

## **9.6 Appendix 6 – Summary and Description of Selected Cores**

J. M. Huber Corporation, Hollingsworth #1  
NE NE Section 1, T.3S., R.3W.  
Carter County, Oklahoma  
Fox-Graham Field

The Hollingsworth #1 core consists of three intervals within the Arbuckle Group. The upper interval (9160 to 9208 feet) is the most complete and contains some fifty feet of dolostone. The middle interval (10023 to 10058 feet) is dolomitic limestone. The lower interval (10132 to 10303 feet) is limestone, dolomitic limestone and dolostone. The middle and lower interval are incomplete. The lower is more fragmented and consists of short intervals of core (typically 2 to 8 feet) separated by gaps of missing core.

### Upper Interval

The upper interval extends from 9160 feet to 9208 feet. It consists laminated to thinly bedded dolomudstone with a light brown cast except where calcareous. These thin calcareous zones of dolomitic limestone (mudstone) are dark gray. Depositional features include burrowing from 9198 to 9200. Tectonic dip is low and ranges from 0 to 3 degrees. A few vertical fractures were evident and these were cemented with calcite. Porosity determined by wireline sonic/acoustic log ranged from 5 to 17%. The laminated dolomudstone is interpreted as upper intertidal. The thickness of this interval is several times that of the upper intertidal zones interpreted in outcrop, but the bedding thickness and lithology are similar.

### Middle Interval

This interval consists of three (3) feet of core (10023 to 10026 feet), a gap of twenty three (23) feet, and nineteen (19) feet of core. The upper section is mudstone with sparse peloids. The upper five (5) feet of the lower interval is grain-rich, peloidal packstone with rounded carbonate clasts that grades downward in to thicker bedded peloidal wackestone. The bottom six (6) feet is dolomitic packstone. The carbonate is thin- to medium-bedded and rich in pellets and rounded carbonate clasts. Tectonic modification is minimal as dip is 0 to 3 degrees and fractures, though not abundant, are solution-enlarged and partially open. Porosity logs measurements across this interval

are generally around 4 to 5%. The highest value is recorded around 10040 feet and is approximately 9%. This middle interval is interpreted as representing partial depositional cycles from the subtidal to lower intertidal settings. The upward change from wackestone to packstone is interpreted as shallowing and is analogous to cycles evident in outcrops of the Kinblade and West Spring Creek formations.

#### Lower Interval

The lower interval consists of approximately fifty (50) of core across a cored interval of 170 feet. As a result of the incomplete nature of the column, it is impossible to reconstruct depositional cycles with confidence. However, partial cycles are evident in the preserved intervals. Preserved core includes examples of subtidal, high energy intertidal and upper intertidal mud flat deposition. Subtidal limestones and slightly dolomitic limestones are relatively clast starved. High-energy intertidal carbonates (10291 to 10293; 10206 to 10208 feet) are represented by oolitic and peloid packstone-grainstones. Upper intertidal carbonates are finely laminated dolostones and limestones with carbonate rip-up clasts. Upper intertidal to supratidal fenestral porosity with anhydrite/gypsum cement occurs in the core from 10213 to 10215 feet. Algal stromatolites occur in core at 10132 to 10136 feet and 10150 to 10155 feet. Porosity across the interval is typically <10%, but increases to near 20% in the dolostones. Porosity increases in limestone intervals with small vugs that formed after the dissolution of peloids and ooids. The lower interval is relatively flat-lying and contains a few scattered solution-enlarged fractures.

Operator & Lease: J. M. Huber Corporation, Hollingsworth #1  
 Location: NE NE Sec. 1, T.3S., R.3W.  
 County & State: Carter Co., OK (Fox-Graham Field)  
 Stratigraphic Interval: Arbuckle Group,

Grainstone	Packstone	Wackestone	Mudstone	Interval	Basic Rock Type	Color	Dissolution Features	Fossils	Sed. Feat.	Thin Section	Comments and Porosity (% Sonic Log)			
											20	10	0	
				9160										
				0-3° dip										
				9170										
				9180										
				9190										
				9200										
				0-3° dip										
				9210										

Thinly bedded to laminated dolostone (dolomudstone)

Calcareous (dolomitic limestone) where dk. grey

Calcite-cemented fractures

Burrowing

Calcite-cemented fractures





Operator & Lease: J. M. Huber Corporation, Hollingsworth #1  
 Location: NE NE Sec. 1, T.3S., R.3W.  
 County & State: Carter Co., OK (Fox-Graham Field)  
 Stratigraphic Interval: Arbuckle Group,

Grainstone	Packstone	Wackestone	Mudstone	Interval Tectonic Mod.	Basic Rock Type	Color	Dissolution Features	Fossils	Sed. Feat.	Thin Section	Comments and Porosity (% Sonic log)				
											20	10	0		
	✓			10210											Carbonate clasts, peloids, and ooids
		✓		0-3° dip 10220											Dolomite w/ fenestral pores filled with anhydrite/gypsum cement
					Core Missing										
				10230 0-3° dip											
		✓	✓	10240											Laminated dolomite Carbonate conglomerate and burrowed dolomite
		✓													Massive dolomite
				10250	Core Missing										
		✓	✓	Break for 10280 Missing Core											
		✓	✓	10290				Pe							Limestone, dark grey, small vuggy pores after pellets and ooids
✓	✓			10300											Solution-enlarged fractures and occasional vugs (1-2mm)

Pure Oil Corporation, Pruitt Unit #1  
NE NW Section 26, T.3S., R.1E.  
Carter County, Oklahoma  
Caddo Field  
Arbuckle Group, West Spring Creek Formation

The Pruitt Unit #1 core is continuous from 8556 to 8752 feet in the West Spring Creek Formation of the Arbuckle Group. The lithology is dominantly limestone that contains depositional features similar to those in depositional cycles within the West Spring Creek Formation that outcrops in the Arbuckle Mountains. The core exhibits tectonic dip of mostly 25 to 40 degrees, but intervals of much lower dip (<5 degrees) and very high dip (>60 degrees) are evident. The limestone is abundantly fractured, but most are cemented. Open, solution-enlarged fractures are less common and generally sparse. No density or sonic/acoustic porosity logs were available for the cored interval.

The uppermost interval (8559 to 8568.5 feet) consists of pelmatozoan packstone overlying wackestone. The underlying interval (8568.5 to 8570.5 feet) is laminated carbonate and a thin dark colored shale. From 8570.5 feet to 8615 feet, the core is irregularly bedded carbonate that is burrowed and contains hemispheroid stromatolites. This interval contains thicker bedded to thinner bedded cycles that are interpreted as incomplete shallowing-upward cycles that encompass subtidal to intertidal settings.

The next interval extends from 8615 feet to 8710 feet. Two types of carbonate dominate lithology. The first is a shaly or argillaceous darker-colored carbonate. This clayey carbonate is succeeded by the second type of carbonate, a cleaner (less clayey) limestone. The uppermost of these "cleaning upward" cycles culminates with a breccia zone and thinly laminated limestone from 8615 to 8620 feet. The percentage of clasts does not change profoundly and wackestone-packstones dominate the interval. This interval is interpreted as being comprised of several incomplete carbonate cycles in the subtidal (open marine) to lower intertidal setting. Clay-rich limestones represent deeper-water deposition, whereas cleaner limestones represent deposition in the higher energy lower intertidal setting.

The lowermost cored interval extends from 8710 to 8752 feet. The upper 10 feet contains burrowed limestone that is overlain by thinly bedded/laminated limestone and may represent a shallowing-upward cycle of the upper subtidal to lower intertidal zone. The remaining thirty two (32) feet from 8720 to 8752 feet is somewhat irregular bedded with no remarkably obvious depositional features. This lower portion of the core is

interpreted as representing deposition in a subtidal, open marine environment. All fractures and vugs in the lowermost core are calcite cemented.



Operator & Lease: Pure Oil Company, Pruitt Unit #1  
 Location: NE NW Sec. 26, T.3S., R.1E.  
 County & State: Carter Co., OK (Caddo Field)  
 Stratigraphic Unit: Arbuckle Group, West Spring Creek Fm.

Grainstone	Packstone	Wackestone	Mudstone	Interval	Basic Rock Type	Color	Dissolution Features	Fossils	Sed. Feat.	Thin Section	Comments and Porosity	
											20	10
				8560 /								
				25-30° dip					P			Subvertically oriented fractures: cemented Horizontal and vertical stylolites
				8570								Laminated
				35-40° dip								Thin dark shale @70.5 Highly burrowed
				8580 /								Minor sed. infill in fractures, mostly cemented
				40° dip								Thin, irregular bedding; burrowed
				8590								Fractures mostly cemented w/ calcite
				40° dip								
				30° dip								
				8600								Hemispheroid stromatolites @ 99'
				40° dip								Vugs cemented
				8610								
				0-3° dip								Fracture swarm: mostly cemented
				30-45° dip								Brecciated zone
				8620								
				0-3° dip								Few Solution-enlarged fractures
				8630								



