

Aptim Environmental & Infrastructure, LLC

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Legend for Geotechnical Data

Grain Size Scale for Sediments

Unified Soil	Classification	APTIM Standard Sieve Stack					
	(USCS) 2487/2488)	Sieve Number	Size (phi)	Size (mm)			
	Coarse Gravel	3/4	-4.25	19.03			
		5/8	-4.00	16.00			
Gravel	Fine Gravel	7/16	-3.50	11.20			
Glavei		5/16	-3.00	8.00			
		3 ½	-2.50	5.60			
		4	-2.25	4.75			
		5	-2.00	4.00			
	Coarse Sand	7	-1.50	2.80			
		10	-1.00	2.00			
		14	-0.50	1.40			
	Medium Sand	18	0.00	1.00			
		25	0.50	0.71			
Sand		35	1.00	0.50			
		45	1.50	0.36			
		60	2.00	0.25			
	Fine Sand	80	2.50	0.18			
		120	3.00	0.13			
		170	3.50	0.09			
		200	3.75	0.08			
Fines	Silt/Clay	230	4.00	0.06			

Proportional Definition of Descriptive Terms

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

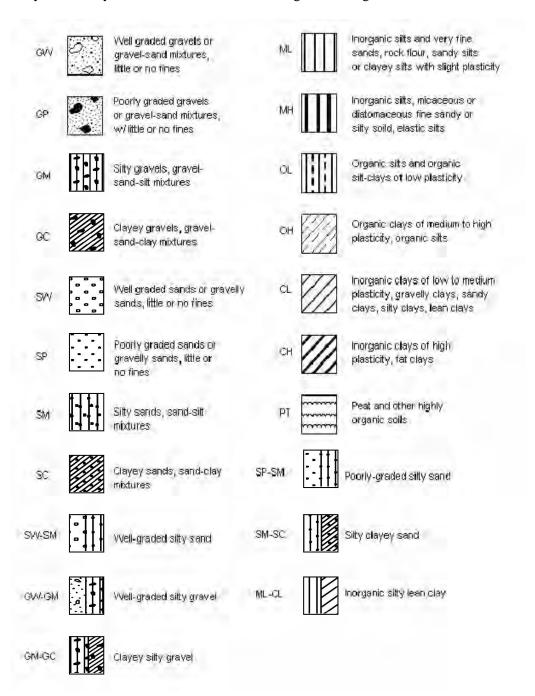
Consistency of Cohesive Soils

Description	Consistency Index	Approximate Undrained Shear Strength (kPa)	Field Identification
Hard		Over 300	Indented with difficulty by thumbnail, brittle.
Very Stiff	>1	150-300	Readily indented by thumbnail, still very tough.
Stiff	0.75-1	75-150	Readily indented by thumb but penetrated only with difficulty. Cannot be moulded in the fingers.
Firm	0.5-0.75	40-75	Can be penetrated several centimeters by thumb with moderate effort and moulded in fingers by strong pressure.
Soft	< 0.5	20-40	Easily penetrated several centimeters by thumb, easily moulded.
Very Soft		Less than 20	Easily penetrated several centimeters by fist, exudes between fingers when squeezed in fist.

Source: Engineering Properties of Soils and Rocks, Fourth Edition by Fred G. Bell

USCS Classifications

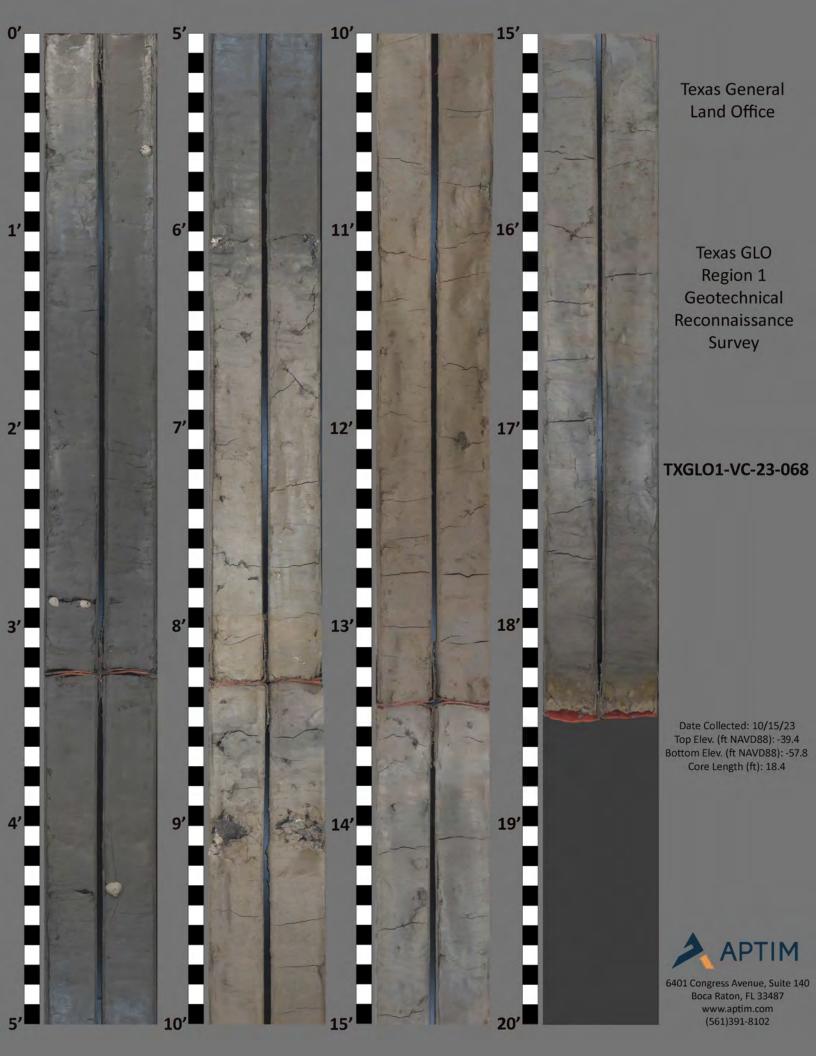
Refers to the Army Corps of Engineers Unified Soils Classification System. Class types are defined primarily by grain size, sorting and percent of material passing the #200 sieve. Classification of materials on the core logs based on visual field examinations are identified on the core logs under the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



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

Boring Designation TXGLO1-VC-23-068

1. PROJECT TX GLO Region 1 Recon Geotechnical Sand Search Jefferson, Chambers, Galveston and Brazoria Co. BORING DESIGNATION TXGLO1-VC-23-068 TXGLO1-VC-23-068 TEXAS STATE Plane South TEXAS STATE Plane South TEXAS STATE Plane South T1. MANUFACTURER'S DESIGNATION OF DRILL APTIM SEAS VC-700 Vibracore MANUAL HAMMER TABLET 10. COORDINATE SYSTEM/DATUM TEXAS STATE Plane South NAD 1983 NAVD88 11. MANUFACTURER'S DESIGNATION OF DRILL AUTO HAMMER APTIM SEAS VC-700 Vibracore	DRI	LLING	LOC	DIVIS	SION			INS	STALL	ATION	<u> </u>	dion TAGE		SHEET 1
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Section of Boring Dec. From Vertical 15. Date Boring 10-15-23 10-15			LER					13.	. то	TAL NUMB	ER CORE BO	XES		
S. DATE BORING 10-15-23 10-			BORIN	G	DEG. FRO	OM MC	BEARING	14.	. ELE	VATION G	ROUND WAT	TER		
6. THICKNESS OF OVERBURDEN 0.0 Ft. 16. ELEVATION TOP OF BORING -39.4 Ft. 7. DEPTH DRILLED INTO ROCK 0.0 Ft. 17. TOTAL RECOVERY FOR BORING 18.4 Ft. 18. SIGNATURE AND TITLE OF INSPECTOR BF. 18. SIGNATURE AND TITLE OF INSPECTOR BF. 19. DEPTH (ft)					VERTICA	\L		15.	. DA	TE BORING	i	!	- [
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LEAN CLAY, stiff, some sand, fine grained, quartz, trace shell hash, trace whole shell, sand and shell hash distributed in laminae, 2 (0.25°) whole bivalves (@ 2.9°, 1.0° whole bivalve (@ 4.3°, dark gray (5Y-4/1), (CL). 45.4 6.0 FAT CLAY, very stiff, trace organics, trace sand, fine grained, quartz, trace shell hash, organics distributed in laminae, sand distributed in pockets up to 0.5° and laminae, sand distributed in pockets up to 0.5° and laminae, sand distributed in pockets up to 0.5° and laminae, sand distributed in pockets up to 0.5° and laminae, organic shorts in motitions, organi			<u>-</u>					,						
trace shell hash, trace whole shell, sand and shell hash distributed in laminae, 2 (2.0.25") whole bivalves @ 2.9", 1.0" whole bivalve @ 4.3", dark gray (5Y-4/1), (CL). FAT CLAY, very stiff, trace organics, trace sand, fine grained, quartz, trace shell hash, organics distributed in laminae, sand distributed in laminae, sand distributed in laminae, shell hash typically distributed in laminae, 1.0" shell hash pocket @ 0.0", cools is mottled olive gray (5Y-5/2), brown (10YR-5/3) and olive brown (2.5Y-4/3), (CH). FAT CLAY, hard, trace whole shell, whole shells are whole bivalves typically up to 0.25", (1.0" x 1.5") whole articulated bivalve @ 3.8", (1.5" x 2.0") whole bivalve whole bivalve @ 9.0", (2.0" x 3.0") whole bivalve pocket @ 9.0", brown (7.5YR-5/4), (CH). FAT CLAY, hard, trace organics, organics distributed in laminae, organics increase with depth in layer, color is mottled gray (5Y-5/1) and dark gray (5Y-4/1), (CH). FAT CLAY, hard, trace organics, organics distributed in laminae, organics increase with depth in layer, color is mottled gray (5Y-5/1) and dark gray (5Y-4/1), (CH). FAT CLAY, hard, trace organics, trace shell hash, trace sitl, layer is partially lithified, organics distributed in laminae, brown (10YR-5/3), (SP). No recovery.	-40.5	_ 1.1	<i>\</i>					\mathcal{A}			Ave. Field	vane (tsr): 0.03		
trace shell hash, trace whole shell, sand and shell hash distributed in laminae, 2 (0.25") whole bivalves @ 2.9', 1.0" whole bivalve @ 4.3', dark gray (5Y-4/1), (CL). FAT CLAY, very stiff, trace organics, trace sand, fine grained, quartz, trace shell hash, organics distributed in laminae, sand distributed in laminae, sand distributed in laminae, she hash typically ectributed in laminae, 1.0" shell hash pocket @ 6.0', color is motified olive gray (5Y-5/2), brown (10'R-5/3) and olive brown (2.5'Y-4/3), (CH). FAT CLAY, hard, trace whole shell, whole shells are whole bivalves typically up to 0.25", (10" x 1.5") whole articulated bivalve @ 3.9 (1, 5" x 2.0") whole bivalve with color bivalves (2.9.0", color is motified olive gray (5Y-5/2), whole bivalve (9.9.0", color is motified olive articulated bivalve @ 3.9.0", (15" x 2.0") whole bivalve with color is motified only and color with color is motified only only of the color with color w		-												
hash distributed in laminae, 2 (0.25") whole bivalves @ 2.9", 1.0" whole bivalve @ 4.3", dark gray (5Y-4/1), (CL). FAT CLAY, very stiff, trace organics, trace sand, fine grained, quartz, trace shell hash, organics distributed in laminae, and distributed in laminae, shell hash typically distributed in laminae, and disminae, shell hash typically distributed in laminae, and laminae, shell hash typically up to 0.25", (1.0" x 1.5") whole gray (5Y-5/2), brown (10YR-5/3), and olive brown (2.5Y-4/3), (CH). FAT CLAY, hard, trace whole shell, whole shells are whole bivalves typically up to 0.25", (1.0" x 1.5") whole articulated bivalve @ 9.9", (1.5" x 2.0") whole bivalve with each of the whole bivalve @ 9.9", (1.5" x 2.0") whole bivalve with each of the whole bivalve @ 9.0", (2.0" x 3.0") whole bivalve pocket @ 9.0", brown (7.5YR-5/4), (CH). FAT CLAY, hard, trace organics, organics distributed in laminae, organics increase with depth in layer, color is mottled gray (5Y-5/1) and dark gray (5Y-4/1), (CH). FAT CLAY, hard, trace organics, organics distributed in laminae, organics increase with depth in layer, color is mottled gray (5Y-1) and dark gray (5Y-4/1), (CH). Sample #T3, Depth = 11.2' Ave. Field Vane (tsf): 0.31 T4 Sample #T5, Depth = 15.0' Ave. Field Vane (tsf): 0.82				LEAN C	CLAY, stiff, sor	me sand,	fine grained, quartz,							
@ 2.9', 1.0" whole bivalve @ 4.3', dark gray (5Y-4/1), (CL). ### Ave. Field Valle (Ist), 0.15 ### Sample ### Ave. Field Vane (Ist): 0.31 ### Ave. Field Vane (Ist): 0.31 ### Ta CLAY, hard, trace whole shell, whole shells are whole bivalve gay (5Y-5/2), brown (10YR-5/3), and olive brown (2.5Y-4/3), CH). ### FAT CLAY, hard, trace whole shell, whole shells are whole bivalve go.9.0', (2.0" x 3.0") whole bivalve go.9.0', brown (7.5YR-5/4), (CH). ### FAT CLAY, hard, trace organics, organics distributed in laminae, organics increase with depth in layer, color is mottled gray (5Y-5/1) and dark gray (5Y-4/1), (CH). ### FAT CLAY, hard, trace organics, organics distributed in laminae, organics increase with depth in layer, color is mottled gray (5Y-5/1) and dark gray (5Y-4/1), (CH). ### FAT CLAY, hard, trace organics, organics distributed in laminae, organics increase with depth in layer, color is mottled gray (5Y-5/1) and dark gray (5Y-4/1), (CH). ### FAT CLAY, hard, trace organics, organics distributed in laminae, organics increase with depth in layer, color is mottled gray (5Y-5/1) and dark gray (5Y-4/1), (CH). ### FAT CLAY, hard, trace organics, trace shell hash, trace silt, layer is partially lithified, organics distributed in laminae, brown (10YR-5/3), (SP). ### No recovery.		-		trace s	hell hash, trac	e whole s	shell, sand and shell			T2				
FAT CLAY, very stiff, trace organics, trace sand, fine grained, quartz, trace shell hash, organics distributed in laminae, and distributed in pockets up to 0.5° and laminae, shell hash typically distributed in laminae, 1.0° shell hash pocket @ 6.0°, color is mottled olive gray (5Y-5/2), brown (10YR-5/3) and olive brown (2.5Y-4/3), (CH). FAT CLAY, hard, trace whole shell, whole shells are whole bivalves typically up to 0.25°, (1.0° x 1.5°) whole articulated bivalve @ 9.0°, (2.0° x 3.0°) whole bivalve bivalve pocket @ 9.0°, brown (7.5YR-5/4), (CH). FAT CLAY, hard, trace organics, organics distributed in laminae, organics increase with depth in layer, color is mottled gray (5Y-5/1) and dark gray (5Y-4/1), (CH). FAT CLAY, hard, trace organics, organics distributed in laminae, organics increase with depth in layer, color is mottled gray (5Y-5/1) and dark gray (5Y-4/1), (CH). FAT CLAY, hard, trace organics, organics distributed in laminae, organics increase with depth in layer, color is mottled gray (5Y-5/1) and dark gray (5Y-4/1), (CH). Table #T3, Depth = 7.4' Ave. Field Vane (tsf): 0.31 FAT CLAY, hard, trace organics, organics distributed in laminae, organics increase with depth in layer, color is mottled gray (5Y-5/1) and dark gray (5Y-4/1), (CH).	ŀ	-	V/A			alve @ 4.				12	Ave. Field	Vane (tsf): 0.15		
FAT CLAY, hard, trace whole shell, whole shells are whole bivalves typically up to 0.5" (1.0" x 1.5") whole shells are whole bivalves typically up to 0.5" (1.0" x 1.5") whole articulated bivalves typically up to 0.25", (1.0" x 1.5") whole articulated bivalves (@ 9.0", (2.5", 4.7") whole bivalve (% 9.0", 4.7") whole bivalve (% 9.0", 4.7") whole bivalve (% 9.0", 4.7") whole bivalve (% 9.0"						(CL).								
FAT CLAY, hard, trace whole shell, whole shells are whole bivalves typically up to 0.5" (1.0" x 1.5") whole shells are whole bivalves typically up to 0.5" (1.0" x 1.5") whole articulated bivalves typically up to 0.25", (1.0" x 1.5") whole articulated bivalves (@ 9.0", (2.5", 4.7") whole bivalve (% 9.0", 4.7") whole bivalve (% 9.0", 4.7") whole bivalve (% 9.0", 4.7") whole bivalve (% 9.0"			V //											
grained, quartz, trace shell hash, organics distributed in laminae, sand distributed in pockets up to 0.5" and laminae, shell hash typically distributed in laminae, 1.0" shell hash pocket @ 6.0", color is mottled olive gray (5Y-5/2), brown (10YR-5/3) and olive brown (2.5Y-4/3), (CH). FAT CLAY, hard, trace whole shell, whole shells are whole bivalves typically up to 0.25", (1.0" x 1.5") whole articulated bivalve @ 8.9', (1.5" x 2.0") whole bivalve @ 9.0", brown (7.5YR-5/4), (CH). FAT CLAY, hard, trace organics, organics distributed in laminae, organics increase with depth in layer, color is mottled gray (5Y-5/1) and dark gray (5Y-4/1), (CH). FAT CLAY, hard, trace organics, organics distributed in laminae, organics increase with depth in layer, color is mottled gray (5Y-5/1) and dark gray (5Y-4/1), (CH). Sample #T4, Depth = 11.2' Ave. Field Vane (tsf): 0.79 T5 Sample #T5, Depth = 15.0' Ave. Field Vane (tsf): 0.82	-45.4	6.0		FAT CLA	Y, very stiff. t	race orga	anics, trace sand, fine	-						
alaminae, shell hash typically distributed in laminae, 1.0" shell hash pocket @ 6.0', color is mottled olive gray (SY-5/2), brown (10/R-5/3) and olive brown (2.5Y-4/3), (CH). FAT CLAY, hard, trace whole shell, whole shells are whole bivalves typically up to 0.25", (1.0" x 1.5") whole articulated bivalve @ 89,0", (1.5" x 2.0") whole bivalve @ 9.0", brown (7.5YR-5/4), (CH). FAT CLAY, hard, trace organics, organics distributed in laminae, organics increase with depth in layer, color is mottled gray (5Y-5/1) and dark gray (5Y-4/1), (CH). FAT CLAY, hard, trace organics, organics distributed in laminae, organics increase with depth in layer, color is mottled gray (5Y-5/1) and dark gray (5Y-4/1), (CH). FAT CLAY, hard, trace organics, organics distributed in laminae, organics increase with depth in layer, color is mottled gray (5Y-5/1) and dark gray (5Y-4/1), (CH). Sample #13, Depth = 11.2' Ave. Field Vane (tsf): 0.31 Table 11.2' Ave. Field Vane (tsf): 0.31		_		grained,	quartz, trace s	shell hast	n, organics distribute	ı l						
-48.3 8.9 Gray (5Y-5/2), brown (10YR-5/3) and olive brown (2.5Y-4/3), (CH). FAT CLAY, hard, trace whole shell, whole shells are whole bivalves typically up to 0.25°, (1.0" x 1.5") whole articulated bivalve @ 8.9', (1.5" x 2.0") whole bivalve (@ 9.0", 2.0" x 3.0") whole bivalve pocket (@ 9.0", brown (7.5YR-5/4), (CH). FAT CLAY, hard, trace organics, organics distributed in laminae, organics increase with depth in layer, color is mottled gray (5Y-5/1) and dark gray (5Y-4/1), (CH). FAT CLAY, hard, trace organics, organics distributed in laminae, organics increase with depth in layer, color is mottled gray (5Y-5/1) and dark gray (5Y-4/1), (CH). Sample #T4, Depth = 11.2' Ave. Field Vane (tsf): 0.79 FAT CLAY, hard, trace organics, organics distributed in laminae, organics distributed in laminae, brown (10YR-5/3), (SP). No recovery.				laminae	e, shell hash ty	pically di	stributed in laminae,			Т3				
FAT CLAY, hard, trace whole shell, whole shells are whole bivalves typically up to 0.25", (1.0" x 1.5") whole articulated bivalve @ 8.9', (1.5" x 2.0") whole bivalve @ 9.0', (2.0" x 3.0") whole bivalve @ 9.0', brown (7.5YR-5/4), (CH). FAT CLAY, hard, trace organics, organics distributed in laminae, organics increase with depth in layer, color is mottled gray (5Y-5/1) and dark gray (5Y-4/1), (CH). FAT CLAY, hard, trace organics, organics distributed in laminae, organics increase with depth in layer, color is mottled gray (5Y-5/1) and dark gray (5Y-4/1), (CH). Sample #T4, Depth = 11.2' Ave. Field Vane (tsf): 0.79 Sample #T5, Depth = 15.0' Ave. Field Vane (tsf): 0.82	ŀ	_		1.0" she	ell hash pocke Y-5/2) brown	et @ 6.0', n (10YR-#	color is mottled olive	9			Ave. I leiu	varie (tsi). 0.01		
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@ 9.0', (2.0" x 3.0") whole bivalve pocket @ 9.0', brown (7.5YR-5/4), (CH). FAT CLAY, hard, trace organics, organics distributed in laminae, organics increase with depth in layer, color is mottled gray (5Y-5/1) and dark gray (5Y-4/1), (CH). Sample #T5, Depth = 15.0' Ave. Field Vane (tsf): 0.82 T5 SAND, fine grained, quartz, trace organics, trace shell hash, trace silt, layer is partially lithified, organics distributed in laminae, brown (10YR-5/3), (SP). No recovery.	-	-		whole biv	alves typically	up to 0.2	25", (1.0" x 1.5") whole	e		T4				
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Mini Vane Shear Test Results

	SAMPLE DEPTH	TORVANE	TORVANE	TORVANE		
CORE ID	(ft)	(kg/cm²)	(tsf)	(kpa)	DESCRIPTION ¹	
	1.6	1.5	0.15	147.10	Stiff	
TXGLO1-VC-23-059	2.3	2.5	0.26	245.17	Very Stiff	
	3.5	2.0	0.20	196.13	Very Stiff	
	5.2	4.0	0.41	392.27	Hard	
	10.0	7.0	0.72	686.47	Hard	
	2.4	6.5	0.67	637.43	Hard	
TXGLO1-VC-23-060	11.1	1.5	0.15	147.10	Stiff	
1XGLU1-VC-23-000	13.1	6.0	0.61	588.40	Hard	
	17.0	6.0	0.61	588.40	Hard	
TXGLO1-VC-23-061		No Tor	vane Conducte	ed		
	1.0	0.3	0.03	24.52	Soft	
TXGLO1-VC-23-062	2.6	1.0	0.10	98.07	Stiff	
	5.0	4.0	0.41	392.27	Hard	
	1.5	4.5	0.46	441.30	Hard	
TXGLO1-VC-23-063	5.0	2.5	0.26	245.17	Very Stiff	
1XGLU1-VC-23-003	11.0	2.8	0.28	269.68	Very Stiff	
	15.0	2.5	0.26	245.17	Very Stiff	
	0.3	0.0	0.00	0.00	Very Soft	
TXGLO1-VC-23-064	0.7	0.5	0.05	49.03	Firm	
	13.1	2.5	0.26	245.17	Very Stiff	
TXGLO1-VC-23-065	1.8	2.0	0.20	196.13	Very Stiff	
1XGLU1-VC-23-005	6.1	1.3	0.13	122.58	Stiff	
	0.5	0.3	0.03	24.52	Soft	
TXGLO1-VC-23-066	3.1	1.5	0.15	147.10	Stiff	
	13.0	5.5	0.56	539.37	Hard	
TXGLO1-VC-23-067	0.1	0.0	0.00	0.00	Very Soft	
1XGLO1-VC-23-007	3.0	0.5	0.05	49.03	Firm	
	0.3	0.3	0.03	24.52	Soft	
	3.5	1.5	0.15	147.10	Stiff	
TXGLO1-VC-23-068	7.4	3.0	0.31	294.20	Very Stiff	
	11.2	7.8	0.79	760.02	Hard	
	15.0	8.0	0.82	784.53	Hard	
TYGLO1-VC 22 060	0.4	0.0	0.00	0.00	Very Soft	
TXGLO1-VC-23-069	3.5	0.8	0.08	73.55	Firm	
	0.7	0.3	0.03	24.52	Soft	
	1.9	2.0	0.20	196.13	Very Stiff	
TXGLO1-VC-23-070	3.3	2.0	0.20	196.13	Very Stiff	
	5.5	3.5	0.36	343.23	Hard	
	11.9	0.0	0.00	0.00	Very Soft	