

SCANNED

# Open File Envelope

**NUMBER 7331/2**

**PPL 17**

**EROMANGA BASIN AND COOPER BASIN**

**MERRIMELIA 29**

**TEST REPORTS**

Submitted by

Santos Ltd  
1992

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**MINES and ENERGY**  
**RESOURCES** SOUTH AUSTRALIA



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**ENVELOPE 7331/2**

**TENEMENT:** PPL 17; Eromanga and Cooper Basins

**TENEMENT HOLDER:** Santos Ltd (operator) and Cooper Basin Unit

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|                |                                                                                      |                       |                           |
|----------------|--------------------------------------------------------------------------------------|-----------------------|---------------------------|
| <b>REPORT:</b> | <b>Schlumberger Inc., 1992. Merrimelia 29 well evaluation using ELAN* (24/9/92).</b> | <b>MESA NO.</b>       |                           |
|                |                                                                                      | <b>7331/2 R 1</b>     |                           |
|                |                                                                                      | <b>Pgs 3-20</b>       |                           |
| <b>PLAN</b>    |                                                                                      |                       |                           |
| Encl.          | ELAN evaluation plot, depth interval<br>6980-7300 feet KB.                           | <b>Scale</b><br>1:240 | <b>7331/2-1</b> <b>A0</b> |

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000003

Schlumberger

## SANTOS AND PARTNERS

Well Evaluation  
Using ELAN\*

Merrimelia #29

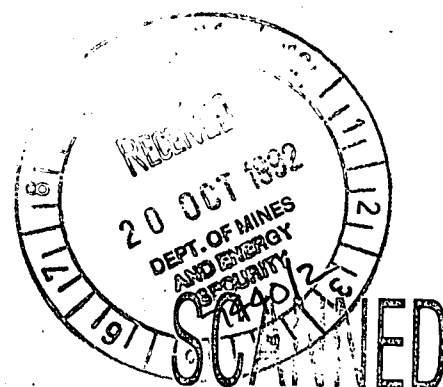
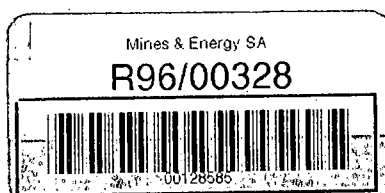
STATE : South Australia

COUNTRY : Australia

DATE OF SURVEY : 21 September 1992

REFERENCE NO : 200088

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# 1. Summary

000005

The objectives of Merrimelia 29 were :

- Mid Nappamerri 75-5 sand (gas/oil)
- Mid Nappamerri 74-9 and 75-1 sands (gas)
- Hutton (oil)

Gas and oil shows were recorded in both the Nappamerri and Hutton Formations. Elan was run from 6980 ft to 7300 ft in the Nappamerri group. Four DSTs were conducted in the Nappamerri Formation.

DST 1 testing the basal 75-5 sand (7102 ft - 7116 ft) resulted in gas to surface(GTS) at 2 MMCFD, oil to surface(OTS) at 292 BOPD, water to surface(WTS) at 189 BWPD. 6.5 BBLS of oil and 3.4 BBLS of water were recovered.

DST 2 was a misrun.

DST 3 tested the entire 74-9 from 7004 ft to 7036 ft. The test resulted in GTS at 2.62 MMCFD, OTS at 293 BOPD and recovered 6.2 BBLS of oil and 1.8 BBLS of water. Based on Elan and the DST results, the 74-9 sand is classified as gas and oil sand which superseded the pay prognosis.

DST 4 tested the upper 75-5 sand from 7076 ft to 7101 ft. It resulted in GTS at 6.1 MMCFD, OTS at 146 BOPD, WTS at 6 BWPD. 1.1 BBLS of oil and 0.2 BBLS of water were recovered.

The results of DST 1 and 4 together with ELAN analysis indicate a possible GOC and OWC at 7097 ft(KB) and 7101 ft(KB) respectively.

## 2. Data Acquisition and Pre-processing

000006

- Available logs

DLL-MSFL-GR-SDT  
LDL-CNL-GR

A series of environmental corrections were applied to all logs (before crossplots) to correct them for the following:

- (a) Mudcake signal
- (b) Mud signal
- (c) Shoulder bed effects
- (d) Borehole and formation salinity
- (e) Stand-off effects
- (f) Borehole rugosity

The values of  $R_t$  and  $R_{xo}$  were obtained after correction for invasion.

## 3. Model and Parameter Selection

- Model

The model was used in Elan:

Model 1 : QUA CLA SIL XWA UWA XGA UGA XOI UOI

Where

|         |   |                                      |
|---------|---|--------------------------------------|
| QUA     | = | Quartz                               |
| CLA     | = | Clay                                 |
| SIL     | = | Silt                                 |
| XWA,UWA | = | Water in invaded and noninvaded zone |
| XGA,UGA | = | Gas in invaded and noninvaded zone   |
| XOI,UOI | = | Oil in invaded and noninvaded zone   |

Table 1: PARAMETERS USED IN ELAN

| Logs | QUA  | SIL          | CLA  |
|------|------|--------------|------|
| RHOB | 2.65 | 2.68         | 2.70 |
| NPHI | -6   | 10.0         | 25   |
| DT   | 55.5 | 60           | 70   |
| U    | 4.78 | 7            | 8    |
| GR   | 40   | 120          | 190  |
| A*   |      | 1.00         |      |
| M*   |      | 1.8          |      |
| N*   |      | 1.8          |      |
| Rw*  |      | 1.62 at 75 F |      |
| CWB  |      | 10 at 224 F  |      |

\*values are supplied by Santos

#### 4. ELAN - The Method

Log analysis quantifies the volumes of the different minerals and fluids of a formation, from the tool responses to these constituents.

In the simplest case, the tool response equation (t) can be written as:

$$t = R.v$$

with R the matrix of constant Response parameters (density of quartz, capture cross-section of calcite,...), and v their respective volumes (the unknowns). Calculating the volumes is solving the log analysis inverse problem.

When the standard log analysis response equations are formulated in terms of volumes of minerals and fluids, rather than saturations, the problems are expressed as linear or non-linear functions with linear constraints. The solution (volume) representing the best possible agreement between the model and the tool data, is found analytically and is unique.

ELAN is a general-purpose inverse problem solver. It can explicitly define 30 mineral components and 5 individual models. Each model corresponds to a particular formation type, is processed in parallel and can be combined. This avoids the need for cosmetics and vaguely defined parameters often required when the petrophysical model is incomplete or too general. The analytical solution is fast, making interactive level-by-level processing practical.

The two other components of the ELAN system are SYNDAT and CALPAR. SYNDAT generates the synthetic logs to verify the solutions (volumes) of the inverse solver, and CALPAR estimates the response parameters.

- ELAN: Find  $v$ , given  $t$  and  $R$ . Classical log analysis.
- SYNDAT: Find  $t$ , given  $v$  and  $R$ . Generate synthetic logs.
- CALPAR: Find  $R$ , given  $t$  and  $v$ . Estimate parameters.

#### 4.1 ELAN Features

- Solves for and combines up to 5 models and more than 30 minerals and fluids simultaneously with 5 different sets of tools. Explicit logics and models, no black box results.
- Extensive choice of equations (linear or non-linear for water saturation, neutron and sonic porosity, variable  $m$  and  $n$ ,...). Local definition of equations (in-house sonic porosity equation,  $Dt$  Shear,...). Can include parallel resistor path (fractures) and isolated pores (vugs) for heterogeneous formation analysis.
- Logging suite can consist of any tool, can be very complex or reduced. Open-hole or cased-hole suite. Effective TDT interpretation, time-lapse TDT or GST, only program for GLT interpretation. Uses core data or any outside sample data. Effective re-interpretation of old open-hole data with recent cased-hole logs (SDT, TDT, CNL, NGS, GST,...).
- Powerful quality control with reconstructed logs, resolution number and volume uncertainties. Seven predefined constraints, up to 150 user defined constraints (mini-maximum volume of orthoclase in sandstone,...). Any sampling rate.
- ELANH: Digital chart book (dual-water parameters, hydrocarbon parameters, new CNT salinity corrections,...).
- User friendly, interactive on graphics colour monitor, or batch processing.
- FAST!



5. List of Enclosures

000009

## 5.1 Elan listing

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*****
*                                     *
*                                     *
*                                     *
*                                     *
*****
*                                     *
*          SCHLUMBERGER              *
*                                     *
*****
```

## ELAN CLIENT LISTING

COMPANY : SANTOS AND PARTNERS  
WELL : MERRIMELIA 29  
FIELD : MERRIMELIA  
COUNTRY : AUSTRALIA  
REFERENCE: 200088

## SAMPLED

VCL - Volume of Clay  
 VXBW - Flushed zone volume fraction Bound Water with respect to total volume  
 VQUA - Volume fraction of Quartz with respect to total volume  
 VSIL - Volume fraction of Silt with respect to total volume  
 PIGT - sum of all fluids with VISO and VPAR removed  
 PIGN - sum of all fluids with VISO, VPAR, and bound water removed  
 SUWI - non-clay water intergranular water saturation for the undisturbed zone  
 Parameters for Elan :

MODEL1+000 =QUA CLA SIL XWA UWA XOI UOI XGA UGA

TOOLS1+000 = RHOB NPHI DT U GR CXDC\_INDON CUDC\_INDON

RMF +000 = 7300.00, 6980.00, .25200  
 MST +000 = 7300.00, 6980.00, 75.0000  
 A +000 = 7300.00, 6980.00, 1.00000  
 M +000 = 7300.00, 6980.00, 1.80000  
 N +000 = 7300.00, 6980.00, 1.80000

EVCL +000 = 7300.00, 6980.00, 2  
 MVCL +000 = 7300.00, 6980.00, .50000  
 MC2 +000 = 7300.00, 6980.00, 0  
 EXPXO +000 = 7300.00, 6980.00, 2.00000  
 PHICT +000 = 7300.00, 6980.00, 0  
 BVIRR +000 = 7300.00, 6980.00, 3.00000  
 PHIMAX +000 = 7300.00, 6980.00, 50.0000

RHOB.A.QUA +000 = 7300.00, 6980.00, 2.65000  
 RHOB.A.CLA +000 = 7300.00, 6980.00, 2.70000  
 RHOB.A.SIL +000 = 7300.00, 6980.00, 2.68000

NPHI.A.QUA +000 = 7300.00, 6980.00, -6.00000  
 NPHI.A.CLA +000 = 7300.00, 6980.00, 25.0000  
 NPHI.A.SIL +000 = 7300.00, 6980.00, 10.0000

DTA.QUA +000 = 7300.00, 6980.00, 55.5000  
 DTA.CLA +000 = 7300.00, 6980.00, 70.0000  
 DTA.SIL +000 = 7300.00, 6980.00, 60.0000  
 DTA.XWA +000 = 7300.00, 6980.00, 189.000  
 DTA.XOI +000 = 7300.00, 6980.00, 200.000  
 DTA.XGA +000 = 7300.00, 6980.00, 215.000

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 UA.SIL +000 = 7300.00, 6980.00, 7.00000

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 CUDCA.UWA +000 = 7300.00, 6980.00, 1.89000

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 GRYA.SIL +000 = 7300.00, 6980.00, 120.000

WCLP.CLA +000 = 7300.00, 6980.00, 12.0000  
 CBWA.CLA +000 = 7300.00, 6980.00, 10.0000  
 SALIN.XWA +000 = 7300.00, 6980.00, 24.6170  
 SALIN.UWA +000 = 7300.00, 6980.00, 3.35100

000013

COMPANY : SANTOS AND PARTNERS  
PAGE 1

WELL : MERRIMELIA 29

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*****
* DEPTH * VCL * VXBW * VQUA * VSIL * PIGT * PIGN * SUWI *
* FT * PU * PU * PU * PU * PU * PU * PU *
*****
* * * * *
* 7300.0 * 78.2 * 9.4 * 21.8 * * 9.4 * * *100.0 *
* 99.0 * 78.6 * 9.4 * 20.8 * * 10.0 * .5 *100.0 *
* 98.0 * 80.7 * 9.7 * 19.3 * * 9.7 * * *100.0 *
* 97.0 * 76.6 * 9.2 * 23.4 * * 9.2 * * *100.0 *
* 96.0 * 74.0 * 8.9 * 25.7 * * 9.2 * .3 *100.0 *
* 95.0 * 76.4 * 9.2 * 23.5 * * 9.2 * * *100.0 *
* 94.0 * 80.8 * 9.7 * 19.2 * * 9.7 * * *100.0 *
* 93.0 * 80.5 * 9.7 * 16.7 * * 12.5 * 2.8 * 99.0 *
* 92.0 * 88.8 * 10.7 * 6.8 * * 15.1 * 4.4 * 79.3 *
* 91.0 * 95.8 * 11.5 * * * * 15.7 * 4.2 * 70.0 *
* 7290.0 * 86.9 * 10.4 * 11.1 * * 12.5 * 2.1 * 82.9 *
* 89.0 * 74.3 * 8.9 * 23.0 * * 11.6 * 2.7 * 90.0 *
* 88.0 * 59.4 * 7.1 * 38.3 * * 9.4 * 2.3 *100.0 *
* 87.0 * 67.8 * 8.1 * 31.7 * * 8.7 * .6 *100.0 *
* 86.0 * 73.5 * 8.8 * 26.1 * * 9.2 * .4 *100.0 *
* 85.0 * 65.4 * 7.8 * 33.9 * * 8.6 * .7 *100.0 *
* 84.0 * 58.6 * 7.0 * 39.3 * * 9.1 * 2.1 *100.0 *
* 83.0 * 48.8 * 5.9 * 48.6 * * 8.5 * 2.6 *100.0 *
* 82.0 * 46.7 * 5.6 * 51.5 * * 7.5 * 1.9 *100.0 *
* 81.0 * 48.7 * 5.8 * 49.6 * * 7.6 * 1.8 *100.0 *
* 7280.0 * 56.0 * 6.7 * 42.2 * * 8.5 * 1.8 *100.0 *
* 79.0 * 64.8 * 7.8 * 32.7 * * 10.3 * 2.5 *100.0 *
* 78.0 * 64.0 * 7.7 * 34.2 * * 9.4 * 1.7 *100.0 *
* 77.0 * 61.0 * 7.3 * 37.6 * * 8.7 * 1.4 *100.0 *
* 76.0 * 72.2 * 8.7 * 21.8 * * 14.6 * 5.9 * 99.1 *
* 75.0 * 80.9 * 9.7 * 15.4 * * 13.5 * 3.8 * 86.5 *
* 74.0 * 69.8 * 8.4 * 16.1 * 13.3 * 9.2 * .8 *100.0 *
* 73.0 * 56.1 * 6.7 * 43.5 * * 7.1 * .4 *100.0 *
* 72.0 * 49.2 * 5.9 * 50.3 * * 6.4 * .5 *100.0 *
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* 7270.0 * 62.1 * 7.5 * 36.9 * * 8.4 * 1.0 *100.0 *
* 69.0 * 68.1 * 8.2 * 30.4 * * 9.7 * 1.5 *100.0 *
* 68.0 * 75.3 * 9.0 * 24.3 * * 9.5 * .5 *100.0 *
* 67.0 * 77.0 * 9.2 * 22.5 * * 9.8 * .5 *100.0 *
* 66.0 * 77.7 * 9.3 * 21.9 * * 9.7 * .4 *100.0 *
* 65.0 * 75.1 * 9.0 * 23.2 * * 10.7 * 1.7 *100.0 *
* 64.0 * 73.9 * 8.9 * 25.1 * * 9.8 * 1.0 *100.0 *
* 63.0 * 72.6 * 8.7 * 25.8 * * 10.3 * 1.5 *100.0 *
* 62.0 * 61.9 * 7.4 * 36.0 * * 9.5 * 2.0 *100.0 *
* 61.0 * 57.2 * 6.9 * 41.4 * * 8.3 * 1.4 *100.0 *
* 7260.0 * 65.8 * 7.9 * 30.7 * * 11.4 * 3.5 *100.0 *
* 59.0 * 63.4 * 7.6 * 31.4 * * 12.8 * 5.2 *100.0 *
* 58.0 * 78.7 * 9.4 * 10.1 * * 20.6 * 11.2 * 76.9 *
* 57.0 * 88.9 * 10.7 * * * * 21.8 * 11.1 * 63.9 *
* 56.0 * 92.6 * 11.1 * * * * 18.5 * 7.4 * 69.5 *
* 55.0 * 97.7 * 11.7 * * * * 14.0 * 2.3 * 78.8 *
* 54.0 * 94.4 * 11.3 * 1.8 * * 15.2 * 3.8 * 72.8 *
* 53.0 * 90.4 * 10.9 * 9.6 * * 10.9 * * *100.0 *
*****

```

COMPANY : SANTOS AND PARTNERS  
PAGE 2

WELL : MERRIMELIA 29

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*****
* DEPTH * VCL * VXBW * VQUA * VSIL * PIGT * PIGN * SUWI *
* FT * PU * PU * PU * PU * PU * PU * PU *
*****
*      *      *      *      *      *      *      *
* 52.0 * 85.4 * 10.3 * 13.1 *      * 11.7 * 1.5 * 82.4 *
* 51.0 * 78.9 * 9.5 * 20.2 *      * 10.4 * .9 * 92.9 *
* 7250.0 * 77.4 * 9.3 * 22.4 *      * 9.5 * .2 * 100.0 *
* 49.0 * 80.3 * 9.6 * 19.6 *      * 9.8 * .2 * 100.0 *
* 48.0 * 84.0 * 10.1 * 15.7 *      * 10.4 * .4 * 95.4 *
* 47.0 * 82.7 * 9.9 * 17.3 *      * 9.9 *      * 100.0 *
* 46.0 * 80.2 * 9.6 * 19.6 *      * 9.8 * .2 * 100.0 *
* 45.0 * 79.0 * 9.5 * 19.9 *      * 10.6 * 1.1 * 96.8 *
* 44.0 * 76.7 * 9.2 * 20.1 *      * 12.4 * 3.2 * 87.6 *
* 43.0 * 80.1 * 9.6 * 19.9 *      * 9.6 *      * 100.0 *
* 42.0 * 76.4 * 9.2 * 23.6 *      * 9.2 *      * 100.0 *
* 41.0 * 74.2 * 8.9 * 23.2 *      * 11.5 * 2.6 * 100.0 *
* 7240.0 * 76.0 * 9.1 * 21.7 *      * 11.4 * 2.3 * 99.5 *
* 39.0 * 78.5 * 9.4 * 19.2 *      * 11.7 * 2.2 * 75.5 *
* 38.0 * 44.9 * 5.4 * 51.9 *      * 8.6 * 3.2 * 100.0 *
* 37.0 * 27.5 * 3.3 * 68.6 *      * 7.2 * 3.9 * 100.0 *
* 36.0 * 43.4 * 5.2 * 53.7 *      * 8.1 * 2.9 * 100.0 *
* 35.0 * 60.4 * 7.2 * 35.3 *      * 11.5 * 4.3 * 100.0 *
* 34.0 * 51.7 * 6.2 * 44.5 *      * 10.0 * 3.8 * 100.0 *
* 33.0 * 65.6 * 7.9 * 32.7 *      * 9.5 * 1.7 * 100.0 *
* 32.0 * 77.7 * 9.3 * 20.7 *      * 10.9 * 1.6 * 100.0 *
* 31.0 * 70.8 * 8.5 * 27.1 *      * 10.6 * 2.1 * 94.7 *
* 7230.0 * 52.5 * 6.3 * 44.7 *      * 9.1 * 2.8 * 100.0 *
* 29.0 * 43.8 * 5.3 * 53.3 *      * 8.2 * 2.9 * 100.0 *
* 28.0 * 48.7 * 5.8 * 48.8 *      * 8.4 * 2.5 * 100.0 *
* 27.0 * 55.4 * 6.7 * 42.5 *      * 8.7 * 2.1 * 100.0 *
* 26.0 * 55.8 * 6.7 * 42.2 *      * 8.7 * 2.0 * 100.0 *
* 25.0 * 56.4 * 6.8 * 42.1 *      * 8.3 * 1.5 * 100.0 *
* 24.0 * 57.0 * 6.8 * 41.2 *      * 8.6 * 1.8 * 100.0 *
* 23.0 * 59.9 * 7.2 * 39.0 *      * 8.3 * 1.1 * 100.0 *
* 22.0 * 63.7 * 7.6 * 36.1 *      * 7.8 * .2 * 100.0 *
* 21.0 * 69.3 * 8.3 * 30.3 *      * 8.7 * .4 * 100.0 *
* 7220.0 * 65.7 * 7.9 * 32.8 *      * 9.3 * 1.4 * 100.0 *
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* 16.0 * 70.7 * 8.5 * 29.3 *      * 8.5 *      * 100.0 *
* 15.0 * 75.6 * 9.1 * 24.4 *      * 9.1 *      * 100.0 *
* 14.0 * 88.2 * 10.6 * 11.8 *      * 10.6 *      * 100.0 *
* 13.0 * 89.8 * 10.8 * 10.1 *      * 10.9 * .1 * 70.6 *
* 12.0 * 66.8 * 8.0 * 31.7 *      * 9.6 * 1.5 * 99.6 *
* 11.0 * 61.0 * 7.3 * 24.1 * 14.9 * 7.3 *      * 100.0 *
* 7210.0 * 58.8 * 7.1 *      * 41.1 * 7.1 * .1 * 100.0 *
* 9.0 * 91.0 * 10.9 *      * 9.0 * 10.9 *      * 100.0 *
* 8.0 * 81.6 * 9.8 *      * 18.4 * 9.8 *      * 100.0 *
* 7.0 * 62.0 * 7.4 *      * 38.0 * 7.4 *      * 100.0 *
* 6.0 * 59.1 * 7.1 * 14.3 * 26.6 * 7.1 *      * 100.0 *
* 5.0 * 50.1 * 6.0 * 3.8 * 45.7 * 6.5 * .5 * 100.0 *
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*****
* DEPTH * VCL * VXBW * VQUA * VSIL * PIGT * PIGN * SUWI *
* FT * PU * PU * PU * PU * PU * PU * PU *
*****
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* 3.0 * 80.1 * 9.6 *      * 19.9 * 9.6 *      * 100.0 *
* 2.0 * 79.8 * 9.6 *      * 20.2 * 9.6 *      * 100.0 *
* 1.0 * 77.4 * 9.3 *      * 22.6 * 9.3 *      * 100.0 *
* 7200.0 * 77.3 * 9.3 *      * 22.7 * 9.3 *      * 100.0 *
* 99.0 * 77.9 * 9.3 *      * 22.1 * 9.3 *      * 100.0 *
* 98.0 * 69.7 * 8.4 *      * 30.3 * 8.4 *      * 100.0 *
* 97.0 * 69.2 * 8.3 *      * 30.8 * 8.3 *      * 100.0 *
* 96.0 * 61.3 * 7.4 *      * 38.7 * 7.4 *      * 100.0 *
* 95.0 * 60.9 * 7.3 * 1.1 * 38.0 * 7.3 *      * 100.0 *
* 94.0 * 55.1 * 6.6 *      * 44.8 * 6.6 *      * 100.0 *
* 93.0 * 56.3 * 6.8 * 26.5 * 17.3 * 6.8 *      * 100.0 *
* 92.0 * 44.6 * 5.4 * 25.5 * 28.8 * 6.4 * 1.0 * 100.0 *
* 91.0 * 36.7 * 4.4 * 11.4 * 51.3 * 5.0 * .6 * 100.0 *
* 7190.0 * 24.1 * 2.9 *      * 75.3 * 3.5 * .6 * 100.0 *
* 89.0 * 71.4 * 8.6 * 25.0 * 3.6 * 8.6 *      * 100.0 *
* 88.0 * 85.8 * 10.3 * 14.2 *      * 10.3 *      * 100.0 *
* 87.0 * 92.3 * 11.1 * 7.7 *      * 11.1 *      * 100.0 *
* 86.0 * 87.8 * 10.5 *      * 12.2 * 10.5 *      * 100.0 *
* 85.0 * 83.7 * 10.0 *      * 16.3 * 10.0 *      * 100.0 *
* 84.0 * 84.3 * 10.1 *      * 15.7 * 10.1 *      * 100.0 *
* 83.0 * 89.4 * 10.7 *      * 10.6 * 10.7 *      * 100.0 *
* 82.0 * 76.5 * 9.2 * 22.2 *      * 10.5 * 1.3 * 57.3 *
* 81.0 * 71.4 * 8.6 * 27.1 *      * 10.1 * 1.5 * 63.4 *
* 7180.0 * 54.0 * 6.5 * 5.5 * 40.6 * 6.5 *      * 100.0 *
* 79.0 * 77.2 * 9.3 * 15.6 * 7.2 * 9.3 *      * 100.0 *
* 78.0 * 80.2 * 9.6 *      * 19.8 * 9.6 *      * 100.0 *
* 77.0 * 90.4 * 10.8 *      * 9.6 * 10.9 *      * 100.0 *
* 76.0 * 82.9 * 9.9 *      * 17.1 * 10.0 *      * 100.0 *
* 75.0 * 61.0 * 7.3 *      * 39.0 * 7.3 *      * 100.0 *
* 74.0 * 31.5 * 3.8 * 58.3 *      * 14.0 * 10.3 * 86.6 *
* 73.0 * 23.6 * 2.8 * 64.5 *      * 14.8 * 11.9 * 75.6 *
* 72.0 * 19.8 * 2.4 * 67.0 *      * 15.6 * 13.2 * 64.2 *
* 71.0 *      *      * 44.4 * 43.3 * 12.3 * 12.3 * 64.1 *
* 7170.0 *      *      * 36.2 * 53.3 * 10.5 * 10.5 * 68.4 *
* 69.0 *      *      * 35.6 * 52.9 * 11.4 * 11.4 * 72.5 *
* 68.0 *      *      * 43.8 * 43.7 * 12.5 * 12.5 * 76.9 *
* 67.0 *      *      * 32.0 * 56.6 * 11.4 * 11.4 * 82.3 *
* 66.0 *      *      * 28.4 * 62.8 * 8.8 * 8.8 * 100.0 *
* 65.0 * 60.6 * 7.3 * 35.2 *      * 11.5 * 4.2 * 57.3 *
* 64.0 * 76.1 * 9.1 *      * 23.9 * 9.1 *      * 100.0 *
* 63.0 * 81.9 * 9.8 *      * 18.1 * 9.8 *      * 100.0 *
* 62.0 * 80.5 * 9.7 *      * 19.5 * 9.7 *      * 100.0 *
* 61.0 * 76.1 * 9.1 *      * 23.9 * 9.1 *      * 100.0 *
* 7160.0 * 79.1 * 9.5 *      * 20.9 * 9.5 *      * 100.0 *
* 59.0 * 91.4 * 11.0 *      * 8.6 * 11.0 *      * 100.0 *
* 58.0 * 88.0 * 10.6 *      * 11.9 * 10.7 * .1 * 63.8 *
* 57.0 * 89.6 * 10.8 * 8.5 *      * 12.6 * 1.8 * 59.4 *
*****

```

COMPANY : SANTOS AND PARTNERS  
PAGE 4

WELL : MERRIMELIA 29

```

*****
* DEPTH * VCL * VXBW * VQUA * VSIL * PIGT * PIGN * SUWI *
* FT * PU * PU * PU * PU * PU * PU * PU *
*****
*      *      *      *      *      *      *      *
* 56.0 * 94.1 * 11.3 * 5.9 *      * 11.3 *      * 100.0 *
* 55.0 * 74.8 * 9.0 *      * 25.2 * 9.0 *      * 100.0 *
* 54.0 * 67.7 * 8.1 *      * 32.3 * 8.1 *      * 100.0 *
* 53.0 * 81.1 * 9.7 *      * 18.9 * 9.7 *      * 100.0 *
* 52.0 * 95.1 * 11.4 *      * 4.9 * 11.4 *      * 100.0 *
* 51.0 * 94.5 * 11.3 *      * 5.5 * 11.3 *      * 100.0 *
* 7150.0 * 86.0 * 10.3 *      * 14.0 * 10.3 *      * 100.0 *
* 49.0 * 95.4 * 11.5 *      * 4.6 * 11.5 *      * 100.0 *
* 48.0 * 100.0 * 12.0 *      *      * 12.0 *      * 100.0 *
* 47.0 * 100.0 * 12.0 *      *      * 12.0 *      * 100.0 *
* 46.0 * 100.0 * 12.0 *      *      * 12.0 *      * 100.0 *
* 45.0 * 99.2 * 11.9 *      *      * 12.4 * .5 * 28.5 *
* 44.0 * 65.5 * 7.9 * 30.2 *      * 12.1 * 4.3 * 37.2 *
* 43.0 * 52.4 * 6.3 * 37.6 *      * 16.3 * 10.0 * 35.9 *
* 42.0 * 48.9 * 5.9 * 43.2 *      * 13.7 * 7.8 * 52.1 *
* 41.0 * 35.2 * 4.2 * 56.4 *      * 12.6 * 8.3 * 80.4 *
* 7140.0 * 29.1 * 3.5 * 62.1 *      * 12.2 * 8.7 * 96.9 *
* 39.0 * 28.0 * 3.4 * 61.9 *      * 13.5 * 10.1 * 98.0 *
* 38.0 *      *      * 31.4 * 58.4 * 10.2 * 10.2 * 100.0 *
* 37.0 *      *      * 21.5 * 69.6 * 9.0 * 9.0 * 100.0 *
* 36.0 *      *      * 7.6 * 84.8 * 7.6 * 7.6 * 99.8 *
* 35.0 *      *      * 11.4 * 80.8 * 7.8 * 7.8 * 100.0 *
* 34.0 *      *      * 5.3 * 87.9 * 6.8 * 6.8 * 100.0 *
* 33.0 * 16.0 * 1.9 *      * 79.5 * 6.4 * 4.5 * 100.0 *
* 32.0 * 53.7 * 6.4 * 15.6 * 30.7 * 6.5 *      * 100.0 *
* 31.0 * 60.9 * 7.3 * 19.2 * 19.9 * 7.3 *      * 100.0 *
* 7130.0 * 77.8 * 9.3 *      * 22.2 * 9.3 *      * 100.0 *
* 29.0 * 85.4 * 10.3 * 14.6 *      * 10.3 *      * 100.0 *
* 28.0 * 72.9 * 8.7 *      * 27.1 * 8.7 *      * 100.0 *
* 27.0 * 71.0 * 8.5 *      * 29.0 * 8.5 *      * 100.0 *
* 26.0 * 66.3 * 8.0 *      * 33.7 * 8.0 *      * 100.0 *
* 25.0 * 63.9 * 7.7 *      * 36.1 * 7.7 *      * 100.0 *
* 24.0 * 62.1 * 7.4 *      * 37.9 * 7.4 *      * 100.0 *
* 23.0 * 64.4 * 7.7 *      * 35.6 * 7.7 *      * 100.0 *
* 22.0 * 67.3 * 8.1 * 3.9 * 28.9 * 8.1 *      * 100.0 *
* 21.0 * 82.1 * 9.9 *      * 17.9 * 9.9 *      * 100.0 *
* 7120.0 * 90.5 * 10.9 *      * 9.5 * 10.9 *      * 100.0 *
* 19.0 * 83.6 * 10.0 *      * 16.4 * 10.0 *      * 100.0 *
* 18.0 * 94.4 * 11.3 *      * 5.6 * 11.3 *      * 100.0 *
* 17.0 * 93.0 * 11.2 *      * 7.0 * 11.2 *      * 100.0 *
* 16.0 * 89.5 * 10.7 *      * 10.5 * 10.7 *      * 100.0 *
* 15.0 * 86.7 * 10.4 *      * 13.3 * 10.4 *      * 100.0 *
* 14.0 * 83.9 * 10.1 *      * 16.1 * 10.1 *      * 100.0 *
* 13.0 * 100.0 * 12.0 *      *      * 12.0 *      * 100.0 *
* 12.0 * 100.0 * 12.0 *      *      * 12.0 *      * 100.0 *
* 11.0 * 83.0 * 10.0 * 17.0 *      * 10.0 *      * 100.0 *
* 7110.0 * 60.5 * 7.3 * 39.5 *      * 7.3 *      * 100.0 *
* 9.0 * 29.0 * 3.5 * 62.9 *      * 11.6 * 8.1 * 100.0 *
*****

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000017

COMPANY : SANTOS AND PARTNERS  
PAGE 5

WELL

: MERRIMELIA 29

```
*****
DEPTH * VCL * VXBW * VQUA * VSIL * PIGT * PIGN * SUWI *
FT * PU * PU * PU * PU * PU * PU * PU *
*****
      *      *      *      *      *      *      *      *
8.0 * 33.6 * 4.0 * 59.1 *      * 11.3 * 7.3 * 89.4 *
7.0 *      *      * 31.4 * 60.9 * 7.7 * 7.7 * 100.0 *
6.0 *      *      * 18.6 * 76.4 * 5.0 * 5.0 * 100.0 *
5.0 * 30.4 * 3.7 * 59.4 *      * 13.8 * 10.2 * 84.8 *
4.0 *      *      * 50.2 * 31.9 * 17.9 * 17.9 * 81.0 *
3.0 *      *      * 49.0 * 32.5 * 18.5 * 18.5 * 77.5 *
2.0 *      *      * 53.4 * 28.5 * 18.1 * 18.1 * 76.6 *
1.0 *      *      * 61.9 * 19.3 * 18.9 * 18.9 * 67.2 *
7100.0 * 9.9 * 1.2 * 71.9 *      * 19.4 * 18.2 * 62.5 *
99.0 * 9.2 * 1.1 * 71.8 *      * 20.1 * 19.0 * 59.2 *
98.0 * 9.6 * 1.2 * 71.9 *      * 19.7 * 18.5 * 58.1 *
97.0 * 13.7 * 1.6 * 69.5 *      * 18.5 * 16.8 * 59.7 *
96.0 *      *      * 44.7 * 40.4 * 14.8 * 14.8 * 67.6 *
95.0 *      *      * 35.5 * 53.0 * 11.5 * 11.5 * 74.2 *
94.0 *      *      * 13.7 * 78.6 * 7.7 * 7.7 * 100.0 *
93.0 * 31.4 * 3.8 * 56.9 *      * 15.4 * 11.7 * 64.7 *
92.0 *      *      * 41.7 * 43.2 * 15.2 * 15.2 * 67.7 *
91.0 *      *      * 34.5 * 52.6 * 12.9 * 12.9 * 76.8 *
7090.0 *      *      * 39.4 * 46.9 * 13.6 * 13.6 * 80.5 *
89.0 *      *      * 42.6 * 44.3 * 13.1 * 13.1 * 84.8 *
88.0 *      *      * 31.7 * 56.6 * 11.7 * 11.7 * 90.9 *
87.0 *      *      * 16.7 * 74.6 * 8.7 * 8.7 * 100.0 *
86.0 *      *      *      * 94.1 * 5.9 * 5.9 * 100.0 *
85.0 *      *      * 8.6 * 85.2 * 6.2 * 6.2 * 100.0 *
84.0 * 15.9 * 1.9 *      * 80.0 * 6.0 * 4.1 * 100.0 *
83.0 * 66.5 * 8.0 * 31.6 *      * 9.9 * 1.9 * 48.2 *
82.0 * 42.9 * 5.1 * 50.3 *      * 12.0 * 6.8 * 72.2 *
81.0 *      *      * 13.8 * 78.1 * 8.0 * 8.0 * 100.0 *
7080.0 *      *      *      * 95.9 * 4.1 * 4.1 * 100.0 *
79.0 *      *      * 14.2 * 78.0 * 7.8 * 7.8 * 100.0 *
78.0 * 35.2 * 4.2 *      * 58.8 * 10.2 * 6.0 * 100.0 *
77.0 * 84.4 * 10.1 *      * 15.6 * 10.1 *      * 100.0 *
76.0 * 88.2 * 10.6 *      * 11.8 * 10.6 *      * 100.0 *
75.0 * 100.0 * 12.0 *      *      * 12.0 *      * 100.0 *
74.0 * 98.2 * 11.8 * 1.8 *      * 11.8 *      * 100.0 *
73.0 * 74.6 * 9.0 * 25.4 *      * 9.0 *      * 100.0 *
72.0 * 60.3 * 7.2 * 39.7 *      * 7.2 *      * 100.0 *
71.0 * 19.5 * 2.3 * 29.0 * 43.9 * 10.0 * 7.7 * 100.0 *
7070.0 *      *      * 2.5 * 91.0 * 6.5 * 6.5 * 100.0 *
69.0 *      *      * 12.3 * 81.8 * 5.9 * 5.9 * 100.0 *
68.0 *      *      * 21.6 * 70.0 * 8.4 * 8.4 * 100.0 *
67.0 * 16.0 * 1.9 * 14.5 * 62.3 * 9.1 * 7.2 * 100.0 *
66.0 * 7.3 * .9 *      * 87.3 * 6.3 * 5.4 * 100.0 *
65.0 * 52.7 * 6.3 * 43.2 *      * 10.4 * 4.1 * 65.2 *
64.0 * 47.4 * 5.7 * 46.2 *      * 12.1 * 6.4 * 62.7 *
63.0 *      *      * 8.2 * 84.6 * 7.1 * 7.1 * 100.0 *
62.0 * 34.8 * 4.2 * 34.5 * 26.0 * 8.8 * 4.7 * 100.0 *
61.0 * 36.4 * 4.4 * 27.7 * 32.1 * 8.2 * 3.8 * 100.0 *
*****
```

COMPANY : SANTOS AND PARTNERS  
PAGE 6

WELL : MERRIMELIA 29

```

*****
* DEPTH * VCL * VXBW * VQUA * VSIL * PIGT * PIGN * SUWI *
* FT * PU * PU * PU * PU * PU * PU * PU *
*****
*
* 7060.0 * 37.7 * 4.5 * 25.9 * 33.0 * 8.0 * 3.5 * 100.0 *
* 59.0 * 42.0 * 5.0 * 25.3 * 29.2 * 8.4 * 3.4 * 100.0 *
* 58.0 * 51.8 * 6.2 * 44.2 * * 10.2 * 4.0 * 70.8 *
* 57.0 * 47.9 * 5.7 * 46.4 * * 11.5 * 5.7 * 67.9 *
* 56.0 * 50.1 * 6.0 * 44.4 * * 11.5 * 5.5 * 66.7 *
* 55.0 * 41.5 * 5.0 * 35.0 * 17.8 * 10.6 * 5.6 * 87.7 *
* 54.0 * 56.9 * 6.8 * 28.0 * 12.7 * 9.2 * 2.4 * 73.3 *
* 53.0 * 73.8 * 8.9 * 25.7 * * 9.3 * .5 * 49.9 *
* 52.0 * 75.3 * 9.0 * 24.0 * * 9.7 * .7 * 48.6 *
* 51.0 * 43.1 * 5.2 * 8.6 * 44.8 * 8.6 * 3.4 * 100.0 *
* 7050.0 * 27.2 * 3.3 * * * 69.4 * 6.6 * 3.4 * 100.0 *
* 49.0 * 22.0 * 2.6 * * * 73.6 * 7.0 * 4.4 * 100.0 *
* 48.0 * 13.9 * 1.7 * * * 82.0 * 5.8 * 4.1 * 100.0 *
* 47.0 * 23.3 * 2.8 * * * 73.5 * 6.0 * 3.2 * 100.0 *
* 46.0 * 23.0 * 2.8 * * * 72.7 * 7.0 * 4.3 * 100.0 *
* 45.0 * 30.2 * 3.6 * 11.1 * 53.8 * 8.5 * 4.9 * 100.0 *
* 44.0 * 30.2 * 3.6 * * * 65.9 * 7.6 * 3.9 * 100.0 *
* 43.0 * 28.1 * 3.4 * * * 68.9 * 6.4 * 3.0 * 100.0 *
* 42.0 * 4.0 * .5 * * * 91.1 * 5.4 * 4.9 * 100.0 *
* 41.0 * 50.5 * 6.1 * 34.5 * 10.2 * 10.9 * 4.9 * 69.4 *
* 7040.0 * 56.8 * 6.8 * 38.3 * * 11.7 * 4.9 * 61.9 *
* 39.0 * 60.3 * 7.2 * 35.1 * * 11.8 * 4.6 * 56.4 *
* 38.0 * 66.4 * 8.0 * 30.1 * * 11.5 * 3.5 * 48.7 *
* 37.0 * 55.8 * 6.7 * 39.4 * * 11.4 * 4.7 * 60.4 *
* 36.0 * 53.3 * 6.4 * 41.8 * * 11.3 * 4.9 * 66.1 *
* 35.0 * 54.8 * 6.6 * 40.2 * * 11.6 * 5.0 * 63.7 *
* 34.0 * 59.6 * 7.2 * 36.1 * * 11.4 * 4.3 * 57.2 *
* 33.0 * 59.1 * 7.1 * 36.6 * * 11.4 * 4.3 * 57.1 *
* 32.0 * 62.7 * 7.5 * 33.2 * * 11.6 * 4.1 * 54.2 *
* 31.0 * 61.9 * 7.4 * 34.6 * * 10.9 * 3.5 * 56.9 *
* 7030.0 * 62.5 * 7.5 * 35.0 * * 10.1 * 2.6 * 58.0 *
* 29.0 * 59.7 * 7.2 * 37.1 * * 10.4 * 3.2 * 60.0 *
* 28.0 * 37.3 * 4.5 * 16.8 * 41.5 * 8.8 * 4.4 * 100.0 *
* 27.0 * 36.1 * 4.3 * .9 * 58.9 * 8.4 * 4.1 * 100.0 *
* 26.0 * 41.3 * 5.0 * * * 56.1 * 7.6 * 2.6 * 96.5 *
* 25.0 * 68.9 * 8.3 * 21.5 * 8.6 * 9.3 * 1.0 * 45.3 *
* 24.0 * 52.9 * 6.4 * 39.0 * * 14.4 * 8.0 * 55.6 *
* 23.0 * * * * 32.3 * 52.2 * 15.5 * 15.5 * 79.4 *
* 22.0 * * * * 48.4 * 34.4 * 17.2 * 17.2 * 67.4 *
* 21.0 * * * * 49.2 * 33.1 * 17.7 * 17.7 * 57.7 *
* 7020.0 * * * * 48.0 * 34.7 * 17.3 * 17.3 * 52.9 *
* 19.0 * * * * 48.5 * 34.3 * 17.1 * 17.1 * 57.8 *
* 18.0 * * * * 28.8 * 56.0 * 15.2 * 15.2 * 63.8 *
* 17.0 * * * * 5.1 * 86.9 * 8.0 * 8.0 * 100.0 *
* 16.0 * 2.1 * .3 * * * 92.7 * 5.4 * 5.2 * 100.0 *
* 15.0 * 35.0 * 4.2 * 20.8 * 41.3 * 7.1 * 2.9 * 100.0 *
* 14.0 * * * * 4.4 * 91.6 * 4.0 * 4.0 * 100.0 *
* 13.0 * 27.4 * 3.3 * * * 71.6 * 4.2 * 1.0 * 100.0 *
*****

```

000019

COMPANY : SANTOS AND PARTNERS  
PAGE 7

WELL : MERRIMELIA 29

```

*****
* DEPTH * VCL * VXBW * VQUA * VSIL * PIGT * PIGN * SUWI *
* FT * PU * PU * PU * PU * PU * PU * PU *
*****
* * * * *
* 12.0 * 45.2 * 5.4 * * * 54.8 * 5.4 * *100.0 *
* 11.0 * 49.9 * 6.0 * * * 50.1 * 6.0 * *100.0 *
* 7010.0 * 67.2 * 8.1 * * * 32.8 * 8.1 * *100.0 *
* 9.0 * 83.3 * 10.0 * * * 16.7 * 10.0 * *100.0 *
* 8.0 * 94.3 * 11.3 * * * 5.7 * 11.3 * *100.0 *
* 7.0 * 97.3 * 11.7 * 2.7 * * 11.7 * *100.0 *
* 6.0 * 97.4 * 11.7 * 2.6 * * 11.7 * *100.0 *
* 5.0 * 99.5 * 11.9 * * * 12.4 * .5 * 50.1 *
* 4.0 * 87.5 * 10.5 * * 12.5 * 10.5 * *100.0 *
* 3.0 * 76.6 * 9.2 * * 23.4 * 9.2 * *100.0 *
* 2.0 * 78.2 * 9.4 * * 21.8 * 9.4 * *100.0 *
* 1.0 * 95.5 * 11.5 * * 4.5 * 11.5 * *100.0 *
* 7000.0 * 82.4 * 9.9 * * 17.5 * 10.0 * .1 *100.0 *
* 99.0 * 82.2 * 9.9 * * 16.9 * 10.8 * 1.0 * 57.9 *
* 98.0 * 78.8 * 9.5 * * 21.2 * 9.5 * *100.0 *
* 97.0 * 84.1 * 10.1 * 15.7 * * 10.2 * .1 * 53.5 *
* 96.0 * 73.6 * 8.8 * * 26.4 * 8.8 * *100.0 *
* 95.0 * 76.8 * 9.2 * * 23.2 * 9.2 * *100.0 *
* 94.0 * 84.2 * 10.1 * * 15.8 * 10.1 * *100.0 *
* 93.0 * 84.3 * 10.1 * 14.7 * * 11.1 * 1.0 * 52.4 *
* 92.0 * 71.5 * 8.6 * 25.1 * * 12.0 * 3.4 * 53.3 *
* 91.0 * 38.1 * 4.6 * * 59.0 * 7.5 * 2.9 *100.0 *
* 6990.0 * 69.7 * 8.4 * 28.7 * * 10.0 * 1.6 * 62.2 *
* 89.0 * 48.3 * 5.8 * 6.6 * * 42.2 * 8.8 * 3.0 *100.0 *
* 88.0 * 52.5 * 6.3 * * * 47.0 * 6.9 * .6 *100.0 *
* 87.0 * 57.1 * 6.9 * * * 41.6 * 8.1 * 1.2 * 99.2 *
* 86.0 * 72.2 * 8.7 * * * 27.8 * 8.7 * *100.0 *
* 85.0 * 82.0 * 9.8 * * * 18.0 * 9.8 * *100.0 *
* 84.0 * 63.3 * 7.6 * * * 35.5 * 8.8 * 1.2 * 78.9 *
* 83.0 * 62.1 * 7.5 * * * 36.1 * 9.2 * 1.8 * 71.1 *
* 82.0 * 60.4 * 7.3 * * * 38.8 * 8.0 * .8 * 83.3 *
* 81.0 * 60.4 * 7.2 * * * 38.3 * 8.5 * 1.3 * 87.3 *
* 6980.0 * 74.1 * 8.9 * * * 25.9 * 8.9 * *100.0 *
*****

```

## 5.2 Elan result



7331/2-1

Schlumberger

COMPUTER  
PROCESSED  
INTERPRETATION

ELAN\*

EVALUATION

A Mark of Schlumberger

Using the following logs:

LDL-CNL-GR-DLL-MSFL-CALL

Company:

SANTOS AND PARTNERS

Well:

MERRIMELIA 29

Field:

MERRIMELIA

Country:

AUSTRALIA

Reference No:

2000088

Interval:

7300.00 to 6980.00

Date Logged:

21 SEP 92

Date Processed:

24 SEP 92

Location:

027 44 21.591 S

140 11 20.468 E

Elevations:

KB: 148 F

DF: 147 F

GL: 131 F

Permanent Datum:

MSL

Depth Units:

FEET

FOLD HERE

The well name, location and borehole reference data were furnished by the customer.

All interpretations are opinions based on inferences from electrical or other measurements and we cannot, and do not guarantee the accuracy or correctness of any interpretations, and we shall not, except in the case of gross or willful negligence on our part, be liable for any loss, costs, damages or expenses incurred or sustained by anyone resulting from any interpretations made by any of our officers, agents or employees. These interpretations are also subject to Clause 4 of our General Terms and Conditions as set out in our current Price Schedule.

FIELD RECORDING:

Engineer:

P MCDUGALL

Location:

LEA

Program Version:

32

COMPUTATION:

Analyst:

S LOOI

Centre:

EAJ

Baseline:

20

Remarks:

A = 1, M = 1.8, N = 1.8

RW = 1.62 AT 75 F

