

STATE OF OREGON  
DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES  
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OPEN-FILE REPORT O-80-13

LITHOLOGIC LOGS OF ELEVEN WELLS  
AND  
FORAMINIFERAL SPECIES LISTS OF  
FOUR WELLS IN  
SOUTHWESTERN OREGON

Species lists by

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Geology and Oil and Gas Prospects of the Coos Basin,  
Western Coos, Douglas, and Lane Counties, Oregon.

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DISCLAIMER

This report has not been edited for complete conformity with Oregon Department of Geology and Mineral Industries standards.

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Lithologic logs  
of eleven southwestern Oregon wells

1. Lithologic log, Coast Oil Company Fat Elk 1

SE $\frac{1}{4}$  sec. 11, T. 28 S., R. 13 W., Coos County, Oregon

Depth (ft)	Description
0 - 39	Clay and sand.
39 - 105	Sandy shale.
105 - 146	Loose sand and water.
146 - 150	Blue shale.
150 - 183	Brown shale.
183 - 191	Lime.
191 - 208	Hard brown shale.
208 - 245	Blue shale.
245 - 260	Sandy lime.
260 - 270	Shale.
270 - 295	Sand.
295 - 312	Sand.
312 - 314	Gilsonite(?) (coal).
314 - 322	Blue shale.
322 - 365	Limestone.
365 - 368	Pink limestone.
368 - 374	Sand with oil show.
374 - 380	Lime.
380 - 392	Sand, lime.
392 - 422	Shale.
422 - 580	Gray limy sand.

Lithologic log, Coast Oil Company Fat Elk 1 (continued)

Depth (ft)	Description
580 - 585	Gray limy sand.
585 - 600	Sandy clay.
600 - 620	Lignite and clay.
620 - 630	Sandy clay.
630 - 645	Sand, clay, and lignite.
645 - 670	Limy sand.
670 - 790	Brown sandy clay.
790 - 815	Gray limy sand.
815 - 850	Gray limy sand with gas show.
850 - 855	Dark-gray sandy shale.
855 - 865	Gray limy sand.
865 - 900	Dark-gray pebble shale.
900 - 905	Gray limy sand.
905 - 915	Gray sand.
915 - 980	Dark-gray shale.
980 - 1,069	Dark-gray limy shale.
1,069 - 1,073	Gray limy shale.
1,073 - 1,175	Gray limy shale and gas show.
1,175 - 1,200	Gray limy shale and gas and oil shows.
1,200 - 1,300	Gray limy shale and gas and oil shows.
1,300 - 1,476	Gray limy shale and gas show.

Lithologic log, Coast Oil Company Fat Elk 1 (continued)

Depth (ft)	Description
1,476 - 1,630	Blue shale and gas show.
1,630 - 1,675	Gray lime.
1,675 - 1,690	Blue shale, some sand, and some free oil; gas burns with flame 20 ft high.
1,690 - 1,728	Blue shale and oil and gas shows.
1,728 - 1,760	Blue shale and oil and gas shows.
1,760 - 1,765	Dark-gray to black limestone.
1,765 - 1,790	Blue limy shale and gas shows.
1,790 - 1,805	Hard lime and water.
1,805 - 1,817	Shale.
1,817 - 1,832	Lime.
1,832 - 1,895	Sand and good gas show.
1,895 - 2,006	Lime.
2,006 - 2,026	Chocolate shale and good gas show.
2,026 - 2,075	Chocolate shale, streaks of sand, and good gas show.
2,075 - 2,100	Alternating bed of lime and shale and good gas show.
2,100 - 2,255	Sandy lime with thin streaks of shale and continued gas shows.
2,526 T.D.	

2. Lithologic log, General Petroleum Corporation Long Bell 1

SW $\frac{1}{4}$  sec. 27, T. 20 S., R. 10 W., Douglas County, Oregon

Depth (ft)	Description
0 - 569	Sandstone, greenish-gray, very fine-grained, angular to subround grains, argillaceous, micaceous.
569 - 810	Sandstone, as above, but interbeds of reddish-brown siltstone, dark-gray sandy carbonaceous siltstone, and dark-brown shale; some gray claystone.
810 - 1,180	Siltstone, brown and light-gray, sandy, micaceous, carbonaceous siltstone and dark-brown siltstone.
1,180 - 1,510	Sandstone, brownish-green, fine- to coarse-grained, micaceous, argillaceous, some calcite.
1,510 - 2,040	Sandstone, grayish-green, very fine- to medium-grained, argillaceous, micaceous.
2,040 - 2,450	Siltstone, gray to grayish-brown, with interbeds of gray, very fine- to medium-grained argillaceous sandstone; some calcite and sandy claystone.
2,450 - 2,860	Sandstone, grayish-green, fine- to coarse-grained, angular to subangular, micaceous sandstone, some interbedded brown siltstone.
2,860 - 2,960	Siltstone, gray to grayish-brown siltstone and fine sandstone.
2,960 - 4,078	Sandstone, gray to grayish-green, fine- to coarse-grained, angular to subangular sandstone; trace of pyrite, some interbedded dark-brown siltstone, and some carbonaceous matter.
4,078 - 4,098	Core No. 1 rec. 20 ft Sandstone, light-gray when dry, gray-green when wet, fine- to medium-grained, very massive, 20 ft without silt break, poorly sorted, silty, large mica flakes, carbonaceous. Large, scattered angular siltstone fragments up to $\frac{1}{2}$ in.; scattered small basalt pebbles; no flash; no staining.
4,098 - 4,180	Sandstone, as above.

Lithologic log, General Petroleum Corporation Long Bell 1 (continued)

Depth (ft)	Description
4,180 - 4,200	Core No. 2, rec. 17 ft 11 in. Sandstone, gray-green, fine- to medium-grained, large mica flakes; carbonaceous, silty, scattered large angular siltstone fragments up to $\frac{1}{2}$ in. and small basalt pebbles and alternating thin-bedded siltstone and sandstone. Sandstone, gray-green, fine, micromicaceous. Siltstone, black, micromicaceous, large carbonaceous fragments. Small amount of shale with siltstone.
4,200 - 4,220	Core No. 3, rec. 18 ft 10 in. Sandstone, gray-green, fine- to medium-grained, hard, very massive, silty, carbonaceous, large mica flakes. Scattered small siltstone fragments. Local calcite. Black shale and dark-gray siltstone, micromicaceous, highly carbonaceous.
4,220 - 4,350	Sandstone, as above.
4,350 - 4,370	Siltstone.
4,370 - 4,385	Sandstone, trace of oil staining on samples, faint $\text{CCl}_4$ cut. Possible gas sand.
4,385 - 4,699	Shale, dark-gray, silty, micaceous, trace of buff-colored limestone.
4,699 - 4,704	Core No. 4, rec. 5 ft. Shale, dark-gray, hard, finely laminated, rare large carbonaceous fragments on bedding planes, breaks easily on bedding plane, common pyrite, shale in part grades into siltstone, dark-gray; with common thin ( $\frac{1}{32}$ to $\frac{1}{8}$ in.) interbedded sandstone, light-gray to white, very fine- to medium-grained, silty. Common microfossils, rare megafossil fragments. Rare thin ( $\frac{1}{32}$ in.) , cross-cutting calcite veins. No odor, stain, or fluorescence. Dip $0-2^\circ$ (good).
4,704 - 5,215	Shale, as above. Bentonite layer 5,036 ft.
5,215 - 5,221	Core No. 5, rec. 6 ft. Shale, dark-gray, hard, common pyrite replacement of microfossils, grading into siltstone, dark-gray, rare mica, carbonaceous fragments, common pyrite; interbedded sandstone, light-gray, very fine-grained silty interbeds $\frac{1}{32}$ to 2 in. Common small,

Lithologic log, General Petroleum Corporation Long Bell 1 (continued)

Depth (ft)	Description
5,221 - 5,351	high-angle fractures filled with calcite. Dip 10-15° (good). No odor, stain, or cut.
5,221 - 5,351	Shale, as above.
5,351 - 5,371	Core No. 6, rec. 20 ft. Shale, dark-gray, finely laminated, common pyrite; interbedded with light-gray, fine-grained sandstone, silty. Slightly fractured with calcite. 6-10° dip (good). No odor, stain, cut, or fluorescence. Shale breccia with fragments of shale and sandstone as above and olive-gray limestone; fragments up to 3 in. Matrix shale.
5,371 - 5,589	Shale, as above.
5,589 - 5,609	Core No. 7, rec. 17 ft. Sandstone, light-purple, granular, massive, silty, scattered large calcite, common pyrite, veins filled with pyrite, rare fractures calcite-filled, grades into shale. No odor, stain, cut, or fluorescence. Shale, dark-gray, finely laminated, grades into sandstone, light-gray, very fine-grained silty, highly chloritic, commonly thinly interbedded. Common pyrite, calcite-filled fractures, rare fractures in upper 12½ ft, lower 3½ ft highly fractured with highly polished slickensides. Common microfossils. Dip 0°. Cross-bedding up to 15°. No odor, stain, faint amber cut. At 5,600 ft, both shale and sandstone had pale-yellow fluorescence with CCl <sub>4</sub> for 3 ft.
5,609 - 5,629	Core No. 8, rec. 6 ft. Shale, dark-gray, finely laminated, grades into thinly interbedded shale and sandstone, light-gray, very fine-grained, silty, rare pyrite filling of fractures. Common highly polished slickensides, rare calcite-filled. Microfossils. Dip 4-10° (good). No odor, stain, faint amber cut, pale-yellow fluorescence with CCl <sub>4</sub> , very slow.
5,629 - 5,750	Sandstone, light-gray, very fine grained, some calcite cement and interbeds of brown to grayish-green siltstone and dark-gray soft shale, trace of pyrite. Possible untested hydrocarbon zone(?).
5,750 - 5,910	Shale.

Lithologic log, General Petroleum Corporation Long Bell 1 (continued)

Depth (ft)	Description
5,910 - 6,030	Sandstone and siltstone, light-green, very fine-grained, chloritic, possible untested hydrocarbon zone(?).
6,030 - 6,040	Shale.
6,040 - 6,060	Core No. 9, rec. 20 ft. Shale, dark-gray, massive, hard, rare carbonaceous fragments. Rare small sand pods. Grades into siltstone, dark-gray, hard, with common elongated, dark-gray shale pods ( $\frac{1}{2}$ to $\frac{1}{8}$ in.). Rare interbedded, finely laminated shale and sandstone. Sandstone, light-gray, extremely fine-grained, silty, rare pyrite. Common microfossils, breaks easily on bedding planes. Rare calcite-filled fractures 6,058 ft; $\frac{3}{4}$ in. quartz vein at 6,053 ft. $\frac{1}{2}$ in. white calcareous shale. Dip 0-3°. No stain or odor. Faint pale-yellow fluorescence with $\text{CCl}_4$ throughout core when crushed.
6,060 - 6,530	Shale, dark grayish-brown to gray and grayish-green, silty, trace of pyrite and calcite. Slow pale-yellow fluorescence with $\text{CCl}_4$ at 6,470 to 6,515 ft.
6,530 - 6,576	Shale.
6,576 - 6,596	Core No. 10, rec. 20 ft. Shale, dark-gray, hard, massive, sand pods, rare pyrite. Finely laminated shale and sandstone. Shale, dark-gray, sandstone, light-gray, very fine-grained silty, micromicaeous. Carbonaceous on bedding planes, slightly contorted, depositional. Also some beds of olive-green massive limestone. Dip 10-15° (good).
6,596 - 7,095	Shale, with thin sandstone interbeds as above. Pale-yellow cut with $\text{CCl}_4$ , 6,620-6,625, 6,635-6,645, 6,745-6,750, 6,885-6,890, 6,890-6,905, 7,015-7,025 ft. Tar staining with pale greenish-yellow cut in $\text{CCl}_4$ , 6,930-6,950 ft. Some beds of light-gray to buff-colored tuff.
7,095 - 7,110	Core No. 11, rec. 11 ft. Shale, dark-gray, tuffaceous, carbonaceous fragments, rare pyrite with pods and thin interbeds up to $\frac{1}{4}$ in. of tuff, light-gray and fine-grained. Shale has rare, light-brown limestone interbeds. Tuff, light-gray to light-green, fine- to medium-grained, hard, with shale fragments. Dip 5-10° (good).

Lithologic log, General Petroleum Corporation Long Bell 1 (continued)

Depth (ft)	Description
7,110 - 7,377	Shale, as above.
7,362 - 7,377	Core No. 12, rec. 8 ft. Shale, multi-colored, dark-gray, red-brown, and green. Hard, massive, highly tuffaceous. Shale has lenses, pods, interbeds, and grades into tuff, red-brown, light-green, dark-green, blue-green, light-gray, fine- to medium-grained and hard, rare carbonaceous matrix with some pyrite, rare high- to low-angle fractures. Dip 10°-15° (poor).
7,377 - 7,874	Shale and tuff, as above.
7,874 - 7,881	Core No. 13, rec. 6 ft. Shale, finely laminated, tuffaceous, and tuff, silty, dark reddish-brown to gray-brown, medium-grained tuff and rare carbonaceous fragments in shale, hard and massive, common interbeds and irregular pods of tuff, dark-green to gray, fine- to coarse-grained, rare high-angle fractures. Dips 0-5°, some primary cross-bedding.
7,881 - 7,970	Shale and tuff, as above.
7,970 - 8,053	Shale.
8,053 - 8,336	Tuff, varicolored, chocolate-brown siltstone, some altered, some shale.
8,336 - 8,345	Core No. 14, rec. 5 ft. Shale, tuffaceous, red-brown and dark-gray with green, scattered angular fragments and irregular pods of tuff, light-green and gray, fine- to medium-grained, occasional thin interbeds of shale. Light-green, tuffaceous. Sandstone, dark-gray and dark-green, medium-grained, angular grains, hard, highly tuffaceous. Dip 0° (good).
8,345 - 8,430	Shale and tuff, as above.
8,430 - 8,468	Basalt, dark-green to black; hard; phenocrysts of plagioclase, augite, and olivine.
8,468 - 8,550	Shale and tuff, as above.

Lithologic log, General Petroleum Corporation Long Bell 1 (continued)

Depth (ft)	Description
8,550 - 8,582	Basalt.
8,582 - 8,592	Core No. 15, rec. 8 ft. Basalt, dark-green; hard to soft; phenocrysts of olivine, plagioclase, and augite; common pyrite. Highly altered, very common chlorite, rare small veins filled with zeolites.
8,592 - 8,995	Basalt, some shale interbeds.
8,995 - 9,004	Core No. 16, rec. 1 ft. Basalt, black, very hard, rare phenocrysts, broken in core barrel.
9,004 T. D.	

3. Lithologic log, Majestic Oil Company Rhoades-Menasha 1

SW $\frac{1}{4}$  sec. 32, T. 26 S., R. 13 W., Coos County, Oregon

Depth (ft)	Description
0 - 11	Top soil.
11 - 42	Shale and clay.
42 - 50	Yellow shale.
50 - 58	Black shale.
58 - 90	Hard black shale.
90 - 98	Black shale.
98 - 112	Sandy black shale.
112 - 116	Brown shale.
116 - 146	Hard sandy shale.
146 - 202	Gray shale. Hard streak 194-196 ft.
202 - 208	Soft shale.
208 - 238	Hard black shale.
238 - 241	Soft black shale.
241 - 254	Hard black shale.
254 - 283	Hard sandy shale.
283 - 315	Brown and gray shale.
315 - 329	Hard gray shale.
329 - 338	Soft black shale.
338 - 368	Hard sandy shale.
368 - 369	Hard chert.
369 - 375	Black shale.

Lithologic log, Majestic Oil Company Rhoades-Menasha 1 (continued)

Depth (ft)	Description
375 - 402	Soft, sandy gray shale.
402 - 404	Hard light-brown shale.
404 - 424	Gray and brown shale.
424 - 453	As above.
453 - 456	Hard gray shale.
456 - 469	Hard gray and brown shale.
469 - 530	Hard, sandy black shale.
530 - 542	Black and gray shale.
542 - 551	Soft brown shale with few particles of gray shale.
551 - 585	Soft gray shale.
585 - 590	Hard, sandy gray shale with some hard black particles.
590 - 591 $\frac{1}{2}$	Very hard gray sandstone.
591 $\frac{1}{2}$ - 600	Soft, sandy black shale with gas showing.
600 - 662	Fine black shale.
662 - 698	Black and gray shale.
698 - 700	Coal.
700 - 714	Hard shale and streaks of coal.
714 - 717	Hard sandy shale.
717 - 720	Some coal showing.
720 - 826	Soft, sandy blue shale with streaks of coal. Went in with new three-way drag bit.

Lithologic log, Majestic Oil Company Rhoades-Menasha 1 (continued)

Depth (ft)	Description
826 - 880	Soft gray mixture.
880 - 882	Hard conglomerate with tar showings(?).
882 - 895	Gray and black shale.
895 - 915	Solid black coal with oil-stained sandstone(?).
915 - 939	Black and gray formations.
939 - 960	Sandy black shale.
960 - 962	Hard shale.
962 - 1,004	Shale and coal.
1,004 - 1,041	Black shale and some coal.
1,041 - 1,070	Brown shale with coal streaks. New drag bit three-way.
1,070 - 1,124	Soft, gray sandy shale.
1,124 - 1,149	Sandy blue shale.
1,149 - 1,150	Hard cap rock.
1,150 - 1,156	Sandy black shale.
1,156 - 1,195	Light black shale.
1,195 - 1,200	Coal with some black shale.
1,200 - 1,220	Black sandy shale with some coal.
1,220 - 1,250	Coal with some shale.
1,250 - 1,302	Shale with streaks of coal. Sticky 1,282-1,285 ft.
1,302 - 1,303	Hard cap rock.
1,303 - 1,352	Cored--black shale and coal. Some sandstone saturated with gas.

Lithologic log, Majestic Oil Company Rhoades-Menasha 1 (continued)

Depth (ft)	Description
1,352 - 1,362 $\frac{1}{2}$	Cored--recovered one foot of hard shale with black impregnations.
1,362 $\frac{1}{2}$ - 1,365	Cored--hard black and gray shale with black impregnations. Core contained considerable gas.
1,600 T. D.	

4. Lithologic log, Oregon Coastal Corporation John Coy 1  
 NE $\frac{1}{4}$  SE $\frac{1}{4}$  sec. 4, T. 29 S., R. 14 W., Coos County, Oregon

Depth (ft)	Description
0 - 21	Marine sand.
21 - 141	Black sand.
141 - 185	Hard sand and blue clay.
185 - 299	Sandy shale.
299 - 300	Hard blue shale, small gas show.
300 - 330	Fine-grained, argillaceous gray sandstone containing high percentage biotite and dark mafic minerals ranging from subangular to subrounded in individual grains. Minor amounts blue-gray mudstone and buff to white tuffaceous claystone.
330 - 360	Predominately gray siltstone; minor amounts gray silty sand.
360 - 390	Blue-gray siltstone. Minor amounts light-gray, fine-grained silty sand. Rarely occurring limonite-stained igneous rocks.
390 - 420	Same as above.
420 - 450	Sandy silt, minor amounts of gray siltstone and buff to white tuffaceous clay.
450 - 480	Light blue-gray, fine-grained silty sandstone. Minor amounts gray siltstone.
480 - 510	Dark-gray siltstone. Gray, silty, fine-grained sandstone with minor amounts of buff-colored tuffaceous clay.
510 - 540	Buff-colored tuffaceous claystone. Minor amounts dark-gray siltstone and silty fine-grained sand.
540 - 570	Dark-gray siltstone. Minor amounts fine-grained, silty sandstone and dark-gray mudstone.
570 - 600	Gray, fine-grained, silty sandstone. Minor amounts of gray siltstone and mudstone. Some buff tuffaceous claystone.

Lithologic log, Oregon Coastal Corporation John Coy 1 (continued)

Depth (ft)	Description
600 - 630	Dark-gray siltstone. Minor amounts fine-grained silty sandstone. Some buff, tuffaceous claystone.
630 - 660	Dark-gray siltstone. Minor amounts gray, fine-grained, silty sandstone. Rarely occurring limonite-stained fragments of igneous rocks. Some buff tuffaceous claystone.
660 - 690	Same as above.
690 - 720	Buff tuffaceous claystone. Dark-gray, fine-grained, silty sandstone and gray siltstone, with minor amounts dark-gray mudstone.
720 - 750	Light-gray, fine-grained, silty sandstone and dark-gray siltstone. Minor amounts buff tuffaceous claystone and dark-gray mudstone.
750 - 780	Buff tuffaceous claystone. Dark-gray siltstone. Minor amounts light-gray, fine-grained, silty sand.
780 - 810	Same as above.
810 - 840	Same as above with more dark-gray siltstone and lesser amounts of light-gray, fine-grained, silty sandstone.
840 - 870	Dark-gray siltstone. Buff tuffaceous claystone with minor amounts of gray, fine-grained, silty sand and dark-gray mudstone.
870 - 900	Same as above.
900 - 930	Dark-gray siltstone. Minor amounts of fine-grained gray sandstone. Very rarely occurring fragments of medium-grained limonite-stained, predominantly quartz sandstone. Minor amounts buff tuffaceous claystone.
930 - 960	Predominantly dark-gray siltstone. Minor amounts of gray, fine-grained, silty sandstone with very rarely occurring fragments of fine- to medium-grained limonitic sandstone and some buff tuffaceous claystone.
960 - 990	Dark-gray mudstone and siltstone. Minor amounts buff tuffaceous claystone. Minor amounts light-gray siltstone.

Lithologic log, Oregon Coastal Corporation John Coy 1 (continued)

Depth (ft)	Description
990 - 1,020	Dark-gray siltstone with minor amounts light-gray, fine-grained siltstone and buff tuffaceous claystone.
1,020 - 1,050	Dark-gray siltstone. Dark-gray mudstone. Minor amounts gray, fine-grained sandstone and buff tuffaceous clay.
1,050 - 1,080	Dark-gray siltstone with minor amounts dark-gray mudstone and light-gray, fine-grained sandstone and very small amounts buff tuffaceous clay.
1,080 - 1,110	Dark-gray siltstone and mudstone. Minor amounts buff to light-gray tuffaceous clay and light-gray, fine-grained, silty sandstone.
1,110 - 1,140	Dark-gray siltstone. Minor amounts light-gray, fine-grained, silty sand and dark-gray mudstone and rarely occurring fragments of light-gray tuffaceous clay.
1,140 - 1,170	Dark-gray siltstone. Minor amounts light-gray, fine-grained sandstone. Some dark-gray mudstone and very rarely occurring fragments of medium-grained limonite-stained quartz(?) sandstone.
1,170 - 1,200	Dark-gray siltstone. Minor amounts dark- to light-gray mudstone, fine-grained, gray, silty sandstone and buff to gray tuffaceous claystone.
1,200 - 1,230	Light-gray, fine-grained, silty sandstone. Dark-gray siltstone. Minor amounts dark-gray mudstone and rare limonite-stained igneous(?) rock fragments. Light-gray tuffaceous claystone.
1,230 - 1,250	Dark- to light-gray siltstone and mudstone with minor amounts of light-gray, fine-grained, silty sandstone.
1,250 - 1,290	Same as above. Rarely occurring limonite-stained fragments of igneous(?) rocks.
1,290 - 1,320	Same as above, with minor amounts light-gray tuffaceous clay and very rare limonite-stained fragments of medium-grained quartz(?) sandstone.

Lithologic log, Oregon Coastal Corporation John Coy 1 (continued)

Depth (ft)	Description
1,320 - 1,350	Same as above.
1,350 - 1,380	Same as above. Medium-grained sandstone absent.
1,380 - 1,400	Dark- to light-gray siltstone and mudstone with minor amounts light-gray, fine-grained, silty sandstone and rare fragments of limonite-stained, medium-grained sandstone and gray to buff tuffaceous claystone.
1,400 - 1,470	Same as above.
1,470 - 1,500	Dark-gray siltstone. Minor amounts sandy silt and gray mudstone.
1,500 - 1,530	Dark-gray siltstone. Minor amounts fine-grained, light-gray sandstone and dark-gray mudstone.
1,530 - 1,560	Dark- to light-gray siltstone. Minor amounts medium- to dark-gray mudstone.
1,560 - 1,590	Same as above.
1,590 - 1,620	Same as above.
1,620 - 1,650	Same as above.
1,650 - 1,680	Same as above with minor amounts buff tuffaceous claystone.
1,680 - 1,710	Same as above with minor amounts fine-grained, light-gray silty sand.
1,710 - 1,740	Same as above.
1,740 - 1,770	Same as above.
1,770 - 1,790	Same as above with very rarely occurring limonite-stained fragments of igneous(?) rock; also very rare fragments fine- to medium-grained, limonite-stained quartz sandstone.

Lithologic log, Oregon Coastal Corporation John Coy 1 (continued)

Depth (ft)	Description
1,790 - 1,820	Dark-gray siltstone. Minor amounts sandy siltstone and mudstone.
1,820 - 1,850	Same as above with very rarely occurring fragments of buff tuffaceous claystone.
1,894 T.D.	

5. Lithologic log, Pacific Petroleum Corporation Morrison 1

NW $\frac{1}{4}$  SE $\frac{1}{4}$  sec. 28, T. 28 S., R. 14 W., Coos County, Oregon

Depth (ft)	Description
0 - 130	Marine sandstone.
130 - 366	Conglomerate, water at 220 ft.
366 - 380	Hard shell.
380 - 440	Hard shale.
440 - 500	Hard black rock, limestone or siliceous concretion(?).
500 - 560	Hard shale.
560 - 600	Hard sandstone. Encountered some gas at 570 ft and a trace of oil at 580 ft.
600 - 630	Gumbo.
630 - 632	Hard shell.
632 - 658	Gumbo.
658 - 660	Hard shale.
660 - 715	Limy shale.
715 - 720	Hard shell.
720 - 780	Cored gas sand
780 - 800	Sandy shale.
800 - 811	Gas sand.
811 - 821	Hard shell.
821 - 1,010	Hard shale.
1,010 - 1,014	Hard shell.

Lithologic log, Pacific Petroleum Corporation Morrison 1 (continued)

Depth (ft)	Description
1,014 - 1,050	Hard shale.
1,050 - 1,060	Sandstone, shows of gas and oil.
1,060 - 1,070	Cap rock.
1,070 - 1,100	Hard shale.
1,100 - 1,118	Sticky blue clay.
1,118 - 1,160	Hard shale.
1,160 - 1,206	Cored gas sand.
1,206 - 1,210	Hard shell.
1,210 - 1,240	Hard shale.
1,240 - 1,250	Clay.
1,250 - 1,460	Hard shale.
1,460 - 1,462	Hard shell.
1,462 - 1,518	Gas sand.
1,518 - 1,600	Hard shale.
1,600 - 1,640	Cored gas sand.
1,640 - 1,790	Sandy shale.
1,790 - 1,880	Soft shale.
1,880 - 1,920	Hard gas sand.
1,920 - 1,930	Shale.
1,930 - 2,038	Gas sand.
2,038 - 2,040	Hard rock.

Lithologic log, Pacific Petroleum Corporation Morrison 1 (continued)

Depth (ft)	Description
2,040 - 2,100	Hard sand.
2,100 - 2,105	Hard cap rock.
2,105 - 2,189	Soft sand, gas and oil shows.
2,189 - 2,209	Sandstone with show of oil.
2,209 - 2,235	Sandy shale.
2,235 - 2,236	Hard shell.
2,236 - 2,282	Gas sand.
2,282 T. D.	

6. Lithologic log, Pacific Power and Light Company Eden Ridge 101

NW $\frac{1}{4}$  SW $\frac{1}{4}$  sec. 21, T. 33 S., R. 11 W., Coos County, Oregon

Depth (ft)	Description
0 - 50	No recovery.
50 - 60	Pebble conglomerate, brown to greenish-brown, weathered and steel-gray sandy siltstone, with serpentine and chert.
60 - 70	Silty shale, dark bluish-green.
70 - 90	Shale, dark bluish-green, firm.
90 - 110	Sandstone, dark bluish-gray, very fine-grained, slightly micaceous.
110 - 138	Sandstone, light bluish- to greenish-gray, fine- to medium-grained, hard, massive, with muscovite and jasper.
138 - 140	Siltstone, dark bluish-gray, shaly, slickensided.
140 - 145	Sandstone, gray, very fine-grained, micaceous, silty.
145 - 148	Siltstone, shaly.
148 - 162	Sandstone, gray, medium-grained, silty micaceous and interbedded siltstone. Apparent dip 25-35°, grades to silty carbonaceous shale below.
162 - 184	Shale, gray to dark-gray, compact, carbonaceous. Coal stringer 182-184 ft.
184 - 192	Siltstone and shale, grayish-green, massive, indurated.
192 - 204	No recovery.
204 - 208	Shale, as above.
208 - 212	Sandstone, gray, massive, hard.
212 - 240	Mudstone, bluish-gray.
240 - 246	Siltstone, bluish, hard, with thin sandstone layers.

Lithologic log, Pacific Power and Light Company Eden Ridge 101 (continued)

Depth (ft)	Description
246 - 256	Shale, dark-gray, some carbonaceous partings.
256 - 262	Siltstone, grayish-green, hard, massive.
262 - 267	Sandstone, gray, hard, with siltstone partings.
267 - 298	Shale, dark-gray, with occasional carbonaceous partings.
298 - 342	Sandstone, gray, very fine-grained. Beds of gray carbonaceous shale 318-320 and 332-342 ft with coal stringers.
342 - 376	Sandstone, light-gray, medium-grained, well-sorted, massive, badly fractured.
376 - 380	Shale, dark-gray, hard, interbedded with siltstone.
380 - 400	Sandstone, light-gray, medium-grained, friable, quartzose, with some interbeds of carbonaceous shale. Coal partings 394-396 ft.
400 - 409	Shale, gray, carbonaceous, silty.
409 - 464	Sandstone, medium-gray, fine-grained, firm. Pebble conglomerate 432-434 ft.
464 - 500	Siltstone, black to gray, silty, carbonaceous, with shale partings.
500 - 576	Sandstone, gray, fine- to medium-grained, firm, some carbonaceous layers. Calcite-filled fractures at 546 ft.
576 - 586	Siltstone and sandstone, thinly interbedded, gray.
586 - 614	Sandstone, gray, fine-grained, micaceous, bedded.
614 - 620	Siltstone, gray, with sandstone stringers.
620 - 654	Sandstone, gray, fine-grained, micaceous, bedded, with carbonaceous inclusions.
654 - 658	Siltstone, as above.

Lithologic log, Pacific Power and Light Company Eden Ridge 101 (continued)

Depth (ft)	Description
658 - 682	Sandstone, gray, very fine-grained, massive, hard, with siltstone partings.
682 - 697	Siltstone, gray to dark-gray, with shale and sandstone partings.
697 - 828	Mudstone, dark-gray, hard.
828 - 876	Siltstone, gray, hard, massive, slightly fossiliferous.
876 - 884	Sandstone, gray, hard, poorly sorted, fossiliferous.
884 - 914	Shale and siltstone, gray, interbedded. Shale is carbonaceous.
914 - 942	Sandstone, light-gray, very fine-grained, hard, quartzose, with some layers of pebbly, subrounded sandstone.
942 - 961	Conglomerate, gray, sandy, with pebbles of basalt, chert and quartz.
961 - 986	Shale, dark-gray, carbonaceous.
986 - 1,040	Shale, dark-gray, silty, with carbonaceous streaks, some coal.
1,040 - 1,046	Sandstone, gray, fine-grained, hard, massive.
1,046 - 1,056	Siltstone, bluish-gray, hard, massive.
1,056 - 1,060	Shale, dark-gray, massive, silty, carbonaceous.
1,060 - 1,079	Siltstone, dark-gray.
1,079 - 1,150	Sandstone, gray, fine- to medium-grained, thinly bedded. Conglomerate layers at 1,088, 1,094-1,100, and 1,136-1,138 ft.
1,150 - 1,160	Shale, dark-gray, silty, carbonaceous.
1,160 - 1,196	Mudstone, grayish-green, lower portion silty.
1,196 - 1,200	Sandstone, medium-grained, thinly interbedded with siltstone.
1,200 T. D.	

7. Lithologic log, Phillips Petroleum Company Dobbys 1

NW $\frac{1}{4}$  SW $\frac{1}{4}$  sec. 28, T. 26 S., R. 13 W., Coos County, Oregon

Depth (ft)	Description
0 - 1,416	Sandstone, hard, and siltstone interbeds. Some thin coal beds. Gas sand at 1,040-1,055 ft(?).
1,416 - 1,424	Core No. 1, recovered 8 ft. Dense, biotitic, medium-coarse, angular quartzose sand. Low porosity.
1,424 - 1,709	Sandstone, hard, and interbedded shale.
1,709 - 1,718	Core No. 2, recovered 9 ft. Dense, fine-grained angular micaceous sand with streaks of carbonized material. Very low porosity.
1,718 - 1,737	Sandstone, as above and interbed of shale.
1,737 - 1,746	Core No. 3, recovered 9 ft. Dense, gray, carbonaceous sandstone. Dips in laminae approximately 30° to core axis.
1,746 - 2,330	Sandstone, as above and interbed of shale and siltstone.
2,330 - 2,400	Basalt(?).
2,400 - 2,790	Sandstone, and shale as above.
2,790 - 3,535	Shale, gray to greenish-gray, some thin sandstone beds.
3,535 - 3,538	Core No. 4, recovered 4 in. Thin section shows serpentinized amygdaloidal basalt. Vesicles filled with calcite and several types of zeolites.
3,538 - 3,542	Core No. 5, recovered 4 ft. Massive serpentine, little vesiculation.
3,542 - 3,630	Shale, gray to greenish-gray, some thin sandstone beds.
3,630 - 3,740	Sandstone, greenish-gray, hard.
3,740 - 3,940	Shale.

Lithologic log, Phillips Petroleum Company Dobbys 1 (continued)

Depth (ft)	Description
3,940 - 4,030	Basalt (?).
4,030 - 4,454	Shale and siltstone.
4,454 - 4,464	Core No. 6, recovered 10 ft. Massive, sheared, serpentized basalt.
4,464 - 5,180	Shale, may be a tight gas sand at 4,640-4,660 ft.
5,180 - 5,470	Basalt, altered, and interbedded shale.
5,470 - 5,480	Core No. 7, recovered 6 ft. Fresh diabasic dike in upper 2 ft; thin section shows euhedral crystals of unaltered magnesian olivine. Lower portion of core cut in dense, well-indurated, calcite-veined shale made up largely of fine-grained, "chloritic" basaltic debris.
5,480 - 6,352	Basalt, altered, with calcite and zeolite veining, some interbeds of shale.
6,352 - 6,360	Core No. 8, recovered 5 ft. Basalt breccia, hard, dense, well-indurated, fractured, slickensided and veined with calcite. Thin section shows fine quartz and feldspar in a matrix of calcite and basic swelling clay.
6,360 - 6,930	Basalt, altered.
6,930 - 6,938	Core No. 9, recovered 5 ft. Dense basalt in upper portion. Dark, calcite-veined, sheared, altered in lower portion.
6,938 - 6,941	Basalt, as above.
6,941 T.D.	

8. Lithologic log, Sinclair Oil and Gas Mapleton 1

SE $\frac{1}{4}$  sec. 12, T. 16 S., R. 10 W., Lane County, Oregon

Depth (ft)	Description
0 - 770	Sandstone, dark-gray, fine-grained, buff to reddish-brown silty sandstone and siltstone, firm to hard, micaceous, arkosic, locally contains carbonaceous material. Some interbedded dark-gray shale and mudstone.
770 - 1,200	Sandstone, light- to dark-gray, silty, very fine-grained, micaceous, with interbeds of dark-gray mudstone and siltstone, trace of pyrite, arkosic, locally medium-grained, some calcareous layers.
1,200 - 1,260	Siltstone, dark-gray, micromicaceous, and mudstone, slightly calcareous.
1,260 - 1,510	Sandstone, light-gray, silty, very fine-grained, micaceous, tight, some interbedded dark-gray siltstone and shale.
1,510 - 1,700	Sandstone, as above, contains some rounded basalt grains, interbedded siltstone and shale.
1,700 - 1,915	Shale, greenish-gray to dark-gray, silty and very fine-grained siltstone interbeds, slightly calcareous.
1,915 - 1,965	Graywacke sandstone, dark-gray.
1,965 - 2,022	Basalt, greenish-gray, altered to dense fine-grained.
2,022 - 2,160	Sandstone, light-gray, very fine-grained, micaceous, poorly sorted, quartzose, some brown crenulated mica flakes, some interbedded dark-gray silty shale, some woody carbonaceous material.
2,160 - 2,200	Shale and silty shale, dark-gray, micaceous.
2,200 - 2,387	Sandstone, light-gray, very fine-grained, micaceous, some biotite, some carbonaceous material and interbedded silty shale.
2,387 - 2,482	Basalt, dark greenish-gray, even textured, dense, with some calcite veinlets.
2,482 - 2,500	Shale, silty, micaceous. Slight increase in gas on logging unit.

Lithologic log, Sinclair Oil and Gas Mapleton 1 (continued)

Depth (ft)	Description
2,500 - 2,535	Sandstone, light-gray, very fine-grained, micaceous, quartzose, somewhat calcareous, and some dark-gray shale.
2,535 - 2,690	Shale, dark-gray, silty, micaceous, with interbeds of fine sandstone, some carbonaceous material.
2,690 - 2,770	Shale, dark-gray, silty, micaceous.
2,770 - 2,858	Basalt, greenish-gray, altered, calcite veining.
2,858 - 2,965	Shale, dark-gray, some mica, interbedded silty shale, bentonitic.
2,965 - 3,030	Basalt, greenish-gray, altered.
3,030 - 3,390	Shale, dark-gray to dark greenish-gray, some silty shale, some calcite veining, trace of pyrite.
3,390 - 3,520	Shale, dark-gray with thin interbeds of light-brown calcareous siltstone to silty limestone, calcite veining in shale.
3,520 - 3,932	Shale, dark-gray to medium greenish-gray, silty, bentonitic.
3,932 - 3,940	Tuff, light grayish-white, hard, calcareous.
3,940 - 3,964	Basalt - gabbro, dark greenish-gray to dark grayish-brown.
3,964 - 4,436	Shale, dark-gray, silty, with interbeds of medium greenish-gray bentonitic shale, some interbeds of light-brown silty limestone, occasional thin bed of very fine-grained gray sandstone.
4,436 - 4,447	Sandstone, light-gray, silty, fairly firm, calcareous, no shows or fluorescence.
4,447 - 4,808	Shale, dark-gray, silty, some brown silty limestone.
4,808 - 4,815	Core No. 1, recovered 6 ft. Shale. Recovery is badly broken and fractured to shattered, gray to slightly greenish-gray, very slightly silty. Abundant calcite veinlets. Recovery is fragmentary to biscuit-type recovery. At 4,809 ft is curved high-angle to vertical calcite veining suggestive

Lithologic log, Sinclair Oil and Gas Mapleton 1 (continued)

Depth (ft)	Description
	of complex jointing. At 4,809 to 4,809.5 ft, slight banding to laminae of silty shale. Measured dip 70°. From 4,811 to 4,811.3 ft slickensided shale. Remainder of recovery massive, in biscuits, hard, dark-gray, somewhat silty shale traversed by 1/16 to 1/8 in. calcite veinlets at angles from 40° to 80°. Shale is slightly calcareous.
4,815 - 4,910	Shale, as above.
4,910 - 4,915	Shale, dark-gray and hard, indurated, gray silty shale cut by calcite veinlets and minute pyrite veinlets, cut by slickensided surface.
4,915 - 4,970	Basalt, dark greenish-gray, dense and dark-gray shale.
4,970 - 4,989	Shale, dark-gray as before, trace of tan silty limestone, calcite fragments in cuttings.
4,989 - 5,000	Core No. 2, recovered 11 ft. Shale, dark-gray, hard, very slightly silty as before. Some slickensiding, possibly due to coring. Recovery badly broken by coring, abundant minute calcite veining. Mica is minute and disseminated. Some slickensided section. Exhibits vari-angled jointing. Recovery is broken and fractured and in biscuits and limestone, somewhat silty, gray to gray-brown, in contact with shales. Measured dip 20°.
5,000 - 5,100	Shale, dark-gray, silty, with calcite veinlets, some slickensides, trace of gray siltstone. Mineral fluorescence, light-yellow at 4,694-4,700 ft, trace of powder-blue fluorescence at 4,680-4,690 ft, some brown limestone.
5,100 - 5,117	Shale, dark-gray as above, calcite veinlets in shale, some slickensiding, some light-gray siltstone, pyrite and pyrite veinlets.
5,117 - 5,170	Basalt, dark-gray, calcite veining and interbedded dark shale.
5,170 - 5,384	Shale, dark-gray, some light-gray firm siltstone, trace of light-tan silty limestone, slickensiding, calcite veinlets.

Lithologic log, Sinclair Oil and Gas Mapleton 1 (continued)

Depth (ft)	Description
5,384 - 5,392	Basalt, thin flow.
5,392 - 5,580	Shale, dark as above.
5,580 - 5,660	Shale, as above with some gray to light greenish-gray, dense, very fine-grained tuffaceous sandstone.
5,660 - 5,790	Shale, as above.
5,790 - 5,840	Sandstone, light-gray, very fine-grained, calcareous cemented, hard, faint pale-blue fluorescence in CCl <sub>4</sub> , trace of coal.
5,840 - 5,875	Shale, as above, somewhat calcareous with trace of brown limestone, trace of very fine-grained graywacke.
5,875 - 5,910	Graywacke, light-green, very fine-grained, no shows or fluorescence.
5,910 - 5,962	Shale, dark-gray, somewhat calcareous.
5,962 - 6,005	Tuff, red to brick-red, fine to sandy-textured, some mottled coloring, bentonitic.
6,005 - 6,020	Shale, dark-gray, silty.
6,020 - 6,042	Conglomerate - coarse sandstone (submarine extrusives?); consisting of medium to very coarse fragments of dark-gray shale and maroon to reddish fragments of soft shale, cemented tightly in a matrix of calcite and lime; shale fragments are predominantly rounded.
6,042- 6,052	Core No. 3, recovery 8.5 ft. Microscopic conglomerate; massive, composed of pinpoint- to pea-sized fragments of dark grayish-blue to black shale (50%), light-green shale (40%), and maroon and reddish-brown soft shale fragments (10%), tightly cemented in a matrix of calcite and amorphous calcium carbonate. Fragments are predominantly rounded, but some are angular. Traces of pyrite. Heavy. Volcanic and igneous fragments absent. Baroid analysis: Porosity--12%, permeability--zero, water saturation--97%, oil saturation--zero. Note, September 5, 1955, revised calculations by Baroid: Porosity--7%, water saturation--71%.

Lithologic log, Sinclair Oil and Gas Mapleton 1 (continued)

Depth (ft)	Description
6,052 - 6,614	Conglomerate (coarse sandstone), as above.
6,614 - 6,620	Core No. 4, recovery 3 ft. Conglomerate, massive, hard, generally coarse, with fragments to 3-in.-plus size. Fragments are shale, generally dark, hard, with subordinate maroon fragments, angular to sub-rounded, ill-sorted with very thin calcite veining and very minor quartz veining. Brecciated appearance. Top 0.4 ft of core is very dense, very dark-gray, hard, fine-grained, silty sandstone, microscopically gritty, equivalent to resistive section on electric log from 6,580 to 6,600 ft. Local incipient high-angle fractures. Some dark-gray to black shale fragments, comparatively soft. No igneous fragments. Color cast of core predominantly chocolate or maroon.
6,620 - 6,660	Conglomerate, as above.
6,660 - 7,162	Basalt, grayish-green, some calcite, some reddish.
7,162 - 7,172	Core No. 5, recovery 9 ft. Basalt, dark gray-green to grayish, locally somewhat porphyritic, generally glassy. Groundmass generally glassy, locally dense, very fine-textured. Jointing at 7,168-7,171 ft with serpentinized mineral surfaces. Some greenish calcite. Heavy; joint or fracture surfaces with alteration minerals with serpentinized aspect. Basal 0.5 in. with white, rounded, slightly calcic amygdaloidal fillings. Euhedral pyroxene-augite phenocrysts.
7,172 - 8,820	Basalt, dark-gray to grayish-black, dense, hard, some thin interbeds of tuff, calcite veining in tuff, some calcite veining in basalt. Section at 7,248-7,258 ft is fractured, lost 30 bbls of mud. Reddish alteration zones probably flow contacts.
8,820 - 10,070	Basalt and greenish altered basalt, dark-gray, dense, some greenish augite, reddish altered portions, zeolite, serpentinized sections, asbestiform mineral, some diabase, trace of native copper, calcite- and zeolite-filled amygdules, numerous calcite and zeolite veinlets.
10,070 - 10,310	Basalt, dark-gray, dense, augite-bearing.
10,310 - 10,923	Basalt and altered basalt.

Lithologic log, Sinclair Oil and Gas Mapleton 1 (continued)

Depth (ft)	Description
10,923 - 10,928	<p>Core No. 6, recovery 3½ ft.</p> <p>Basalt, dark-gray to gray, slightly altered, fairly dense and even-textured, with prominent green augite phenocrysts. Some altered reddish to rust-colored feldspars. Calcic-altered zeolite areas.</p> <p>Altered basalt, vesicular to amygdaloidal. Gray-brown in general cast with soft altered rust or copper-colored feldspars. Amygdaloidal fillings are secondary calcite and zeolites. Filled amygdules are prominent locally to 5-6 mm in size. Products of hydrothermal alteration, soft, almost rotten. Numerous fine calcite veinlets. Also prominent augite. Has reddish, flecked appearance due to altered feldspars. Calcite-altered amygdules are white to pale-green to pale-bluish in color and are ellipsoidal in cross-section, i.e. zeolites elongated normal to axis of hole. The soft altered rust or copper-colored feldspar is from iron solutions percolated between cleavage faces. Possible submarine flow. Possible weathered phase of a flow. Magnetic. Olivine(?). Some faint speckled mineral fluorescence.</p>
10,928 - 11,242	Basalt, as above.
11,242 - 11,246	<p>Core No. 7, recovery 3 ft.</p> <p>Basalt, dark-gray, dense, exhibiting slight alteration, almost glassy or abundant augite.</p> <p>Basalt, very dense and even-textured, dark-gray, calcite-veined, magnetic.</p> <p>Basalt, highly veined with calcite high-angle veining. Abundant calcite pockets and feldspars altered to calcite. Large augite crystals. Is progressively more highly altered downward, reddish in cast, zeolitic in part, with some altered zeolites.</p> <p>Basalt, highly altered, almost rotten, broken, fragmentary recovery, very similar to phases of Core No. 6. Groundmass has dark, red altered feldspars, abundant augite. Vertical fractures. Large augite phenocrysts show alteration. Serpentinized planes. Note: No core analysis made.</p>
11,246 - 12,721	Basalt, greenish-gray, badly altered, and some soft ashy tuffaceous to clayey siltstone.

Lithologic log, Sinclair Oil and Gas Mapleton 1 (continued)

Depth (ft)	Description
12,721 - 12,726	<p>Core No. 8, recovery 3 ft.                      Top 6 in. dark-gray to black porphyritic basalt, common glassy green and black phenocrysts of pyroxene (pigeonite?) and rare phenocrysts of feldspar in very fine-grained aphanatic groundmass. Some pyroxenes altering to antigorite(?) and chlorite(?), grades into 18 in. of same basalt with common amygdules of zeolites and calcite. Slickensided surfaces coated with iron oxide, dip 60°. Common red iron staining and alteration of pyroxenes. Grades into 1 ft of basalt as described at top, with common zeolites. Bottom 2 ft has calcite-filled cross-fractures, dipping 75°. Core has isolated areas of oriented amygdules, but areas do not parallel each other.</p>
12,726 - 12,766	Basalt, as above.
12,766 - 12,771	<p>Core No. 9, recovery 4.2 ft.                      Basalt, gray to slightly reddish-gray, amygdaloidal with some rare, partially-lined vesicles. Filled amygdules vary widely in size and shape (to 1½ in. diameter). Minor calcite veining and green-gray amygdaloidal (fine) porphyritic basalt; prominent augite phenocrysts.</p>
12,776 - 12,880	Basalt, as above.
12,880 T.D.	

9. Lithologic log, E.M. Warren Coos County 1-7

SW $\frac{1}{4}$  SE $\frac{1}{4}$  sec. 7, T. 27 S., R. 13 W., Coos County, Oregon

Depth (ft)	Description
0 - 400	Sandstone, medium- to fine-grained, consists of angular quartz and reworked material, friable.
400 - 580	Claystone, dark-gray to black and grayish-green, sandy.
580 - 640	Siltstone, dark-brown, sticky.
640 - 683	Siltstone, grayish-brown and tan shale.
683 - 727	Sandstone, medium-gray, hard to brittle, mostly quartz, probably silica cement, including tan shale and some lignite, fairly well-sorted.
727 - 885	Siltstone, medium- to dark grayish-brown, firm to brittle, slightly sandy, lower portion grades to shale. Thin sand at 850-858 ft may be gas sand.
885 - 935	Siltstone, dark-gray, with coaly inclusions.
935 - 977	Sandstone, shells, some interbeds of dark-gray to black shale. Grains consist of quartz and decomposed feldspar, some lignite.
977 - 1,005	Shale, grayish-brown, soft.
1,005 - 1,650	Siltstone, medium grayish-brown, and dark-gray to black shale, some thin calcite veining.
1,650 - 2,085	Shale, dark-gray, with interbedded light-gray siltstone.
2,085 - 2,100	Sandstone, subangular to subround, quartzitic, kaolinitic, well-sorted.
2,100 - 2,140	Siltstone, light-gray.
2,140 - 2,150	Sandstone, angular to subangular, medium-grained quartz, hard, cemented with silica.
2,150 - 2,240	Sandstone, light-gray, fine- to medium-grained quartz, with minor dark ferro-magnesian minerals interbedded with thin beds of hard dark shale.

Lithologic log, E.M. Warren Coos County 1-7 (continued)

Depth (ft)	Description
2,240 - 2,427	Sandstone, light-gray, fine-grained, interbedded with claystone and shale.
2,427 - 2,483	Sandstone, fine- to coarse-grained, angular quartz grains, well-sorted.
2,483 - 2,525	Claystone, light-green.
2,525 - 2,595	Sandstone, fine-grained, quartz, well-sorted, with minor biotite and reworked material, some claystone interbeds.
2,595 - 2,640	Claystone.
2,640 - 2,915	Sandstone, light to medium dark-gray, firm, partially cemented with calcite, micaceous, some bent mica flakes.
2,915 - 2,945	Siltstone, dark-brown, with carbonaceous material, pyrite, lignite. Gas kick, 60 units.
2,945 - 3,350	Sandstone, light-gray to gray, fine-grained quartz with minor reworked material and muscovite, coalinitic. Shale and lignite bed at 3,100 ft, interbedded dark grayish-brown siltstone and some coal. Gas kick, 40 units.
3,350 - 3,500	Shale and fine sandstone, gray quartz sand and dark grayish-brown silty shale.
3,500 - 3,950	Shale and sandstone, dark grayish-brown shale and subangular fine-grained quartzitic sandstone. Coal beds at 3,460-3,465, 3,490-3,510, 3,565-3,570, 3,595-3,600, 3,620-3,640, 3,830-3,835, 3,870-3,880, 3,885-3,925, and 3,935-3,940 ft. Gas kicks up to 250 units.
3,950 - 4,830	Shale and sandstone, black shale and fine- to medium-grained quartz sandstone, coal seams at 4,045-4,065, 4,100-4,105, 4,110-4,115, 4,280-4,285, 4,455-4,460, 4,495-4,500, 4,595-4,600, 4,630-4,645, 4,655-4,665, 4,680-4,700, and 4,800-4,805 ft. Gas kicks up to 480 units.
4,830 - 4,885	Sandstone, light-gray, clear angular quartz grains, micaceous and whitish-colored kaolinite. Some well-cemented sandstone and interbeds of siltstone.

Lithologic log, E.M. Warren Coos County 1-7 (continued)

Depth (ft)	Description
4,885 - 6,336	Siltstone, dark-gray, firm to brittle, and medium-gray silty shale. Some sandstone interbeds, quartzitic, micaceous; some sandstone is well cemented with calcite (beds at 5,000-5,080 ft). CCl <sub>4</sub> oil cuts, good at 5,200-5,280 ft, trace 5,310-5,400 ft, good 5,410-5,450 ft, fair to good 5,475-5,530 ft, trace 5,530-5,565 and 5,750-6,336 ft.

6,337 T.D.

Note: No conventional cores taken.

10. Lithologic log, Pan American Petroleum OCS P-0112

43.24603° North Latitude - 124.59268° West Longitude

Depth (ft)	Description
0 - 424	Water depth 352 ft, kelly bushing to ocean floor 424 ft.
424 - 950	Claystone, light-gray to tan, with stringers of fine- to medium-grained sandstone, fair sorting, contains glauconite, trace pyrite, mostly quartz grains.
950 - 1,060	Claystone, tan to gray, sandy, glauconite, mostly quartz, occasional gas fragments.
1,060 - 1,085	Sandstone, gray, fine- to medium-grained, subrounded grains, poorly sorted, friable, slightly carbonaceous.
1,085 - 1,400	Claystone, light-tan, very silty, medium-firm, grading to siltstone, slightly calcareous, glauconitic.
1,400 - 1,440	Sandstone, medium-gray, fine- to medium-grained, fair sorting, glauconitic, slightly carbonaceous, friable to firm, some interbeds of claystone above.
1,495 - 1,680	Claystone, gray and tan, silty, sandy, soft to firm.
1,680 - 1,740	Sandstone, light-gray, occasional varicolored grains, mostly fine-grained, some medium-grained, fair sorting, subangular, argillaceous.
1,737 - 1,745	Claystone, light-gray, sandy, soft, sticky.
1,745 - 1,830	Sandstone, light-gray, fine-grained, subrounded, glauconitic, predominantly composed of clear and milky quartz.
1,830 - 2,150	Siltstone and claystone, light grayish-brown, sandy, firm, some glauconite, trace of pyrite.
2,150 - 2,200	Sandstone, gray, firm to hard, fine-grained, some medium to coarse stringers, fair sorting, some calcite.
2,200 - 2,240	Claystone, light-gray, silty, soft, sticky.
2,354 - 2,380	Sandstone, light-gray, very fine-grained, angular, silty, abundant glauconite, lime-cemented, firm, some interbedded siltstone, light-brown.

Lithologic log, Pan American Petroleum OCS P-0112 (continued)

Depth (ft)	Description
2,380 - 2,390	Claystone, light-gray, silty to sandy, soft, sticky.
2,390 - 2,610	Siltstone and claystone, light-brown, some sandy portions, glauconitic, soft to firm.
2,610 - 2,810	Sandstone, light grayish-brown, silty to sandy, subangular, glauconitic, mostly quartz, some biotite and muscovite.
2,810 - 2,880	Siltstone, light-brown, some sandy streaks, firm and medium-gray claystone.
2,880 - 2,975	Claystone, grayish-brown, soft, sticky, bentonitic, some silty and sandy streaks.
2,975 - 3,225	Siltstone, light-brown, firm, some sandy streaks with interbeds of cream to grayish-brown, soft, sticky, bentonitic claystone.
3,225 - 3,280	Sandstone, light-gray, fine-grained, subrounded, some glauconite, argillaceous, mostly clear and milky quartz grains.
3,260 - 3,448	Claystone and siltstone, light-gray to light-brown, some portions sandy, soft, sticky, lower portion bentonitic, some mica.
3,448 - 3,620	Claystone, as above, some interbedded sandstone.
3,620 - 3,735	Sandstone, light-gray, fine- to medium-grained, subangular, fair sorting, glauconitic, micaceous with interbeds of claystone,
3,735 - 3,670	Claystone, light-gray to medium-gray, soft, sticky bentonitic, some mica.
3,670 - 3,746	Siltstone, gray, firm, some calcareous, glauconitic, trace of tan-colored tuff.
3,746 - 4,160	Claystone, gray to buff, sticky, medium to soft, silty, lower portion bentonitic, some mica.
4,160 - 4,205	Shale, medium-gray, silty to sandy, noncalcareous, occasional pyrite, firm.
4,205 - 4,275	Claystone, light-gray, silty, soft, sticky, trace of pyrite.

Lithologic log, Pan American Petroleum OCS P-0112 (continued)

Depth (ft)	Description
4,275 - 4,315	Shale, medium-gray, silty, firm.
4,315 - 4,345	Claystone, as above.
4,345 - 4,410	Shale, medium-gray, some silty streaks, noncalcareous, firm, trace of pyrite.
4,410 - 4,465	Claystone, light-gray, silty streaks, soft, sticky.
4,465 - 4,490	Shale, medium-gray, silty, noncalcareous, some pyrite, firm.
4,490 - 4,525	Claystone, gray, medium, soft, sticky.
4,525 - 4,580	Siltstone, gray, firm, grades to shale.
4,580 - 4,610	Claystone, gray, medium-soft, sticky.
4,610 - 4,670	Siltstone, gray, firm, grades to shale below.
4,670 - 4,710	Shale, gray to blue-gray, firm, silty with common buff-colored grains.
4,710 - 4,930	Claystone, as above.
4,930 - 4,990	Sandstone, gray, fine, subangular, fair sorting, common reddish-brown and buff-colored grains.
4,990 - 5,090	Shale, gray, silty streaks, firm, calcareous.
5,090 - 5,130	Sandstone, very fine- to fine-grained, subangular, glauconitic, consisting of clear and milky grains of quartz, some interbedded claystone, mottled green color.
5,130 - 5,160	Shale, as above.
5,160 - 5,170	Sandstone, fine-grained, subangular, some glauconite, consists of grains of varicolored quartz.
5,170 - 5,250	Shale, medium- to dark-gray, silty to sandy, firm.
5,250 - 5,265	Sandstone, light grayish-green, fine-grained, some glauconite, mostly varicolored quartz, some interbedded dark-gray shale composed of feldspar and ultrabasic minerals.

Lithologic log, Pan American Petroleum OCS P-0112 (continued)

Depth (ft)	Description
5,265 - 5,364	Shale, as above.
5,364 - 5,420	Sandstone, greenish-gray, fine- to medium-grained, fair sorting, subangular to subrounded, glauconitic, micaceous, composed of weathered feldspar and clays.
5,420 - 5,440	Sandstone, light-gray, very fine- to fine-grained, subrounded, calcareous cement, mostly clear and milky quartz grains. Strong gas show, over 600,000 ppm, on the logging unit.
5,440 - 5,475	Shale, as above.
5,475 - 5,530	Sandstone, light- to dark-gray, very fine- to fine-grained, moderately sorted, some calcareous material, tight, hard.
5,530 - 5,545	Sandstone, silty with some fragments of volcanic rock, argillaceous, some dark-grayish-black shale containing pebbles of ultrabasic minerals.
5,545 - 5,600	Claystone, light-gray, bentonitic, soft, dark-gray to grayish-brown shale.
5,600 - 5,665	Sandstone, light grayish-green, very fine-grained, some conglomerates, slightly calcareous, hard, tight, dark grayish-brown shale.
5,665 - 5,690	Sandstone, whitish-gray, very fine- to fine-grained, subangular to subrounded, clear quartz grains. Gas shows. Some dark-grayish-brown shale.
5,690 - 5,710	Claystone, whitish-gray, bentonitic, soft.
5,710 - 5,760	Sandstone, gray, very fine- to fine-grained, streaks of calcareous material, carbonaceous, poorly sorted.
5,760 - 5,850	Claystone, light- to medium-gray, silty, soft, bentonitic and dark grayish-brown shale.
5,850 - 5,945	Sandstone, light-green, very fine- to fine-grained, subrounded, poorly sorted, bentonitic, highly glauconitic, soft, with some interbeds of medium-gray silty shale.

Lithologic log, Pan American Petroleum OCS P-0112 (continued)

Depth (ft)	Description
5,945 - 5,975	Claystone, whitish-gray, soft, plastic, sticky, dark-gray silty shale.
5,975 - 6,030	Sandstone, as above.
6,030 - 6,118	Shale, silty, some very fine-grained sandstone.
6,118 - 6,135	Sandstone, light-grayish-green, very fine- to fine-grained, poorly sorted, common metamorphic and volcanic grains, slightly micaceous, slightly calcareous, tight, hard, some interbeds of light- to medium-gray silty claystone. Gas shows, 750 units, on logging chart.
6,135 - 6,146	Shale, dark grayish-brown, silty.
6,146 T.D.	

NOTE: No conventional cores taken, only sidewall samples.

Sidewall Samples

2,797	Coarse siltstone, mica, sandy, brown-gray, glauconitic, carbonaceous with biotite.
2,803	Sandstone, light-gray, very fine-grained, salt-and-pepper with biotite-muscovite, subangular grains with glauconite.
2,850	Claystone, silty to sandy, soft.
2,900	Claystone, medium-gray, silty, blocky, slightly sandy with occasional muscovite.
2,965	Claystone, medium-gray, blocky fracture, occasional muscovite.
3,170	Claystone, dark-gray, micaceous, slightly silty, trace pyrite.
3,235	Sandstone, gray, fine, essentially as below with silt laminae.
3,264	Sandstone, light- to medium-gray, firm, finely laminated with dark-gray silt, very fine-grained, subangular, silty, common green and red grains, scattered mica.

Lithologic log, Pan American Petroleum OCS P-0112 (continued)

Sidewall Samples

Depth (ft)	Description
3,305	Siltstone, sandy, medium-gray, micaceous, carbonaceous.
3,327	Sandstone, light-gray, very fine to fine, subangular, silty, glauconitic, slightly calcareous, occasional biotite.
3,411	Siltstone and sandstone as above.
3,429	Siltstone, tan-gray, firm, friable, to very fine-grained sandstone, subangular, with common green grains, scattered mica, occasional wisps carbonaceous material.
3,443	Sandstone, gray, very fine-grained, grading to silty, firm, friable, fair sorting, grains angular to subangular, scattered fine mica and dark minerals, occasional pockets brown-gray clay.
3,576	Sandstone, light- to medium-gray, fine to very fine, firm, friable, silty, angular grains, brown mottling, common green grains and scattered common red grains, no oil stain or fluorescence.
3,626	Siltstone, dark-gray, firm, finely sandy, scattered micromica and pyrite crystals, dark-gray carbonaceous clay, laminations rare.
3,650	Sandstone, medium- to light-gray, very silty and argillaceous, common mica.
3,693	Sandstone, light-gray, very fine-grained, angular to subangular, very friable, slightly silty, moderately clean, glauconitic.
3,726	Siltstone, light green-gray, argillaceous, with abundant very fine sand grains, common mica.
3,850	Silty claystone, light- to medium-gray, firm, hackly, less mica than below.
3,918	Silty claystone, light- to medium-gray, micaceous, firm, hackly.
4,010	Silty claystone, light- to medium-gray mica, large mica flakes, occasional sand grains.

Lithologic log, Pan American Petroleum OCS P-0112 (continued)

Sidewall Samples

Depth (ft)	Description
4,023	Silty claystone, light- to medium-gray, micaceous, calcareous.
4,070	Silty claystone, medium-gray, mica, pyrite traces, interbedded with fine-grained sand, salt-and-pepper sand, calcareous cement in part.
4,130	Silty claystone, medium- to dark-gray, soft, hackly, foraminifers, mica, not calcareous.
4,245	Silty claystone, medium-gray, hackly, slightly micaceous, occasional very fine-grained sand.
4,350	Slightly silty, claystone, dark-gray, firm, hackly, slightly micaceous, occasional fine sand, floating dark minerals, not calcareous.
4,432	Silty claystone, medium-gray, slightly micaceous, hackly, not calcareous.
4,465	Silty claystone, medium-gray, abundant to common mica, slightly fissile, not calcareous.
4,490	Silty claystone, medium-gray, abundant to common mica, slightly fissile.
4,515	Silty claystone, medium-gray, micaceous, not calcareous, firm, hackly fracture.
4,550	Claystone, light- to medium-gray, firm, not calcareous, muscovite mica.
4,610	Claystone, light- to medium-gray, glauconitic, hackly.
4,730	Claystone, medium to dark gray-brown, silty, micaceous, soft, not calcareous, hackly.
4,828	Siltstone, dark-gray, firm, massive.

Lithologic log, Pan American Petroleum OCS P-0112 (continued)

Sidewall Samples

Depth (ft)	Description
4,852	Siltstone, dark brown-gray, slightly micaceous, trace glauconite.
4,935	Silty claystone, sandy, dark-brown, glauconitic, sub-rounded sand grains, trace pyrite, slightly fissile.
4,974	Sandy siltstone, dark-brown, fine, blocky fracture with calcareous nodule.
5,039	Sandy siltstone, dark-brown, fine, blocky fracture.
5,052	Silty sandstone, very fine- to fine-grained, trace biotite, glauconite, subangular grains, medium-gray, with calcareous cement.
5,085	Sandy siltstone, dark-brown, slightly fissile.
5,100	Sandy siltstone, green-gray, hackly, traces pyrite.
5,122	Silty claystone, dark-brown, slightly fissile, contact with light-orange-banded white ash(?), sandy with subrounded sand grains.
5,146	Silty claystone, dark gray-brown, occasional floating aeolian(?) sand grains.
5,253	Sandstone, very fine-grained, glauconitic, occasional macerated carbonaceous material, clay-silt matrix, subrounded, slightly calcareous.
5,310	Claystone, dark-gray, hackly, slightly silty, aeolian(?) sand grains, floating.
5,370	Sandstone, very fine- to fine-grained, poorly sorted, clayey matrix, subrounded, calcareous, intergranular, light-gray.
5,386	Sandstone, very fine-grained, very silty, salt-and-pepper, dark lithic fragments, macerated carbonaceous material, subrounded, possibly glauconitic, medium-sorted, slightly calcareous (from calcite and cement).

Lithologic log, Pan American Petroleum OCS P-0112 (continued)

Sidewall Samples

Depth (ft)	Description
5,391	Sandstone, very fine- to fine-grained, silty, light-gray, glauconitic, subangular to subrounded, poorly sorted, dark lithic fragments.
5,405	Conglomerate, muddy, very fine pebbles, mudstone and siltstone clasts.
5,408	Sandstone, very fine-grained, poorly sorted, lithic fragments, predominantly quartz, silt-clay matrix, subangular to subrounded, light-gray, calcareous.
5,426	Sandstone, very fine- to fine-grained, silty, clay matrix, glauconitic, occasional dark lithic fragments, predominantly quartz and altered feldspar, calcareous, angular to subangular, possible petroleum odor, light-gray.
5,440	Claystone, dark gray-brown, slightly silty, glauconitic, slightly fissile, firm, hackly.
5,467	Shale, dark-gray to dark brown-gray, with coarse-grained fragments of metamorphic micromica.
5,477	Sandstone, fine-grained, gray-green, salt-and-pepper, fair to good sorting, weathered feldspars and ultrabasics, tight, no show.
5,499	Sandstone, dark gray-green, composed of weathered feldspars and ultrabasics, feldspars weathered to clays(?), tight to very poor porosity.
5,503	Sandstone, light-gray, fine-grained, conglomeratic, some very coarse-grained to pebbles, clay-filled, mineralogy as above.
5,531	Shale, dark-gray, with pebbles of rock fragments and shale.
5,577	Shale, dark-gray-brown.
5,593	As above.
5,603	Shale, dark gray-brown, with rounded pebbles of weathered ultrabasics (green).

Lithologic log, Pan American Petroleum OCS P-0112 (continued)

Sidewall Samples

Depth (ft)	Description
5,615	Shale, dark gray-brown.
5,635	As above.
5,654	As above.
5,663	Shale, dark gray-brown, with angular rock fragments of very fine-grained sandstone.
5,677	Shale, dark-gray, gray, and light-brown, slump(?).
5,689	Shale, dark gray-brown, with traces of siltstone, dark-brown.
5,715	Shale, dark gray-brown, and shale, gray, silty (may be shale conglomerate).
5,735	Shale, dark-gray to brown-gray.
5,749	Sandstone, very fine-grained, silty, gray, salt-and-pepper with carbonaceous fragments, tight, no show, fair sorting.
5,765	Shale, dark gray-brown.
5,785	As above.
5,815	As above.
5,837	Shale, dark gray-brown, with large angular pebbles, siltstone, gray.
5,861	Shale, green-black, with lustrous appearance, may be slickensides.
5,872	Basalt, dark gray-green, altered.
5,880	Basalt, as above, weathered mafic rock fragments(?).
5,886	Basalt porphyry, altered.
5,907	Siltstone, gray, clay-filled, bentonitic.

Lithologic log, Pan American Petroleum OCS P-0112 (continued)

Sidewall Samples

Depth (ft)	Description
5,919	Siltstone, dark-gray, with large authigenic feldspars.
5,934	Sandstone, very fine-grained, very silty, gray, fair sorting, clay-filled, tight, no show.
5,955	Shale, dark-gray, silty, sandy.
5,965	Shale, dark-gray, slightly silty, slickensided.
5,979	Basalt, altered, dark-green, some olivine.
5,985	Sandstone, fine- to very fine-grained, gray, salt-and-pepper, with much weathered dark mafic material.
5,993	Sandstone, gray, very bentonitic, lithic arkose, micaceous.
6,001	Sandstone, very fine-grained, gray, good sorting, subangular, very bentonitic, tight, no show. Grains are feldspar and quartz.
6,011	Sandstone, very fine-grained, dark gray-green, conglomerate, with much large weathered basaltic material, slickensides.
6,017	Sandstone, as above, with conglomerate of completely weathered mafic material, tight, no show.
6,058	Siltstone, gray, bentonitic.
6,075	Sandstone, very fine-grained, gray, good sorting, friable, clay-filled, tight, no show.
6,121	Sandstone, fine-grained, gray, good sorting, clay-filled, feldspar and weathered mafics, tight, no show.
6,131	Shale, dark gray-brown.
6,137	Shale, dark gray-brown to brown-gray.
6,141	Shale, dark gray-brown.

11. Lithologic log, Union Oil Company OCS P-0130

44.05987° North Latitude - 124.64711° West Longitude

Depth (ft)	Description
0 - 2,150	Clay, gray, soft, silty. Lost circulation 852 ft. No cuttings recovered between 852 and 2,150 ft.
2,150 - 2,200	Siltstone, grayish-green, argillaceous, micaceous, massive, firm.
2,200 - 2,270	Claystone, medium-gray, silty, micaceous, massive, firm. Salinity mud filtrate 4,350 ppm. Chloride.
2,270 - 2,415	Siltstone, gray to olive-green, argillaceous, micromicaceous, with fine carbonaceous streaks, firm, microfossils common. Slight gas show.
2,415 - 2,440	Tuff, cream-tan color.
2,440 - 2,620	Siltstone, grayish-green, sandy, silty, some glauconite, some white altered ash, some olive-colored claystone, some micromicaceous, some glass shards.
2,665 - 2,685	Tuff, whitish-tan, altered.
2,685 - 2,860	Siltstone, medium-gray, argillaceous, limy, grayish-brown claystone. Portions with abundant shell fragments.
2,860 - 2,945	Shale, dark grayish-brown, cherty.
2,945 - 3,060	Claystone, light grayish-brown, cherty, limy, some portions with abundant shell fragments, firm-hard, some silty sections.
3,065 - 3,190	Sandstone, whitish-tan, chert fragments, calcite veinlets, glauconite and pyrite and interbedded tan-colored welded tuff. Gas shows.
3,190 - 3,210	Silty shale, grayish-brown, highly glauconitic, massive, firm, some pyrite.
3,210 - 3,335	Claystone, light olive-green, silty, plastic, occasional tuff beds with calcite and pyrite veinlets, foraminifers common and grayish-brown siltstone.

Lithologic log, Union Oil Company OCS P-0130 (continued)

Depth (ft)	Description
3,335 - 4,050	Claystone, grayish-green, soft, and some grayish-brown micromicaceous fossiliferous firm siltstone, some fossiliferous. Gas shows in thin stringers of quartz sand.
4,050 - 4,750	Claystone, some siltstone, with trace of coal, some glauconitic micromicaceous siltstone and interbedded light blue-gray micaceous claystone, some stringers of light-gray, fine- to very fine-grained argillaceous arkosic sandstone.
4,750 - 4,775	Tuff, whitish color, compact, limy, hard.
4,775 - 5,040	Claystone, grayish-brown, sandy micromicaceous, slightly carbonaceous, firm to friable, some coal and interbedded fine- to medium-grained angular to subangular quartz sandstone. Good shows of petroleum gas.
5,040 - 5,350	Claystone and siltstone, gray to gray-brown, micaceous, trace of pyrite.
5,350 - 5,460	Sandstone, light-gray, fine to very fine, silty, micaceous, friable, interbedded with hard siltstone and claystone.
5,460 - 5,670	Siltstone, gray to reddish-brown, massive, argillaceous, micaceous, fairly firm. Good shows of petroleum gas.
5,670 - 5,780	Sandstone, white, fine- to medium-grained, angular to subangular quartz grains and varicolored grains. Good shows of petroleum gas.
5,780 - 5,965	Siltstone and claystone, medium- to light-gray, micaceous, fairly firm, some fine sandstone interbeds.
5,965 - 6,110	Sandstone, light-gray, fine-grained, subangular to subrounded, trace pyrite, quartz grains. Good shows of petroleum gas.
6,110 - 6,545	Siltstone, grayish-brown, sandy, micaceous, iron-stained, firm and interbedded claystone. Some interbeds of fine sandstone. Some shows of gas.
6,545 - 6,715	Sandstone, medium-gray, fine, firm to hard, abundant weathered mica flakes, composed of clear quartz grains and ferromagnesian minerals, angular to subangular, siltstone interbeds. Good shows of petroleum gas.

Lithologic log, Union Oil Company OCS P-0130 (continued)

Depth (ft)	Description
6,715 - 6,890	Siltstone.
6,890 - 7,130	Silty sandstone, firm to very firm, good shows of gas.
7,130 - 7,390	Sandstone, light-gray, very firm to hard, composed of clear quartz grains, angular to subangular, abundant weathered mica with interbeds of medium grayish-brown siltstone. Good shows of petroleum gas.
7,390 - 7,570	Siltstone and claystone, light-gray to grayish-brown, sandy, micaceous, carbonaceous, firm to hard.
7,570 - 7,650	Sandstone, grayish-white, fine- to medium-grained, composed of grains of clear quartz, subangular to subrounded, trace of pyrite, argillaceous. Shows of gas.
7,650 - 7,890	Siltstone and claystone, light grayish-brown, micaceous, sandy, hard, claystone, soft, sticky.
7,890 - 8,060	Sandstone, grayish-white, fine- to medium-grained, clear quartz grains, angular to subangular, interbedded with bluish-gray, hard, brittle, micaceous, carbonaceous siltstone. Good shows of petroleum gas.
8,060 - 8,320	Siltstone, light-brown to grayish-brown, sandy, firm to hard. Good shows of petroleum gas.
8,320 - 8,490	Siltstone, grayish-brown, sandy, hard, with some claystone interbeds, carbonaceous.
8,320 - 8,490	Sandstone, gray, fine- to medium-grained, hard, silty, some calcium cement, trace of pyrite. Consists of clear quartz grains, subangular to angular. Interbeds of grayish-brown hard, brittle, carbonaceous siltstone. Good shows of petroleum gas.
8,490 - 8,618	Siltstone, grayish-brown, hard, brittle, micaceous, abundant carbonaceous material, trace of pyrite. Good shows of petroleum gas.
8,618 - 8,630	Coal(?).
8,630 - 8,920	Claystone, light-gray, firm, sticky, silty, some siltstone interbeds. Gas shows.

Lithologic log, Union Oil Company OCS P-0130 (continued)

Depth (ft)	Description
8,920 - 8,990	Siltstone, sandy, dark-gray to brown, hard, brittle, shaley, slightly carbonaceous, very firm to hard.
8,990 - 9,270	Claystone, light-gray, hard, dense, somewhat silty, shaley, carbonaceous, micaceous. Good shows of petroleum gas.
9,270 - 9,380	Siltstone, grayish-brown, micaceous, hard, dense, somewhat carbonaceous. Good gas shows.
9,380 - 9,410	Claystone or shale.
9,410 - 9,505	Sandstone, varicolored quartz, very fine- to fine-grained, angular to subangular, carbonaceous, calcareous cement.
9,505 - 9,610	Siltstone, as above. Some sandy layers.
10,070 - 10,230	Siltstone, dark grayish-brown, sandy, hard, brittle, micaceous, streaks of carbonaceous material, trace of pyrite. Good gas shows.
10,230 - 10,310	Sandstone, grayish-white to tan, fine- to medium-grained, very firm, well-cemented with calcite, argillaceous. Excellent shows of petroleum gas.
10,310 - 10,570	Siltstone, light-gray to brown, sandy, brittle, hard, slightly carbonaceous. Excellent shows of gas.
10,570 - 10,745	Sandstone, as above. Excellent show of gas.
10,745 - 10,835	Siltstone and claystone, medium-brown, sandy, sticky to very firm. Gas shows.
10,835 - 11,130	Sandstone, grayish-white, fine- to coarse-grained, quartzose, angular to subrounded, cemented with calcite. Excellent gas shows. Oil show 11,000-11,100 ft.
11,130 - 11,570	Siltstone and some claystone, grayish-brown, hard, brittle, micaceous. Some sandstone interbeds. Good gas shows. Oil shows 11,150-11,300 ft.
11,570 - 11,750	Sandstone, hard, dense, well-cemented with calcite. Good shows of petroleum gas.

Lithologic log, Union Oil Company OCS P-0130 (continued)

Depth (ft)	Description
11,750 - 12,150	Siltstone, gray, hard, micaceous, some brown carbonaceous material.
12,150 - 12,182	Sandstone, grayish-brown, fine- to medium-grained, micaceous silty, hard.
12,182 - 12,285	Siltstone, as above.
12,285 T.D.	

CORE SAMPLE

Core No. 1, 6,572-6,596 ft, Recovery 24 ft

Depth (ft)	Description
6,572 - 6,581	(9 ft) Sandstone, mud-gray to salt-and-pepper, generally fine-grained with scattered mud grains; angular to subangular, firm to hard, generally massive. Common interstitial clay mineral, and common to abundant ferromagnesian minerals with common fresh muscovite and brown mica. Some thin interbeds and few inclusions dark-gray clay. Rare high-angle fracture planes with calcite in fractures, also few thin laminae of carbonaceous material. Core bled gas through mud sheath. In a few places, interval badly broken in barrel. No odor, stain, cut, or fluorescence. Sampled for porosity and permeability at 6,573, 6,574, 6,577, and 6,579 ft.
6,581 - 6,581½	(½ ft) Siltstone, light- to dark-gray, badly broken.
6,581½ - 6,584	(2½ ft) Interbedded sandstone, siltstone, and claystone broken. Sandstone medium- to dark-gray, essentially as described above. Fracture in sand dipping 39°. Abundant interstitial clay and silt. Sand grains predominantly quartz, angular to subrounded. No odor, stain, cut, or fluorescence. Claystone, dark-gray, with common random oriented fractures.
6,584 - 6,587	(3 ft) Sandstone, medium-gray, fine-grained, hard, tight, well-cemented, predominantly quartz, but with abundant ferromagnesian minerals. Abundant fresh biotite flakes giving faint lineation - all

Lithologic log, Union Oil Company OCS P-0130 (continued)

CORE SAMPLE

Depth (ft)	Description
	oriented parallel to bedding plane. Dip 22°, fair. Scattered coarse muscovite, abundant interstitial clay. Vertical fractures through core common, with calcite on surfaces. Lower 1 ft contained clay inclusions suggesting fair 25° dip. No odor, stain, cut, or fluorescence. Porosity and permeability sample at 6,584 ft.
6,587 - 6,593	(6 ft) Gouge, dark-gray, crushed, broken, waxy.
6,593 - 6,596	(3 ft) Interbedded sandstone and claystone. Sandstone, medium-to dark-gray, fine-grained, angular to subangular, hard, tight, well-cemented, broken in part. Abundant quartz, common ferromagnesian minerals and mica. Scattered gray pebble inclusions. Interstitial clay material. Dip 12°-15°, fair to good. No odor, stain, cut, or fluorescence. Sample for porosity and permeability at 6,596 ft.

Sidewall Samples, Run No. 1

850	Silty claystone, olive-gray, soft, massive, abundant foraminifers. No odor, stain, or fluorescence.
880	Claystone, very slightly silty, olive-gray, soft, massive. No odor, stain, or fluorescence.
900	Claystone, very slightly silty, olive-gray, soft, massive. No odor, stain, or fluorescence.
1,000	— —
1,100	Wall cake, no good sample, clay and sand grains.
1,225	Silty claystone, olive-gray, greenish cast, soft, massive. No odor, stain, or fluorescence.
1,285	Claystone, medium-gray, brownish cast, soft, massive, finely micaceous. No odor, stain, or fluorescence.
1,340	Claystone, brownish-gray, soft, massive, small nest of glauconite at end of core, abundant foraminifers. No odor, stain, or fluorescence.

Lithologic log, Union Oil Company OCS P-0130 (continued)

Sidewall Samples, Run No. 1 (continued)

Depth (ft)	Description
1,377	Sand, dark greenish-gray, fine-grained, soft, clayey and silty, massive, abundant dark grains (glaucinite ?), micaceous. No odor, stain, or fluorescence.
1,450	Shot two samples. Claystone, brownish-gray, soft, massive common foraminifers. No odor, stain, or fluorescence.
1,500	Shot two samples.
1,550	Claystone, somewhat silty, brownish-gray, soft, massive, micaceous, nest of glauconite. No odor, stain, or fluorescence.
1,605	Sand, dark brownish-gray and greenish-gray, fine-grained, soft, dirty, clayey, banded irregularly, grains are volcanic(?) or glauconite(?). No odor, stain, or fluorescence.
1,673	Shot two samples. Sand, very dark-gray, fine-grained, soft, dirty, very clayey, mottled, grains are volcanic(?) or glauconite(?). No odor, stain, or fluorescence.
1,732	Claystone, tan, soft, massive. No odor, stain, or fluorescence.
1,790	Claystone, light gray-brown, soft, massive, slightly silty, finely micaceous, scattered glauconite grains. No odor, stain, or fluorescence.
1,850	Claystone, light gray-brown, soft, massive, slightly silty, finely micaceous, scattered glauconite grains. No odor, stain, or fluorescence.
1,918	Claystone, medium gray-brown, soft, massive, finely micaceous, scattered glauconite grains. No odor, stain, or fluorescence.
1,968	Shot two samples. Claystone, light gray-brown, mottled, hackly fracture, massive, could be described simply as tan crumbly clay. No odor, stain, or fluorescence.
2,020	Shot two samples. Claystone, dark-tan, soft, crumbly, massive, rare megafossil remains, scattered glauconite grains. No odor, stain, or fluorescence.

Lithologic log, Union Oil Company OCS P-0130 (continued)

Sidewall Samples, Run No. 1 (continued)

Depth (ft)	Description
2,052	Silty claystone, tan, soft, crumbly, massive. No odor, stain, or fluorescence.
2,113	Claystone, brown to tan, soft, banded irregularly, weathered foraminifers. No odor, stain, or fluorescence.
2,140	Claystone, tan to brownish, soft, massive, abundant foraminifers. No odor, stain, or fluorescence.

Sidewall Samples, Run No. 2

2,200	Claystone, light-brown or buff, massive, foraminifers. No odor, stain, or fluorescence.
2,315	Claystone, medium-brown, massive, firm, foraminifers, one fracture plane with slickensides (due to core pressure?). No odor, stain, or fluorescence.
2,600	Claystone, medium-brown, with tuffaceous, paper-thin lamination to massive, firm, foraminifers. No odor, stain, or fluorescence.
2,752	Claystone with tuffaceous laminations, firm, foraminifers. No odor, stain, or fluorescence.
2,835	Claystone, tuffaceous, medium-brown ash fragments or bentonite, firm, essentially massive, foraminifers. No odor, stain, or fluorescence.
2,880	Claystone, tuffaceous, medium brown, weathered megafossil fragments, firm, essentially massive. No odor, stain, or fluorescence.
3,000	Claystone, dark-gray to brown, massive, firm. No odor, stain, or fluorescence. (Lithology change from above samples.)
3,150	Claystone, dark-gray to brown, massive, firm, micaceous, one pocket of light-gray silt or tuffaceous material. No odor, stain, or fluorescence.
3,250	Wall cake, no good sample.

Lithologic log, Union Oil Company OCS P-0130 (continued)

Sidewall Samples, Run No. 2 (continued)

Depth (ft)	Description
3,655	Claystone, buff-brown, massive, soft, occasionally tuffaceous material. No odor, stain, or fluorescence.
3,800	Siltstone, medium-gray to brown, massive, firm to hard, foraminifers. No odor, stain, or fluorescence.
3,900	Silty claystone, medium-gray to brown, firm to hard, massive, micaceous. No odor, stain, or fluorescence.
4,000	Siltstone, laminated with tuffaceous and fine sandy streaks, medium-gray to brown, firm to hard, micaceous. No odor, stain, or fluorescence.
4,100	Claystone, medium-gray to brown, hard, massive, finely micaceous, foraminifers. No odor, stain, or fluorescence.
4,198	Sandstone shell, light-gray to brown, calcareous, very hard, massive. No odor, stain, or fluorescence.
4,300	Silty claystone, medium-gray to brown, firm to hard, massive finely micaceous, foraminifers. No odor, stain, or fluorescence.
4,400	Silty claystone, medium-gray to brown, firm to hard, massive. No odor, stain or fluorescence.
4,500	Claystone, medium gray-brown, massive, firm to hard, foraminifers, finely micaceous, weathered shell fragments. No odor, stain, or fluorescence.
4,600	Siltstone, medium gray-brown, massive, firm to hard, abundant foraminifers which look weathered. No odor, stain, or fluorescence.
4,700	Claystone, dark-gray, massive, firm to hard, slickensided (due to coring?). No odor, stain, or fluorescence.
4,800	Claystone, dark-gray, massive, firm to hard, irregular streak of silt or very fine sand in center. No odor, stain, or fluorescence.
4,860	Gouge (?), dark-gray, highly slickensided and polished fragments, crumbly, looks like fault gouge. No odor, stain, or fluorescence.

Lithologic log, Union Oil Company OCS P-0130 (continued)

Sidewall Samples, Run No. 2 (continued)

Depth (ft)	Description
4,910	Silty claystone, medium-gray, firm to hard, massive, appears to have several small rounded shale pebbles, shell fragments (weathered), several fine sandy nests or streaks. No odor, stain, or fluorescence.
4,930	Claystone, silty (?), somewhat gouged, firm, massive. No odor, stain, or fluorescence.
4,940	Claystone, silty (?), somewhat gouged, firm, massive. No odor, stain, or fluorescence.
4,950	Sandstone, light brownish-gray, fine-grained, massive, probably very low permeability, firm to hard, very dirty and clayey. No odor, stain, or fluorescence.
5,000	Claystone, medium-gray, greenish cast, possibly somewhat gouged, firm, massive. No odor, stain, or fluorescence.
5,020	Silty claystone, medium-gray-brown, massive, hard. No odor, stain, or fluorescence.
5,047	Claystone, medium gray-brown, massive, somewhat gouged appearance, firm. No odor, stain, or fluorescence.

Sidewall Samples, Run No. 3

5,320	Sandstone and claystone, very fine-grained, soft, light-gray sandstone and firm to soft dark-gray claystone, irregularly laminated. No odor, stain, or fluorescence.
5,400	Claystone, dark-gray, massive, soft, finely micaceous. No odor, stain, or fluorescence.
5,596	Claystone (?) and angular fragments of hard siltstone. This may be cuttings and wall cake but looks like formation in color (dark gray). May be a breccia. No odor, stain, or fluorescence.
5,666	Claystone, dark-gray, massive, firm, hackly fracture. No odor, stain, or fluorescence.
5,675	--

Lithologic log, Union Oil Company OCS P-0130 (continued)

Sidewall Samples, Run No. 3 (continued)

Depth (ft)	Description
5,681	Sandstone, light-gray, soft, fine-grained to medium-grained, badly infiltrated with drill mud, looks permeable and porous, fragments of sand not suitable to run for porosity and permeability. No odor, stain, or fluorescence.
5,692	Sandstone, fine- to medium-grained, medium-gray, firm, massive, dirty, micaceous, poorly sorted, probably some porosity and permeability. No odor, stain, or fluorescence.
5,708	Drill mud only.
5,745	Sandstone, medium-gray, medium-grained, massive, firm, dirty with interstitial material, abundant mica, angular grains, feldspars, ferromagnesian minerals, streaks of soft, white, calcareous material which fluoresce bright yellow. No oil shows. Insufficient sample for porosity and permeability. Would guess permeability is low, but might have some.
5,980	Sandstone, light- to medium-gray, fine-grained, dirty with interstitial material, abundant mica, soft, friable, massive, abundant calcareous material, fragments too small for porosity and permeability. No odor, stain, or fluorescence.
6,013	Sandstone, medium-gray, fine- to medium-grained, poorly sorted, dirty, soft, massive, abundant mica, looks permeable, fragments too small for core analyses. No odor, stain, or fluorescence.
6,079	Fine-grained sandstone and claystone; interbedded sandstone, light-gray, fine-grained, soft, massive, micaceous and claystone, dark-gray, massive, soft, hackly fracture. No odor, stain, or fluorescence.
6,553	Sandstone, light- to medium-gray, fine-grained, hard, massive, dirty, abundant calcareous interstitial material, abundant mica, too small for core analysis. No odor, stain, or fluorescence.
6,615	— —
6,679	Sandstone, medium-gray, fine-grained, dirty, poorly sorted with angular grains, abundant calcareous interstitial material, and calcareous veinlets (weathered shell fragments) which fluoresce, soft, massive, micaceous, probably low permeability. Sample too small for core analysis. No oil shows.

Lithologic log, Union Oil Company OCS P-0130 (continued)

Sidewall Samples, Run No. 3 (continued)

Depth (ft)	Description
6,705	— —
6,904	Sandstone, medium-gray, fine-grained, soft, massive, dirty, micaceous. No odor, stain, or fluorescence.
6,981	Sandstone and claystone, medium- and dark-gray, irregularly bedded; sandstone is fine-grained, massive, soft to firm, micaceous; claystone, firm. No odor, stain, or fluorescence.
7,162	Sandstone, light-gray, fine-grained, soft, massive, dirty, micaceous. No odor, stain, or fluorescence.
7,199	Sandstone, light-gray, fine-grained, soft to firm, massive, dirty, micaceous, gas (?). On thin mud sheath numerous holes and hollows. Calcareous material which may be weathered shell fragments. No oil shows.
7,319	— —
7,340	— —
7,575	— —
7,589	Sandstone, medium-gray, fine- to medium-grained, soft, massive, dirty, poorly sorted, micaceous. Evidence of gas bubbles on mud sheath. No odor, stain, or fluorescence.
7,607	Sandstone, medium-gray, fine- to medium-grained, soft, massive, dirty, poorly sorted, abundant interstitial material, pyrite, mica, no oil shows, calcareous streaks fluoresce.
7,624	Sandstone, light-gray, fine-grained, soft, massive, micaceous, looks to be permeable. No odor, stain, or fluorescence.
7,895	Claystone, dark-gray, soft, massive, hackly fracture, micro-micaceous. No odor, stain, or fluorescence.
7,918	Sandstone, medium-gray, fine-grained, massive, soft, dirty, mica, too small for core analysis. No odor, stain, or fluorescence.

Lithologic log, Union Oil Company OCS P-0130 (continued)

Sidewall Samples, Run No. 3 (continued)

Depth (ft)	Description
7,963	— —
8,049	Silty sandstone, medium- to dark-gray, fine-grained, to silt, very dirty, massive, firm, micaceous, not enough sample for core analysis. No odor, stain, or fluorescence.

Sidewall Samples, Run No. 4

5,676	Claystone, medium-gray, firm, massive, broken, crumbly. No odor, stain, or fluorescence.
5,682	Sandstone, gray, soft, fine- to coarse-grained, poorly sorted, angular to subangular, quartzose, massive, with abundant biotite flakes.
5,978	Claystone, light-gray, soft, broken, scattered dark minerals, and few medium quartz grains, somewhat slickensided. No odor, stain, or fluorescence.
6,020	Sandstone, gray, soft, fine- to medium-grained, poorly sorted, angular to subangular, silty, tuffaceous, common mica and chlorite. No odor, stain, or fluorescence.
6,615	Sandstone, medium-gray, soft, fine-grained, angular to subangular, silty, very tuffaceous, common mica and scattered dark mineral grains.
6,629	— —
6,704	Sandstone, light-gray, soft, fine- to coarse-grained, very poorly sorted, angular to subangular, abundant interstitial clay, probably very low permeability.
7,200	Sandstone, gray, soft, fine- to coarse-grained. Very poorly sorted, angular to subangular, clayey, massive, with mica flakes and chlorite common. No odor, stain, or fluorescence.
7,210	— —
7,238	Sandstone, light-gray, soft, fine- to medium-grained, very poorly sorted, angular to subangular, clayey, massive, very low porosity and permeability. No odor, stain, or fluorescence.

Lithologic log, Union Oil Company OCS P-0130 (continued)

Sidewall Samples, Run No. 4 (continued)

Depth (ft)	Description
7,272	Sandstone, light-gray, soft, fine- to medium-grained, very poorly sorted, angular to subangular, clayey, massive, very low porosity and permeability. No odor, stain, or fluorescence.
7,318	— —
7,573	— —
7,917	Siltstone, medium-gray, hard, massive, calcareous, cemented. No odor, stain, or fluorescence.
7,921	Sandstone, medium-gray, soft, fine- to coarse-grained, poorly sorted, angular to subangular with abundant interstitial clay, massive, common mica flakes. Probably very low porosity and permeability. No odor, stain, or fluorescence.
7,968	Bullet missing. — —
8,332	Misfire. — —
8,379	Bullet missing. — —
8,450	Bullet missing. — —
9,428	— —
9,440	— —
9,710	Bullet missing. — —
9,821	Bullet missing. — —
10,677	Sandstone, gray, soft, fine-grained, angular to subangular, massive, clayey, abundant fresh mica, common chlorite. No odor, stain, or fluorescence.
10,873	Sandstone, gray, soft, fine-grained, angular to subangular, massive, clayey, abundant fresh mica, common chlorite. No odor, stain, or fluorescence.

Lithologic log, Union Oil Company OCS P-0130 (continued)

Sidewall Samples, Run No. 4 (continued)

Depth (ft)	Description
10,993	Claystone, dark-gray, firm, massive, somewhat broken and slickensided.
11,105	Sandstone, medium-gray, soft, very fine- to fine-grained, angular to subangular, massive, very clayey, no visible porosity, common mica flakes. No odor, stain, or fluorescence.
12,175	Sandstone, medium-gray, hard, fine- to coarse-grained, angular to subangular, massive, silty, very siliceous, abundant mica and ferromagnesian minerals. No visible porosity. No odor, stain, or fluorescence.
12,181	Sandstone, gray, soft, coarse- to medium-grained, angular to subangular, firm, but easily friable, clayey, contains abundant mica and ferromagnesian minerals, minor fractures are calcite-filled. Probably fair porosity and permeability. Too small and badly broken for core analysis. No odor, stain or fluorescence.

Foraminiferal species lists  
and paleobathymetric interpretations of four southwestern Oregon wells

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1. Key to abbreviations of all foraminiferal genera  
or other fossils mentioned in the following species lists.

AC	Acarinina	GST	Gastropod (s)
ALA	Alabamina	GY	Gyroidina
AMD	Ammodiscus	GYD	Gyroidinoides
AMPM	Amphimorphina	HP	Haplophragmoides
AMPS	Amphistegina	KR	Karrerella
ANG	Angulogerina	LNT	Lenticulina
ANO	Anomalina	MRS	Marssonella
AREN.	Arenaceous	MRZ	Morozovella
AS	Asterigerina	NDG	Nodogenerina
BC	Buccella	NDS	Nodosaria
BF	Bifarina	NGQ	Neogloboquadrina
BLM	Bulimina	NN	Nonion
BLMA	Buliminella	NNA	Nonionella
BLV	Bolivina	PGD	Pseudoglandulina
B.O.F.	Barren of Foraminifera	PGQ	Pseudogloboquadrina
B.O.I.F.	Barren of indigenous Foraminifera	PLF	Plectofrondicularia
BT	Bathysiphon	PLL	Pullenia
CB	Cibicides	PLN	Planulina
CBD	Cibicidoides	PLR	Planorotalites
CHG	Chiloguembelina	PRG	Pyrgo
CL	Clavulina	PRL	Parrella
CN	Cancris	PSH	Pseudohastigerina
CRN	Cribrononion	QDM	Quadrimorphina
CS	Cassidulina	QN	Quinqueloculina
CSD	Cassidulinoides	RT	Rotalia
CT	Catapsydrax	SBT	Subbotina
CY	Cyclammina	SG	Suggrunda
DN	Dentalina	SL	Silicosigmoilina
DRT	"Dorothia"	SPD	Sphaeroidina
DSCR	"Discorbis"	SPG	Siphogenerina
DTM	Diatom (s)	SPGD	Spongodiscidae
ECH	Echinoid spines	SPM	Spumellaria
EG	Eggerella	SPN	Siphonina
EL	Elphidium	SPPT	Spiroplectammina
ELA	Elphidiella	SPR	Spirillina
ELN	Ellipsonodosaria	SPUM.	Spumellarian Radiolaria
EPN	Eponides	SR	Saracenaria
EPS	Epistomina	TPN	Tappanina
EPSL	Epistominella	TRB	Turborotalia
FR	Fronicularia	TRCH	Trochammina
FS	Fissurina	TRCR	Truncorotaloides
GBB	Globobulimina	TRF	Trifarina
GDL	Glandulina	TRT	Tritaxilina
GDR	Gaudryina	TX	Textularia
GL	Globigerina	U	Uvigerina
GLB	Globanomalina	UA	Uvigerinella
GLQ	Globoquadrina	VAL	Valvulineria
GLR	Globorotalia	VGP	Vaginulinopsis
GLTH	Globigerinatheka	VRG	Virgulina
GM	Glomospira		

2. Foraminiferal species list for samples from Phillips Petroleum Company Dobbys 1 well

Sample (ft)	Species and specimen occurrence per sample VR=1-2; R=2-10; C=11-32; A=33-100; VA= 100
50 - 104	Sponge spicules VR. B.O.F.
240 - 290	Sponge spicules R. B.O.F.
415 - 460	AREN. spp. (crushed) R.
600 - 650	AREN. sp. (crushed) VR, HP sp (crushed) VR.
780 - 830	B.O.F.
900 - 950	B.O.F.
1,020 - 1,070	B.O.F.
1,140 - 1,190	B.O.F.
1,260 - 1,310	B.O.F.
1,380 - 1,430	B.O.F.
1,560 - 1,610	B.O.F.
1,740 - 1,790	B.O.F.
1,800 - 1,850	AREN. sp. (crushed) R, EPN gaviotaensis? (juvenile) R, GY guayabalensis (of Mallory, 1959)/ orbicularis planata* A, HP spp. R, LNT sp. VR.
1,860 - 1,910	AC rugosoaculeata VR, BLM schencki A, CRN cf. roemeri C, CS sp. VR, DTM (pyritized) VR, "EL" californicum (of Mallory, 1959, pl. 15, fig. 10) VR, EPN gaviotaensis? (juveniles) R, GY guayabalensis (of Mallory, 1959) / orbicularis planata* VA, HP sp. (crushed) VR, LNT aff. limbosa hockleyensis (small) VR, LNT inornatus VR, LNT simplex? VR, LNT spp. R, NN applini VR, NN cf. incisum R, OSTRACODS R.

\* Forms of both species plus transitional forms appear to be present.

\*\* Specimens too small to determine wall texture.

Foraminiferal species list for samples from Phillips Petroleum Company Dobbys 1 well (continued)

Sample (ft)	Species and specimen occurrence per sample VR=1-2; R=2-10; C=11-32; A=33-100; VA= 100
1,920 - 1,970	BLM schencki C, CRN cf. roemeri C, "EL" californicum (of Mallory, 1959, pl. 15, fig. 10) R, DTM (pyritized) R, EPN? sp. VR, GST VR, GL? (SBT?) sp. (crushed) VR, GY guayabalensis (of Mallory, 1959) / orbicularis planata* A, LNT cf. hockleyensis limbosus VR, LNT inornata VR, LNT sp. VR, NN cf. applini VR, NN incisum VR, SPUM. R.
1,980 - 2,030	BLM schencki VR, CRN cf. roemeri R, DTM (pyritized) R, EPN gaviotaensis? (juvenile) VR, GY guayabalensis (of Mallory, 1959) / orbicularis planata* R-C, SHELL? fragments R, NN incisum VR, OSTRACODS (juvenile) VR, PTEROPOD? (encrusted) VR, QN goodspeedi? VR, QN imperialis? (juvenile) VR.
2,040 - 2,090	BLM schencki R, CRN cf. roemeri R, EPN gaviotaensis R, EPN yeguaensis VR, GY guayabalensis (of Mallory, 1959) / orbicularis planata* A, HP sp. R, LNT inornata VR, LNT sp. VR, SHELL fragments VR, QN sp. (fragment) VR.
2,100 - 2,150	BLM schencki VR, CRN cf. roemeri R, EPN gaviotaensis VR, EPN yeguaensis (juvenile) R, GST R, GY guayabalensis (of Mallory, 1959) / orbicularis planata* C, LNT inornata R, NN incisum VR, SHELL fragments R.
2,160 - 2,210	BLM schencki VR, CRN cf. roemeri C, DTM (pyritized) R, GST R, GY guayabalensis (of Mallory, 1959) / orbicularis planata* C, LNT inornata R, OSTRACOD (juvenile) VR, QN sp. VR, SHELL fragments VR.
2,220 - 2,270	BLM schencki R, CRN cf. roemeri C, DTM (pyritized) R, EL sp. R, EPN yeguaensis R, GST R, GY guayabalensis (of Mallory, 1959) / orbicularis planata* A, LNT inornata C, NN incisum R, OSTRACOD (juvenile) VR, PELECYPOD (small, smooth, pyritized) VR, QN imperialis? (juvenile) VR, QN sp. R, SHELL fragments VR.
2,280 - 2,330	CRN cf. roemeri R, EPN yeguaensis VR, GY guayabalensis (of Mallory, 1959) / orbicularis planata* R, HP sp. VR, LNT inornata VR, OSTRACOD VR, SHELL fragments R.

\* Forms of both species plus transitional forms appear to be present.

\*\* Specimens too small to determine wall texture.

Foraminiferal species list for samples from Phillips Petroleum Company Dobbys 1 well (continued)

Sample (ft)	Species and specimen occurrence per sample VR=1-2; R=2-10; C=11-32; A=33-100; VA= 100
2,340 - 2,390	GY guayabalensis (of Mallory, 1959) / orbicularis planata* R, LNT inornata VR, NN incisum VR. Probably B.O.I.F.
2,400 - 2,450	GY guayabalensis (of Mallory, 1959) VR. B.O.I.F.
2,760 - 2,810	B.O.F.
3,180 - 3,230	B.O.F.
3,600 - 3,650	B.O.F.
3,960 - 4,010	B.O.F.
4,380 - 4,430	B.O.F.
4,800 - 4,850	B.O.F.
4,980 - 5,030	B.O.F.
5,040 - 5,090	SPUM. VR.
5,100 - 5,150	SBT spp. R, SBT/GL** sp. (juvenile) VR, SPUM. R.
5,160 - 5,210	CB cf. sandiegensis (of Mallory, 1959) R, SBT spp. R, SPUM. VR.
5,340 - 5,390	SBT sp. VR, SBT/GL sp.** (juvenile) R-C, SPUM. R.
5,400 - 5,450	CB? sp. (juvenile) VR, "GL" aquiensis? VR, "GL" inaequispira VR, SBT spp. R, SBT/GL spp.** (juvenile) R, SBT triloculoides, s.l. VR, TRCR nitidus VR, TRCR primitivus VR.
5,460 - 5,510	BLM spp. (unidentifiable) R, SBT spp. R, SBT/GL spp.** (juvenile) A, SPUM. R, TRCR mckannai (juvenile) R, TRCR mckannai/spiralis VR, TRCR primitivus R.
5,520 - 5,570	"GL" inaequispira R, SBT spp. R, SBT/GL spp.** (juvenile) R, TRCR mckannai VR, TRCR nitidus VR, TRCR primitivus VR, "TRCR" pseudotopilensis VR.

\* Forms of both species plus transitional forms appear to be present.

\*\* Specimens too small to determine wall texture.

Foraminiferal species list for samples from Phillips Petroleum Company Dobbys 1 well (continued)

Sample (ft)	Species and specimen occurrence per sample VR=1-2; R=2-10; C=11-32; A=33-100; VA= 100
5,580 - 5,630	CB cf. sandiegensis (of Mallory, 1959) VR, CB?? sp. VR, CS? sp. VR, "GL" inaequispira R, MRZ aequa (diminutive) R, SBT spp. C, SPUM. C, TRCR mckannai VR, TRCR nitidus R.
5,760 - 5,810	"GL" inaequispira VR, SBT spp. R, SBT/GL spp** (juvenile) R-C, TRCR nitidus VR, TRCR primitivus VR.
5,880 - 5,930	SBT spp. R, SPUM. R, TRCR nitidus VR, TRCR spiralis? VR.
5,940 - 5,990	EPN umbonatus VR, LNT? sp. VR, SBT spp. R, SBT/GL** spp. (juvenile) R, SPUM. R, TRCR primitivus VR, TRCR soldadoensis VR.
6,060 - 6,110	CB whitei (of Mallory, 1959) R, EPS? sp. VR, SBT spp. R, SBT/GL spp. ** (juvenile) R-C, TRCR mckannai VR.
6,120 - 6,170	ANO? sp. (juvenile) VR, CB cf. sandiegensis VR, CB whitei (of Mallory, 1959) VR, GY florealis VR, LNT sp. VR, SBT triloculinoides, s.l. VR, SBT spp. C, SBT/GL spp** (juvenile) C, SPUM. R, TRCR primitivus R, TRCR soldadoensis VR.
6,180 - 6,230	PLL sp. (crushed) VR, SBT spp. R-C, SPUM. R, TRCR soldadoensis? (juvenile) VR, TRCR cf. soldadoensis VR, TRCR sp. VR.
6,240 - 6,290	ANO sp. (fragment) VR, CHG sp. (juvenile, rough surface) VR, MRZ aequa? VR, MRZ sp. VR, PLR sp. (?planoconica of Miles, 1977) VR, PLR pseudomenardii? (diminutive) VR, QN? sp. VR, SBT spp. C, SPUM. A, TRCR pseudotopilensis VR, TRCR soldadoensis/mckannai VR.
6,300 - 6,350	CB sp. B (of Mallory, 1959) VR, SPUM. C., SBT sp. VR.
6,360 - 6,410	CB sp. B (of Mallory, 1959) VR, GY (AS?) sp. (broken) VR, MRZ sp. (juvenile) VR, SBT spp. R, Sponge spicules VR, SPUM. C.
6,420 - 6,470	SBT sp. VR, SPUM. VR. Probably B.O.I.F.
6,660 - 6,710	B.O.F.
6,900 - 6,938	B.O.F.

\* Forms of both species plus transitional forms appear to be present.

\*\* Specimens too small to determine wall texture.

3. Foraminiferal species list for samples from Sinclair Oil and Gas Company Mapleton 1 well

Sample (ft)	Species and specimen occurrence per sample VR=1-2; R=2-10; C=11-32; A=33-100; VA=>100
970 - 990	B.O.F.
2,170 - 2,190	B.O.F.
2,530 - 2,550	B.O.F.
2,770 - 2,790	SPM* (spheres) R**, SBT sp. VR, MRZ twisselmanni? (diminutive) VR, DN? (fragment) VR, EPN umbonata? (etched) VR.
3,190 - 3,210	SPM (spheres) VA, SBT spp. R, EPN umbonata VR, AC bullbrooki VR, TRCR collactea? (juv.) R, SPGD var. (elongate) VR.
3,370 - 3,390	SBT spp. C, SPM (spheres) VA, TRCR nitidus VR, GM sp. VR, TRCR quetra? VR, KR elongata VR, SBT soldadoensis cf. soldadoensis (4 chambers) VR, SBT frontosa R, CBD cf. venezuelanus VR, CB martinezensis malloryi? VR, MRZ spinulosa? VR, PLR planoconica (diminutive- of Miles, 1977) VR, MRZ broedermanni? (juv.) VR, TRCR nicoli? VR, MRZ cf. angulata (juv.) VR, PLR cf. pseudomenardii R.
3,550 - 3,570	SBT spp. R, SPM (spheres) R.
3,730 - 3,750	SPM R, CB sp. VR, TRCR wilcoxensis? (juv.) VR, SBT sp. VR.
4,090 - 4,110	BT eocenica VR, BLM guayabalensis (of Mallory, 1959) VR, SBT spp. R, SPM (spheres) C, QDM sp. VR, DTM (pennate) VR.
4,270 - 4,290	SBT spp. R, SPM R, SBT cf. turgida? VR, TRB? sp. (juv.) VR.
4,510 - 4,530	SPM R, DTM (pennate) VR, TRCR sp. (juv.) VR, MRZ cf. angulata VR, SBT sp. VR, BLV sp. (small) VR.
4,750 - 4,770	SBT spp. R, SPM (spheres) R, PLR cf. imitata VR, CBD cf. venezuelanus VR, BF nuttalli VR, BLM whitei/corrugata (juv.) VR, PLR cf. capdevilensis? (diminutive) VR.
4,870 - 4,890	SPM R, SBT sp. VR, PLR planoconica (of Miles, 1977) VR, U sp. (small) VR, MRZ sp. (juv.) VR, PLR capdevilensis? VR, BLV explicata lodoensis R.

\* Forms of both species plus transitional forms appear to be present.

\*\* Specimens too small to determine wall texture.

Foraminiferal species list for samples from Sinclair Oil and Gas Company  
Mapleton 1 well (continued)

Sample (ft)	Species and specimen occurrence per sample VR=1-2; R=2-10; C=11-32; A=33-100; VA=>100
5,170 - 5,190	AREN. (indeterminate) VR, SBT spp. R, SPM (spheres, crushed, "elongate") R, AS crassaformis VR, PLF? (fragment) VR.
5,530 - 5,550	SHELL FRAGMENTS? R, SPM (spheres "elongate") R, SBT spp. R, TRCR collactea? (juv.) VR, BLV explicata lodoensis VR, DN? (fragment) VR, ANO? sp. (crushed) VR.
5,770 - 5,790	SBT spp. R, ANO dorri VR, BLM curtissima (of Mallory, 1959) VR, KR chapapotensis monumentensis (diminutive, crushed) VR, SPM C, VGP? (crushed) VR, AMD? (fragment) VR, BLV explicata lodoensis VR.
6,010 - 6,030	LARGER FORAMINIFERA? R, CB spiropunctatus? VR, SBT spp. C, GY soldanii octocamerata VR, PGQ primitiva R, GM sp. ("green") VR, SBT esnaensis VR, SBT frontosa VR, PRL tenuicarinata (of Mallory, 1959) VR, PSH wilcoxensis, s.s. VR, MRS oxycona VR, VAL childsi VR, GY sp. VR, AREN. sp. (cylindrical, "green") VR.
6,030 - 6,040	MRZ subbotinae? (worn, broken) VR, GM sp. VR, LNT sp. VR, CB spiropunctatus? (worn) VR, SBT spp. R, SPM (spheres) R, SBT spp. ("green") R, SBT cf. triloculinooides ("green") VR.
6,150 - 6,200	LARGER FORAMINIFERA (indeterminate) R, AMPS sp. VR, SBT cf. velascoensis VR, GST (ornate) R, TRCR quetra VR, SBT spp. R, SPM (spheres - some "green") R, LNT sp. VR, SBT sp. ("green") VR, TRCR soldadoensis cf. angulosa VR, GY florealis (s.s. Mallory, 1959 illustration) VR, GY soldanii octocamerata VR, MRZ? (juv.) VR, BLM bradburyi (juv.) VR, MRZ subbotinae ("green") VR, PGQ primitiva VR.
6,350 - 6,400	LARGER FORAMINIFERA (indeterminate) C, SPPT cf. richardi VR, SPM (spheres) R, SBT spp. R, PRL culter midwayana VR.
6,520 - 6,550	LARGER FORAMINIFERA (indeterminate) C, ECH VR, SBT spp. R, ANO dorri VR, EPN umbonatus VR, SBT soldadoensis cf. soldadoensis VR, AS crassaformis umbilicatula ("green") VR, PSH wilcoxensis VR, TRCR nitidus VR, AMPS sp. R, CB spp. R, SBT frontosa VR, PRL culter midwayana VR, TRCR soldadoensis c.f. angulosa VR, GST VR, VAL childsi VR, MRZ lensiformis? (juv.) PLR cf. pseudomenardii VR.

\* Forms of both species plus transitional forms appear to be present.

\*\* Specimens too small to determine wall texture.

Foraminiferal species list for samples from Sinclair Oil and Gas Company  
Mapleton 1 well (continued)

Sample (ft)	Species and specimen occurrence per sample VR=1-2; R=2-10; C=11-32; A=33-100; VA=>100
6,620 - 6,650	CB spp. R, AMPS (fragment) VR, SBT spp. R, LNT sp. VR, PRISM (INOCERAMUS??) VR, SPM (spheres) R, MRZ marks? (juv.) VR, PLR? sp. (diminutive) VR. This sample is probably barren of indigenous fossils.

\* Forms of both species plus transitional forms appear to be present.

\*\* Specimens too small to determine wall texture.

4. Foraminiferal species list and paleobathymetric interpretations  
for samples from Pan American Petroleum well OCS P-0112

Sample (ft)	Species and specimen occurrence per sample VR=1-2; R=2-10; C=11-32; A=33-100
1,010 - 1,040	BC cf. frigida VR, BLM cf. ovata VR, CS crassipunctata C, GL cf. praebulloides VR, PLF miocenica R, UA cf. obesa impolita R, VAL menloensis VR. Upper bathyal.
1,040 - 1,070	BC cf. frigida VR, B. mansfieldi oregonensis, s.l. VR, CS crassipunctata VR, EL cf. minutum VR, GL cf. praebulloides VR, U garzaensis? VR, UA cf. obesa impolita VR, VAL menloensis R. Upper bathyal.
1,430 - 1,460	BC cf. frigida R, CS crassipunctata R, PLL aff. bulloides VR, U cf. montesanensis VR, UA sparsicostata? (juv.) VR. Upper bathyal.
1,550 - 1,580	BC mansfieldi oregonensis, s.l. R, BT sp. R, CL communis pallida VR, CS cf. globosa VR, CY incisa R, EL cf. minutum VR, GL cf. praebulloides VR, HP trullissata R, PGD cf. inflata VR, U beccarii VR, U cf. montesanensis R. Outer neritic to upper bathyal.
1,580 - 1,610	BC frigida VR, B. mansfieldi oregonensis, s.l. R, BLM cf. pyrula (of Rau, 1951) VR, BT sp. VR, CB aff. fletcheri R, CB aff. perlucida VR, CY incisa R, EL cf. minutum R, ELA sp. VR, EPN umbonatus VR, EPSL parva C, HP trullissata R, PLL cf. multilobata VR, U beccarii R, U cf. montesanensis C. Outer neritic to upper bathyal.
1,820 - 1,850	BLM cf. ovata R, CL communis pallida R, CSD sp. R, CY incisa VR, GDL?sp. VR, HP trullissata R, UA cf. obesa impolita R. Outer neritic to upper bathyal.
2,090 - 2,120	BLMA subfusiformis VR, CL communis pallida VR, CS crassipunctata R, CY incisa R, FS sp. VR, GL cf. euapertura VR, G. cf. opima R, G. opima nana R, G. spp. C, HP trullissata R, U cf. galloway VR, U cf. montesanensis VR, U sp. (hispidocostate) VR, UA obesa impolita R, UA cf. sparsicostata R, VAL menloensis VR. Upper bathyal.

Foraminiferal species list and paleobathymetric interpretations  
for samples from Pan American Petroleum well OCS P-0112 (continued)

Sample (ft)	Species and specimen occurrence per sample VR=1-2; R=2-10; C=11-32; A=33-100
2,270 - 2,300	BLM alsatica (of Rau, 1964) VR, BT sp. R, CL communis pallida R, CS crassipunctata R, CSD sp. VR, EG sp. (large) VR, EPN umbonatus R, GL aff. ampliapertura VR, G. cf. euapertura VR, GL spp. A, HP trullissata C, PGD cf. inflata R, PLF miocenica VR, QN weaveri R, RT sp. R, VRG? sp. VR. Upper bathyal.
2,510 - 2,540	BT sp. VR, CL communis pallida A, CS crassipunctata R, C. Globosa R, EPN umbonata VR, GL spp. R, GLR cf. scitula VR, GY orbicularis planata VR, HP trullissata R, NDS grandis VR, NNA pauciloba (of Tipton, et al., 1973) VR, RT sp. R, SPD variabilis R, U gallowayi (of Rau, 1951) VR, UA cf. obesa impolita R, UA cf. sparsicostata VR. Upper bathyal.
2,660 - 2,690	BC mansfieldi oregonensis, s.l. R, BLM inflata alligata R, B. cf. ovata VR, B. cf. pyrula (of Rau, 1951) VR, BLMA subfusiformis R, BT sp. VR, CB elmaensis, s.l. R, CL communis pallida C, CS crassipunctata A, EPN umbonata VR, GBB hannai VR, GLQ venezuelana? VR, HP trullissata C, NNA miocenica R, QN weaveri VR, SR sp. VR, TX sp. VR, U garzaensis R, UA obesa? VR, U. cf. sparsicostata VR, VRG bramlettei R. Upper bathyal.
2,780 - 2,810	BC mansfieldi oregonensis VR, BLM alsatica VR, B. inflata alligata R, BLMA brevior VR, B. curta VR, B. cf. elegantissima (large) VR, B. subfusiformis R, BLV chehalisensis R, BT sp. VR, CB elmaensis, s.l. VR, CL communis pallida R, CS globosa VR, CY incisa VR, EPN umbonata VR, EPSL parva VR, GL cf. praebulloides VR, G. spp. R, GY orbicularis planata VR, G. soldanii VR, HP trullissata R, NDG aff. koina VR, NN pompilioides VR, N. sp. (of Rau, 1951) VR, NNA miocenica VR, PGD inflata VR, QN weaveri VR, U garzaensis R, UA cf. obesa impolita VR. Upper bathyal.
2,930 - 2,960	BLMA cf. subfusiformis VR, CL communis pallida R, CS crassipunctata R, C. aff. cushmani VR, EL cf. minutum VR, EPSL parva VR, GL sp. VR, HP trullissata R, NN incisum VR, QN cf. weaveri VR, UA cf. obesa impolita VR. Middle to outer neritic.

Foraminiferal species list and paleobathymetric interpretations  
for samples from Pan American Petroleum well OCS P-0112 (continued)

Sample (ft)	Species and specimen occurrence per sample VR=1-2; R=2-10; C=11-32; A=33-100
2,960 - 2,990	ANO rosana? VR, A. sp. R, BLM inflata alligata VR, B. spp. R, BLV basisenta VR, CB elmaensis, s.l. R, CS crassipunctata R, C. galvanensis VR, C. globosa R, GLTH index? (juv.) VR, GY condoni R, G. orbicularis planata VR, LNT cf. propinquus cowlitzensis VR, NDG sanctaerucis VR, PGD inflata VR, PLF packardi VR, SPD variabilis VR, U cf. gallowayi VR, U garzaensis R, VAL jacksonensis welcomensis R, V. tumeyensis C. Outer neritic to upper bathyal.
3,020 - 3,050	ALA kernensis VR, BC mansfieldi oregonensis VR, BLM cf. pyrula (of Rau, 1951) VR, B. schencki VR, BLV basisenta R, BT eocenica R, CN joaquinensis VR, CB aff. spiropunctatus VR, CS crassipunctata VR, C. galvanensis VR, C. globosa R, GL brevis VR, G. spp. R, GY condoni R, G. orbicularis planata VR, NDG sanctaerucis VR, PLF packardi R, U beccarii VR, U aff. cocoaensis VR, U garzaensis R, VAL tumeyensis R, VRG bramlettei VR. Upper bathyal.
3,290 - 3,320	ANO glabrata VR, BLM alsatica R, BLMA cf. subfusiformis VR, BT eocenica VR, CN joaquinensis VR, CB elmaensis, s.s. VR, CB aff. spiropunctatus VR, CS crassipunctata R, C. galvinensis VR, C. globosa R, GL sp. (brevis?) VR, GY condoni R, G. cf. soldanii VR, NN sp. (of Rau, 1951) VR, NNA miocenica R, U beccarii VR, U garzaensis R, VAL tumeyensis VR. Upper bathyal.
3,500 - 3,530	CB haydoni R, CB aff. illingi VR, CBD coalingensis R, CN joaquinensis VR, GY guayabalensis (of Mallory, 1959) R, EPN gaviotaensis C, GL increbescens VR, GL spp. R, GY condoni VR, PLF packardi VR, VAL tumeyensis R. Upper bathyal.
3,740 - 3,770	ALA scitula VR, AMPM? sp. VR, CS crassipunctata R, CS globosa VR, EPN gaviotaensis R, GL sp. VR, GY condoni VR, LNT spp. (large) R, PLF packardi VR, VAL tumeyensis R. Outer neritic to upper bathyal.
3,890 - 3,920	AC sp. (juv.) VR, ANO umbonata (of Mallory, 1959) VR, AS crassaformis umbilicatula VR, BLV basisenta VR, CB haydoni VR, CB pseudowuellorstorffi VR, EPN gaviotaensis R, EPN minimus VR, GL spp. R, GY sp. VR, NDG lepidula (of Mallory, 1959) VR, PLF packardi VR, PLF searsi VR, PRG sp. VR, SBT angiporoides VR, SBT frontosa VR, U beccarii VR. Outer neritic to upper bathyal.

Foraminiferal species list and paleobathymetric interpretations  
for samples from Pan American Petroleum well OCS P-0112 (continued)

Sample (ft)	Species and specimen occurrence per sample VR=1-2; R=2-10; C=11-32; A=33-100
3,918 SWC (sidewall core)	ANO dorri aragonensis VR, CB pseudowuellorstorffi VR, CB sandiegensis VR, CS globosa R, "DSCR" assulata (of Mallory, 1959) C, EPN umbonata VR, EPS sp. VR, PLR australiformis R, PLR laevigata VR, SBT frontosa VR, SPR sp. R. Outer neritic to upper bathyal.
4,220 - 4,250	ALA scitula VR, AMD sp. VR, CN joaquinensis VR, CS globosa R, CY spp. R, EPN gaviotaensis R, GL prasaepis (of McKeel and Lipps, 1975) VR, GL spp. R, GY cf. soldanii VR, RT sp. (aff. garveyensis) R, U garzaensis VR, VAL tumeyensis VR. Upper bathyal.
4,490 SWC (sidewall core)	AC rotundimarginata VR, ANO cf. regina minor VR, ANO cf. sampsoni R, BLM callahani R, BLM whitei R, BLV aragonensis VR, BLV explicata lodoensis C, CB felix/spiropunctatus VR, CS globosa R, "DSCR" baintoni? VR, EPN minima VR, GY soldanii octocamerata VR, PLR laevigata VR, PLR cf. planoconica VR, SPN sp. (juv.) VR. Upper to middle bathyal.
4,550 - 4,580	AC bullbrooki VR, AC rotundimarginata VR, AMPM becki? VR, ANO sp. A? (see Mallory, 1959, pl. 23, fig. 5) VR, ANO sp. VR, AS crassaformis R, BLM whitei? R, BLV aragonensis R, CB pseudowuellorstorffi R, CB spiropunctatus R, CT primitiva R, EPN umbonatus VR, GY guayabalensis (of Mallory, 1959) VR, GY soldanii octocamerata VR, MRZ aragonensis R, MRZ crassata (of Subbotina, 1953) VR, MRZ sp. (small) C, NDS latejugata R, PSH micra A, PSH cf. micra R, PSH cf. wilcoxensis VR, SBT corpulenta VR, SBT frontosa VR, SBT senni VR, SBT spp. R, TRT colei VR. Upper to middle bathyal.
4,610 SWC (sidewall core)	AC pseudotopilensis R, BLMA grata convoluta R, "BLV" cf. louisiana (of Mallory, 1959 - see pl. 16, fig. 22) VR, CB fortunatus VR, KR sp. (see Mallory, 1959, pl. 5, fig. 2) VR, MRZ subbotinae R, PLR capdevilensis A, PLR cf. indiscriminata VR, PSH cf. wilcoxensis VR. Middle to outer neritic.
4,610 - 4,640	BLM callahani (of Mallory, 1959) R, BLM lirata? R, CB fortunatus R, CB pachyderma (of Mallory, 1959) VR, "DRT" cubana VR, KR elongata VR, MRZ aragonensis R, MRZ lensiformis VR, MRZ subbotinae R, PSH wilcoxensis R, TRCR primitivus VR, VAL childsi R. Middle to outer neritic.

Foraminiferal species list and paleobathymetric interpretations  
for samples from Pan American Petroleum well OCS P-0112 (continued)

Sample (ft)	Species and specimen occurrence per sample VR=1-2; R=2-10; C=11-32; A=33-100
4,850 - 4,880	ALA cf. wilcoxensis R, AS crassaformis umbilicatula R, BLM impendens VR, BT eocenica R, CB felix? (small, of Mallory, 1959) VR, CB fortunatus VR, DN colei VR, GY florealis VR, LNT vortex VR, LNT sp. (thin) VR, NN applini VR, PLF kerni VR, PSH micra VR, SBT spp. R. Outer neritic to upper bathyal.
4,852 SWC (sidewall core)	ALA cf. wilcoxensis R, BF eleganta (of Mallory, 1959) VR, EL californicum VR, EPN mexicana VR, GY soldanii octocamerata VR, SPN claibornensis cowlitzensis R, TRF advena californica R, TX lajollaensis (of Mallory, 1959) VR, U lodoensis R. Outer neritic to upper bathyal.
5,030 - 5,060	AMPS sp. VR, ANO dorri aragonensis VR, AREN. indeterminate VR, BT eocenica VR, BT sp. (thin, small, smooth) VR, EL californicum VR, GM sp. VR, INOCERAMUS sp. R. Neritic.
5,060 - 5,090	ANO dorri aragonensis VR, AS crassaformis umbilicatula VR, INOCERAMUS sp. VR. Marine.
5,210 - 5,240	BT spp. R, BT eocenica VR, SL californica (small) VR. Marine.
5,510 - 5,540	B.O.I.F. Indeterminate.
5,810 - 5,840	BT sp. (small, thin, smooth) R, CB pachyderma (of Mallory, 1959) VR, EL? sp. VR. Probable marine.
6,110 - 6,140	BT sp. VR. Probably marine.
6,131 SWC (sidewall core)	BT spp. R. Probably marine.

5. Foraminiferal species lists and paleobathymetric interpretations  
for samples from Union Oil well OCS P-0130

Species and specimen occurrence per sample	
VR=1-2; R=2-10; C=11-32; A=33-100;	
Sample (ft)	VA=101-320; VVA=321-1,000; FL (flood)=more than 1,000
760	ANG angulosa VVA, BC frigida R, BC tenerrima VR, BLMA elegantissima VR, BLV spissa C, BLV interjuncta R, CB fletcheri R, CB lobatulus VR, CB mckannai suppressus R, CS californica C, CS limbata R, CS pulchella VR, CS sp. "A" (subrdd. periphery, smooth) RC, EL cf. hughesi (large) R, ELA hannai R, EPSL pacifica VA, GL bulloides R, NDS tympanipectrififormis R, NGQ pachyderma form three of Keller (1978) C, NGQ pachyderma form two of Keller (1978) VA, NGQ pachyderma, sinistral (=form one of Keller, 1978) VVA, NN labradoricum R, QN ackneriana R, U cf. juncea C, U peregrina (large) C, U cf. peregrina VA, VAL araucana R. Upper bathyal.
1,340 SWC (sidewall core)	CS sp. "A" (see above) RC, DTM FL, EL cf. hughesi (large) C, EPSL pacifica (large) VVA, GL cf. bulloides R, GL umbilicata C, HP sp. (fat, small) C, NGQ humerosa R, NGQ pachyderma form three (see above) R, form two (dextral) RC, form one (dextral) VR, NNA sp. VA, PLL sp. R, TRB puncticulata (sinistral) R, U aff. juncea (upper portion smooth) R, VRG? sp. (very small, thin) A. Middle to outer neritic.
1,450 SWC (sidewall core)	Bulimina rostrata RC, BLM subacuminata A, CB mckannai (small) R, CS translucens VA, FR advena R, GL bulloides C, GL falconensis R, GL quinqueloba R, GLR scitula (small, of Keller, 1978) VR, GY altiformis R, Nassellaria R, NDG lepidula VR, NDS parexilis R, NDS tosta C, NN pompilioides R, PLF californica A, PRG sp. R, Spumellaria VA, SG sp. VR, U cf. subperegrina C. Lower bathyal.
1,850 SWC (sidewall core)	BLMA brevior RC, BLMA curta R, BLV cuneiformis? R, EPSL bradyana VA, EPSL cf. gyroidinaformis (juvenile) VR, FR advena VR, Spongodiscidae (large) C, SG kleinPELLI R, U cf. hootsi R, U subperegrina R, U aff. subperegrina (very light costae) C, VAL alicia R. Upper to middle bathyal.
2,020 SWC (sidewall core)	BLMA aff. californica (of KleinPELLI, 1938), s.l. VR, BLMA curta VR, CS quadrata VR, EPSL bradyana R, EPSL cf. gyroidinaformis VR, EPSL pacifica VR, GL bulloides R-C, PLN cf. ariminensis (of KleinPELLI, 1938)? (juvenile) VR, PLF californica VR, Spongodiscidae (large) R-C, U subperegrina VR, VRG cf. schreibersiana (of KleinPELLI, 1938) R. Upper to middle bathyal.

Foraminiferal species lists and paleobathymetric interpretations  
for samples from Union Oil well OCS P-0130 (continued)

Species and specimen occurrence per sample	
VR=1-2; R=2-10; C=11-32; A=33-100;	
Sample (ft)	VA=101-320; VVA=321-1,000; FL (flood)=more than 1,000
2,140 SWC (sidewall core)	BLV tumida C, BLMA brevior, s.l. VR, BLMA aff. californica (of Kleinpell, 1938), s.s. R-C, BLMA subfusiformis R, EPSL bradyana VA, EPSL aff. gyroidinaformis VR, EPSL pacifica VA, FR advena R, GL cf. bulloides R, NDG advena R, NDS? sp. "A" VR, PLF? sp. (of Kleinpell, 1938) R, SG kleinpelli VR, U cf. hootsi (small neck) R, U cf. subperegrina A, VRG cf. schreibersiana R. Upper to middle bathyal.
2,800	BLV marginata (of Kleinpell, 1938, pl. 9, fig. 2) R, BLMA aff. californica? (fragment) VR, CS aff. limbata (laevigata carinata?) A, CB aff. elmaensis? R-C, ELN? pecki? A, EPSL aff./cf. gyroidinaformis VR, EPSL pacifica R, EPSL subperuviana A, EPN healdi R, EPN cf. healdi R, EPN umbonata R, GL bulloides R, PLN cf. ariminensis/baggi? VR, SPD variabilis VR, Spongi-discidae VVA, U subperegrina? R. Upper to middle bathyal.
2,980	ANO cf. patella (of Kleinpell, 1938) (juvenile) VR, BLV cf. advena (small) R, BLV marginata (of Kleinpell, 1938, pl. 9, fig. 2) RC, BLV tumida R, DE quadrulata R, EPN umbonata R, LNT sp. (straight, limbate sutures) R, SPG transversa R, SPG transversa/cymricensis R, SPG sp. (of Kleinpell, 1938) R, Spongodiscidae VA. Lower bathyal.
3,250	ANO cf. patella (juvenile) VR, BLV marginata A, BLV pisciformis R, BLM alligata kernensis R, BLM inflata alligata R, CT stainforthi VR (possibly contamination from up hole), CS crassipunctata C, CS subglobosa (elongate, uncoiled) R-C, CB americanus crassiseptus R, CB cushmani VR, CB elmaensis, s.s. VVA, CY sp. VR, DN quadrulata R, EPSL parva C, EPN duprei R, GDR sp. (of Tipton, et al., 1973) R, GL euapertura (of McKeel and Lipps, 1972) R, HP trullisata R-C, LNT alato-limbata R, LNT cymricensis? R, NN costiferum R, NN ynezianum? R-C, Spumellaria FL, TRB gemma R, UA obesa impolita R, VRG bramlettei VA. Middle to lower bathyal.
3,760	ANO garzaensis (juvenile) VR, BT eocenica R, BLV cf. advena VR, BLM corrugata R, BLM inflata alligata R, CS crassipunctata A, CB elmaensis, s.s. R, CB pseudoungerianus evolutus (of Tipton, et al., 1973, s.s.) VR, CL communis pallida C, EPSL parva VA,

Foraminiferal species lists and paleobathymetric interpretations  
for samples from Union Oil well OCS P-0130 (continued)

	Species and specimen occurrence per sample VR=1-2; R=2-10; C=11-32; A=33-100; VA=101-320; VVA=321-1,000; FL (flood)=more than 1,000
3,760 (continued)	GY soldanii C, Nassellaria VVA, PLF californica R, PGD inflata? (fat) R, Spumellaria VVA, VRG bramlettei R. Lower bathyal.
4,240	ANO garzaensis R, BLM alligata kernensis R, BLM corrugata, s. s. VR, BLM corrugata, s.l. R, BLM inflata alligata C, CS crassipunctata A, CB elmaensis, s.s. R, CL communis pallida A, EPSL parva C, GY orbicularis planata VA, Nassellaria A, PLF cf. californica R, PLF packardi multilineata R, U garzaensis C, UA obesa impolita R, VRG zetina (of Tipton, et al., 1973) R. Lower bathyal.
4,300	ANO garzaensis R, BLV marginata R, BLM inflata alligata R, CS crassipunctata A, CS galvanensis R, CB americanus crassiseptus R, CB elmaensis, s.s. R, CB cf. spiropunctatus (biconvex) VR, CSD sp. R, CL communis pallida C, EPSL parva VA, GY orbicularis planata VA, NN pompilioides C, PLF cf. californica R, PLF cf. vaughani VR, U beccarii C, U garzaensis A, UA obesa VA. Reworked species include BLV explicata lodoensis VR, and VGP vacavillensis VR. Lower bathyal.
4,540	ALA scitula VR, ANO garzaensis R, BLM corrugata VR, BLM microcostata VR, CS subglobosa (uncoiling variety) VR, CB cushmani VR, CB cf. sandiegensis R, CB cf. spiropunctatus VR, EPN gaviotaensis? (juvenile) R, LNT alatolimbata VR, LNT cf. terryi (of Tipton, et al., 1973) VR, MRZ densa? (juvenile) VR, PSH micra VR, TRCR aspensis? (juvenile) VR, VAL jacksonensis welcomensis R. Species considered reworked include BLV explicata lodoensis VR, BLM whitei (of Mallory, 1959) VR, GLB planoconica (of Miles, 1977) VR, TRF advena californica VR. Bathyal.
4,720	BLM corrugata, s.s. R, BLM corrugata, s.l. VR, BLM sculptilis R, BLM sculptilis laciniata C, CN joaquinensis R, CT spp. R. CB cushmani/ANO crassisepta VR, CHG cubensis VR, EPN gaviotensis? R, GL prasaepis (of McKeel and Lipps, 1975, = GLTH index index juveniles) R, GLTH index index VR, GY condoni A, PLF packardi, s.s. R-C, SPN sp. VR, U garzaensis, s.s. A. Bathyal.

Foraminiferal species lists and paleobathymetric interpretations  
for samples from Union Oil well OCS P-0130 (continued)

	Species and specimen occurrence per sample VR=1-2; R=2-10; C=11-32; A=33-100; VA=101-320; VVA =321-1,000; FL (flood)=more than 1,000
4,930	AST crassaformis umbilicatula R, BLV aragonensis VR, BLV explicata lodoensis R, "GLR" cf. naussi VR, GY childsi (diminutive) VR, MRZ aequa (diminutive) VR, MRZ subbotinae (broken) VR, MRZ wilcoxensis (juvenile) VR, PSH wilcoxensis (juvenile) VR, QDM sp. VR, SPN sp. VR, TRF advena cali - fornica R, TRCR nitidus R, TRCR primitivus R, U wilcoxensis (juvenile) VR. Bathyal.
5,000	ANO keenae/judas (diminutive) VR, AST crassaformis umbilicatula R, BLV aragonensis VR, BLV explicata lodoensis VR, CHG trinitatensis? R, CB pachecoensis VR, MRZ aequa (diminutive) VR, MRZ cf. subbotinae (juvenile) VR, PRL culter midwayana (of Mallory, 1959) VR, PLR pseudomenardii (diminutive) VR, TRCR mckannai? (diminutive) VR, TRCR nicoli R, TRCR nitidus C, TRCR cf. quetra (juvenile) VR. Bathyal.
5,041	AMPM ignota? (diminutive) VR, ANO keenae/judas VR, CHG midwayensis VR, CHG wilcoxensis? (diminutive) VR, EPN lodoensis VR, "GLR" perclara/reissi R, LNT vortex (of Mallory, 1959) VR, MRZ aequa (diminutive) VR, MRZ aequa, s.l. VR, MRZ apanthesma VR, MRZ subbotinae VR, PLR elongata (diminutive) VR, PLR cf. imitata (diminutive) VR, PLR pseudomenardii (diminutive) VR, PLR pussilla/pseudoscitula R, TPN selmensis VR, TRCR mckannai R, TRCR primitivus R, TRCR pseudotopilensis R, TRCR quetra, s.s. VR, VGP kelleyi? (fragment) VR. Outer neritic to bathyal.
5,370	AMPS sp. VR, BT vitta? R, BLV aragonensis VR, "GL" transitional soldadoensis/gravelli (see Bolli, 1957, pl. 16) VR, MRZ aequa (diminutive) R, MRZ angulata? (diminutive) VR, MRZ californica VR, MRZ convexa, s.l. (five chambers) VR, MRZ subbotinae (large) VR, Ostracods VR, PLR cf. pussilla laevigata VR, SBT cf. aquiensis VR, SBT pseudobulloides? (diminutive) VR, SBT triloculinoïdes, s.s. R, TRCH globigerinaformis VR, TRCR esnaensis VR, TRCR cf. mckannai C. Outer neritic to bathyal.
5,400	BT vitta? R, CHG midwayensis var. VR, SBT aquiensis VR, SBT spiralis, s.l. VR, TRCR mckannai, s.l. VR, GYD bandyi VR. The stratigraphic range of GYD bandyi in California is Coniacian to Campanian according to Sliter, 1968. Bathyal?.

Foraminiferal species lists and paleobathymetric interpretations  
for samples from Union Oil well OCS P-0130 (continued)

Sample (ft)	Species and specimen occurrence per sample
	VR=1-2; R=2-10; C=11-32; A=33-100; VA=101-320; VVA=321-1,000; FL (flood)=more than 1,000
6,330	Arenaceous indeterminate R, BT vitta? C. Marine.
7,350	Arenaceous indeterminate VR. Probably marine.
8,340	B.O.F. Paleobathymetry indeterminate.
9,330	Arenaceous indeterminate VR, BT vitta? R. Marine.
10,320	B.O.F. Paleobathymetry indeterminate.
11,310	BT vitta? R. Marine.
12,285 T.D.	BT vitta? R. Marine.

## BIBLIOGRAPHY

- Bolli, H.M., 1957, The genera *Globigerina* and *Globorotalia* in the Paleocene-lower Eocene Lizard Springs Formation of Trinidad, B.W.I., in Loeblich, A., and others, 1957, *Studies in Foraminifera*: U.S. National Museum Bulletin 215, p. 61-82.
- Keller, G., 1978, Late Neogene planktonic foraminiferal biostratigraphy and paleoceanography of the northeastern Pacific: evidence from DSDP sites 172 and 310 at the north Pacific front: *Journal of Foraminiferal Research*, v. 8, no. 4, p. 332-349.
- Kleinpell, R.M., 1938, Miocene stratigraphy of California: Tulsa, Okla., American Association of Petroleum Geologists, 450 p.
- Mallory, V.S., 1959, Lower Tertiary biostratigraphy of the California Coast Ranges: Tulsa, Okla., American Association of Petroleum Geologists, 416 p.
- McKeel, D.R., and Lipps, J.H., 1972, Calcareous plankton from the Tertiary of Oregon: *Paleogeography, Paleoclimatology, Paleoecology*, v. 12, no. 1-2, p. 75-93.
- \_\_\_\_\_, 1975, Eocene and Oligocene planktonic Foraminifera from the central and southern Oregon Coast Range: *Journal of Foraminiferal Research*, v. 5, no. 4, p. 249-269.
- Miles, G.A., 1977, Planktonic Foraminifera of the lower Tertiary Roseburg, Lookingglass, and Flourney Formations, southwest Oregon: Eugene, Oreg., University of Oregon doctoral dissertation, 360 p.
- Rau, W.W., 1951, Tertiary Foraminifera from the Willapa River valley of southwest Washington: *Journal of Paleontology*, v. 25, no. 4, p. 417-453.
- \_\_\_\_\_, 1964, Foraminifera from the northern Olympic Peninsula, Washington: U.S. Geological Survey Professional Paper 374-G, 33 p. 7 pl.
- Subbotina, N.N., 1953, *Globigerinidy, Khantkhennidy i Globorotaliidy: Vsesoluznyi Neftianoy Nauchno-Issledovatel'skiy Geologo-Razvedochnyi Institut (Leningrad), Trudy, novaia seriia*, v. 76, p. 1-294.
- Tipton, A., Kleinpell, R.M., and Weaver, D.W., 1973, Oligocene biostratigraphy, San Joaquin Valley, California: University of California Publications in Geological Sciences, v. 105, 81 p. 14 pl.