

SE SE 31-43-24

GEOLOGIST'S LOG

LM-3273

0-700'

CA-3508

<u>Depth (feet)</u>	<u>Lithology</u>
0-3	Sand, very light gray to yellowish-brown (10YR 5/4), fine to very fine grained, unconsolidated.
3-5	Sandstone, pale yellowish-brown (10YR 6/2), sandy micrite, moderately hard, abundant shells.
5-7	Peat, brownish-black (5YR 2/1).
7-20	Sand and shell, fine to very fine grained quartz, unconsolidated.
20-30	Sand, very light gray, fine to very fine grained, loosely consolidated, clayey, fossiliferous.
30-50	Sandy clay, olive-gray (5Y 4/1), firm, silty to sandy, trace of shells.
50-85	Clay, olive-gray, firm, pure, terrigenous clay.
85-89	Sandy clay, medium gray, very fine grained, unconsolidated to loosely consolidated, with abundant shells and phosphate to pebble sized.
89-92	Sandy limestone, light olive-gray (5Y 5/2), micrite with very fine grained quartz sand, hard, friable, phosphatic, with minor moldic porosity.
92-99	Marl, medium light gray (N6), soft, silty, phosphatic and fossiliferous.
99-118	Sandy clay, medium dark gray (N4), soft, phosphate to pebble sized, minor shell fragments.
118-140	Silty clay, olive-gray (5Y 3/2), stiff, very abundant phosphate.
140-147	Sandstone, light olive-gray, fine to very fine grained quartz and phosphate, firm and friable, calcite cemented.

Continued:

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<u>Depth (feet)</u>	<u>Lithology</u>
147-160	Silty clay, olive-gray, firm abundant phosphate and trace of shells.
160-181	Marl, light gray (N7), soft, silty, phosphatic, with interbedded marly biomicrite.
181-192	Marl, light olive-gray (5Y 6/1), soft to firm, silty, fossiliferous and phosphatic.
192-214	Marl, yellowish-gray (5Y 8/1), soft, silty, abundant phosphate and common shells.
214-224	Marl, as above, with interbedded light olive-gray sandy limestone.
224-244	Limestone, light olive-gray micrite and biomicrite, sandy (quartz and phosphate), firm to hard, with moderate to good apparent porosity and interbedded marl, as above.
244-249	Clay, medium gray (N5), stiff, terrigenous clay with minor phosphate and shell fragments.
249-258	Clay, light olive-gray (5Y 5/2), soft to firm, fossiliferous, with abundant phosphate.
258-265	Marl, light gray, soft, with abundant phosphate and shell fragments.
265-275	Limestone, yellowish-gray (5Y 8/1), biomicrite, firm but friable, silty (quartz and phosphate), having good apparent porosity.
275-282	Clay, medium gray (N5), stiff, with minor phosphate.
282-290	Marl, light olive-gray, soft, phosphatic, with abundant shells and minor interbedded limestone.

Continued:

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<u>Depth (feet)</u>	<u>Lithology</u>
290-315	Limestone, yellowish-gray biomicrite, hard, phosphatic, with good apparent porosity and interbedded sandy, phosphatic micrite.
315-328	Marly limestone, yellowish-gray to light olive-gary micrite, firm, silty (quartz and phosphate), fossiliferous, with low to moderate porosity.
328-339	Marl, very light gray (N8), soft, silty, very fossiliferous, with interbedded marly limestone, as above.
339-355	Marl, light gray (N7) to light olive-gray (5Y 6/1), soft to firm, phosphatic and very fossiliferous.
355-370	Marl, as above, with interbedded silty, phosphatic micrite.
370-390	Marl, medium light gray (N6), firm, phosphatic, with abundant fossils and with minor interbedded biomicrite.
390-401	Clay, medium dark gray (N4), stiff, common shell fragments.
401-425	Clay, medium gray (N5), light olive-gray, soft, cohesive, phosphatic, with trace of shell fragments.
425-432	Clay, as above, with interbedded light yellowish-brown, stiff clay.
432-463	Clay, light olive-gray, soft, cohesive, phosphatic, with traces of medium dark gray, soft clay.
463-490	Marl, yellowish-gray to light olive-gray, soft, fossiliferous, with decreased phosphate.
490-505	Clay, dark gray, stiff, grading to a light olive-gray, soft clay with depth.

Continued:

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<u>Depth (feet)</u>	<u>Lithology</u>
505-510	Marl, medium light gray, soft, silty, with abundant phosphate to pebble sized and interbedded medium gray, fossiliferous clay.
510-519	Clay and marl, interbedded brownish-gray (5YR 4/1), soft clay and marl, as above, but with reduced phosphate grain size.
519-521	Clay, medium gray, firm, stiff, terrigenous.
521-526	Marl, medium light gray to very light gray, soft to firm, abundant phosphate, with interbedded medium gray, phosphatic clayey marl.
526-536	Clayey marl, greenish-gray (5GY 6/1) to medium gray, soft, with minor phosphate and interbedded light gray, silty marl.
536-541	Clay, olive-gray (5Y 4/1), stiff, pure terrigenous clay.
541-548	Clayey marl, light olive-gray, soft to firm, phosphatic.
548-561	Marl, very light gray to light olive-gray, soft, fossiliferous, with increased phosphate content.
561-565	Limestone, pinkish-gray (5YR 8/1), biomicrite, firm, slightly marly but with moderate to good apparent porosity.
565-575	Limestone, as above, with increased marl content and slight reduction in porosity.
575-583	Marl, very light gray, soft, with minor phosphate and interbedded marly limestone, as above.
583-590	Marl, very light to light gray, soft to stiff pure carbonate mud.
590-593	Marl, as above, but fossiliferous and with minor pinkish-gray, silty biomicrite.

Continued:

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<u>Depth (feet)</u>	<u>Lithology</u>
593-603	Marl, medium light gray (N6), soft, clayey, with increasing phosphate content.
603-612	Limestone, light olive-gray micrite, silty, firm and friable, with minor fossils and abundant phosphate to granule sized, and with interbedded light olive-gray, clayey marl.
612-623	Limestone, pinkish-gray (5YR 8/1), micrite and biomicrite, firm to hard, phosphatic, with moderate to good moldic and intergranular porosity.
623-625	Marl, very light gray, soft, carbonate mud.
625-635	Limestone, pinkish-gray biomicrite, firm, marly, with moderate to good porosity.
635-640	Limestone, light gray to light bluish-gray (5B 7/1), biomicrite, hard, silty, with good to excellent intergranular and moldic porosity.
640-670	Limestone, yellowish-gray to light bluish-gray biomicrudite to micrite, hard, phosphatic, very fossiliferous with good to excellent porosity as above.
670-680	Limestone, yellowish-gray micrite, firm, silty (quartz and phosphate), friable, fossiliferous with good to excellent intergranular porosity.
680-695	Limestone, as above, but with biomicrite, increasing hardness, and with good moldic porosity.
695-700	Limestone, yellowish-gray micrite and biomicrite, firm to hard but friable, silty (quartz and phosphate), slightly marly, with good moldic and intergranular porosity.
700-705	Limestone, as above, with increased fossil content and with excellent moldic porosity.

GEOLOGIST'S LOG OF WELL LM-3508

NOTE: No samples taken above 700 feet; refer to log of well LM-3273 for upper section.

<u>Depth (feet)</u>	<u>Lithology</u>
700-714	Limestone, white, soft, finely phosphatic, moldic, fossiliferous, shell common, common white lime mud, moderate permeability.
714-752	Limestone, white to very light gray, phosphatic, biomicritic, moderately soft, good moldic porosity, minor shell.
752-760	Marly limestone; limestone as above with limey white clay, finely phosphatic, very soft, low permeability.
760-786	Limestone, white to very light gray as above with common limestone, very pale orange, moderately hard, sucrosic texture, moderate permeability.
786-810	Limestone, very pale orange (10YR, 8/2), soft, sucrosic texture, moldic, good porosity.
810-842	Limestone, very pale orange (10YR, 8/2), soft, well indurated, calcarenitic texture, excellent interparticular and moldic porosity.
842-847	Interbedded limestone as above; limestone, white to very light gray, moderately hard, micritic; dolomite, hard, brownish-gray; dolomite, medium gray, phosphatic; minor shell.
847-867	Limestone, very pale orange (10YR, 8/2) to white, very soft, calcarenitic texture, very limey, minor shell, moderate porosity.
867-877	Limestone, very pale orange (10YR, 8/2) to grayish-orange pink (5YR, 7/2), calcarenitic texture, abundant fossils, soft, good moldic porosity.
877-885	Limestone, very pale orange (10YR, 8/2), micritic, moderately hard, moderate to good moldic porosity.

GEOLOGIST'S LOG OF WELL LM-3508 - Continued:

<u>Depth (feet)</u>	<u>Lithology</u>
885-887	Limestone, very pale orange (10YR, 8/2), calcarenitic texture, very soft and crumbly, moderate moldic porosity, very limey.
887-900	Limestone, very pale orange (10YR, 8/2), micritic, moderately hard, good moldic porosity. Minor interbedded limestone, light gray, sucrosic texture, hard.
900-905	Marl: Clay, white, limey, soft, cohesive; limestone, white, micritic, fairly hard, low permeability.
905-907	Marl, as above, with addition of limestone, very pale orange, calcarenitic texture; minor banded clay, very pale orange, medium gray and light gray interbedded, cohesive, dry, low permeability, slow drilling.
907-915	Clay, medium light gray, cohesive, moderately soft, moderately dry, common limestone, very pale orange and white, low permeability, slow drilling.
915-919	Clay, white to very pale orange, soft, cohesive, slow drilling, low permeability.
919-930	Limestone, very pale orange, moderately hard, micritic, moldic.
930-937	Limestone, very pale orange, calcarenitic texture, soft, moderate to low permeability.
937-983	Limestone, very pale orange, calcarenitic texture, soft, moderate interparticular porosity.
983-990	Limestone, pale yellowish-brown (10YR, 6/2), moderately hard, micritic, abundant spines, common shell, moderate to good porosity.
990-997	Limestone, very pale orange, moderately soft, calcarenitic texture, minor shell.
997-1010	Limestone as above, shell common.

GEOLOGIST'S LOG OF WELL LM-3508 - Continued:

<u>Depth (feet)</u>	<u>Lithology</u>
1010-1020	Limestone, very pale orange, micritic, hard, good moldic porosity.
1020-1048	Limestone, very pale orange, calcarenitic texture, soft, well indurated, moderate to low permeability.
1048-1054	Limestone, very pale orange, micritic, hard, well indurated, good moldic porosity.
1054-1060	Limestone, dark yellowish-brown (10YR, 4/2), moderately hard, micritic, moderate to low permeability, minor moldic porosity, trace black clay, very dry, cohesive, moderately hard for clay.
1060-1077	Limestone, light brownish-gray (5YR, 6/1), micritic, slightly fossiliferous, hard, moderate moldic porosity.
1077-1085	Limestone, pinkish-gray (5YR, 8/1) to very pale orange, micritic, soft, moderate to low permeability.
1085-1089	Limestone, very pale orange with gray inclusions, micritic, moderately hard, good moldic porosity.
1089-1094	Limestone, as above, calcarenitic texture, soft, crumbly, minor shell, moderate interparticular porosity.
1094-1097	Limestone, pinkish-gray (5YR, 8/1), moderately soft, micritic, minor moldic porosity.
1097-1100	Clay, pinkish-gray, cohesive, soft, low permeability, common limestone as above.