

GEOLOGIST LOG OF WELL LM-3680

<u>Depth (Feet)</u>	<u>Lithology</u>
0 - 1	Sand, light gray to dark brownish black, fine to medium grained, subrounded, moderately sorted, much organic material.
1 - 2	Sandstone, light olive gray (5Y 6/1) to yellowish gray (5Y 8/1), hard to very hard, fossiliferous.
2 - 17	Shells, yellowish gray (5Y 7/2), and sand, very fine grained, quartzose.
17 - 28	Sand, light olive gray (5Y 6/1), fine to medium grained, rounded, well sorted, and shells as above.
28 - 45	Sand and shells, as above, with thin sandstone layers, hard.
45 - 60	Clay, medium gray (N5), soft, sandy, interbedded shell layers and coquinas.
60 - 66	Clay, pale olive (10Y 6/2), soft, phosphatic, minor shell.
66 - 76	Clay, as above.
76 - 86	Clay, grayish olive (10Y 4/2), soft, trace shell.
86 - 97	Clay, as above with trace fine phosphate.
97 - 117	Clay, as above.
117 - 132	Clay, light olive gray (5Y 5/2), soft, phosphatic, minor shell.
132 - 134	Interbedded sandstone, phosphate, clay, and shell. Sandstone is light gray N7, medium hard, clay is pale olive (10Y 6/2), soft.
134 - 137	As above.
137 - 142	Interbedded sandstone, phosphate, shell, clay, and minor white lime mud.

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Continued:

<u>Depth (Feet)</u>	<u>Lithology</u>
142 - 148	Sandstone, yellowish gray (5Y 8/1), soft to medium hard, finely phosphatic, minor shell and clay, occasional phosphate modules.
148 - 165	Lime mud, light olive gray (5Y 6/1), soft, phosphatic, trace shell.
165 - 170	Lime mud, as above with common shell and limestone fragments.
170 - 180	Lime mud, dark greenish gray (5G 4/1), soft, highly phosphatic, trace shell and limestone fragments.
180 - 195	Lime mud, light olive gray (5Y 6/1), soft, phosphatic, minor shell.
195 - 211	Lime mud, dark greenish gray (5GY 4/1), soft, finely phosphatic.
211 - 237	Lime mud, medium dark gray (N4), soft, fine to coarse phosphatic grains, sticky.
237 - 242	Limestone, yellowish gray (5Y 8/1), medium hard, fine phosphatic grains, some interbedded lime mud, as above, minor shell material and phosphate nodules.
242 - 255	Limestone, light olive gray (5Y 6/1), very phosphatic, micritic, common shell fragments.
255 - 275	Limestone, very light gray (N8) to light gray (N7), medium soft, micritic, common shell fragments, minor sandstone layers, very fine to fine grained, subrounded, quartzose, calcite cement, in part friable.
275 - 282	Limestone, as above, some interbedded lime mud between 276 and 278 feet.
282 - 292	Limestone, yellowish gray (5Y 8/1), medium soft to medium hard, biomicritic, common fossils, fair porosity.

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292 - 302	Limestone, yellowish gray (5Y 8/1), micritic, very phosphatic, very fossiliferous, medium hard, fair porosity.
302 - 318	Limestone, as above, increasingly biomicritic.
318 - 325	Limestone, yellowish gray (5Y 8/1), micritic, very fossiliferous, phosphatic, marly.
325 - 340	Limestone, very light gray (N8), fossiliferous, phosphatic, fair porosity.
340 - 355	Limestone, yellowish gray (5Y 8/1), micritic, silty, slightly chalky, very fossiliferous, abundant phosphatic grains.
355 - 360	Limestone, light olive gray (5Y 6/2) to yellowish gray (5Y 8/1), hard, spar cement, silty, phosphatic, very fossiliferous, fair porosity.
360 - 370	Limestone, yellowish gray (5Y 8/1) to very light gray (N8), medium hard, micritic to biomicritic, phosphatic, some moldic porosity.
370 - 385	Limestone, very light gray (N8) to yellowish gray (5Y 8/1), micritic, medium hard, phosphatic, common shell fragments.
385 - 395	Lime mud, greenish gray (5GY 6/1), soft, cohesive, interbedded layers of limestone, micritic.
395 - 410	Lime mud, olive gray (5GY 6/1), soft, cohesive, phosphatic, common shell fragments.
410 - 415	Lime mud, as above, increasing amounts of limestone, light olive gray (5Y 6/1), micritic.

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415 - 435	Limestone, yellowish gray (5Y 8/1) to light gray (N7), marly, hard, phosphatic.
435 - 440	Limestone, yellowish gray (5Y 8/1), hard, micritic to biomicritic, phosphatic.
440 - 450	Limestone, yellowish gray (5Y 8/1), hard to very hard, spar cement, biomicritic, dolomitic, phosphatic.
450 - 460	Limestone, yellowish gray (5Y 8/1) to very light gray (N8), marly, micritic, medium soft, phosphatic, fossiliferous.
460 - 495	Lime mud, light olive gray (5Y 6/1) to yellowish gray (5Y 8/1), soft, phosphatic, fossiliferous, interbedded micritic limestone.
495 - 505	Limestone, yellowish gray (5Y 8/1), medium hard, micritic, minor lime mud, phosphatic.
505 - 525	Lime mud, light gray (N7) to light olive gray (5Y 6/1), soft, cohesive, abundant phosphate grains and shell fragments.
525 - 540	Lime mud, as above, with interbedded layers of biosparitic to biomicritic limestone, phosphatic.
540 - 550	Limestone, light olive gray (5Y 6/1), medium hard, common shell fragments, minor phosphate.
550 - 560	Limestone, as above with occasional lime mud.
560 - 569	Limestone, medium light gray (N6), and clay, light gray (N7), marly.
569 - 571	Sandstone, medium dark gray (N4), clayey, phosphatic.

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<u>Depth (Feet)</u>	<u>Lithology</u>
571 - 577	Limestone, light olive gray (5Y 6/1), dolomitic, very fossiliferous, good porosity, some minor chert, brownish black (5YR 2/1), hard at 575.
577 - 587	Limestone, light gray (N7), and some marl, grayish olive (10Y 4/2), sandy, thin phosphate layer at 580.
587 - 591	Limestone, light olive gray (5Y 6/1), micritic, dolomitic, in part microsucrosic, fair porosity, some minor interbedded marl.
596 - 601	Dolomite, olive-gray (5Y 4/1), hard, well indurated, fine grained, common shell, common limestone fragments.
601 - 606	Limestone, pinkish-gray (5YR 8/1), soft-to-medium hard, moldic, vuggy, common shell and fossil.
606 - 611	Limestone, pinkish-gray (5YR 8/1), medium hard, moderately well indurated, casts and molds, common shell and fossil.
611 - 616	Limestone, very pale orange (10YR 8/2), hard, well indurated, moldic, vuggy, common shell.
616 - 621	Limestone, yellowish-gray (5Y 8/1), hard, well indurated, micritic, casts.
621 - 626	Limestone, very pale orange (10YR 8/2), hard, well indurated, moldic, vuggy, common shell and fossil.
626 - 632	Limestone, light gray (N7), hard, well indurated, casts and molds, common shell.
632 - 637	Limestone, as above.
637 - 642	Limestone, very pale orange (10YR 8/2), hard, well indurated, casts and molds, vuggy, common shell and fossil.

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642 - 647	Limestone, very pale orange (10YR 8/2), hard, well indurated, casts and molds, occasional dolomitic shell.
647 - 652	Limestone, pinkish-gray (5YR 8/1), very hard, well indurated, casts and shell molds.
652 - 658	Limestone, very pale orange (10YR 8/2), hard, well indurated, casts and molds, vuggy, common shell and fossil.
658 - 663	Limestone, as above.
663 - 668	Limestone, very pale orange (10YR 8/2), soft-to-medium hard, friable, finely phosphatic, moldic.
668 - 673	Limestone, yellowish-gray (5Y 8/1), medium hard, finely phosphatic, minor coral, occasional dolomitic shell.
673 - 678	Limestone, yellowish-gray (5Y 8/1), medium hard, finely phosphatic, casts and molds, common shell and fossil.
678 - 683	Limestone, pinkish-gray (5YR 8/1), medium hard, casts and molds, vuggy, common shell.
683 - 688	Limestone, yellowish-gray (5Y 8/1), soft-to-medium hard, friable, casts and molds, common shell.
688 - 694	Limestone, yellowish-gray (5Y 8/1), hard, well indurated, casts and molds, vuggy, common shell and fossil.
694 - 699	Limestone, very pale orange (10YR 8/2), medium hard, casts and molds, common dolomitic shell.
699 - 704	Limestone, pinkish-gray (5YR 8/1), medium hard, casts and molds, common shell and fossil.

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<u>Depth (Feet)</u>	<u>Lithology</u>
704 - 709	Limestone, pinkish-gray (5YR 8/1), hard, well indurated, casts and molds, common shell and fossils.
709 - 714	Limestone, medium light gray (N6), medium hard, casts and molds, vuggy, common shell and fossil.
714 - 719	Limestone, very pale orange (10YR 8/2), hard, well indurated, casts and molds, vuggy, common shell and fossil.
719 - 726	Limestone, as above.
726 - 729	Dolomite, yellowish-gray (5Y 7/2), hard, well indurated, minor white clay interbedded.
729 - 735	Dolomite, yellowish-gray (5Y 8/1), hard, well indurated, microsucrosic, fair pinpoint porosity, very thin phosphate layer.
735 - 738.5	Dolomite, as above, slightly marly, dolomitized fossils nearly observed, fair vugular porosity.
738.5 - 739	Clay, pale yellowish-brown (10YR 6/2) to very light gray (N8).