

Facies Code	Full Name	Description	TOC (Wt. %)	Si (Wt. %)	Al (Wt. %)	Ca (Wt. %)	Mg (Wt. %)	Mo (PPM)	Depositional Process
<b>BMR-1</b>	Black Mudrock 1	Very dark grey to black, primarily massively bedded and ungraded, occasionally has continuous parallel to sub parallel laminations. Commonly includes phosphate nodules. Fine laminations of silt/sand sized <i>Tasmanites</i> cysts filled with quartz in thin section. (n=165)	2.17-7.83 $\mu=5.15$	14.90-34.07 $\mu=27.25$	2.04-7.30 $\mu=5.00$	0.21-7.83 $\mu=2.07$	0.04-3.26 $\mu=0.85$	2.90-42.91 $\mu=25.25$	Suspension fallout
<b>BMR-2</b>	Black Mudrock 2	Very dark grey to black, primarily massively bedded and ungraded. Phosphate nodules are occasionally present. Macrofossils are typically rare, and often pyritized when present. Quartz filled <i>Tasmanites</i> cysts are present but, overall texture in thin section is disrupted. (n=307)	1.57-8.93 $\mu=3.81$	14.90-32.75 $\mu=25.55$	0.69-11.13 $\mu=6.38$	0.10-12.22 $\mu=2.32$	0.00-0.75 $\mu=0.75$	0.00-39.38 $\mu=17.10$	Suspension fallout
<b>GMR</b>	Grey Mudrock	Light to medium grey, and occasionally tannish in color. Macrofossils and skeletal fragments are common. Massive texture due to bioturbation. Commonly has evidence of scour, and lags of skeletal fragments. (n=716)	0.79-3.15 $\mu=1.67$	7.01-29.83 $\mu=22.74$	0.83-8.87 $\mu=5.99$	0.40-13.70 $\mu=5.16$	0-2.70 $\mu=0.70$	0.00-30.22 $\mu=4.91$	Low density turbidites and suspension fallout
<b>DOL</b>	Dolostone	Massive, cryptocrystalline texture. Grey or brown in color. Macrofossils and evidence of burrowing are rare. (n=70)	0.54-1.27 $\mu=0.90$	4.53-18.29 $\mu=10.75$	0.96-6.04 $\mu=3.26$	10.63-28.26 $\mu=17.08$	0.43-10.70 $\mu=3.56$	0.00-15.72 $\mu=0.76$	<i>In situ</i> submarine lithification
<b>GNST</b>	Grainstone	Composed of sand size calcite, and lacks a mud matrix. Massive or normal grading. Occasion fine interlaminations of siliciclastic mud. Pronounced scour at the base, often bioturbated at the top. Pyrite laminations are common. (n=38)	n/a	3.63-25.63 $\mu=14.16$	0.36-8.39 $\mu=2.65$	4.86-34.90 $\mu=17.99$	0.00-4.86 $\mu=1.43$	0.00-15.04 $\mu=1.28$	Turbidites
<b>Mixed</b>	Mixed	Distorted and convoluted laminations and thin beds of carbonate debris, within a matrix of grey mudrock. (n=4)	n/a	18.02-29.05 $\mu=24.54$	2.16-6.98 $\mu=4.45$	2.77-7.88 $\mu=4.69$	0.42-1.51 $\mu=0.98$	0.00-18.24 $\mu=12.43$	Soft sediment deformation (slumping)
<b>DMB</b>	Diagenetic Mineralized Beds	Enriched in the digenetic minerals pyrite, phosphate and gluconate. Evidence of scour and reworking of skeletal fragments, both pyritized and calcareous.	n/a	n/a	n/a	n/a	n/a	n/a	Diagenetic Alteration, and scour leaving course lags

Supplemental Table 1. Facies Table, Midland County Core.

Seven facies types have been identified within the Wolfcamp portion of the Midland County core, based on lithostratigraphic, elemental chemostratigraphic, and thin section analysis. This table displays the facies codes, full names, descriptions, weight percent TOC, key elemental abundance values, and interpreted depositional processes. Numerical data for the geochemical data indicates the range of values, and the population mean ( $\mu$ ) for each facies type. The number of analyses used to calculate the ranges and mean values for each facies type are after the descriptions (n=number of ED-XRF analyses of the facies type).