

**APPENDIX A – MONITORING WELL AS-BUILTS, AND WELL  
CONSTRUCTION FIELD FORMS**

**DESCRIPTOR CONVENTION:**

**Proportions:** TRACE (0-10%); LITTLE (10-20%); SOME (20-35%); AND (35-50%).

**Contrast:** FAINT; DISTINCT; PROMINENT.

**Abundance:** FEW; COMMON; MANY.

**Color:** Munsell Standards (wet)

**Odor:** FAINT; SLIGHT; MODERATE; STRONG; VERY STRONG

**Formation Abbreviations:**

- UHG - Upper Hawthorn Group
- MHG - Middle Hawthorn Group
- LHG - Lower Hawthorn Group



**LEGEND**

- AGS – Above Ground Surface
- BGS – Below Ground Surface
- BOC – Bottom of Casing
- BOS – Bottom of Steel Casing
- CS - Carbon Steel Pipe (Black Mild Steel)
- DIA – Diameter
- FP - Filter Pack
- GS – Ground Surface
- G – Gravel
- ID – Inside Diameter
- LHG – Lower Hawthorn Group Sediment Formation
- MHG – Middle Hawthorn Group Sediment Formation
- MIP - Moderately Indurated Packstone
- MP – Measuring Point
- NA – Not Applicable
- NR – Not Recorded
- NOM - Nominal
- OD – Outside Diameter
- PIP - Poorly Indurated Packstone
- SAA – Same As Above
- SI – Screen Interval
- SS – Stainless Steel
- TOC – Top of Casing
- TOFP – Top of Filter Pack
- TOFS – Top of Filter Sand
- TOS – Top of Screen
- TOSS – Top of Stainless Steel
- UHG – Upper Hawthorn Group Sediment Formation
- WIP - Weakly Indurated Packstone

MODIFIED DUNHAM'S CARBONATE ROCK CLASSIFICATION					
Depositional texture recognizable					Depositional texture not recognizable
Original components not bound together during deposition		Original components were bound together			
Contains mud (clay and fine silt-size carbonate)		Lacks mud and is grain supported			
Mud-supported (Matrix materials usually consist of microcrystalline or cryptocrystalline carbonate sediments.)		Grain-supported (Dominance of visible sedimentary grains)			
Less than 10% grains	More than 10% grains	Packstone	Grainstone	Boundstone	Crystalline
Mudstone	Wackestone				
<p>Dunham (1962) proposed a carbonate rock classification system that first looked at textural considerations of a rock including whether texture was recognizable in the rock. He then looked to see whether sedimentary materials were somehow bound as part of the depositional process. He was interested in separating those rock types where biologic activity had trapped sedimentary materials, as in the case of stromatolites. In his hierarchy, once the basic textural categories were assigned, he then looked at the relative proportion of mud in the sample. If the rock had no mud and was dominated by coarse-grained sediments, he classified these rocks as grainstones. However, if the sample contained any amount of mud it was then considered in percent relative to the number of grains. In this way, he was designated mudstones as having less than 10% grains, wackestones with more than 10% grains but less than the amount required to support the rock, and packstones where the sedimentary grains supported the rock framework but still had appreciable quantities of mud. Dunham's rock names are shown in blue below.</p>					
<b>RQD (Rock Quality Index)</b>					
RQD = cumulative length of core pieces that are >10 cm in a run divided by the total length of the core run, including all lost core sections. Measure ASAP after coring.					
<b>FRACTURE FREQUENCY</b>					
Measure and record the number of natural fractures per foot of core, up to a maximum of 10/ft. For more than 10 fractures/ft, enter ">10/ft" in the measured section.					

## **DRILLING METHODS:**

### **CABLE TOOL DRILLING INSTALLED:**

- 18-in OD Black Steel Conductor Casings (TD varies 22.2 to 26.6) ft bgs
- 12-in ID Black Steel Conductor Casings (TD varies 63.0 to 72.5) ft bgs
- All logging from Bailer and Tool Inspection

### **ROTASONIC DRILLING INSTALLED:**

- 8-in ID Black Steel Conductor Casings (TD varies 116.9 to 125.6) ft bgs
- 4-in SS Multi-Screen Well (TD = 232.4 to 250.9) ft bgs
- Continuous Core from MHG Clay to Total Depth

## **General Ocala Core Stratigraphy**

The Ocala Limestone at the Site is primarily comprised of pure limestone with occasional dolostone and silicified limestone (chert). The facies is a yellowish gray to very light gray, poorly to moderately indurated, well graded to gap graded, very fossiliferous limestone. Fossils present include prominent small and medium-sized foraminifers, mollusks, and echinoids. The foraminifera *Lepidocyclus* sp. is abundant in core from the. The limestone is generally classified as a "packstone" using the Dunham Carbonate Classification System (grain-supported carbonate rocks with less clay size matrix than clasts). The formation is highly solution-weathered with a prominent "oatmeal texture" within interlayered thin and moderate beds of variable karstification. A subjective karstic classification system was developed to describe Ocala sample core integrity and associated intergranular porosity based upon the following definitions and criterion:

### **Moderately Indurated Packstone (MIP)**

Well graded core with sufficient integrity to resist crumbling under moderate hand pressure. The majority of all clasts (silt to fossils) are cemented and can only be fractured into smaller aggregated pieces (also cemented together) from degradation inherent in the sonic drilling method. The core has relatively low intergranular porosity.

### **Poorly Indurated Packstone (PIP)**

Gap graded core lacking integrity. The recovered sample generally slumped from its own weight after being unzipped from the plastic core bag. The majority of all clasts (silt to fossils) are disaggregated from each other (presumably due to solution weathering) giving the impression of unconsolidated clean to sandy gravel sediments. Much of the original matrix is preferentially dissolved creating substantial secondary coarse-grained porosity.

### **Weakly Indurated Packstone (WIP)**

Well graded sample core lacking integrity. The recovered sample generally maintained its extruded shape after being unzipped from the plastic core bag, but is friable under minor to moderate hand pressure. Like PIP, the majority of all clasts (silt to fossils) are disaggregated from each other; but unlike PIP, WIP tends to have substantial fines. Much of the original carbonate matrix and other fossils/molds remain intact with only the cement preferentially dissolved. WIP has only slightly more porosity than thick-bedded MIP and much less porosity than PIP.

Typically, approximately 15-30% of Ocala core is comprised of MIP layers and angular to sub-rounded gravel-size MIP aggregates. Some of these MIP gravels have presumably been mechanically degraded (to some extent) by sonic drilling. When a sufficient volume of angular-subangular MIP rock fragments were found concentrated in zones within the core, a presumption of in situ MIP layers was made with an estimated thickness determined from re-assembling the mechanically fractured pieces.

PIP layers typically contain higher percentages of sub-rounded MIP gravel-size aggregates than WIP layers. Sulfide odors tend to be more prominent in the finer grained matrix of WIP layers than in coarser PIP layers and are readily detected with the PID. NAPL or residual NAPL was not observed from within any of the more than 1,300 ft of Ocala core collected during this investigation.

*This investigation installed fourteen (14) multi-screen Ocala Fm bedrock wells throughout the Upper Transmissive Zone of the Upper Floridan Aquifer, FW-10B through FW-23B. All wells are all telescopic, quadruple cased, multi-screen, 4-in wells with four x 10 LF stainless steel 0.020 slot screens, with combination stainless steel to mild steel risers to above grade. Three telescopic mild steel conductor casings (18-in, 12-in and 8-in diameter) were grouted into successive clay units to help restrict vertical groundwater migration. Westbay multi-port wells were subsequently installed inside the 4-in wells.*

## Lithologic Library



CL  
Lean Clay



CH  
Fat Clay



ML  
Silt



SC  
Clayey SAND



SM  
Silty SAND



SP - Poorly  
Graded SAND



GC  
Clayey  
GRAVEL



GM  
Sandy  
GRAVEL



Grout



LIMESTONE



CHERT



DOLOMITE

# BORING LOG AND MONITOR WELL COMPLETION

## Monitor Well ID: FW-10B

**Project No.** 2201.083.02  
**Total Well Depth (ft bgs):** 237.85  
**Well Location:** Transect Well  
**Well Screens:** Four x 10 ft, 4-in dia SS, 0.020 slot, 20 ft C-C, 12/20 filter pack, 30/65 seal sand between filter packs  
**Well Description:** 4-in Multiscreen SS Well w/in Ocala LS with Westbay MP38 4-port Sampling Well

**Project Name:** Upper Floridan Aquifer Invest.  
**Site:** Koppers Industries, Gainesville, FL  
**Top of Casing Elev. (Ft NGVD-29):** 184.56  
**NAD 83 (FL North) X =** 2658068

**Start/Finish Date:** 7/22/05 - 11/18/05  
**Client:** Beazer East  
**Ground Elev. (Ft NGVD-29):** 184.5  
**NAD 83 (FL North) Y =** 253577

SUBSURFACE PROFILE				SOIL SAMPLE			AS-BUILT
Depth (ft bgs)	Elevation (ft NGVD-29)	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation	As-Built
-2							TOC →
0	184.6		Ground Surface				
2							24-in Ø Borehole ↓
4							18 in. Conductor Casing
6							
8							
10							
12						Surficial Deposits	
14							12 in. Conductor Casing
16							
18							
20							
22							
24	159.6					25.0 ft bgs	
26		▨	(25.0 - 28.0) ft bgs - Upper Hawthorn Group Clay Confirmed with GeoProbe Sample.		18-in steel conductor casing installed to 26.0 ft bgs using cable tool methods	HG - Upper Clay Unit	
28	156.6	▨	No other core or samples were collected from GS to 63 ft bgs.			28.0 ft bgs	
30							
32							

BORING LOG AND MONITOR WELL COMPLETION

**Monitor Well ID: FW-10B**

SUBSURFACE PROFILE			SOIL SAMPLE		AS-BUILT		
Depth (ft bgs)	Elevation ft NGVD-29	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation	As-Built
34						Hawthorn Group	
36							
38							
40							
42							
44							
46							
48							
50							
52							
54							
56							
58							
60	124.6					60 ft bgs	
62			<b>CONTINUOUS CORE BEGINS AT 63.0 FT BGS</b>		12-in steel conductor casing installed to 63.0 ft bgs using cable tool methods	HG - Middle Clay Unit	
64	121.5		Slough (GRAVEL) with grout from cable tool installation of 12-in CS conductor casing.				
66	119.6		GM (Sandy GRAVEL), with limestone cobbles, little fine sand, little silt/clay, coarse grained, compact, gap graded, subrounded, greenish gray [5GY 6/1] blend, moist, odorless.				
	118.1						

BORING LOG AND MONITOR WELL COMPLETION

**Monitor Well ID: FW-10B**

SUBSURFACE PROFILE				SOIL SAMPLE		AS-BUILT
Depth (ft bgs)	Elevation ft NGVD-29	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation
69	114.5		CL (Sandy CLAY) Some fine to very fine grained sand, some silt, trace sub-angular gravel, firm, medium plastic, chaotic bedding of vermiculated gradational thin lenses of silty clay with clayey sand, greenish gray [5GY 6/1] blend with blue-green mottling and prominent grayish blue [5PB 4/2] staining (68-69) ft bgs, moist, odorless.	8	Collect 7-in sonic core in advance of 10-in override casing, from within 12-in ID permanent casing	70.1 ft bgs
71			GM (Sandy GRAVEL), with cobbles and fine sand, little silt, little clay, med to coarse grained, compact, gap graded, light gray [N7] gravel blended with blue-green [5BG 4/2] sand, wet, odorless. Gravels and cobbles are predominantly limestone wackestone, very light gray [N8] blend with little dark gray [N3] carbonate grains (salt and pepper appearance, hereafter referenced as <b>S&amp;P Wackestone</b> ), with little rounded to subrounded coarse grained lustrous silica sand with smooth crystal faces in a very fine to medium grained carbonate sand matrix and with little small shell fragments.			
73				10	All sonic cores were collected without drilling water	Hawthorn Group
75						
77	107.6		SM (Silty SAND) with gravel lens (78.1 - 78.3) ft bgs, some gravel, some silt, little clay, fine grained, firm grading to hard, low to non-plastic, compact, gap graded, irregular laminations and thin lenses, well graded matrix, greenish gray [5G 6/1] blend, moist, odorless.			
79				10		12-in Ø Borehole
81	104.1		SM (Silty SAND), some silt, little clay, trace gravel, fine grained, hard, low to non-plastic, dense, prominent irregular laminations and thin lenses, well graded matrix, dark greenish gray [5G 4/1] monotone with [N8] gravels, moist grading to dry, odorless, prominent [N9] rock flour below 84 ft bgs. Mechanically degraded into fine to coarse gravel aggregates by sonic drilling.			
83				10		
85	99.6		SM (Silty SAND) matrix with some medium to coarse gravel carbonate lenses and cobbles, some silt, little clay, fine grained, firm to stiff, medium plastic, irregular laminations and thin lenses, well graded matrix, greenish gray [5G 6/1] blend, moist, odorless.			
87				10		
89	95.3		Limestone Cobble			
91	93.1		GM (Sandy GRAVEL) Same As Above (SAA) (85.0 - 89.3) ft bgs, but with more gravel. Mechanically degraded by sonic drilling into medium gravel size aggregates.	10		
93	90.3		CL (Silty CLAY), lean, some silt, little medium gravel, little very fine sand, clay zones with prominent thin gravel lenses alternating with clay zones showing prominent laminations and stringers, stiff, medium plastic, dark greenish gray [5G 4/1] monochromatic clay w/ [N8] gravel and yellow gray [5Y 8/1] laminations and stringers, moist, odorless.			
95				10		
97	88.1		SP (SAND) little clay [gravel absent], medium grained clean silica sand, loose, poorly graded, few thin lenticular sandy clay lenses, greenish gray [5GY 6/1] & light olive gray [5Y 6/1] blend, moist, odorless, 0.5-ft carbonate lens at 96 ft bgs.			
99	86.6			10		
101			CL (Gravelly CLAY), lean, some medium gravel, some silt, little fine sand, stiff, medium plasticity, massive clay with prominent thin fine grained sand lenses and stringers and prominent medium gravel lenses, dark greenish gray [5GY 5/1] and light olive gray [5Y 6/1] laminations, moist, odorless.			

BORING LOG AND MONITOR WELL COMPLETION

**Monitor Well ID: FW-10B**

SUBSURFACE PROFILE				SOIL SAMPLE		AS-BUILT
Depth (ft bgs)	Elevation ft NGVD-29	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation
104	81.6		SP (SAND) little clay/silt, trace gravel, medium grained clean silica sand, compact, poorly graded, few thin lenticular sandy clay lenses, light olive gray [5Y 6/1] blend, moist, odorless.			
106	77.6		SC (Clayey SAND) some clay, little sub-angular gravel (sandstone, dolomite, and S&P Wackestone), fine grained, firm, low plasticity, lenticular bedding, abundant organic staining, greenish gray [5GY 6/1] blend, moist, odorless.			
108			GM (Sandy GRAVEL), some fine sand, little silt/clay, coarse to medium grained angular to sub-angular carbonate gravel consolidated in moderately-bedded lenses, firm matrix, low plasticity, color SAA, moist, odorless.	10		110.8 ft bgs HG - Lower Clay Unit
110	73.8		CL (CLAY), lean, some silt, little very fine sand, [gravel absent], stiff, medium plasticity, typical "massive" clay but only in thin beds with prominent fine sand and silt stringers and thin lenses. Dark greenish gray [5GY 4/1] clay with [5Y 6/1] sand seams, moist, odorless.			
112	72.9		CL (Sandy CLAY), lean, some fine sand, some silt, little gravel (carbonates and shells), firm, medium plasticity, irregularly laminated/ thin lensed silty clay and sandy-clayey-silt, mottled greenish gray [5GY 6/1] with light olive gray [5Y 6/1] and [5GY 4/1], moist, odorless.			
114	70.8		CL (CLAY) massive, same as above (110.8 - 111.7) ft bgs.			
116	70.1		Carbonate cobble, S&P wackestone, moist, mechanically degraded by sonic drilling into gravel-size aggregates.	10	8-in steel conductor casing installed to 122.0 ft bgs using rotasonic methods	
118	66.1		ML (Sandy SILT), calcareous, some fine sand, some medium sub-rounded gravel, little clay, with common lenticular sand seams, very soft grading to firm, medium plasticity, greenish gray [5G 6/1], saturated, odorless.			
120	64.5		CL (Silty CLAY), massive, some silt, some very fine sand, stiff, medium plastic, lean, prominent lenticular bedding with irregular thin lenses, stringers and laminations of rock flour silt, dark greenish gray [5GY 5/1], [N9] rock flour, moist, odorless.			
122	62.0		CL (Silty CLAY), massive, SAA but without [N9] rock flour and with common laminations and thin lenses of pale yellow brown [10YR 6/2] fine sand stringers and seams, mottled pale blue [5B 6/2] and dark greenish gray [5GY 4/1], moist, odorless.			
124	60.8		CL (Silty CLAY) - Same as above (118.5 - 120.1) ft bgs.	5	Collect 4-in sonic core in advance of 7-in override casing, all within 8-in ID conductor casing	
126	59.6		SC (Clayey SAND), some clay & silt, [gravel absent], fine grained, soft, non-plastic, chaotic bedding with thin lenses of clayey sand, clay, silt, and silty clay, greenish gray [5GY 6/1] blend from several similar colors, wet, odorless.			
128	55.9		ML (Sandy SILT), some fine sand, some clay, [gravel absent], stiff, non plastic, composed of irregular thin lenses and clayey-silt laminations with silty-sandy-clay and few clay seams (rock flour increasing w/ depth), greenish gray multi-colored [5GY 6/1] blend, moist, odorless. Core mechanically degraded (127.1-128.7) ft bgs into coarse gravel size aggregates.	5		
130			S&P Wackestone cobble.			
132			ML (Sandy SILT) - Same as above (125.0 - 128.7) ft bgs with few fine-grain S&P Wackestone gravel lenses.			
134	50.1		CL (CLAY) lean, some silt, little very fine sand, [gravel absent], stiff, medium plastic, massive with few carbonate silt/sand stringers and lenses, grading down to common, mottled dark greenish gray (slightly bluer) [5GY 4/1], moist, odorless.			
136	47.1					

8-in Ø Borehole

**BORING LOG AND MONITOR WELL COMPLETION**

**Monitor Well ID: FW-10B**

SUBSURFACE PROFILE				SOIL SAMPLE		AS-BUILT	
Depth (ft bgs)	Elevation ft NGVD-29	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation	As-Built
139	46.4		SP (SAND) little clay/silt, trace gravel, medium, clean, loose, poorly graded, sub-rounded olive gray [5Y 4/1], wet, odorless.	5			
	45.1		Limestone (mudstone) cobble, mechanically degraded by sonic drilling into gravel size aggregates, [N9], dry, odorless.				
141	42.8		SC (Clayey SAND) some clay, some gravel (shells and rounded pebbles), medium grained sub-rounded sand, compact, gap graded, conglomeratic sediments from granule to fine gravel-sized rip-up clasts deposited in horizontal beds, including silt and clay blebs. Multiple conglomeratic colors averaging olive gray [5Y 4/1], moist, odorless.	5	Start of typical weathered Ocala at 141.8 ft bgs	141.8 ft bgs	
143			ML (Gravelly SILT), Some gravel (medium sub-angular S&P Wackestone with fine sub-rounded pebbles), some fine sand, firm, low plasticity, prominent irregular lenses, light brownish gray [5YR 6/1] blend, wet, faint sulfide odor.		First loss of override casing drilling water circulation at 143 ft bgs.	Ocala LS Formation	
145	39.6		<b>OCALA LIMESTONE</b> Moderately Indurated Packstone (MIP) rotasonically degraded into 1"- 3" core "disks" along bedding planes & angular gravel-size aggregates interlayered with PIP. Contains prominent Leps fossils. Yellowish gray [5Y 8/1], dry to slightly moist, faint sulfide odor. Estimated core integrity volumes: 30% Unconsolidated (PIP/WIP) 70% Consolidated (MIP layers and gravel-size aggregates)	5.5	Circulation was never re-established for the remainder of the borehole		
147							
149							
151	34.1		<b>(145 to 155) ft bgs</b> Differentially weathered Packstone. Interlayered PIP & WIP [MIP Layers absent]. Light olive gray [5Y 6/1] monotone, wet, odorless to faint sulfide odors. Estimated core integrity volumes: 80% Unconsolidated (PIP/WIP) 20% Consolidated (MIP fine-coarse gravel-size aggregates)				
153							
155	29.6		NO RECOVERY		All Ocala FM 10-ft sonic cores drilled in 10-45 seconds for an average penetration rate of 1.9 secs/ft.		
157							
159			<b>(155 to 165) ft bgs</b> Differentially weathered Packstone. Interlayered PIP, WIP, and MIP. Yellowish gray [5Y 8/1] to light olive gray [5Y 6/1], wet, odorless to faint sulfide odors. 6-in thick competent chert packstone cobble at 156 ft bgs. Estimated core integrity volumes: 75% Unconsolidated (PIP/WIP) 25% Consolidated (Chert layer and MIP fine-coarse gravel-size aggregates, RQD = 0.05)	10			
161							
163					All sonic cores drilled w/ minimal vibrations and no added feed pressure (only weight of rods)		
165	19.6						
167			<b>(165 to 175) ft bgs</b> Differentially weathered Packstone. Interlayered PIP & WIP [MIP Layers absent]. Light olive gray [5Y 6/1] to slightly darker [5Y 5/1], wet, odorless. Estimated core integrity volumes: 80% Unconsolidated (PIP/WIP) 20% Consolidated (MIP fine-coarse gravel-size aggregates, layers absent). RQD = 0.0	10			
169							
171							

BORING LOG AND MONITOR WELL COMPLETION

**Monitor Well ID: FW-10B**

SUBSURFACE PROFILE			SOIL SAMPLE		AS-BUILT		
Depth (ft bgs)	Elevation ft NGVD-29	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation	As-Built
174	9.6	[Brick pattern symbol]	<p><b>(175 to 195) ft bgs</b>                      Differentially weathered Packstone. Interlayered PIP &amp; WIP [MIP Layers absent]. Light olive gray [5Y 6/1] to yellowish gray [5Y 8/1], wet, odorless. Estimated core integrity volumes:                      85% Unconsolidated (PIP/WIP)                      15% Consolidated (MIP fine-coarse gravel-size aggregates, layers absent). RQD = 0.0</p>	10	Faint sulfide odors prominent from 140 to 161 ft bgs. Odorless in all other Ocala LS horizons	Ocala LS	[As-built well diagram showing casing and screen]
176							
178							
180							
182							
184							
186							
188							
190							
192							
194			<p><b>(195 to 201.5) ft bgs</b>                      Differentially weathered Packstone. Interlayered PIP &amp; WIP [MIP Layers absent]. Light olive gray [5Y 7/1] monotone, wet, odorless. Estimated core integrity volumes:                      75% Unconsolidated (PIP/WIP)                      25% Consolidated (MIP fine-coarse gravel-size aggregates). RQD = 0.0</p>	10			
196							
198							
200			NO RECOVERY	6.5			
202							
204							
206							

BORING LOG AND MONITOR WELL COMPLETION

**Monitor Well ID: FW-10B**

SUBSURFACE PROFILE			SOIL SAMPLE		AS-BUILT		
Depth (ft bgs)	Elevation ft NGVD-29	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation	As-Built
209		[Brick pattern symbol]	<p><b>(205 to 225) ft bgs</b>                      Differentially weathered Packstone. Interlayered PIP, WIP, and MIP. Light olive gray [5Y 7/1] monotone, wet, odorless. Six (6) MIP layers observed, ranging in size from approximately 1-in to 2-in thick. Estimated core integrity volumes:                      70-85% Unconsolidated (PIP/WIP)                      15-30% Consolidated (MIP fine-coarse gravel-size aggregates) RQD = 0.0</p>	10		Ocala LS	
211				10			
213				10			
215				10			
217				10			
219				10			
221				10			
223				10			
225	-40.4			10			
227				[Brick pattern symbol]	<p><b>(225 to 235) ft bgs</b>                      Differentially weathered Packstone. Interlayered PIP, WIP, and MIP. Three (3) distinct MIP layers observed (1-2 in thick). Estimated core integrity volumes:                      70% Unconsolidated (PIP/WIP)                      30% Consolidated (MIP fine-coarse gravel-size aggregates) RQD = 0.0</p>	10	
229		10					
231		10					
233		10					
235	-50.4		No sample collected (235-237.9) ft bgs				
237			End of Log				
239					4-in Well TD = 237.9 ft bgs		
241							

# BORING LOG AND MONITOR WELL COMPLETION

## Monitor Well ID: FW-11B

**Project No.** 2201.083.02  
**Total Well Depth (ft bgs):** 237.13  
**Well Location:** Transect Well  
**Well Screens:** Four x 10 LF, 4-in dia SS, 0.020 slot, 20 LF C-C, 12/20 filter pack, 30/65 seal sand between filter packs  
**Well Description:** 4-in Multiscreen SS Well w/in Ocala LS with Westbay MP38 4-port Sampling Well

**Project Name:** Upper Floridan Aquifer Invest.  
**Site:** Koppers Industries, Gainesville, FL  
**Top of Casing Elev. (Ft NGVD-29):** 182.3  
**NAD 83 (FL North) X =** 2658056

**Start/Finish Date:** 8/15/05 - 12/09/05  
**Client:** Beazer East  
**Ground Elev. (Ft NGVD-29):** 182.30  
**NAD 83 (FL North) Y =** 253908

SUBSURFACE PROFILE			SOIL SAMPLE			AS-BUILT	
Depth (ft bgs)	Elevation (ft NGVD-29)	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation	As-Built
-2							TOC →
0	182.3		Ground Surface				
2							24-in Ø Borehole ↕
4							18 in. Conductor Casing
6							
8							
10							
12						Surficial Deposits	
14							12 in. Conductor Casing
16							
18	163.3					19.0 ft bgs	
20			(19.0 - 21.3) ft bgs - Upper Hawthorn Group Clay Confirmed with GeoProbe Sample.			HG - - Upper Clay Unit	
22	161.0		<i>No other core or samples were collected from GS to 64 ft bgs.</i>			21.3 ft bgs	
24					18-in steel conductor casing installed to 25.8 ft bgs using cable tool methods		
26							
28							
30							
32							

BORING LOG AND MONITOR WELL COMPLETION

**Monitor Well ID: FW-11B**

SUBSURFACE PROFILE			SOIL SAMPLE			AS-BUILT	
Depth (ft bgs)	Elevation ft NGVD-29	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation	As-Built
34						Hawthorn Group	
36							
38							
40							
42							
44							
46							
48							
50							
52							
54							
56							
58							
60	122.3					60 ft bgs	
62							
64	118.3		<b>CONTINUOUS CORE BEGINS AT 64.0 FT BGS</b>		12-in steel conductor casing installed to 63.5 ft bgs using cable tool methods	HG - - Middle Clay Unit	
66			CL (Sandy CLAY) and fine to very fine grained sand, some silt, trace gravel, hard grading to firm, low plasticity, chaotic bedding of vermiculated gradational thin lenses of silty clay with clayey sand, greenish gray [5GY 6/1] blend with blue-green mottling and prominent gray-blue [5PB 4/2] staining, moist, odorless. (Atypical MHG Clay - lacks "massive" clay deposits).				

**BORING LOG AND MONITOR WELL COMPLETION**

**Monitor Well ID: FW-11B**

SUBSURFACE PROFILE				SOIL SAMPLE		AS-BUILT
Depth (ft bgs)	Elevation ft NGVD-29	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation
69				10	Collect 7-in sonic core in advance of 10-in override casing, from w/in 12-in ID permanent casing	
71	110.8					71.5 ft bgs
73	109.8		SC (Clayey SAND) some clay, some silt, little sub-angular carbonate gravel, firm, medium plasticity, lenticular chaotic bedding, greenish gray [5GY 6/1] blend, wet, odorless.			
75					All sonic cores were collected without drilling water	
77			CL (Sandy CLAY) - SAA (64.0 - 71.5) ft bgs with additional mottles of very pale orange [10YR 8/2] and a carbonate sand and gravel lens (77-78) ft bgs.			
79				10		
81	100.8					Hawthorn Group
83	98.8		ML (Clayey SILT), some clay, some fine sand, little fine gravel, very soft, medium- to high-plasticity, common lenticular sand and silt seams, light greenish gray [5GY 7/1], wet, odorless.			
85			CL (Sandy CLAY) - SAA (74.0 - 81.5) ft bgs.			
87			SC (Clayey SAND) some clay, some carbonate gravel, little silt, fine grained, firm, low to non-plastic, chaotic lenticular structure, greenish gray [5G 6/1] with vermiculated very pale orange [10YR 8/2] and [N8] gravel, moist, odorless.			
89	94.3			10		
91	92.0		CL (CLAY), lean, some silt, little very fine sand, [gravel absent], stiff, medium plasticity, typical "massive" clay but in thin beds separated by prominent fine carbonate sand and silt stringers, lenses, and thin dipping clean sand seams. Grayish blue green [slightly bluer than 5BG 5/2] with [5Y 7/1] and [N8] stringers, moist, odorless.			
93	89.3		SP (SAND) little clay & silt, [gravel absent], medium to coarse silica sand, loose, poorly graded, few thin lenticular sandy clay and silt lenses within homogeneous clean sand, greenish gray [5GY 5/1], wet, odorless.			
95	88.3		SC (Clayey SAND) some clay & silt, trace gravel, hard, low- to non-plastic, lensed, grayish blue green [5BG 5/2] blend, slightly moist, odorless. Mechanically fractured into fine to medium size material along chaotic weakness planes by sonic drilling.			
97						
99			SP (SAND) little clay, trace gravel, medium to coarse grained clean silica sand, sub-rounded, loose, poorly graded, few thin lenticular sandy clay lenses, chaotic bedding, greenish gray [5GY 6/1] blend with medium bluish gray [5B 5/1] organic stained fingering and blotches, moist, odorless.	10		
101	80.3					

12-in Ø Borehole

BORING LOG AND MONITOR WELL COMPLETION

**Monitor Well ID: FW-11B**

SUBSURFACE PROFILE				SOIL SAMPLE		AS-BUILT
Depth (ft bgs)	Elevation ft NGVD-29	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation
104	78.3		SM (Silty SAND) some silt, little sub-angular and sub-rounded gravel, little clay, fine grained, compact, gap graded, lenticular bedding, [5G 6/1] blend, moist, odorless. Mechanically degraded into medium to coarse gravel size material.	10		
106	74.8		SC (Clayey SAND) some clay & silt, little fine to medium gravel, fine grained, hard, low to medium plasticity, lenticular bedding with thin lenses of clay, clayey sand, silt, and gravel, greenish gray [5GY 6/1] blend, moist, odorless.			
108			CL (CLAY), lean, some silt, little very fine sand, little gravel; stiff, medium plasticity, typical "massive" clay but only in thin beds separated by prominent lenticular fine sand and silt stringers, laminations, and thin lenses, increasing with depth. Dark greenish gray [5GY 4/1] clay with [5Y 6/1] sand seams and [N8] rock flour, moist, faint sulfide odor, grading to odorless.	10	8-in steel conductor casing installed to 123.0 ft bgs using rotasonic methods	107.5 ft bgs HG - Lower Clay Unit
110	71.6		ML (Clayey SILT), calcareous, some clay, some fine sand, little medium gravel, hard, low- to non-plastic, common lenticular sand and silt seams, light greenish gray [5GY 8/1], moist, grading to dry, odorless. Mechanically fractured into lenticular fine to medium size gravel material.			
112	68.3		GC (Clayey GRAVEL), some silt & clay, some very fine sand; coarse-medium grained angular to sub-angular carbonate gravel consolidated in moderately-bedded lenses, chaotic lenticular silty clay and clayey silt matrix, stiff, medium plasticity, grayish green [5G 5/2] blend, very moist, odorless.	10		
114	66.5		ML (Clayey SILT), some clay, little fine sand, trace gravel, hard, low plasticity, chaotic lenticular beds of clayey silt, silty-sandy-clay, and few clay seams (rock flour increasing w/ depth), greenish gray multicolored [5GY 6/1] blend, moist, odorless.			
116	64.8		CL (CLAY), [second massive clay zone w/in the LHG] some silt, little fine sand, [gravel absent], stiff, medium plasticity, lean, common lenticular fine sand and silt stringers, thin lenses and laminations, with prominent pale yellowish brown [10YR 6/2] clean calcareous seams grading down to typical "massive" clay. Bluer than dark greenish gray [5GY 4/1], moist, odorless.	10		
118	62.8		ML (Sandy SILT), some fine sand, some clay, trace gravel (including shells), grading to some gravel, stiff to hard, low plasticity grading to medium plasticity, irregularly stratified thin lenses and laminations of clayey silt with silty-sandy-clay, light olive gray [5Y 6/1] blend, dry, odorless.			
120	54.2		SC (Clayey SAND), some clay & silt, [gravel absent], fine grained quartz, stiff, low- to non-plastic, chaotic bedding with thin lenses of clayey sand, clay, silt, and silty clay, greenish gray [5Y 6/1] blend from several similar colors, moist, odorless.	10	Collect 4-in sonic core in advance of 7-in override casing, all within 8-in ID conductor casing	8-in Ø Borehole
122	51.2		SC (Clayey SAND) some clay, some gravel (shells and rounded pebbles), medium grained sub-rounded sand, stiff to firm, medium- to non-plastic, compact, gap graded, conglomeratic sediments from granule to fine gravel-sized rip-up clasts deposited in horizontal beds, including silt blebs and clay blebs. One cobble size "massive clay" rip up clast in a medium sand seam at 134.5 ft bgs. Multiple conglomeratic colors blending into olive gray [5Y 4/1], moist, odorless.			
124						
126						
128						
130						
132						
134	47.3					
136						

**BORING LOG AND MONITOR WELL COMPLETION**

**Monitor Well ID: FW-11B**

SUBSURFACE PROFILE			SOIL SAMPLE		AS-BUILT	
Depth (ft bgs)	Elevation ft NGVD-29	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation	As-Built
139	43.3	SM (Silty SAND), some silt, some angular gravel, little clay, fine grained grading down to medium grained, soft to firm, variable plasticity, lensed with prominent rip up clasts of clay, shells, and gravel. One "massive clay" cobble-sized rip up clast at 137.8 ft bgs. Light brownish gray [5YR 6/1] blend, wet.	11	Start of typical weathered Ocala at 141.9 ft bgs	Ocala LS Formation	
141	42.3					
143	40.4	ML (SILT), little fine sand, little clay, trace gravel, hard, non-plastic, wavy stratified 1mm-thick "varved-like" layers of [5YR 6/1] silt and [N9] rock flour, moist.				
145	37.3	Cherty Limestone cobbles - packstone (typical Ocala rip up clasts), partially silicious with interlayered mudstone cobbles. Competent rock.				
145		<b>OCALA LIMESTONE</b> Moderately Indurated Packstone (MIP) mechanically degraded into MIP angular gravel-size aggregates interlayered with PIP and MIP. Contains prominent Leps fossils. Yellowish gray [5Y 8/1], dry to slightly moist. Estimated core integrity volumes: 70% Unconsolidated (PIP/WIP) 30% Consolidated (MIP layers and gravel-size aggregates). RQD = 0.0				
149		<b>(145 to 155) ft bgs</b> Differentially weathered Packstone. Interlayered PIP & WIP [MIP Layers absent]. Light olive gray [5Y 6/1] monotone, wet, odorless to faint sulfide odors. Estimated core integrity volumes: 80% Unconsolidated (PIP/WIP) 20% Consolidated (MIP med-coarse gravel-size aggregates)	10			
155	27.3	<b>(155 to 165) ft bgs</b> Differentially weathered Packstone. Interlayered PIP, WIP, and MIP. Yellowish gray [5Y 8/1] to light olive gray [5Y 6/1], wet, odorless to faint sulfide odors. One (1) MIP layers observe approximately 2-in thick. Estimated core integrity volumes: 75% Unconsolidated (PIP/WIP) 25% Consolidated (MIP med-coarse gravel-size aggregates). RQD = 0.0	10	All sonic cores drilled w/ minimal vibrations and no added feed pressure (only weight of rods)		
165	17.3	<b>(165 to 175) ft bgs</b> Differentially weathered Packstone. Interlayered PIP, WIP, and MIP layers and gravel-size aggregates. Pale yellowish brown [10YR 7/2], monotone, wet, odorless to faint sulfide odor. Two (2) MIP layers observed, approximately 2-in thick. Estimated core integrity: 80% Unconsolidated (PIP/WIP) 20% Consolidated (MIP med-coarse gravel-size aggregates)	10	All Ocala FM 10-ft sonic cores drilled in 15-30 seconds for an average penetration rate of 2.4 secs/ft.		

BORING LOG AND MONITOR WELL COMPLETION

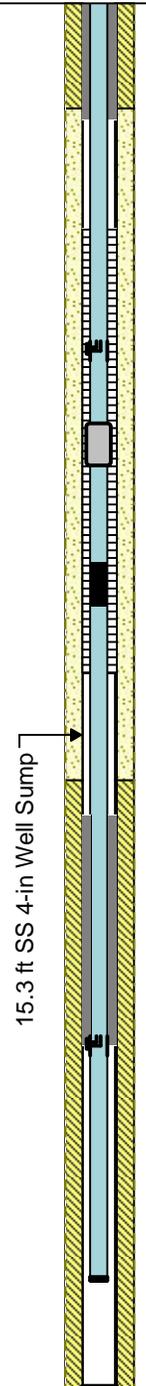
**Monitor Well ID: FW-11B**

SUBSURFACE PROFILE			SOIL SAMPLE			AS-BUILT	
Depth (ft bgs)	Elevation ft NGVD-29	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation	As-Built
174	7.3		<p><b>(175 to 185) ft bgs</b> Differentially weathered Packstone. Interlayered PIP, WIP, and MIP layers and gravel-size aggregates. Yellowish gray [5Y 7/1], wet, odorless. Four (4) MIP layers observed, ranging in size from approximately 2-in to 3-in thick. Estimated core integrity volumes: 75% Unconsolidated (PIP/WIP) 25% Consolidated (MIP med-coarse gravel-size aggregates). RQD = 0.0</p>	10	<p>Faint sulfide odors prominent from 145-169, and 230-234 ft bgs.</p> <p>All other Ocala LS cores were odorless.</p>	Ocala LS	
176							
178							
180							
182							
184	-2.7		<p><b>(185 to 195) ft bgs</b> Differentially weathered Packstone. Interlayered PIP &amp; WIP [MIP Layers absent]. Light olive gray [5Y 6/1] monotone, wet, faint sulfide odor. Estimated core integrity volumes: 80% Unconsolidated (PIP/WIP) 20% Consolidated (MIP med-coarse gravel-size aggregates)</p>	10			
186							
188							
190							
192							
194	-12.7		<p><b>(195 to 205) ft bgs TEST CORE - ROTARY ONLY</b>  Cored and drilled the override casing and extruded the sample with normal sonic equipment, but w/out vibration to compare rotary-only sample core integrity with cores retrieved using vibration. No added down pressure was used other than the weight of the rods. The full 10-ft rotary sample was cored in approximately 3 minutes.</p>	9			
196							
198							
200							
202							
204	-22.7		<p>Differentially weathered Packstone. Interlayered PIP, WIP and MIP Layers. Light olive gray [5Y 6/1] monotone, wet, odorless. Ten (10) MIP layers observed, ranging in size from approximately 0.5-in to 5-in thick. Estimated core integrity volumes: 70% Unconsolidated (PIP/WIP) 30% Consolidated (MIP layers and med-coarse gravel-size aggregates). RQD=0.4</p>				
206							

BORING LOG AND MONITOR WELL COMPLETION

**Monitor Well ID: FW-11B**

SUBSURFACE PROFILE				SOIL SAMPLE		AS-BUILT	
Depth (ft bgs)	Elevation ft NGVD-29	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation	
209		[Brick pattern symbol]	<b>(205 to 215) ft bgs</b> Differentially weathered Packstone. Interlayered PIP, WIP, and MIP. Light olive gray [5Y 7/1] monotone, wet, odorless. Six (6) MIP layers observed, ranging in size from approximately 1-in to 4-in thick. Estimated core integrity volumes: 75% Unconsolidated (PIP/WIP) 25% Consolidated (MIP layers and med-coarse gravel-size aggregates)	10		Ocala LS	
211							
213							
215	-32.7						
217							
219							
221							
223				<b>(215 to 235) ft bgs</b> Differentially weathered Packstone. Interlayered PIP, WIP, and MIP. Yellowish gray [5Y 8/1] monotone, wet, odorless. Seven (7) MIP layers observed, ranging in size from approximately 1-in to 3-in thick. Estimated core integrity volumes: 80% Unconsolidated (PIP/WIP) 20% Consolidated (MIP med-coarse gravel-size aggregates)	10		
225							
227							
229							
231							
233			10	Lost 2,400 net gallons potable water w/ 2,100 mg/L NaBr tracer into Ocala LS during drilling and well installation.			
235	-52.7		NO SAMPLE COLLECTED (235 - 237.1) ft bgs				
237			End of Log		4-in Well TD = 237.1 ft bgs		
239							
241							



# BORING LOG AND MONITOR WELL COMPLETION

## Monitor Well ID: FW-12B

Project No. 2201.083.02  
 Total Well Depth (ft bgs): 239.66  
 Well Location: Transect Well  
 Well Screens: Four x 10 ft, 4-in dia SS, 0.020 slot, 20 ft C-C, 12/20 filter pack, 30/65 seal sand between filter packs  
 Well Description: 4-in Multiscreen SS Well w/in Ocala LS with Westbay MP38 4-port Sampling Well

Project Name: Upper Floridan Aquifer Invest.  
 Site: Koppers Industries, Gainesville, FL  
 Top of Casing Elev. (Ft NGVD-29): 181.78  
 NAD 83 (FL North) X = 2658430

Start/Finish Date: 8/27/05 - 11/20/05  
 Client: Beazer East  
 Ground Elev. (Ft NGVD-29): 181.7  
 NAD 83 (FL North) Y = 253908

SUBSURFACE PROFILE			SOIL SAMPLE			AS-BUILT	
Depth (ft bgs)	Elevation (ft NGVD-29)	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation	As-Built
-2							TOC →
0	181.8		Ground Surface				
2							24-in Ø Borehole ↓
4							18 in. Conductor Casing
6							
8							
10							
12						Surficial Deposits	
14							12 in. Conductor Casing
16							
18							
20							
22							
24	157.1					24.7 ft bgs	
26	154.8	▨	<b>24.7 ft bgs - Top of Upper Hawthorn Group Clay</b> Confirmed with GeoProbe Sample. Base of Clay layer not penetrated at 25.0 ft bgs (deepest GeoProbe sample collected).		18-in steel conductor casing installed to 25.9 ft bgs using cable tool methods	HG -- Upper Clay Unit	
28						~ 27ft bgs	
30			<i>No other core or samples were collected from GS to 64 ft bgs.</i>			Hawthorn Group	
32							

BORING LOG AND MONITOR WELL COMPLETION

**Monitor Well ID: FW-12B**

SUBSURFACE PROFILE			SOIL SAMPLE			AS-BUILT	
Depth (ft bgs)	Elevation ft NGVD-29	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation	As-Built
34						Hawthorn Group	<p>16-in Ø Borehole</p> <p>8 in. Conductor Casing</p> <p>4 in. SS Well Casing</p> <p>2 in. Westbay MP System</p>
36							
38							
40							
42							
44							
46							
48							
50							
52							
54							
56							
58							
60							
62	119.8					62 ft bgs	
64	118.0		<p><b>CONTINUOUS CORE BEGINS AT 64.0 FT BGS</b></p> <p>GM (Sandy GRAVEL), some fine calcareous sand, trace clay/silt, loose, lensed, medium-coarse limestone mudstone and wackestone, light greenish gray [5GY 8/1], wet, odorless.</p>	12-in steel conductor casing installed to 64.0 ft bgs using cable tool methods	HG -- Middle Clay Unit	63.8 ft bgs	
	117.3						
66						Hawthorn Group	

BORING LOG AND MONITOR WELL COMPLETION

**Monitor Well ID: FW-12B**

SUBSURFACE PROFILE				SOIL SAMPLE		AS-BUILT
Depth (ft bgs)	Elevation ft NGVD-29	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation
69			SC (Clayey SAND), and clay, some silt, fine to very fine grained, firm, medium to low plasticity, vermiculated interlayered thin lenses and irregular laminations of clay, silt, silty clay and clayey sand, with "marbled" bedding, greenish gray [5G 6/1] mottled blend with common diffuse greenish black [5G 2/1] chaotic stained seams, moist, odorless.	11	Collect 7-in sonic core in advance of 10-in override casing, from w/in 12-in ID permanent casing	12-in Ø Borehole
71						
73						
75	107.3		CH (CLAY), fat, little silt, trace fine sand, soft to very soft, highly plastic, homogeneous, dark green-gray [5G 3/1], wet, odorless.	10	All sonic cores were collected without using drilling water	
77	104.0		CL (Sandy CLAY) some sand, some fine carbonate gravel (sub-angular wackestone & dolomite), stiff, medium plasticity, greenish gray [5G 6/1] mottled blend w/ common dusky blue [5PB 3/2] silty clay blebs, and medium bluish gray [5B 5/1] mottles, moist, odorless.			
79						
81			SC (Clayey SAND) some clay, some coarse coral-shaped wackestone gravel, coarse grained, rounded to sub-rounded, stiff (grading to soft, then firm), low plasticity, vermiculated thin lenses of irregularly interlayered clayey sand, sand and sandy clay, greenish gray [5G 6/1], moist, odorless. Gravels are limestone wackestone, very light gray [N8] blend with little dark gray [N3] carbonate grains (salt and pepper appearance, hereafter referenced as <b>S&amp;P Wackestone</b> ), with little rounded to subrounded coarse grained lustrous silica sand with smooth crystal faces in a very fine to medium grained carbonate sand matrix and with little small shell fragments.	10		
83						
85						
87	94.6					
89	93.3		CL (Sandy CLAY), some fine to very fine sand, little silt, little fine grained angular to sub-angular gravel, prominent irregular thin lenses of very fine silty sand stringers and thin seams, firm, low plasticity, greenish gray [5GY 6/1] with light olive gray [5Y 6/1] fine sand laminations, moist, odorless.	10		
91			SP (SAND) little clay, coarse grained, loose, poorly graded, w/ few irregular layers/lenses of SAA, [5Y 6/1], wet, odorless. Gradational through several layers of clayey sand.			
93			CL (CLAY) calcareous, little silt, little fine sand, [gravel absent], stiff, medium plastic, lean, irregular thin lenses and laminations, prominent poorly indurated clay (blocky-platy cleavage), [5G 6/1], moist, odorless.	10	Hawthorn Group	
95	86.8		Alternating thin beds of SC (Clayey SAND) and SP (SAND) - SAA (88.5-92.2) ft bgs, odorless.			
97			SP (SAND), little clay, trace S&P wackestone gravel, common irregular clayey sand thin lenses, coarse to medium grained, loose, poorly graded, overall greenish gray [5GY 6/1] with light olive gray [5Y 6/1] and few dark gray [N3] diffuse-stained fingering and blotches, wet, faint creosote-like odor.			
99				10		
101	81.8					

BORING LOG AND MONITOR WELL COMPLETION

**Monitor Well ID: FW-12B**

SUBSURFACE PROFILE				SOIL SAMPLE		AS-BUILT
Depth (ft bgs)	Elevation (ft NGVD-29)	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation
104			GM (Sandy GRAVEL) with cobbles and medium to coarse sand, little clay, med-coarse gravel, cobbles increasing with depth, compact, gap graded, SAA color and staining w/ very light gray [N8] carbonate gravels, wet, faint to slight creosote-like odors.			
106						
108	73.3					108.5
110	71.0		CL (Gravelly CLAY) some sub-angular gravel (isolated and w/in lenses), some fine-medium sand, little silt, soft, medium to high plasticity, prominent carbonate silt and sand stringers, prominent sand and gravel thin lenses, dark greenish gray [5GY 4/1] with very light gray [N8] gravel and dark gray [N4] diffuse staining, moist, faint creosote-like odor. Gradational layer into typical "massive" LHG clay, below.	10		HG - Lower Clay Unit
112						
114			CL (CLAY), lean, grading to massive, some silt, little gravel, little fine sand, stiff, medium plasticity, prominent irregular thin lenses of carbonate sand and gravel, common pale yellowish brown [10YR 6/2] irregular silty laminations, SAA colors, moist, faint creosote-like odors.			
116	64.3					
118	62.8		CL (Sandy CLAY) and fine sand, some silt, [gravel absent], stiff, blocky-platy clay peds, prominent thin lenses with irregular fine sand and silt stringers and seams. Peds are low-medium plastic. Seams are non-plastic. SAA color, moist, odorless, mechanically fractured into coarse gravel size material.	9	8-in steel conductor casing installed to 118.5 ft bgs using rotasonic methods	
120	61.3		CL (CLAY) massive, matrix has some silt and little fine sand [gravel absent], common pale yellowish brown [10YR 6/2], fine carbonate sand laminations with two 1/2-in thick clean seams, prominent very light gray N8] silty laminations and thin lenses, stiff, medium plastic, SAA color, moist, odorless.			
122						
124	57.3		SP (SAND), little matrix clay, common thin lenses of clay (SAA) [gravel absent], medium-coarse grained silica sand, sub-rounded, loose, poorly graded, [5Y 6/1], wet, odorless.			
126			GC (Clayey GRAVEL), and clay, little fine sand, soft, high plasticity, medium gravel lenses, SAA color, wet, odorless.			
128	52.3		ML (Sandy SILT), some fine sand, some clay [gravel absent], stiff, low plasticity, irregular laminations and lenses of silty clay in sandy silt matrix, w/ prominent carbonate [N8] silt laminations (127.0-129.5) ft bgs, [5Y 6/1], moist, faint creosote-like odors.	5		
130	51.6		SC (Gravelly, Clayey SAND) with LS cobbles, some gravel, some clay, fine grained, firm, non plastic, very light gray [N8] cobbles & gravels w// light olive gray [5Y 6/1] matrix, odorless.		Collect 4-in sonic core in advance of 7-in override casing, all within 8-in ID conductor casing	
132			SC (Clayey SAND), some clay, [gravel absent], medium grained, firm, non-plastic, irregular laminations & lenses of clayey sand, sandy clay, "massive" clay rip up clasts, and clean medium-grained sand, with prominent clay and silt blebs with shell fragments below 133.2 ft, greenish gray [5GY 6/1] and light olive gray [5Y 6/1] with several similar hues, moist, odorless.	5		
134	46.8					
136	45.4					

8-in Ø Borehole

**BORING LOG AND MONITOR WELL COMPLETION**

**Monitor Well ID: FW-12B**

SUBSURFACE PROFILE			SOIL SAMPLE		AS-BUILT	
Depth (ft bgs)	Elevation ft NGVD-29	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation	As-Built
139	41.5	CL (CLAY) lean, some silt, little fine sand [gravel absent]; massive, stiff, med plastic, few stringers and irregular thin lenses of carbonate sand and silt, thick bedded, mottled [5GY 4/1], moist, odorless.	5			
141	40.2	ML (Sandy SILT) some fine sand, some clay, little gravel, few LS cobbles, stiff, low plasticity, common silty laminations and thin lenses within alternating thin zones of silty clay, clayey silt, and clayey sand. Overall blend of light olive gray [5Y 6/1] with very light gray [N8] stringers, lenses, and gravel, and one zone of dark greenish gray [5G 4/1] clay, moist, odorless.	5	First loss of drilling water circulation within the Ocala at 142 ft bgs	143.6 ft bgs	
143	38.2	SC (Gravelly SAND) some gravel (predominantly large shell fragments with sub-rounded pebbles and granules), some clay, well graded, fine to very coarse sand, stiff, overall blend light olive gray [5Y 6/1] composed of numerous green and gray hues, moist, odorless.			Ocala LS Formation	
145	36.8	GM (Sandy GRAVEL) with cobbles, some sand, some silt (rock flour), little clay, packstone gravel rip-up clasts including few isolated shells; firm, low plasticity, chaotic structure, very light olive gray [5Y 7/1] with few grayish olive [10YR 4/2] irregular lenses of fine sand, moist, odorless.		Faint creosote-like odors first detected in Ocala from 145-148 ft bgs.		
147						
149						
151		<b>OCALA LIMESTONE</b> Moderately Indurated Packstone with thin layers of highly weathered WIP and PIP. Typical Site Ocala Limestone Formation. Yellowish Gray [5Y 8/1], wet, odorless. Contains prominent Leps fossils. Approximately 70% of the core is consolidated (MIP) and 30% unconsolidated (PIP and/or WIP).	9	Circulation returned during 145-155 ft bgs override casing drilling and maintained return to TD.		
153						
155						
157						
159		<b>(145 to 164.5) ft bgs</b> Differentially weathered Packstone (SAA). Interlayered PIP and WIP (MIP layers absent). Very Light Olive Gray [5Y 7/1], wet, faint creosote-like odor grading down to odorless. Estimated core integrity volumes: 70% Unconsolidated (PIP/WIP) 30% Consolidated (MIP med-coarse gravel-size aggregates)	10	All sonic cores were drilled w/ minimal vibrations and no added down pressure beyond the weight of the rods		
161						
163						
165	17.3	<b>(164.5 to 185) ft bgs</b> Differentially weathered Packstone (SAA). Interlayered PIP, WIP, and MIP. Very Light Olive Gray [5Y7/1] to very pale orange [10YR 8/2], wet, odorless to faint sulfide odors. Four (4) MIP layers observed, ranging in size from approximately 1- in to 2-in thick. Estimated core integrity volumes: 70-80% Unconsolidated (PIP/WIP) 20-30% Consolidated (MIP layers and med-coarse gravel-size aggregates). RQD = 0.0	9	All Ocala FM 10-ft sonic cores were drilled in 10 to 120 secs for an avg. penetration rate of 4.8 secs/ft	Ocala LS	
167						
169						
171						

BORING LOG AND MONITOR WELL COMPLETION

**Monitor Well ID: FW-12B**

SUBSURFACE PROFILE			SOIL SAMPLE			AS-BUILT
Depth (ft bgs)	Elevation ft NGVD-29	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation	As-Built
174						
176						
178						
180			8.7			
182						
184	-3.2					
186						
188				Faint petroleum-like odors detected in Ocala LS at 188, 198, 200-205, and 210-215 ft bgs.		
190			10			
192		<b>(185 to 205.5) ft bgs</b> Differentially weathered Packstone (SAA). Interlayered PIP, WIP and MIP layers and gravels. Very pale orange [10YR 8/2] grading to light olive gray [5Y 6/1], wet, odorless grading down to faint petroleum-like odor. Ten (10) MIP layers observed, ranging in size from approximately 1-in to 4-in thick. Estimated core integrity volumes: 70% Unconsolidated (PIP/WIP) 30% Consolidated (MIP layers and med-coarse gravel-size aggregates). RQD = 0.0				
194						
196						
198						
200			10	Faint sulfide odors detected in Ocala LS at 170-175, 181, 185, 187, 206-211 ft bgs		
202						
204						
206	-23.7					

BORING LOG AND MONITOR WELL COMPLETION

**Monitor Well ID: FW-12B**

SUBSURFACE PROFILE			SOIL SAMPLE		AS-BUILT	
Depth (ft bgs)	Elevation ft NGVD-29	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation	As-Built
209		<p><b>(205.5 to 215) ft bgs</b> Differentially weathered Packstone (SAA). Interlayered PIP and WIP [MIP layers absent]. Very pale orange [10YR 8/2], wet, faint sulfide odor grading to faint petroleum-like odor. Estimated core integrity volumes: 75% Unconsolidated (PIP/WIP) 25% Consolidated (MIP med-coarse gravel-size aggregates). RQD = 0.0</p>	10		Ocala LS	
211						
213						
215	-33.2					
217		<p><b>(215 to 235) ft bgs</b> Differentially weathered Packstone (SAA). Interlayered PIP, WIP and MIP layers and gravel-size aggregates. Very pale orange [10YR 8/2], wet, moderate creosote-like odors 217-223.5 ft bgs and faint to strong creosote odors 225-233 ft bgs. Two (2) MIP layers observed approximately 1-in and 3-in thick. Estimated core integrity volumes: 75-80% Unconsolidated (PIP/WIP) 20-25% Consolidated (MIP layers and med-coarse gravel-size aggregates). RQD = 0.0</p>	10	Faint to strong creosote-like odors noted from 217-233 ft bgs		
219						
221						
223						
225						
227						
229						
231			10			
233						
235	-53.2					
NO SAMPLE COLLECTED (235 - 239.7) ft bgs				TD core = 235.0 ft bgs		
End of Log						
237						
239						
241				4-in Well TD = 239.66 ft bgs		

# BORING LOG AND MONITOR WELL COMPLETION

## Monitor Well ID: FW-13B

**Project No.** 2201.083.02  
**Total Well Depth (ft bgs):** 239.33  
**Well Location:** Transect Well  
**Well Screens:** Four x 10 ft, 4-in dia SS, 0.020 slot, 20 ft C-C, 12/20 filter pack, 30/65 seal sand between filter packs  
**Well Description:** 4-in Multiscreen SS Well w/in Ocala LS with Westbay MP38 4-port Sampling Well

**Project Name:** Upper Floridan Aquifer Invest.  
**Site:** Koppers Industries, Gainesville, FL  
**Top of Casing Elev. (Ft NGVD-29):** 178.82  
**NAD 83 (FL North) X =** 2658808

**Start/Finish Date:** 9/10/05 - 12/17/05  
**Client:** Beazer East  
**Ground Elev. (Ft NGVD-29):** 178.8  
**NAD 83 (FL North) Y =** 253937

SUBSURFACE PROFILE				SOIL SAMPLE			AS-BUILT
Depth (ft bgs)	Elevation (ft NGVD-29)	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation	As-Built
-2							TOC →
0	178.8		Ground Surface				
2							
4							
6							
8							
10							
12							
14							
16							
18							
20							
22							
24	154.7		<b>24.1 ft bgs - Top of Upper Hawthorn Group Clay</b> Confirmed with GeoProbe Sample. Base of Clay layer not penetrated at 25.0 ft bgs (deepest GeoProbe sample collected).		18-in steel conductor casing installed to 26.0 ft bgs using cable tool methods	24.1 ft bgs HG - Upper Clay Unit	
26	151.8						
28			<i>No other core or samples were collected from GS to 65 ft bgs.</i>				
30							
32							

BORING LOG AND MONITOR WELL COMPLETION

**Monitor Well ID: FW-13B**

SUBSURFACE PROFILE			SOIL SAMPLE			AS-BUILT	
Depth (ft bgs)	Elevation ft NGVD-29	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation	As-Built
34						Hawthorn Group	
36							
38							
40							
42							
44							
46							
48							
50							
52							
54							
56							
58							
60	118.8					60 ft bgs HG - - Middle Clay Unit	
62							
64			<b>CONTINUOUS CORE BEGINS AT 65.0 FT BGS</b>		12-in steel conductor casing installed to 64.0 ft bgs using cable tool methods		
66	113.8		CL (CLAY) lean, some silt, little fine to very fine grained sand [gravel absent], stiff, high plasticity, massive, few thin lenses of clayey sand, few silty stringers, color between dark greenish gray [5G 4/1] and pale blue [5B 6/2], mottled, moist, odorless.				

BORING LOG AND MONITOR WELL COMPLETION

**Monitor Well ID: FW-13B**

SUBSURFACE PROFILE			SOIL SAMPLE		AS-BUILT		
Depth (ft bgs)	Elevation ft NGVD-29	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation	As-Built
69	110.3		GM (Sandy GRAVEL) with cobbles, some fine sand, little silt, little clay, medium to coarse grained, compact, gap graded, lensed, light gray [N8] gravel in greenish gray [5G 6/1] matrix, moist, odorless.	10	Collect 7-in sonic core in advance of 10-in override casing, from w/in 12-in ID permanent casing	68.5 ft bgs	
71							
73	106.1		SC (Clayey SAND) with common gravel and cobble lenses and seams. Matrix is a chaotic lenticular mix of clayey sand, silty sand, and silty clay with trace gravel, firm, medium plastic, greenish gray [5GY 6/1] blend, moist, odorless. Gravel lenses and thin dipping seams (1/8-in to 2-in thick) are GP (GRAVEL) loose, poorly graded, fine gravel with some granules, pebbles, and very coarse sand, angular to sub-angular, dolomite and limestone-wackestone, [N8], wet, odorless. Some gravels are limestone wackestone, very light gray [N8] blend with little dark gray [N3] carbonate grains (salt and pepper appearance, hereafter referenced as <b>S&amp;P Wackestone</b> ), with little rounded to subrounded coarse grained lustrous silica sand with smooth crystal faces in a very fine to medium grained carbonate sand matrix and with little small shell fragments.	10	All sonic cores were collected without drilling water	Hawthorn Group	
75							
77							
79							
81							
83							
85			GM (Sandy GRAVEL), some fine sand, some clay, little silt, coarse to medium grained angular to sub-angular carbonate gravel lenses. Clayey sand matrix, firm, medium plastic, grayish green [5G 6/1] with very light gray [N8] carbonates, wet, odorless.	10			
87	90.8						
89	89.0						
91	86.5		GC (Clayey GRAVEL) with cobbles, some clay, some fine sand, coarse to medium grained angular- to sub-angular S&P Wackestone gravel within a chaotic matrix of clayey sand lenses [SAA 73-88 ft bgs] and lean clay lenses [same as below 92.3-93.7 ft bgs], firm, medium plastic, moist, odorless.	10			
93	85.1						
95			CL (Silty CLAY), lean, some silt, little very fine sand, little gravel, stiff grading to firm, medium plasticity, typical "massive" clay but only in one thin bed followed by prominent fine carbonate sand and silt stringers, lenses, and dipping gravel seams, clay volume decreasing with depth, slightly bluer than [5BG 5/2] with very light gray [N8] carbonates, moist, odorless.	10			
97	81.9						
99			SC (Clayey SAND) - SAA (73-88) ft bgs, odorless.	10			
101							

**BORING LOG AND MONITOR WELL COMPLETION**

**Monitor Well ID: FW-13B**

SUBSURFACE PROFILE				SOIL SAMPLE		AS-BUILT
Depth (ft bgs)	Elevation (ft NGVD-29)	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation
104	74.3		SP (SAND) little silt & clay, trace gravel, coarse grained clean silica sand, sub-rounded, loose, poorly graded, few thin lenticular sandy clay lenses, chaotic bedding, blend of light olive gray [5Y 6/1] with greenish gray [5GY 6/1] and few greenish black [5G 2/1] irregularly stained fingerings and seams ; no reaction to Sudan IV dye NAPL field shake test, wet, odorless.			
106						
108			GM (Sandy GRAVEL), some fine sand, little silt & clay, fine to coarse grained sub-angular to sub-rounded S&P Wackestone within silty-clayey-sand matrix, firm, light olive green [5Y 6/1] with very light gray [N8] carbonates, moist, odorless.			
110	68.5			10		110.3 ft bgs
112	67.0		CL (CLAY) lean, some silt, little very fine sand, trace gravel, stiff, medium plasticity, typical "massive" clay but only in thin beds separated by prominent lenticular fine carbonate sand and silt stringers, laminations, and thin lenses, dark greenish gray [5GY 5/1] clay with white [N9] carbonate clasts, moist, odorless.			HG - - Lower Clay Unit
114	64.5					
116	63.3		GM (Sandy GRAVEL), SAA (104.5-110.3) ft bgs interbedded with lean clay SAA (110.3-111.8) ft bgs, odorless.			
118			CL (CLAY), SAA (110.3 - 111.8) ft bgs, odorless.			
120	59.4		CL (Silty CLAY), lean, some silt, some fine sand [gravel absent], hard, non-plastic, prominent chaotically interbedded lenticularly laminated and thin lensed carbonate fine sand and silt, slightly bluer than dark greenish gray [5GY 4/1] clay with light gray [N7] stringers, moist, odorless. Mechanically fractured in few horizons into medium to coarse gravel size material.	10	8-in steel conductor casing installed to 120.0 ft bgs using rotasonic methods	
122	56.3		ML (Sandy SILT), some very fine sand, some clay, trace gravel, stiff, low- to non-plastic, common lenticular sand and silt seams, light greenish gray [5GY 6/1] blend, moist, odorless. Mechanically degraded into coarse gravel size material.			
124	55.2		SC (Clayey SAND), some clay & silt, trace gravel, compact, well graded, fine grained, greenish gray [5GY 5/1] blend, moist, odorless. Mechanically degraded into coarse gravel-size material.			
126	53.8		ML (Sandy SILT), SAA (119.4 - 122.5) ft bgs, but dry and mechanically degraded.			
128	51.3		SC (Clayey SAND), some clay, trace gravel, fine-medium grained, stiff, non-plastic, compact, well graded, chaotic thin lenses, greenish gray blend [5GY 6/1], moist, odorless.			
130	48.6		SC (Clayey SAND), some clay, some gravel (shells and rounded pebbles), medium grained sub-rounded sand, compact, gap graded, conglomeratic sediments from granule to fine gravel-sized rip-up clasts, including silt and clay blebs. Multiple conglomeratic colors blending into [5GY 6/1], moist, odorless.	10	Collect 4-in sonic core in advance of 7-in override casing, all within 8-in ID conductor casing	
132	47.0		ML (Sandy SILT), some sand, some fine-medium gravel, little clay, soft, medium plastic, irregular thin lenses, light brownish gray [5YR 6/1], wet, odorless.			
134	43.9		CL (CLAY), lean, some silt, little very fine sand [gravel absent], stiff, medium plasticity, typical "massive" clay, few lenticular fine carbonate sand and silt stringers, laminations, and thin lenses, slightly bluer than dark greenish gray [5G 4/1], with light gray [N7] carbonate stringers, moist, odorless.			
136	42.3					

8-in Ø Borehole

**BORING LOG AND MONITOR WELL COMPLETION**

**Monitor Well ID: FW-13B**

SUBSURFACE PROFILE			SOIL SAMPLE		AS-BUILT	
Depth (ft bgs)	Elevation ft NGVD-29	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation	As-Built
139	39.4	ML (Clayey SILT), some clay, little fine sand, trace gravel, very soft grading to stiff, variable plasticity, laminated with interlayered thin chaotic lenses, stratified greensih gray [5G 6/1] mixed with light gray [N7] and light olive gray [5Y 8/1], moist, odorless.	10			
141		ML (Sandy SILT), calcareous, some fine sand, some medium gravel (shells and sub-rounded mudstone), little clay, firm, low plasticity, irregular thin lenses and laminations, light brownish gray [5YR 6/1] blend, wet.				
143	35.7 35.1	Limestone cobbles and gravels (typ Ocala rip up clasts), chert, mudstone, S&P Wackestone, trace to little fine sand matrix.		Start of typical weathered Ocala at 143.7 ft bgs	143.7 ft bgs	
145		GM (Silty GRAVEL), some silt, some fine sand, angular medium gravel (mudstone, chert packstone), moist, odorless.			Ocala LS Formation	
147		<p><b>OCALA LIMESTONE</b> Poorly Indurated Packstone (PIP) with WIP and MIP layers and angular gravel-size aggregates. Contains prominent Leps fossils. Light olive gray [5Y 6/1] and yellow gray [5Y 8/1] alternating horizons, wet, odoless. Two (2) MIP layers observed, approximately 1-in and 2-in thick. Estimated core integrity volumes:                      80% Unconsolidated (PIP/WIP)                      20% Consolidated (MIP layers and gravel-size aggregates).                      RQD=0.0</p>	10			
149						
151						
153						
155	23.8	(155 to 165) ft bgs <b>TEST CORE - ROTARY ONLY</b>		All sonic cores drilled w/ minimal vibrations and no added feed pressure (only weight of rods)		
157		Cored and drilled the override casing and extruded the sample with normal sonic equipment, but w/out vibration to compare rotary-only sample core integrity with cores retrieved using vibration. No added down pressure was used other than the weight of the rods. Rotary refusal was encountered at 159.8 ft bgs after 5 minutes of coring. Minimal sonic vibrations were used in the remaining 5 ft of core to break through each successive rotary-only refusal.	10			
159		Differentially weathered Packstone. Interlayered PIP, WIP, and MIP Layers. Yellowish gray [5Y 8/1] monotone, wet, faint non-specific organic odor to odorless. Two (2) MIP layers observed, approximately 2-in and 1.3-ft thick. Estimated core integrity volumes: 70% Unconsolidated (PIP/WIP) 30% Consolidated (MIP layers and med-coarse gravel-size aggregates) RQD=0.0				
161						
163				All Ocala FM 10-ft sonic cores drilled in 10-45 seconds for an average penetration rate of 2.5 secs/ft.		
165	13.8	(165 to 175) ft bgs	10			
167		Differentially weathered Packstone. Interlayered PIP, WIP, and MIP layers. Four (4) MIP layers observed, ranging in size from approximately 1-in to 2-in thick. Yellowish gray [5Y 8/1] monotone, wet, odorless. Estimated core integrity volumes: 80% Unconsolidated (PIP/WIP) 20% Consolidated (MIP med-coarse gravel-size aggregates). RQD=0.0				
169						
171						

BORING LOG AND MONITOR WELL COMPLETION

**Monitor Well ID: FW-13B**

SUBSURFACE PROFILE			SOIL SAMPLE		AS-BUILT		
Depth (ft bgs)	Elevation ft NGVD-29	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation	As-Built
174	3.8	[Brick pattern symbol]	<p><b>(175 to 185) ft bgs</b> Differentially weathered Packstone. Interlayered PIP, WIP, and MIP layers. One distinct MIP layer approximately 2-in thick. Yellowish gray [5Y 8/1] monotone, wet, mostly odorless with a faint sulfide odor at 178 ft bgs. Estimated core integrity volumes: 85% Unconsolidated (PIP/WIP) 15% Consolidated (MIP med-coarse gravel-size aggregates). RQD=0.0</p>	10	Faint sulfide odors in the Ocala at 178 and 182 ft bgs. Non-specific faint organic odors at 155-159 and 197-200 ft. Odorless in all other Ocala LS core.	Ocala LS	[As-built diagram showing casing and core]
176							
178							
180							
182							
184	-6.2	[Brick pattern symbol]	<p><b>(185 to 195) ft bgs</b> Differentially weathered Packstone. Interlayered PIP &amp; WIP [MIP Layers absent]. Light olive gray [5Y 6/1] to yellowish gray [5Y 8/1], wet, odorless. Estimated core integrity volumes: 80% Unconsolidated (PIP/WIP) 20% Consolidated (MIP med-coarse gravel-size aggregates). RQD=0.0</p>	10			
186							
188							
190							
192							
194							
196	-16.2	[Brick pattern symbol]	<p><b>(195 to 205) ft bgs TEST CORE - ROTARY ONLY</b>  Cored and drilled the override casing and extruded the sample with normal sonic equipment, but w/out vibration to compare rotary-only sample core integrity with cores retrieved using vibration. No added down pressure was used other than the weight of the rods. Rotary refusal was encountered at 195.9 ft bgs after 5 minutes of coring. Minimal sonic vibrations were used in the remaining 9 ft of core to break through each successive rotary-only refusal.</p>	10			
198							
200							
202			<p>Differentially weathered Packstone. Interlayered PIP, WIP and MIP Layers. Yellowish gray [5Y 8/1] monotone, wet, faint non-specific organic odor to odorless. Three (3) MIP layers observed, ranging in size from approximately 1-in to 3-in thick. Estimated core integrity volumes: 80% Unconsolidated (PIP/WIP) 20% Consolidated (MIP layers and med-coarse gravel-size aggregates). RQD=0.0</p>				
204							
206	-26.2						

BORING LOG AND MONITOR WELL COMPLETION

**Monitor Well ID: FW-13B**

SUBSURFACE PROFILE			SOIL SAMPLE		AS-BUILT		
Depth (ft bgs)	Elevation ft NGVD-29	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation	As-Built
209		[Brick pattern symbol]	<p><b>(205 to 225) ft bgs</b>                      Differentially weathered Packstone. Interlayered PIP &amp; WIP [MIP Layers absent]. Yellowish gray [5Y 8/1], wet, odorless. Estimated core integrity volumes:                      75-80% Unconsolidated (PIP/WIP)                      20-25% Consolidated (MIP med-coarse gravel-size aggregates). RQD=0.0</p>	10		Ocala LS	
211							
213							
215							
217							
219							
221				10	Lost 2,100 net gallons potable water with 300 mg/L NaBr tracer into Ocala LS during drilling and well installation.		
223							
225	-46.2						
227				[Brick pattern symbol]	<p><b>(225 to 235) ft bgs</b>                      Differentially weathered Packstone. Interlayered PIP, WIP, and MIP. Yellowish gray [5Y 8/1] monotone, wet, odorless. Four (4) MIP layers observed, ranging in size from approximately 1-in to 3-in thick. Estimated core integrity volumes:                      70% Unconsolidated (PIP/WIP)                      30% Consolidated (MIP med-coarse gravel-size aggregates). RQD=0.0</p>	10	
229							
231							
233							
235	-56.2						
237		NO SAMPLE COLLECTED (235 - 239.3) ft bgs					
239		End of Log			4-in Well TD = 239.33 ft bgs		
241							

# BORING LOG AND MONITOR WELL COMPLETION

## Monitor Well ID: FW-14B

**Project No.** 2201.083.02  
**Total Well Depth (ft bgs):** 240.68  
**Well Location:** Transect Well  
**Well Screens:** Four x 10 ft, 4-in dia SS, 0.020 slot, 20 ft C-C, 12/20 filter pack, 30/65 seal sand between filter packs  
**Well Description:** 4-in Multiscreen SS Well w/in Ocala LS with Westbay MP38 4-port Sampling Well

**Project Name:** Upper Floridan Aquifer Invest.  
**Site:** Koppers Industries, Gainesville, FL  
**Top of Casing Elev. (Ft NGVD-29):** 176  
**NAD 83 (FL North) X =** 2659042

**Start/Finish Date:** 9/21/05 - 12/13/05  
**Client:** Beazer East  
**Ground Elev. (Ft NGVD-29):** 176.0  
**NAD 83 (FL North) Y =** 253960

SUBSURFACE PROFILE				SOIL SAMPLE			AS-BUILT
Depth (ft bgs)	Elevation (ft NGVD-29)	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation	As-Built
-2							TOC →
0	176.0		Ground Surface				
2							24-in Ø Borehole ▼
4							18 in. Conductor Casing
6							
8							
10							
12						Surficial Deposits	
14							12 in. Conductor Casing
16							
18							
20							
22							
24	151.3						
26		▨	<b>24.7 ft bgs - Top of Upper Hawthorn Group Clay</b> Confirmed with GeoProbe Sample. Base of Clay layer not penetrated at 25.0 ft bgs (deepest GeoProbe sample collected).			24.7 ft bgs	
28	148.8	▨				HG - - Upper Clay Unit	
30			<i>No other core or samples were collected from GS to 65 ft bgs.</i>			~27 ft bgs	
32							

BORING LOG AND MONITOR WELL COMPLETION

**Monitor Well ID: FW-14B**

SUBSURFACE PROFILE			SOIL SAMPLE			AS-BUILT
Depth (ft bgs)	Elevation ft NGVD-29	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation	As-Built
34					Hawthorn Group	<p>16-in Ø Borehole</p> <p>8 in. Conductor Casing</p> <p>4 in. SS Well Casing</p> <p>2 in. Westbay MP System</p>
36						
38						
40						
42						
44						
46						
48						
50						
52						
54						
56						
58						
60						
62	113.0				63 ft bgs	
64	111.0	<b>CONTINUOUS CORE BEGINS AT 65.0 FT BGS</b>		12-in steel conductor casing installed to 66.0 ft bgs using cable tool methods	HG - - Middle Clay Unit	
66	109.5	Slough (CLAY) with bentonite chips and river gravel from cable tool installation of 12-in conductor casing.				

**BORING LOG AND MONITOR WELL COMPLETION**

**Monitor Well ID: FW-14B**

SUBSURFACE PROFILE				SOIL SAMPLE		AS-BUILT
Depth (ft bgs)	Elevation ft NGVD-29	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation
69	107.3		CH (CLAY) fat, little silt, trace very fine grained sand [gravel absent], soft, high plasticity, massive with few sand and silt stringers, medium gray [N5] monotone, wet, odorless.	10	Collect 7-in sonic core in advance of 10-in override casing, from w/in 12-in ID permanent casing	74.2 ft bgs
71			CL (CLAY) lean, some silt, little fine to very fine grained sand [gravel absent, except for little w/in the matrix at 70.0-70.5 ft bgs], stiff, high plasticity, massive, prominent silty stringers and bedding plane seams, mottled dark greenish gray [5G 4/1], moist, odorless. Mechanically fractured along bedding plane silt seams.			
73						
75	101.8		GM (Sandy GRAVEL) w/ cobbles, some fine sand, little silt & clay, med to coarse grained, compact, gap graded, lensed, [N8] gravels in greenish gray [5G 6/1] matrix, moist, odorless. Gravels are limestone wackestone, very light gray [N8] blend with little dark gray [N3] carbonate grains (salt and pepper appearance, hereafter referenced as <b>S&amp;P Wackestone</b> ), with little rounded to subrounded coarse grained lustrous silica sand with smooth crystal faces in a very fine to medium grained carbonate sand matrix and with little small shell fragments.	10	All sonic cores were collected without drilling water	
77	100.7					
79			SM (Silty SAND) with few GP(GRAVEL) lenses, some silt, little clay, little gravel, very fine grained, stiff, high plasticity, prominent irregular laminations and thin lenses, well graded matrix, laminated greenish gray [5G 6/1] matrix with medium dark gray [N4] stained blotches, banding, and fingering, light gray [N8] carbonate seams, very moist, odorless; grading down to less gravel, medium plasticity.			
81	94.0			10	Hawthorn Group	
83			SP (SAND), little silt & clay, little fine gravel, medium grained clean silica sand, sub-rounded, loose, poorly graded, few thin lenticular sandy clay lenses, chaotic bedding, blend of light olive gray [5Y 6/1] with greenish gray [5GY 6/1] and few medium dark gray [N4] stained blotches, wet, odorless.			
85	91.0			10		
87	88.8		CL ( Silty CLAY), lean, some silt, little very fine sand, little gravel, stiff, medium plasticity, typical "massive" clay but only in thin beds with prominent irregular fine carbonate sand and silt stringers, lenses, and fine gravel seams, dark greenish gray [5G 4/1] with [5Y 6/1] carbonates, moist, odorless.			
89				10		
91						
93				10		
95						
97			SP (SAND) with common 6-12-in thick interlayered silty clay lenses SAA (85-87) ft bgs. Sand matrix has little silt & clay, trace gravel, coarse grained clean silica sand, sub-rounded, loose, poorly graded, few thin lenticular sandy clay lenses, chaotic bedding, blend of light olive gray [5Y 6/1] with greenish gray [5GY 6/1], and prominent dark gray[N3] staining (103-105) ft bgs, wet, odorless, grading down to faint creosote-like odors.			
99				10		
101						

12-in Ø Borehole

**BORING LOG AND MONITOR WELL COMPLETION**

**Monitor Well ID: FW-14B**

SUBSURFACE PROFILE				SOIL SAMPLE		AS-BUILT
Depth (ft bgs)	Elevation ft NGVD-29	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation
104	71.0					
106	69.3		GM (Sandy GRAVEL), some fine sand, little silt & clay, fine to coarse grained sub-angular to sub-rounded S&P Wackestone lenses within silty-clayey-sand matrix, firm, low plasticity, light gray [N7] blend, wet, odorless.			106.7 ft bgs HG - Lower Clay Unit
108						
110	64.5		CL (CLAY) lean, some silt, little very fine sand, stiff, high plasticity, typical "massive" clay but only in thin beds separated by prominent lenticular fine carbonate sand and silt stringers, laminations, and thin lenses, dark greenish gray [5GY 5/1] clay with light olive gray [5Y 6/1] carbonate clasts, moist, odorless.	10		
112	62.7		GC (Clayey GRAVEL), some clay, some fine sand, coarse to medium grained angular to sub-angular limestone gravel. Matrix is a chaotic blend of clayey sand lenses mixed with lean clay lenses [SAA 106.7-111.5 ft bgs], firm, low- to non-plastic, light olive gray [5Y 6/1] blend, moist, odorless.			
114						
116	59.5		CL (CLAY), SAA (106.7 - 111.5) ft bgs. Second unit of massive clay within the LHG sediments - Fine sand content increases with depth, while plasticity decreases with depth.			
118					8-in steel conductor casing installed to 118.0 ft bgs using rotasonic methods	
120	56.0		ML (SILT) calcareous, some clay, little very fine sand, stiff, high plasticity, massive with prominent irregular thin lenses and blebs of of rock flour, light olive gray [5Y 6/1] blend with white [N9] rock flour thin lenses and discontinuous laminations, dry, odorless.	10		
122						
124						
126	50.5		SC (Clayey SAND), some clay and silt, little gravel, little fine sand, firm, medium plastic, chaotic lenticular mix of clayey sand, silty sand, and silty clay, greenish gray [5GY 6/1] blend, dry, odorless. Mechanically fractured into coarse gravel size material.			
128	48.4		SC (Clayey SAND), some clay, some gravel, fine grained sand, firm, medium plastic, chaotic lenticular mix of clayey sand, silty sand, and silty clay, with isolated lenses of coarse grained gravel (sub-angular mudstone to sub-rounded S&P Wackestone) greenish gray [5GY 6/1] blend, moist, odorless.	5		
130						
132	45.1		SC (Clayey SAND) some clay, little (grading to some) gravel (shells and rounded pebbles), fine grained subrounded sand grading to medium grained, compact, gap graded, conglomeratic sediments from granule to fine gravel-sized rip-up clasts deposited in horizontal beds, including clay lenses and silt and clay blebs. Multiple conglomeratic colors averaging olive gray [5Y 4/1], moist, odorless.	5	Collect 4-in sonic core in advance of 7-in override casing, all within 8-in ID conductor casing	
134	41.5		CL (CLAY) lean, some silt, little VF sand [gravel absent], stiff, medium plastic, typical "massive" clay, common lenticular fine sand and silt stringers, laminations, and thin lenses, mottled matrix color between dark greenish gray [5G 4/1] and pale blue [5B 6/2], with [5Y 6/1] carbonate stringers, moist, odorless.			
136			SP (SAND), trace silt & clay, coarse, clean silica, sub-rounded, loose, poorly graded, light olive gray [5Y 6/1], wet, odorless.			

8-in Ø Borehole

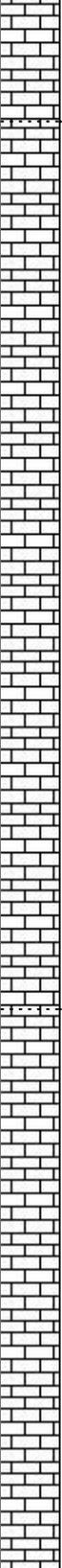
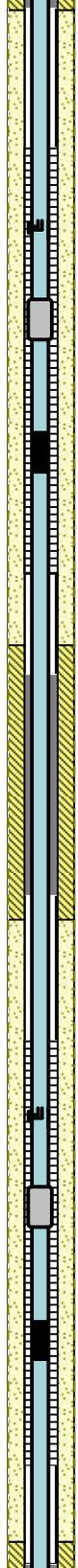
BORING LOG AND MONITOR WELL COMPLETION

**Monitor Well ID: FW-14B**

SUBSURFACE PROFILE			SOIL SAMPLE		AS-BUILT		
Depth (ft bgs)	Elevation ft NGVD-29	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation	As-Built
139	38.1		ML (Clayey SILT), some clay, some fine sand [gravel absent], firm, variable plasticity, laminated with interlayered thin chaotic lenses, stratified light olive gray [5Y 6/1] blend, moist, odorless.	5	Start of typical weathered Ocala at 140.9 ft bgs	140.9 ft bgs Ocala LS Formation	<p>Bentonite Grout</p> <p>Fine Sand Seal</p> <p>Filter Pack</p> <p>Magnet</p> <p>Packer</p> <p>Sampling Port</p> <p>Purging Port</p>
141	35.1		SC (Clayey SAND), SAA (127.6 - 130.9) ft bgs, odorless.	5			
143			Limestone and chert cobbles and gravels, typical Ocala rip up clasts. Chert is partially silicious with a 5-in competent core and gravels. Trace to little fine sand matrix (RQD = 0.5).	5			
145							
147							
149				10			
151							
153			<p><b>OCALA LIMESTONE</b> Weakly Indurated Packstone (WIP) with PIP and MIP layers and MIP aggregates. Contains prominent Leps fossils. Light olive gray [5Y 5/1] grading to very pale orange [10YR 8/2], wet, odorless grading to faint sulfide odor. Three (3) MIP layers observed, ranging in size from approximately 2-in to 6-in thick. Estimated core integrity volumes:</p> <p>80% Unconsolidated (PIP/WIP)</p> <p>20% Consolidated (MIP layers and gravel-size aggregates).</p> <p>RQD = 0.0</p>		All sonic cores drilled w/ minimal vibrations and no added feed pressure (only weight of rods)		
155							
157							
159				10			
161							
163							
165	11.0		<p><b>(165 to 175) ft bgs</b></p> <p>Differentially weathered Packstone. Interlayered PIP, WIP, and MIP Layers. Pale yellowish orange [10YR 8/2] monotone, wet, faint sulfide odor. Four (4) MIP layers observed, ranging in size from approximately 1-in to 1.3-ft thick. Estimated core integrity volumes:</p> <p>65% Unconsolidated (PIP/WIP)</p> <p>35% Consolidated (MIP layers and med-coarse gravel-size aggregates). RQD=0.0</p>		All Ocala FM 10-ft sonic cores drilled in 10-45 seconds for an average penetration rate of 2.5 secs/ft.		
167							
169							
171				10			

BORING LOG AND MONITOR WELL COMPLETION

**Monitor Well ID: FW-14B**

SUBSURFACE PROFILE			SOIL SAMPLE		AS-BUILT		
Depth (ft bgs)	Elevation ft NGVD-29	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation	As-Built
174	1.0		<p><b>(175 to 195) ft bgs</b></p> <p>Differentially weathered Packstone. Interlayered PIP, WIP, and MIP layers. Yellowish gray [5Y 8/1] to light olive gray [5Y 6/1] in distinct thin to thick layers, wet, odorless. Two (2) MIP layers observed, ranging in size from approximately 1-in to 2-in thick. Estimated core integrity volumes:                      75-80% Unconsolidated (PIP/WIP)                      20-25% Consolidated (MIP layers and med-coarse gravel-size aggregates) RQD = 0.0</p>	<p align="center"><b>10</b></p>	<p>Faint sulfide odors at 145-175 , 211, and 218-219 ft bgs. Odorless in all other Ocala LS core.</p>	<p align="center">Ocala LS</p>	
176							
178							
180							
182							
184							
186							
188							
190							
192							
194	-19.0			<b>10</b>			
196							
198							
200				<b>10</b>			
202							
204							
206							

BORING LOG AND MONITOR WELL COMPLETION

**Monitor Well ID: FW-14B**

SUBSURFACE PROFILE			SOIL SAMPLE		AS-BUILT				
Depth (ft bgs)	Elevation ft NGVD-29	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation	As-Built		
209		[Brick pattern symbol]	<p><b>(195 to 225) ft bgs</b></p> <p>Differentially weathered Packstone. Interlayered PIP, WIP, and MIP aggregates [MIP Layers absent]. Yellowish gray [5Y 8/1] to light olive gray [5Y 6/1], monotone, wet, predominantly odorless with faint sulfide odors noted at 211, and 218-220 ft bgs. Estimated core integrity volumes:                      80-85% Unconsolidated (PIP/WIP)                      15-20% Consolidated (MIP layers and med-coarse gravel-size aggregates). RQD = 0.0</p>	10		Ocala LS			
211									
213									
215									
217									
219						10			
221									
223									
225	-49.0								
227					<p><b>(225 to 235) ft bgs</b></p> <p>Differentially weathered Packstone. Interlayered PIP, WIP, and MIP. Light olive gray [5Y 6/1] monotone, wet, odorless. Multiple interlayered 1" to 3" MIP layers from 232-235 ft bgs. Estimated core integrity volumes:                      65% Unconsolidated (PIP/WIP)                      35% Consolidated (MIP layers and med-coarse gravel-size aggregates). RQD = 0.0</p>	10		Lost 1,580 net gallons potable water w/ 4,000 mg/L NaBr tracer into Ocala LS during drilling and well installation	
229									
231									
233									
235	-59.0								
237			NO SAMPLE COLLECTED (235 - 240.7) ft bgs						
239			End of Log						
241					4-in Well TD = 240.68 ft bgs				

# BORING LOG AND MONITOR WELL COMPLETION

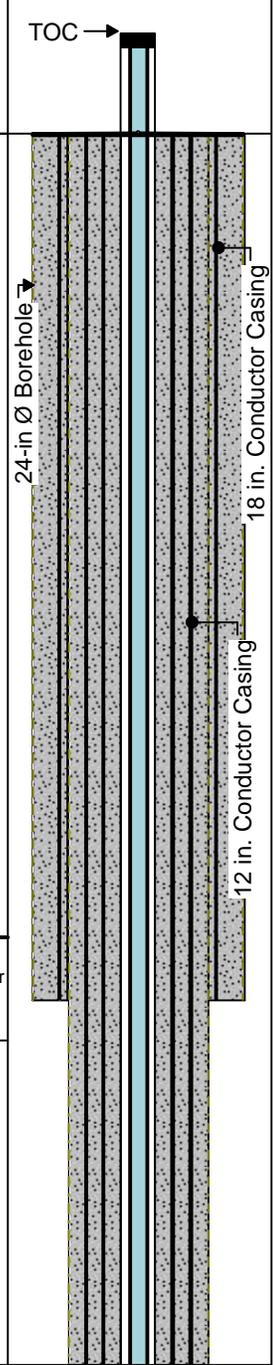
## Monitor Well ID: FW-15B

Project No. 2201.083.02  
 Total Well Depth (ft bgs): 238.71  
 Well Location: Transect Well  
 Well Screens: Four x 10 ft, 4-in dia SS, 0.020 slot, 20 ft C-C, 12/20 filter pack, 30/65 seal sand between filter packs  
 Well Description: 4-in Multiscreen SS Well w/in Ocala LS with Westbay MP38 4-port Sampling Well

Project Name: Upper Floridan Aquifer Invest.  
 Site: Koppers Industries, Gainesville, FL  
 Top of Casing Elev. (Ft NGVD-29): 176.42  
 NAD 83 (FL North) X = 2659212

Start/Finish Date: 09/28/05 - 1/06/06  
 Client: Beazer East  
 Ground Elev. (Ft NGVD-29): 176.4  
 NAD 83 (FL North) Y = 253723

SUBSURFACE PROFILE				SOIL SAMPLE			AS-BUILT
Depth (ft bgs)	Elevation (ft NGVD-29)	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation	As-Built
-2							TOC →
0	176.4		Ground Surface				
2							
4							
6							
8							
10							
12						Surficial Deposits	
14							
16							
18							
20							
22	155.0	▨	<b>(21.4 - 24.2) ft bgs - Upper Hawthorn Group Clay</b> Confirmed with GeoProbe Sample.			21.4 ft bgs	
24	152.2	▨	<i>No other core or samples were collected from GS to 67.7 ft bgs.</i>		18-in steel conductor casing installed to 23.1 ft bgs using cable tool methods	HG - - Upper Clay Unit 24.2 ft bgs	
26							
28							
30							
32							



BORING LOG AND MONITOR WELL COMPLETION

**Monitor Well ID: FW-15B**

SUBSURFACE PROFILE			SOIL SAMPLE			AS-BUILT
Depth (ft bgs)	Elevation ft NGVD-29	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation	As-Built
34					Hawthorn Group	
36						
38						
40						
42						
44						
46						
48						
50						
52						
54						
56						
58						
60						
62	113.4				63 ft bgs	
64					HG - Middle Clay Unit	
66		CONTINUOUS CORE BEGINS AT 67.7 FT BGS				

BORING LOG AND MONITOR WELL COMPLETION

**Monitor Well ID: FW-15B**

SUBSURFACE PROFILE				SOIL SAMPLE		AS-BUILT
Depth (ft bgs)	Elevation ft NGVD-29	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation
69	105.9		CL (CLAY) lean, some silt, little fine to very fine grained sand [gravel absent], stiff, high plasticity, massive, some blocky-platty clay ped cleavage, common thin carbonate silt stringers, one 2-in clayey sand seam at 69.8 ft bgs, mottled dark greenish gray [5G 4/1] with light olive gray [5Y 6/1] silt stringers, moist, faint non-descript organic odor.	10	12-in steel conductor casing installed to 68.0 ft bgs using cable tool methods	70.5 ft bgs
71			GC (Clayey GRAVEL) with cobbles, some clay, some fine sand, med to coarse grained, compact, gap graded, lensed, greenish gray [5G 6/1] matrix, wet, faint non-descript organic odor grading into a faint creosote-like odor. Cobbles are limestone wackestone, very light gray [N8] blend with little dark gray [N3] carbonate grains (salt and pepper appearance, hereafter referenced as <b>S&amp;P Wackestone</b> ), with little rounded to subrounded coarse grained lustrous silica sand with smooth crystal faces in a very fine to medium grained carbonate sand matrix and with little small shell fragments.		Collect 7-in sonic core in advance of 10-in override casing, from w/in 12-in ID permanent casing	
73						
75	100.1					
77						
79						
81			GM (Sandy GRAVEL) with cobbles, some fine sand, some clay, little silt, coarse to medium grained angular to sub-angular carbonate gravel lenses (predominantly S&P Wackestone), within clayey sand matrix, soft to firm, medium plasticity, homogeneous, medium bluish green [5B 5/1] grading to grayish green [5G 6/1] with [N8] cobbles and gravels, wet, slight creosote-like odor, grading to odorless.	10	All sonic cores were collected without drilling water	Hawthorn Group
83						
85						
87						
89	86.5					
91			CL (Silty CLAY) lean, some silt, some very fine sand, little gravel, stiff, medium plasticity, typical "massive" clay but only in very thin beds with prominent fine carbonate sand and silt stringers, lenses, and seams, prominent blocky-platty clay ped cleavage, greenish gray blend [5GY 5/1] clay with light olive gray [5Y 6/1] carbonate silt stringers & seams, moist, odorless.	8.5		
93	82.9					
95	81.4		NO RECOVERY			
97			SP (SAND) little silt & clay, trace gravel grading to some gravel (coral molded S&P Wackestone), coarse grained clean silica sand, sub-rounded, loose, poorly graded, few thin lenticular sandy clay lenses grading to common lenses, chaotic bedding, blend of light olive gray [5Y 6/1] with greenish gray [5GY 6/1], [darker staining absent], wet, faint creosote-like odor.	10		
99						
101						

12-in Ø Borehole

**BORING LOG AND MONITOR WELL COMPLETION**

**Monitor Well ID: FW-15B**

SUBSURFACE PROFILE				SOIL SAMPLE		AS-BUILT
Depth (ft bgs)	Elevation (ft NGVD-29)	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation
104	71.4					
106	69.9		GM (Sandy GRAVEL) with cobbles and few clay lenses (same as directly below), little fine sand, little silt & clay, sub-angular to sub-rounded S&P Wackestone within silty-clayey-sand matrix, firm, low plasticity, greenish gray [5GY 6/1] with very light gray [N8] carbonates, moist, faint creosote-like odor.			
108			CL (Sandy CLAY) very lean, some silt, some fine sand, little gravel, soft, grading to firm, high plasticity, prominent fine carbonate sand and silt stringers and thin lenses (increasing with depth), medium bluish gray [5B 5/1] grading down to dark greenish gray [5GY 5/1] clay with prominent dark gray [N3] stained seams and blotches in the upper 2 ft of recovery, very moist, faint creosote-like odor grading to odorless.	10		
110						
112	64.2					
114	62.1		GM (Sandy GRAVEL) some fine-medium sand, some silt & clay. Gravel is angular limestone and shells surrounded by a clayey-sand matrix, soft, low plasticity, well graded, lensed, greenish gray [5GY 6/1] blend with very light gray [N8] gravels, moist, odorless.			114.3 ft bgs HG - Lower Clay Unit
116	60.2		CL (CLAY), lean, some silt, some very fine sand, little gravel grading to trace gravel, stiff, medium high plasticity, typical "massive" clay separated by prominent lenticular fine carbonate sand and silt stringers, laminations, and thin lenses, dark greenish gray [5BG 4/1] clay with prominent very light gray [N8] lenses and rock flour, moist, odorless.			
118	59.2					
120	57.2		CL (Silty-Sandy CLAY) calcareous, some silt, some fine sand, little gravel, stiff, non-plastic seams, prominent blocky-platy clay ped cleavage, prominent chaotic sand-silt stringers, laminations, and thin lenses, [5G 6/1] and [5Y 6/1], moist, odorless.	10	8-in steel conductor casing installed to 120.5 ft bgs using rotasonic methods	
122	54.1					
124	53.4		ML (Clayey SILT), some clay, little very fine sand, trace gravel, stiff, non-plastic, prominent silt and sand irregularly laminated layers, [5Y 6/1] blend, moist, odorless. Mechanically degraded into fine to medium gravel size material by sampling.			
126	51.4		CL (Silty CLAY) and silt, calcareous, some fine sand [gravel absent], stiff, medium plasticity, laminated and thin lensed, stratified [5Y 6/1] mixture, moist, odorless.			
128	47.5		GM (Sandy GRAVEL), some fine-medium sand, some silt & clay, angular limestone gravel, clayey sand matrix, compact, gap graded, [5Y 6/1], moist, odorless. Mechanically fractured.			
130	45.4		SC (Clayey SAND), some clay & silt, little carbonate gravel, fine grained, hard, chaotic lenticular structure, [5GY 6/1] with vermiculated [5GY 5/1] and [5Y 6/1], wet, odorless.	10	Collect 4-in sonic core in advance of 7-in override casing, all within 8-in ID conductor casing	
132	43.3		ML (Sandy SILT), some fine sand, some clay, little gravel, stiff, medium plastic, prominent laminations and lenticular sand, silt, and clay seams, light greenish gray [5GY 6/1], moist, odorless.			
134	41.4		SC (Clayey SAND), some clay, trace gravel, medium grained sand, compact, well graded, conglomeratic sediments from granule to fine gravel-size rip-up clasts in horizontal beds, including silt and clay blebs. Multiple conglomeratic colors averaging olive gray [5Y 4/1], moist odorless.			
136						

8-in Ø Borehole

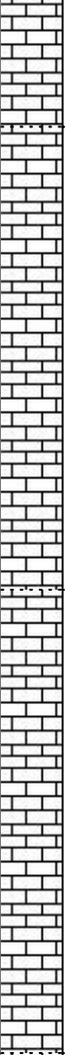
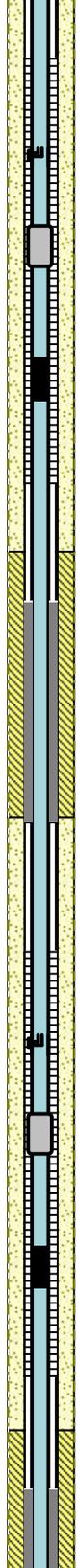
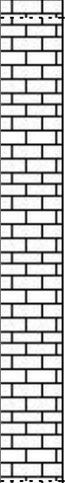
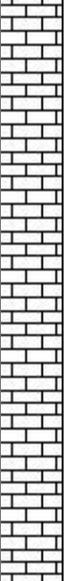
**BORING LOG AND MONITOR WELL COMPLETION**

**Monitor Well ID: FW-15B**

SUBSURFACE PROFILE			SOIL SAMPLE		AS-BUILT		
Depth (ft bgs)	Elevation ft NGVD-29	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation	As-Built
139	37.9	[Symbol]	CL (CLAY), lean, some silt, little VF sand [gravel absent], stiff, med-plastic, typical "massive" clay, few lenticular fine carbonate sand and silt stringers, laminations, and thin lenses, [5G 4/1], moist, odorless w/ a 1-in seam of moderate yellowish brown [10YR 5/4] calcareous, fine, clean, wet sand at 133.0 ft bgs.	10	First lost override drilling circulation at 141 ft bgs		
141			SM (Silty SAND), some silt, little clay, little gravel (shells and S&P Wackestone), fine to medium grained, soft, medium plasticity, loose, thin chaotic lensed, greenish gray [5GY 5/1] with light brownish gray [5YR 6/1], moist, odorless.		Start of typical weathered Ocala at 143.5 ft bgs	143.5 ft bgs	
143	33.9	[Symbol]	SC (Clayey SAND) and clay, some gravel (mostly large shell fragments), fine-medium grained, firm, low plasticity, conglomeratic sediments from granule to fine gravel-size rip-up clasts, [5GY 7/1], wet, odorless.			Ocala LS Formation	
145	32.9	[Symbol]	ML (Sandy SILT), calcareous, some fine sand, some medium gravel (S&P Wackestone, dolomite, and shells), little clay, very soft, medium plasticity, irregular thin lenses and laminations, light brownish gray [5YR 6/1] and [5Y 8/1], wet, odorless.				
147	31.4	[Symbol]	Chert cobble, partially silicious replacement w/in a limestone-packstone (typical Ocala Fm), consolidated.				
149			<b>OCALA LIMESTONE</b> Moderately Indurated Packstone (MIP) with PIP and WIP layers. Contains prominent Leps fossils. Light olive gray [5Y 7/1], wet, faint sulfide odor. Estimated core integrity volumes: 50% Unconsolidated (PIP/WIP) 50% Consolidated (MIP layers and gravel-size aggregates). RQD = 0.0	10			
151							
153							
155					All sonic cores drilled w/ minimal vibrations and no added feed pressure (only weight of rods)		
157							
159				10			
161			<b>(145 to 175) ft bgs</b>				
163			Differentially weathered Packstone. Interlayered PIP, WIP, and MIP Layers. Yellowish gray [5Y 8/1] to yellowish olive gray [5Y 7/1], wet, faint sulfide odors (145-155), (165-169), 172, and 174 ft bgs; odolress elsewhere. One (1) MIP layer observed approximately 1-in thick. Estimated core integrity volumes: 80% Unconsolidated (PIP/WIP) 20% Consolidated (MIP layers and med-coarse gravel-size aggregates). RQD=0.0				
165					All Ocala FM 10-ft sonic cores drilled in 20-30 seconds for an average penetration rate of 2.6 secs/ft.		
167							
169				10			
171							

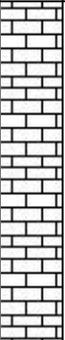
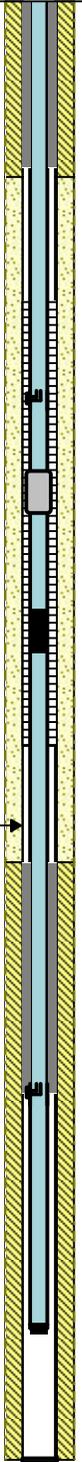
BORING LOG AND MONITOR WELL COMPLETION

**Monitor Well ID: FW-15B**

SUBSURFACE PROFILE			SOIL SAMPLE		AS-BUILT		
Depth (ft bgs)	Elevation ft NGVD-29	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation	As-Built
174	1.4		<p><b>(175 to 185) ft bgs</b> Differentially weathered Packstone. Interlayered PIP, WIP, and MIP aggregates [MIP Layers absent]. Yellowish gray [5Y 8/1] and light olive gray [5Y 6/1] horizons, wet, odorless with a faint sulfide odor within the fine, loose, poorly graded sand of the WIP layers; odorless in PIP layers. Estimated core integrity volumes: 85% Unconsolidated (PIP/WIP) 15% Consolidated (MIP med-coarse gravel-size aggregates). RQD = 0.0</p>	10	<p>Faint sulfide odors at 145-155, 165-185, 195-197 ft bgs. Faint non-specific organic odors from 186-189 ft bgs.  Odorless in all other Ocala LS core.</p>	Ocala LS	
176	178						
180	182						
184	186						
186	-8.6		<p><b>(185 to 195) ft bgs TEST CORE - ROTARY ONLY</b>  Cored and drilled the override casing and extruded the sample with normal sonic equipment, but without vibration to compare rotary-only sample core integrity with cores retrieved using vibration. No added down pressure was used other than the weight of the rods. Rotary refusal was encountered at several horizons. Added intermittent vibrations for normal sonic drilling through refusals. Override casing and sample extrusion were conducted with normal vibration.</p>	10	<p>Override casing circulation re-established during 185-195 ft core (20% return).</p>	Ocala LS	
188	190						
192	194						
196	198						
196	-18.6		<p><b>(195 to 215) ft bgs</b> Differentially weathered Packstone. Interlayered PIP, WIP and MIP Layers. Yellowish gray [5Y 8/1] monotone, wet, faint sulfide odors grading to odorless. Thirteen (13) MIP layers observed, ranging in size from approximately 1-in to 3-in thick. Estimated core integrity volumes: 75% Unconsolidated (PIP/WIP) 25% Consolidated (MIP layers and med-coarse gravel-size aggregates). RQD=0.0</p>	10	<p>Maintained circulation to TD with flow reduction to 10%</p>	Ocala LS	
198	200						
202	204						
206							

BORING LOG AND MONITOR WELL COMPLETION

**Monitor Well ID: FW-15B**

SUBSURFACE PROFILE			SOIL SAMPLE		AS-BUILT		
Depth (ft bgs)	Elevation ft NGVD-29	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation	As-Built
209				10		Ocala LS	
211							
213							
215	-38.6						
217							
219					10		
221							
223				<p><b>(215 to 235) ft bgs</b>                      Differentially weathered Packstone. Interlayered PIP, WIP and MIP Layers. Yellowish gray [5Y 8/1] to a lighter [5Y 7/1], wet, odorless. One distinct MIP layer identified approximately 2-in thick. Estimated core integrity volumes:                      75-80% Unconsolidated (PIP/WIP)                      20-25% Consolidated (MIP layers and med-coarse gravel-size aggregates). RQD=0.0</p>			
225							
227							
229					10	Lost 2,090 net gallons potable water with 1,000 mg/L NaBr tracer into Ocala LS during drilling and well installation	
231							
233							
235	-58.6		NO SAMPLE COLLECTED (235 - 238.7) ft bgs				
237			End of Log				
239					4-in Well TD = 238.71 ft bgs		
241							

## BORING LOG AND MONITOR WELL COMPLETION

### Monitor Well ID: FW-16B

**Project No.** 2201.083.02  
**Total Well Depth (ft bgs):** 250.90  
**Well Location:** Transect Well  
**Well Screens:** Four x 10 ft, 4-in dia SS, 0.020 slot, 20 ft C-C, 12/20 filter pack, 30/65 seal sand between filter packs  
**Well Description:** 4-in Multiscreen SS Well w/in Ocala LS with Westbay MP38 4-port Sampling Well

**Project Name:** Upper Floridan Aquifer Invest.  
**Site:** Koppers Industries, Gainesville, FL  
**Top of Casing Elev. (Ft NGVD-29):** 178.63  
**NAD 83 (FL North) X =** 2659220

**Start/Finish Date:** 10/10/05 - 11/10/05  
**Client:** Beazer East  
**Ground Elev. (Ft NGVD-29):** 178.6  
**NAD 83 (FL North) Y =** 253415

SUBSURFACE PROFILE				SOIL SAMPLE			AS-BUILT
Depth (ft bgs)	Elevation (ft NGVD-29)	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation	As-Built
-2							TOC →
0	178.6		Ground Surface				
2							24-in Ø Borehole
4							18 in. Conductor Casing
6							
8							
10							
12						Surficial Deposits	
14							12 in. Conductor Casing
16							
18							
20	158.6		(20.0 - 24.3) ft bgs - Upper Hawthorn Group Clay Confirmed with GeoProbe Sample and drilling returns.			20.0 ft bgs	
22			<i>No other core or samples were collected from GS to 67 ft bgs.</i>		18-in steel conductor casing installed to 22.2 ft bgs using cable tool methods	HG - - Upper Clay Unit	
24	154.3					24.3 ft bgs	
26							
28							
30							
32							

BORING LOG AND MONITOR WELL COMPLETION

**Monitor Well ID: FW-16B**

SUBSURFACE PROFILE			SOIL SAMPLE			AS-BUILT	
Depth (ft bgs)	Elevation ft NGVD-29	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation	As-Built
34						Hawthorn Group	
36							
38							
40							
42							
44							
46							
48							
50							
52							
54							
56							
58							
60							
62							
64	113.6					65 ft bgs	
66	111.6		<b>CONTINUOUS CORE BEGINS AT 67.0 FT BGS</b>			HG - - Middle Clay Unit	

BORING LOG AND MONITOR WELL COMPLETION

**Monitor Well ID: FW-16B**

SUBSURFACE PROFILE				SOIL SAMPLE		AS-BUILT
Depth (ft bgs)	Elevation ft NGVD-29	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation
69			CL (CLAY) lean, some silt, little fine to very fine grained sand [gravel absent], firm to stiff, medium to high plasticity, massive clay with common silty stringers and thin lenses (increasing w/ depth), mottled dark greenish gray [5G 4/1], moist, odorless. Few mechanical fractures along bedding plane silt seams from sonic drilling.	8	12-in steel conductor casing installed to 69.6 ft bgs using cable tool methods	72.2 ft bgs
71	106.4					
73			GM (Sandy GRAVEL) w/ cobbles (dolomite and wackestone), some fine sand, little silt & clay, med to coarse grained, compact, gap graded, lensed, in greenish gray [5G 6/1] matrix, moist, odorless. WACKESTONE cobbles and gravels are limestone wackestone, very light gray [N8] blend with little dark gray [N3] carbonate grains (salt and pepper appearance, hereafter referenced as <b>S&amp;P Wackestone</b> ), with little rounded to subrounded coarse grained lustrous silica sand with smooth crystal faces in a very fine to medium grained carbonate sand matrix and with little small shell fragments.	8.5	Collect 7-in sonic core in advance of 10-in override casing, from w/in 12-in ID permanent casing	Hawthorn Group
75	103.6					
77	102.1		NO RECOVERY			
79			SC (Clayey SAND), some clay & silt, little S&P Wackestone gravel, fine grained, stiff, high plasticity, prominent irregular laminations and thin lenses, clean coarse sand (81.5-82.0) ft bgs, gap graded matrix, olive gray [5Y 4/1] and medium bluish gray [5B 5/1] matrix, wet, faint non-descript organic odor to odorless.	8.5		12-in Ø Borehole
81						
83	95.1					
85			GM (Sandy GRAVEL) w/ cobbles (dolomite and S&P Wackestone), some fine sand, little (grading to some) silt & clay, coarse grained sub-rounded to sub angular gravel lenses, matrix is clayey sand, stiff, low plasticity, compact. Medium light gray [N6] gravel and matrix, very moist, odorless grading down to a faint petroleum-like odor.	10	All sonic cores were collected without drilling water	
87	90.4					
89			CL (Sandy CLAY) lean, some fine sand, some silt, little gravel, stiff, medium plastic, thin beds of typical "massive" clay with prominent irregular fine carbonate sand and silt stringers, lenses, and fine gravel seams, mottled dark greenish gray [5G 6/1] blend with common [5Y 6/1] carbonates stringers and lenses, with common greenish black [5G 2/1] stained fingering, moist, faint to slight petroleum-like odor.	10		
91	87.6					
93	85.3		SP (SAND) little silt & clay, trace gravel, coarse grained clean silica sand, sub-rounded, loose, poorly graded, few thin lenticular sandy clay lenses, light olive gray [5Y 6/1], wet, slight petroleum-like odor.	10		
	84.3					
95	83.6		GM (Sandy GRAVEL) SAA (83.5-88.2) ft bgs, wet, slight petroleum-like odor.	10		
	82.6					
97			CL (Sandy CLAY) SAA (88.2-91.0) ft bgs, slight petroleum-like odor.	10		
99						
	78.1		SC (Clayey SAND) some clay & silt, trace fine gravel, medium grained, stiff, low plasticity, prominent irregular laminations and thin lenses, well graded, greenish gray [5GY 6/1] with [5GY 5/1] thin clay lenses and seams, wet, faint petroleum-like odor.	10		
101						
			SP (SAND), little silt & clay, trace gravel, coarse grained clean silica sand, sub-rounded, loose, poorly graded, few thin lenticular sandy clay lenses, chaotic bedding, greenish gray [5GY 5/1] blend, wet, faint petroleum-like odors.			

**BORING LOG AND MONITOR WELL COMPLETION**

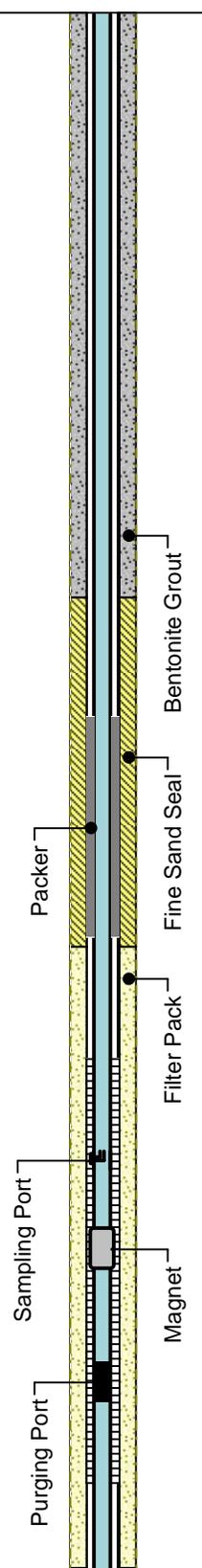
**Monitor Well ID: FW-16B**

SUBSURFACE PROFILE				SOIL SAMPLE		AS-BUILT	
Depth (ft bgs)	Elevation ft NGVD-29	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation	As-Built
104			SM (Gravelly SAND) with cobbles, some gravel (S&P wackestone), little silt & clay with a 3-in thick, poorly graded gravel layer immediately above the gradational contact to LHG Clay; pebble to medium grained sub-angular to sub-rounded gravel, compact, well graded, lenticular bedding, greenish gray [5G 6/1] blend, moist to wet, faint petroleum-like odor. Mechanically degraded into medium to coarse gravel-size material.	10			
106							
108							
110							
112	67.1		CL (CLAY) lean, some silt, little very fine sand, little (grading to none) gravel, firm (grading to stiff), high plasticity, thin irregular lenticular fine carbonate sand and silt stringers, laminations, and thin lenses, with prominent (grading to none) rip-up clasts of gravel and silt blebs, grading to more massive (114.8-119.5) ft bgs with few stringers and sandy thin lenses, strongly mottled greenish gray [5GY 5/1] clay with common light gray [N8] rock flour, and common greenish black [5GY 2/1] organic stained diffuse fingering and blotches, moist, faint non-descript organic odor grading to odorless.	10	8-in steel conductor casing installed to 118.0 ft bgs using rotasonic methods	111.5 ft bgs HG - Lower Clay Unit	
114							
116							
118							
120	58.4		SC (Gravelly SAND), some gravel, some clay & silt, calcareous, fine grained sand, stiff, non-plastic, compact, gap graded, chaotic lenticular mix of clayey sand, silty sand, rock flour, clean sand and gravel, dark greenish gray [5GY 4/1] blend with [N7] gravels, and pale red [10YR 6/2] clean fine sand seam (120.6-120.8) ft bgs, moist with dry seams, odorless. Differentially mechanically fractured into lenticular coarse to fine gravel-size material.	10			
122							
124							
126			ML (Sandy SILT) calcareous, some clay, one mudstone cobble, some very fine sand, stiff, low plasticity, prominent chaotic laminations and irregular thin lenses and blebs of rock flour and sandy silt, grayish green [5GY 6/1] blend w/ light olive gray [5Y 6/1] stringers and [N8] rock flour, moist, odorless.	5			
128							
130	48.6		Carbonate cobble, dry, RQD = 0.5		Collect 4-in sonic core in advance of 7-in override casing, all within 8-in ID conductor casing		
132	47.1		CL (CLAY), lean, some silt, little very fine sand, [gravel absent], stiff, low plasticity, typical "massive" clay, common lenticular fine carbonate sand and silt stringers, laminations, and thin lenses, mottled matrix color between dark greenish gray [5G 4/1] and pale blue [5B 6/2], with [5Y 6/1] carbonate stringers, moist, faint petroleum-like odor grading to odorless.	5			
134							
136	41.6		Carbonate cobble (133.0-134.1) ft bgs, dry (RQD = 0.0). Mechanically degraded into medium gravel-size material.				

**BORING LOG AND MONITOR WELL COMPLETION**

**Monitor Well ID: FW-16B**

SUBSURFACE PROFILE				SOIL SAMPLE		AS-BUILT
Depth (ft bgs)	Elevation ft NGVD-29	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation
139	40.6		ML (Sandy SILT), some fine-medium sand, some clay lenses, little gravel, stiff, low plasticity, thin lenses and irregular laminations with conglomeratic sediments from granule to fine gravel-sized rip-up clasts, greenish gray [5GY 6/1] blend of dark green [5G 4/1] clay, light olive gray [5Y 6/1] sand and white [N9] rock flour, wet, odorless.	5	Lost overide casing drilling circulation at 142 ft bgs.	
141	39.4		GM (Sandy GRAVEL) w/ cobbles, little fine sand, trace silt & clay, coarse grained sub-angular gravel lenses, matrix is clayey sand, firm, low plasticity, loose in some zones, gap graded, light olive gray [5Y 6/1] with light gray [N7] cobbles, moist, odorless.	5	Start of typical weathered Ocala at 142.4 ft bgs	142.4 ft bgs Ocala LS Formation
143	38.6		SP (SAND), trace silt & clay, little gravel, medium grained, clean, silica, sub-rounded, loose, poorly graded sand, light olive gray [5Y 6/1], moist, odorless.			
145	36.2		Limestone and chert cobbles & gravels (typical Ocala rip up clasts and mudstone), chert is partially silicious (RQD=0.5) with gravels, matrix absent.			
147			<b>OCALA LIMESTONE</b> Moderately Indurated Packstone (MIP) with PIP and WIP layers and MIP aggregates. Contains prominent Leps fossils. Light olive gray [5Y 6/1] and very pale orange [10YR 8/2], wet, faint sulfide odor grading to odorless. Estimated core integrity volumes: 40-60% Unconsolidated (PIP/WIP) 40-60% Consolidated (MIP layers and gravel-size aggregates). RQD = 0.0	5		
149	28.6		NO RECOVERY			
151						
153						
155	23.6					
157					All sonic cores drilled w/ minimal vibrations and no added feed pressure (only weight of rods)	
159						
161				10		
163			(155 to 175) ft bgs			
165			Differentially weathered Packstone. Interlayered PIP, WIP and MIP Layers. Very pale orange [10YR 8/2] monotone, wet, faint to slight sulfide odor. Six (6) MIP layers observed, ranging in size from approximately 1-in to 3-in thick. Estimated core integrity volumes: 80% Unconsolidated (PIP/WIP) 20% Consolidated (MIP layers and med-coarse gravel-size aggregates). RQD=0.0			
167						
169				10		
171						



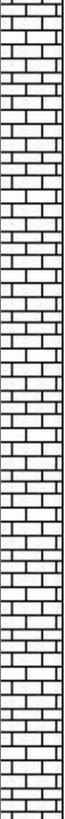
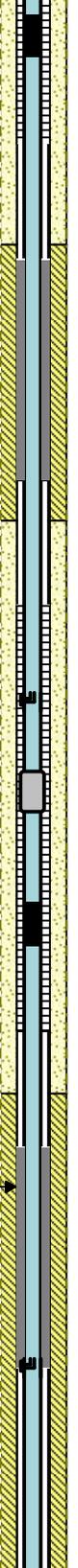
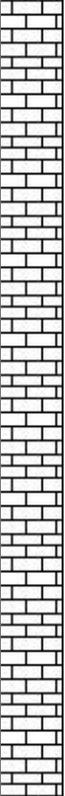
BORING LOG AND MONITOR WELL COMPLETION

**Monitor Well ID: FW-16B**

SUBSURFACE PROFILE			SOIL SAMPLE			AS-BUILT	
Depth (ft bgs)	Elevation ft NGVD-29	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation	As-Built
174	3.6	[Brick pattern symbol]	<p><b>(175 to 195) ft bgs</b></p> <p>Differentially weathered Packstone. Interlayered PIP, WIP, with MIP gravel aggregates [MIP layers absent]. Very pale orange [10YR 8/2] to light olive gray [5Y 7/1], wet, faint sulfide odors throughout. Estimated core integrity volumes:                      80% Unconsolidated (PIP/WIP)                      20% Consolidated (MIP med-coarse gravel-size aggregates).                      RQD = 0.0</p>	10	Faint to slight sulfide odors noted within all Ocala LS cores	Ocala LS	[As-built well diagram showing casing, screen, and gravel pack]
176							
178							
180							
182							
184							
186							
188							
190							
192							
194	-16.4			10			
196							
198							
200				10			
202							
204							
206							

BORING LOG AND MONITOR WELL COMPLETION

**Monitor Well ID: FW-16B**

SUBSURFACE PROFILE			SOIL SAMPLE		AS-BUILT		
Depth (ft bgs)	Elevation (ft NGVD-29)	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation	As-Built
209			<p><b>(195 to 225) ft bgs</b></p> <p>Differentially weathered Packstone. Interlayered PIP, WIP, with MIP gravel aggregates [MIP layers absent]. Light olive gray [5Y 7/1] to very pale orange [10YR 8/2], wet, faint sulfide odors throughout. Estimated core integrity volumes:                      70-80% Unconsolidated (PIP/WIP)                      20-30% Consolidated (MIP med-coarse gravel-size aggregates). RQD = 0.0</p>	10		Ocala LS	 <p>20.3 ft SS 4-in Well Sump</p>
211				9.5			
213							
215							
217							
219							
221							
223							
225	-46.4						
227					<p><b>(225 to 245) ft bgs</b></p> <p>Differentially weathered Packstone. Interlayered PIP, WIP, and MIP layers and gravel-size aggregates. Very pale orange [10YR 8/2] to light olive gray [5Y 6/1], wet, faint sulfide odors throughout. Thirteen (13) MIP layers observed, ranging in size from approximately 1-in to 3-in thick. Estimated core integrity volumes:                      65-70% Unconsolidated (PIP/WIP)                      30-35% Consolidated (MIP layers and med-coarse gravel-size aggregates) grading to slightly more consolidate with depth. RQD = 0.0</p>	10	
229		10					
231							
233							
235							
237							
239							
241							

BORING LOG AND MONITOR WELL COMPLETION

**Monitor Well ID: FW-16B**

SUBSURFACE PROFILE			SOIL SAMPLE		AS-BUILT		
Depth (ft bgs)	Elevation ft NGVD-29	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation	As-Built
244	-66.4						
246			NO SAMPLE COLLECTED (245 - 250.9) ft bgs				
250	-72.3						
252			End of Log		4-in Well TD = 250.90 ft bgs		
254							
256							
258							
260							
262							
264							
266							
268							
270							
272							
274							
276							

## BORING LOG AND MONITOR WELL COMPLETION

### Monitor Well ID: FW-17B

Project No. 2201.083.02  
 Total Well Depth (ft bgs): 240.86  
 Well Location: Transect Well  
 Well Screens: Four x 10 ft, 4-in dia SS, 0.020 slot, 20 ft C-C, 12/20 filter pack, 30/65 seal sand between filter packs  
 Well Description: 4-in Multiscreen SS Well w/in Ocala LS with Westbay MP38 4-port Sampling Well

Project Name: Upper Floridan Aquifer Invest.  
 Site: Koppers Industries, Gainesville, FL  
 Top of Casing Elev. (Ft NGVD-29): 181.96  
 NAD 83 (FL North) X = 2659238

Start/Finish Date: 10/24/05 - 1/24/06  
 Client: Beazer East  
 Ground Elev. (Ft NGVD-29): 181.9  
 NAD 83 (FL North) Y = 252614

SUBSURFACE PROFILE				SOIL SAMPLE			AS-BUILT
Depth (ft bgs)	Elevation (ft NGVD-29)	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation	As-Built
-2							TOC →
0	182.0		Ground Surface				
2							
4							
6							
8							
10							
12							
14							
16							
18							
20							
22							
24	157.7					24.3 ft bgs	
26			<b>(24.3 - 28.0) ft bgs - Upper Hawthorn Group Clay</b> Confirmed with GeoProbe Sample		18-in steel conductor casing installed to 26.3 ft bgs using cable tool methods	HG - Upper Clay Unit	
28	154.0					28.0 ft bgs	
30			<b>No other core or samples were collected from GS to 65.8 ft bgs</b>				
32							

BORING LOG AND MONITOR WELL COMPLETION

**Monitor Well ID: FW-17B**

SUBSURFACE PROFILE			SOIL SAMPLE			AS-BUILT	
Depth (ft bgs)	Elevation ft NGVD-29	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation	As-Built
34						Hawthorn Group	
36							
38							
40							
42							
44							
46							
48							
50							
52							
54							
56							
58							
60							
62							
64	118.0					64 ft bgs	
			<b>CONTINUOUS CORE BEGINS AT 65.8 FT BGS</b>			HG - - Middle Clay Unit	
66	116.2						

BORING LOG AND MONITOR WELL COMPLETION

**Monitor Well ID: FW-17B**

SUBSURFACE PROFILE			SOIL SAMPLE		AS-BUILT		
Depth (ft bgs)	Elevation ft NGVD-29	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation	As-Built
69	111.3		CL (CLAY) lean, some silt, little very fine grained sand [gravel absent], firm to stiff, medium plasticity, massive clay with common silty stringers and thin lenses, mottled dark greenish gray [5G 4/1] with greenish black [5GY 2/1], moist, odorless.	9.2	12-in steel conductor casing installed to 67.8 ft bgs using cable tool methods	75.0 ft bgs	
71	109.3		CL (Silty CLAY) SAA but with more matrix silt and sand (some fine sand), soft to firm, medium plasticity, odorless.				
73	107.0		CH (CLAY) fat clay, little silt, trace very fine grained sand [gravel absent], soft, high plasticity, fat, interfingering with SAA, few sand and silt stringers, medium gray [N5] monotone, wet, odorless.				
75	107.0		GM (SANDY GRAVEL) w/ cobbles (dolomite and wackestone), some (grading down to little) silt & clay, little (grading down to some) fine sand, medium to coarse grained, compact, gap graded, lensed, greenish gray [5GY 6/1] blend w/ few medium gray [N5] stained seams, very moist, odorless grading down to faint petroleum-like odors. Gravels and cobbles are predominantly limestone wackestone, very light gray [N8] blend with little dark gray [N3] carbonate grains (salt and pepper appearance, hereafter referenced as S&P Wackestone), with little rounded to subrounded coarse grained lustrous silica sand with smooth crystal faces in a very fine to medium grained carbonate sand matrix and with little small shell fragments.	10	Collect 7-in sonic core in advance of 10-in override casing, from w/in 12-in ID permanent casing	Hawthorn Group	
77							
79							
81							
83	98.8						
85	97.0		SP (SAND), some gravel (S&P Wackestone), little silt & clay, med-coarse grained clean silica sand, sub-rounded, loose, poorly graded (gap graded), few thin lenticular sandy clay lenses, light olive gray [5Y 6/1], wet, faint petroleum-like odor.	8	All sonic cores were collected without drilling water		
87	95.0		ML (SILT), very soft, saturated (too soft to recover a full sample).				
89			SM (Silty SAND) with cobbles, some silt, some sub-angular to sub-rounded S&P Wackestone and mudstone gravel, trace clay, medium grained, loose, gap graded, homogeneous matrix with common clean SP (SAND) lenses, greenish gray [5GY 6/1], wet, faint to moderate petroleum-like odor.				
91							
93							
95	88.0						
95	87.0		GM (SANDY GRAVEL) with cobbles, SAA (82.0-83.2) ft bgs but without the coarse sand fraction, faint petroleum-like odor.				
97	85.0		NO RECOVERY				
99			GM (SANDY GRAVEL), some fine sand, little silt & clay, fine-coarse grained, sub-rounded to sub angular gravel lenses. Matrix is silty-clayey sand, soft, medium plasticity, homogeneous, light olive gray [5GY 6/1] blend, wet, odorless grading down to slight petroleum-like odor.	8			
101	81.1						
	79.7						

**BORING LOG AND MONITOR WELL COMPLETION**

**Monitor Well ID: FW-17B**

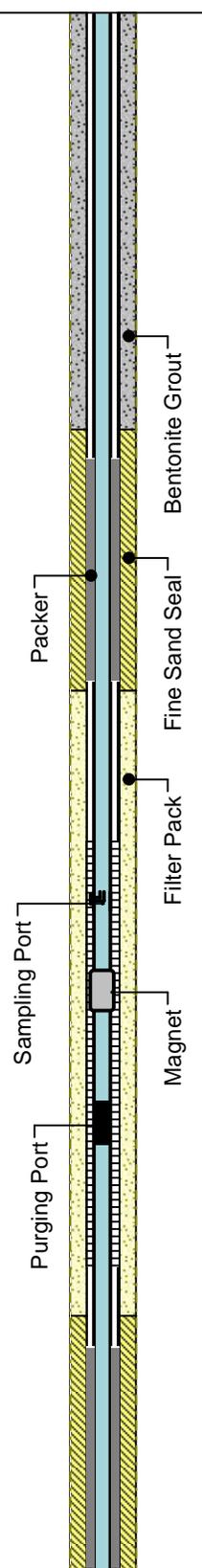
SUBSURFACE PROFILE				SOIL SAMPLE		AS-BUILT
Depth (ft bgs)	Elevation ft NGVD-29	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation
104	79.0		CL (Sandy CLAY) with common massive clay rip-up clasts, some fine sand, little fine gravel, little silt, soft sand, stiff clay lenses, medium plasticity, greenish gray [5GY 5/1] blend, wet, faint petroleum-like odor.	10		
106	77.0		GC (Clayey GRAVEL), some clay, little silt, trace sand, coarse sub-angular to sub-rounded carbonate gravel, stiff, medium plastic, lensed, [5GY 5/1], moist, faint petroleum-like odor.			
108	75.0		Refusal - No Sample			
110			SP (SAND), little gravel, little silt & clay, medium grained clean silica sand, sub-rounded, loose, poorly graded, homogeneous, greenish gray [5G 6/1] with few medium gray [N5] irregularly stained seams, wet, odorless.			
112			SC (Clayey SAND) some clay & silt, some coarse S&P wackestone gravel, fine grained, matrix is firm, low plastic, homogeneous, compact, well graded, greenish gray [5GY 6/1] blend, moist, odorless with one thin seam of dark yellowish brown [10YR 4/2] fine, clean, calcareous (wet at 110 ft bgs).	10		
114	69.0		SP (SAND) little silt & clay, trace gravel, medium to coarse grained, clean, silica, sub-rounded, loose, poorly graded sand, greenish gray [5GY 6/1] blend, wet, odorless.			
116			CL (CLAY) lean, some silt, some gravel, little fine sand, stiff, low plasticity, atypical "massive" clay with prominent medium- and coarse-grained angular gravel rip-up clasts in lenticular bedded clay, with common lenticular fine carbonate sand and silt stringers, laminations, and thin lenses. Strongly mottled greenish gray [5GY 5/1] clay with prominent medium dark gray [N4] organic stained diffuse fingering and blotches, moist, odorless.	10	8-in steel conductor casing installed to 124.2 ft bgs using rotasonic methods	115.0 ft bgs HG - Lower Clay Unit
118	62.9		ML (Clayey SILT) some clay, little gravel, little fine sand, hard, low plasticity, prominent chaotic laminations and irregular thin lenses of rock flour and sandy silt, grayish green blend of [5GY 6/1] w/ light olive gray [5Y 6/1] stringers and very light gray [N8] rock flour, moist, odorless. Sample mechanically fractured into well graded granules to med-gravel size aggregates by sonic drilling.			
122	59.1		CL (Silty CLAY) lean, some silt, little very fine sand, trace gravel, stiff, low plasticity, atypical "massive" clay with very prominent lenticular fine carbonate sand and silt stringers, laminations, and thin lenses, mottled greenish gray [5GY 6/1] with few brownish gray [5YR 4/1] clean fine sand seams and lenses, moist, odorless. Mechanically fractured into coarse gravel-size lenticular material.			
124	57.0		SC (Clayey SAND), some silt & clay, [gravel absent], fine grained sand, stiff, low- to non-plastic, chaotic lenticular mix of clayey sand and silty clay, [5GY 6/1] blend, moist, odorless.			
126	54.7		ML (Sandy SILT), calcareous, some fine sand, little clay, little gravel (mudstone and shells), stiff, low plasticity, thin lenses and irregular laminations of light brownish gray [5YR 6/1] silt and white [N9] rock flour with conglomeratic rip-up clasts from granule to fine gravel-size sediments, moist, odorless.	5	Collect 4-in sonic core in advance of 7-in override casing, all within 8-in ID conductor casing	
128			SM (Silty SAND) some silt, little clay, trace gravel, fine-medium grained, hard to stiff, low- to non-plastic, lenticular bedding with thin lenses of clay and clayey silt, very light olive gray [5Y 7/1] blend, moist, odorless.			
130	52.0			5		
132						
134	46.3					
136						

8-in Ø Borehole

**BORING LOG AND MONITOR WELL COMPLETION**

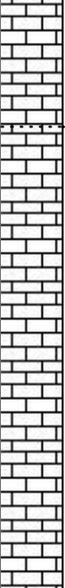
**Monitor Well ID: FW-17B**

SUBSURFACE PROFILE			SOIL SAMPLE		AS-BUILT		
Depth (ft bgs)	Elevation ft NGVD-29	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation	As-Built
139	42.7	[Symbol]	CL (CLAY) lean, some silt, little very fine sand [gravel absent], hard, low plasticity, typical "massive" clay, common lenticular fine carbonate sand and silt stringers, laminations, and thin lenses (few 1/4- to 1/2-in thick sand seams), mottled matrix dark greenish gray [5GY 4/1], moist, odorless.	10	Did not lose override drilling circulation at any time to TD		
141	41.5	[Symbol]	SM (Silty SAND), some silt, little clay, little gravel (LS and shells), medium-coarse grained sand, stiff, low plasticity, lenticular bedding, light brownish gray [5YR 6/1] blend, wet, odorless.				
143	40.3	[Symbol]	SM (Silty SAND), some silt, little clay, little gravel (LS and shells), fine grained sand, hard, non-plastic, lenticular bedding, very light gray [N8] dry, odorless. Mechanically degraded into medium to coarse gravel-size lenticular material.	10	Start of typical weathered Ocala at 144.6 ft bgs	144.6 ft bgs	
145	39.5	[Symbol]	SM (Silty SAND) SAA (139.3-140.5) ft bgs				
147	38.4	[Symbol]	ML (Clayey SILT) some clay, little fine sand, little angular fine-medium gravel, rock flour; very soft, medium plasticity, lensed with conglomeratic rip-up clasts, [5Y 6/1] blend, wet, odorless.	10		Ocala LS Formation	
149	37.4	[Symbol]	Limestone and chert cobbles and gravels (RQD=0.3), wet, [Leps fossils absent, soil absent]. Mechanically fractured into coarse gravel-size aggregates.				
151		[Symbol]	<b>OCALA LIMESTONE</b> Moderately Indurated Packstone (MIP) with PIP and WIP layers and with MIP aggregates. Contains prominent Leps fossils. Four (4) MIP layers observed, ranging in size from 1-in to 3-in thick. Yellowish gray [5Y 8/1], with thin to thick zones of light olive gray [5Y 6/1] and moderate yellowish brown [10YR 6/2], wet, moderate to strong sulfide odor and non-descript organic odor. Estimated core integrity volumes: 75% Unconsolidated (PIP/WIP) 25% Consolidated (MIP layers and gravel-size aggregates). RQD = 0.0	10	All sonic cores drilled w/ minimal vibrations and no added feed pressure (only weight of rods)		
153		[Symbol]					
155	27.0	[Symbol]	(155 to 175) ft bgs Differentially weathered Packstone. Interlayered PIP, WIP, and MIP Layers. Four (4) MIP layers observed, ranging in size from approximately 1-in to 2-in thick. Light olive gray [5Y 6/1] grading to yellowish gray [5Y 7/1], wet, moderate sulfide and organic odor throughout. Estimated core integrity volumes: 80-85% Unconsolidated (PIP/WIP) 20-25% Consolidated (MIP layers and med-coarse gravel-size aggregates). RQD=0.0	10			
157		[Symbol]		10			
159		[Symbol]		10			
161		[Symbol]		10			
163		[Symbol]		10			
165		[Symbol]		10			
167		[Symbol]		10			
169		[Symbol]		10			
171		[Symbol]		10			



**BORING LOG AND MONITOR WELL COMPLETION**

**Monitor Well ID: FW-17B**

SUBSURFACE PROFILE			SOIL SAMPLE		AS-BUILT		
Depth (ft bgs)	Elevation ft NGVD-29	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation	As-Built
174	7.0		<p><b>(175 to 185) ft bgs TEST CORE - ROTARY ONLY</b></p> <p>Cored and drilled the override casing and extruded the sample with normal sonic equipment, but without vibration to compare rotary-only sample core integrity with cores retrieved using vibration. No added down pressure was used other than the weight of the rods. The full 10 ft sample was rotary cored in 6 minutes.</p> <p>Differentially weathered Packstone. Interlayered PIP, WIP and MIP Layers. Yellowish gray [5Y 8/1] with many thin zones of olive gray [5Y 4/1], wet, faint sulfide odors throughout. Four (4) MIP layers observed, ranging in size from approximately 1-in to 8-in thick. Estimated core integrity volumes:                      70% Unconsolidated (PIP/WIP)                      30% Consolidated (MIP layers and med-coarse gravel-size aggregates). RQD=0.1</p>	9.2	<p>Faint to strong sulfide and non-specific organic odors noted within most of the Ocala cores.</p> <p>Odorless in Ocala cores between 195-205 ft bgs.</p>	Ocala LS	
176							
178							
180							
182							
184	-3.0						
186			<p><b>(185 to 195) ft bgs</b></p> <p>Differentially weathered Packstone. Interlayered PIP, WIP, and MIP Layers. Two (2) MIP layers observed, ranging in size from approximately 1-in to 5-in thick. Light olive gray [5Y 7/1] with thin zone of yellowish gray [5Y 8/1], wet, faint sulfide odor throughout. Estimated core integrity volumes:                      75% Unconsolidated (PIP/WIP)                      25% Consolidated (MIP layers and med-coarse gravel-size aggregates). RQD=0.0</p>	10			
188							
190							
192							
194							
196	-13.0		<p><b>(195 to 205) ft bgs TEST CORE - ROTARY ONLY</b></p> <p>Cored and drilled the override casing and extruded the sample with normal sonic equipment, but without vibration to compare rotary-only sample core integrity with cores retrieved using vibration. No added down pressure was used other than the weight of the rods. The full 10-ft sample was rotary cored in 5 minutes.</p> <p>Differentially weathered Packstone. Interlayered PIP, WIP, and MIP Layers. Yellowish gray [5Y 8/1] grading through various similar hues and chromas, wet, odorless. Nine (9) MIP layers observed, ranging in size from approximately 1-in to 7-in thick. Estimated core integrity volumes:                      70% Unconsolidated (PIP/WIP)                      30% Consolidated (MIP layers and med-coarse gravel-size aggregates). RQD=0.1</p>	10			
198							
200							
202							
204							
206	-23.0						

BORING LOG AND MONITOR WELL COMPLETION

**Monitor Well ID: FW-17B**

SUBSURFACE PROFILE			SOIL SAMPLE		AS-BUILT		
Depth (ft bgs)	Elevation ft NGVD-29	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation	As-Built	
209		<p><b>(205 to 235) ft bgs</b>                      Differentially weathered Packstone. Interlayered PIP, WIP, and MIP Layers. Four (4) MIP layers observed, ranging in size from approximately 1-in to 3-in thick. Light olive gray [5Y 7/1] and slightly darker [5Y 6/1] with thin horizons of olive gray [5Y 4/1], wet, odorless to moderate sulfide odors throughout.                      Estimated core integrity volumes:                      75% Unconsolidated (PIP/WIP)                      25% Consolidated (MIP layers and med-coarse gravel-size aggregates). RQD=0.0</p>	10		Ocala LS		
211							
213							
215							
217							
219				10			
221							
223							
225					Lost 1,420 net gallons potable water with 1,000 mg/L NaBr tracer into Ocala LS during drilling and well installation		
227				10			
229							
231			10				
233							
235	-53.0	NO SAMPLE COLLECTED (235 - 240.9) ft bgs					
237		End of Log					
239							
241			10	4-in Well TD = 240.86 ft bgs			

# BORING LOG AND MONITOR WELL COMPLETION

## Monitor Well ID: FW-18B

Project No. 2201.083.02

Total Well Depth (ft bgs): 238.15

Well Location: Process Area Source-Area NAD 83 (FL North) X = 2659111

Well Screens: Four x 10 ft, 4-in dia SS, 0.020 slot, 20 ft C-C, 12/20 filter pack, 30/65 seal sand between filter packs

Well Description: 4-in Multiscreen SS Well w/in Ocala LS with Westbay MP38 4-port Sampling Well

Project Name: Upper Floridan Aquifer Invest.

Site: Koppers Industries, Gainesville, FL

Top of Casing Elev. (Ft NGVD-29): 183.53

NAD 83 (FL North) Y = 252283

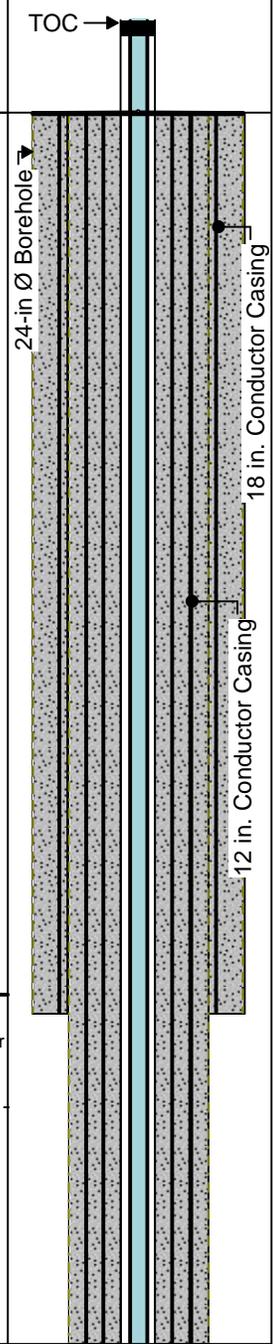
Start/Finish Date: 11/21/05 - 2/04/06

Client: Beazer East

Ground Elev. (Ft NGVD-29): 183.5

NAD 83 (FL North) Y = 252283

SUBSURFACE PROFILE			SOIL SAMPLE			AS-BUILT	
Depth (ft bgs)	Elevation (ft NGVD-29)	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation	As-Built
-2							TOC →
0	183.5		Ground Surface				
2							
4							
6							
8							
10							
12						Surficial Deposits	
14							
16							
18							
20							
22							
24	160.0		(23.5 to ~26) ft bgs - Upper Hawthorn Group Clay Confirmed with drilling returns.		18-in steel conductor casing installed to 24.0 ft bgs using cable tool methods	23.5 ft bgs	
26	157.0		No core or samples were collected from GS to 71 ft bgs.			~26 ft bgs	
28							
30							
32							



BORING LOG AND MONITOR WELL COMPLETION

**Monitor Well ID: FW-18B**

SUBSURFACE PROFILE				SOIL SAMPLE			AS-BUILT
Depth (ft bgs)	Elevation ft NGVD-29	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation	As-Built
34						Hawthorn Group	<p>16-in Ø Borehole</p> <p>8 in. Conductor Casing</p> <p>4 in. SS Well Casing</p> <p>2 in. Westbay MP System</p> <p>Zone 1 (May 2006)</p>
36							
38							
40							
42							
44							
46							
48							
50							
52							
54							
56							
58							
60							
62							
64							
66							

BORING LOG AND MONITOR WELL COMPLETION

**Monitor Well ID: FW-18B**

SUBSURFACE PROFILE				SOIL SAMPLE		AS-BUILT
Depth (ft bgs)	Elevation (ft NGVD-29)	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation
69	114.5			4	12-in steel conductor casing installed to 72.5 ft bgs using cable tool methods	69 ft bgs
71	112.5		<b>CONTINUOUS CORE BEGINS AT 71.0 FT BGS</b>			HG - Middle Clay Unit
73			ML (Clayey SILT) and clay, lean, some fine-coarse sand (prominently in seams) [gravel absent], stiff, low plasticity, massive clayey silt with prominent fine sandy silt stringers with laminations and thin lenses & seams of well graded clayey sand, mottled light greenish gray [5GY 7/1] with dark gray [N3] seams, moist, odorless.			
75	108.5			10	Collect 7-in sonic core in advance of 10-in override casing, from w/in 12-in ID permanent casing	Hawthorn Group
77	107.2		CL (CLAY) lean, some silt, little very fine grained sand [gravel absent], firm, medium plasticity, massive clay with few silty stringers, mottled greenish gray [5G 6/1], moist, odorless.			
79	105.8		SC (Clayey SAND), some clay and silt, trace gravel, firm, medium plastic, chaotically thin lensed clayey sand with silty clay, lenticular greenish gray [5GY 6/1] blend, moist, odorless.			
81	102.2		ML (Clayey SILT) and clay, SAA (71.0 - 75.0) ft bgs, odorless.			
83	100.5		GM (Sandy GRAVEL), some fine-medium sand, little silt & clay, med to coarse grained, loose, gap graded, lensed, greenish gray [5GY 6/1] blend, very moist, odorless.	8	All sonic cores were collected without drilling water	81.3 ft bgs
85	98.5		SC (Clayey SAND) some clay, little silt [gravel absent], medium grained, chaotic lenticular mix of clayey sand, silty clay, and clean SP(SAND) lenses, stiff, medium plastic, greenish gray [5GY 6/1] blend, moist, odorless.			
87	95.5		GM (Sandy GRAVEL) with cobbles, med to coarse grained wackestone gravel. Matrix is clayey sand, firm, medium plastic, lensed, light olive gray [5Y 6/1] blend, moist, odorless. Gravels and cobbles are predominantly limestone wackestone, very light gray [N8] blend with little dark gray [N3] carbonate grains (salt and pepper appearance, hereafter referenced as <b>S&amp;P Wackestone</b> ), with little rounded to subrounded coarse grained lustrous silica sand with smooth crystal faces in a very fine to medium grained carbonate sand matrix and with little small shell fragments.			
89	92.8			10		
91	90.5		SM (SAND), little clay, trace gravel, fine-coarse grained, well graded, compact, homogeneous matrix, medium dark gray [N4] blend, moist, odorless.			
93	88.5		GC (Clayey GRAVEL), some clay, little silt, little fine sand, med-coarse, sub-rounded, carbonate gravel, firm, medium plastic, lensed, [5GY 5/1], moist, faint petroleum-like odor.			
95	86.5		NO RECOVERY			
97	86.5		SP (SAND), little silt & clay, trace gravel (S&P Wackestone), med-coarse grained clean silica sand, sub-rounded, loose, poorly graded, chaotic bedding, few thin lenticular sandy clay lenses, light olive gray [5Y 6/1], wet, odorless.			
99	83.8		CL (Sandy CLAY) with common massive clay rip-up clasts, some fine sand, some gravel, firm sand lenses, stiff clay lenses, low plasticity, greenish gray [5G 6/1] blend, moist, odorless.			
101						

12-in Ø Borehole

**BORING LOG AND MONITOR WELL COMPLETION**

**Monitor Well ID: FW-18B**

SUBSURFACE PROFILE			SOIL SAMPLE		AS-BUILT		
Depth (ft bgs)	Elevation ft NGVD-29	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation	As-Built
104	78.5		SP (SAND), SAA (95.0 - 97.0) ft bgs with common medium gray [N5] irregular stained fingering, faint petroleum-like odor.				
106			GM (Sandy GRAVEL) with cobbles, some fine-medium sand, little silt & clay, med to coarse grained S&P Wackestone (common coral-molded shapes). Clayey sand matrix, firm, homogeneous, with few clay blebs and seams, greenish gray [5GY 6/1] blend, very moist, faint petroleum-like odor, grading to odorless.	10		115.0 ft bgs HG - Lower Clay Unit	
108							
110							
112							
114	68.5		CL (CLAY) lean, some silt, little fine sand [gravel absent], firm to stiff, medium plasticity, typical "massive" clay with few lenticular fine carbonate sand and silt stringers, laminations, and thin lenses (116.1 - 120.0) ft bgs (common to prominent elsewhere). Strongly mottled dark greenish gray [5GY 4/1] clay with common dark gray [N3] organic stained diffuse fingering and blotches, moist, odorless. Prominent grayish orange [10YR 7/4] fine clean sand (SP) seams and laminations below 120 ft bgs.	10	8-in steel conductor casing installed to 122.5 ft bgs using rotasonic methods		
116							
118							
122	61.5		CL (Sandy CLAY), some fine sand (grading to little), some silt [gravel absent -grading to trace], stiff (grading to soft), low plasticity, prominent irregular clayey sand lenses, garyish green [5GY 6/1] and dark green [5GY 4/1], moist, odorless. Wet (GP) gravel seam (124.1-124.4) ft bgs.				
124	58.5						
126	56.6		SM (Silty SAND), some silt, some clay, trace gravel, fine-medium grained, stiff, low plasticity, lenticular bedding with thin chaotic swirled lenses of rock flour, "massive" clay, silty sand, and clayey silt, light olive gray [5Y 6/1] with grayish green [5GY 6/1], and very light gray [N8], moist, odorless.				
128	54.1						
130	53.3		CL (Silty CLAY) lean, some silt, little very fine sand, trace gravel, stiff, low plasticity, atypical "massive" clay with very prominent lenticular fine carbonate sand and silt stringers, laminations, and thin lenses increasing with depth, mottled dark greenish gray [5GY 4/1] with prominent light olive gray [5Y 6/1] and very light gray [N8] stringers, moist, odorless. Mechanically fractured into coarse gravel-size lenticular material.	10	Collect 4-in sonic core in advance of 7-in override casing, all within 8-in ID conductor casing		
132							
134			SM (Silty SAND), SAA (125.0 - 126.9) ft bgs, odorless.				
136	48.3		SC (Clayey SAND), some silt & clay, trace gravel, fine grained sand, stiff, non-plastic to low plasticity, chaotic lenticular mix of clayey sand and silty clay, [5GY 8/1] blend with [N8] rock flour, moist, odorless.				

**BORING LOG AND MONITOR WELL COMPLETION**

**Monitor Well ID: FW-18B**

SUBSURFACE PROFILE			SOIL SAMPLE		AS-BUILT		
Depth (ft bgs)	Elevation ft NGVD-29	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation	As-Built
139	45.2		CL (CLAY) lean, some silt, little very fine sand [gravel absent], stiff, low-medium plastic, typical "massive" clay, few lenticular fine carbonate sand and silt stringers, laminations, and thin lenses, mottled dark greenish gray [5GY 4/1], moist, odorless.	10	Maintained override casing drilling circulation to TD.		
141	43.5		GM (Sandy GRAVEL), some fine sand, little silt & clay, med to coarse grained SR-SA limestone and shells, stiff, low plasticity, lensed with rip-up clasts, light olive gray [5Y 7/1] with very light gray [N8] gravels, moist, odorless.				
143	41.7		SC (Clayey SAND), some clay & silt, little gravel (limestone and shells), fine to medium grained, stiff, low plasticity, lenticular bedding including "massive" clay rip up clasts and clay and silt blebs, light olive gray [5Y 6/1] blend, moist, odorless.				
145	39.8		ML (Sandy SILT), calcareous, some fine sand, little clay, little gravel (mudstone and shells), soft, medium plasticity, thin lenses and irregular laminations of light brownish gray [5YR 6/1] and yellowish gray [5Y 8/1] with conglomeratic rip-up clasts (granule to fine gravel-size), moist, odorless.				
149			<b>OCALA LIMESTONE</b> Moderately Indurated Packstone (MIP) with PIP and WIP layers and MIP aggregates. Contains prominent Leps fossils. Five (5) MIP layers observed, ranging in size from approximately 1-in to 4-in thick. Yellowish gray [5Y 8/1], wet, odorless to moderate sulfide odor. Estimated core integrity volumes: 75-80% Unconsolidated (PIP/WIP) 20-25% Consolidated (MIP layers and gravel-size aggregates). RQD = 0.0	10	Start of typical weathered Ocala at 143.7 ft bgs	143.7 ft bgs Ocala LS Formation	
155	28.5		<b>(155 to 175) ft bgs</b> Differentially weathered Packstone. Interlayered PIP, WIP and MIP Layers. Yellowish gray [5Y 8/1] monotone, wet, odorless to moderate sulfide odors. Five (5) MIP layers observed, ranging in size from approximately 1-in to 3-in thick. Estimated core integrity volumes: 85% Unconsolidated (PIP/WIP) 15% Consolidated (MIP layers and med-coarse gravel-size aggregates). RQD=0.0	10	All sonic cores drilled w/ minimal vibrations and no added feed pressure (only weight of rods)		
163				10			
165				10	All Ocala FM 10-ft sonic cores drilled in 5-45 seconds for an average penetration rate of 3.5 secs/ft.		
167							
169							
171							

BORING LOG AND MONITOR WELL COMPLETION

**Monitor Well ID: FW-18B**

SUBSURFACE PROFILE			SOIL SAMPLE		AS-BUILT		
Depth (ft bgs)	Elevation ft NGVD-29	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation	As-Built
174	8.5	[Brick pattern symbol]	<p><b>(175 to 185) ft bgs TEST CORE - ROTARY ONLY</b></p> <p>Cored and drilled the override casing and extruded the sample with normal sonic equipment, but without vibration to compare rotary-only sample core integrity with cores retrieved using vibration. No added down pressure was used other than the weight of the rods. Rotary refusal was encountered at 180.0 ft bgs after 18 minutes of coring. Minimal sonic vibrations were used in the remaining 5 ft of core to break through each successive rotary-only refusal, drive the OR casing, and extrude the sample.</p> <p>Differentially weathered Packstone. Interlayered PIP, WIP and MIP Layers. Yellowish gray [5Y 8/1] monotone. Two (2) MIP layers observed, approximately 1-in to 2-in thick. Estimated core integrity volumes:                      85% Unconsolidated (PIP/WIP)                      15% Consolidated (MIP layers and med-coarse gravel-size aggregates). RQD=0.0</p> <p><b>(185 to 205) ft bgs</b></p> <p>Differentially weathered Packstone. Interlayered PIP, WIP and MIP aggregates [MIP Layers absent]. Yellowish gray [5Y 8/1] grading to light olive gray [5Y 6/1], wet, odorless to strong sulfide odor. Estimated core integrity volumes:                      85-90% Unconsolidated (PIP/WIP)                      10-15% Consolidated (MIP layers and med-coarse gravel-size aggregates). RQD=0.0</p>	9	Faint to strong sulfide odors noted throughout most of the Ocala LS cores.  Odorless in cores from 145-149, 153-167, 205-209, and 235 ft bgs.	Ocala LS	
176							
178							
180							
182							
184	-1.5						
186							
188							
190							
192							
194							
196							
198							
200							
202							
204	-21.5			10			
206							

BORING LOG AND MONITOR WELL COMPLETION

**Monitor Well ID: FW-18B**

SUBSURFACE PROFILE				SOIL SAMPLE		AS-BUILT	
Depth (ft bgs)	Elevation ft NGVD-29	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation	As-Built
209		[Brick pattern symbol]	<p><b>(205 to 225) ft bgs</b>                      Differentially weathered Packstone. Interlayered PIP, WIP, and MIP Layers. Yellowish gray [5Y 8/1] with one light olive gray [5Y 8/1] horizon, wet, odorless to moderate sulfide odors. Six (6) MIP layers observed, ranging in size from approximately 1-in to 3-in thick. Estimated core integrity volumes:                      75-85% Unconsolidated (PIP/WIP)                      15-25% Consolidated (MIP layers and med-coarse gravel-size aggregates). RQD=0.0</p>	10		Ocala LS	
211							
213							
215							
217							
219							
221				10	Lost 1,570 net gallons potable water with 1,000 mg/L NaBr tracer into Ocala LS during drilling and well installation		
223							
225	-41.5			<p><b>(225 to 235) ft bgs TEST CORE - ROTARY ONLY</b></p> <p>Cored and drilled the override casing and extruded the sample with normal sonic equipment, but without vibration to compare rotary-only sample core integrity with cores retrieved using vibration. No added down pressure was used other than the weight of the rods. Rotary refusal was encountered at 228.2 ft bgs after 3 minutes of coring. Minimal sonic vibrations were used in the remaining 6.8 ft of core to break through each successive rotary-only refusal, drive the OR casing, and extrude the sample.</p>	10		
227							
229							
231							
233		<p>Differentially weathered Packstone. Interlayered PIP, WIP and MIP Layers. Yellowish gray [5Y 7/1] monotone, wet, odorless to moderate sulfide odors. Four (4) MIP layers observed, ranging in size from approximately 1-in to 2-in thick. Estimated core integrity volumes:                      75% Unconsolidated (PIP/WIP)                      25% Consolidated (MIP layers and med-coarse gravel-size aggregates). RQD=0.0</p>					
235	-51.5	NO SAMPLE COLLECTED (235 - 238.2) ft bgs					
237		End of Log					
239			10	4-in Well TD = 238.15 ft bgs			
241							

# BORING LOG AND MONITOR WELL COMPLETION

## Monitor Well ID: FW-19B

Project No. 2201.083.02

Total Well Depth (ft bgs): 238.18

Well Location: South Lagoon Source-Area NAD 83 (FL North) X = 2658631

Well Screens: Four x 10 ft, 4-in dia SS, 0.020 slot, 20 ft C-C, 12/20 filter pack, 30/65 seal sand between filter packs

Well Description: 4-in Multiscreen SS Well w/in Ocala LS with Westbay MP38 4-port Sampling Well

Project Name: Upper Floridan Aquifer Invest.

Site: Koppers Industries, Gainesville, FL

Top of Casing Elev. (Ft NGVD-29): 183.44

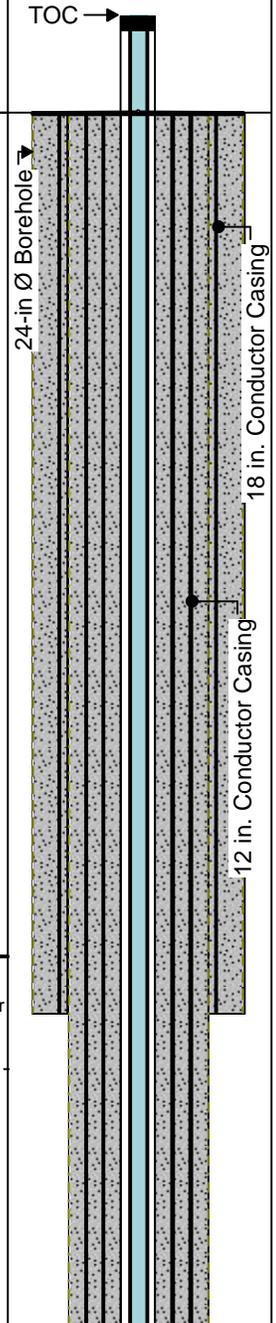
Start/Finish Date: 12/13/05 - 2/01/06

Client: Beazer East

Ground Elev. (Ft NGVD-29): 183.4

NAD 83 (FL North) Y = 252412

SUBSURFACE PROFILE			SOIL SAMPLE			AS-BUILT	
Depth (ft bgs)	Elevation (ft NGVD-29)	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation	As-Built
-2							TOC →
0	183.4		Ground Surface				
2							
4							
6							
8							
10							
12						Surficial Deposits	
14							
16							
18							
20							
22	160.9					22.5 ft bgs	
24			(22.5 to ~25) ft bgs - Upper Hawthorn Group Clay Confirmed with drilling returns.		18-in steel conductor casing installed to 24.0 ft bgs using cable tool methods	HG - - Upper Clay Unit	
26	157.9		No core or samples were collected from GS to 65.9 ft bgs.			~25 ft bgs	
28							
30							
32							



BORING LOG AND MONITOR WELL COMPLETION

**Monitor Well ID: FW-19B**

SUBSURFACE PROFILE			SOIL SAMPLE		AS-BUILT		
Depth (ft bgs)	Elevation ft NGVD-29	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation	As-Built
34						Hawthorn Group	
36							
38							
40							
42							
44							
46							
48							
50							
52							
54							
56							
58							
60							
62	120.4					63 ft bgs	
64			<b>CONTINUOUS CORE BEGINS AT 65.9 FT BGS</b>		12-in steel conductor casing installed to 66.0 ft bgs using cable tool methods	HG - - Middle Clay Unit	
66	117.5		CL (CLAY) lean, some silt, little very fine grained sand [gravel absent], stiff, medium plasticity, "massive" clay with few silty stringers, dark greenish gray [5GY 6/1], wet, odorless.				
	116.4						

BORING LOG AND MONITOR WELL COMPLETION

**Monitor Well ID: FW-19B**

SUBSURFACE PROFILE				SOIL SAMPLE		AS-BUILT
Depth (ft bgs)	Elevation ft NGVD-29	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation
69	114.4		ML (Clayey SILT) and clay, some very fine to coarse sand, well graded, subrounded to rounded, trace medium carbonate gravel, firm, low plasticity, prominent stringers and thin lenses & seams of well graded clayey sand, mottled light greenish gray [5GY 5/1] with common dark gray [N3] seams, moist, odorless.	9	All sonic cores were collected without drilling water	72.7 ft bgs
71			CL (CLAY) lean, some silt, little very fine grained sand [gravel absent], stiff, medium plasticity, massive silty clay with few silty stringers and common clayey-silty-sand laminated seams (SAA), greenish gray [5G 7/1], moist, odorless.			
73	110.7		GC (Clayey GRAVEL) with wackestone cobbles, some clay & silt, some fine-medium sand, med to coarse grained, loose, gap graded, lensed, matrix is sandy clay, both soft and firm (different zones), low plasticity, dark greenish gray [5GY 4/1] blend, very moist, odorless. Gravels and cobbles are limestone wackestone, very light gray [N8] blend with little dark gray [N3] carbonate grains (salt and pepper appearance, <b>hereafter referenced as S&amp;P Wackestone</b> ), with little rounded to subrounded coarse grained lustrous silica sand with smooth crystal faces in a very fine to medium grained carbonate sand matrix and with little small shell fragments.	4.5		Hawthorn Group
75			NO RECOVERY			
77						
79	103.9		SW (Gravelly SAND) some gravel, little silt, little clay, fine to coarse grained, well graded, loose, with common thin lenses of clean sand (SP) and clayey sand (SC), lenticular dark greenish gray [5GY 4/1] blend, wet, odorless.	10	Collect 7-in sonic core in advance of 10-in override casing, from w/in 12-in ID permanent casing	12-in Ø Borehole
81			GM (Sandy GRAVEL) with cobbles, medium to coarse grained S&P wackestone gravel. Matrix is clayey sand, soft, low- to non-plastic, compact, well graded, greenish gray [5GY 6/1] blend, moist, odorless.			
83						
85	98.4		CL (Silty CLAY), some silt, some fine sand, trace gravel, massive (90.1 to 91.2) ft bgs, with few stringers followed by very prominent lenticular fine carbonate sand and silt stringers, laminations, and thin lenses increasing with depth, stiff, low plasticity, grayish green [5BG 5/2] blend, moist, odorless. Mechanically fractured into lenticular fine to medium gravel-size material.	10		
87	96.4		SC (Clayey SAND), some silt & clay, trace gravel, fine to medium grained sand, hard, non-plastic, homogeneous, dense, well graded, greenish gray [5GY 6/1] clay with light olive gray [5GY 6/1] sand, wet, odorless.			
89	93.3		SP (SAND), little silt & clay [gravel absent], medium grained clean silica sand, sub-rounded, loose, poorly graded, chaotic bedding, few thin lenticular sandy clay lenses, light olive gray [5Y 6/1], wet, faint creosote-like odor.	10		
91			GC (Clayey GRAVEL), some fine sand, little clay & silt, medium-coarse, sub-rounded to sub-angular carbonate gravel, firm matrix, non plastic, lensed, light olive gray [5Y 6/1], moist, faint creosote-like odor.			
93	89.0					
95	88.4					
97	86.9					
99	86.3					
101						

**BORING LOG AND MONITOR WELL COMPLETION**

**Monitor Well ID: FW-19B**

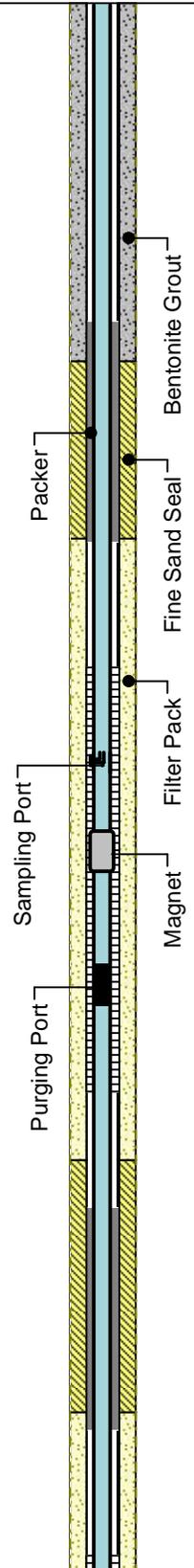
SUBSURFACE PROFILE				SOIL SAMPLE		AS-BUILT
Depth (ft bgs)	Elevation ft NGVD-29	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation
104	78.4		SP (SAND), little silt & clay [gravel absent], medium to coarse clean silica sand, sub-rounded, loose, poorly graded, chaotic bedding, prominent "massive" clay lenticular rip-up clasts (97.1-101.0) ft bgs, followed w/ common thin lenticular sandy clay lenses, light olive gray [5Y 6/1], wet, faint creosote-like odor.	10		
106	77.4		GM (Sandy GRAVEL) with cobbles, some fine sand, little silt & clay, med to coarse grained S&P Wackestone (common coral-molded shapes). Clayey sand matrix, soft, low plasticity, homogeneous, with few clay blebs and seams, greenish gray [5GY 6/1] blend, wet, faint creosote-like odor.			
110	72.4		SP (SAND), little silt & clay, little coarse gravel (coral-molded S&P Wackestone), medium grained clean silica sand, sub-rounded, loose, poorly graded, few thin lenticular sandy clay lenses, with one lens of stratified clay (110.5-111.0) ft bgs, light olive gray [5Y 6/1], wet, faint creosote-like odor.	10	8-in steel conductor casing installed to 117.3 ft bgs using rotasonic methods	115.6 ft bgs HG - Lower Clay Unit
112			SC (Clayey SAND) and clay, little silt, little gravel, fine grained, chaotic lenticular mix of clayey sand, silty clay, and clean SP (SAND) lenses, stiff, medium plasticity, greenish gray [5GY 6/1] blend, with prominent medium dark gray [N4] stained organic fingering, moist, faint creosote-like odor.			
114	67.8		CL (CLAY) lean, some silt, little fine sand [gravel absent], stiff, high plasticity, typical "massive" clay with few lenticular fine carbonate sand and silt stringers, laminations, and thin lenses, greenish gray [5GY 5/1] clay with common [5GY 4/1] mottles, faint creosote-like odor grading to odorless.	10		
118	63.8		SC (Clayey SAND), some silt & clay, few gravel lenses [gravel absent in matrix], fine sand, stiff, non-plastic, chaotic lenticular mix of clayey sand and silty clay with prominent stringers and laminations, greenish gray [5GY 8/1] blend with [5Y 7/1] rock flour, moist to dry, odorless. Mechanically fractured into lenticular coarse gravel-size material.			
120				10		
122						
124	58.1			10	Collect 4-in sonic core in advance of 7-in override casing, all within 8-in ID conductor casing	
126			CL (Silty CLAY) lean, some silt, little very fine sand, trace gravel, stiff, low plasticity, typical "massive" clay with few stringers, but with few thick lenses of ML clayey silt rock flour, light greenish gray [5GY 8/1], clay is dark greenish gray [5GY 4/1], moist, odorless.			
128	53.4			10		
130			SC (Clayey SAND), some silt & clay, little gravel, fine grained sand, stiff, low plasticity, chaotic lenticular mix of clayey sand and silty clay, [5GY 7/1] blend with very light gray [N8] rock flour, moist, odorless.			
132	50.9		CL (Silty CLAY) lean, some silt, little very fine sand, trace gravel, stiff, medium plasticity, typical "massive" clay with few stringers, few irregular thin seams of clayey silt rock flour, mottled dark greenish gray [5GY 4/1], moist, odorless.	10		
134	48.4		ML (Sandy SILT) some very fine sand, some clay, trace gravel, stiff, low plasticity, lenticular bedding with thin chaotic lenses of rock flour, silty sand, and clay, light olive gray [5Y 6/1] with very light gray [N8] rock flour, moist, odorless.			
136						

8-in Ø Borehole

BORING LOG AND MONITOR WELL COMPLETION

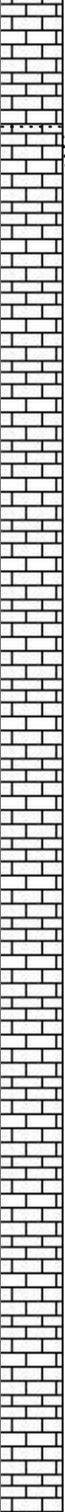
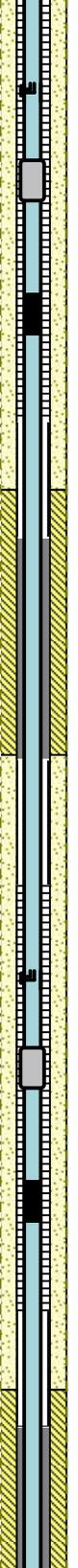
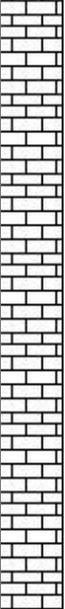
**Monitor Well ID: FW-19B**

SUBSURFACE PROFILE			SOIL SAMPLE		AS-BUILT			
Depth (ft bgs)	Elevation ft NGVD-29	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation	As-Built	
139				10				
141								
143	40.5		<p><b>OCALA LIMESTONE</b> Moderately Indurated Packstone (MIP) with PIP and WIP layers and MIP aggregates. Contains prominent Leps fossils. Yellowish gray [5Y 8/1], wet, odorless. Estimated core integrity volumes:                      25% Unconsolidated (PIP/WIP)                      75% Consolidated (MIP gravel-size aggregates) grading down to slightly more unconsolidated fraction</p> <p><b>(145 to 165) ft bgs</b>                      Differentially weathered Packstone. Interlayered PIP, WIP and MIP Layers. Nine (9) MIP layers observed, ranging in size from approximately 1-in to 4-in thick. Very light gray [N8] to yellowish gray [5Y 8/1], wet, faint to strong sulfide odors and non-descript organic odors throughout. Estimated core integrity volumes:                      70% Unconsolidated (PIP/WIP)                      30% Consolidated (MIP layers and med-coarse gravel-size aggregates). RQD=0.0</p>		Start of typical weathered Ocala at 142.9 ft bgs	Ocala LS Formation		
145	38.4				10	Intermittent loss of override casing drilling circulation 143-175 ft bgs. Return noted from 175-235 ft bgs.		
147								
149								
151								
153								
155								
157				10	All sonic cores drilled w/ minimal vibrations and no added feed pressure (only weight of rods)			
159								
161								
163								
165	18.4			10	All Ocala FM 10-ft sonic cores drilled in 10 secs to 3 mins			
167								
169								
171	12.4			6				



BORING LOG AND MONITOR WELL COMPLETION

**Monitor Well ID: FW-19B**

SUBSURFACE PROFILE			SOIL SAMPLE		AS-BUILT		
Depth (ft bgs)	Elevation ft NGVD-29	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation	As-Built
174	8.4		<p><b>(165 to 174) ft bgs TEST CORE - ROTARY ONLY</b></p> <p>Cored and drilled the override casing and extruded the sample with normal sonic equipment, but without vibration to compare rotary-only sample core integrity with cores retrieved using vibration. No added down pressure was used other than the weight of the rods. Rotary refusal was encountered at 174.0 ft bgs after 16 minutes of coring. The core run was terminated at 9 ft and the sample retrieved. There was no recovery from 171-174 ft bgs.</p> <p>Differentially weathered Packstone. Interlayered PIP, WIP with MIP gravels [MIP Layers absent]. No recovery from 171-174 ft bgs. Sample predominantly WIP with a prominent silt matrix. Yellowish gray [5Y 8/1] monotone, wet, faint to strong sulfide odors. Estimated core integrity volumes:                      85% Unconsolidated (PIP/WIP)                      15% Consolidated (MIP med-coarse gravel-size aggregates).                      RQD=0.0</p> <p>NO RECOVERY 171-175 ft bgs</p>		Faint to strong sulfide odors and non-specific organic odors noted throughout most of the Ocala LS cores.	Ocala LS	
176				10			
178							
180				10			
182							
184							
186							
188							
190				10			
192							
194			<p><b>(175 to 205) ft bgs</b></p> <p>Differentially weathered Packstone. Interlayered PIP, WIP and MIP (layers and aggregates). Three (3) MIP layers observed per core, ranging in size from approximately 1-in to 8-in thick. Yellowish gray [5Y 8/1] to light olive gray [5Y 6/1], wet, odorless to strong sulfide odor throughout. Estimated core integrity volumes:                      70-80% Unconsolidated (PIP/WIP)                      20-30% Consolidated (MIP layers and med-coarse gravel-size aggregates). RQD=0.0</p>				
196				10			
198							
200				10			
202							
204							
206	-21.6						

BORING LOG AND MONITOR WELL COMPLETION

**Monitor Well ID: FW-19B**

SUBSURFACE PROFILE			SOIL SAMPLE		AS-BUILT		
Depth (ft bgs)	Elevation ft NGVD-29	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation	As-Built
209			<p><b>(205 to 215) ft bgs TEST CORE - ROTARY ONLY</b></p> <p>Cored and drilled the override casing and extruded the sample with normal sonic equipment, but without vibration to compare rotary-only sample core integrity with cores retrieved using vibration. No added down pressure was used other than the weight of the rods. Rotary refusal was encountered at 205.8 ft bgs after 3 minutes of coring. Added vibrations for normal sonic drilling to complete the additional 9.2 feet core, override casing advancement, and sample extrusion.</p> <p>Differentially weathered Packstone. Interlayered PIP, WIP and MIP Layers. Light olive gray [5Y 6/1] monotone, wet, odorless to faint to sulfide odors. One distinct MIP layer identified at the refusal horizon: 3-in thick. Estimated core integrity volumes:                      80% Unconsolidated (PIP/WIP)                      20% Consolidated (MIP layers and med-coarse gravel-size aggregates) RQD=0.0</p>	10		Ocala LS	
211							
213							
215	-31.6						
217							
219							
221				10	Lost 1,475 net gallons potable water with 1,000 mg/L NaBr tracer into Ocala LS during drilling and well installation		
223							
225							
227							
229		10					
231							
233							
235	-51.6		NO SAMPLE COLLECTED (235 - 237.2) ft bgs				
237			End of Log		4-in Well TD = 237.18 ft bgs		
239				10			
241							

# BORING LOG AND MONITOR WELL COMPLETION

## Monitor Well ID: FW-20B

Project No. 2201.083.02

Total Well Depth (ft bgs): 238.09

Well Location: North Lagoon Source-Area NAD 83 (FL North) X = 2658681

Well Screens: Four x 10 ft, 4-in dia SS, 0.020 slot, 20 ft C-C, 12/20 filter pack, 30/65 seal sand between filter packs

Well Description: 4-in Multiscreen SS Well w/in Ocala LS with Westbay MP38 4-port Sampling Well

Project Name: Upper Floridan Aquifer Invest.

Site: Koppers Industries, Gainesville, FL

Top of Casing Elev. (Ft NGVD-29): 180.85

NAD 83 (FL North) Y = 253723

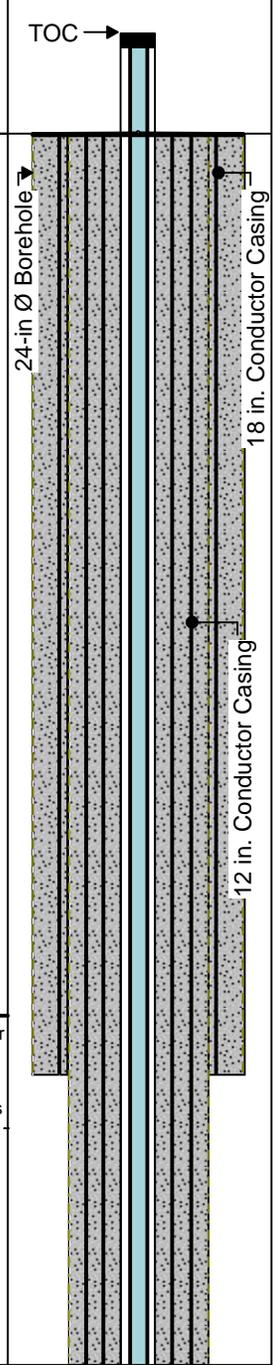
Start/Finish Date: 11/04/05 - 2/16/06

Client: Beazer East

Ground Elev. (Ft NGVD-29): 180.9

NAD 83 (FL North) Y = 253723

SUBSURFACE PROFILE			SOIL SAMPLE			AS-BUILT	
Depth (ft bgs)	Elevation (ft NGVD-29)	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation	As-Built
-2							TOC →
0	180.9		Ground Surface				
2							
4							
6							
8							
10							
12						Surficial Deposits	
14							
16							
18							
20							
22							
24	157.4		(23.5 to ~26.5) ft bgs - Upper Hawthorn Group Clay Confirmed with drilling returns.		18-in steel conductor casing installed to 25.1 ft bgs using cable tool methods	HG - Upper Clay Unit	
26	154.4		<i>No core or samples were collected from GS to 63 ft bgs.</i>				
28							
30							
32							



BORING LOG AND MONITOR WELL COMPLETION

**Monitor Well ID: FW-20B**

SUBSURFACE PROFILE			SOIL SAMPLE		AS-BUILT		
Depth (ft bgs)	Elevation ft NGVD-29	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation	As-Built
34						Hawthorn Group	
36							
38							
40							
42							
44							
46							
48							
50						Hawthorn Group	
52							
54							
56							
58							
60				2			
62			<b>CONTINUOUS CORE BEGINS AT 63.0 FT BGS</b>				
64	117.9		CL (CLAY) lean, some silt, trace very fine sand [gravel absent], stiff, medium plastic, massive, few silt stringers, mottled dark greenish gray [5GY 4/1], moist, moderate creosote-like odor.		12-in steel conductor casing installed to 65.5 ft bgs using cable tool methods	63 ft bgs HG - Middle Clay Unit	
66	116.2		CL (Sandy CLAY), some very fine sand, some silt, trace gravel, firm, med plastic, "massive" clay with thin lenses of clayey sand, [5GY 4/1], with diffuse pockets of medium dark gray [N4] organic staining, moist, moderate creosote-like odor.			66.8 ft bgs	
	114.1						

BORING LOG AND MONITOR WELL COMPLETION

**Monitor Well ID: FW-20B**

SUBSURFACE PROFILE				SOIL SAMPLE		AS-BUILT
Depth (ft bgs)	Elevation ft NGVD-29	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation
69			GM (Sandy GRAVEL), with cobbles, some fine sand, little silt, little clay, med to coarse grained, compact, gap graded, light greenish gray [5GY 8/1] blend, wet, moderate creosote-like odor. Cobbles and gravels are predominantly limestone wackestone, very light gray [N8] blend with little dark gray [N3] carbonate grains (salt and pepper appearance, <b>hereafter referenced as S&amp;P Wackestone</b> ), with little rounded to subrounded coarse grained lustrous silica sand with smooth crystal faces in a very fine to medium grained carbonate sand matrix and with little small shell fragments.	10	Collect 7-in sonic core in advance of 10-in override casing, from within 12-in ID permanent casing	12-in Ø Borehole
71						
73						
75	105.9					
77	104.6		SC (Clayey SAND), some clay, some silt, little sub-angular gravel, fine to very fine grained, firm, medium plasticity, vermiculated thin lenses of silty clay with clayey sand, light greenish gray [5GY 8/1] blend with few medium gray [N5] organic stained seams, moist, strong creosote-like odor.			
79	102.4		GC (Clayey GRAVEL) with S&P Wackestone cobbles, some clay, some fine sand, med to coarse grained, firm matrix, low plasticity, greenish gray [5GY 6/1] blend, very moist, strong creosote-like odor.	10	All sonic cores were collected without drilling water	
81	101.4		CL (Sandy CLAY) lean, some very fine sand, some silt, trace gravel, stiff, low plasticity, irregularly laminated/ thin lensed silty clay and sandy-clayey-silt, dark greenish gray [5GY 4/1] and light olive gray [5Y 6/1] laminations, moist, strong creosote-like odor.			
83			GM (Sandy GRAVEL) with S&P Wackestone cobbles, some fine sand, some silt, little clay, medium to coarse grained and sub-rounded to sub-angular carbonate gravel, gap graded. Matrix is firm, medium plastic, with irregular thin lenses of sandy clay and clayey sand with few clean sand & garvel clean lenses (wet, porous), greenish gray [5GY 6/1] blend, moist, strong creosote-like odor.			
85						
87	93.6		CL (Silty CLAY), some silt, little very fine sand, trace gravel grading down to little gravel, stiff, low plasticity, irregularly thin lensed and mottled grayish blue green [5BG 5/2] clay and light olive gray [5Y 6/1] silty sand, moist, moderate creosote-like odor.	10		
89	91.4		SC (SAND) with S&P Wackestone cobbles, little clay, little sub-rounded gravel, medium grained, firm, low- to non-plastic, irregularly laminated and lensed, compact, gap graded, greenish gray [5G 6/1] blend with very light gray [N8] carbonates, moist, moderate creosote-like odor.		Hawthorn Group	
91	88.9		CL (Silty CLAY), SAA (87.3 - 89.5) ft bgs, moderate creosote-like odor.			
93	87.9		SP (SAND), little clay [gravel absent], medium to coarse grained clean silica sand, loose, poorly graded, few thin sandy clay lenses, greenish gray [5GY 6/1] blend, wet, high intergranular porosity, strong creosote-like odor.			
95	85.9		SC (Clayey SAND), some clay, little gravel, interbedded with common irregular thin lenses of (SP) clean sand (SAA), wet, strong creosote-like odor.			
97	83.8		SP (SAND), little silt/clay, trace gravel, medium grained, clean silica sand, loose, poorly graded, light olive gray [5GY 6/1] blend, wet, moderate creosote odor.	10		
99						
101						

**BORING LOG AND MONITOR WELL COMPLETION**

**Monitor Well ID: FW-20B**

SUBSURFACE PROFILE				SOIL SAMPLE		AS-BUILT
Depth (ft bgs)	Elevation (ft NGVD-29)	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation
104	76.6		GM (Sandy GRAVEL) with S&P Wackestone cobbles, some FS, little clay & silt, coarse to medium grained sub rounded carbonate gravel. Matrix is clayey sand, firm, low plasticity, homogeneous, greenish gray [5G 6/1] blend, moist, with moderate creosote-like odor.	10		108.5 ft bgs
	75.9		Carbonate cobbles, S&P Wackestone (RQD=1.0).			
106	74.6		SP (SAND) little silt/clay, little gravel, medium grained, clean silica sand, loose, poorly graded, greenish gray [5GY 5/1] blend, wet, moderate creosote-like odor.			
108	72.4		GM (GRAVEL) with S&P Wackestone cobbles, little clayey sand matrix, coarse to medium grained sub-angular carbonate gravel, compact, gap graded, light olive gray [5GY 6/1], moist, moderate creosote-like odor.			
110			CL (CLAY) lean, some silt, little very fine sand, little angular to sub-angular gravel, stiff, low plasticity, massive, with prominent fine sand and sandy gravel stringers, irregular laminations, thin lenses, and seams with few aggregations of poorly indurated blocky clay. Greenish gray [5GY 4/1] blend with medium dark gray [N5] organic stained blotches, moist, moderate creosote-like odor.			
112						
114	65.9		ML (Clayey SILT), calcareous, some clay, little very fine sand, trace angular to sub-angular fine gravel, stiff, medium plasticity, homogeneous matrix with thin lenses of rock flour and silty clay, light greenish gray [5GY 7/1], very moist, faint creosote-like odor.			
116	64.1		SM (Silty SAND), some silt, little clay, little gravel (chert and LS), very fine grained, hard, non-plastic to low plasticity, dense, irregular laminations and lenses, gap graded, light greenish gray [5GY 7/1] blend with very light gray [N8] stringers, dry, faint creosote-like odor grading to odorless. Mechanically degraded by sonic drilling into medium to coarse gravel-size material.			
118			SP (SAND) with clay lenses [gravel absent], fine grained carbonate sand, clean, loose, poorly graded, mod yellowish brown [10YR 5/4], interlayered with clay lenses, moist, odorless (mechanically degraded into medium to coarse gravel-size material).			
120			CL (Silty CLAY), some silt, some VF sand [gravel absent], hard, low- to non-plastic, lean, with prominent irregular carbonate sand/silt seams and stringers, dark greenish gray [5GY 4/1], moist, odorless. Mechanically degraded into medium to coarse gravel-size material. Mudstone cobble (124.0 - 124.8) ft bgs.			
122	58.3		SC (Clayey SAND), some clay, some silt, little gravel, very fine to fine grained, stiff, low plasticity, chaotic bedding with laminations and thin lenses of clayey sand, clay, silt, and silty clay, greenish gray [5GY 6/1] blend of several similar colors, with common medium gray [N5] organic-stained seams, moist, moderate creosote-like odor.			
124	55.8		GM (Sandy GRAVEL), with carbonate cobbles, some fine sand, little silt/clay, med grained, sub-angular, matrix, dense, non plastic, homogeneous, white [N9], dry, faint creosote-like odor.			
126			CL (Silty CLAY), SAA (122.9 - 124.0) ft bgs, moderate creosote-like odor. Mechanically degraded into medium to coarse gravel-size material.			
128	51.8					
130	50.9					
132	49.3					
	47.9					
134	46.7					
	45.8					
136	44.3					

8-in steel conductor casing installed to 124.8 ft bgs using rotasonic methods

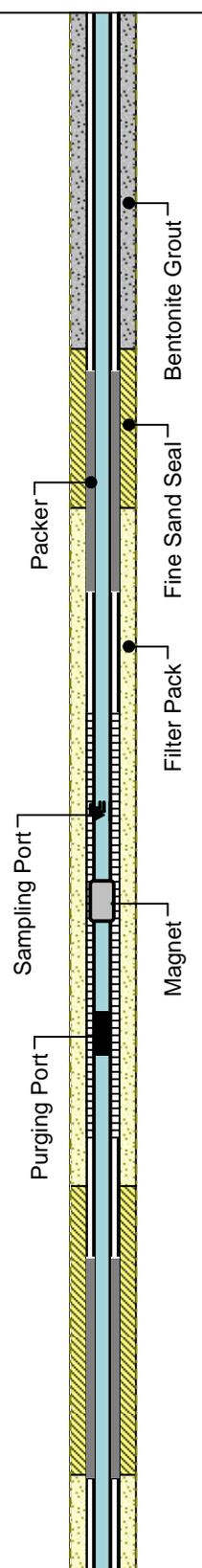
Collect 4-in sonic core in advance of 7-in override casing, all within 8-in ID conductor casing

8-in Ø Borehole

**BORING LOG AND MONITOR WELL COMPLETION**

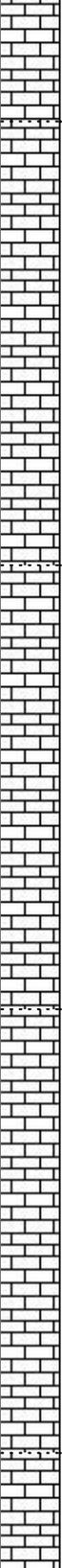
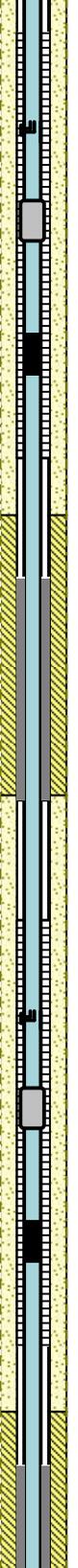
**Monitor Well ID: FW-20B**

SUBSURFACE PROFILE			SOIL SAMPLE		AS-BUILT		
Depth (ft bgs)	Elevation ft NGVD-29	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation	As-Built
139			SM (Silty SAND), SAA (116.8 - 122.6) ft bgs, moderate creosote-like odor.		Lost overide casing drilling water circulation at 139, 142, and 143 ft bgs.		
141	39.8		SC (Clayey SAND) - SAA (125.0 - 129.0) ft bgs. Mudstone cobble (133.6-133.9) ft bgs. Mechanically degraded.	10			
143	37.9		SC (Clayey SAND) some clay, little silt, little gravel (shells and rounded pebbles), fine grained, firm to stiff, non- to medium-plastic. Clayey-sand matrix surrounds conglomeratic sediments from granule to fine gravel-sized rip-up clasts deposited in horizontal beds, including silt blebs and clay blebs. Multiple conglomeratic colors averging medium light gray [N6], moist, moderate creosote-like odor.		Start of typical weathered Ocala at 142.9 ft bgs	142.9 ft bgs	
145	36.8		CL (CLAY) lean, little very fine sand, trace gravel, stiff, medium plastic, homogeneous material with few silt & sand stringers and lenses, mottled dark greenish gray [5G 4/1] with similar lighter and darker chromas, moist, odorless.			Ocala LS Formation	
147			ML (Clayey SILT), some clay, little very fine sand, little gravel (grading down to some gravel - shells and LS) stiff, low plasticity, composed of irregular thin lenses and laminations of clayey silt with silty-sandy-clay and few clay seams (increasing with depth), light greenish gray [5GY 8/1] blend, moist, faint creosote-like odor.				
149			ML (Sandy SILT), some fine sand, some angular gravel, soft, medium plastic, prominent irregular lenses, light brownish gray [5YR 6/1] blend, wet, odorless.	10			
151			<b>OCALA LIMESTONE</b> Moderately Indurated Packstone (MIP) rotosonically degraded into 1" - 3" cores & angular gravel-size aggregates. Contains prominent Leps fossils. Very light gray [N8], dry to slightly moist, odorless.				
153							
155	25.8		<b>(144.1 to 155) ft bgs</b> Differentially weathered Packstone. Interlayered PIP, MIP, and WIP. Two (2) MIP layers observed, approximately 2-in to 3-in thick. Moderate yellowish brown [5Y 8/1] monotone, wet, faint to strong creosote-like odors. Estimated core integrity volumes: 70% Unconsolidated (PIP/WIP) 30% Consolidated (MIP layers and gravel-size aggregates). RQD = 0.0		All Ocala FM 10-ft sonic cores drilled in 5-20 seconds for an average penetration rate of 1.4 secs/ft.		
157							
159							
161			<b>(155 to 165) ft bgs</b> Differentially weathered Packstone. Interlayered PIP & WIP [MIP Layers absent]. Moderate yellowish brown [5Y 8/1] monotone, wet, faint to moderate creosote-like odors combined with faint sulfide odors from 160-165 ft bgs. Estimated core integrity volumes: 70% Unconsolidated (PIP/WIP) 30% Consolidated (MIP med-coarse gravel-size aggregates). RQD = 0.0	10			
163							
165	15.8						
167			<b>(165 to 175) ft bgs</b> Differentially weathered Packstone (SAA, MIP layers absent) with faint creosote-like odors grading down to absent. Moderate sulfide odors w/in WIP layers, and faint to absent sulfide odors within PIP layers. Estimated volumes from core: 85% Unconsolidated (PIP/WIP) 15% Consolidated (MIP med gravel-size aggregates, layers absent). RQD = 0.0	10	All sonic cores drilled w/ minimal vibrations and no added feed pressure (only weight of rods)	Ocala LS	
169							
171							



BORING LOG AND MONITOR WELL COMPLETION

**Monitor Well ID: FW-20B**

SUBSURFACE PROFILE			SOIL SAMPLE		AS-BUILT		
Depth (ft bgs)	Elevation ft NGVD-29	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation	As-Built
174	5.8		<p><b>(175 to 185) ft bgs</b>                      Differentially weathered Packstone (SAA, MIP layers absent), slightly darker [5Y 7/1] with faint sulfide odors within WIP layers; odorless in PIP layers. Estimated volumes from core:                      75% Unconsolidated (PIP/WIP)                      25% Consolidated (MIP med-coarse gravel-size aggregates).                      RQD = 0.0</p>	10	Faint to strong creosote-like odors prominent in cores from 145 - 171 ft bgs; but absent 171 - 235 ft bgs.  (139-180) ft bgs - Lost all drilling circulation - no returns  (180-215) ft bgs - Drilling circulation returns noted		
176							
178							
180							
182							
184	-4.2						
186							
188							
190							
192							
194	-14.2						
196							
198							
200							
202							
204	-24.2						
206							

BORING LOG AND MONITOR WELL COMPLETION

**Monitor Well ID: FW-20B**

SUBSURFACE PROFILE			SOIL SAMPLE		AS-BUILT		
Depth (ft bgs)	Elevation ft NGVD-29	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation	As-Built	
209		<p><b>(205 to 235) ft bgs</b>                      Differentially weathered Packstone (SAA, MIP layers absent).                      Mostly odorless, faint sulfide odors to odorless. Estimated volumes from core:                      75% Unconsolidated (PIP/WIP)                      25% Consolidated (MIP med- to coarse- gravel-size aggregates). RQD = 0.0</p>	10	Lost 2,460 net gallons potable water w/ 1,000 mg/L NaBr tracer into Ocala LS during drilling and well installation	Ocala LS		
211							
213							
215					(215-225) ft bgs - 10% drill fluid returns		
217							
219				10			
221							
223							
225					(225-235) ft bgs - Lost all drilling circulation - no returns		
227							
229			10				
231							
233							
235	-54.2	NO SAMPLE COLLECTED (235 - 238.1) ft bgs					
237		End of Log					
239				4-in Well TD = 238.09 ft bgs			
241							

# BORING LOG AND MONITOR WELL COMPLETION

## Monitor Well ID: FW-21B

Project No. 2201.083.02

Total Well Depth (ft bgs): 236.98

Well Location: Drip Track Source-Area

Well Screens: Four x 10 ft, 4-in dia SS, 0.020 slot, 20 ft C-C, 12/20 filter pack, 30/65 seal sand between filter packs

Well Description: 4-in Multiscreen SS Well w/in Ocala LS with Westbay MP38 4-port Sampling Well

Project Name: Upper Floridan Aquifer Invest.

Site: Koppers Industries, Gainesville, FL

Top of Casing Elev. (Ft NGVD-29): 179.82

NAD 83 (FL North) X = 2659027

Start/Finish Date: 11/10/05 - 2/08/06

Client: Beazer East

Ground Elev. (Ft NGVD-29): 179.8

NAD 83 (FL North) Y = 253283

SUBSURFACE PROFILE			SOIL SAMPLE			AS-BUILT	
Depth (ft bgs)	Elevation (ft NGVD-29)	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation	As-Built
-2							TOC →
0	179.8		Ground Surface				
2							
4							
6							
8							
10							
12						Surficial Deposits	
14							
16							
18							
20							
22	156.8					23.0 ft bgs	
24			(23.0 to ~26) ft bgs - Upper Hawthorn Group Clay Confirmed with drilling returns.			HG - - Upper Clay Unit	
26	153.8		No core or samples were collected from GS to 63.8 ft bgs.		18-in steel conductor casing installed to 26.6 ft bgs using cable tool methods	~26 ft bgs	
28							
30						Hawthorn Group	
32							

BORING LOG AND MONITOR WELL COMPLETION

**Monitor Well ID: FW-21B**

SUBSURFACE PROFILE			SOIL SAMPLE			AS-BUILT	
Depth (ft bgs)	Elevation ft NGVD-29	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation	As-Built
34							<p>16-in Ø Borehole</p> <p>8 in. Conductor Casing</p> <p>4 in. SS Well Casing</p> <p>2 in. Westbay MP System</p>
36							
38							
40							
42							
44							
46							
48							
50						Hawthorn Group	
52						Zone 1 (May 2006)	
54							
56				1.2			
58							
60							
62	117.8					62 ft bgs	
64	116.0		<b>CONTINUOUS CORE BEGINS AT 63.8 FT BGS</b>			HG - - Middle Clay Unit	
66	114.7		CL (CLAY), lean, little silt, one sub-angular cobble, little very fine sand, stiff, medium plastic, massive, dark greenish gray [5GY 4/1], moist, odorless.		12-in steel conductor casing installed to 65.3 ft bgs using cable tool methods		
	112.7						

**BORING LOG AND MONITOR WELL COMPLETION**

**Monitor Well ID: FW-21B**

SUBSURFACE PROFILE				SOIL SAMPLE		AS-BUILT
Depth (ft bgs)	Elevation ft NGVD-29	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation
69	109.8		CL (Sandy CLAY) lean, some very fine sand, some silt [gravel absent], firm, low plasticity, chaotically interlayered laminations and thin lenses of silty clay and sandy clay, dark greenish gray [5GY 4/1] monotone, moist, moderate creosote-like odor.	10	All sonic cores were collected without drilling water	70 ft bgs
71	107.6		CH (CLAY), fat clay, trace silt, [sand and gravel absent], firm, high plasticity, massive, light olive gray [5GY 6/1] monotone with few chaotic, diffuse, darker stained blotches and fingering, moist, odorless.			
73			GC (Clayey GRAVEL) with cobbles, some clay, some fine sand, med to coarse grained, compact, gap graded, greenish gray [5GY 5/1], very moist to wet, odorless. Gravels are dolomite mudstone and limestone wackestone.	10	Collect 7-in sonic core in advance of 10-in override casing, from within 12-in ID permanent casing	Hawthorn Group
75	104.4		SC (Clayey SAND), some clay, trace sub-rounded gravel, fine to med grained, non-plastic and low plasticity seams, irregularly interlayered lenses of firm well graded clayey sand with loose clean sand. Light greenish gray [5GY 8/1] blend with light gray [N6] organic stained seams and fingering, moist, odorless.			
77			GM (Sandy GRAVEL) with wackestone cobbles, some fine sand, little silt & cclay, compact, gap graded. Matrix varies from clayey sand to sand, soft, low plasticity to non plastic, homogeneous, light greenish gray [5GY 8/1] blend, very moist to wet, faint creosote odor. Predominantly cobbles (81 - 85) ft bgs. Cobbles and gravels are mostly limestone wackestone, very light gray [N8] blend with little dark gray [N3] carbonate grains (salt and pepper appearance, hereafter referenced as <b>S&amp;P Wackestone</b> ), with little rounded to subrounded coarse grained lustrous silica sand with smooth crystal faces in a very fine to medium grained carbonate sand matrix and with little small shell fragments.	10		
81				10		
83				10		
85				10		
87	92.4		CL (Silty CLAY), some silt, some angular to sub-angular gravel, little very fine sand, stiff, medium plastic, common silt & sand stringers and irregular cobble-size lenses of sandy gravel [SAA 75.4 -87.4 ft bgs], dark greenish gray [5GY 4/1], moist, moderate creosote-like odor.	10		
89	88.7		SP (SAND) little silt & clay [gravel absent], medium grained clean silica sand, loose, poorly graded, greenish gray [5GY 6/1] light olive gray [5Y 7/1] mix, wet, faint creosote-like odor.	10		
91	86.6		CL (Silty CLAY), SAA (87.4-91.1) ft bgs, faint creosote-like odor.	10		
93	84.8		SP (SAND), little clay, little gravel, medium to coarse grained clean silica sand, loose, poorly graded, sub-rounded, greenish gray [5GY 6/1] monotone blend, wet, very porous, with few thin sandy-silty-clay lenses, moderate creosote-like odor grading to strong odor. Few irregular medium light gray [N6] fingering stains (103-105) ft bgs.	10		
95				10		
97				10		
99				10		
101				10		

12-in Ø Borehole

**BORING LOG AND MONITOR WELL COMPLETION**

**Monitor Well ID: FW-21B**

SUBSURFACE PROFILE			SOIL SAMPLE		AS-BUILT		
Depth (ft bgs)	Elevation ft NGVD-29	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation	As-Built
104	74.8						
106							
108			GM (Sandy GRAVEL), with S&P Wackestone cobbles, some fine sand, little clay/silt, coarse to medium grained sub-rounded carbonate gravel, compact, gap graded. Matrix is firm, low plasticity, homogeneous, greenish gray [5GY 7/1] blend, wet, with moderate to strong creosote-like odor.	10			
110							
112	68.0		CL (CLAY), lean, some silt, little very fine sand, little angular to sub-angular gravel, soft, medium plasticity, prominent fine sand & silt laminations and thin lenses of carbonate sand & gravel. Greenish gray [5GY 5/1] blend with common irregular dark gray [N3] organic stained seams and blotches, very moist, strong creosote-like odor.			111.8 ft bgs HG - Lower Clay Unit	
114	65.9		CL (Silty CLAY) SAA but very soft with more prominent clayey sand lenses and laminations, moderate yellowish brown [10YR 5/4], grading to very light gray [N8]. Clay commonly cleaves into blocky-platy peds, moderate creosote-like odor.				
116							
118							
120	58.8		SC (Clayey SAND), calcareous, some clay, little silt, little gravel, fine to very fine grained, hard, low- to non-plastic, dense, chaotic vermiculated thin lenses of clayey sand, silt, and sandy clay, mottled light greenish gray [5GY 8/1] with light gray [N8], slightly moist to dry, with faint creosote-like odors in moist horizons (odorless in dry horizons). Mechanically fractured into lenticular coarse to fine gravel-size material.	10	8-in steel conductor casing installed to 125.6 ft bgs using rotasonic methods		
122							
124	54.8		ML (Sandy, Gravelly SILT), some fine sand, some fine to medium gravel (carbonates and shell fragments) little clay, stiff, low- to non-plastic, conglomeratic clay blebs, silt blebs, and gravels, with chaotic laminations and thin lenses with friable seams, greenish gray [5Y 6/1] conglomeratic blend, moist, odorless.				
126							
128							
130	49.2		CL (CLAY) lean, some silt, little fine sand [gravel absent], stiff, low plasticity, lean, faint platy-blocky clay cleavage, common sandy silt stringers and thin lenses with friable seams, dark greenish gray [5GY 4/1], moist, odorless.	10	Collect 4-in sonic core in advance of 7-in override casing, all within 8-in ID conductor casing		
132	46.3		SC (Clayey SAND), some clay/silt, some sub-angular gravel, fine to very fine grained, stiff, low plasticity, irregular laminations and thin lenses, light olive gray [5Y 6/1] with few moderate yellowish brown [10YR 5/4] clean sand seams, moist, odorless.				
134	45.1		Limestone Cobble, dry, sonically fractured, very light gray [N8],				
136	43.0						

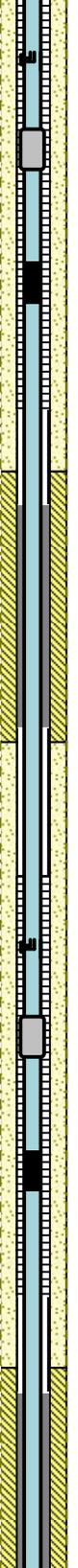
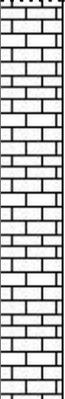
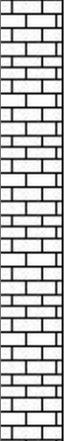
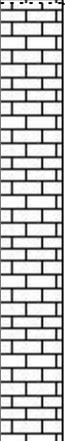
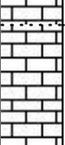
**BORING LOG AND MONITOR WELL COMPLETION**

**Monitor Well ID: FW-21B**

SUBSURFACE PROFILE			SOIL SAMPLE		AS-BUILT	
Depth (ft bgs)	Elevation (ft NGVD-29)	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation	As-Built
139	39.8	ML (Sandy SILT), some fine sand, some clay, little med-coarse gravel (LS, little shells), stiff, low to medium plasticity, laminated and irregular thin lenses, light olive gray [5Y 6/1] blend, moist, odorless.	10	Start of typical weathered Ocala at 140.0 ft bgs	140.0 ft bgs	Ocala LS Formation
141	38.5	Limestone cobble, dry, sonically fractured, very light gray N8], odorless				
143	37.6 37.0	ML (Clayey SILT), some very fine sand, little subangular to sub-rounded gravel, firm (grading to stiff), medium plastic, prominent irregular lenses and laminations, light pale yellow brown [10YR 7/2] and brownish gray [5YR 6/1] blend, moist (grading drier), odorless.	10	All Ocala 10-ft sonic cores drilled in 10-20 seconds for an average penetration rate of 1.6 secs/ft.		Bentonite Grout
145	34.8	<b>OCALA LIMESTONE</b> Moderately Indurated Packstone (MIP) rotosonically degraded into 1" - 3" cores & angular gravel-size aggregates. Contains prominent small to medium Leps, mollusks, and echinoid fossils. Very pale orange [10YR 8/2], dry to slightly moist, odorless.				
147		(141.3 to 142.2) ft bgs WIP, containing medium-grained calcareous sand, some sub-rounded gravel, little silt, trace clay, loose, yellowish gray [5Y8/1], wet, odorless.	10	Lost drill fluid circulation from 155 to TD (238 ft bgs).		Packer
149		(142.1 to 142.8) ft bgs MIP - SAA (140.0 to 141.3) ft bgs.				
151		(142.8 to 145.0) ft bgs Differentially weathered Packstone. Interlayered PIP, MIP & WIP. Thin layers of MIP at 143.0, 143.4, 143.8, 144.3 and 145.0. Yellowish gray [5Y 8/1] monotone, moist, odorless. Estimated core integrity volumes: 40% Unconsolidated (PIP) 60% Consolidated (MIP layers). RQD = 0.0	10	All sonic cores drilled w/ minimal vibrations and no added feed pressure (only weight of rods)		Fine Sand Seal
153		(145 to 165) ft bgs Differentially weathered Packstone. Interlayered PIP & WIP [MIP layers absent]. More fines than at comparable horizons within typical Ocala cores. Yellowish gray [5Y 8/1] to very pale orange [10YR 8/2] monotone, grading down to light pale yellowish brown [10YR 7/2], grading further to light yellowish gray [5Y 9/1], and further to dark yellowish gray [5Y 7/1], moist to wet, discrete intervals of odorless, faint to strong sulfide odors, and non-specific organic odors. Estimated core integrity volumes: 80% Unconsolidated (PIP & WIP) 20% Consolidated (MIP gravel-size aggregates). RQD = 0.0				
155			10	145-190 ft bgs competent MIP layers absent from sonic core recovery		Filter Pack
157						
159			10			Magnet
161						
163			10			Sampling Port
165	14.8					
167			10			Purging Port
169						
171						

BORING LOG AND MONITOR WELL COMPLETION

**Monitor Well ID: FW-21B**

SUBSURFACE PROFILE			SOIL SAMPLE		AS-BUILT		
Depth (ft bgs)	Elevation ft NGVD-29	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation	As-Built
174	6.6		No Recovery				
	4.8						
176			<p><b>(175 to 184) ft bgs</b> Differentially weathered Packstone (SAA), with interlayered PIP &amp; WIP [MIP layers absent]. Prominent WIP layers are comprised mostly of silt. Yellowish gray [5Y 8/1], moderate sulfide odor, wet. Estimated core integrity volumes: 80% Unconsolidated (PIP &amp; WIP) 20% Consolidated (MIP gravel-size aggregates). RQD = 0.0</p>	10			
178							
180							
182							
184	-4.2		No Recovery				
	-5.2						
186			<p><b>(185 to 195) ft bgs TEST CORE - ROTARY ONLY</b></p> <p>Cored and drilled the override casing and extruded the sample with normal sonic equipment, but without vibration to compare rotary-only sample core integrity with cores retrieved using vibration. No added down pressure was used other than the weight of the rods. Rotary refusal was encountered at 192.7 ft bgs after 18 minutes of coring. Minimal sonic vibrations were used in the remaining 2.3 ft of core to break through each successive rotary-only refusal.</p>	10		Ocala LS	
188							
190							
192							
194			<p>Differentially weathered Packstone (SAA), with interlayered PIP, WIP &amp; MIP, yellowish gray [5Y 8/1], odorless grading down to faint sulfide odor, wet. Thin MIP layers at 190 &amp; 191 ft with a 1.1-ft thick MIP layer at 192 ft (horizon of rotary-only refusal). Estimated core integrity volumes: 75% Unconsolidated (PIP &amp; WIP) 25% Consolidated (MIP gravel-size aggregates). RQD = 0.0</p>	10			
196	-15.2						
198			<p><b>(195 to 205) ft bgs</b> Differentially weathered Packstone (SAA), with interlayered PIP, WIP &amp; MIP. Thin MIP layers at 202 ft bgs. Yellowish gray [5Y 8/1], faint organic odor grading down to faint to moderate sulfide odor, then odorless, wet. Estimated core integrity volumes: 70% Unconsolidated (PIP &amp; WIP) 30% Consolidated (MIP gravel-size aggregates). RQD = 0.0</p>	10			
200							
202							
204							
206	-25.2						

BORING LOG AND MONITOR WELL COMPLETION

**Monitor Well ID: FW-21B**

SUBSURFACE PROFILE				SOIL SAMPLE		AS-BUILT		
Depth (ft bgs)	Elevation ft NGVD-29	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation	As-Built	
209		[Brick pattern symbol]	<b>(205 to 215) ft bgs</b> Differentially weathered Packstone (SAA), with interlayered PIP, WIP & MIP. Four, thin MIP layers at 210 to 214 ft bgs approximately 1-in to 2-in thick. Yellowish gray [5Y 8/1] grading down to dark yellowish gray [5Y 7/1], odorless, with two discrete intervals of moderate sulfide odors, [creosote-like odors absent], wet. Estimated core integrity volumes: 80% Unconsolidated (PIP & WIP) 20% Consolidated (MIP gravel-size aggregates). RQD = 0.0	10				
211								
213								
215	-35.2		<b>(215 to 225) ft bgs</b> Differentially weathered Packstone (SAA), with interlayered PIP, WIP & MIP. Two, thin MIP layers from 221 to 223 ft bgs. Yellowish gray [5Y 8/1] grading down to [5Y 7/1], strong sulfide odors, wet. Estimated core integrity volumes: 80% Unconsolidated (PIP & WIP) 20% Consolidated (MIP gravel-size aggregates), RQD = 0.0					
217								
219					10	Lost 5,300 net gallons potable water with 1,000 mg/L NaBr tracer into Ocala LS during drilling and well installation		Ocala LS
221								
223			<b>(225 to 235) ft bgs</b> Differentially weathered Packstone (SAA), with interlayered PIP & WIP [consolidated MIP layers absent]. Light olive gray [5Y 6/1], strong sulfide odors, wet. Estimated core integrity volumes: 70% Unconsolidated (PIP & WIP) 30% Consolidated (MIP gravel-size aggregates). RQD = 0.0					
225	-45.2							
227								
229			NO SAMPLE COLLECTED (235 - 237.0) ft bgs  End of Log					
231								
233								
235	-55.2				Lost circulation at 155 ft bgs, never re-established			
237					4-in Well TD = 237.0 ft bgs			
239								
241								

# BORING LOG AND MONITOR WELL COMPLETION

## Monitor Well ID: FW-22B

Project No. 2201.083.02  
 Total Well Depth (ft bgs): 242.58  
 Well Location: Downgradient Perimeter  
 Well Screens: Four x 10 ft, 4-in dia SS, 0.020 slot, 20 ft C-C, 12/20 filter pack, 30/65 seal sand between filter packs  
 Well Description: 4-in Multiscreen SS Well w/in Ocala LS with Westbay MP38 4-port Sampling Well

Project Name: Upper Floridan Aquifer Invest.  
 Site: Koppers Industries, Gainesville, FL  
 Top of Casing Elev. (Ft NGVD-29): 178.81  
 NAD 83 (FL North) X = 2658201

Start/Finish Date: 3/02/06 - 3/20/06  
 Client: Beazer East  
 Ground Elev. (Ft NGVD-29): 178.8  
 NAD 83 (FL North) Y = 254565

SUBSURFACE PROFILE			SOIL SAMPLE			AS-BUILT	
Depth (ft bgs)	Elevation (ft NGVD-29)	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation	As-Built
-2							TOC →
0	178.8		Ground Surface				
2							
4							
6							
8							
10							
12						Surficial Deposits	
14							
16							
18							
20							
22	155.8				18-in steel conductor casing installed to 24.0 ft bgs using cable tool methods	23.0 ft bgs	
24			<b>(23.0 to ~26) ft bgs - Upper Hawthorn Group Clay</b> Confirmed with drilling returns.			HG - Upper Clay Unit	
26	152.3		<i>No core or samples were collected from GS to 56.5 ft bgs.</i>			~ 26 ft bgs	
28							
30							
32							

BORING LOG AND MONITOR WELL COMPLETION

**Monitor Well ID: FW-22B**

SUBSURFACE PROFILE			SOIL SAMPLE			AS-BUILT
Depth (ft bgs)	Elevation ft NGVD-29	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation	As-Built
34					Hawthorn Group	
36						
38						
40						
42						
44						
46						
48						
50					Hawthorn Group	
52						
54						
56	122.3	<b>CONTINUOUS CORE BEGINS AT 56.5 FT BGS</b>				
58	120.9	Slough (CLAY) w/ bentonite chips from cable tool installation of 12-in conductor casing.				
60	118.0	Slough (CLAY) with grout.	8.5		60 ft bgs	
62	117.0	GROUT Hard, brittle			HG - Middle Clay Unit	
64		Limestone-wackestone cobbles (RQD = 0.4), very light gray [N8] blend with little dark gray [N3] carbonate grains (salt and pepper appearance, hereafter referenced as <b>S&amp;P Wackestone</b> ), with little rounded to subrounded coarse grained lustrous silica sand with smooth crystal faces in a very fine to medium grained carbonate sand matrix and with little small shell fragments.		12-in steel conductor casing installed to 63.6 ft bgs using cable tool methods		
66	113.1					

BORING LOG AND MONITOR WELL COMPLETION

**Monitor Well ID: FW-22B**

SUBSURFACE PROFILE				SOIL SAMPLE		AS-BUILT
Depth (ft bgs)	Elevation ft NGVD-29	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation
69			GC (Clayey GRAVEL) with cobbles, some clay, some fine sand, med-coarse sub-angular S&P wackestone, gravel matrix is sandy clay, firm, low plasticity, very light olive gray [5Y 7/1], wet, odorless.	10	Collect nom 7-in sonic core in advance of 10-in override casing, from w/in 12-in ID permanent casing	77.8 ft bgs
71			CL (Sandy CLAY), some fine to very fine sand, some silt, little fine-medium gravel, hard, low plasticity, greenish gray [5GY 6/1] matrix with very pale orange [10YR 8/2] sharp thin lenses and irregular thin seams of carbonate silt, sand and gravel (increasing frequency with depth). Prominent light brown [5YR 6/4] blotchy staining (from 66.2 to 69.2 ft). Prominent diffuse medium dark gray [N3] natural organic staining (68-69) ft bgs and (73-75) ft bgs, moist, odorless.			
73						12-in Ø Borehole
75						
77	101.0					
79			SM (Silty SAND), some silt, little clay, little S&P Wackestone gravel, firm, low plasticity, fine-med grained quartz sand, greenish gray [5GY 7/1] irregularly laminated with slightly lighter and darker horizons and with very light gray [N8] carbonate sands and light olive gray [5Y 7/1] clayey sand, moist, odorless. Mechanically fractured into medium to coarse gravel-size material.	10		
81	97.7					
83			SC (Clayey SAND), some clay, little silt, trace S&P gravel, fine-medium grained, medium- to non-plastic, vermiculated thin lenses of irregularly interlayered clayey sand, sandy clay, and clean sand, greenish gray [5GY 7/1] blend, moist, odorless.			
85	93.8					
87	92.6		SC (Clayey SAND) SAA with coarse S&P Wackestone gravel and cobbles, coarse to very coarse grained sand, firm, medium plastic matrix, moist, odorless.			
89			GM (Sandy GRAVEL) with cobbles, some sand, little silt, little clay, med-coarse grained, soft to firm, low- to non-plastic, irregularly interbedded with SAA (Clayey SAND). Greenish gray [5GY 7/1] with light olive gray [5Y 7/1] sand seams and lenses, and very light gray [N8] cobbles, moist, odorless.	10		
91	88.3					
93	86.3		SP (SAND) little silt & clay, trace gravel, coarse grained clean silica sand, sub-rounded, loose, poorly graded, few thin lenticular sandy clay lenses, chaotic bedding, blend of light olive gray [5Y 7/1] with greenish gray [5GY 7/1], wet, odorless.			
95	83.8		CL (Sandy CLAY) with irregular carbonate gravel seams, some fine to very fine sand, little matrix gravel (with inclusions of blocky-platy clay peds), stiff, medium plastic, greenish gray [5GY 7/1], prominently interlayered with irregular lenses and stringers of firm, low plasticity clayey-silty-sand, light olive gray [5Y 7/1], moist, odorless.			
97			SP (SAND) with coral-shaped S&P Wackestone cobbles, little clay/silt, little coarse gravel, loose, gap graded, medium to coarse grained, chaotic bedding, common gravel/cobble lenses, greenish gray [5GY 7/1] blend matrix, prominent chaotic dark gray [N4] organic staining (diffuse), moist, odorless.	10		
99						
101						

**BORING LOG AND MONITOR WELL COMPLETION**

**Monitor Well ID: FW-22B**

SUBSURFACE PROFILE				SOIL SAMPLE		AS-BUILT
Depth (ft bgs)	Elevation ft NGVD-29	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation
104	73.8		Limestone - S&P Wackestone cobbles (RQD = 0.7) with little sandy clay matrix, moist, odorless.			
106						
108	70.2		CL (CLAY) lean, little silt, little fine-medium gravel, trace fine sand, firm, medium plastic, massive, few gravel lenses, prominent silt stringers, dark greenish gray [5GY 4/1] clay with light olive gray [5Y7/1] silty sand stringers and very light gray [N8] carbonate sands and gravels, moist, odorless.	10		108.6 ft bgs
110						
112	65.2		CL (Silty CLAY), some silt, little fine sand, trace gravel, soft to firm, blocky-platy cleavage, prominent sandy silt stringers and thin lenses, greenish gray [5GY 6/1] blend, moist, odorless.			HG - Lower Clay Unit
114					8-in steel conductor casing installed to 116.9 ft bgs using rotasonic methods	
116	61.8		CL (Sandy CLAY), some fine to very fine sand, some silt, trace gravel, lean, stiff, low to non-plastic, monotone dark greenish gray [5GY 4/1] with few light olive gray [5Y6/1] fine sand seams, increasing to prominent with depth, moist, odorless. Mechanically fractured into coarse gravel-size pieces.	10	Collect 4-in sonic core in advance of 7-in override casing, all within 8-in ID conductor casing	
118	59.3		SC (Clayey SAND / Sandy Clay), little gravel with prominent sand/silt stringers and irregular seams and lenses, non-plastic to low plasticity, SAA color, but lighter with more light olive gray [5Y 6/1] and very light gray rock flour very light gray [N8] becoming more prominent with depth, moist, odorless.			
120						
122						
124						
126						
128	49.2		CL (Silty CLAY) lean, some silt, little fine sand, firm, medium plastic, massive, homogeneous, very dark greenish gray [5GY 3/1], moist, odorless.	10		
130	47.1		SC (Clayey SAND) some clay, some gravel (mudstone, shell fragments - granules and pebbles) medium to coarse grained, stiff, non-plastic containing high-energy conglomeratic sediments, light olive gray [5Y 6/1] blend, moist, grading down to SP (SAND), odorless.			
132						
134	43.8		CL (Silty CLAY) lean, some silt [gravel absent], few silt & sand stringers (increasing with depth), stiff, medium plastic, massive, dark greenish gray [5GY 4/1] with laminated mottles of similar lighter and darker shades, odorless.			
136						

8-in Ø Borehole

**BORING LOG AND MONITOR WELL COMPLETION**

**Monitor Well ID: FW-22B**

SUBSURFACE PROFILE				SOIL SAMPLE		AS-BUILT	
Depth (ft bgs)	Elevation ft NGVD-29	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation	As-Built
139	39.2		GM (Sandy GRAVEL) with partially dolomitized cobbles, some fine sand, little silt, little clay, med-coarse grained, stiff, low- to non-plastic, light greenish gray [5GY 8/1], moist, odorless.	10	Start of typical weathered Ocala at 142.7 ft bgs	142.7 ft bgs Ocala LS Formation	
141	36.5		SC (Clayey SAND), some clay, some gravel, fine to medium grained, firm, low to medium plasticity, light gray [N7] with moderate yellowish brown [10YR 5/4] sand seams, moist, grading down to (SP) sand, some gravel, little clay, wet, odorless.				
143	33.8		<b>OCALA LIMESTONE</b> Highly weathered OCALA FM Limestone, unconsolidated. Appears similar to unconsolidated ML (calcareous SILT) little clay, little sand, trace gravel (shells), soft, low plasticity, spongy, very light gray [N8] grading to yellowish gray [5Y 8/1], moist, faint sulfide odor.	9	All Ocala LS 10-ft sonic cores were drilled in 10 to 20 seconds for an average penetration rate of 1.3 secs/ft	Ocala LS	
145	32.8		<p><b>(142.7 to 145) ft bgs</b> Differentially weathered Packstone WIP and MIP. Very Light Gray [N8] monotone, wet, faint sulfide odors. Contains prominent Leps fossils. Estimated core integrity volumes: 40% Unconsolidated (WIP) 60% Consolidated (MIP med-coarse gravel-size aggregates)</p> <p><b>NO RECOVERY</b></p> <p><b>(145 to 155) ft bgs</b> Differentially weathered Packstone (SAA). Interlayered PIP &amp; WIP [MIP Layers absent]. Very light gray [N8] grading to very light olive gray [5Y 7/1], wet, faint to moderate sulfide odors throughout. Estimated core integrity volumes: 80% Unconsolidated (PIP/WIP) 20% Consolidated (MIP medium-coarse gravel-size aggregates). RQD = 0.0</p>				
147				10	All sonic cores were drilled w/ minimal vibrations and no added down pressure beyond the weight of the rods	Ocala LS	
149							
151				9			
153							
155	23.9			10			
157							
159				9			
161							
163				10			
165							
167				9			
169							
171							

BORING LOG AND MONITOR WELL COMPLETION

**Monitor Well ID: FW-22B**

SUBSURFACE PROFILE			SOIL SAMPLE			AS-BUILT	
Depth (ft bgs)	Elevation (ft NGVD-29)	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation	As-Built
174		[Brick pattern symbol]					[Well diagram showing casing and screen]
176							
178							
180	-2.2			10			
182		[Brick pattern symbol]	<b>(181 to 185) ft bgs</b> CHERT, consolidated, moderately bedded, with incomplete silica replacement of calcium carbonate clasts that were present in the original limestone (packstone). Extremely hard (knife blade will not scratch surface), glass-like fractures, with sharpness along the edges of broken fragments, vuggy porosity, olive gray [5Y 4/1] and light blue gray [5B 7/1], dry, with few thin lenses of very fine clayey sand, odorless to faint hydrogen sulfide odor. RQD = 0.3				
184	-6.2						
186							
188		[Brick pattern symbol]	<b>(185 to 195) ft bgs</b> Differentially weathered Packstone (SAA). Interlayered PIP, WIP, and MIP. Yellowish Gray [5Y 8/1], wet, odorless to strong sulfide odors throughout. Three (3) MIP layers observed, ranging in size from approximately 1-in to 2-in thick. Estimated core integrity volumes: 70% Unconsolidated (PIP/WIP) 30% Consolidated (MIP med-coarse gravel-size aggregates). RQD = 0.0	10			
190							
192							
194	-16.2						
196		[Brick pattern symbol]	<b>(195 to 215) ft bgs</b> Differentially weathered Packstone (SAA). Interlayered PIP, WIP, and MIP gravels (layers absent). Yellowish Gray [5Y 8/1] to very light olive gray [5Y 7/1], wet, odorless to moderate sulfide odors throughout. Estimated core integrity volumes: 70-80% Unconsolidated (PIP/WIP) 20-30% Consolidated (MIP med-coarse gravel-size aggregates). RQD = 0.0	10			
198							
200							
202							
204							
206							

BORING LOG AND MONITOR WELL COMPLETION

**Monitor Well ID: FW-22B**

SUBSURFACE PROFILE			SOIL SAMPLE		AS-BUILT	
Depth (ft bgs)	Elevation ft NGVD-29	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation	As-Built
209			10		Ocala LS	
211						
213						
215	-36.2					
217		<b>(215 to 225) ft bgs</b> Differentially weathered Packstone (SAA). Interlayered PIP, WIP, and MIP. Yellowish Gray [5Y 8/1], wet, odorless to moderate sulfide odors throughout. Estimated core integrity volumes: 75% Unconsolidated (PIP/WIP) 25% Consolidated (MIP med-coarse gravel-size aggregates)	10	Lost 3,625 net gallons potable water w/ 1,000 mg/L NaBr tracer into Ocala LS during drilling and well installation		
219						
221						
223						
225	-46.2					
227		<b>(225 to 235) ft bgs</b> Differentially weathered Packstone (SAA). Interlayered PIP, WIP, and MIP. Yellowish Gray [5Y 8/1], wet, odorless to faint sulfide odors throughout. Eleven (11) MIP layers observed, ranging in size from approximately 1-in to 3-in thick. Estimated core integrity volumes: 70% Unconsolidated (PIP/WIP) 30% Consolidated (MIP med-coarse gravel-size aggregates). RQD = 0.0	10	First loss of drilling circulation at this borehole was 225-235 ft bgs interval.		
229						
231						
233						
235	-56.2	NO SAMPLE COLLECTED (235 - 237.6) ft bgs				
237		End of Log		4-in Well TD = 237.58 ft bgs		
239						
241						

# BORING LOG AND MONITOR WELL COMPLETION

## Monitor Well ID: FW-23B

Project No. 2201.083.02

Total Well Depth (ft bgs): 232.35

Well Location: Downgradient Perimeter

Well Screens: Four x 10 ft, 4-in dia SS, 0.020 slot, 20 ft C-C, 12/20 filter pack, 30/65 seal sand between filter packs

Well Description: 4-in Multiscreen SS Well w/in Ocala LS with Westbay MP38 4-port Sampling Well

Project Name: Upper Floridan Aquifer Invest.

Site: Koppers Industries, Gainesville, FL

Top of Casing Elev. (Ft NGVD-29): 169.95

NAD 83 (FL North) X = 2658753

Start/Finish Date: 2/14/06 - 3/28/06

Client: Beazer East

Ground Elev. (Ft NGVD-29): 169.9

NAD 83 (FL North) Y = 254757

SUBSURFACE PROFILE				SOIL SAMPLE			AS-BUILT
Depth (ft bgs)	Elevation (ft NGVD-29)	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation	As-Built
-2							TOC →
0	170.0		Ground Surface				
2							
4							
6							
8							
10							
12						Surficial Deposits	
14							
16							
18							
20							
22	148.0		(22.0 to ~25) ft bgs - Upper Hawthorn Group Clay Confirmed with drilling returns.		18-in steel conductor casing installed to 22.8 ft bgs using cable tool methods	22.0 ft bgs HG - Upper Clay Unit	
24	145.0		No core or samples were collected from GS to 61 ft bgs.			~25 ft bgs	
26							
28							
30							
32							

BORING LOG AND MONITOR WELL COMPLETION

**Monitor Well ID: FW-23B**

SUBSURFACE PROFILE			SOIL SAMPLE			AS-BUILT
Depth (ft bgs)	Elevation ft NGVD-29	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation	As-Built
34					Hawthorn Group	<p>16-in Ø Borehole</p> <p>18 in. Conductor Casing</p> <p>4 in. SS Well Casing</p> <p>2 in. Westbay MP System</p> <p>Zone 1 (May 2006)</p>
36						
38						
40						
42						
44						
46						
48						
50						
52						
54						
56						
58						
60	109.9	<b>CONTINUOUS CORE BEGINS AT 61.0 FT BGS</b>	4		60 ft bgs	
62	108.9	Slough (CLAY) mixed with grout from cable tool installation of 12-in conductor casing, soft, wet.				
64	106.6	CL (CLAY) lean, little silt, trace very fine grained sand [gravel absent], firm, high plasticity, massive clay with common silt stringers, mottled dark greenish gray [5G 4/1] with greenish black [5GY 2/1] stained fingering, moist, odorless.			12-in steel conductor casing installed to 64.6 ft bgs using cable tool methods	65.0 ft bgs
66	104.9					
	102.6					

**BORING LOG AND MONITOR WELL COMPLETION**

**Monitor Well ID: FW-23B**

SUBSURFACE PROFILE			SOIL SAMPLE		AS-BUILT		
Depth (ft bgs)	Elevation ft NGVD-29	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation	As-Built
69			GM (Sandy GRAVEL) with cobbles (dolomite and wackestone), little (grading up to some) silt & clay, some fine sand, med to coarse grained, clayey sand matrix, firm, medium plastic, lensed, light olive gray [5Y 6/1] to greenish gray [5GY 6/1], wet, odorless. Cobbles and gravels are predominantly limestone wackestone, very light gray [N8] blend with little dark gray [N3] carbonate grains (salt and pepper appearance, <b>hereafter referenced as S&amp;P Wackestone</b> ), with little rounded to subrounded coarse grained lustrous silica sand with smooth crystal faces in a very fine to medium grained carbonate sand matrix and with little small shell fragments.	10	Collect 7-in sonic core in advance of 10-in override casing, from w/in 12-in ID permanent casing	Hawthorn Group	
71							
73			SC (Clayey SAND), some clay & silt, little carbonate gravel, fine grained, stiff, low plasticity, chaotic lenticular structure, vermiculated light greenish gray [5GY 8/1] with light yellowish gray [5Y 9/1] carbonate lenses & seams (irregular orientations), very light gray [N8] stained fingering, prominent dark greenish gray [5GY 4/1] organic staining, common dark yellowish orange [10YR 6/6] stained banding, moist, odorless.	10	All sonic cores were collected without drilling water	Hawthorn Group	
75							
77			SM (Silty SAND) with cobbles, some silt, some gravel (sub-angular to sub-rounded, fine to coarse S&P Wackestone and mudstone), trace clay, fine to coarse grained, well graded, lensed matrix, greenish gray [5GY 6/1] blend, odorless.	10			
79							
81			SC (Clayey SAND) some clay & silt, trace gravel, fine grained, stiff, low plasticity, lenticular structure, pale olive [10Y 6/2], moist, odorless.	10			
83							
85	84.9		SP (SAND) little silt & clay, coarse grained clean silica sand, sub-rounded, loose, poorly graded (gap graded), high intergranular porosity, light olive gray [5Y 6/1], wet, faint creosote-like odor.	10			
87							
89			SM (Silty SAND) with cobbles (coral-molded S&P Wackestone) little silt & clay, little gravel, fine to medium grained silica sand, sub-rounded, loose, well graded matrix, prominent lenticular (SP) clean sand lenses and (SC) lenses, chaotically laminated and lensed, light olive gray [5Y 6/1] with pale olive [10Y 6/2] mix, prominent dark gray [N3] stained seams and blotches, wet, faint creosote-like odors.	10			
91	78.1						
93	76.9		SC (Clayey SAND) some clay & silt, trace gravel, fine grained, stiff, low plasticity, lenticular structure, pale olive [10Y 6/2], moist, odorless.	10			
95	74.9						
97			SM (Silty SAND) with cobbles (coral-molded S&P Wackestone) little silt & clay, little gravel, fine to medium grained silica sand, sub-rounded, loose, well graded matrix, prominent lenticular (SP) clean sand lenses and (SC) lenses, chaotically laminated and lensed, light olive gray [5Y 6/1] with pale olive [10Y 6/2] mix, prominent dark gray [N3] stained seams and blotches, wet, faint creosote-like odors.	10			
99							
101							

**BORING LOG AND MONITOR WELL COMPLETION**

**Monitor Well ID: FW-23B**

SUBSURFACE PROFILE				SOIL SAMPLE		AS-BUILT
Depth (ft bgs)	Elevation (ft NGVD-29)	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation
104	64.9					
106			CL (Sandy CLAY) with cobbles, some fine sand, some fine gravel (shell fragments and limestone), little silt, firm, low- to medium-plastic, lensed with laminated clay and lenticular clayey sand zones, common cobble lenses, greenish gray [5G 5/1] blend, moist to wet, faint creosote-like odor grading to odorless.			
108	61.2					
110			CL (CLAY) lean, some silt, little fine sand, trace gravel, firm, high plasticity, typical "massive" clay with few lenticular fine carbonate sand and silt stringers, laminations, and thin lenses, prominent irregular 1/16-in to 1/4-in grayish orange [10YR 7/4] horizontal sand seams (113-115) ft bgs. Mottled light greenish gray [5GY 5/1] blend, moist, odorless.	10		108.7 ft bgs HG - Lower Clay Unit
112						
114						
116	53.7					
118	53.0		SM (Silty SAND), calcareous, some silt & clay, trace gravel, fine grained, stiff, low plasticity, irregular lenticular & laminated carbonate seams, light olive gray [5Y 6/1] and yellowish gray [5Y 8/1] lenses, moist, odorless. S&P Wackestone cobble, mechanically fractured.		8-in steel conductor casing installed to 117.0 ft bgs using rotasonic methods	
120			SC (Clayey SAND) some clay & silt, trace carbonate gravel grading to little (pebbles and shell fragments), fine to medium grained, stiff, low- to non-plastic, chaotic lenticular structure with prominent silt stringers and chaotic laminations, vermiculated greenish gray [5GY 6/1] with yellowish gray [5Y8/1] and [N8] carbonate lenses & seams (irregular orientations), moist, odorless. Mechanically degraded into fine to coarse gravel-size lenticular material.	10		
122						
124	44.9					
126			CL (Silty CLAY), lean, some silt, little very fine sand grading to some fine sand, trace gravel, stiff, medium plasticity (non-plastic in rock flour seams), atypical "massive" clay with very prominent lenticular fine carbonate sand and silt stringers, laminations, and thin lenses, mottled greenish gray [5GY 6/1] with common very pale orange [10YR 8/2] clean fine sand seams and lenses (129.0 - 130.4) ft bgs, moist, odorless. Mechanically fractured into coarse gravel-size lenticular material (127.0 - 130.4) ft bgs.	10		
128						
130	39.5				Collect 4-in sonic core in advance of 7-in override casing, all within 8-in ID conductor casing	
132			Interlayered competent dolomite cobbles, with CL (CLAY) SAA.			
134	34.9					
136	32.6		NO RECOVERY GC (Clayey GRAVEL) with dolomite cobbles, some clay, little fine sand, coarse sub-angular gravel, sandy clay matrix, firm, high plasticity, homogeneous, [5Y 6/1], wet, odorless.			137.6 ft bgs

8-in Ø Borehole

BORING LOG AND MONITOR WELL COMPLETION

**Monitor Well ID: FW-23B**

SUBSURFACE PROFILE			SOIL SAMPLE		AS-BUILT		
Depth (ft bgs)	Elevation ft NGVD-29	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation	As-Built
139			SC (Clayey SAND) some clay & silt, little carbonate gravel (pebbles and shell fragments), fine grained, soft, low plasticity, chaotic lenticular structure with prominent silt stringers and chaotic laminations, [5GY 4/1] clay with grayish orange [10YR 7/4] sand, wet, odorless.	9.5	Lost override casing drilling water circulation at 138 ft bgs. Never returned to TD.	Ocala LS Formation	
141		<b>OCALA LIMESTONE</b> Moderately Indurated Packstone (MIP) with PIP and WIP layers and with MIP aggregates. Contains prominent Leps fossils. MIP layers absent. Yellowish gray [5Y 8/1], wet, faint sulfide odors throughout. Estimated core integrity volumes: 75% Unconsolidated (PIP/WIP) 25% Consolidated (MIP gravel-size aggregates). RQD=0.0					
143							
145	24.9				Start of typical weathered Ocala at 137.6 ft bgs		
147				10			
149			<b>(145 to 175) ft bgs</b> Differentially weathered Packstone. Interlayered PIP, WIP and MIP aggregates [MIP Layers absent]. Yellowish gray [5Y 7/1] grading to light olive gray [5Y 6/1], wet, odorless to moderate sulfide odors. Estimated core integrity volumes: 75% Unconsolidated (PIP/WIP) 25% Consolidated (MIP layers and med-coarse gravel-size aggregates). RQD=0.0				
151							
153				10	All sonic cores drilled w/ minimal vibrations and no added feed pressure (only weight of rods)		
155							
157							
159							
161							
163							
165							
167							
169				10			
171							

BORING LOG AND MONITOR WELL COMPLETION

**Monitor Well ID: FW-23B**

SUBSURFACE PROFILE			SOIL SAMPLE		AS-BUILT		
Depth (ft bgs)	Elevation ft NGVD-29	Symbol	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation	As-Built
174	-5.1	[Brick pattern symbol]	<p><b>(175 to 195) ft bgs</b>                      Differentially weathered Packstone. Interlayered PIP, WIP and MIP Layers. Yellowish gray [5Y 8/1] monotone, wet, odorless to faint sulfide odors throughout. Three (3) MIP layers observed, ranging in size from approximately 1-in to 5-in thick. Estimated core integrity volumes:                      70-75% Unconsolidated (PIP/WIP)                      25-30% Consolidated (MIP layers and med-coarse gravel-size aggregates). RQD=0.0</p>	10	Faint to strong sulfide odors noted intermittently within most of the Ocala core. Creosote / petroleum odors absent	Ocala LS	[As-built well diagram showing casing, screen, and packer]
176							
178							
180							
182							
184							
186							
188							
190							
192							
194	-25.1	[Brick pattern symbol]	<p><b>(195 to 215) ft bgs</b>                      Differentially weathered Packstone. Interlayered PIP, WIP and MIP Layers. Yellowish gray [5Y 8/1], wet, odorless to faint sulfide odor throughout. Twelve (12) MIP layers observed, ranging in size from approximately 1-in to 2-in thick. Estimated core integrity volumes:                      65-70% Unconsolidated (PIP/WIP)                      30-35% Consolidated (MIP layers and med-coarse gravel-size aggregates). RQD=0.0</p>	10	Lost 2,700 net gallons potable water with 1,000 mg/L NaBr tracer into Ocala LS during drilling and well installation	[As-built well diagram showing casing, screen, and packer]	
196							
198							
200							
202							
204							
206							

BORING LOG AND MONITOR WELL COMPLETION

**Monitor Well ID: FW-23B**

SUBSURFACE PROFILE			SOIL SAMPLE		AS-BUILT	
Depth (ft bgs)	Elevation ft NGVD-29	Lithologic Description of Sample	Recovery (ft)	Remarks	Formation	As-Built
209			10		Ocala LS	<p>15.3 ft SS 4-in Well Sump</p>
211						
213						
215	-45.1					
217						
219			10			
221						
223		<p><b>(215 to 235) ft bgs</b>                      Differentially weathered Packstone. Interlayered PIP, WIP and MIP Layers. Twelve (12) MIP layers observed, ranging in size from approximately 1-in to 8-in thick. Yellowish gray [5Y 8/1], wet, faint sulfide odor grading to odorless. Estimated core integrity volumes:                      60-65% Unconsolidated (PIP/WIP)                      35-40% Consolidated (MIP layers and med-coarse gravel-size aggregates). RQD=0.0</p>				
225						
227						
229				10		
231						
233				4-in Well TD = 232.35 ft bgs		
235	-65.1					
237		End of Log				
239						
241			10			

<b>WELL CONSTRUCTION LOG</b>	PROJECT/SITE: Beazer/KI Site, Gainesville, FL		WELL ID:
OUTER CASING DRILLING CONTRACTOR:	DRILLED BY:	DRILLING EQUIPMENT:	START/FINISH DATE:
	OVERSIGHT:		18" 12"
INNER CASING DRILLING CONTRACTOR:	DRILLED BY:	DRILLING EQUIPMENT:	START/FINISH DATE:
	OVERSIGHT:		8" CS 8" BORING WELL

LOCATION/NOTES:

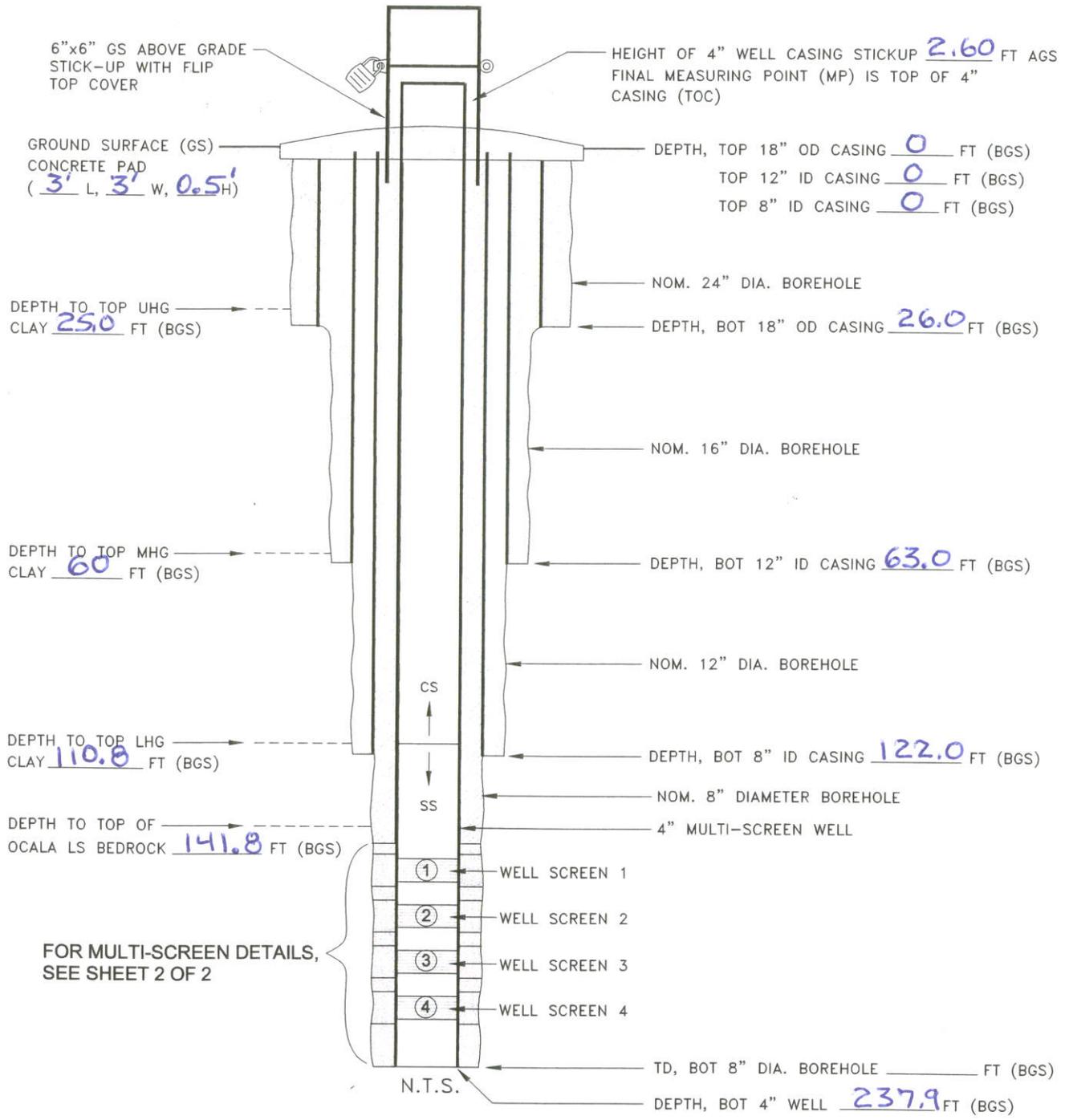
*This investigation installed fourteen (14) multi-screen Ocala Fm bedrock wells throughout the Upper Transmissive Zone of the Upper Floridan Aquifer, FW-10B through FW-23B. All wells are all telescopic, quadruple cased, multi-screen, 4-in wells with four x 10 LF stainless steel 0.020 slot screens, with combination stainless steel to mild steel risers to above grade. Three telescopic mild steel conductor casings (18-in, 12-in and 8-in diameter) were grouted into successive clay units to help restrict vertical groundwater migration. Westbay multi-port wells were subsequently installed inside the 4-in wells.*

## LEGEND

AGS – Above Ground Surface  
 BGS – Below Ground Surface  
 BOC – Bottom of Casing  
 BOS – Bottom of Steel Casing  
 CS - Carbon Steel Pipe (Black Mild Steel)  
 DIA – Diameter  
 FP - Filter Pack  
 GS -- Ground Surface  
 G - Gravel  
 ID – Inside Diameter  
 LHG – Lower Hawthorn Group Sediment Formation  
 MHG – Middle Hawthorn Group Sediment Formation  
 MP – Measuring Point  
 NOM - Nominal  
 OD – Outside Diameter  
 PVC – Polyvinyl Chloride  
 SI – Screen Interval  
 SS – Stainless Steel  
 TOC – Top of Casing  
 TOFP – Top of Filter Pack  
 TOFS – Top of Filter Sand  
 TOS – Top of Screen  
 TOSS – Top of Stainless Steel  
 UHG – Upper Hawthorn Group Sediment Formation

<b>WELL CONSTRUCTION LOG</b>	PROJECT/SITE: Beazer/KI Site, Gainesville, FL		WELL ID: <b>FW-10B</b>
OUTER CASING DRILLING CONTRACTOR: <b>PROSONIC CORP.</b> Marietta, OH	DRILLED BY: <b>L. Hunsberger</b>	DRILLING EQUIPMENT: <b>CABLE TOOL</b> (Wellmaster)	START/FINISH DATE: 18" July 22-26, 2005 12" July 27-Aug 4, 2005
	OVERSIGHT: <b>S. McGuire</b>		
INNER CASING DRILLING CONTRACTOR: <b>PROSONIC CORP.</b> Ocala, FL	DRILLED BY: <b>F. Kraus</b>	DRILLING EQUIPMENT: <b>Roto Sonic</b> (Proprietary Drill Rig)	START/FINISH DATE: 8" CS Sept. 24-25, 2005 8" BORING Oct 9-11, 2005 WELL (Temp Backfill)
	OVERSIGHT: <b>J. Toth</b>		

LOCATION/NOTES: Nov 11-16, 2005  
Nov 16-18, 2005



FOR MULTI-SCREEN DETAILS, SEE SHEET 2 OF 2

WELL CONSTRUCTION LOG

PROJECT/SITE:  
Beazer/KI Site, Gainesville, FL

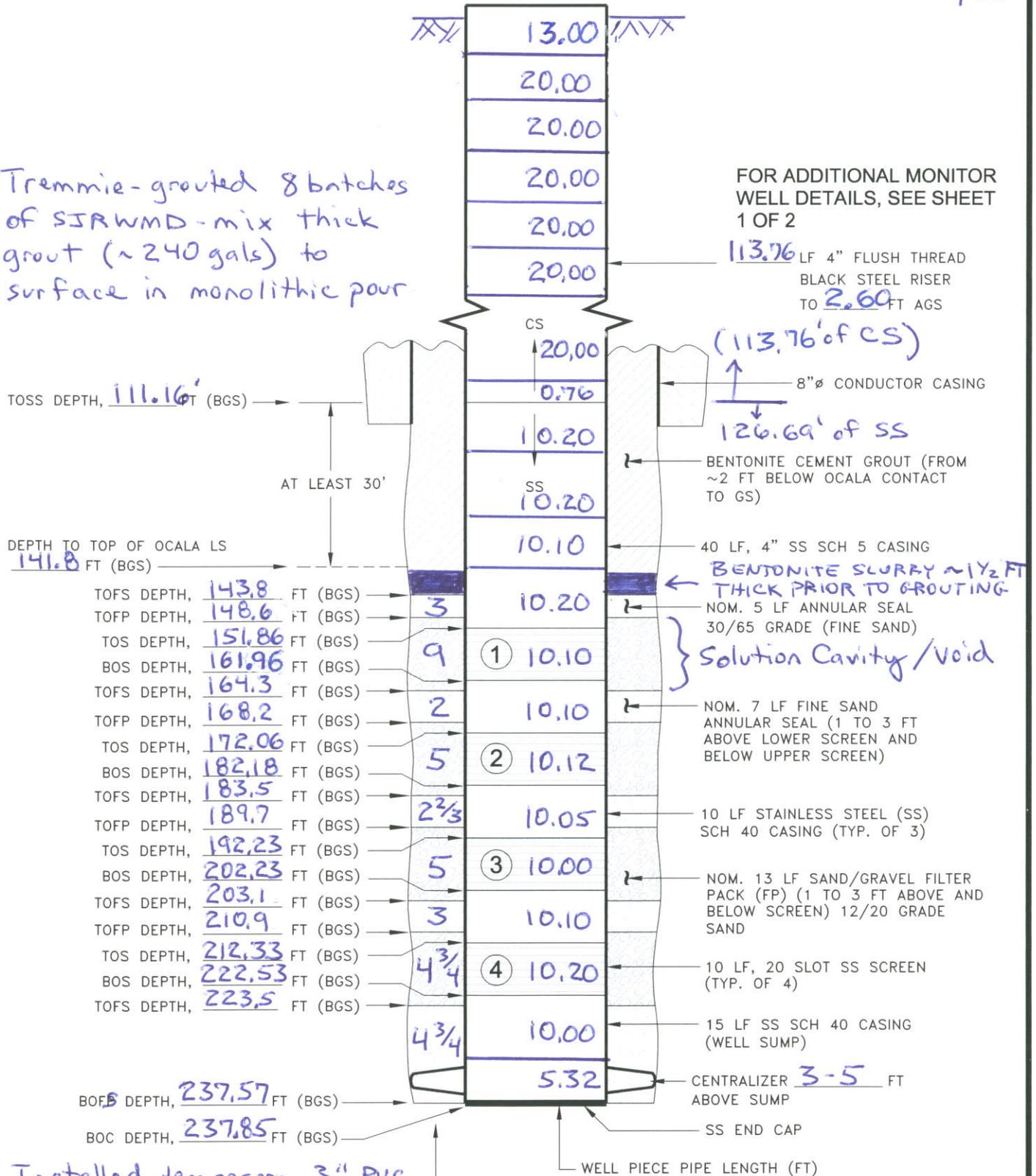
WELL ID:  
FW-10B

2/2

NOTES:

Tremmie-grouted 8 batches of SJRWMD-mix thick grout (~240 gals) to surface in monolithic pour

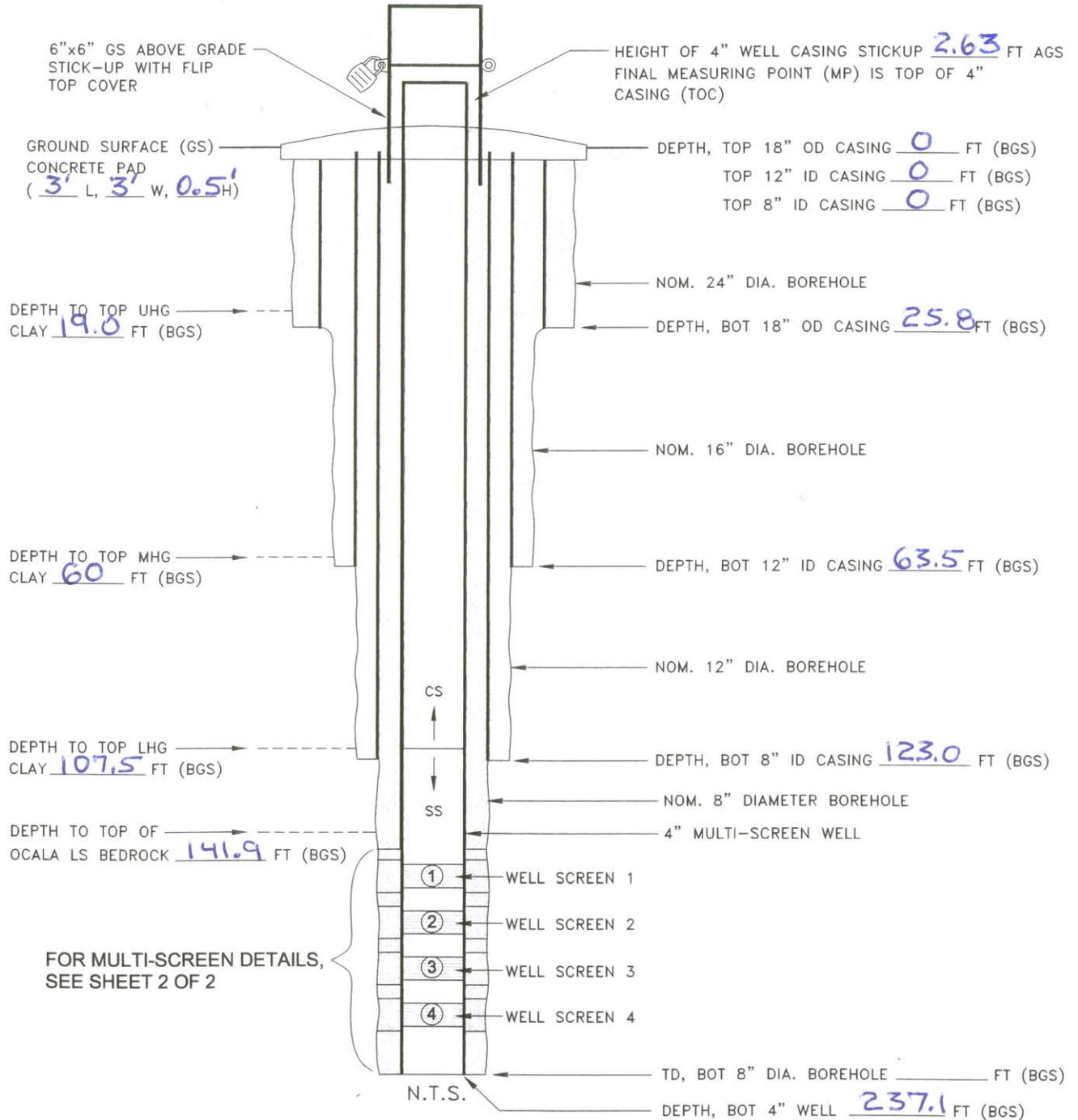
FOR ADDITIONAL MONITOR WELL DETAILS, SEE SHEET 1 OF 2



Installed temporary 3" PVC Flush thread to TD inside well to limit influx of fine sand through 20-slots during placement.

WELL CONSTRUCTION LOG	PROJECT/SITE: Beazer/KI Site, Gainesville, FL		WELL ID: <b>FW-11B</b>
	OUTER CASING DRILLING CONTRACTOR: <b>PROSONIC CORP.</b> Marietta, OH	DRILLED BY: <b>L. Hunsberger</b> OVERSIGHT: <b>S. McGuire</b>	DRILLING EQUIPMENT: <b>CABLE TOOL</b> <b>(Wellmaster)</b>
INNER CASING DRILLING CONTRACTOR: <b>PROSONIC CORP.</b> Ocala, FL	DRILLED BY: <b>F. Kraus</b> OVERSIGHT: <b>J. Toth</b>	DRILLING EQUIPMENT: <b>Roto Sonic</b> <b>(Proprietary)</b> <b>Drill Rig</b>	START/FINISH DATE: 18" <b>Aug 15-18, 2005</b> 12" <b>Aug 23-26, 2005</b>
INNER CASING DRILLING CONTRACTOR: <b>PROSONIC CORP.</b> Ocala, FL		DRILLED BY: <b>F. Kraus</b> OVERSIGHT: <b>J. Toth</b>	DRILLING EQUIPMENT: <b>Roto Sonic</b> <b>(Proprietary)</b> <b>Drill Rig</b>
START/FINISH DATE: 8" CS <b>Sept 20-22, 2005</b> 8" BORING <b>Dec 6-7, 2005</b> WELL <b>Dec 7-9, 2005</b>			

LOCATION/NOTES:



**WELL CONSTRUCTION LOG**

PROJECT/SITE:  
Beazer/KI Site, Gainesville, FL

WELL ID:  
**FW-11B**

NOTES:

2/2

Tremmie - Grouted using 8 batches of standard SJRWMD-mix (~240 gals) in monolithic event starting w/ side-discharge tremmie pipe at a TD of 141' bgs (~5 gpm rate)

FOR ADDITIONAL MONITOR WELL DETAILS, SEE SHEET 1 OF 2

TOSS DEPTH, 111.70 FT (BGS)

AT LEAST 30'

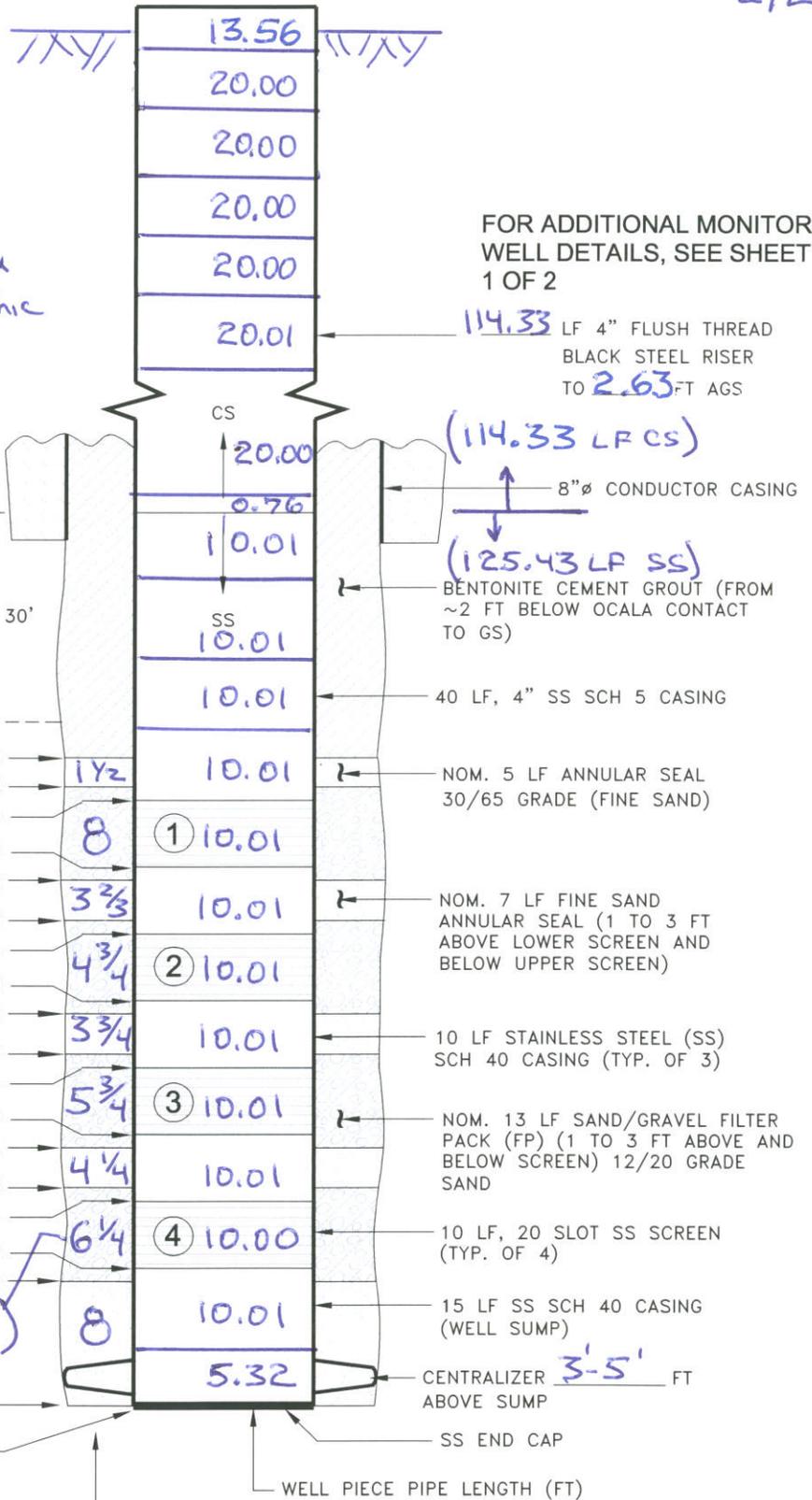
DEPTH TO TOP OF Ocala LS  
141.9 FT (BGS)

TOFS DEPTH,	<u>143.3</u>	FT (BGS)
TOFP DEPTH,	<u>148.9</u>	FT (BGS)
TOS DEPTH,	<u>151.74</u>	FT (BGS)
BOS DEPTH,	<u>161.75</u>	FT (BGS)
TOFS DEPTH,	<u>163.4</u>	FT (BGS)
TOFP DEPTH,	<u>168.9</u>	FT (BGS)
TOS DEPTH,	<u>171.76</u>	FT (BGS)
BOS DEPTH,	<u>181.77</u>	FT (BGS)
TOFS DEPTH,	<u>183.0</u>	FT (BGS)
TOFP DEPTH,	<u>189.1</u>	FT (BGS)
TOS DEPTH,	<u>191.78</u>	FT (BGS)
BOS DEPTH,	<u>201.79</u>	FT (BGS)
TOFS DEPTH,	<u>203.1</u>	FT (BGS)
TOFP DEPTH,	<u>209.5</u>	FT (BGS)
TOS DEPTH,	<u>211.80</u>	FT (BGS)
BOS DEPTH,	<u>221.80</u>	FT (BGS)
TOFS DEPTH,	<u>224.0</u>	FT (BGS)

(~20% Spillage)

BOFB DEPTH, 236.9 FT (BGS)

BOC DEPTH, 237.13 FT (BGS)

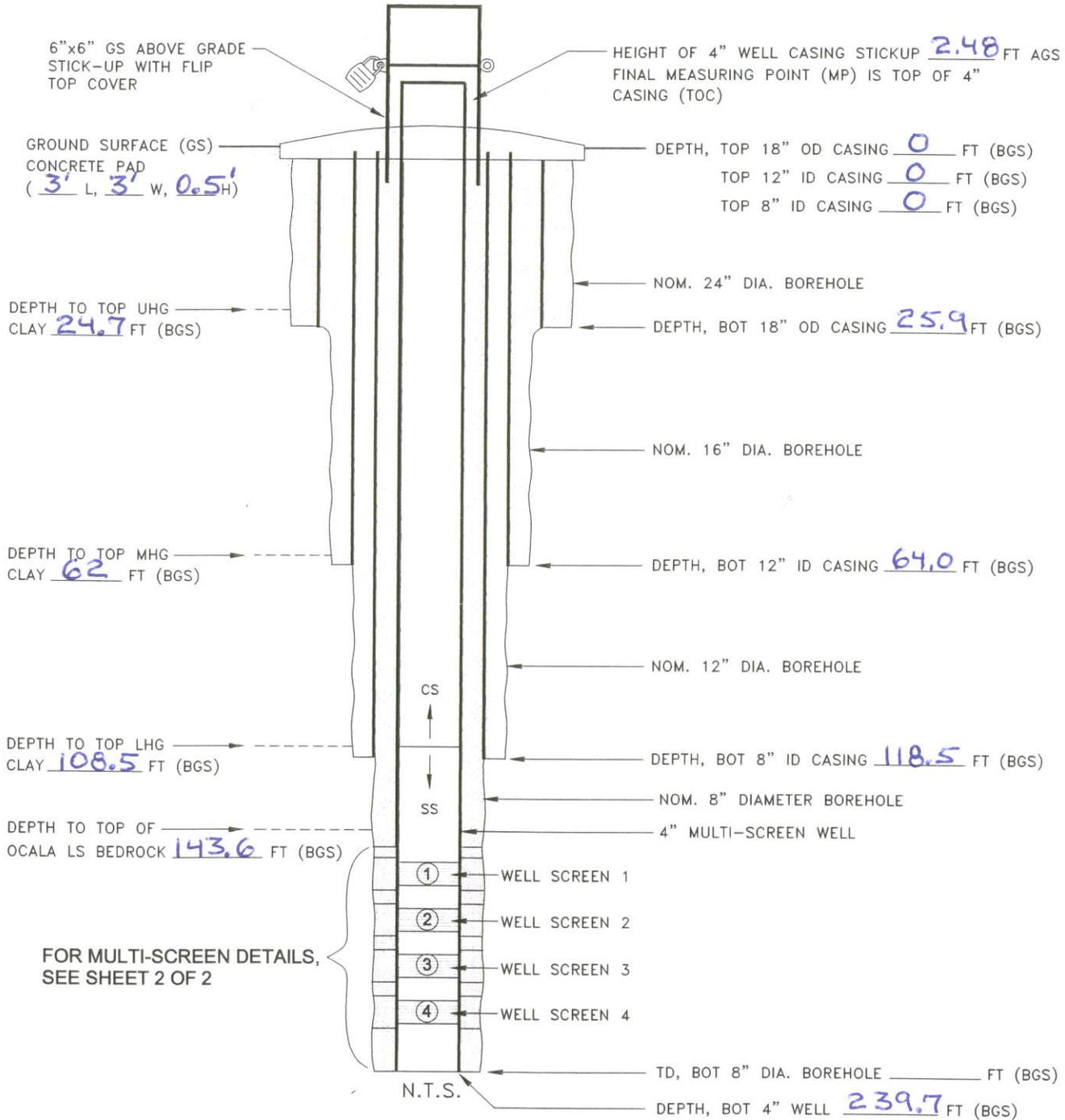


NO. OF 50-LB BAGS OF SILICA SAND USED FOR FILTER PACK AND SEAL

N.T.S.

<b>WELL CONSTRUCTION LOG</b>		PROJECT/SITE: Beazer/KI Site, Gainesville, FL	WELL ID: <b>FW-12B</b>
OUTER CASING DRILLING CONTRACTOR: <b>PROSONIC CORP.</b> Marietta, OH	DRILLED BY: <b>L. Hunsberger</b>	DRILLING EQUIPMENT: <b>CABLE TOOL</b> (Wellmaster)	START/FINISH DATE: 18" Aug 27-30, 2005
	OVERSIGHT: <b>S. McGuire</b>		12" Aug 31-Sep 9, 2005
INNER CASING DRILLING CONTRACTOR: <b>PROSONIC CORP.</b> Ocala, FL	DRILLED BY: <b>F. Kraus</b>	DRILLING EQUIPMENT: <b>Roto Sonic</b> (Proprietary Drill Rig)	START/FINISH DATE: 8" CS Sep 26-28, 2005
	OVERSIGHT: <b>J. Toth</b>		8" BORING Oct 11-12, 2005 WELL (Temp. Backfill) Nov 19-19, 2005 Nov 19-20, 2005

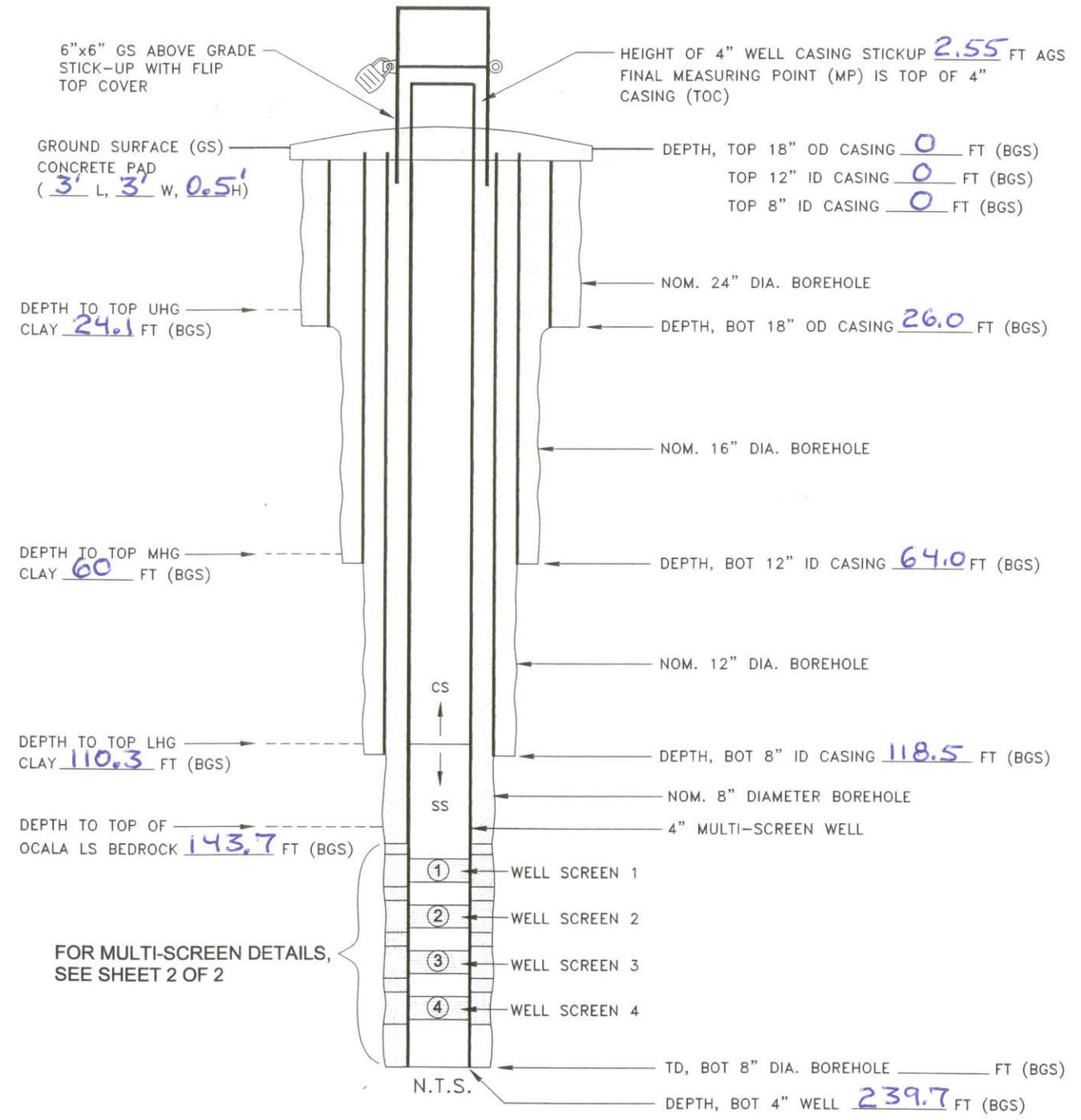
LOCATION/NOTES:





WELL CONSTRUCTION LOG	PROJECT/SITE: Beazer/KI Site, Gainesville, FL		WELL ID: <b>FW-13B</b>
	OUTER CASING DRILLING CONTRACTOR: <b>PROSONIC CORP.</b> Marietta, OH	DRILLED BY: <b>L. Hunsberger</b>	DRILLING EQUIPMENT: <b>CABLE TOOL</b> (Wellmaster)
INNER CASING DRILLING CONTRACTOR: <b>PROSONIC CORP.</b> Ocala, FL	OVERSIGHT: <b>S. McGuire</b>	START/FINISH DATE: 18" Sept 10-12, 2005 12" Sept. 13-20, 2005	
	DRILLED BY: <b>F. Kraus</b>	DRILLING EQUIPMENT: <b>Roto Sonic</b> (Proprietary Drill Rig)	START/FINISH DATE: 8" CS Sept. 28-Oct 4, '05 8" BORING Dec 15-15, 2005 WELL Dec 16-17, 2005
OVERSIGHT: <b>J. Toth</b>			

LOCATION/NOTES:



FOR MULTI-SCREEN DETAILS, SEE SHEET 2 OF 2

WELL CONSTRUCTION LOG

PROJECT/SITE:

Beazer/KI Site, Gainesville, FL

WELL ID:

FW-13B

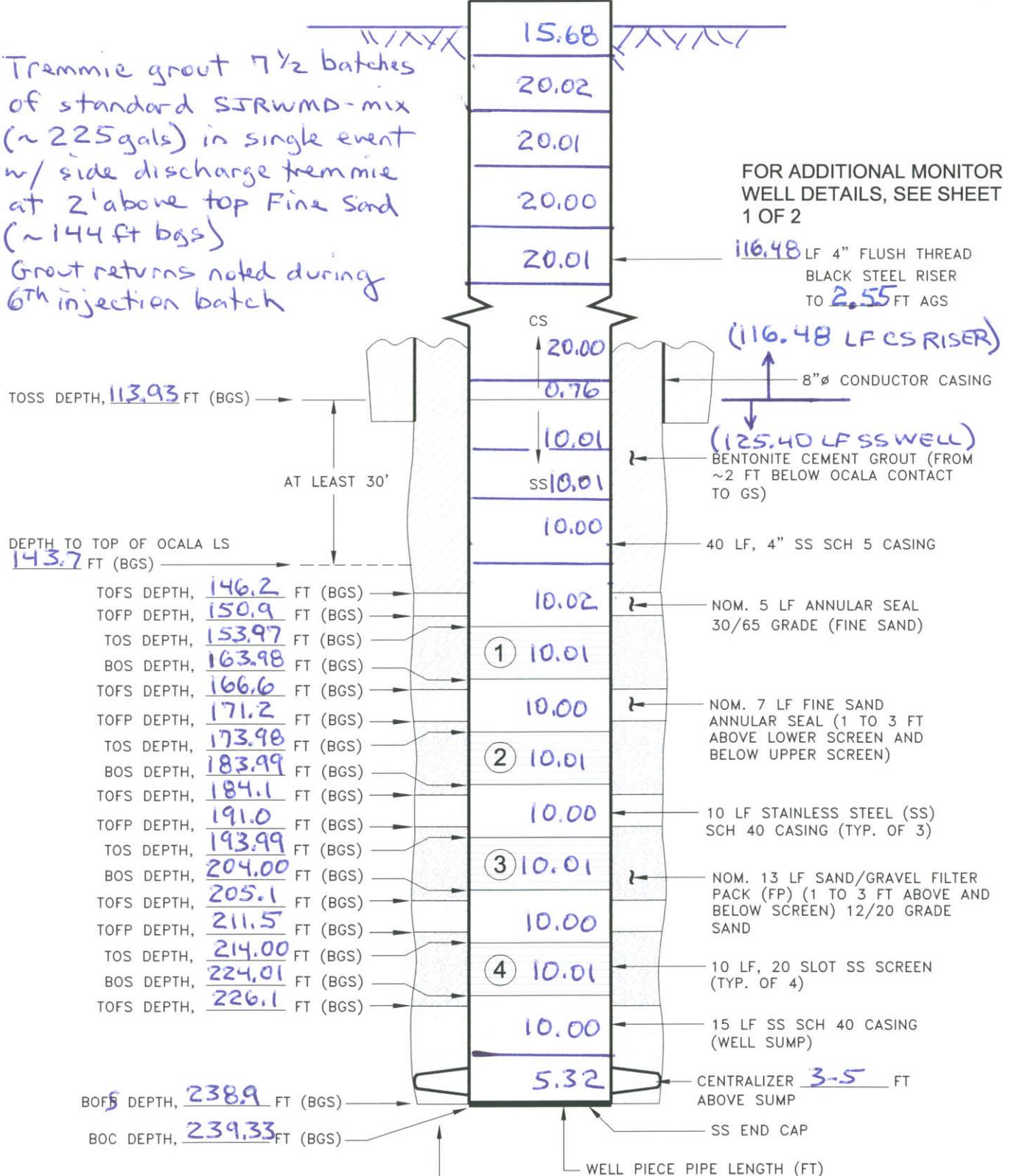
2/2

NOTES:

Tremmie grout 7 1/2 batches of standard SJRWMP-mix (~225 gals) in single event w/ side discharge tremmie at 2' above top Fine Sand (~144 ft bgs)

GROUT RETURNS NOTED DURING 6TH INJECTION BATCH

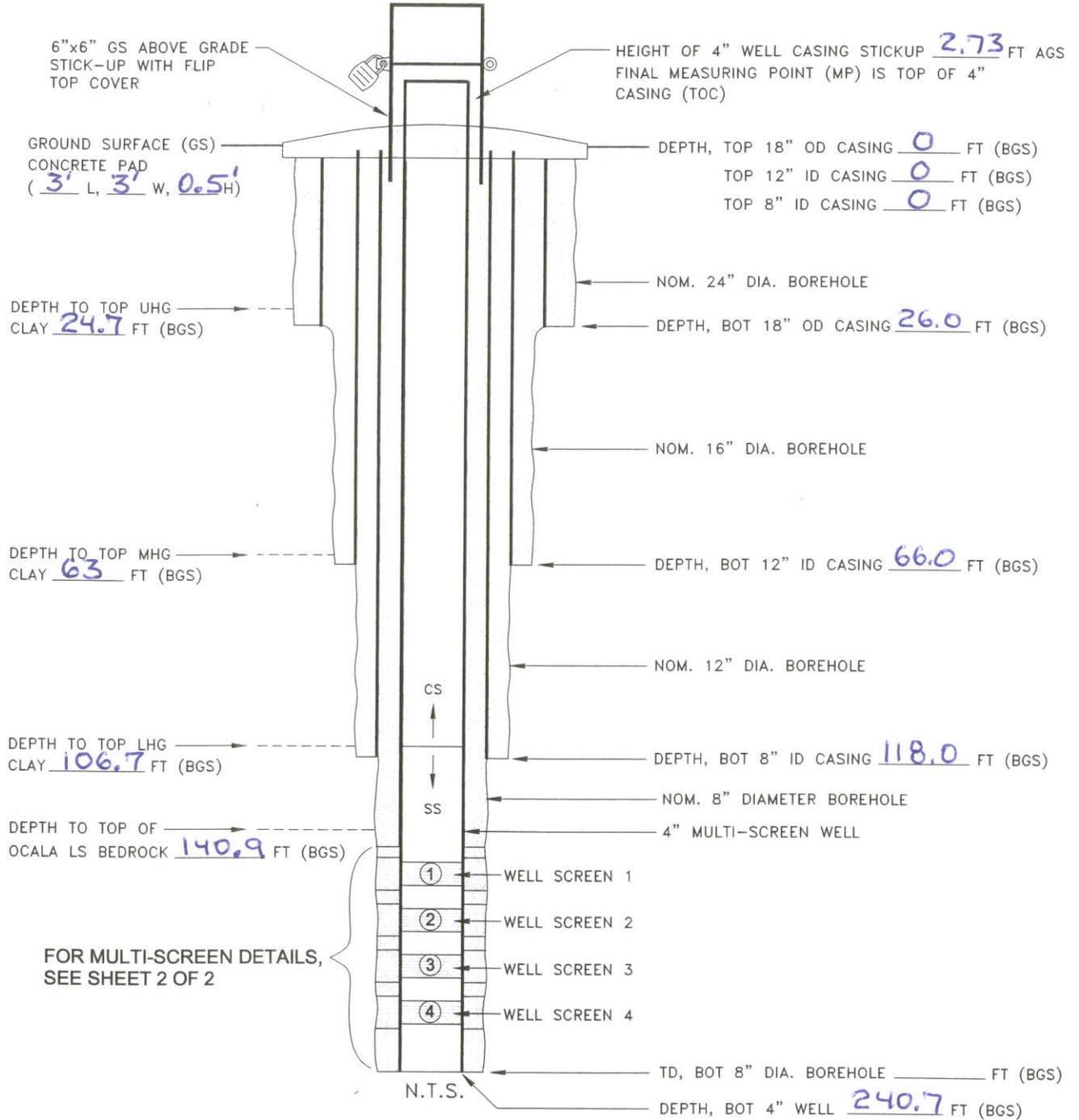
FOR ADDITIONAL MONITOR WELL DETAILS, SEE SHEET 1 OF 2



N.T.S.

WELL CONSTRUCTION LOG	PROJECT/SITE: Beazer/KI Site, Gainesville, FL		WELL ID: <b>FW-14B</b>
	OUTER CASING DRILLING CONTRACTOR: <b>PROSONIC CORP.</b> Marietta, OH	DRILLED BY: <b>L. Hunsberger</b>	DRILLING EQUIPMENT: <b>CABLE TOOL</b> (Wellmaster)
INNER CASING DRILLING CONTRACTOR: <b>PROSONIC CORP.</b> Ocala, FL	OVERSIGHT: <b>S. McGuire</b>	START/FINISH DATE: 18" Sept 21-23, 2005 12" Sept 24-27, 2005	
	DRILLED BY: <b>F. Kraus</b>	DRILLING EQUIPMENT: <b>Roto Sonic</b> (Proprietary Drill Rig)	START/FINISH DATE: 8" CS Oct 5-6, 2005 8" BORING Oct 7-8, 2005 WELL (Temp. Backfill)
OVERSIGHT: <b>J. Toth</b>		Dec 12-12, 2005 Dec 13-13, 2005	

LOCATION/NOTES:

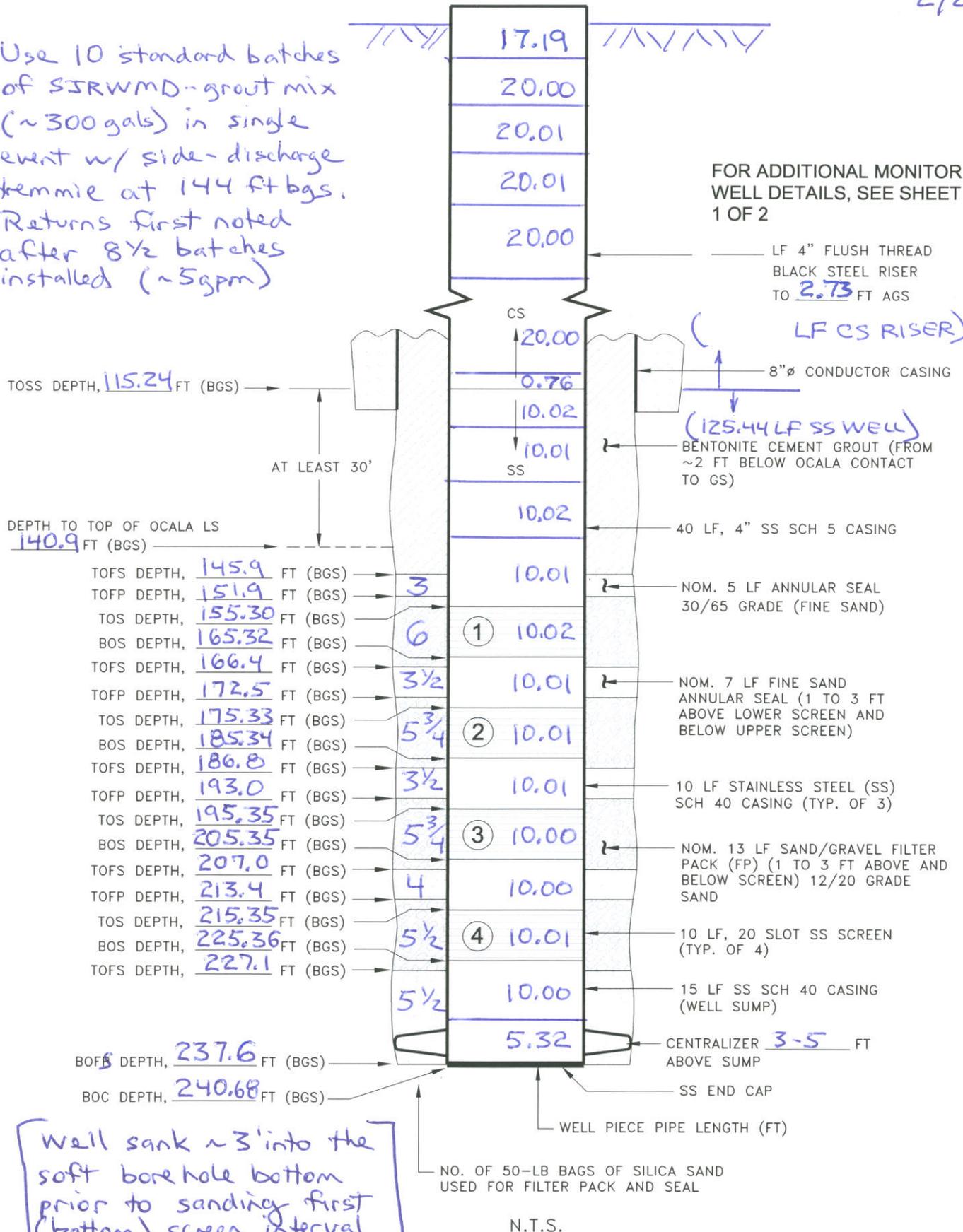


FOR MULTI-SCREEN DETAILS, SEE SHEET 2 OF 2

NOTES:

Use 10 standard batches of SJRWMD-grout mix (~300 gals) in single event w/ side-discharge kemmie at 144 ft bgs. Returns first noted after 8 1/2 batches installed (~5gpm)

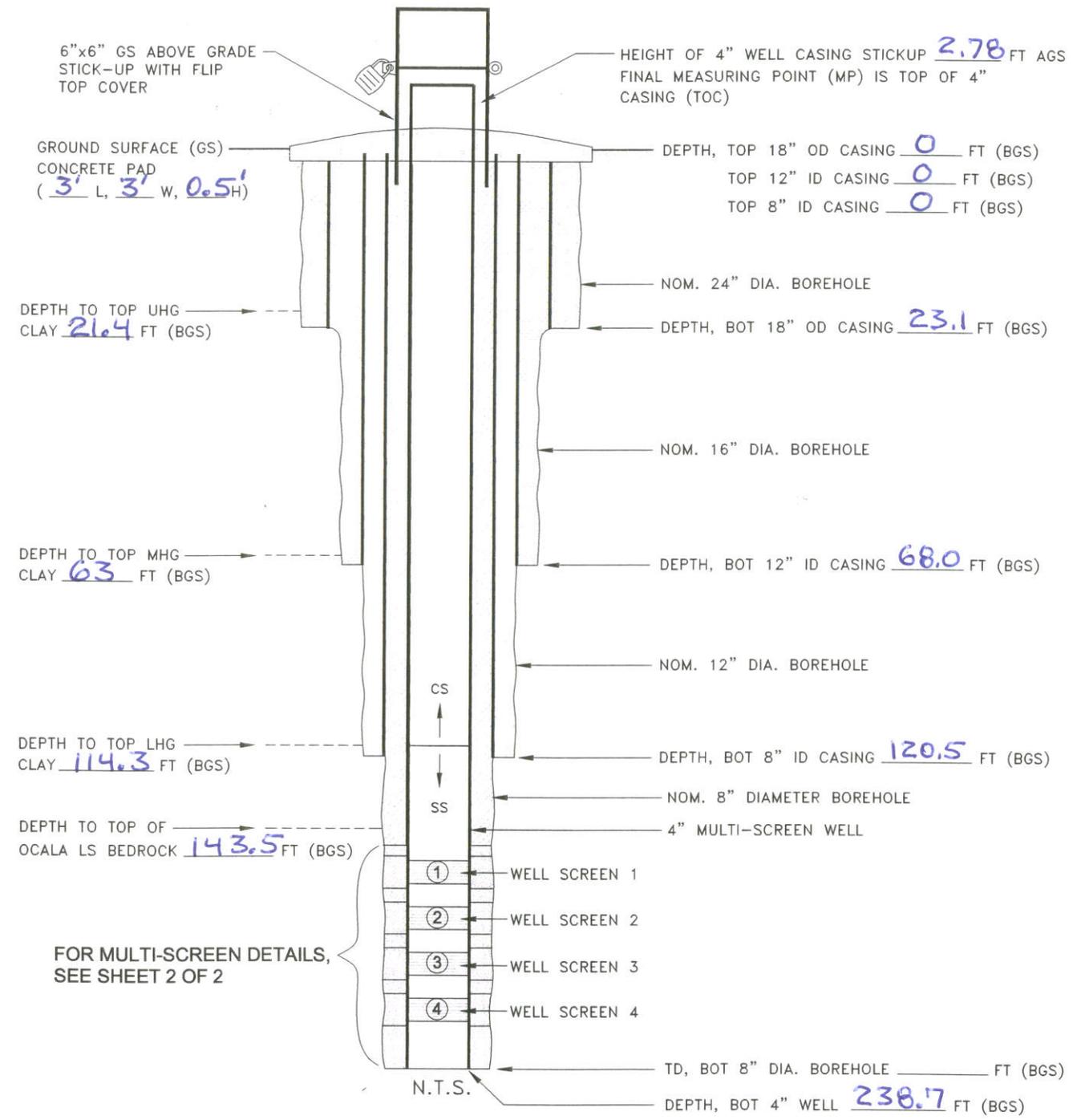
FOR ADDITIONAL MONITOR WELL DETAILS, SEE SHEET 1 OF 2



Well sank ~3' into the soft bore hole bottom prior to sanding first (bottom) screen interval

WELL CONSTRUCTION LOG	PROJECT/SITE: Beazer/KI Site, Gainesville, FL		WELL ID: <b>FW-15B</b>
	OUTER CASING DRILLING CONTRACTOR: <b>PROSONIC CORP.</b> Marietta, OH	DRILLED BY: <b>L. Hunsberger</b>	DRILLING EQUIPMENT: <b>CABLE TOOL</b> (Wellmaster)
INNER CASING DRILLING CONTRACTOR: <b>PROSONIC CORP.</b> Ocala, FL	OVERSIGHT: <b>S. McGuire</b>	START/FINISH DATE: 18" <b>9/28/05-10/05/05</b> 12" <b>10/06/05-10/09/05</b>	
	DRILLED BY: <b>F. Kraus</b>	DRILLING EQUIPMENT: <b>Roto Sonic</b> (Proprietary Drill Rig)	START/FINISH DATE: 8" CS <b>10/12/05-10/13/05</b> 8" BORING <b>1/4/06-1/5/06</b> WELL <b>1/5/06-1/6/06</b>
OVERSIGHT: <b>J. Toth</b>			

LOCATION/NOTES:



**WELL CONSTRUCTION LOG**

PROJECT/SITE:

Beazer/KI Site, Gainesville, FL

WELL ID:

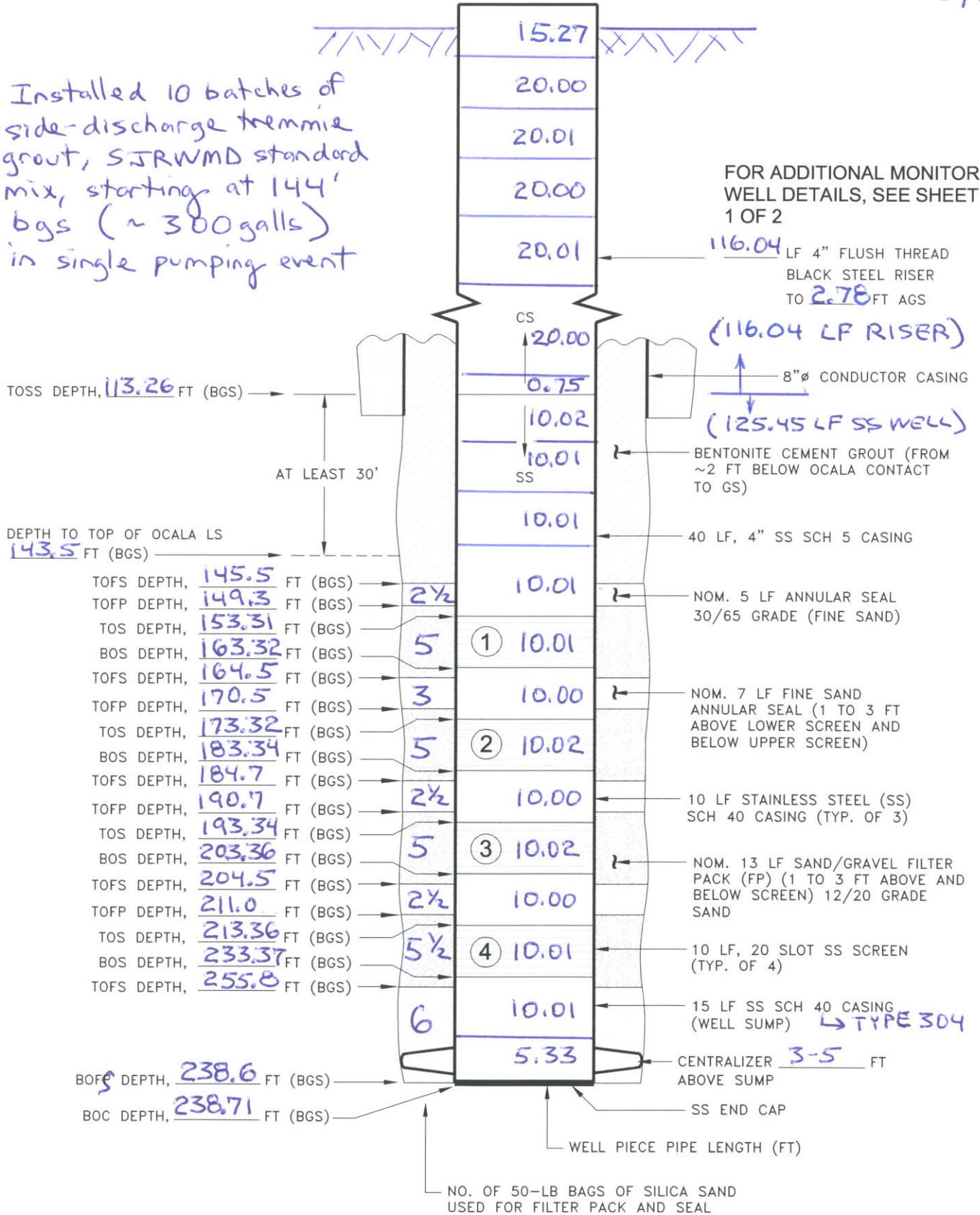
FW-15B

2/2

NOTES:

Installed 10 batches of side-discharge tremmie grout, SJRWMD standard mix, starting at 144' bgs (~300 galls) in single pumping event

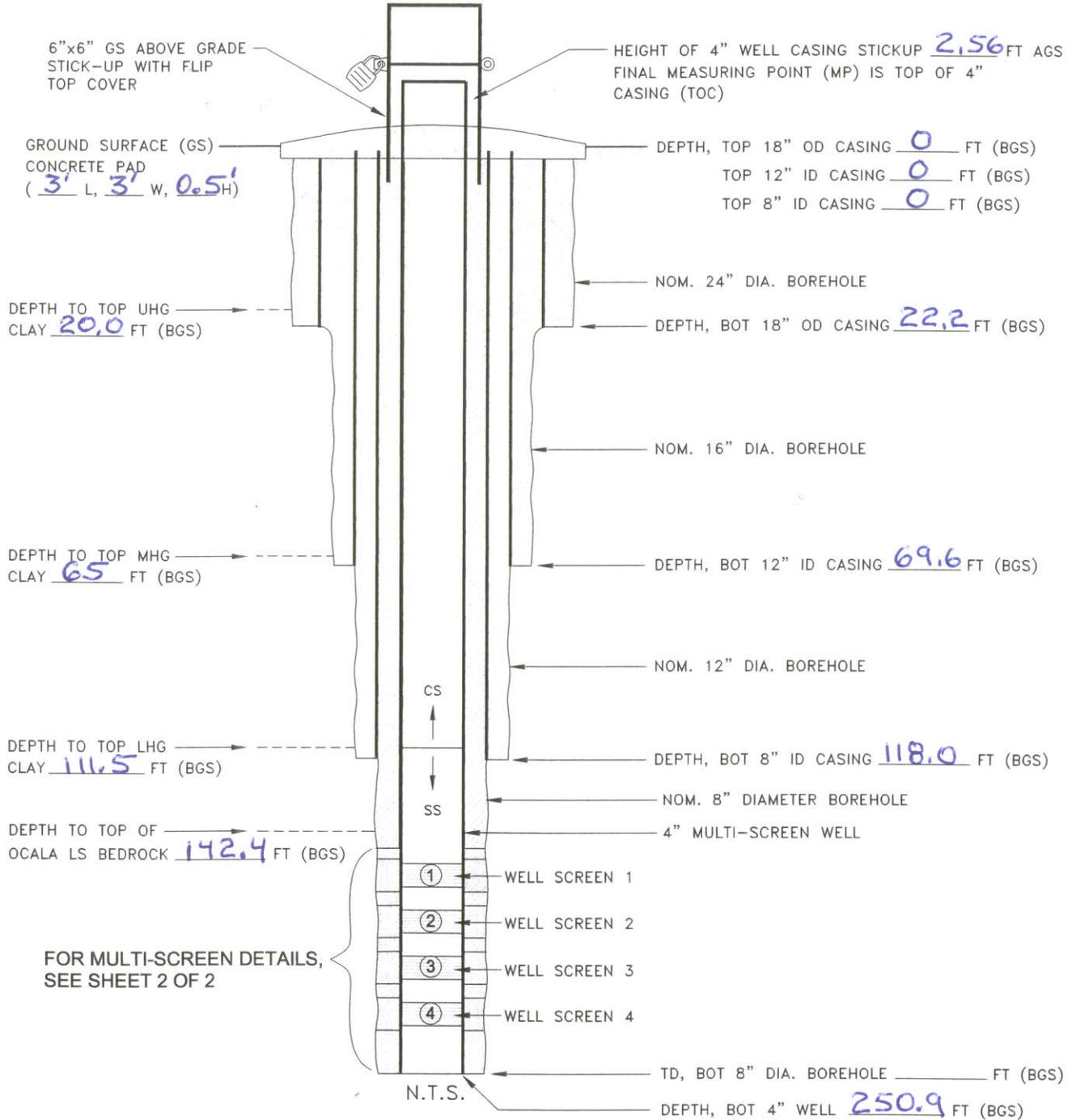
FOR ADDITIONAL MONITOR WELL DETAILS, SEE SHEET 1 OF 2



N.T.S.

WELL CONSTRUCTION LOG	PROJECT/SITE: Beazer/KI Site, Gainesville, FL		WELL ID: <b>FW-16B</b>
	OUTER CASING DRILLING CONTRACTOR: <b>PROSONIC CORP.</b> Marietta, OH	DRILLED BY: <b>L. Hunsberger</b> OVERSIGHT: <b>S. McGuire</b>	DRILLING EQUIPMENT: <b>CABLE TOOL</b> <b>(Wellmaster)</b>
INNER CASING DRILLING CONTRACTOR: <b>PROSONIC CORP.</b> Ocala, FL	DRILLED BY: <b>F. Kraus</b> OVERSIGHT: <b>J. Toth &amp; B. Shine</b>	DRILLING EQUIPMENT: <b>Roto Sonic</b> <b>(Proprietary)</b> <b>Drill Rig</b>	START/FINISH DATE: 18" <b>Oct 10-11, 2005</b> 12" <b>Oct 12-23, 2005</b>
START/FINISH DATE: 8" CS <b>Nov 1-2, 2005</b> 8" BORING <b>Nov 3-4, 2005</b> WELL <b>Nov 4-10, 2005</b>			

LOCATION/NOTES:



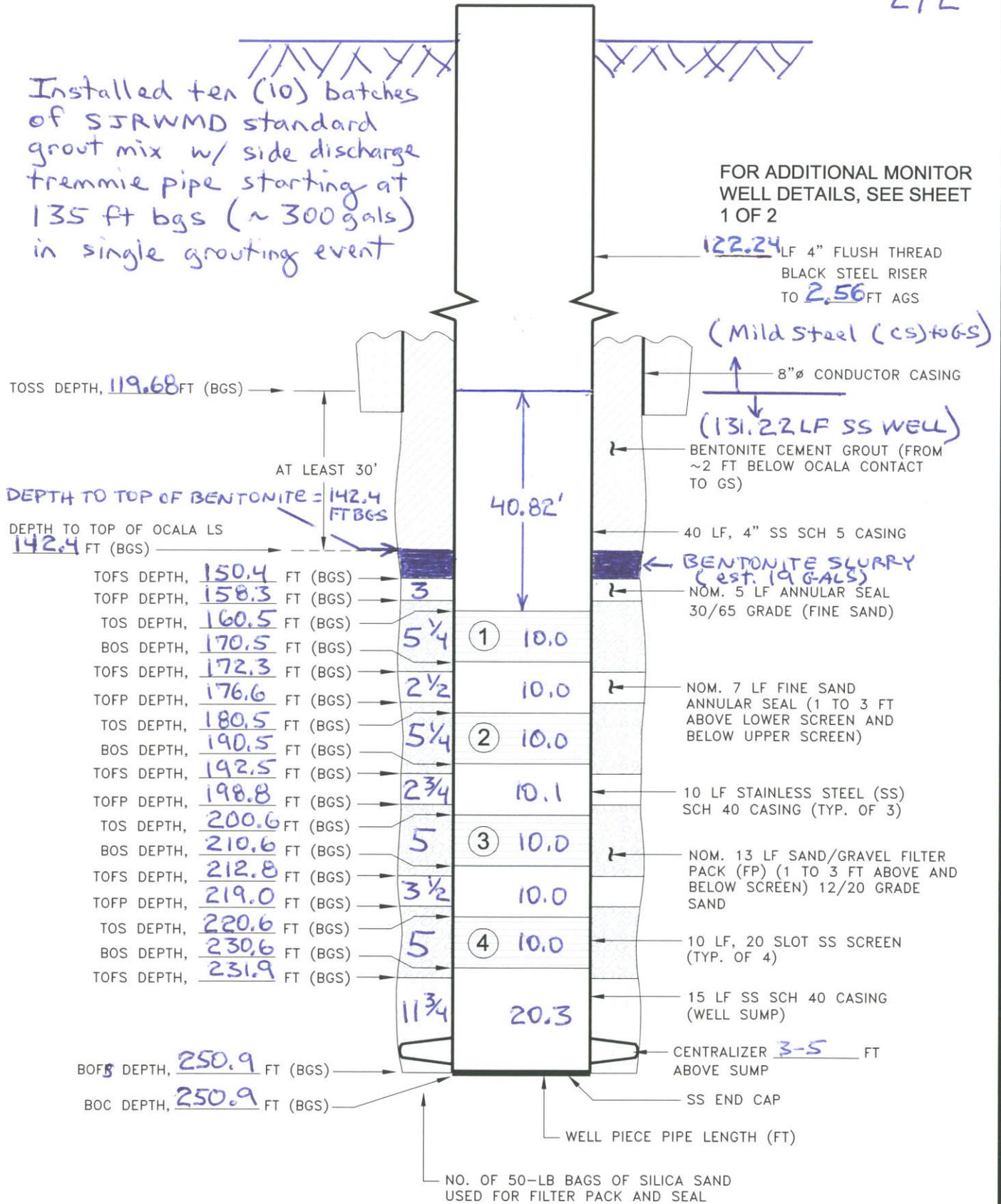
FOR MULTI-SCREEN DETAILS, SEE SHEET 2 OF 2

2/2

NOTES:

Installed ten (10) batches of SJRWMD standard grout mix w/ side discharge tremmie pipe starting at 135 ft bgs (~300 gals) in single grouting event

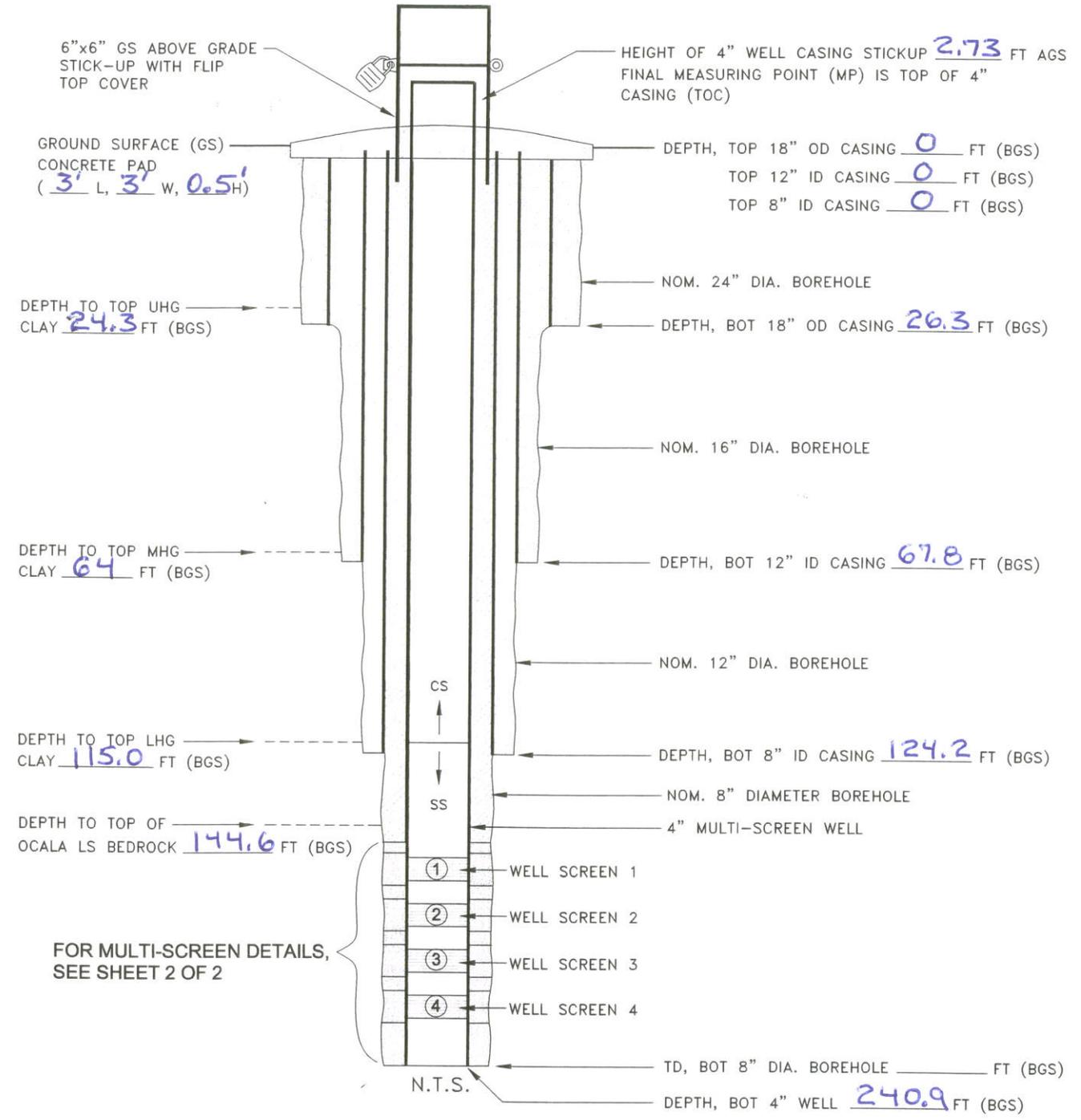
FOR ADDITIONAL MONITOR WELL DETAILS, SEE SHEET 1 OF 2



N.T.S.

WELL CONSTRUCTION LOG	PROJECT/SITE: Beazer/KI Site, Gainesville, FL		WELL ID: <b>FW-17B</b>
	OUTER CASING DRILLING CONTRACTOR: <b>PROSONIC CORP.</b> Marietta, OH	DRILLED BY: <b>L. Hunsberger</b>	DRILLING EQUIPMENT: <b>CABLE TOOL</b> (Wellmaster)
INNER CASING DRILLING CONTRACTOR: <b>PROSONIC CORP.</b> Ocala, FL	OVERSIGHT: <b>S. McGuire</b>	START/FINISH DATE: 18" 10/24/05-10/26/05 12" 10/27/05-11/3/05	
	DRILLED BY: <b>F. Kraus</b>	DRILLING EQUIPMENT: <b>Roto Sonic</b> (Proprietary Drill Rig)	START/FINISH DATE: 8" CS 1/10/06-1/11/06 8" BORING 1/22/06-1/23/06 WELL 1/23/06-1/24/06
OVERSIGHT: <b>J. Toth</b>			

LOCATION/NOTES:



**WELL CONSTRUCTION LOG**

PROJECT/SITE:

Beazer/KI Site, Gainesville, FL

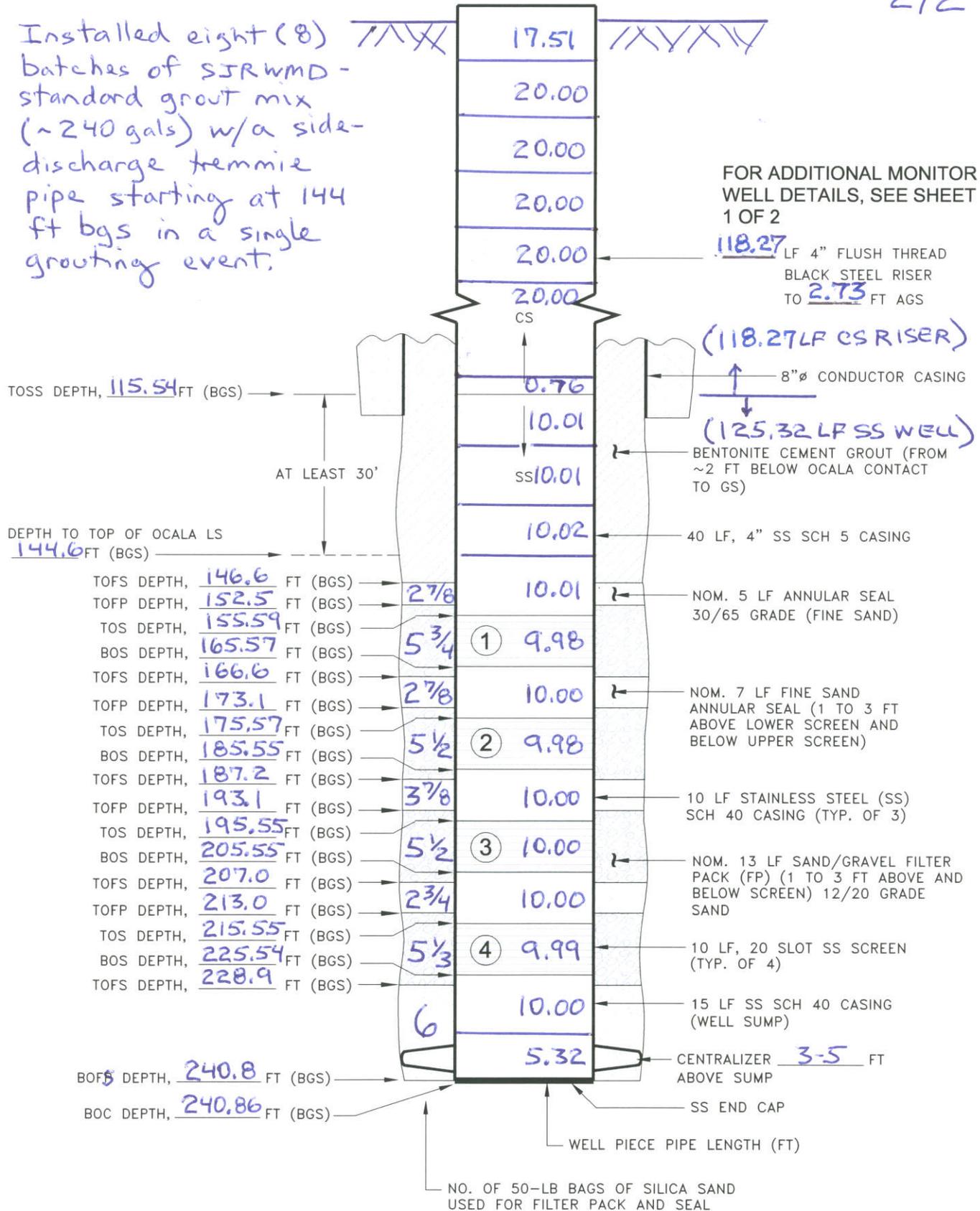
WELL ID:

FW-17B

NOTES:

Installed eight (8) batches of SJRWMD - standard grout mix (~240 gals) w/a side-discharge tremmie pipe starting at 144 ft bgs in a single grouting event.

2/2



**WELL CONSTRUCTION LOG**

PROJECT/SITE:  
Beazer/KI Site, Gainesville, FL

WELL ID:  
**FW-18B**

OUTER CASING DRILLING CONTRACTOR:  
**PROSONIC CORP.**  
Marietta, OH

DRILLED BY:  
**L. Hunsberger**  
OVERSIGHT:  
**S. McGuire**

DRILLING EQUIPMENT:  
**CABLE TOOL**  
**(Wellmaster)**

START/FINISH DATE:  
18" 11-21-05/12-08-05  
12" 12-09-05/12-12-05

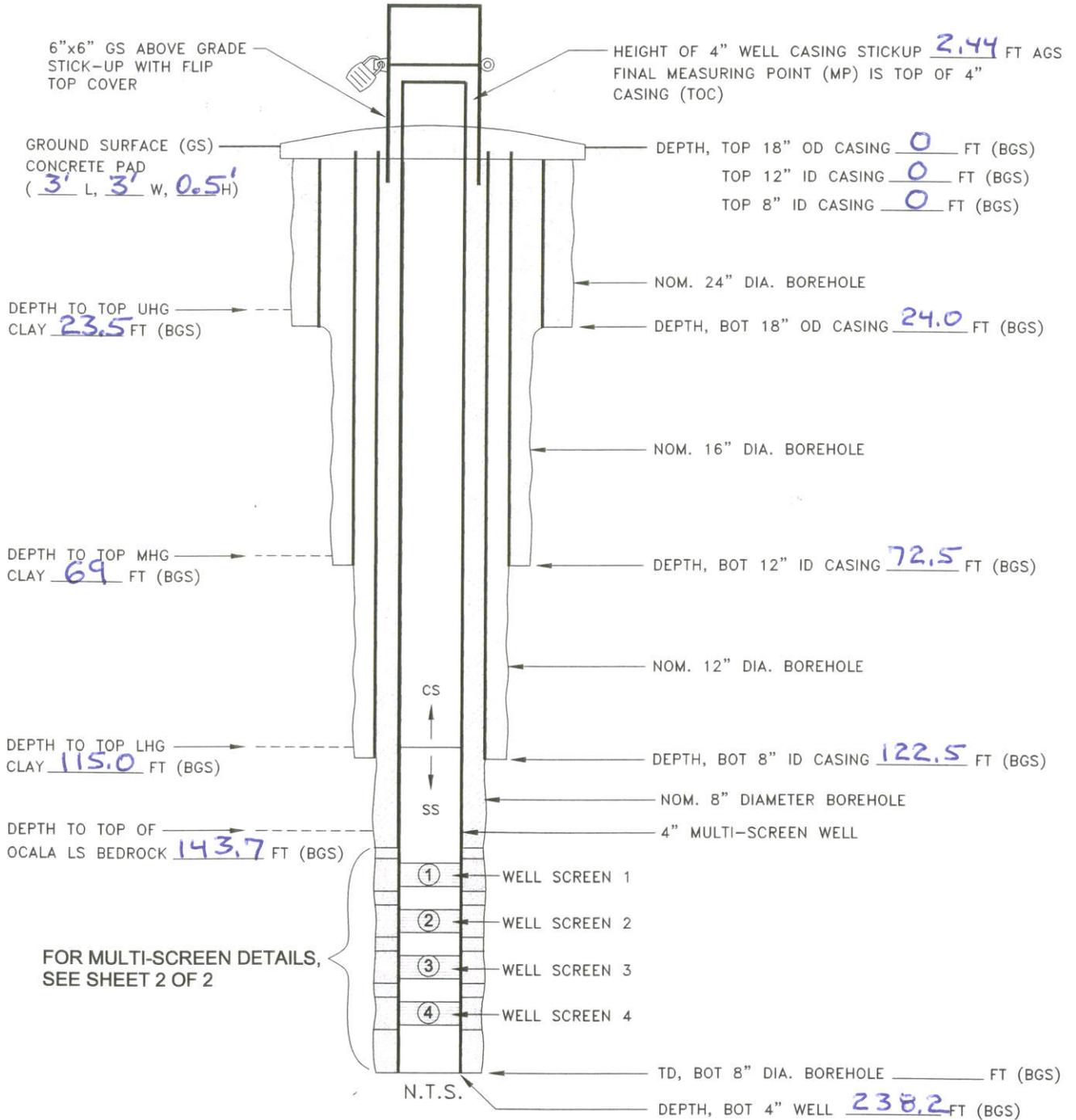
INNER CASING DRILLING CONTRACTOR:  
**PROSONIC CORP.**  
Ocala, FL

DRILLED BY:  
**F. Kraus**  
OVERSIGHT:  
**J. Toth**

DRILLING EQUIPMENT:  
**Roto Sonic**  
**(Proprietary)**  
**Drill Rig**

START/FINISH DATE:  
8" CS 1-12-06/1-18-06  
8" BORING 2-2-06/2-3-06  
WELL 2-3-06/2-4-06

LOCATION/NOTES:



**WELL CONSTRUCTION LOG**

PROJECT/SITE:  
Beazer/KI Site, Gainesville, FL

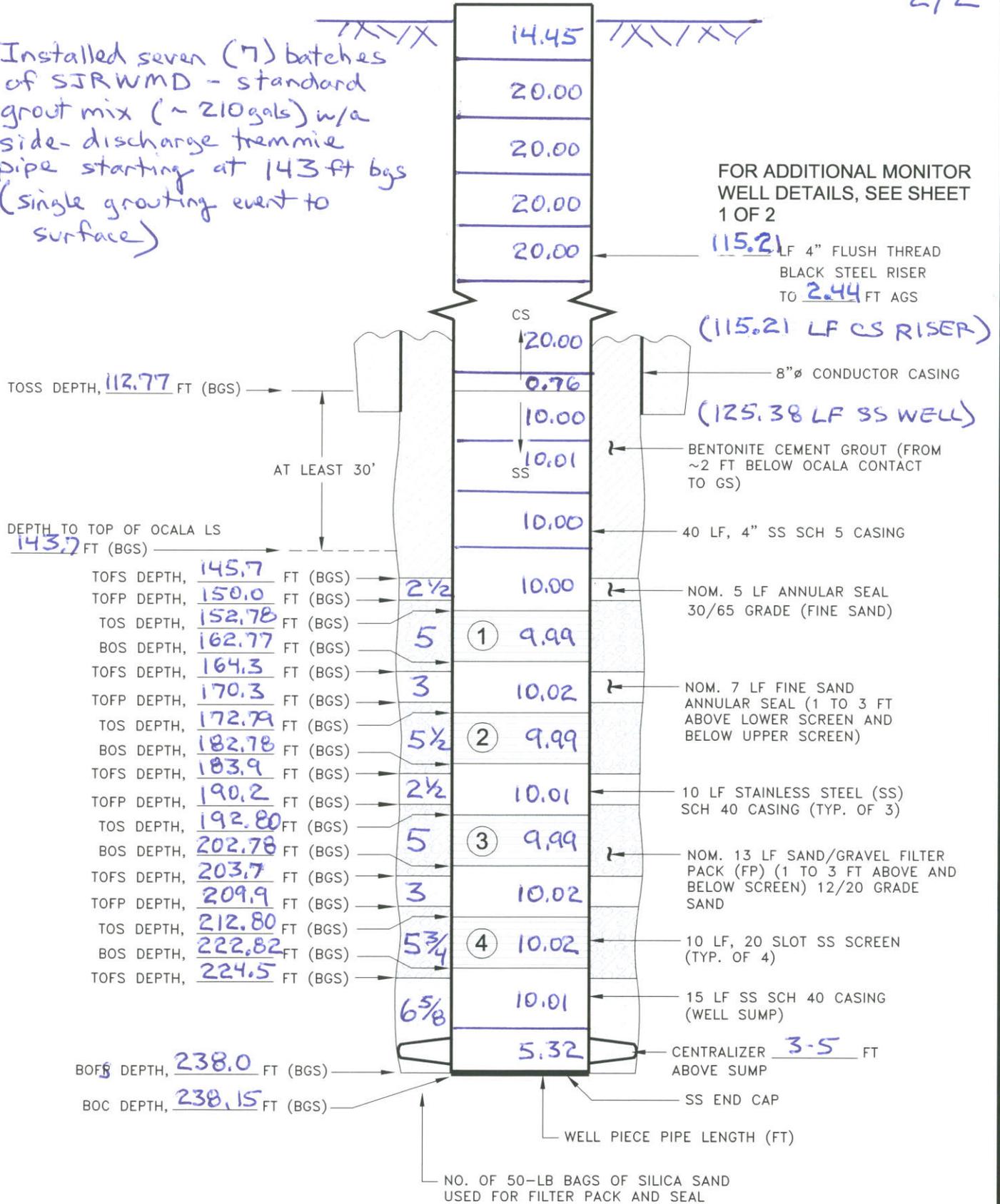
WELL ID:  
**FW-18B**

NOTES:

2/2

Installed seven (7) batches of SJRWMD - standard grout mix (~ 210gals) w/a side-discharge tremmie pipe starting at 143 ft bgs (single grouting event to surface)

FOR ADDITIONAL MONITOR WELL DETAILS, SEE SHEET 1 OF 2



N.T.S.

**WELL CONSTRUCTION LOG**

PROJECT/SITE:  
Beazer/KI Site, Gainesville, FL

WELL ID:  
**FW-19B**

OUTER CASING DRILLING CONTRACTOR:  
**PROSONIC CORP.**  
Marietta, OH

DRILLED BY:  
**L. Hunsberger**  
OVERSIGHT:  
**S. McGuire**

DRILLING EQUIPMENT:  
**CABLE TOOL**  
**(Wellmaster)**

START/FINISH DATE:  
18" **12-13-05/12-14-05**  
12" **12-15-05/12-17-05**

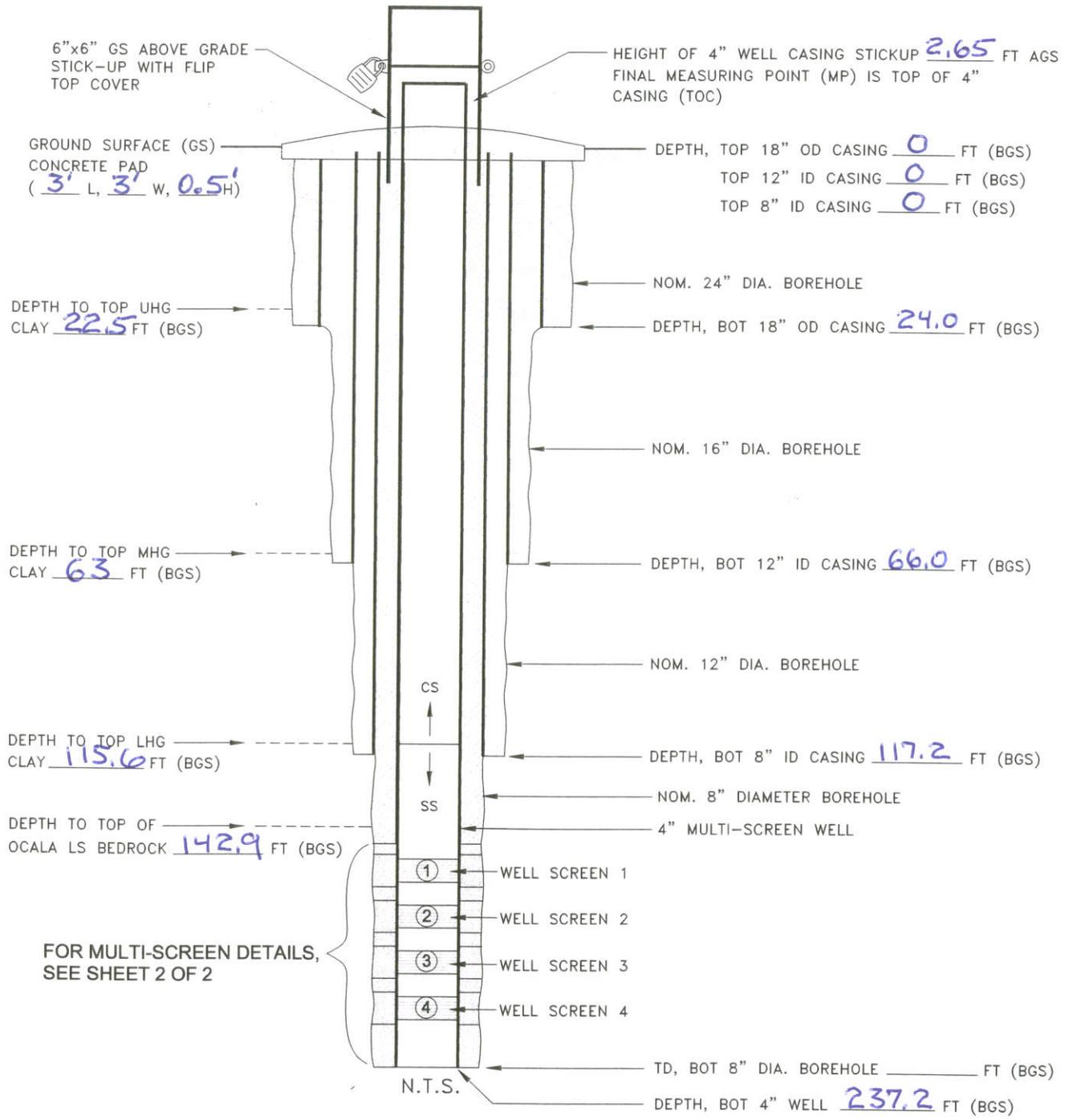
INNER CASING DRILLING CONTRACTOR:  
**PROSONIC CORP.**  
Ocala, FL

DRILLED BY:  
**F. Kraus**  
OVERSIGHT:  
**J. Toth**

DRILLING EQUIPMENT:  
**Roto Sonic**  
**(Proprietary)**  
**Drill Rig**

START/FINISH DATE:  
8" CS **1-8-06/1-9-06**  
8" BORING **1-31-06/1-31-06**  
WELL **2-1-06/2-1-06**

LOCATION/NOTES:



**WELL CONSTRUCTION LOG**

PROJECT/SITE:

Beazer/KI Site, Gainesville, FL

WELL ID:

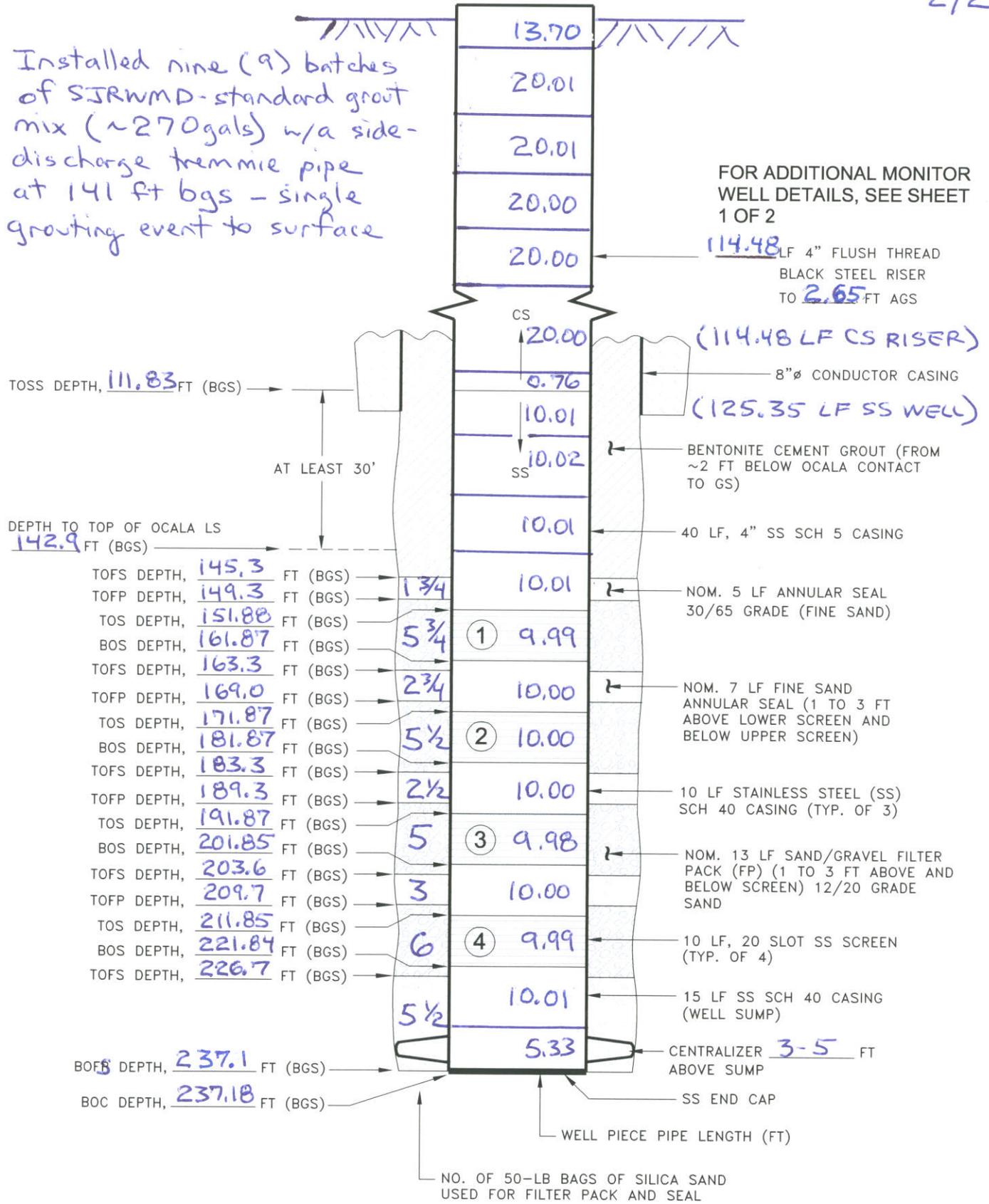
FW-19B

NOTES:

2/2

Installed nine (9) batches of SJRWMD-standard grout mix (~270gals) w/a side-discharge tremmie pipe at 141 ft bgs - single grouting event to surface

FOR ADDITIONAL MONITOR WELL DETAILS, SEE SHEET 1 OF 2



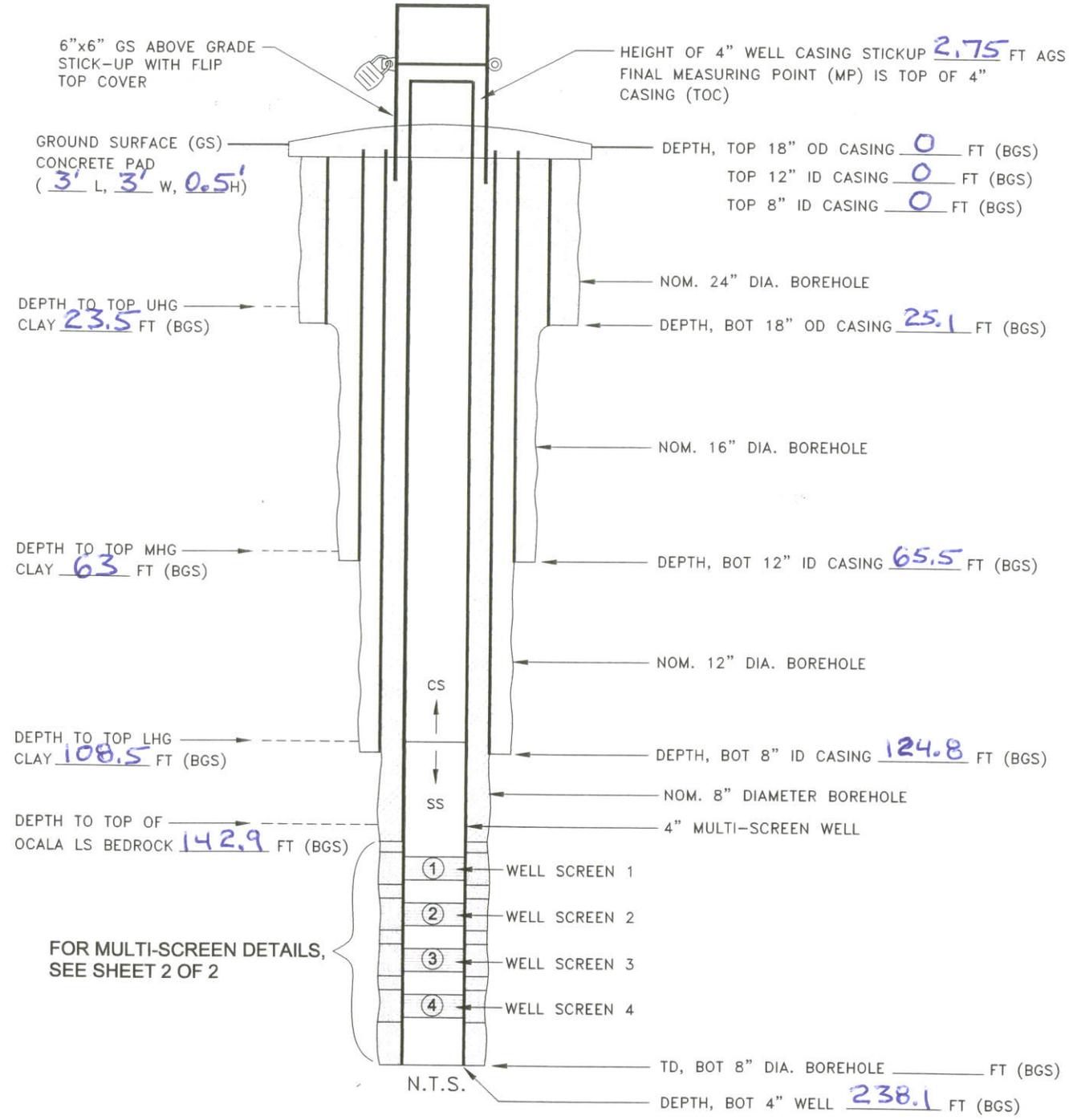
TOFS DEPTH,	145.3	FT (BGS)	1 3/4	
TOFP DEPTH,	149.3	FT (BGS)		
TOS DEPTH,	151.80	FT (BGS)	5 3/4	①
BOS DEPTH,	161.87	FT (BGS)		
TOFS DEPTH,	163.3	FT (BGS)	2 3/4	
TOFP DEPTH,	169.0	FT (BGS)		
TOS DEPTH,	171.87	FT (BGS)	5 1/2	②
BOS DEPTH,	181.87	FT (BGS)		
TOFS DEPTH,	183.3	FT (BGS)	2 1/2	
TOFP DEPTH,	189.3	FT (BGS)		
TOS DEPTH,	191.87	FT (BGS)	5	③
BOS DEPTH,	201.85	FT (BGS)		
TOFS DEPTH,	203.6	FT (BGS)	3	
TOFP DEPTH,	209.7	FT (BGS)		
TOS DEPTH,	211.85	FT (BGS)	6	④
BOS DEPTH,	221.84	FT (BGS)		
TOFS DEPTH,	226.7	FT (BGS)	5 1/2	

BOFS DEPTH, 237.1 FT (BGS)  
 BOC DEPTH, 237.18 FT (BGS)

N.T.S.

<b>WELL CONSTRUCTION LOG</b>	PROJECT/SITE: Beazer/KI Site, Gainesville, FL		WELL ID: <b>FW-20B</b>
OUTER CASING DRILLING CONTRACTOR: <b>PROSONIC CORP.</b> Marietta, OH	DRILLED BY: <b>L. Hunsberger</b>	DRILLING EQUIPMENT: <b>CABLE TOOL</b> (Wellmaster)	START/FINISH DATE: 18" 11-4-05/11-6-05
	OVERSIGHT: <b>S. McGuire</b>		12" 11-7-05/11-9-05
INNER CASING DRILLING CONTRACTOR: <b>PROSONIC CORP.</b> Ocala, FL	DRILLED BY: <b>F. Kraus</b>	DRILLING EQUIPMENT: <b>Roto Sonic</b> (Proprietary Drill Rig)	START/FINISH DATE: 8" CS 1-18-06/1-19-06
	OVERSIGHT: <b>J. Toth</b>		8" BORING 2-15-06/2-15-06 WELL 2-16-06/2-16-06

LOCATION/NOTES:

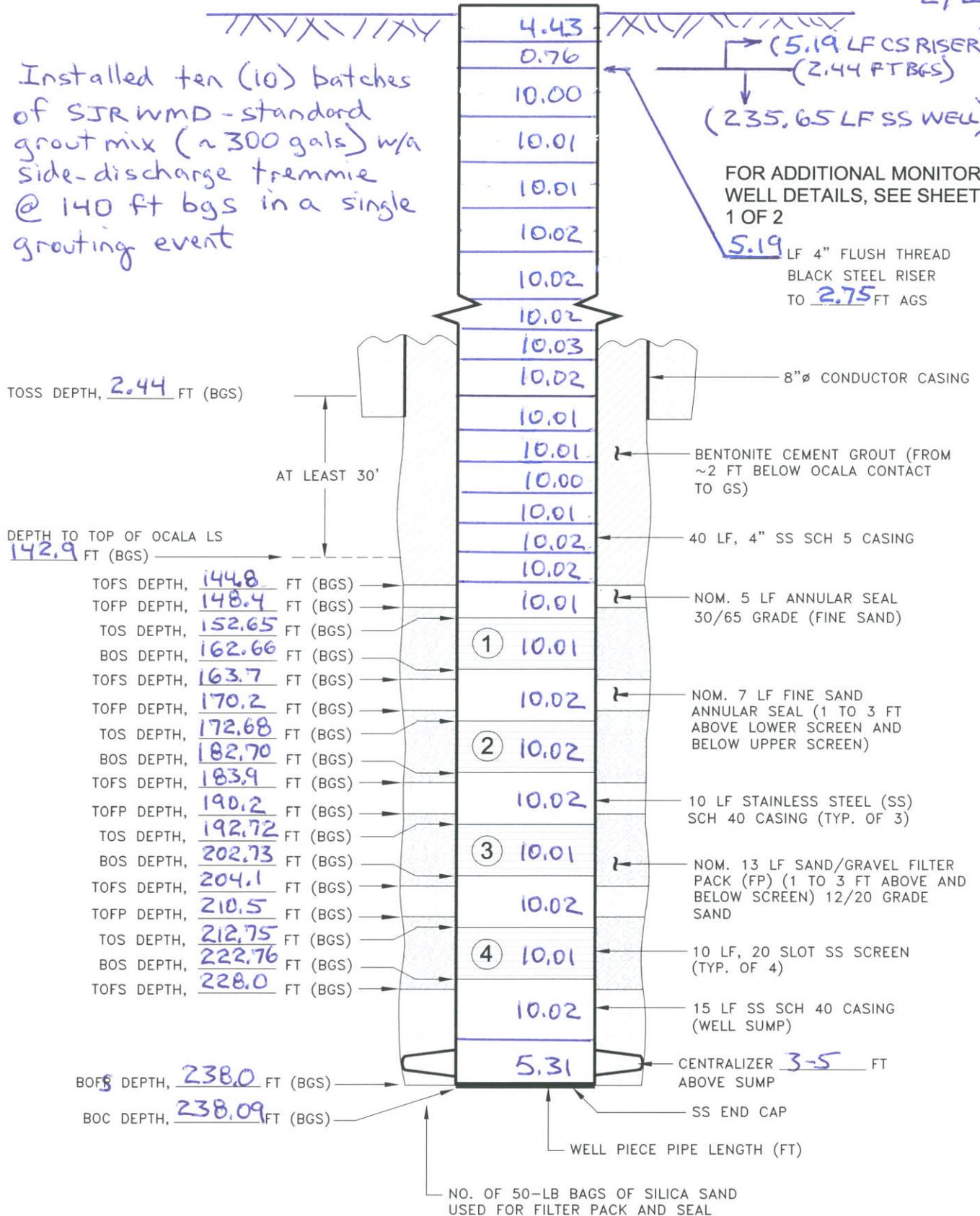


FOR MULTI-SCREEN DETAILS, SEE SHEET 2 OF 2

NOTES:

Installed ten (10) batches of SJRWMD-standard grout mix (~300 gals) w/a side-discharge tremmie @ 140 ft bgs in a single grouting event

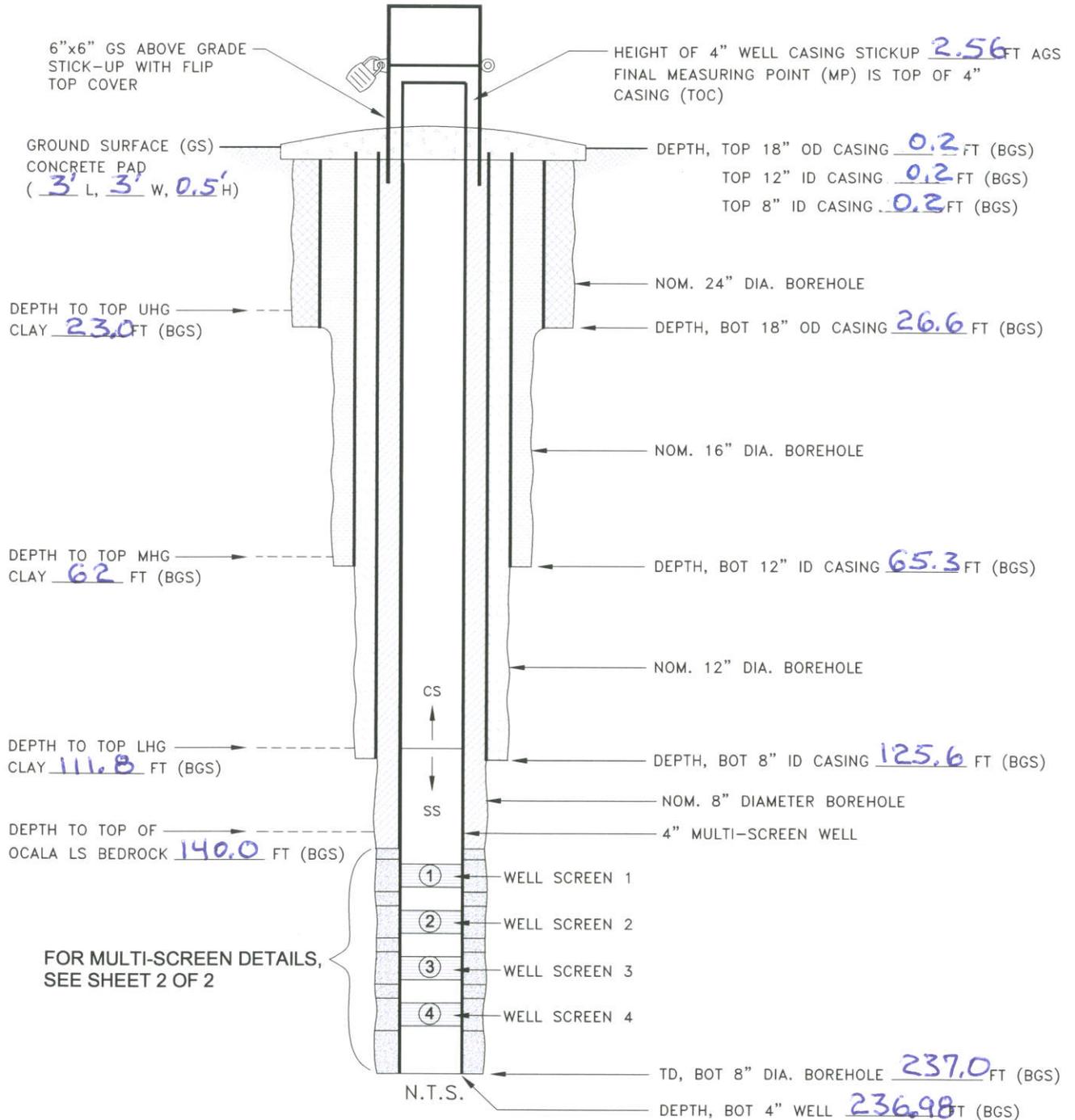
2/2



N.T.S.

<b>WELL CONSTRUCTION LOG</b>	PROJECT/SITE: Beazer/KI Site, Gainesville, FL		WELL ID: <b>FW-21B</b>
OUTER CASING DRILLING CONTRACTOR: <b>Prosonic</b> Marietta, OH	DRILLED BY: <b>Hunsberger</b>	DRILLING EQUIPMENT: <b>Cable Tool</b> (Wellmaster)	START/FINISH DATE: 18" 11/10/05-11/17/05
	OVERSIGHT: <b>S. McGuire</b>		12" 11/18/05-11/20/05
INNER CASING DRILLING CONTRACTOR: <b>Prosonic</b> Ocala, FL	DRILLED BY: <b>Kraus</b>	DRILLING EQUIPMENT: <b>Roto Sonie</b> (Proprietary Rig)	8" CS 1/20/06-1/21/06
	OVERSIGHT: <b>J. Toth</b>		8" BORING 2/05/06-2/06/06 WELL 2/06/06-2/08/06

LOCATION/NOTES:



NOTES:

Installed Tremmie Grout in two stages:

Stage 1: 2/07/06 ~50 gals of Grout ~10 LF above Bot 8" CS

Stage 2: 2/08/06 ~210 gals of Grout to GS

(Grout mix is standard) SJRWMD

TOSS DEPTH, 111.57 FT (BGS)

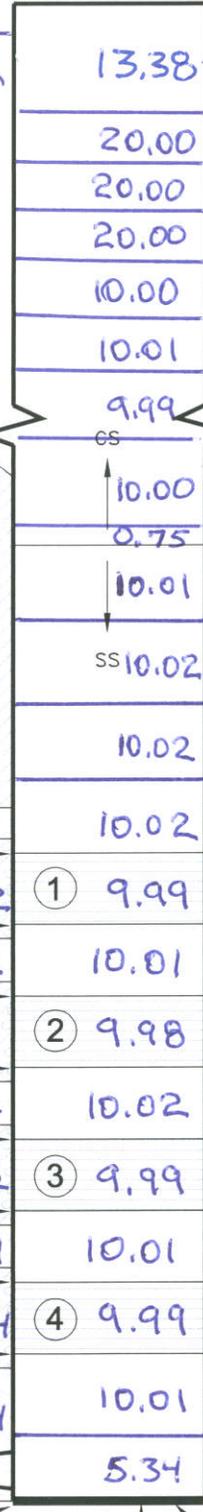
AT LEAST 30'

DEPTH TO TOP OF OCALA LS 140.0 FT (BGS)

TOFS DEPTH,	142.0	FT (BGS)
TOFP DEPTH,	148.6	FT (BGS)
TOS DEPTH,	151.64	FT (BGS)
BOS DEPTH,	161.63	FT (BGS)
TOFS DEPTH,	163.0	FT (BGS)
TOFP DEPTH,	168.6	FT (BGS)
TOS DEPTH,	171.64	FT (BGS)
BOS DEPTH,	181.62	FT (BGS)
TOFS DEPTH,	182.9	FT (BGS)
TOFP DEPTH,	189.0	FT (BGS)
TOS DEPTH,	191.64	FT (BGS)
BOS DEPTH,	201.63	FT (BGS)
TOFS DEPTH,	203.1	FT (BGS)
TOFP DEPTH,	209.0	FT (BGS)
TOS DEPTH,	211.64	FT (BGS)
BOS DEPTH,	221.63	FT (BGS)
TOFS DEPTH,	223.8	FT (BGS)

BOFB DEPTH, 236.98 FT (BGS)

BOC DEPTH, 236.98 FT (BGS)



FOR ADDITIONAL MONITOR WELL DETAILS, SEE SHEET 1 OF 2

114.13 LF 4" FLUSH THREAD BLACK STEEL RISER TO 2.56 FT AGS

(114.13 LF OF CS RISER)

8"Ø CONDUCTOR CASING

(125.41 LF OF SS WELL)

BENTONITE CEMENT GROUT (FROM ~2 FT BELOW OCALA CONTACT TO GS)

40 LF, 4" SS SCH 5 CASING

NOM. 5 LF ANNULAR SEAL 30/65 GRADE (FINE SAND)

NOM. 7 LF FINE SAND ANNULAR SEAL (1 TO 3 FT ABOVE LOWER SCREEN AND BELOW UPPER SCREEN)

10 LF STAINLESS STEEL (SS) SCH 40 CASING (TYP. OF 3)

NOM. 13 LF SAND/GRAVEL FILTER PACK (FP) (1 TO 3 FT ABOVE AND BELOW SCREEN) 12/20 GRADE SAND

10 LF, 20 SLOT SS SCREEN (TYP. OF 4)

15 LF SS SCH 40 CASING (WELL SUMP)

CENTRALIZER 3-5 FT ABOVE SUMP

SS END CAP

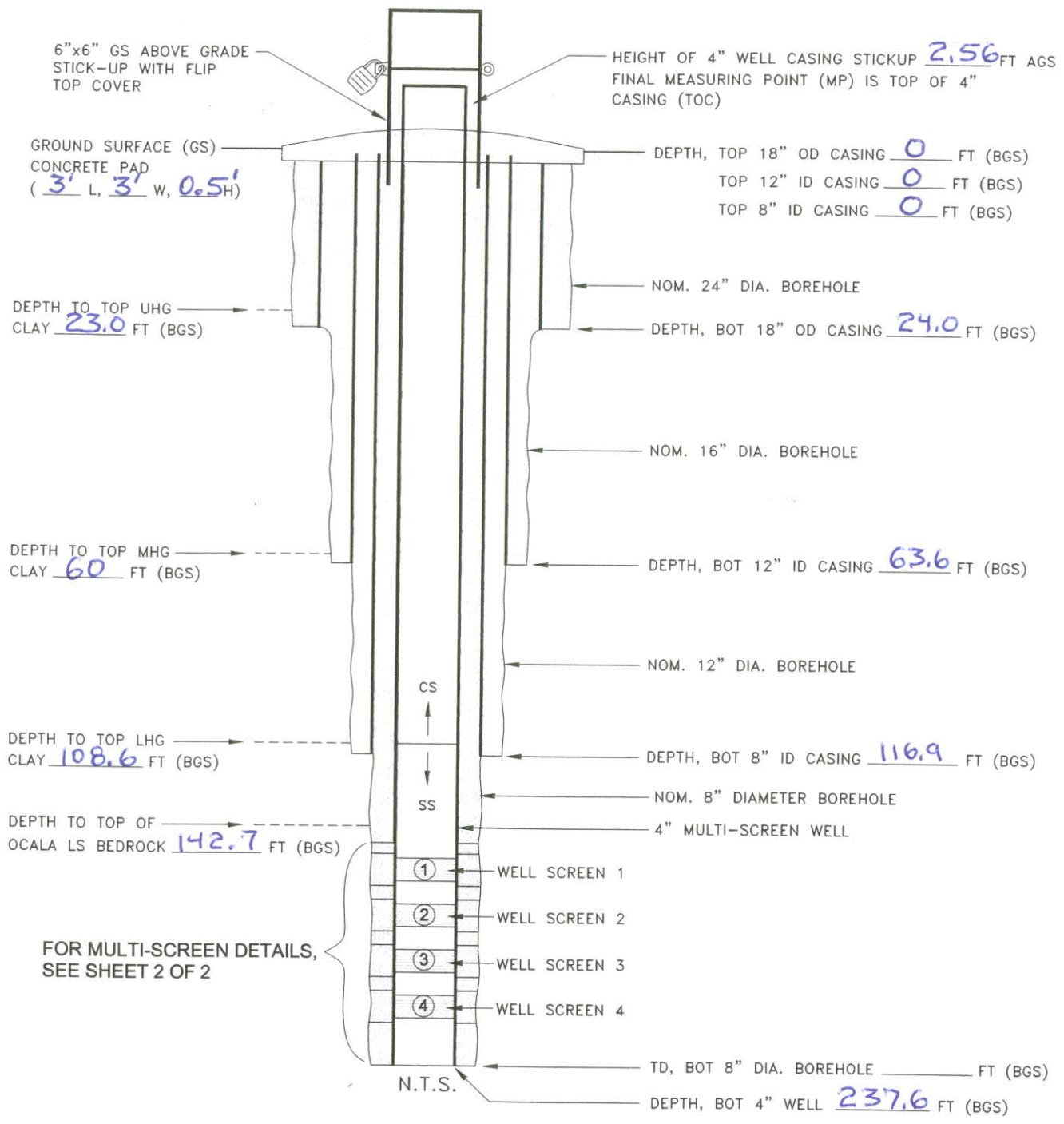
WELL PIECE PIPE LENGTH (FT)

NO. OF 50-LB BAGS OF SILICA SAND USED FOR FILTER PACK AND SEAL

N.T.S.

<b>WELL CONSTRUCTION LOG</b>	PROJECT/SITE: Beazer/KI Site, Gainesville, FL		WELL ID: <b>FW-22B</b>
OUTER CASING DRILLING CONTRACTOR: <b>PROSONIC CORP.</b> Marietta, OH	DRILLED BY: <b>L. Hunsberger</b>	DRILLING EQUIPMENT: <b>CABLE TOOL</b> (Wellmaster)	START/FINISH DATE: 18" <b>3-2-06/3-4-06</b>
	OVERSIGHT: <b>S. McGuire</b>		12" <b>3-5-06/3-8-06</b>
INNER CASING DRILLING CONTRACTOR: <b>PROSONIC CORP.</b> Ocala, FL	DRILLED BY: <b>F. Kraus</b>	DRILLING EQUIPMENT: <b>Roto Sonic</b> (Proprietary Drill Rig)	START/FINISH DATE: 8" CS <b>3-14-06/3-15-06</b>
	OVERSIGHT: <b>J. Toth</b>		8" BORING <b>3-16-06/3-17-06</b> WELL <b>3-17-06/3-20-06</b>

LOCATION/NOTES:



**WELL CONSTRUCTION LOG**

PROJECT/SITE:

Beazer/KI Site, Gainesville, FL

WELL ID:

FW-22B

NOTES:

Installed ten and a half (10.5) batches of SJRWMD-standard grout mix (~315gal) w/a side discharge tremmie at 140 ft bgs in a single event. (Returns first noted after 7 batches of water)

2/2

(4.86 LF CS RISER) (2.3' BGS)  
(235.28 LF SS WELL)

FOR ADDITIONAL MONITOR WELL DETAILS, SEE SHEET 1 OF 2

4.86 LF 4" FLUSH THREAD BLACK STEEL RISER TO 2.56 FT AGS

TOSS DEPTH, 2.30 FT (BGS)

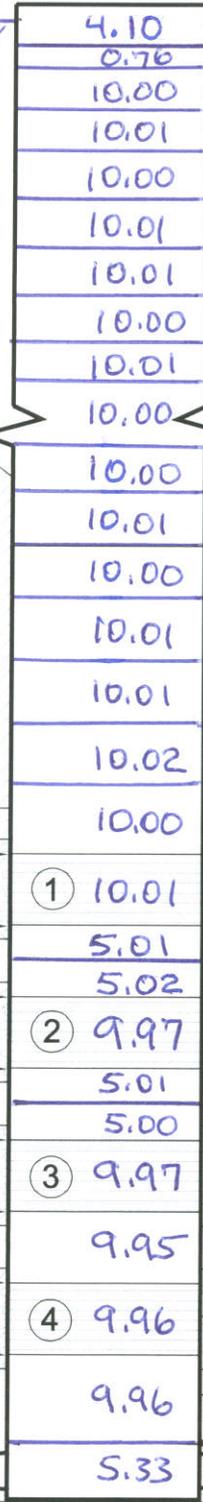
AT LEAST 30'

DEPTH TO TOP OF OCALA LS  
142.7 FT (BGS)

TOFS DEPTH,	144.9	FT (BGS)
TOFP DEPTH,	149.5	FT (BGS)
TOS DEPTH,	152.39	FT (BGS)
BOS DEPTH,	162.40	FT (BGS)
TOFS DEPTH,	163.4	FT (BGS)
TOFP DEPTH,	169.1	FT (BGS)
TOS DEPTH,	172.43	FT (BGS)
BOS DEPTH,	182.40	FT (BGS)
TOFS DEPTH,	183.9	FT (BGS)
TOFP DEPTH,	190.1	FT (BGS)
TOS DEPTH,	192.41	FT (BGS)
BOS DEPTH,	202.38	FT (BGS)
TOFS DEPTH,	203.4	FT (BGS)
TOFP DEPTH,	209.6	FT (BGS)
TOS DEPTH,	212.33	FT (BGS)
BOS DEPTH,	222.29	FT (BGS)
TOFS DEPTH,	227.2	FT (BGS)

BOFS DEPTH, \_\_\_\_\_ FT (BGS)

BOC DEPTH, 237.58 FT (BGS)



8"Ø CONDUCTOR CASING

BENTONITE CEMENT GROUT (FROM ~2 FT BELOW OCALA CONTACT TO GS)

40 LF, 4" SS SCH 5 CASING

NOM. 5 LF ANNULAR SEAL 30/65 GRADE (FINE SAND)

NOM. 7 LF FINE SAND ANNULAR SEAL (1 TO 3 FT ABOVE LOWER SCREEN AND BELOW UPPER SCREEN)

10 LF STAINLESS STEEL (SS) SCH 40 CASING (TYP. OF 3)

NOM. 13 LF SAND/GRAVEL FILTER PACK (FP) (1 TO 3 FT ABOVE AND BELOW SCREEN) 12/20 GRADE SAND

10 LF, 20 SLOT SS SCREEN (TYP. OF 4)

15 LF SS SCH 40 CASING (WELL SUMP)

CENTRALIZER 3-5 FT ABOVE SUMP

SS END CAP

WELL PIECE PIPE LENGTH (FT)

NO. OF 50-LB BAGS OF SILICA SAND USED FOR FILTER PACK AND SEAL

N.T.S.

<b>WELL CONSTRUCTION LOG</b>	PROJECT/SITE: Beazer/KI Site, Gainesville, FL		WELL ID: <b>FW-23B</b>
OUTER CASING DRILLING CONTRACTOR: <b>PROSONIC CORP.</b> Marietta, OH	DRILLED BY: <b>L. Hunsberger</b>	DRILLING EQUIPMENT: <b>CABLE TOOL</b> (Wellmaster)	START/FINISH DATE: 18" <b>2-14-06 → 2-19-06</b>
	OVERSIGHT: <b>S. McGuire</b>		12" <b>2-20-06 → 2-24-06</b>
INNER CASING DRILLING CONTRACTOR: <b>PROSONIC CORP.</b> Ocala, FL	DRILLED BY: <b>F. Kraus</b>	DRILLING EQUIPMENT: <b>Roto Sonic</b> (Proprietary Drill Rig)	START/FINISH DATE: 8" CS <b>3-22-06 → 3-23-06</b>
	OVERSIGHT: <b>J. Toth</b>		8" BORING <b>3-24-06 → 3-27-06</b> WELL <b>3-28-06 → 3-28-06</b>

LOCATION/NOTES:

