

December 31, 2012

Mr. Murat K. Mustafayev Chief Geologist JSC KazMunaiGas EP 17, Kabanbai Ave. Left Bank of Ishim River Astana, 010000 Republic of Kazakhstan

Re: JSC KazMunaiGas EP

Reserves and Resources As of December 31, 2012

Dear Mr. Mustafayev:

At your request, Miller and Lents, Ltd. (MLL) estimated the net liquids and gas reserves and future net revenues as of December 31, 2012 attributable to JSC KazMunaiGas EP (KMG EP) in certain oil and gas fields. Liquids include oil, condensate, and natural gas liquids (NGLs). The properties evaluated are located in the Republic of Kazakhstan. In addition, we estimated the net oil resources as of December 31, 2012 attributable to KMG EP. A total of 42 KMG EP fields were evaluated by MLL.

Our reserves evaluations were performed using the prices and expenses provided by KMG EP. The aggregate results of our evaluations as of December 31, 2012 for KMG EP, up to and beyond the license expiration dates, are summarized below:

## **Total Company**

	To L	Net Reserves, To License Expiration Date  Additional Net Reserves, Beyond License Expiration Date		Total Net Reserves		
Reserves Category	Liquids, MMBbls.	Liquids, MMTonnes	Liquids, Liquids, MMBbls. MMTonnes		Liquids, MMBbls.	Liquids, MMTonnes
Proved Developed Producing	326.2	44.6	306.1	41.8	632.3	86.4
Proved Developed Nonproducing	52.6	7.2	28.2	3.8	80.8	11.0
Proved Undeveloped	84.6	10.5	65.5	8.9	150.1	19.4
Total Proved	463.5	62.2	399.6	54.6	863.1	116.8
Probable	30.7	4.1	197.9	27.1	228.6	31.2
Possible	21.3	2.9	238.5	32.6	259.8	35.5



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The estimated gas reserves for the total properties are summarized below.

	To L	Net Reserves, To License Expiration Date		Net Reserves, I License tion Date	Total Net Reserves		
Reserves Category	Gas, Bcf	Gas, Bem	Gas, Bcf	Gas, Bem	Gas, Bcf	Gas, Bem	
Proved Undeveloped	275.6	7.8	0.0	0.0	275.6	7.8	
Total Proved	275.6	7.8	0.0	0.0	275.6	7.8	
Probable	12.0	0.3	0.0	0.0	12.0	0.3	

The estimated future net revenues for the total properties, up to and past the license expiration dates, are summarized below.

	Future Net Revenues, To License Expiration Date		Beyon	et Revenues, d License tion Date	Total Future Net Revenues		
Reserves Category	Undisc., MM\$	Discounted at 10% Per Year, MM\$	Undisc., MM\$	Discounted at 10% Per Year, MM\$	Undisc., MM\$	Discounted at 10% Per Year, MM\$	
Proved Developed Producing	7,815.0	5,841.1	9,613.3	2,492.0	17,428.3	8,333.1	
Proved Developed Nonproducing	1,744.5	1,063.6	1,585.1	517.4	3,329.6	1,581.0	
Proved Undeveloped	3,021.6	1,061.3	812.8	167.2	3,834.4	1,228.5	
Other Capital	-3,220.9	-2,427.7	-4,444.9	-1,083.8	-7,665.8	-3,511.5	
Total Proved	9,360.2	5,538.3	7,566.4	2,092.7	16,926.6	7,631.0	
Probable	710.8	372.4	5,757.9	805.3	6,468.7	1,177.7	
Possible	811.6	505.1	9,514.4	1,138.0	10,326.0	1,643.1	

The current license expiration dates were provided by KMG EP. Considering license expiration dates causes reserves to be reduced for two reasons. First, production projections are stopped at the license expiration date. Second, development well work scheduled prior to the license expiration date is excluded as uneconomic if payout does not occur before the expiration date.

## **Definitions**

The reserves and resources reported herein conform to the standards of the Petroleum Resources Management System (PRMS), which was prepared by the Oil and Gas Reserves Committee of the Society of



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Petroleum Engineers (SPE). The document (SPE-PRMS) was reviewed and jointly sponsored by the World Petroleum Council, the American Association of Petroleum Geologists, and the Society of Petroleum Evaluation Engineers. Net reserves and resources are attributed to the interests of KMG EP.

The mineral extraction taxes with respect to crude oil, condensate, natural gas and NGLs used in our evaluation are based on tax rate schedules prescribed by current Kazakhstan tax regulations. The schedules for mineral extraction taxes are generally based on annual production with different tax rates for volumes sold domestically and internationally.

The mineral extraction tax was a deduction from gross revenues in determining net revenues, but was not a deduction from gross reserves in determining net reserves. As instructed by KMG EP, the interest used in the reserves evaluation of the KMG EP fields is 100 percent, with the exception of the Rozhkovskoye gas field where the interest used is 50 percent.

Future net revenues as used herein are defined as the total gross revenues less mineral extraction taxes, operating costs, and capital expenditures. The total gross revenue is the total revenue received by KMG EP after deduction of transportation costs, export and customs duties, value added tax, and rent tax. The future net revenues for total proved reserves include deductions for other capital and property taxes that are not included in the individual proved categories. Future net revenues do not include deductions for taxes on net profit.

Reserves for all categories are considered economic for development if undiscounted future net revenues are positive.

Estimates of future net revenues and discounted future net revenues are not intended and should not be interpreted to represent fair market values for the estimated reserves.

Well counts, as reported in the various economic output tables, represent counts of existing or newly drilled wells as appropriate for the reserves category. The well counts also include well work in existing wells. Thus, a single well bore may be counted more than once in the total well count.

## **Economic Considerations**

The oil prices employed in the computations of gross revenues were provided by KMG EP. A 28-year schedule of prices was used in our evaluations. Beyond that date, prices were held constant. KMG EP instructed MLL to assume a domestic obligation of 1.9 million tonnes per year for the life of the properties. The obligation was split between OMG and EMG wih a maximum of 0.5 million tonnes per year coming from EMG and the remainder coming from OMG. The volumes were split proportionately after EMG could no longer achieve 0.5 million tonnes per year. The prices for OMG and EMG were used to calculate weighted average prices and mineral extraction taxes.



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The condensate, gas and NGL prices employed in the computations of gross revenues for the Rozhkovskoye gas field were provided by KMG EP. KMG EP instructed MLL to assume a domestic obligation of 24 percent for the condensate. The prices shown for the Rozhkovskoye gas field were used to calculate weighted average prices and mineral extraction taxes.

The operating expenses employed in estimating future net revenues for the oil fields were provided by KMG EP and are based on forecasted expenses from the KMG EP five year business plan. In estimating the operating costs, MLL deducted total depreciation and mineral extraction taxes. We allocated the operating expenses to the number of active completions on a per-completion basis and to the oil production rates on a per-barrel basis. We assumed that the number of active completions for the large waterfloods would decline to approximately one-half the fully developed count as the field declined in production and approached the economic limit.

The operating expenses employed in estimating future net revenues for the Rozhkovskoye gas field were provided by KMG EP and are based on KMG EP's forecasted future expenses for the field. These operating costs do not include depreciation and mineral extraction taxes. We allocated the operating expenses to the number of active completions on a per-completion basis and to the gas production rates on a per-Mcf basis.

Future gross capital investments for drilling and completing new wells and for well work in existing wells were provided by KMG EP. Forecasts of other capital investments, such as surface facilities and pipelines, were also provided by KMG EP.

### **Reserves Considerations**

Reserves were estimated using standard geologic and engineering methods generally accepted by the petroleum industry. Volumes of oil and gas originally in place were calculated from structure and isopach maps, representative values for porosity and water saturation, and representative values of fluid properties. Estimates of recovery factors were derived from estimates of ultimate recovery and in-place volumes. Reserves were calculated by subtracting any historical production from the ultimate recovery, and further assigning the volumes to the appropriate reserves category.

The proved developed producing reserves and production forecasts for the majority of the reservoirs were estimated by rate versus time production decline extrapolations. For some reservoirs with insufficient performance history to establish trends, we estimated future production based on volumetric calculations or by analogy with other reservoirs having similar rock and fluid characteristics. Production declines were extrapolated to economic limits based on operating cost and product price data. Extrapolations of future performance are based, whenever possible, upon the average performance trend of active wells during periods of stable field activity.

The estimated proved developed nonproducing reserves can be produced from existing well bores but require capital costs for well work. The estimates of reserves and producing rates for the various types of



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well work were based on volumetric calculations and analogies with other wells that commercially produce the same fields.

The estimated proved undeveloped reserves require significant capital expenditures, such as well costs for development drilling and completion. The proved undeveloped reserves are expected to be produced from undeveloped portions of known reservoirs that have been adequately defined by wells. Reserves estimates were based upon volumetric calculations and the performance of analogous reservoirs. Producing rates are based upon analogy.

The estimated probable and possible reserves include the development of undeveloped portions of the fields and require significant capital expenditures. As new wells are drilled, portions of these probable and possible reserves quantities will be either upgraded to a higher reserves category or dropped entirely. The estimated probable reserves are expected to be produced from undeveloped portions of known reservoirs not adequately defined to be classified as proved.

The estimated possible reserves are expected to be produced from undeveloped portions of known reservoirs where (1) the reservoir is thin and uncertain to be developed or (2) where subsurface control is limited. Estimates of reserves for undeveloped portions of known reservoirs were estimated by volumetric methods.

Additional probable and possible oil reserves were assigned to certain producing reservoirs under the assumption that performance may exceed what is indicated by the rate versus time production projections. The probable and possible reserves projections were based on extrapolations of the water-oil ratio versus cumulative production performance trends for these reservoirs. These unproved reserves are based on performance and not on further development of undeveloped areas of the field.

Reserves estimates from volumetric calculations and analogies are often less certain than reserves estimates based on well performance obtained over a period during which a substantial portion of the reserves were produced.

No net gas reserves are attributed to the KMG EP oil fields because no revenues are derived from produced gas.

## **Contingent Resources**

Contingent resources are defined by the SPE-PRMS as those quantities of petroleum estimated, as of a given date, to be potentially recoverable from known accumulations by application of development projects not currently considered to be commercially recoverable due to one or more contingencies.

In the estimation of reserves for KMG EP as of December 31, 2012, MLL has assigned reserves to the well work scheduled by KMG EP over an eight year period which has been approved by their management. Subsequent to this eight year period, MLL has included in its evaluations contingent resources



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associated with the continuation of KMG EP's well work schedules. These contingent resources include a five year extension of KMG EP's well work schedules.

Also included in contingent resources are the volumes associated with well work evaluated by MLL that are uneconomic at current economic conditions.

A summary of the estimated contingent resources is shown in the table below:

# Contingent Resources Technically Recoverable

1	C	2C 30			3C
Net Oil, MMBbls.	Net Oil, MMTonnes	Net Oil, MMBbls.	Net Oil, MMTonnes	Net Oil, MMBbls.	Net Oil, MMTonnes
75.5	10.3	113.5	15.4	143.1	19.4

## **Prospective Resources**

At the request of KMG EP, MLL estimated the prospective resources for nine licenses located in the North Caspian Basin.

Prospective resources are those quantities of petroleum, estimated as of a given date, to be potentially recoverable from an undiscovered accumulation by the application of future development projects. Prospective resources have both an associated chance of discovery and a chance of development. Prospective resources are further subdivided in accordance with the level of certainty associated with recoverable estimates assuming their discovery and development and may be sub-classified based on project maturity.

Summary results for the nine prospects evaluated by MLL are included in Attachment 1. The prospect hydrocarbon volumes reported in Attachment 1 are gross volumes which were determined probabilistically and are adjusted for commercial risk. Commercial risk is the chance of commerciality (Pc) and is the product of the chance of discovery (Pg), and the chance of development.

Five geologic risk factors were evaluated for each prospect within the licenses: source, seal, reservoir, timing/migration, and closure. The chance of discovery (Pg) is assessed based on the chance that all necessary components (reservoir, closure, seal, source, and timing) for a hydrocarbon accumulation are present and effective. The discovery is judged successful if the well(s) have penetrated a hydrocarbon accumulation(s) with sufficient volume to flow to the surface at a measurable rate and justify completion. Since these five chance factors are independent and all five must be present and effective for a successful outcome, the overall Pg is calculated as the product of the five factors. For example, if all five chance factors are judged to have a 50 percent chance of success, the result for the prospect would be a chance of discovery of 3.125 percent.



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Given that a discovery is made, the full distribution of the range of uncertainty in potentially recoverable hydrocarbons will include some outcomes that are below the economic threshold for a commercially viable project. The probability of being above that economic threshold is used to define the chance of development. Therefore, the chance of commerciality (Pc) is calculated by multiplying the chance of discovery (Pg) by the chance of development. The distribution of potential outcomes is then recomputed for the "success case" or for a discovery that is larger than the economic threshold. The resulting chance of commerciality (Pc) is then multiplied by the mean value from the "success case" resource distribution to determine the risked mean resource value.

The prospective resource volumes shown herein were estimated by probabilistic methods using ranges of parameter values for reservoir volume, porosity, oil and gas saturation, pressure, temperature, density, oil and gas composition, and recovery factor. The ranges of reservoir volume employed for the probabilistic estimates were based on seismic depth structure maps prepared by KMG EP and reviewed by MLL. The other reservoir and fluid parameter values were based on data supplied by KMG EP, and the ranges of parameter values were estimated using ranges found in analogous fields in the area. For each prospect, a low estimate (equivalent to the P90 probabilistic value), a best estimate (equivalent to the P50 probabilistic value), and a high estimate (equivalent to the P10 probabilistic value) of unrisked prospective resources were estimated by MLL. For prospects with multiple reservoirs, resource estimates were calculated for individual reservoirs and then combined using probabilistic methods to obtain a total for the prospect.

It is important to note that the probability of finding hydrocarbon volumes that equal or exceed the mean volume cited herein for a prospect must consider not only the Pg for the prospect but also where the calculated mean value falls on the probabilistic distribution of possible outcomes for that prospect. However, if it is assumed that the calculated mean volumes and values are appropriate representations of their probabilistic distributions, MLL believes the approach described above gives a reasonable expected value quantification for each prospect. Arithmetic addition of results for each prospect at a specific probabilistic value (e.g. P10) does not give a correct probabilistic result for the aggregate except at the Mean Estimate.

## Liman Block

The Liman Block was awarded to KMG EP in 2000 under Contract No. 406 for a term of 25 years. The initial five year exploration period on the block expired in 2005 but was extended until 2011. However, the state Geological Committee has agreed to extend the exploration period of the southern part of the block until February 2014.

The Liman Block is located in the Atyrau Oblast, along the southern margin of the Precaspian Basin and covers an area of approximately 6,470 square kilometers. Infrastructure in the region is well developed and includes oil and gas pipelines as well as a railway. Oil in this area occurs in the post-salt section over the crest and along the flanks of salt domes. Production on the license comes from the Novobogatinskoye, Rovnoye, Martyshi, and Kamyshitovoye fields.



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Of particular interest is the Novobogatinskoye Field, where oil is trapped in onlapping Permo-Triassic sands beneath a three-kilometer salt overhang that extruded subaerially beginning in Late Triassic time. Low-sulfur oil is produced below the overhang from 11 reservoirs that range in thickness from less than 20 to more than 100 meters. Seismic imaging of the reservoir section is poor, even with the benefit of a 3D survey.

Three prospects have been identified by KMG EP on the Liman Block. All are considered to have a low chance of success. The first is the Novobogat S.E. Triassic T-2 G-7 Prospect, a high risk salt flank prospect where reservoir mapping is difficult and closure uncertain. The potential for lack of seal only increases the risk for this prospect. The offsetting G-4 well, an unsuccessful test of the same section drilled in 2011, further reduces prospectivity of G-7.

The two other prospects, PR-1 and PR-2, occur beneath a salt overhang and are mapped as northwest extensions of the Novobogatinskoye S.E. Field. Although source, charge, and reservoir risk components have been largely established for the field, mapping confidence is low. Adding to the risk is the 6-E well which is located in the same fault block as the PR-1 Prospect and slightly downdip. This well encountered 30 meters of wet sand in six separate reservoirs.

## **Temir Block**

KMG EP acquired the Temir Block in 2010 under Contract No. 3578 for an initial term of six years. The contract carries a right to extend the exploration period until 2019.

The Temir Block is located onshore Kazakhstan along the eastern margin of the Precaspian Basin. The license is about 240 kilometers south of the city of Aktobe and covers an area of approximately 3,854 square kilometers. A north-south running pipeline crosses the western half of the block.

Exploration on the block has been disappointing despite being in regional proximity to such fields as Kenkiyak, Zhanazhol, and Alibekmola. To date, a total of 24 wells have been drilled within the license into both the sub-salt and post-salt sections without a commercial discovery. Underlying much of the block is the north-south-trending Temir Platform, an uplifted basement block capped by Carboniferous carbonates and patch reefs that have been the target of the sub-salt drilling.

Subsurface mapping on the block has been facilitated by the use of a 2D seismic grid that was acquired in 2011. This widely-spaced grid has helped to identify four prospects in the sub-salt section (prospects I, II, III, and IV). Given the drilling history and quality of the seismic, significant risk exists for all four prospects. The risks are mainly tied to migration, mapping confidence, and to a smaller measure, reservoir. Closure is an added risk on Prospect II since it does not have full seismic coverage.



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# **Zharkamys East-1 Block**

The Zharkamys East-1 Block was acquired by KMG EP in December, 2010 and is governed by Subsoil Exploration and Production Contract No. 2193 which has been extended to the end of 2014.

The Zharkamys East-1 Block covers an area of approximately 1,190 square kilometers and is located in the Pre-Ural plateau in the Aktyubinsk region of Kazakhstan. The block lies within the Zharkamys-Temir Petroleum District that includes Akzhar, East Akzhar, Karatobe, South Karatobe, Loktybay, and Zhanatan fields.

The five prospects evaluated in this license are all sub-salt structural closures delineated with either 2D or 3D seismic data. The objectives in these prospects are Carboniferous and Lower Permian carbonate sediments that range in depth from 3,500 to 6,800 meters subsea.

The Tuskum Prospect is delineated by a 3D seismic survey acquired by KMG EP in 2011. The Carboniferous KT-2 carbonate reservoir lies at a depth of 3,500 meters subsea and covers a mean area of 6.9 square kilometers. The prospect is a fault closure. The primary geologic risk is fault seal separating the prospect from the up-dip RA-1-T well that is wet in the same objective section.

The Karatobe Prospect is delineated by 2D seismic with potential P3 Middle Devonian sandstone reservoirs trapped on the high side of a vertical fault with a vertical displacement of approximately 250 meters. The prospective closure is mapped at a depth of 6,300 meters subsea and covers a mean area of 3.5 square kilometers. The primary geologic risks are reservoir, closure, and containment risks.

The Berkut North Prospect is an anticlinal structure delinated by 2D seismic. Approximately 60 percent of the structure lies within KMG EP's Zharkamys East-1 license and the volumes in this report have been restricted to the KMG EP license. The prospective structure at the P3 Middle Devonian level is mapped with approximately 350 meters of structural closure at 6,400 meters subsea and covers a mean area of 3.5 square kilometers within the license. The primary geologic risks are reservoir and closure.

The Kindysai North Prospect is an anticlinal structure delineated by 2D seismic. The prospective structure at the P3 Middle Devonian level is mapped with approximately 350 meters of vertical closure and covers a mean area of 6.6 square kilometers at a depth of 6,750 meters subsea. The primary geologic risks are adequate reservoir and structural closure.

The Shotykol Prospect is an anticlinal structure delineated by 2D and partial 3D seismic data coverage. The prospective structure at the P3 Middle Devonian is mapped at a depth of 6,800 meters subsea and covers a mean area of 10.7 square kilometers with approximately 300 meters of structural closure. The primary geologic risk is adequate reservoir quality.



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# **Uzen-Karamandybas Block**

KMG EP acquired the Uzen-Karamandybas Block in 2010 under Contract No. 3579. The exploration block encompasses a number of mature oil and gas fields including the large Uzen Field. Although several of the fields are covered by 3D seismic, most of the prospects were generated using older 2D seismic data.

The Uzen-Karamandybas Block is the most southerly of the KMG EP exploration licenses and lies within the South Mangyshlak Sub-basin. The dominant petroleum reserves of the basin are in Middle Jurassic sandstones in structural traps. Minor reserves are in fractured Triassic carbonates and clastics. Lower Cretaceous sandstones and fractured basement granites also produce locally. All of the oils have similar chemical characteristics. They are of medium gravity (31-38 degree API), and have high paraffin and low sulfur content.

Most oil and gas fields and discovered reserves are found on the Zhetybay step, a gently south dipping structural terrace north of the deeper Mangyshlak Basin. Originally a rift zone, the Zhetybay step was structurally inverted at the end of the Triassic by intense compression into a series of elongated, northwest-southeast-trending anticlines that form most of the traps.

Source rocks for the basin are generally considered to be basinal Middle Triassic shales. The only regional seal of high quality is the Upper Jurassic transgressive marine shale and carbonate sequence. Although the Upper Jurassic seal is greater than 500 meters thick in the deepest parts of the Mangyshlak Basin, it thins to less than 100 meters in the Uzen Field where it helps trap an oil column more than 300 meters. The Triassic section does not contain regional seals and wells drilled into the Triassic section in the Uzen Field did not produce any commercial flow.

Northwest Tenge is the only KMG EP prospect on the Uzen-Karamandybas Block. The prospect is mapped as a structural closure on a series of Triassic reflectors bounded by high-angle normal fault to the north. The prospect appears to more of a stratigraphic trap beneath a regional Jurassic angular unconformity. Principal risks relate to reservoir, as no wells have penetrated the Triassic in this part of the basin, and to the likely absence of a top seal.

# **Taysoygan Block**

Following expiration of the Taysoygan license in 2010, KMG EP applied for a two year extension, which was approved in May 2011. Details of the work commitment for the extension of the exploration license have not been disclosed.

The Taysoygan Block is the most centrally located of all the KMG EP licenses within the Precaspian Basin in an area referred to as South-Embin. The sub-salt section, normally targeted on the flanks of the basin, lies at depths in excess of eight kilometers on this block and has not been penetrated by drilling. The block comprises an area of 9,605 square kilometers and access to much of the area is restricted due to the presence of a missile testing range. Prospectivity is limited to the post-salt section, notably the mixed



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clastic-carbonate Middle Triassic interval, which onlaps a number of salt domes on the block beneath a regional Lower Jurassic unconformity. Oil fields in the area include Kenbay, Zhylankabak, and Kozha South.

Originally mapped using 2D seismic data, the Bazhir East Prospect is the only KMG EP prospect on the block. The prospect is located west of the Kondybai and Uaz fields, along the southern margin of the license, and is mapped as a single, north-south-trending feature with a south and north culmination. In 2011, KMG EP drilled the G-1 well to test the southern feature in a crestal position. The well was unsuccessful and reportedly tested water with an oil skim. Since then, KMG EP has re-mapped the Bazhir East Prospect using a newly acquired 86 square kilometer 3D survey. The principal risks to the Bazhir East Prospect are map reliability and closure, and secondarily, reservoir presence and quality.

#### R-9 Block

The R-9 exploration license expired in August, 2011 and was extended for an additional two years.

The license covers an area of 5,984 square kilometers and is located 170 kilometers west of Atyrau in Makat and Zhylyoi districts of the Atyrau Region. The major sub-salt fields of Tengiz, Korolov, and Ansagan lie to south of the license and are productive from the Carboniferous and Devonian.

To date, no sub-salt fields have been discovered in the R-9 license. Two sub-salt prospects, Buiyrgyn and Kyzylkuduk, were evaluated in this report. Both prospects are located in the southern portion of the license and were delineated by 3D seismic and have multiple Carboniferous and Devonian objectives. Although both prospects are delineated by 3D seismic, there is considerable uncertainty in the interpretation of seismic data beneath thick salt beds and at depths below 5,500 meters subsea.

The Buiyrgyn Prospect is an anticlinal structure with three objectives mapped in the Carboniferous and Devonian. The structures are mapped with 125 to 300 meters of structural closure at depths ranging from 5,600 to 8,100 meters subsea.

The Carboniferous P2 carbonate structure is mapped at a depth of 5,600 meters subsea with 150 meters of structural closure. The objective closure is bisected by the R-9 license boundary and has a mean area of 5square kilometers within the R-9 license. The primary geologic risks are the timing of structure and migration.

The Upper Devonian Dt carbonate objective is mapped at a depth of 6,500 meters subsea with 300 meters of structural closure. The objective closure is bisected by the R-9 license boundary and has a mean area of 10.1 square kilometers located within the R-9 license. The primary geologic risks are the timing of structure and migration.



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The Devonian P3 objective is mapped at a depth of 8,100 meters subsea with 125 meters of structural closure. The P3 closure is located within the R-9 license and has a mean area of 3.1 square kilometers. The primary geologic risk is the quality of the reservoir.

The Kyzylkuduk Prospect is located approximately 200 kilometers northwest of the Buiyrgyn Prospect. The Kyzylkuduk structure is a faulted closure on the high side of a vertical fault with approximately 200 meters of vertical displacement. The prospect has three objectives in the Carboniferous and Devonian at depths ranging from 5,600 to 6,700 meters subsea. All objective structures are bisected by the R-9 license boundary and the areas and volumes in this report are located within the R-9 license.

The Carboniferous P2 carbonate objective is mapped at a depth of 5,600 meters subsea with 150 meters of structural closure and a mean area of 16.4 square kilometers under closure within the license. The primary geologic risks are timing and migration.

The Upper Devonian P2d carbonate objective is mapped at a depth of 6,000 meters subsea with 125 meters of structural closure and a mean area of 12.2 square kilometers under closure within the license. The primary geologic risks are timing and migration.

The Devonian P3 carbonate objective is mapped at a depth of 6,700 meters subsea with 150 meters of structural closure and a mean area of 4.8 square kilometers of structure closure within the license. The primary geologic risks are timing and migration.

#### **Karaton-Sarkamys Block**

The Karaton-Sarkamys license was awarded to KMG EP in 2010 by Contract No. 3577 and expires in 2016. Under terms of the license agreement, only exploration of the post-salt section is permitted.

The Karaton-Sarkamys Block is located in the southeast portion of the Precaspian Basin and covers an area of 2,642 square kilometers. A number of post-salt fields have been developed within the block as well as two sub-salt fields, Tengiz and Korolev. The post-salt fields range in size from 7 to 500 million barrels of oil-in-place, and are generally related to salt structures, either as onlap traps on salt flanks, fault traps, or four-way closures above salt. Reservoirs properties of Jurassic and Cretaceous sandstones that occur above salt domes can be excellent. The properties deteriorate somewhat for the more deeply buried Triassic and Upper Permian strata.

Two prospects, Kenaral and Dosmukhambetovskoye, have been identified by KMG EP on the license. Both prospects are covered by 3D seismic. The Kenaral Prospect lies in the eastern part of the license and is mapped as an upthrown three-way closure against a down-to-the-north, east-west-trending normal fault. Prospectivity of the Kenaral feature has already been reduced by two previously drilled wells on the structure. The Matken G-4 was a downdip dry hole in the same fault block as the prospect. The Ansagan-1 well penetrated the shallow prospective horizons downthrown to (across) the trapping fault. The well crossed the fault just above the J-IV horizon and drilled into the prospective fault block. However, the well



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was located in a downdip position below the proposed oil-water contact and did not encounter economic hydrocarbons. Neither well was made available for this evaluation. Principal risks for the Kenaral Prospect are cross-fault seal, the presence and quality of reservoir, and the timing of trap formation versus oil migration.

The Dosmukhambetovskoye Prospect is situated in the south-central part of the license and is actually comprised of three separate fault traps along the eastern flank of the Dosmukhambetovskoye field, which produces from Cretaceous and Upper Jurassic sands in a four-way closure above salt. As with Kenaral, the main risks to the series of fault traps at Dosmukhambetovskoye are the ability of the faults to seal and the timing of trap formation relative to oil migration. For some of the deeper horizons mapping confidence near the salt face is also less certain. Those prospects having a component of independent four-way closure are considered to have less risk.

## Karpovsky North Block

The Karpovsky North Block occupies an area of 1,669 square kilometers and is located along the narrow north margin of the Precaspian Basin near the border with Russia. Three thick carbonate intervals and their time equivalent clastics in the Upper Devonian-Lower Permain sub-salt section are the principal drilling targets for this portion of the basin. Uplifted basement blocks, some overlain with carbonate buildups, and thrust structures comprise most of the productive structures on trend with the license. Nearby fields such as Karachanganak, Chinarevskoye, and Nepryakhinskoye produce mainly oil and gas-condensate.

Two prospects, Melovaya and Orlovskaya, have been identified by KMG EP within the Karpovsky license. Both prospects are supported by 3D seismic and mapped as closed four-way structures. The primary targets in Melovaya are Devonian clastics that have previously been found to be productive in the area (Nepryakhinskoye Field). In Orlovskaya, the principal target is a carbonate of Late Devonian to Early Mississippian age. Thrust faulting purportedly occurs north of the Melovaya Prospect, an observation consistent with the structural style common to this area.

Geological risks for the Karpovsky North Block primarily involve the presence and quality of reservoir (due to an overall lack of well control) and uncertainty of an effective migration pathway and seal. Closure may be an additional risk for the shallower targets.

## Fyodorovsky Block

In 2011, KMG EP acquired the interests of Ural Oil & Gas LLP and, therefore, a 50 percent working interest in the Fyodorovsky Block. Current exploration partners include MOL Caspian Oil and Gas Limited and First International Oil Corporation with 27.5 and 22.5 percent working interests, respectively. The exploration license, which was originally issued in 2000 as Contract No. 486, expired in 2010 but has been extended to 2014.



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The Fyodorovsky Block is located east of the Karpovsky license, in the area where the northern flank of the Precaspian Basin borders the southwestern extension of the Ural Mountain foldbelt. Structurally, the sub-salt section of the license is dominated by a series of northwest-southeast-trending basement highs and intervening lows. The core of the uplifts are Riphean (Precambrian) basement rocks.

On the flanks of the uplifts, Middle-Lower Devonian clastic and carbonate reservoirs occur as part of a transgressive shoreline wedge. This onlapping wedge thickens off structure and down the plunge of the basement highs, and is preserved beneath a regional Upper Devonian (Frasnian) angular unconformity. At the base of the wedge are Lower Devonian (D1 horizon) rocks, which range in thickness between 40 to 80 meters and consist of sandstones, siltstones, and mudstones. Middle Devonian rocks present just below the Upper Devonian unconformity (P3 horizon) are comprised of carbonates and interbedded clastics, some of which produce locally. Younger lowstand clastics, deposited above the Upper Devonian unconformity, constitute one of the more prospective but least explored plays on the block.

Two prospects, Rubezhinskaya P3 and D1 have been identified by KMG EP on the Fyodorovsky Block using 3D seismic. The Rubezhinskaya P3 Prospect is comprised of a preserved section of the Upper Devonian against a northwest-southeast-trending thrust fault as a footwall trap. This prospect is mapped on the regional Upper Devonian unconformity (P3) seismic event and is located immediately east of the RBZ-8 well. In the northwest part of the license is the Rubezhinskaya D1 Prospect, a similarly structured footwall prospect involving the deeper Lower Devonian (D1) clastic interval.

Geologic risks for the Fyodorovsky Block prospects mainly involve reservoir presence and quality, mapping confidence, and seal. The prospects rely on relatively small faults (two in the case of the Rubezhinskaya P3 Prospect) for lateral seal and both assume the presence of reservoir in a depositional environment that could have changed dramatically over short distances. Although seismic data quality for the sub-salt section is reasonably good, fault definition and continuity of mappable events are sometimes poor.

In addition to the prospects evaluated above, MLL evaluated nine other prospects identified by KMG EP in the same nine license areas. Geologic descriptions and maps of these additional prospects have not been included in this report but the results of our evaluations are included in Attachment 1.

#### **Other Considerations**

None of the reserves volumes or the estimated future net revenues therefrom have been adjusted for uncertainty. None of the proved, probable, or possible reserves volumes, nor the revenues projected therefrom, should be combined with either of the other without adjustment for uncertainty.

Future costs of abandoning facilities and wells and any future costs of restoration of producing fields to satisfy environmental standards were not deducted from total revenues as such estimates are beyond the scope of this assignment.



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In conducting this evaluation, we relied upon production histories; accounting and cost data; ownership; geological, geophysical, and engineering data; and drilling, recompletion, and workover schedules supplied by KMG EP. KMG EP represented that their field development plans provided to us to use in our evaluations are consistent with their business plan and have been approved by the management of KMG EP. These data were accepted as represented, as verification of such data and information was beyond the scope of this assignment.

The evaluations presented in our final report, with the exceptions of those parameters specified by others, reflect our informed judgments based on accepted standards of professional investigation but are subject to those generally recognized uncertainties associated with interpretation of geological, geophysical, and engineering information. Government policies and market conditions different from those employed in this study may cause the total quantity of oil or gas to be recovered, actual production rates, prices received, or operating and capital costs to vary from those presented in this report. Minor precision inconsistencies in subtotals or totals may exist in the report due to truncation or rounding of aggregated values.

Miller and Lents, Ltd. is an independent oil and gas consulting firm. No director, officer, or key employee of Miller and Lents, Ltd. has any financial ownership in KMG EP or any affiliate of KMG EP. Our compensation for the required investigations and preparation of this report is not contingent on the results obtained and reported, and we have not performed other work that would affect our objectivity. Production of this report was supervised by an officer of the firm who is a professionally qualified and licensed Professional Engineer in the State of Texas with more than 30 years of relevant experience in the estimation, assessment, and evaluation of oil and gas reserves.

Yours very truly,

MILLER AND LENTS, LTD. Texas Registered Engineering Firm No. F-1442

James C. Pearson, P.E.

Chairman

JCP/jj

# **GROSS PROSPECTIVE RESOURCES**

# JSC KazMunaiGas EP As of December 31, 2012

			Probability	Prospective Resources					
License	Prospect	Reservoir	of Commercial Success, Pc,	Low Unrisked, MBOE	Median Unrisked, MBOE	High Unrisked, MBOE	Mean Unrisked, MBOE	Mean Risked, MBOE	
Liman	Novobogat SE	T-2	9.6	4,820	15,340	50,250	22,070	2,097	
Lilliali	Novobogat SE  Novobogat SE	VI-I (PR-2)	17.3	2,020	5,180	13,180	6,490	1,123	
	Novobogat SE Novobogat SE	VI-I (PR-2) VI-I (PR-1)	21.6	810	2,750	8,190	3,620	782	
Temir	Prospect I	C2	13.1	3,270	10,270	31,970	14,330	1,877	
	Prospect II	C2	10.4	4,260	13,530	43,790	19,140	1,991	
	Prospect III Prospect IV	C2 C2	10.2	2,660 3,540	5,860 10,430	13,630 32,190	7,020 14,440	716 1,863	
Zharkamys East	Tuskum	KT-2	6.9	4,740	8,450	25,140	11,130	768	
Zharkamys Last	Karatobe	P3	2.0	4,550	6,780	14,460	7,780	156	
Uzen- Karamandybas	NW Tenge	T	6.8	4,560	8,160	23,170	10,950	745	
Taysoygan	Bazhir East 1-R	T-2	5.8	7,360	21,160	70,170	30,710	1,781	
	Bazhir East 2-R Uaz U-1	T-2 T	5.1	11,700 4,100	28,260 4,580	67,500 6,300	34,370 4,350	1,753 9	
R-9	Buiyrgyn	Dt	10.3	1,460	7,430	39,010	14,850	1,530	
	Buiyrgyn Buiyrgyn	P2 P3	8.8 5.9	980 1,180	4,130 3,300	17,790 9,410	7,110 4,390	626 259	
	Probabilistic Total		10.9				21,440	2,337	
	Kyzylkuduk	P2	10.1	9,710	22,950	55,340	28,110	2,839	
	Kyzylkuduk	P2d	10.1	2,640	11,660	52,780	20,820	2,103	
	Kyzylkuduk Probabilistic	P3	10.1	1,980	5,930	18,320	8,290	837	
	Total		12.6				44,350	5,588	
Karaton-Sarkamys	Dosmuk. Dome 1	J-IV	21.6	120	310	850	410	89	
	Probabilistic Total	J-V	16.4 18.2	320	840	2,210	1,070 1,340	175 244	
	1100a0iiistic 10tai		10.2				1,540	<i>4</i> ⊤₹	

# **GROSS PROSPECTIVE RESOURCES**

# JSC KazMunaiGas EP As of December 31, 2012

			Probability	Prospective Resources					
	D	ъ.	of Commercial Success, Pc,	Low Unrisked,	Median Unrisked,	High Unrisked,	Mean Unrisked,	Mean Risked,	
License	Prospect	Reservoir	%	MBOE	MBOE	MBOE	MBOE	MBOE	
	Dosmuk. Dome 2	K1v	24.5	320	820	2,060	1,020	250	
		J-III	24.5	170	490	1,450	670	164	
		J-3	24.5	40	160	560	240	59	
		J-IV	30.2	100	270	730	350	106	
	D 1 1'1' ' TD / 1	J-V	16.4	80	200	460	240	39	
	Probabilistic Total		33.9				1,820	617	
	Dosmuk. Dome 3	J-IV	30.2	100	270	730	350	106	
		J-V	24.6	100	570	3,160	1,190	293	
	Probabilistic Total		24.4			ĺ	1,530	373	
							,		
	Kenaral	K1v	15.0	250	1,060	4,520	1,820	273	
		J-III	18.0	400	1,420	4,980	2,130	383	
		J-3	18.0	1,200	4,220	15,010	6,380	1,148	
		J-IV	18.0	1,470	3,890	10,320	4,980	896	
		J-V	18.0	480	1,550	4,940	2,190	394	
	Probabilistic Total		25.8				11,290	2,913	
Karpovsky North	Melovoya	C 1-2	14.8	1,210	4,760	18,540	7,620	1,128	
Kaipovsky Noitii	Wiciovoya	C 1-2	14.8	1,460	5,890	23,640	9,660	1,128	
		P2	18.4	800	2,170	5,850	2,810	517	
		P3	20.1	2,010	5,560	15,370	7,270	1,461	
		D2/D3	20.1	1,530	4,650	14,270	6,440	1,401	
	Probabilistic Total	D2/D3	24.0	1,330	4,030	14,270	22,830	5,479	
	Trobabilistic Total		24.0				22,630	3,479	
	Orlovskaya Central	P2	18.8	620	1,550	3,830	1,920	361	
		C 1-2	15.8	170	460	1,240	590	93	
		C 1-1	13.3	7,050	14,060	27,940	15,890	2,113	
		D3	13.7	400	1,480	5,530	1,950	267	
	Probabilistic Total		13.2				19,760	2,608	
	Orlovskaya South	P2	18.8	620	1,550	3,830	1,920	361	
	2110 (Simja South	P3	21.7	240	1,850	14,030	5,080	1,102	
		C 1-2	19.7	800	1,472	4,270	2,210	435	
		D3	14.8	210	530	1,380	680	101	
		D2	21.7	440	1,240	3,480	1,620	352	
	Probabilistic Total	<del>_</del>	8.7	1.0	_,	2,.00	15,600	1,357	

## **GROSS PROSPECTIVE RESOURCES**

# JSC KazMunaiGas EP As of December 31, 2012

			Probability	Prospective Resources					
License	Prospect	Reservoir	of Commercial Success, Pc, %	Low Unrisked, MBOE	Median Unrisked, MBOE	High Unrisked, MBOE	Mean Unrisked, MBOE	Mean Risked, MBOE	
	Persovetskaya	D2	2.8	7,520	11,230	25,990	12,860	360	
Fyodorovsky	Rubezhinskaya	P3	10.9	690	2,020	6,520	2,870	313	
	Rubezhinskaya	D1	19.6	990	2,360	5,820	2,910	570	
	Rozhavskaya U-26	D2	5.8	1,450	2,760	7,380	3,590	208	
	Rozhavskaya East	D2	5.7	1,390	2,440	6,100	3,080	176	
	Rozhavskaya West	D2	14.2	3,250	11,850	47,400	19,290	2,739	
	Burlinskaya	C-1	5.0	3,110	11,720	44,440	18,340	917	
	Burlinskaya	D-3	5.0	2,000	7,670	30,080	12,320	616	
	Probabilistic Total		6.1				24,080	1,469	
	Januartevskaya Januartevskaya	C-1 D-3	1.4 1.4	560 310	2,260 1,130	9,180 4,280	3,710 1,770	52 25	
	Probabilistic Total		1.5			,	4,970	75	
	Zhaik Zhaik	C-1 D-3	8.6 8.6	630 510	1,900 1,760	5,960 6,260	2,670 2,670	230 230	
	Probabilistic Total		8.9				4,780	425	

Unrisked results assume all prospects are commercially successful. Risk adjustment considers the probability of geologic success (Pg) and the probability of commercial success (Pc) for each prospect.

These results include probabilistic aggregations for each prospect. However, the total shown above for all prospects was estimated summing the value for each prospect.

In addition to the above prospects, we evaluated other prospects that we did not believe had commercial resources. Those properties are as follows:

- 1. Berkut North
- 2. Kindysai North
- 3. Shotykol
- 4. Belosyrtovskaya