

ELF NORGE A/S

L-89

3

725.21

3/7 - 1

SIV 1

GEOLOGICAL REPORT

BA 73-2-1

1. PERTINENT DATA

11 General data

Licence : 023  
 Association : AMOCO = 25 %  
                   PETRONORD (1st. attribution) = 15 %  
                   PETRONORD (2nd. attribution) = 60 %  
 Operator : ELF NORGE A/S  
 Rig : OCEAN TIDE  
 Contractors : Rig: CANAM  
                   Mud Logging = CORELAB

Location

Seismic : Line 66.47, SP 6664  
 Geographic : x = 04° 00' 07,8" E  
                   y = 56° 27' 43,5" N

Water depth : 62,5 m

Air Gap : 31 m

12 Drilling and operations time table

1.08.73 = Spudded  
 2.08.73 = Start drilling  
 3.08.73 = 30" casing set at 127 m  
 6.08.73 = 20" casing set at 454 m  
 16.08.73 = SPE Run 1 = GR.BHC - IES  
 17.08.73 = 13 3/8" casing set at 1458,7 m  
 1.09.73 = SPE Run 2 = IES - GR.BHC - CBL - SWC1 - SWC2  
 2.09.73 = 9 5/8" casing set at 3138 m  
 6.09.73 = Core No. 1 3223 - 3229 m  
                   T.D. = 3229 m  
                   Logging SPE - Run No. 3 IES - GR-SL.BHC  
 13.09.73 = Completed  
                   Rig back to PETROLAND

1.3 Status

Plugged and abandoned as a dry hole.

## GEOLOGICAL DATA AND RESULTS

### 1. OBJECTIVES

The 3/7-1 well is located near the top of a large anticline which axis trends northwesterly with a 200 km<sup>2</sup> closure at the prezechstein horizon. This structure is to be considered as a north-western extension of the Fynn Falster high.

The expected reservoirs were as follows:

- a. Danian and Maestrichtian chalky limestone. Partly interesting as a reservoir in the surrounding wells.
- b. Jurassic sandstone.
- c. Rotliegend sandstone.
- d. Carboniferous or Devonian sandstone.

It was supposed that all or none of these reservoirs could be encountered, as well as the basement could be found at different depths, owing to the difficulties in identifying main seismic horizons below the top of the chalky limestone.

### 2. STRATIGRAPHICAL AND STRUCTURAL RESULTS

#### 2-1- Stratigraphy

The correlation tabulation presented below has been inferred from the 2/6-1 and 2/9-1 wells results, but without any laboratory data about 3/7-1 well.

| STRATIGRAPHICAL UNITS        | TOP<br>(below RkB)<br>meter | TOP<br>(below m.s.l.)<br>meter | THICKNESS<br>meter |
|------------------------------|-----------------------------|--------------------------------|--------------------|
| PLEISTOCENE                  | 93,5                        | -62,5 <i>under base</i>        | 530,5              |
| PLIOCENE TO UPPER<br>MIOCENE | 624                         | -593                           | 163                |
| MIDDLE MIOCENE               | 787                         | -756                           | 648                |
| LOWER MIOCENE                | 1435                        | -1404                          | 285                |
| OLIGOCENE                    | 1720                        | -1689                          | 685                |
| EOCENE                       | 2405                        | -2374                          | 271                |
| PALEOCENE                    | 2676                        | -2645                          | 85                 |
| DANIAN                       | 2761                        | -2730                          | 91                 |
| MAESTRICHTIAN                | 2852                        | -2821                          | 132,5              |
| CAMPANIAN TO TURONIAN        | 2984,5                      | -2953,5                        | 233,5              |
| BASEMENT                     | 3218                        | -3187                          | 711                |

TOTAL DEPTH

3229

-3198

## 2-2 Structural results

The Paleocene and Maestrichtian horizons were encountered respectively at 2676 m and 2852 m, which is 27 m and 28 m low to the geologic prognosis estimated depths.

The basement (chloritic gneiss) has been found directly underlying the Turonian limestone, ascertaining unfortunately the less favourable hypothesis.

## 2-3 Reservoirs

Only the middle part of the chalky Maestrichtian section shows some reservoir characteristics.

Inferred porosity from the BHC log is about 12% from 2852 m to 2951 m and about 18% from 2951 to 2984,5 m.

The underlying Turonian - Campanian limestone is very tight.

## 2-4 Shows and fluids

No shows were recorded, but small traces of C<sub>1</sub> gas (1%) have been detected by chromatograph (see 1/5000 data sheet enclosed).

The Maestrichtian reservoir is reputed saturated water wet from the IES log.

## Annexes

1. Position map 1/250000
2. Synthetic log 1/5000
3. Composite log 1/500
4. Side Wall Cores Descriptions
5. Core Descriptions



elf

# POSITION MAP

elf NORGE A/S

Echelle : 1/25000000

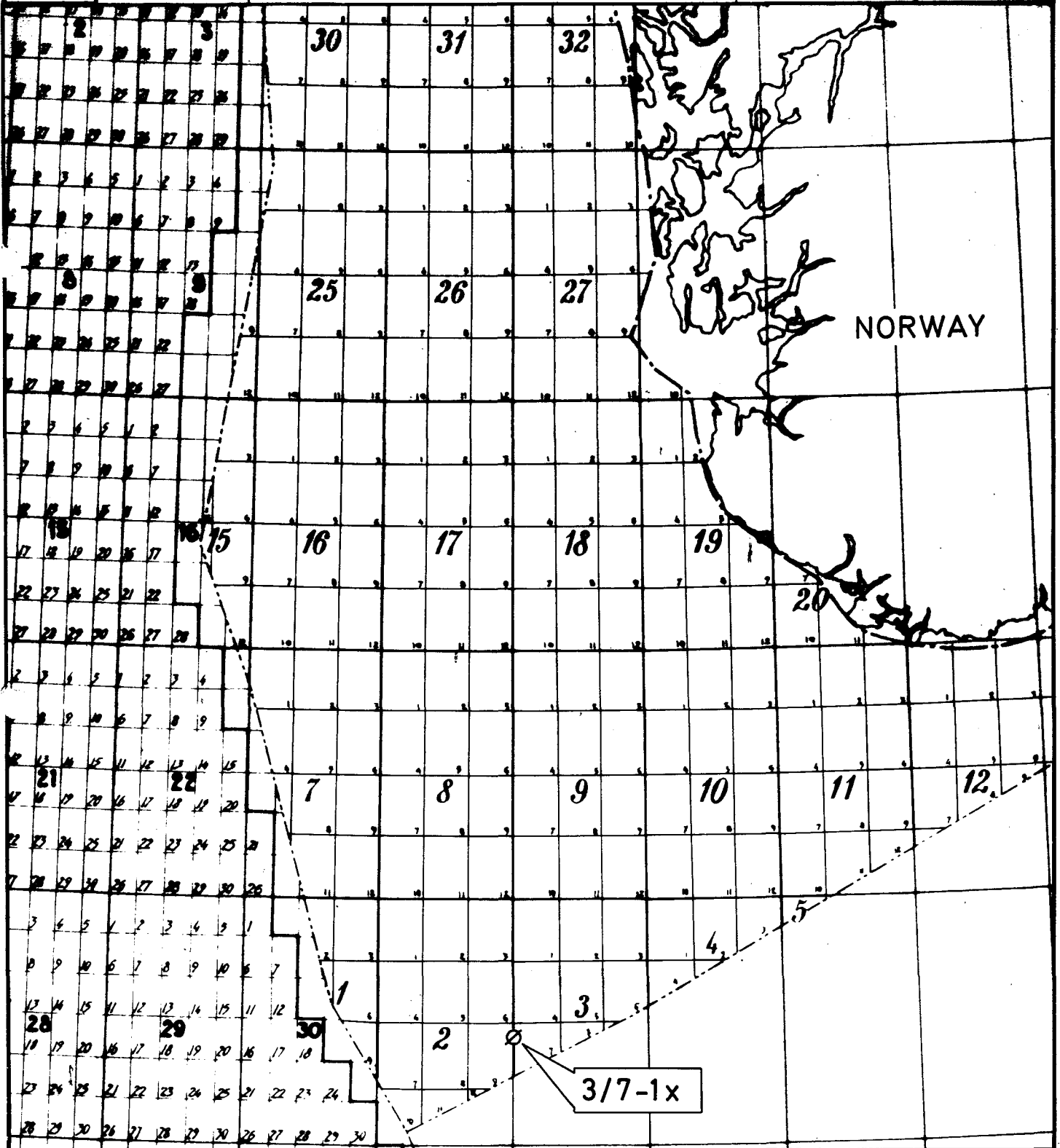
Date 15.10.73

elf NORGE

Auteur

3/7-1x - SIV 1

N°classé



|   |                 |  |                 |   |                |
|---|-----------------|--|-----------------|---|----------------|
| Coord<br>x 06°00'07,8"E Z ground -62,5m<br>y 56°27'43,5"N Z RKB. 31m<br>Depths datum RKB<br>Rig Ocean Tide (CANAM)<br>Stopped in Basement |                 | Spudded 1.08.73<br>Started drilling 2.08.73<br>At TD 6.09.73<br>Completed 13.09.73<br>TD Driller 3227m TD Logger 3229m |                 | Well<br><b>3/7-1x</b><br>SIV 1.<br>Country<br><b>Norway</b><br>OFFSHORE |                |
| OPERATOR <b>ELF NORGE A/S</b>   |                 | LICENCE <b>023</b>   |                 | OWNED BY <b>PETRONORD</b>   |                |
| TARGETS<br>Jurassic and Zechstein sandstones.   |                 | RESULTS<br>Jurassic and Zechstein section missing. Basement underlying upper cretaceous chalk.                         |                 |   |                |
| CASINGS<br>30" 127m<br>20" 454m<br>13 3/8" 1458,7m<br>9 5/8" 3138 m   |                 | CORES<br>1 3221 - 3227 100%<br>SWC1 2600 - 2898 11/30<br>SWC2 2100 - 2395 28/30  |                 |   |                |
| SHOWS<br>* C1 =<br>610 - 760 = 1to 2%<br>950 - 1100 = 1%<br>1100 - 1300 = 1to 2%<br>1300 - 1450 = 1%<br>1780 - 1820 = 1%<br>2900 = 1%     |                 |  |                 |   |                |
| TESTS   |                 | LOGS   |                 | Date  | INTERPRETATION |
| NONE  |                 | IES  | 455,5 - 1466    | 15  |                |
|   |                 | GR.  | 93,3 - 1462,5   | à   |                |
|   |                 | BHC  | 455,5 - 1462,5  | 16.08   |                |
|   |                 | IES  | 1460,5 - 3138,5 | 31<br>à<br>1.09   |                |
|   |                 | BHC  | 1460,5 - 3134,5 |   |                |
| CBL   | 93 - 1457       |  |                 |   |                |
| HRT   | 93 - 3113       | 3.09   |                 |   |                |
| IES   | 3138,2 - 3230   | 6.09   |                 |   |                |
| GR.   | 3090 - 3229,2   |  |                 |   |                |
| BHC   | 3138,2 - 3229,1 |  |                 |   |                |

|                             |  |  |                        |                |
|-----------------------------|--|--|------------------------|----------------|
| SIDE WALL CORES DESCRIPTION |  |  | SERVICE COMPANY : SPES |                |
|                             |  |  | ASKED : 30             | RECOVERED : 11 |
| WELL : 3/7-1 SIV 1          |  |  | RUN N° : 1             | SHOT : 13      |
| LICENCE : 023               |  |  | PAGE N° : 1            | LOST : 2       |
| Norway - offshore           |  |  | DATE : 01.09.1973.     | FULL BULLET :  |
|                             |  |  | ELF NORGE A/S          |                |

tr : trace - M : medium - G : good

| N° | DEPTHS | REC | L I T H O L O G Y                                | Fluorescence |   |     |
|----|--------|-----|--|--------------|---|-----|
|    |        |     |  | U            | S | CUT |
| 1  | 2898   | 1/4 | limestone, chalky, white, microxln               | Miner.       |   |     |
| 2  | 2888   | 0   | lost   |              |   |     |
| 3  | 2878   | 0   | lost   |              |   |     |
| 4  | 2868   | 3/4 | limestone, chalky, white, microxln               | Miner.       |   |     |
| 5  | 2855   | 1   | limestone, chalky, white, very compact, microxln | none         |   |     |
| 6  | 2845   | 1/4 | limestone, chalky, light grey, shaly, compact    | none         |   |     |
| 7  | 2830   | 1/4 | limestone, chalky, shaly                         | none         |   |     |
| 8  | 2815   | 1/4 | limestone, chalky, shaly                         | none         |   |     |
| 9  | 2800   | 1/2 | chalk, white, very fine                          | Miner.       |   |     |
| 10 | 2785   | 1   | limestone, chalky, shaly, grey to greenish       | none         |   |     |
| 11 | 2775   | 1/4 | limestone, chalky, shaly, grey                   | none         |   |     |
| 12 | 2768,5 | 0   | Misfire  |              |   |     |
| 13 | 2762   | 3/4 | chalk, white, microgranular - abundant pyrite    | Miner.       |   |     |
| 14 | 2750   |     | Misfire  |              |   |     |
| 15 | 2740   |     | shale, soft, dark grey                           | none         |   |     |
| 16 | 2730   |     | Misfire  |              |   |     |
| 17 | 2720   |     | "  |              |   |     |
| 18 | 2708   |     | "  |              |   |     |
| 19 | 2705   |     | "  |              |   |     |



|                                    |       |                    |                        |    |
|------------------------------------|-------|--------------------|------------------------|----|
| <b>SIDE WALL CORES DESCRIPTION</b> |       |                    | SERVICE COMPANY : SPES |    |
|                                    |       |                    | ASKED :                | 30 |
|                                    |       |                    | RECOVERED :            | 11 |
|                                    |       |                    | SHOT :                 | 13 |
|                                    |       |                    | LOST :                 | 2  |
|                                    |       |                    | FULL BULLET :          |    |
| WELL : 3/7-1                       | SIV 1 | RUN N° : 1         |                        |    |
| LICENCE : 023                      |       | PAGE N° : 2        |                        |    |
| Norway - offshore                  |       | DATE : 01.09.1973. |                        |    |
| <b>ELF NORGE A/S</b>               |       |                    |                        |    |

tr : trace - M : medium - G : good

| N° | DEPTHS | REC | LIT H O L O G Y | Fluorescence |    |
|----|--------|-----|-----------------|--------------|----|
|    |        |     |                 | CU           | Fe |
| 20 | 2703   |     | Misfire         |              |    |
| 21 | 2690   |     |                 |              |    |
| 22 | 2680   |     |                 |              |    |
| 23 | 2670   |     |                 |              |    |
| 24 | 2660   |     |                 |              |    |
| 25 | 2650   |     |                 |              |    |
| 26 | 2640   |     |                 |              |    |
| 27 | 2630   |     |                 |              |    |
| 28 | 2620   |     |                 |              |    |
| 29 | 2610   |     |                 |              |    |
| 30 | 2600   |     |                 |              |    |
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|------------------------------------|-------------------|--------|----------------------|----------------------|
|                                    |                   |        | SERVICE COMPANY SPES |                      |
|                                    |                   |        | ASKED                | 30                   |
|                                    |                   |        | RECOVERED            | 28                   |
|                                    |                   |        | SHOT                 | 29                   |
|                                    |                   |        | LOST                 | 1                    |
|                                    |                   |        | FULL BULLET          |                      |
| <b>SIDE WALL CORES DESCRIPTION</b> |                   |        |                      |                      |
| WELL                               | 3/7-1             | SIV 1. | RUN N°               | 2                    |
| LICENCE                            | 023               |        | PAGE N°              | 1                    |
|                                    | Norway - offshore |        | DATE                 | 01.09.1973.          |
|                                    |                   |        |                      | <b>ELF NORGE A/S</b> |

tr trace - M medium - G good

| N° | DEPTHS | REC | LITHOLOGY                               | Fluorescence |  |     |
|----|--------|-----|---|--------------|--|-----|
|    |        |     |   |              |  | CUT |
| 1  | 2395   | 1   | shale, soft, dark grey to greenish      | none         |  |     |
| 2  | 2385   | 1   | " " , greenish, limy nodules            | "            |  |     |
| 3  | 2375   | 1   | " " , greenish grey                     | "            |  |     |
| 4  | 2365   | 1   | shale, soft, greenish grey, sliken side | "            |  |     |
| 5  | 2355   |     | lost                                    |              |  |     |
| 6  | 2353   | 1   | shale, soft, dark grey                  | "            |  |     |
| 7  | 2346   | 1   | shale, soft, dark greenish              | "            |  |     |
| 8  | 2342   | 1   | " " "                                   | "            |  |     |
| 9  | 2335   | 1   | " " "                                   | "            |  |     |
| 10 | 2324   | 1   | shale, soft, greenish.                  | "            |  |     |
| 11 | 2317   | 1/2 | " " "                                   | "            |  |     |
| 12 | 2310   | 1   | " " "                                   | "            |  |     |
| 13 | 2300   | 1   | " " , dark grey, sliken side            | "            |  |     |
| 14 | 2290   | 1   | " " , dark greenish                     | "            |  |     |
| 15 | 2280   | 1   | " " , greenish grey                     | "            |  |     |
| 16 | 2270   | 1   | " " , brownish grey                     | "            |  |     |
| 17 | 2260   |     | Misfire                                 |              |  |     |
| 18 | 2250   | 1   | shale, soft, brownish grey              | "            |  |     |
| 19 | 2240   | 1   | " " , dark grey                         |              |  |     |

|                                  |  |  |                 |      |
|----------------------------------|--|--|-----------------|------|
| SIDE WALL CORES DESCRIPTION      |  |  | SERVICE COMPANY | SPES |
|                                  |  |  | ASKED           | 30   |
| WELL 3/7-1 SIV 1.                |  |  | RECOVERED       | 28   |
|                                  |  |  | SHOT            | 29   |
| LICENCE 023<br>Norway - offshore |  |  | LOST            | 1    |
|                                  |  |  | FULL BULLET     |      |
| RUN N° 2                         |  |  | ELF NORGE A/S   |      |
| PAGE N° 2                        |  |  |                 |      |
| DATE 01.09.1973.                 |  |  |                 |      |

tr : trace - M : medium - G : good

| N° | DEPTHS | REC | LITHOLOGY  | Fluorescence |  |     |
|----|--------|-----|--|--------------|--|-----|
|    |        |     |  |              |  | CUT |
| 20 | 2230   | 1   | shale , soft , dark grey                               | None         |  |     |
| 21 | 2220   | 1   | " " "  | "            |  |     |
| 22 | 2210   | 1   | " " "  | "            |  |     |
| 23 | 2200   | 1   | " " "  | "            |  |     |
| 24 | 2190   | 1   | " " "  | "            |  |     |
| 25 | 2175   |     | shale , soft , dark brown , pyrite                     | "            |  |     |
| 26 | 2160   |     | shale , soft , dark brown                              | "            |  |     |
| 27 | 2145   |     | " " "  | "            |  |     |
| 28 | 2130   |     | " " "  | "            |  |     |
| 29 | 2115   | 0   |  |              |  |     |
| 30 | 2100   |     | sh , soft , drk brn , with fine incl. of tan limestone | "            |  |     |
|    |        |     |  |              |  |     |
|    |        |     |  |              |  |     |
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|    |        |     |  |              |  |     |

Cut 6 m  
 Recovered 6 m  
 Loss: -----

100%

Company ELF NORGE  
 Well no 3/7-1 (SIV 1)  
 Core no 1

Date 6.9.73.

Depths: 3221 à 3227 m

Scale: 1/40

| Depths | Co Co | PERM | POROS | SHOW | DIPS | Log | DESCRIPTION   |
|--------|-------|------|-------|------|------|-----|---|
| 3222   |       |      |       |      |      |     | <p><u>Gneiss</u> : Banded - 45°, Chloritic and pink feldspar segregations. Below 3222 m, numerous vertical fractures with a chloritic infill.</p>   |
| 3223   |       |      |       |      |      |     |   |
| 3224   |       |      |       |      |      |     | <p>crushed zone while extracting the core.</p>  |
| 3225   |       |      |       |      |      |     | <p><u>Field microscopic diagnosis</u> :</p> <p>Feldspar plagioclase slightly kaolinized, small angular quartz elements in "rolling" polarization patches. Abundant chlorite - rare olivine(?) crystals.</p> |
| 3226   |       |      |       |      |      |     |   |
| 3227   |       |      |       |      |      |     |   |

| Depth<br>m | Litho<br>Section | FORMATION | STAGES<br>STOPS | Descriptions, Obs.           | Z     |                         | Well             |
|------------|------------------|-----------|-----------------|------------------------------|-------|-------------------------|------------------|
|            |                  |           |                 |                              | RKB   | Ground<br>or Sea bottom |                  |
|            |                  |           |                 |                              | 31m   | -62,5 m                 | 3/7-1x<br>SIV 1. |
| 7800       |                  |           |                 |                              | 3500  |                         |                  |
|            |                  |           |                 |                              | 11600 |                         |                  |
| 8000       |                  |           |                 | cly gry                      | 11800 |                         |                  |
|            |                  |           |                 | rare dol lmst                | 12000 |                         |                  |
| 8200       |                  |           |                 |                              | 12200 |                         |                  |
| 8500       |                  |           |                 |                              | 3750  |                         |                  |
| 8600       |                  |           |                 |                              | 12400 |                         |                  |
| 8800       |                  |           |                 | 2676                         | 12600 |                         |                  |
|            |                  |           |                 | cly rd, gry, limy w/volcanic |       |                         |                  |
|            |                  |           |                 | Tuff grn, interbeded         |       |                         |                  |
| 8900       |                  |           |                 | sh, glauc. sltst             | 12800 |                         |                  |
| 2750       |                  |           |                 | 2751 MI grey                 |       |                         |                  |
|            |                  |           |                 | 2782 Mly lmst                |       |                         |                  |
| 9200       |                  |           |                 | chk with rare cherts         | 13000 |                         |                  |
|            |                  |           |                 | 2852                         | 4900  |                         |                  |
| 9400       |                  |           |                 | chky lmst tan                | 13200 |                         |                  |
|            |                  |           |                 |                              | 13400 |                         |                  |
| 9600       |                  |           |                 | 2984,5                       |       |                         |                  |
|            |                  |           |                 | chky lmst locally            | 13600 |                         |                  |
| 9800       |                  |           |                 | siliceous                    |       |                         |                  |
| 3066       |                  |           |                 | 3065                         | 13800 |                         |                  |
|            |                  |           |                 | chky lmst w/rare qtz         | 4250  |                         |                  |
| 10000      |                  |           |                 | 3124                         | 14000 |                         |                  |
| 10200      |                  |           |                 | chky lmst pink, locally      | 14200 |                         |                  |
| 10400      |                  |           |                 | siliceous                    |       |                         |                  |
| 10600      |                  |           |                 | 3218                         | 14400 |                         |                  |
| 3250       |                  |           |                 | I.D. 3229m chloritic gneiss  |       |                         |                  |
| 10600      |                  |           |                 |                              | 14600 |                         |                  |
| 11000      |                  |           |                 |                              | 4500  |                         |                  |
|            |                  |           |                 |                              | 14800 |                         |                  |
| 11200      |                  |           |                 |                              | 15000 |                         |                  |
| 11400      |                  |           |                 |                              | 15200 |                         |                  |

