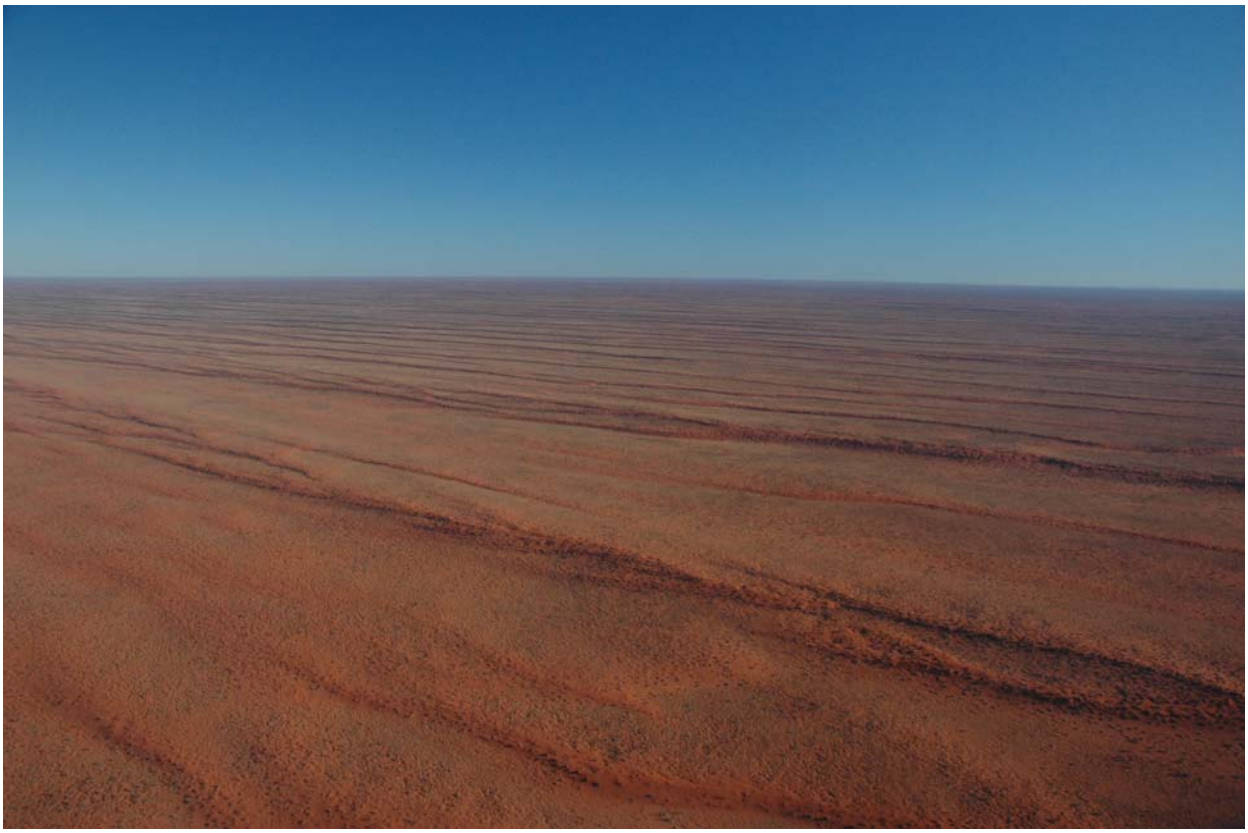
2006 EP 97 Pedirka Basin Soil-gas Geochemical Survey

RAWSON RESOURCES LIMITED



Operations & Interpretation

EP 97 – Northern Territory

Petrofocus Consulting Pty. Ltd
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BOWRAL NSW 2576

For
RAWSON RESOURCES LTD
ABN 69 082 752 095

FIGURES

PHOTOGRAPHS

TABLES.....

APPENDICES

LIST OF ENCLOSURES

1.0 INTRODUCTION

Rawson Resources Limited successfully conducted a helicopter-borne soil-gas geochemical survey in EP 97 (Pedirka Basin) in the Northern Territory. The survey commenced from Old Andado Station (photograph 1) on Tuesday 13th June with a one-day WAC survey. Sampling commenced on Wednesday 14th June 2006 and finished on Sunday 18th June 2006 with 414 soil-gas samples being collected concurrently by 2 field parties (one party being helicopter-borne and one using a 4X4 vehicle) and analysed. Figure 1 shows the general location of Old Andado, figure 2 shows the location of the survey and location of the sampling stations.

Photograph 1. Old Andado Station (NT)

The primary objective of the survey was to high-grade mapped leads (Colson Track, Bejah, and Simpson leads) within EP 97.

Permitting and consultation with landholders was conducted in early 2006. Native Title claimants were consulted on the location of the survey and asked to indicate areas of significance that may need to be avoided. A helicopter-borne Work Area Clearance (WAC) process preceded the survey.

All sample locations were recorded as GPS (Global Positioning System) sample points, and transferred to the Petrosys mapping package each day, together with the analyses for that day.

Table 1 Survey Statistics

Recorded Stations/sample points	**414**
Line Spacing	**500 - 2000m**
Station Spacing along line	**250 - 500m**

2.0 FIELD OPERATIONS

2.1 Permitting

Landowners and land managers, whose properties may be traversed by the survey, were contacted well in advance of the survey to explain the sampling program and to discuss logistics (accommodation, fuel storage etc), land access, and to identify any issue requiring special attention.

A one-day helicopter-borne Work Area Clearance (WAC) was undertaken by representatives of the Central Lands Council (Alice Springs) and their team of specialists on the day prior to the commencement of the survey (13th June 2006). Their letter of successful completion is attached as Appendix A.

2.2 Survey Overview

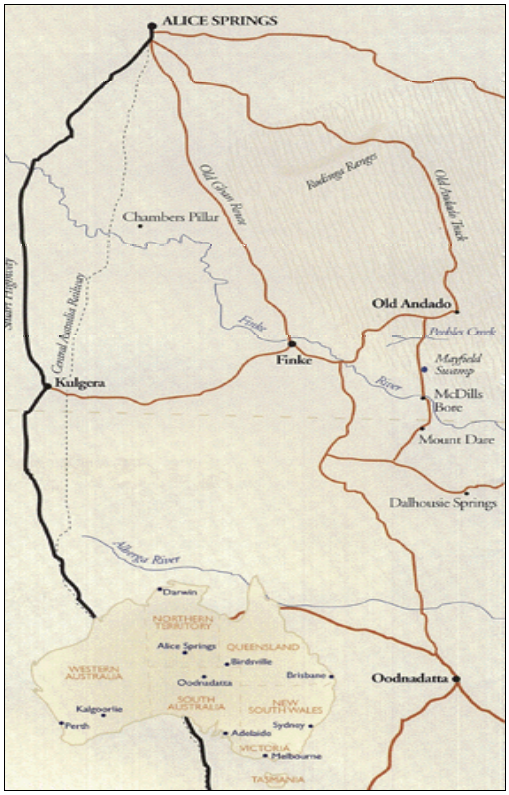
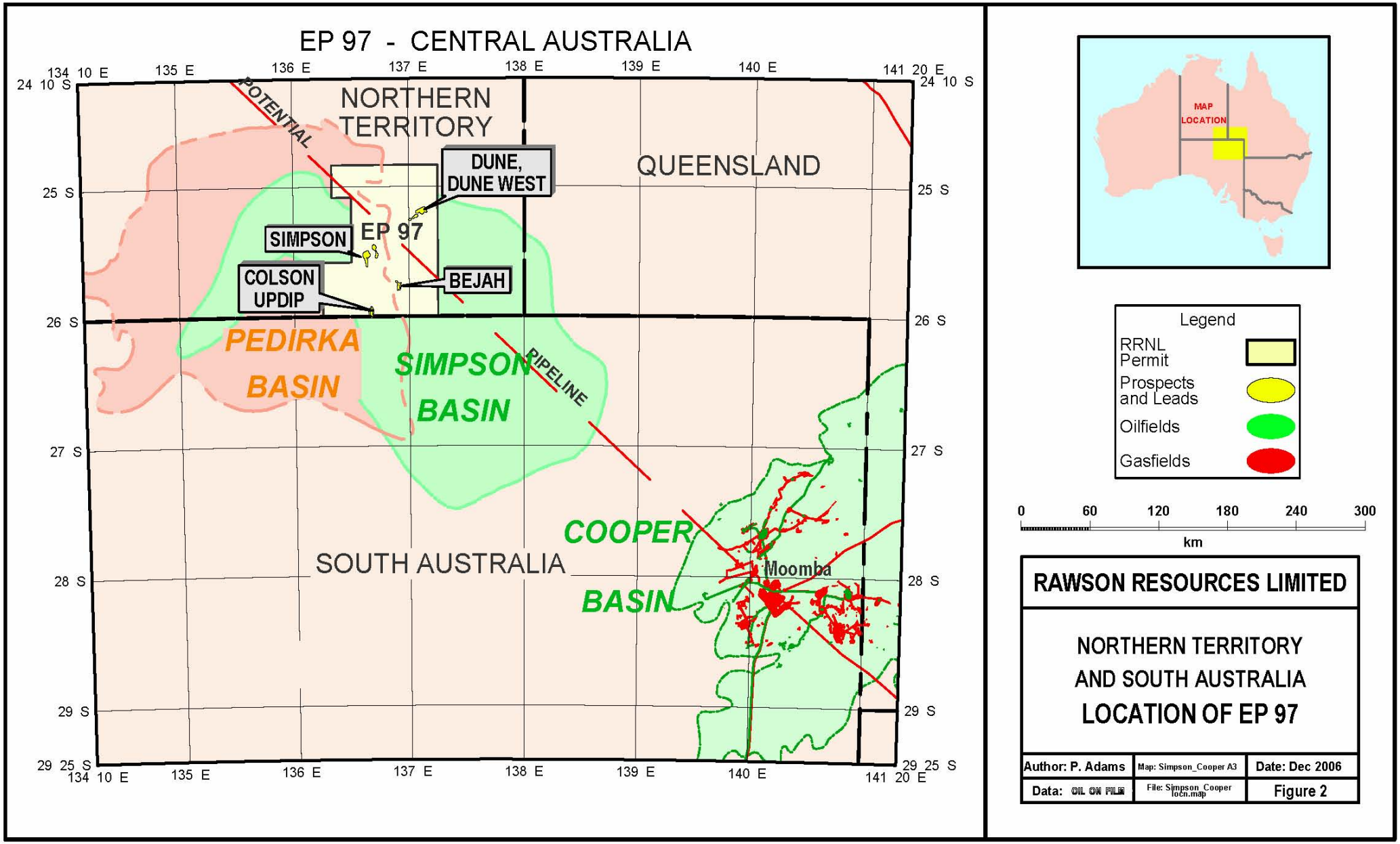


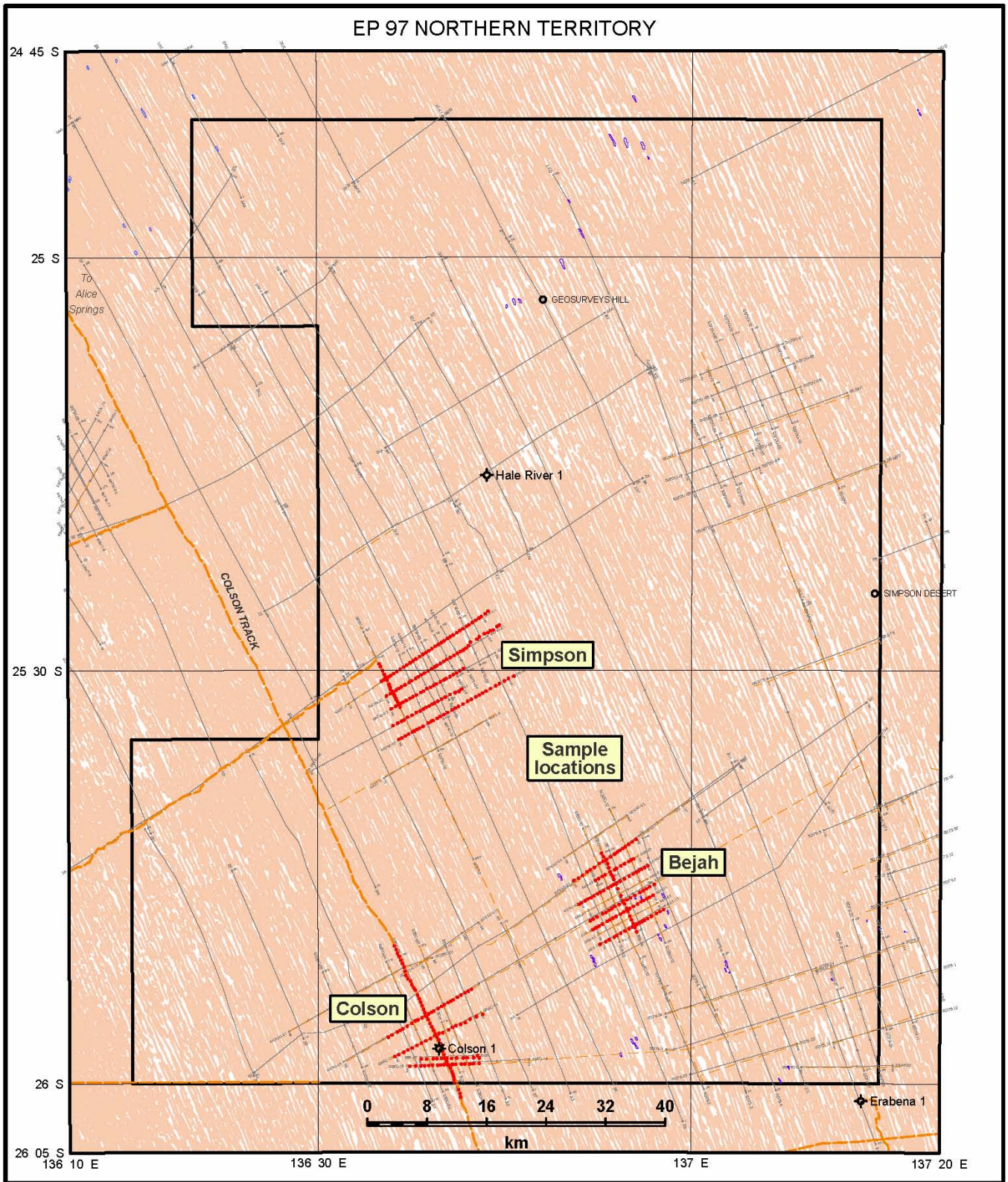
Figure 1.Access location

The survey team consisted of Dr. John Conolly, Executive Chairman, Mr. Paul Adams and Mr John Doughty, Directors, Rawson Resources, Mr. Bob Moffitt, a consultant geologist and Mr Ross Nielson.

Old Andado Station, situated approximately 330km south southeast from Alice Springs (about 270km from the Stuart Highway) was used as the base for the survey. Old Andado Station is generally accessible by 2 main routes; 2WD/conventional vehicle via Finke unless there has been significant rainfall in which case the road may be closed. Northern access is via the Old Andado Track and is 4WD accessible only.

A Bell Jet Ranger helicopter owned and flown by Alice Springs Helicopter's principal Mr. Chris Collins, was used for sampling and was stationed and refueled daily at the Old Andado airstrip. Due to the excessive distance flown daily a secondary fuel dump was situated on the Colson Track for mid-daily refueling.


EP 97 - CENTRAL AUSTRALIA
134 10 E
135 E
136 E
137 E
138 E
139 E
140 E
141 20 E
24 10 S
25 S
26 S
27 S
28 S
29 S
29 25 S
NORTHERN TERRITORY
QUEENSLAND
SOUTH AUSTRALIA
POTENTIAL
DUNE, DUNE WEST
EP 97
SIMPSON
COLSON UPDIP
BEJAH
PEDIRKA BASIN
SIMPSON BASIN
PIPELINE
COOPER BASIN
Moomba
MAP LOCATION
Legend
RRNL Permit
Prospects and Leads
Oilfields
Gasfields
0
60
120
180
240
300
km
RAWSON RESOURCES LIMITED
NORTHERN TERRITORY
AND SOUTH AUSTRALIA
LOCATION OF EP 97
Author: P. Adams
Map: Simpson_Cooper A3
Date: Dec 2006
Data: OIL ON FILE
File: Simpson_Cooper loch.map
Figure 2



Legend

Wells

- Oil & Gas shows
- Oil shows
- Plugged & Abandoned

Lines

- Tracks
- Cleared line
- Seismic line
- Sand dunes
- Sample locations
- EP 97 boundary

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2006 EP 97 SOIL GEOCHEMICAL SURVEY FOR RAWSON RESOURCES

Showing location of soilgas sample points

Author: John Conolly		Date: December 2006
Produced: OIL GAS FILM	MapSheet: EP 97 WGS 84 A3 File: 2006\Sample location.map	Figure 3

Photograph 2. 4X4 vehicle used for ground sampling.

A purpose-built remote-area 4X4 vehicle (photograph 2) was used to access a limited number of sample points along the Colson Track to enable the helicopter to be used more efficiently for more remote sampling. Because of landowner access restrictions, access to the larger part of the Colson Track was by the Rig Road and the French Line.

Sampling conditions were ideal; dry with cool to warm (15º to 23ºc) weather persisting over the whole period of the survey. Soil-gas samples were collected largely from dry dune sands and some sandy claypan soils.

A hand-made stainless steel probe designed by Petrofocus was used for sampling. The probe is hammered into the soil "C" horizon at depths of 40 to 80 cm beneath the upper soil surface and a sample of gas drawn taken through a series of septa into a syringe which was capped to remain gas-tight and the contained soil-gas analysed that evening or early the next day.

Photograph 3. Soil-gas sample being collected using metal probe and syringe.

The sampling procedure was carefully controlled with samples being collected away from any possible contamination. Probes were cleaned between each sample location.

Petrofocus used a small portable Photovac 1050S gas chromatograph to analyse the samples. Nitrogen is used as a carrier gas, and a standard or calibrant gas for the Alkane gases made up of known amounts of methane, ethane, propane and butane (prepared by the BOC Research Laboratory) was used to calibrate the Photovac 1050S.

Values of methane (C_1) generally range from a few parts per million up to 20 parts per million while it was found that ethane (C_2) values were generally less than 1

part per million to 2 parts per million. Values of propane (C_3) were generally less than 0.1 part per million.

The amounts of C_1 to C_3 in the gases in each sample were recorded manually as the Photovac machine does not have a digital memory.

Periodically, the calibrant and some samples were rerun to check the reproducibility of values. The values for C_1 to C_3 for each sample are given in Appendix B.

Since the values for each sample location were quickly established it was possible to prepare preliminary sample maps showing values while in the field.

Each traverse is described separately as each traverse represents a series of soil gas samples taken during a short sampling period. Since changes in weather and/or soil conditions can alter the absolute values obtained, each traverse or sets of traverses, sampled on a given day can be regarded as a unique set of values.

The following general guidelines can be used when interpreting soil gas data.

1. Each profile sampled on a given day is a stand-alone data set. Conditions can vary from day to day, week by week and of course through longer periods. However during this survey, sampling conditions remained fairly constant.
2. Low values are common, i.e. low background.
3. Values higher than background can be meaningful.
4. A one point anomaly is statistically meaningless, but clusters of higher values can be meaningful.
5. It is dangerous to compare absolute values from samples taken on different sampling days or from different localities.
6. Clusters of higher than background value establish initial “areas of interest” or geochemical “leads” and are shown on the enclosures and described in the text.

2.3 Data Acquisition

Photograph 4. Operator directing helicopter to sample points

The data was acquired using a helicopter and two operators; one operator directing the helicopter (photograph 4) to sampling points with lap-top-based navigation package and the second operator collecting samples. On a daily basis, the lines to be sampled were dependent on wind direction and fuel consumption considerations. The helicopter would land at 500 m intervals, the sampler would exit the helicopter and using the Petrofocus probe collect a sample of interstitial gas from the soil in a syringe. A handheld Garmin GPS was used to record the exact location of each sample.

At the end of the day, or the sampling session, the syringes would be flown back to base camp where they were analysed using a Photovac 1050S gas chromatograph. The results were recorded manually into Petrosys Mapping software, where they were combined with the GPS locations recorded for each sample point and subsequently exported to an Excel spreadsheet. These data were then displayed on a map to assist in planning the following day's operations.

2.4 Environmental

This soil-gas survey was conducted using Rawson's own Environmental Policy guidelines. These guidelines have been adopted to provided a clear guidance on management practices and measures to be taken to protect the environment during onshore exploration, development and production. This policy has been developed to;

- comply with applicable laws, regulations, standards and guidelines for the protection of the environment and in their absence adopt the best practicable means available to prevent or minimise adverse environmental impacts,
- work and consult with appropriate government agencies with regard to policies, laws, regulations or procedures to protect the environment,

- ensure that adequate waste management practices are carried out based on the prevention, minimisation, recycling, treatment and disposal of wastes,
- provide adequate training to enable employees and contractors to adopt environmentally responsible work practices and to be aware of their stewardship responsibilities,
- develop emergency plans and procedures so that incidents can be responded to in a timely and effective manner,
- develop and maintain management systems to identify, control and monitor risks and compliance with government regulations and industry guidelines,
- monitor environmental effects and assess environmental performance at all stages of exploration, development, production, production and rehabilitation,
- communicate openly with government, non-government bodies, the public and traditional landowners in a timely manner on environmental issues which relate to Rawson's operations.

2.5 Health and Safety

Safety receives the highest priority from Rawson Resources. All personnel during this survey were cognisant of all aspects of general field safety, especially when working in remote areas (e.g. the effects of heat stress). Alice Springs Helicopter's principal conducted a concise helicopter safety briefing prior to the commencement of sampling.

Fully charged satellite phones (2 in the helicopter), an EPIRB and comprehensive first-aid kits were carried by each of the parties at all times.

As a result of these safety procedures, and Rawson's own corporate safety management procedures being adhered to, there were no incidents of a health and safety nature on this survey.

3.0 SUMMARY OF RESULTS AND CONCLUSIONS

(See Enclosures 1, 2, 3, & 4)

This Survey can be regarded as highly successful. Firstly some exceptionally high values of C_2 and C_3 were found over the Simpson Prospect. These values confirm that ethane and propane which must be thermogenically derived occur in anomalous proportions over a previously mapped seismic and over most of the structural high.

High values also occur over the Simpson East Prospect area, indicating that anomalous microseepage occurs there as well.

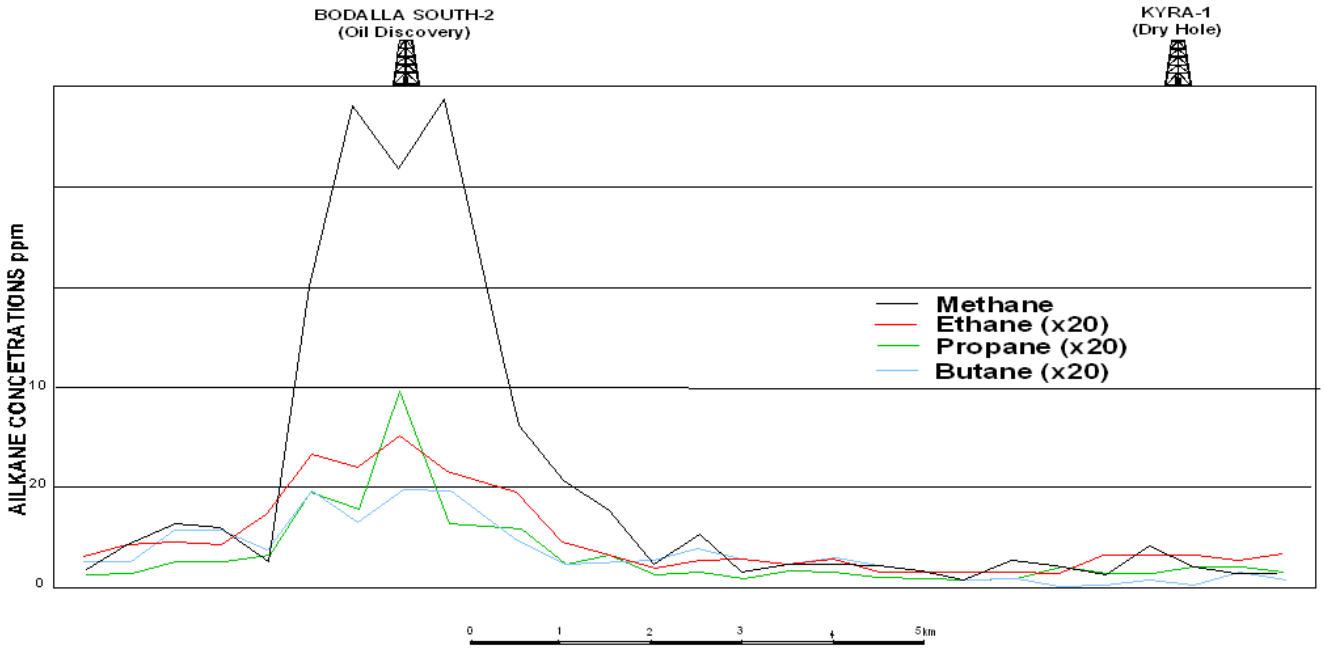
The values of 6.5ppm ethane over the Simpson Prospect are similar to the very high values found over the Bodalla Field in Western Queensland that are up to 10 times greater than background. (See Figure 4 below)

The Bejah Prospect has a range of moderately high background values (up to 2ppm ethane) In several clusters over the general region of the Bejah Prospect area this indicates the microseepage of C_2 and C_3 from the area.

The Colson Prospect region was characterised by low background values of C2 and C3 suggesting there is currently no active microseepage over this region.

Note: The enclosures with the posted values are self-explanatory. Clusters of high values are typical of microseepage anomalies over undrilled fields, such as those that clusters occur over the Simpson and Bejah regions.

Figure 4



Composite profile along seismic lines HQ 83-98 and HQ 84-215, showing contrast of light alkanes over a producing field and a dry structural feature

4.0 GENERAL DISCUSSION

Although success has been claimed over the fifty or more years for various geochemical exploration techniques, enthusiasm for their employment is not widely shared by professionals in the petroleum industry.

Anomalous concentrations of hydrocarbon gases were first reported above petroleum reservoirs in the 1930s (Laubmeyer, 1933; Sokolov, 1933, 1959; Horvitz, 1939). These results quickly lead to the development of techniques for use in petroleum exploration, and in 1959 Sokolov summarised successful applications of the techniques in the U.S.S.R. with consequent discoveries of major gas fields. In the past decade surface geochemical techniques have been used to help locate leaking oil and gas fields in offshore areas. There is now a vast literature on the occurrence of gas chimneys as seen on seismic and their relationship to overlying oil and gas fields (Aminzadeh *et al* 2001; Canales 2002).

A summary of methods and techniques was made by Schumacher and Abrams in their 1996 AAPG Memoir 66. This more modern approach has become favourable in the past decade. More recently, Dr. Conolly has spent much time with Dr. Abrams who is currently conducting a world wide review of surface geochemical techniques for EGI (Energy Geoscience Institute, University of Utah) funding by 15 major oil companies.

Successful employment of geochemical exploration techniques relies upon the phenomenon of vertical migration of light hydrocarbons that leak in trace amounts from petroleum reservoirs (Durham 2003; El-Bishlawy *et al* 2001; Saunders *et al* 1999 and Viforeanu *et al* 2003). The weight of evidence from reliable sources clearly demonstrates that vertical migration does in fact occur, even though leakage up major fault zones can displace anomalies (Schumacher & Abrahams 1996). It must now be conceded that light hydrocarbon gases do leak from at least some moderately deep to deep petroleum reservoirs and can be detected as microseepage located vertically above, or peripheral to, the surface projection of the reservoir as:-

(i) free gas in the soil or absorbed to soil minerals;

(ii) as a chemical or mineralogical alteration of soil and surface rocks;

(iii) in vegetation as either morphological or chemical effects.

In addition, case studies conducted by Petrofocus since 1980 unambiguously show anomalous concentrations of light hydrocarbon gases directly above or immediately peripheral to the surface projection of known petroleum reservoirs in the Amadeus, Eromanga and Otway Basins.

The detection of the light hydrocarbon gases was selected as the most reliable sampling medium since only gaseous hydrocarbons can pass directly through aquifers which are commonly present above petroleum reservoirs in many Australian sedimentary basins. On the other hand, hydrocarbons transported in solution, including dissolved gases, will be entrained in the aquifer or in the surficial groundwater system and may be released at some remote location which cannot be related to the parent petroleum reservoir.

In Petrofocus surveys soil-gas samples are carefully collected from depths ranging from 40 to 80 cm using a probe of proprietary design and pre-prepared syringes. Samples are analysed for the light alkanes methane through butane with a gas chromatographic technique. The sensitivity of the Photovac chromatograph, as presently employed, is approximately 0.5 ppmv methane, 0.05 ppmv ethane, 0.02 ppmv propane, and 0.005 ppmv butane. The alkane concentrations of samples are determined by comparison with known concentrations in a specially prepared gas standard. Reproducibility of results is typically better than ±5%. Obviously if there is only say 0.02 ppmv propane in a sample then that is at the limit of detection. This must be borne in mind when viewing the results of this survey.

Petrofocus Consulting Pty. Ltd. and its predecessor Petrofocus Pty. Ltd. has been conducting soil-gas surveys for over 20 years. The principal, Dr. John Conolly instigated the formation of Petrofocus in Sydney in 1980 with the help of Dr. William Ryall, formerly a senior CSIRO geochemist with vast experience in vapour research in soils. Petrofocus found that the techniques of collecting gas samples from fairly shallow soil depths (40 to 80 cm) was useful as a screening process for known prospects and leads and also useful as an empirical tool to help locate microseepage from deeper oil and gas reservoirs.

The results of any soil-gas survey has to be used in conjunction with other methods such as seismic and knowledge from wells. It certainly will never be "stand-alone" tool. In some basins the results were confusing in so far that the basins had so many different sand/reservoirs rich in hydrocarbons it was impossible to correlate a microseepage anomaly with a single known subsurface feature. However, in other cases surface soil gas anomalies did correspond to single subsurface features (anticlines in particular) which contained commercial accumulations of oil and gas.

The examples used are those found by Petrofocus (Petrofocus 1985) in the Eromanga Basin in Queensland, namely the Nockatunga trend and the Bodalla oil trends.

Dr. Michael Abrams of EGI is conducting research for oil companies on surface geochemical techniques, of which there are many. Dr. Abrams believes that like all techniques the soil-gas method should be used with care and caution, but to quote, he also believes that if it is found to work in a given region, because the

natural conditions are correct, it can be very useful in locating areas of interest for further hydrocarbon exploration.

Hence one must temper ones enthusiasm for a surface sampling method that has been found to be useful in dry and soil conditions with the knowledge that values can be difficult to interpret, as conditions both surface and subsurface change.

Throughout the survey in the Pedirka Basin the weather remained dry and mild with daily temperatures ranging from 15°C to 23°C. These conditions are regarded as ideal conditions for soil-gas geochemical work by Petrofocus.

5.0 REFERENCES

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BEJAH PROSPECT

25 40 19 S
685000M E
690000M E
695000M E
700000M E
7155000M N
7150000M N
7145000M N
7140000M N
25 50 S
25 51 50 S
136 48 13 E
136 50 E
137 E
137 00 57 E

Bejah

Moderate to High background values over Bejah region

Legend

- Soilgas sample number
- Soilgas sample point
- Methane ppm 25
- Ethane ppm (x10) 15
- Propane ppm (x10) 2
- Anomalous samples
- Prospect or Lead
- Plugged & Abandoned
- Sand ridge
- Watercourse
- Vegetation
- Track

1:50000

0 1 2 3 4 5

KILOMETRES

UNIVERSAL TRANSVERSE MERCATOR PROJECTION
WGS 1984 SPHEROID
CENTRAL MERIDIAN 135 E
Mapsheet datum: "WGS 1984"

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EP 97 SOIL GEOCHEMICAL SURVEY BEJAH PROSPECT

Methane values (ppm) in blue

Ethane values (ppm x10) in red

Propane values (ppmx10) in green

Author: John Conolly		Date: December 2006
Produced: OIL ON FILM	File: 2006\ Bejah results.map Mapsheet: Bejah 50K	Enclosure 3

SIMPSON PROSPECT

660000M E | 665000M E | 670000M E | 675000M E

25 25 S | 25 30 S | 25 38 S

7185000M N | 7180000M N | 7175000M N | 7170000M N | 7165000M N

136 33 E | 136 40 E | 136 47 E

Simpson

A cluster of high values over the Simpson and Simpson East Prospects, and very high values over the central Simpson Prospect

Legend

- Soilgas sample number _ _ _ _ _
- Soilgas sample point _ _ _ _ _ _
- Methane ppm _ _ _ _ _ _ _ _ _ 25
- Ethane ppm (x10) _ _ _ _ _ _ _ 15
- Propane ppm (x10) _ _ _ _ _ _ 2
- Anomalous Soilgasa Values _ _ _
- High Soilgas values _ _ _ _ _ _
- Very High Soilgas values _ _ _ _
- Prospect or Lead _ _ _ _ _ _ _
- Plugged & Abandoned _ _ _ _ _
- Sand ridge _ _ _ _ _ _ _ _ _ _
- Watercourse _ _ _ _ _ _ _ _ _ _
- Vegetation _ _ _ _ _ _ _ _ _ _
- Track _ _ _ _ _ _ _ _ _ _ _ _ _

1:50000

0 1 2 3 4 5

KILOMETRES

UNIVERSAL TRANSVERSE MERCATOR PROJECTION
WGS 1984 SPHEROID
CENTRAL MERIDIAN 135 E
Mapsheet datum: "WGS 1984"

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EP 97 SOIL GEOCHEMICAL SURVEY
SIMPSON PROSPECT
Methane values (ppm) in blue
Ethane values (ppm x10) in red
Propane values (ppmx10) in green

Author: John Conolly		Date: December 2006
Produced: OIL ON FILM	Mapsheet: Simpson 50K File: 2006\ Simpson results.map	Enclosure 2

COLSON PROSPECT

660000M E | 665000M E | 670000M E | 675000M E

25 50 S | 26 S | 26 02 S

7140000M N | 7135000M N | 7130000M N | 7125000M N | 7120000M N

136 33 E | 136 40 E | 136 45 E

Colson

Colson 1

COLSON TRACK

Some medium background values

Legend

- Soilgas sample number
- Soilgas sample point
- Methane ppm — 25
- Ethane ppm (x10) — 15
- Propane ppm (x10) — 2
- Anomalous samples
- Prospect or Lead
- Plugged & Abandoned
- Sand ridge
- Watercourse
- Vegetation
- Track

1:50000

0 1 2 3 4 5

KILOMETRES

UNIVERSAL TRANSVERSE MERCATOR PROJECTION
WGS 1984 SPHEROID
CENTRAL MERIDIAN 135 E
Mapsheet datum: "WGS 1984"

PETROFOCUS CONSULTING PTY LTD

EP 97 SOIL GEOCHEMICAL SURVEY

Showing location of sample points

Methane values (ppm) in blue

Ethane values (ppm x10) in red

Propane values (ppmx10) in green

Author: John Conolly		Date: December 2006
Produced: OIL ON FILM	Mapsheet: Colson 50K File: 2006\ Colson results.map	Enclosure 4