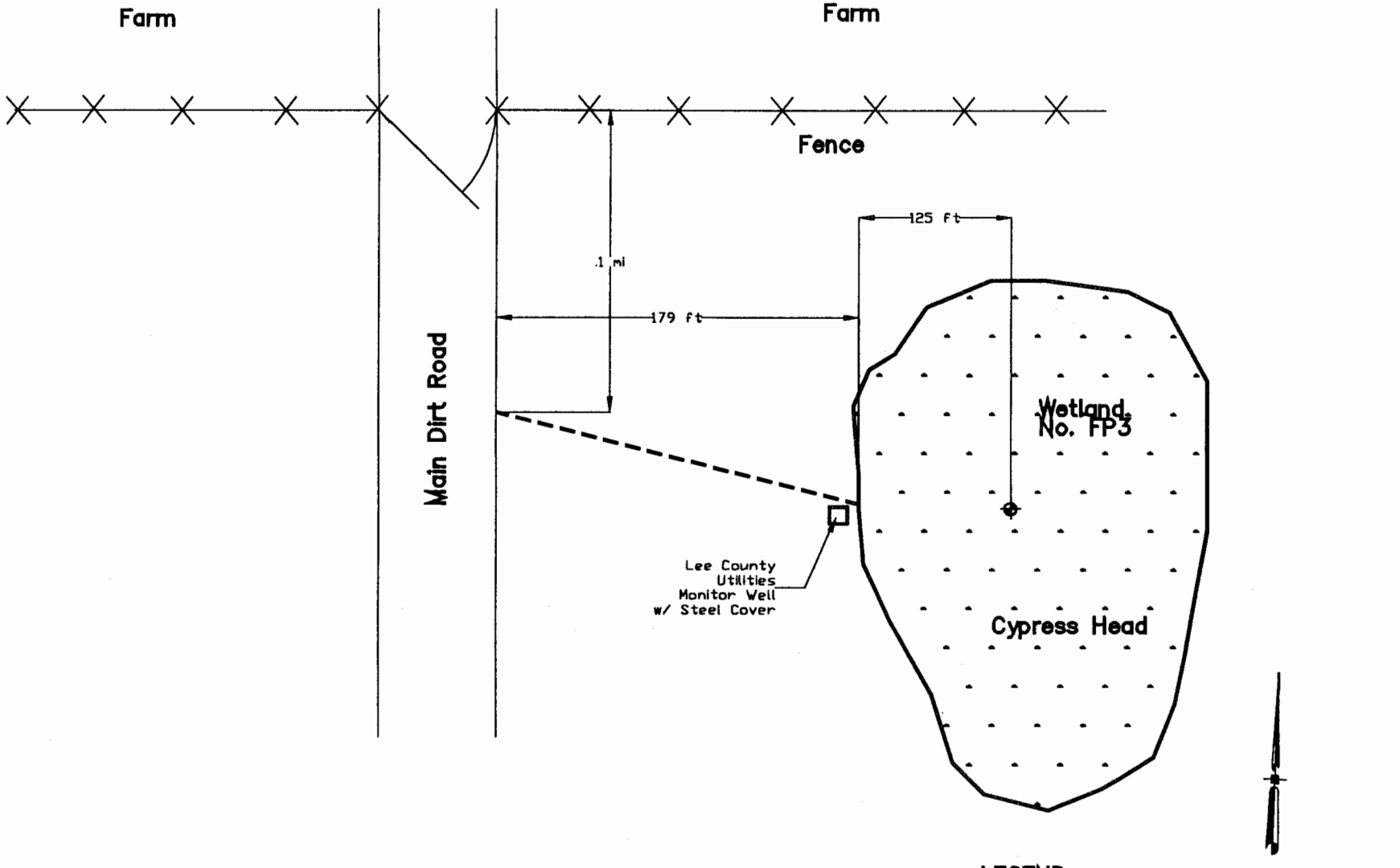
SITE LOCATION MAP – FLINT PEN

ISOLATED WETLANDS DRILLING PHASE 1
SOUTH FLORIDA WATER MANAGEMENT DISTRICT

CONTRACT NO.:C-7665	FILENAME: FPEN1.dwg	DATE: 3/28/97	SCALE: NTS

12

c:\projects\wetlands1\FPEN1.DWG



ENGINEERED ENVIRONMENTAL SOLUTIONS, INC.
1301 NW 4th Street, Boca Raton, FL 33486 Tel/Fax 561-394-3969, Beeper 708-0165

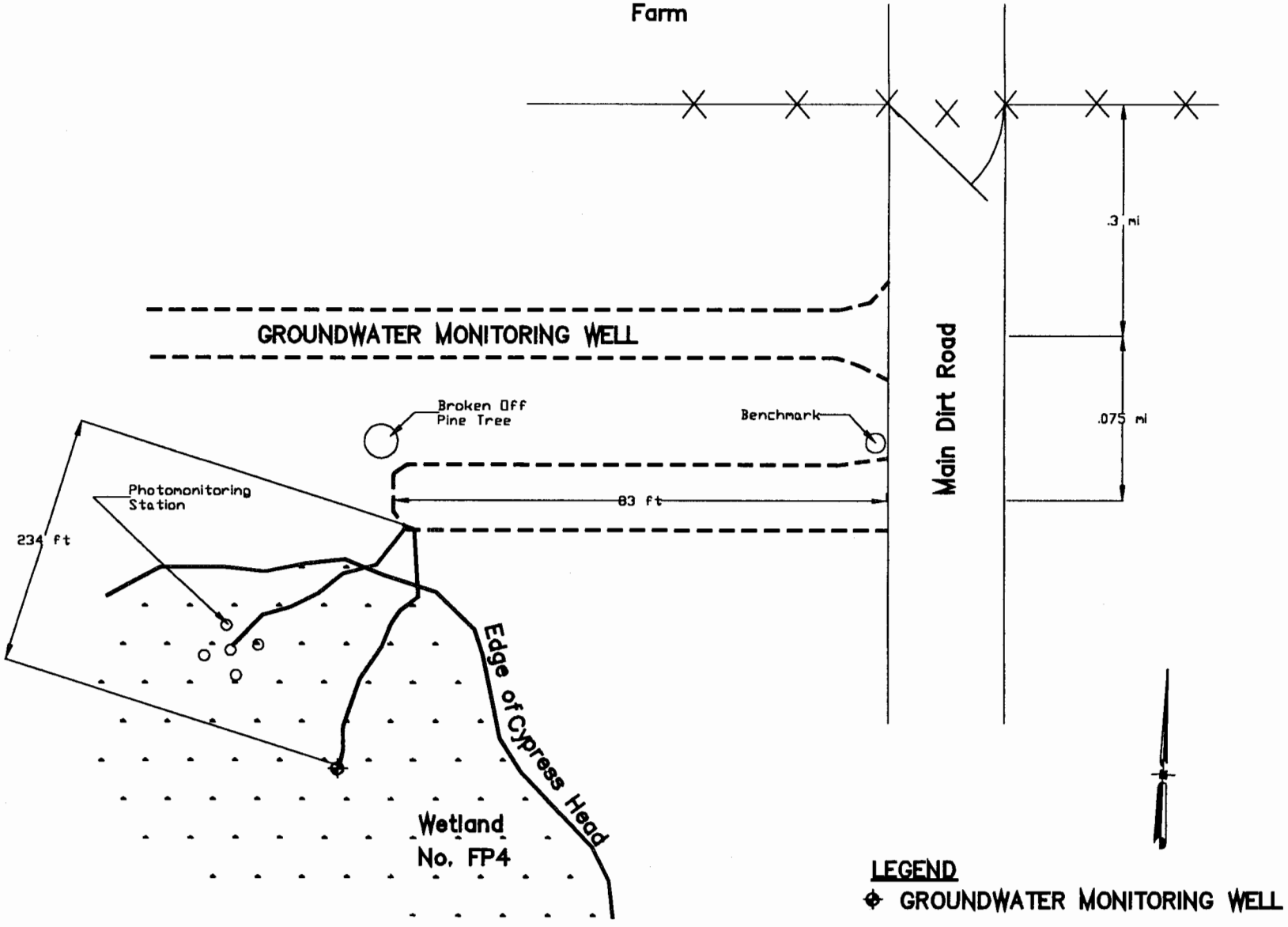
SITE LOCATION MAP – FP3

ISOLATED WETLANDS DRILLING PHASE 1
SOUTH FLORIDA WATER MANAGEMENT DISTRICT

CONTRACT NO.:C-7665	FILENAME: FP3.dwg	DATE: 3/28/97	SCALE: NTS

14

c:\projects\wetlands1\FP3.dwg



ENGINEERED
ENVIRONMENTAL
SOLUTIONS, INC.
1301 NW 4th Street, Boca Raton, FL 33486 Tel/Fax 561-394-3869, Beeper 708-0165

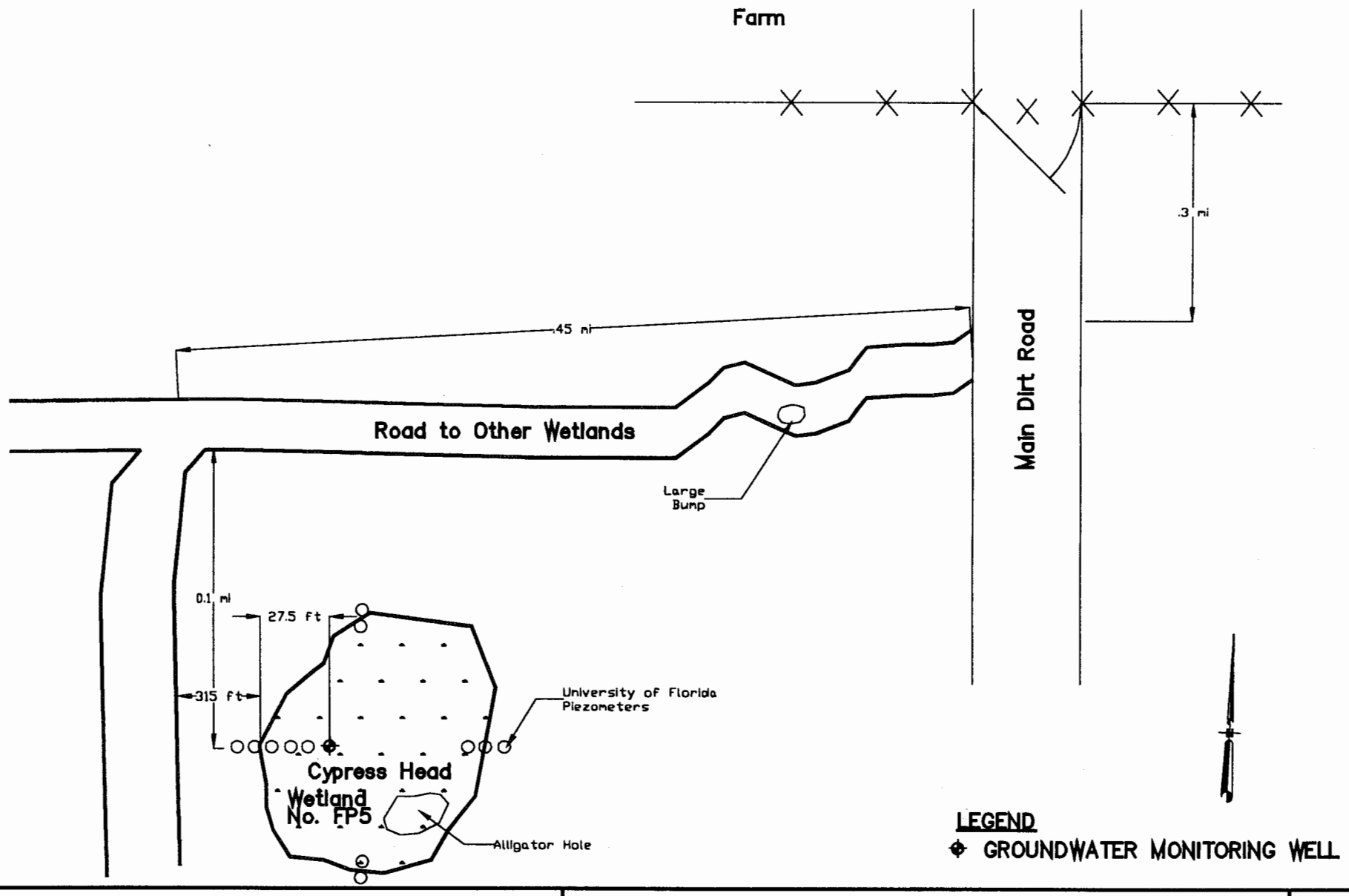
SITE LOCATION MAP – FP4

ISOLATED WETLANDS DRILLING PHASE 1
SOUTH FLORIDA WATER MANAGEMENT DISTRICT

CONTRACT NO.:C-7665	FILENAME: FP4.dwg	DATE: 3/28/97	SCALE: NTS

15

c:\projects\wetlands1\FP4.dwg



ENGINEERED ENVIRONMENTAL SOLUTIONS, INC.
1301 NW 4th Street, Boca Raton, FL 33486 Tel/Fax 561-394-3969, Beeper 708-0165

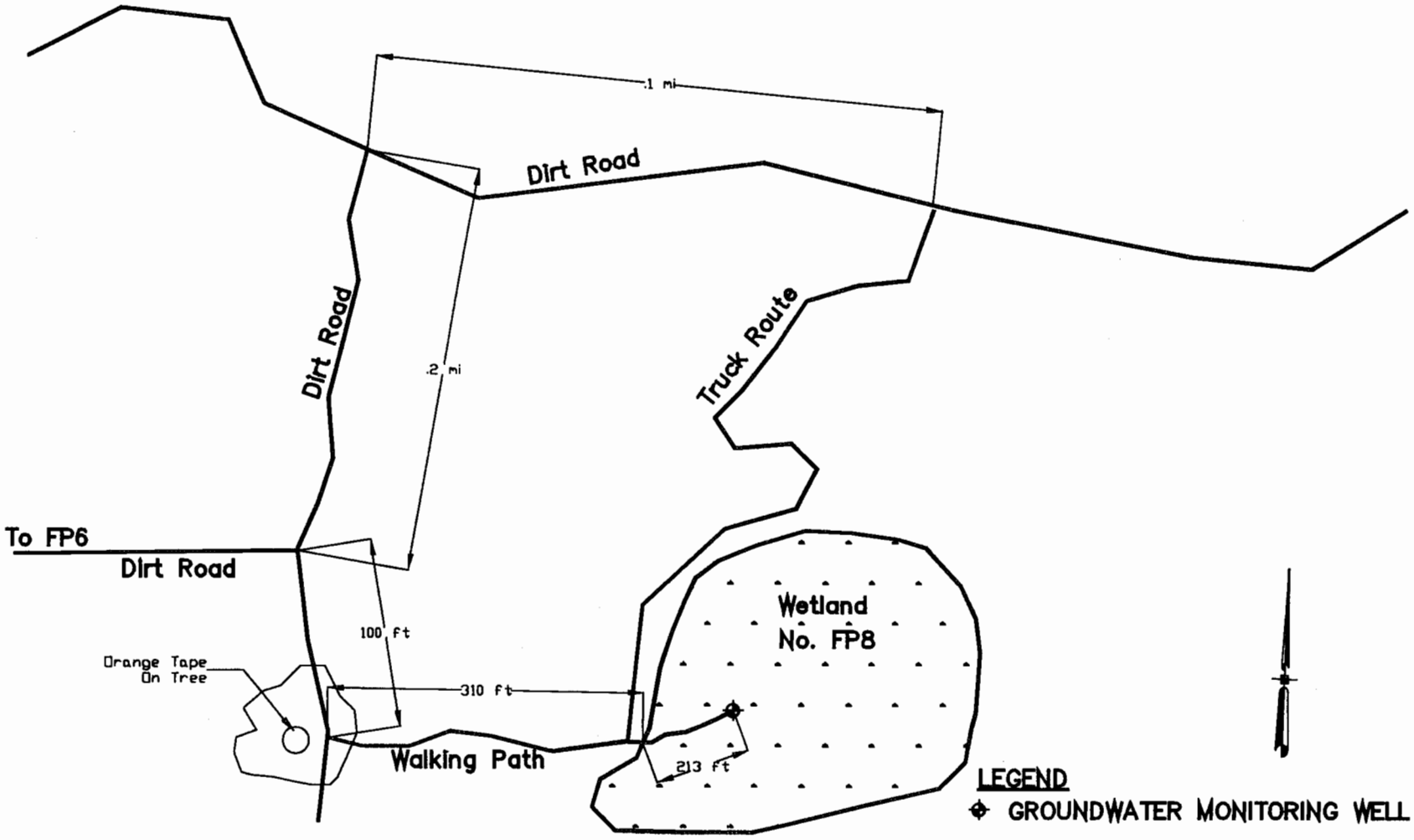
SITE LOCATION MAP – FP5

ISOLATED WETLANDS DRILLING PHASE 1
SOUTH FLORIDA WATER MANAGEMENT DISTRICT

CONTRACT NO.:C-7665	FILENAME: FP5.dwg	DATE: 3/28/97	SCALE: NTS

16

c:\projects\wetlands1\FP5.dwg



ENGINEERED
ENVIRONMENTAL
SOLUTIONS, INC.
1301 NW 4th Street, Boca Raton, FL 33486 Tel/Fax 561-394-3969, Beeper 708-0165

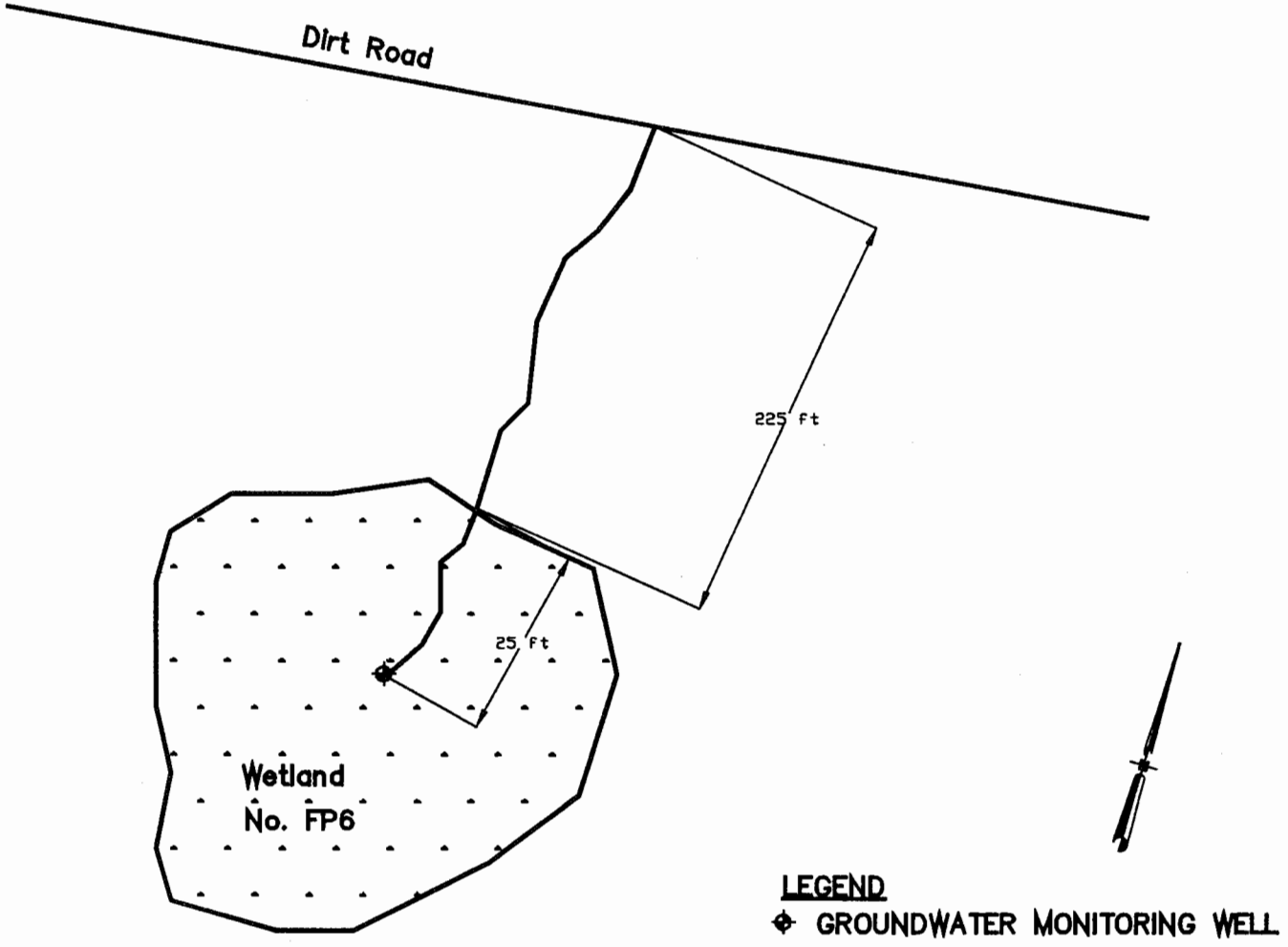
SITE LOCATION MAP – FP8

ISOLATED WETLANDS DRILLING PHASE 1
SOUTH FLORIDA WATER MANAGEMENT DISTRICT

CONTRACT NO.:C-7665	FILENAME: FP8.dwg	DATE: 3/28/97	SCALE: NTS

17

c:\projects\wetlands1\FP8.dwg



ENGINEERED
ENVIRONMENTAL
SOLUTIONS, INC.
1301 NW 4th Street, Boca Raton, FL 33486 Tel/Fax 561-394-3969, Beeper 708-0165

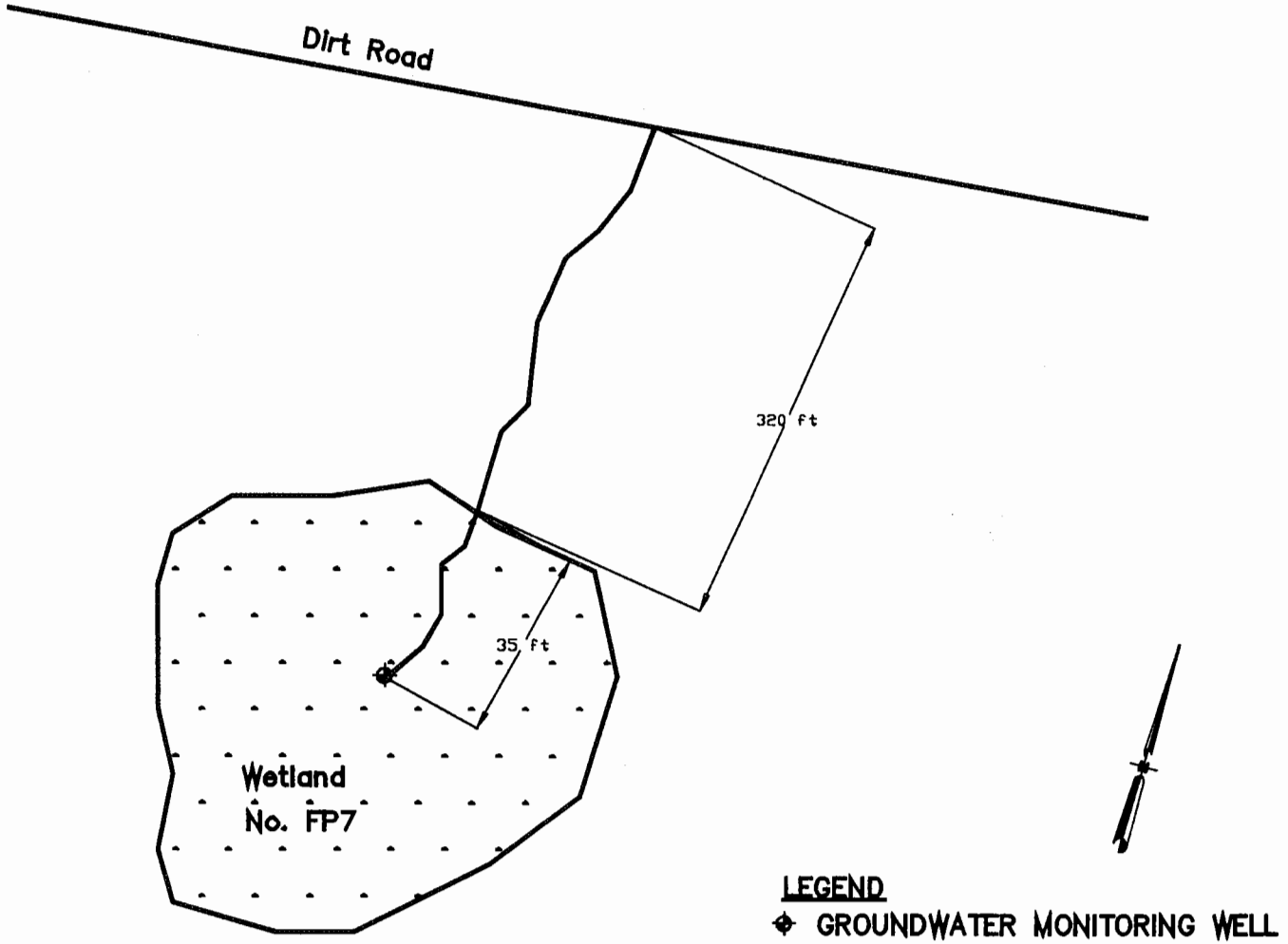
SITE LOCATION MAP – FP6

ISOLATED WETLANDS DRILLING PHASE 1
SOUTH FLORIDA WATER MANAGEMENT DISTRICT

CONTRACT NO.:C-7665	FILENAME: FP6.dwg	DATE: 3/28/97	SCALE: NTS

18

c:\projects\wetlands1\FP6.dwg



LEGEND

◆ GROUNDWATER MONITORING WELL

ENGINEERED ENVIRONMENTAL SOLUTIONS, INC.
1301 NW 4th Street, Boca Raton, FL 33486 Tel/Fax 561-394-3969, Beeper 708-0165

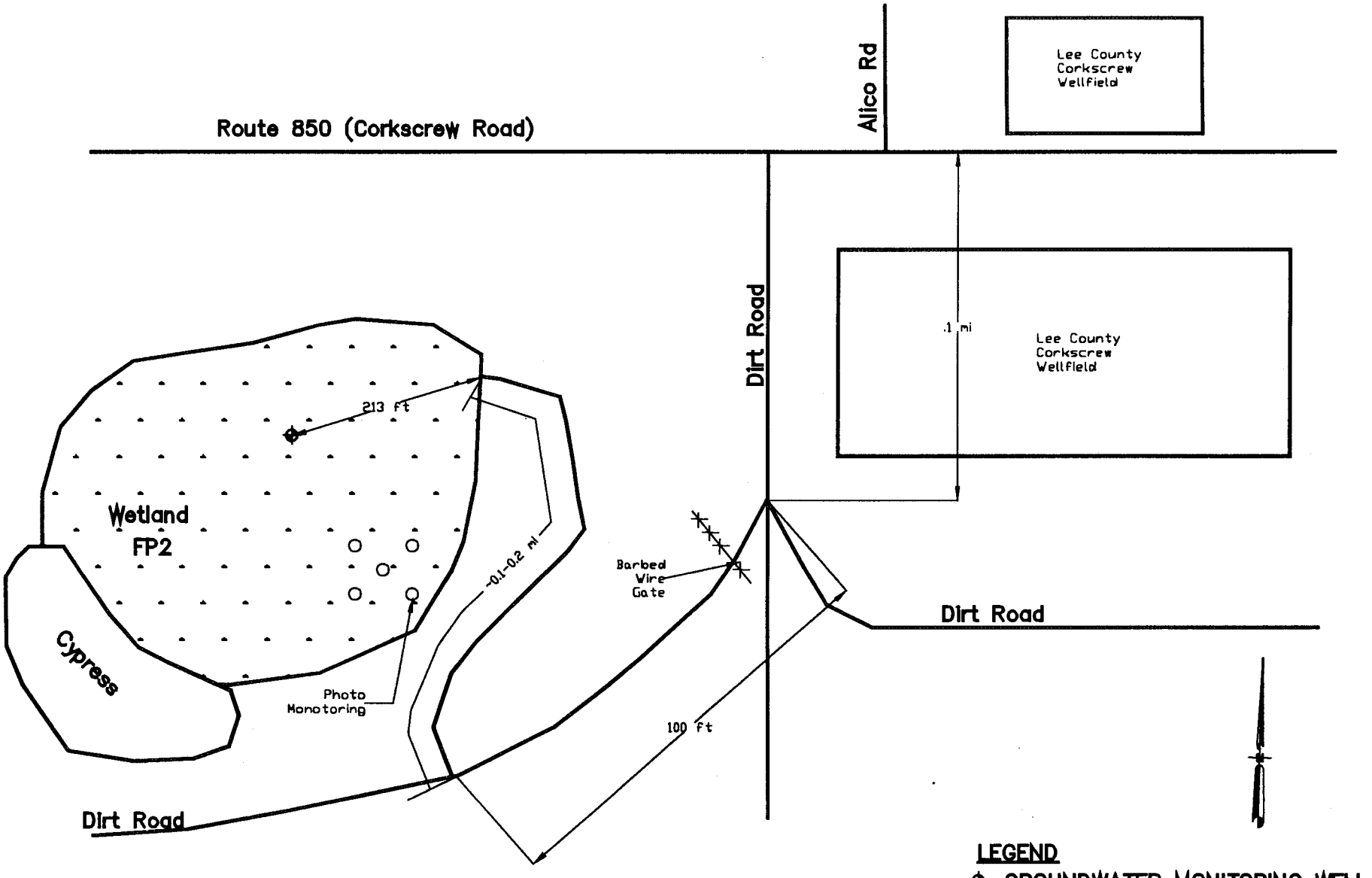
SITE LOCATION MAP – FP7

ISOLATED WETLANDS DRILLING PHASE 1
SOUTH FLORIDA WATER MANAGEMENT DISTRICT

CONTRACT NO.:C-7665	FILENAME: FP7.dwg	DATE: 3/28/97	SCALE: NTS

19

c:\projects\wetlands1\FP7.dwg



ENGINEERED
ENVIRONMENTAL
SOLUTIONS, INC.
1301 NW 4th Street, Boca Raton, FL 33486 Tel/Fax 561-394-3969, Beeper 708-0165

SITE LOCATION MAP – FP2

ISOLATED WETLANDS DRILLING PHASE 1
SOUTH FLORIDA WATER MANAGEMENT DISTRICT

CONTRACT NO.:C-7665	FILENAME: FP2.dwg	DATE: 3/28/97	SCALE: NTS

20

c:\projects\wetlands1\FP2.dwg

BORING LOGS AND WELL CONSTRUCTION DRAWINGS

South Florida Water Management District
3301 Gun Club Road
West Palm Beach, Florida 33406
(561) 686-8800 / Fax 687-6442

Engineered Environmental Solutions, Inc.
1301 NW 4th Street
Boca Raton, Florida 33486
Ph/Fax: (561) 394-3969

BORING LOG

BORING/WELL NO.	PROJECT NO./NAME	LOCATION
FP2	1033/Isolated Wetlands Shallow Drilling Program	Flint Pen Strand, Fort Myers, Florida

DRILLING CONTRACTOR/DRILLER: **Precision Drilling/Robert Miller**

GEOLOGIST/OFFICE: **Steve Krupa/South Florida Water Management District**

DRILLING EQUIPMENT/METHOD	SIZE/TYPE OF BIT	SAMPLING METHOD	START/FINISH DATE
Tripod/SPT	3'-5"dia. casing, driven and washed	Split Spoon	2/16/97-2/16/97

WELL INSTALLED?	CASING MAT./DIA.	SCREEN:				
YES ☒ NO ☐	Sch.40 monoflex PVC/2"	TYPE Slotted	MAT. PVC	LENGTH 2'	DIA. 2"	SLOT SIZE .010

ELEVATION OF:	GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN	DATE
(FT. ABOVE M.S.L.)	17.60 ft	4.0 ft	11.78 ft/13.78 ft	2/17/97

REMARKS:

LOG OF TEST BORING

Depth (ft)	Sample Type & Recovery	Sample Number	Penetration Resistance Blows/6" N-Value	Unified Classification	FIELD DESCRIPTION	Munsell Field Color
		S1		PT	Organic Material	12.5/N
					2.0	
		S2	2 2 2 3 4	CL	Clay w/ Iron Staining	10 YR 8/2
5		S3	3 5 4 6 9			10 YR 6/2
		S4	7 3 4 3 7			
		S5	12 6 3 3 9			
					10.0	
10		S6	9 8 9 15 17	SP	Fine sand w/ iron staining	10 YR 8/1
		S7	12 6 5 25 11		Fine sand grading to clay size particles	
					14.0	
		S8	18 33 28 13 61	SP-SC	9 in. Fine Sand w/ shell fragments grading to clay size particles w/ sand	
15					16.0	
		S9 S10				No sample

Penetration Resistance (Blows/Foot) 0 15 35 55 75 100

Graphic Litho Log

Well Construction

Fine Sand | Medium Sand | Bentonite Pellets | Cement Grout | Silt/Clay w/ shell

Organic Material | Clay | Split Spoon | Percent Recovery | No Recovery

EM...TLA 9/9/97

South Florida Water Management District
3301 Gun Club Road
West Palm Beach, Florida 33406
(561) 686-8800 / Fax 687-6442

Engineered Environmental Solutions, Inc.
1301 NW 4th Street
Boca Raton, Florida 33486
Ph/Fax: (561) 394-3969

BORING LOG

BORING/WELL NO.	
FP3	

PROJECT NO./NAME	LOCATION
1033/Isolated Wetlands Shallow Drilling Program	Flint Pen Strand, Fort Myers, Florida

DRILLING CONTRACTOR/DRILLER
Precision Drilling/Robert Miller

GEOLOGIST/OFFICE
Steve Krupa/South Florida Water Management District

DRILLING EQUIPMENT/METHOD	SIZE/TYPE OF BIT	SAMPLING METHOD	START/FINISH DATE
Tripod/SPT	3'-5" dia. casing Driven and Washed	Split Spoon	2/11/97-2/11/97

WELL INSTALLED?	CASING MAT./DIA.	SCREEN:				
YES ☒ NO ☐	Sch.40 monoflex PVC/2"	TYPE Slotted	MAT. PVC	LENGTH 2'	DIA. 2"	SLOT SIZE .010

ELEVATION OF:	GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN	DATE
(FT. ABOVE M.S.L.)	15.00 ft	3.46 ft	16.90 ft/18.90 ft	2/17/97

REMARKS:

Depth (ft)	Sample Type & Recovery	Sample Number	Penetration Resistance Blows/6" N-Value	Unified Classification	LOG OF TEST BORING — FIELD DESCRIPTION	Munsell Field Color
		S1	1 1 1 2 / 2	PT	Fibrous Organic Material	1 2.5/N
		S2	1 1 4 6 / 5			
5		S3	5 4 6 5 / 10			
		S4	15 5 6 5 / 11	SP	6 inches 10 YR 3/1 grading to 13 inches fine sand (10 YR 7/2)	1 2.5/N = 10YR 6/1 / 10 YR 3/1 = 10 YR 7/2
		S5	5 3 2 1 / 5		Marbled fine sand grading toward 11 inches fine sand (10 YR 6/3)	10 YR 4/1 = 10 YR 6/3
10		S6	2 2 1 4 / 3		13 inches fine sand with 10% shell fragments grading towards 60% shell fragments (6.0)	10 YR 5/2 = 10 YR 8/1
		S7	1 10 27 29 / 37	SC	Fine sand w/ 50% shell fragments w/ clay size particles (12.0)	10 YR 8/1
		S8	8 14 8 6 / 22	SP	8 inches shell mash grading towards fine sand w/ 60% shell	
15		S9	4 5 21 21 / 26		10 inches shell mash grading towards fine sand w/ 80% shell	
		S10	6 12 10 12 / 22		Shell fragments (20.0)	
20						

Penetration Resistance (Blows/Foot): 0 15 35 55 75 100

Graphic Litho Log

Well Construction

EVETLA 9/9/97

Fine Sand | Medium Sand | Bentonite Pellets | Cement Grout | Silt/Clay w/ shell

Organic Material | Clay | Split Spoon | Percent Recovery | No Recovery

South Florida Water Management District
3301 Gun Club Road
West Palm Beach, Florida 33406
(561) 686-8800 / Fax 687-6442

Engineered Environmental Solutions, Inc.
1301 NW 4th Street
Boca Raton, Florida 33486
Ph/Fax: (561) 394-3969

BORING LOG

BORING/WELL NO.	**FP4**
PROJECT NO./NAME	**1033/Isolated Wetlands Shallow Drilling Program**
LOCATION	**Flint Pen Strand, Fort Myers, Florida**
DRILLING CONTRACTOR/DRILLER	**Precision Drilling/Robert Miller**
GEOLOGIST/OFFICE	**Steve Krupa/South Florida Water Management District**
DRILLING EQUIPMENT/METHOD	**Tripod/SPT**
SIZE/TYPE OF BIT	**3'-5"dia. casing, driven and washed**
SAMPLING METHOD	**Split Spoon**
START/FINISH DATE	**2/13/97-2/13/97**
WELL INSTALLED? YES ☒ NO ☐	
CASING MAT./DIA.	**Sch.40 monoflex PVC/2"**
SCREEN: TYPE **Slotted** MAT. **PVC** LENGTH **2'** DIA. **2"** SLOT SIZE **.010**	
ELEVATION OF: (FT. ABOVE M.S.L.) GROUND SURFACE	**15.25 ft**
TOP OF WELL CASING	**2.55 ft**
TOP & BOTTOM SCREEN	**18.00 ft/20.00 ft**
DATE	**2/17/97**
REMARKS:	

Depth (ft)	Sample Type & Recovery	Sample Number	Penetration Resistance Blows/6" N-Value	Unified Classification	LOG OF TEST BORING — FIELD DESCRIPTION	Munsell Field Color
		S1	1 1 1 1 2	PT	Fibrous organic material	1 2.5/N
		S2	1 1 2 5 3		Fibrous organic material w/ fine sand	
					4.0	
		S3	4 3 3 4 6	SP	Fine sand	1 2.5/N = 1 8/N
5					6.0	
		S4	7 6 5 7 11	SP-SC	Fine sand grading toward clay size particles	2.5 YR 7/1
					8.0	
		S5	6 5 6 8 11		Fine sand w/ iron staining	10 YR 6/1
10		S6	12 11 12 14 23	SP		
		S7	10 5 4 3 9			
		S8	11 4 2 2 6			10 YR 6/3
15					16.0	
		S9	4 3 3 3 6	OHSH	Fine sand w/ shell fragments grading towards clay size particles	10 YR 6/1 = 10 YR 8/1
		S10	5 5 3 3 8		Fine sand w/ shell mash w/ 50% shell fragments grading toward clay size particles	10 YR 8/1
20						
					22.0	

Penetration Resistance (Blows/Foot): 0, 15, 35, 55, 75, 100

Graphic Litho Log

Well Construction

Fine Sand | Medium Sand | Bentonite Pellets | Cement Grout | Silt/Clay w/ shell

Organic Material | Clay | Split Spoon | Percent Recovery | No Recovery

WETLA 9/9/97

South Florida Water Management District
3301 Gun Club Road
West Palm Beach, Florida 33406
(561) 686-8800 / Fax 687-6442

Engineered Environmental Solutions, Inc.
1301 NW 4th Street
Boca Raton, Florida 33486
Ph/Fax: (561) 394-3969

BORING LOG

BORING/WELL NO.	
FP5	

PROJECT NO./NAME	LOCATION
1033/Isolated Wetlands Shallow Drilling Program	Flint Pen Strand, Fort Myers, Florida

DRILLING CONTRACTOR/DRILLER: **Precision Drilling/Robert Miller**

GEOLOGIST/OFFICE: **Steve Krupa/South Florida Water Management District**

DRILLING EQUIPMENT/METHOD	SIZE/TYPE OF BIT	SAMPLING METHOD	START/FINISH DATE
Tripod/SPT	3'-5" dia. casing, driven and washed	Split Spoon	2/12/97-2/12/97

WELL INSTALLED? YES ☒ NO ☐ | CASING MAT./DIA.: Sch.40 monoflex PVC/2" | SCREEN: TYPE Slotted MAT. PVC LENGTH 2' DIA. 2" SLOT SIZE .010

ELEVATION OF: (FT. ABOVE M.S.L.)	GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN	DATE
	14.80 ft	2.3 ft	16.00 ft/18.00 ft	2/17/97

REMARKS:

Depth (ft)	Sample Type & Recovery	Sample Number	Penetration Resistance Blows/6" N-Value	Unified Classification	LOG OF TEST BORING: FIELD DESCRIPTION	Munsell Field Color
		S1	2 2 2 2 4	PT	Organic Material w/ fine sand	1 2.5/N
					2.0	
		S2	2 3 3 4 6		13 in. fine sand (1 2.5/N) grading to 7 in. (1 4/N)	1 2.5/N = 1 4/N
		S3	5 4 4 4 8	SP	Fine sand	10 YR 8/1
5		S4	6 4 4 4 8			
		S5	9 9 9 9 18			10 YR 7/1
10		S6	12 11 10 10 22		Fine sand w/ iron staining	10 YR 8/1
		S7	21 8 4 8 12			
		S8	13 6 6 4 12			
15					16.0	
		S9	1 1	OLSH	6 in. fine sand w/ clay grading to fine sand w/ 50 % shell	1 6/N = 2.5 YR 8/1
					18.0	
	○	S10			No sample	

Penetration Resistance (Blows/Foot): 0 15 35 55 75 100

Graphic Litho Log

Well Construction

WETLA 9/9/97

Fine Sand | Medium Sand | Bentonite Pellets | Cement Grout | Silt/Clay w/ shell

Organic Material | Clay | Split Spoon | Percent Recovery | No Recovery

South Florida Water Management District
3301 Gun Club Road
West Palm Beach, Florida 33406
(561) 686-8800 / Fax 687-6442

Engineered Environmental Solutions, Inc.
1301 NW 4th Street
Boca Raton, Florida 33486
Ph/Fax: (561) 394-3969

BORING LOG

BORING/WELL NO.	PROJECT NO./NAME	LOCATION
FP6	1033/Isolated Wetlands Shallow Drilling Program	Flint Pen Strand, Fort Myers, Florida

DRILLING CONTRACTOR/DRILLER: Precision Drilling/Robert Miller

GEOLOGIST/OFFICE: Steve Krupa/South Florida Water Management District

DRILLING EQUIPMENT/METHOD	SIZE/TYPE OF BIT	SAMPLING METHOD	START/FINISH DATE
Tripod/SPT	3'-5" dia. casing, driven and washed	Split Spoon	2/15/97-2/15/97

WELL INSTALLED? YES ☒ NO ☐ | CASING MAT./DIA.: Sch.40 monoflex PVC/2" | SCREEN: TYPE Slotted MAT. PVC LENGTH 2' DIA. 2" SLOT SIZE .010

ELEVATION OF:	GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN	DATE
(FT. ABOVE M.S.L.)	14.75 ft	2.70 ft	15.62 ft/17.62 ft	2/17/97

REMARKS:

Depth (ft)	Sample Type & Recovery	Sample Number	Penetration Resistance Blows/6" N-Value	Unified Classification	LOG OF TEST BORING — FIELD DESCRIPTION	Munsell Field Color
		S1	1 1 1 1 2	PT	Fibrous organic material	1 2.5/N
		S2	1 1 4 4 5		Fibrous organic w/ fine sand 4.0	
5		S3	11 7 4 4 11	SP	Fine sand	10 YR 4/1
		S4	8 4 4 5 8			10 YR 6/2
		S5	22 10 10 10 20		2 in. fine sand grading to 10 YR 7/1 w/ iron staining	10 YR 2/1 = 10 YR 7/1
10		S6	8 11 12 16 23		3 in. 10 YR 7/1 fine sand grading to 2 in. 10 YR 3/1 fine sand grading to 8/1 w/ iron staining	10 YR 7/1 = 10 YR 4/1
		S7	18 6 6 6 12		4 in. fine sand marbled w/ organic material grading to 15 in. fine sand	10 YR 7/1
		S8	20 4 1 1 5		Fine sand w/ iron staining 16.0	
15		S9	7 7 7 5 14	OLSH-	Fine sand w/ shell fragments grading to 8 in. of 1 8/N fine sand	1 8/N = 1 2.5/N
		S10	8 11	SC	Fine sand w/ 50 % shell grading to fine sand w/ clay size particles 20.0	1 8/N
20						

Penetration Resistance (Blows/Foot): 0 15 35 55 75 100

Graphic Litho Log

Well Construction

WETLA 9/9/97

Fine Sand | Medium Sand | Bentonite Pellets | Cement Grout | Silt/Clay w/ shell
Organic Material | Clay | Split Spoon | Percent Recovery | No Recovery

South Florida Water Management District
3301 Gun Club Road
West Palm Beach, Florida 33406
(561) 686-8800 / Fax 687-6442

Engineered Environmental Solutions, Inc.
1301 NW 4th Street
Boca Raton, Florida 33486
Ph/Fax: (561) 394-3969

BORING LOG

BORING/WELL NO.	
FP7	

PROJECT NO./NAME	LOCATION
1033/Isolated Wetlands Shallow Drilling Program	Flint Pen Strand, Fort Myers, Florida

DRILLING CONTRACTOR/DRILLER
Precision Drilling/Robert Miller

GEOLOGIST/OFFICE
Steve Krupa/South Florida Water Management District

DRILLING EQUIPMENT/METHOD	SIZE/TYPE OF BIT	SAMPLING METHOD	START/FINISH DATE
Tripod/SPT	3'-5" dia. casing, driven and washed	Split Spoon	2/16/97-2/16/97

WELL INSTALLED?	CASING MAT./DIA.	SCREEN:				
YES ☒ NO ☐	Sch.40 mononflex PVC/2"	TYPE Slotted	MAT. PVC	LENGTH 2'	DIA. 2"	SLOT SIZE .010

ELEVATION OF:	GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN	DATE
(FT. ABOVE M.S.L.)	16.90 ft	2.85 ft	13.95 ft/15.95 ft	2/17/97

REMARKS:

Depth (ft)	Sample Type & Recovery	Sample Number	Penetration Resistance Blows/6" N-Value	Unified Classification	LOG OF TEST BORING — FIELD DESCRIPTION	Munsell Field Color
		S1	1 1 1 1 2	PT	Fibrous Organic Material	1 2.5/N
		S2	3 3 5 5 8			
					4.0	
		S3	7 5 4 5 9	SP	18 in. fine sand (1 2.5/N) grading to 5 in. fine sand (10 YR 7/1)	1 2.5/N = 10 YR 7/1
5		S4	3 3 3 3 6		Fine sand	10 YR 6/2
		S5	2 2 2 2 4		Marbled fine sand	10 YR 2/1 = 10 YR 6/1
10		S6	7 3 3 3 6		5 in. fine sand (10 YR 2/1) grading to 8 in. fine sand (10 YR 5/2)	10 YR 2/1 = 10 YR 5/2
		S7	3 2 1 1 3		7 in. fine sand (10 YR 4/1) grading to 10 in. 2.5 YR 6/3	10 YR 4/1 = 2.5 YR 6/3
		S8	8		14.8	
15					5 in. fine sand w/ 30% black specks grading to 9 in. fine sand w/ shell fragments	2.5 YR 7/1
					16.0	
		S9			No sample	
		S10			No sample	

Penetration Resistance (Blows/Foot): 0, 15, 35, 55, 75, 100

Graphic Litho Log

Well Construction

WETLA 9/9/97

Fine Sand | Medium Sand | Bentonite Pellets | Cement Grout | Silt/Clay w/ shell

Organic Material | Clay | Split Spoon | Percent Recovery | No Recovery

South Florida Water Management District
3301 Gun Club Road
West Palm Beach, Florida 33406
(561) 686-8800 / Fax 687-6442

Engineered Environmental Solutions, Inc.
1301 NW 4th Street
Boca Raton, Florida 33486
Ph/Fax: (561) 394-3969

BORING LOG

BORING/WELL NO.	FP8
PROJECT NO./NAME	1033/Isolated Wetlands Shallow Drilling Program
LOCATION	Flint Pen Strand, Fort Myers, Florida
DRILLING CONTRACTOR/DRILLER	Precision Drilling/Robert Miller
GEOLOGIST/OFFICE	Steve Krupa/South Florida Water Management District
DRILLING EQUIPMENT/METHOD	Tripod/SPT
SIZE/TYPE OF BIT	3'-5"dia. casing, driven and washed
SAMPLING METHOD	Split Spoon
START/FINISH DATE	2/14/97-2/14/97
WELL INSTALLED?	YES ☒ NO ☐
CASING MAT./DIA.	Sch.40 monoflex PVC/2"
SCREEN:	TYPE Slotted MAT. PVC LENGTH 2' DIA. 2" SLOT SIZE .010
ELEVATION OF: (FT. ABOVE M.S.L.)	GROUND SURFACE 14.60 ft; TOP OF WELL CASING 2.58 ft; TOP & BOTTOM SCREEN 10.68 ft/12.68 ft; DATE 2/17/97
REMARKS:	

Depth (ft)	Sample Type & Recovery	Sample Number	Penetration Resistance Blows/6" N-Value	Unified Classification	LOG OF TEST BORING — FIELD DESCRIPTION	Munsell Field Color
		S1	1 1 1 1 2	PT	Organic Material	1 2.5/N
					2.0	
		S2	2 3 3 2 6	SP	17 in. fine sand w/ organic staining grading to 6 in. fine sand (7.5 YR 5/1)	1 2.5/N = 7.5 YR 5/1
		S3	2 3 3 2 6			
5					6.0	
		S4	4 1 1 1 2		5 in. fine sand (1 2.5/N) grading to fine sand grading to fine sand w/ 20% shell	1 2.5/N = 10 YR 7/1
		S5	5 5 5 6 10		14 in. fine sand w/ 20% shell fragments	
10		S6	6 3 2 2 5	SP-SW	10.0	
					4 in. med/fine sand w/ shell grading to calcareous sand w/ 10% shell fragments	10 YR 6/1 = 10 YR 8/1
		S7	3 5 10 +50 15	SP	12.0	
					10 in. 80% shell mash grading to fine sand w/ < 10% shell fragments	10 YR 8/1
		S8			14.0	
15					Limestone Fragments	10 YR 8/1
					16.0	
	○	S9			No sample	
	○	S10			No sample	

Penetration Resistance (Blows/Foot): 0 15 35 55 75 100

Graphic Litho Log

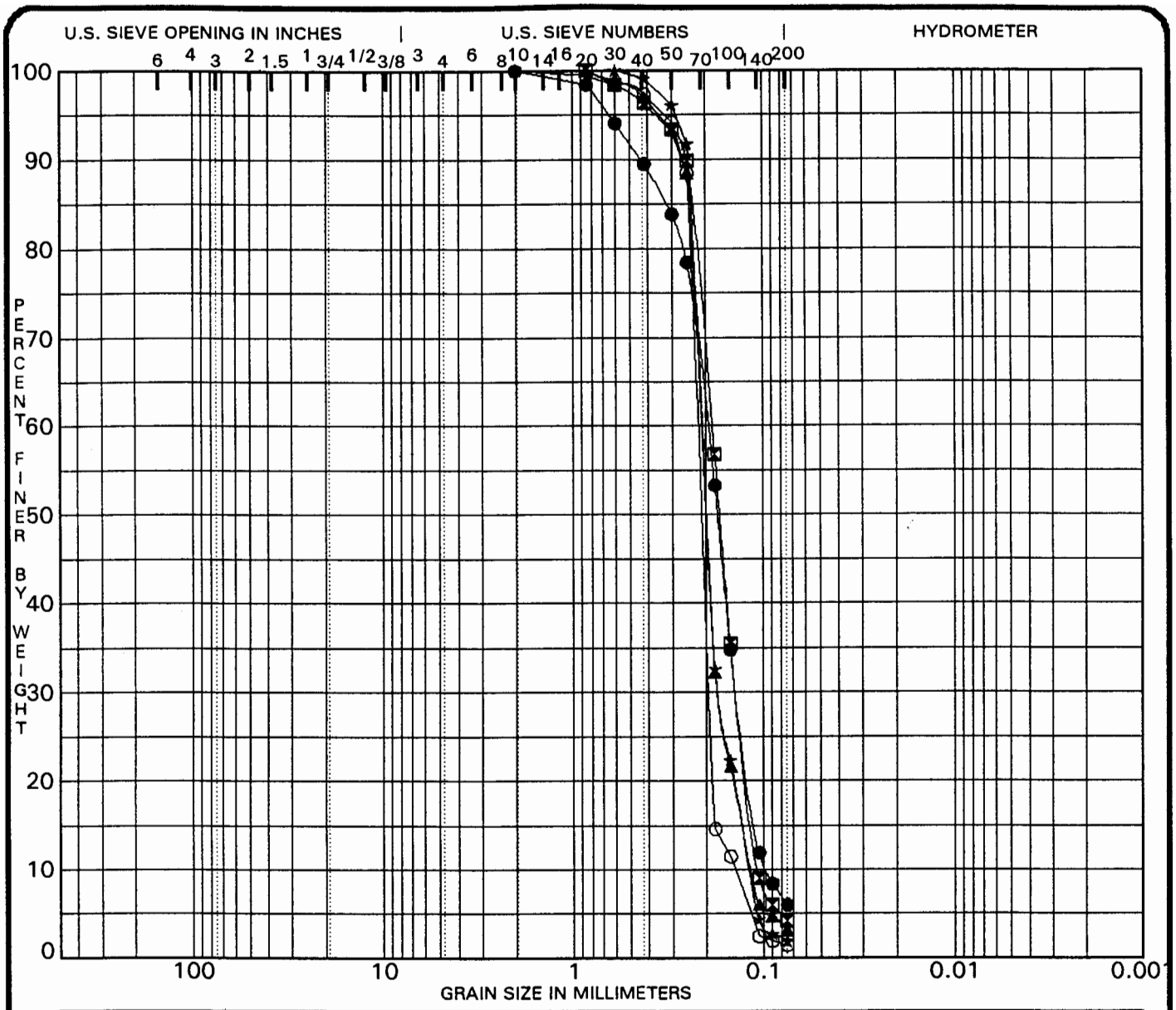
Well Construction

ETLA 9/9/97

Fine Sand; Medium Sand; Bentonite Pellets; Cement Grout; Silt/Clay w/ shell

Organic Material; Clay; Split Spoon; Percent Recovery; No Recovery

GRAIN SIZE ANALYSIS LABORATORY DATA



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
●	FP2	2.0	POORLY GRADED SAND with SILT SP-SM		NP	NP	NP	1.02	2.0
⊠	FP2	4.0	POORLY GRADED SAND SP					0.98	1.7
▲	FP2	6.0	POORLY GRADED SAND SP					1.22	1.8
★	FP2	8.0	POORLY GRADED SAND SP					1.19	1.8
⊙	FP2	10.0	POORLY GRADED SAND SP					1.19	1.6

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	FP2	2.0	2.00	0.20	0.140	0.0970	0.0	94.0	6.0	
⊠	FP2	4.0	0.85	0.19	0.140	0.1074	0.0	95.8	4.2	
▲	FP2	6.0	0.85	0.21	0.173	0.1159	0.0	96.8	3.2	
★	FP2	8.0	0.60	0.21	0.172	0.1182	0.0	98.0	2.0	
⊙	FP2	10.0	2.00	0.22	0.193	0.1416	0.0	98.5	1.5	

PROJECT **Isolated Wetlands Shallow Drilling Program - Flint Pen Strand, Fort Myers, Florida**

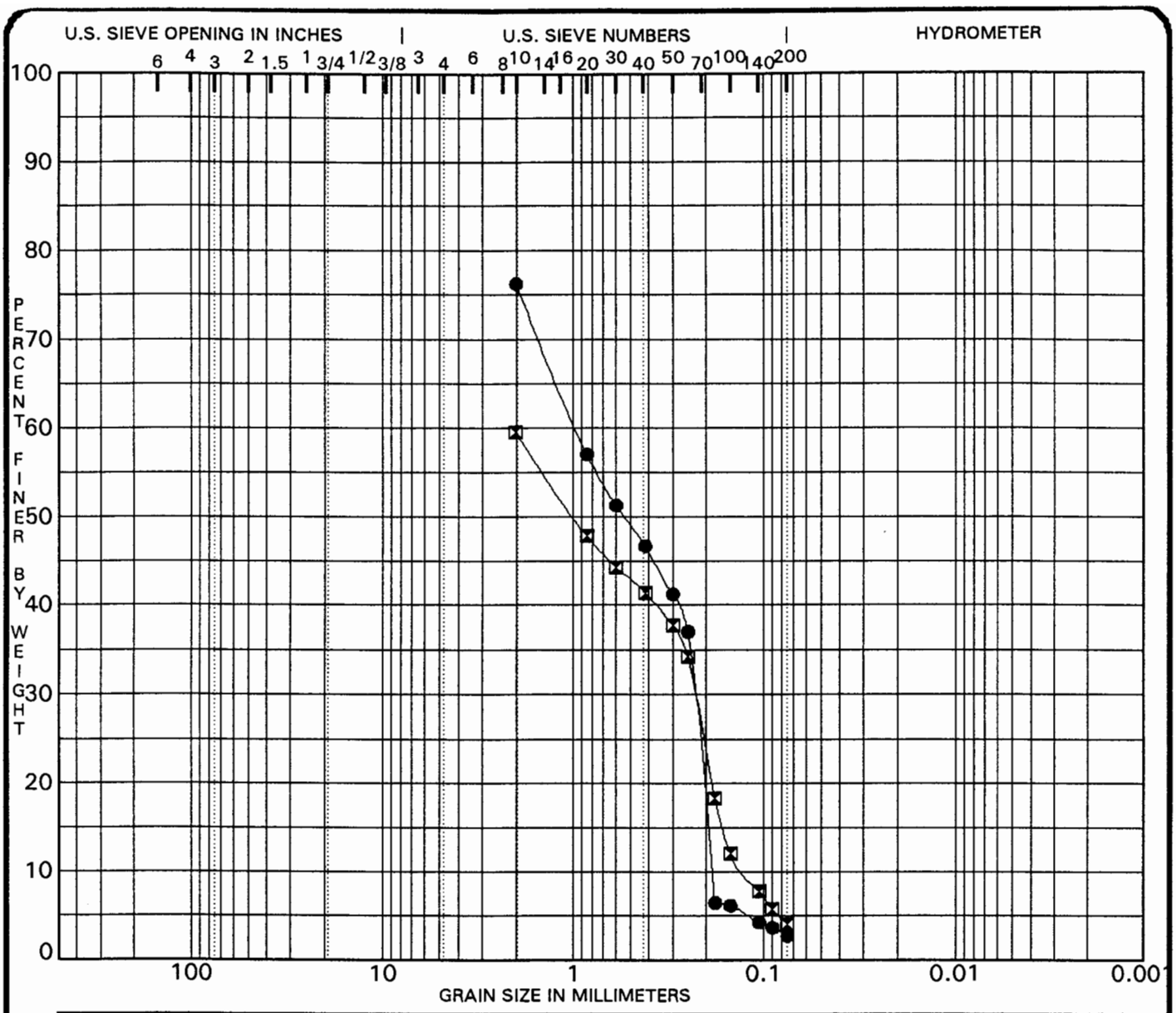
JOB NO. **1033**

DATE **9/8/97**

GRADATION CURVES

Engineered Environmental Solutions, Inc.

1301 NW 4th Street, Boca Raton, FL



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
● FP2	12.0			NP	NP	NP	0.30	5.2
⊠ FP2	14.0							

Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● FP2	12.0		0.97	0.232	0.1869			2.8	
⊠ FP2	14.0			0.229	0.1271			4.1	

PROJECT **Isolated Wetlands Shallow Drilling Program - Flint Pen Strand, Fort Myers, Florida**

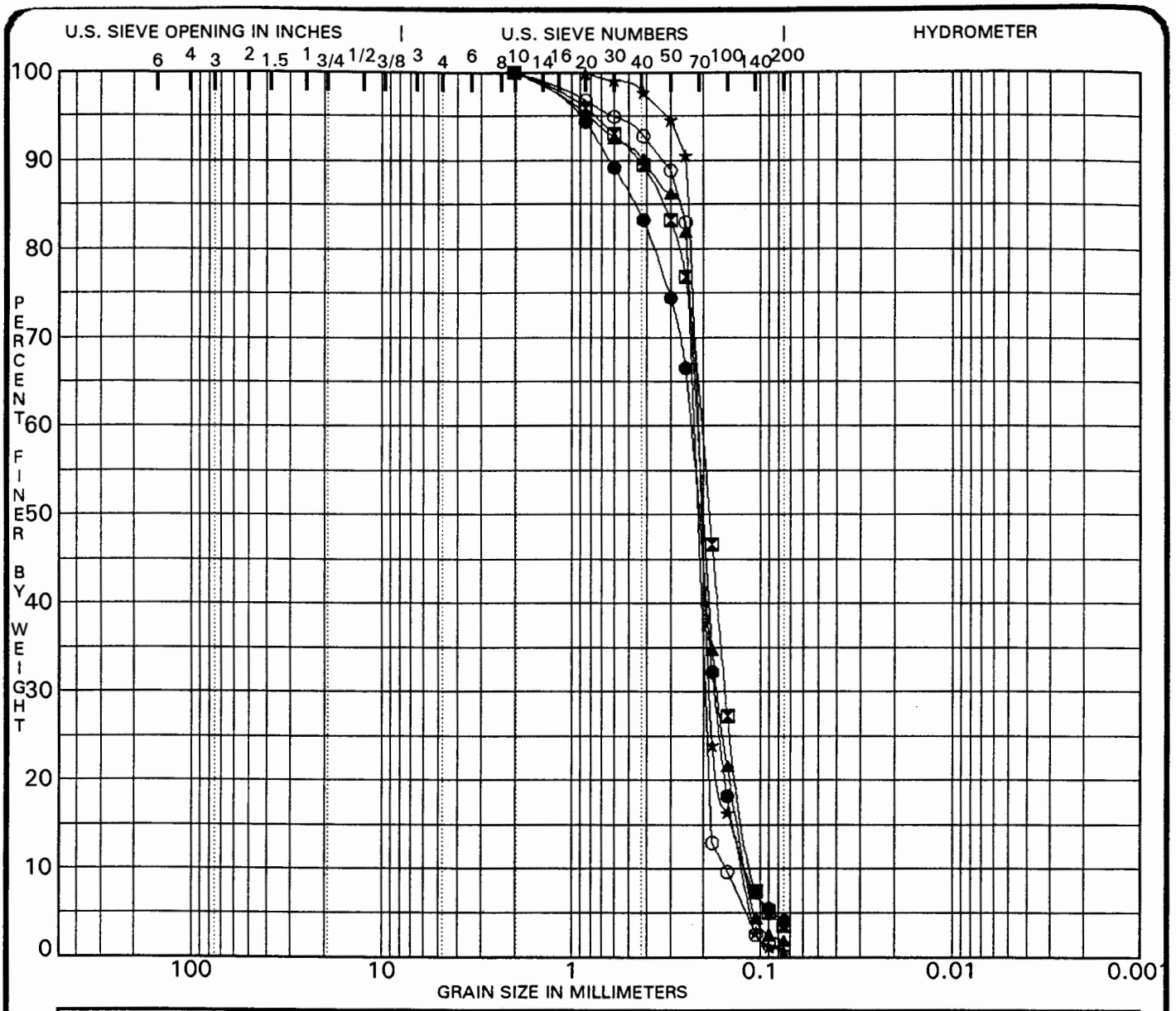
JOB NO. **1033**

DATE **9/8/97**

GRADATION CURVES

Engineered Environmental Solutions, Inc.

1301 NW 4th Street, Boca Raton, FL



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification			Classification	MC%	LL	PL	PI	Cc	Cu
●	FP3	0.0	POORLY GRADED SAND SP					1.13	2.0
⊠	FP3	2.0	POORLY GRADED SAND SP					1.03	1.9
▲	FP3	4.0	POORLY GRADED SAND SP					1.12	1.8
★	FP3	6.0	POORLY GRADED SAND SP					1.25	1.7
○	FP3	8.0	POORLY GRADED SAND SP					1.10	1.5

Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	FP3	0.0	2.00	0.23	0.175	0.1155	0.0	95.9	4.1	
⊠	FP3	2.0	2.00	0.21	0.154	0.1108	0.0	96.4	3.6	
▲	FP3	4.0	2.00	0.21	0.169	0.1185	0.0	98.1	1.9	
★	FP3	6.0	2.00	0.22	0.186	0.1276	0.0	99.3	0.7	
○	FP3	8.0	2.00	0.22	0.195	0.1534	0.0	99.0	1.0	

PROJECT **Isolated Wetlands Shallow Drilling Program - Flint Pen Strand, Fort Myers, Florida**

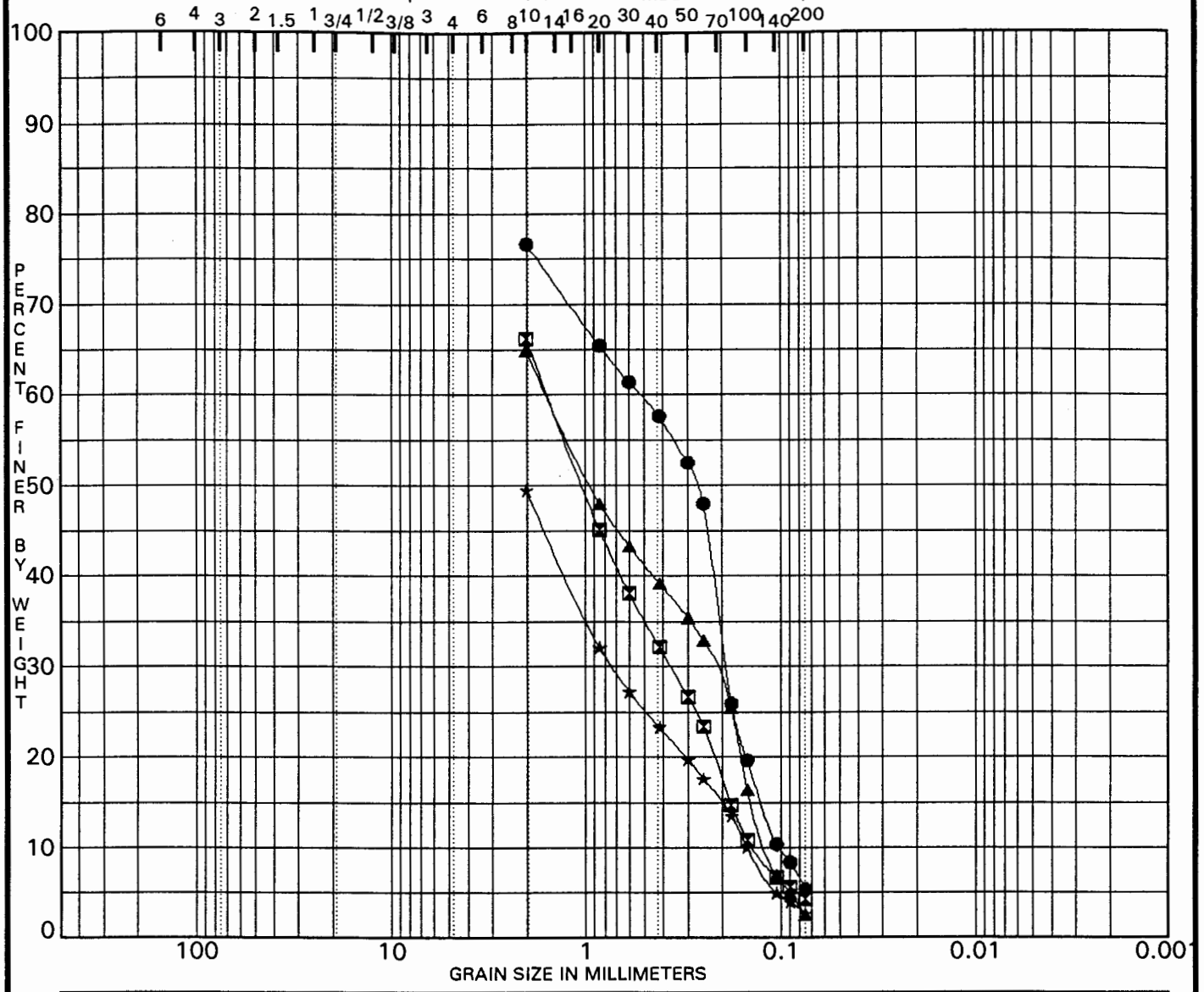
JOB NO. **1033**

DATE **9/8/97**

GRADATION CURVES

Engineered Environmental Solutions, Inc.

1301 NW 4th Street, Boca Raton, FL



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
●	FP3	10.0						0.68	5.1
⊠	FP3	12.0						0.62	11.2
▲	FP3	14.0						0.26	13.2
★	FP3	16.0							

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	FP3	10.0		0.53	0.191	0.1026			5.4	
⊠	FP3	12.0		1.56	0.367	0.1390			4.3	
▲	FP3	14.0		1.56	0.220	0.1184			2.5	
★	FP3	16.0			0.732	0.1500			2.7	

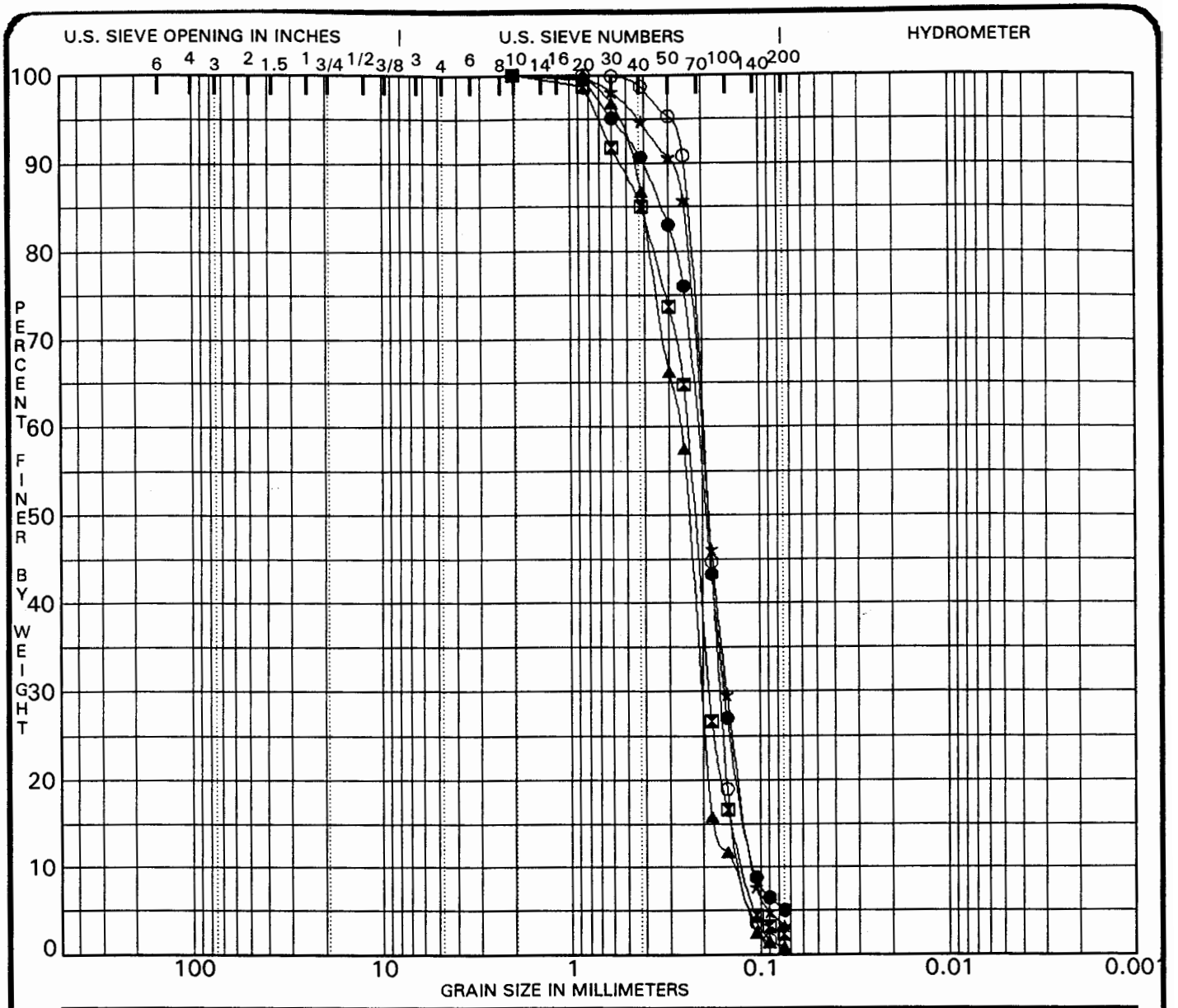
PROJECT **Isolated Wetlands Shallow Drilling Program - Flint Pen Strand, Fort Myers, Florida**

JOB NO. **1033**

DATE **9/8/97**

GRADATION CURVES

Engineered Environmental Solutions, Inc.
1301 NW 4th Street, Boca Raton, FL



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
●	FP4	0.0	POORLY GRADED SAND with SILT SP-SM		NP	NP	NP	1.04	2.0
⊠	FP4	2.0	POORLY GRADED SAND SP					1.15	1.9
▲	FP4	4.0	POORLY GRADED SAND SP					1.09	1.9
★	FP4	6.0	POORLY GRADED SAND SP					1.02	1.8
○	FP4	8.0	POORLY GRADED SAND SP					1.07	1.6

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	FP4	0.0	2.00	0.21	0.155	0.1085	0.0	94.9	5.1	
⊠	FP4	2.0	2.00	0.24	0.185	0.1241	0.0	97.6	2.4	
▲	FP4	4.0	0.85	0.26	0.201	0.1406	0.0	99.1	0.9	
★	FP4	6.0	2.00	0.20	0.151	0.1099	0.0	96.7	3.3	
○	FP4	8.0	0.85	0.20	0.162	0.1223	0.0	98.9	1.1	

PROJECT **Isolated Wetlands Shallow Drilling Program - Flint Pen Strand, Fort Myers, Florida**

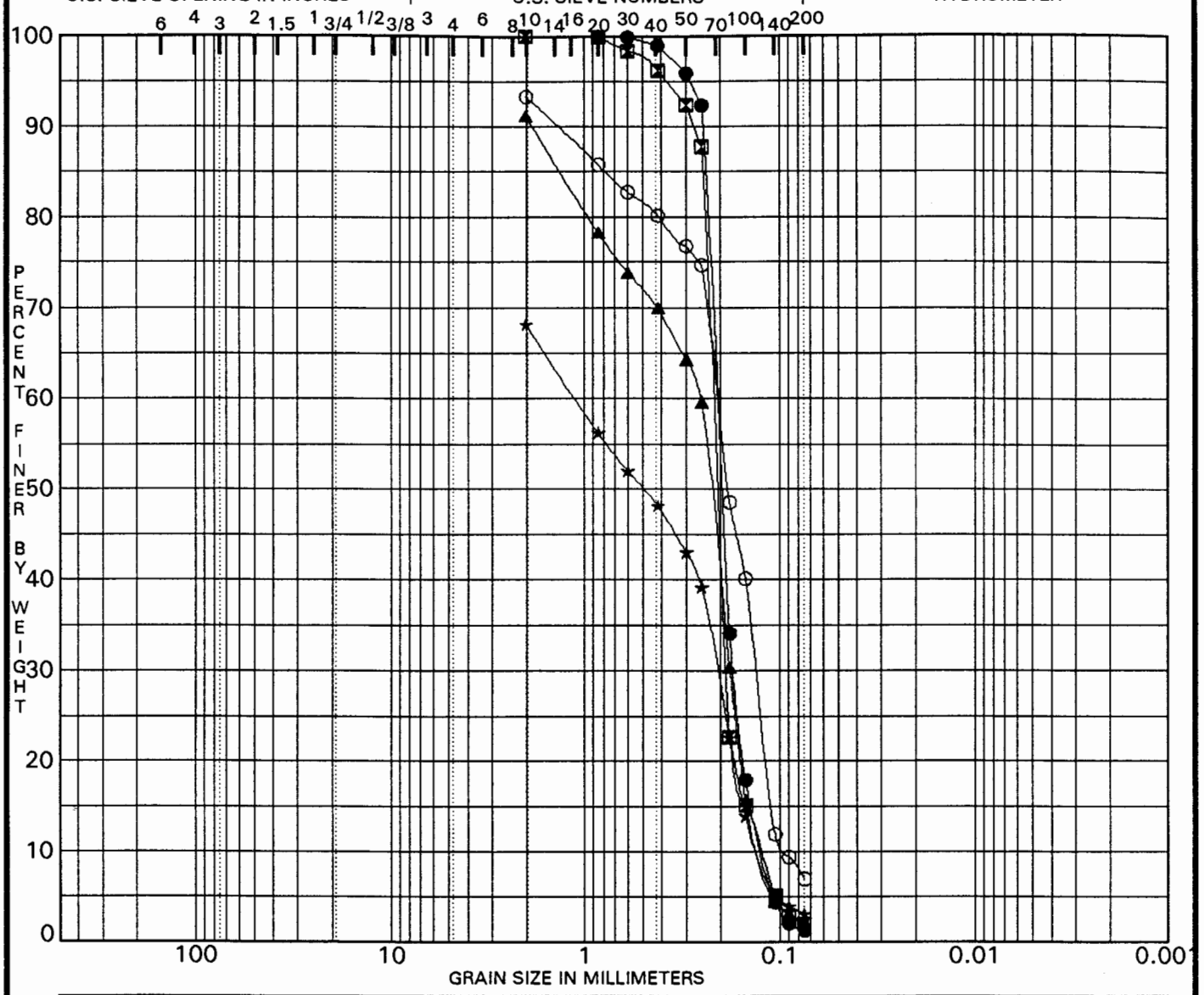
JOB NO. **1033**

DATE **9/9/97**

GRADATION CURVES

Engineered Environmental Solutions, Inc.

1301 NW 4th Street, Boca Raton, FL



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification			Classification	MC%	LL	PL	PI	Cc	Cu
●	FP4	10.0	POORLY GRADED SAND SP					1.16	1.7
⊠	FP4	12.0	POORLY GRADED SAND SP					1.28	1.7
▲	FP4	14.0						1.01	2.0
★	FP4	16.0						0.30	8.7
○	FP4	18.0			NP	NP	NP	0.90	2.2

Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	FP4	10.0	0.85	0.21	0.172	0.1224	0.0	98.7	1.3	
⊠	FP4	12.0	2.00	0.22	0.187	0.1254	0.0	97.9	2.1	
▲	FP4	14.0		0.25	0.179	0.1257			2.3	
★	FP4	16.0		1.12	0.208	0.1284			3.1	
○	FP4	18.0		0.21	0.133	0.0936			7.0	

PROJECT **Isolated Wetlands Shallow Drilling Program - Flint Pen Strand, Fort Myers, Florida**

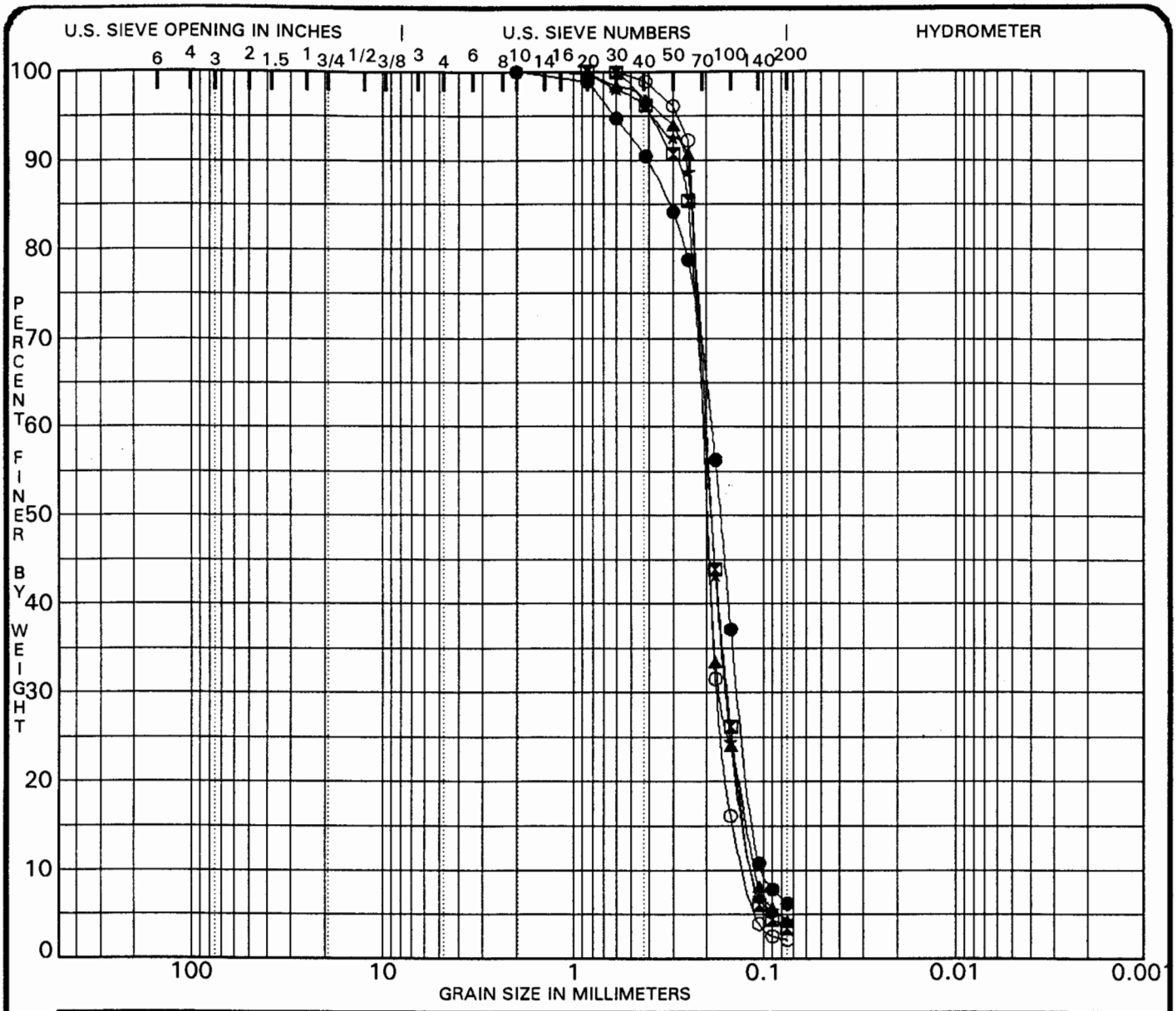
JOB NO. **1033**

DATE **9/9/97**

GRADATION CURVES

Engineered Environmental Solutions, Inc.

1301 NW 4th Street, Boca Raton, FL



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification			Classification	MC%	LL	PL	PI	Cc	Cu
●	FP5	0.0	POORLY GRADED SAND with SILT SP-SM		NP	NP	NP	0.97	1.9
⊠	FP5	2.0	POORLY GRADED SAND SP					1.05	1.8
▲	FP5	4.0	POORLY GRADED SAND SP					1.23	1.9
★	FP5	6.0	POORLY GRADED SAND SP					1.10	1.8
⊙	FP5	8.0	POORLY GRADED SAND SP					1.18	1.7

Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	FP5	0.0	2.00	0.19	0.137	0.1013	0.0	93.7	6.3	
⊠	FP5	2.0	0.85	0.20	0.156	0.1133	0.0	96.5	3.5	
▲	FP5	4.0	0.85	0.21	0.169	0.1103	0.0	95.8	4.2	
★	FP5	6.0	2.00	0.20	0.158	0.1125	0.0	95.6	4.4	
⊙	FP5	8.0	0.60	0.21	0.177	0.1259	0.0	97.8	2.2	

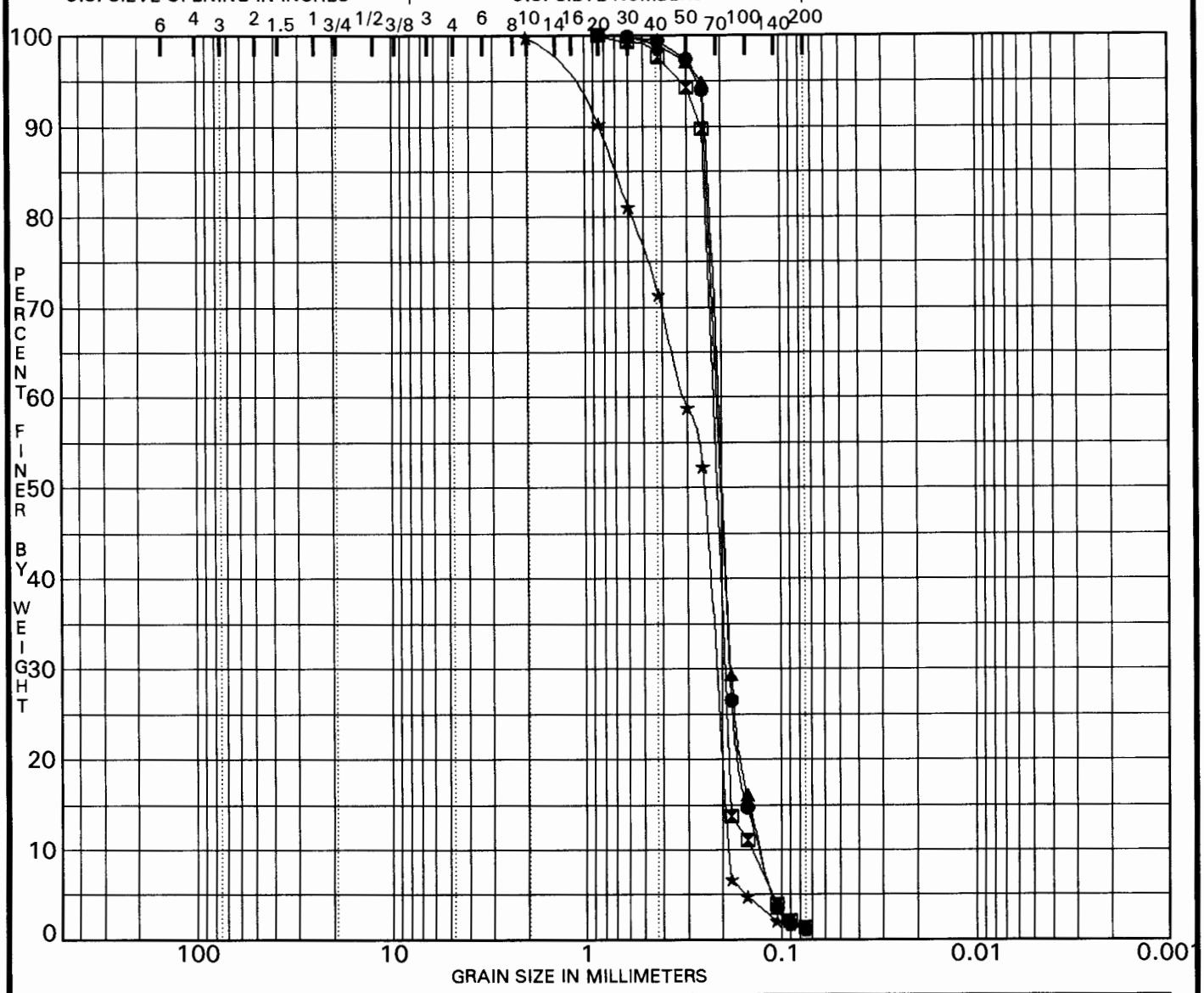
PROJECT **Isolated Wetlands Shallow Drilling Program - Flint Pen Strand, Fort Myers, Florida**

JOB NO. **1033**

DATE **9/9/97**

GRADATION CURVES

Engineered Environmental Solutions, Inc.
1301 NW 4th Street, Boca Raton, FL



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
●	FP5	10.0	POORLY GRADED SAND SP					1.22	1.6
⊠	FP5	12.0	POORLY GRADED SAND SP					1.19	1.5
▲	FP5	14.0	POORLY GRADED SAND SP					1.23	1.7
★	FP5	16.0			NP	NP	NP	0.79	1.7

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	FP5	10.0	0.85	0.21	0.183	0.1295	0.0	98.8	1.2	
⊠	FP5	12.0	0.85	0.22	0.193	0.1421	0.0	98.6	1.4	
▲	FP5	14.0	0.85	0.21	0.181	0.1268	0.0	98.7	1.3	
★	FP5	16.0		0.31	0.213	0.1843			1.2	

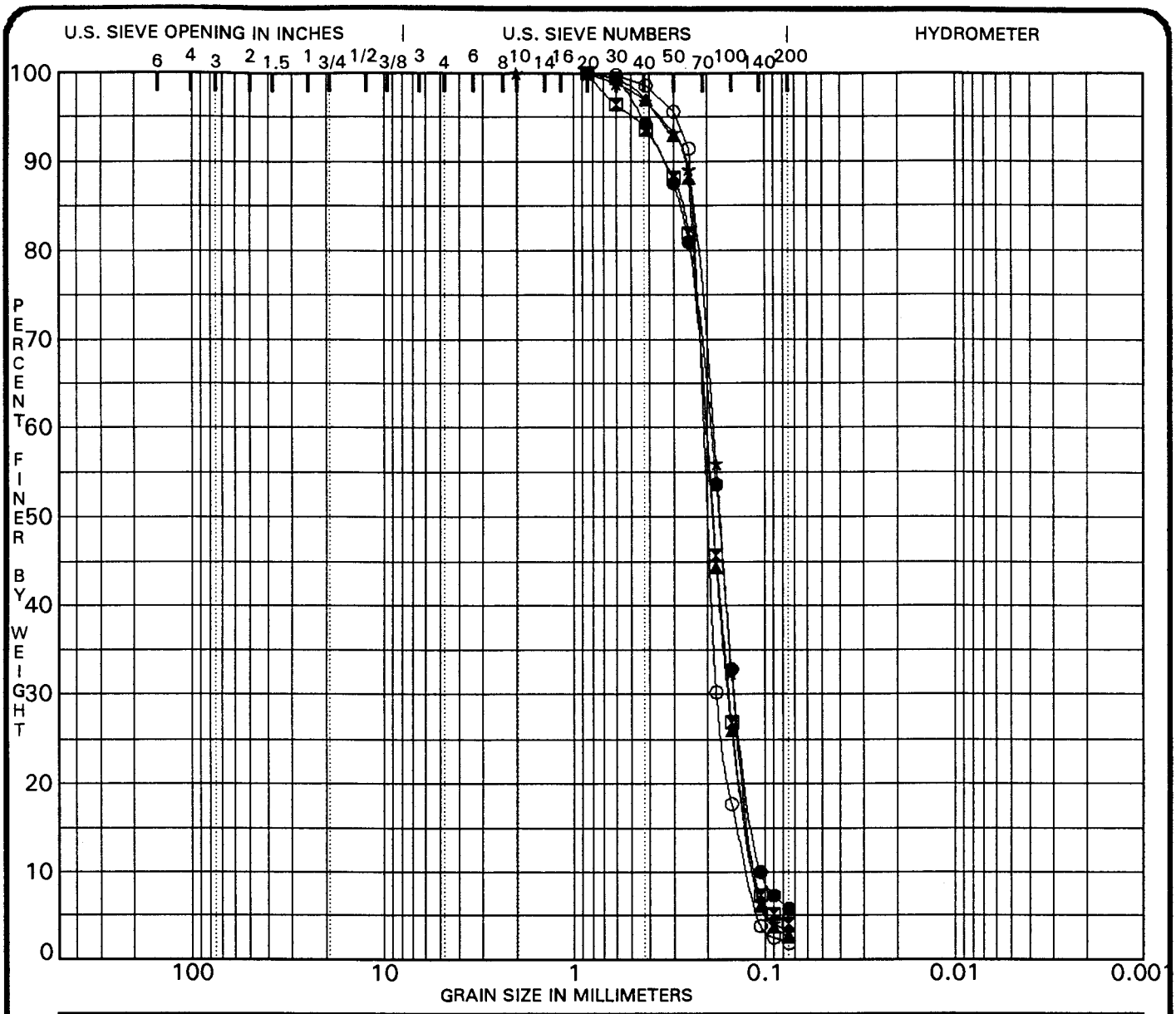
PROJECT **Isolated Wetlands Shallow Drilling Program - Flint Pen Strand, Fort Myers, Florida**

JOB NO. **1033**

DATE **9/9/97**

GRADATION CURVES

Engineered Environmental Solutions, Inc.
1301 NW 4th Street, Boca Raton, FL



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification			Classification	MC%	LL	PL	PI	Cc	Cu
●	FP6	0.0	POORLY GRADED SAND with SILT SP-SM		NP	NP	NP	1.00	1.8
⊠	FP6	2.0	POORLY GRADED SAND SP					1.05	1.8
▲	FP6	4.0	POORLY GRADED SAND SP					1.06	1.8
★	FP6	6.0	POORLY GRADED SAND SP					1.02	1.7
○	FP6	8.0	POORLY GRADED SAND SP					1.23	1.7

Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	FP6	0.0	0.85	0.19	0.144	0.1060	0.0	94.2	5.8	
⊠	FP6	2.0	0.85	0.20	0.155	0.1112	0.0	95.9	4.1	
▲	FP6	4.0	0.85	0.20	0.156	0.1136	0.0	97.4	2.6	
★	FP6	6.0	2.00	0.19	0.145	0.1111	0.0	96.9	3.1	
○	FP6	8.0	0.85	0.21	0.180	0.1238	0.0	98.1	1.9	

PROJECT **Isolated Wetlands Shallow Drilling Program - Flint Pen Strand, Fort Myers, Florida**

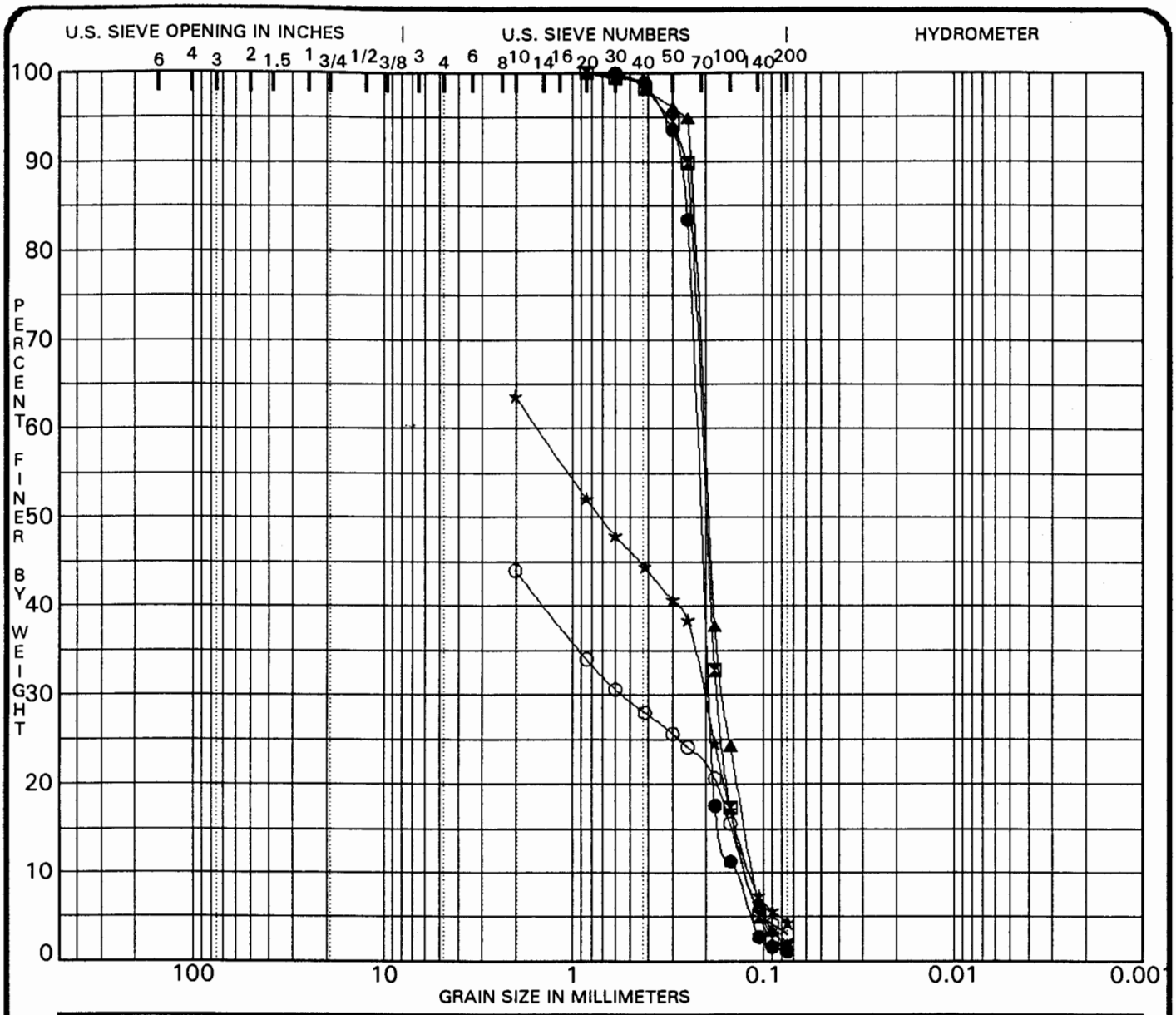
JOB NO. **1033**

DATE **9/9/97**

GRADATION CURVES

Engineered Environmental Solutions, Inc.

1301 NW 4th Street, Boca Raton, FL



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification			Classification	MC%	LL	PL	PI	Cc	Cu
●	FP6	10.0	POORLY GRADED SAND SP					1.16	1.6
⊠	FP6	12.0	POORLY GRADED SAND SP					1.18	1.7
▲	FP6	14.0	POORLY GRADED SAND SP					1.14	1.8
★	FP6	16.0						0.24	13.2
○	FP6	18.0							

Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	FP6	10.0	0.60	0.22	0.192	0.1422	0.0	98.8	1.2	
⊠	FP6	12.0	0.85	0.21	0.174	0.1217	0.0	98.4	1.6	
▲	FP6	14.0	0.85	0.20	0.162	0.1131	0.0	98.3	1.7	
★	FP6	16.0		1.53	0.205	0.1163			4.4	
○	FP6	18.0			0.553	0.1233			3.1	

PROJECT **Isolated Wetlands Shallow Drilling Program - Flint Pen Strand, Fort Myers, Florida**

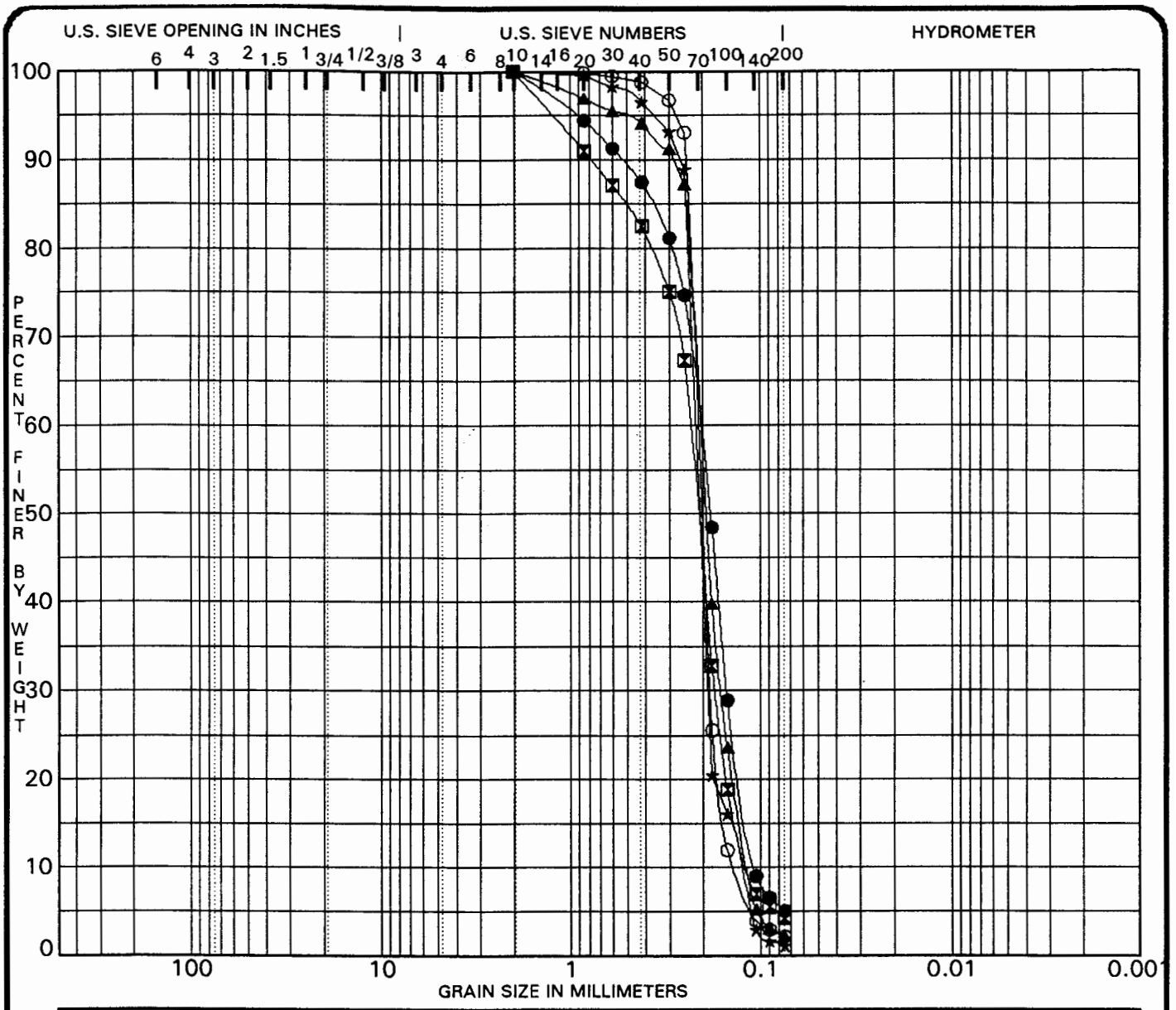
JOB NO. **1033**

DATE **9/9/97**

GRADATION CURVES

Engineered Environmental Solutions, Inc.

1301 NW 4th Street, Boca Raton, FL



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification			Classification	MC%	LL	PL	PI	Cc	Cu
●	FP7	0.0	POORLY GRADED SAND with SILT SP-SM		NP	NP	NP	1.02	1.9
⊠	FP7	2.0	POORLY GRADED SAND SP					1.12	2.0
▲	FP7	4.0	POORLY GRADED SAND SP					1.08	1.8
★	FP7	6.0	POORLY GRADED SAND SP					1.28	1.7
○	FP7	8.0	POORLY GRADED SAND SP					1.15	1.5

Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	FP7	0.0	2.00	0.21	0.152	0.1079	0.0	94.9	5.1	
⊠	FP7	2.0	2.00	0.23	0.174	0.1158	0.0	95.6	4.4	
▲	FP7	4.0	2.00	0.21	0.161	0.1159	0.0	97.7	2.3	
★	FP7	6.0	2.00	0.22	0.189	0.1278	0.0	98.8	1.2	
○	FP7	8.0	2.00	0.21	0.184	0.1380	0.0	97.8	2.2	

PROJECT **Isolated Wetlands Shallow Drilling Program - Flint Pen Strand, Fort Myers, Florida**

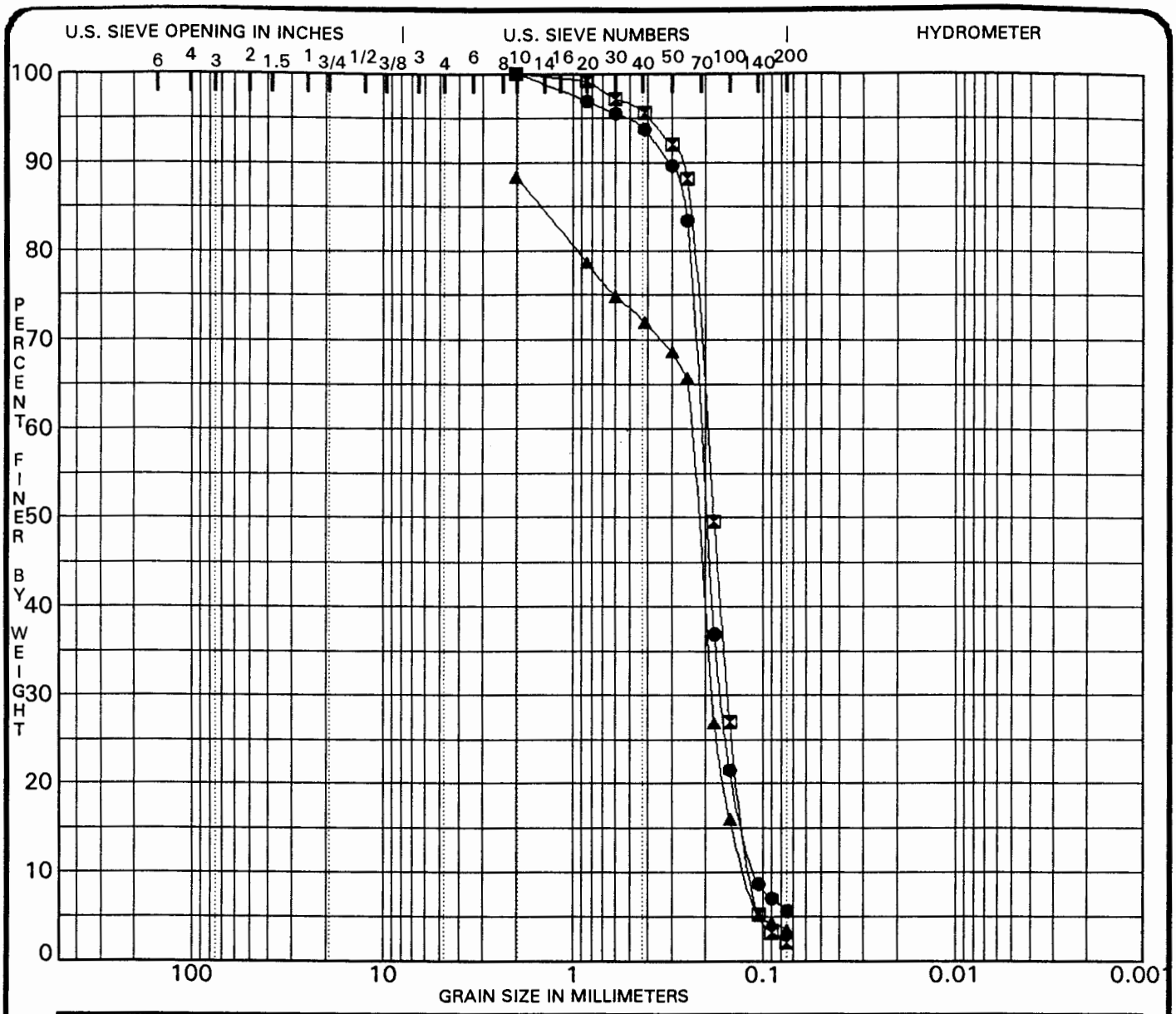
JOB NO. **1033**

DATE **9/9/97**

GRADATION CURVES

Engineered Environmental Solutions, Inc.

1301 NW 4th Street, Boca Raton, FL



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
●	FP7	10.0	POORLY GRADED SAND with SILT SP-SM		NP	NP	NP	1.18	1.9
⊠	FP7	12.0	POORLY GRADED SAND SP		NP	NP	NP	1.05	1.7
▲	FP7	14.0			NP	NP	NP	1.16	1.9

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	FP7	10.0	2.00	0.21	0.166	0.1098	0.0	94.3	5.7	
⊠	FP7	12.0	2.00	0.20	0.154	0.1143	0.0	97.8	2.2	
▲	FP7	14.0		0.24	0.185	0.1237			3.6	

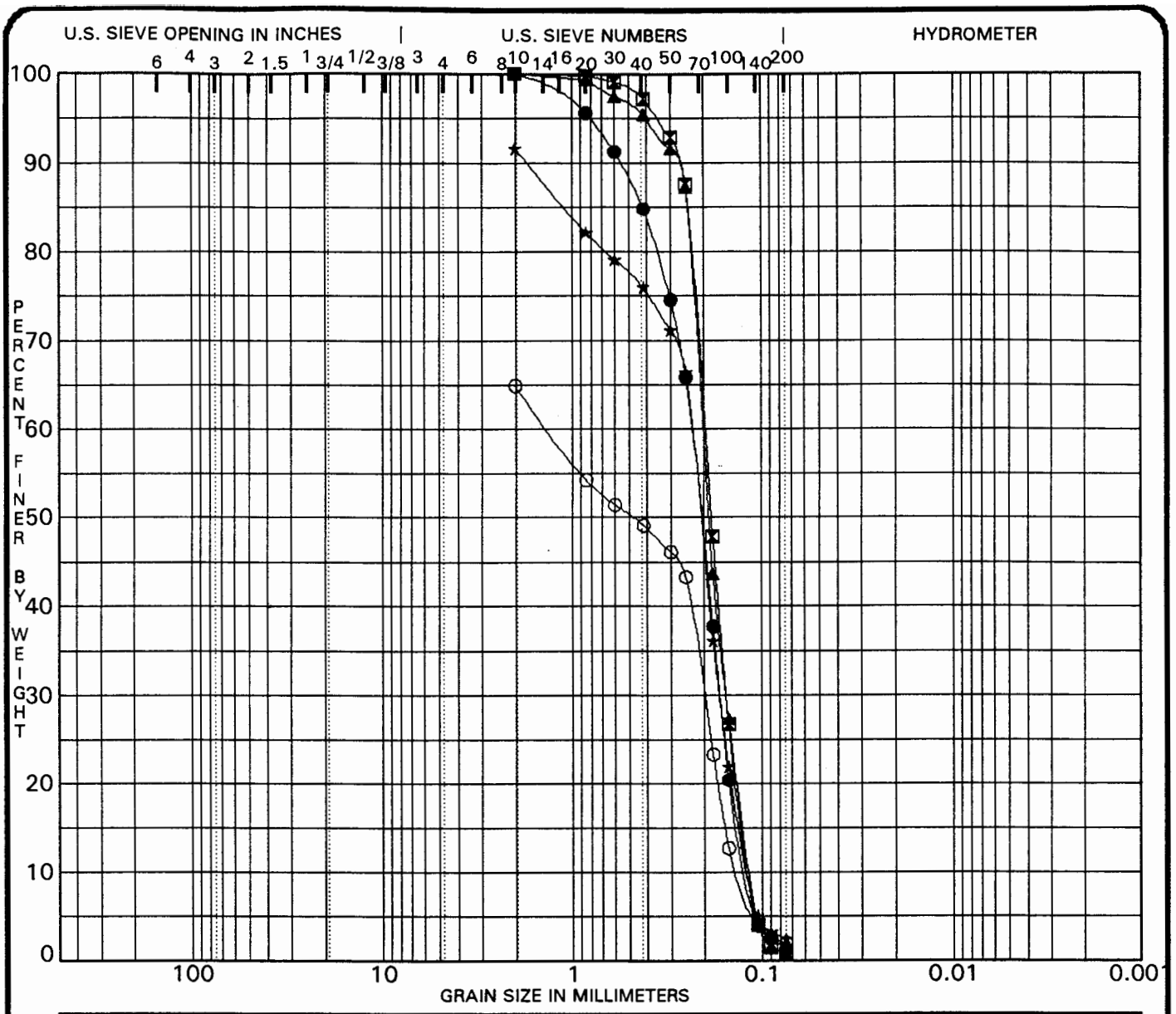
PROJECT **Isolated Wetlands Shallow Drilling Program - Flint Pen Strand, Fort Myers, Florida**

JOB NO. **1033**

DATE **9/9/97**

GRADATION CURVES

Engineered Environmental Solutions, Inc.
1301 NW 4th Street, Boca Raton, FL



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification			Classification	MC%	LL	PL	PI	Cc	Cu
●	FP8	0.0	POORLY GRADED SAND SP					0.98	1.9
⊠	FP8	2.0	POORLY GRADED SAND SP					1.03	1.7
▲	FP8	4.0	POORLY GRADED SAND SP					1.02	1.8
★	FP8	6.0			NP	NP	NP	1.01	2.0
○	FP8	8.0			NP	NP	NP	0.22	10.0

Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	FP8	0.0	2.00	0.23	0.166	0.1200	0.0	98.6	1.4	
⊠	FP8	2.0	2.00	0.20	0.154	0.1160	0.0	99.1	0.9	
▲	FP8	4.0	2.00	0.20	0.154	0.1152	0.0	99.1	0.9	
★	FP8	6.0		0.23	0.166	0.1173			2.5	
○	FP8	8.0		1.35	0.201	0.1347			2.1	

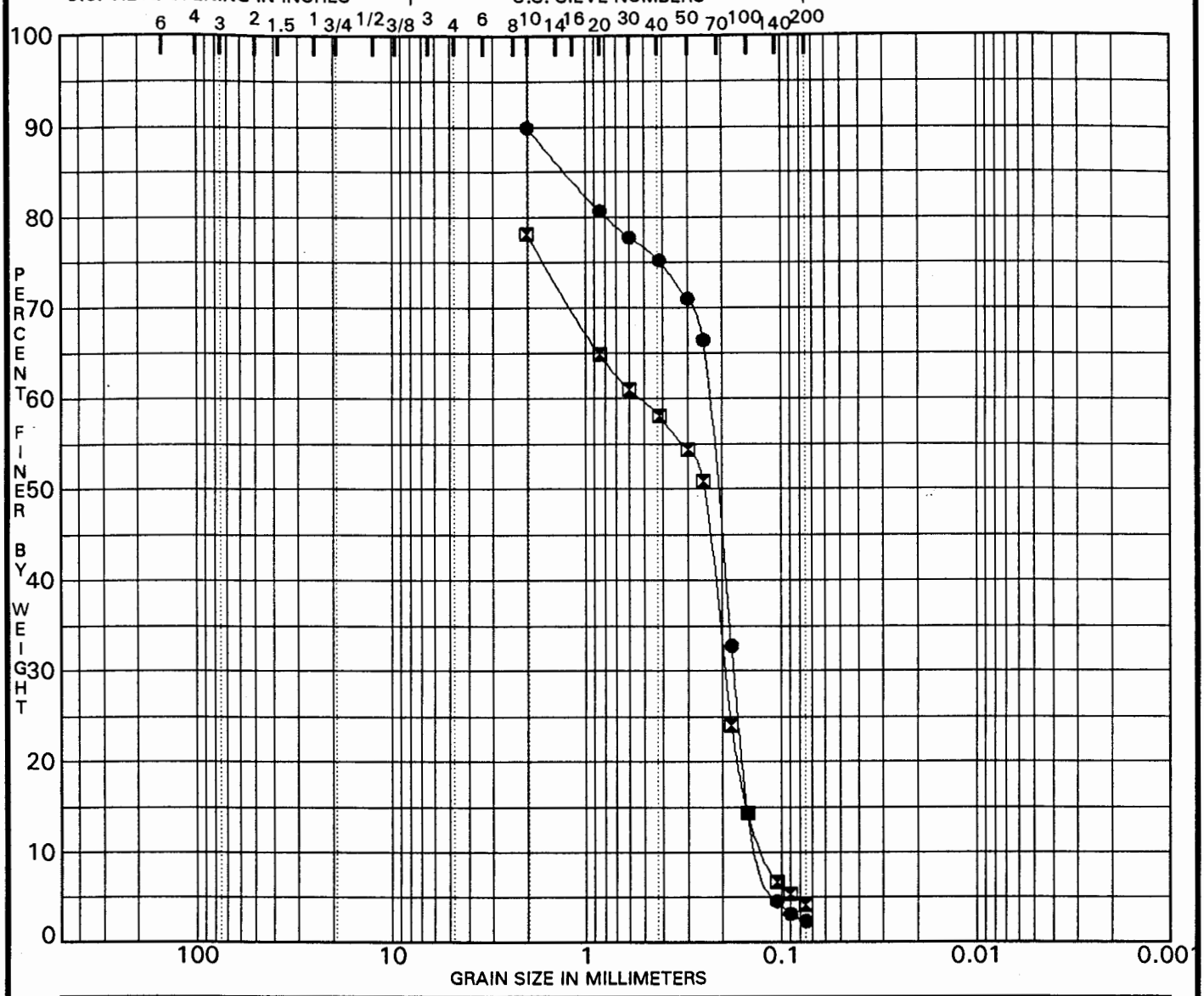
PROJECT **Isolated Wetlands Shallow Drilling Program - Flint Pen Strand, Fort Myers, Florida**

JOB NO. 1033

DATE 9/9/97

GRADATION CURVES

Engineered Environmental Solutions, Inc.
1301 NW 4th Street, Boca Raton, FL



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
● FP8	10.0			NP	NP	NP	1.02	1.8
⊠ FP8	12.0			NP	NP	NP	0.58	4.3

Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● FP8	10.0		0.23	0.175	0.1283			2.4	
⊠ FP8	12.0		0.53	0.194	0.1227			4.2	

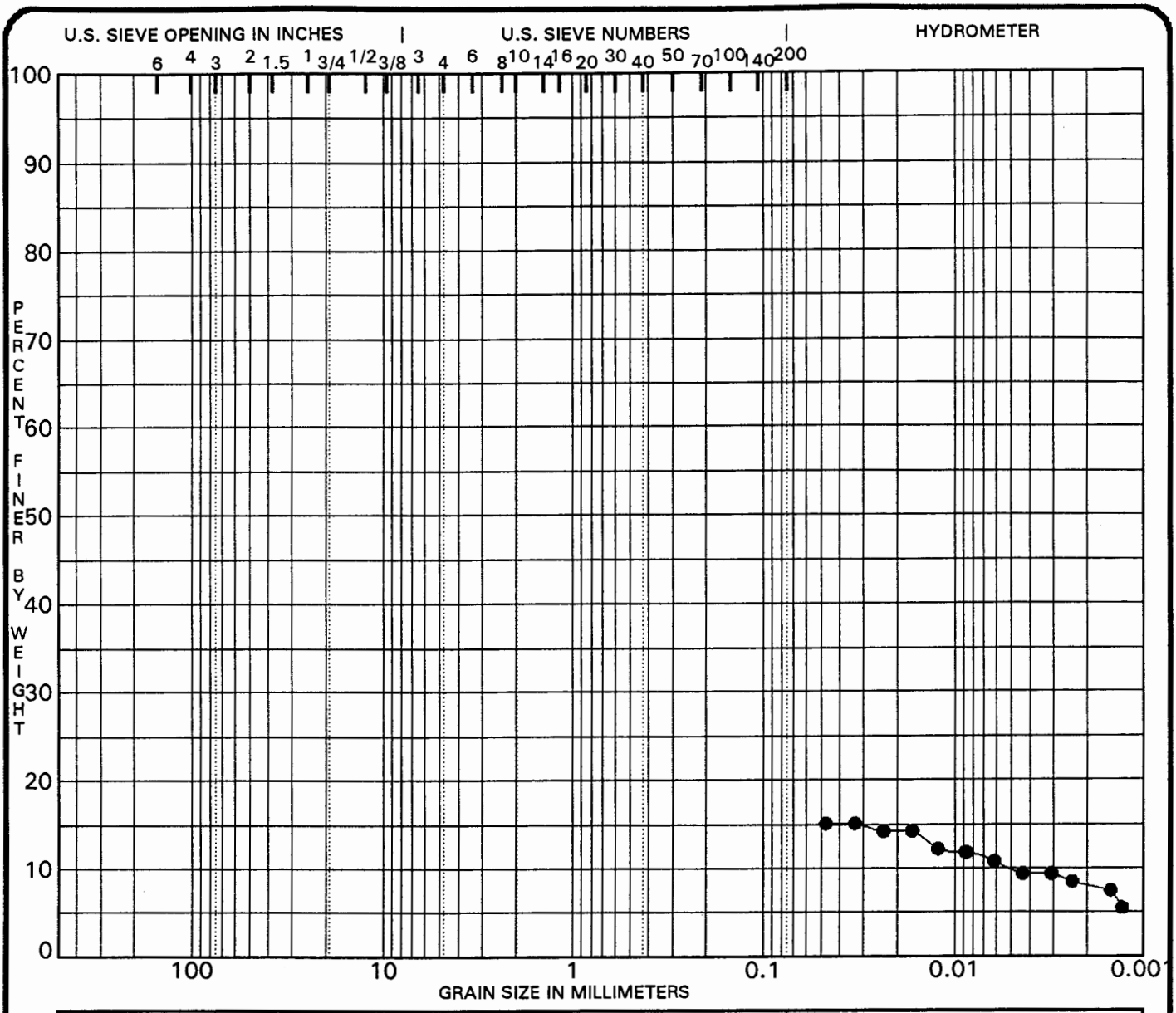
PROJECT **Isolated Wetlands Shallow Drilling Program - Flint Pen Strand, Fort Myers, Florida**

JOB NO. **1033**

DATE **9/9/97**

GRADATION CURVES

Engineered Environmental Solutions, Inc.
1301 NW 4th Street, Boca Raton, FL



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Classification	MC%	LL	PL	PI	Cc	Cu
● FP7SHELB 0.0							

Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● FP7SHELB 0.0				0.0051				9.9

PROJECT **Isolated Wetlands Shallow Drilling Program - Flint Pen Strand, Fort Myers, Florida**

JOB NO. **1033**

DATE **9/12/97**

GRADATION CURVES

Engineered Environmental Solutions, Inc.

1301 NW 4th Street, Boca Raton, FL

Project ID: Wetla
Point ID: FP7SHELB
Depth: 0.0

Hydrometer Analysis - ADDRESS 2306 gINT

Sample - FP7 Shelby Tube sample 0-2 feet

Dry Test Weight g - 50.0 g
Specific Gravity of particles - 2.7
Hydrometer - Standard Bouyoucos ASTM 152H

Time, Min.	Temp. c.	Hydrometer Reading	Effective Depth cm.	Max. Diameter, mm.
1	27.0	10.5	14.6	0.0473
2	27.0	10.5	14.6	0.0334
4	27.0	10.0	14.7	0.0237
8	27.0	10.0	14.7	0.0168
15	27.0	9.0	14.8	0.0123
30	26.5	9.0	14.8	0.0088
60	26.5	8.5	14.9	0.0062
120	26.0	8.0	15.0	0.0044
240	26.0	8.0	15.0	0.0031
420	26.0	7.5	15.1	0.0024
1020	26.0	7.0	15.2	0.0015
1440	26.0	6.0	15.3	0.0013
2880	26.0	6.0	15.3	0.0009

Maximum diameter of particles in suspension calculated according to Stokes' law.

Well Name: **FP2**

Location: Flint Pen Strand - - - Fort Myers

Sieve # (U.S. Standard)		#10	#20	#30	#40	#50	#60	#80	#100	#140	#170	#200	Pan	Weight Recovered	% diff.
Sample #	Sample Weight														
S-1	No Recovery														
S-2	195.9	0.0	3.2	8.5	8.9	11.0	10.5	49.0	36.0	44.6	6.9	4.6	11.7	194.9	0.51
S-3	265.5	0.0	0.0	4.3	5.5	8.0	9.2	87.4	56.4	70.0	7.9	4.8	11.1	264.6	0.34
S-4	242.9	0.0	0.0	2.8	4.8	8.9	11.5	136.0	25.7	37.7	3.3	3.5	7.8	242.0	0.37
S-5	250.8	0.0	0.0	0.0	2.2	7.5	11.0	147.6	25.6	44.6	4.0	2.2	4.9	249.6	0.48
S-6	269.6	0.0	1.5	2.6	3.3	8.4	15.5	199.1	8.4	24.1	1.5	1.3	4.0	269.7	0.04
S-7	254.5	60.0	48.2	14.3	11.7	13.7	10.5	76.9	0.7	4.9	1.4	2.2	7.1	251.6	1.14
S-8	177.8	71.9	20.7	6.3	5.0	6.6	6.3	28.2	11.2	7.4	3.5	3.1	7.2	177.4	0.22
S-9	No Sample														
S-10	No Sample														

* Units=Grams

Well Name: **FP3**

Location: Flint Pen Strand - - Fort Myers

Sieve # (U.S. Standard)		#10	#20	#30	#40	#50	#60	#80	#100	#140	#170	#200	Pan	Weight Recovered	% diff.
Sample #	Sample Weight														
S-1	55.2	0.0	3.2	2.9	3.3	4.9	4.4	19.2	7.8	6.1	1.0	0.8	2.3	55.9	1.27
S-2	134.7	0.0	5.4	4.0	4.6	8.2	8.5	40.1	25.6	26.2	3.2	1.9	4.8	132.5	1.63
S-3	270.0	0.0	12.5	7.5	6.7	10.3	11.5	126.6	35.2	46.0	5.0	1.9	5.2	268.4	0.59
S-4	270.4	0.0	0.3	2.0	4.0	8.4	11.0	179.3	20.3	36.4	4.2	1.4	2.0	269.3	0.41
S-5	219.2	0.0	7.0	4.2	4.6	8.7	12.7	152.5	7.2	15.2	2.5	1.0	2.2	217.8	0.64
S-6	210.9	48.6	23.3	8.4	7.9	10.6	9.5	45.9	13.2	19.0	4.3	6.2	11.2	208.1	1.33
S-7	199.4	66.5	41.7	13.8	11.5	10.9	6.6	17.1	7.4	8.2	2.1	2.8	8.4	197.0	1.20
S-8	241.1	84.4	40.6	11.3	9.7	9.2	5.9	18.0	21.6	22.8	4.8	6.0	5.9	240.2	0.37
S-9	219.2	110.3	37.8	10.7	8.6	7.9	4.6	8.8	7.6	10.9	2.3	2.7	6.0	218.2	0.46
S-10	Sample not sieved - - - Greater than #10 sieve														

* Units=Grams

Well Name: **FP4**

Location: Flint Pen Strand - - - Fort Myers

Sieve # (U.S. Standard)		#10	#20	#30	#40	#50	#60	#80	#100	#140	#170	#200	Pan	Weight Recovered	% diff.
Sample #	Sample Weight														
S-1	165.1	0.0	0.8	7.3	7.5	12.7	11.3	54.0	26.9	30.0	3.9	2.2	8.5	165.1	0.00
S-2	209.8	0.0	2.6	14.6	13.8	23.4	18.5	78.8	20.6	24.9	2.8	1.6	5.0	206.6	1.53
S-3	256.2	0.0	0.0	8.2	25.5	52.2	22.1	106.0	10.4	23.0	3.0	1.4	2.3	254.1	0.82
S-4	258.8	0.0	0.9	4.0	8.7	10.8	12.6	102.4	42.6	56.6	7.2	4.0	8.6	258.4	0.15
S-5	248.8	0.0	0.0	0.3	2.9	8.6	11.1	114.7	63.9	38.2	4.9	1.4	2.8	248.8	0.00
S-6	263.6	0.0	0.0	0.2	2.5	8.1	9.4	153.1	42.4	35.5	6.0	2.2	3.4	262.8	0.30
S-7	258.7	0.0	0.3	3.9	5.5	10.1	12.1	167.9	19.7	25.7	5.8	2.2	5.4	258.6	0.04
S-8	234.8	20.9	30.3	10.3	9.0	13.1	11.1	68.5	34.4	26.3	3.3	1.7	5.5	234.4	0.17
S-9	287.2	90.8	33.7	12.1	10.9	14.5	10.9	47.1	24.8	24.7	3.3	2.6	8.9	284.3	1.01
S-10	271.9	18.2	20.3	8.3	7.0	9.2	5.6	70.4	22.7	76.2	6.7	6.5	18.8	269.9	0.74

*Units=Grams

Well Name: **FP5**

Location: Flint Pen Strand - - - Fort Myers

Sieve # (U.S. Standard)		#10	#20	#30	#40	#50	#60	#80	#100	#140	#170	#200	Pan	Weight Recovered	% diff.
Sample #	Sample Weight														
S-1	62.3	0.0	0.7	2.6	2.7	3.9	3.4	13.9	12.0	16.4	1.8	1.0	3.9	62.3	0.00
S-2	276.1	0.0	0.0	0.4	10.1	15.0	14.4	113.7	48.9	54.4	4.6	2.8	9.6	273.9	0.80
S-3	288.7	0.0	0.1	4.5	4.7	8.2	9.6	165.2	27.1	45.7	6.9	4.6	12.2	288.8	0.03
S-4	242.1	0.0	0.6	4.3	4.8	8.5	9.4	109.8	45.4	42.1	3.7	2.6	10.7	241.9	0.08
S-5	245.0	0.0	0.0	0.1	2.5	6.9	9.6	148.4	37.5	29.6	3.4	1.1	5.3	244.4	0.24
S-6	250.7	0.0	0.1	0.4	1.1	5.0	8.3	169.1	29.5	28.0	4.3	1.5	3.1	250.4	0.12
S-7	254.8	0.0	0.0	1.9	4.0	8.6	11.7	192.9	6.6	18.0	4.6	2.0	3.6	253.9	0.35
S-8	250.9	0.0	0.0	0.3	2.3	4.7	5.4	164.6	33.0	31.7	3.6	2.0	3.2	250.8	0.04
S-9	181.7	0.4	17.0	16.5	17.2	22.3	11.6	81.1	3.5	4.8	0.5	1.0	2.2	178.1	1.98
S-10	No Recovery														

* Units=Grams

Well Name: **FP6**

Location: Flint Pen Strand - - - Fort Myers

Sieve # (U.S. Standard)		#10	#20	#30	#40	#50	#60	#80	#100	#140	#170	#200	Pan	Weight Recovered	% diff.
Sample #	Sample Weight														
S-1	111.2	0.0	0.0	0.6	5.7	7.4	7.2	29.9	22.7	25.0	2.9	1.7	6.3	109.4	1.62
S-2	260.7	0.0	0.0	9.2	7.5	14.2	15.9	94.0	48.5	50.9	5.3	3.0	10.6	259.1	0.61
S-3	241.4	0.0	0.0	1.6	5.6	9.9	11.9	105.5	44.1	48.3	5.8	2.4	6.3	241.4	0.00
S-4	243.6	0.0	0.2	2.6	5.0	8.8	10.2	80.4	57.5	62.7	5.8	2.3	7.6	243.1	0.21
S-5	246.1	0.0	0.0	0.4	3.0	7.4	10.4	150.3	30.7	34.3	3.1	1.5	4.7	245.8	0.12
S-6	246.7	0.0	0.0	0.0	2.6	13.4	24.8	162.4	15.4	20.9	2.9	1.1	3.0	246.5	0.08
S-7	259.7	0.0	0.0	1.0	3.6	9.8	12.2	148.0	39.8	32.1	6.5	2.5	4.2	259.7	0.00
S-8	245.3	0.0	0.0	1.4	3.2	4.9	2.8	139.2	32.4	42.9	7.6	4.4	4.2	243.0	0.94
S-9	172.3	61.8	19.6	7.2	6.0	6.2	3.9	23.7	12.5	16.6	2.8	2.3	7.4	170.0	1.33
S-10	208.4	116.2	20.9	7.0	5.3	5.1	3.1	7.3	10.4	20.4	3.1	2.4	6.4	207.6	0.38

* Units=Grams

Well Name: **FP7**

Location: Flint Pen Strand - - - Fort Myers

Sieve # (U.S. Standard)		#10	#20	#30	#40	#50	#60	#80	#100	#140	#170	#200	Pan	Weight Recovered	% diff.
Sample #	Sample Weight														
S-1	114.1	0.0	6.3	3.7	4.3	7.1	7.3	29.7	22.1	22.5	2.7	1.7	5.8	113.2	0.79
S-2	166.6	0.0	15.0	6.5	7.5	12.2	12.8	56.8	23.1	19.5	2.4	2.0	7.2	165.0	0.96
S-3	262.4	0.0	8.1	3.7	3.7	7.9	10.3	124.3	42.4	47.9	5.5	2.4	6.1	262.3	0.04
S-4	256.2	0.0	1.0	3.4	4.5	8.8	11.0	175.6	11.2	33.4	3.2	1.3	3.1	256.5	0.12
S-5	259.7	0.0	0.5	0.7	1.9	5.6	9.4	175.5	35.7	20.5	2.5	2.2	5.7	260.2	0.19
S-6	250.7	0.0	7.9	3.5	4.5	10.3	15.4	116.6	38.7	32.1	4.0	3.5	14.3	250.8	0.04
S-7	251.9	0.0	1.9	5.1	4.1	9.0	9.9	96.8	56.8	54.6	4.9	2.8	5.5	251.4	0.20
S-8	232.7	27.0	22.4	8.7	6.7	7.6	6.8	89.6	25.1	25.1	1.7	2.0	8.2	230.9	0.77
S-9	No Sample														
S-10	No Sample														

* Units=Grams

Well Name: **FP8**

Location: Flint Pen Strand - - - Fort Myers

Sieve # (U.S. Standard)		#10	#20	#30	#40	#50	#60	#80	#100	#140	#170	#200	Pan	Weight Recovered	% diff.
Sample #	Sample Weight														
S-1	56.6	0.0	2.5	2.5	3.6	5.8	4.9	15.9	9.8	9.1	1.0	0.6	0.8	56.5	0.18
S-2	215.9	0.0	0.4	1.5	4.1	9.5	11.4	85.5	45.5	48.8	5.5	1.5	1.9	215.6	0.14
S-3	218.3	0.0	1.5	4.2	4.4	8.4	9.4	94.4	35.4	49.9	5.9	1.8	2.0	217.3	0.46
S-4	195.0	16.1	18.4	5.9	6.0	9.2	9.1	58.3	27.4	32.3	3.6	1.4	4.9	192.6	1.23
S-5	248.8	87.2	26.6	7.0	5.6	7.6	7.0	49.6	26.3	21.6	3.3	1.6	5.1	248.5	0.12
S-6	217.3	21.8	20.0	6.3	5.4	9.3	9.7	72.7	39.8	21.0	3.0	1.9	5.1	216.0	0.60
S-7	234.7	51.2	31.0	8.9	6.7	8.8	8.2	62.7	22.5	17.8	3.2	2.7	9.9	233.6	0.47
S-8	Sample not sieved - - - Sample larger than #10 sieve														
S-9	No Sample														
S-10	No Sample														

* Units=Grams

ENGINEERED
ENVIRONMENTAL
SOLUTIONS,
INC.

October 2, 1997

Mr. Patrick M. Ryan
Staff Contract Administrator
South Florida Water Management District
Division of Procurement & Contract Administration
3301 Gun Club Road
West Palm Beach, FL 33406

RE: Letter of Transmittal
SFWMD Project No. C-7665
"Isolated Wetlands Drilling Project"
Final Report Revision

Dear Mr. Ryan:

Please forward the enclosed information to Mr. Steve Krupa. We have revised a portion of our final report and wish to replace certain pages in the report with the attached pages. This was discussed with Mr. Krupa on October 2, 1997. There are three complete sets of spreadsheets with the sieve data that need to replace the spreadsheets in the reports we submitted. The only difference is that these pages are typed and the originals were hand-written raw data. In addition, we have included a diskette to be inserted in the original master copy. I have discussed all this with Mr. Krupa and he should know what to do. However, if you have any questions, please call me at 561-394-3969. Thank you for your attention to this matter.

Sincerely,
ENGINEERED ENVIRONMENTAL SOLUTIONS, INC.

Joseph Ziegler, P.E.
President

Cc: Steve Krupa, P.G. – SFWMD
EESI File 1034

Well Name: **JD6**

Location: Jonathan Dickinson State Park

Sieve # (U.S. Standard)		#10	#20	#30	#40	#50	#60	#80	#100	#140	#170	#200	Pan	Weight Recovered	% diff.
Sample #	Sample Weight														
S-1	182.7	0.0	0.5	3.3	17.0	45.0	24.5	25.3	14.1	41.9	6.1	1.9	2.7	182.3	0.22
S-2	276.7	0.0	0.9	5.0	23.0	60.6	32.2	38.6	26.6	70.9	7.4	2.6	7.5	275.3	0.51
S-3	263.7	0.0	0.3	2.5	16.4	62.0	36.1	47.0	22.5	61.7	7.6	2.4	4.5	263.0	0.27
S-4	199.2	0.0	0.0	7.4	29.0	65.5	28.5	29.6	11.3	17.1	1.8	1.3	6.6	198.1	0.55
S-5	247.6	0.0	1.0	4.7	18.3	42.7	28.0	46.6	22.5	66.3	8.8	3.3	4.9	247.1	0.20
S-6	198.2	0.0	1.8	7.8	24.1	62.6	25.3	36.9	9.3	19.1	4.1	1.9	4.2	197.1	0.55
S-7	No Recovery														
S-8	No Recovery														
S-9	265.4	0.0	3.8	14.0	36.5	71.2	38.9	43.6	13.2	24.8	5.1	3.1	8.6	262.8	0.98
S-10	210.4	0.0	2.2	6.2	9.8	76.8	46.6	46.9	8.3	9.1	1.2	0.5	1.3	208.9	0.71

* Units=Grams

Well Name: **JD12**

Location: Jonathan Dickinson State Park

Sieve # (U.S. Standard)		#10	#20	#30	#40	#50	#60	#80	#100	#140	#170	#200	Pan	Weight Recovered	% diff.
Sample #	Sample Weight														
S-1	248.5	0.0	0.6	9.8	21.1	47.3	27.3	43.9	25.6	55.5	5.7	2.3	8.1	247.2	0.52
S-2	214.8	0.0	0.6	6.9	16.2	38.3	23.0	41.3	26.3	43.9	5.0	2.5	10.0	214.0	0.37
S-3	236.4	0.0	6.1	6.8	19.6	57.5	33.9	54.3	20.2	26.0	4.2	1.7	6.0	236.3	0.04
S-4	241.7	0.0	6.1	8.1	22.5	73.6	33.7	56.6	15.0	17.6	3.1	1.2	4.0	241.5	0.08
S-5	210.5	0.0	2.2	5.4	22.9	80.3	41.9	38.6	6.8	6.3	1.1	0.9	5.3	211.7	0.57
S-6	259.4	0.0	2.7	7.0	36.7	119.9	44.5	33.9	4.0	4.5	0.8	0.6	3.6	258.2	0.46
S-7	203.8	0.0	1.4	10.7	53.1	102.6	19.1	8.7	1.5	1.8	0.7	0.7	3.4	203.7	0.05
S-8	231.6	0.0	0.2	2.7	39.8	113.9	42.0	25.8	2.0	1.2	0.4	0.5	3.1	231.6	0.00
S-9	No Recovery														
S-10	246.5	0.0	1.1	6.4	36.4	127.2	47.0	23.6	1.1	0.9	0.4	0.4	1.9	246.4	0.04

* Units=Grams

Well Name: **JD26**

Location: Jonathan Dickinson State Park

Sieve # (U.S. Standard)		#10	#20	#30	#40	#50	#60	#80	#100	#140	#170	#200	Pan	Weight Recovered	% diff.
Sample #	Sample Weight														
S-1	141.2	0.0	0.0	2.4	12.6	38.0	24.6	25.6	12.4	20.5	2.1	0.6	1.6	140.4	0.57
S-2	136.8	0.0	0.9	2.7	12.0	34.3	21.6	23.4	12.6	18.4	1.9	1.3	7.6	136.7	0.07
S-3	190.3	0.0	0.4	3.1	15.7	46.7	32.4	35.8	14.5	32.9	4.0	1.1	1.9	188.5	0.95
S-4	218.2	0.0	0.7	4.4	20.1	58.7	40.5	42.6	15.5	25.3	1.7	0.7	7.0	217.2	0.46
S-5	236.4	0.0	3.5	9.1	25.1	57.7	34.2	41.9	14.7	29.7	6.6	3.4	8.5	234.4	0.85
S-6	230.9	0.0	0.3	1.8	22.8	109.9	24.7	37.4	8.5	18.4	2.8	0.7	0.4	227.7	1.39
S-7	247.3	0.0	7.3	12.1	27.5	53.7	30.6	37.2	14.2	37.9	8.7	5.5	12.6	247.3	0.00
S-8	207.5	0.0	4.1	11.2	30.0	60.2	29.8	35.1	10.6	15.6	3.0	1.4	2.8	203.8	1.78
S-9	257.4	0.0	2.8	9.2	35.3	100.0	34.5	51.3	9.9	9.7	1.0	0.4	1.3	255.4	0.78
S-10	240.3	0.0	0.4	2.2	8.7	52.1	48.0	77.2	20.4	22.5	2.7	0.7	0.6	235.5	2.00

* Units=Grams

Well Name: **SV1**

Location: Savannas State Preserve

Sieve # (U.S. Standard)		#10	#20	#30	#40	#50	#60	#80	#100	#140	#170	#200	Pan	Weight Recovered	% diff.
Sample #	Sample Weight														
S-1	228.9	0.0	0.5	3.5	17.0	54.3	40.4	57.5	16.2	29.7	4.0	1.4	2.7	227.2	0.74
S-2	223.8	0.0	1.1	3.9	17.9	57.8	38.5	51.5	15.9	22.7	2.7	1.8	9.3	223.1	0.31
S-3	240.2	0.0	0.5	3.9	17.9	56.5	44.0	62.6	18.0	26.9	2.5	1.0	5.5	239.3	0.37
S-4	247.8	0.0	0.4	3.1	15.9	50.2	39.2	60.3	24.2	38.1	3.1	1.3	9.6	245.4	0.97
S-5	220.8	0.0	1.0	2.8	4.1	7.4	5.9	19.0	25.4	135.2	10.8	2.5	5.2	219.3	0.68
S-6	203.4	0.0	0.4	1.9	3.7	6.1	5.3	17.9	34.2	118.1	8.2	0.2	5.2	201.2	1.08
S-7	243.8	0.0	0.9	3.2	5.4	6.5	4.0	12.8	23.7	161.5	14.1	4.2	7.5	243.8	0.00
S-8	214.9	0.0	0.0	0.4	2.7	9.3	9.7	32.7	34.7	109.4	9.9	2.6	2.9	214.3	0.28
S-9	266.0	0.0	0.4	0.8	2.7	19.4	29.5	61.7	33.8	98.7	10.2	2.8	5.1	265.1	0.34
S-10	218.8	0.0	0.2	0.4	0.8	5.0	14.0	38.0	30.3	116.3	10.4	1.8	1.0	218.2	0.27

* Units=Grams

Well Name: **SV4**

Location: Savannas State Preserve

Sieve # (U.S. Standard)		#10	#20	#30	#40	#50	#60	#80	#100	#140	#170	#200	Pan	Weight Recovered	% diff.
Sample #	Sample Weight														
S-1	233.2	0.0	2.8	19.5	55.0	69.4	30.9	29.1	8.3	12.1	1.7	0.8	2.2	231.8	0.60
S-2	256.0	0.0	5.5	36.0	76.0	66.0	23.4	18.2	5.8	8.1	2.1	2.1	10.2	253.4	1.02
S-3	245.8	0.0	5.3	38.6	77.9	63.7	21.3	16.0	4.7	5.7	1.4	1.4	6.0	242.0	1.55
S-4	218.4	0.0	0.8	4.3	15.4	43.9	37.9	58.6	23.3	23.5	1.6	1.0	5.5	215.8	1.19
S-5	194.6	0.0	0.0	0.3	2.4	17.7	25.9	78.6	40.3	27.4	0.9	0.2	0.7	194.4	0.10
S-6	226.0	0.0	4.9	15.7	49.0	93.9	33.2	16.8	3.1	3.7	0.7	0.5	2.5	224.0	0.88
S-7	249.8	0.0	1.7	7.2	28.3	96.6	67.1	35.7	4.4	3.2	0.4	0.3	2.2	247.1	1.08
S-8	253.7	0.0	2.5	6.9	25.6	70.1	43.8	45.2	23.7	24.6	1.6	1.1	8.5	253.6	0.04
S-9	227.2	0.0	0.6	3.7	18.0	51.8	42.4	53.8	18.7	29.3	3.2	1.0	3.0	225.5	0.75
S-10	239.6	0.0	0.6	3.7	19.0	54.1	44.7	55.6	18.8	31.1	3.6	1.2	5.0	237.4	0.92

* Units=Grams

Well Name: **SV5**

Location: Savannas State Preserve

Sieve # (U.S. Standard)		#10	#20	#30	#40	#50	#60	#80	#100	#140	#170	#200	Pan	Weight Recovered	% diff.
Sample #	Sample Weight														
S-1	179.1	0.0	2.4	14.6	40.0	51.0	21.6	20.4	7.4	14.2	1.5	0.8	3.1	177.0	1.17
S-2	242.7	0.0	3.2	18.5	49.5	66.0	32.3	33.2	11.6	17.8	1.7	1.0	5.6	240.4	0.95
S-3	217.4	0.0	0.2	1.7	6.6	21.0	28.0	49.7	30.0	67.9	4.0	0.9	4.7	214.7	1.24
S-4	221.8	0.0	0.1	1.3	6.0	18.2	17.4	37.7	32.7	92.5	7.0	1.5	4.7	219.1	1.22
S-5	220.0	0.0	0.4	2.0	9.7	37.2	34.2	58.0	28.1	40.7	4.0	1.1	4.0	219.4	0.27
S-6	231.6	0.0	1.0	4.3	16.9	55.4	45.2	55.4	19.9	22.7	2.1	0.9	4.8	228.6	1.30
S-7	222.1	0.0	0.5	2.1	10.5	44.8	55.1	60.8	20.9	19.2	1.2	0.6	4.4	220.1	0.90
S-8	218.6	0.0	0.5	3.1	17.8	62.4	50.6	50.8	12.2	10.1	1.4	1.1	6.4	216.4	1.01
S-9	239.2	0.0	0.5	7.5	39.6	84.4	47.0	40.3	4.7	3.2	0.7	0.9	8.7	237.5	0.71
S-10	236.1	0.0	1.8	11.1	33.7	63.0	47.5	53.7	9.3	4.5	0.5	0.6	9.0	234.7	0.59

* Units=Grams

Well Name: **SV6**

Location: Savannas State Preserve

Sieve # (U.S. Standard)		#10	#20	#30	#40	#50	#60	#80	#100	#140	#170	#200	Pan	Weight Recovered	% diff.
Sample #	Sample Weight														
S-1	248.8	0.0	1.6	10.2	38.1	77.4	40.1	42.3	10.2	16.8	2.9	1.7	7.3	248.6	0.08
S-2	236.5	0.0	2.3	12.0	37.5	71.2	40.3	42.8	9.1	13.9	2.3	1.1	3.7	236.2	0.13
S-3	215.5	0.0	2.2	6.1	18.1	37.6	26.6	45.8	29.4	44.6	2.2	0.5	2.1	215.2	0.14
S-4	226.8	0.0	2.5	10.5	35.2	60.0	24.5	28.3	19.5	41.2	2.3	0.4	1.6	226.0	0.35
S-5	197.0	0.0	0.0	0.8	5.2	24.3	27.2	36.9	16.8	73.2	7.9	1.4	3.3	197.0	0.00
S-6	236.7	0.0	0.4	2.5	19.6	68.3	46.2	58.6	18.7	16.3	1.2	0.6	3.4	235.8	0.38
S-7	206.7	0.0	0.8	5.8	18.0	50.9	37.3	50.9	18.4	16.3	1.5	0.9	5.0	205.8	0.44
S-8	213.3	0.0	10.6	14.6	28.8	55.1	34.2	40.5	12.7	12.6	0.9	0.4	2.4	212.8	0.23
S-9	233.3	0.0	0.6	4.3	28.0	92.0	50.8	47.1	5.9	3.2	0.3	0.1	0.6	232.9	0.17
S-10	229.6	0.0	1.2	3.8	23.3	78.7	54.4	54.5	6.7	3.1	0.3	0.2	0.8	227.0	1.13

* Units=Grams

Well Name: **WR6**

Location: Disney Preserve

Sieve # (U.S. Standard)		#10	#20	#30	#40	#50	#60	#80	#100	#140	#170	#200	Pan	Weight Recovered	% diff.
Sample #	Sample Weight														
S-1	152.2	0.0	0.5	2.5	12.3	39.9	29.6	36.9	8.5	9.1	3.0	2.0	6.8	151.1	0.72
S-2	215.5	0.0	0.0	2.3	14.0	51.0	42.3	59.8	11.9	13.7	4.1	2.5	10.4	212.0	1.62
S-3	214.1	0.0	0.4	2.5	14.5	49.4	42.5	61.7	12.9	10.7	3.8	3.0	10.1	211.5	1.21
S-4	244.4	0.0	0.4	4.7	23.2	71.2	46.1	60.4	9.7	8.3	3.4	3.0	12.3	242.7	0.70
S-5	251.4	0.0	0.8	8.2	31.7	78.2	48.4	55.2	9.2	7.0	2.2	1.7	6.1	248.7	1.07
S-6	246.0	0.0	1.2	6.2	24.5	73.2	48.5	64.7	10.8	7.7	2.2	1.7	5.3	246.0	0.00
S-7	238.2	0.0	0.6	3.7	21.2	66.5	45.9	65.0	10.9	8.0	2.4	2.7	11.1	238.0	0.08
S-8	224.8	0.0	0.8	6.3	22.4	62.0	40.9	55.2	11.4	8.3	3.6	3.0	8.5	222.4	1.07
S-9	230.0	0.0	0.2	2.3	13.9	50.3	45.1	83.1	19.3	7.9	0.8	0.7	5.4	229.0	0.43
S-10	178.1	0.0	0.1	0.6	5.5	29.3	32.0	77.0	18.1	10.3	1.3	0.7	3.2	178.1	0.00

* Units=Grams

Well Name: **WR8**

Location: Disney Preserve

Sieve # (U.S. Standard)		#10	#20	#30	#40	#50	#60	#80	#100	#140	#170	#200	Pan	Weight Recovered	% diff.
Sample #	Sample Weight														
S-1	No Recovery														
S-2	255.8	0.0	1.3	3.0	16.8	62.1	49.5	69.2	12.3	11.3	4.7	4.4	21.2	255.8	0.00
S-3	255.5	0.0	0.8	3.0	17.7	65.8	50.8	70.8	12.4	12.3	4.4	3.6	13.2	254.8	0.27
S-4	291.2	0.0	1.3	6.1	25.9	79.9	57.3	74.9	9.9	8.8	3.6	3.6	18.8	290.1	0.38
S-5	247.2	0.0	1.6	5.6	21.8	76.1	47.2	68.4	8.3	5.5	1.9	1.7	6.9	245.0	0.89
S-6	234.8	0.0	2.3	5.6	21.2	78.6	43.8	61.5	6.8	4.9	1.7	1.6	6.8	234.8	0.00
S-7	221.7	0.0	0.5	2.6	14.7	57.3	51.4	66.3	9.6	6.0	1.8	1.6	8.7	220.5	0.54
S-8	237.0	0.0	0.5	1.7	9.9	45.1	51.3	96.8	16.1	8.2	1.0	0.9	5.6	237.1	0.04
S-9	246.3	0.0	0.4	1.8	10.2	50.0	58.6	98.7	15.0	7.7	0.9	0.6	2.2	246.1	0.08
S-10	266.8	0.0	0.3	1.8	11.1	55.1	60.0	106.3	17.8	8.5	1.0	0.8	4.4	267.1	0.11

* Units=Grams

Well Name: **WR9**

Location: Disney Preserve

Sieve # (U.S. Standard)		#10	#20	#30	#40	#50	#60	#80	#100	#140	#170	#200	Pan	Weight Recovered	% diff.
Sample #	Sample Weight														
S-1	216.7	0.0	0.4	2.1	12.1	47.1	44.1	66.8	13.3	11.9	4.5	3.4	10.7	216.4	0.14
S-2	225.0	0.2	3.0	4.8	18.5	50.2	42.3	58.5	9.7	10.2	4.1	4.1	11.8	217.4	3.38
S-3	221.1	0.0	1.0	2.6	11.8	42.6	41.1	71.4	14.1	9.1	4.2	4.1	19.1	221.1	-0.00
S-4	232.4	0.0	2.7	5.2	20.1	59.2	49.1	63.1	9.5	7.6	2.8	2.4	9.7	231.4	0.43
S-5	241.5	0.2	1.7	6.0	25.1	64.5	49.0	64.4	9.9	7.0	2.5	2.2	8.4	240.9	0.25
S-6	200.0	0.0	0.5	2.8	11.1	36.9	39.6	82.3	14.5	5.9	0.8	0.7	3.7	198.8	0.60
S-7	150.9	0.0	0.3	2.2	8.4	23.2	24.6	65.6	14.7	5.8	0.8	0.6	3.4	149.6	0.86
S-8	No Recovery														
S-9	180.0	0.0	0.1	0.4	3.8	29.7	36.7	85.8	12.9	2.9	0.6	0.7	6.2	179.8	0.11
S-10	234.4	0.0	0.0	0.1	1.5	20.2	50.6	124.5	18.9	4.4	0.6	0.5	12.1	233.4	0.43

* Units=Grams

Well Name: **WR11**

Location: Disney Preserve

Sieve # (U.S. Standard)		#10	#20	#30	#40	#50	#60	#80	#100	#140	#170	#200	Pan	Weight Recovered	% diff.
Sample #	Sample Weight														
S-1	224.2	0.0	0.0	3.0	16.9	52.7	42.5	65.1	13.9	10.6	3.3	2.6	11.6	222.2	0.89
S-2	208.3	0.1	4.2	4.6	15.4	44.7	37.4	63.9	12.4	8.3	2.7	2.6	10.3	206.6	0.82
S-3	204.7	0.5	4.2	4.4	14.8	42.9	35.5	64.6	14.1	8.2	2.6	2.6	9.8	204.2	0.24
S-4	240.3	0.0	0.8	4.0	18.7	56.1	45.4	77.6	14.1	8.2	2.1	1.9	9.4	238.3	0.83
S-5	230.4	0.6	1.3	4.7	20.5	56.9	42.5	67.5	13.1	7.2	1.8	1.7	9.4	227.2	1.39
S-6	268.8	0.0	0.5	5.1	23.5	78.3	63.6	73.2	11.0	4.6	0.5	0.4	6.3	267.0	0.67
S-7	244.1	0.0	0.4	4.5	20.9	67.2	55.9	69.1	11.8	5.6	0.8	0.6	6.3	243.1	0.41
S-8	199.9	0.0	0.4	3.8	16.9	53.6	46.5	58.8	10.9	4.8	0.7	0.5	3.0	199.9	0.00
S-9	230.3	0.0	0.3	3.2	16.6	59.8	55.9	73.5	12.0	5.0	0.4	0.2	1.8	228.7	0.69
S-10	254.2	0.0	0.6	4.1	18.4	66.2	59.7	81.0	13.5	6.2	0.8	0.5	2.2	253.2	0.39

* Units=Grams

Well Name: **WR15**

Location: Disney Preserve

Sieve # (U.S. Standard)		#10	#20	#30	#40	#50	#60	#80	#100	#140	#170	#200	Pan	Weight Recovered	% diff.
Sample #	Sample Weight														
S-1	133.8	0.0	0.0	4.3	12.6	32.9	22.5	31.9	7.2	8.9	3.0	2.1	6.9	132.3	1.12
S-2	253.7	0.0	0.1	2.8	19.4	62.9	47.5	70.3	13.1	16.5	4.8	3.3	11.5	252.2	0.59
S-3	252.7	0.0	0.4	3.4	19.9	60.8	45.0	72.4	15.0	16.3	6.5	4.3	7.3	251.3	0.55
S-4	251.0	0.0	0.6	3.1	16.0	53.7	44.1	74.8	15.9	18.3	7.6	5.0	10.2	249.3	0.68
S-5	228.9	0.0	1.4	6.0	18.6	55.5	43.3	65.6	9.0	13.4	4.3	2.9	6.2	226.2	1.18
S-6	212.6	0.0	1.2	4.6	17.3	51.8	41.3	62.1	9.2	10.8	3.3	2.2	6.3	210.1	1.18
S-7	242.0	0.0	1.7	4.5	17.8	57.4	46.3	73.3	10.0	12.5	3.5	2.5	6.9	236.4	2.31
S-8	255.9	0.0	1.7	3.5	17.7	64.8	45.2	77.3	10.7	17.9	5.0	3.1	8.4	255.3	0.23
S-9	241.0	0.0	0.8	4.8	24.0	80.5	45.8	66.4	8.6	4.2	0.7	0.6	4.3	240.7	0.12
S-10	242.2	0.0	0.9	4.4	21.3	78.7	50.1	65.5	8.5	4.7	1.0	0.9	6.0	242.0	0.08

* Units=Grams

Well Name: **WR16**

Location: Disney Preserve

Sieve # (U.S. Standard)		#10	#20	#30	#40	#50	#60	#80	#100	#140	#170	#200	Pan	Weight Recovered	% diff.
Sample #	Sample Weight														
S-1	166.6	0.0	0.3	2.0	13.3	43.5	31.9	42.9	9.4	10.4	3.2	2.3	5.4	164.6	1.20
S-2	266.3	0.0	0.3	2.4	17.1	60.9	50.5	77.6	17.9	19.4	5.8	3.9	9.7	265.5	0.30
S-3	265.4	0.0	0.1	2.5	18.7	66.5	52.6	74.2	14.3	15.8	4.5	3.2	12.4	264.8	0.23
S-4	202.8	0.0	0.2	2.3	12.3	39.5	34.7	60.5	13.4	14.3	5.2	3.5	16.8	202.7	0.05
S-5	230.4	0.0	0.2	2.5	14.7	48.8	40.7	66.4	12.8	15.4	4.6	3.5	19.2	228.8	0.69
S-6	254.7	0.0	0.3	2.8	14.7	51.1	47.0	81.2	16.4	17.4	6.3	4.3	12.4	253.9	0.31
S-7	274.8	0.0	0.5	3.0	20.2	72.8	52.2	70.5	10.3	15.7	5.7	5.2	18.0	274.1	0.25
S-8	251.3	0.0	1.3	5.0	23.1	76.7	52.3	56.1	7.3	10.7	3.3	2.8	9.0	247.6	1.47
S-9	276.2	0.0	1.3	7.1	28.0	89.5	57.2	64.9	5.1	9.1	2.2	2.2	8.2	274.8	0.51
S-10	291.0	0.0	1.2	8.3	32.7	103.5	43.8	68.8	8.9	9.0	2.3	2.4	8.6	289.5	0.52

* Units=Grams

Well Name: **FP2**

Location: Flint Pen Strand - - - Fort Myers

Sieve # (U.S. Standard)		#10	#20	#30	#40	#50	#60	#80	#100	#140	#170	#200	Pan	Weight Recovered	% diff.
Sample #	Sample Weight														
S-1	No Recovery														
S-2	195.9	0.0	3.2	8.5	8.9	11.0	10.5	49.0	36.0	44.6	6.9	4.6	11.7	194.9	0.51
S-3	265.5	0.0	0.0	4.3	5.5	8.0	9.2	87.4	56.4	70.0	7.9	4.8	11.1	264.6	0.34
S-4	242.9	0.0	0.0	2.8	4.8	8.9	11.5	136.0	25.7	37.7	3.3	3.5	7.8	242.0	0.37
S-5	250.8	0.0	0.0	0.0	2.2	7.5	11.0	147.6	25.6	44.6	4.0	2.2	4.9	249.6	0.48
S-6	269.6	0.0	1.5	2.6	3.3	8.4	15.5	199.1	8.4	24.1	1.5	1.3	4.0	269.7	0.04
S-7	254.5	60.0	48.2	14.3	11.7	13.7	10.5	76.9	0.7	4.9	1.4	2.2	7.1	251.6	1.14
S-8	177.8	71.9	20.7	6.3	5.0	6.6	6.3	28.2	11.2	7.4	3.5	3.1	7.2	177.4	0.22
S-9	No Sample														
S-10	No Sample														

* Units=Grams

Well Name: **FP3**

Location: Flint Pen Strand - - Fort Myers

Sieve # (U.S. Standard)		#10	#20	#30	#40	#50	#60	#80	#100	#140	#170	#200	Pan	Weight Recovered	% diff.
Sample #	Sample Weight														
S-1	55.2	0.0	3.2	2.9	3.3	4.9	4.4	19.2	7.8	6.1	1.0	0.8	2.3	55.9	1.27
S-2	134.7	0.0	5.4	4.0	4.6	8.2	8.5	40.1	25.6	26.2	3.2	1.9	4.8	132.5	1.63
S-3	270.0	0.0	12.5	7.5	6.7	10.3	11.5	126.6	35.2	46.0	5.0	1.9	5.2	268.4	0.59
S-4	270.4	0.0	0.3	2.0	4.0	8.4	11.0	179.3	20.3	36.4	4.2	1.4	2.0	269.3	0.41
S-5	219.2	0.0	7.0	4.2	4.6	8.7	12.7	152.5	7.2	15.2	2.5	1.0	2.2	217.8	0.64
S-6	210.9	48.6	23.3	8.4	7.9	10.6	9.5	45.9	13.2	19.0	4.3	6.2	11.2	208.1	1.33
S-7	199.4	66.5	41.7	13.8	11.5	10.9	6.6	17.1	7.4	8.2	2.1	2.8	8.4	197.0	1.20
S-8	241.1	84.4	40.6	11.3	9.7	9.2	5.9	18.0	21.6	22.8	4.8	6.0	5.9	240.2	0.37
S-9	219.2	110.3	37.8	10.7	8.6	7.9	4.6	8.8	7.6	10.9	2.3	2.7	6.0	218.2	0.46
S-10	Sample not sieved - - - Greater than #10 sieve														

* Units=Grams

Well Name: **FP4**

Location: Flint Pen Strand - - - Fort Myers

Sieve # (U.S. Standard)		#10	#20	#30	#40	#50	#60	#80	#100	#140	#170	#200	Pan	Weight Recovered	% diff.
Sample #	Sample Weight														
S-1	165.1	0.0	0.8	7.3	7.5	12.7	11.3	54.0	26.9	30.0	3.9	2.2	8.5	165.1	0.00
S-2	209.8	0.0	2.6	14.6	13.8	23.4	18.5	78.8	20.6	24.9	2.8	1.6	5.0	206.6	1.53
S-3	256.2	0.0	0.0	8.2	25.5	52.2	22.1	106.0	10.4	23.0	3.0	1.4	2.3	254.1	0.82
S-4	258.8	0.0	0.9	4.0	8.7	10.8	12.6	102.4	42.6	56.6	7.2	4.0	8.6	258.4	0.15
S-5	248.8	0.0	0.0	0.3	2.9	8.6	11.1	114.7	63.9	38.2	4.9	1.4	2.8	248.8	0.00
S-6	263.6	0.0	0.0	0.2	2.5	8.1	9.4	153.1	42.4	35.5	6.0	2.2	3.4	262.8	0.30
S-7	258.7	0.0	0.3	3.9	5.5	10.1	12.1	167.9	19.7	25.7	5.8	2.2	5.4	258.6	0.04
S-8	234.8	20.9	30.3	10.3	9.0	13.1	11.1	68.5	34.4	26.3	3.3	1.7	5.5	234.4	0.17
S-9	287.2	90.8	33.7	12.1	10.9	14.5	10.9	47.1	24.8	24.7	3.3	2.6	8.9	284.3	1.01
S-10	271.9	18.2	20.3	8.3	7.0	9.2	5.6	70.4	22.7	76.2	6.7	6.5	18.8	269.9	0.74

*Units=Grams

Well Name: **FP5**

Location: Flint Pen Strand - - - Fort Myers

Sieve # (U.S. Standard)		#10	#20	#30	#40	#50	#60	#80	#100	#140	#170	#200	Pan	Weight Recovered	% diff.
Sample #	Sample Weight														
S-1	62.3	0.0	0.7	2.6	2.7	3.9	3.4	13.9	12.0	16.4	1.8	1.0	3.9	62.3	0.00
S-2	276.1	0.0	0.0	0.4	10.1	15.0	14.4	113.7	48.9	54.4	4.6	2.8	9.6	273.9	0.80
S-3	288.7	0.0	0.1	4.5	4.7	8.2	9.6	165.2	27.1	45.7	6.9	4.6	12.2	288.8	0.03
S-4	242.1	0.0	0.6	4.3	4.8	8.5	9.4	109.8	45.4	42.1	3.7	2.6	10.7	241.9	0.08
S-5	245.0	0.0	0.0	0.1	2.5	6.9	9.6	148.4	37.5	29.6	3.4	1.1	5.3	244.4	0.24
S-6	250.7	0.0	0.1	0.4	1.1	5.0	8.3	169.1	29.5	28.0	4.3	1.5	3.1	250.4	0.12
S-7	254.8	0.0	0.0	1.9	4.0	8.6	11.7	192.9	6.6	18.0	4.6	2.0	3.6	253.9	0.35
S-8	250.9	0.0	0.0	0.3	2.3	4.7	5.4	164.6	33.0	31.7	3.6	2.0	3.2	250.8	0.04
S-9	181.7	0.4	17.0	16.5	17.2	22.3	11.6	81.1	3.5	4.8	0.5	1.0	2.2	178.1	1.98
S-10	No Recovery														

* Units=Grams

Well Name: **FP6**

Location: Flint Pen Strand - - - Fort Myers

Sieve # (U.S. Standard)		#10	#20	#30	#40	#50	#60	#80	#100	#140	#170	#200	Pan	Weight Recovered	% diff.
Sample #	Sample Weight														
S-1	111.2	0.0	0.0	0.6	5.7	7.4	7.2	29.9	22.7	25.0	2.9	1.7	6.3	109.4	1.62
S-2	260.7	0.0	0.0	9.2	7.5	14.2	15.9	94.0	48.5	50.9	5.3	3.0	10.6	259.1	0.61
S-3	241.4	0.0	0.0	1.6	5.6	9.9	11.9	105.5	44.1	48.3	5.8	2.4	6.3	241.4	0.00
S-4	243.6	0.0	0.2	2.6	5.0	8.8	10.2	80.4	57.5	62.7	5.8	2.3	7.6	243.1	0.21
S-5	246.1	0.0	0.0	0.4	3.0	7.4	10.4	150.3	30.7	34.3	3.1	1.5	4.7	245.8	0.12
S-6	246.7	0.0	0.0	0.0	2.6	13.4	24.8	162.4	15.4	20.9	2.9	1.1	3.0	246.5	0.08
S-7	259.7	0.0	0.0	1.0	3.6	9.8	12.2	148.0	39.8	32.1	6.5	2.5	4.2	259.7	0.00
S-8	245.3	0.0	0.0	1.4	3.2	4.9	2.8	139.2	32.4	42.9	7.6	4.4	4.2	243.0	0.94
S-9	172.3	61.8	19.6	7.2	6.0	6.2	3.9	23.7	12.5	16.6	2.8	2.3	7.4	170.0	1.33
S-10	208.4	116.2	20.9	7.0	5.3	5.1	3.1	7.3	10.4	20.4	3.1	2.4	6.4	207.6	0.38

* Units=Grams

Well Name: **FP7**

Location: Flint Pen Strand - - - Fort Myers

Sieve # (U.S. Standard)		#10	#20	#30	#40	#50	#60	#80	#100	#140	#170	#200	Pan	Weight Recovered	% diff.
Sample #	Sample Weight														
S-1	114.1	0.0	6.3	3.7	4.3	7.1	7.3	29.7	22.1	22.5	2.7	1.7	5.8	113.2	0.79
S-2	166.6	0.0	15.0	6.5	7.5	12.2	12.8	56.8	23.1	19.5	2.4	2.0	7.2	165.0	0.96
S-3	262.4	0.0	8.1	3.7	3.7	7.9	10.3	124.3	42.4	47.9	5.5	2.4	6.1	262.3	0.04
S-4	256.2	0.0	1.0	3.4	4.5	8.8	11.0	175.6	11.2	33.4	3.2	1.3	3.1	256.5	0.12
S-5	259.7	0.0	0.5	0.7	1.9	5.6	9.4	175.5	35.7	20.5	2.5	2.2	5.7	260.2	0.19
S-6	250.7	0.0	7.9	3.5	4.5	10.3	15.4	116.6	38.7	32.1	4.0	3.5	14.3	250.8	0.04
S-7	251.9	0.0	1.9	5.1	4.1	9.0	9.9	96.8	56.8	54.6	4.9	2.8	5.5	251.4	0.20
S-8	232.7	27.0	22.4	8.7	6.7	7.6	6.8	89.6	25.1	25.1	1.7	2.0	8.2	230.9	0.77
S-9	No Sample														
S-10	No Sample														

* Units=Grams

Well Name: **FP8**

Location: Flint Pen Strand - - - Fort Myers

Sieve # (U.S. Standard)		#10	#20	#30	#40	#50	#60	#80	#100	#140	#170	#200	Pan	Weight Recovered	% diff.
Sample #	Sample Weight														
S-1	56.6	0.0	2.5	2.5	3.6	5.8	4.9	15.9	9.8	9.1	1.0	0.6	0.8	56.5	0.18
S-2	215.9	0.0	0.4	1.5	4.1	9.5	11.4	85.5	45.5	48.8	5.5	1.5	1.9	215.6	0.14
S-3	218.3	0.0	1.5	4.2	4.4	8.4	9.4	94.4	35.4	49.9	5.9	1.8	2.0	217.3	0.46
S-4	195.0	16.1	18.4	5.9	6.0	9.2	9.1	58.3	27.4	32.3	3.6	1.4	4.9	192.6	1.23
S-5	248.8	87.2	26.6	7.0	5.6	7.6	7.0	49.6	26.3	21.6	3.3	1.6	5.1	248.5	0.12
S-6	217.3	21.8	20.0	6.3	5.4	9.3	9.7	72.7	39.8	21.0	3.0	1.9	5.1	216.0	0.60
S-7	234.7	51.2	31.0	8.9	6.7	8.8	8.2	62.7	22.5	17.8	3.2	2.7	9.9	233.6	0.47
S-8	Sample not sieved - - - Sample larger than #10 sieve														
S-9	No Sample														
S-10	No Sample														

* Units=Grams