GEOLOGIST LOG OF WELL
LM-4267 (ASR WELL)

Depth (ft BLS)	Lithology
0 - 5	Sand, quartz, yellowish brown (10Y 6/2), fine grained, rounded, well sorted, traces of shells and shell fragments, medium apparent permeability, minor organic material.
5 - 10	Sand, as above, Limemud, light grey (N7) to medium gray N6), soft, gummy texture, traces of shell fragments and very fine quartz sand (10%), low permeability.
10 - 15	Sand, quartz, grayish brown (5YR 3/2), very fine to fine grained, rounded, well sorted, abundant fossils, bivalves, gastropods, sponge spicules, moderate permeability.
15 - 19	Sand, quartz, light gray (N7) to light brown (5YR 6/4), fine to medium grained, subrounded to rounded moderately sorted, abundant shell fragments, as above, high permeability.
19- 21	Limestone, very light grey (N8), minor yellowish gray (5Y 7/2), micritic to biomicritic, traces of shell fragments, molds, and casts, low moldic porosity, good apparent permeability.
21 - 31	Limestone, yellowish gray (5Y 7/2) to light olive gray (5Y 5/2), hard, biomicritic, common shells and shell fragments, good to fair apparent moldic porosity, primarily low apparent permeability with occasional zones of fair to good permeability.
31 - 35	Limestone, grayish orange (10 YR 7/4) biomicritic, hard, poor apparent porosity and permeability; light olive gray (5Y 6/1) biomicritic, mottled with light bluish gray, moldic porosity, good to excellent apparent porosity, fair to good permeability.
35 - 41	Limestone, grayish orange (10 YR 7/4) biomicritic, to micritic, moderately hard to soft, matrix has fair to good moldic and intergranular porosity with occasional shell fragments, low to fair apparent porosity and permeability.

GEOLOGIST LOG OF WELL
LM-4267 (ASR WELL)
-CONTINUED-

Depth (ft BLS)	Lithology
41 - 45	Limemud, grayish orange (10 YR 7/4) to very pale orange (10YR 8/2) soft, gummy texture, poor porosity and apparent permeability.
45 - 52	Limestone, grayish orange (10 YR 7/4) biomicritic, friable good to excellent porosity and apparent permeability; light olive gray (5Y 6/1) biomicritic, mottled with light bluish gray, moldic porosity, common shell fragments, slightly calcarenitic, good to excellent apparent porosity, fair to good permeability.
52 - 68	Limestone light olive gray (10YR 7/4), moderately hard, calcarenitic, slightly friable, h some micrite, minor molds, shell fragments (bivalves), good to excellent moldic porosity, good apparent permeability.
68 - 72	Silty Clay, pale olive (10Y6/2) soft, semi-cohesive, occasional fine phosphate grains, very low apparent porosity and permeability.
72 - 91	Clay, grayish olive (10Y 4/2) semi-firm to soft, cohesive, sticky, minor dark purple to black fine phosphatic grains, very low apparent porosity and permeability, occasional limestone, as above.
91 - 99	Clay, as above, occasional stringers of limestone and limemud, traces of phosphatic grains and shell fragments.
99 - 110	Clay, as above, more cohesive, less shell fragments, blocky, stiff, contains traces of fine to medium phosphatic grains.
110 - 119	Limestone, yellowish gray (5Y 7/2) to light gray (N7), biomicritic, traces of calcarenite, moderately hard, friable, common shell fragments, traces of phosphatic grains.
119 - 148	Limestone, yellowish gray (5Y 7/2), biomicritic, sandy to calcarenitic, friable, good to excellent intergranular and moldic porosity, good apparent permeability, occasional shell fragments, minor interbedded clay, grayish olive (10 Y 4/2).

GEOLOGIST LOG OF WELL
LM-4267 (ASR WELL)
-CONTINUED-

Depth (ft BLS)	Lithology
148 - 161	Limestone, as above, good intergranular and moldic porosity, fair to good apparent permeability, abundant shell fragments, minor phosphatic grains.
161 - 163	Clay, grayish olive (10Y 4/2) semi-firm to soft, cohesive, sticky, minor dark purple to black fine phosphatic grains, very low apparent porosity and permeability.
163 - 176	Limestone, yellowish gray (5Y 7/2), biomicritic, sandy to calcarenitic, friable, good to excellent intergranular and moldic porosity, good apparent permeability, occasional shell fragments, minor interbedded clay, grayish olive (10 Y 4/2).
176 - 179	Limestone, olive gray (5Y 4/2), sandy, friable, moderately soft, traces of shell fragments, traces of phosphatic grains, fair to good intergranular porosity and permeability.
179 - 189	Limestone,light olive gray (5Y 6/1), sandy, friable, moderately soft, traces of shell fragments, traces of phosphatic grains, fair to good intergranular porosity and permeability, common soft, cohesive, limemud.
189 - 190	Clay, grayish olive (10Y 4/2) soft slightly cohesive.
190 - 210	Limestone, as above, phosphate, nodule zone 199 - 200, common medium sized nodules, common shells and shell fragments (barnacles present), traces of clay, as above.
210 - 223	Clay, light olive gray (5Y 6/1) to greenish gray (5GY 6/1) to pale olive (10Y 6/2), soft to very soft, silty, increase in amount of barnacles toward base.

GEOLOGIST LOG OF WELL
LM-4267 (ASR WELL)
-CONTINUED-

Depth (ft BLS)	Lithology
223 - 238	Limestone, medium light gray (N6), to light olive grey, biomicritic, most grains sandy, moderately hard to soft and friable, common shell fragments, fair to good intergranular porosity, fair apparent permeability.
238 - 248	Limestone, very light grey (N8), minor yellowish gray (5Y 7/2), micritic to biomicritic, traces of shell fragments, molds, and casts, good moldic porosity, good apparent permeability, traces of sandy soft clay.
248 - 281	Clay, light olive gray (5Y 6/1) to greenish gray (5GY 6/1) to pale olive (10Y 6/2), soft to very soft, silty, sandy, increase in phosphatic grains.
281 - 302	Clay, olive gray (5Y 3/2), as above, occasional light olive gray (5Y 6/1) to pale olive (10Y 6/1), very soft, slightly silty, fine disseminated phosphate, common phosphate nodules coarse sand to fine gravel sized. traces of limestone. yellowish gray (5Y 7/2) sandy moderately soft, fair to poor apparent porosity and permeability.
302 - 322	Limemud, light grey (N7), to dark grey (N4), soft, sticky, cohesive, minor interbedded limestone in a limemud matrix, traces of shell fragments and phosphatic grains.
322 - 323	Limestone, light olive gray (5Y,6/1) to olive gray (5Y,4/1) biosparitic, very hard, common black phosphatic grains, sandy, as above, except medium to fine grains and increasing coarse grains with depth, abundant shell and shell fragments, medium permeability.
323 - 323	Limestone, grayish orange (10YR 7/4), micritic to biomicritic, moderately hard, common shell fragments, and finely phosphatic grains, good to excellent moldic porosity, high apparent permeability.

GEOLOGIST LOG OF WELL
LM-4267 (ASR WELL)
-CONTINUED-

Depth (ft BLS)	Lithology
332 - 346	Limestone, grayish orange (10YR 7/4), micritic to biomicritic, moderately hard, common shell fragments, and finely phosphatic grains, good to excellent moldic porosity, high apparent permeability.
346 - 348	Limestone, yellowish gray (5Y,7/2) to light olive gray (5Y,6/1), sandy biosparite, very hard, increasing shell fragments, good moldic porosity, high apparent permeability.
348 - 354	Clay, olive gray (5Y 3/2), as above, occasional light olive gray (5Y 6/1) to pale olive (10Y 6/1), very soft, slightly silty, fine disseminated phosphate, common phosphate nodules coarse sand to fine gravel sized. traces of limestone. yellowish gray (5Y 7/2) sandy moderately soft, fair to poor apparent porosity and permeability.
354 - 364	Limestone, yellowish gray (5Y 8/1) to light olive gray (5YR 6/1), micritic to biomicritic, moderately hard, common shell fragments, and finely phosphatic grains, high apparent permeability and porosity.
364 - 371	Sand, clear to slightly frosted quartz, rounded to sub-rounded, medium to coarse grained, common limestone, light gray (N7), biomicritic moderately hard, good to fair apparent porosity and permeability.
371 - 376	Limestone, yellowish gray (5Y,7/2) to light olive gray (5Y,6/1), biomicritic to calcarenitic, hard to moderately soft, friable, fair to good apparent porosity and permeability.
376 - 386	Limestone, yellowish gray (5Y,7/2) to light olive gray (5Y,6/1), hard to moderately soft, biomicritic to calcarenitic, abundant shell fragments, friable, fair to good apparent porosity and permeability.
386 - 392	Clay olive gray (10 YR 6/2) soft, sticky, silty, contains abundant shell fragments.