PEL 32

Onshore Otway Basin

South Australia

Annual Report

For the Period

19 February 2000 To 18 February 2001

Permit Year 1, Term 4

Prepared by:
Origin Energy Resources Ltd

April 2001

CONTENTS

1 Introduction

Petroleum Exploration Licence No.32 ("PEL 32") is located in the onshore portion of the Otway Basin, South Australia. This report covers the work performed by Origin Energy Resources Ltd as Operator of the PEL 32 Joint Venture over the period 19 February 2000 to 18 February 2001. This period being the first year of the fourth term.

PEL 32 is in good standing with all required work commitments exceeded.

2 Administration

The working interests in the permit are as follows:

Origin Energy Resources Ltd	20%
SAGASCO South East Inc	55.7143%
Omega Oil NL	24.2857%

Boral Energy Resources Ltd changed its name in February 2000 to Origin Energy Resources Ltd, following the de-merger of Boral Energy from Boral Ltd in February 2000.

Omega Oil NL is a subsidiary of Australian Worldwide Exploration NL.

Origin Energy Resources acts as Operator under an agency agreement with SAGASCO South East.

A Joint Venture technical meeting was held on 15 November 2000.

The first and second year work commitments for PEL 32 are G&G Studies to $80,000, and a 100 square kilometre 3D seismic survey. The acquisition of the 213 square kilometres Balnaves 3D seismic survey and its interpretation in the first year greatly exceeds these commitments. PEL 32 is therefore in good standing.

3 Exploration Activity

3.1 DRILLING

No exploration drilling was undertaken during the reporting period.

3.2 SEISMIC DATA ACQUISITION

The Balnaves 3D Seismic Survey was recorded between 4 April 2000 and 20 May 2000. A total of 213.466 square kilometres of 3D data with a nominal fold of 40 was acquired. The survey contained 35 source lines with a total of 466 kilometres, and 96 receiver lines with a total of 903.36 kilometres.

Source lines were spaced at 480 metre intervals running east-west, and receiver lines were spaced at 240 metre intervals running north-south. Both source and receiver points were spaced at 40 metres. The survey design required six receiver lines to be active and all source lines were traversed twice.

The survey was conducted by Schlumberger Reservoir Evaluation Seismic, commonly referred to as Geco-Prakla of Brisbane, Queensland. The data was processed at Western Geophysical in Adelaide.

Field supervision was carried out by Bill Foster of Resubi Exploration Services based in Perth, Western Australia. Geodrill Pty Ltd provided uphole drilling services, and the upholes were logged by Velocity data.

The majority of the survey was located on privately owned farming land with the balance, approximately 15%, falling within pine plantation and native forest reserves. Exploration Field Services performed all permitting, fencing and line preparation.

The objective of the Balnaves 3D Seismic Survey was to detail the Balnaves Prospect west of the Katnook Field, and the complex of 'E' leads south of Ladbroke Grove. A final Operations Report for the survey is in preparation.

3.3 SEISMIC DATA PROCESSING/REPROCESSING

Balnaves 3D Seismic Survey

Seismic data processing of the Balnaves 3D seismic Survey was contracted to Western Geophysical in Adelaide. Significant steps in the processing sequence are discussed below:

Combination with Haselgrove 3D Seismic Survey - CMP gathers of the Haselgrove 3D Seismic Survey were reassigned to the Balnaves grid geometry and interleaved with the Balnaves gathers in the fold taper zone. The Haselgrove data were reprocessed in

conjunction with the Balnaves data. This provided a continuous volume covering the Balnaves and Haselgrove surveys, without any fold taper effects in the overlap zone.

FX Coherent Noise Suppression (FXCNS) - This process was applied to optimise the signal-to-noise ratio of the shot gathers. It is desirable to have the cleanest gathers possible to achieve confident velocity analyses, and to improve the performance of pre-stack processes such as dip-moveout and pre-stack migration. FXCNS works by sorting the data into azimuth bins, estimating the noise using FX filtering and least squares optimisation, and subsequently subtracting the noise.

Deconvolution - The deconvolution parameters have a significant effect on data quality. For the best results a multi-gate surface-consistent design was used. The multiple design gates resulted in optimal deconvolution of the deeper data, which has a significantly different frequency spectrum to the shallower data, due to the attenuation of high frequency energy.

Migration - Given the complex structure in the survey area, it was decided to test pre-stack time migration (PSTM) to reduce the cancellation of diffraction energy in the CMP stack, and thereby improve the focusing of dipping seismic energy. Two methods of PSTM were tested: Kirchoff and DMO-Stolt. The Kirchoff method is theoretically superior because diffraction trajectories are more accurately predicted. The DMO-Stolt method is two-stage processes where the offset volumes have DMO applied and are corrected to zero offset before the PSTM. Unfortunately, the PSTM routines did not perform well in practise, because of the low signal-to-noise ratio of the offset volumes. Attempts to improve the performance of the migration by summing adjacent offset volumes and applying FXY-deconvolution resulted in the cancellation of steeply dipping energy. Consequently, a conventional modified residual post-stack migration was applied.

Random Noise attenuation before migration - Significant improvement was achieved by applying FXY-deconvolution prior to the post-stack migration. This process is very effective at canceling random noise bursts, which can have a detrimental effect in the migration.

The final migrated volume was received 9 February 2001. The combined dataset, which includes the reprocessed Haselgrove 3D seismic data and the Balnaves 3D seismic data, will be copied and forwarded directly.

Amplitude versus offset (AVO)

2D AVO has been a successful exploration tool in PEL 32. Previous attempts to apply the technique to the Haselgrove 3D CMP gathers have not been successful because of the poor signal-to-noise ratio of the gathers. To overcome the signal-noise problem, a simplified procedure was tested, where an intercept-gradient crossplot relationship is defined from three angle-limited, migrated volumes. If a crossplot relationship can be defined with confidence, it is then possible to highlight anomalous AVO responses, which could be related to hydrocarbons. To achieve accurate results it is critical to pre-condition the input angle volumes, by band-limiting and scaling. An initial test of this procedure has been applied over the Haselgrove Field, which was discovered on the basis of 2D AVO. The test results (received February 2001) look sufficiently encouraging to proceed with an AVO project over the entire Balnaves and Haselgrove 3D area. The Joint Venture is currently considering the timing and scope of this study.

Jacaranda PSDM

Two 2D seismic lines over Jacaranda Ridge-1 were reprocessed in-house using pre-stack depth migration (PSDM). The reprocessing aimed to improve the imaging of fault plane energy, critical to the structural interpretation of the prospect. The lines included a low-fold line that intersected the well location (UA85-43DB) and a higher fold line that intersected this line (R93-15). The velocity model was constructed in a layer-stripping fashion using iterations of coherency inversion and reflection tomography. The PSDM processing provided a subtle enhancement of the fault plane energy, particularly for the higher fold line, where the velocity model could be defined with higher confidence. It is believed that significant improvement is not possible because of the inherent limitations of the 2D wavefield sampling.

3.4 GEOLOGICAL AND GEOPHYSICAL STUDIES

Dipmeter FMS analysis for Jacaranda Ridge 1

Dipmeter FMS analysis for Jacaranda Ridge 1 has allowed an improved understanding of the structural history of the area, including relative fault timing and orientation. Early south dipping normal faults formed while mud rich sediments were still very plastic. This may have been associated with some NW-SE strike slip movement. Later north to NE dipping faults were initiated

after mud rich sediments became more indurated. All faults may have been subjected to recent reactivation and mineralisation.

CMR analysis (Jacaranda Ridge 1)
Schlumberger investigated the apparent discrepancy between CMR permeability and MDT permeability in Jacaranda Ridge-1. The CMR was reprocessed to obtain NMR gas corrected porosity and permeability, independent estimates of NMR permeability and estimates of gas volume in the flushed zone. ELAN statistical petrophysical analysis was performed to obtain estimates of permeability independent of the CMR. The MDT pretests were reprocessed to validate and optimize drawdown mobilities.

CMR permeabilities were found to be 100 to 500 times larger than MDT pretest mobilities. The various CMR permeability estimates were consistent. ELAN permeabilities exhibited "outstanding" correlation with CMR permeability. The discrepancy could not be explained from errors in tool measurement, fluid effects or settings for permeability equation parameters.

Structural and sedimentological analysis of the Jacaranda Ridge structure (NCPGG project)
Structural conclusions are that the core intersected a fault damage zone causing the top Sawpit sand to be tight.
Sedimentological conclusions are that the upper Sawpit sand is probably an extensive braid plain sheet sand overlying a sequence boundary, which was intersected in the core. Below the sequence boundary, high sinuosity disconnected sands are more probable.
A final report is in preparation.

Wynn Prospect
Mapping is currently being done using 3D fault analysis software to evaluate the cross-fault sealing capacity of the bounding fault, and any remaining exploration potential.

Balnaves 3D Interpretation
The final Balnaves 3D seismic data volume was received on the 9 February 2001, and interpretation has commenced.

Jacaranda Ridge 1 Well Completion Report
The Jacaranda Ridge 1 Well Completion Report was prepared during the year and was distributed to the Joint Venture and Government in January 2001.

Penley 1 Well Completion Report
The Penley 1 Well Completion Report was prepared during the year and was distributed to the Joint Venture and Government in October 2000.

3.5 REPORTS/DATA SUBMITTED

Well completion reports for the Jacaranda Ridge 1 and Penley 1 wells were submitted on 17 January 2001 and 25 October 2000 respectively.
An engineering report entitled "Jacaranda Ridge 1 MDT, Open Hole DST, Cased Hole DST and Extended Production Test Reports", (2 volumes), was sent to PIRSA on 28 November 2000.
The Jacaranda Ridge 1 FMS interpretation report was submitted on 23 February 2001.

A report on the CMR analysis of Jacaranda Ridge 1 by Schlumberger accompanies this report.

4 Environmental Compliance

No environmental incidents were reported during the Permit year.

4.1 BALNAVES 3D SEISMIC SURVEY

The long-term impact on the environment of the survey was not significant, as the majority of the land had already been given over to farming and grazing.

The remnant native vegetation sections on private land and in a Heritage Agreement area had only narrow, slashed walking tracks meandering through them, leaving larger vegetation in place. Regeneration in these areas is expected to be rapid with no long-term effects.

Recording operations in pine plantation zones saw most source lines offset to existing firebreaks and easements, as well as some receiver lines. Other receiver lines largely utilised existing extraction rows for access with only minor hand pruning of tree limbs. No pine trees had to be removed.

An environmental field audit is being undertaken to assess the impact of the Balnaves 3D seismic survey, and a report will be included in the final Balnaves 3D Operations Report.

5 Expenditure Statement

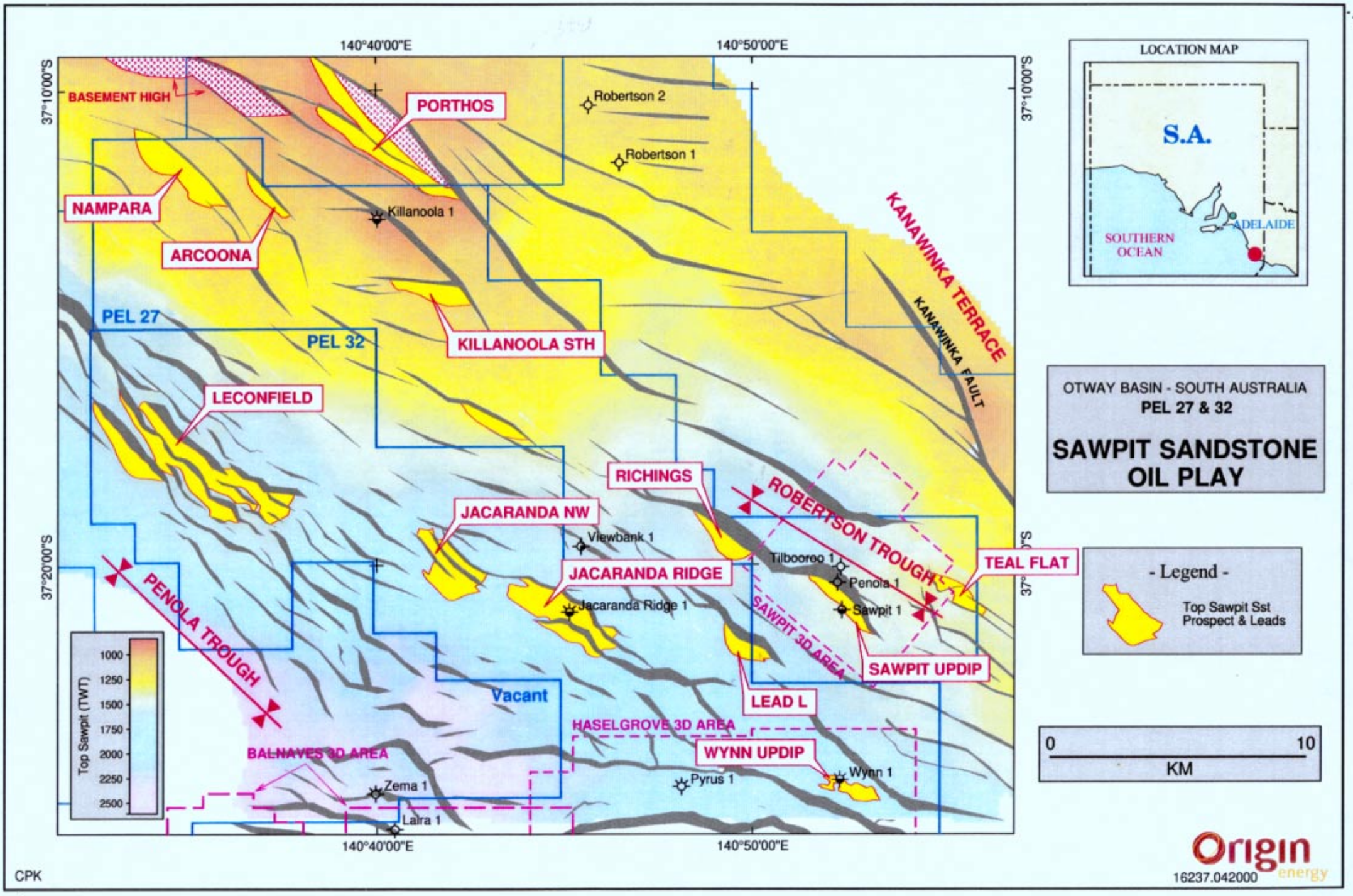
An Expenditure Statement for PEL 32 Joint Venture during the period from 19 February 2000 to 18 February 2001 is attached.

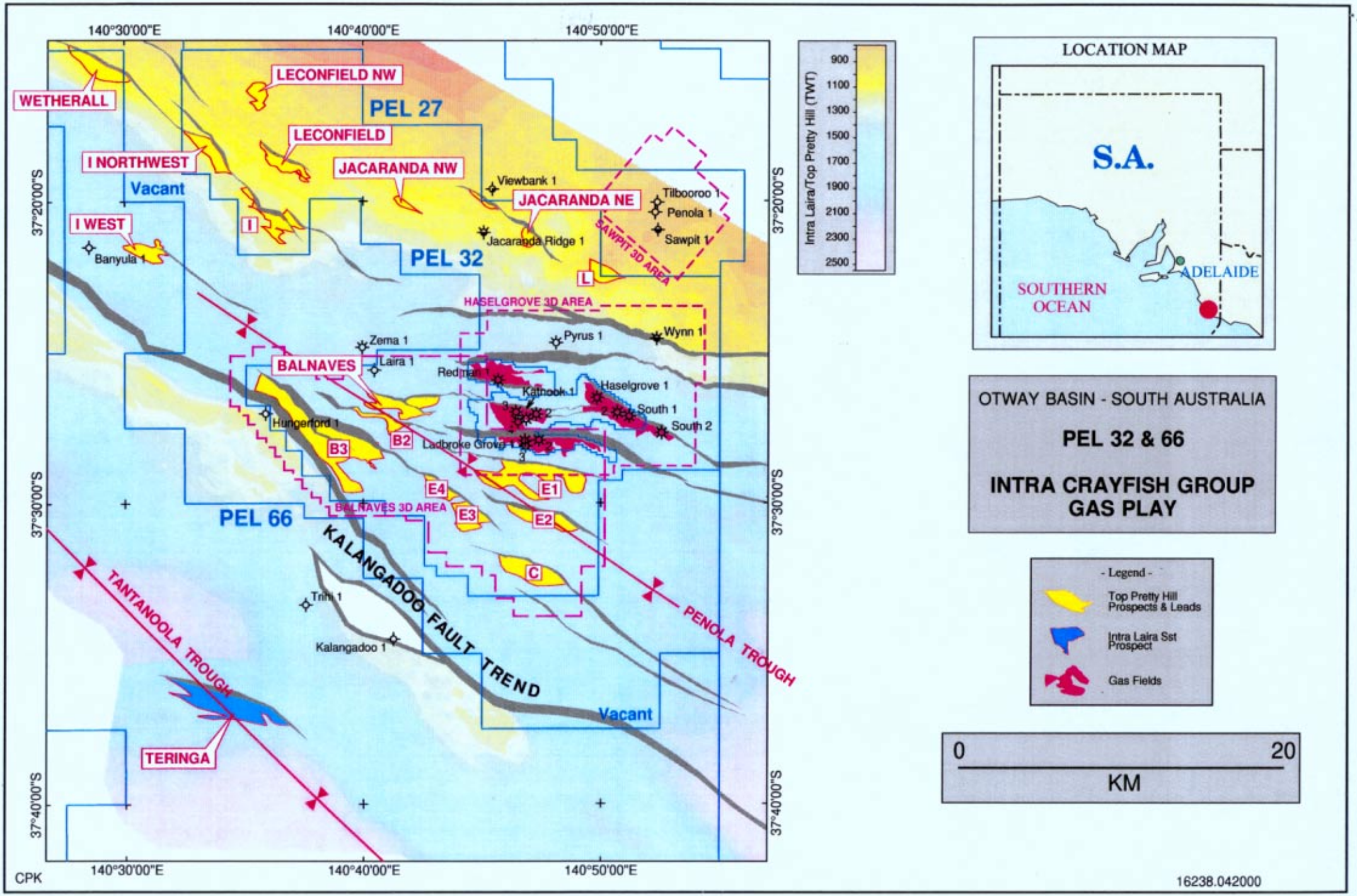
Information not available for public inspection as per Regulation 33 (5)

PEL 32 ONSHORE OTWAY BASIN, SOUTH AUSTRALIA

19TH FEBRUARY 2000 TO 18TH FEBRUARY 2001

ANNUAL STATEMENT OF EXPENDITURE


140°40'00"E
140°50'00"E
37°10'00"S
37°20'00"S
BASEMENT HIGH
PORTHOS
Robertson 2
Robertson 1
NAMPARA
ARCOONA
Killanoola 1
KANAWINKA TERRACE
KANAWINKA FAULT
PEL 27
PEL 32
KILLANOOLA STH
LECONFIELD
RICHINGS
ROBERTSON TROUGH
JACARANDA NW
Viewbank 1
Tilbooroo 1
TEAL FLAT
Penola 1
JACARANDA RIDGE
Jacaranda Ridge 1
Sawpit 1
SAWPIT 3D AREA
SAWPIT UPDIP
PENOLA TROUGH
LEAD L
Vacant
HASELGROVE 3D AREA
WYNN UPDIP
Wynn 1
Pyrus 1
BALNAVES 3D AREA
Zema 1
Laira 1
Top Sawpit (TWT)
1000
1250
1500
1750
2000
2250
2500
LOCATION MAP
S.A.
ADELAIDE
SOUTHERN OCEAN
OTWAY BASIN - SOUTH AUSTRALIA
PEL 27 & 32
SAWPIT SANDSTONE OIL PLAY
- Legend -
Top Sawpit Sst Prospect & Leads
0
10
KM
CPK
16237.042000
Origin energy


140°30'00"E
140°40'00"E
140°50'00"E
37°20'00"S
37°30'00"S
37°40'00"S
LECONFIELD NW
WETHERALL
PEL 27
LECONFIELD
I NORTHWEST
JACARANDA NW
Vacant
JACARANDA NE
Viewbank 1
Tilbooroo 1
Penola 1
Sawpit 1
I WEST
I
Banyula 1
Jacaranda Ridge 1
PEL 32
SAWPIT 3D AREA
L
HASELGROVE 3D AREA
Zema 1
Pyrus 1
Wynn 1
BALNAVES
Laira 1
Redman 1
Kathook 1
Haselgrove 1
South 1
South 2
Hungerford 1
B2
B3
Ladbroke Grove 1
E4
E1
BALNAVES 3D AREA
E3
E2
PEL 66
KALANGADOO FAULT TRENDS
C
TANTANOOLA TROUGH
PENOLA TROUGH
Trihi 1
Kalangadoo 1
Vacant
TERINGA
CPK
Intra Laira/Top Pretty Hill (TWT)
900
1100
1300
1500
1700
1900
2100
2300
2500
LOCATION MAP
S.A.
ADELAIDE
SOUTHERN OCEAN
OTWAY BASIN - SOUTH AUSTRALIA
PEL 32 & 66
INTRA CRAYFISH GROUP GAS PLAY
- Legend -
Top Pretty Hill Prospects & Leads
Intra Laira Sst Prospect
Gas Fields
0
20
KM
16238.042000