# RESOURCE ESTIMATE MAKÓ TROUGH, HUNGARY

Effective Date: March 31, 2008

# Prepared for FALCON OIL & GAS LTD





4849 Greenville Avenue, Suite 1150, Dallas, Texas 75206, USA **T** +1 214 987 1042 **F** +1 214 987 1047 **E** Dallas@scotia-group.com **W** www.rpsgroup.com/energy

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# 1.0 INTRODUCTION

#### **1.1 AUTHORIZATION**

RPS Scotia (the Consultant) has been retained by Falcon Oil & Gas, Ltd. (the Client) to prepare this Report under the Canadian Oil & Gas Evaluation Handbook (COGEH) and Canadian securities instrument National Instrument 51-101 – Standards of Disclosure for Oil and Gas Issues (51-101) standards regarding the Client's Mining license in the Makó trough and Tisza license blocks in Hungary (each the Makó Mining License and Tisza License and together Licenses). Reference to the Client refers collectively to the parent Canadian company and its wholly owned operating entities in Hungary. This report is an update of the previous report prepared by The Scotia Group in August of 2006.

# 1.2 INTENDED PURPOSE AND USERS OF REPORT

The purpose of this Report is to disclose estimates of Makó trough Mining license resources for use in the Client's public disclosure record and to fulfill Canadian securities filing requirements. The anticipated users of this report included, but are not limited to, the Client's directors, officers, employees and consultants, and the Company's current shareholders and prospective investors.

### 1.3 OWNER CONTACT AND PROPERTY INSPECTION

This Consultant has had frequent contact with the Client and the Client's other consultants up to the effective date of this Report. This Consultant has physically inspected the property in Hungary, and for the purpose of this resource estimate, the property inspection is not considered relevant.

### 1.4 SCOPE OF WORK

This Report is intended to describe and quantify the resources contained within the Deep Gas prospect in the Client's Makó and Tisza License blocks in Hungary. The effective date of this report is March 31, 2008, and is an update of the previous analysis.

# 1.5 APPLICABLE STANDARDS

This Report has been prepared in accordance with COGEH and NI 51-101. 51-101 requires disclosure of specific information concerning prospects, as will be provided in Section 2 of this Report.

# 1.6 ASSUMPTIONS AND LIMITING CONDITIONS

This Report is limited to an estimate of the resources (as defined by COGEH) of the property, namely the Mining License of the Makó trough. This Report does not attempt to place a value thereon. Due to the fact that exploration of the subject properties is in an early stage, it was considered that any attempt to economically model the potential of the properties would involve such a wide range of uncertainty as to be potentially misleading. For this reason, no economic modeling was performed.

The accuracy of any estimate is a function of available time, data and of geological, engineering and commercial interpretation and judgment. While the resource estimates presented herein are believed to be reasonable, they should be viewed with the understanding that additional analysis or new data may justify their revision and this Consultant reserves the right to make such revisions as the Consultant believes are necessary.

# 1.7 INDEPENDENCE/DISCLAIMER OF INTEREST

This Consultant has acted independently in the preparation of this Report. This Consultant and its employees have no direct or indirect ownership in the property appraised or the area of study described, or own any publicly or privately traded stock of the Client.

Our fee for this Report and the other services that may be provided is not dependent on the amount of resources estimated.

# 2.0 REQUIRED DISCLOSURES REGARDING PROSPECTS

# 2.1 LOCATION AND BASIN NAME

The Makó Basin is a large structural sag or trough, which is located in southeastern Hungary near the Romanian border. The axis of the trough strikes in a NW-SE direction. The trough is bounded to the west by the Algyö structural high and to the east by the Battonya structure. The major Hungarian city of Szeged lies about 10 km to the west of the Makó trough.

# 2.2 THE CLIENT'S GROSS AND NET INTEREST IN THE PROPERTY

The Makó License covers an aggregate of 1,374 square kilometers (339,378 acres). The Tisza License covers an aggregate of 955 square kilometers (235,885 acres). Under each of the Licenses, the Client is obligated to pay a 12% royalty to the Government of Hungary and a 5% royalty to Prospect Resources, Inc. (which is the original licensee of the Licenses) on all sales of oil and gas.

# 2.3 EXPIRY DATE OF INTEREST

The Client presently holds the Licenses for the exclusive right to explore for oil and gas through December 31, 2009 and has obtained a production license which lasts 35 years and renewable as long as there is production.

# 2.4 DESCRIPTION OF TARGET ZONE

The target zones are the entire accumulations of Szolnok and Endröd clastic sediments in the Makó trough as well as the underlying Basal Conglomerate and Synrift Sequence and perhaps the portions of the overlying Algyö formation. In the recently drilled Makó-6 well, high background gas readings were recorded while drilling the Szolnok, Endröd, Basal Conglomerate and underlying Synrift Sequence, indicating active current gas generation. The overlying Algyö formation recorded elevated background gas readings, particularly in its lower sections. The high gas readings were recorded from approximately 3,200 m to total depth of the well, or an interval of over 2,000 m. These formations are the source rocks for the surrounding oil and gas fields and appear to contain additional hydrocarbons (most likely gas) trapped in so-called basin-centered gas accumulations (BCGA) and possibly in conventional traps. BCGA's are characterized by overpressured, gas-saturated, low-permeability reservoirs. The Makó-6 well

encountered a tuffitic sand and conglomerate sequence in the lower Endröd formation that may represent a series of reservoirs with more conventional properties.

# 2.5 DISTANCE TO THE NEAREST COMMERCIAL PRODUCTION

The Makó trough is surrounded by oil and gas production on the structural highs, which bound the depression. The distance varies from 23 kilometers to approximately 5 kilometers from the Algyö field (approximately 400 million oil-equivalent barrels of oil and gas produced to date).

# 2.6 PRODUCT TYPES REASONABLY EXPECTED

Natural gas is reasonably expected from the Lower Szolnok, Lower Endröd and underlying conglomeratic sequences. The Upper Endröd formation tested in the Magyarcsanad-1 indicated the presence of mobile oil and gas. The Upper Szolnok and the Algyö formations may yield both oil and gas.

# 2.7 RANGE OF POOL OR FIELD SIZES

The basin-centered gas accumulation (BCGA) in the Makó trough is expected to be a continuous pool with varying degrees of technically and economically recoverable gas. This Consultant has conducted a probabilistic analysis of the likely distribution of resources for the Licenses, which are described in Section 3 of the Report.

# 2.8 DEPTH OF THE TARGET ZONE

The BCGA is interpreted to exist within the Szolnok and Endröd formations from a depth of about 3,200 m (as encountered in the Makó-6 well) and to persist to the total depth of that well at 5,689 m (driller's depth), to include the underlying Basal Conglomerate and Synrift Sequence. This is based on an evaluation of available data for the deep section within the Makó trough.

# 2.9 ESTIMATED DRILLING AND TESTING COSTS

Exploitation and development plans for the subject licenses are not currently available. No economic modeling of the resource accumulation was performed.

# 2.10 DRILLING, COMPLETION AND TEST RESULTS

The initial wells (Szekkutas-1, Puszatszer-1, Makó-4, Makó-6, Makó-7 and Magyarcsanad-1) have been drilled, cased and partially tested as of the effective date of this report.

### Pusztaszer-1

In late 2005, Falcon began its initial exploration drilling program with the Pusztaszer-1. The well was designed as a delineation well to test the northeastern extent of the Makó trough. The well was drilled to a total depth of 3,785 meters and encountered Gneiss Basement, the Endröd and Szolnok formations. The Pustaszer was then tested in the Szolnok formation following small fracture stimulation. The well tested approximately 200 Mcfd and 200 bwpd.

#### Székkutas 1

The next well to be drilled and tested in early 2006 was the Székkutas 1. The well was designed to test the northwest extension of the Makó trough and was drilled to a total depth of 3,585 meters. The well encountered the Triassic Basement, Endröd and the Szolnok formations. The well tested 130 Mcfd and 549 bwpd from the Triassic Basement. The Endröd tested gas at an unstabilized rate of 1,577 Mcfd at 50 to 100 ppm hydrogen sulfide and 150 Mcfd at similar  $H_2S$  concentrations from the Szolnok. The presence of  $H_2S$  in these concentrations required Falcon to abort the test due to safety considerations.

#### <u>Makó 6</u>

The Makó 6 was the next well in the evaluation program to be drilled and tested. The Makó 6 was drilled to a total depth of 5,692 meters and was the first deep test in the basin by Falcon. The well encountered the Synrift, Basal Conglomerate, Endröd and Szolnok formations. Petrophysical analysis of the log and core data indicated the possible presence of hydrocarbons in all formations, establishing a possible hydrocarbon column of 2 kilometers. A test of the Synrift was attempted which proved tight. An interval at the base of the Basal Conglomerate was tested with initial rates of up to 700 Mcfd with associated  $H_2S$  of 400 ppm, and improving. The test was aborted when a suspected down-hole failure occurred.

#### <u>Makó 7</u>

The Makó 7 was the next evaluation well to be drilled and was designed to be a second deep basin test. The well was drilled to a total depth of 6,085 meters and encountered the Basal Conglomerate, Endröd and Szolnok formations. Petrophysical analysis indicates the possible presence of hydrocarbon in all formations encountered, but no testing has been accomplished to date. If the well tests hydrocarbons it may indicate the presence of a 2.5 kilometer hydrocarbon column.

### Magyarcsanad 1

The next well in the evaluation program to be drilled was the Magyarcsanad 1. This well was designed to test the southern end of the Makó trough. The well was drilled to a total depth of 4,272 meters and encountered the Endröd and Szolnok formations. The well tested oil from the Endröd formation at unstabilized rates of 360 bopd and 1,100 Mcfd, declining to 65 bopd and 137 Mcfd without stimulation.

This is very encouraging in that it establishes the presence of mobile high gravity oil in the Endröd formation. In addition, it indicates the Endröd in the area of the wellbore to be a naturally fractured reservoir capable of delivering hydrocarbon. If future analysis and testing establishes the Endröd to contain a pervasive natural fracture system, charged with hydrocarbon and capable of transmissibility of the hydrocarbon, this could significantly add to resources of the basin.

#### <u>Makó 4</u>

The next evaluation well drilled was the Makó 4, designed to test the Szolnok formation in the southern portion of the basin. The well was drilled to a total depth of 4,011 meters. The well encountered the Szolnok formation and is suspended pending completion of the current geologic and operational review.

# 2.11 EXPECTED PRICES

The anticipated price to be received for natural gas at the property currently runs about US\$200 per 1,000 cubic meters (roughly US\$6.00 per Mcf). The price of oil or condensate, if any, follows the European market, which is quoted daily as compared to Brent crude oil.

# 2.12 EXPECTED MARKETING AND TRANSPORTATION ARRANGEMENTS

The property is transected by several gas pipelines, which under new European Union (EU) regulations must accept any gas for transport via common carrier to end users within the EU. Oil or condensate, may be transported to local refineries within 10 kilometers.

# 2.13 IDENTITY AND RELEVANT EXPERIENCE OF THE OPERATOR

The Client is the operator of the exploration and drilling project in Hungary. The operator has successfully drilled six wells to date in Hungary, including the Makó-6 deep test in the deepest part of the Makó trough. The Client has assembled a team of engineering personnel with experience in the drilling and testing of wells in many regions of the world.

# 2.14 RISKS AND PROBABILITY OF SUCCESS

The exploration program in the Makó trough is in the early stages of evaluating the BCGA and other potentially productive situations. BCGA plays are termed "unconventional" due to the low permeabilities that characterize such plays and the fact that thick, continuous, gas-charged sections are encountered across the play without the requirement for a conventional stratigraphic or structural trap. Due to the low permeability, commercially successful wells require the presence of a thick gas bearing section and successful implementation of hydraulic

fracture treatments. Experience has shown that considerable experimentation is usually required to find the optimal completion technology. Given that even with successful completion technology, the productivity of low permeability gas wells is less than that of their conventional counterparts, the risks are to engineering and economic factors, rather than geological.

The drilling results to date have shown the presence of a thick sequence of hydrocarbonbearing sediments. The presence of hydrocarbon is not in question, as drilling and testing results to date have confirmed its existence. The unknowns at present concern whether technology can be applied that will allow these hydrocarbon accumulations can be produced at commercial rates.

# 2.15 APPLICABLE INFORMATION SPECIFIED IN SECTION 5.10 OF 51-101

This Report does not include an estimate of Fair Value of the prospects; therefore, the information specified in Section 5.10 of 51-101 is not required to be included in this Report.

### 3. 0 PROBABILISTIC RESOURCE ESTIMATE

### 3.1 GENERAL

This resource estimate has been conducted under the definitions specified in the COGEH. Figure 3.1 is a schematic diagram of the COGEH definition of Discovered Resources as presented in the COGEH as at the effective date.

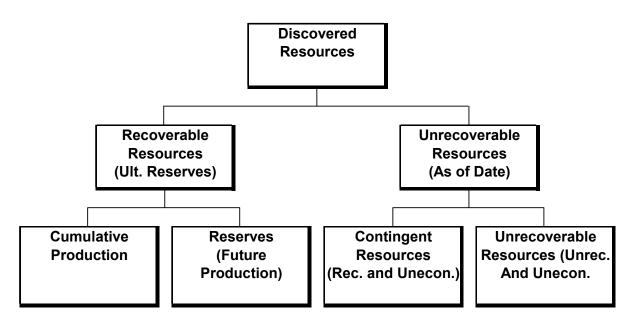


Figure 3.1: Schematic of COGEH Definitions for Discovered Resources

Drilling in the Makó trough has identified a thick, hydrocarbon-bearing sequence within the Szolnok, Endröd and underlying formations that has been interpreted to be a BCGA. As such, the resources that comprise this BCGA are discovered for the purpose of the definitions above. This estimate focuses on estimating Recoverable Resources (i.e., that portion of Discovered Resources that are potentially recoverable). Since there are no conclusive tests indicating the presence of commercial hydrocarbons available as of the effective date, there are <u>no</u> Reserves, and it should be clearly stated that this estimate comprises Recoverable Resources only, <u>not</u> Reserves and there is no certainty that it will be commercially viable to produce any portion of the resources. Subsequent references to "resources" in this document refer to "recoverable resources" under the COGEH definitions.

This estimate involves BCGA unconventional resources. These resources are characterized by their location at the center of basins, by the presence of a continuous gas phase across the BCGA, and by the absence of a formal trap or seal and general lack of water contacts. The

BCGA is its own source, seal and reservoir, characterized by low permeability and thick gascharged sections. While gas may be present throughout the BCGA, commercial productivity may be limited to a much smaller area due to the interaction of a complex variety of controls. This contrasts with conventional gas accumulations, which have much higher permeabilities and are trap-bound having upper and lateral seals and a lower limit often being defined by a water contact.

The probabilistic method (otherwise known as Monte Carlo simulation) was used in this Report for estimating the resources in the Makó trough. Since the Report relates to a large area containing a thick sequence of hydrocarbon-bearing, low permeability reservoirs, and have few subsurface control points, there is a significant degree of uncertainty with respect to each of the controlling input parameters, and how the value of those parameters may change across the area and with increasing depth. For this reason, each controlling parameter is not given a single value, but rather is expressed as a probability distribution. Each distribution is expressed so as to encompass the known or anticipated range of values based on the data available at the time the estimate is made. These distributions are randomly sampled a large number of times and resources calculated. The result of this exercise is a distribution of recoverable resources that illustrates the range of expectation for the Makó trough and the most likely or highest probability outcome. It should be stressed that the analysis is based on data available up to the effective date and will be revised as new data becomes available, and that the volumes estimated are potentially recoverable resources, <u>not</u> reserves.

The analysis for this Report was carried out considering uncertainty for all input parameters in the volumetric equation. For most of the parameters, triangular probability distributions were used, with input of minimum, maximum, and most likely values based on the analysis of available subsurface data.

#### 3.2 INPUT PARAMETERS

The parameters required for this analysis consist of the inputs to the volumetric equation, and are described as follows, including a brief statement as to the source of information for each parameter

<u>Gross Rock Volume</u> - The dependency between area and thickness in calculating gross rock volume from distributions is eliminated by starting with a gross rock volume estimate itself rather than area and thickness. Seismic structural mapping of each prospective horizon and basement

was conducted and then isopachs were created by subtraction. These isopachs were gridded and gross rock volumes thus calculated, including only those volumes that are inside the License areas.

<u>Porosity</u> – An estimation of the rock pore volumes that are available to contain fluids, including hydrocarbons. These porosities were determined by Gustavson Associates, LLC using Statmin, the statistical mineral analysis add-on module to Fugro-Jason's *PowerLog*, that uses a probabilistic model to calculate the reservoir volumetric composition based on actual log responses and anticipated component log measurement endpoints. One such endpoint was the measured grain density from the core data. Adverse environmental effects required log measurement corrections and normalizations. The previously determined minimum porosity cutoff value of 6% was used to differentiate between reservoir and non-reservoir intervals. Using this value and a maximum clay volume cut-off of 40%, a net reservoir thickness for each well was determined.

<u>Fluid Saturations</u> – Estimations of the percentage of the rock pore volume that contain fluids, either water or hydrocarbons. This estimate, when calculated from logs, is highly dependent on knowledge of the resistivity or composition of the formation waters. The water saturations were determined by Gustavson Associates, LLC (Boulder, Colorado) using the Archie Water Saturation model within Fugro-Jason's *PowerLog* well log interpretation software.

The formation water resistivity value of 0.30 ohm-m at 75° F was verified through SP deflection analysis and was temperature-corrected to the value corresponding to the interval temperature based on a temperature gradient established for the Makó Trough. The other selected values of the saturation parameters of tortuosity (a), cementation (m), and saturation (n), were 1.0, 1.8, and 2.0. In the Monte Carlo simulation model, gas saturation was modeled as a direct function of porosity.

<u>Net-to-Gross Ratio</u> – The fraction of the gross rock volume that is estimated to contain gas pay. The net reservoir thickness calculated using the 6% minimum porosity and 40% maximum clay volume was divided by the gross thickness for each interval under consideration to yield the netto-gross ratio for each layer.

<u>Percent Productive</u> - An estimate of what fraction of the total play will be productive. As noted above, even though gas saturation is ubiquitous, commercial productivity is not. Percent

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productive is a key unknown, and was estimated by performing an analysis of five BCGA plays in the Rocky Mountain area of the US and using these plays as analogies.

<u>Formation Volume Factor</u> - The factor that represents the amount of expansion of gas from reservoir to surface conditions. Estimation of formation volume factor is dependent on knowledge of temperature, pressure and gas compositional variations. Data from the existing well penetrations was used in calculating these factors, and is consistent with the original estimate performed by Scotia in 2006.

<u>Recovery Factor</u> - The fraction of the calculated in-place resources that is considered typically recoverable. Note that the amounts estimated represent potentially recoverable resources, <u>not</u> reserves. Since there is insufficient information at this point in time on the potential productivity of each zone, no meaningful economic analysis is possible. However, knowledge of the performance of U.S. BCGA wells does provide information on the typical recovery and drainage areas. Since drainage areas are typically small, a large number of wells are required to achieve the optimal recovery factor. For this exercise, it is assumed that an optimal development plan would be adopted that would recover the theoretical amounts modeled. Based on the current level of knowledge, constant recovery factors were used since we have no basis for randomizing this parameter at this time. The factors used in this analysis are consistent with those used by Scotia in 2006.

Table 3.1 summarizes the parameters used in the probabilistic analysis.

Summary of Reservoir Parameters for Probabilistic Analysis				
Upper Szolnok	Units	Minimum	Most Likely	Maximum
Bulk Rock Volume	MM ac.ft	474.3	527.0	579.7
Net:Gross Ratio	ratio	0.025	0.299	0.406
Fraction Productive	dec.fr	0.050	0.400	0.700
Porosity	dec.fr	0.060	0.100	0.141
Gas Saturation	dec.fr	0.400	0.532	0.700
Fmn Vol Factor	vol/vol	273.224	297.619	316.456
Overall Recovery factor	dec.fr	0.700	0.700	0.700
Lower Szolnok	Units	Minimum	Most Likely	Maximum
Bulk Rock Volume	MM ac.ft	279.9	311.0	342.1
Net:Gross Ratio	ratio	0.098	0.306	0.470
Fraction Productive	dec.fr	0.050	0.400	0.700
Porosity	dec.fr	0.060	0.100	0.133
Gas Saturation	dec.fr	0.400	0.566	0.700
Fmn Vol Factor	vol/vol	273.224	300.000	316.456
Overall Recovery factor	dec.fr	0.700	0.700	0.700
Upper Endröd	Units	Minimum	Most Likely	Maximum
Bulk Rock Volume	MM ac.ft	229.5	225.0	280.5
Net:Gross Ratio	ratio	0.044	0.250	0.649
Fraction Productive	dec.fr	0.050	0.150	0.300
Porosity	dec.fr	0.060	0.070	0.097
Oil Saturation	dec.fr	0.400	0.585	0.650
Oil Shrinkage	MMstb	0.4281	0.4566	0.4852
Overall Recovery factor	dec.fr 0.040		0.060	0.080
Lower Endröd	Units	Minimum	Most Likely	Maximum
Bulk Rock Volume	MM ac.ft	135.0	150.0	165.0
Net:Gross Ratio	ratio	0.066	0.130	0.178
Fraction Productive	dec.fr	0.050	0.150	0.300
Porosity	dec.fr	0.060	0.070	0.108
Gas Saturation	uration dec.fr 0.400 0		0.499	0.550
Fmn Vol Factor	vol/vol	327.869	332.226	336.700
Overall Recovery factor	dec.fr	0.500	0.500	0.500
Basal Conglomerate	Units	Minimum	Most Likely	Maximum
Bulk Rock Volume	MM ac.ft	99.0	110.0	121.0
Net:Gross Ratio	ratio	0.070	0.400	0.521
Fraction Productive	dec.fr	0.050	0.150	0.300
Porosity	dec.fr	0.060	0.075	0.089
Gas Saturation	dec.fr	0.400	0.545	0.850
Fmn Vol Factor	vol/vol	273.224	300.000	316.456
Overall Recovery factor	dec.fr	0.700	0.700	0.700
Synrift Sequence	Units	Minimum	Most Likely	Maximum
Bulk Rock Volume	MM ac.ft	29.7	33.0	36.3
Net:Gross Ratio	ratio	0.060	0.065	0.069
Fraction Productive	dec.fr	0.050	0.150	0.300
Porosity	dec.fr	0.060	0.075	0.095
Gas Saturation	dec.fr	0.400	0.523	0.750
Fmn Vol Factor	vol/vol	341.297	343.643	347.222
Overall Recovery factor	dec.fr	0.399	0.400	0.401

TABLE 3.1

# 3.3 PROBABILISTIC SIMULATION

Probabilistic resource estimates were computed using the Crystal Ball<sup>®</sup> software. This software allows for input of a variety of probability distributions for each uncertain parameter. The program then performs a large number of iterations randomly sampling each variable and honoring the dependencies that were input. The number of iterations was set at 5,000, which achieved the desired level of stability of the resulting answers. The results include a probability distribution for the output, sampled probability for the inputs, and sensitivity analysis showing which input parameters have the most effect on the uncertainty in each output parameter.

# 3.4 RESULTS

Recoverable resources were estimated for the Upper and Lower Szolnok formation, Upper Endröd which appears to contain oil and the Lower Endröd, the Basal Conglomerate, and finally for the Synrift Sequence. The presence of  $CO_2$  and  $H_2S$  has been detected throughout the Mining licenses. The concentration of these has been very inconsistent throughout the tests. In certain locations within the accumulation, the concentration of  $CO_2$  may prove to be substantial, this has not been modeled in the resource estimation, but should be considered on a location basis, when consistent information is acquired.

	Probability Greater Than			
Potential Zone	P90	P50	P10	
Upper Szolnok, Tcf	8.7	22.3	44.4	
Lower Szolnok, Tcf	7.0	15.7	30.0	
Lower Endrod, Tcf	0.445	0.819	1.4	
Basal Conglomerate, Tcf	1.1	2.3	4.2	
Synrift Sequence, Tcf	0.069	0.150	0.333	
Arithmetic Summation	17.3	41.3	80.3	
Probabilistic Summation	25.8	43.9	68.0	
Upper Endrod (Oil), MMbo *	42.6	97.8	202.7	

# TABLE 3.2 RECOVERABLE RESOURCE ESTIMATES Mako Mining and Tisza Licenses, Hungary, Effective 31 March 2008

\* Tests in the Upper Endröd in the Magyarcsanad 1 showed the zone to contain oil. The existence of oil in this formation is surprising. This accumulation may prove to be a local phenomenon only occurring in the area surrounding the Magyarcsanad 1. Other wells penetrating this horizon had oil and heavy gas composition shows, but were not tested. The

zone may prove to be too tight to sustain oil production, but for this report, the data was honored and modeled as containing oil.

Figure 3.2 is the probabilistic summary of the results of this resource estimate. Table 3.2 contains a breakdown of individual zone resources with each distribution sampled at the 10<sup>th</sup>, 50<sup>th</sup> and 90<sup>th</sup> percentiles (P10, P50 and P90). The totals have been expressed arithmetically, as required under the COGEH guidelines. Note that the probabilistic summation results in totals with a more central tendency than arithmetic summation.

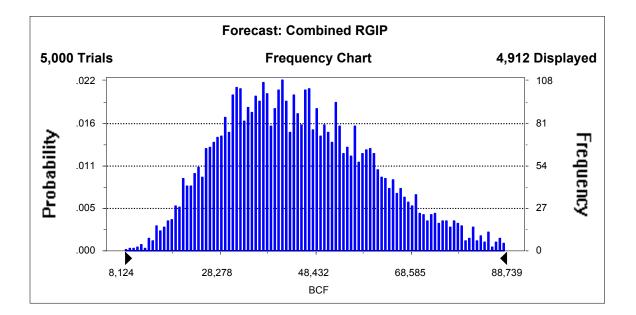


Figure 3.2 Distribution of estimated recoverable resources Licenses

It should be noted that the shape of the probability distributions all result in fairly wide spacing between the minimum and maximum expected resources, ranging from 8.1 Tcf to over 89 Tcf. This is reflective of the high degree of uncertainty associated with any evaluation such as this one prior to actual field discovery, development, and production. These estimates are made based on data available as of the effective date. As of the effective date the wells have not been fully tested. As a result the recovery factors used are based on analogy with US BCGA plays.

# 4.0 FORM 51-101F2

#### REPORT ON RESOURCE DATA FOR THE MAKÓ TROUGH, HUNGARY BY INDEPENDENT QUALIFIED RESERVES EVALUATOR OR AUDITOR

This is the form referred to in Item 2 of Section 2.1 of National Instrument 51-101 Standards of Disclosure for Oil and Gas Activities ("NI 51-101").

- 1. Terms to which a meaning is ascribed in NI 51-101 have the same meaning in this form.
- 2. The report on reserves data referred to in item 2 of section 2.1 of NI 51-101, to be executed by one or more qualified reserves evaluators or auditors independent of the reporting issuer, shall in all material respects be as follows:

#### Report on Reserves Data

To the Board of Directors of Falcon Oil & Gas Ltd (the Company):

- 1. We have evaluated the Company's reserves and resources data as at 31 March 2008. The Company has no reserves. The resources data consist of recoverable gas resources estimated as at 31 March 2008. The related future net revenue has not been estimated.
- 2. The reserves and resources data are the responsibility of the Company's management. Our responsibility is to express an opinion on the reserves and resources data based on our evaluation.

We carried out our evaluation in accordance with standards set out in the Canadian Oil and Gas Evaluation Handbook (the "COGE Handbook") prepared jointly by the Society of Petroleum Evaluation Engineers (Calgary Chapter) and the Canadian Institute of Mining, Metallurgy & Petroleum (Petroleum Society).

3. Those standards require that we plan and perform an evaluation to obtain reasonable assurance as to whether the reserves and resources data are free of material misstatement. An evaluation also includes preparing estimates of reserves and resources data in accordance with principles and definitions presented in the COGE Handbook.

The following table sets forth the estimated resources of the Company evaluated by us as of 31 March 2008, and identifies the respective portions thereof that we have evaluated and reported on to the Company's management:

Independent Qualified	Description and	Location of Reserves (Country or	Dreenestive Deseverable Deseverable			
Reserves	Preparation	Foreign		Prospective Recoverable Resources		
Evaluator or	Date of	Geographic				
Auditor	Report	Area)	Audited	Evaluated	Reviewed	Total
	Evaluation	Hungary,		Low – 17.3 Tcf		Low – 17.3 Tcf
Ian S. Howrie	Report	Makó			Best – 41.3 Tcf	
	31 March	Trough	High – 80.3 Tcf High – 80.3 T		High – 80.3 Tcf	
	2008					
lan S. Howrie	Evaluation	Hungary,		Low – 42.6 MMbo		Low – 42.6 MMbo
	Report	Makó	0	Best - 97.8 MMbo	0	Best - 97.8 MMbo
	31 March	Trough		High – 202.7 MMbo		High – 202.7 MMbo
	2008					

- 5. In our opinion, the reserves and resources data respectively evaluated by us have, in all material respects, been determined and are in accordance with the COGE Handbook. We express no opinion on the reserves and resources data that we reviewed but did not audit or evaluate; however, to our knowledge, all data were evaluated.
- 6. We have no responsibility to update our reports referred to in paragraph 4 for events and circumstances occurring after their respective preparation dates.
- 7. Because the reserves data are based on judgments regarding future events, actual results will vary and the variations may be material. However, any variations should be consistent with the fact that reserves are categorized according to the probability of their recovery.

Executed as to our report referred to above:

Ian S. Howrie, Dallas, Texas, 2 May 2008

a Show

# 5.0 CONSENT LETTER

RPS Scotia, Inc. hereby consents to the use of this Resource Evaluation Report for the Tisza and Makó License Areas in the Makó Trough, Hungary, as of 31 March 2008, in any document filed with any Canadian Securities Commission by Falcon Oil & Gas Ltd.

Ian S. Howrie Principal Engineering Advisor RPS Scotia, Inc.

# 6.0 QUALIFICATIONS

# IAN S. HOWRIE PRINCIPAL ADVISOR RESERVOIR ENGINEERING

# **KEY SKILLS**

#### PETROLEUM ENGINEERING

• More than 40 years experience in the application of numerical simulation to a wide variety of fields internationally and domestic (Canada and USA)	<ul> <li>Experienced in working in advisory and mentoring capacities in National companies and government agencies</li> </ul>
Extensive experience with well test analysis (PTA) and nodal analysis.	<ul> <li>Skilled in basic reservoir engineering analysis</li> </ul>

#### INFORMATION TECHNOLOGY

• Experienced user of Landmark's VIP, GeoQuest's Eclipse, CMG's IMEX and other proprietary simulators	Experienced user of Kappa's Saphir PTA software
Skilled MS Office user	Familiar with MS Project
<ul> <li>Experienced user of Nodal analysis software, Prosper and WEM</li> </ul>	

#### **BUSINESS**

•	Management of multi-disciplinary teams performing grass roots studies of oil and gas fields leading to field development or re-development planning	Experienced preparer of project proposals and cost estimation
•	Strong communication skills, written and oral	Contract negotiation experience

# **PROFESSIONAL SUMMARY**

50 years of diverse international petroleum reservoir engineering experience with a strong emphasis on reservoir simulation. First 10 years working in Canada for Chevron, progressing from drilling and production engineer to head office reservoir engineer. During the latter four years of this period, worked exclusively on a pioneering reservoir simulation study of the Leduc D3 complex of reservoirs in Central Alberta. Specialized in integrated studies including large oil fields in Algeria, Tunisia, Saudi Arabia, Abu Dhabi, Indonesia, India, Thailand, Iran and several fields in Canada and the United States and reservoir engineering in Norway, working closely with Statoil's exploration, production, and engineering departments in planning studies for the development of some of Norway's largest oil fields. Worked in the research area, performing a three-year simulation research study of fractured reservoir behavior for the U.S. Department of Energy.

#### **RPS SCOTIA (FORMERLY THE SCOTIA GROUP, INC.)** 1 PRINCIPAL ADVISOR RESERVOIR ENGINEERING

### 1993 TO PRESENT

Responsibilities include heading engineering aspects of reservoir simulation and large-scale field study projects, both foreign and domestic. Projects include field rehabilitation, waterflood

and EOR feasibility studies. Ian's extensive experience in these areas complements the Group's innovative approach in analysis techniques and problem solving.

#### **RECENT PROJECTS**

- Review of prospects in new exploration block in South Central Kazakhstan awarded to inexperienced industrial company wishing to diversify into the oil industry. Now acting as technical advisor for seismic survey, interpretation, exploratory prospect identification and drilling. Expected total duration is five years.
- Simulation engineering responsibility for field development planning study in Columbia
  - Serving as petroleum engineering subcontractor to MWH Americas, the principal contractor assisting Vandenberg Air Force Base assess the impact of an operator's proposal to construct a production and directional drilling facility on the base near tidewater to produce oil from a large undeveloped field offshore Santa Barbara County, California
  - Project manager for comprehensive, multi-year development planning studies of two of Kazakhstan's largest oilfields.

#### PREVIOUS CAREER DETAILS

#### MCCORD-LEWIS ENERGY SERVICES (AND SUCCESSORS) VICE PRESIDENT

Responsible for large oil field reservoir simulation studies in Algeria, Tunisia, Saudi Arabia, Abu Dhabi, Indonesia, India, Thailand, Iran as well as fields in Canada and the U.S. As a consultant to Statoil, participated in planning studies for some of Norway's largest fields. Completed a study of a gas field in South China Sea and initiated a very large study of oil fields in Assam Province of India. Completed a three-year research study of fractured reservoir behavior for the U.S. Department of Energy.

#### CHEVRON CANADA

#### 1957 то 1967

**1967** TO **1993** 

**RESERVOIR ENGINEER** Pioneered a reservoir simulation study of the Leduc D3 complex of reservoirs in Central Alberta.

#### OTHER INFORMATION

#### **QUALIFICATIONS AND TECHNICAL COURSES**

- BSc Petroleum Engineering, University of Saskatchewan, Canada
- Post Graduate Studies in Petroleum Engineering, University of Calgary, Canada
- Licensed Professional Engineer, Texas

#### PUBLICATIONS

Ian Howrie, Dwight Dauben: "Simulation Studies to Evaluate the Effect of Fracture Closure on the Performance of Fractured Reservoirs," DOE, March 1994.

#### AFFILIATIONS

Registered Professional Engineer in Alberta Society of Petroleum Engineers of AIME

LANGUAGES English NATIONALITY: CANADA/U.S.

# SELECTED PROJECT EXPERIENCE

Kalamkas and Zhetybai Fields, Kazakhstan. Reservoir engineering for due diligence review of production potential, reservoir performance forecasts, waterflooding and polymer flooding efficacy for reserves estimation and cash flow analysis for privatization of Mangistaumunaigaz and \$B4 investment commitment.

Project manager for comprehensive, multi-year geological and reservoir simulation studies for field development planning. Supervised team comprised geologists, petrophysicists, geophysicists, reservoir, production and facilities engineers. Combined, the two field had more than 5000 wells and more than 25 years of production history. Official estimates of OOIP exceeded 6 billion barrels.

Pearsall Field, Austin Chalk. Lead investigator for a three-year research program to evaluate the effect of fracture closure on the recovery of oil and gas from naturally fractured reservoirs. The overall objectives of the study were to: (1) evaluate the reservoir conditions for which fracture closure is significant, and (2) evaluate innovative fluid injection schemes capable of reducing fracture closure and improving oil displacement efficiency. Simulations of natural depletion performance quantified the degree of well performance degradation due to stress-sensitive fractures. The severity of the degradation worsened as the initial reservoir pressure approached the reservoir rock frame stress. Simulations with water injection indicated that permeability degradation can be counteracted and oil recovery efficiency improved.

Troporo Field, Low Permeability Oil Reservoir. Lead reservoir engineer for an integrated study of the field. Elements included reservoir geophysics and geology, petrophysical analysis, reservoir engineering analysis to characterize the reservoir in detail sufficient to initialize a 3-D reservoir simulator. The simulator was history matched to 14 years of well performance data and employed to plan continued field development by waterflooding.

Allegheny and Morpeth Fields, Deep Water Gulf of Mexico. These fields are being produced from subsea completions with unusually complex downhole production equipment. As a result, pressure gauges could not be run deeper than 300 to 500 above the top of perforations. A nodal analysis model was employed to match initial stabilized well test data. After matching, the model was used to determine pressure losses through the downhole equipment for a range of increasing GOR and water cuts. These results were used for determining abandonment conditions for reserve determination and for planning future well completions.

Simulation of The Harmattan Elkton Field, Canada. Simulation Engineer. Gas condensate gas cap with downdip oil column. EUR =  $250 \times 10^6$  stb oil and condensate;  $200 \times 10^9$  scf gas. Project duration six months, nine man-months. The client, petitioned the conservation authorities for permission to produce the gas cap contemporaneous with continued oil column depletion. A simulation was commissioned to determine the feasibility and practicality of using line drive water injection along the GOC to isolate the two accumulations (oil from gas). Work included composition pseudoizing of the reservoir oil and reservoir gas phase into four pseudo components: surface oil originating from the reservoir oil phase, surface gas arising from the reservoir gas phase, and surface oil arising from the reservoir gas phase; pseudo component phase behavior and properties were determined in a compositional phase behavior simulator; Initialized model and history matched well performance; formulated co-production/injection scenarios and simulate resulting reservoir performance; simulated gas plant performance to determine sales product quantities.

Champ de Hassi Messaoud, Algeria. Project Supervisor. High gravity oil. EUR >  $5 \times 10^9$  stb; 364,000 stbd (1992). Project duration three years, 100+ man-months. Supervised the team of

professionals who collectively performed this study. Had overall responsibility for the technical work quality. Performed several of the reservoir engineering tasks including: relative permeability and capillary pressure correlation with rock type; simulator modification to accommodate revised treatment of capillary pressure; hydrocarbon fluid property characterization for input to the four component pseudo compositional model suitable for miscible gas injection; simulator initialization data preparation including recurrent data for 150 wells with up to eight years of producing history; history matching; performance forecasts.

South Bassein Field Development Study Offshore Bombay. Project Engineer. Gas condensate. Project duration six months, nine man-months. Responsible for reservoir simulation of this undeveloped offshore field. Particular attention was given to the treatment of the thin oil column underlying the principal resource, a large gas-condensate gas cap. Simulation focused on the optimal depletion of the gas resource. Extensive attempts to simulate preferential oil column development proved the impracticality of doing so. The reservoir oil and gas phases were represented in the simulator as four pseudo components based on reservoir phase of origin and in terms of surface product. Thus, there were two surface liquid components, oil from the reservoir oil and condensate from the reservoir gas and two surface gas components, gas from the reservoir gas and gas from the reservoir oil. Phase behavior and properties of the pseudo components were determined with the aid of a compositional phase behavior simulator.

Oseberg Development Planning Norway. Lead Reservoir Engineer. Light oil with gascondensate gas cap.  $EUR = 2 \times 10^9$  stb, 450,000 stbd (1992). Project duration 11 months, 36+ man-months. Development planning study undertaken by the nonoperating majority interest owner. Responsible for reservoir simulation. This involved initialization of a large 3-D black oil simulator for the field. Development plans consistent with multiple platform proposals were formulated and tested by simulation. In addition, several gas injection alternatives to the field operator's planned water injection scheme were investigated. A combination injection scheme: gas into the gas cap with water at the WOC at rates reckoned to stabilize the oil column mid point, was found to have clear recovery and operational advantages. As a result of this work, the field development has employed the combined injection scheme with make-up injection gas supplied by remotely operated gas producing wells in the Troll Field via submarine pipeline to the Oseberg processing platform.

Panna Field Development Study, India. Project Engineer. Gas condensate with oil column. Oil rate = 3,000 stbd (1992). Project duration seven months, ten man-months. Reservoir simulations were performed to determine how best to concurrently exploit this large gas resource with a relatively thin oil column. Simulations were also performed to prove the impracticality of preferential (postponing gas cap exploitation) oil column development. The reservoir oil and gas phases were represented in the simulator as four pseudo components based on reservoir phase of origin and in terms of surface product. Thus there were two surface liquid components, gas from the reservoir gas and gas from the reservoir oil. Phase behavior and properties of the pseudo components were determined with the aid of a compositional phase behavior simulator.

Tommeliten Field Development, Norway. Advisor. Gas condensate (rich). Condensate: EUR =  $40 \times 10^6$  stb, 7,500 stbd. Project duration ten months, 20+ man-months. A relatively small fractured chalk reservoir containing a rich retrograde gas condensate was thought to be too small and too far removed from the Ekofisk center for economic development. This study demonstrated that the field could be economically exploited as an Ekofisk satellite. The accurate forecasting of condensate yield under pressure depletion was a key element of the study. A very finely gridded single well simulator was used to determine the deposition of condensate near the wellbore due to pressure drawdown and the eventual flow of condensate into the wellbore. The phase behavior complexities posed by this mechanism required

compositional EOS simulation treatment. Advisor to the staff members performing the EOS characterization of the reservoir fluids and the compositional reservoir simulation. This work resulted in the eventual development of the Tommeliten Field.

Naval Petroleum Reserve No. 1 31S Stevens Zone. Project Manager. Oil. EUR =  $1.5 \times 10^9$  stb, rate 65,000 stbd (1993). Project duration 23 months, 34 man-months. The reservoir geology was provided by the geological subcommittee. Reviewed the geological characterization and adapted it to the needs of the study. A large database of log and core data was analyzed to characterize the properties of the reservoir. The data was integrated with special core analysis data to obtain relative permeability and capillary pressure correlation to rock types. The reservoir fluid data was correlated to depth and hydrocarbon parameter and arranged into a black oil characterization. A simulator of the most productive segment of the Stevens zone reservoir was initialized. Individual matches of pressure and GOR were used to tune the model. The influence of stratification on waterflood performance was evaluated using four finely gridded cross-sectional simulators, two on each structural flank, and extending from the WOC to the structural crest. The output of these models was used to develop pseudo relative permeability for use in the larger, more coarsely gridded areal model. Forecasts were made with this model for continued natural depletion and several waterflood cases.

Gas Injection Simulation Study, Meyal Field, Potwar Basins, Pakistan. Lead Reservoir Engineer. Gas condensate reservoir deep anticlinal structure bounded by reverse faults and significant interior faulting. Produces from low porosity Chorgali-Sakesar fractured carbonate. Project duration approximately four months. Integrated study of this mature oil field was made for development planning purposes, and included geophysics, geology, petrophysics, reservoir engineering analysis, and reservoir simulation. Specific tasks were: Reservoir fluid characterization black oil; well test data analysis; simulator initialization; history matching simulation; performance forecasting.

Gilmore Field, Australia. Lead reservoir engineer for a gas reserves determination of a developed non-producing very low permeability reservoir. The exploration wells had been extensively tested. These tests were matched using modern well test analysis techniques to determine the distribution of reservoir properties across the field. The performance of the wells was forecasted by coupling a multi-phase wellbore and tubing flow model with a compartmental material balance model. This model was used to plan continued field development and provide a basis for reserves establishment.

Lama Sur Field, Venezuela. Lead reservoir engineer and reservoir simulation engineer for an integrated study of a large mature oil field. A detailed reservoir characterization was performed by an integrated team of geophysicists, geologists, petrophysicists, and reservoir and production engineers. This led to initialization of large 3-D simulators of the two major sand reservoirs. These models were history matched to 38 years of well performance data and used to plan redevelopment waterflood projects in both reservoirs.

# EPHRAIM A. UBANI PRINCIPAL RESERVOIR ENGINEER

# **KEY SKILLS**

#### PETROLEUM ENGINEERING

•	Experienced in integrated model studies of	•	Experi	enced	in the use of	of industry sta	ndard
	oil and gas reservoirs.		tools	for	reservoir	evaluation	and
			manac	aemen	t.		

#### INFORMATION TECHNOLOGY

<ul> <li>Proficiency in the use of reservoir simulation tools including Eclipse, VIP, IMEX, and Dual-GEM.</li> </ul>	• Very good knowledge of well test analysis tool (Kappa Engineering Saphir), material balance tool (Petroleum Experts MBAL), Crystalball (), etc.
<ul> <li>Very good knowledge of Microsoft Office support tools.</li> </ul>	
BUSINESS	

•	Have managed projects in socially volatile	•	Ability to adapt and function in relatively	
	regions.		hostile environments.	

# PROFESSIONAL SUMMARY

Over 20 years of petroleum industry diverse experience encompassing comprehensive reservoir evaluation and research and development. First 4 years working as a research associate with emphasis on exploitation of naturally fractured gas reservoirs. For the last 16 years have been responsible for detailed reservoir studies of major oil and gas fields in Pakistan, Egypt, Syria, Nigeria, Venezuela, Kazakhstan, Mexico, Argentina, and the USA. Gained proficiency in the use of reservoir simulation tools including Eclipse, VIP, IMEX, and Dual-GEM. Conducted traditional engineering and EOR studies in numerous fields.

# RPS SCOTIA (FORMERLY THE SCOTIA GROUP, INC.)1997 TO PRESENTPRINCIPAL RESERVOIR ENGINEER1997 TO PRESENT

Responsibilities include heading engineering aspects of reservoir simulation and large-scale field study projects, both foreign and domestic. Projects include field rehabilitation, waterflood and EOR feasibility studies. Ian's extensive experience in these areas complements the Group's innovative approach in analysis techniques and problem solving.

#### **RECENT PROJECTS**

- Model study of a very complex oil field in Argentina, operated by Repsol. Project objective is to determine a viable rehabilitation plan for this field that has a long history, but low recovery. The project is ongoing.
- A sector model of a large reservoir in Mexico operated by PEMEX. Model was used in support for the optimization of existing water injection project.
- Integrated reservoir study of a very large reservoir in the Caspian Sea region. A simulation model of this field with over 2600 wells was developed and used to recommend a development plan for a 30-year lease period. The scope of the model

study was limited to history matching of the observed field wide performance as against well-by-well history matching. It is planned to perform more detailed simulation study on specific reservoir units of this field.

#### PREVIOUS CAREER DETAILS

#### IPR

#### **RESERVOIR SIMULATION ENGINEER**

Led large reservoir simulation projects on major fields in various parts of the world including Pakistan, Syria, Nigeria, Egypt, and Australia. Also performed upgrades to black oil simulation models and other reservoir evaluation software.

#### U.S. DEPARTMENT OF ENERGY, BARTLESVILLE PROJECT OFFICE (NPTO) 1985 TO 1988 RESERVOIR ENGINEER

Developed statistical reservoir characterization models and worked with EOR predictive models. Also conducted research on unconventional reservoirs and tight gas production.

### **OTHER INFORMATION**

#### QUALIFICATIONS AND TECHNICAL COURSES

- BSc Natural Gas Engineering, Texas A&M University
- MSc Petroleum Engineering, University of Oklahoma
- PhD Petroleum Engineering, University of Oklahoma

Training courses attended:

Fundamentals of Enhanced Oil Recovery, Larry Lake (SPE), February 1988

PVT Simulation Course, Calsep, November 2000

Streamline Simulation: Theory and Practice, SPE, February 2001

DeskTop-VIP, Landmark, September 2001

Decision Space, Landmark, June 2004

#### Awards

Oklahoma Mining and Mineral Resource Research Institute Fellowship (1982, 1983, 1984) Nigerian National Petroleum Corporation award (1980) Federal Government of Nigeria undergraduate award (1977-1979)

#### PUBLICATIONS

Ubani, E.A.: "The Well Performance of Naturally Fractured Lenticular Sand Reservoirs," Doctoral Dissertation, University of Oklahoma, 1985.

Ubani, E.A. and Ray, R.M.: "On the Performance of Noncontinuous Tight Gas Sands," SPE 17728, SPE Gas Technology Symposium, Dallas, Texas, June 13-15, 1988.

Evans, R.D. and Ubani, E.A.: "An Equivalent Cell Block Porosity and Permeability Concept for Modelling Multiphase Flow in Naturally Fractured, Lenticular Reservoirs," SPE/DOE 16430, SPE/DOE Low Permeability Reservoirs Symposium, Denver, Colorado, May 18-19, 1987.

#### 1989 то 1997

AFFILIATIONS Society of Petroleum Engineers Tau Beta Pi Alpha Chi Registered Petroleum Engineer, Texas

LANGUAGES Igbo English NATIONALITY Nigeria/U.S.

# SELECTED PROJECT EXPERIENCE

Mexico, Burgos Basin. Team reservoir engineer advising Pemex' Reynosa integrated study teams on developing several producing fields in the Rio Grande Embayment. Formations include Lobo, Queen City, Vicksburg and Frio. Integrated field studies involving well history, performance and fracture completions analysis, reservoir fluids analysis, nodal and material balance interpretations, reserves studies and mentoring. Main objective is to assist in accelerating the gas development program for the basin.

Kazakhstan, Kalamkas Field. Lead simulation engineer for full-field modeling of 2,300 well field, to assess performance under various water-flood scenarios. Ongoing.

Egypt, Western Desert, Umbarka: Lead engineer for the simulation of two anti-clinal structures bearing highly volatile oil.

Pakistan, Potwar Basin, Meyal Field: Lead engineer for the simulation study of Chorgali-Sakesar low matrix porosity, fractured carbonate bearing highly volatile oil.

Gulf of Suez, Amal Field: Lead engineer for the simulation study of the Kareem member of the Lower Miocene sand, and the material balance evaluation of the Rudeis horizon.

Pakistan, Indus Basin, Mazarani Field: Field development study of low porosity fractured Laki carbonate. Constructed dual porosity model simulation to determine field development, including horizontal well simulation. Performed conceptual design of production facilities.

Pakistan, Indus Basin, Kandhkot: Project engineer for the simulation of three separate domes communicating through the aquifer. Surface facilities coupling was a key consideration for the simulator used.

Gulf of Suez, North Bakr Field: Project engineer for 2-D and 3-D simulation of Eocene cherty/dolomite limestone reservoir under gas injection.

Queensland, Australia, Naccowlah Block, Cooper Basin: EOR feasibility study of 32 fields.

Gulf of Suez, North Geisum Field: Lead engineer for production planning study following extended flow test period.

Nigeria, Niger Delta, Abura Field: Lead engineer for the development study of several sand/shale reservoir zones.

Nigeria, Niger Delta, Kanuskiri-Kurogbagba Field: Lead engineer for the development study of several sand/shale reservoir zones

Nigeria, Niger Delta, Oziengbe Field: Lead engineer for the development study of several sand/shale reservoir zones

Syria, Roumelan Field: Project engineer for the Integrated Reservoir Studies of Six Fields.

Pakistan, Kunar-Pashaki Field: Sindh Basin: Lead engineer for the simulation study of the Sakesa formation reservoirs.

U. S. A. Gulf Coast, Garden Banks and Eugene Island: Review of well completion practices for vertical and horizontal wells to evaluate effect on performance.

U. S. A., Permian Basin, Dagger Draw Field: Pilot waterflood design based on detailed flow unit reservoir characterization.

Venezuela, Lama Sur Area: Project engineer for large-scale study including geophysics, petrophysics, geological modeling, reservoir description, and simulation to evaluate future field development options.

# LONNIE MCDADE VICE PRESIDENT

# **KEY SKILLS**

#### PETROLEUM ENGINEERING

<ul> <li>Acquisition: Extensive experience in property and company evaluation, deal structure, negotiations, both company and government, financial alternatives, mergers and closing.</li> </ul>	<ul> <li>Re-Development: Broad experience in revitalization of mature fields worldwide.</li> </ul>
Operations: Experience in managing multidiscipline teams in remote, environmentally-challenging locations worldwide.	<ul> <li>Reserves Evaluation: Experienced in reserves and value determination and documentation.</li> </ul>

#### **INFORMATION TECHNOLOGY**

• System Design: Leading teams in the design requirements and development of enterprise solutions and remote monitoring and management process systems.	• Familiar with the standard suit of business and technical evaluation products.
• System Integration: experienced in leading multi-disciplined teams in the installation and integration of large-scale enterprise solutions (SAP, Peoplesoft, and custom).	

#### **BUSINESS**

• Strategy Development/Implementation: strategic advisor to global companies related to portfolio management, rationalization, market positioning, new business development, operational improvements and competitive positioning.	• Financial Management: Track record of performance in financial growth through strategic positioning, restructuring, alternative financing, workout and turnaround programs.
• Performance Enhancement: Significant experience in supply chain, logistical and third party contracts performance improvement.	• Investment Consulting: Advisor to a number of companies related to exploration and development investments and acquisitions both upstream and service sector.
Program Implementation: Exploration and exploitation execution and management.	

# PROFESSIONAL SUMMARY

Over 25 years experience in oil and gas industry as an advisor in business development with several companies. Primary focus has been on all phases of the strategic planning/execution, negotiations, operations development, financial management, reserves growth, and investment consulting.

# RPS SCOTIA (FORMERLY THE SCOTIA GROUP, INC.) VICE PRESIDENT

2007 TO PRESENT

Responsible for operations and strategic planning services.

#### **RECENT PROJECTS**

- Field redevelopment, West Texas, Heritage Group
- Exploration Program, Hungary, Falcon Oil and Gas
- Exploration program, Kazakhstan, Gentech
- Caribbean Lease sale, Colombia, Ecopetrol

#### PREVIOUS CAREER DETAILS

# PHOENIX RESOURCES, INC. FOUNDER/CEO

Responsible for company growth focusing upon applying the latest technology in oil and gas development. Through aggressive management and growth, the company acquired and/or developed in excess of 200 Bcf at an overall F&D cost of approximately \$0.35/Mcfe

#### DELOITTE CONSULTING

#### INTERNATIONAL, STRATEGIC MANAGEMENT CONSULTANT

Served as a strategic advisor to a host of companies globally related to portfolio management, rationalization, market positioning, new business development, operational improvements and competitive positioning.

#### THE BRITISH PETROLEUM COMPANY

#### DIRECTOR STRATEGIC INITIATIVES, ANCHORAGE, AK

Created and managed several regional and global relationships beneficial to the growth of the company. Delivered recommendations related to the successful implementation of a plan which saved in excess of \$200 million per annum across the British Petroleum Group. Including the full integration of a group supply chain/logistical management, cultural and behavioural considerations, and communication plan.

Field Manager, Prudhoe Bay, AK. Responsible for the daily production of 1,250,000 Bopd and 7Bcf of natural gas in an environmentally sensitive, extreme, arctic environment. Expanded the gas handling capacity of the field to 9 Bcfd while maintaining field operations and increasing net income per barrel by \$50MM/annum. Prepared, managed and executed annual operating budget of \$750MM.

Manager Technical Support, Glasgow, Scotland. Responsible for the exploration and appraisal of North Sea properties. Included the scheduling and management of drilling activities, seismic acquisition and processing, reservoir modelling and data/laboratory support.

Manager, UK Land, Eakring, England. Responsible for the turn-around of a failing business unit in Europe from a negative 7 pounds per barrel operating income to a positive 5 pounds per barrel operating income.

28

# 1998 то 2002

**1988 TO 1998** 

2002 TO 2007

# **STANDARD OIL PRODUCTION COMPANY**

# MANAGER, RESERVOIR ENGINEERING, HOUSTON, TX

Responsible for project development, geologic interpretation, well planning, location selection, document and permit preparation, partner relations, production operations and reserve evaluation and documentation in a number of international and U.S. operations. As acquisition and divestiture manager in Dallas, responsible for the identification, deal structure, purchase. and/or sale. As senior reservoir engineer, was project coordinator for the deep gas exploration project in western Oklahoma.

#### SAMSON RESOURCES COMPANY **DIVISION MANAGER, DENVER, CO**

Responsible for project development, geologic interpretation, well planning, location selection, document and permit preparation, partner relations, production operations and reserve evaluation. As district engineer in Tulsa, OK, responsible for all company operational activities within the area.

#### **AMOCO PRODUCTION COMPANY PETROLEUM/RESERVOIR ENGINEER**

# OTHER INFORMATION

# **QUALIFICATIONS AND TECHNICAL COURSES**

- BSc Petroleum Engineering with Honours, Mississippi State University
- MBA Fugal School of Business, Duke University •

# **AFFILIATIONS**

Society of Petroleum Engineers Independent Petroleum Association of America American Association of Petroleum Landmen Registered Professional Engineer, Colorado, Mississippi, and Oklahoma

English, Russian (basic), Indonesian, French LANGUAGES

NATIONALITY U.S.

#### 29

#### **1985 TO 1988**

**1981 TO 1985** 

#### 1978-1981

# PATRICK H. LOWRY COO\GEOLOGIST

# **KEY SKILLS**

#### GEOSCIENCE

<ul> <li>Integrated reservoir studies. Plan, manage and participate in studies requiring the integration of geophysics, petrophysics, geology and reservoir engineering.</li> </ul>	<ul> <li>Geocellular model construction. Independently developed methods and software for static model preparation and visualization using petrophysical and geophysical data.</li> </ul>
<ul> <li>Petrophysics. Full-field log data processing and analysis to derive rock and reservoir properties for modelling and volumetrics.</li> </ul>	• 3-D workspace integration of all aspect of well, biostratigraphic, geochemical, test, geological and geophysical data.

#### INFORMATION TECHNOLOGY

• Expert user of PETCOM Powerlog software, Petra and other workstation software.	Programming: Tcl/tk and Fortran
<ul> <li>Very familiar with all Microsoft offices applications and Microsoft Project.</li> </ul>	Systems management
Expert in relational data base: MS Access	GIS and mapping

#### **BUSINESS**

• Operations accounting: manager in contract operating company including drilling, completions, operations and reporting.	<ul> <li>Development planning from integrated reservoir studies; infill drilling, waterflooding and deviated well development.</li> </ul>
<ul> <li>Reserves: determination of PDNP and PUD volumes from analog and geological data.</li> </ul>	Corporate management and planning.

### PROFESSIONAL SUMMARY

Over 28 years of geological and petrophysical experience in reservoir characterization, well log evaluation, subsurface mapping, economics, and improved recovery. Specializing in integrated reservoir characterization and reservoir development planning using geocellular models derived from the integration of log, core analysis, seismic, well test, and production data. Developed proprietary software for geocellular modelling and generated numerous multi-million-cell geocell models for various basins of the world. His pioneering use of computer methods for database management, mapping, log analysis, core analysis data processing, and engineering computations has helped him succeed at integrating geologic descriptions and engineering analyses. Patrick's combined operations and technical experience give him the valuable ability to quantitatively assess reservoir hydrocarbon disposition and production potential.

### RPS SCOTIA (FORMERLY THE SCOTIA GROUP, INC.) 1996 TO PRESENT COO (2003 - Present)

Principal Geoscientist. Responsibilities include heading RPS Scotia's petrophysical analytical efforts and reservoir characterization for static modelling and simulation. Involved in a variety of geological, petrophysical, geophysical and engineering studies. Specializes in statistical analysis of reservoir parameters, numerical surface modelling, and reservoir model development.

#### **RECENT PROJECTS**

- Field development assessment for a 2,000-foot Wilcox interval in a 45 square mile area of LaSalle Parish, Louisiana. Full well history reconstruction and database development. Determined reservoir architecture and drainage using geocellular modelling to discern key reservoir elements and identify reservoir compartments. Integrated well history with reservoir identification to identify remaining potential
- Assess offshore development plan using a geocellular model prepared from the integration of seismic stratigraphy calibrated to well log and core data. Fully comprehensive project integrated core and log data from six wells and with the interpretation of 400 square kilometres of seismic data in a deepwater depositional setting off the east coast of India.
- Generate prospects in a carbonate secondary porosity system using inverted seismic data and 3-D data volume visualization and processing methods. Worked with the geophysicists to invert the seismic data and wrote routine to redatum the inversion data set, in depth, relative to stratigraphy. For proof of concept, mined the data for porosity volumes corresponding to existing production and reconciled recovery efficiency. Generated prospects in undeveloped reservoir volumes.
- Produced two full-field models for giant fields in Kazakhstan, one with 2,400 wells and another with 1,500. Normalized and process all log data, produced stratigraphic interpretation, populated fully configured Petra project including completion and production data, generated geocellular models and reconciled reservoir geology with production and injection on a pattern-by-pattern basis. Interfaced with simulation engineer for dynamic simulation.

### PREVIOUS CAREER DETAILS

#### CONSULTING GEOLOGIST AND PETROPHYSICIST

Specializing in detailed reservoir description and simulation studies for development planning, especially involving horizontal wells. Also provided instruction in formation evaluation, reservoir characterization, and simulation for several international clients.

#### KEPLINGER & ASSOCIATES

#### MANAGER OF GEOLOGICAL SERVICES

Duties included computer-aided studies involving low permeability (shale) fractured reservoirs, formation evaluation, and conventional and geostatistical mapping. Directed numerous reservoir studies involving integrated geology, geophysics and reservoir engineering, including field operations for core recovery and well testing. Managed operating company group accounting and reporting as well as providing services in drilling, completions and operations. Acted as lead geologist in Keplinger's contracts with the Department of Energy to study the occurrence of oil in the Devonian shale in West Virginia and for the Gas Research Institute to perform field studies to determine the controls on gas production from the Devonian shale.

### 1994 то 1995

**1981 TO 1993** 

#### 0839

1979 TO 1981

#### VICTOR GAS COMPANY

#### GEOLOGIST

Prospect mapping and evaluation and well site supervision, northeastern Oklahoma and numerous international localities.

### OTHER INFORMATION

#### **QUALIFICATIONS AND TECHNICAL COURSES**

- BSc Geology, Arizona State University
- MSc Geology, Arizona State University

#### PUBLICATIONS

Boneau, D. and Lowry, P., 1999 "Waterflood Strategy Evolves From Improved 3-D Flow Unit Characterization," world Oil Petroleum Technology Digest, September supplement.

Lowry, P., 1994 "Petrophysical Facies Stratigraphy Using Statistical Log Response Characterization, Monte Carlo Simulation and Inversion Methods," 35<sup>th</sup> Annual Logging Symposium Transactions, Paper BBB 1-18.

Kubik, West and Lowry, Patrick, 1993 "Fracture Identification and Characterization Using Cores, FMS Cast, and Borehole Camera: Devonian Shale, Pike County, Kentucky, SPE 25897.

Meek, J. and Lowry, P., 1992 "Data Management: A Case Study, SPE 24442.

Lancaster, D.E., Guidry, F., Lowry, P. and Abraham, R., 1991 GRI's Devonian Shales Research Program: A Progress Report, SPE 23420.

Lowry, P., Hamilton-Smith, T. and Peterson, R., 1989 "Devonian Shales of Central Appalachian Basin: Geologic Controls on Gas Production, Abstract AAPG International Meeting.

Watts, R., Yost III, A., Farrell, H., Kennedy, T. and Lowry, P., 1988 "Devonian Shale Oil Production Analysis and Evaluation, SPE 18552.

(numerous others)

#### AFFILIATIONS

American Association of Petroleum Geologists Society of Petroleum Engineers Society of Professional Well Log Analysts; 2000 Dallas Chapter President Dallas Geological Society; 2005-2006 International Committee Program Chairman 2006-2007 International Committee Chairman

#### LANGUAGES

English; native Spanish; un pocito Russian; "pivo pasalsta"

NATIONALITY: U.S.

# SELECTED PROJECT EXPERIENCE

U.S.A., New Mexico, Delaware Sands Mountain Group: Detailed petrophysical analysis and high-resolution definition of stratigraphic framework for geocellular modeling for development planning of highly compartmentalized, deep marine depositional system reservoirs. Constructed six geocellular models to identify flow units and prepare drilling and recompletion program.

U.S.A., Gulf Coast, Flour Bluff & Pita Island: Detailed petrophysical and geological analysis of a complex multi-pay structural trap and identification of remaining reserves potential. U.S.A., Deepwater Gulf of Mexico: Performed regional technical and commercial review of the deep water and assessed play entry strategies.

U.S.A., Deepwater Gulf of Mexico: Evaluation of horizontal and multilateral well technology for deepwater applications. Study performed for DeepStar consortium.

U.S.A., West Texas: Detailed petrophysical analysis and definition of stratigraphic framework in preparation for development of geocellular models and 3-D visualization of complex carbonate reservoirs, leading to identification of bypassed reserves, waterflood design and deviated well planning.

Kazakhstan, Kalamkas & Zhetybai: Reserves evaluation as part of a technical due diligence review for the privatization of Mangistaumunaigaz, involving a \$4B commitment. Principal Petrophysicist, developed interpretation algorithms for Russian logs of various vintages. Developed batch processing routines for well logs from 2,500-well field and 1,700-well field. Developed interpretation quality-control methods for substantial volume of logs. Integrated core data and derived rock properties for volumetric mapping and geocell modeling. Construction of integrated geological model including 10 million cell geocellular model reservoir architecture visualization and reservoir simulation.

U.S.A., Rockies; Green River, Uinta, Piceance & Wind River Basins: Regional geological synthesis of three basin centered tight gas deposits in support of resource and reserves estimates. Conducted core and log petrophysical analysis on tight gas plays from several hundred wells.

New Zealand, Tariki: Detailed geologic, petrophysical and engineering study leading to reserves evaluation.

U.S.A., North Texas, Various: Geologic Characterization study of several Caddo conglomerate fields to determine remaining primary recovery and waterflood potential.

Mexico, Burgos Basin: Petrophysicist team member in three-year Subsurface Advisory contract to Pemex. Conducted single exploratory well evaluations and multi-well field studies. Work involved editing (QC, depth shift, splicing, normalizing, borehole corrections), developing petrophysical models, integration of routine and special core data, batch processing, derivation of rock properties for mapping and selection of testing/completion/workover intervals. Work covered all aspects of exploration for, and development of, gas reservoirs across the basin.

U.S.A., Rockies, Green River, Uinta, Piceance, & Wind River Basins: Development and calibration of tight gas core and log analysis techniques leading to volumetric resource estimates.

U.S.A., Texas & Louisiana, Travis Peak/Hosston Play: Regional play synthesis and evaluation of remaining field potential as a basis for proactive acquisition campaign.

U.S.A., California, Elk Hills: Selected as an independent assessor by the U.S. government to value the DOE interest in Elk Hills. This interest was subsequently sold for \$3.65B in the largest privatization in U.S. history. Scotia was competitively selected to perform this work.

U.S.A., Gulf Coast, Laura LaVelle: Geological study and reservoir description, leading to reservoir simulation and evaluation of production enhancement options.

U.S.A., New Mexico, Draw: Study of waterflood performance and evaluation of technology options for increasing recovery.

# JAMES D. LEWIS PRINCIPAL PETROPHYSICIST

# **KEY SKILLS**

#### GEOSCIENCES

• Experienced in all aspects of open hole well logging, from data acquisition and interpretation to integration with other well data.	Experienced in both onshore and offshore logging operations.
<ul> <li>Experienced in cased hole and production logging interpretation with emphasis on- pulsed neutron logs and spinner surveys.</li> </ul>	Knowledgeable of Russian-style formation evaluation.

#### INFORMATION TECHNOLOGY

•	Proficient using PETCOM (Jason-Fugro) <i>PowerLog</i> log analysis system.	• Familiar with geoPLUS <i>PETRA</i> .
•	Very familiar with all Microsoft Office applications.	• Proficient working with difficult image data.

#### BUSINESS

•	Client interfacing, career experiences include service, operating, and consulting companies.	Project management and team integration.
•	Willingness to travel with acceptance of local customs and practices.	

# **PROFESSIONAL SUMMARY**

Over 30 years experience in the petroleum industry, ranging from the acquisition of wireline log data to conducting petrophysical basin studies. Graduated from the University of West Florida in Pensacola, Florida in 1970 with a Bachelor of Science degree in Physics. Responsible for all phases of petrophysical work relating to integrated field studies.

# RPS SCOTIA (FORMERLY THE SCOTIA GROUP, INC.)2004 TO PRESENTPRINCIPAL PETROPHYSICIST2004 TO PRESENT

Responsible for the generation of reservoir properties utilizing well logs and other petrophysical data, the integration of reservoir properties with geological mapping, the estimation of reservoir volumes and drainage, and the support of client coring and logging operations.

#### **RECENT PROJECTS**

• Assessment of wells with Hosston/Cotton Valley formations as primary objectives for local client. Advised client of procedural technique to improve log quality in rugose boreholes. Completed comparative study of adjacent field using historical log data retrieved from the Louisiana Department of Natural Resources website.

**1995** TO **2004** 

**1994** TO **1995** 

1987 TO 1994

- Assessment of Columbian well logs for identification of non-completed pay intervals using reported production information and reservoir parameter integration into seismic modelling project.
- Determination of shale volumes and porosities for 800+ well field in Louisiana for geocellular modelling. The log data for these wells cover a 60-year period of field development.

#### PREVIOUS CAREER DETAILS

# DEGOLYER AND MACNAUGHTON PETROPHYSICIST/VICE PRESIDENT

Evaluated petrophysical data for numerous projects in Algeria, Austria, Iraq, Madagascar, the North Sea, Yemen, and Russia while assigned to the Europe/Middle East/Africa division and Reservoir Studies Division. Majority of assignments involved Algerian field studies. Travelled to Russia and is knowledgeable of Russian logging practices and interpretation techniques. Introduced technique of using Adobe Acrobat PDF format to present log images and contributed to establishing report-on-CDROM standards.

# NUMAR OILFIELD SERVICES

#### STAFF PETROPHYSICIST

Responsible for the interpretation of nuclear magnetic resonance well logs. Provided support of field operations by log quality program and solution of technical issues. Instituted numerous changes in company computing center operations reducing processing time and providing the client with an improved interpretation product. Provided classroom instruction to field engineer staff. Redesigned format and content of log examples used for sales presentations. Attended short course in Malvern, Pennsylvania, instruction received from leading NMR experts.

#### ARCO OIL AND GAS COMPANY

#### SENIOR PETROPHYSICIST

Performed immediate analysis of log data from exploration wells for casing and completion decisions for the South Louisiana and Houston exploration districts. Completed log analyses for prospect generation and well recompletions. Supervised logging operations and provided well log interpretation on deepwater exploration wells. Supervised logging operations offshore Mobile Bay in Alabama, on/offshore Louisiana, West/East/South Texas, Alabama, Northwest Florida, California, and Michigan. Supervised logging operations in Black Warrior Basin and provided log analysis support of coal-bed methane exploration. Provided classroom instruction on logging topics for new geoscientists. Computed critical drawdown pressure predictions to avoid sanding problems in offshore wells and rock strength parameters from log data for the design of fracture programs. Determined shear velocities from full-waveform sonic data using proprietary software for seismic applications. Developed transit time replacement method to correct erroneous sonic logs. Member of evaluation team to determine personal computer log analysis software to replace VAX mainframe application.

#### TELEDYNE GEOTECH

#### PROJECT FIELD ENGINEER

Responsible for design and field implementation of downhole micro-seismic array at the Geyser's geothermal site in northern California. Provided on-site supervision of construction of remote radio-linked geophone installations.

**1986 TO 1987** 

# SUN EXPLORATION AND PRODUCTION COMPANY SENIOR LOG ANALYST

Completed studies of log data for prospect generation, domestic and international. Performed fracture analyses of reservoirs using techniques developed by Dr. Roberto Aguilera. Supervised critical offshore logging operations in the Gulf of Mexico and in the Santa Barbara Channel in California. Organized log analyses for international basin studies for concession bids. Presented well logging classroom instruction. Provided programming direction and needed software functionality for in-house log analysis software development. Compiled job control and batch language files for log analysis work on Prime, CDC Cyber, and Cray systems.

#### DRESSER ATLAS WIRELINE SERVICES FIELD ENGINEER/SR. F.E. /GEN. F.E.

Responsible for recording open hole wireline measurement and other services on drilling rigs, located both onshore and offshore in the Gulf Coast, USA. Attended six week field engineer school to learn logging equipment operation and later selected to attend several advanced services workshops. Performed routine and specialized log interpretations at the Rocky Mountain Computing Center using PerkinElmer computer system. Processed dipmeter logs and compiled log data for customer library tapes. Provided client support and supervised logging operations.

#### Tyler Junior College INSTRUCTOR

Instructed courses on various petroleum technology topics: Drilling Fluids, Hydraulics, Drilling Practices, Production Methods, Oil & Gas Records, Reading Blueprints. Developed laboratory demonstrations and student exercises. Initiated and coordinated out-of-classroom instruction. Completed three courses during this period, BASIC/Fortran, Geophysical Methods, Well Logging Methods, as an evening student.

# **OTHER INFORMATION**

# **QUALIFICATIONS AND TECHNICAL COURSES**

• BSc Physics, Minor Education, University of West Florida, Pensacola

Training courses attended:

Defining a Prospect	AAPG
Creative Exploration	AAPG
Oil & Gas Property Evaluation	AAPG
Advanced Formation Evaluation	OGCI
Basic Reservoir Engineering	OGCI
Exploration for Carbonate Reservoirs	OGCI
Integration of Log and Seismic Data	IHRDC
Open Hole Logging Engineer School	Dresser Atlas
Open Hole Log Interpretation (Home Study)	Dresser Atlas
Neutron Lifetime Seminar	Dresser Atlas
Diplog Seminar	Dresser Atlas
SpectraLog Seminar	Dresser Atlas
Fundamentals of DIPLOG Analysis (Ed Bigelow)	Dresser Atlas
Russian Logs Symposium Short Course	SPWLA
MWD Seminar	SPWLA
Russian Logging	SPWLA

Resource Estimate Makó Trough, Hungary

# 1983 то 1986

# 1981 то 1983

1981 TO 1983

#### AFFILIATIONS

Society of Petrophysicists and Well Log Analysts since 1978, currently past-president Dallas chapter. formerly Dallas chapter Vice President of Technology; Treasurer and Secretary, each twice.

LANGUAGES English NATIONALITY U.S.

# SELECTED PROJECT EXPERIENCE

Russian Log School, Oslo Norway. Prepared and presented two-day client school, *Basic Russian Well Logs* in 2006.

Reserves Assessment – Surgutneftegaz, Russia. Analyzed numerous wells for economic evaluation of company assets. Required travel to Siberia, three weeks, for data gathering.

Infield Opportunity Assessment – Yukos, Russia. Analyzed numerous wells of Yuganskneftegaz, Samaraneftegaz, Tomskneftegaz (operating units of YUKOS) to determine recompletion, potential shut-in, and in-fill drilling locations. Required travel to Moscow for four weeks for data collection and onsite analysis of data. Assisted project engineer in determination of J-function water saturations used for reservoir modeling.

Muravlenkovskoye Field, Russia. Analyzed Pokar sandstone reservoir for infill drilling potential. Required one month living in Moscow. Instructed client petrophysicists in operation of Petcom *PowerLog* software to assist project completion.

Kazakhstan Fields. Assisted in completion of 2,500 well field study. Required one month living in Aktau, Kazakhstan.

Norton Basin, Bering Sea, Offshore Alaska. Petrophysical studies of data from cost and exploration wells for OCS lease bid considerations. Clastic and volcanic lithologies.

North Gabon Basin, Offshore Gabon, West Africa. Analyses of well log data, primarily the Gamba sandstone and Madiela (clastic and carbonate) sections for lease considerations.

South China Sea, Offshore China. Petrophysical studies of well log for lease feasibility study. Log and core data presented in Chinese with Soviet style log formats - large panel sheets with unconventional presentations.

Timor Basin, Offshore Australia. Petrophysical studies of well logs for lease feasibility study.

Re-Appraisal of Cano Limon discovery well, Columbia. Analysis of well log data for offset lease considerations.

Oriskany Sand Gas Pay, West Virginia. Analysis of well log data for gas storage project owned by electric power generation company. Included fracture identification by early Schlumberger FMI, noise and temperature logging.

Midway-Sunset field, California. Petrophysical studies of well logs for recompletion and in-fill drilling potential with the Potter sand as the main objective.

Railroad Valley, Nye County, Nevada. Petrophysical studies of well logs for exploration potential. Emphasis placed on fracture detection using conventional log information. Designed multi-log presentation with grading criteria to identify potential fracture systems.

Trenton-Black River Pay, Michigan Basin. Petrophysical studies of well logs for exploration potential and immediate wellsite analysis for casing decision. Ordovician Sandstone.

Monterey Shale, offshore California. Wellsite logging supervisor and analyzed log data for exploration well.

Tulare Sands, Bakersfield, California. Wellsite logging supervisor and analyzed log data for exploration well.

Bol-Mex Pay, South Louisiana. Wellsite logging supervisor and analyzed log data for exploration well

Yequa Pay, South Louisiana. Wellsite logging supervisor and analyzed log data for exploration program.

Wilcox Pay, South Texas. Wellsite logging supervisor and analyzed log data for exploration program.

Miocene Gas, Offshore Louisiana. Wellsite logging supervisor and analyzed log data for exploration program.

Oligicene Gas, Offshore Louisiana. Wellsite logging supervisor and analyzed log data for exploration program.

Deep Tuscaloosa, onshore Louisiana. Wellsite logging supervisor and analyzed log data for exploration program.

Smackover Pay, South Alabama & West Florida. Wellsite logging supervisor and analyzed log data for exploration program.

Cotton Valley Pay, East Texas. Wellsite logging supervisor and analyzed log data for exploration program.

Rhourde Nouss, Algeria. Conducted log interpretation for reservoir parameters used in reservoir simulations and modeling. Evaluated production logs for monitoring water injection and reservoir depletion. The TAGS (Trias Argileux Greseux Superior) sandstone is the main reservoir. The logs for the 100+ well field were analyzed using a multi-mineral probabilistic model.

Ohanet Field, Illizi Province, Algeria. Conducted log interpretation for reservoir parameters used in reservoir simulations and modeling. The main reservoirs were Devonian and Ordovician sands.

Stah Field, Algeria. Conducted log interpretation for reservoir parameters used in reservoir simulations and modeling.

Guellala Field, Algeria. Conducted log interpretation for reservoir parameters used in reservoir simulations and modeling.

Ourhoud and Block 404, Berkine Basin, Algeria. Conducted log interpretation for reservoir parameters used in reservoir simulations and modeling. The main reservoirs were the TAGI (Triassic Argilo-Greseux Inferieur) sandstones.

Hassi Berkine South Field, Algeria. Conducted log interpretation for reservoir parameters used in reservoir simulations and modeling.

Zarzaitine, Algeria. Conducted log interpretation for reservoir parameters used in reservoir simulations and modeling.

Rhourde Hamra, Algeria. Conducted log interpretation for reservoir parameters used in reservoir simulations and modeling.

Temane Field, Mozambique. Analyzed limited number of wells for economic evaluation of field.

Jannah Field, Yemen. Analyzed limited number of wells for economic evaluation of fields.

Geysers, California. Project field engineer for the implementation of a micro-seismic geophone array system at the Geyser's geothermal site in northern California for the detection of subterranean events. Provided on-site supervision of construction of remote radio-linked geophone installations. Tested hardware and carried out feasibility studies of proposed equipment. Responsible for problem solving and design modifications in response to conditions in hostile terrain in remote areas.

Tuba and Zubair Fields, Iraq. Petrophysicist responsible for analysis of log data for economic evaluation of field. The reservoirs studied were clastic and carbonates.

Underground Gas Storage, Austria. Petrophysicist responsible for analyzing a number of monitoring wells for determination of gas storage leakage.

Offshore Miocene Gas Play – Mobile Bay, Alabama. Project petrophysicist provided supervision of all logging operations, directly responsible for saving over \$100,000 on single logging run by presence at wellsite, negotiated with Chevron on equity determinations.

Black Warrior Basin, Alabama. Lafayette district Project petrophysicist for coalbed methane exploration. Supervised coring/logging operations and conducted extensive studies in determining maximum resolution of measurement of conventional logging devices to determine true coal bed thickness.

Green Canyon, Gulf of Mexico. Project petrophysicist for high cost, deep water, offshore Louisiana exploration project. Provided wellsite logging supervision and analyzed log data on location and reported results directly to upper management. Designed program to minimize logging risks and for cost containment.

Domestic Exploration Plays, South Texas, S. Louisiana (onshore & offshore), Alabama, and West Florida. Project petrophysicist responsible for wellsite logging supervision and immediate analyses of log data for exploration program. Often reported results directly to upper management. Conducted log analyses for generation of prospects.

# DANIEL H. COOPER, PhD, PE

PhD Geological Engineering, University of Mississippi MS Engineering Science, Rice University BS Civil Engineering, University of Mississippi

#### PROFESSIONAL EXPERIENCE

Over 25 years of petroleum industry experience in middle management and senior professional positions. Senior level responsibility in reservoir simulation and reservoir management activities. Pioneer in advanced reservoir characterization and geological modeling, with emphasis on seismic attribute analysis and interpretation for the determination of rock properties and hydrocarbon signature. Directly responsible for the successful modeling of several large Middle East reservoirs, including the initial modeling of the more recent Central Arabian discoveries. Extensive knowledge of sequence stratigraphic relationships. Engineering background with excellent understanding of applied mathematics, fluid dynamics and geophysics. Responsible for original research in the areas of reservoir characterization, seismic integration and data analysis. Over 30 years of computer programming experience with an extensive software development portfolio. Presented technical papers at international, national and regional geological conferences. Authored or co-authored over 20 technical reports and studies.

2003–Present RPS Scotia, Inc. and Advanced GeoSolutions - Consultant

Production geologist specializing in geocellular modeling and reservoir characterization, providing consulting services at the corporate and individual levels. Expert user of Petrel integrated interpretation and modeling workflow with advanced training and experience in complex modeling scenarios. Special interest in carbon dioxide sequestration and enhanced hydrocarbon recovery.

- 2002–2003 Saudi ARAMCO *Exploration Systems Consultant* Advisory position for the identification and implementation of new technologies. Special interest in the use of geophysical attribute analysis and interpretation to define and delineate reservoir properties.
- 1998–2001 Saudi ARAMCO Reservoir Simulation Systems Consultant Special assignment with Saudi ARAMCO Mega-Cell Simulator Development Team. Developed a mission critical procedure for the interactive interpretation of multi-parameter reservoir simulation results in an integrated environment to support corporate Asset Management Team objectives. Employed advanced technologies for the successful integration of high-resolution (mega-cell) simulation models with geologic models and seismic volumes.
- 1996–1998 Saudi ARAMCO Reservoir Management Systems Consultant Coordinated a multi-disciplinary project for the development and implementation of a strategy for analyzing and interpreting fluid movement in developed reservoirs. Special emphasis was placed on the prediction of water movement and the detection and recovery of by-passed oil.
- 1993–1996 Saudi ARAMCO *Exploration Systems Consultant* Responsible for the initiation of original research in the areas of geologic mapping, 3-D geologic modeling and geostatistical analyses. Pioneered the incorporation of seismic attribute analysis and inversion techniques in support of reservoir characterization and modeling efforts. Promoted the use of sequence stratigraphy as a basis for model definition. Honored as a member of the Saudi

ARAMCO Exploration Team of the Year for work in developing advanced techniques used in modeling the newly discovered Central Arabian hydrocarbon reservoirs. Received AAPG special recognition and Landmark Worldwide Exploration Forum outstanding paper award for work in advanced modeling techniques.

#### 1989–1993 Saudi ARAMCO - Exploration Systems Specialist

Provided specialist assistance for corporate geologists in exploration and reservoir characterization activities, requiring advanced applied mathematics and computer based techniques. Evaluated and recommended new strategies and procedures for the assimilation and analysis of geological and geophysical data. Project team leader for the integration and implementation of an advanced 3-D geologic modeling system. Developed and implemented the five year business plan for software and hardware acquisitions and developed all software necessary to provide and integrated modeling solution.

# 1985–1988 Saudi ARAMCO - Division Administrator, Geological Support Division

Administrative responsibility for three geological support units, supporting geologists in exploration, reservoir development, hydrology and cartography. Responsible for preparing the multi-million dollar yearly operating plan and budget for the computer hardware and software support of exploration and reservoir geology activities. Responsible for acquiring, implementing and maintaining all exploration and reservoir geology computer software.

#### 1984–1985 Saudi ARAMCO - *Unit Leader, Mapping and Modeling* Supervisory responsibility for the implementation and support of all exploration mapping and modeling activity. Supervised the development of Saudi ARAMCO specific mapping and modeling applications. Directly involved in the completion of several geologic projects and studies. Organized and contributed to mapping and modeling in-house training.

#### 1983–1984 Saudi ARAMCO - *Exploration System Analyst* Participated in various exploration and reservoir characterization project activities. Designed and developed the Saudi ARAMCO device independent graphics environment, which remained the graphics standard for eight years. Developed the geologic model-to-simulator interface (GEOSIM).

1982–1983 GeoScience and Services, Inc. - *Director, Computer Applications* Responsible for the specification and acquisition of the corporate Landsat analysis system. Directed all activity requiring the integration of seismic data, landsat imagery, gravity/magnetics and geodynamics. Jointly supervised a twoday remote sensing seminar held at Texas Christian University and sponsored by GeoScience and Services, Inc.

#### 1982-1983 GeoScience and Services, Inc. - Staff Geologist / Geological Engineer Supervised prospect development leading to eight discovery sites. Worked directly with clients in developing oil and gas prospects, using processed seismic data and remote sensing techniques. Prospect areas included most of the Texas and Louisiana Gulf Coast, Arkansas, Mississippi, Alabama, Oklahoma, Colorado and Wyoming. Assisted petroleum geologists in developing small field and estimates. Provided assessments reserves detailed geological interpretations as input to regional basin studies. Developed techniques for the integration of gravity, and magnetic survey data with Landsat imagery data.

1981–1982 Mississippi Mineral Resources Institute - *Geological Engineer* Conducted environmental and geohydrological investigations associated with the Mississippi Lignite Program and the Salt Dome Repository Studies for Nuclear Waste Disposal. Supervised offshore seismic operations in conjunction with U.S. Army Corps of Engineers. Developed a digital geological database for Mississippi Sound and environs. Provided professional expertise for municipality and regional groundwater studies.

#### PROFESSIONAL AFFILIATIONS

Governor's Appointment to Arkansas Board of Registration for Professional Geologists Member AAPG Chi Epsilon - Civil Engineering Honorary Tau Beta Pi - Engineering Honorary Sigma Gamma Epsilon - Geological Engineering Honorary Licensed Professional Engineer Registered Professional Geologist AAPG Certified Petroleum Geologist

#### SELECTED PROJECT EXPERIENCE

Baram Field FFR Study Team, Malaysia. - Objective: To develop and implement a scenario for the integration of multiple reservoir studies into a unified full field modeling and dynamic simulation program. Activity: Consulting Geologist, contributing to the development and implementation of a unified program for the large-scale full field modeling and dynamic simulation of the Baram Field (Baram Delta Operation, Malaysia). The project required extensive use of Petrel modeling in a complex geologic environment. Geology: Heavily faulted clastic depositional environment.

Baram Field IFR Study Team, Malaysia. - Objective: To use static and dynamic models to identify opportunities for increased hydrocarbon production and to identify and mitigate major risks and uncertainties. Activity: Consulting Geologist, responsible for the development of Petrel based static models required for reserves review and dynamic simulation. Activities included 1) seismic interpretation of faults and horizons, 2) model framework definition, 3) geostatistical evaluation and properties characterization, 4) volumetrics, 5) sensitivity analysis and uncertainty assessment and 6) simulation support. Geology: Heavily faulted clastic depositional environment.

Poza Rica Field FFR Study Team, Mexico. - Objective: Full Field Review utilizing Petrel geologic model to validate OOIP and support reservoir engineers in the identification and assessment of underdeveloped hydrocarbon reserves. Activity: Consulting Geologist, responsible for the development of the Petrel based geologic model required for reserves review and dynamic simulation. Geology: Faulted carbonate depositional environment.

Fayetteville Shale Play Lease Assessment and Review, USA. Consulting Geologist responsible for the review and recommendation of lease potential for areas of Arkansas defined by the Fayetteville Shale Play. Activities include the preliminary determination of trend extent and the lease value of acreage based on production potential and geologic uncertainties.

CO2 Sequestration Economic Opportunities and Risk Assessment, USA. Consulting Geologist responsible for the development of a proprietary review of the economic potential of CO2 sequestration and the CO2 related enhanced recovery of hydrocarbon in the Texas Gulf Coast

area. The 6 month baseline study addressed critical aspects of the gathering, transmission and disposal of anthropogenic CO2, including the economic gains and risks associated with EOR and enhanced CBM recovery. The study also addressed liability and potential legal concerns.

# 7.0 CERTIFICATION

This resource estimation was performed by an integrated project team comprising Mr. Ian S. Howrie (engineer), Dr. Ephraim A. Ubani (engineer), Mr. Lonnie J. McDade (engineer), Mr. Patrick H. Lowry (geologist), Mr. James D. Lewis (petrophysicist), and Dr. Daniel H. Cooper (engineer). I hereby certify that this Report was prepared by me and by others working in direct cooperation with me.

lan S. Howrie Principal Engineering Advisor RPS Scotia, Inc. Texas Registered Engineer #85054 Member of the Association of Professional Engineers, Geologists and Geophysicists of Alberta, #M14210