Esso

# WELL COMPLETION REPORT
# SAWBELLY-1
# VOLUME 1
# BASIC DATA

## GIPPSLAND BASIN
## VICTORIA

## ESSO AUSTRALIA LIMITED

COMPILED BY: A.P. CLARE:

APRIL 1990

04890121

# SAWBELLY-1

## WELL COMPLETION REPORT

VOLUME 1: BASIC DATA

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APPENDICES

ESSO AUSTRALIA LTD

1. WELL DATA RECORD

SAWBELLY-1

| | | |
|---|---|---|
| LOCATION | : | Latitude : 38° 22' 31.0" South<br>Longitude : 148° 02' 05.9" East<br>X = 590404.27 mE<br>Y = 5752024.17 mN<br>Map Projection: UTM Zone 55<br>Geographical Location: Bass Strait, Victoria<br>Field: Sawbelly-1 |
| PERMIT | : | Vic/P26 |
| ELEVATION | : | 21m |
| WATER DEPTH | : | 63m |
| TOTAL DEPTH | : | 3068m |
| PLUG BACK TYPE | : | Cement Plug |
| REASONS FOR PLUGGING BACK | : | Plugged and abandoned |
| MOVE IN | : | 03/03/90 0400 hours |
| SPUDDED | : | 04/03/90 0815 hours |
| REACHED T.D. | : | 21/03/89 1630 hours ? |
| RIG RELEASED | : | 26/03/89 2000 hours ? |
| OPERATOR | : | Esso Australia Resources Limited |
| PERMITTEE OR LICENCEE | : | Esso/BHP Petroleum (Victoria) Pty. Ltd. |
| ESSO INTEREST | : | 50% |
| OTHER INTEREST | : | 50% |
| CONTRACTOR | : | South Seas Drilling Company |
| RIG NAME | : | Southern Cross |
| EQUIPMENT TYPE | : | Semi-submersible |
| TOTAL RIG DAYS | : | 24.0 |
| DRILLING AFE NO. | : | 230002 (Segment 34) |
| TYPE COMPLETION | : | Plugged and abandoned |
| WELL CLASSIFICATION | : | Before Drilling: Wildcat<br>After Drilling: Plugged and abandoned |

ESSO AUSTRALIA LTD.
SAWBELLY-1 FINAL WELL REPORT
Operations Summary

## 1. MOVING/MOORING

After completing the Nerdlihc Company farm-out, the Southern Cross was moved by the MV Torungen Supplier to the Sawbelly-1 location. The rig passed the line of longitude that it had originally departed from to begin the farm-out at 1900 hours March 2, 1990. At this time, the rig and associated mud/ party charges went back under contract to Esso. The rig arrived in the proximity of the location at 0400 hours March 3, 1990. However, because the rig was approaching location on an unsuitable heading, it was necessary to make a second approach and the No. 1 anchor was not dropped until 0520 hours.

MV's Torungen Supplier and Lady Penelope ran and set the eight anchors in 11.25 hours. While the Torungen Supplier was running anchor No. 7, the vessel had a power control failure causing engine power to briefly go to 100% before all power was lost. The vessel drifted over the No. 6 mooring wire before power was restored. No damage to the wire was observed and the anchor was set without further incident. As part of SSDC's mooring equipment maintenance plan, new forged swivels and pear links were installed on mooring lines Nos. 2 and 7. The anchors were load tested to 250 kips and slacked off to an operating pretension of 80-100 kips. After ballasting down, the TGB was run and landed at a seafloor depth of 84m RKB. The rig position was 1.3m on a bearing of 300° from the called location.

## 2. DRILLING OPERATIONS

### a) 26" Hole/20" Casing

After setting the TGB the 26" bit/26" hole opener BHA was made up and stabbed into the TGB and the well was spudded at 0815 hours March 4, 1990. The 26" hole was drilled from 84m to 205m, at an average ROP of 13.1 mph, using seawater and high viscosity gel slugs to clean the hole. After pumping a high viscosity sweep, 275 bbls of high viscosity mud was spotted, a Totco was dropped and the bit was pulled to the seafloor. The Totco was recovered ($^1/_4°$) and the bit was RIH. No drag or fill was encountered, 350 bbls of high viscosity mud was spotted in the hole at TD and the drillstring was POOH to just below the seafloor and an additional 100 bbls of high viscosity mud was spotted. The drillstring was then POOH to run casing.

Eight joints of 20", 94 ppf, X-56, RL-4S casing, plus a crossover joint (129 ppf, RL-4S x ALT-2) and the 24" pile joint/18$^{3}/_{4}$" Vetco SG-5 wellhead assembly were run with the 20" shoe at 198m. The casing was cemented to the seafloor, using a drillpipe stinger, with a lead slurry of 750 sx of Class "G" cement plus 2.2% prehydrated gel and a tail slurry of 600 sx of Class "G" cement plus 1.5% $CaCl_2$.

The BOP stack was run and landed and the shear rams, wellhead connector and casing were tested to 500 psi.

b) 17 1/2" Hole/13 3/8" Casing

A 17 1/2" center jet bit and pendulum BHA were picked up and RIH to the TOC at 192m. The cement and 20" casing shoe were drilled and the 17-1/2" hole was drilled from 205m to 815m at an average ROP of 20.9 mph using a seawater/gel mud. After reaching TD, a Totco was dropped and a wiper trip was made to the 20" casing shoe. The Totco was recovered (1/2°) and the bit was RIH and three meters of fill was washed. The hole was then circulated clean, the drillstring was POOH and the BHC/GR/CAL log was run.

The wearbushing was pulled and 61 joints of 13 3/8", 54.5 ppf, K-55, BTC casing, plus the casing hanger pup joint (68 ppf, N-80) were run and landed with the shoe at 800m. The casing was cemented in place with 1000 sx of Class "G" neat cement. The estimated TOC was calculated to be at 300m based on an 18" average hole diameter as per the caliper log. The plug was bumped and the pressure was increased to 1500 psi to test the casing. After circulating the riser, closing the annular and flushing the wellhead sealing area with 10 bbls of high viscosity mud, the packoff was successfully energized, using a cementing kelly, and tested to 200/2000 psi along with the BOP stack. A Phase I PIT was run against the shear rams to 1500 psi and the choke manifold was tested to 200/1500 psi.

c) 12 1/4" Hole

An ATJ-1 bit and pendulum BHA, with a 12 3/16" stabilizer, were RIH to the TOC at 772m. The cement plugs and float collar/float shoe were drilled out and 3m of new hole was drilled to 818m, where a Phase II PIT was conducted to leakoff at 540 psi (13.3 ppg EMW).

The 12 1/4" hole was drilled from 818m to 1915m in one bit run, at an average ROP of 23.4 mph. This bit run set the record for the most footage drilled by one rock bit (1100m) for all wells drilled (47) in the Bass Strait by the Southern Cross. This surpassed the record of 1007m set on the Conger-1, the nearest offset well. Lithology in this section graded from the Gippsland Limestone to the Lakes Entrance formation, which was picked at ± 1720m. While drilling this section at about 1683m, the mud in the hole was displaced with a 9.0 ppg, 6% KCl mud system. While POOH from 1915m, up to 100 kips of overpull was encountered. Therefore, the bit was run back to bottom and the hole was circulated clean while increasing the mud weight to 9.5 ppg. The bit was then POOH with 40 kips maximum overpull and graded T2 B4 I after running 49 hours.

An S84F bit was then RIH to 1824m, where a bridge was tagged. Tight hole was reamed to bottom and drilling in the 12-1/4" hole continued from 1915m to 1974m, until both mud pumps quit working. Thirty minutes of NPT were incurred before coming back on-line. The Top of the Latrobe Group was encountered at 1984m. The S84F bit drilled from 1915m to 2320m at an average ROP of 9.5 mph. When POOH to change the bit, 70 kips of overpull were encountered over the interval 2234-2034m. A survey showed that the hole deviation was 3.5° at 2320m. The bit was 5/8" out of gauge. Because of this, the ATJ-22 which was run back reamed for 2 hours from 2269m to TD at 2320m before drilling ahead to 2373m at an average ROP of 3.6 mph. A bit change was made due to low rate of penetration, probably due to broken teeth from the previous bit run. This bit came out of the hole 1/8" undergauge. An HP53A was RIH and spent 5 hours reaming from 2201m to TD at 2373m before drilling ahead to 2646m at 7 mph. Again, the bit was 1/8" undergauge. A Smith F27D was used to drill from 2646 to 2925m at an average ROP of 4.8 mph. The drillstring was POOH without incident. This bit was in gauge after 57-3/4 hours of drilling. Because TD was near, a HTC ATJ33 bit was used to TD the well at a depth of 3068m. A survey at TD showed a deviation of 1.9°.

After rigging up Schlumberger, electric logs were run as follows:

Run No. 1 = DLL/MSFL/LDL/CNL/GR/BHC/AMS
Run No. 2 = WST (11 levels)
Run No. 3 = SWC (60 cores shot, 45 recovered)

3. PLUG & ABANDONMENT

After completing final logs, open-ended drillpipe was RIH to 2070m and a [illegible]m balanced cement plug (P & A Plug No. 1) was set across the Top of Latrobe using 240sx of Class "G" neat cement mixed in freshwater. After tagging the plug with 15 kips at 1990m, the pipe was pulled up to 850m and a [illegible]m balanced cement plug (P & A Plug No.2) was set across the $13^{3/8}$" casing shoe using 285sx of Class "G" neat cement mixed in seawater. The plug was later pressure tested to 1500 psi and tagged at 752m with 15 kips.

After POOH and retrieving the wearbushing, Schlumberger was rigged up and the $13^{3/8}$" casing was cut at 168m using a Pengo explosive cutter. A spear was run to retrieve the 13-3/8" casing.

Open-ended drillpipe was RIH and a 198m balanced cement plug (P & A Plug No. 3) was set across the $13^{3/8}$" casing stub, from 198m to 118m, using 360sx of Class "G" cement mixed in seawater. While laying down drillpipe, Plug No. 3 was pressure tested 500 psi.

The inner barrel of the slip joint was then pinned closed and the BOP stack and riser were pulled. A mechanical cutter was RIH and the 20" casing was cut at 93.6m ( ± 1m below the pile joint assembly ALT-2 connector). An $18^{3/4}$" wellhead running tool and bumper sub were then run and the wellhead, PGB and TGB were retrieved and laid down.

4. PULLING ANCHORS

After the rig was deballasted from drilling draft to transit draft (21.7ft), the MV Torungen Supplier recovered anchors No. 7,3,6 and 2. The MV Lady Caroline recovered anchors 4,5,8 and 1. The anchors were recovered in 38 hours. Included in this time was 8.75 hours of NPT standing by for fog to lift to bring required personnel on board for the rig move. Also included are 8.25 hours required to recover the No. 4 pendant line. The line had been dropped as it was being transferred from the workboat to the rig. The rig departed location enroute to Terakihi-1 at 2000 hours March 26, 1990.

While deballasting/pulling anchors, a seabed survey of the location was conducted using the RCV 225 vehicle.

ESSO AUSTRALIA LTD.
SAWBELLY-1 FINAL WELL REPORT
CASING DATA

| OD (In.) | WEIGHT (LB/FT) | GRADE | CONNECTION | LENGTH (m) | SHOE DEPTH (mRKB) | CENTRALIZER POSITION | REMARKS |
|---|---|---|---|---|---|---|---|
| 20 | 94 | X-56 | RL-4S | 12.43 | 198 | NONE | FLOAT SHOE JOINT |
| 20 | 94 | X-56 | RL-4S | 82.95 | | NONE | 7 INTERMEDIATE JOINTS |
| 20 | 129 | X-56 | RL-4S x ALT-2 | 11.70 | | NONE | CROSSOVER JOINT |
| 24 | 670 | ---- | ALT-2 | 9.83 | | NONE | WELLHEAD: VETCO SG-5 S/N 854220-1 |
| | | | | 116.91 | | | |
| 13-3/8 | 54.5 | K-55 | BTC | 11.58 | 800 | NONE | FLOAT SHOE JOINT |
| | 54.5 | K-55 | BTC | 11.56 | | 1 ACROSS COLLAR | FLOAT JOINT |
| | 54.5 | K-55 | BTC | 11.59 | | NONE | FLOAT COLLAR JOINT |
| | 54.5 | K-55 | BTC | 678.81 | | 1 ACROSS FIRST FIVE COLLARS | 58 INTERMEDIATE JOINTS |
| | 68 | N-80 | BTC | 2.56 | | NONE | CASING HANGER PUP JOINT -CSG HANGER: SG-5, TYPE T, S/N 336470-3 (LOCK RING REMOVED) -PACKOFF ASSY: SG-5, S/N 34092 |
| | | | | 716.10 | | | |

ESSO AUSTRALIA LTD.
SAWBELLY-1 FINAL WELL REPORT
CEMENT DATA

| DATE (1990) | TYPE JOB | INTERVAL (M-RKB) | TYPE CEMENT | VOLUME (SX) | SLURRY WEIGHT (PPG) | ADDITIVES | MIX WATER | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 05-Mar | 20" PRIMARY LEAD | 198-84 | CLASS "G" | 750 | 13.2 | 2.2% PHG (BY WT CMT) | FW | CEMENT THROUGH DP STINGER. CMT VOLUME AS PER PROGRAM TO PROVIDE 200% EXCESS ABOVE GAUGE HOLE VOLUME W/ TOC @ SEAFLOOR. |
| 05-Mar | 20" PRIMARY TAIL | | CLASS "G" | 600 | 15.8 | 1.5% CaCl2 (BY WT CMT) | SW | |
| 08-Mar | 13-3/8" PRIMARY | 800-300 | CLASS "G" | 1000 | 15.8 | ---- | SW | CMT VOLUME BASED ON 18" AVERAGE HOLE DIAMETER. BUMPED PLUG WITH 1500 PSI. |
| 22-Mar | P & A PLUG No.1 | 2070-1970 | CLASS "G" | 240 | 15.8 | 0.5%HR6L (VOL % MW) | FW | SET TO COVER THE TOP OF LATROBE PICKED @ 2020m. TAGGED WITH 15 KIPS. |
| 23-Mar | P & A PLUG No.2 | 850-750 | CLASS "G" | 285 | 15.8 | ---- | SW | SET ACROSS 13-3/8" CASING SHOE @ 800m. TESTED TO 1500 PSI, TAGGED WITH 15 KIPS. |
| 23-Mar | P & A PLUG No.3 | 198-118 | CLASS "G" | 360 | 15.8 | ---- | SW | SET ACROSS 13-3/8" CASING STUB @ 168m. TESTED TO 500 PSI. |

## 5. SAMPLES, SIDEWALL CORES

### SAWBELLY-1

| INTERVAL (m) | TYPE |
|---|---|
| 815 - 3068 | Cutting samples - 3 sets of washed and oven dried and 1 set of bagged air dried cuttings.<br><br>Samples from 815 - 1920m at 10m intervals.<br>Samples from 1920 - 3068m at 5m intervals. |
| 815 - 3068 | Unwashed composite tinned samples for geochemistry<br><br>Samples from 815 - 1920m at 30m intervals.<br>Samples from 1920 - 3068m at 15m intervals. |
| 1976 - 3022 | CST, 60 Shot, Recovered and Brought 43. |

## 6. WIRELINE LOGS AND SURVEYS
## SAWBELLY-1

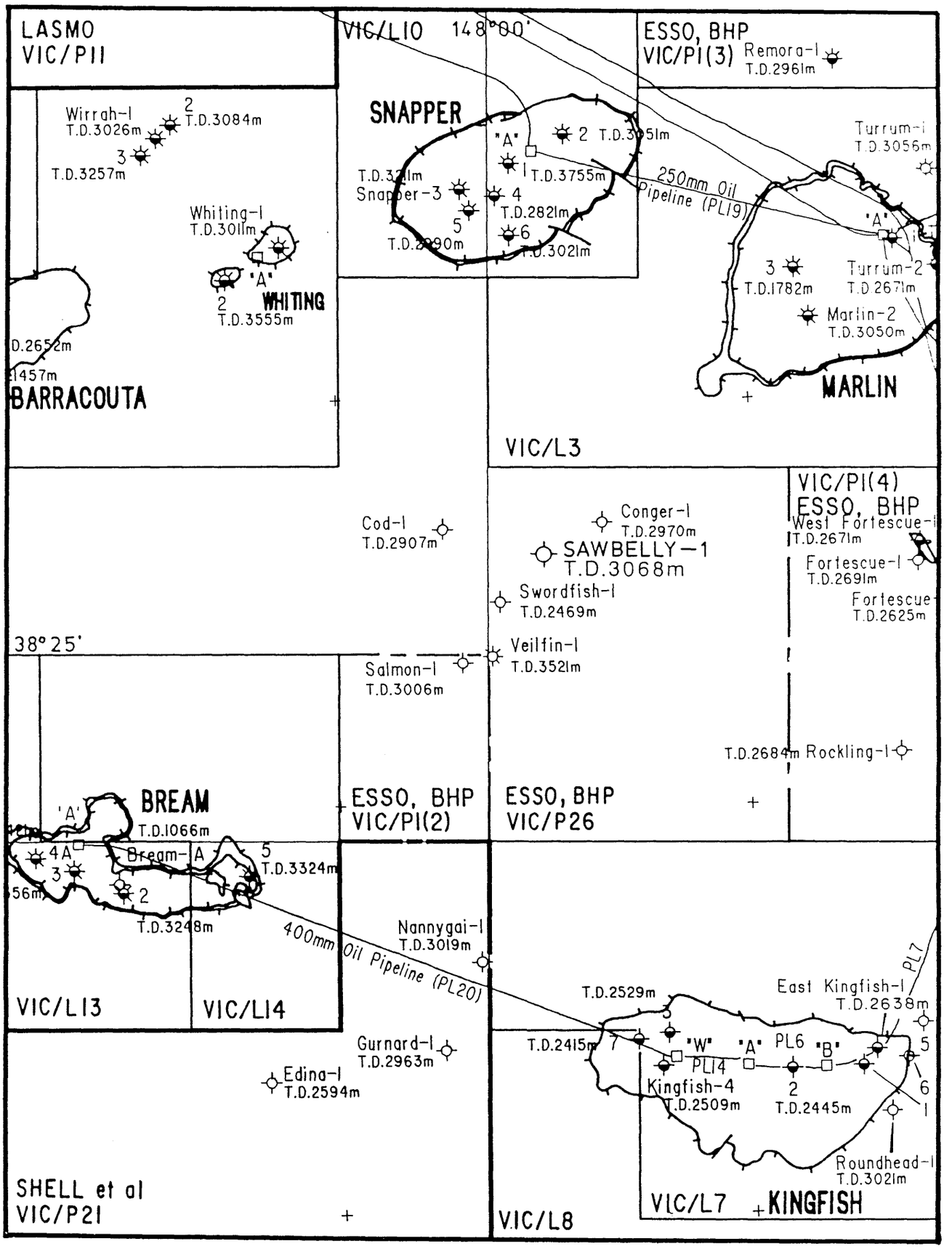
| TYPE AND SCALE | | FROM | TO |
|---|---|---|---|
| | SUITE 1 | | |
| BHC-CAL-GR | 1:200<br>1:500 | 815.0 - | 63.0 |
| | SUITE 2 | | |
| DLL-MSFL-SP-GR | 1:200<br>1:500 | 3065.0 - | 798.0 |
| LDL-CNL-GR | 1:500<br>1:200 | 3059.5 - | 1925.0 |
| BHC-GR | 1:500<br>1:200 | 3042.0 - | 798.0 |
| WSS | 14 Levels | 3069.5 - | 798.5 |
| CST-GR | (60 Shots) | 3022.5 - | 1976.0 |

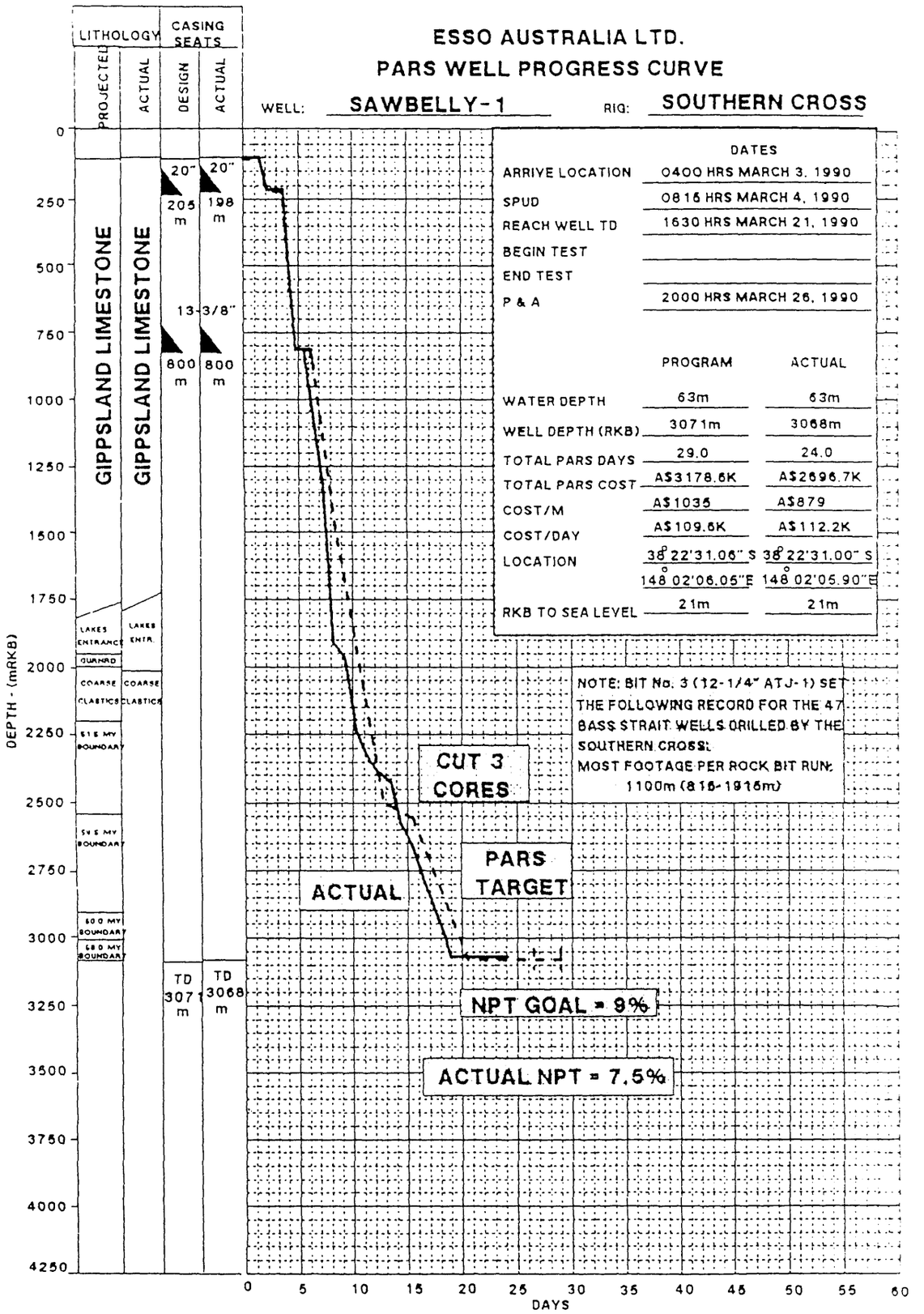
## 7. TEMPERATURE RECORD - SAWBELLY-1

| LOGGING RUN | THERMOMETER DEPTH (m) | MAX. RECORDED TEMPERATURE ($C^o$) | CIRCULATION TIME ($t_k$) (hours) | TIME AFTER CIRCULATION STOPPED (t) | HORNER TEMPERATURE ($C^o$) | GEOTHERMAL GRADIENT ($C^o$/km) |
|---|---|---|---|---|---|---|
| Suite 1 | | | | | | |
| BHC-CAL-GR | 815 | 44 | 1H 30M (1.5) | 4H 26M(4.3) | | |
| Suite 2 | | | | | | |
| DLL-MSFL-LDL-CNL-BHC-GR-SP | 3065.0 | 82.2 } | 1H 30M (1.5) | 8H 18M(8.3) } | 96 | 28.82 |
| WSS | 3069.5 | 94.0 } | | 13H 40M(13.66) } | | |
| CST's | No Thermometers Run | | | | | |

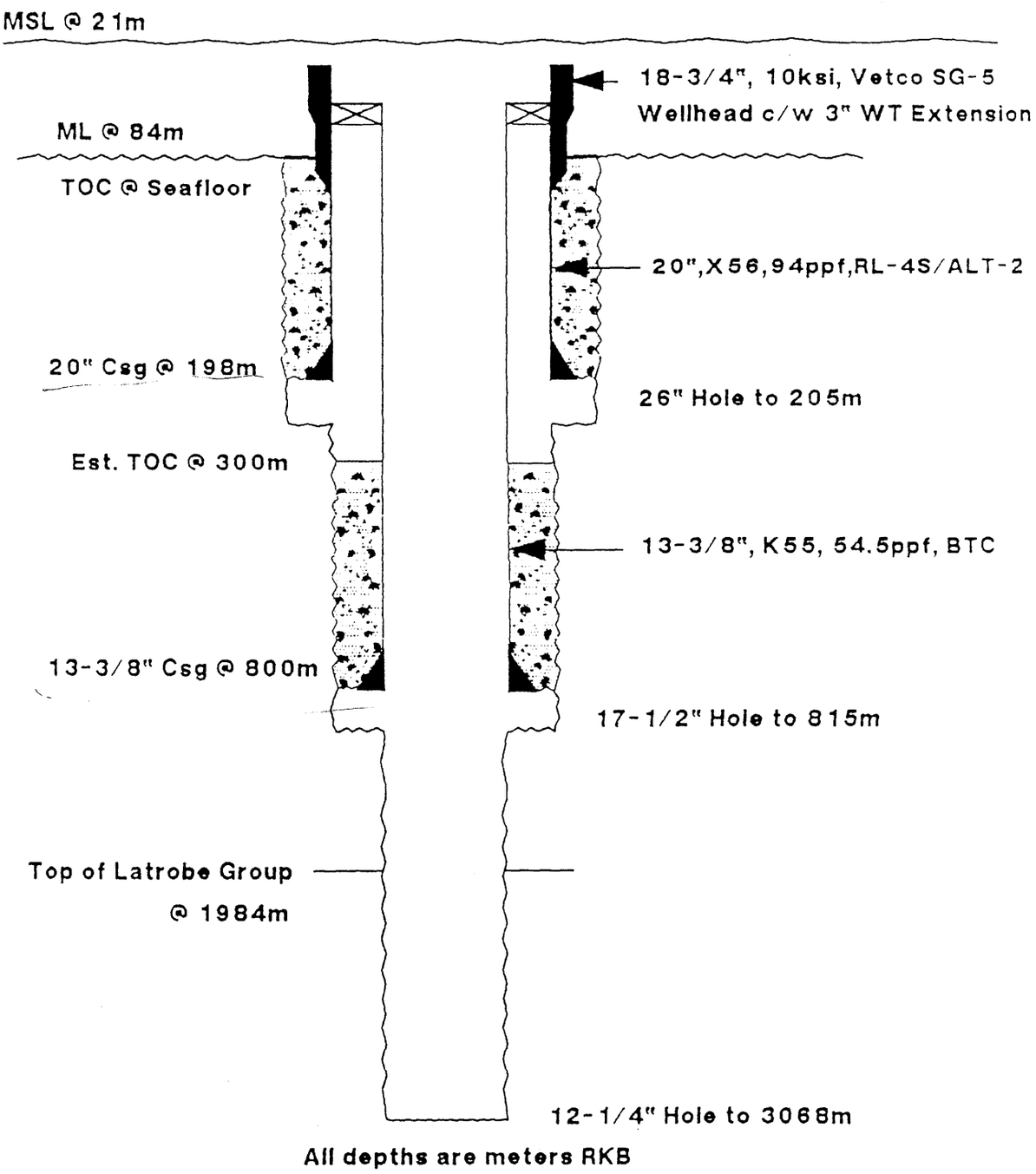
# FIGURES

# SAWBELLY-1
## Location Map
Scale 1: 250 000

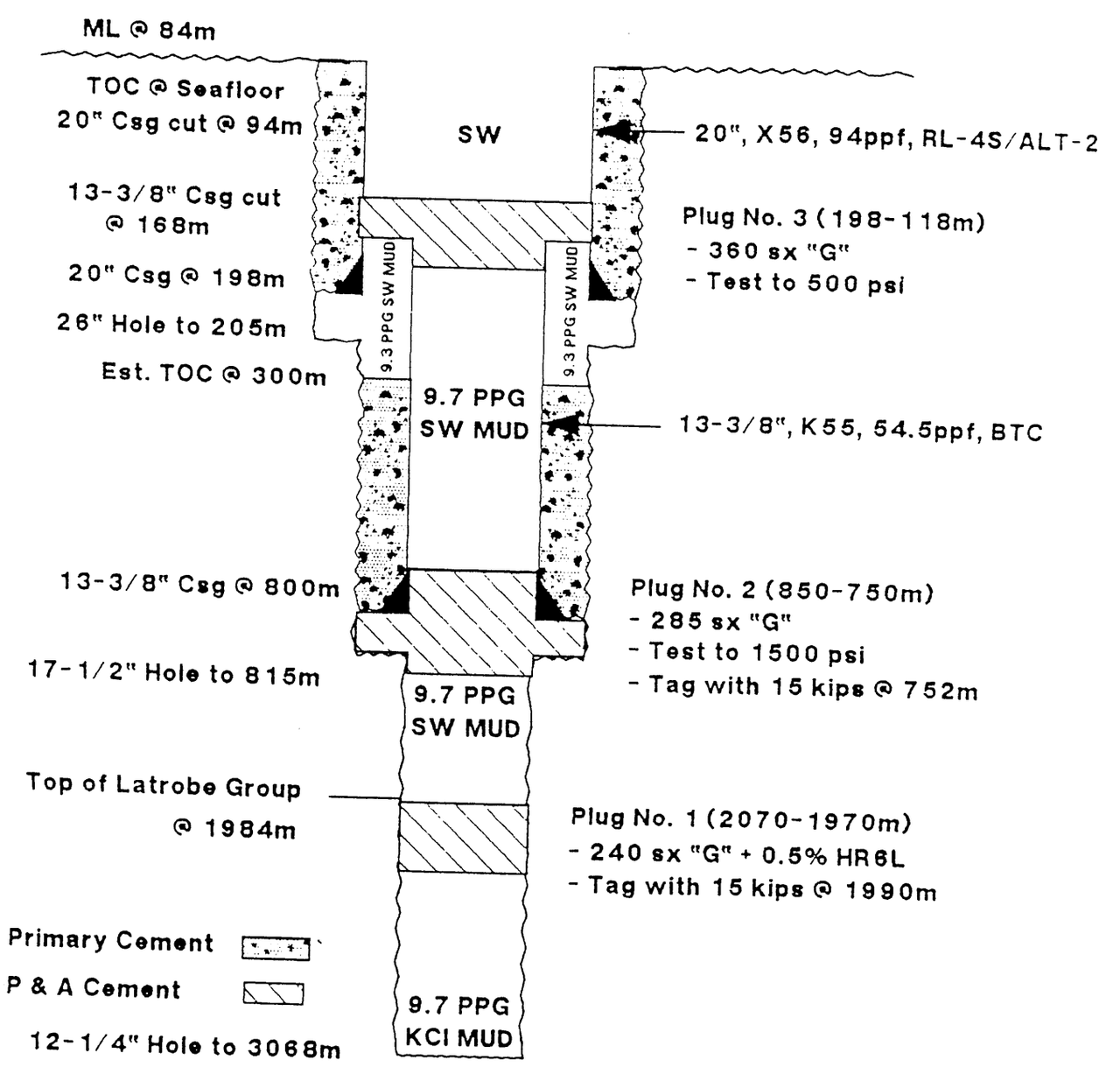



ESSO AUSTRALIA LTD.
PARS WELL PROGRESS CURVE
WELL: SAWBELLY-1
RIG: SOUTHERN CROSS
LITHOLOGY
CASING SEATS
PROJECTED
ACTUAL
DESIGN
ACTUAL
GIPPSLAND LIMESTONE
GIPPSLAND LIMESTONE
20"
205 m
20"
198 m
13-3/8"
800 m
800 m
TD 3071 m
TD 3068 m
DEPTH - (mRKB)
0
250
500
750
1000
1250
1500
1750
2000
2250
2500
2750
3000
3250
3500
3750
4000
4250
0
5
10
15
20
25
30
35
40
45
50
55
60
DAYS
ACTUAL
PARS TARGET
CUT 3 CORES
NPT GOAL = 9%
ACTUAL NPT = 7.5%
DATES
ARRIVE LOCATION 0400 HRS MARCH 3, 1990
SPUD 0815 HRS MARCH 4, 1990
REACH WELL TD 1630 HRS MARCH 21, 1990
BEGIN TEST
END TEST
P & A 2000 HRS MARCH 26, 1990
PROGRAM
ACTUAL
WATER DEPTH 63m 63m
WELL DEPTH (RKB) 3071m 3068m
TOTAL PARS DAYS 29.0 24.0
TOTAL PARS COST A$3178.6K A$2696.7K
COST/M A$1035 A$879
COST/DAY A$109.6K A$112.2K
LOCATION 38° 22'31.06" S 38° 22'31.00" S
148° 02'06.05"E 148° 02'05.90"E
RKB TO SEA LEVEL 21m 21m
NOTE: BIT No. 3 (12-1/4" ATJ-1) SET THE FOLLOWING RECORD FOR THE 47 BASS STRAIT WELLS DRILLED BY THE SOUTHERN CROSS:
MOST FOOTAGE PER ROCK BIT RUN:
1100m (815-1915m)

# ESSO AUSTRALIA LTD.
# SAWBELLY-1 FINAL WELL REPORT
## WELLBORE SCHEMATIC

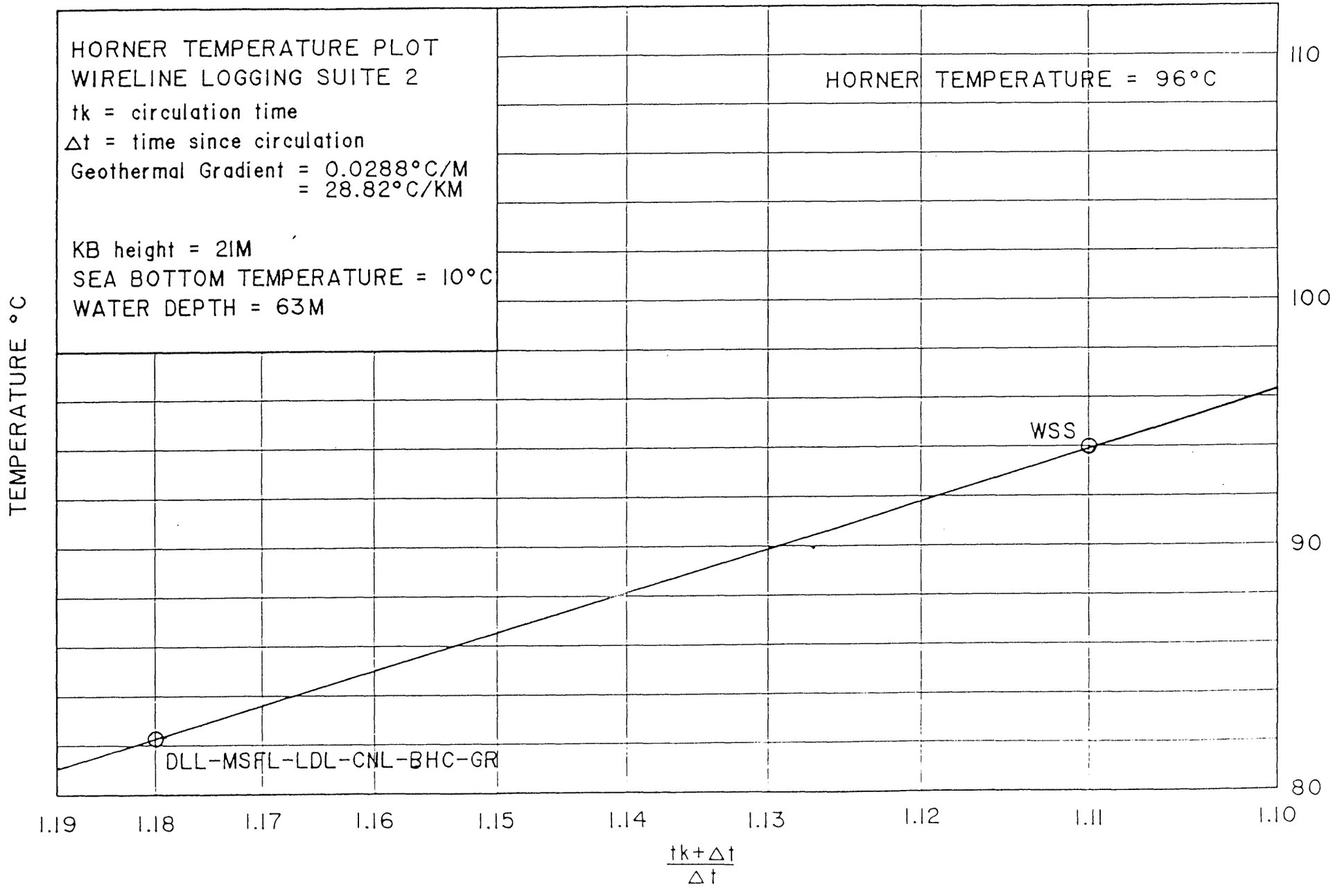


# ESSO AUSTRALIA LTD.
# SAWBELLY-1 P & A FINAL
# WELLBORE ABANDONMENT SCHEMATIC




All depths are meters RKB

# SAWBELLY-1


HORNER TEMPERATURE PLOT
WIRELINE LOGGING SUITE 2
tk = circulation time
Δt = time since circulation
Geothermal Gradient = 0.0288°C/M
= 28.82°C/KM
KB height = 21M
SEA BOTTOM TEMPERATURE = 10°C
WATER DEPTH = 63M
HORNER TEMPERATURE = 96°C
WSS
DLL-MSFL-LDL-CNL-BHC-GR
TEMPERATURE °C
110
100
90
80
1.19
1.18
1.17
1.16
1.15
1.14
1.13
1.12
1.11
1.10
tk+Δt / Δt

# APPENDIX 1

SAWBELLY-1

Lithology Descriptions

| Depth | % | Description |
|---|---|---|
| 1920 | 100 | CALCAREOUS CLAYSTONE: Medium grey, homogeneous, grades to calcsiltite in part, abundant micropyrite, common forams, trace shell fragments, trace echinoid spines, blocky, soft to firm. |
| 1925 | 100 | CALCAREOUS CLAYSTONE: As above, rare pyrite, trace micromica, trace forams. |
| 1930 | 100 | CALCAREOUS CLAYSTONE: As above, common forams, rare loose iron stained quartz grains. |
| 1935 | 100 | CALCAREOUS CLAYSTONE: As above, common forams, no pyrite, no glauconite. |
| 1940 | 100 | CALCAREOUS CLAYSTONE: As above. |
| 1945 | 100 | CALCAREOUS CLAYSTONE: As above. |
| 1950 | 100 | CALCAREOUS CLAYSTONE: As above. |
| 1955 | 100 | CALCAREOUS CLAYSTONE: As above. |
| 1960 | 100 | CALCAREOUS CLAYSTONE: As above, rare very fine glauconite nodules, rare nodular pyrite, becoming slightly silty. |
| 1965 | 100 | CALCAREOUS CLAYSTONE: As above, rare very fine glauconite nodules. |

SAWBELLY-1

Lithology Descriptions

| Depth | % | Description |
|---|---|---|
| 1970 | 100 | CALCAREOUS CLAYSTONE: As above becoming medium grey, trace loose silt sized quartz grains, common forams. |
| 1975 | 100 | CALCAREOUS CLAYSTONE: As above. |
| 1980 | 100 | CALCAREOUS CLAYSTONE: As above. |
| 1985 | 100 | CALCAREOUS CLAYSTONE: As above. |
| 1990 | 100 | CALCAREOUS CLAYSTONE: Olive green to buff, common to abundant very fine to fine glauconite nodules, blocky, firm to soft. |
| 1995 | 100 | CALCAREOUS CLAYSTONE: Olive green to medium brown, common fine to medium dark green glauconite nodules, trace to minor pyrite, common to abundant very fine to silty loose quartz grains, blocky soft to firm. |
| 2000 | 100 | CALCAREOUS CLAYSTONE: As above, trace black calcareous forams, common loose silt as above. |
| 2005 | 100 | CALCAREOUS CLAYSTONE: As above, rare crystalline gypsum (?cavings). |

SAWBELLY-1

Lithology Descriptions

| Depth | % | Description |
|---|---|---|
| 2010 | 100 | CALCAREOUS CLAYSTONE: As above. |
| | Trace | SANDSTONE: Light grey, translucent (waxy lustre), medium grained, angular (crystalline) to well rounded, frosted surface texture, loose, good inferred porosity, no fluorescence. |
| 2015 | 90 | CALCAREOUS CLAYSTONE: As above, common forams, fish tooth. |
| | 10 | SANDSTONE: As above, predominantly very well rounded, polished medium quartz grains, trace glauconite staining, no inferred porosity, no fluorescence. |
| 2020 | 85 | CALCAREOUS CLAYSTONE: Becoming silty, sideritic and micromicaceous. |
| | 15 | SANDSTONE: As above, medium to coarse, loose polished quartz grains, well rounded, common brown residual oil staining, fair inferred porosity, no fluorescence, no cut. |
| 2025 | 90 | SANDSTONE: Light brown to tan, medium to coarse, well sorted, well rounded, polished surface texture, loose, abundant oil staining, good inferred porosity, no fluorescence, no cut. |
| | 10 | CALCAREOUS SILTSTONE: Medium grey to speckled green, glauconite, micaceous, trace siderite, blocky, firm to moderately hard. |

SAWBELLY-1

Lithology Descriptions

| Depth | % | Description |
|---|---|---|
| 2030 | 100 | SANDSTONE: As above, 40% residual oil stained, 60% medium to coarse, clear to translucent, subangular to rounded, clean and loose, good to very good inferred porosity, no fluorescence. |
| | Trace | CALCAREOUS SILTSTONE: As above. |
| | Trace | COAL: Black, subvitreous, silty, blocky, hard. |
| 2035 | 95 | SANDSTONE: As above, 30% oil stained, trace pyrite adhering to grains, loose, very good inferred porosity, no fluorescence, no cut. |
| | 5 | SILTSTONE: Medium grey, micaceous, sideritic in part, common pyrite and glauconite, calcareous, blocky, firm to moderately hard. |
| 2040 | 90 | SANDSTONE: As above, 10% oil stained, very good inferred porosity, no fluorescence. |
| | 10 | SILTSTONE: As above. |
| 2045 | 100 | SANDSTONE: As above, 5% oil stained, no fluorescence. |
| | Trace | SILTSTONE: As above. |
| | Trace | COAL: As above. |
| 2050 | 100 | SANDSTONE: As above, 5% oil stained, becoming subangular to subrounded with depth, common pyrite, very good inferred porosity, no fluorescence. |
| | Trace | SILTSTONE: As above |

SAWBELLY-1

Lithology Descriptions

| Depth | % | Description |
|---|---|---|
| | Trace | COAL: As above. |
| 2055 | 85 | SANDSTONE: Light grey, clear to translucent, fine to coarse, predominantly medium, subangular to well rounded, predominantly subangular to subrounded, loose and clean, trace oil strained, medium to coarse grains, good to very good inferred porosity, no fluorescence. |
| | 10 | SILTSTONE: Light to medium brown, homogeneous, trace siderite in part, blocky to subfissile, firm. |
| | 5 | COAL: Black, subvitreous, subconchoidal, platy in part, brittle, hard. |
| 2060 | 80 | SANDSTONE: Fine to coarse, poorly sorted, angular to subrounded, common well rounded medium to coarse quartz grains, loose and clean, trace pyrite, very good inferred porosity, no fluorescence. |
| | 20 | COAL: As above. |
| | Trace | SILTSTONE: As above. |
| 2065 | 70 | SANDSTONE: As above, trace muscovite, very good inferred porosity, no fluorescence. |
| | 30 | COAL: As above. |
| 2070 | 70 | SANDSTONE: As above, very good inferred porosity, no fluorescence. |
| | 30 | COAL: As above. |

SAWBELLY-1

Lithology Descriptions

| Depth | % | Description |
|---|---|---|
| 2075 | 90 | SANDSTONE: As above, very good inferred porosity, no fluorescence. |
| | 10 | COAL: As above. |
| 2080 | 100 | SANDSTONE: As above, medium to coarse, moderately sorted, loose and clean, very good inferred porosity, no fluorescence. |
| | Trace | COAL: As above, trace siderite. |
| 2085 | 100 | SANDSTONE: As above, very good inferred porosity, no fluorescence. |
| | Trace | COAL: As above. |
| 2090 | 100 | SANDSTONE: As above, no fluorescence. |
| | Trace | COAL: As above. |
| 2095 | 100 | SANDSTONE: As above, medium to very coarse, common muscovite, very good inferred porosity, no fluorescence,. |
| | Trace | COAL: As above. |
| 2100 | 100 | SANDSTONE: As above, commonly well rounded medium to coarse grains, very good inferred porosity, no fluorescence. |
| 2105 | 100 | SANDSTONE: As above, common bit fractured grains, very good inferred porosity, no fluorescence. |

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Lithology Descriptions

| Depth | % | Description |
|---|---|---|
| 2110 | 100 | SANDSTONE: As above, medium to coarse, very good inferred porosity, no fluorescence. |
| 2115 | 100 | SANDSTONE: As above, common bitumen staining, very good inferred porosity, no fluorescence. |
| 2120 | 100 | SANDSTONE: As above, rare bitumen staining, rare medium to coarse well rounded grey chert grains, very good inferred porosity, no fluorescence. |
| 2125 | 100 | SANDSTONE: As above, becoming very coarse, abundant bit fractured grains/pebbles, excellent inferred porosity, no fluorescence. |
| 2130 | 100 | SANDSTONE: As above, rare aggregates of fine to very coarse quartz grains with strong siliceous cement, fair to good visual porosity, no fluorescence. |
| 2135 | 100 | SANDSTONE: As above, trace aggregates as above, rare medium grey chert grains, good to very good inferred porosity, no fluorescence. |
| 2140 | 60 | SANDSTONE: As above, minor fine grains, dirty (?carbonaceous or bitumen stained), rare plagioclaze, common muscovite, poor inferred porosity, no fluorescence. |

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Lithology Descriptions

| Depth | % | Description |
|---|---|---|
| | 40 | SILTSTONE: Brown, argillaceous, carbonaceous, grading to silty coal in part, abundant micromica, blocky to subfissile, firm. |
| 2145 | 60 | SANDSTONE: As above, medium to very coarse, subangular to well rounded, loose and clean, trace bitumen staining, good inferred porosity, no fluorescence. |
| | 40 | SILTSTONE: Medium brown to black, carbonaceous, argillaceous, coal inclusions and laminae, slightly waxy texture, blocky to subfissile, firm. |
| 2150 | 90 | COAL: Black, subvitreous to vitreous, hackly to platy, brittle, hard. |
| | 10 | SILTSTONE: Medium to dark brown, as above. |
| | Trace | SANDSTONE: As above. |
| 2155 | 50 | COAL: As above. |
| | 50 | SILTSTONE: As above, arenaceous laminae in part. |
| | Trace | SANDSTONE: As above. |
| 2160 | 60 | SANDSTONE: Light grey, clear to translucent, fine to coarse, poorly sorted, angular to subangular, loose, trace argillaceous/silty matrix, poor inferred porosity, no fluorescence. |

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Lithology Descriptions

| Depth | % | Description |
|---|---|---|
| | 40 | SILTSTONE: As above, common arenaceous laminae, trace siderite cement. |
| | Trace | COAL: As above. |
| 2165 | 60 | SANDSTONE: As above, common muscovite, common inferred silty/argillaceous matrix, loose, poor inferred porosity, no fluorescence. |
| | 40 | SILTSTONE: As above. |
| 2170 | 80 | SANDSTONE: As above, trace very fine ground aggregates with abundant muscovite mica, moderate silica cement, firm to moderately hard, poor to very poor visual porosity, no fluorescence. |
| | 10 | SILTSTONE: As above. |
| | 10 | COAL: As above. |
| 2175 | 90 | SANDSTONE: As above, medium to coarse, fair inferred porosity, no fluorescence. |
| | 5 | SILTSTONE: As above. |
| | 5 | COAL: As above. |
| 2180 | 100 | SANDSTONE: As above, medium to coarse, loose and clean good inferred porosity, no fluorescence. |
| | Trace | SILTSTONE: As above. |
| | Trace | COAL: As above. |

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Lithology Descriptions

| Depth | % | Description |
|---|---|---|
| 2185 | 100 | SANDSTONE: As above, rare lithics, good inferred porosity, no fluorescence. |
| 2190 | 100 | SANDSTONE: As above, good inferred porosity, no fluorescence. |
| 2195 | 100 | SANDSTONE: As above, medium to very coarse, common bitumen fractured grains, generally subangular to subrounded, good inferred porosity, no fluorescence. |
| 2200 | 100 | SANDSTONE: As above, common kaolinite, very good inferred porosity, no fluorescence. |
| 2205 | 100 | SANDSTONE: very light grey, translucent to transparent quartz grains, medium to very coarse, rare feldspar, common fractured grains, loose quartz, subangular to occasional subrounded, moderately sorted, trace to moderately weak silica cement, nil matrix, trace lithic grains and carbonaceous detritus, good inferred porosity, no fluorescence. |
| 2210 | 100 | SANDSTONE: As above, rare trace pyrite cement. |
| 2215 | 100 | SANDSTONE: As above, including very fine to fine grains. |
| | Trace | SILTSTONE |

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Lithology Descriptions

| Depth | % | Description |
|---|---|---|
| 2220 | 60 | SANDSTONE: As above, dominant light to very light brown grey. |
| | 20 | SILTSTONE: Light to dominantly dark brown, very argillaceous, moderately carbonaceous flecks and coal microlaminae, trace to moderate silica to very fine quartz, rare fine quartz, firm to moderately hard, subfissile. |
| | 20 | COAL: Very dark brown, grey to black, dull to occasional subvitreous lustre, moderate to very silty, moderately hard, angular to occasional subconchoidal fracture. |
| 2225 | 60 | SANDSTONE: Light grey loose translucent quartz grains, medium to occasionally very coarse, subrounded to occasional subangular, moderately sorted, trace silica cement, trace to occasionally moderate argillaceous matrix, trace carbonaceous/coal detritus, rare pyrite, loose quartz grains, fair to good inferred porosity, no fluorescence. |
| | 30 | SILTSTONE: As above. |
| | 10 | COAL: As above. |
| 2230 | 70 | SANDSTONE: As above. |
| | 30 | SILTSTONE: As above. |
| 2235 | 100 | SANDSTONE: Very light to light grey, translucent loose quartz grains, medium to |

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Lithology Descriptions

| Depth | % | Description |
|---|---|---|
| | | coarse, occasional very coarse, subrounded to angular, moderately sorted, moderately strong silica cement, trace argillaceous and carbonaceous matrix, trace lithic grains and carbonaceous detritus, good inferred porosity, no fluorescence. |
| | Trace | SILTSTONE |
| 2240 | 90 | SANDSTONE: As above, common coarse to very coarse. |
| | 10 | SILTSTONE |
| 2245 | 40 | SANDSTONE: As above, medium to very coarse, common bit fractured grains, fair inferred porosity, no fluorescence. |
| | 60 | SILTSTONE: Dark brown to black, carbonaceous, grades to coal, common coal fragments and laminae, waxy texture, blocky to subfissile, firm to moderately hard. |
| 2250 | 100 | SILTSTONE: As above, common sideritic laminae. |
| | Trace | SANDSTONE: As above. |
| 2255 | 90 | SILTSTONE: Brown carbonaceous, as above, becoming more argillaceous, waxy (keragenous) texture, subfissile, firm to moderately hard. |
| | 10 | SANDSTONE: As above. |

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Lithology Descriptions

| Depth | % | Description |
|---|---|---|
| 2260 | 90 | SILTSTONE: Dark grey to dark brown, carbonaceous in part, predominantly arenaceous with argillaceous matrix, micromica, blocky, firm to moderately hard. |
| | 10 | SANDSTONE: As above, no fluorescence. |
| 2265 | 80 | SILTSTONE: As above. |
| | 20 | SANDSTONE: As above, loose, medium to very coarse, fair inferred porosity, no fluorescence. |
| 2266 (spot sample) | 100 | COAL: black, vitreous to subvitreous, common amber, blocky to subconchoidal, brittle, hard. |
| 2270 | 80 | SILTSTONE: As above. |
| | 20 | SANDSTONE: As above, no fluorescence. |
| 2275 | 90 | SILTSTONE: Light brown, arenaceous, grades to very fine sandstone, common brown carbonaceous flecks, trace argillaceous matrix, sideritic cement, blocky to sucrosic, firm to hard. |
| | 10 | SANDSTONE: As above, no fluorescence. |
| 2280 | 90 | SILTSTONE: Medium brown, carbonaceous, argillaceous, waxy texture, common coal fragments, blocky to subfissile, firm to moderately hard. |

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Lithology Descriptions

| Depth | % | Description |
|---|---|---|
| | 10 | SANDSTONE: As above, no fluorescence. |
| 2285 | 90 | SILTSTONE: As above, arenaceous in part. |
| | 10 | SANDSTONE: As above. |
| 2290 | 90 | SILTSTONE: As above, cream arenaceous laminae with white argillaceous matrix. |
| | 10 | SANDSTONE: As above, plus trace very fine to fine loose clean quartz grains, fair to poor inferred porosity, no fluorescence. |
| 2295 | 90 | SILTSTONE: As above, thinly interbedded, carbonaceous, argillaceous, arenaceous. |
| | 10 | COAL: As above. |
| | Trace | SANDSTONE: As above, no fluorescence. |
| 2300 | 100 | SILTSTONE: As above, predominantly medium brown, carbonaceous. |
| | Trace | COAL: As above. |
| | Trace | SANDSTONE: As above predominantly very fine to medium, loose and clean, poor inferred porosity, no fluorescence. |
| 2305 | 100 | SILTSTONE: As above, predominantly medium brown, carbonaceous, abundant light grey, calcareous, common siderite. |
| | Trace | COAL: As above. |
| | Trace | SANDSTONE: As above, no fluorescence. |

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Lithology Descriptions

| Depth | % | Description |
|---|---|---|
| 2310 | 100 | SILTSTONE: Light grey, argillaceous, calcareous, common to abundant intraclasts (intraformational breccia) well rounded siltstone clasts in siltstone matrix, blocky, firm to moderately hard. |
| | Trace | COAL: As above. |
| | Trace | SANDSTONE: As above. |
| 2315 | 90 | SILTSTONE: Light grey, argillaceous, calcareous, rare forams, sponge spicules, shell fragments, intraformational breccia, blocky, firm to moderately hard. |
| | 5 | COAL: As above, cavings. |
| | 5 | SANDSTONE: As above, cavings. |
| 2320 | 80 | SILTSTONE: As above. |
| | 20 | CLAYSTONE: Medium green grey, as above, cavings. |
| 2325 | 70 | SILTSTONE: As above. |
| | 30 | CLAYSTONE: As above, (cavings) |
| 2330 | 70 | SILTSTONE: Light to dominantly medium dark brown, moderate to very argillaceous, non to occasional moderately calcareous, trace to moderate carbonaceous flecks, occasional carbonaceous/coal microlaminae, trace micromica, rare silty to very fine quartz, trace nodules and disseminated pyrite, firm to occasionally moderately hard, subfissile. |

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Lithology Descriptions

| Depth | % | Description |
|---|---|---|
| | 30 | CLAYSTONE: Light to medium green grey, moderately calcareous, silty in part, trace nodules and disseminated pyrite, firm to moderately hard, subfissile. |
| 2335 | 60 | SILTSTONE: As above, very arenaceous in part. |
| | 30 | SANDSTONE: Off white to light grey brown, opaque, very fine to fine, common silt size quartz, subrounded, moderately well sorted, moderately calcareous and dolomite cement, moderate to common argillaceous matrix, trace to moderately carbonaceous flecks and feldspar, trace micromica and pyrite, friable to moderately hard, very poor visual porosity, 10% moderately bright yellow mineral fluorescence, no cut or crush cut. |
| | 10 | CLAYSTONE: As above. |
| 2340 | 60 | SILTSTONE: As above. |
| | 40 | SANDSTONE: As above, with 30% mineral fluorescence, as above. |
| | Trace | COAL |
| 2345 | 80 | SILTSTONE |
| | 20 | SANDSTONE: As above, with 10% fluorescence (no cut or crush cut). |
| 2350 | 70 | SILTSTONE: As above. |

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Lithology Descriptions

| Depth | % | Description |
|---|---|---|
| | 20 | SANDSTONE: As above with 10% fluorescence (no cut). |
| | 10 | CLAYSTONE: Medium to light grey, grades to siltstone, calcareous, common forams and calcareous fragments, rare glauconite ?(cavings). |
| 2355 | 70 | SILTSTONE: Light to dark brown, dominantly medium brown, soft to firm, common carbonaceous flecks and laminae, grades to coal, blocky to subfissile. |
| | 20 | CLAYSTONE: As above. |
| | 5 | COAL: Black to dark brown, subconchoidal fracture, hard, brittle. |
| | 5 | SANDSTONE: As above with 5% fluorescence (no cut). |
| | Trace | PYRITE: |
| 2360 | 75 | SILTSTONE: As above. |
| | 20 | CLAYSTONE: As above, contains rare pyrite. |
| | 5 | COAL: As above. |
| | Trace | SANDSTONE: As above with 2% Fluorescence (no cut). |
| 2365 | 80 | SILTSTONE: Light brown to dark brown. Dominantly medium brown, predominantly soft, common carbonaceous flecks and laminae, argillaceous, grades to coal, amorphous to blocky. |
| | 20 | CLAYSTONE: As above (cavings). |

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Lithology Descriptions

| Depth | % | Description |
|---|---|---|
| 2365 cont. | Trace | COAL: As above. |
| | Trace | SANDSTONE: As above, trace pyrite. |
| 2370 | 20 | SILTSTONE: As above, predominantly dark brown, vary carbonaceous, grades to coal. |
| | Trace | CLAYSTONE: As above (carvings). |
| | 20 | SANDSTONE: (Type 1): Composed loose quartz grains, transparent to translucent, rare milky grains, very poorly sorted, very fine to coarse grained, sub-angular to sub-rounded, moderate to high sphericity, fair to good inferred visual porosity, no shows. |
| | Trace | SANDSTONE: (Type 2): As above, very fine grained, white argillaceous matrix, sucrosic texture, micromica and carbonaceous in part, poor inferred porosity, no shows, trace mineral fluorescence. |
| | 60 | COAL: Black to dark brown, as above. |
| 2375 | 30 | SILTSTONE: Light to dark brown, dominant medium brown composed quartz grains, mica (white), feldspar and carbonaceous flecks, argillaceous matrix, firm to soft, dominantly soft, grades to coal, blocky to subfissile, very poor visual porosity, no fluorescence but some cuttings produced faint pale yellow crush cut. |
| | 70 | CLAYSTONE: As above, very calcareous, grades to siltstone. |

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Lithology Descriptions

| Depth | % | Description |
|---|---|---|
| 2375 cont. | Trace | SANDSTONE: (Type 1): As above, no shows. |
| | Trace | SANDSTONE: (Type 2): As above, no shows. Orange-gold mineral fluorescent - no cut (trace). |
| | Trace | COAL: As above. |
| 2380 | 35 | SILTSTONE: As above, trace pyrite. |
| | 60 | COAL: As above. |
| | Trace | SANDSTONE: (Type 1): As above. |
| | 5 | SANDSTONE: (Type 2): Composed, clear to translucent quartz grains (aggregates), mica (white), rare feldspar and carbonaceous flecks, grain supported, fine grained, moderate to well sorted, variable white clay matrix (5-20%), siliceous cement, grains subangular to subrounded, moderate to high sphericity, poor visual porosity, no shows. |
| | Trace | COAL: As above. |
| 2385 | 35 | SANDSTONE: (Type 1) Loose quartz grains, Translucent to transparent, predominantly medium grained moderate sorted, grains subangular to subrounded, moderate high sphericity, no visual cement or matrix, good to very good visual porosity, no shows. |
| | 10 | SILTSTONE: As Above. |
| | 25 | CLAYSTONE: As Above, trace calcite. |

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Lithology Descriptions

| Depth | % | Description |
|---|---|---|
| 2385 cont. | 30 | COAL: Black to dark brown, grades to siltstone, earthy to vitreous, Sub-conchoidal fracture in part, disseminated pyrite common (partly fromboidal), blocky, trace to common amber, pale yellow to orange in colour, brilliant blue white fluorescence. |
| 2390 | 20 | SANDSTONE: (Type 1): As above. |
| | Trace | SILTSTONE: As above. |
| | Trace | CLAYSTONE: As above. |
| | 80% | COAL: As above, vitreous lustre and number of grains with sub-conchoidal fracture, common to trace amber, coal, grades in part to carbonaceous siltstone, has no fluorescence but does produce a pale yellow/green crush cut and moderate bright pale yellow/white discontinuous residual ring. |
| 2395 | 10 | SANDSTONE: (Type 2): Fine grain aggregate composed chiefly of quartz in argillaceous matrix moderately well sorted, grain supported, sucrosic texture, subangular to subrounded moderately high sphericity, friable, rare mica, common carbonaceous flecks and laminae, very poor visual porosity, no shows. |
| | Trace | SILTSTONE: As above. |
| | Trace | CLAYSTONE: As above. |
| | Trace | SANDSTONE: (Type 1): As above, no shows. |
| | 90 | COAL: As above. |

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Lithology Descriptions

| Depth | % | Description |
|---|---|---|
| 2400 | 70 | SANDSTONE: (Type 2): White to light grey, buff to light brown, as above, grades into siltstone, variable white clay matrix, common carbonaceous flecks and laminae, predominantly soft to friable, grain supported, poor visual porosity, no shows. |
| | 20 | SILTSTONE: As above, grades to Type 2 sandstone. |
| | 10 | CLAYSTONE: As above. |
| | Trace | SANDSTONE: (Type 1): As above. |
| | Trace | COAL: As above, trace pyrite. |
| 2405 | 60 | SANDSTONE: (Type 2): As above, no shows (Trace dull yellow fluorescence - calcite), trace pyrite encrusted aggregates. |
| | 20 | SILTSTONE: As above. |
| | 20 | CLAYSTONE: Medium grey, very calcareous, rare forams and fossil fragments, firm to soft. |
| | Trace | SANDSTONE: (Type 1): As above, no shows. |
| | Trace | COAL: As above, commonly pyrite encrusted. |
| 2410 | 70 | SANDSTONE: (Type 2): As above some cuttings show interbedded laminae of fine sandstone and siltstone (alternating fawn & medium brown), argillaceous in part, soft to firm, blocky to subfissile. |

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Lithology Descriptions

| Depth | % | Description |
|---|---|---|
| 2410 cont. | 10 | SILTSTONE: Light brown to medium brown, grades into carbonaceous siltstone. |
| | 15 | CLAYSTONE: As above. |
| | 5 | SANDSTONE: (Type 1): Composed loose quartz grains, translucent to transparent, fine to medium grained, moderate to poorly sorted, Subangular to subrounded, moderate to high sphericity, some of the finer grains may be from dissagg. type-1 sandstone, good inferred porosity. |
| | Trace | COAL: As above. |
| 2415 | 85 | SANDSTONE: (Type 1): Composed loose quartz grains, clear to translucent, predominantly fine to medium grained, subangular to subrounded, moderate to high sphericity, moderately sorted, possible small amount of white clayey matrix but most washed off disaggregated grains, good to very good visual porosity. |
| | 5 | SANDSTONE: (Type 2): As above. |
| | 5 | SILTSTONE: As above. |
| | 5 | CLAYSTONE: As above. |
| 2420 | 5 | SANDSTONE: (Type 1): As above, no shows. |
| | 50 | SANDSTONE: (Type 2): Aggregates composed primarily quartz, fine grained, grain supported, moderately to well sorted, |

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Lithology Descriptions

| Depth | % | Description |
|---|---|---|
| 2420 cont. | | sucrosic texture, white clayey matrix (variable amount), poor visual porosity, no shows, trace dull yellow mineral fluorescence. |
| | 30 | SILTSTONE: As above. |
| | 15 | CLAYSTONE: As above. |
| | Light Trace | COAL: As above. |
| 2425 | 20 | SILTSTONE: As above, some cuttings show interlaminated with fine grain sandstone, commonly micromica. |
| | 5 | SANDSTONE: (Type 2): As above, no shows. |
| | 75 | COAL: Predominately black, sub-vitreous lustre, sub-conchoidal fracture in part, blocky, very hard, brittle, 3 cuttings with amber to bright blue white fluorescence. |
| | Trace | CLAYSTONE: As above. |
| | Trace | SANDSTONE: (Type 1): As above, no shows. |
| 2430m | 45 | SILTSTONE: As above. |
| | 40 | SANDSTONE: (Type 2): As above. |
| | 5 | SANDSTONE: (Type 1): As above. |
| | 10 | CLAYSTONE: As above. |
| | Trace | COAL: As above. |
| 2435 | 80 | SILTSTONE: Light to Medium brown, Very argillaceous in part composed quartz mica and carbonaceous fragments and laminae, arenaceous in part grading to sandstone (Type |

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Lithology Descriptions

| Depth | % | Description |
|---|---|---|
| 2435 cont. | | 2), soft to firm but predominantly soft, blocky to subfissile, no shows. |
| | 10 | SANDSTONE: (Type 2): As above, some cuttings show interbedding with siltstone, sucrosic texture, no shows, trace dull yellow mineral fluorescence. |
| | 10 | CLAYSTONE: As above. |
| | Trace | COAL: As above. |
| 2440m | 90 | SILTSTONE: Light brown to fawn to medium brown, increasingly argillaceous, grades to claystone, less carbonaceous flecks and laminae in claystone. |
| | 10 | CLAYSTONE: As above, very calcareous, continued cavings from Gippsland Limestone & especially Lakes Entrance. |
| | Trace | SANDSTONE: (Type 2): As above, trace pyrite. |
| | Trace | COAL: As above. |
| 2445 | 50 | SANDSTONE: (Type 2): Aggregates of quartz grains, fine grained, subangular to subrounded, moderate to high sphericity, moderate to well sorted, argillaceous matrix to white to fawn, micromica in places, common carbonaceous flecks/laminae, trace pyrite encrustations on sandstone, grades to siltstone, poor visual porosity, no shows. |
| | 40 | SILTSTONE: As above, common darker brown cuttings with greater carbonaceous content. |

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Lithology Descriptions

| Depth | % | Description |
|---|---|---|
| 2445 cont. | 10 | CLAYSTONE: As above. |
| | Trace | COAL: As above. |
| 2450 | 60 | SANDSTONE: (Type 2): As above with increasing clay content, passes into an argillaceous siltstone which is buff white, often speckled and very soft but still composed of fine grained to silt sized quartz grains set in a white clayey matrix, trace pyrite. |
| | 35 | SILTSTONE: As above, less of the claystone - dominantly siltstone. |
| | 5 | CLAYSTONE: As above. |
| | Trace | COAL: As above. |
| 2455m | 20 | SANDSTONE: (Type 2): As above. |
| | 20 | SILTSTONE: As above. |
| | Trace | CLAYSTONE: As above. |
| | 60 | COAL: Black, waxy, dull but predominantly subvitreous, common sub-conchoidal fracture, hard, brittle. |
| 2460m | 35 | SANDSTONE: (Type 2): As above, no shows. |
| | 40 | SILTSTONE: As above, grades to dispersive mudstone. |
| | Trace | CLAYSTONE: As above cavings. |
| | 20 | COAL: As above. |
| | 5 | SANDSTONE: (Type 1): Fine to medium grained, poorly sorted, loose, unconsolidated, subangular to subrounded, moderate sphericity, no visual cement/matrix, |

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Lithology Descriptions

| Depth | % | Description |
|---|---|---|
| 2460 cont. | | fair to good visual porosity, no shows. |
| 2465m | 70 | SANDSTONE: (Type 1): Loose, unconsolidated, quartz grains, translucent to transparent very fine to medium grained, predominantly fine grained, some of the grains may be from disaggregated Type 2 sandstone, subangular to subrounded, moderate to high sphericity, poor to moderate sorting, no obvious cement/matrix, good visual porosity, no shows. |
| | 20 | SANDSTONE: (Type 2): As above, no shows. |
| | 10 | SILTSTONE: As above. |
| | Trace | CLAYSTONE: As above. |
| | Light Trace | COAL: As above. |
| 2470m | 60 | SANDSTONE: (Type 1): As above, some small aggregates held together by white clayey matrix present, good to fair visual porosity. |
| | 10 | SANDSTONE: (Type 2): As above, with increasing clay content becomes claystone with some quartz grains, complete gradation between argillaceous sandstone, siltstone and claystone, poor visual porosity. |
| | 30 | SILTSTONE: As above. |
| | Trace | COAL: Dark brown to black, grades into carbonaceous siltstone, trace pyrite. |

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Lithology Descriptions

| Depth | % | Description |
|---|---|---|
| 2470 cont. | Trace | CLAYSTONE: As above. |
| 2475m | 70 | SANDSTONE: (Type 1): Loose, unconsolidated quartz grains, translucent to transparent, fine to medium grained, subangular to subrounded, poor to moderately sorted, possible small amount of white clay matrix, no cement, good visual porosity, no shows. |
| | 10 | SANDSTONE: (Type 2): As above, no shows. |
| | 20 | SILTSTONE: As above, grades to claystone, claystone off white, very soft - dispersive in part, resembles rock flour, argillaceous to common carbonaceous fragments. |
| | Trace | CLAYSTONE: As above. |
| | Trace | COAL: As above. |
| 2480m | 85 | SANDSTONE: (Type 1): Loose, unconsolidated, quartz, translucent to transparent, medium to coarse, predominantly subangular, poor to moderately sorted, little or no matrix, no cement, good to very good visual porosity, no shows. |
| | 5 | SANDSTONE: (Type 2): As above, no shows. |
| | 10 | SILTSTONE: As above. |
| | Trace | CLAYSTONE: As above. |
| | Trace | COAL: As above. |
| 2485 | 75 | SANDSTONE: (Type 1): As above, medium to coarse grained, have either very poorly |

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Lithology Descriptions

| Depth | % | Description |
|---|---|---|
| 2485 cont. | | sorted sand or two friable sands one medium to coarse the other fine grained, good to very good visual porosity. |
| | 5 | SANDSTONE: (Type 2): As above. |
| | 20 | SILTSTONE: As above. |
| | Trace | CLAYSTONE: As above. |
| | Trace | COAL: As above. |
| 2490 | 90 | SANDSTONE: (Type 1): As above, fine grained sand present as well - loose, good to very good visual porosity. |
| | Trace | SANDSTONE: (Type 2): As above, trace pyrite. |
| | 10 | SILTSTONE: As above, grading to claystone. |
| | Trace | CLAYSTONE: As above. |
| | Trace | COAL: As above. |
| 2495 | 10 | SANDSTONE: (Type 1): As above, no shows. |
| | 30 | SANDSTONE: (Type 2): Predominantly fine grained, quartzose, translucent to transparent, moderate to well sorted, white to grey argillaceous matrix, grain supported, soft to friable, common carbonaceous flecks and laminae, grades to siltstone, poor visual porosity, no shows. |
| | 55 | SILTSTONE: As above. |
| | Trace | CLAYSTONE: As above. |
| | 5 | COAL: As above. |

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Lithology Descriptions

| Depth | % | Description |
|---|---|---|
| 2500 | Trace | SANDSTONE: (Type 1): As above. |
| | 20 | SANDSTONE: (Type 2): As above. |
| | 30 | SILTSTONE: Grades to coal, dark brown to light brown to fawn. |
| | 50 | COAL: Dark brown to black, subvitreous/earthy, rare subconchoidal fracture, silty in part, common disseminated pyrite. |
| | Trace | CLAYSTONE: As above. |
| 2505 | Trace | SANDSTONE: (Type 1): As above, only scattered individual quartz grains. |
| | 20 | SANDSTONE: (Type 2): As above. |
| | 70 | SILTSTONE: As above. |
| | Trace | CLAYSTONE: |
| | 10 | COAL: As above, coals and carbonaceous siltstone still give pale to bright yellow crush cut. |
| 2510 | Trace | SANDSTONE: (Type 1): As above. |
| | 10 | SANDSTONE: (Type 2): Fawn to light grey, fire grained quartz in aggregates, sucrosic texture, soft to friable, composed of individual fine quartz grains probably from disaggregated cuttings, argillaceous matrix, poor visual porosity. |
| | 20 | SILTSTONE: As above, soft, dispersive in part, grades to claystone. |
| | 70 | COAL: Black, waxy to subvitreous, common |

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Lithology Descriptions

| Depth | % | Description |
|---|---|---|
| 2510m cont. | | sub-conchoidal fracture, hard, brittle, disseminated pyrite. |
| 2515m | Trace | SANDSTONE: (Type 1): As above, no shows. |
| | 20 | SANDSTONE: (Type 2): As above, trace calcite/dolomite cement, no shows, dull yellow mineral fluorescence. |
| | 20 | SILTSTONE: As above. |
| | 60 | COAL: As above. |
| 2520m | 10 | SANDSTONE: (Type 2): As above, some cuttings show interbedding with siltstone, off white to grey, trace pyrite, 2% dull yellow/gold mineral fluorescence. |
| | 20 | SILTSTONE: As above. |
| | 70 | COAL: As above, trace bright yellow to white fluorescence (amber). |
| 2525m | 20 | SANDSTONE: (Type 2): As above, < 2% dull yellow to orange mineral fluorescence, no shows. |
| | 60 | SILTSTONE: As above. |
| | 20 | COAL: Less vitreous than sample above, silty, rare sub-conchoidal fracture. |
| 2530m | 20 | SANDSTONE: (Type 2): As above, common irregular grains, trace carbonaceous laminae, trace dull yellow to orange mineral fluorescence. |
| | 50 | SILTSTONE: As above. |

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Lithology Descriptions

| Depth | % | Description |
|---|---|---|
| 2530m cont. | 30 | COAL: As above, trace yellow to white fluorescence (amber). |
| 2535m | 40 | SANDSTONE: (Type 2): As above, opaque white fine grained grains probably feldspar (rare), carbonaceous matrix seemingly reworked, rounded fragments as well as irregular shapes and laminae, trace pyrite, poor visual porosity, interbedded with siltstone in part. |
| | 40 | SILTSTONE: Light brown to dark brown, very argillaceous in part, carbonaceous, soft to firm, blocky to subfissile, no fluorescence but definite crush cut (pale yellow to white colour), trace residual ring. |
| | 20 | COAL: As above. |
| 2540m | 60 | SILTSTONE: Becoming very argillaceous, grades to claystone, dispersive, very soft, abundant free clay in sample. |
| | 40 | SANDSTONE: (Type 2): As above, becoming increasingly argillaceous, often totally unconsolidated, abundant fine grained free quartz grains and clay, very poor visual porosity, no shows. |
| | Trace | COAL: |
| 2545 | 70 | SILTSTONE: As above, cuttings more coherent, still argillaceous, soft to firm, grades to claystone, blocky to subfissile, carbonaceous |

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Lithology Descriptions

| Depth | % | Description |
|---|---|---|
| 2545m cont. | | composed of quartz and white mice (rare feldspar) in an argillaceous matrix. |
| | 30 | SANDSTONE: (Type 2): As above, moderately to highly argillaceous, no shows. |
| | Trace | COAL: As above. |
| 2550m | 90 | SILTSTONE: Medium to predominantly brown, moderate to very argillaceous, trace to common silt - very fine quartz, carbonaceous in part, occasional coal microlaminae, trace micromica, soft to dominantly firm, subfissile. |
| | 10 | SANDSTONE: As above, dominantly very fine. |
| 2555m | 70 | SILTSTONE: As above, slightly calcareous in part. |
| | 30 | SANDSTONE: Off white to medium grey brown, opaque, very fine to occasional fine, common silt size quartz, subrounded, moderately well sorted, trace to moderately calcareous cement, trace silica cement, trace to common silty matrix, moderately carbonaceous flecks and microlaminae, trace feldspar, firm to friable, very poor to nil visual porosity, no fluorescence. |
| | Trace | COAL: As above. |
| 2560m | 80 | SILTSTONE: As above, becoming very argillaceous. |
| | 20 | SANDSTONE: As above. |

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Lithology Descriptions

| Depth | % | Description |
|---|---|---|
| 2565m | 90 | SILTSTONE: As above. |
| | 10 | SANDSTONE: As above, common to abundant argillaceous matrix. |
| | Trace | COAL: As above. |
| 2570m | 70 | SILTSTONE: As above, medium to dominant dark brown, occasional light brown, moderate to very argillaceous, slightly calcareous, trace to moderate silty to very fine quartz, slightly carbonaceous, trace micromica, rare pyrite, firm to moderately hard, sublimey to subfissile, interlaminated in part with sandstone and coal. |
| | 30 | SANDSTONE: As above, medium grey to medium grey brown, opaque, very fine to fine, common silt sized quartz, subrounded, moderately well sorted, trace calcareous and silica cement, poor pyrite cement, moderate to abundant argillaceous matrix, trace to moderate coal/carbonaceous detritus and microlaminae, rare feldspar and mica, friable to moderately hard, nil to poor visual porosity, no fluorescence. |
| | Trace | COAL: As above. |
| 2575m | 70 | SILTSTONE: As above. |
| | 20 | SANDSTONE: As above. |
| | 10 | COAL: Very dark brown/grey to black, dull to subvitrinite lustre, moderate to very silty, |

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Lithology Descriptions

| Depth | % | Description |
|---|---|---|
| 2575m cont. | | rare subconchoidal fracture, blocky to occasionally platy, firm to moderately hard. |
| 2580m | 60 | SILTSTONE: As above. |
| | 40 | SANDSTONE: As above. |
| 2585m | 50 | SILTSTONE: As above. |
| | 50 | SANDSTONE: As above, becoming dominantly fine. |
| | Trace | COAL: As above. |
| 2590m | 70 | SILTSTONE: Medium to dark grey brown, moderately to very argillaceous, non to slightly calcareous, grading in part to very fine sandstone, trace to moderate carbonaceous flecks, occasional coal microlaminae, trace micromica, trace nodular pyrite, firm to moderately hard, sublimey to subfissile. |
| | 30 | SANDSTONE: Light grey to medium grey brown, opaque to occasionally translucent, very fine to fine, rounded to subrounded, moderately well sorted, trace calcareous and silica cement, moderate to abundant argillaceous matrix, trace carbonaceous detritus, trace lithic grains and feldspar, friable to moderately hard, nil to very poor visual porosity, no fluorescence. |
| | Trace | COAL: As above. |

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Lithology Descriptions

| Depth | % | Description |
|---|---|---|
| 2595m | 80 | SILTSTONE: As above. |
| | 20 | SANDSTONE: As above. |
| 2600m | 80 | SILTSTONE: As above, abundantly argillaceous. |
| | 20 | SANDSTONE: As above, becoming very fine. |
| | Trace | COAL: Very dark grey to black, dull to subvitreous, occasional vitrinite lustre, argillaceous in part, angular to occasional subconchoidal fracture, blocky to platy, moderately hard. |
| 2605m | 70 | SILTSTONE: Occasional light grey brown, as above. |
| | 20 | SANDSTONE: Occasional white argillaceous (kaolin?) matrix. |
| | 10 | COAL: As above. |
| 2610m | 80 | SILTSTONE: Light brown to dark grey brown, dominantly medium brown, very argillaceous, trace to common silt sized carbonaceous flecks and quartz, occasional carbonaceous microlaminae, trace micromica, non to slightly calcareous, soft where very argillaceous to occasional moderately hard, blocky to occasional subfissile. |
| | 20 | SANDSTONE: Off white to medium grey to medium grey brown, opaque, very fine to occasionally fine, common silt sized quartz grains, rounded to occasionally subangular, |

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Lithology Descriptions

| Depth | % | Description |
|---|---|---|
| 2610m cont. | | moderately well sorted, trace calcareous and silica cement, argillaceous matrix, trace lithic grains and feldspar, trace carbonaceous flecks, rare carbonaceous microlaminae, trace feldspar and mica, friable, very poor visual porosity, no fluorescence. |
| 2615m | 40 | SANDSTONE: (Type 2) Light to medium grey, medium brown, composed of very fine to fine quartz grains, mica (white), carbonaceous flecks and laminae and rare feldspar, common argillaceous matrix (5% to 40%), trace dolomite and silica cements, moderately to well sorted, friable to soft depending on clay content, poor to very poor visual porosity, no shows. |
| | 50 | SILTSTONE: As above, grades to coal. |
| | 10 | COAL: Black to dark brown, silty in part, dull greasy to subvitreous lustre, subconchoidal fracture in part, hard, brittle. |
| 2620m | 30 | SANDSTONE: (Type 2): As above. |
| | 60 | SILTSTONE: As above. |
| | 10 | COAL: As above. |
| 2625m | 60 | SANDSTONE: (Type 2): As above, greater percentage of sample contains dolomite cement, those cuttings cemented by dolomite |

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Lithology Descriptions

| Depth | % | Description |
|---|---|---|
| 2625m cont. | | generally medium grey colour, trace pyrite, firm to hard, waxy lustre, trace dull yellow to gold, mineral fluorescence, no shows. |
| | 40 | SILTSTONE: As above. |
| | Trace | COAL: As above. |
| 2630m | 100 | SANDSTONE: (Type 2): As above, trace of massive, microcrystalline and crystalline pyrite, less dolomite cement and slightly more argillaceous, trace dull yellow to gold mineral fluorescence, no shows. |
| | Trace | COAL: As above. |
| 2635m | 40 | SANDSTONE: (Type 2): Light to medium grey, light to medium brown, friable to firm, composed dominantly of quartz, rare mica, trace feldspar and carbonaceous material, quartz grains subangular to subrounded, moderate to low sphericity, moderately well sorted, grain supported but variable, white to fawn argillaceous matrix, common dolomite cement, trace dull pale yellow to gold mineral fluorescence, poor to very poor visual porosity, no shows. |
| | 60 | SILTSTONE: As above. |
| | Trace | COAL: As above. |
| 2640 | 60 | SANDSTONE: (Type 2): As above, trace pyrite, dolomite cement aggregates approximately 30% of total sample. |

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Lithology Descriptions

| Depth | % | Description |
|---|---|---|
| 2640m cont. | 40 | SILTSTONE: As above. |
| 2645m | 60 | CLAYSTONE: Light to medium grey, very calcareous, trace forams, shell fragments, sponge spicules, calcareous fragments in argillaceous matrix, rare pyrite, firm (cavings). |
| | 25 | SILTSTONE: Light brown to dark brown, carbonaceous, micromica, silt sized quartz grains set in argillaceous matrix, carbonaceous flecks and laminae, grades to coal, soft to firm, predominantly soft, blocky to subfissile. |
| | 10 | SANDSTONE: (Type 2): Aggregates, light grey to light brown, buff, composed of very fine to fine grained quartz in argillaceous matrix, very argillaceous in part, dolomite and slight silica cement in part, common carbonaceous fragments and laminae, rare mica (white) and feldspar, blocky friable to firm, poor visual porosity (to very poor), trace mineral fluorescence. |
| | 5 | COAL: Black to dark brown, silty in part, subconchoidal fracture in part, blocky, hard, brittle. |
| | Trace | QUARTZ GRAINS: Fine to coarse. |
| | Trace | PYRITE: Nodular, disseminated fragments, crystalline masses. |

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Lithology Descriptions

| Depth | % | Description |
|---|---|---|
| 2645m cont. | Trace | AMBER: Bright blue white/yellow white fluorescence, amber to honey yellow colour in white light. |
| 2650m | 80 | CLAYSTONE: As above, cavings, trace glauconite. |
| | 15 | SILTSTONE: As above. |
| | 5 | SANDSTONE: As above, trace pyrite. |
| 2655m | 70 | SANDSTONE: (Type 2): Light grey to fawn, light brown, composed of quartz grains, translucent to transparent, subangular to subrounded, very fine to fine grained, low to moderate sphericity, moderately sorted, common carbonaceous flecks and laminae, rare feldspar and white mica, white to light brown argillaceous matrix, trace granular and crystalline pyrite encrusting sandstone aggregates, approximately 10% dull pale yellow to gold mineral fluorescence (dolomitic cement), no shows, some aggregates pyrite encrusted (trace). |
| | 20 | SILTSTONE: As above, rare cuttings with pyrite veins. |
| | 10 | CLAYSTONE: As above, (cavings). |
| | Trace | COAL: As above. |
| 2660m | 65 | SANDSTONE: (Type 2): As above, except greater percentage as loose, unconsolidated |

## Lithology Descriptions

| Depth | % | Description |
|---|---|---|
| 2660m cont. | | grains or small aggregates of 3-4 grains held together by matrix, grain size medium to very fine, poorly sorted, very poor to fair visual porosity, trace dolomitic cement and mineral fluorescence, no shows. |
| | 30 | SILTSTONE: As above. |
| | 5 | CLAYSTONE: As above. |
| | Trace | COAL: As above. |
| 2665m | 50 | SANDSTONE: As above, except less loose aggregates, grains fine to coarse. |
| | 40 | SILTSTONE: As above. |
| | 10 | CLAYSTONE: As above. |
| | Trace | COAL: As above. |
| 2670 | 35 | SANDSTONE: (Type 2): Light to medium grey, fawn to cream, occasionally light brown, very fine to fine grains, common carbonaceous fragments, rare feldspar and mica in argillaceous matrix (aggregates), moderately to poorly sorted, subangular to subrounded, very poor to poor visual porosity, very light trace dolomitic cement (dull yellow to gold mineral fluorescence), friable to hard predominantly friable. |
| | 55 | SILTSTONE: Light brown to dark brown, predominantly medium brown, argillaceous and carbonaceous, predominantly composed of silt sized quartz grains and mica in argillaceous |

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Lithology Descriptions

| Depth | % | Description |
|---|---|---|
| 2670m cont. | | matrix, carbonaceous matrix, blocky to subfissile, soft to firm, predominantly firm. |
| | 10 | CLAYSTONE: As above. |
| | Trace | COAL: |
| 2675m | 30 | SANDSTONE: As above. |
| | 60 | SILTSTONE: As above. |
| | 10 | CLAYSTONE: As above. |
| | Trace | COAL: As above. |
| 2680m | 45 | SANDSTONE: (type 2): As above, rare feldspar in part, well developed thin carbonaceous laminae in part. |
| | 45 | SILTSTONE: As above. |
| | 10 | CLAYSTONE: As above. |
| | Trace | COAL: Pyrite encrustations in part. |
| 2685m | 30 | SANDSTONE: (Type 2): As above, trace pyrite. |
| | 60 | SILTSTONE: As above. |
| | 10 | CLAYSTONE: As above. |
| | Trace | COAL: As above. |
| 2690m | 45 | SANDSTONE: (Type 2): Light grey to fawn, light brown, aggregates of quartz, very fine to predominantly fine grained, argillaceous in part, quartz subangular to subrounded, moderate to low sphericity, moderately sorted, variable amount argillaceous matrix (white to light brown), dolomitic cement in |

## Lithology Descriptions

| Depth | % | Description |
|---|---|---|
| 2690m cont. | | places, friable to firm/hard (if cemented) very poor to poor visual porosity, very light trace dull yellow to gold mineral fluorescence, no shows, trace pyrite. |
| | 45 | SILTSTONE: As above. |
| | 10 | CLAYSTONE: As above. |
| | Trace | COAL: As above. |
| 2695m | 40 | SANDSTONE: (Type 2): As above, very argillaceous in part, no shows, trace pyrite. |
| | 55 | SILTSTONE: As above, very argillaceous in part. |
| | 5 | CLAYSTONE: As above. |
| | Trace | COAL: As above, very light trace amber. |
| 2700m | 10 | SANDSTONE: Quartz grains and aggregates, fine to coarse grained, translucent to transparent, subangular to subrounded, moderate to low sphericity, poorly sorted, white argillaceous matrix in part, quartz overgrowths, common siliceous cement, no significant dolomitic cement, no shows, very poor to no visual porosity. |
| | 65 | SANDSTONE: (Type 2): As above, dolomitic cement, 5% dull yellow to gold mineral fluorescence, trace pyrite. |
| | 20 | SILTSTONE: As above. |
| | 5 | CLAYSTONE: As above. |
| | Trace | COAL: As above. |

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Lithology Descriptions

| Depth | % | Description |
|---|---|---|
| 2705m | Trace | SANDSTONE: As above. |
| | 45 | SANDSTONE: (Type 2): As above, very argillaceous in part, very light trace mineral fluorescence. |
| | 20 | SILTSTONE: As above. |
| | 5 | CLAYSTONE: As above. |
| | 30 | COAL: Black to dark brown, silty in part, earthy, waxy to subvitreous, subconchoidal, fractured in part, blocky, hard, brittle. |
| 2710m | Trace | SANDSTONE: As above, heavy siliceous cement, very rare dolomite cement. |
| | 45 | SANDSTONE: (Type 2): As above, very light trace dull yellow to gold mineral fluorescence, trace pyrite. |
| | 30 | SILTSTONE: As above. |
| | 20 | COAL: Very silty in part. |
| | 5 | CLAYSTONE: As above. |
| 2715m | 40 | SANDSTONE: (Type 2): Light grey to light brown, fawn aggregates, quartz, very fine to fine grains, subangular to subrounded, moderately sorted, moderate sphericity, common carbonaceous fragments and mica, rare feldspar, commonly very argillaceous, argillaceous matrix (white), very light trace dull yellow to gold mineral fluorescence, no shows, very poor to poor visual porosity. |

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Lithology Descriptions

| Depth | % | Description |
|---|---|---|
| 2715m cont. | 55 | SILTSTONE: As above. |
| | 5 | CLAYSTONE: As above. |
| | Trace | SANDSTONE: Cemented quartz grains (silica). medium grained. |
| | Trace | COAL: As above. |
| 2720m | 5 | SANDSTONE: (Type 2): As above. |
| | 5 | SILTSTONE: As above. |
| | Trace | CLAYSTONE: As above. |
| | 90 | COAL: Black to dark brown, predominantly black, waxy, earthy to predominantly subvitreous, subconchoidal fractures in part, blocky, hard, brittle, silty in part, very light trace blue white fluorescent amber. |
| 2725m | 30 | SANDSTONE: (Type 2): As above, medium to coarse quartz grains, translucent to transparent, weak silica cement and dolomitic cement, very light trace dull yellow white fluorescence. |
| | 70 | SILTSTONE: Medium brown to dark brown, argillaceous, carbonaceous, silt sized quartz grains, white mica and carbonaceous fragments/laminae in an argillaceous matrix, blocky to subfissile, soft to firm, predominantly firm. Note: Coal and siltstone still have crush cut no fluorescence (pale milky yellow), some colour residual ring. |

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Lithology Descriptions

| Depth | % | Description |
|---|---|---|
| 2725m cont. | Trace | CLAYSTONE: As above, (cavings). |
| | Trace | COAL: As above. |
| 2730m | 60 | SANDSTONE: (Type 2): As above, fine to very coarse quartz grains, no shows. |
| | 30 | SILTSTONE: As above. |
| | 10 | CLAYSTONE: As above. |
| | Trace | COAL: As above. |
| 2735m | 30 | SANDSTONE: (Type 2): As above, trace quartz grains. |
| | 60 | SILTSTONE: As above, arenaceous to argillaceous. |
| | Trace | CLAYSTONE: As above. |
| | 10 | COAL: As above. |
| 2740m | 80 | SANDSTONE: (Type 2): Light grey to medium brown, aggregates very fine to fine grains, quartz, mica, carbonaceous matrix and rare feldspar, quartz subangular to subrounded, moderate to low sphericity, moderately sorted, white to brown argillaceous matrix, grades to arenaceous siltstone in part, very poor to poor visual porosity, trace dolomitic cement, no shows. |
| | 15 | SILTSTONE: As above, trace pyrite. |
| | 5 | CLAYSTONE: As above. |
| | Trace | COAL: As above |

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Lithology Descriptions

| Depth | % | Description |
|---|---|---|
| 2745m | 60 | SANDSTONE: As above, very argillaceous, no shows. |
| | 30 | SILTSTONE: As above, very argillaceous. |
| | Trace | CLAYSTONE: As above. |
| | 10 | COAL: Predominantly black, subvitreous, common subconchoidal fracture, blocky, hard, brittle, rare amber. |
| 2750m | 40 | SANDSTONE: As above. |
| | 40 | SILTSTONE: As above. |
| | 20 | COAL: As above. |
| | Trace | CLAYSTONE: As above. |
| 2755m | 60 | SANDSTONE: (Type 2): Light grey, beige/fawn to light medium brown, aggregates, very fine to fine grained quartz, mica, carbonaceous fragments and laminae, rare feldspar, quartz grains subangular to subrounded, moderate sphericity, very argillaceous in part, moderately sorted, white to light brown, argillaceous matrix, friable, very poor to poor visual porosity, trace dolomite cement, dull yellow to gold mineral fluorescence, no shows. |
| | 35 | SILTSTONE: As above. |
| | 5 | CLAYSTONE: As above. |
| | Trace | COAL: As above. |

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Lithology Descriptions

| Depth | % | Description |
|---|---|---|
| 2760m | 30 | SANDSTONE: (Type 2): As above. |
| | 50 | SILTSTONE: As above. |
| | Trace | CLAYSTONE: As above. |
| | 20 | COAL: As above, predominantly black, silty in part, predominantly subvitreous, subconchoidal fractures in part, nodular and vein-like pyrite in part, hard, brittle, blocky. |
| 2765m | 20 | SANDSTONE: (Type 2): As above, very argillaceous in part, no shows. |
| | 80 | SILTSTONE: As above, argillaceous in part. |
| | Trace | CLAYSTONE: As above. |
| | Trace | COAL: As above. |
| 2770m | 30 | SANDSTONE: (Type 2): Becoming increasingly argillaceous and grading to arenaceous, siltstone/mudstone. |
| | 60 | SILTSTONE: Medium to dark brown, very argillaceous and carbonaceous, scattered silt sized quartz grains, white mica, rare feldspar, common carbonaceous flecks and laminae, light to dark brown argillaceous matrix. |
| | 10 | COAL: As above. |
| | Trace | CLAYSTONE: As above. |
| 2775m | 40 | SANDSTONE: (Type 2): As above. |
| | 60% | SILTSTONE: As above. |

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Lithology Descriptions

| Depth | % | Description |
|---|---|---|
| 2775m cont. | Trace | COAL: As above. |
| | Trace | CLAYSTONE: As above. |
| 2780m | 10 | SANDSTONE: Loose unconsolidated quartz grains and aggregates, predominantly very coarse to coarse grains, translucent to transparent, colourless to faint milky white, grains often shattered, subangular to subrounded, moderate sphericity, moderately sorted, silica cement, very rare white argillaceous matrix, pyrite inclusions in quartz in part, aggregates, very hard, no visual porosity. |
| | 30 | SANDSTONE: (Type 2): As above. |
| | 60 | SILTSTONE: As above. |
| | Trace | COAL: As above. |
| | Trace | CLAYSTONE: As above. |
| 2785m | 10 | SANDSTONE: As above, few more unshattered grains and fewer aggregates suggest less cementation therefore possibly better porosity and permeability than above. |
| | 40 | SANDSTONE: (Type 2): As above, argillaceous. |
| | 50 | SILTSTONE: As above. |
| | Trace | COAL: As above. |
| | Trace | CLAYSTONE: As above. |
| 2790m | 30 | SANDSTONE: (Type 2): As above, 10% dolomitic cement, dull yellow to gold mineral |

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Lithology Descriptions

| Depth | % | Description |
|---|---|---|
| 2790 cont. | | fluorescence, dolomitic cement sandstone hard and medium grey colour, no shows. |
| | 5 | SANDSTONE: Unconsolidated translucent to transparent quartz grains, very fine to fine grained, subangular to subrounded, moderate to well sorted, white argillaceous matrix, no cut, fair inferred visual porosity, no shows. |
| | 65 | SILTSTONE: As above. |
| | Trace | CLAYSTONE: As above. |
| | Trace | COAL: As above. |
| 2795m | 45 | SANDSTONE: (Type 2): As above, trace dolomitic cement, no shows. |
| | 55 | SILTSTONE: As above. |
| | Trace | COAL: As above. |
| | Trace | CLAYSTONE: As above. |
| 2800m | 30 | SANDSTONE: (Type 2): As above. |
| | 60 | SILTSTONE: As above. |
| | 10 | SANDSTONE: Loose, unconsolidated, small aggregate, very fine to fine grains, subangular to subrounded, moderate to well sorted, moderate sphericity, white argillaceous matrix present between grains in aggregates, fair visual porosity. |
| | Trace | COAL: As above. |
| | Trace | CLAYSTONE: As above. |

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Lithology Descriptions

| Depth | % | Description |
|---|---|---|
| 2805m | 40 | SANDSTONE: (Type 2): As above, no shows. |
| | 55 | SILTSTONE: Light brown to dark brown, argillaceous to arenaceous, as above. |
| | 5 | SANDSTONE: Medium to coarse grained, loose grains and well cemented aggregates, larger grains and aggregates often shattered, translucent to transparent, subangular to subrounded, moderate sphericity, moderately sorted, silica cement, no visual porosity, no shows. |
| | Trace | COAL: As above, trace pyrite. |
| | Trace | CLAYSTONE: As above. |
| 2810m | 70 | SANDSTONE: (Type 2): Light grey to medium brown, aggregates, subangular to subrounded, moderate sphericity quartz grains, rare feldspar, white mica and carbonaceous flecks and laminae, variable white argillaceous matrix, moderately sorted, grades to arenaceous siltstone/mudstone, friable to soft. |
| | 30 | SILTSTONE: As above. |
| | Trace | SANDSTONE: As above. |
| | Trace | COAL: As above, trace pyrite. |
| | Trace | CLAYSTONE: As above. |
| 2815m | 40 | SANDSTONE: (Type 2): As above, trace pyrite, very coarse to coarse quartz grains, no shows. |

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Lithology Descriptions

| Depth | % | Description |
|---|---|---|
| 2815m cont. | 60 | SILTSTONE: As above. |
| | Trace | CLAYSTONE: As above. |
| | Trace | COAL: As above. |
| 2820m | 40 | SANDSTONE: (Type 2): As above, silica cement, no shows. |
| | 60 | SILTSTONE: Light to dark brown, predominantly medium, argillaceous and carbonaceous, some cuttings show few visual constants while others quartz, feldspar, white mica and carbonaceous fragments in argillaceous matrix. |
| | Trace | CLAYSTONE: As above. |
| | Trace | COAL: As above. |
| 2825m | 10 | SANDSTONE: Fine grained, loose, unconsolidated quartz grains, subangular to subrounded, moderate to high sphericity, moderate to well sorted, white argillaceous matrix, rare mica, fair porosity, no shows. |
| | 10 | SANDSTONE: (Type 2): As above. |
| | 40 | SILTSTONE: As above. |
| | 10 | CLAYSTONE: As above, (cavings). |
| | 30 | COAL: Predominantly black. |
| 2830m | 15 | SANDSTONE: Loose unconsolidated quartz grains, small aggregates, medium to very coarse, poorly sorted, loose grains, |

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Lithology Descriptions

| Depth | % | Description |
|---|---|---|
| 2830m cont. | | subangular to subrounded, moderate sphericity, silica cement, trace white argillaceous matrix, no visual porosity, loose grains fair to good, no shows. |
| | 10 | SANDSTONE: (Type 2): As above, no shows. |
| | 65 | SILTSTONE: As above, very carbonaceous in places. |
| | 5 | CLAYSTONE: As above, |
| | Trace | ROCK FLOUR: White to beige, soft, argillaceous,common quartz grains, grading to arenaceous siltstone/mudstone. |
| | 5 | COAL: As above. |
| 2835m | 75 | SANDSTONE: As above, medium to very coarse, very poorly sorted, porosity is fair to good where uncemented, none where cemented. |
| | 10 | SANDSTONE: (Type 2): As above. |
| | 10 | SILTSTONE: |
| | 5 | COAL: As above. |
| | Trace | CLAYSTONE: As above. |
| 2840m | 20 | SANDSTONE: As above. |
| | 50 | SANDSTONE: (Type 2): As above. |
| | 30 | SILTSTONE: As above. |
| | Trace | CLAYSTONE: As above. |
| | Trace | COAL: As above. |
| 2845m | 30 | SILTSTONE: Medium to dark brown, very carbonaceous, grades to coal, firm. |

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Lithology Descriptions

| Depth | % | Description |
|---|---|---|
| 2845m cont. | 70 | COAL: Dark brown to black, silty in part, earthy to predominantly subvitreous, subconchoidal fracture in part, blocky, hard, brittle. |
| | Trace | SANDSTONE: (Type 2): As above, medium to very coarse quartz grains. |
| | Trace | CLAYSTONE: As above. |
| 2850m | 65 | SANDSTONE: (Type 2): Light grey to light brown, aggregates of predominantly fine to coarse quartz grains, mica, trace feldspar, carbonaceous flecks and laminae, variable amount of argillaceous matrix (white) grades to arenaceous siltstone/mudstone in part, large amount calcareous/dolomitic cement, 5-10% predominantly moderate bright yellow fluorescence, very calcareous, none to very poor visual porosity, no shows. |
| | 30 | SILTSTONE: As above. |
| | Trace | CLAYSTONE: As above. |
| | 5 | COAL: As above. |
| 2855m | 50 | SANDSTONE: (Type 2): As above 5% mineral fluorescence as above, no shows. |
| | 50 | SILTSTONE: As above. |
| | Trace | CLAYSTONE: As above. |
| | Trace | COAL: As above. |
| 2860m | 100 | COAL: Predominantly black, subvitreous, common hackly to subconchoidal fracture, |

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Lithology Descriptions

| Depth | % | Description |
|---|---|---|
| 2860m cont. | | hard, brittle, blocky, trace carbonaceous siltstone. |
| 2865m | 100 | COAL: As above. |
| 2870m | 100 | COAL: As above. |
| 2875m | 80 | COAL: As above. |
| | 10 | SILTSTONE: As above. |
| | Trace | CLAYSTONE: As above. |
| | 10 | SANDSTONE: (type 2): As above. |
| 2880m | 70 | SANDSTONE: Loose, unconsolidated and small aggregates, fine to very fine quartz grains, subangular to subrounded, moderate to high sphericity, moderately sorted, white argillaceous matrix, fair visual porosity, no shows. |
| | 20 | SANDSTONE: (Type 2): Aggregates of quartz grains, light grey to beige to light brown, predominantly fine grained, composed of quartz, mica, carbonaceous flecks and laminae and feldspar, white to light brown argillaceous matrix, friable to soft, very poor to poor visual porosity, no shows, very light trace mineral fluorescence. |
| | 10 | SILTSTONE: As above. |
| | Trace | COAL: As above. |
| | Trace | CLAYSTONE: As above. |

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Lithology Descriptions

| Depth | % | Description |
|---|---|---|
| 2885m | 90 | SANDSTONE: As above, fine to medium grain (rare coarse grains), light trace siliceous cement, fair to good visual porosity, no shows. |
| | 5 | SANDSTONE: (Type 2): As above, trace pyrite. |
| | 5 | SILTSTONE: As above. |
| | Trace | CLAYSTONE: As above. |
| | Trace | COAL: As above. |
| 2890m | 55 | SANDSTONE: As above, fine to coarse, poorly sorted, fair to good porosity, no shows. |
| | 30 | SANDSTONE: (Type 2): Light grey to beige to light brown, aggregates composed quartz (subangular to subrounded, moderate to high sphericity, well sorted in part), white beige argillaceous matrix, small amount calcareous/dolomite cement, silica cement in part, very poor to poor visual porosity, no shows. |
| | 10 | SILTSTONE: As above. |
| | 5 | COAL: As above. |
| | Light Trace | CLAYSTONE: As above. |
| 2895m | 75 | SANDSTONE: As above, fine to coarse, predominantly medium grain, well developed silica cement in part, fair to good visual porosity (where uncemented). |
| | 10 | SANDSTONE: (Type 2): As above, trace pyrite. |
| | 10 | SILTSTONE: As above. |
| | 5 | COAL: As above. |
| | Trace | CLAYSTONE: As above. |

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Lithology Descriptions

| Depth | % | Description |
|---|---|---|
| 2900m | 35 | SANDSTONE: As above, predominantly medium to coarse grains, loose quartz grains, larger grains shattered, silica cement and small amount argillaceous matrix present in aggregates, none to good visual porosity, aggregates friable to hard, no shows. |
| | 35 | SANDSTONE: (Type 2): As above, very fine to fine grain silica cement (quartz overgrowths) in part, very argillaceous in part, very poor to poor visual porosity, soft (argillaceous), friable (little matrix) to firm (silica cement), no shows, trace pyrite. |
| | 30 | SILTSTONE: As above. |
| | Trace | COAL: As above. |
| | Trace | CLAYSTONE: As above. |
| 2905m | 20 | SANDSTONE: As above, no shows. |
| | 50 | SANDSTONE: (Type 2): As above, no shows. |
| | 30 | SILTSTONE: As above. |
| | Trace | CLAYSTONE: As above. |
| | Trace | COAL: As above. |
| 2910m | 10 | SANDSTONE: As above. |
| | 70 | SANDSTONE: (Type 2): As above, trace pyrite. |
| | 20 | CLAYSTONE: As above. |
| | Trace | COAL: As above. |
| 2915m | 60 | SANDSTONE: (Type 2): Very fine to fine grained quartz aggregates, light grey to |

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Lithology Descriptions

| Depth | % | Description |
|---|---|---|
| 2915m cont. | | light medium brown, subangular to subrounded, moderate sphericity, moderately sorted, feldspar, carbonaceous fragments and laminae, white mica, variable cement, white to beige argillaceous matrix, grades to arenaceous siltstone in part, silica cement in part, friable to moderately hard if well cemented, trace pyrite, none to very poor visual porosity, 5% dull yellow to gold fluorescence (mineral-dolomite/calcite) mainly dolomite. |
| | 40 | SILTSTONE: Light to dark brown, scattered quartz grains, medium to very coarse quartz grains, subangular to subrounded, rare feldspar, common carbonaceous fragments and laminae, white mica, argillaceous and carbonaceous, some cuttings very argillaceous, soft to firm, blocky to subfissile. |
| | Trace | COAL: As above. |
| 2920m | 45 | SANDSTONE: (Type 2): As above. |
| | 15 | SILTSTONE: As above. |
| | 40 | COAL: Black to dark brown, predominantly subvitreous, subconchoidal fracture in part, silty in part, hard, brittle, blocky. |
| 2925m | 20 | COAL: As above. |
| | 70 | CLAYSTONE: Light to medium grey, very calcareous, even colour and texture, common |

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Lithology Descriptions

| Depth | % | Description |
|---|---|---|
| 2925m cont. | | forams, calcareous fragments, very argillaceous, (cavings). |
| | 5 | SANDSTONE: (Type 2): As above, medium to coarse quartz grains, no shows. |
| | 5 | SILTSTONE: As above. |
| 2930m | 70 | CLAYSTONE: As above, (cavings). |
| | 20 | SILTSTONE: As above. |
| | 10 | SANDSTONE: (Type 2): As above, no shows. |
| | Trace | COAL: As above. |
| 2935m | 60 | CLAYSTONE: As above. |
| | 30 | SILTSTONE: As above. |
| | 10 | SANDSTONE: (Type 2): As above, light trace moderately bright to dull yellow gold fluorescence (calcite to dolomite), rare medium to coarse quartz grains, no shows. |
| | Trace | COAL: As above. |
| 2940m | 50 | CLAYSTONE: As above. |
| | 25 | SILTSTONE: As above. |
| | 15 | SANDSTONE: (Type 2): No shows. |
| | 10 | SANDSTONE: Loose, unconsolidated, predominantly medium to very coarse grain, well rounded to subangular, larger grains shattered, very little matrix but well cemented by silica in part, visual porosity good where uncemented, no shows. |
| | Trace | COAL: As above. |

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Lithology Descriptions

| Depth | % | Description |
|---|---|---|
| 2945m | 60 | SANDSTONE: Loose, unconsolidated, medium to coarse grained (predominantly medium), grades into low matrix type 2 sandstone which is predominantly fine grained with 5% white argillaceous matrix, subangular to subrounded, silica cement in part, moderate to poorly sorted, poor to good visual porosity. |
| | 10 | SANDSTONE: (Type 2): As above, common carbonaceous fragments, mica, white, beige argillaceous matrix, rare lithic grains (very fine grains, dark grey chert), very light trace bright to dull yellow, yellow to gold mineral fluorescence (dolomite to calcite). |
| | 20 | SILTSTONE: As above. |
| | 10 | CLAYSTONE: As above. |
| | Trace | COAL: As above. |
| 2950m | 60 | SANDSTONE: Predominantly medium to coarse, as above. |
| | Trace | SANDSTONE: (Type 2): As above. |
| | Trace | SILTSTONE: As above. |
| | Trace | CLAYSTONE: As above. |
| | 40 | COAL: Black, predominantly subvitreous, hackly to striated and subconchoidal fractures in part, hard, brittle, blocky. |
| 2955m | 85 | SANDSTONE: As above, no shows, fair to very good visual porosity. |

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Lithology Descriptions

| Depth | % | Description |
|---|---|---|
| 2955m cont. | 5 | SANDSTONE: (Type 2): As above, trace mica, trace pyrite, no shows. |
| | Trace | SILTSTONE: As above. |
| | Trace | CLAYSTONE: As above, trace glauconite. |
| | 10 | COAL: As above. |
| 2960m | 85 | SANDSTONE: Loose, unconsolidated, predominantly medium to coarse, quartz grains, subangular to subrounded, moderate sphericity, moderately sorted, trace matrix and silica cement, fair to very good visual porosity, no shows. |
| | 5 | SANDSTONE: (Type 2): As above, no shows. |
| | 10 | SILTSTONE: As above. |
| | Trace | CLAYSTONE: As above. |
| | Trace | COAL: As above. |
| 2965m | 90 | SANDSTONE: Loose, unconsolidated to small aggregates, fine to very coarse, predominantly medium to coarse, subangular to subrounded, moderate sphericity, poorly sorted, trace glauconite, white argillaceous matrix in part, dolomite and silica cements, rare feldspar, mica and lithic fragments in finer grained aggregates, trace dull yellow gold mineral fluorescence (dolomite), no shows. |
| | 5 | SANDSTONE: (Type 2): As above. |
| | 5 | SILTSTONE: As above. |

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Lithology Descriptions

| Depth | % | Description |
|---|---|---|
| 2965m cont. | Trace | CLAYSTONE: As above. |
| | Trace | COAL: As above. |
| 2970 | 60 | SANDSTONE: As above, aggregates cemented by dolomite and silica cement. |
| | 5 | SILTSTONE: Light to dark brown, argillaceous, carbonaceous composed of silt sized scattered quartz grains, rare feldspar, mica, carbonaceous flecks and laminae, predominantly firm, blocky, subfissile, grades into very fine to fine grained sandstone and coal. |
| | 5 | SANDSTONE: (Type 2): As above, very fine to fine grained, 10-30% argillaceous matrix, common carbonaceous flecks and laminae grading to siltstone, trace pyrite. |
| | 30 | COAL: Predominantly black, occasional dark brown, subconchoidal fractures in part, hard, brittle, blocky. |
| | Trace | CLAYSTONE: As above. |
| 2975m | 20 | SANDSTONE: As above, no shows. |
| | 20 | SANDSTONE: (Type 2): As above, no shows. |
| | 50 | SILTSTONE: As above. |
| | 10 | COAL: As above. |
| | Trace | CLAYSTONE: As above. |
| 2980m | 75 | SILTSTONE: Light brown to dark brown, predominantly medium brown, composed of |

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Lithology Descriptions

| Depth | % | Description |
|---|---|---|
| 2980m cont. | | scattered silt sized quartz grains, white mica, common carbonaceous flecks and laminae, rare feldspar interbedded with light grey, very fine to fine grained sandstone in part, soft to predominantly firm, (no shows). |
| | 20 | SANDSTONE: (Type 2): Aggregates of very fine to fine grained quartz, subangular to subrounded, moderate to high sphericity, moderate to well sorted, common white mica and carbonaceous fragments, rare feldspar and lithics, variable white argillaceous matrix, some dolomite/silica cement, no shows. |
| | Trace | SANDSTONE: As above, trace pyrite. |
| | Trace | CLAYSTONE: As above. |
| | 5 | COAL: As above. |
| 2985m | 90 | SILTSTONE: As above but becoming more argillaceous, grades into claystone in part. |
| | 10 | SANDSTONE: (Type 2): As above, medium to coarse quartz grains, subangular to subrounded, trace pyrite. |
| | Trace | COAL: As above. |
| | Trace | CLAYSTONE: As above. |
| 2990m | 90 | SILTSTONE: As above. |
| | 10 | SANDSTONE: (Type 2): As above, 5% dull to rarely bright yellow mineral fluorescence (dolomite and calcite cement), trace medium to coarse quartz grains, trace pyrite. |

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Lithology Descriptions

| Depth | % | Description |
|---|---|---|
| 2990 cont. | Trace | CLAYSTONE: As above. |
| | Trace | COAL: As above. |
| 2995m | 95 | SILTSTONE: Light to dark brown, composed of scattered silt sized quartz grains, white mica, rare feldspar, common carbonaceous fragments and laminae, argillaceous matrix, carbonaceous, arenaceous to very argillaceous in part, predominantly firm, predominantly blocky but subfissile in part, pale milky yellow crush cut and residual ring. |
| | 5 | SANDSTONE: (Type 2): As above, all sandstone has calcite/dolomite cement to moderately bright to dull yellow to yellow white mineral fluorescence, trace quartz grains, trace pyrite. |
| | Trace | CLAYSTONE: As above. |
| | Trace | COAL: As above. |
| 3000m | 60 | SILTSTONE: As above. |
| | 40 | COAL: Predominantly black, subconchoidal fractures, hard, brittle, blocky. |
| | Trace | SANDSTONE: (Type 2):As above. |
| 3005m | 20 | SILTSTONE: As above, grades into coal. |
| | 80 | COAL: As above, silty in part. |

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Lithology Descriptions

| Depth | % | Description |
|---|---|---|
| 3025m | 95 | SILTSTONE: Medium to dark brown, predominantly dark, argillaceous and carbonaceous, abundant plant fragments, firm, grades to carbonaceous mudstone, blocky to subfissile, fissile in part. |
| | Trace | COAL: As above. |
| | 5 | SANDSTONE: Loose quartz grains and aggregates, fine to medium grain, angular to subangular, predominantly subangular, moderate to poorly sorted, moderate sphericity composed of quartz, mica, rare feldspar, rare lithics, carbonaceous fragments in part, white argillaceous matrix, coarser grained aggregates well cemented by dolomite and silica, friable to hard, trace dull yellow/gold fluorescence, no cut. |
| | Trace | CLAYSTONE: As above. |
| 3030m | 70 | SANDSTONE: Loose unconsolidated with small aggregates, fine to predominantly medium grain, angular to subangular, because grains been cemented, clasts have nearly all been shattered, very straight faces on some quartz grains due to overgrowths, aggregates friable to hard, none to poor visual porosity, dolomite and silica and siderite? cements, trace pyrite. |
| | 30 | SILTSTONE: As above. |
| | Trace | CLAYSTONE: As above. |
| | Trace | COAL: As above. |

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Lithology Descriptions

| Depth | % | Description |
|---|---|---|
| 3035m | 85 | SANDSTONE: Fine to very coarse, poorly sorted. |
| | 5 | SANDSTONE: (Type 2): As above, 2% dull to moderately bright yellow mineral fluorescence (dolomite/siderite?). |
| | 5 | SILTSTONE: As above. |
| | 5 | COAL: As above. |
| | Trace | CLAYSTONE: As above. |
| 3040m | 95 | SANDSTONE: Loose, unconsolidated quartz grains and small aggregates, fine to very coarse grains, predominantly medium to coarse grained, very poorly sorted, larger grains and silica cement aggregates shattered, subangular to subrounded, less shattered grains than above becoming less cementation, small amount argillaceous matrix in part, heavy trace silica, dolomite/siderite? cement, poor to good visual porosity, no shows, trace dull to moderately bright yellow to yellow white mineral fluorescence. |
| | 5 | SANDSTONE: (Type 2): Aggregates subangular to subrounded, moderate to high sphericity, moderate to well sorted, white mica, feldspar, rare lithics, carbonaceous fragments, white argillaceous matrix, friable to hard where silica, dolomite/siderite cement, very poor to poor visual porosity, trace dull to moderately bright yellow, |

## Lithology Descriptions

| Depth | % | Description |
|---|---|---|
| 3040m cont. | | yellow to white mineral fluorescence, trace pyrite, no shows. |
| | Trace | SILTSTONE: As above. |
| | Trace | CLAYSTONE: As above. |
| | Trace | COAL: As above. |
| 3045m | 90 | SANDSTONE: As above. |
| | 5 | SILTSTONE: As above. |
| | 5 | SANDSTONE: (Type 2): As above. |
| | Trace | COAL: As above. |
| | Trace | CLAYSTONE: As above. |
| 3050m | 95 | SANDSTONE: Loose, unconsolidated, small aggregates, medium to coarse grains, angular to subangular, moderate to low sphericity, poorly sorted, most grains shattered due to heavy cement, common silica and dolomite/siderite? cement, none to very poor visual porosity, no shows. |
| | Trace | SANDSTONE: (Type 2): As above, no shows, trace yellow to gold dull mineral fluorescence, moderate to bright siderite? |
| | 5 | SILTSTONE: As above. |
| | Trace | CLAYSTONE: As above. |
| | Trace | COAL: As above. |
| 3055m | 95 | SANDSTONE: Medium to coarse, no shows. |
| | Trace | SANDSTONE: (Type 2): As above, Light trace dull to moderately bright yellow to yellow white fluorescence dolomite/siderite. |

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Lithology Descriptions

| Depth | % | Description |
|---|---|---|
| 3055m cont. | 5 | SILTSTONE: As above. |
| | Trace | CLAYSTONE: As above. |
| | Trace | COAL: As above. |
| 3060m | 90 | SANDSTONE: Fine to very coarse, predominantly medium to coarse, very poorly sorted, loose, unconsolidated aggregates, angular to subangular, moderate to low sphericity, common silica, dolomite/siderite and rare pyrite cements, none to very poor visual porosity, no shows. |
| | 5 | SANDSTONE: (Type 2): Fine grained aggregates, composed of quartz (subangular to subrounded, moderate sphericity, moderately sorted), rare feldspar and lithics, mica and carbonaceous fragments/laminae, crystal faces on recrystalized quartz, common white to beige argillaceous matrix, dolomite/siderite cement, rarer silica cement, none to very poor visual porosity, trace mica, trace pyrite, no shows. |
| | 5 | SILTSTONE: As above. |
| | Trace | CLAYSTONE: As above. |
| | Trace | COAL: As above. |
| 3065m | 85 | SANDSTONE: As above. |
| | 5 | SANDSTONE: (Type 2): Dull to moderately bright yellow white to yellow mineral fluorescence dolomite/siderite. |

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Lithology Descriptions

| Depth | % | Description |
|---|---|---|
| 3065m cont. | 10 | SILTSTONE: As above, medium to dark brown, argillaceous, carbonaceous, composed of scattered quartz, rare feldspar, mica, carbonaceous flecks and laminae, common plant fragments, predominantly firm, subfissile to blocky. |
| | Trace | CLAYSTONE: As above, (cavings). |
| | Trace | COAL: As above. |
| 3068m | 10 | SANDSTONE: (Type 2): Light grey to light brown, very fine to fine grained aggregates, composed of quartz, feldspar, mica, carbonaceous fragments and laminae, very argillaceous in places, grading to siltstone, no shows. |
| | 80 | SANDSTONE: As above, excellent crystal faces on recrystalized quartz. |
| | 10 | SILTSTONE: As above. |
| | Trace | COAL: As above. |
| | Trace | CLAYSTONE: As above. |

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Lithology Descriptions

| Depth | % | Description |
|---|---|---|
| 3005m cont. | Trace | SANDSTONE: (Type 2): As above, calcareous cement in part (trace), trace medium quartz grains. |
| | Trace | CLAYSTONE: As above (cavings). |
| 3010m | 90 | SILTSTONE: Predominantly dark brown, very carbonaceous and argillaceous, rare plant fragments, clay matrix, almost all carbonaceous claystone in part, in coarser cuttings do have silt sized quartz, mica, rare feldspar, complete gradation into coal, firm. |
| | 10 | COAL: Black, subvitreous, subconchoidal, "striated" surface upon fracture, blocky, hard, brittle. |
| | Trace | SANDSTONE: (Type 2): As above. |
| | Trace | CLAYSTONE: As above. |
| 3015m | 90 | SILTSTONE: As above. |
| | 10 | COAL: As above. |
| | Trace | SANDSTONE: (Type 2): As above, trace pyrite. |
| | Trace | CLAYSTONE: As above. |
| 3020m | 100 | SILTSTONE: As above. |
| | Trace | COAL: As above. |
| | Trace | SANDSTONE: (Type 2): As above, 2% dull to moderately bright yellow to white mineral fluorescence (dolomite/calcite). |
| | Trace | CLAYSTONE: As above. |

# APPENDIX 2

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SIDEWALL CORE DESCRIPTIONS

| NO. | Depth (m) | Rec. (mm) | B/R | Description |
|---|---|---|---|---|
| 1 | 3022.5 | 25 | B | SILTSTONE: argillaceous, carbonaceous, mica, very slightly calcareous, dark brown, soft to firm, silty, no fluorescence, moderately bright, moderate to slow streaming cut pale milky yellow, heavy cut residue (colourless in white light, bright pale to milky yellow in ultra-violet). |
| 2 | 3008 | 35* | B | SILTSTONE/MUDSTONE: argillaceous, carbonaceous (common plant fragments), rare mica, medium to dark brown, firm, clayey to silty, no fluorescence, pale milky yellow crush cut, heavy cut residue (colourless in white light, bright pale to milky yellow in ultra-violet). |
| 3 | 2997 | LB | - | |
| 4 | 2981 | 45 | B | MUDSTONE: (coal), subvitreous to vitreous coal fragments and laminae, dark brown to black, firm to hard, no fluorescence, moderate to slow streaming cut pale milky yellow, heavy cut residue (colourless in white light, bright pale to milky yellow in ultra-violet). |

COMMENTS: * Note: Rec. length estimated from amount of broken material in sample jar - not a direct measurement.

LB = Lost Bullet

E = Empty

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SIDEWALL CORE DESCRIPTIONS

| NO. | Depth (m) | Rec. (mm) | B/R | Description |
|---|---|---|---|---|
| 5 | 2977 | 17 | B | SILTSTONE: argillaceous, composed of silt sized quartz, rare feldspar, mica, carbonaceous fragments in argillaceous matrix, grades to very fine sandstone in part, light to medium brown, soft, very dull yellow to gold mineral fluorescence in sandstone (dolomite), very weak pale milky yellow crush cut, light cut residue (colourless in white light, very pale to milky yellow in ultra-violet). |
| 6 | 2957 | 30 | B | MUDSTONE: (coal), subvitreous to vitreous coal fragments and laminae interbedded with mudstone, dark brown to black, soft to firm, no fluorescence, slow streaming cut, pale to milky yellow, medium to light cut residue (colourless in white light, pale to milky yellow in ultra-violet). |
| 7 | 2931 | E | - | |
| 8 | 2928 | 20 | B | SANDSTONE: composed predominately of quartz (subangular to subrounded, moderate sphericity), rare feldspar, mica, carbonaceous fragments, abundant argillaceous matrix, (kaolinite) i.e. approximately 40%, grades to arenaceous mudstone, very fine to fine grained, light grey to white, friable to soft, |

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SIDEWALL CORE DESCRIPTIONS

| NO. | Depth (m) | Rec. (mm) | B/R | Description |
|---|---|---|---|---|
| | | | | none to very poor visual porosity, pinpoint bright yellow to white mineral fluorescence (no reaction to acid - siderite?), no cut. |
| 9 | 2921 | LB | - | |
| 10 | 2913 | 30 | B | SANDSTONE: composed predominately of quartz (subangular to subrounded, moderately sphericity), rare feldspar, trace mica, carbonaceous fragments, abundant argillaceous matrix, very fine grained, (kaolinitic?) i.e. approximately 20% grades to arenaceous siltstone, medium grey, heavily cemented in part, friable, nil to very poor visual porosity, trace pinpoint bright yellow to white mineral fluorescence (siderite?), no cut. |
| 11 | 2906.5 | LB | - | |
| 12 | 2895 | E | - | |
| 13 | 2877 | LB | - | |
| 14 | 2860 | 15 | B | MUDSTONE: scattered plant fragments but very even colour and texture, medium brown, no fissility, soft to firm, no fluorescence, very poor crush cut (from coaly fragments) pale to milky yellow (same colour residual ring). |

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SIDEWALL CORE DESCRIPTIONS

| NO. | Depth (m) | Rec. (mm) | B/R | Description |
|---|---|---|---|---|
| 15 | 2838 | 25 | B | SANDSTONE: composed predominantly of quartz (subangular to subrounded, moderate sphericity), very fine grained, also rare feldspar, trace mica, carbonaceous fragments and laminae, abundant argillaceous matrix (kaolinitic), i.e. approximately 20% grades to arenaceous siltstone, medium grey, cemented in part, friable, nil to very poor visual porosity, trace pinpoint bright yellow to white fluorescence, no cut. |
| 16 | 2822 | 30 | B | SILTSTONE: argillaceous, arenaceous grading to very fine grained sandstone, medium brown, composed silt sized quartz, mica and carbonaceous material in argillaceous matrix, soft to friable, no fluorescence, no cut. |
| 17 | 2817.5 | 25 | B | SILTSTONE: argillaceous, carbonaceous, micaceous in part, medium brown, firm, grades into mudstone, no fluorescence, no direct cut but faint pale milky yellow residual ring. |
| 18 | 2804 | 25 | B | SILTSTONE: argillaceous, heavy trace carbonaceous fragments (silt sized), micaceous in part, rare feldspar, medium brown, soft to firm, grades into mudstone and very fine grained sandstone in part, no fluorescence, no direct cut but pale milky yellow residual ring. |

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SIDEWALL CORE DESCRIPTIONS

| NO. | Depth (m) | Rec. (mm) | B/R | Description |
|---|---|---|---|---|
| 19 | 2796.8 | LB | - | |
| 20 | 2772 | LB | - | |
| 21 | 2743 | LB | - | |
| 22 | 2713 | LB | - | |
| 23 | 2685 | 35 | B | SANDSTONE: very fine grain, predominately quartz (subangular to subrounded, moderate sphericity), rare mica, common carbonaceous fragments, grades into arenaceous siltstone, argillaceous matrix, cemented in part, nil to very poor visual porosity, no fluorescence, no direct cut but pale milky yellow residual ring. |
| 24 | 2661.7 | LB | - | |
| 25 | 2639.5 | 30 | B | MUDSTONE: massive, even colour and texture, dark brown, trace mica, no visual organic matter, firm, no fluorescence, no direct cut but very faint milky yellow residual ring. |
| 26 | 2607 | 40 | B | SILTSTONE: argillaceous, mottled dark brown, light grey, dark brown, silty/argillaceous zones poorly laminated with light grey silty/arenaceous zones, friable, no visual porosity, no cut. |

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SIDEWALL CORE DESCRIPTIONS

| NO. | Depth (m) | Rec. (mm) | B/R | Description |
|---|---|---|---|---|
| 27 | 2570 | LB | - | |
| 28 | 2552 | E | - | |
| 29 | 2531 | 20 | B | INTERBEDDED SANDSTONE & SILTSTONE: finely laminated, silty, dark brown, argillaceous, carbonaceous in part, sandstone light grey, very fine grained, common argillaceous matrix, dominantly quartz but also mica and carbonaceous fragments, some cementation, laminae sub-parallel to wavy/lenticular, boundaries sharp, laminae several mm thick, none to very poor visual porosity, no cut. |
| 30 | 2500 | - | B | CUTTINGS: calcareous claystone - probably Gippsland/Lakes Entrance cavings. |
| 31 | 2460 | LB | - | |
| 32 | 2438 | 35 | B | MUDSTONE: massive, even colour and texture, medium brown, trace mica, no visual carbonaceous debris, material, soft/plastic to firm, no fluorescence, no cut. |
| 33 | 2431 | 25 | B | SANDSTONE: very fine grained, predominantly quartz (subangular to subrounded, moderate sphericity), moderately well sorted, also micaceous, carbonaceous fragments and rare |

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SIDEWALL CORE DESCRIPTIONS

| NO. | Depth (m) | Rec. (mm) | B/R | Description |
|---|---|---|---|---|
| | | | | feldspar, argillaceous matrix, friable, some cement (silica, dolomite), very poor to poor visual porosity, no fluorescence, no cut. |
| 34 | 2423 | 30 | B | MUDSTONE: massive, even colour and texture, very dark brown, rare very fine carbonaceous grains?, disseminated very fine grained pyrite and fine nodules of pyrite, thin (<0.5mm) stringer of siltstone, firm to hard, no fluorescence, no direct cut but trace moderately bright yellow to white residue. |
| 35 | 2417 | 30 | B | SANDSTONE: very fine to fine grained, composed predominantly of quartz, common mica, carbonaceous fragments, argillaceous matrix (kaolinite), subangular to subrounded, moderate sphericity, moderate to well sorted, very poor to poor visual porosity, no fluorescence, no direct cut. |
| 36 | 2404 | 30 | B | SANDSTONE: fine grained, composed predominantly of quartz (subangular to subrounded, moderate to high sphericity), moderate to well sorted, rare mica, abundant carbonaceous fragments, argillaceous matrix (kaolinitic?), very poor to poor visual porosity, trace pinpoint bright yellow to white fluorescence, no cut. |

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SIDEWALL CORE DESCRIPTIONS

| NO. | Depth (m) | Rec. (mm) | B/R | Description |
|---|---|---|---|---|
| 37 | 2389.5 | LB | - | |
| 38 | 2381.5 | 30 | B | SANDSTONE: very fine to fine grained, composed predominantly of quartz (subangular to subrounded, moderate to high sphericity), moderately sorted, rare mica, trace carbonaceous fragments, white argillaceous matrix, very poor visual porosity, no fluorescence, no cut. |
| 39 | 2360 | LB | - | |
| 40 | 2331 | 25 | - | SILTSTONE: argillaceous, silt sized quartz grains often brown in colour, trace mica and carbonaceous fragments, trace argillaceous matrix, firm, no fluorescence, very pale to milky yellow crush cut and light residue. |
| 41 | 2309 | 25 | B | SANDSTONE: very fine grained, composed predominantly of quartz (subangular to subrounded, moderate sphericity), moderate to well sorted, trace mica, trace carbonaceous fragments, trace feldspar and lithics, white to light grey argillaceous matrix, very poor visual porosity, no fluorescence, no cut. |
| 42 | 2301 | 25 | B | SANDSTONE: WITH SILTSTONE INTERBEDS: sandstone light grey, very fine to fine grained quartz, predominantly (subangular to subrounded, |

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SIDEWALL CORE DESCRIPTIONS

| NO. | Depth (m) | Rec. (mm) | B/R | Description |
|---|---|---|---|---|
| | | | | moderate to high sphericity), moderately well sorted, rare mica and carbonaceous fragments, white argillaceous matrix, very poor to poor visual porosity, friable, siltstone medium brown, argillaceous with carbonaceous fragments and mica, contacts sharp and laminae subparallel but irregular and lenticular, no fluorescence, no cut. |
| 43 | 2275 | 30 | B | SILTSTONE: argillaceous, composed silt sized quartz grains, common mica and carbonaceous flecks and plant material, argillaceous matrix, medium to dark brown, firm, rare thin lenticular sandstone (very fine) interbeds, no fluorescence, very weak crush cut, pale to milky yellow ring residue. |
| 44 | 2252 | 10 | B | SILTSTONE: argillaceous, composed almost exclusively of silt sized quartz grains in white argillaceous matrix with conspicuous black carbonaceous specks, soft to firm, grades to mudstone, no fluorescence, no cut. |
| 45 | 2240 | 40 | B | COAL: black, vitreous to subvitreous, hackly to subconchoidal fracture, very flat fracture faces in part, disseminated pyrite laminae, nodular pyrite, hard, brittle, no fluorescence, instant streaming cut initially pale to milky |

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SIDEWALL CORE DESCRIPTIONS

| NO. | Depth (m) | Rec. (mm) | B/R | Description |
|---|---|---|---|---|
| | | | | yellow then intensifying to golden yellow, residue dark brown in white light, gold to yellow white in ultra-violet. |
| 46 | 2223 | 30 | B | SILTSTONE: argillaceous, composed silt sized quartz grains, mica (white), carbonaceous fragments and plant fragments, medium brown, firm, very weak crush cut and trace ring residue. |
| 47 | 2156 | 30 | B | MUDSTONE: dark brown, poorly laminated, even colour and texture, trace carbonaceous fragments, interbedded with light grey mudstone, firm, no fluorescence, slow streaming cut pale to moderately bright yellow to white, heavy residue ring, colourless residue in white light (cut from plant fragments/carbonaceous material). |
| 48 | 2144.7 | 25 | B | SILTSTONE: argillaceous, micromica, composed predominantly silt sized quartz grains, thin laminations of very fine grained sandstone (light grey colour), siltstone medium brown, firm, no fluorescence, weak crush cut pale to milky yellow, trace ring residue. |
| 49 | 2116.8 | 25 | B | SANDSTONE: very fine to coarse grained quartz, angular to subangular, moderate to low |

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SIDEWALL CORE DESCRIPTIONS

| NO. | Depth (m) | Rec. (mm) | B/R | Description |
|---|---|---|---|---|
| | | | | sphericity, very poorly sorted, light grey to medium brown, mottled colour, light grey to brown argillaceous matrix, silica cement, carbonaceous fragments, and white mica, very poor visual porosity, friable, no fluorescence, no cut. |
| 50 | 2109 | 25 | B | SANDSTONE: light grey, very fine to medium grained quartz (subangular to subrounded, moderate sphericity), poorly sorted, larger medium grains encased in "matrix" of very fine quartz grains which in turn is held together by white argillaceous matrix, rare mica, carbonaceous fragments and lithics, friable, very poor visual porosity, no fluorescence, no cut. |
| 51 | 2066.8 | 30 | B | SANDSTONE: light to medium brown, composed of very fine to coarse grained quartz (angular to subrounded. moderate to low sphericity), very poorly sorted carbonaceous fragments and mica, brown argillaceous matrix, friable, very poor visual porosity, no fluorescence, no cut. |
| 52 | 2041 | 40 | B | SANDSTONE: light to medium brown, mottled colouring, very fine to coarse grained quartz (subangular to subrounded, moderate sphericity), |

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SIDEWALL CORE DESCRIPTIONS

| NO. | Depth (m) | Rec. (mm) | B/R | Description |
|---|---|---|---|---|
| | | | | iron oxide staining/cement, very poorly sorted, some brown argillaceous matrix (<5-10%), friable, very poor to fair visual porosity, no fluorescence, no cut. |
| 53 | 2023 | 32 | B | SANDSTONE: very fine to very coarse grains with siltstone/argillaceous matrix, quartz grains (subangular to wellrounded, moderate to low sphericity), very poorly sorted, white to dark brown, argillaceous matrix (>10%), carbonaceous fragments common, iron oxide staining or as cement, very poor visual porosity, no fluorescence, no cut. |
| 54 | 2011 | 45 | B | GREENSAND: very fine to very coarse grained quartz (predominantly fine), amorphous and pelletal glauconite 30% (fine to medium grains), trace pyrite, argillaceous matrix and iron oxide staining cement, very poorly sorted, very poor visual porosity, no fluorescence, no cut, noncalcareous. |
| 55 | 2006 | LB | - | |
| 56 | 2000 | 50 | B | SANDSTONE: very fine to medium grained, quartz predominantly subangular to well rounded, moderate sphericity, poorly sorted, trace glauconite, white, brown to yellow argillaceous |

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SIDEWALL CORE DESCRIPTIONS

| NO. | Depth (m) | Rec. (mm) | B/R | Description |
|---|---|---|---|---|
| | | | | matrix, iron oxide and calcite as cement (very calcareous and reactive to 10% HCL), nil to very poor visual porosity, no fluorescence, no cut. |
| 57 | 1994 | 55 | B | MUDSTONE: dark brown to grey, abundant glauconite (approximately 30%), unidentified phyllosilicate (probably chlorite), soft to plastic, glauconite as amorphous masses and pelletal, very calcareous, no fluorescence, no cut. |
| 58 | 1989 | 50 | B | MUDSTONE: dark brown, abundant glauconite (approximately 20%, amorphous and pelletal), soft to plastic, very calcareous, trace pyrite, no fluorescence, no cut. |
| 59 | 1983 | 50 | B | MUDSTONE: medium grey, soft to plastic, uniform colour and texture, numerous pyritised burrows, pyritised fossil fragments, rare foraminafera, highly calcareous, no fluorescence, no cut. |
| 60 | 1976 | 45 | | MUDSTONE: light grey, firm, uniform colour and texture, no fossils, highly calcareous, no fluorescence, no cut. |