RESERVES AND RESOURCES EVALUATION
OIL AND GAS ASSETS IN UKRAINE

Prepared for

CADOGAN PETROLEUM PLC

February, 2010

The Americas

1360 Post Oak Blvd.,
Suite 2500
Houston, Texas 77056
Tel: +1 713 850 9955
Fax: +1 713 850-9966
email: gcah@gaffney-cline.com

Europe, Africa, FSU and the Middle East

Bentley Hall, Blacknest
Alton, Hampshire
United Kingdom GU34 4PU
Tel: +44 1420 525366
Fax: +44 1420 525367
email: gcauk@gaffney-cline.com

Asia Pacific

80 Anson Road
31-01C Fuji-Xerox Towers
Singapore 079907
Tel: +65 6225 6951
Fax: +65 6224 0842
email: gcas@gaffney-cline.com

and at Argentina - Brazil - Kazakhstan - Russia - UAE - Australia
www.gaffney-cline.com

CONFIDENTIAL

Copies: Client
Electronic
Project No: E2248

Prepared for: Cadogan Petroleum PLC

This report was prepared by the following Gaffney, Cline & Associates personnel:

Original signed by John W. Barker MSc, PhD

Project Manager
Title: Senior Reservoir Engineer
Date:16th march, 2010

Original signed by William B. Cline Bsc, CEng, PE

Project Reviewer
Title: Senior Principal
Date: 16th march, 2010

This report has been reviewed and endorsed by the following Executive of Gaffney, Cline & Associates:

Original signed by Drew Powell BSc, CEng
Title: Regional Manager

Date: 16th march, 2010

Page No.

Page No.

Tables

Figures

Appendices

At the request of Cadogan Petroleum plc (Cadogan), Gaffney, Cline and Associates (GCA) has performed an independent technical and economic evaluation of the Reserves and Resources in the seven licence areas in the Ukraine in which Cadogan holds an interest (Table 0.1), as at an Effective Date of 31st December, 2009. The evaluation has been conducted on the basis of a data set of technical information made available to GCA by Cadogan including: details of contract interests and agreements, geological and geophysical data, interpretations and technical reports, historical production and engineering data, cost and commercial data, and approved development plans as at the Effective Date. In carrying out its evaluation, GCA has relied upon the accuracy and completeness of this information. GCA has not inspected any equipment or plant, nor conducted any site inspection visits to field installations or transportation networks.

The SPE PRMS[1] has been used as the basis for the classification and categorization of hydrocarbon volumes. An abbreviated form of the SPE PRMS definitions and guidelines are given in Appendix I. Reserves, Contingent Resources and Prospective Resources have been attributed to Cadogan's licences:

- Reserves are those quantities of petroleum that are anticipated to be commercially recoverable by application of development projects to known accumulations from a given date forward under defined conditions. Reserves must therefore be discovered, recoverable, commercial and remaining (as of the evaluation date), based on the development project(s) applied. Reserves are categorized in accordance with the level of certainty associated with the estimates. All categories of Reserve volumes quoted herein have been determined within the context of an Economic Limit Test (ELT).
- Contingent Resources are those quantities of petroleum estimated, as of a given date, to be potentially recoverable from known accumulations, but where the applied project(s) are not yet considered mature enough for commercial development due to one or more contingencies. Contingent Resources may include, for example, projects for which there are currently no evident viable markets, or where commercial recovery is dependent on technology under development, or where evaluation of the accumulation is insufficient to clearly assess commerciality. Contingent Resources are categorized in accordance with the level of certainty associated with the estimates.
- Prospective Resources are those quantities of petroleum that are estimated, as of a given date, to be potentially recoverable from undiscovered accumulations by application of future development projects. Prospective Resources are categorized in accordance with the level of certainty associated with recoverable estimates assuming their discovery and development. Only those prospects that are sufficiently well defined, on the basis of geological and geophysical data, to be considered drillable are suitable for explicit quantification.

It should be noted that the reported Reserve and Resource volumes and production rates are based on professional engineering judgement and are subject to future revisions, upward or downward, as a result of future operations or as additional data become available.

In accordance with Cadogan's instructions, GCA has estimated a Net Present Value (NPV) for each Reserve volume and an Expected Monetary Value (EMV) for each Contingent Resource and each Prospective Resource, as at an Effective Date of 31st December, 2009.

[1] SPE PRMS is the Petroleum Resources Management System published by the Society of Petroleum Engineers (SPE), the World Petroleum Council (WPC), the American Association of Petroleum Geologists (AAPG) and the Society of Petroleum Evaluation Engineers (SPEE) in March 2007.

It should also be noted that the NPVs and EMVs of future revenue potential of a petroleum property, such as those discussed in this report, do not represent an opinion as to the market value of that property, nor any interest in it. In assessing a likely market value, it would be necessary to take into account a number of additional factors including: reserves risk (i.e. that Reserves or Resources may not be realised within the anticipated timeframe for their exploitation); perceptions of economic and sovereign risk; potential upside; other benefits, encumbrances or charges that may pertain to a particular interest; and the competitive state of the market at the time. GCA has explicitly not taken such factors into account in deriving the reference NPVs and EMVs presented herein.

In preparing this report, GCA has served as an independent advisor. The firm's employees have no direct or indirect holding in Cadogan. GCA's remuneration was not in any way contingent on reported estimates. No representations are made herein in respect of property title or encumbrances thereon.

This report has been prepared in support of a financial audit of Cadogan at year end, 2009, and must be used only for the purpose for which it was intended.

A glossary of industry standard abbreviations is contained in Appendix II, some or all of which may have been used in this report.

TABLE 0.1

CADOGAN LICENCES, FIELDS AND NET WORKING INTERESTS

Licence	Licence Type	Gross Area (km^2)	Expiry Date	Fields	Cadogan WI (%)
Bitlyanska	E&D	390.0	23/12/14	Bitlya Borynya Vovchenska	97.1 96.5 96.8
Debeslavetska	Prod	26.9	04/10/26	Debeslavetska	98.29
	E&D	218.0	07/09/11	See note 3	98.29
Sloboda Rungurske	E&D	101.0	11/04/11	Sloboda Rungurske	100.0
Cheremkhivkse	Prod	119.0	14/05/18	Cheremkhivkse	49.8
Pirkovskoe	E&D	71.6	19/05/10[6]	Pirkovskoe	97.0
Zagoryanskoe	E&D	49.6	24/04/14	Zagoryanskoe	90.0
Pokrovskoe	E&D	49.5	10/08/11	Pokrovskoe	100.0

Notes:

1. E&D = Exploration and Development.
2. Prod = Production.
3. The Debeslavetska E&D Licence covers an area surrounding the Debeslavetska field.
4. It would normally be expected that an E&D licence would be converted to a production licence of about 20 years duration if the obligations have been met and a field development plan is submitted.
5. Cadogan's net Working Interest in some fields is variable, depending on a number of factors, but the degree of variation is small and the fixed numbers presented in this Table are used for all calculations in this report.
6. Extension of the Pirkovskoe licence has been applied for.

Cadogan acquired its interests in the licences in Ukraine during the two and a half years prior to its listing on the London Stock Exchange in June, 2008. Cadogan operates the licences through various wholly owned subsidiary companies. The assets within the licences fall into three main groups (Figures 0.1 and 0.2): the Pirkovskoe and Zagoryanskoe gas/condensate (and light oil) fields and the Pokrovskoe prospect in the Dniepr-Donets Basin in Eastern Ukraine; the Bitlya and Borynya gas/condensate discoveries in Bitlyanska licence in the Carpathian Basin in Western Ukraine; and three small producing oil and gas fields (Sloboda Rungurske, Debeslavetska and Cheremkivskoe) also located in the Carpathian Basin.

The licences lie in mature petroleum producing provinces. Prior to Cadogan's involvement, all of the licences had seen previous activity, including seismic acquisition, exploration and appraisal drilling, and in some cases commercial production. This activity was undertaken by Ukrainian operators using Soviet era technology and suffered from many limitations: seismic data were of marginal quality and limited to 2D surveys; the old wells were drilled without the benefit of modern practices so that severe formation damage is likely to have occurred; logs are of poor to medium quality; coring was sporadic, often missing the reservoir intervals; and testing conditions did not meet international standards with no meaningful pressure measurements and no reliable fluid samples. Some of these data are no longer available, others incomplete, poorly presented or contradictory.

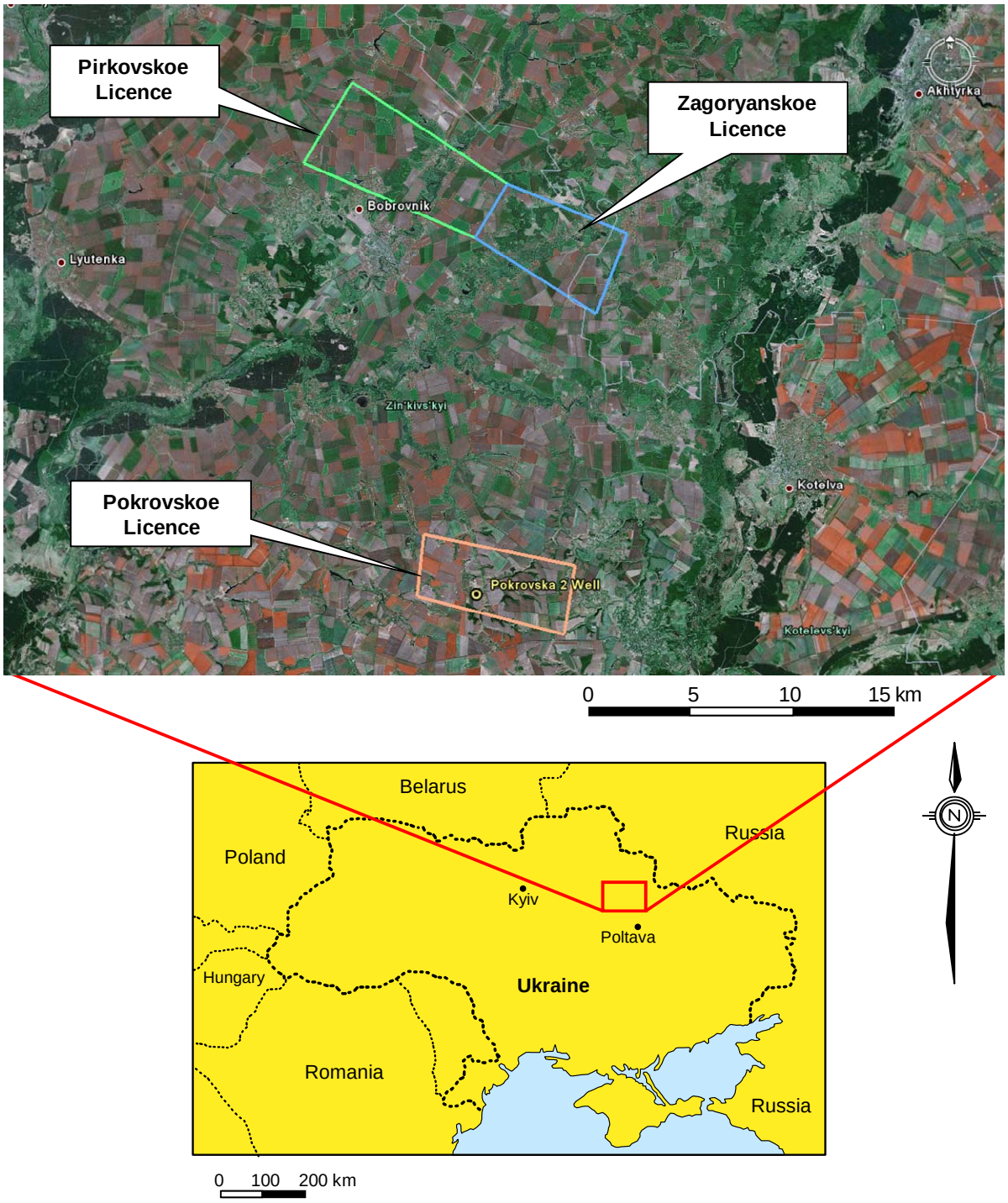
Since becoming operator, Cadogan has completed 3D seismic surveys on the Pokrovskoe, Pirkovskoe and Zagoryanska licences in Eastern Ukraine, although interpretation is still on-going. At the time of the listing, an ambitious drilling campaign was under way in all four of the main licences (the three just mentioned plus Bitlyanska) with the aim of starting large scale commercial production early in 2009. However, the strategy of using low-cost, Ukrainian rigs has met with limited success. Despite the fact that up to seven drilling rigs were in operation simultaneously, only one well was successfully completed and put into production (Pirk-1). Two others (Zag-3 and Bor-3) reached the target horizons (at depths of 3,000-5,000 m) but Zag-3 was suspended with mechanical problems following an inconclusive production test while Bor-3 was suspended due to drilling through a series of pressure ramps, although commercial production rates were achieved in short term production tests of the shallower target in this well.

Thus, although most of the licences contain discoveries, principally of gas and condensate, further appraisal is needed in nearly all cases. There is a stratigraphic component to the hydrocarbon traps, which for the most part cannot be resolved on the available seismic data. In-place volumes are thus uncertain, as are the area that will be effectively drained by a single well and the rate at which the hydrocarbons can be extracted. The production rates achieved during testing of the old wells (prior to Cadogan's involvement) in the principal assets were predominantly sub-commercial, but with some instances of higher rates.

Following a change in management in 2009, Cadogan suspended nearly all drilling activity while strategic and sub-surface reviews were conducted. Effort is now focussed on a smaller number of objectives and western drilling equipment is to be introduced, supported by a heavy duty workover rig for completion and testing operations. The higher cost of such equipment will be offset by faster drilling and completion times. It is expected that better drilling practices and better quality completions will result in significantly higher production rates than have hitherto been achieved. The first field to benefit from this strategy will be Pokrovskoe where a western rig will arrive in 2010 to drill up two new wells before moving to the Zagoryanska and Bitlyanska licences.

FIGURE 0.1

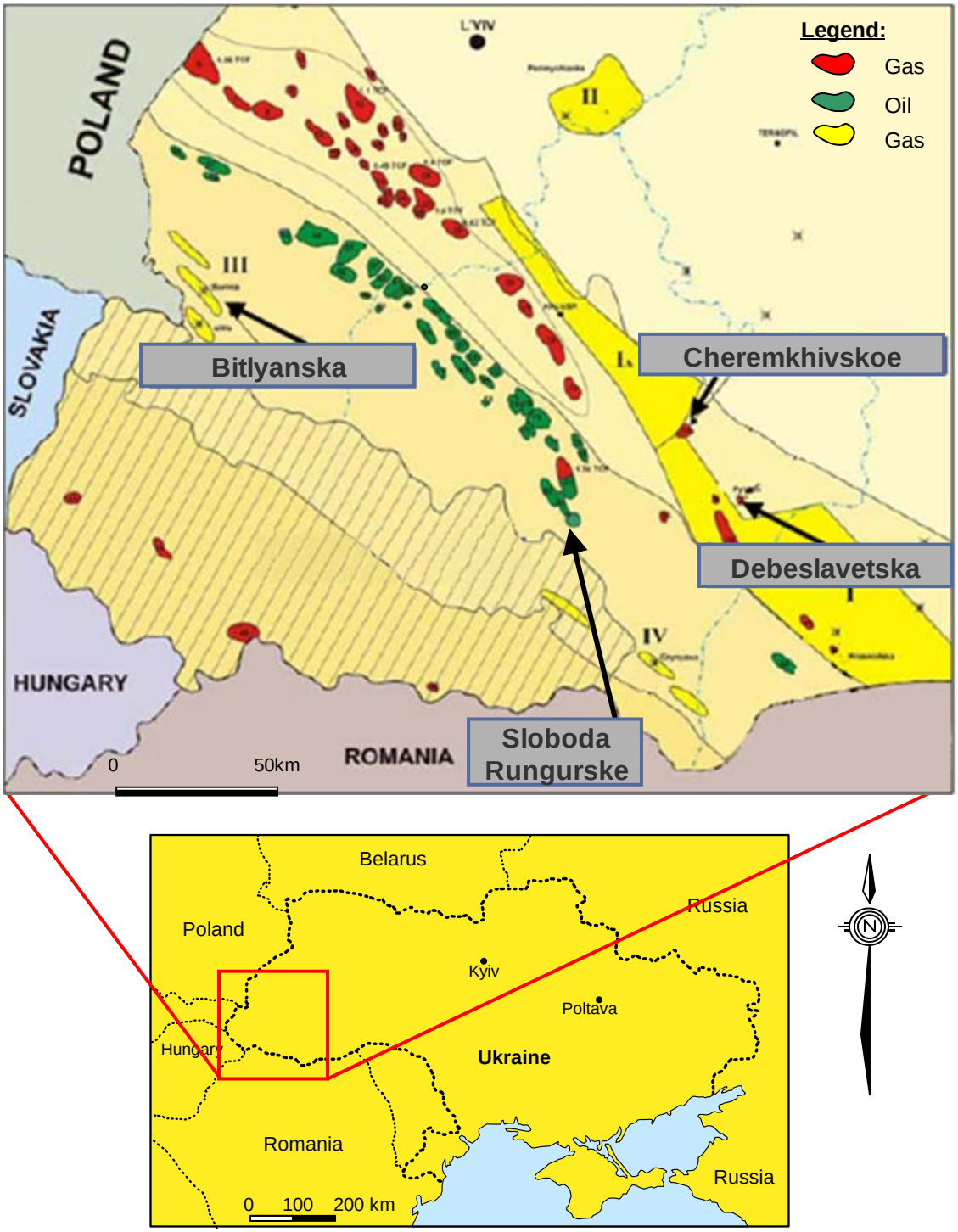
CADOGAN LICENCES IN EASTERN UKRAINE



Source: Cadogan (upper figure)

FIGURE 0.2

CADOGAN LICENCES IN WESTERN UKRAINE



Reserves and Resources Summary

Reserves are assigned only to the currently producing fields, including the Pirk-1 well in Pirkovskoe but excluding Sloboda Rungurske where production is currently uneconomic.

Contingent Resources are assigned to Pirkovskoe, Zagoryanskoe, Borynya and Bitlya, where development is contingent on further appraisal.

Prospective Resources are attributed to Pokrovskoe, where there has not yet been a production test.

Tables 0.2, 0.3 and 0.4 respectively summarise the Reserves, Contingent Resources and Prospective Resources attributable to the assets as at 31st December, 2009.

The principal change from Reserves and Resources reported as at 31st December, 2008 is the reclassification of most of the Reserves in the Pirkovskoe field as Contingent Resources. The reason for this reclassification is the failure of the previously intended development plan. That plan relied on the use of low-cost, Ukrainian drilling rigs which have turned out to be inadequate to drill the relatively deep wells required to reach the reservoir intervals.

In order to show that development of Pirkovskoe is viable, Cadogan must:

- Demonstrate that wells can be drilled in a routine manner without major mechanical problems and without causing excessive formation damage;
- Demonstrate, through test production, that commercially attractive production rates can be routinely achieved and that connected gas volumes are sufficient to sustain the production long enough to generate an economically attractive return on the capital investment.

The same two things need to be demonstrated at the other fields currently classified as Contingent Resources, i.e. Zagoryanskoe, Borynya and Bitlya.

Other changes from the Reserves and Resources reported as at 31st December, 2008 include:

- Revisions to the Resource volume estimates in Pirkovskoe and Zagoryanska, and a simplification of the way they are presented, as a result of preliminary interpretation of the 3D seismic data;
- An increase in the Contingent Resource volume estimates in Borynya as a result of the drilling of the Bor-3 well; and
- A slight reduction in the Prospective Resource volume estimates in Pokrovskoe, also as a result of preliminary interpretation of the 3D seismic data.

TABLE 0.2

SUMMARY OF RESERVES
AS OF 31st DECEMBER, 2009

Field	Cadogan Working Interest (%)	Net Interest Gas Reserves (Bcf)		
		Proved	Proved + Probable	Proved + Probable + Possible
Pirkovskoe (Pirk-1)	97.0	1.5	10.0	29.0
Debeslavetska	98.29	0.64	1.3	1.8
Cheremkhivkse	49.8	0.21	0.26	0.31
Total	**-**	**2.4**	**12**	**31**

Field	Cadogan Working Interest (%)	Net Interest Condensate Reserves (MMBbl)		
		Proved	Proved + Probable	Proved + Probable + Possible
Pirkovskoe (Pirk-1)	97.0	0.07	0.57	2.1
Total	**-**	**0.07**	**0.57**	**2.1**

Field	Cadogan Working Interest (%)	Net Interest Oil Reserves (MMBbl)		
		Proved	Proved + Probable	Proved + Probable + Possible
Pirkovskoe (Pirk-1)	97.0	0.01	0.02	0.04
Sloboda Rungurske	100.0	-	-	-
Total	**-**	**0.01**	**0.02**	**0.04**

Notes:

1. The above Reserves are reported after being subjected to an Economic Limit Test.
2. Reserves in Pirkovskoe are attributed only to the Pirk-1 well.
3. No Reserves are attributed to Sloboda Rungurske as current production is uneconomic.

TABLE 0.3

SUMMARY OF CONTINGENT RESOURCES
AS OF 31st DECEMBER, 2009

Field	Cadogan Working Interest (%)	Net Interest Gas Contingent Resources (Bcf)		
		1C	2C	3C
Bitlya	97.1	236	539	944
Borynya	96.5	473	1,008	1,688
Pirkovskoe	97.0	49	547	1,101
Zagoryanskoe	90.0	69	394	777
Total		-	**2,487**	-

Field	Cadogan Working Interest (%)	Net Interest Condensate Contingent Resources (MMBbl)		
		1C	2C	3C
Bitlya	97.1	6.9	16.9	32.9
Borynya	96.5	12.3	30.1	67.1
Pirkovskoe	97.0	3.4	35.6	72.7
Zagoryanskoe	90.0	4.5	25.5	50.3
Total		-	**108**	-

Notes:

1. The primary Contingent Resource volume reported here is the 2C, or "Best Estimate", value.
2. It is inappropriate to aggregate Contingent Resource volumes other than the 2C or "Best Estimate" values, or to aggregate Contingent Resource volumes with other classes of resource (i.e. Reserves or Prospective Resources).
3. There may be a significant risk that accumulations containing Contingent Resources will not achieve commercial production.

TABLE 0.4

SUMMARY OF PROSPECTIVE RESOURCES
AS OF 31st DECEMBER, 2009

Prospect	Cadogan Working Interest (%)	Net Interest Gas Prospective Resources (Bcf)			GCoS (%)
		Low	Best	High	
Pokrovskoe	100.0	92	237	950	40

Prospect	Cadogan Working Interest (%)	Net Interest Condensate Prospective Resources (MMBbl)			GCoS (%)
		Low	Best	High	
Pokrovskoe	100.0	3.0	8.4	32.8	40

Notes:

1. The primary Prospective Resource volume reported here is the "Best Estimate" value.
2. It is inappropriate to aggregate Prospective Resource volumes, or to aggregate Prospective Resource volumes with other classes of resource (i.e. Reserves or Contingent Resources).
3. The Geologic Chance of Success (GCoS) represents an indicative estimate of the probability that the drilling of this prospect would result in a discovery which would warrant the re-classification of that volume as a Contingent Resource (the GCoS value for a Contingent Resource is 100 %). These GCoS percentage values have not been arithmetically applied to the volumes presented here.

NPV Summary

Reference Net Present Values (NPVs) have been attributed to the "Proved", the "Proved plus Probable" and the "Proved plus Probable plus Possible" Reserves. The reference Post-Tax NPVs for these cases are summarised in Table 0.5.

GCA employed its own Ukrainian Gas and Brent Oil price scenario (adjusted for quality and location) for the first quarter of 2010 in preparing these NPVs (see Section 4 for further details). GCA considers this to be reasonable for the purpose of examining a range of monetary values that might be attributable to the assets. All NPVs quoted are those exclusively attributable to Cadogan's net interests in the properties under review.

It should also be noted that the NPVs of future revenue potential of a petroleum property, such as those discussed in this report, do not represent an opinion as to the market value of that property, nor any interest in it. In assessing a likely market value, it would be necessary to take into account a number of additional factors including: reserves risk (i.e. that Reserves or Resources may not be realised within the anticipated timeframe for their exploitation); perceptions of economic and sovereign risk; potential upside; other benefits, encumbrances or charges that may pertain to a particular interest; and the competitive state of the market at the time. GCA has explicitly not taken such factors into account in deriving the reference NPVs presented herein.

TABLE 0.5

SUMMARY OF POST-TAX NET PRESENT VALUE (NPV) OF FUTURE NET REVENUE FROM RESERVES AS OF 31st DECEMBER, 2009

Field	Net Interest NPV (U.S.$ MM)											
	Proved				Proved + Probable				Proved + Probable + Possible			
Discount Rate	7.5%	10%	12.5%	15%	7.5%	10%	12.5%	15%	7.5%	10%	12.5%	15%
Pirkovskoe (Pirk-1)	7.1	6.6	6.1	5.7	54.1	46.9	41.0	36.1	150.2	122.4	101.1	84.5
Debeslavetska	2.7	2.6	2.5	2.4	4.8	4.4	4.1	3.9	6.9	6.4	5.9	5.5
Cheremkhivkse	1.0	1.0	0.9	0.9	1.2	1.2	1.1	1.0	1.5	1.4	1.3	1.2
Sloboda Rungurske	-	-	-	-	-	-	-	-	-	-	-	-
Total	**10.8**	**10.1**	**9.5**	**9.0**	**60.1**	**52.5**	**46.2**	**41.0**	**-**	**-**	**-**	**-**

Notes:

1. The primary reference NPVs reported here are the "Proved" and "Proved + Probable" values; it should be noted that Possible Reserves are less likely to be realised than not.
2. The reference NPVs reported here do not represent an opinion as to the market value of a property or any interest in it.
3. The reference NPVs reported here are computed based on mid-year cashflows.
4. The NPV shown for Pirkovskoe relates to production from the Pirk-1 well only.

EMV Summary

Expected Monetary Values (EMVs) have been attributed to the Contingent Resources and to the Prospective Resources. The reference Post-Tax EMVs for these cases are summarised in Tables 0.6 and 0.7 respectively.

GCA employed its own Ukrainian Gas and Brent Oil price scenario (adjusted for quality and location) for the first quarter of 2010 in preparing these EMVs (see Section 4 for further details). All EMVs quoted are those exclusively attributable to Cadogan's net interests in the properties under review.

It should also be noted that the EMVs of future revenue potential of a petroleum property, such as those discussed in this report, do not represent an opinion as to the market value of that property, nor any interest in it. They are no more than indicative numbers, used primarily for force-ranking of opportunities. There is inherently a great deal of subjectivity in their estimation.

TABLE 0.6

SUMMARY OF POST-TAX EXPECTED MONETARY VALUE (EMV) OF FUTURE NET REVENUE FROM CONTINGENT RESOURCES AS OF 31st DECEMBER, 2009

Field	Cadogan Working Interest (%)	Net Interest EMV (U.S.$ MM)			
		7.5%	10%	12.5%	15%
Bitlya	97.1	365	276	213	166
Borynya	96.5	856	646	497	389
Pirkovskoe	97.0	1,174	952	781	647
Zagoryanskoe	90.0	531	424	343	280
Total		**4,236**	**2,926**	**2,298**	**1,833**

Notes:

1. The reference EMVs reported here do not represent an opinion as to the market value of a property or any interest in it.
2. EMVs are no more than indicative numbers, used primarily for force-ranking of opportunities.

TABLE 0.7

SUMMARY OF POST-TAX EXPECTED MONETARY VALUE (EMV) OF FUTURE NET REVENUE FROM PROSPECTIVE RESOURCES AS OF 31st DECEMBER, 2009

Prospect	Cadogan Working Interest (%)	Net Interest EMV (U.S.$ MM)			
		7.5%	10%	12.5%	15%
Pokrovskoe	100.0	255	207	170	141

Notes:

1. The reference EMVs reported here do not represent an opinion as to the market value of a property or any interest in it.
2. EMVs are no more than indicative numbers, used primarily for force-ranking of opportunities

1. EASTERN UKRAINE

1.1 Background

Cadogan operates the Pirkovskoe, Zagoryanskoe and Pokrovskoe licences in the Poltava region of Eastern Ukraine. They lie in the Dniepr-Donets basin, an established petroleum province which accounts for 90% of Ukraine's oil and gas production.

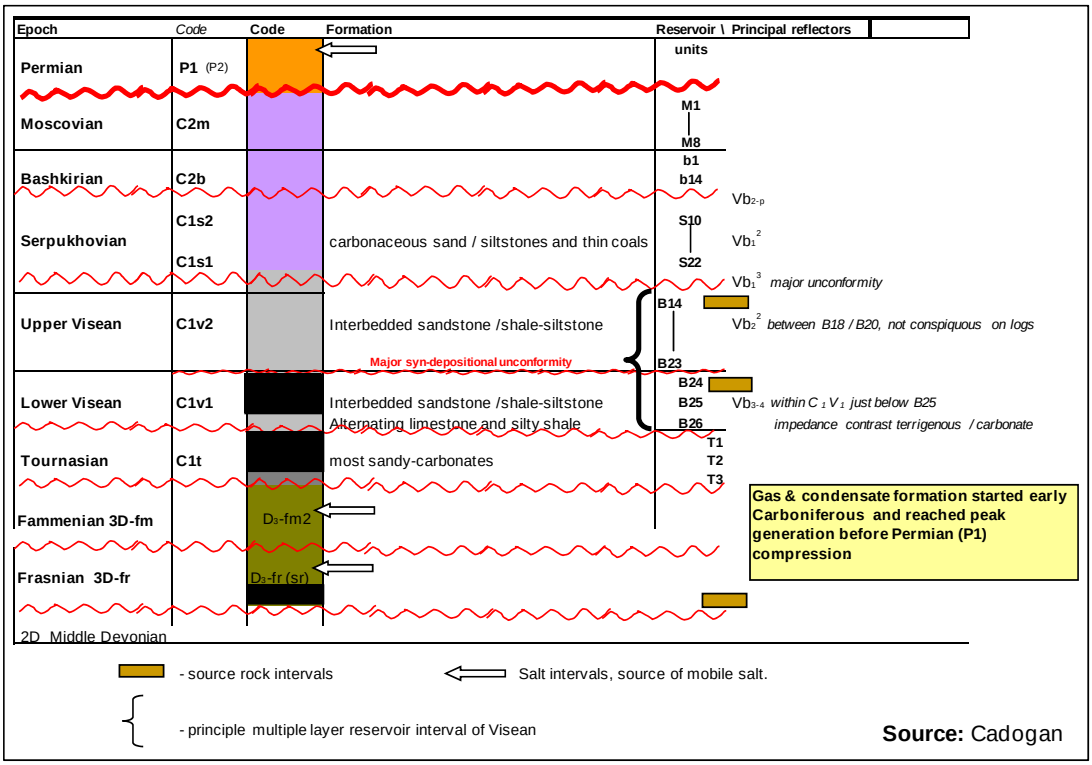
The primary reservoirs in this area are (Lower Carboniferous) Upper Visean, Lower Visean, and Tournaisian clastics and carbonates (Figure 1.1) at depths from about 4,000 m to more than 5,500 m. There may be further reservoirs in the even deeper, Devonian-aged, Famennian rocks.

Many different potential reservoir levels exist, identified as V14 to V22 (or V23) in the Upper Visean, V23 (or V24) to V26 in the Lower Visean, and T1 through T3 in the Tournaisian. Within each level, there may be several individual reservoir zones. Identification of the specific levels within a well is not straightforward and leads to some ambiguity of terminology. The limited lateral extent of individual reservoirs, particularly in the Lower Visean, contributes to this ambiguity. Correlation of reservoirs between wells is often difficult.

A fuller description of the geology of the licence areas and past activity within them may be found in earlier reports.

FIGURE 1.1

STRATIGRAPHIC SUMMARY, POLTAVA REGION, DNIEPR-DONETS BASIN



1.2 Pirkovskoe Licence

Four wells were drilled on the Pirkovskoe licence in the 1980s and 1990s but successful production tests were limited to three zones (V19, V23 and T3) in the 408 well with a maximum gas rate of 37,000 m^3/d (1.3 MMcf/d) and two (V17 and V26) in the 460 well with a maximum gas rate of 150,000 m^3/d (5.3 MMcf/d). Severe formation damage may have occurred in these wells due to poor drilling practices, and this would have restricted the production rates that were achieved.

In 2008/9, Cadogan drilled two new wells and also attempted to re-test the Pirk-460 well, but were unsuccessful in restoring it to production. The first of the new wells, Pirk-1, encountered light oil in the Upper Visean V16-17 and produced gas at a rate of 70,000 m^3/d (2.8 MMcf/d) from the Lower Visean V26 in a production test. The well was completed in the V16-17 and has been in commercial oil production at 10-15 m^3/d (60-90 bopd) since June, 2009. The second new well, Pirk-2, has been suspended before reaching the target reservoir zones due to a mechanical problem.

1.3 Zagoryanskoe Licence

The Zagoryanskoe licence is immediately to the east of the Pirkovskoe licence. Five wells were drilled within the licence area during the 1980s and 1990s. Gas and condensate were tested in Lower Visean and Tournaisian carbonates between 4,500 m and 5,500 m. There was some pilot production from Zag-1, Zag-2 and Zag-8 from 1997 to 2004 but it is suspected that production records are incomplete. Zag-7 was described as tight but with some oil and gas shows. Zag-3 did not originally reach the reservoir targets but was deepened by Cadogan to a depth of 5,115 m in 2008 and briefly tested at a rate of up to 100,000 m^3/d (3.5 MMcf/d) on a restricted choke from the Lower Visean V26. However, wellhead pressure fell rapidly during the test, possibly indicating a small connected volume, although liquid loading is another possible explanation.

1.4 3D Seismic Data

Cadogan acquired and processed 3D seismic data over the Pirkovskoe and Zagoryanskoe licences in 2009. Previously, the only seismic data available for the licences comprised a set of 2D seismic lines with sparse coverage. On the basis of the older data, the two licences had been divided into a number of separate fault blocks.

The 3D seismic data were provided to GCA along with a preliminary time interpretation by a Ukrainian contractor in the form of five horizons (denoted B-16, B-17, B-24, Vv4 and Vv4p) and a set of fault surfaces. A review of the seismic data yielded the following observations:

- The data are of moderate quality, with mappable events clearly defined. However, the volume would benefit from reprocessing to enhance event continuity in areas of greater dip and to improve resolution of stratigraphic elements that are currently "hinted at".
- The interpretation of the five horizons is poor: the overall shape of the reservoir is captured, but detail is missing. The impression gained is that a few cross-lines have been interpreted, and that the interpretation has then been copied to adjacent cross-lines with a time-shift to accommodate the general structural dip to the south-west.
- The fault interpretation is equally poor: in some sections, there does appear to be some correspondence between the interpretation and potential fault features, but elsewhere that correspondence is missing, while many other features have not been interpreted. The interpretation cannot be accepted as a valid representation of the fault system.

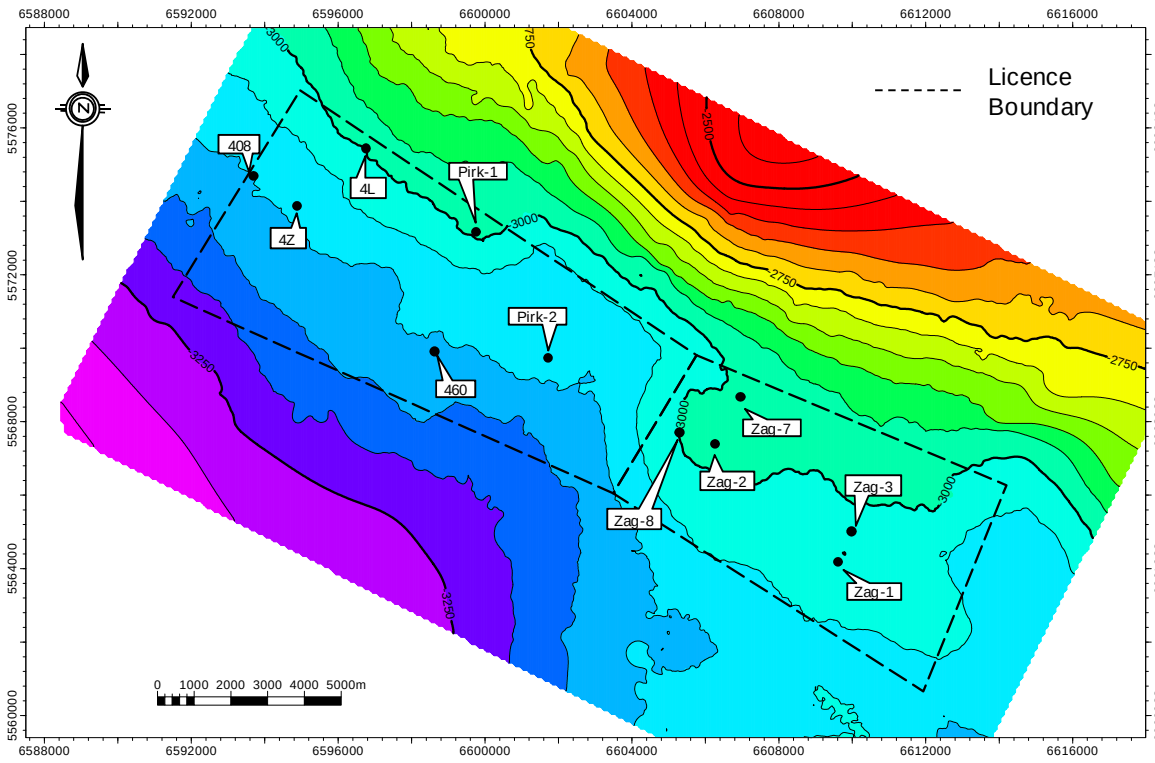
- A line-by-line review of the seismic data indicates that there are no major faults within the zone of interest. There are many minor faults at the limit of seismic resolution (estimated at 40-50m) that do not significantly offset the reservoir, and are not persistent over more than a few lines (100-200m). These features are unlikely to form significant connectivity barriers, but a detailed fault network interpretation, preferably utilising reprocessed seismic data, will be required to determine the potential for compartmentalisation.
- Throughout the zone of interest, there are many indications of stratigraphic complexity, with event discontinuities and possible clinoform features. However, the quality of the seismic is insufficient to resolve the relevant detail, and any interpretation of reservoir continuity must remain speculative.

In conclusion, the 3D seismic data has the potential to unlock some of the structural and stratigraphic complexity of the Pirkovskoe-Zagoryanskoe reservoir. However, the processing and interpretation are currently insufficiently mature to provide information regarding reservoir continuity and connectivity.

Figure 1.2 shows a time structure map over the Pirkovskoe and Zagoryanskoe licences. The surface shown is a prominent reflector picked by GCA near the middle of the Visean section. The striking feature is the absence of any structural closure for the gas accumulations. The faults picked on the earlier 2D seismic are not substantiated, and the structure simply rises from south-west to north-east across and beyond the licence areas.

FIGURE 1.2

PIRKOVSKOE AND ZAGORYANSKOE TIME STRUCTURE MAP

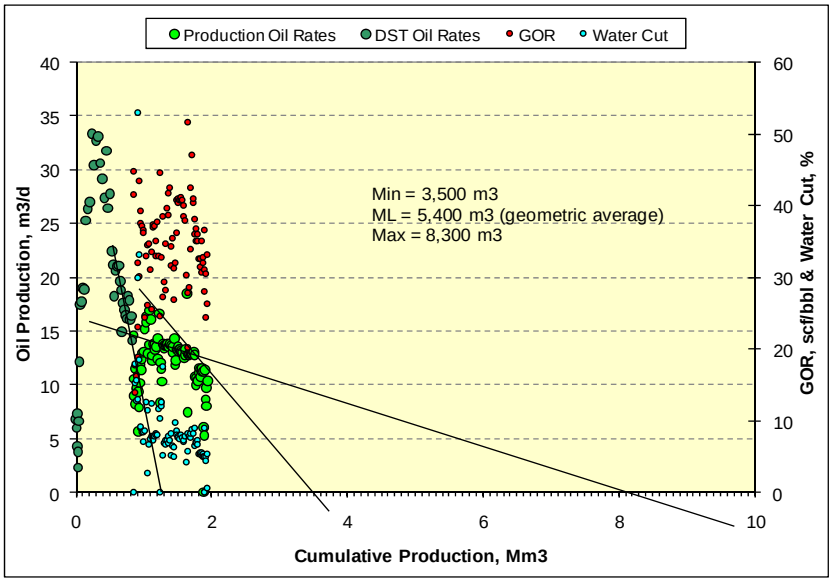


1.5 Analysis of Pirk-1 Production Data

Pirk-1 produced oil from a 5.6 m thick perforated interval in the V16-17 at a rates of up to 33 m^3/d (207 bopd) during a drill stem test (DST) in late 2007. This zone was subsequently placed on production in June, 2009 at a rate of approximately 15 m^3/d (94 bopd). Figure 1.3 plots the well's production rate against cumulative oil production.

FIGURE 1.3

PIRK-1 PRODUCTION DATA ANALYSIS



The production performance does not clearly define the decline rate, although two trends are suggested by the data: the more recent trend suggests an ultimate recovery of 3,500 m^3 (22,000 Bbl), whereas an earlier trend suggests a higher ultimate recovery of 8,300 m^3 (52,000 Bbl). A rough analysis of the reservoir pressure data measured during the DST was also conducted: the permeability is estimated at 1-2 mD and the STOIIP within the drainage area at about 50,000 m^3 (314 MBbl), corresponding to a drainage area of about 0.5 km^2 (120 acres). Although this is a very approximate analysis, it fits quite well with the estimates of ultimate recovery which would then correspond to recovery factors of 7-17%.

A previous analysis of the DST by TRACS suggested a drainage area of about 3 km^2 (radius of 1 km) but that analysis used an oil compressibility of 5.80×10^{-5} /atm (3.95×10^{-6} /psi) which is an unusually low value, so the drainage area may have been an over-estimated.

1.6 Estimation of Hydrocarbon Volumes

Previous resource estimates for Pirkovskoe and Zagoryanskoe were based on the now discredited division of the area into several fault blocks. GCA has therefore re-estimated the in-place and recoverable hydrocarbon volumes for each licence as a whole, with no areal sub-division

(except for the V16-17 in an area around Pirk-1). However, volumes are estimated separately for three stratigraphic units: the Upper Visean (UV) sandstones; the Lower Visean and Tournaisian (LVT) sandstones; and the carbonates (which are predominantly in the Lower Visean and Tournaisian).

Volumes have been estimated using a probabilistic approach. All input parameters are listed in Appendix III. Apart from the areas, the values used are essentially the same as in GCA's previous volume estimations. A deterministic approach has been used to define the low or "proved" volume estimates: in this, the minimum area is multiplied by the best estimate of all the other parameters. Results are summarised in Appendix III. The carbonate formations are excluded from the Proved volumes in Pirkovskoe because no gas has yet been produced to the surface from the carbonates within that licence. Past gas production in Zagoryanskoe has been mainly from the carbonate intervals, but it is suspected that fractures and/or vugs, not detectable on the logs, may be necessary for production to occur. The carbonates are in general poorly understood and for this reason a wide range of possible recovery factors have been applied in estimating recoverable volumes there from.

Separate volume estimates have been made for the UV reservoir in Pirk-1, which is oil-bearing. However, future production from the UV in Pirk-1 is estimated from the decline curve analysis described in Section 1.4. The rest of the licence areas have been treated as gas-bearing, although it is quite possible that other oil accumulations will be found, or that some gas accumulations will have an underlying oil zone. However, the average condensate content of the gas is currently uncertain and clearly varies across the area and between reservoirs. Thus, the possible presence of a certain amount of light oil is effectively treated as an uncertainty on the amount of condensate present, which is an acceptable approximation for present purposes.

1.7 Development Plans and Production Profiles

The primary interest in Pirkovoske is the potential for gas production, rather than the minor oil production from Pirk-1. Cadogan have a commitment to deepen Pirk-2 through the Lower Visean and Tournaisian reservoirs in 2010 using an upgraded local rig. If gas is encountered and can be produced at a commercial rate, the well could be tied in to Cadogan's gas processing plant at Krasnozayarska for production by the end of the year. This gas plant was acquired by Cadogan in 2007 and was expanded to a capacity of 1 MMm^3/d (35 MMcf/d), although it is currently idle.

A reasonable development approach might see two further wells being drilled in 2011 although there is presently no commitment to drill new wells in the licence and mobilisation of a western style rig in time to drill these wells is not a certainty. If results of the first few wells are sufficiently encouraging, a second rig could be brought in to allow the pace of development to be accelerated. Based on the best estimate of recoverable volumes, a total of 25 wells might be needed to fully develop the field (allowing for separate wells dedicated to the UV, LVT and carbonate formations), with process plant capacity increased in stages to 140 MMcf/d and 12,000 bpd of condensate. A provisional production profile has been generated for this scenario, together with the associated costs, and is shown in Appendix IV along with provisional production profiles and costs for the low and high estimates of recoverable volume.

In Zagoryanska, it is planned to workover Zag-2 and Zag-3 in 2010. If the workovers are successful, and gas can be produced at a commercial rate, the wells could again be tied in to Cadogan's gas processing plant at Krasnozayarska for production by the end of the year. A new well is planned for 2011. If results from these wells are sufficiently encouraging, further wells would

follow. Based on the best estimate of recoverable volumes, a total of 14 additional wells might be added by 2016 and process plant capacity increased in stages to 105 MMcf/d and 9,000 bpd of condensate. Provisional production profiles and associated costs have been generated for this scenario, as well as for the low and high estimates of recoverable volume, and are shown in Appendix IV.

1.8 Reserves and Resources

The development plans and production profiles just described represent a "success" scenario. However, both in Pirkovskoe and in Zagoryanskoe, significant uncertainty in recoverable volumes remains at present (as is evident from Table 1.2). It has not yet been demonstrated that wells can be drilled and completed in a routine manner. Doubts persist about the production rates that will be achieved in practice and the drainage volumes of individual wells.

Thus, potentially recoverable volumes from Pirkovskoe (with the exception of the Pirk-1 well) and Zagoryanskoe are currently considered to be Contingent Resources.

Future production from Pirk-1 is classified as Reserves. Reserve volumes have been estimated on the basis that the well will be recompleted as a gas producer in the Lower Visean V26 reservoir after oil production from the shallower V16-17 reservoir has declined to an uneconomic rate.

1.9 Pokrovskoe

Pokrovskoe is an exploration prospect located about 20 km south of Pirkovskoe and Zagoryanskoe and just to the north of (but down-dip from) the producing Solochovskoe oil and gas field. The main target reservoirs in Pokrovskoe are again the UV and LVT formations at around 5,000 m depth. An exploration well, Pok-2, was drilled by Cadogan in 2008. It reached the UV reservoir where strong gas shows were observed in the drilling mud and the presence of gas was interpreted from open hole logs. However, attempts to conduct a production test were thwarted by mechanical problems, and the well was later suspended having reached 5,185 m. A second well, Pok-1 is suspended at 5,018 m. To date, then, neither well has made a definitive discovery at Pokrovskoe, although the gas shows and the logs are encouraging.

Cadogan acquired 3D seismic over Pokrovskoe in 2008. Some preliminary interpretations have been made but work is still in progress. The seismic data and some horizons picked by Cadogan as part of the ongoing work were supplied to GCA. These have been briefly reviewed by GCA and do not change the overall picture of the prospect:

- At the UV level, there is no structural closure to the south where the UV horizons appear to continue upward into the Solochovskoe gas field; either a fault or a stratigraphic trap is therefore needed for a hydrocarbon accumulation to be present in the UV at Pokrovskoe, but this is not implausible.
- A clear structural rollover is visible on the seismic at the Lower Visean (Vb3 reflector). In the new interpretation, the area of the structure appears to be somewhat smaller than previously mapped.

Apart from this last observation, there is no reason to modify previous resource estimates for Pokrovskoe. GCA has accordingly used the same in-place and recoverable volume estimates for

the UV as before[2], while for the LVT the previous estimates have been multiplied by a factor of 0.67. The resulting volumes are listed in Appendix III.

There is a commitment to drill two further wells before the exploration licence expires in 2012, and Cadogan intends to bring in a western drilling rig to fulfil this commitment. In the meantime, both Pok-1 and Pok-2 will be deepened to the LVT using a local rig. If any of these wells are successful in producing gas at a commercial rate, they could be completed and tied back to local production facilities in 2011.

Prospective Resources are attributed to the Pokrovskoe prospect. The geological chance of success (GCoS) was previously estimated by GCA to be about 40% (and there is no reason to change that value at present).

For the purposes of estimating an EMV, production profiles and associated costs have been developed for the success scenario, in which a discovery is made and volumes and rate are sufficient to justify commercial development, for three cases corresponding to the low, best and high estimates of recoverable volume. These are shown in Appendix IV.

[2] Competent Person's Report, Evaluation of Ukrainian Petroleum Assets, prepared for Cadogan Petroleum PLC, 18th June, 2008

2. BITLYANSKA LICENCE, WESTERN UKRAINE

2.1 Background

The Bitlyanska licence lies in the long-established Carpathian Basin, in hilly terrain close to the Polish border. Within the licence are three elongated rollover anticlinal structures at the surface where hydrocarbons have been found (Figure 2.1). The northernmost of these contains the small, shallow Vovchenska oil field, currently shut in. Although there may be some potential in deeper horizons, there are no plans for further activity at the present time.

Exploration wells on the other two anticlines have discovered two accumulations of gas and condensate, the Borynya and Bitlya fields, at depths of 3,000 to 5,000 m. The gas is found in the Oligocene Kliwa Sandstones in the Golovetsky (Menilite) and Verchovinsky (Krosno) formations (Figure 2.2). These are fairly thin sands sandwiched between thicker shale layers. The most sand prone interval is the lower half of the Golovetsky, referred to as the P3gl1 formation. Structurally, the area is complex: the potential hydrocarbon traps lie in heavily folded and faulted thrust belts. Available seismic data are of poor quality and limited to a few widely-spaced 2D lines. Reservoir rocks were deposited in the midst of thick shales that probably constitute the source rock and a part of the seal, so a stratigraphic component to the trapping is probable and reservoir continuity is somewhat uncertain.

2.2 Borynya Field

The Borynya-1 well was drilled in 1974 but suffered a blow out at 4,500 m and was abandoned. Borynya-2 was drilled in 1978-81 at a nearby location, to a depth of 5,230 m. Several promising zones identified on the logs were tested but only one (at about 5,000 m) flowed gas at a commercial rate: 400,000 m^3/d (14 MMcf/d) according to test reports by NakNadra. The long drilling times and the use of heavy drilling mud may have caused severe formation damage which could have impacted the flow rates.

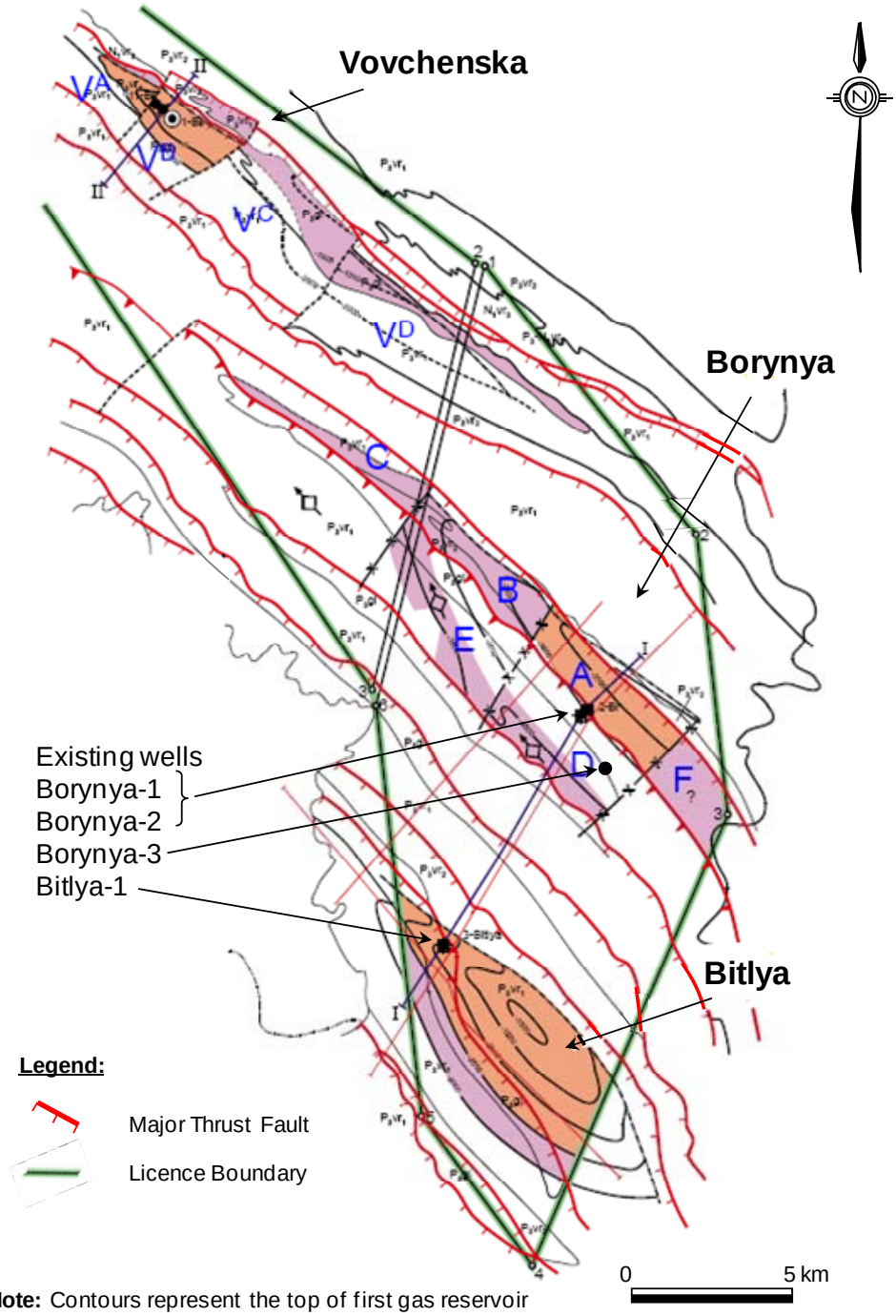
Cadogan began drilling Borynya-3 in December, 2007. The well is located about 1 km to the southeast of the two earlier wells. It was logged down to 4514.7 m and three DSTs were conducted: an interval from 2,599.3-2,690 mTVD produced gas at 46,345 m^3/d (1.64 MMcf/d) and another from 3,475-3,553 mTVD at 128,397 m^3/d (4.53 MMcf/d). Drilling then continued to the deeper target, but the well was suspended after drilling a series of pressure ramps. Petrophysical properties in the logged interval appear to be similar to those inferred from the earlier wells.

The drilling of Borynya-3 has increased confidence in the extent of the accumulations discovered by the earlier wells. GCA has consequently revised the estimates of in-place and recoverable hydrocarbon volumes. The same probabilistic approach is used as in GCA's previous evaluation, with all parameters unchanged except that the minimum area is increased. Inputs and results are summarised in Appendix III.

The DST results have increased confidence in the ability to achieve commercial production rates. However, whether these rates can be sustained over longer periods of production is not yet established. A great deal of uncertainty remains on the size, structure and continuity of the reservoirs and further appraisal is clearly needed before development could be envisaged. The number of wells and the size of the gas processing facilities required are highly uncertain at this stage.

FIGURE 2.1

SURFACE GEOLOGICAL MAP OF THE BITLYANSKA AREA

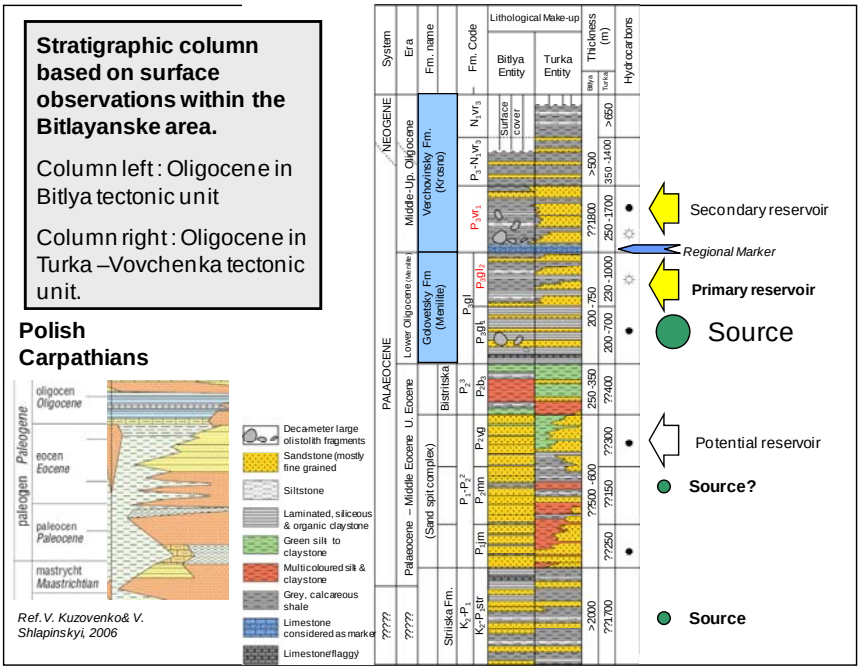


Note: Contours represent the top of first gas reservoir (Oligocene P3-gl and P3-vr) in the subsurface.

Source: Cadogan

FIGURE 2.2

CARPATHIAN AREA STRATIGRAPHY



For the purposes of estimating an EMV, provisional production profiles and associated costs have been developed for a success scenario, in which future appraisal wells prove up the potential volumes and production rates needed to justify commercial development, for three cases corresponding to the low, best and high estimates of recoverable volume (see Appendix IV).

2.3 Bitlya Field

The Bitlya-1 well was drilled in 1992 and partly re-drilled in 1999. Gas shows were noted throughout drilling, but only one interval at about 3,000 m depth flowed gas in a production test and then at a rate of only 6,200 m³/d (0.22 MMcf/d). Poor drilling practices could again have caused severe formation damage.

There has been no new data on Bitlya since GCA's previous evaluations so there is no reason to revise the previous Contingent Resource estimates, which were made using a probabilistic approach (see Appendix III).

Cadogan has no immediate plans for further activity although there are three remaining commitment wells to be drilled. Further appraisal is clearly needed before any development could be envisaged. For the purposes of estimating an EMV, production profiles and associated costs have been developed for a success scenario, in which future appraisal wells prove up the potential volumes and production rates needed to justify commercial development, for three cases corresponding to the low, best and high estimates of recoverable volume (see Appendix IV).

3. SMALL FIELDS, WESTERN UKRAINE

Cadogan acquired the Sloboda Rungurske, Debeslavetska and Cheremkhivkse licences through the purchase of Momentum Energy in May, 2007 and now operates them through a local company, JV Delta.

3.1 Sloboda Rungurske

Oil production from Sloboda Rungurske oil field began in 1881 and peaked in 1885 when 25,000 tonnes were produced (an average of about 500 bpd). Over 300 wells were drilled in these early years. By the late 1930s, production had declined to 1,500 tonnes per year (30 bpd) and the field was destroyed by saboteurs in 1941.

Some appraisal activities took place over the period from 1956 to the 1990's, apparently demonstrating the presence of hydrocarbons in the deeper blocks/folds. The field was re-activated in 1997 by Ukrnafta and in July, 2009 was producing at about 5 bpd of 38-41°API oil, with a water cut of 95%. Cumulative oil production to date is 2.25 MMbbl.

Future production from the existing wells has been estimated by decline curve analysis (DCA). Currently, production is uneconomic, so no Reserves can be attributed. Cadogan are reviewing how to improve flow and whether there is a deeper target. There is a stimulation program under consideration, but this is dependent on a number of factors. No Resources are attributed to this field at the present time.

3.2 Debeslavetska

Production from Debeslavetska gas field began in 1999, supplying local towns and factories, and is now about 25,000 m^3/d (0.9 MMcf/d), having peaked at 140,000 m^3/d (4.9 MMcf/d) in 2001. Gas is found in shallow, often unconsolidated, Miocene sandstone reservoirs deposited in a deltaic-coastal plain environment. A total of 13 producing wells have been drilled as well as a significant number of dry holes. Cumulative production to end 2009 was about 198 MMm^3. The long term development licence expires in 2026.

A separate exploration licence for the wider Debeslatevska area (218 km^2) runs until 2011, but Cadogan has no firm plan for drilling exploration wells at present.

Future production has been estimated using decline curve analysis. One new well (Well 42) is planned in 2010, to which Probable and Possible Reserves are assigned.

3.3 Cheremkhivkse

The Cheremkhivkse gas field was discovered in 1958. After extensive appraisal the field was brought into commercial production in 1996. The field contains a relatively small amount of gas at shallow depth in Lower Miocene sandstone. The trap is predominantly stratigraphic. Production varies in response to seasonal demand, but peaked at just over 50,000 m3/d (1.8 MMcf/d) in 1998. The field is currently producing at about 10,000 m^3/d (0.35 MMcf/d), and cumulative production to end 2009 was about 96 MMm^3 (3.4 Bcf). Gas treatment takes place on site and the produced gas is sold to neighbouring towns for local consumption.

The field appears to be fully developed and no further wells are planned. Future production has been estimated using decline curve analysis.

4. ECONOMIC ASSESSMENT

For those fields to which Reserves are attributable, GCA has conducted an Economic Limit Test (ELT) for each of the "Proved", "Proved plus Probable" and "Proved plus Probable plus Possible" production profiles to assess the corresponding categories of Reserves. The economic limit (or economic cut-off) is the point in time beyond which the net operating cash flows are negative, i.e. the end of the project's economic life. Additionally, reference NPVs of estimated after-tax cash flows (as at 31st December, 2009) attributable to a net economic interest have been assigned to each Reserves case. NPVs have been calculated at nominal discount rates of 7.5%, 10%, 12.5% and 15%, which are discount rates typical of those Cost of Capital rates used in the petroleum industry for the appraisal of this type of asset.

For fields to which Contingent Resources are attributable, GCA has conducted an ELT for each of the "1C", "2C" and "3C" production profiles to assess the corresponding categories of Contingent Resources. Post-Tax EMVs have been assigned at nominal discount rates of 7.5%, 10%, 12.5% and 15%.

For fields to which Prospective Resources are attributable, GCA has conducted an ELT for each of the "Low", "Best" and "High" production profiles to assess the corresponding categories of Prospective Resources. Post-Tax EMVs have been assigned at nominal discount rates of 7.5%, 10%, 12.5% and 15%.

The values of physical assets, i.e. plant and equipment, have not been considered separately as such values have been implicitly included in the assessment of the NPVs and EMVs as part of the petroleum property rights and facilities relating to the project.

GCA's assessments are based upon GCA's understanding of the fiscal and contractual terms governing these assets, and the various economic and commercial assumptions described herein. No adjustments have been made for cash balances, inventories, indebtedness or other balance sheet effects. GCA's economic analysis excludes VAT in all calculations.

4.1 Fiscal Terms

The relevant elements of the Ukraine fiscal regime for petroleum operations in 2010, as they pertain to the Licences, as advised by Cadogan, are summarised below and are held constant going forward. An exchange rate of 8.0 Ukrainian Hryvnia/U.S.$ has been used.

Production Taxes

1. Rent (Royalty)
   - Natural gas sold to industrial consumers
     - Horizons shallower than 5,000 m — U.S.$0.82 /Mcf
     - Horizons deeper than 5,000 m — U.S.$0.41 /Mcf
   - Crude Oil/Condensate
     - Horizons shallower than 5,000 m — U.S.$17.01 /Bbl
     - Horizons deeper than 5,000 m — U.S.$6.29 /Bbl
   - Rent adjustment coefficient
     - Applied to crude oil and condensate rent to

adjust for changes in crude oil prices against the base price	
Base crude oil price	U.S.$74.00 /Bbl
2. Subsurface Petroleum Tax	
• Natural gas	U.S.$0.0187 /Mcf
• Crude Oil/Condensate	U.S.$1.08 /Bbl
3. Geological Tax	
• Natural gas	US$0.0960 /Mcf
• Crude Oil/Condensate	US$0.70 /Bbl
Corporate Income Tax	25% of taxable income

4.2 Costs

Estimates of capital and operating expenditures have been provided by Cadogan in the form of budgets, plans, historical costs and company's forecast. These have been used together with GCA's own data base to estimate costs associated with the potential development scheme for each licence. Specific costs vary from licence to licence and are described in the relevant Sections of this report. Costs have been escalated by 2% annually from 2011.

4.3 Oil and Gas Prices

The basis for the oil and gas prices used in performing the ELTs and assessing cash flows is the reference Brent oil price scenario shown in the table below.

GCA has applied an oil price discount to Brent of U.S.$22 /Bbl (excluding VAT) for production from the Pirk-1 well in Pirkovskoe field, and U.S.$38 /Bbl (excluding VAT) for production from Sloboda Rungurske field, These discounts reflect oil quality and location and are based on 2009 auction prices for local crude oil supplied by Cadogan, understood to be sold at the field gate with trucking costs at customers' expense.

Condensate price in Ukraine has been assumed to track 78% of Brent price (excluding VAT, equivalent to 94% of Brent including VAT). This is again based on Cadogan's 2009 auction prices. Since the auction prices are for small volumes of condensate, this price may be a conservative one.

Cadogan's current gas production from the small Debeslavetska and Cheremkhivkse fields is sold to local factories. Ukraine has a well developed field and pipeline infrastructure used both for internal distribution and for transit of Russian gas to Europe. Although gas prices for household use are strictly regulated, there is a significant and growing domestic demand for industrial use and the industrial gas price is linked to the price of gas imported from Russia. It is assumed that any future gas production from Cadogan's assets would be sold to industrial customers within Ukraine. Industrial gas price in Ukraine has been derived from an oil-indexed price of Russian gas at the German border and netbacked to Ukraine

TABLE 4.1.

OIL AND GAS PRICE SCENARIO

Year	Brent Price (U.S.$/Bbl)	Ukraine Industrial Gas Price	
		(U.S.$/Mcf)	(U.S.$/Mcm)
2010	80.94	8.59	303.07
2011	85.76	10.16	358.75
2012	88.02	10.62	375.01
2013	87.21	10.72	378.34
2014	86.59	10.62	375.06
2015	88.33	10.70	377.63
Thereafter	+2.0%p.a.	+2.0%p.a.	+2.0%p.a.

APPENDIX I

SPE/WPC/AAPG/SPEE Petroleum Resources Management System: Definitions and Guidelines

PETROLEUM RESOURCES CLASSIFICATION AND DEFINITIONS

SOCIETY OF PETROLEUM ENGINEERS (SPE)
WORLD PETROLEUM CONGRESSES (WPC)
AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS (AAPG)

In March 1997, the Society of Petroleum Engineers (SPE) and the World Petroleum Congresses (WPC) approved a set of petroleum* reserves definitions which represented a major step forward in their mutual desire to improve the level of consistency in reserves estimation and reporting on a worldwide basis. As a further development, the SPE and WPC recognized the potential benefits to be obtained by supplementing those definitions to cover the entire resource base, including those quantities of petroleum contained in accumulations that are currently sub-commercial or that have yet to be discovered. These other resources represent potential future additions to reserves and are therefore important to both countries and companies for planning and portfolio management purposes. In addition, the American Association of Petroleum Geologists (AAPG) participated in the development of these definitions and joined SPE and WPC as a sponsoring organization.

In 1987, the WPC published its report "Classification and Nomenclature Systems for Petroleum and Petroleum Reserves", which included definitions for all categories of resources. The WPC report, together with definitions by other industry organizations and recognition of current industry practice, provided the basis for the system outlined here.

Nothing in the following resource definitions should be construed as modifying the existing definitions for petroleum reserves as approved by the SPE/WPC in March 1997.

As with unproved (i.e. probable and possible) reserves, the intent of the SPE and WPC in approving additional classifications beyond proved reserves is to facilitate consistency among professionals using such terms. In presenting these definitions, neither organization is recommending public disclosure of quantities classified as resources. Such disclosure is left to the discretion of the countries or companies involved.

Estimates derived under these definitions rely on the integrity, skill, and judgement of the evaluator and are affected by the geological complexity, stage of exploration or development, degree of depletion of the reservoirs, and amount of available data. Use of the definitions should sharpen the distinction between various classifications and provide more consistent resources reporting.

DEFINITIONS

The resource classification system is summarized in Figure 1 and the relevant definitions are given below. Elsewhere, resources have been defined as including all quantities of petroleum which are estimated to be initially-in-place; however, some users consider only the estimated recoverable portion to constitute a resource. In these definitions, the

* For the purpose of these definitions, the term "petroleum" refers to naturally occurring liquids and gases that are predominantly comprised of hydrocarbon compounds. Petroleum may also contain nonhydrocarbon compounds in which sulfur, oxygen, and/or nitrogen atoms are combined with carbon and hydrogen. Common examples of nonhydrocarbons found in petroleum are nitrogen, carbon dioxide, and hydrogen sulfide.

quantities estimated to be initially-in-place are defined as Total Petroleum-initially-in-place, Discovered Petroleum-initially-in-place and Undiscovered Petroleum-initially-in-place, and the recoverable portions are defined separately as Reserves, Contingent Resources and Prospective Resources. In any event, it should be understood that reserves constitute a subset of resources, being those quantities that are discovered (i.e. in known accumulations), recoverable, commercial and remaining.

TOTAL PETROLEUM-INITIALLY-IN-PLACE

Total Petroleum-initially-in-place is that quantity of petroleum which is estimated to exist originally in naturally occurring accumulations. Total Petroleum-initially-in-place is, therefore, that quantity of petroleum which is estimated, on a given date, to be contained in known accumulations, plus those quantities already produced therefrom, plus those estimated quantities in accumulations yet to be discovered. Total Petroleum-initially-in-place may be subdivided into Discovered Petroleum-initially-in-place and Undiscovered Petroleum-initially-in-place, with Discovered Petroleum-initially-in-place being limited to known accumulations.

It is recognized that all Petroleum-initially-in-place quantities may constitute potentially recoverable resources since the estimation of the proportion which may be recoverable can be subject to significant uncertainty and will change with variations in commercial circumstances, technological developments and data availability. A portion of those quantities classified as Unrecoverable may become recoverable resources in the future as commercial circumstances change, technological developments occur, or additional data are acquired.

DISCOVERED PETROLEUM-INITIALLY-IN-PLACE

Discovered Petroleum-initially-in-place is that quantity of petroleum which is estimated, on a given date, to be contained in known accumulations, plus those quantities already produced therefrom. Discovered Petroleum-initially-in-place may be subdivided into Commercial and Sub-commercial categories, with the estimated potentially recoverable portion being classified as Reserves and Contingent Resources respectively, as defined below.

RESERVES

Reserves are defined as those quantities of petroleum which are anticipated to be commercially recovered from known accumulations from a given date forward. Reference should be made to the full SPE/WPC Petroleum Reserves Definitions for the complete definitions and guidelines.

Estimated recoverable quantities from known accumulations which do not fulfil the requirement of commerciality should be classified as Contingent Resources, as defined below. The definition of commerciality for an accumulation will vary according to local conditions and circumstances and is left to the discretion of the country or company concerned. However, reserves must still be categorized according to the specific criteria of the SPE/WPC definitions and therefore proved reserves will be limited to those quantities that are commercial under current economic conditions, while probable and possible reserves may be based on future economic conditions. In general, quantities should not be

classified as reserves unless there is an expectation that the accumulation will be developed and placed on production within a reasonable timeframe.

In certain circumstances, reserves may be assigned even though development may not occur for some time. An example of this would be where fields are dedicated to a long-term supply contract and will only be developed as and when they are required to satisfy that contract.

CONTINGENT RESOURCES

Contingent Resources are those quantities of petroleum which are estimated, on a given date, to be potentially recoverable from known accumulations, but which are not currently considered to be commercially recoverable.

It is recognized that some ambiguity may exist between the definitions of contingent resources and unproved reserves. This is a reflection of variations in current industry practice. It is recommended that if the degree of commitment is not such that the accumulation is expected to be developed and placed on production within a reasonable timeframe, the estimated recoverable volumes for the accumulation be classified as contingent resources.

Contingent Resources may include, for example, accumulations for which there is currently no viable market, or where commercial recovery is dependent on the development of new technology, or where evaluation of the accumulation is still at an early stage.

UNDISCOVERED PETROLEUM-INITIALLY-IN-PLACE

Undiscovered Petroleum-initially-in-place is that quantity of petroleum which is estimated, on a given date, to be contained in accumulations yet to be discovered. The estimated potentially recoverable portion of Undiscovered Petroleum-initially-in-place is classified as Prospective Resources, as defined below.

PROSPECTIVE RESOURCES

Prospective Resources are those quantities of petroleum which are estimated, on a given date, to be potentially recoverable from undiscovered accumulations.

ESTIMATED ULTIMATE RECOVERY

Estimated Ultimate Recovery (EUR) is not a resource category as such, but a term which may be applied to an individual accumulation of any status/maturity (discovered or undiscovered). Estimated Ultimate Recovery is defined as those quantities of petroleum which are estimated, on a given date, to be potentially recoverable from an accumulation, plus those quantities already produced therefrom.

AGGREGATION

Petroleum quantities classified as Reserves, Contingent Resources or Prospective Resources should not be aggregated with each other without due consideration of the significant differences in the criteria associated with their classification. In particular,

there may be a significant risk that accumulations containing Contingent Resources or Prospective Resources will not achieve commercial production.

RANGE OF UNCERTAINTY

The Range of Uncertainty, as shown in Figure 1, reflects a reasonable range of estimated potentially recoverable volumes for an individual accumulation. Any estimation of resource quantities for an accumulation is subject to both technical and commercial uncertainties, and should, in general, be quoted as a range. In the case of reserves, and where appropriate, this range of uncertainty can be reflected in estimates for Proved Reserves (1P), Proved plus Probable Reserves (2P) and Proved plus Probable plus Possible Reserves (3P) scenarios. For other resource categories, the terms Low Estimate, Best Estimate and High Estimate are recommended.

The term “Best Estimate” is used here as a generic expression for the estimate considered to be the closest to the quantity that will actually be recovered from the accumulation between the date of the estimate and the time of abandonment. If probabilistic methods are used, this term would generally be a measure of central tendency of the uncertainty distribution (most likely/mode, median/P50 or mean). The terms “Low Estimate” and “High Estimate” should provide a reasonable assessment of the range of uncertainty in the Best Estimate.

For undiscovered accumulations (Prospective Resources) the range will, in general, be substantially greater than the ranges for discovered accumulations. In all cases, however, the actual range will be dependent on the amount and quality of data (both technical and commercial) which is available for that accumulation. As more data become available for a specific accumulation (e.g. additional wells, reservoir performance data) the range of uncertainty in EUR for that accumulation should be reduced.

RESOURCES CLASSIFICATION SYSTEM

Graphical Representation

Figure 1 is a graphical representation of the definitions. The horizontal axis represents the range of uncertainty in the estimated potentially recoverable volume for an accumulation, whereas the vertical axis represents the level of status/maturity of the accumulation. Many organizations choose to further sub-divide each resource category using the vertical axis to classify accumulations on the basis of the commercial decisions required to move an accumulation towards production.

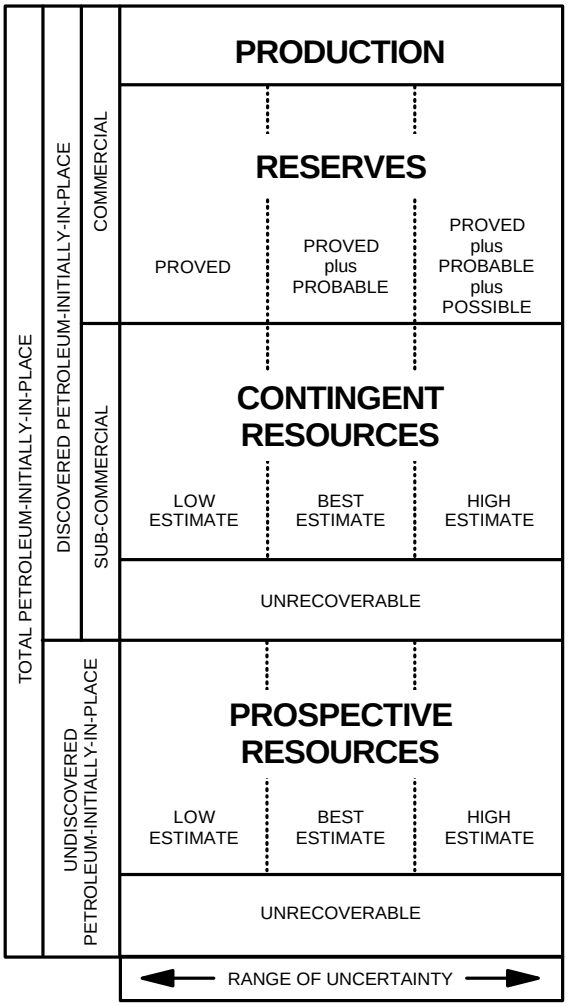
As indicated in Figure 1, the Low, Best and High Estimates of potentially recoverable volumes should reflect some comparability with the reserves categories of Proved, Proved plus Probable and Proved plus Probable plus Possible, respectively. While there may be a significant risk that sub-commercial or undiscovered accumulations will not achieve commercial production, it is useful to consider the range of potentially recoverable volumes independently of such a risk.

If probabilistic methods are used, these estimated quantities should be based on methodologies analogous to those applicable to the definitions of reserves; therefore, in general, there should be at least a 90% probability that, assuming the accumulation is developed, the quantities actually recovered will equal or exceed the Low Estimate. In

addition, an equivalent probability value of 10% should, in general, be used for the High Estimate. Where deterministic methods are used, a similar analogy to the reserves definitions should be followed.

As one possible example, consider an accumulation that is currently not commercial due solely to the lack of a market. The estimated recoverable volumes are classified as Contingent Resources, with Low, Best and High estimates. Where a market is subsequently developed, and in the absence of any new technical data, the accumulation moves up into the Reserves category and the Proved Reserves estimate would be expected to approximate the previous Low Estimate.

FIGURE 1 - RESOURCES CLASSIFICATION SYSTEM



Not to scale

Approved by the Board of Directors, Society of Petroleum Engineers (SPE), Inc., the Executive Board, World Petroleum Congresses (WPC), and the Executive Committee, American Association of Petroleum Geologists (AAPG), February, 2000.

APPENDIX II

GLOSSARY OF TERMS

GLOSSARY

API	American Petroleum Institute
°API	Degrees API (a measure of oil gravity)
atm	Atmospheres (1 atm = 14.7 psi)
Bbl	Barrels
/Bbl	Per barrel
Bcf	Billion cubic feet
bopd	Barrels of oil per day
bpd	Barrels per day
cc	Cubic centimetre
CIIP	Condensate initially in place
DST	Drill Stem Test
ELT	Economic Limit Test
GCoS	Geologic chance of success
GEF	Gas expansion factor
GIIP	Gas initially in place
km	Kilometres
km^2	Square kilometres
LVT	Lower Visean and Tournaisian
m	Metres
mTVD	Metres true vertical depth
m^3	Cubic metres
m^3/d	Cubic metres per day
M	Thousand
MBbl	Thousand barrels
mD	Millidarcies (a measure of permeability)
MM	Million
MMBbl	Million barrels
MMcf/d	Million cubic feet per day
p.a.	Per annum
psi	Pounds per square inch
P90	Value there is a 90% probability of exceeding
P50	Value there is a 50% probability of exceeding
P10	Value there is a 10% probability of exceeding
RF	Recovery factor
STOIIP	Stock tank oil initially in place
U.S.$	United States Dollar
UV	Upper Visean
%	Percentage

APPENDIX III

SUMMARY OF VOLUMETRIC ESTIMATES

INPUTS TO VOLUMETRIC CALCULATIONS

PIRKOVSKOE

Reservoir	Parameter	Min	ML	Max
Upper Visean (excl. Pirk-1)	Area (km²)	4	20	55
	Net height (m)	8	12	19
	Porosity (%)	6	10	14
	Gas saturation (%)	55	60	73
	GEF	305	315	325
	Gas RF (%)	55	65	75
	Condensate Yield (cc/m³)	450	650	850
	Condensate RF (%)	40	47.5	55
Lower Visean/ Tournaisian	Area (km²)	5	20	55
	Net height (m)	5	9.6	15
	Porosity (%)	8	12	16
	Gas saturation (%)	60	70	80
	GEF	320	340	350
	Gas RF (%)	55	65	75
	Condensate Yield (cc/m³)	350	450	550
	Condensate RF (%)	40	47.5	55
Carbonates	Area (km²)	5	20	55
	Net height (m)	20	38.4	60
	Porosity (%)	8	12	16
	Gas saturation (%)	60	70	80
	GEF	320	340	350
	Gas RF (%)	5	20	65
	Condensate Yield (cc/m³)	350	450	550
	Condensate RF (%)	4	15	47.5

ZAGORYANSKOE

Reservoir	Parameter	Min	ML	Max
Upper Visean	Area (km²)	4	17	40
	Others	As for Pirkovskoe		
Lower Visean/ Tournaisian	Area (km²)	4	17	40
	Others	As for Pirkovskoe		
Carbonates	Area (km²)	4	17	40
	Others	As for Pirkovskoe		

BORYNYA

Reservoir	Parameter	Min	ML	Max
Upper	Area (km²)	4	10.8	23
	Net height (m)	107	172	227
	Porosity (%)	5	8	10
	Gas saturation (%)	55	65	70
	GEF	273	303	333
	Gas RF (%)	45	55	65
	Condensate Yield (cc/m³)	10	35	60
	Condensate RF (%)	40	50	60
Lower	Area (km²)	4	10.8	23
	Net height (m)	48	59	92
	Porosity (%)	5	8	11
	Gas saturation (%)	55	65	70
	GEF	320	354	390
	Gas RF (%)	45	55	65
	Condensate Yield (cc/m³)	10	35	60
	Condensate RF (%)	40	50	60

BITLYA

Reservoir	Parameter	Min	ML	Max
Upper	Area (km²)	1.3	14	27.6
	Net height (m)	38	72	102
	Porosity (%)	9	11	13
	Gas saturation (%)	55	65	70
	GEF	223	248	273
	Gas RF (%)	45	55	65
	Condensate Yield (cc/m³)	10	35	60
	Condensate RF (%)	40	50	60
Lower	Area (km²)	1.3	14	27.6
	Net height (m)	19	28	38
	Porosity (%)	8	10	12
	Gas saturation (%)	55	65	70
	GEF	252	280	308
	Gas RF (%)	45	55	65
	Condensate Yield (cc/m³)	10	35	60
	Condensate RF (%)	40	50	60

RESULTS OF VOLUMETRIC CALCULATIONS (GROSS VOLUMES)

PIRKOVSKOE

Parameter	Reservoir	P90	P50	P10
GIIP (Bcf)	UV	32	222	393
	LVT	48	240	431
	Carbonates	194	962	1751
CIIP (MMBbl)	UV	3.7	25	46
	LVT	3.9	19	35
	Carbonates	15	76	141
Recoverable Gas (Bcf)	UV	21	144	257
	LVT	31	155	282
	Carbonates	39	264	584
Recoverable Condensate (MMBbl)	UV	1.8	12	22
	LVT	1.8	9	17
	Carbonates	2.3	16	36

[1] P90 values are deterministic, P50/P10 are probabilistic.

ZAGORYANSKOE

Parameter	Reservoir	P90	P50	P10
GIIP (Bcf)	UV	32	173	298
	LVT	39	187	327
	Carbonates	155	742	1297
CIIP (MMBbl)	UV	3.7	20	35
	LVT	3.1	15	26
	Carbonates	12	59	104
Recoverable Gas (Bcf)	UV	21	112	195
	LVT	25	121	214
	Carbonates	31	203	453
Recoverable Condensate (MMBbl)	UV	1.8	9	17
	LVT	1.5	7	13
	Carbonates	1.9	12	26

[1] P90 values are deterministic, P50/P10 are probabilistic.

BORYNYA

Parameter	Reservoir	P90	P50	P10
GIIP (Bcf)	Upper	640	1317	2143
	Lower	293	584	1000
Recoverable Gas (Bcf)	Upper	343	741	1209
	Lower	147	303	539
Recoverable Condensate (MMBbl)	Upper	8.93	21.88	42.82
	Lower	3.79	9.31	26.63

[1] All values are probabilistic.

BITLYA

Parameter	Reservoir	P90	P50	P10
GIIP (Bcf)	Upper	330	735	1285
	Lower	130	283	463
Recoverable Gas (Bcf)	Upper	177	399	706
	Lower	66	156	265
Recoverable Condensate (MMBbl)	Upper	5.2	12.9	24.8
	Lower	1.9	4.6	9.1

[1] All values are probabilistic.

POKROVSKOE

Parameter	Reservoir	P90	P50	P10
GIIP (Bcf)	Upper	124	265	1137
	Lower	50	102	227
CIIP (MMBbl)	Upper	5.6	12.1	50.8
	Lower	3.2	6.5	14.0
Recoverable Gas (Bcf)	Upper	74	172	796
	Lower	30	66	159
Recoverable Condensate (MMBbl)	Upper	2.3	5.4	25.4
	Lower	1.3	2.9	7.0

[1] Values in Lower reservoir multiplied by 0.67 compared to previous evaluation.
[2] Values in Upper reservoir unchanged from previous evaluation.

APPENDIX IV

PROVISIONAL PRODUCTION PROFILES

	DEBESLAVETSKE											
	Proved				Proved + Probable				Proved + Probable + Possible			
	Sales Gas	Condensate	Capex	Opex	Sales Gas	Condensate	Capex	Opex	Sales Gas	Condensate	Capex	Opex
		bpd	U.S.$ MM	U.S.$ MM	MMcf/d	bpd	U.S.$ MM	U.S.$ MM	MMcf/d	bpd	U.S.$ MM	U.S.$ MM
2010	0.60			0.216	0.72		0.55	0.216	0.80		0.55	0.216
2011	0.41			0.181	0.63			0.222	0.80			0.252
2012	0.28			0.158	0.50			0.198	0.66			0.226
2013	0.19			0.142	0.39			0.179	0.54			0.205
2014	0.13			0.131	0.31			0.164	0.44			0.187
2015	0.09			0.124	0.24			0.152	0.36			0.173
2016	0.06			0.119	0.19			0.143	0.30			0.162
2017	0.04			0.115	0.15			0.135	0.24			0.152
2018	0.03			0.113	0.12			0.130	0.20			0.144
2019	0.02			0.111	0.09			0.125	0.16			0.138
2020	0.01			0.110	0.07			0.121	0.13			0.132
2021	0.01			0.110	0.06			0.119	0.11			0.128
2022	0.01			0.109	0.05			0.116	0.09			0.124
2023	0.00			0.109	0.04			0.115	0.07			0.121
2024	0.00			0.108	0.03			0.113	0.06			0.119
2025	0.00			0.108	0.02			0.112	0.05			0.117
2026	0.00			0.108	0.01			0.110	0.03			0.114
2027												
2028												
2029												
2030												
2031												
2032												
Totals:	**0.68**			**2.17**	**1.33**		**0.55**	**2.47**	**1.84**		**0.55**	**2.71**
	(Bcf)	**(MMBbl)**			**(Bcf)**	**(MMBbl)**			**(Bcf)**	**(MMBbl)**		

	CHEREMKHIVKSE											
	Proved				Proved + Probable				Proved + Probable + Possible			
	Sales Gas	Condensate	Capex	Opex	Sales Gas	Condensate	Capex	Opex	Sales Gas	Condensate	Capex	Opex
	MMcf/d	bpd	U.S.$ MM	U.S.$ MM	MMcf/d	bpd	U.S.$ MM	U.S.$ MM	MMcf/d	bpd	U.S.$ MM	U.S.$ MM
2010	0.33			0.048	0.35			0.048	0.36			0.05
2011	0.24			0.041	0.27			0.044	0.30			0.05
2012	0.18			0.037	0.22			0.039	0.25			0.04
2013	0.13			0.033	0.17			0.036	0.21			0.04
2014	0.09			0.031	0.13			0.033	0.17			0.04
2015	0.07			0.029	0.10			0.031	0.14			0.03
2016	0.05			0.028	0.08			0.030	0.12			0.03
2017	0.04			0.027	0.06			0.029	0.10			0.03
2018	0.01			0.025	0.02			0.025	0.03			0.03
2019												
2020												
2021												
2022												
2023												
2024												
2025												
2026												
2027												
2028												
2029												
2030												
2031												
2032												
Totals:	**0.42**			**0.30**	**0.51**			**0.32**	**0.62**			**0.33**
	(Bcf)	**(MMBbl)**			**(Bcf)**	**(MMBbl)**			**(Bcf)**	**(MMBbl)**		

	SLOBODA RUNGURSKE											
	Proved				Proved + Probable				Proved + Probable + Possible			
	Sales Gas	Oil	Capex	Opex	Sales Gas	Oil	Capex	Opex	Sales Gas	Oil	Capex	Opex
	MMcf/d	bpd	U.S.$ MM	U.S.$ MM	MMcf/d	bpd	U.S.$ MM	U.S.$ MM	MMcf/d	bpd	U.S.$ MM	U.S.$ MM
2010		4.2		0.090		4.6		0.090		4.8		0.090
2011		3.5		0.082		4.3		0.090		4.5		0.093
2012		2.9		0.076		3.9		0.087		4.3		0.091
2013		2.4		0.071		3.6		0.083		4.1		0.088
2014		2.0		0.067		3.3		0.080		3.9		0.086
2015		1.7		0.063		3.0		0.077		3.7		0.084
2016		1.4		0.060		2.8		0.075		3.5		0.082
2017		1.2		0.057		2.6		0.072		3.3		0.080
2018		0.4		0.050		1.0		0.056		1.3		0.059
2019												
2020												
2021												
2022												
2023												
2024												
2025												
2026												
2027												
2028												
2029												
2030												
2031												
2032												
Totals:		**0.007**		**0.62**		**0.011**		**0.71**		**0.012**		**0.75**
	(Bcf)	**(MMBbl)**			**(Bcf)**	**(MMBbl)**			**(Bcf)**	**(MMBbl)**		

	PIRKOVSKOE (PIRK-1 ONLY)											
	Proved				Proved + Probable				Proved + Probable + Possible			
	Sales Gas	Liquids	Capex	Opex	Sales Gas	Liquids	Capex	Opex	Sales Gas	Liquids	Capex	Opex
	MMcf/d	bpd	U.S.$ MM	U.S.$ MM	MMcf/d	bpd	U.S.$ MM	U.S.$ MM	MMcf/d	bpd	U.S.$ MM	U.S.$ MM
2010		27		0.21		35		0.24		41		0.26
2011		11		0.16		19		0.19		28		0.22
2012	2.2	121	2.8	0.54		11		0.16		19		0.19
2013	0.9	32		0.39	6.2	478	2.8	1.02		13		0.16
2014	0.5	17		0.35	4.6	280		0.81	9.8	941	2.8	1.53
2015	0.3	10		0.33	3.5	175		0.67	8.6	783		1.36
2016	0.2	7		0.32	2.7	128		0.58	7.7	625		1.21
2017	0.1	5		0.31	2.1	101		0.52	6.9	511		1.10
2018	0.1	4		0.31	1.7	81		0.47	6.2	427		1.00
2019	0.1	3		0.31	1.3	66		0.44	5.5	363		0.92
2020	0.1	2		0.31	1.1	54		0.41	5.0	315		0.85
2021	0.0	2		0.30	0.9	45		0.39	4.5	276		0.79
2022	0.0	1		0.30	0.8	38		0.38	4.0	246		0.74
2023	0.0	1		0.30	0.6	32		0.37	3.6	223		0.70
2024	0.0	1		0.30	0.5	28		0.36	3.3	203		0.66
2025	0.0	1		0.30	0.5	23		0.35	2.9	185		0.63
2026	0.0	1		0.30	0.4	20		0.34	2.6	166		0.59
2027	0.0	1		0.30	0.3	17		0.33	2.4	149		0.56
2028	0.0	0		0.30	0.3	14		0.33	2.1	135		0.54
2029	0.0	0		0.30	0.2	12		0.33	1.9	121		0.51
2030					0.2	10		0.32	1.7	109		0.49
2031					0.2	9		0.32	1.6	98		0.47
2032					0.1	7		0.32	1.4	88		0.46
Totals:	**1.7**	**0.08**	**2.8**	**6.3**	**10**	**0.60**	**2.8**	**9.6**	**30**	**2.2**	**2.8**	**16**
	(Bcf)	**(MMBbl)**			**(Bcf)**	**(MMBbl)**			**(Bcf)**	**(MMBbl)**		

	PIRKOVSKOE (EXCLUDING PIRK-1)											
	1C (5 wells)				2C (25 wells)				3C (36 wells)			
	Sales Gas	Condensate	Capex	Opex	Sales Gas	Condensate	Capex	Opex	Sales Gas	Condensate	Capex	Opex
	MMcf/d	bpd	U.S.$ MM	U.S.$ MM	MMcf/d	bpd	U.S.$ MM	U.S.$ MM	MMcf/d	bpd	U.S.$ MM	U.S.$ MM
2010	0	0	12.4	0.21	0	0	12.4	0.24	0	0	12.4	0.26
2011	4.2	333		0.62	9.3	737	26.9	0.78	12.3	985	98.7	0.88
2012	4.0	316		0.62	32.7	2,606	170.2	1.38	67.1	6,119	253.1	2.33
2013	3.7	290		0.61	70.0	5,583	185.2	2.34	140.0	13,346	288.1	4.29
2014	4.6	346	50.3	0.42	140.0	11,266	120.3	4.14	280.0	25,515	218.1	7.95
2015	15.5	1,304	45.3	0.76	140.0	11,826	113.2	4.18	280.0	23,276	122.8	7.81
2016	18.2	1,557		0.79	140.0	12,045	22.6	4.19	280.0	20,705		7.64
2017	14.7	1,056		0.68	140.0	10,013		3.82	280.0	19,865		7.59
2018	12.1	781		0.61	140.0	8,473		3.72	275.8	18,434		7.41
2019	10.1	613		0.55	136.2	7,249	2.765	3.64	242.4	14,265		6.46
2020	8.4	495		0.51	114.7	5,768		3.18	207.7	11,288		5.56
2021	7.1	413		0.48	94.4	4,708		2.65	178.1	9,146		4.78
2022	6.1	351		0.45	77.5	3,915		2.23	152.7	7,493		4.12
2023	5.2	300		0.43	63.7	3,264		1.88	130.5	6,316		3.56
2024	4.5	259		0.41	52.4	2,717		1.60	111.9	5,398		3.10
2025	3.9	225		0.40	43.0	2,258		1.37	95.7	4,628		2.70
2026	3.4	196		0.38	35.3	1,876		1.18	82.0	3,987		2.36
2027	3.0	172		0.37	29.0	1,557		1.02	70.1	3,431		2.07
2028	2.7	152		0.36	23.9	1,295		0.90	59.8	2,943		1.82
2029	2.4	135		0.36	19.7	1,079		0.79	51.0	2,528		1.60
2030	2.1	121		0.35	16.4	903		0.71	43.4	2,164		1.41
2031	1.9	108		0.35	13.7	760		0.64	36.6	1,838		1.24
2032	1.7	97		0.34	11.5	642		0.59	30.8	1,551		1.10
Totals:	**51**	**3.5**	**108**	**11**	**564**	**36.7**	**628**	**47**	**1,135**	**75.0**	**993**	**88**
	(Bcf)	**(MMBbl)**			**(Bcf)**	**(MMBbl)**			**(Bcf)**	**(MMBbl)**		

	ZAGORYANSKOE											
	1C (9 wells)				2C (15 wells)				3C (26 wells)			
	Sales Gas	Condensate	Capex	Opex	Sales Gas	Condensate	Capex	Opex	Sales Gas	Condensate	Capex	Opex
	MMcf/d	bpd	U.S.$ MM	U.S.$ MM	MMcf/d	bpd	U.S.$ MM	U.S.$ MM	MMcf/d	bpd	U.S.$ MM	U.S.$ MM
2010			19.4				19.4				19.4	
2011	7.6	756		1.25	20.8	2,046	7.4	2.88	31.4	3,056	27.5	4.18
2012	14.0	1,220	77.6	1.99	29.5	2,714	102.2	3.90	35.0	2,834	91.5	4.47
2013	28.1	2,318	84.3	3.67	69.0	5,835	73.4	8.59	70.0	6,193	180.3	8.79
2014	34.5	2,310	28.1	4.29	70.0	6,309	93.4	8.82	105.0	9,903	190.8	13.19
2015	25.6	1,453		3.19	105.0	8,756	84.3	12.89	175.0	15,755	132.8	21.59
2016	17.8	1,024		2.32	105.0	8,235	56.2	12.75	175.0	13,778	84.3	21.07
2017	13.3	760		1.80	105.0	7,649		12.60	175.0	12,553		20.74
2018	10.4	589		1.48	105.0	6,417		12.27	175.0	12,106		20.62
2019	8.6	477		1.26	104.6	5,359		11.95	175.0	12,108		20.62
2020	7.2	397		1.11	90.9	4,346		10.34	175.0	12,023		20.60
2021	6.2	339		1.00	73.9	3,562		8.47	175.0	10,596		20.22
2022	5.4	297		0.91	60.3	2,955		6.98	171.1	8,863		19.38
2023	4.8	262		0.84	49.5	2,459		5.79	147.0	6,807		16.48
2024	4.3	234		0.78	40.8	2,049		4.84	123.1	5,422		13.77
2025	3.9	211		0.74	34.0	1,722		4.08	102.4	4,556		11.52
2026	3.5	191		0.69	28.5	1,466		3.48	84.9	3,827		9.62
2027	3.2	174		0.66	24.2	1,260		3.00	70.2	3,207		8.02
2028	2.9	159		0.63	20.8	1,093		2.62	57.8	2,668		6.66
2029	2.7	146		0.60	18.0	958		2.32	47.2	2,210		5.50
2030	2.5	134		0.58	15.8	848		2.07	38.2	1,809		4.52
2031	2.3	124		0.56	14.0	757		1.87	30.7	1,463		3.69
2032	2.1	115		0.54	12.5	680		1.71	24.3	1,167		2.98
Totals:	**77**	**5.0**	**209**	**31**	**437**	**28.3**	**436**	**144**	**863**	**55.8**	**727**	**278**
	(Bcf)	**(MMBbl)**			**(Bcf)**	**(MMBbl)**			**(Bcf)**	**(MMBbl)**		

	BORYNYA											
	1C (16 wells)				2C (21 wells)				3C (31 wells)			
	Sales Gas	Condensate	Capex	Opex	Sales Gas	Condensate	Capex	Opex	Sales Gas	Condensate	Capex	Opex
	MMcf/d	bpd	U.S.$ MM	U.S.$ MM	MMcf/d	bpd	U.S.$ MM	U.S.$ MM	MMcf/d	bpd	U.S.$ MM	U.S.$ MM
2010												
2011			36.5				36.5				36.5	
2012	18.8	582	61.5	2.20	19.0	635	61.5	2.25	27.9	1,705	61.5	3.65
2013	35.0	1,085	92.4	3.85	35.0	1,173	123.4	3.90	35.0	2,135	143.4	4.49
2014	102.6	3,243	41.9	10.74	105.0	3,473	108.4	11.07	140.0	8,164	158.4	16.83
2015	105.0	3,220	14.0	10.92	140.0	4,612	14.0	14.65	278.5	14,381	88.4	32.04
2016	105.0	3,150		10.87	140.0	4,598		14.64	280.0	14,320	29.5	32.13
2017	105.0	2,927		10.74	140.0	4,454		14.55	280.0	12,773		31.18
2018	104.5	2,541	41.9	10.46	140.0	4,334	41.9	14.48	280.0	11,725	14.0	30.54
2019	104.9	2,366		10.39	140.0	4,309		14.47	280.0	11,535	27.9	30.42
2020	95.5	2,096		9.44	140.0	4,330		14.48	280.0	11,563		30.44
2021	81.6	1,841		8.15	140.0	4,365		14.50	268.6	11,132	14.0	29.24
2022	69.9	1,614		7.04	140.0	4,387		14.51	268.9	10,870	27.9	29.10
2023	60.0	1,410		6.10	140.0	4,374		14.51	257.9	9,596		27.41
2024	51.5	1,229		5.29	140.0	4,261		14.44	236.5	8,266		24.84
2025	44.3	1,071		4.60	139.7	4,008		14.25	216.9	7,229		22.59
2026	38.1	933		4.01	139.3	3,879	7.4	14.14	198.7	6,504		20.65
2027	33.0	813		3.51	135.5	3,662		13.69	182.0	5,887		18.89
2028	28.6	710		3.09	122.3	3,305		12.39	166.7	5,404		17.33
2029	24.9	622		2.73	110.2	2,992		11.21	152.5	4,979		15.90
2030	21.8	547		2.43	99.3	2,728		10.14	139.5	4,585		14.60
2031	19.1	482		2.17	89.5	2,488		9.19	127.6	4,221		13.39
2032	16.8	426		1.94	80.7	2,261		8.33	116.7	3,881		12.28
2033	14.8	378		1.75	72.8	2,042		7.54	106.6	3,565		11.26
2034	13.2	336		1.59	65.7	1,845		6.84	97.3	3,269		10.31
2035	11.7	299		1.45	59.4	1,669		6.21	88.7	2,992		9.44
2036	10.5	268		1.32	53.7	1,510		5.65	80.8	2,736		8.63
2037	9.4	240		1.22	48.6	1,372		5.14	73.6	2,499		7.89
2038	8.4	216		1.13	44.1	1,250		4.70	67.0	2,281		7.21
2039	7.6	195		1.04	40.1	1,140		4.30	60.9	2,079		6.58
Totals:	**490**	**12.7**	**288**	**140**	**1045**	**31.2**	**393**	**296**	**1749**	**69.5**	**601**	**519**
	(Bcf)	**(MMBbl)**			**(Bcf)**	**(MMBbl)**			**(Bcf)**	**(MMBbl)**		

	BITLYA											
	1C (10 wells)				2C (18 wells)				3C (21 wells)			
	Sales Gas	Condensate	Capex	Opex	Sales Gas	Condensate	Capex	Opex	Sales Gas	Condensate	Capex	Opex
	MMcf/d	bpd	U.S.$ MM	U.S.$ MM	MMcf/d	bpd	U.S.$ MM	U.S.$ MM	MMcf/d	bpd	U.S.$ MM	U.S.$ MM
2010												
2011			36.5				36.5				36.5	
2012	17.9	625	46.5	2.17	18.2	590	61.5	2.17	21.6	1,082	61.5	2.76
2013	34.8	1,211	27.9	3.93	35.0	1,138	123.4	3.90	35.0	1,750	143.4	4.29
2014	35.0	1,120		3.89	102.9	3,460	41.9	10.96	128.0	5,934	88.4	14.59
2015	35.0	1,010		3.82	105.0	3,440	14.0	11.12	140.0	5,588	60.5	15.36
2016	35.0	1,015		3.82	105.0	3,394		11.09	140.0	4,794		14.85
2017	35.0	1,049	1.8	3.84	104.1	3,378		11.00	140.0	4,808		14.86
2018	34.7	1,102	1.8	3.85	102.9	3,456	5.5	10.95	140.0	5,033		15.01
2019	34.9	1,147		3.90	97.7	3,188		10.35	140.0	5,271	5.5	15.16
2020	35.0	1,124		3.89	88.5	2,757		9.32	140.0	5,427		15.25
2021	35.0	981	1.8	3.80	80.3	2,426		8.44	140.0	5,459		15.28
2022	34.8	923		3.75	73.0	2,165		7.67	136.7	5,084		14.77
2023	34.7	909	1.8	3.73	66.3	1,966		7.00	127.6	4,519		13.65
2024	34.0	910		3.68	60.4	1,792		6.40	119.1	3,991		12.63
2025	30.7	830		3.35	55.0	1,642		5.87	111.3	3,546		11.71
2026	27.1	733		3.00	50.2	1,510		5.38	104.1	3,246		10.92
2027	24.0	653		2.69	45.8	1,389		4.95	97.5	2,989		10.21
2028	21.3	586		2.42	41.9	1,278		4.56	91.4	2,760		9.57
2029	18.9	526		2.19	38.4	1,173		4.20	85.8	2,574		8.99
2030	16.8	471		1.98	35.1	1,075		3.87	80.5	2,416		8.45
2031	15.0	420		1.80	32.2	985		3.58	75.6	2,272		7.96
2032	13.4	375		1.64	29.6	905		3.31	71.2	2,138		7.51
2033	12.0	335		1.50	27.2	832		3.07	67.0	2,014		7.09
2034	10.8	301		1.38	25.1	767		2.85	63.1	1,904		6.69
2035	9.7	271		1.27	23.2	707		2.65	59.4	1,804		6.33
2036	8.7	245		1.17	21.4	655		2.48	56.1	1,709		6.00
2037	7.9	222		1.09	19.8	607		2.31	52.9	1,620		5.68
2038	7.1	202		1.01	18.3	563		2.17	50.0	1,536		5.38
2039	6.5	184		0.95	17.0	523		2.03	47.2	1,457		5.11
Totals:	**243**	**7.1**	**118**	**76**	**555**	**17.4**	**283**	**164**	**972**	**33.9**	**396**	**286**
	(Bcf)	**(MMBbl)**			**(Bcf)**	**(MMBbl)**			**(Bcf)**	**(MMBbl)**		

	POKROVSKOE											
	Low (4 wells)				Best (8 wells)				High (26 wells)			
	Sales Gas	Condensate	Capex	Opex	Sales Gas	Condensate	Capex	Opex	Sales Gas	Condensate	Capex	Opex
	MMcf/d	bpd	U.S.$ MM	U.S.$ MM	MMcf/d	bpd	U.S.$ MM	U.S.$ MM	MMcf/d	bpd	U.S.$ MM	U.S.$ MM
2010			12.4 `				12.4 `				45.1 `	
2011	11.1	712	57.8	1.47	25.7	1,642	57.8	3.00	35.0	1,687	173.3	3.80
2012	17.2	894	2.8	2.04	34.6	2,075		3.90	139.1	7,272	181.2	14.40
2013	16.9	701		1.95	33.5	1,581	87.9	3.63	207.8	10,846	118.3	21.36
2014	17.5	724	2.8	2.01	70.0	3,271	22.6	7.26	210.0	10,344	67.9	21.37
2015	19.0	791		2.15	69.9	3,090		7.19	210.0	9,726	67.9	21.15
2016	23.2	827		2.52	62.9	2,337		6.35	210.0	8,736		20.81
2017	19.8	561		2.14	53.1	1,614		5.28	210.0	7,163		20.26
2018	21.4	522		2.26	45.1	1,190		4.47	195.6	5,405		18.46
2019	17.5	404		1.90	38.5	953		3.84	169.1	4,253		15.85
2020	14.5	336		1.62	33.1	786		3.33	147.0	3,518		13.75
2021	12.1	285		1.41	28.5	678		2.91	128.5	2,995		12.03
2022	10.2	245		1.24	24.7	590		2.56	112.7	2,633		10.60
2023	8.7	213		1.10	21.6	517		2.27	99.5	2,327		9.38
2024	7.5	186		0.99	18.8	458		2.03	88.1	2,067		8.35
2025	6.5	164		0.90	16.5	407		1.82	78.1	1,855		7.45
2026	5.6	145		0.82	14.6	362		1.64	69.6	1,672		6.67
2027	5.0	128		0.76	12.9	323		1.48	62.2	1,509		6.00
2028	4.4	114		0.70	11.4	289		1.35	55.7	1,366		5.41
2029	3.9	102		0.66	10.1	259		1.23	50.0	1,236		4.89
2030	3.5	92		0.62	9.0	231		1.13	45.0	1,120		4.43
2031	3.1	83		0.59	8.1	207		1.05	40.6	1,016		4.03
2032	2.8	75		0.56	7.3	187		0.97	36.7	921		3.67
Totals:	**92**	**3.0**	**76**	**30**	**237**	**8.4**	**181**	**69**	**950**	**32.8**	**654**	**254**
	(Bcf)	**(MMBbl)**			**(Bcf)**	**(MMBbl)**			**(Bcf)**	**(MMBbl)**		