GEOLOGICAL SUMMARY

COMPLETION REPORT

WILDCAT TEST

ESSO 15/6-2

November 1971

I INTRODUCTION

A. Well Designation: Esso 15/6-2

B. Well Classification: New Field Wildcat

C. Well Location:
1) Country: Norway
2) License: 028
3) Coordinates:
Latitude: 58° 32' 47.6" N
Longitude: 01° 41' 54.1" E

4) Seismic Location:
line SC 23, shotpoint 7490

5) Water Depth: 378 feet.

II Purpose of Well

15/6-2 was drilled in order to:

A) Redrill 15/6-1 which was abandoned due to mechanical reasons after reaching a TD of 5508'. The Glomar "Grand Isle" was skidded 1130 feet east and 72 feet south of 15/6-1 to the coordinates mentioned above. The new location was designated 15/6-2.

B) Evaluate a deep seated structural closure in the Scottish-Norwegian graben.

C) Fulfill the drilling obligation to the Norwegian Government.

III Results of the Well

Esso 15/6-2 reached a total depth of 10,272 in shales, red brown, gray green and light gray, calcareous and firm, of questionable Lower Cretaceous age (10190'-10272' TD).

The Upper Cretaceous section, from 8995 to 10190' was predominantly limestone, pale orange to buff with some white and light grey, micritic, hard, and some softer, white chalky limestone; with thin interbeds of shale, gray green, light to medium gray, and pale red brown, calcareous and firm. Thin interbeds of sandstone, white to light gray, very fine to medium grained, calcareous, firm, with traces of pyrite were also noted. There were no shows in the Upper Cretaceous.

The Danian (8784-8995') consisted of a sequence of thinly interbedded sandstones, clays, shales and chalky limestones. No shows were reported.

The Paleocene section (7280'-8784) was primarily sand, unconsolidated, chiefly fine to medium with some coarse grained zones, clear quartz, poor to fair sorting; with thin beds of clay, white, buff, light gray and red-brown, soft, becoming marly below 7840', and shales, gray green, gray brown, dark gray and red brown, slightly micaceous, firm.

Significant shows were encountered in the interval 7295'-7336'. The cuttings showed good fluorescence and cut, and the hot wire, chromatograph, sidewall and conventional cores corroborated the shows. Weak fluorescence and cut were reported from numerous sidewall cores between 7555 and 8453 feet. However these shows were not substantiated by any other evidence.

The Eocene, from 5280'-7280', was predominantly shale with four major sand bodies ranging from 65 to 180 feet in thickness. The shales varied from brown gray, green gray, medium and dark gray to shades of red at about 6800 feet. A tuffaceous zone was reported from 6970 to 7020 feet. The sands were fine to coarse grained, unconsolidated, with no shows.

The Oligocene through Pleistocene sections were identical to those drilled in the twin well 15/6-1. The Oligocene (4410-5280') is mainly clay, light gray and pale brownish gray, very soft, glauconitic. Microfossils were common in the samples.

The Miocene section (2520-4410') was composed of sands and clays. The sands were fine to medium grained clear quartz, unconsolidated, subrounded, with medium sorting and abundant fossil fragments. The clays were brownish gray, soft and plastic, with brown red, slightly calcareous and firmed clays in places.

The Pliocene-Pleistocene (1200(?)-2520') consisted of very plastic clays, light gray, soft and sticky.

No hydrocarbon shows were encountered in the Oligocene to Pleistocene sections.

IV Well History

A. General

1) Spud Date:	September 9, 1971
2) Completion Date:	October 26, 1971
3) Status:	Plugged and abandoned.
4) Total Depth:	10,272 feet.

B. Contractor and Rig: Global Marine "Grand Isle".

C. Casing:

30" - 488 feet
20" - 1195 feet
13 3/8"- 4297 feet
9 5/8"- 8788 feet

D. Mud Program

Initial drilling from the sea floor to 4365 feet was with sea water and gel. Below 4365 feet a fresh water Spersene XP-20 mud system was used.

E. Drilling Problems

No drilling problems were encountered, however, due to deviation problems around 4500 feet a planned FIT was aborted as the tool would not go beyond this depth.

F. Coring

1) Conventional:

See Part V, B, 2.

No.	Depth	Cut	Rec.
1	7336-56	20	20
2	7666-90	24	10
3	8843-56	13	6

2) Sidewall

See Part V, B, 3.

Depth	Cut	Rec.
5275 - 8815	90	80
8820 - 10,250	30	12

G. Logging

1) Baroid

a) Drilling rate	4360 - 10,272'
b) Lithology	"
c) Cuttings Gas	"
d) Mud Gas	"
e) Chromatograph	"
f) H_2S Detector	"
g) Shāle Density	"

2) Schlumberger

Type Log	Interval (feet)	Run Nos.
a) BHC-GR-Sonic-Cal	4307-10,242 (GR 400-4297)	1, 2, 3
b) DIL	4310-8873	1
c) FDC-Cal	4310-10,251	1, 2
d) Dipmeter	4310-10,251	1,2
e) IES	8796-10,251	2

3) Velocity Survey

a) 8869 feet

Note: Seismograph Services Ltd. ran the velocity survey. A quality control geophysicist from the North Sea Division was present to supervise the survey.

H. Testing

1) Production Test Results

None taken.

2) Formation Interval Test Results

None taken.

I **Abandonment:**

The first cement plug was spotted from 9000-8656 ft. with 255 sacks of neat cement - - this plug was tagged. The second cement plug was spotted from 4500-4200 ft. using 100 sacks of neat cement. The third cement plug was spotted from 1200-900 ft. with 100 sacks of neat cement. Neither the second nor the third plugs were tagged. A junk cap was installed on top of the well head, and a Selco marker buoy was left 200 ft. north of the location with a flashing light.

V Stratigraphy:

Preliminary

A) Table of Stratigraphy 15/6-2 (RT. 31 feet.)

Stratigraphic Unit	Drill Depth (feet	Subsea Top (feet)	Thickness (feet)
Pliocene/Pleistocene	1200 (?)	(-1169)?	1320 +
Miocene	2520	(-2489)	1890
Oligocene	4410	(-4379)	870
Eocene	5280	(-5249)	2000
Paleocene	7280	(-7249)	1504
Danian	8784	(-8753)	211
Cretaceous			
Upper	8995	(-8964)	1195
Cretaceous			
Lower(?)	10,190	(-10,159)	82 +

Note: Subject to Paleontological Revision

B. <u>Lithologic Descriptions</u>

1) Sample Descriptions (wellsite).
   4365 to 10,272 ft.
   (For up-hole descriptions see Esso 15/6-1)

Wellsite Sample Descriptions:

Depth		Description
4365 - 4450	100 %	Clay, brownish grey, soft to moderately firm, silty, slightly calcareous, grades to soft silty claystone.
	Tr.	Siltstone, greyish red, argil, firm.
4450 - 4630	90 %	Clay aa and med. grey, silty, mostly soft, forams, shall fragments, abundant glauconite.
	10 %	Siltstone, light grey, soft to firm, slightly calcareous.
4630 - 4960	90 %	Clay, dominantly med. grey, silty, some soft but becomming firmer, forams, shell fragments, few whole small pelecypods, glauconite, traces fine lignite, at 4900 clay begin approach soft shale.
	10 %	Ls as follows: mic - fn skel. - foram, light brown, hard, tight, dense mic, argil, buff, soft mic w. fn. skel. debris, buff, hard, dense.
	Tr.	Siltstone, lt. grey, soft, finely glauconitic.
4960 - 5140	70 %	Clay, aa with pyrite, pyritized wood fragments, fine mica.
	20 %	Shale, brown grey to med. grey, silty, soft.
	10 %	Ls, mic, buff and tan, hard dense and mic, argil, soft.
5140 - 5260	70%	Shale, brown grey and green grey, soft, silty, finely micaceous, rare glauconite, with forams and shell debris.
	20 %	Clay, med. grey to green grey soft, silty.

	Tr.	Ls, mic and mic-fn skel, tan and brown grey, hard, dense, tight.
	Tr.	Ls, mic, chalky, buff, soft to moderately hard.
5260 - 5440	80 %	Shale, dark brown grey to olive grey, slightly silty, finely lignitic, trace glauconite & very fn. mica.
	20 %	Clay, aa
	Tr.	Ls, chalky aa.
	Tr.	Ls, mic and mic - fn. skel aa.
	Tr.	Sand, from 5350 - 5380, med. to fn. gr. rounded qtz., loose grains.
5440 - 5530	80 %	Shale, brown - grey, very pure argillaceous, non - calc, finely pyritic, shell debris, forams, tr. glauconite, some light green, highly glauc. sh.
	20 %	Clay, aa.
	Tr.	Ls, aa
5530 - 5620	100 %	Shale, green grey, striking color change from brown grey above, non silty, non calc. with traces glauc, forams, fine shell debris.
	Tr.	Clay, aa
	Tr.	Sand, loose, rounded, fn. grains in interval 5530 - 60.
5650 - 5740	100 %	Shale, aa
	Tr.	ss, fn. gr, sub ang, well sorted dolomitic,
	Tr.	Dol, calcareous to dolomitic ls, buff to cream, tight, hard.
5740 - 5800	90 %	Shale aa
	10 %	Sand, fn to med, subrounded to subangular, unconsolidated, fair sorting; increase of v. fn. sand in mud system; no show.

	Tr.	Dol, aa.
	Tr.	ss, dolomitic aa.
5800 - 5830	100 %	Shale, med. grey and green grey; color change here with appearance of med. grey; shale getting firmer; glauc. and forams in green grey sh.
	Tr.	Sand, aa.
	Tr.	Dol, aa.
5830 - 5980	100 %	Shale, med. grey predominantly some green grey, becoming firmer non silty, non calc.
	Tr.	Sand, fn. to coarse clear qtz, subrounded.
5980 - 6010	90 %	Shale, aa.
	10 %	Sand, aa.
6010 - 6130	100 %	Shale, med. grey to brown grey, non silty to slightly silty, non calc, tr. fine lignite in the sh.
	Tr.	Sand, aa; very rare scattered grains; samples essentially all shale, exept 6100 - 6130 where slight increase sd. no show.
6130 - 6310	70 %	Shale, aa
	30 %	Sand, crs to fn, some pebbles, all clear subrounded to subangular qtz, unconsolidated, no show.
	Tr.	Pyrite and pyritized wood fragments.
	Tr.	Glauconite.
	Tr.	Shell debris, one small pelecypod.
	Tr.	Ls, mic, tan hard.
	Tr.	Dol, calc, hard, dense
	Tr.	ss, fn, glauconitic, hard, tight, dol- silica cement, no show.

6310 - 6340	90 %	Shale, dark grey to med, grey, very slightly to non-silty, pyritic; very abrupt color change.
	10 %	Sand, aa.
	Tr.	Ls, aa
	Tr.	Dol, aa
	Tr.	ss, hard , aa
6340 - 6490	100 %	Shale, aa
	Tr.	Sand, aa
	Tr.	ss, hard, aa
	Tr.	Siltstone, argil w. fn. lignite
6490 - 6640	90 %	Shale, dark grey, med, grey, olive grey.
	10 %	Sand, fn-crs, subrounded, unconsolidated, no show.
	Tr.	Dol, sandy, calcareous, hard tight, and finely x-line, hard, tight.
6640 - 6760	100 %	Shale, mostly med grey to olive grey, very pure argil shale few forams; some brown-grey in 6730 - 6760.
	0 %	Sand, sand abruptly drops out.
	Tr.	Ls, mic, buff, hard, dense.
	Tr.	Dol, aa
6760 - 6910		Clear lithologic change - Rosnaes fn ?
	100 %	Shale, rusty brown, brown grey, greyish red and green grey; some mottled red and green; non to slightly silty and finely micaceous; pyritic; green-grey is glauconitic.
	Tr.	Ls, aa
	Tr.	Dol, aa

6910 - 6940		<u>Clear lithologic change & Drilling Break</u>
		<u>Eocene "A" ?</u>
	100 %	<u>Shale</u>, olive grey, trace fine wood fragments, few forams, pyrite.
	Tr.	<u>Ls</u>, mic, tan to lt. grey, hard dense (5 % ±).
6940 - 7000	100 %	<u>Sh</u>, aa
	Tr.	<u>Ls</u>, aa
	Tr.	<u>Tuff</u>, white to lt. grey, mod. hard, slightly calcareous, some grains speckled.

Wellsite Sample Descriptions:

7000 - 7030	90 %	Shale, light-medium gray, gray green, with trace of red brown, calcareous, firm.
	10 %	Clay, medium gray-gray green, sticky, soft.
	Tr.	Sandstone, light buff-light gray, very fine-fine, silty, slightly glauconitic, slightly calcareous, subangular, poorly sorted, hard, No Show.
	Tr.	Siltstone, light brown, very argillaceous, slightly calcareous, soft.
	Tr.	Dolomite, brown, hard.
	Tr.	Tuff, white-light gray, slightly calcareous, with dark specks.
7030 - 7150	80 %	Shale, light gray-gray brown, non-calcareous, soft-firm.
	20 %	Clay, medium gray-gray brown, sticky, soft.
	Tr.	Silt, clear, quartz.
	Tr.	Limestone, white-light orange, micritic, firm.
	Tr.	Tuff, as above.
	Tr.	Lignite.
	Tr.	Pyrite.
	Note:	Trace of limestone, brown, crystalline, firm and a trace of orange chert at 7060 ft.
7150 - 7250	80 %	Shale, light olive gray-gray brown, slightly micaceous, firm.
	20 %	Clay, as above, slightly silty.
	Tr.	Silt, clear, quartz.
	Tr.	Limestone, white, micritic, hard.
	Tr.	Tuff, as above.

7250 - 7300	60 %	Shale, gray brown-light gray green, slightly micaceous, soft-firm.
	40 %	Clay, gray brown-buff-light gray green, silty, sandy, soft.
	Tr.	Silt, as above.
	Tr.	Limestone, white-orange, crystalline, hard.
	Tr.	Pyrite.
	Note:	Trace of Siltstone, brown, siliceous, hard at 7280 ft.
7300 - 7310	60 %	Shale, as above.
	30 %	Clay, as above.
	10 %	Sand, clear very fine-medium, quartz, subrounded, poorly sorted, bright yellow fluorescence and bright yellow-blue cut in 30 % of the sample.
	Tr.	Silt, as above.
	Tr.	Limestone, light brown, crystalline, hard.
7310 - 7336	50 %	Shale, as above.
	30 %	Sand, as above, with show as above (fluorescence gradually decreased to 10 % of the sample).
	20 %	Clay, as above.
	Tr.	Siltstone light brown grading to sandstone, siliceous, firm with oil stain, good fluorescence, and good cut.
	Tr.	Limestone, as above.
	Note:	10 % Lignite at 7320 ft.

7336 - 7356	Core no. 1, Rec. 20 ft. Shale and sandstone. Note: See Core Description.	
7356 - 7460	50 %	Shale, light gray green, light-medium gray, with a trace of red brown, slightly silty, micaceous, firm.
	40 %	Sand, clear, very fine-fine, some medium-coarse, subrounded, fair sorting, trace of pin point yellow fluorescence, no cut. (probably caving).
	10 %	Clay, white-gray brown, sandy, silty, sticky, soft.
	Tr.	Pyrite.
	Tr.	Microfossils.
7460 - 7570	40 %	Sand, clear, very fine-fine, subrounded, well sorted, No Show.
	30 %	Shale, gray brown-gray green, firm.
	30 %	Clay, white-buff with a slight trace of red brown, as above.
	Tr.	Sandstone, white, very fine, subangular-subrounded, well sorted, very calcareous, chalky, firm, No Show.
	Tr.	Limestone, micritic, light orange, firm.
	Tr.	Pyrite.
	Note:	10 % Lignite, black, soft at 7530 ft.
7570 - 7620	50 %	Sand, clear, coarse, some fine-medium, quartz, subrounded-subangular, well sorted, some frosted grains, No Show.
	40 %	Shale, as above, with increase of dark gray brown.
	10 %	Sandstone, white, very fine, silty, subangular-subrounded, well sorted, calcareous, chalky, firm, No Show.

	Tr.	Clay, as above.
	Tr.	Pyrite.
7620 - 7640	50 %	Clay, light gray brown, very sandy, silty, sticky, soft.
	40 %	Sand, clear, very fine-fine, some medium, subrounded, poorly sorted. No Show.
	10 %	Shale, as above.
	Tr.	Sandstone, as above, No Show.
	Tr.	Pyrite.
7640 - 7666	40 %	Sand, as above, No Show.
	30 %	Shale, as above.
	10 %	Sandstone, as above, No Show.
	10 %	Siltstone, gray brown, shaley, slightly calcareous, firm.
	10 %	Limestone, chalky, white, silty, sandy, soft-firm.
	Tr.	Clay, as above.
	Tr.	Pyrite.
7666 - 7690	Core no. 2 Rec. 10 ft. Sandstone and shale. Note: See Core Description.	
7690 - 7720	50 %	Sand, clear, very fine-coarse, quartz, subrounded-subangular, poorly sorted, No Show.
	30 %	Shale, gray green-dark gray, slightly micaceous, firm.
	10 %	Sandstone, white-buff, very fine-medium, subangular, poorly sorted, calcareous, friable.
	10 %	Clay, buff, soft.

	Tr.	Limestone, micritic, white-buff, firm with some chalky, silty, sandy, soft.
7720 - 7760	40 %	Sand, as above, No. Show.
	20 %	Shale, as above.
	20 %	Limestone, micritic, white-pale orange, hard with some chalky, silty, sandy, soft.
	10 %	Sandstone, as above, No Show.
	10 %	Clay, white-buff, soft.
	Tr.	Pyrite.
7760 - 7800	60 %	Sand, as above, mostly coarse, No Show.
	20 %	Shale, as above, with gray green and red brown.
	10 %	Sandstone, buff, as above, No Show.
	10 %	Clay, as above, very sandy.
	Tr.	Siltstone, gray brown, slightly calcareous, soft.
	Tr.	Limestone, as above.
	Tr.	Pyrite.
7800 - 7840	40 %	Sand, clear, very fine-coarse, quartz, subrounded-subangular, poorly sorted, No Show.
	30 %	Shale, gray green-gray brown, slightly micaceous, firm.
	20 %	Clay, white-buff, silty, sandy, soft.
	10 %	Limestone, chalky, white, silty, sandy, very soft, becoming marl.
	Tr.	Sandstone, white, very fine-medium, subangular, fair sorting, calcareous, firm, No Show.
	Tr.	Siltstone, gray brown, slightly calcareous, shaley, soft.
	Tr.	Pyrite.

7840 - 7870	60 %	Clay, as above, marly.
	40 %	Sand, as above, No Show.
	Tr.	Shale, as above.
	Tr.	Limestone, as above, marly.
7870 - 7910	70 %	Sand , as above, fine-medium with some coarse, No Show.
	30 %	Clay, as above.
	Tr.	Shale, as above.
	Tr.	Limestone, as above.
7910 - 7960	60 %	Clay, as above.
	40 %	Sand, clear, very fine-coarse, subrounded-subangular, poorly sorted, No Show.
	Tr.	Shale, as above.
	Tr.	Pyrite.
7960 - 7990	40 %	Sand, as above, No Show.
	30 %	Clay, as above.
	20 %	Shale, as above.
	10 %	Limestone, chalky, white, silty, sandy, soft.
	Tr.	Pyrite.
7990 - 8020	60 %	Sand, clear,fine-coarse, quartz, subrounded-subangular, poorly sorted. No Show.
	20 %	Clay, white-buff, silty, sandy, soft, marly.
	10 %	Shale, gray brown-gray green, slightly micaceous, firm.
	10 %	Limestone, as above.

Wellsite Sample Description.

Depth		Description
8020 - 8030	60 %	Clay, gray brown, buff, soft,
	30 %	Sand, clear quartz, fine to coarse, some frosted grains, unconsolidated poorly sorted.
	10 %	Shale, gray brown - gray green, slightly micaceous.
	Tr.	Limestone, brown, micritic.
8030 - 8050	60 %	Sand, as above.
	30 %	Clay, as above.
	10 %	Shale, as above.
	Tr.	Limestone, brown, micritic.
8050 - 8070	60 %	Sand, as above.
	30 %	Clay, as above.
	10 %	Shale, as above.
	Tr.	Limestone, as above.
	Tr.	Pyrite.
8070 - 8130	70 %	Sand, as above.
	20 %	Clay, as above.
	10 %	Shale, as above.
	Tr.	Pyrite.
8130 - 8170	90 %	Sand, as above.
	10 %	Clay, as above.
	Tr.	Shale, as above.
	Tr.	Pyrite,

./.

8170 - 8250	60 %	Clay, gray, buff, and white.
	30 %	Sand, clear quartz, fine to coarse, unsolidated,
	10 %	Shale, gray-green.
8250 - 8380	50 %	Sand, as above.
	40 %	Clay, as above.
	10 %	Shale, as above.
	Tr.	White chalk.
8380 - 8520	70 %	Clay, gray and buff.
	20 %	Shale, green and gray green.
	10 %	Sand, as above.
8520 - 8590	70 %	Clay, as above.
	20 %	Shale, as above.
	10 %	Sand, as above.
	Tr.	Sandstone, fine grained, calcite cemented, hard.
8590 - 8645	70 %	Clay, as above.
	30 %	Shale, as above.
	Tr.	Sandstone, as above.
	Tr.	xln, calcite. At 8600 5 % soft white chalk.
8645 - 8740	60 %	Clay, gray, calcareous below 8700.
	30 %	Sandstone, white, fine grained, hard, well sorted, calcite and siliceous, cemented.
	10 %	Shale, as above.
8740 - 8843	70 %	Clay, gray and calcareous.
	10 %	Chalk, white to buff.
	10 %	Sand, clear quartz.
	10 %	Shale, as above.

./.

8843 - 8856	Core number 3 (see Core Descriptions)	
8856 - 8869	70 %	Clay, as above.
	10 %	Chalk, as above.
	10 %	Sand, as above.
	10 %	Shale, as above.

Esso 15/6-2

Wellsite Sample Descriptions:

8869 - 8920	50 %	Limestone, chalky, white-light gray, argillaceous, some micrite, soft-hard.
	20 %	Clay, white-pale red brown, very calcareous, marly, soft,
	20 %	Shale, medium gray-gray brown-gray green, calcareous, firm.
	10 %	Cement
	Tr.	Sandstone, lt gray-clear, fine-coarse, quartz, subangular, poorly sorted, calcareous, siliceous, slightly glauconitic, hard, No Show.
	Tr.	Sand, frosted, quartz, very coarse, subrounded, No Show.
8920 - 8960	40 %	Limestone, as above.
	40 %	Shale, red brown, slightly silty, very calcareous, some gray green, firm.
	20 %	Clay, as above.
	Tr.	Pyrite
8960 - 9010	60 %	Limestone, as above, white-tan
	20 %	Shale, gray green with some red brown, slightly silty, calcareous, firm.
	20 %	Clay,red brown with some white, slightly silty, calcareous, marly, soft.
	Tr.	Pyrite.
9010 - 9050	80 %	Limestone, white-tan, mostly micritic, firm, hard.
	20 %	Shale, as above, mostly dark gray green, slightly glauconitic.
	Tr.	Clay, as above.

	Tr.	<u>Sandstone</u>, white-light gray, very fine-fine, quartz, subangular, fair sorting, calcareous, soft-firm, No Show.
9050 - 9100	90 %	<u>Limestone</u>, as above.
	10 %	<u>Shale</u>, dark gray green with some red brown, slightly silty, very calcareous, firm.
	Tr.	<u>Sandstone</u>, light gray, very fine-fine, silty, subangular, fair sorting, slightly calcareous, firm, No Show.
9100 - 9160	70 %	<u>Limestone</u>, chalky and micritic, white-tan, firm-hard.
	30 %	<u>Shale</u>, gray green-gray brown with some red brown, very calcareous, slightly micaceous, firm.
	Tr.	<u>Clay</u>, white-tan, very calcareous, soft.
	Tr.	<u>Sandstone</u>, as above, No Show.
9160 - 9230	90 %	<u>Limestone</u>, mostly micritic, pale orange, firm-hard.
	10 %	<u>Shale</u>, as above.
	Tr.	<u>Sandstone</u>, as above, No Show.
9230 - 9270	50 %	<u>Limestone</u>, as above, chalky in part.
	30 %	<u>Shale</u>, gray brown-gray green with a trace of red brown, very calcareous, slightly micaceous, firm.
	20 %	<u>Sandstone</u>, light gray, very fine-fine, silty, subangular, poorly sorted, very calcareous, firm.
	Tr.	<u>Cement</u>.

9270 - 9350	90 %	**Limestone**, micritic, pale orange-buff, dolomitic in part, firm-hard. A trace of light gray, skeletal limestone was noted at 9300 ft. and a trace of detrital limestone was noted at 9330 ft.
	10 %	**Shale**, dark gray green with some red brown, slightly silty, very calcareous, slightly micaceous, firm.
	Tr.	**Sandstone**, as above, calcareous, No Show.
9350 - 9410	80 %	**Limestone**, as above.
	20 %	**Shale**, as above.
	Tr.	**Sandstone**, as above, No Show.
	Note:	A trace of glauconite was recorded from 9360 - 80 ft.
9410 - 9450	70 %	**Limestone**, micritic, pale orange-buff, dolomitic in part, firm-hard.
	30 %	**Shale**, light-dark gray green with some red brown and light gray brown, very calcareous, firm.
	Tr.	**Sandstone**, light gray, very fine-fine, silty, subangular, poorly sorted, calcareous, firm, No Show.
	Tr.	**Siltstone**, dark gray brown with carbonaceous specks, very calcareous, glauconitic in part, soft.
9450 - 9470	60 %	**Limestone**, as above, some chalky, soft-hard.
	40 %	**Shale**, as above.
	Tr.	**Siltstone**, as above.

Esso 156-2

Wellsite Sample Descriptions:

9470 - 9550	70 %	Limestone, as above (color may be considered paleorange - buff or ranging from white to buff with some light gray).
	30%	Shale, as above.
	Tr.	Sandstone, white, light gray, very fine-medium, subangular, poorly sorted, calcareous, firm, no show.
	Tr.	Siltstone, as above, with trace glauconite.
9550 - 9570	50 %	Limestone, as above.
	40 %	Shale, mostly medium gray, very calcareous, with some light gray, greenish gray and dark red brown.
	10 %	Siltstone, rust brown, clayey, soft.
	Tr.	Sandstone, as above, no show.
9570 - 9630	50 %	Limestone, as above.
	50 %	Shale, as above.
	Tr.	Sandstone, as above, silty in part.
9630 - 9810	70 %	Limestone, as above, with evidence of stylolites.
	30 %	Shale, as above.
	Tr.	Sandstone, as above with trace pyrite.
	Tr.	Siltstone, green gray, clayey, glauconitic, soft.
	Note:	Evidence of Limestone and Sandstone in thin interbeds.

9810 - 9880	50 %	Limestone, as above.
	50 %	Shale, as above.
	Tr.	Sandstone, as above.
	Tr.	Siltstone, as above.
9880 - 10030	70 %	Limestone, as above.
	30 %	Shale, as above.
	Tr.	Sandstone, as above
	Tr.	Pyrite and calcite.
10030 - 10120	90 %	Limestone, micritic, buff to light brown predominates, with some white and light gray, hard.
	10 %	Shale, medium gray, light gray, very calcareous, trace rust brown.
	Tr.	Sandstone, white, light gray, very fine to fine, calcareous, firm, with trace minute glauconite grains.
	Tr.	Siltstone, gray, greenish-gray, sandy, soft, with trace minute glauconite grains.
10120 - 10130	80 %	Limestone, as above.
	10 %	Shale, as above.
	10 %	Clay, pale red brown, calcareous, marl?
10130 - 10170	90 %	Limestone, as above, with some chalky limestone, soft.
	10 %	Shale, as above.
	Tr.	Clay, as above.
10170 - 10200	80 %	Limestone, as above with only trace chalky limestone.
	20 %	Shale, as above.
	Tr.	Clay, as above, with trace white clay, calcareous.

10200 - 10220	80 %	Limestone, as above.
	10 %	Shale, as above.
	10 %	Clay - Clay stone, pale red brown, calcareous, and trace white clay.
10220 - 10230	60 %	Limestone, buff-light orange, micritic, hard.
	40 %	Shale, red brown with some gray green, very calcareous, firm.
	Tr.	Siltstone, light gray brown, calcareous, soft, grading to Sandstone, No show.
	Tr.	Clay, white-pale red brown, calcareous, soft.
10230 - 10240	40 %	Shale, as above.
	30 %	Limestone, as above, chalky in part.
	30 %	Clay, as above, becoming Marl.
	Tr.	Lignite (possibly from mud additives).
10240 - 10260	50 %	Clay,-Marl, as above, sticky.
	40 %	Shale, red brown-gray green-light gray, very calcareous, firm.
	10 %	Limestone, buff-light orange, micritic, hard.
10260 - 10270 (TD = 10,272 ft.)	90 %	Shale, red brown-gray green-light gray, calcareous, firm.
	10 %	Limestone, as above.

2) Core Descriptions (conventional)

Core No. 1	7336 to 7356 feet
Core No. 2	7666 to 7690 feet
Core No. 3	8843 to 8856 feet.

ESSO EXPLORATION NORWAY INC.

15/6-2

Conventional Core Description

Core No. 1 7336-7356 Cut 20 ft. Recovered 20 ft.

Depth	Description
7336 - 7337	Shale, gray green, firm.
7337 - 7338	Sandstone, white-light gray, very fine, silty, subangular, fair sorting, trace of glauconite, friable, pale fluorescence and pale cut.
7338 - 7340	Shale, gray green, very sandy, firm.
7340 - 7342	Sandstone, light gray, very fine, subangular, fair sorting, slightly carbonaceous, very shaley, poor porosity and permeability, firm, No. Show.
7342 - 7345	Shale, medium gray, slightly silty, slightly micaceous, firm.
7345 - 7351	Shale, gray green, slightly silty, highly fractured, firm.
7351 - 7353	Siltstone, grading to Sandstone, light gray-gray brown, very shaley, slightly carbonaceous, poor porosity and permeability, No Show.
7353 - 7355	Shale, gray green, slightly silty, highly fractured, firm.
7355 - 7356	Limestone, gray-buff, crystalline, hard, bright yellow mineral fluorescence, no cut.

Note: Shale sections were highly fractured and slickensides were common.

Core No. 2 7666 - 7690 Cut 24 ft. Recovered 10 ft.

Depth	Description
7666-7668	Sandstone, buff, very fine-medium, quartz, subrounded-subangular, poorly sorted, very friable, clayey, good porosity and permeability, No show.
7668 - 7669	Shale, dark gray, very micaceous, firm.
7669 - 7671	Sandstone, as above non-clayey, excellent porosity and permeability, No Show.
7671 - 7672	Shale, as above.
7672 - 7675	Sandstone, buff, very fine-medium, quartz, subrounded-subangular, poorly sorted, very friable, excellent porosity and permeability, No Show.
7675 - 7676	Sandstone, light-medium gray, very fine-medium, quartz, subrounded-subangular, poorly sorted, very calcareous, very siliceous, very hard, no porosity or permeability, No show.

Note: Strong sulfur odor throughout core.

Core No. 3 8843 - 8856 Cut 13 ft. Recovered 6 ft.

Depth	Description
8843 - 8845	Sandstone, light brown-gray, fine-medium, quartz, rare glauconite and lignite(?) grains, subangular- subrounded, moderate sorting, calcareous and siliceous, grain to matrix ratio (8-2), moderate to very hard, No show.
8845 - 8846	Mudstone, micritic, green-green gray. Bioturbated with bifurcating tubes (1mm dia.) filled with medium brown, calcareous mudstone.

8846 - 8847	<u>Limestone</u>, micritic, argillaceous, trace of glauconite grains, gray green.
8847 - 8849	<u>Mudstone</u>, micritic, green-green gray. Bioturbated with bifurcating tubes (1mm dia.) filled with medium brown, calcareous mudstone.

3) Sidewall Core Descriptions

Runs one, two and three at 8873 feet
Run one at 10,272 feet.

Sidewall Cores - Interval 5275' to 8815'

Sidewall Core Descriptions - Run 3.

By: L.J. Perry
Walton-on-Thames
with shows based on
John Parmenter's original
description.

Depth	Recovery	Description
5275	2"	Shale, brown-grey, soft, finely micaceous, slightly silty, slightly micaceous.
5740	1"	Sandstone, lt. grey, very soft and friable, pure quartz, predominantly fine grained well sorted with a few medium and very fine grains; tr. pyrite, glauconite and white mica; excellent porosity; no show.
5785	1½"	Sandstone, aa
5995	1½"	Sandstone, lt. grey to white, soft and friable, med. to v. fn gr, moderately well sorted, subrounded to subangular; quartzose; tr. fn. glauconite, pyrite; excellent porosity; no shows.
6030	1½"	Sandstone, lt. grey, very soft and friable, pure quartz; well sorted, fn. gr. w. occasional med grains; better sorting than 5995; subrounded to subangular; tr. glauconite, white mica; good porosity; no show.
6155	2"	Sandstone, aa
6215	1½"	Sandstone, lt. grey to white, soft and friable; pure quartz; fn. grained w. occasional med. & crse. grains; moderately well sorted; tr. glauconite and white mica; excellent porosity, no shows.
6275	0	Missing.
6545	1½"	Sandstone, very soft and friable, almost entirely fine gr, well sorted; trace white mica, glauconite, pyrite(?); excellent porosity; no shows.
6580	2"	Sandstone, aa with a few medium grains; excellent porosity; no shows.

6905	0	Broken
7135	1"	Sandstone, very soft and friable, lt. grey to white, pure qtz; moderately well sorted; predominantly fn. to v. fn. grain with occasional med, crse grains or granules; subangular to subrounded; tr. v. fn. glauc. and white mica; excellent porosity; no shows.
		Could 7135 be out of place or mislabeled? Or is it just a very thin ss streak?

Run No. 2

7284	1 1/4"	Shale, firm, moderately hard, greenish grey, slightly silty, slightly calc.
7286	1½"	Shale, firm, moderately hard, med. dk. grey, non-calc., rather pure clay shale; tr. very fn. lignite(?) or wood fragments(?)
7288	2"	Shale, aa
7290	2"	Shale, firm, moderately hard, greenish grey, slightly silty.
7292	½"	Clay, greenish-grey, soft, plastic.
7294	1½"	Shale, med. dk. grey, moderately hard, firm, silty and finely micaceous w. lamina of ss, lt. grey to white, well sorted, fn. gr, quartzose; sharp contact between ss & sh.
7298	1 1/4"	Sandstone, moderately soft and friable, well sorted, fn. gr, pure qtz. w. tr. fine white mica flakes; no cement; excellent porosity; very spotty bright fluorescence; no cut.

7300	1 1/4"	Sandstone, v.fn. to silt, well sorted, subangular slightly argillaceous, w. thin discontinuous laminae of crudely current bedded fine wood-lignite fragments; tr. fine white mica; moderate to poor porosity; no shows.
7302	2"	Shale, dark greenish-grey, moderately firm, waxy, slightly silty, tr. fine mica.
7304	1½"	Interlaminated v. fn. sandstone to siltstone, well sorted, w. fine lignite and shale, greenish grey silty; laminae are pariallel with small-scale scour and current bedding features; no show.
7308	2"	Shale, med. grey, slightly silty, mod. firm, tr. fine mica.
7312	2"	Core cuts a sandstone-sh contact; sandstone is mod. hard, lt. grey, quartzose, massive, well sorted, fn. gr, glauconitic w. good porosity and tr. fn. lignite; sh is med. dk. grey, moderately firm, and slightly silty; contact between sh & ss is sharp. Very weak spotty yellow fluorescence; slight cut.
7314	2"	Shale, greenish-grey, waxy, slightly silty.
7316	2"	Sandstone, v. fn. to siltstone, highly argillacious approaching a highly silty-fn. sandy shale; crudely parallel, current oriented lignite fragments; spotty very weak fluorescence and very weak cut.
7318	2"	Shale, dark grey, firm, moderately hard, very slightly silty, darker than shales above.
7320	2"	Lenticular, irregular laminations of sh, dk. grey, highly silty, and sandstone, well sorted v. fn. grained, silty; no show.
7324	2"	Sandstone, well sorted, v. fn. gr. to silty; fine current laminated wood fragments; few thin greenish grey, silty shale laminae and small greenish grey shale clasts; no show.

7326	1½"	Sandstone, moderately hard, lt. grey, well sorted, fn to v. fn, pure qtz, mostly subrounded, massive, no sed. structures; tr. v. fn. lignite; good porosity weak fluorescence; slight cut.
7328	1 1/4"	Sandstone, v. fn. gr. to siltstone, lt. grey, some med. gr. lignite fragments + tr. fine mica; moderately hard, no show.
7330	1 3/4"	Sandstone, fn. to occasionally med. grains, somewhat coarser than sands above and slightly less well sorted; rare fine glauc. & lignite; excellent porosity; spotty yellow fluorescence, very slight cut.
7332	1 3/4"	Sandstone, argil, v. fn. grained w. fine lignite fragments; one greenish-grey shale laminae; fair porosity; no shows.
7334	1 3/4"	Sandstone, well sorted, fn. gr, rare med, grains quartoze; med. to fn. lignite fragments throughout trace mica; one med. gr. greenish grey sh. clast good porosity; no shows.
7336	1 1/4"	Sandstone, fn. grained aa with common current oriented, crudely parallel, fine lignite fragments; excellent porosity; moderately hard, no shows.
7338	1 1/4"	Disturbed laminae and lenses of ss, argil ss and sh; sandstone is v. fn, clear, quartzose with crudely parallel, current oriented lignite fragments to argil sandstone. Shale is greenish grey, silty aa.
7340	2"	Sandstone, fn. well sorted, lt. grey, with lignite fragments up ½ cm. and green grey shale clasts; good porosity, no show.
7342	1 3/4"	Interlaminated sandstone, v. fn. gr, lt. grey and sandstone, med. grey, fn. gr., argil, lignitic; lignite fragments are current oriented parallel to lamination, no show, good porosity to fair porosity.

Run No. 1

7344	$1\frac{1}{2}$"	Irregular lenses and laminae of sandstone, fn. gr, pure, well sorted quartz and fn. sandstone, argil, lignitic; some lignite up $\frac{1}{2}$ cm across and pyritic.
7440	1"	Sandstone, predominantly fine gr. with some med. or coarse grains; only moderately well sorted; softer and more friable than the moderately hard sandstone abov also very pure clean qtz sand, not laminated, argil or lignitic; rare glauconite pellets. Excellent porosity, no shows.
7462	1"	Sandstone, essentially aa; moderately soft and friable. Excellent porosity, no shows.
7555	1"	Sandstone, lt grey, soft & friable, moderately well sorted, fn to med gr. rare crse grains, subangular to subrounded, excellent porosity weak yellow fluorescence, poor cut.
7600	1"	Sandstone, fn gr, rare med gr, well sorted pure qtz. w. tr. fn. glauc. pellets & fn. lignite fragments, soft, friable. Excellent porosity, weak yellow fluorescence, no cut.
7676	$\frac{1}{2}$"	Sandstone, med to fn gr. well sorted, soft & friable, rare glauc(?) & fine lignite fragments. Excellent porosity, weak yellow fluorescence, no cut.
7765	1"	Sandstone, med to fn gr aa, but with more consolidated zones. Excellent porosity, no shows.
7881	1"	Sandstone, well sorted, med to fine, subrounded predominantly, some subangular soft & friable, tr. fn. lignite and glauconite; excellent porosity, no show.
7965	$\frac{1}{2}$"	Sandstone, moderately hard, med to fn. grained, few coarse grain good porosity; very weak yellow fluorescence, weak yellow cut.

8040	1"	Sandstone, moderately hard, rather poorly sorted crse to fn grains, tr. fn glauc. pellets, tr. fn. lignite; Excellent porosity weak medium yellow fluorescence, weak yellow cut .
8095	1"	Sandstone, med to fine, moderately well sorted, firm but friable, excellent porosity weak medium yellow fluorescence , weak yellow cut.
8185	1"	Sandstone, med. to fine, rare crse grains, moderately well sorted, tr. fn. lignite, tr. red brown qtz. or chert; grains subang.- subrounded; moderately firm but friable; excellent porosity. Weak medium yellow fluorescence; weak yellow cut.
8225	1"	Sandstone, fn to crse, rather poorly sorted, subrounded-subangular, pure qtz; moderately firm but friable; excellent porosity. Weak medium yellow fluorescence; weak yellow cut.
8274	1"	Sandstone, med. to fine, rare crse, moderately well sorted, subrounded- subangular, tr. glauc., tr. rusty brown qtz, firm but friable. Excellent porosity, Weak med. yellow fluorescence. Weak yellow cut.
8325	1"	Sandstone, aa, tr. fine lignite. Excellent porosity, Weak med. yellow fluorescence, weak yellow cut.
8380	1½"	Sandstone aa, tr. red brown qtz or chert, Excellent porosity, Weak yellow fluorescence, Weak yellow cut.
8453	1"	Sandstone, v. fn. to fine, occasionally medium, well sorted, scattered fine lignite, tr. glauc. tr. white mica, firm but friable. Excellent porosity, Weak yellow fluorescence. weak yellow cut.
8613	1"	Mudcake.
8676	1½"	Mudcake.

8753	1"	New lithology Siltstone, light green-grey, highly calcareous, highly argillaceous, slightly sandy (v. fn. grains) with scaltered fine to med. gr. buff subangular chalk clasts; trace white mica, moderately hard. Fair to poor porosity, no shows.
8796	1"	Sandstone, very fine subangular qtz in an argil-calc matric making up about 50 % of the rock; few greenish grey shale clasts and unoriented fine to med wood fragments. Porosity poor, no shows.
8815	1 1/4"	Sandstone, fn. gr. to silt, some med grains argillaceous, highly calcareous, poorly sorted; rare buff micritic ls clasts; grain size coarser 8796; porosity poor due calc-argis. matric; no shows.

Note: SWC's sent to EPR-E for paleo. not available for description.

6500	7265
6625	7296
6653	7306
6684	7310
6755	7322
6779	7867
6894	8494
7140	8619
7182	8646
7229	8722
7235	8784
7255	8834

ESSO EXPLORATION NORWAY INC.

15/6-2

Sidewall Cores - Interval 8820' to 10250'.

Sidewall Core Descriptions: Run No. 1, Shot 30, Recovered 12.

Depth	Recovery	Description
8820	Empty	
8896	Empty	
8978	Empty	
9038	1/2"	Limestone, white-buff, micritic, hard.
9078	Empty	
9157	1"	Limestone, light gray, marly, firm.
9228	1/2"	Limestone, white-buff, micritic, hard.
9255	Empty	
9300	Empty	
9345	Empty	
9413	Empty	
9457	1/4"	Limestone, white-light gray, marly, very firm.
9528	Empty	
9617	1/4"	Limestone, white-buff, micritic, hard.
9671	Empty	
9754	Empty	
9843	Empty	
9914	1/2"	Shale, pale red brown, calcareous, soft.
9965	1/2"	Shale, as above.
10,006	Empty	
10,030	Empty	
10,050	Empty	
10,060	Empty	
10,090	1/2"	Limestone, pale red brown, micritic, slightly argillaceous, very hard.
10,150	Empty	
10,197	1/2"	Shale, light gray green, very calcareous, soft.
10,212	1/4"	Shale, as above, marly.

10,223	1/2"	Shale, red brown, very calcareous, soft-firm.
10,234	1/2"	Shale, as above, grading to Limestone, red brown, very argillaceous, hard.
10,250	Empty.	

Note: All bullets which were empty were either deformed, bent, or broken - - indicating an extremely hard formation.

VI Reservoirs:

The Lower Cretaceous consisted primarily of shale with thin interbeds of tight limestone. No reservoir beds were noted.

The Upper Cretaceous consisted of tight limestone and shale, however a 30 feet potential sandstone reservoir was noted at 9285 feet.

The Danian consisted of shale with very thin interbeds of sandstone, limestone, and marl - - none of which were suitable reservoir beds.

The Paleocene contained abundant potential sandstone reservoirs. The total thickness of these sandstones was 885 feet. Significant shows were encountered at the top of these reservoir beds from 7295-7336 feet. Weak fluorescence and weak cuts were recorded from 7555-8453 feet in sidewall cores. These latter shows are not substantiated by cuttings, cores, hotwire or the chromatograph. The entire reservoir sand section is assumed to be wet below 7336 feet.

The Eocene section contains several thick potential reservoir sandstones. The total thickness of these water wet sandstones is 505 feet.

The Oligocene section consisted entirely of clay and shale. No reservoir beds were noted.

Note: See Esso 15/6-1 for description of reservoirs from Oligocene through Plesitocene.

VII Hydrocarbon Shows

Significant hydrocarbon shows were encountered in the Paleocene from 7295 to 7336 feet. Questionable Paleocene shows were reported in Paleocene sidewall cores from 7555 to 8453 feet. These latter shows were not substantiated by the hotwire, chromatograph, cuttings or conventional cores.

The hotwire and chromatograph indicated gases in one 5 foot Eocene shale section from 7135 - 7140 feet - this was not considered significant as no cuttings shows were noted.

No other shows were recorded in this well.

VIII Conclusions

Well 15/6-2 was drilled on a deep seated structural closure in the Scottish-Norwegian graben with the primary objectives the Eocene-Paleocene sands.

The Eocene sands had no shows. The Paleocene sands had significant shows only in thin sands within the interval 7295-7336 feet and these thin sands appeared wet on E-logs.

The secondary objective Jurassic sands were not reached as the well was abandoned in questionable Lower Cretaceous.

PROPRIETARY EXPLORESSO

ESSO EXPLORATION NORWAY INC.

LIBRARY COPY — COMPLETION LOG — LIBRARY COPY

Scale 1:500

Well Name: ESSO 15/6-2		Status: Plugged and abandoned	
Area: North Sea offshore Norway	Well Classification: New Field Wildcat	Total Depth: 10,272 ft	Deepest Penetration: CRETACEOUS (lower ?)
Location: Lat.: 58° 32' 47,6" N Long.: 01° 41' 54,1" E	Date Spudded: Sep. 9, 1971	Elev. of Datum: 31 ft RT	Water Depth: 378 ft
Prepared by: Esso Exploration Norway Inc. Date: Nov. 1971 Revised:	Date Total Depth Reached: Oct. 22, 1971 Date Oper. Completed: Oct. 26, 1971	Casing Data: 30" at 488'; 20" at 1195'; 13 3/8" at 4297'; 9 5/8" at 8788'	Rig: Glomar Grand Isle Contractor: Global Marine

LOGS RUN

BHC Sonic – GR	DIL	IES	FDC – Cal	HDT
4307' – 10242' (GR to 400')	4310' – 8873'	8796' – 10251'	4310' – 10251'	4310' – 10251'

Seismic check shots: YES

COMPLETION LOG

Scale 1:500

Well Name: ESSO 15/6-2 RE-ENTRY		Status: Plugged and temp. Abandoned	
Area: North Sea offshore Norway	Well Classification: Wildcat	Total Depth: 15680'	Deepest Penetration: L. Mid. Permian
Location: Lat.: 58° 32' 47,6" N Long.: 01° 41' 54,1" E	Date Spudded: May 9, 1974	Elev. of Datum: 78'	Water Depth: 378'
Prepared by: Esso Exploration Norway Inc. Date: Aug. 1974 Revised:	Date Total Depth Reached: July 24, 1974 Date Oper. Completed: Aug. 1, 1974	Casing Data: 30" at 488'; 20" at 1195'; 13 3/8" at 4297'; 9 5/8" at 8788'; 7" at 12 060'	Rig: Drillmaster Contractor: Norsedril

LOGS RUN

DIL	IES	BHC – GR	FDC – CNL	HDT
10100 – 13600	12068 – 15128	10100 – 15128	10050 – 11990 CST 12075 – 15200	10050 – 11990 Caliper 8842 – 15075

Seismic check shots: YES at 12068 ft.

LITHOLOGIC SYMBOLS
(PROVISIONALLY APPROVED FOR FIELD TESTING)

- CLAY (NONFISSILE) - CLAYSTONE < 1/256 mm
- CLAY (FISSILE) OR SHALE
- MUDSTONE
- SILT, COARSE AND SILTSTONE
- SAND (1/16 - 2 mm) AND SANDSTONE
- GRANULE BOULDER (> 2 mm) AND CONGLOMERATE
- QUARTZ
- FELDSPAR
- LITHIC OR ROCK FRAGMENTS
- PYRITE
- SIDERITE
- CHERT
- COAL
- CARBONACEOUS MATTER
- GLAUCONITE
- PHOSPHATE
- VOLCANIC ASH OR BENTONITE
- MICA
- GYPSUM
- ANHYDRITE
- HALITE
- POTASSIUM OR MAGNESIUM SALTS
- LIMESTONE
- DOLOMITIC LIMESTONE – VERY DOLOMITIC
- CALCAREOUS DOLOMITE – VERY CALCAREOUS
- DOLOMITE
- MARL

SPECIFY TYPE OF CARBONATE BY ADDING TO BASIC LIMESTONE OR DOLOMITE SYMBOL THE APPROPRIATE ABBREVIATION AS SHOWN BELOW

- M = MICRITIC LIMESTONE
- G = GRAIN LIMESTONE (FOR GENERAL USE)
- S = SKELETAL LIMESTONE (FRAGMENTED AND NONFRAGMENTED)
- P = PELLETAL LIMESTONE
- F = FRAMEBUILDER LIMESTONE
- O = OOLITIC LIMESTONE
- K = CHALK
- D = DETRITAL LIMESTONE
- L = LUMP LIMESTONE
- m = MICROCRYSTALLINE OR MICROGRAINED

IGNEOUS ROCKS: IGNEOUS ROCKS IN GENERAL (WRITE OUT THE NAME WHERE THE SPECIFIC TYPE IS KNOWN)

METAMORPHIC ROCKS: METAMORPHIC ROCKS IN GENERAL (WRITE OUT THE NAME WHERE THE SPECIFIC TYPE IS KNOWN)

- SHOW OR STAIN
- HYDROCARBON CUT
- FLUORESCENCE
- GAS SHOW
- ABOVE SYMBOLS MAY BE COMBINED
- OIL PRODUCTION
- GAS PRODUCTION
- CONDENSATE PRODUCTION
- WATER PRODUCTION
- INTERPRETED OIL PRODUCTIVE
- INTERPRETED GAS PRODUCTIVE
- INTERPRETED WATER BEARING
- INTERPRETED CONDENSATE PROD.