



KPOGCL

***KHYBER PAKHTUNKHWA OIL & GAS COMPANY LIMITED
PAKISTAN***

KP Government Fully Owned & Provincial Holding Company

In relentless pursuit for Energy Security of Pakistan

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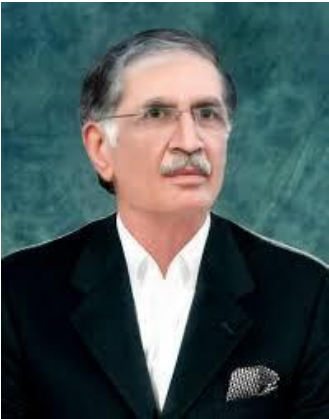
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Message



Pervez Khattak

Chief Minister,
Government of Khyber
Pakhtunkhwa, Pakistan

Khyber Pakhtunkhwa is energy rich Province producing more than 55% of National Crude Oil. Khyber Pakhtunkhwa has become center of Oil & Gas Exploration and Production. Recoverable Potential of KP is 1.1 Billion Barrels Oil and 16 Trillion Cubic feet Gas. Expected production in 2025 of oil is 200,000 barrels per day and 2000 Million Cubic Feet of Gas per day. We expect investment of \$ 200 Million in oil & gas exploration at IRR of 25% and Revenue of over \$ 150 Million in Services companies. The Government of Khyber Pakhtunkhwa Establish a Technical Laboratory on Commercial basis to accelerate E&P activities in the Province.

The Government of Khyber Pakhtunkhwa being cognizant of the opportunities in Oil and Gas Exploration and Production sectors has developed systems to facilitate foreign investment in Khyber Pakhtunkhwa. It has formed an Energy Apex Committee (EAC) chaired by the Chief Minister, Government of Khyber Pakhtunkhwa. This high powered committee irons out any and all impediments that a foreign investor may encounter. Government of Khyber Pakhtunkhwa invites your participation in Oil & Gas Exploration and Production in Khyber Pakhtunkhwa, Pakistan.



Muhammad Atif Khan
Minister of Energy &
Power, Government of
Khyber Pakhtunkhwa,
Pakistan

Khyber Pakhtunkhwa is rich in Oil and Gas reserves and huge deposits of oil & gas have been discovered in southern belt of the Province, including district Kohat, Karak & Hangu. Today it is producing more than 55% of national crude oil. It is also producing 450 million cubic feet of gas per day and 550 tons of LPG per day Government of Khyber Pakhtunkhwa via KPOGCL have signed MOUs with Russian company 'ROSGEO', American company 'Hycarbex' and Canadian company "Tallahassee" to promote the E&P activities and also to attract the international Oil companies for investment in the Province.



Muhammad Azam Khan
Chief Secretary
Government of Khyber Pakhtunkhwa

Khyber Pakhtunkhwa is the new Geological Frontier where presently 14 NOCs/IOCs Exploration and Production Companies are working. The Petroleum Policy 2012 and all previous ones show much high, well head price for Oil and Gas Zone-1 in Khyber Pakhtunkhwa which increase the returns on investment and lowers the risk. KP holds potential for new exciting discoveries, particularly in Kohat Basin which has become main area of focus after successful discoveries by OGDCL and MOL.



MR. Shakeel Qadir Khan

Secretary, Energy & Power,
Government of
Khyber Pakhtunkhwa, Pakistan

The latest Petroleum Policy-2012, a one window facility offers tremendous incentives and thus provides high returns to investors as operators and non-operators JV partners. For Example, the **gas well head price in Khyber Pakhtunkhwa is set at US\$ 6.60 per million BTU** when Crude Oil is US\$ 110/Barrel. This is perhaps highest in the region. The well head price of Crude Oil is benchmarked with international Platts. LPG is linked with ARAMCO Contract Price (CP), thus, making well head not only transparent and unambiguous without any government intervention but also US Dollar based. Repatriation of dividends is easy and quick. Pakistan is divided in 3 On-shore zones. KP lies in Zone-1, for which the well head price is highest compared to Zone-II & III.



Raziuddin (Razi)
CEO, KPOGCL

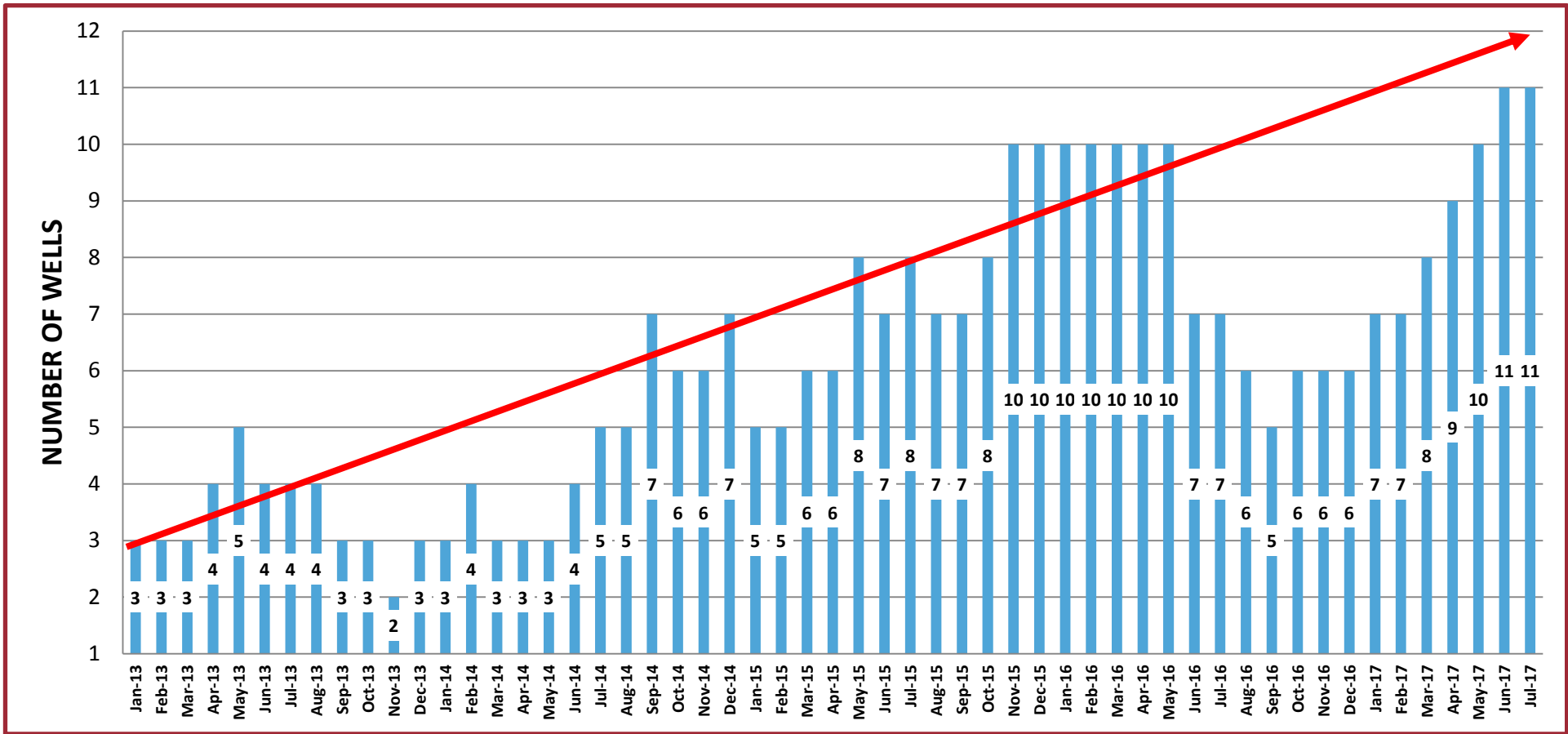
According to one estimate Khyber Pakhtunkhwa has Natural Gas recoverable reserves of 16 Trillion Cubic Feet and Oil reserves exceeding 1.1 Billion Barrels of Oil. Given the high success rate of drilling i.e. 1:2.8 gives the Exploration & Production an impetus to enter Khyber Pakhtunkhwa. The world average is 1:10 and that of Pakistan 1:3.5 thus, the Province offers low risk opportunity for Oil and gas exploration coupled with IRR in the vicinity of 30%. KPOGCL invites your participation in oil & gas exploration and production in Khyber Pakhtunkhwa, Pakistan



GOVERNMENT OF KHYBER PAKHTUNKHWA
KHYBER PAKHTUNKHWA OIL & GAS COMPANY LIMITED
(KPOGCL)

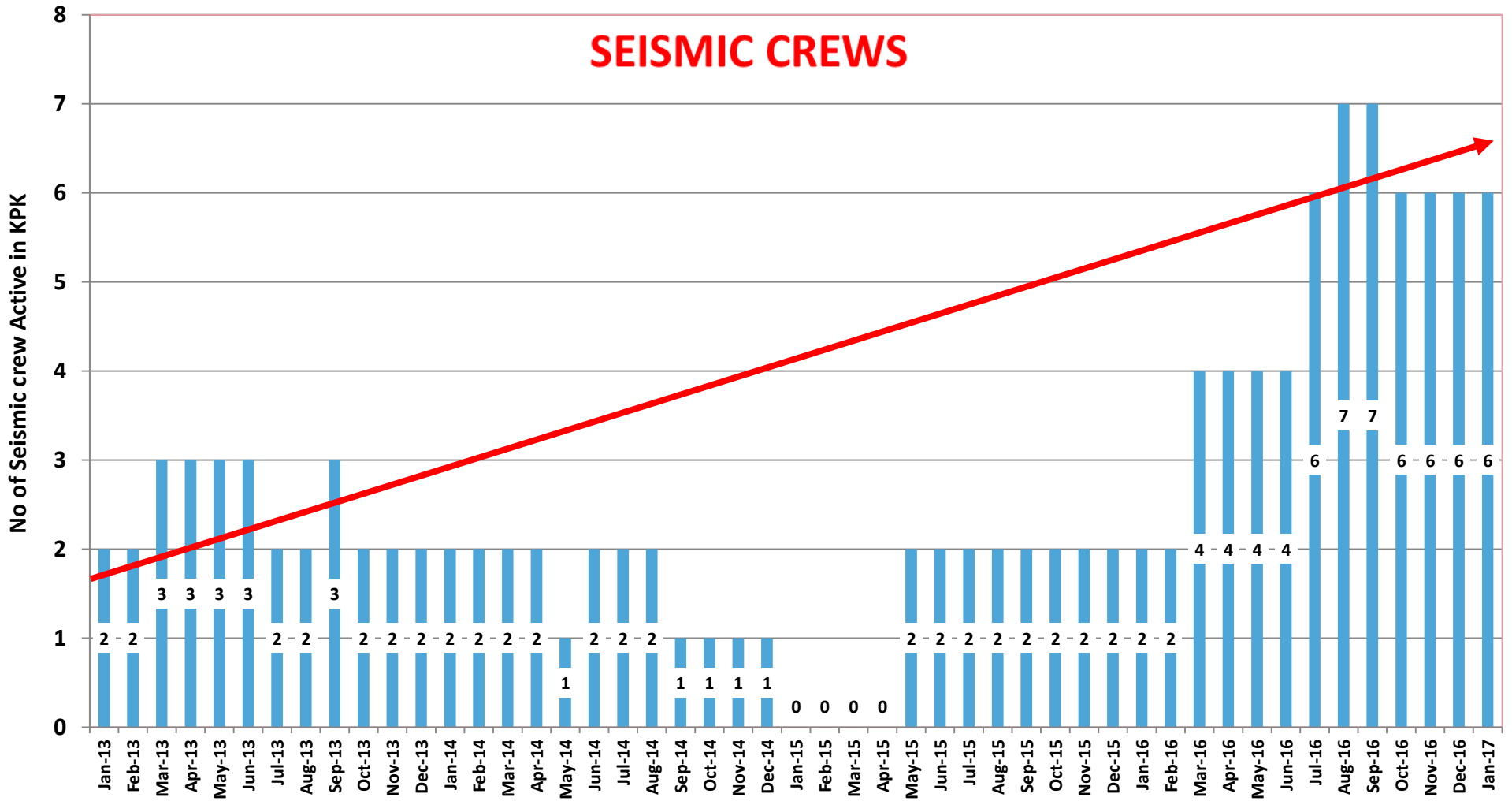
STATUS OF EXPLORATION & PRODUCTION
ACTIVITIES IN KHYBER PAKHTUNKHWA,
PAKISTAN SINCE 2013

EXPLORATORY AND DEVELOPMENT WELLS IN KP SINCE 2013



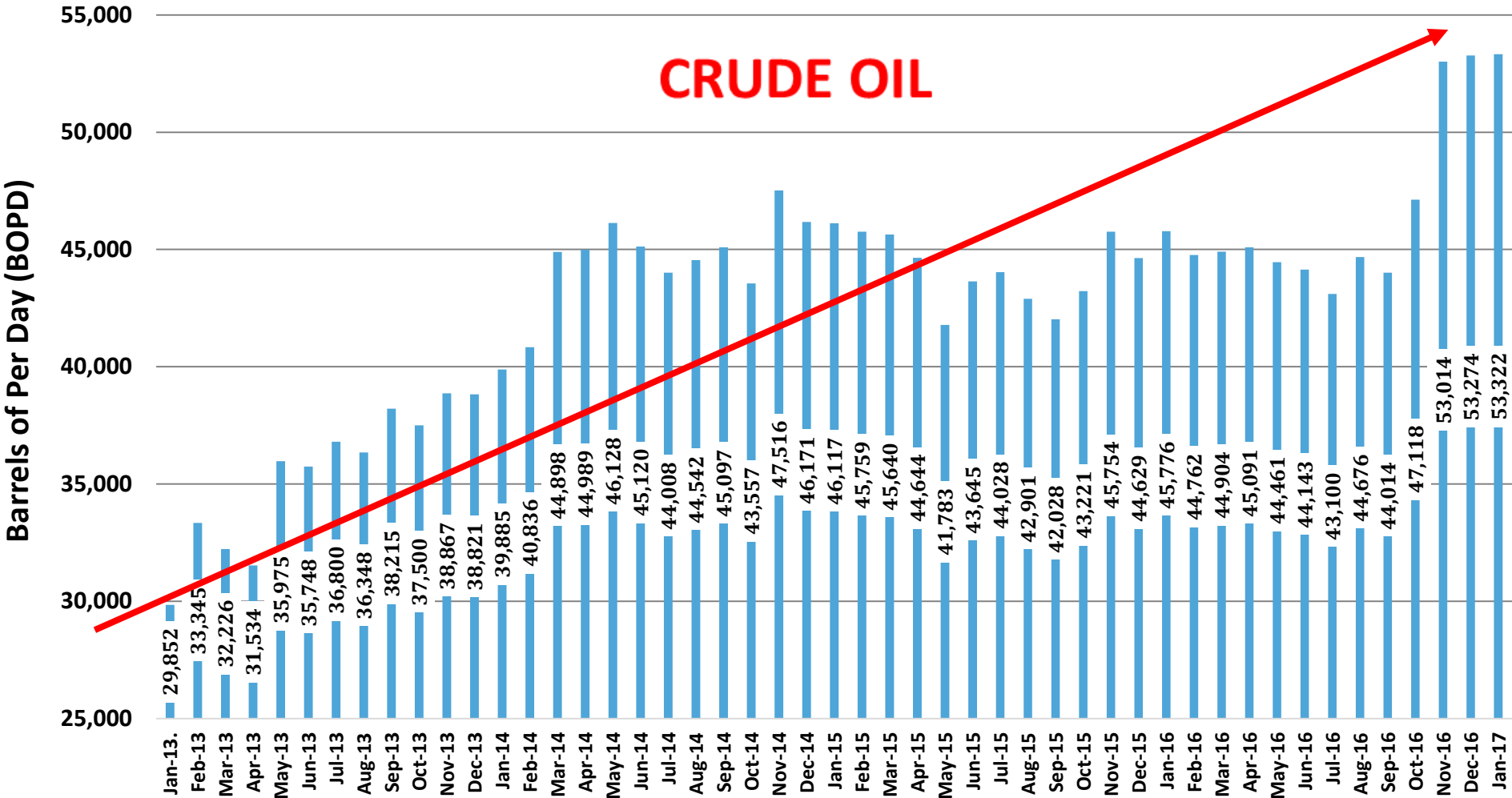
NUMBER OF SEISMIC CREW ACTIVE IN KP SINCE 2013

SEISMIC CREWS



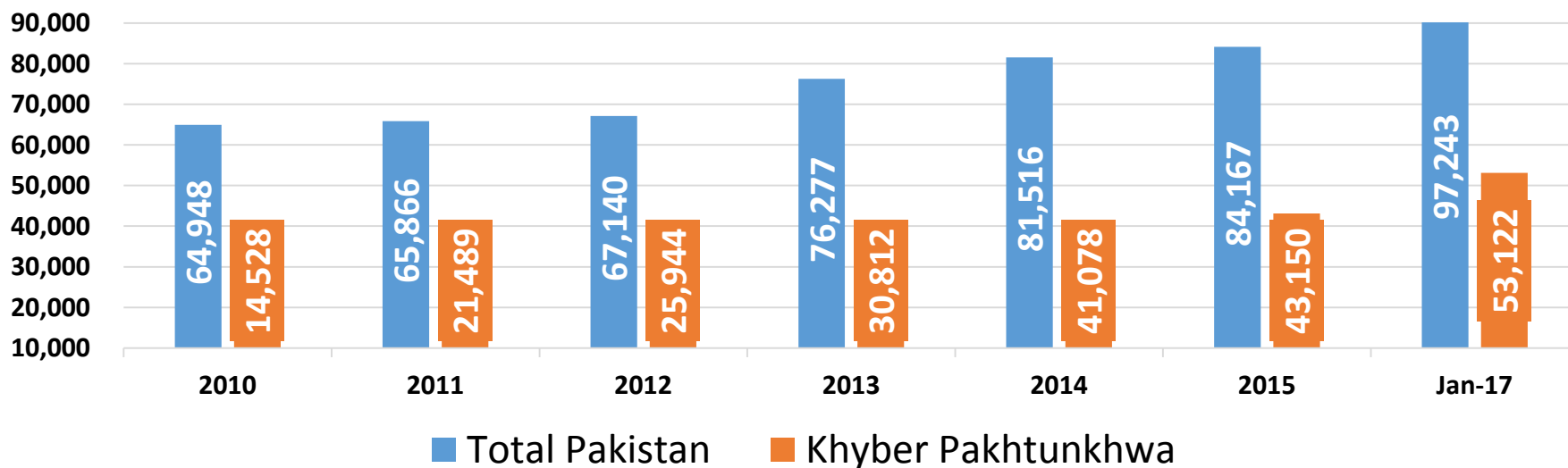
CRUDE OIL (Barrels per day) PRODUCTION IN KP SINCE 2013

CRUDE OIL

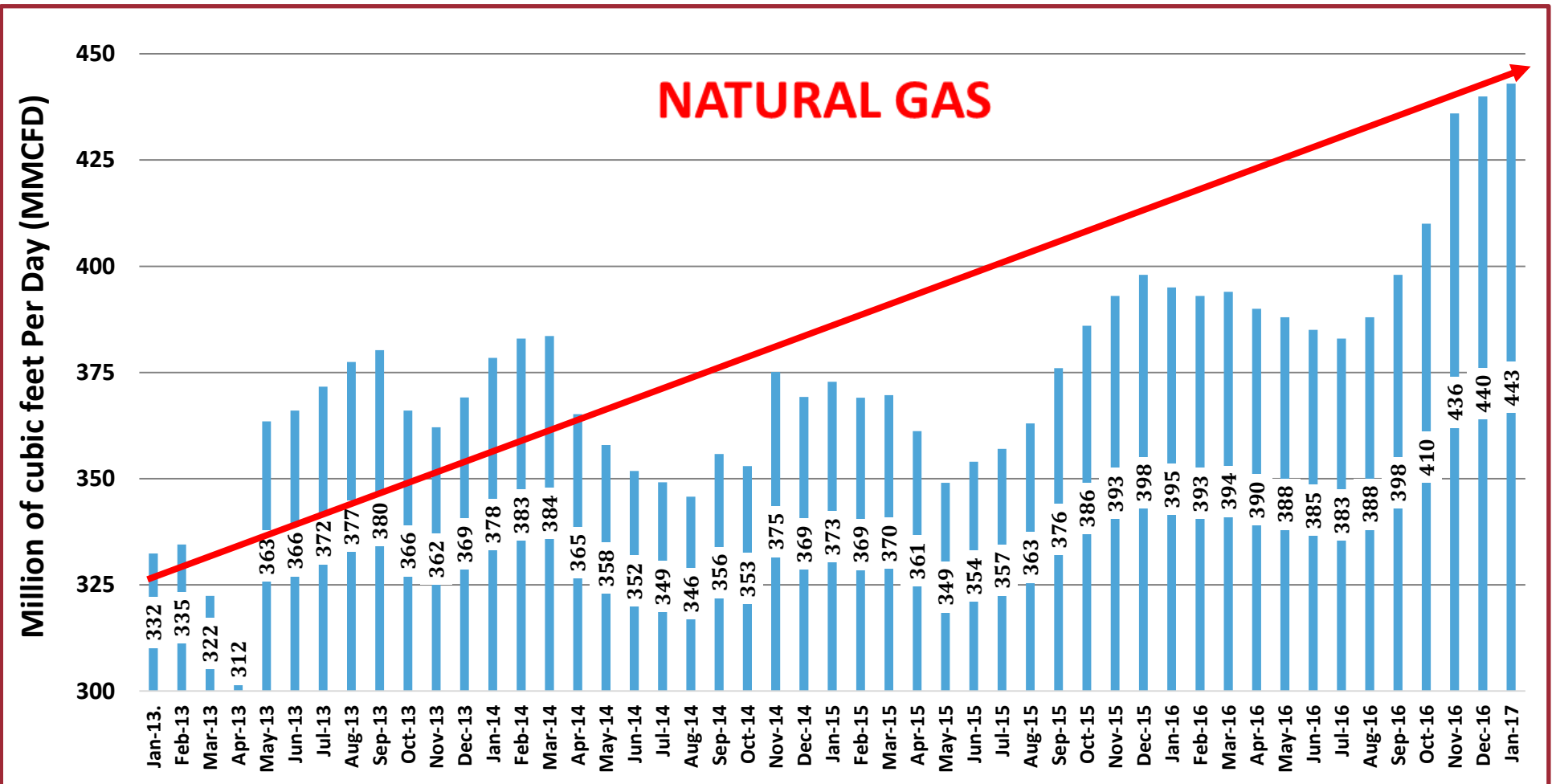


Total Pakistan & Khyber Pakhtunkhwa Crude Oil Production (BPD) from 2010 to 2017

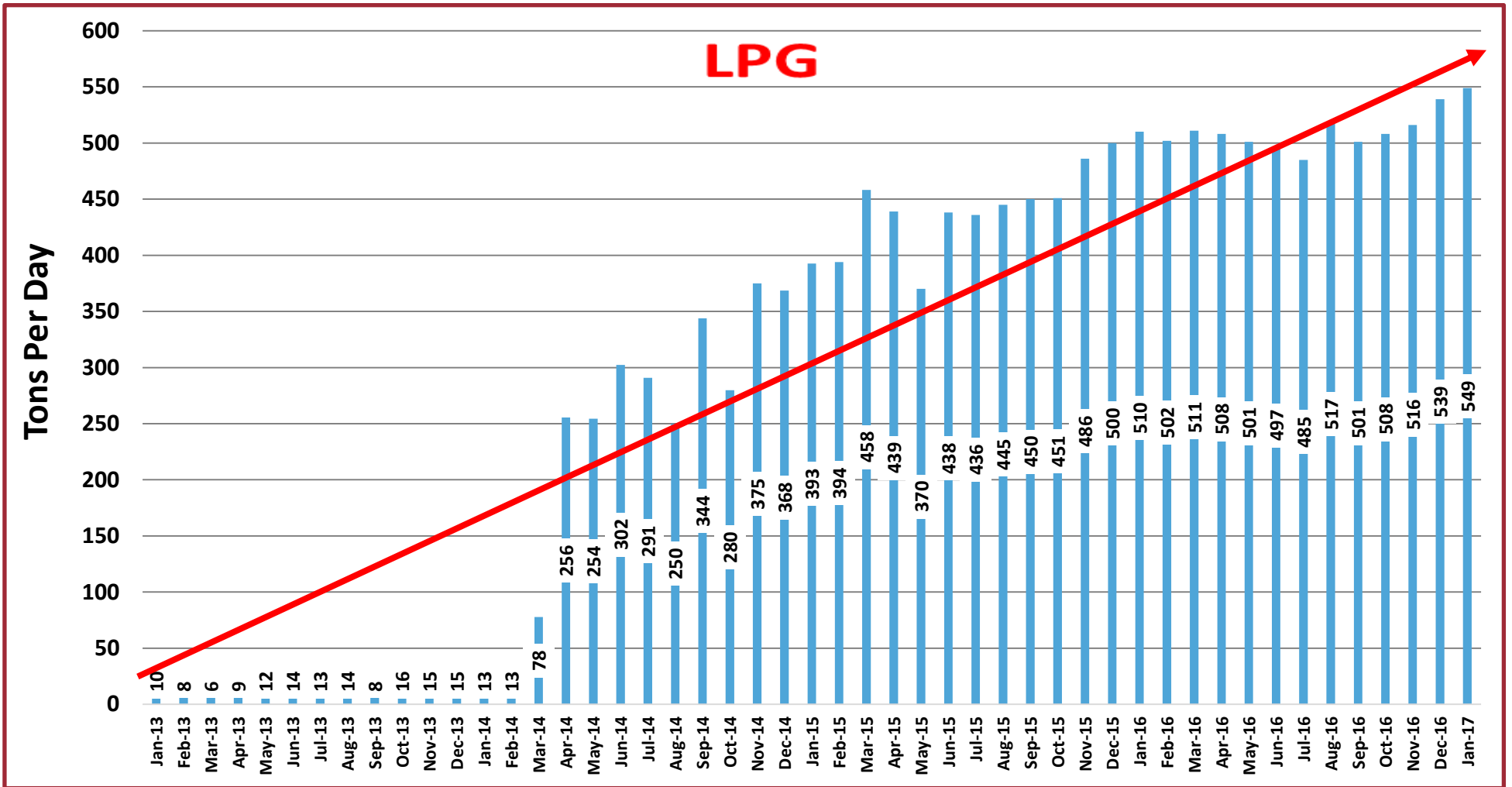
S.No	Total Production	2010	2011	2012	2013	Jan-17
1	Total Pakistan	64,948	65,866	67,140	76,277	97,243
2	Khyber Pakhtunkhwa	14,528	21,489	25,944	30,812	53,122
3	Khyber Pakhtunkhwa %	22	33	39	40	55



GAS (MMCFD) PRODUCTION IN KP SINCE 2013



LPG (Tons per day) PRODUCTION IN KP SINCE 2013



Potential of Oil & Gas in KP

- 16 TCF Gas
- 1.100 Billion Barrels of Oil

**Rs.100 Billion KP Revenue
(2020)**

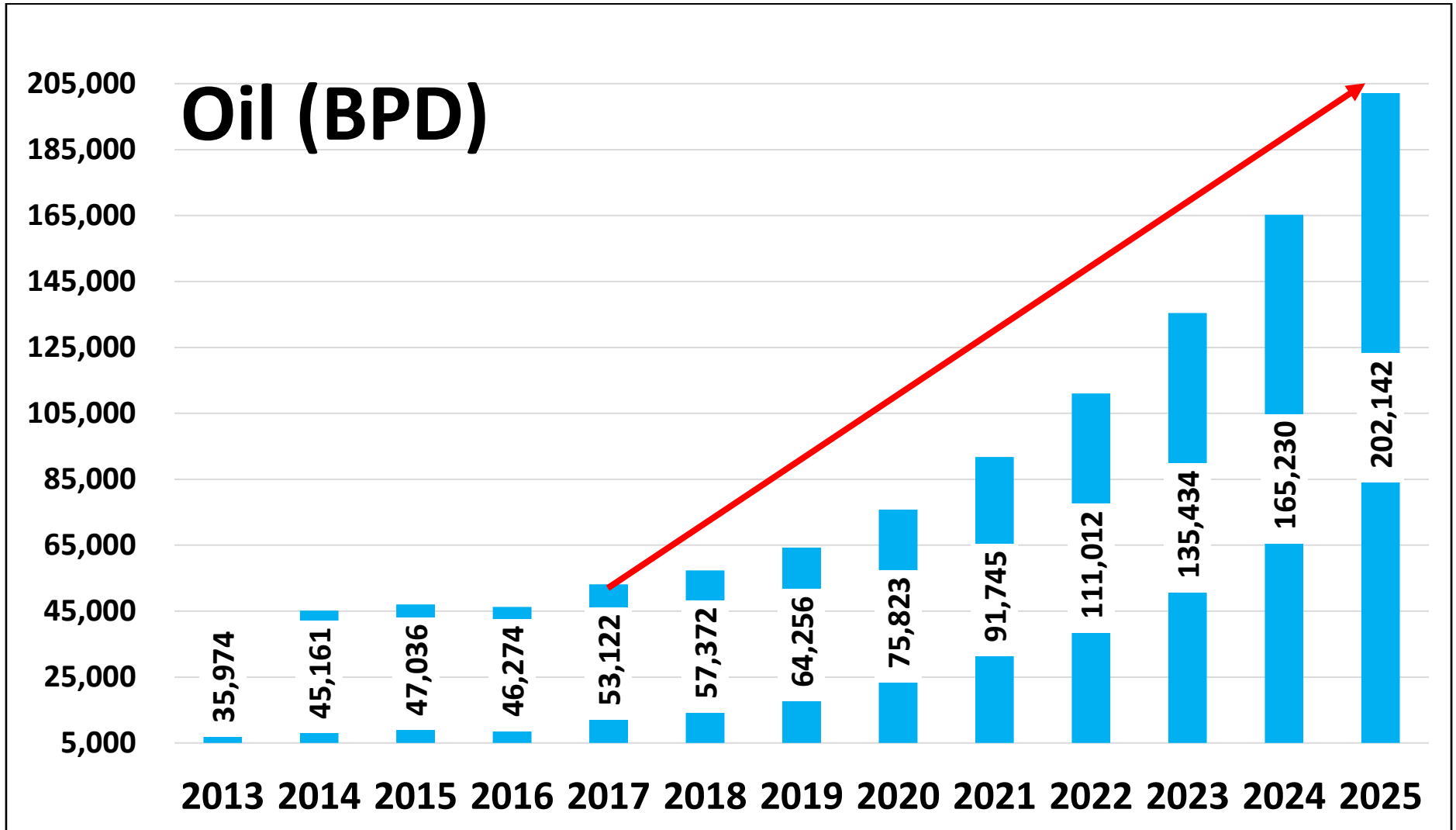
<u>Production</u>	<u>Units</u>	<u>2013</u>	<u>Jan-17</u>	<u>2025</u>
Crude Oil	Barrels per day (BPD)	30,000	53,322	200,000
Gas	Million Cubic Feet per day (MMCFD)	330	443	2,000
LPG	Tons per day (TPD)	10	550	3,000



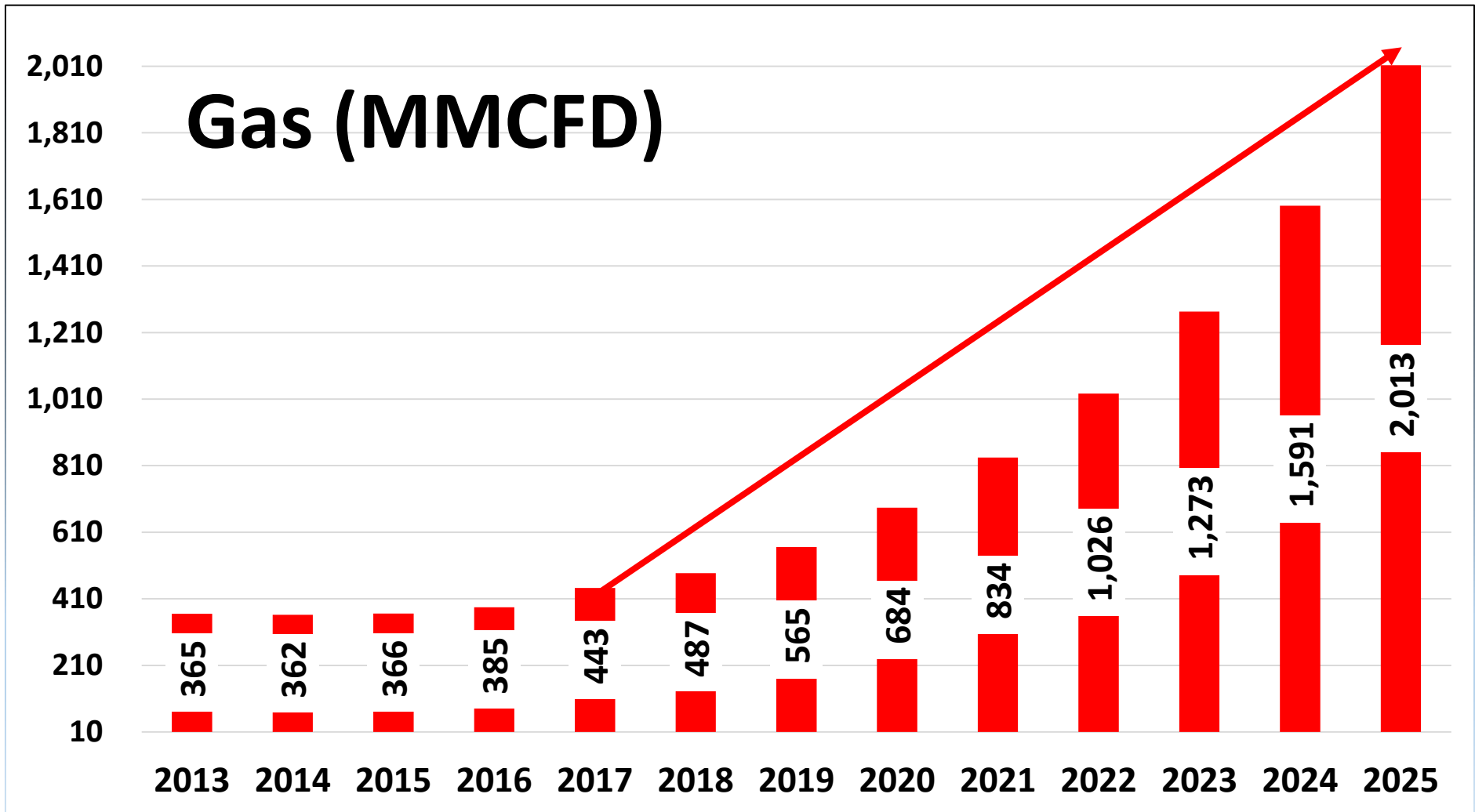
GOVERNMENT OF KHYBER PAKHTUNKHWA
KHYBER PAKHTUNKHWA OIL & GAS COMPANY LIMITED
(KPOGCL)

PRODUCTION FORECAST OF OIL, GAS & LPG
IN KHYBER PAKHTUNKHWA, PAKISTAN
(Conservative Scenario)

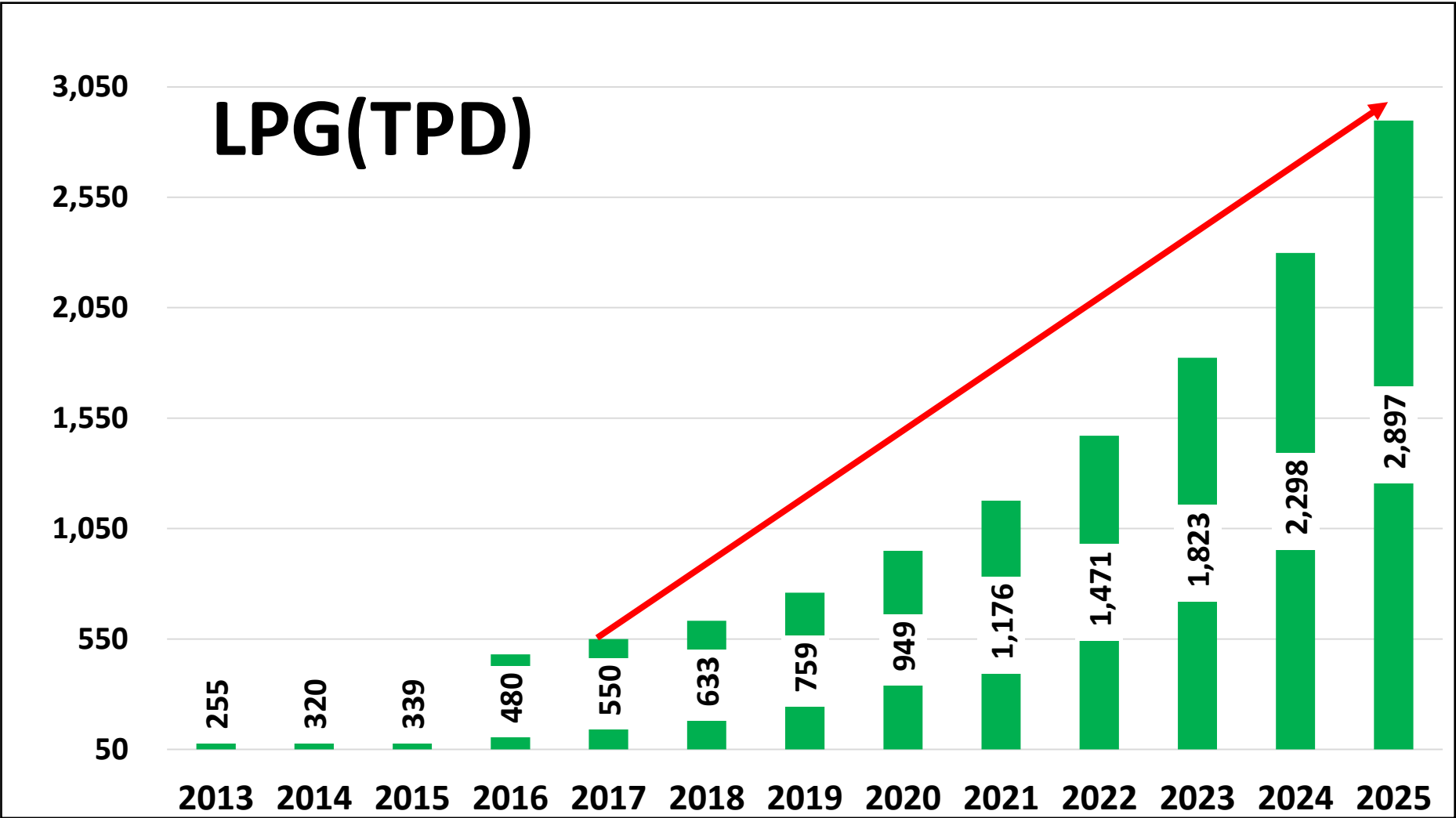
PRODUCTION FORECAST of OIL in KP (Conservative Scenario)



PRODUCTION FORECAST of GAS in KP (Conservative Scenario)



PRODUCTION FORECAST of LPG in KP (Conservative Scenario)



KPOGCL - COMPANY PROFILE

Government of Khyber Pakhtunkhwa, being cognizant of Oil & Gas Reserves and potential in the energy sector, established Khyber Pakhtunkhwa Oil & Gas Company Limited also known as KPOGCL. Incorporated in February 2013 as a corporate entity after the 18th Constitutional Amendment in Law, KPOGCL is entrusted with the responsibility of carrying out Oil & Gas Exploration & Production activities itself, but also to allure more foreign & local E&P Companies by ensuring them with the requisite logistics and technological support, thus paving path for fast track Exploration & Production activities in KP Province. KPOGCL, Being Provincial Governments patronized can very expediently act as an interface between the E&P Companies and all other government agencies. Therefore KPOGCL is actually performing the role of “One Window Operations”.

Under the Petroleum Policy – 2012, KPOGCL is a “Provincial Holding Company” and it is a facilitator to different National & International E&P Companies working in KPK Province. Further More, KPOGCL is also investing in Procurement of Technical Equipment that includes Drilling Rigs and Seismic Recorder for Data Acquisition – all aimed at reducing the energy deficit of Pakistan.

KPOGCL since inception is an active member of Pakistan Petroleum Exploration & Production Companies Association i.e. PPEPCA, Society of Petroleum Engineers i.e. SPE and Petroleum Institute of Pakistan i.e. PIP. KPOGCL is being managed by an independent Board of Directors, where the members are mostly experts from Private Sector with Mr. Raziuddin as Chief Executive Officer who has hands on experience for turning around today’s realities for Both Attock Refinery Limited & state owned OGDCL during his past leadership.

KPOGCL is determined to explore/ exploit the untapped Oil & Gas resources in the province through its own resources along with Farm Out/ Farm in Agreements in collaboration with other International & local E&P Companies.

Working Interest of KPOGCL in Joint Venture Blocks

SR #	Block Name	Operator	Working Interest %
1	Baratai Block	OGDCL	2.50%
2	Pezu Block	OGDCL	1.62%
3	Peshawar East Block	MPCL	1.81%
4	Kulachi Block	OGDCL	2.05%
5	Karak North Block	Tallahassee	2.50%
6	Paharpur Block	KUFPEC	2.37%

We Offer One Window Services



WHY INVEST IN KP PROVINCE

Khyber Pakhtunkhwa (KP) since recent past has become the newest and most attractive geological frontier in Pakistan. The petroleum prospect is high and so is the success rate. Today Khyber Pakhtunkhwa is producing more than 55% of the total oil produced in Pakistan, over 15% of total Gas and 25% of high value LPG. Pakistan is about to break the psychological barrier of 200,000 barrels per day, very soon, by increasing production in Khyber Pakhtunkhwa with discoveries by OGDCL in Nashpa and Tal by MOL Pakistan Oil & Gas Co. B.V. Pakistan's total Gas production is 4 Billion Cubic feet/day and LPG's production is 2,500 tons/day. Pakistan being an acute energy deficit country absorbs all the Oil, Gas or LPG that is indigenously produced. This situation is expected to continue for many decades. Therefore, off-take is quick in terms of contracts and physical infrastructure. Gas transmission and distribution infrastructure is one of the largest and state of the art. 18% of Pakistan's population (32 Million out of 180 Million) has piped gas supply to their houses. Commercial and industrial sectors are also connected with gas infrastructure. Refining capacity is over 17 Million tons per annum and increasing with other key partners wanting to invest in Pakistan. LPG bottling plants are expanding and exhaustive Investment in Oil, Gas & LPG infrastructure has made transportation from Well Head to consumer a source of satisfaction for investors in the Exploration sector.

Fortunately, Pakistan has an infinite pool of talent and technical professionals and technicians. Due to close proximity to the Middle East, over 100,000 Pakistanis are working in Oil and Gas sector at any given point in time and this has been the case since 1973. A number of International and National Service Companies like Weatherford, Halliburton & Schlumberger provide confidence to investors. A number of international E&P companies have been active since 1947 thus providing necessary transfer of knowledge and technologies.

INCENTIVES & ASSISTANCE BY GOVERNEMENT OF PAKISTAN

As briefly stated above, the latest Petroleum Policy-2012, a one window facility, offers tremendous incentives hence provides high returns to investors as operators and/or non-operators JV partners. For Example, the gas well head price in Khyber Pakhtunkhwa is set at US\$ 6.60 per million BTU when Crude Oil is US\$ 110/Barrel along with the well head price of Crude Oil is bench marked with international Platts. LPG is linked with ARAMCO Contract Price (CP), thus, making well head not only transparent and unambiguous without any government intervention but also US Dollar based.

The Government of Khyber Pakhtunkhwa being cognizant of the opportunities in Oil and Gas Exploration and Production sectors has developed systems to facilitate foreign investment in Khyber Pakhtunkhwa. It has formed an Energy Apex Committee (EAC) chaired by Honorable Chief Minister, Government of Khyber Pakhtunkhwa. This high powered committee irons out any and all impediments that a foreign investor may encounter. The provincial government has gone one step further by establishing Khyber Pakhtunkhwa Oil & Gas Company Ltd (KPOGCL) which has been involved in Exploration as well as facilitating investors in Geological & Geophysical studies, feasibilities, data mining, seismic data acquisition, interpretation, well planning, drilling, well completion, EPC and Production.

What KPOGCL Is Offering

Non-Operatorship

KPOGCL is offering 5% to 49% non-operatorship Joint Venture in 28 Concession Blocks of KPK Province with IRR forecasted between the range 30% to 45% considering the rich potential of the province & geological studies. These concessions are owned by both Public and Private sector companies, working under Petroleum Concession Agreement.

Operatorship

For those E&P companies willing to be the Operators, KPOGCL offers 7 blocks which are solely owned by KPOGCL under the Petroleum Policy 2012 arrangement. Interested parties can apply for field studies for competitive bidding.

E&P Services

Increasing demand of Oil & Gas exploration and production provides great opportunities to services companies in Khyber Pakhtunkhwa. We invite you to bring seismic data recorder, drilling rigs (2,500 HP & 3,000 HP), wire-line logging systems and other auxiliary services to Khyber Pakhtunkhwa.

The background of the slide is a photograph of an oil rig at sunset. The sun is low on the horizon, creating a bright, hazy glow that filters through the clouds. The rig's structure is silhouetted against this light. The overall color palette is dominated by soft oranges, yellows, and greys.

KPOGCL

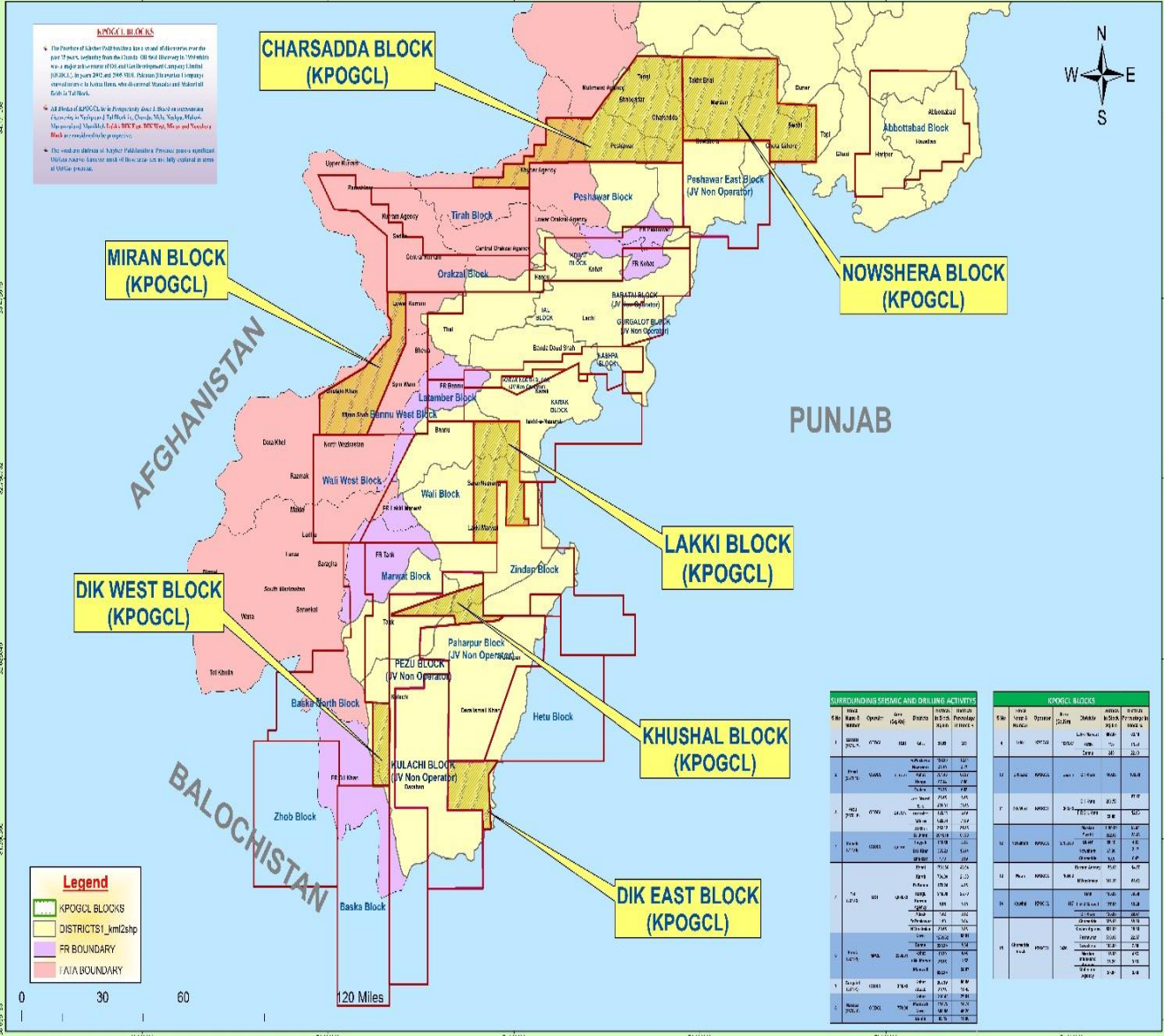
**Exploration
BLOCKS**



CONCESSION BLOCKS IN KHYBER PAKHTUNKHWA

KPOGCL BLOCKS

- The Province of Khyber Pakhtunkhwa has a total oil reserves of the order 17 billion barrels from the Charsadda Oil Field discovered in 1999 which was a major oil reserve in the world and the first oil field in the country. It is situated in the district of Peshawar, Khyber Pakhtunkhwa. The oil field is situated in the district of Peshawar, Khyber Pakhtunkhwa. The oil field is situated in the district of Peshawar, Khyber Pakhtunkhwa.
- All blocks of KPOGCL are in the province of Khyber Pakhtunkhwa. The oil field is situated in the district of Peshawar, Khyber Pakhtunkhwa. The oil field is situated in the district of Peshawar, Khyber Pakhtunkhwa.
- The main oil field of Khyber Pakhtunkhwa Province is situated in the district of Peshawar, Khyber Pakhtunkhwa. The oil field is situated in the district of Peshawar, Khyber Pakhtunkhwa.



SURROUNDING FORMIC AND DAILING ACTIVITIES										
Block	Area (km ²)	Operator	Area (km ²)	Operator	Area (km ²)	Operator	Area (km ²)	Operator	Area (km ²)	Operator
1	10000	PTCL	10000	PTCL	10000	PTCL	10000	PTCL	10000	PTCL
2	10000	PTCL	10000	PTCL	10000	PTCL	10000	PTCL	10000	PTCL
3	10000	PTCL	10000	PTCL	10000	PTCL	10000	PTCL	10000	PTCL
4	10000	PTCL	10000	PTCL	10000	PTCL	10000	PTCL	10000	PTCL
5	10000	PTCL	10000	PTCL	10000	PTCL	10000	PTCL	10000	PTCL
6	10000	PTCL	10000	PTCL	10000	PTCL	10000	PTCL	10000	PTCL
7	10000	PTCL	10000	PTCL	10000	PTCL	10000	PTCL	10000	PTCL
8	10000	PTCL	10000	PTCL	10000	PTCL	10000	PTCL	10000	PTCL
9	10000	PTCL	10000	PTCL	10000	PTCL	10000	PTCL	10000	PTCL
10	10000	PTCL	10000	PTCL	10000	PTCL	10000	PTCL	10000	PTCL

KPOGCL BLOCKS										
Block	Area (km ²)	Operator	Area (km ²)	Operator	Area (km ²)	Operator	Area (km ²)	Operator	Area (km ²)	Operator
1	10000	PTCL	10000	PTCL	10000	PTCL	10000	PTCL	10000	PTCL
2	10000	PTCL	10000	PTCL	10000	PTCL	10000	PTCL	10000	PTCL
3	10000	PTCL	10000	PTCL	10000	PTCL	10000	PTCL	10000	PTCL
4	10000	PTCL	10000	PTCL	10000	PTCL	10000	PTCL	10000	PTCL
5	10000	PTCL	10000	PTCL	10000	PTCL	10000	PTCL	10000	PTCL
6	10000	PTCL	10000	PTCL	10000	PTCL	10000	PTCL	10000	PTCL
7	10000	PTCL	10000	PTCL	10000	PTCL	10000	PTCL	10000	PTCL
8	10000	PTCL	10000	PTCL	10000	PTCL	10000	PTCL	10000	PTCL
9	10000	PTCL	10000	PTCL	10000	PTCL	10000	PTCL	10000	PTCL
10	10000	PTCL	10000	PTCL	10000	PTCL	10000	PTCL	10000	PTCL

KPOGCL EXPLORATION BLOCKS FARM OUT PROPOSALS

Blocks	CAPEX Planned USD\$ Million	Farm Out Share %	IRR % Forecast
Lakki Block	55	49 %	29
Nowshera Block	42	49 %	27
DIK East Block	41	49 %	28
DIK West Block	40	49 %	27
Miran Block	45	49 %	29
Khushal Block	49	49 %	25
Charsadda Block	47	49 %	25



KHYBER PAKHTUNKHWA OIL & GAS COMPANY LIMITED
(KPOGCL)

(KP Government Fully Owned & Provincial Holding Company)

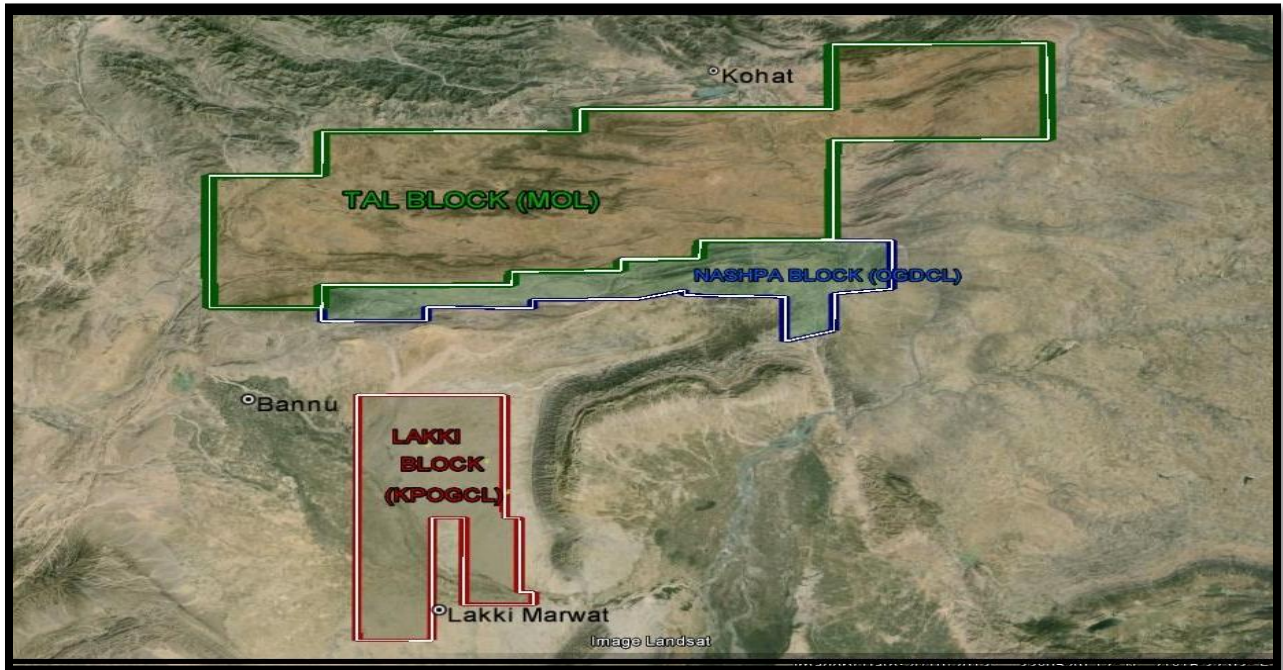


**KPOGCL IS SEEKING EXPRESSIONS OF INTEREST FROM
NATIONAL/ INTERNATIONAL E&P COMPANIES
INTERESTED IN PARTICIPATING AS JOINT VENTURE
PARTNERS WITH KPOGCL**

IN

**LAKKI EXPLORATION BLOCK
(3270-9)**

KHYBER PAKHTUNKHWA, PAKISTAN



3rd Floor, Ali Tower, Opposite Custom House, University Road, Peshawar, Pakistan
Tel: +92-91-9216283 Fax: +92-91-9216295
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Brief on Lakki Block

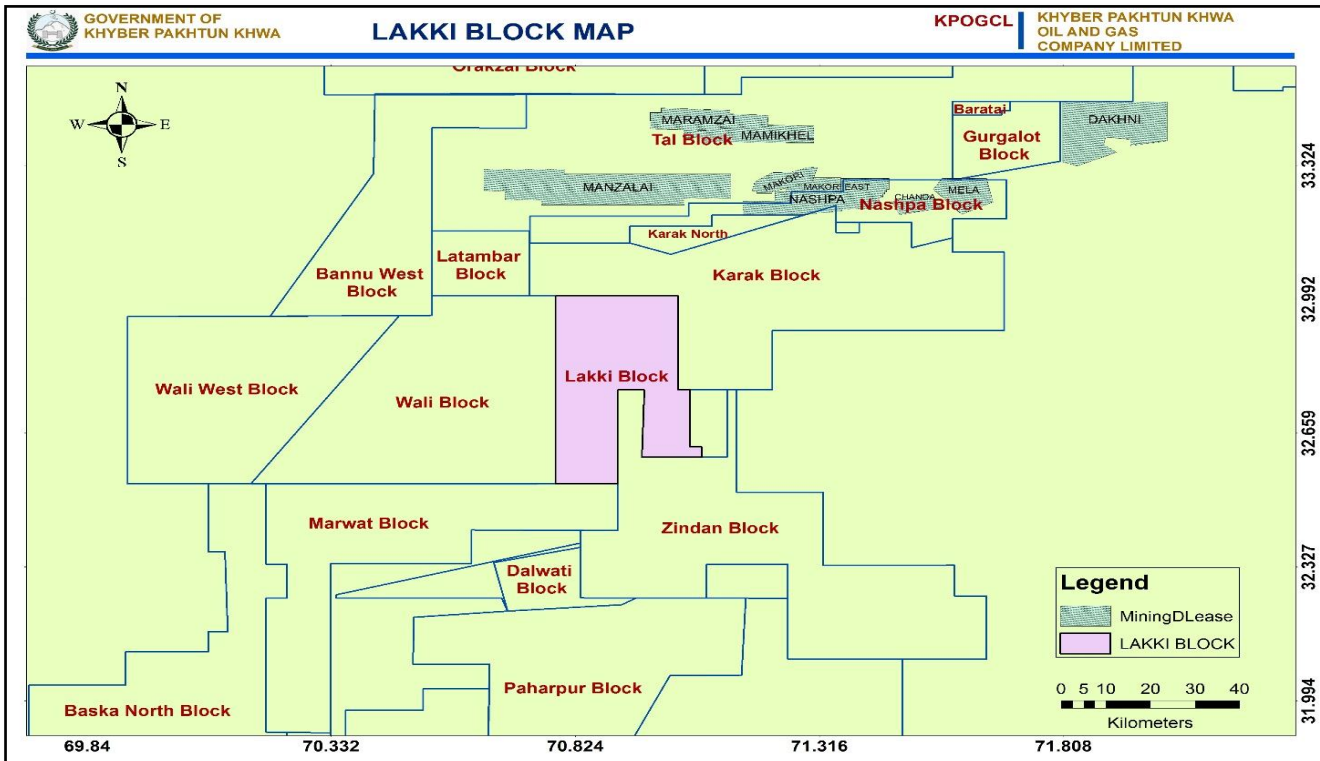
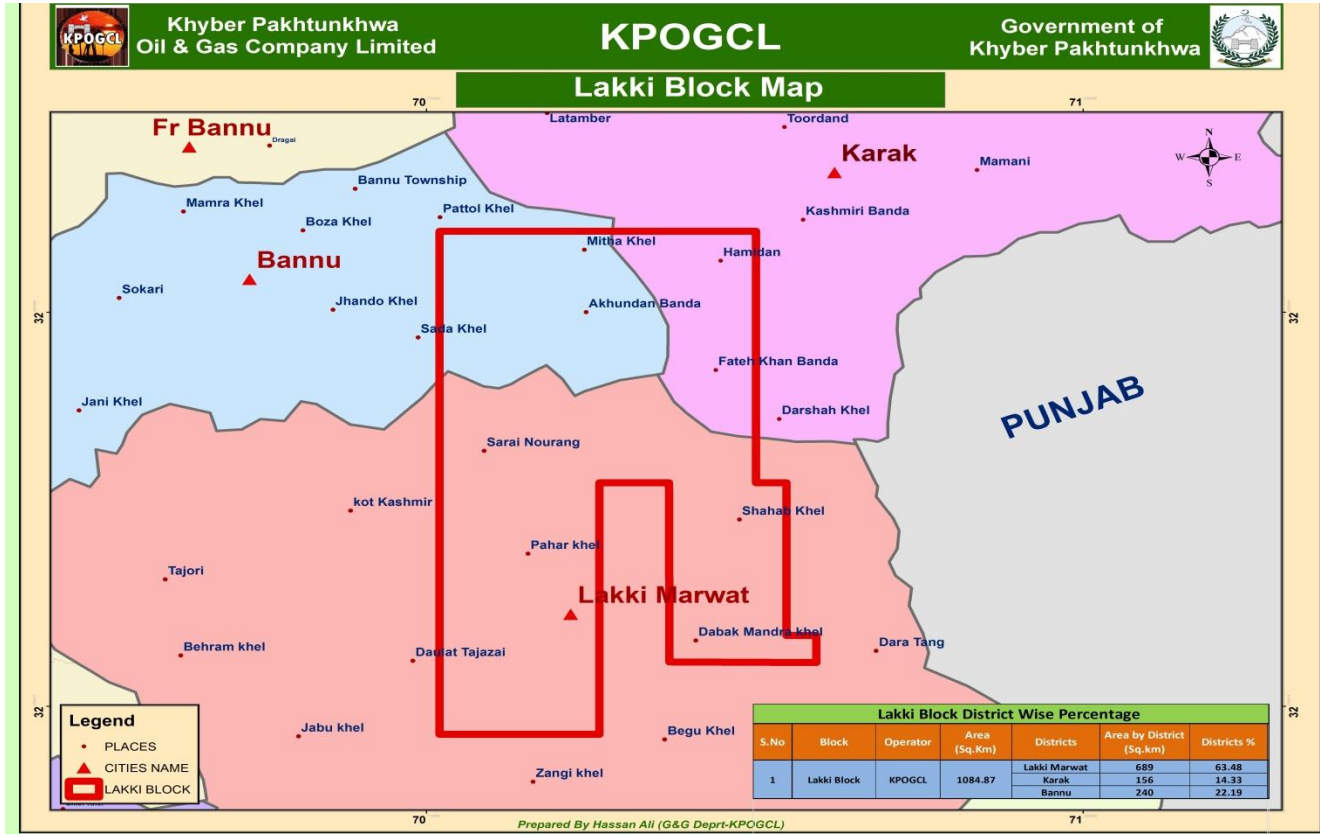
Kohat-Bannu Basin has proven to be a potentially viable Petroleum reservoir, ranging in age from Infra-Cambrian to Miocene rocks. Lakki Exploration Block (3270-9) having an area of 1084.87 Sq. km, is located in Lakki Marwat (63.48%), Karak (14.33%) and Bannu (22.19%) districts of Khyber Pakhtunkhwa, Province of Pakistan. The Block falls in Zone-I. Based on surrounding discoveries in Kohat-Bannu basin i.e. Chanda, Mela, Nashpa, Makori, Maramzai and Mamikhel, Lakki Block is considered to be a profitable project.

The Block is located about 200 Kilometers South-west of Peshawar and 300 km southwest of Islamabad. It is easily approachable by a network of highways and concrete roads from District Peshawar, Bannu, Karak and Lakki Marwat.

Investment Opportunity in Lakki Block

49% farming out opportunity to leading E&P companies to facilitate KPOGCL for Geological, Geophysical and Engineering studies along with initial 1st Exploratory Wells Drilling program and further on production set-up. Work has already been started since September 2016. Capex spending for this program is estimated at USD 55 million which includes the studies along with the initial well.

Location Map of Lakki Block



Salient Features of Lakki Block

- Situated in already proven Kohat-Bannu Basins, which is currently producing 55 % of overall Pakistan's Production of Oil;
- Overall drilling success ratio is 1:2.8 in this region;
- IRR is estimated in the vicinity of 35%-40% considering reservoir reserves;
- Full proof security available with other necessary security clearances for expats working in the province along with all logistics support;
- Full commitment to facilitate in Exploration & Production activities in shape of technical and Non-Technical.

Economic Modeling & Financial Indicators

The Lakki Block project economics has been calculated on a 15 year projected time frame, which is a norm for Khyber Pakhtunkhwa and Potwar basins. The IRR over this period is expected to be 29.4%, whereas the NPV is US\$ 25 million at a discount rate of 15%. Key assumptions are taken for being at a sound economical state are as follow: This economic calculation based on a sustained rate from day 1 till the end of 15 years is not in line with the production of any field.

- Petroleum Policy 2012 will be in vogue.
- 10% Probability of Success in Oil production of 4,000 Barrels Per Day but only 1/3 of the production (i.e. 1400 BPD) has been taken for economic analysis. Lowered production is assumed to be on a very conservative side.
- 10% Probability of Success of Gas production of 25 MMCFD but only 1/3 of production (8.75 mmcf) is taken for economic analysis.
- LPG (Liquefied Petroleum Gas or Cylinder gas) production not included in the economic analysis. Although Khyber Pakhtunkhwa Oil and Gas is very rich is Pentane/Butane (LPG)
- Success ratio of 35% assumed.

Oil prices are assumed at \$40/Barrel and Gas price \$3/MMBTU for the economic analysis, which is highly conservative. Although KPOGCL has taken low oil prices, it should rise by 2018. At one time the price of oil was over \$ 100 per barrel and gas prices were \$6 per MMBTU.

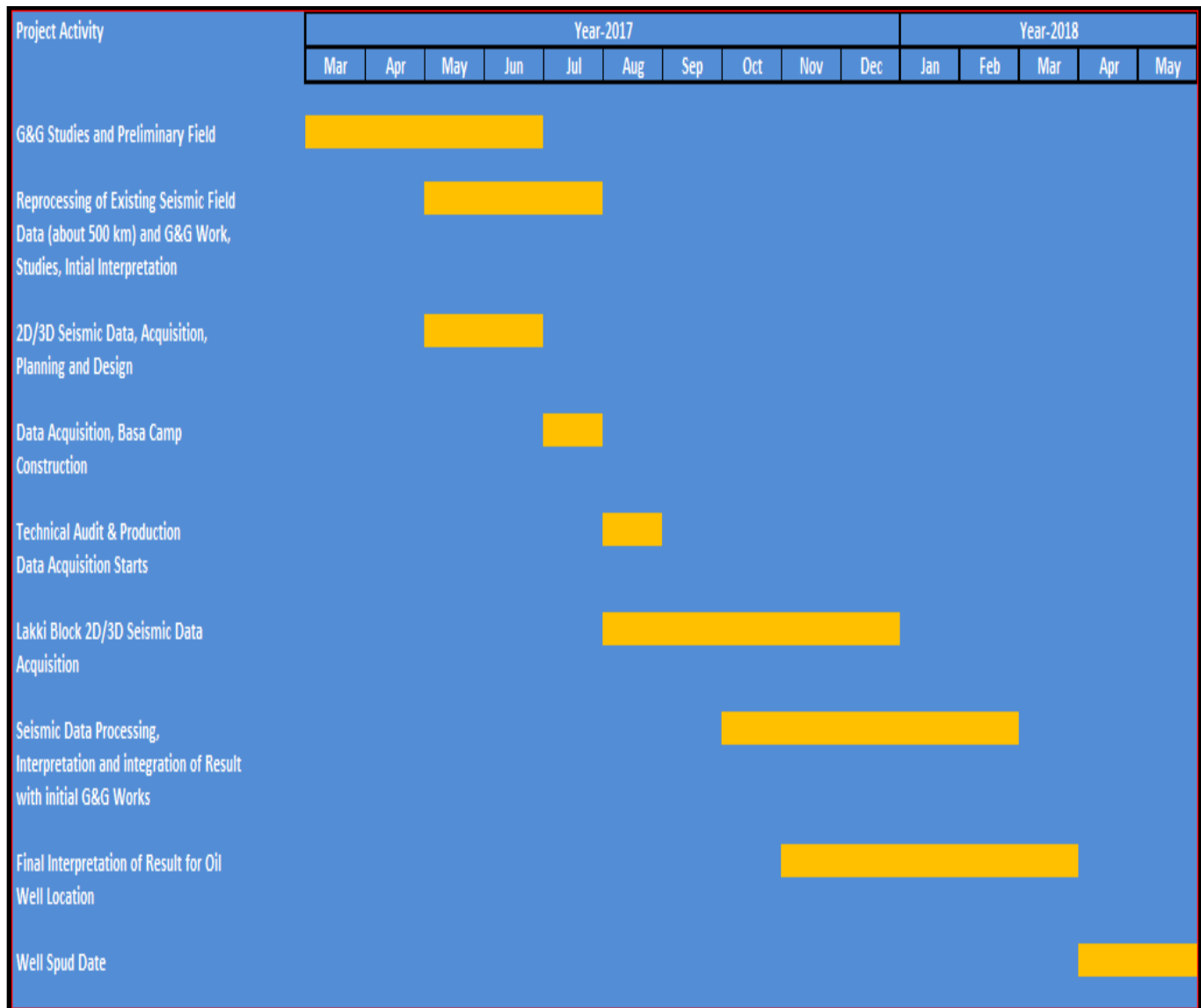
Lakki Block Project Economics for 15 years	US \$ Million
Revenue	439
Gas	145
Oil	294
CAPEX	55
OPEX	57
Royalty	55
Tax	131
Total Expenses	297
Net Cash Flow	142
Present Value @ 10%	45
Present Value @ 12.5%	33
Present Value @ 15%	25
IRR	29.4%
NPV	25

~ Current indicators does not include LPG's Production

Project Highlights

- Oil and Gas producing fields nearby
- Block area: 1084.87 Sq. km
- Capital Expenses \$ 55 Million (3 years)
- Surface Facilities Cost \$ 10 Million (4th year @ production start)
- Expected Oil: 1400/ 4000 BBL/D (35% taken for IRR/NPV)
- Expected Gas: 09/ 25 MMSCFD (35% taken for IRR/NPV)
- Expected LPG: 100 Tons/D (not included in economics)
- IRR: 29.4% | NPV: MM US\$ 25 Million @ 15% Discount Rate
- E&P life-cycle ~15 Years

Work Plan for Lakki Block



Lakki Block Vintage Data

1. Available Seismic Lines

S.No	Line Name	LKM	S.No	Line Name	LKM
1	784-BU-01	25.2	21	794-BU-14	13.9
2	784-BU-02	31.6	22	794-BU-15	23.2
3	784-BU-08	42.9	23	794-BU-16	26.9
4	794-BU-01Ext	7.9	24	794-BU-16Ext	3.6
5	794-BU-18	8.6	25	794-BU-17	14.4
6	794-BU-20	24	26	794-BU-19	18.4
7	794-BU-21	19.8	27	PC-89-9205	10.53
8	794-BU-22	28.4	28	PC-89-9207	9.54
9	794-BU-23	41.7	29	PC-89-9203	20.97
10	794-BU-24	20.6	30	PC-88-9179	18
11	794-BU-25	31.3	31	PC-88-9177	12.2
12	814-LK-31	14	32	PC-88-9175	13.8
13	915-MWI-83	19	33	PC-88-9178	27
14	BLOCK35-17	18.45	34	PC-88-9176	13.6
15	BLOCK35-18	22.6	35	73-BU-7	15.5
16	BLOCK35-19	14.1	36	73-BU-8	10.7
17	BLOCK35-33	17.95	37	73-BU-9	39.7
18	814-LK-40	16.8	38	794-BU-27A	20.2
19	814-LK-41	8.6	39	PC-88-9185	16.7
20	814-LK-42	10		Total Kms	752.34

2. Available Wells Data and Reports

S.no	Well Name
1	KundiX-01
2	IsaKhel-01
3	Chonai-01
4	Kurram-01
5	Pezu-01
6	Marwat-01

Reservoir Rocks

Reservoir rocks include Lockhart, Datta, Lumshiwai and Chichali Formation as primary reservoirs while Tobra and Khewra Sandstone are considered as secondary reservoirs. In this area these petroleum systems are already producing Oil & Gas. All 4 primary reservoir rocks are promising systems and have delivered oil & gas in Khyber Pakhtunkhwa and Potwar. This has increased confidence level of the KPOGCL professionals and BOD, which also comprises of geologists and experienced professionals.

Seal Rocks

Seal rocks; include Bahadur Khel salt and intra-formational shale.

Traps

Existence of structural traps

An Effective petroleum system, as proven by several oil and Gas seepages and discoveries, has increased overall confidence level of the professionals. Recent (August 2016) geological mapping has further enhanced the confidence level of KPOGCL. Negotiation with potential JV partners is being undertaken for Farming out 30 percent working interest in the Block.

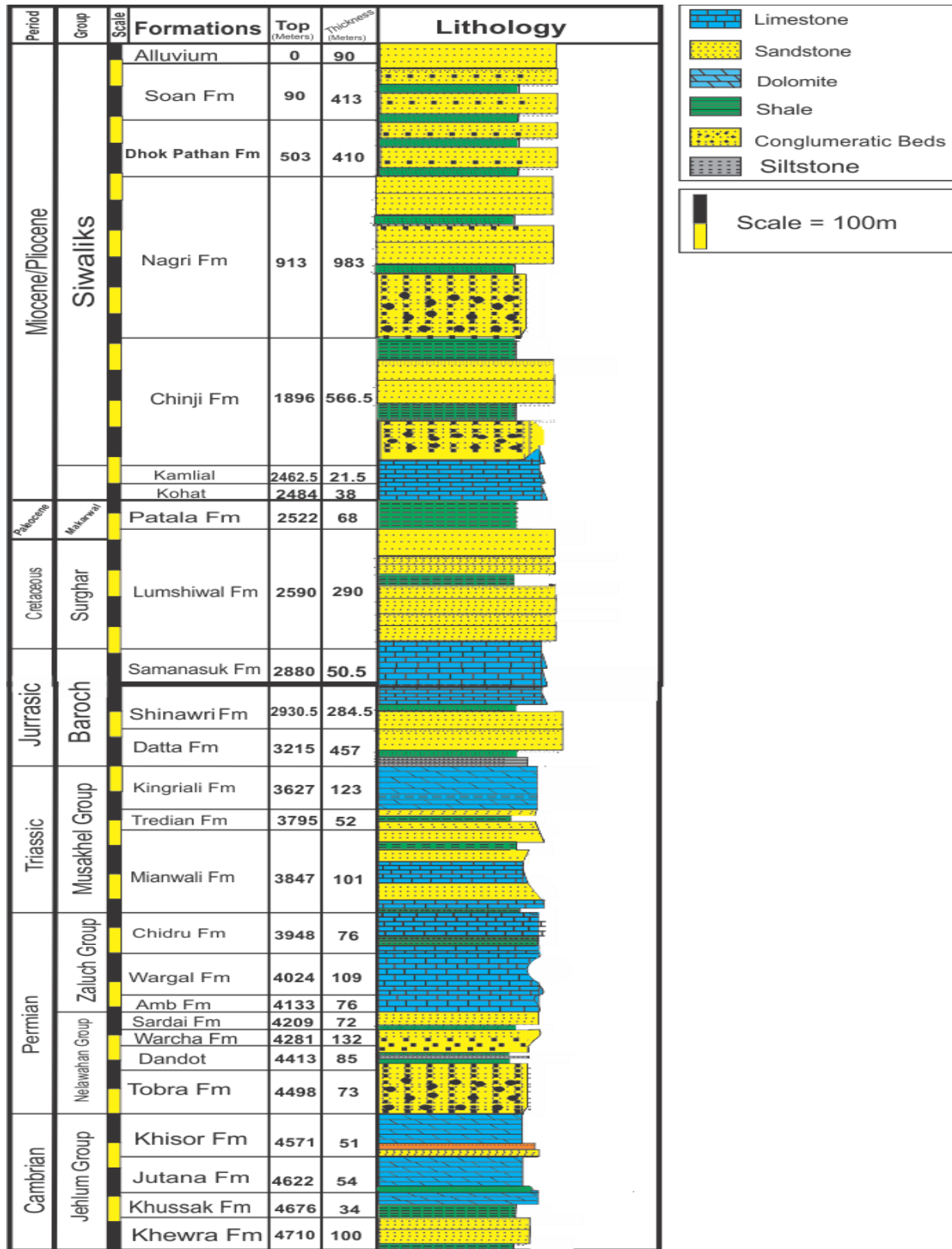
Lakki Block Petroleum System

Rock	0.50 Encouraging	0.60 Very Encouraging	0.70 Favorable	0.80 Very Favorable
Source Rock		x		
Reservoir Rock				x
Seal Rock		x		
Trap Rock	x			

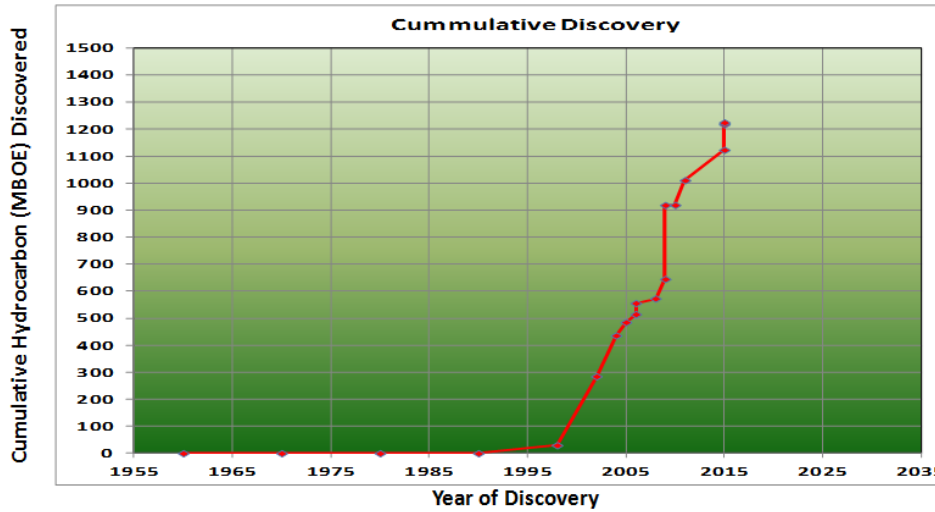
$$\text{Probability of Success (POS)} = 0.6 \times 0.8 \times 0.6 \times 0.5 = 14.4 \%$$

Based on the information gathered during Geological Fieldwork and data review, the probability Of Success has been estimated to be over 14%.

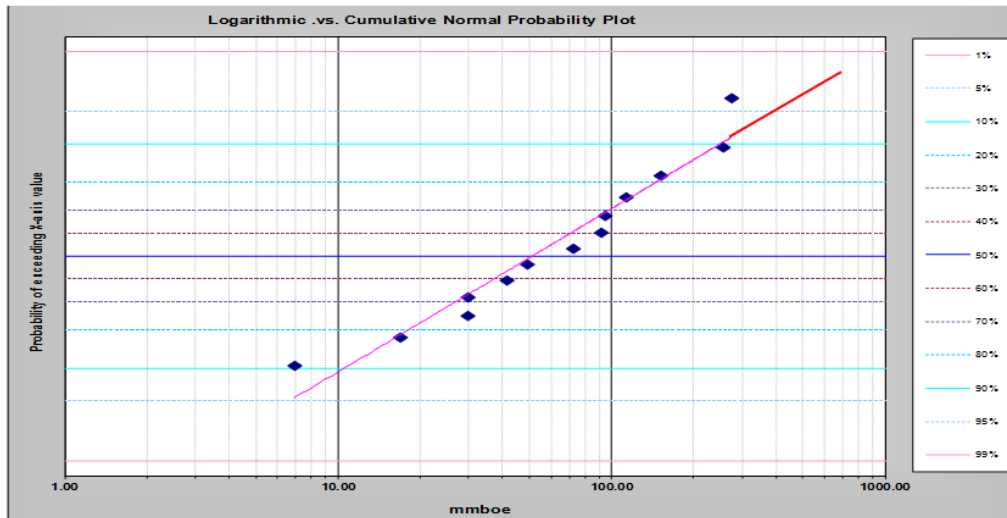
Generalized Stratigraphic Column



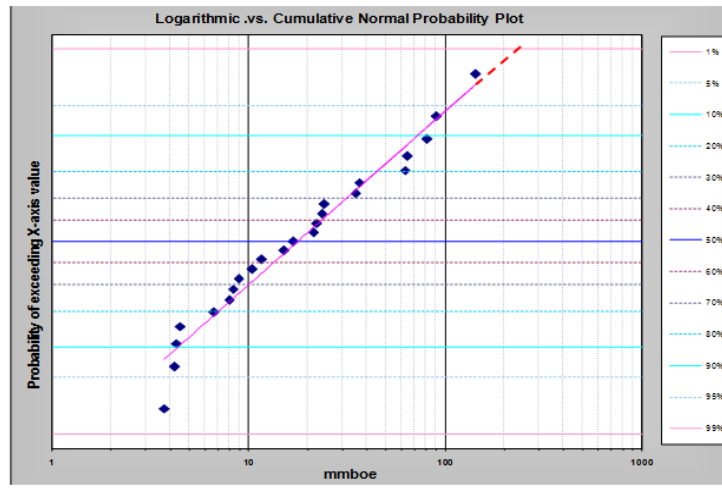
Trans Indus Basin, Creaming Curve by Year, Cumulative discovered H / C



TRI Basin, Field Size Distribution plot vs probabilities of finding expected field size



Potwar Basin, Field Size Distribution plot vs probabilities of finding expected field size





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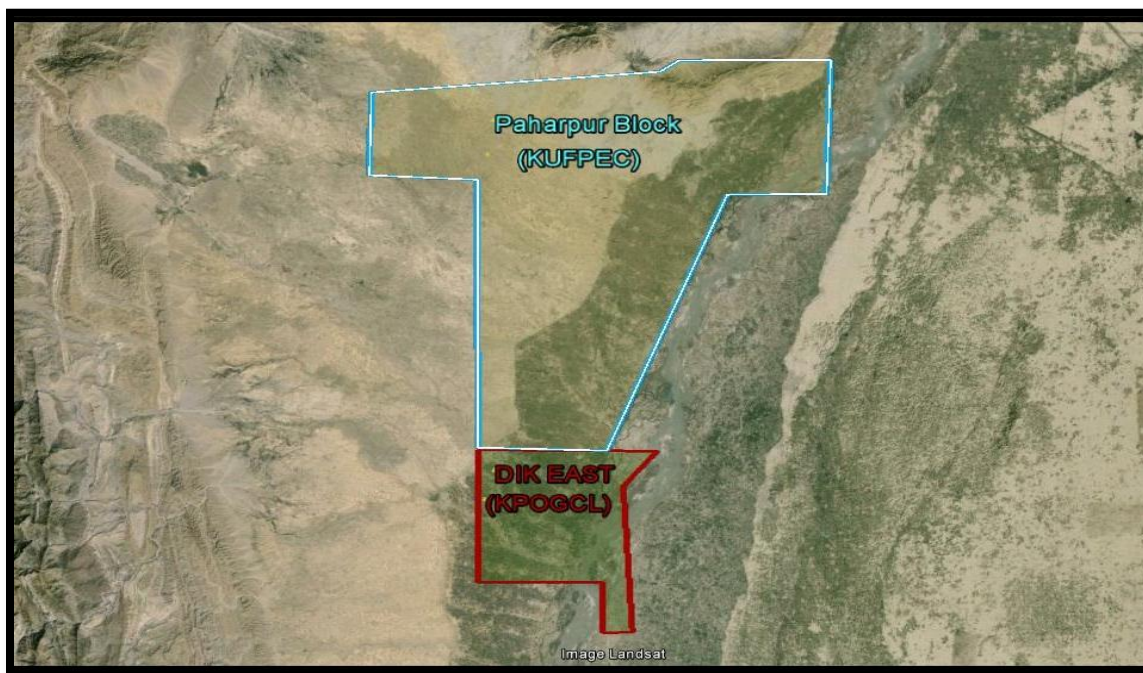


**KPOGCL IS SEEKING EXPRESSIONS OF INTEREST FROM
NATIONAL/ INTERNATIONAL E&P COMPANIES
INTERESTED IN PARTICIPATING AS JOINT VENTURE
PARTNERS WITH KPOGCL**

IN

DIK EAST EXPLORATION BLOCK

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Brief on DIK Exploration Block

DIK East Exploration Block has an area of 446 Sq. km, located in D.I Khan, District of Khyber Pakhtunkhwa Province, Pakistan, (Figure 1). The Block lies prospectively in Zone-I (Figure 2). Based on surrounding discoveries in Kohat-Bannu basin i.e. Chanda, Mela, Nashpa, Makori, Maramzai and Mamikhel, DIK East Block is considered a successful Project.

The Block is located about 300 Kilometers from Peshawar towards South West and 500 km South West from Islamabad. It has access via Indus Highway, where up-to-date facilities are available due to oil & gas exploration and production activities/discoveries in nearby areas.

Investment Opportunity in DIK East Block

Opportunities available for both national and international E&P Companies, who are interested for Joint Venture in the Block. Farming out its 49% working interest to other E&P Companies to assist KPOGCL regarding Geological, Geophysical and Engineering studies and an initial 1st Exploratory wells drilling program. Work has already started in 2017 leading to the drilling activities in 2018-19. Full program cost (Capex) is estimated at US\$ 41 million.

- **Salient Features of DIK East** Situated in already proven Kohat-Bannu Basins, which is currently producing 55 % of overall Pakistan's Production of Oil;
- Overall drilling success ratio is 1:2.8 in this region;
- IRR is estimated in the vicinity of 35%-40% considering reservoir reserves;
- Full proof security with other necessary security clearances for expats working in the province along with all logistics support;
- Full commitment to facilitate in Exploration & Production activities in shape of technical and Non-Technical.

Economic Modeling & Financial Indicators

The DIK East Block project economics has been calculated on a 15 year projected time frame, which is a norm for Khyber Pakhtunkhwa and Potwar basins. The IRR over this period is expected to be 27.8 %, whereas the NPV is US\$ 12 million at a discount rate of 15%. Key assumptions are taken for being at a sound economical state are as follow: This economic calculation based on a sustained rate from day 1 till the end of 15 years is not in line with the production of any field.

- Petroleum Policy 2012 will be in vogue.
- 10% success probability of Oil production of 3000 Barrels Per Day but only 1/3 of the production (i.e. 950 BPD) has been taken for economic analysis. Lowered production is assumed to be on a very conservative side.
- 10% success probability of Gas production of 25 MMCFD but only 1/3 of production (8.75 mmcf) is taken for economic analysis.
- LPG (Liquefied Petroleum Gas or Cylinder gas) production not included in the economic analysis. Although Khyber Pakhtunkhwa Oil and Gas is very rich is Pentane/Butane (LPG)
- Success ratio of 35% assumed.

Oil prices are assumed at \$40/Barrel and Gas price \$3/MMBTU for the economic analysis, which are highly conservative. Although KPOGCL has taken low oil prices but the prices should rise by 2018. At one time the price of oil was over \$ 100 per barrel and gas prices were \$6 per MMBTU.

DIK East Block Project Economics for 15 years	US \$ Million
Revenue	263
Gas	116
Oil	147
CAPEX	41
OPEX	31
Royalty	33
Tax	80
Total Expenses	185
Net Cash Flow	78
Present Value @ 10%	23
Present Value @ 12.5%	16
Present Value @ 15%	12
IRR	27.8 %
NPV	12

~ Current indicators does not include LPG's Production

Project Highlights

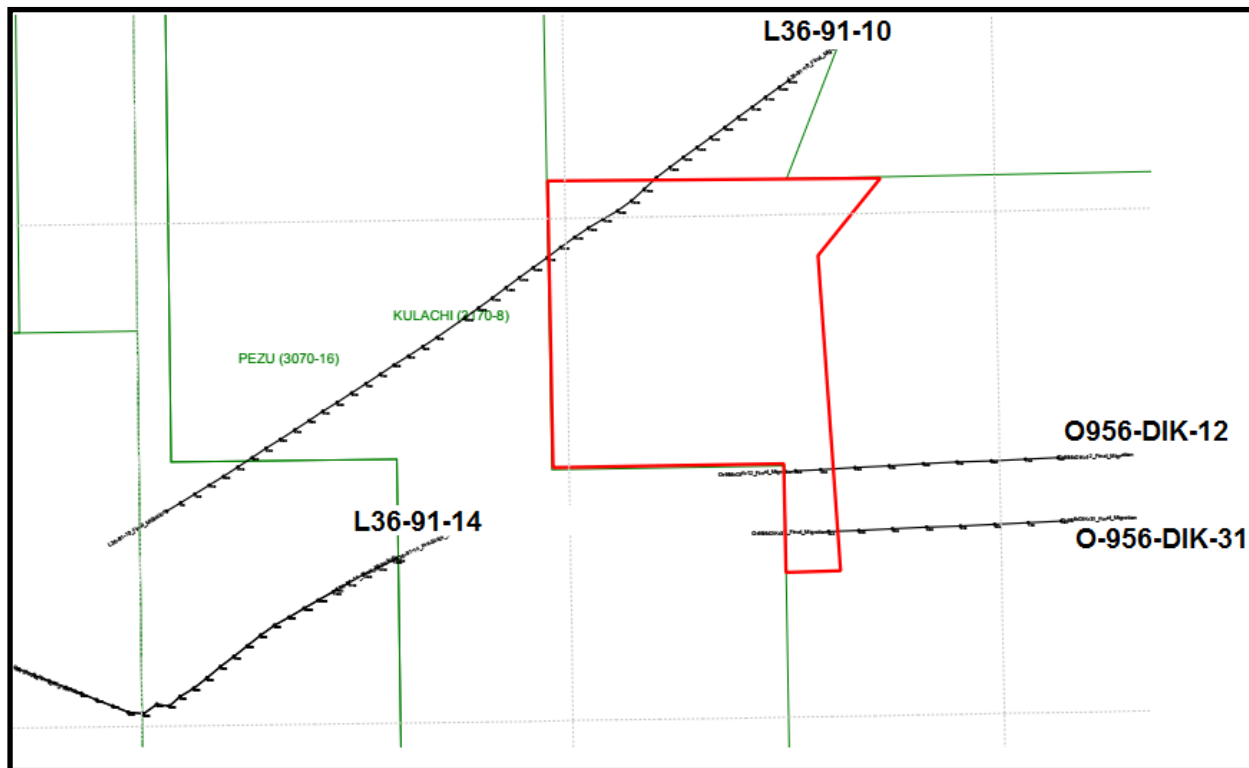
- **Oil and Gas producing fields nearby**
- **Block area: 446 Sq. km**
- **Capital Expenses \$ 41 Million (3 years)**
- **Surface Facilities Cost \$ 05 Million (4th year @ production start)**
- **Expected Oil: 700/ 2000 BBL/D (35% taken for IRR/NPV)**
- **Expected Gas: 07/20 MMSCFD (35% taken for IRR/NPV)**
- **Expected LPG: 100 Tons/D (not included in economics)**
- **IRR: 27.8% | NPV: MM US\$ 12 Million @ 15% Discount Rate**
- **E&P life-cycle ~15 Years**

DIK East Block Vintage Data

1. Available Seismic Line

S.No.	Survey Name	Line Segment Name
1	LASMO-B36-1991	L36-91-10
2	LASMO-B36-1991	L36-91-14
3	OGDC-DIK-1995	O-956-DIK-12
4	OGDC-DIK-1995	O-956-DIK-31

DIK East Base Map



Petroleum System of the Area

The Petroleum system of DIK East Block is based on Ramak, Savi Ragha wells and existing Mughal Kot Oil Seepages.

Source Rocks

Primary Source: Sembar, Darazinda and Goru Fms.

Secondary Source: Lumshiwai Formation.

Reservoir Rocks

Chilton, Pab, Mughalkot, Parh, Ranikot, Dunghan, Habib Rahi & Pirkoh are the regional Reservoirs in the area.

Seal Rocks

Pab, Upper Rani Kot, Eocene Ghazij, Sirki and Darazinda Formations are the regional seals in the area.

Traps

Proterozoic rifting, Drape features, Stratigraphic pinch outs would be the potential traps.

	0.50 Encouraging	0.60 Very Encouraging	0.70 Favorable	0.80 Very Favorable
Source Rocks			X	
Reservoir Rocks			X	
Seal Rocks		X		
Traps	X			

$$\text{Probability of Success} = 0.7 \times 0.7 \times 0.6 \times 0.5 = 14.7 \%$$

Generalize Stratigraphic Column

AGE	Northen Sulaiman Range	Bhittani Range	Khisor- Marwat
PLIESTOCENE	CHAUDWAN	MALAGAN	SIWALIK GROUP
PLIOCENE	LITRA VIHOWA	DHOK PATHAN NAGRI CHINJI	
MIOCENE OLIGOCENE	CHITRAWATA		
EOCENE	KIRTHAR GROUP		
PALEOCENE	BASKA SHALE GHAZU FM.		SURGHAR LIMESTONE
	DUNGHAN FM.		LOCKHART FM.
CRETACEOUS	RANIKOT FM.	HANGU FM.	
	PAB FM. MUGHAL KOT FM. PARH FM. SEMBAR FM. CHILTAN FM.	KAWAGARH FM. LUMSHIWAL FM. CHICHALI FM.	
	JURASSIC	LORALAI FM	SAMANA FM. SHINAWARI FM. DATTA FM.
KINGRIALI FM. TREDIAN FM. MIANWALI FM.			
TRIASSIC	WUGAI FM		
PERMIAN	?-?	CHIDRU FM. WARGAL FM. AMB FM.	
	?-?	SARDHAI FM. WARCHA FM. DANDOT FM. TOBRA FM.	
Ondovician- Carboniferous			
CAMBRIAN			
PRE-CAMBRIAN	SALT RANGE FORMATION.		



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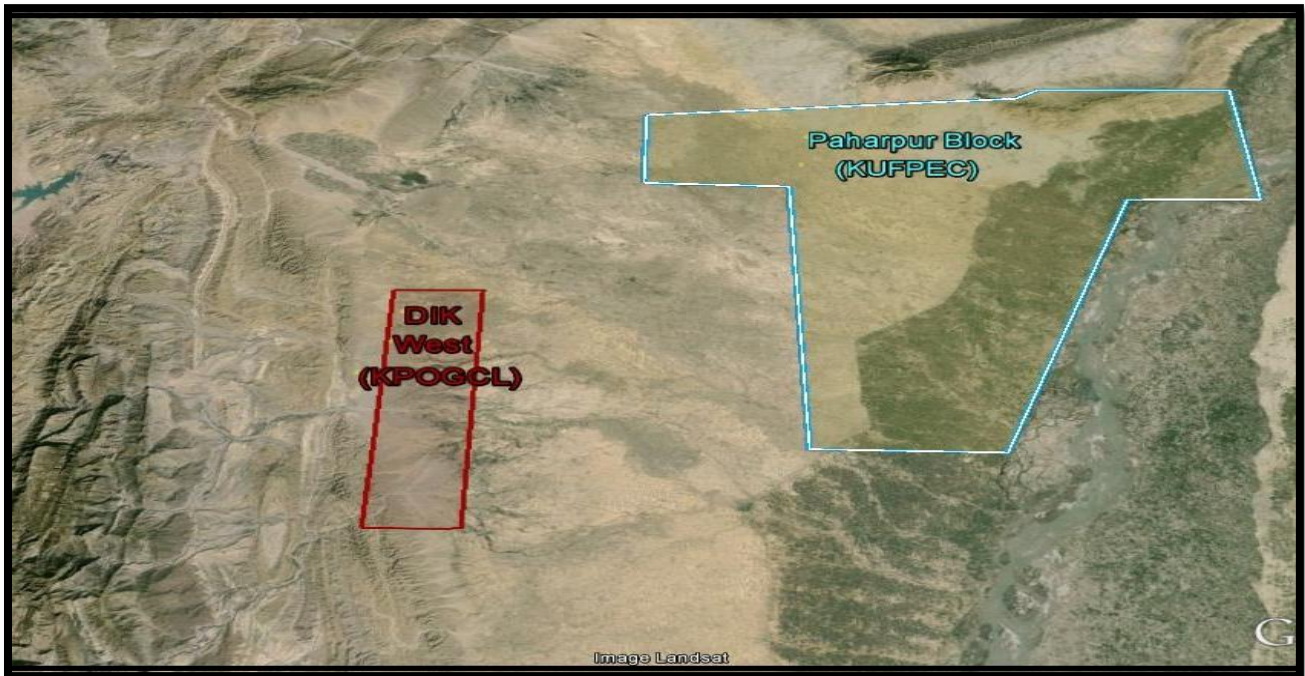


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IN

DIK WEST EXPLORATION BLOCK

KHYBER PAKHTUNKHWA, PAKISTAN



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Cell: +92-333-538 0240 +92-300-500 1038 E-mail: razi.ceo@kpoqcl.com.pk
Web: www.kpoqcl.com.pk

Introduction to DIK West Block

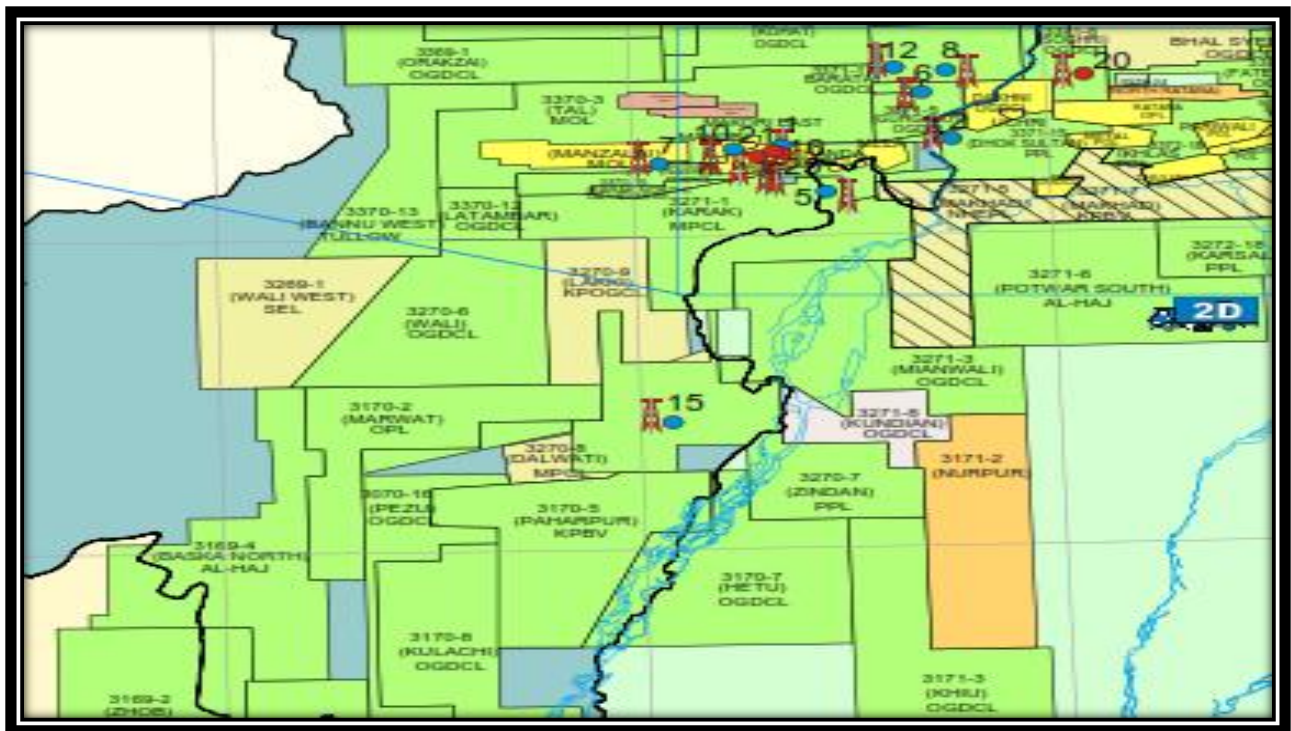
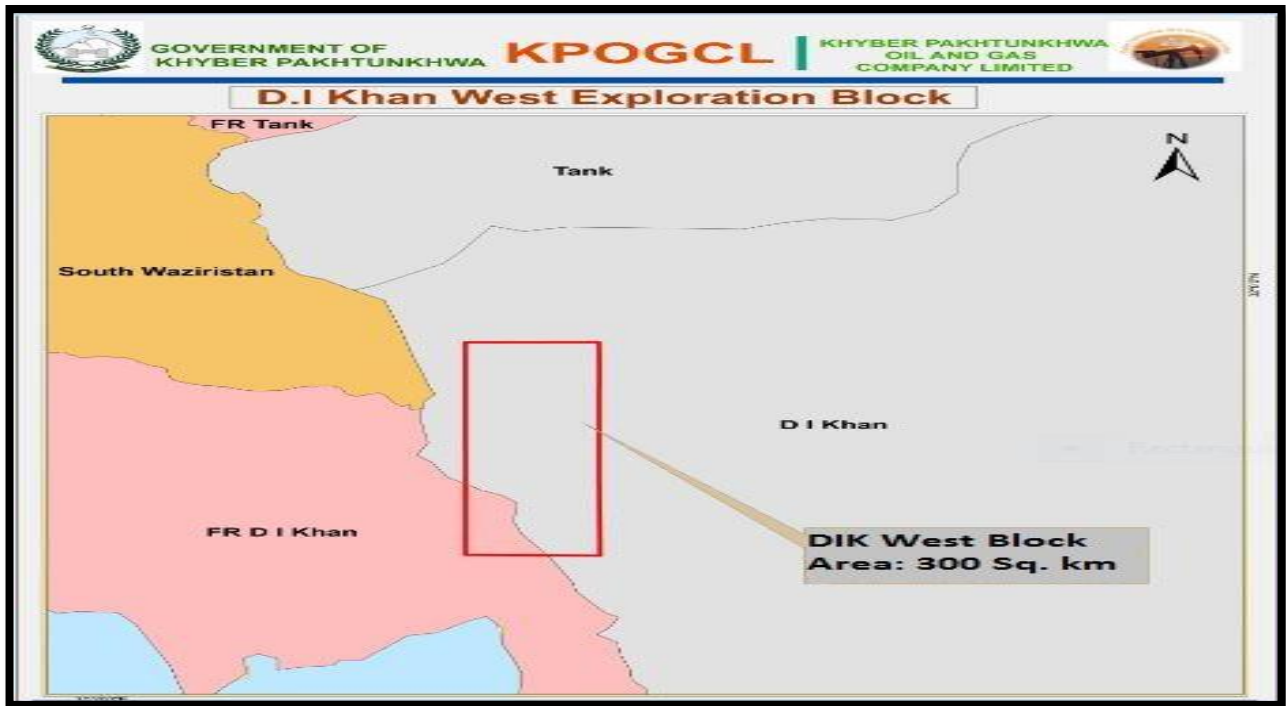
DIK West Exploration Block has an area of 300 Sq. km, located in D.I Khan (88.55%), District of Khyber Pakhtunkhwa Province & FR DI Khan (11.45%), (Figure 1). The Block lies prospectively in Zone-II (Figure 2). Based on surrounding discoveries in Kohat-Bannu basin i.e. Chanda, Mela, Nashpa, Makori, Maramzai and Mamikhel, DIK West Block is considered to be a successful project.

The Block is located about 300 Kilometers from Peshawar towards South West and 500 km South West from Islamabad. It has access via Indus Highway, where up-to-date facilities are available due to oil & gas exploration and production activities/discoveries in nearby areas.

Investment Opportunity in DIK West Block

Opportunities available for both national and international E&P Companies, who are interested for Joint Venture in the Block. Farming out its 49% working interest to other E&P Companies to assist KPOGCL regarding Geological, Geophysical and Engineering studies and an initial 1st Exploratory wells drilling program. Work has already started in 2017 leading to the drilling activities in 2018-19. Full program cost (Capex) is estimated at US\$ 40 million.

Geological Probability = 0.6 (Source) × 0.7 (Reservoir) × 0.6 (Seal) × 0.6 (Trap) = 15.12%



Location Map of DIK West Block

Salient Features of DIK West Block

- Situated in already proven Kohat-Bannu Basins, which is currently producing 55 % of overall Pakistan's Crude Oil;
- Overall drilling success ratio is 1:2.8 in this region;
- IRR is estimated in the vicinity of 35%-40% considering reservoir reserves;
- Full proof security with other necessary security clearances for expats working in the province along with all logistics support;
- Full commitment to facilitate in Exploration & Production activities in shape of technical and Non-Technical.

Economic Modeling & Financial Indicators

The DIK West Block project economics has been calculated on a 15 year projected time frame, which is a norm for Khyber Pakhtunkhwa and Potwar basins. The IRR over this period is expected to be 27.0 %, whereas the NPV is US\$ 15 million at a discount rate of 15%. Key assumptions are taken for being at a sound economical state are as follow: This economic calculation based on a sustained rate from day 1 till the end of 15 years is not in line with the production of any field.

- Petroleum Policy 2012 will be in vogue.
- 10% Success probability of Oil production of 3000 Barrels Per Day but only 1/3 of the production (i.e. 950 BPD) has been taken for economic analysis. Lowered production is assumed to be on a very conservative side.
- 10% Success probability of Gas production of 25 MMCFD but only 1/3 of production (8.75 mmcf) is taken for economic analysis.
- LPG (Liquefied Petroleum Gas or Cylinder gas) production not included in the economic analysis. Although Khyber Pakhtunkhwa Oil and Gas is very rich is Pentane/Butane (LPG)
- Success ratio of 35% assumed.

Oil prices are assumed at \$40/Barrel and Gas price \$3/MMBTU for the economic analysis, which are highly conservative. Although KPOGCL has taken low oil prices but the prices should rise by 2018. At one time the price of oil was over \$ 100 per barrel and gas prices were \$6.8 per MMBTU.

DIK West Block Project Economics for 15 years	US \$ Million
Revenue	292
Gas	145
Oil	147
CAPEX	40
OPEX	32
Royalty	36
Tax	89
Total Expenses	198
Net Cash Flow	94
Present Value @ 10%	28
Present Value @ 12.5%	21
Present Value @ 15%	15
IRR	27.0 %
NPV	15

~ Current indicators does not include LPG's Production

Project Highlights

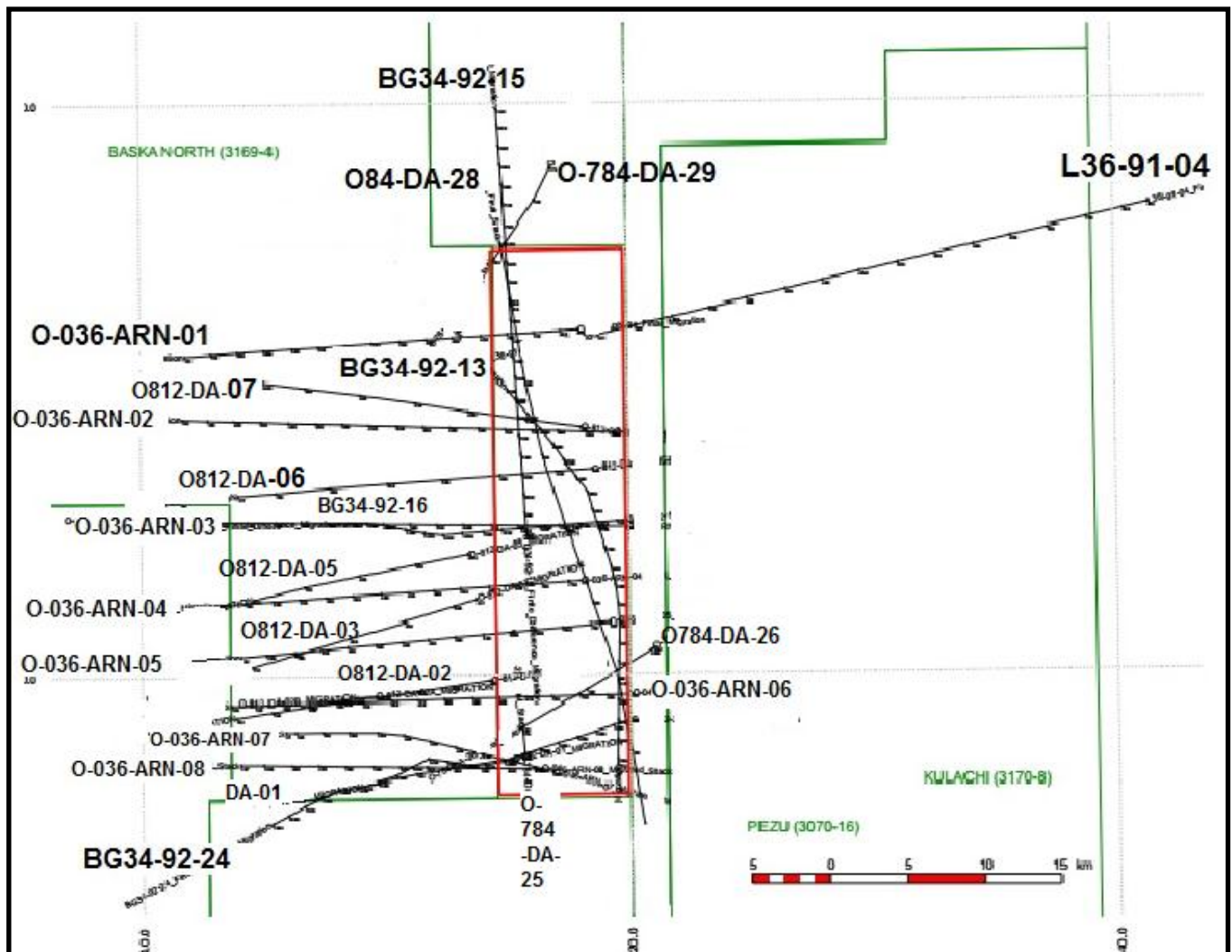
- Oil and Gas producing fields nearby
- Block area: 300 Sq. km
- Capital Expenses \$ 40 Million (3 years)
- Surface Facilities Cost \$ 05 Million (4th year @ production start)
- Expected Oil: 700/ 2000 BBL/D (35% taken for IRR/NPV)
- Expected Gas: 08/25 MMSCFD (35% taken for IRR/NPV)
- Expected LPG: 100 Tons/D (not included in economics)
- IRR: 27% | NPV: MM US\$ 15 Million @ 15% Discount Rate
- E&P life-cycle ~15 Years

DIK West Available Vintage Data

1. Seismic Line

S.No.	Survey Name	Line Segment Name
1	BG-BLOCK34-1992	BG34-92-13
2	BG-BLOCK34-1992	BG34-92-15
3	BG-BLOCK34-1992	BG34-92-16
4	BG-BLOCK34-1992	BG34-92-24
5	LASMO-B36-1991	L36-91-04
6	OGDC-ARN-2003	O-036-ARN-01
7	OGDC-ARN-2003	O-036-ARN-02
8	OGDC-ARN-2003	O-036-ARN-03
9	OGDC-ARN-2003	O-036-ARN-04
10	OGDC-ARN-2003	O-036-ARN-05
11	OGDC-ARN-2003	O-036-ARN-05B
12	OGDC-ARN-2004	O-046-ARN-07
13	OGDC-ARN-2004	O-046-ARN-06
14	OGDC-ARN-2004	O-046-ARN-08
15	OGDC-ARN-2004	O-046-ARN-08E
16	OGDC-DA-1978	O-784-DA-24
17	OGDC-DA-1978	O-784-DA-25
18	OGDC-DA-1978	O-784-DA-26
19	OGDC-DA-1978	O-784-DA-28
20	OGDC-DA-1978	O-784-DA-01
21	OGDC-DA-1978	O-784-DA-29
24	OGDC-DA-1981	O-812-DA-02AB
25	OGDC-DA-1981	O-812-DA-03
26	OGDC-DA-1981	O-812-DA-05
27	OGDC-DA-1981	O-812-DA-06
28	BG-BLOCK34-1992	BG34-92-13

DIK West Base Map



Petroleum System of the Area

The Petroleum system of DIK West Block is based on Ramak, Savi Ragha Wells and existing Mughal Kot Oil Seepages.

Source Rocks

Primary Source: Sembar, Darazinda and Goru Fms.

Secondary Source: Lumshiwai Formation.

Reservoir Rocks

Chilton, Pab, Mughalkot, Parh, Ranikot, Dunghan, Habib Rahi & Pirkoh are the regional Reservoirs in the area.

Seal Rocks

Pab, Upper Rani Kot, Eocene Ghazij, Sirki and Darazinda Formations are the regional Seals in the area.

Traps

Proterozoic rifting, Drape features, Stratigraphic pinch outs would be the potential traps.

DIK West Block Petroleum System

	0.50 Encouraging	0.60 Very Encouraging	0.70 Favorable	0.80 Very Favorable
Source Rocks		X		
Reservoir Rocks			X	
Seal Rocks		X		
Traps		X		

$$\text{Probability} = 0.6 \times 0.7 \times 0.6 \times 0.6 = 15.12 \%$$

Generalize Stratigraphic Column

AGE	Northen Sulaiman Range	Bhittani Range	Khisor- Marwat
PLIESTOCENE	CHAUDWAN	MALAGAN	SIWALIK GROUP
PLIOCENE	LITRA VIHOWA	DHOK PATHAN NAGRI CHINJI	
MIOCENE OLIGOCENE	CHITRAWATA		
EOCENE	KIRTHAR GROUP DRAZINDA FM. PERKOH FM. DOMANDA FM. HABIB RAHI FM.		
PALEOCENE	DUNGHAN FM.		LOCKHART FM.
CRETACEOUS	RANIKOT FM.		HANGU FM.
	PAB FM. MUGHAL KOT FM. PARH FM. SEMBAR FM. CHILTAN FM.		KAWAGARH FM. LUMSHIWAL FM. CHICHALI FM.
			SAMANA FM. SHINAWARI FM. DATTA FM.
JURASSIC	LORALAI FM		KINGRIALI FM. TREDIAN FM. MIANWALI FM.
TRIASSIC	WUGAI FM		
PERMIAN	?-?		CHIDRU FM. WARGAL FM. AMB FM.
	?-?		SARDHAI FM. WARCHA FM. DANDOT FM. TOBRA FM.
Ondovician- Carboniferous			
CAMBRIAN			
PRE-CAMBRIAN	SALT RANGE FORMATION.		



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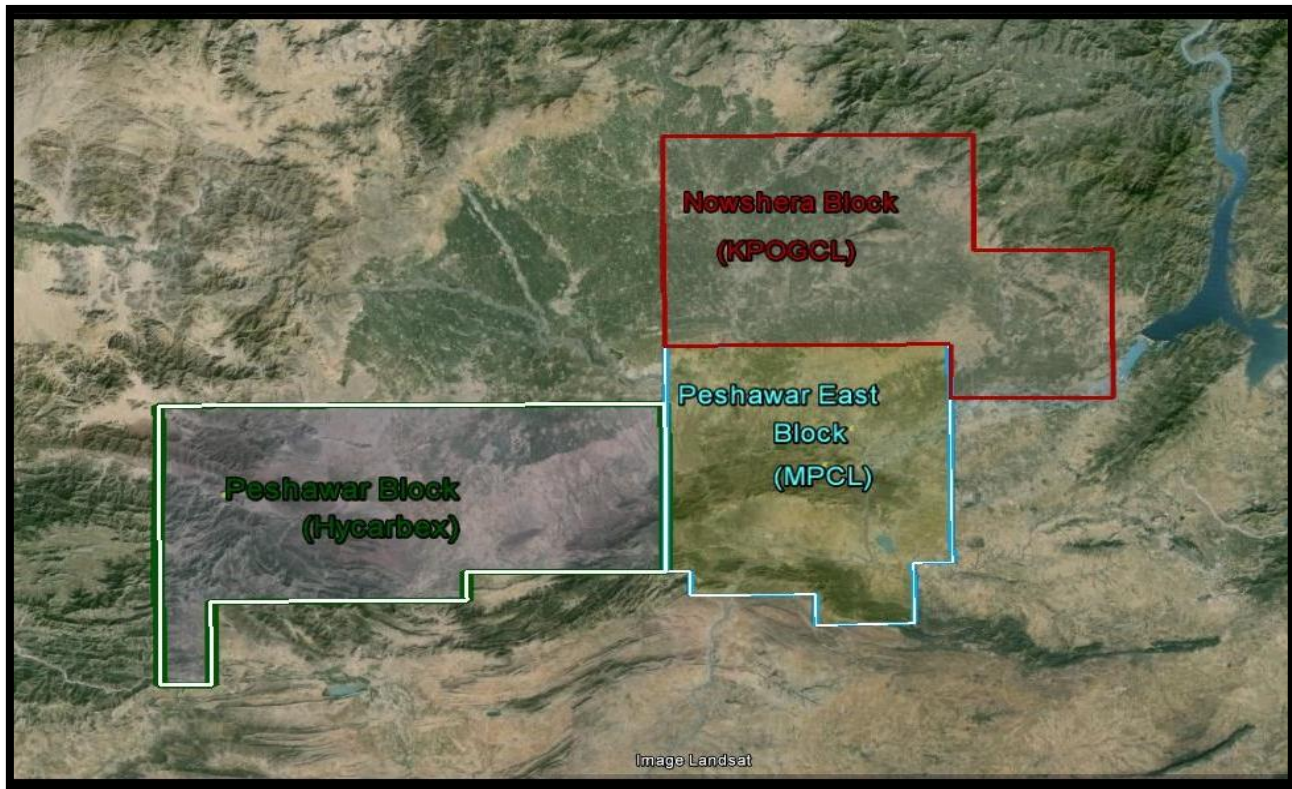


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IN

NOWSHERA EXPLORATION BLOCK

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Brief On Nowshera Block

Nowshera Exploration Block has an area of 2,136 Sq. km, located in Mardan (53.83%), Swabi (38.48%), Buner (4.05%), Nowshera (3.17%) & Charsadda (0.47%), Districts of Khyber Pakhtunkhwa (Figure 1). The Block lies prospectively in Zone-I (Figure 2). Based on surrounding discoveries in Kohat-Bannu basin i.e. Chanda, Mela, Nashpa, Makori, Maramzai and Mamikhel, Nowshera Block is considered to be a successful Project.

The Block is located about 60 Kilometers from Peshawar towards North East and 300 km North West from Islamabad. It can be easily approachable by a network of highways and metaled roads from Districts Peshawar, Mardan, Nowshera and Charsadda where modern facilities are available.

Investment Opportunity in Nowshera Block

Opportunities available for both national and international E&P Companies, who are interested for Joint Venture in the Block. Farming out its 49% working interest to other E&P Companies to assist KPOGCL regarding Geological, Geophysical and Engineering studies and an initial 1st Exploratory wells drilling program. Work has already started in 2017 leading to the drilling activities in 2018-19. Full program cost (Capex) is estimated at US\$ 42 million.

Geological Probability = 0.7 (Source) × 0.6 (Reservoir) × 0.6 (Seal) × 0.5 (Trap) = 12.6%

Salient Features of Nowshera Block

- Situated in Already Proven Kohat-Bannu Basins, which is currently producing 55 % of overall Pakistan's Crude Oil;
- Overall drilling success ratio is 1:2.8 in this region;
- IRR is estimated in the vicinity of 35%-40% considering reservoir reserves;
- Full proof security with other necessary security clearances for expats working in the province along with all logistics support;
- Full commitment to facilitate in Exploration & Production activities in shape of technical and Non-Technical.

Economic Modeling & Financial Indicators

The Nowshera Block project economics has been calculated on a 15 year projected time frame, which is a norm for Khyber Pakhtunkhwa and Potwar basins. The IRR over this period is expected to be 27.2%, whereas the NPV is US\$ 15 million at a discount rate of 15%. Key assumptions are taken for being at a sound economical state are as follow: This economic calculation based on a sustained rate from day 1 till the end of 15 years is not in line with the production of any field.

- Petroleum Policy 2012 will be in vogue.
- 10% success Probability of Oil production of 3,500 Barrels Per Day but only 1/3 of the production (i.e. 1050 BPD) has been taken for economic analysis. Lowered production is assumed to be on a very conservative side.
- 10% success Probability Gas production of 20 MMCFD but only 1/3 of production (7 mmcf) is taken for economic analysis.
- LPG (Liquefied Petroleum Gas or Cylinder gas) production not included in the economic analysis. Although Khyber Pakhtunkhwa Oil and Gas is very rich is Pentane/Butane (LPG)
- Success ratio of 35% assumed.

Oil prices are assumed at \$40/Barrel and Gas price \$3/MMBTU for the economic analysis, which are highly conservative. Although KPOGCL has taken low oil prices but the prices should rise by 2018. At one time the price of oil was over \$ 100 per barrel and gas prices were \$6.8 per MMBTU.

Nowshera Block Project Economics for 15 years	US \$ Million
Revenue	298
Gas	145
Oil	154
CAPEX	42
OPEX	33
Royalty	37
Tax	91
Total Expenses	203
Net Cash Flow	95
Present Value @ 10%	29
Present Value @ 12.5%	21
Present Value @ 15%	15
IRR	27.2 %
NPV	15

~ Current indicators does not include LPG's Production

Project Highlights

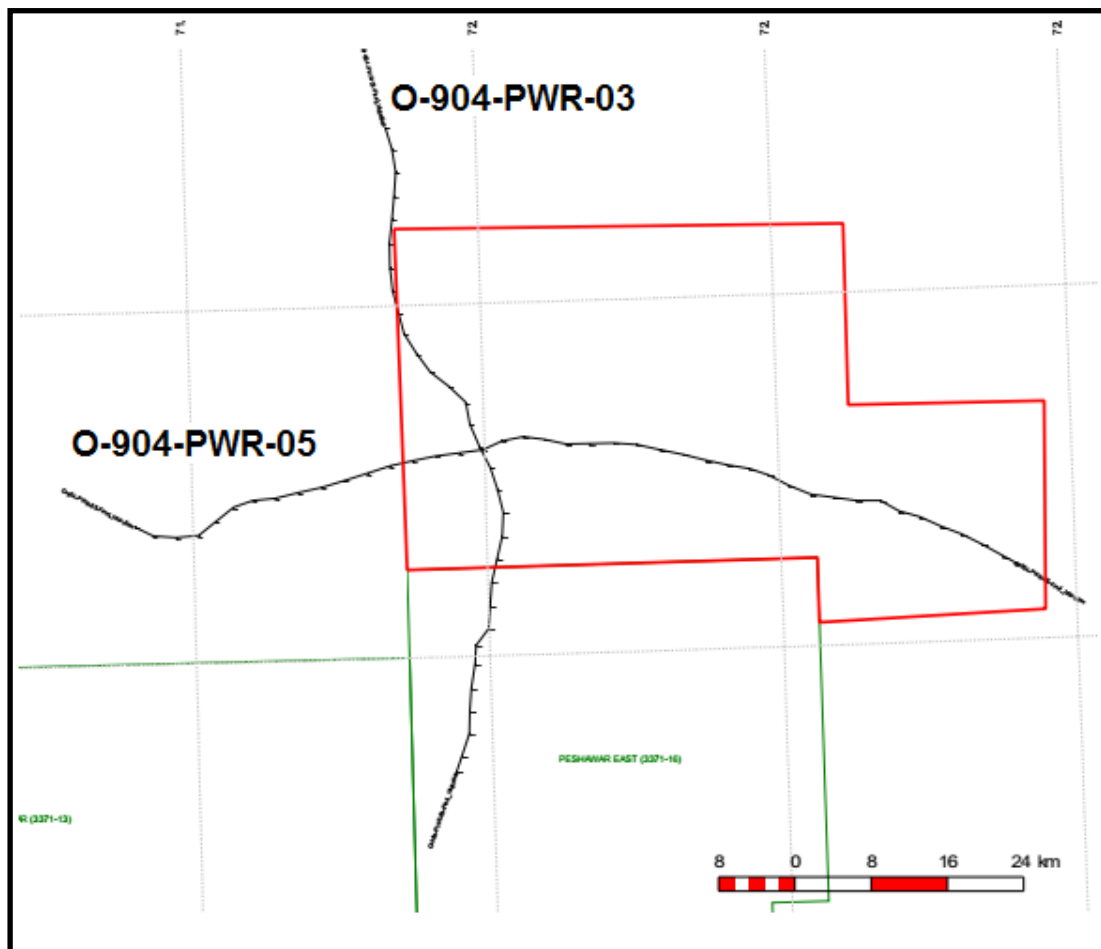
- Oil and Gas producing fields nearby
- Block area: 2,136 Sq. km
- Capital Expenses \$ 42 Million (3 years)
- Surface Facilities Cost \$ 06 Million (4th year @ production start)
- Expected Oil: 700/ 2000 BBL/D (35% taken for IRR/NPV)
- Expected Gas: 08/25 MMSCFD (35% taken for IRR/NPV)
- Expected LPG: 50 Tons/D (not included in economics)
- IRR: 27.2% | NPV: MM US\$ 15 Million @ 15% Discount Rate
- E&P life-cycle ~15 Years

Nowshera Block Vintage Data

1. Available Seismic Line

S.No.	Survey Name	Line Segment Name
1	OGDC-PWR-1990	O-904-PWR-03
2	OGDC-PWR-1990	O-904-PWR-05

Nowshera Block Base Map



Petroleum System of the area

Source Rocks

Hangu, Patala, Chichali & Shales of Datta Formation are the regional Source Rocks in the Block

Reservoir Rocks

Khewra or Equivalent, Lockhart Limestone, Samanasuk, Lumshiwai Formations are the possible Reservoir in the Block

Seal Rocks

Top Shale and intra-formational shale and rest are yet to be established after GFW

Traps

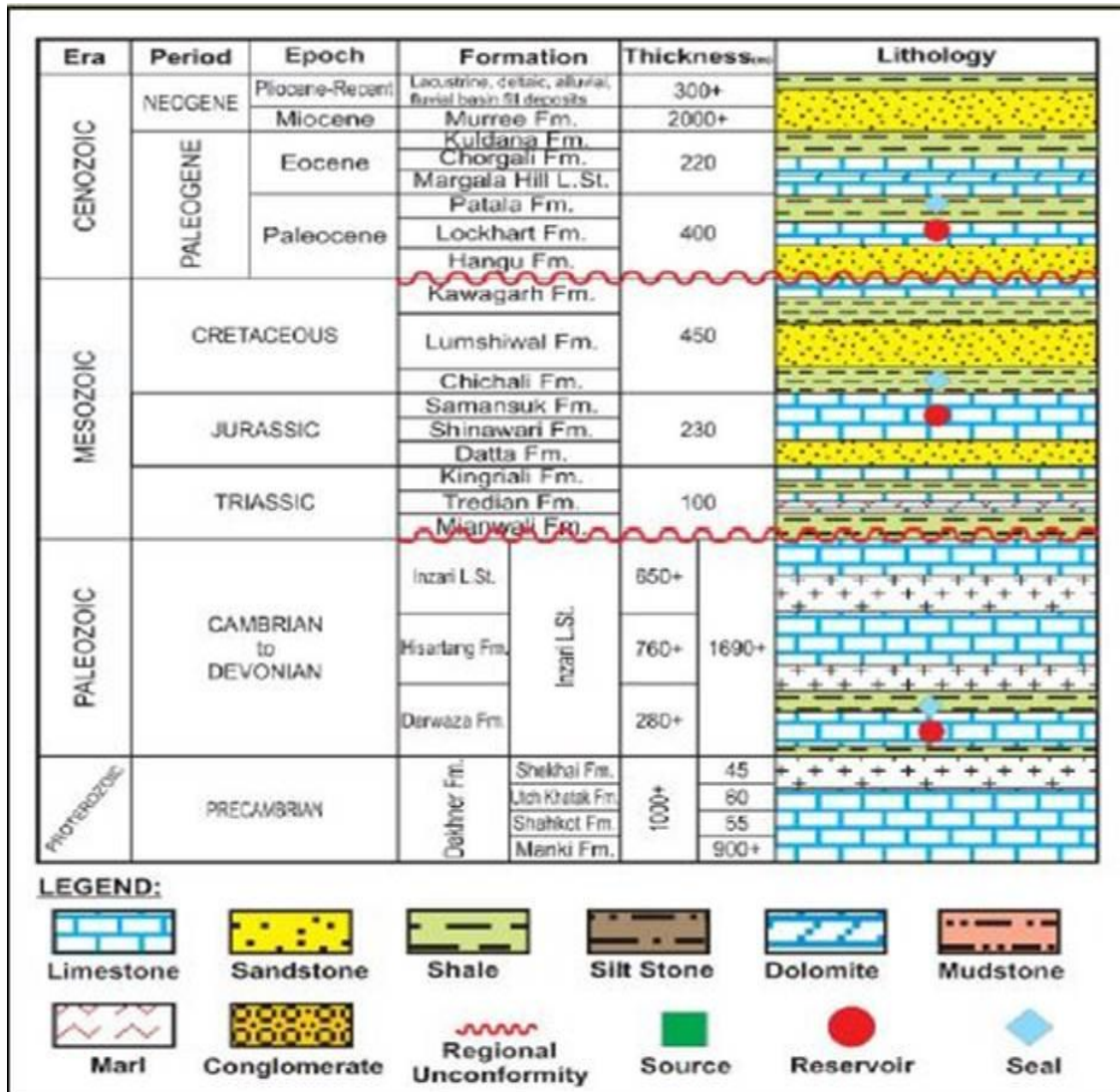
Fault bounded anticline and 4W Dip Closures

Nowshera Block Petroleum System

	0.50 Encouraging	0.60 Very Encouraging	0.70 Favorable	0.80 Very Favorable
Source Rocks			X	
Reservoir Rocks		X		
Seal Rocks		X		
Traps	X			

Probability $0.7 \times 0.6 \times 0.6 \times 0.5 = 12.6\%$

Generalize Stratigraphic Column





KHYBER PAKHTUNKHWA OIL & GAS COMPANY LIMITED (KPOGCL)

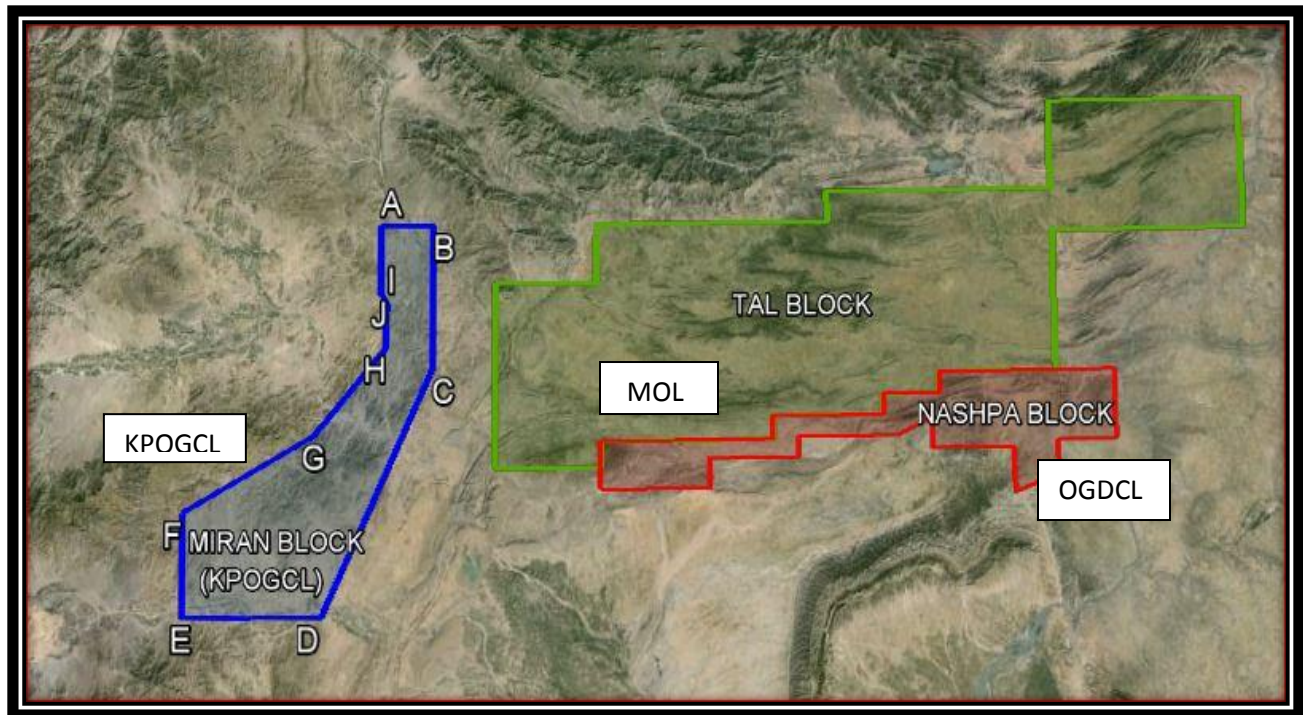
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IN

MIRAN EXPLORATION BLOCK



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Web: www.kpoqcl.com.pk

Brief on Miran Block

Miran Exploration Block has an area of 1064.3 Sq.km, located in North Waziristan agency (85.63%) and Kurram agency (14.37%) of Fata, Pakistan (Figure 1). The Block lies prospectively in Zone-I (Figure 2). Based on surrounding discoveries in Kohat-Bannu basin i.e. Chanda, Mela, Nashpa, Makori, Maramzai and Mamikhel, Miran Block is considered to be prospective.

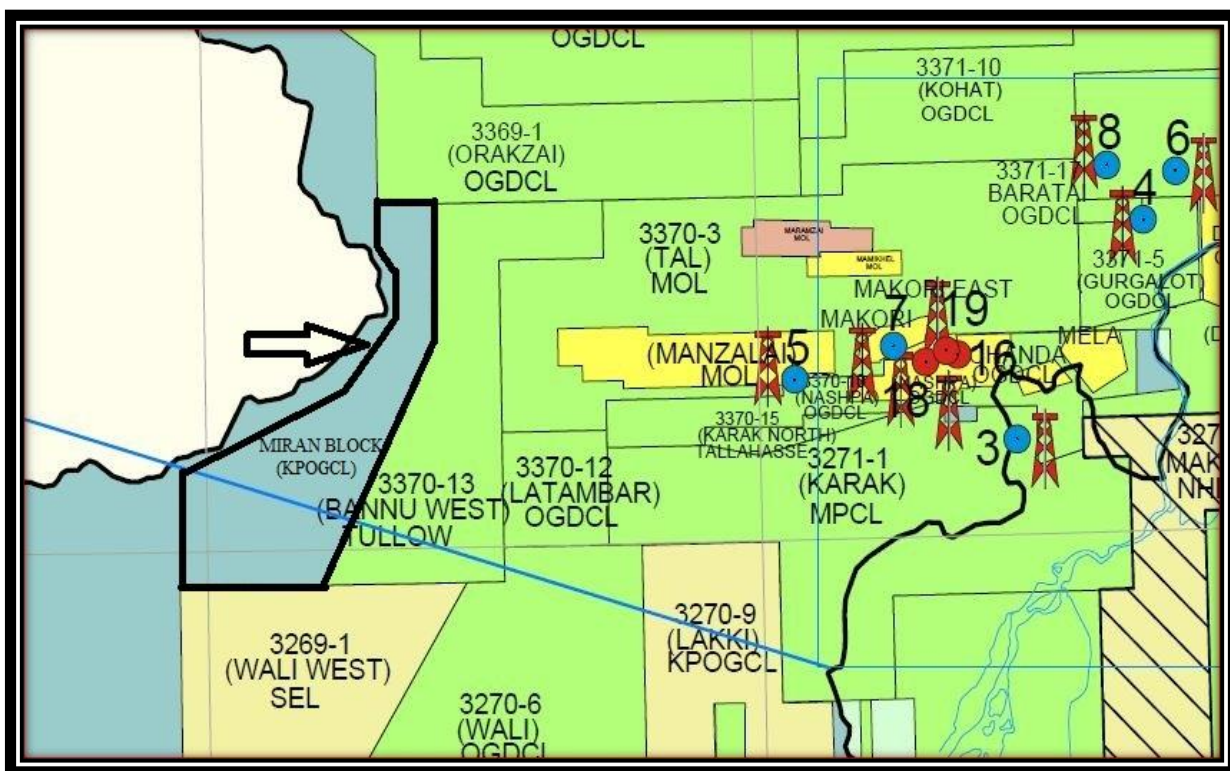
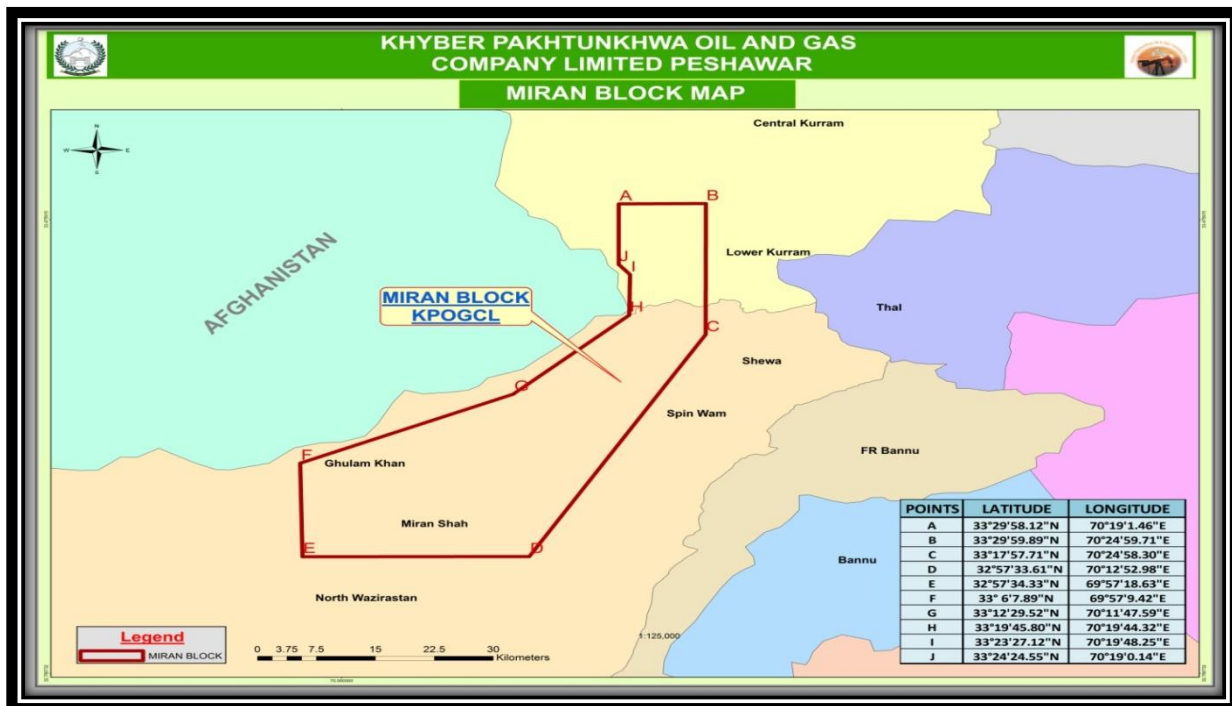
The Block is located about 270 Kilometers from Peshawar towards south-southwest and 400 km southwest from Islamabad. It can be easily approachable by a network of highways and metaled roads from District Peshawar, Kohat, Karak and Bannu, where modern facilities are available due to the current boom of Oil and Gas discoveries in the nearby districts.

Investment Opportunity in Miran Block

Opportunities available for both national and international E&P Companies, who are interested for Joint Venture in the Block. Farming out its 49% working interest to other E&P Companies to assist KPOGCL regarding Geological, Geophysical and Engineering studies and an initial 1st Exploratory wells drilling program. Work has already started in 2017 leading to the drilling activities in 2018-19. Full program cost (Capex) is estimated at US\$ 45million.

Geological Probability = 0.6 (Source) × 0.8 (Reservoir) × 0.6 (Seal) × 0.5 (Trap) = 14.4%

Location Map of Miran Block



Salient Features of Miran Block

- Situated in already proven Kohat-Bannu Basins, which is currently producing 55 % of overall Pakistan's Production of Oil;
- Overall drilling success ratio is 1:2.8 in this region;
- IRR is estimated in the vicinity of 35%-40% considering reservoir reserves;
- Full proof security with other necessary security clearances for expats working in the province along with all logistics support;
- Full Commitment to facilitate in Exploration & Production activities in shape of technical and Non-Technical.

Economic Modeling & Financial Indicators

The Miran Block project economics has been calculated on a 15 year projected time frame, which is a norm for Khyber Pakhtunkhwa and Potwar basins. The IRR over this period is expected to be 28.8 %, whereas the NPV is US\$ 15 million at a discount rate of 15%. Key assumptions are taken for being at a sound economical state are as follow: This economic calculation based on a sustained rate from day 1 till the end of 15 years is not in line with the production of any field.

- Petroleum Policy 2012 will be in vogue.
- 10% Success Probability of Oil production of 3000 Barrels Per Day but only 1/3 of the production (i.e. 950 BPD) has been taken for economic analysis. Lowered production is assumed to be on a very conservative side.
- 10% Success Probability of Gas production of 25 MMCFD but only 1/3 of production (8.75 mmcf) is taken for economic analysis.
- LPG (Liquefied Petroleum Gas or Cylinder gas) production not included in the economic analysis. Although Khyber Pakhtunkhwa Oil and Gas is very rich in Pentane/Butane (LPG)
- Success ratio of 35% assumed.

Oil prices are assumed at \$40/Barrel and Gas price \$3/MMBTU for the economic analysis, which are highly conservative. Although KPOGCL has taken low oil prices but the prices should rise by 2018. At one time the price of oil was over \$ 100 per barrel and gas prices were \$6.8 per MMBTU.

Miran Block Project Economics for 15 years	US \$ Million
Revenue	327
Gas	174
Oil	154
CAPEX	45
OPEX	33
Royalty	41
Tax	101
Total Expenses	220
Net Cash Flow	107
Present Value @ 10%	34
Present Value @ 12.5%	25
Present Value @ 15%	18
IRR	28.8 %
NPV	18

~ Current indicators does not include LPG's Production

Project Highlights

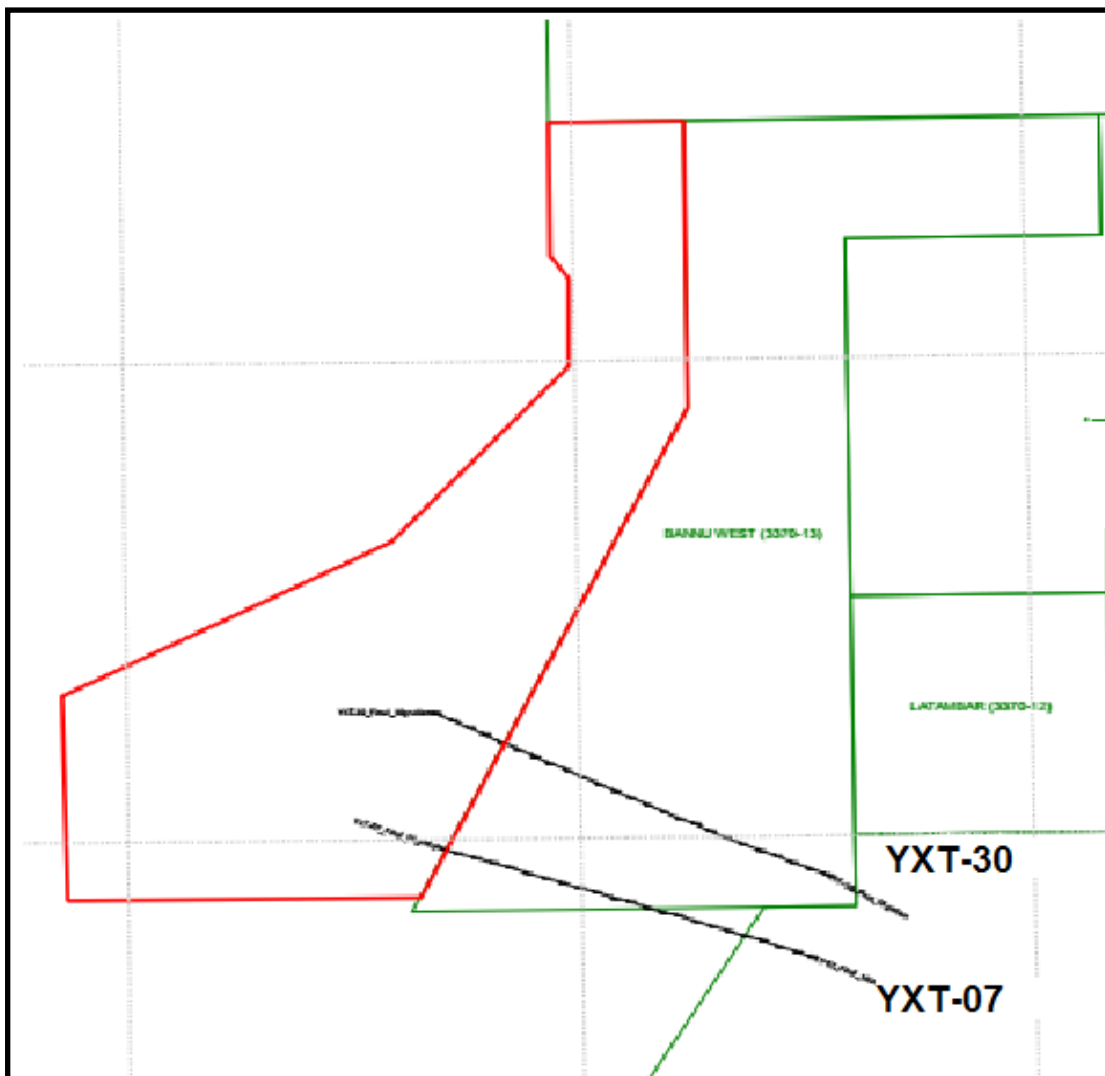
- Oil and Gas producing fields nearby
- Block area: 1064.3 Sq. km
- Capital Expenses \$ 45 Million (3 years)
- Surface Facilities Cost \$ 08 Million (4th year @ production start)
- Expected Oil: 840/ 2000 BBL/D (35% taken for IRR/NPV)
- Expected Gas: 11/30 MMSCFD (35% taken for IRR/NPV)
- Expected LPG: 100 Tons/D (not included in economics)
- IRR: 28.8% | NPV: MM US\$ 18 Million @ 15% Discount Rate
- E&P life-cycle ~15 Years

Miran Block Vintage Data

1. Available Seismic Line

S.No.	Survey Name	Line Segment Name
1	AMOCO-YXT-1992	YXT-07
2	AMOCO-YXT-1992	YXT-30

Miran Block Base Map



Petroleum System of the Area

The Petroleum system of Miran Block is based on Manzalia, Maramzai and Mamikhel Wells.

Source Rocks

Hangu, Patala, Chichali & Shales of Datta Formation are the regional Source Rocks in the Block.

Reservoir Rocks

Lockhart Limestone, Samanasuk, Lumshiwai Formations are the possible Reservoir in the Block.

Seal Rocks

Patala Shale & Panoba Shale are the regional seal in the Block.

Traps

Fault bounded anticline.

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Generalize Stratigraphic Column

Age		Formation	Lithology	Source	Reservoir	Seal	Generation	Traps	
CENOZOIC	Quat	Holocene Pleistocene	Alluvium						
	Tertiary	Miocene - Pliocene	Siwaliks						
			Eocene	Kohat					
				Kuldana					
				Chongali					
				Sakesar					
		Nammal							
		Paleocene	Patala						
			Lockhart						
			Hangu						
			Cretaceous	Early	Lumshwal				
	Chichali								
	MESOZOIC	Jurassic	Middle - Late	Sariana Suk					
			Shinawari						
Early		Datta							
Triassic		Late	Kingtali						
	Middle	Tredian							
	Early	Mianwali							



KHYBER PAKHTUNKHWA OIL & GAS COMPANY LIMITED (KPOGCL)

(KP Government Fully Owned & Provincial Holding Company)

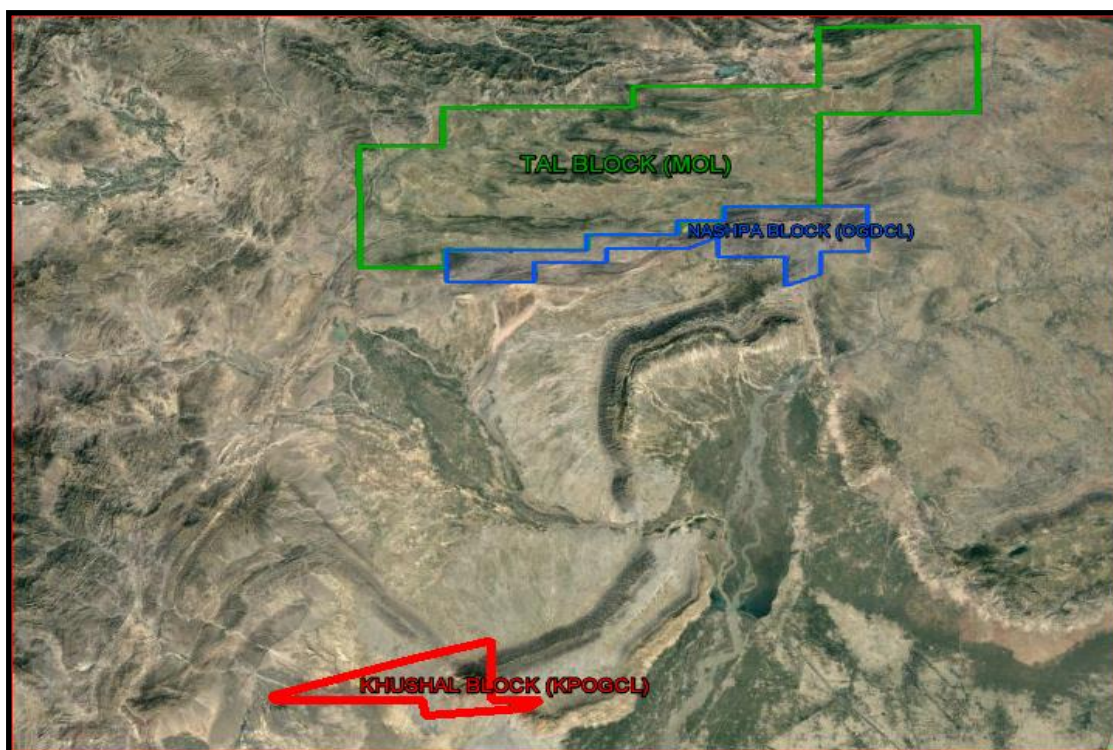


**KPOGCL IS SEEKING EXPRESSIONS OF INTEREST FROM
NATIONAL/ INTERNATIONAL E&P COMPANIES
INTERESTED IN PARTICIPATING AS JOINT VENTURE
PARTNERS WITH KPOGCL**

IN

KHUSHAL EXPLORATION BLOCK

KHYBER PAKHTUNKHWA, PAKISTAN



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Brief on Khushal Block

Kohat-Bannu Basin has proven to be a potentially viable Petroleum reservoir, ranging in age from Infra-Cambrian to Miocene rocks. Khushal Exploration Block having an area of 417 Sq. km is located in Tank (39.56%), Lakki Marwat (30.45%) and D.I Khan (29.97%) districts of Khyber Pakhtunkhwa Province, Pakistan. The Block falls in Zone-I. Based on surrounding discoveries in Kohat-Bannu basin i.e. Chanda, Mela, Nashpa, Makori, Maramzai and Mamikhel, Khushal Block is considered to be prospective.

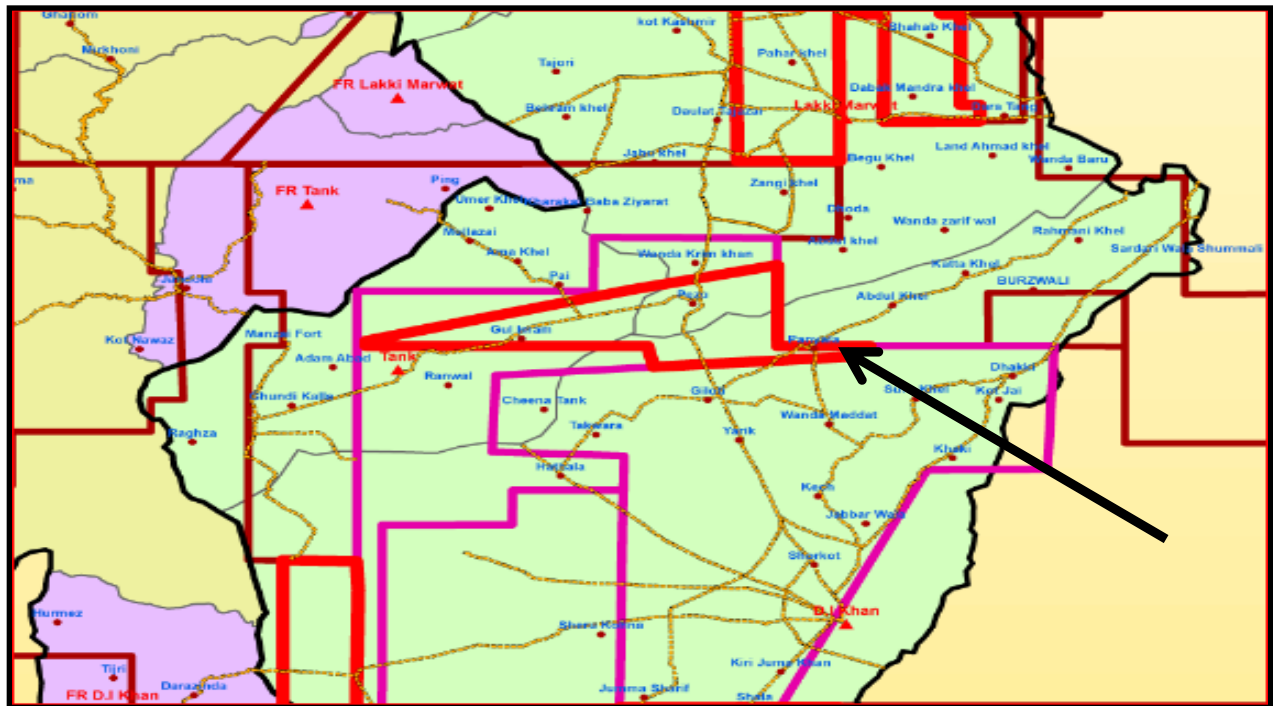
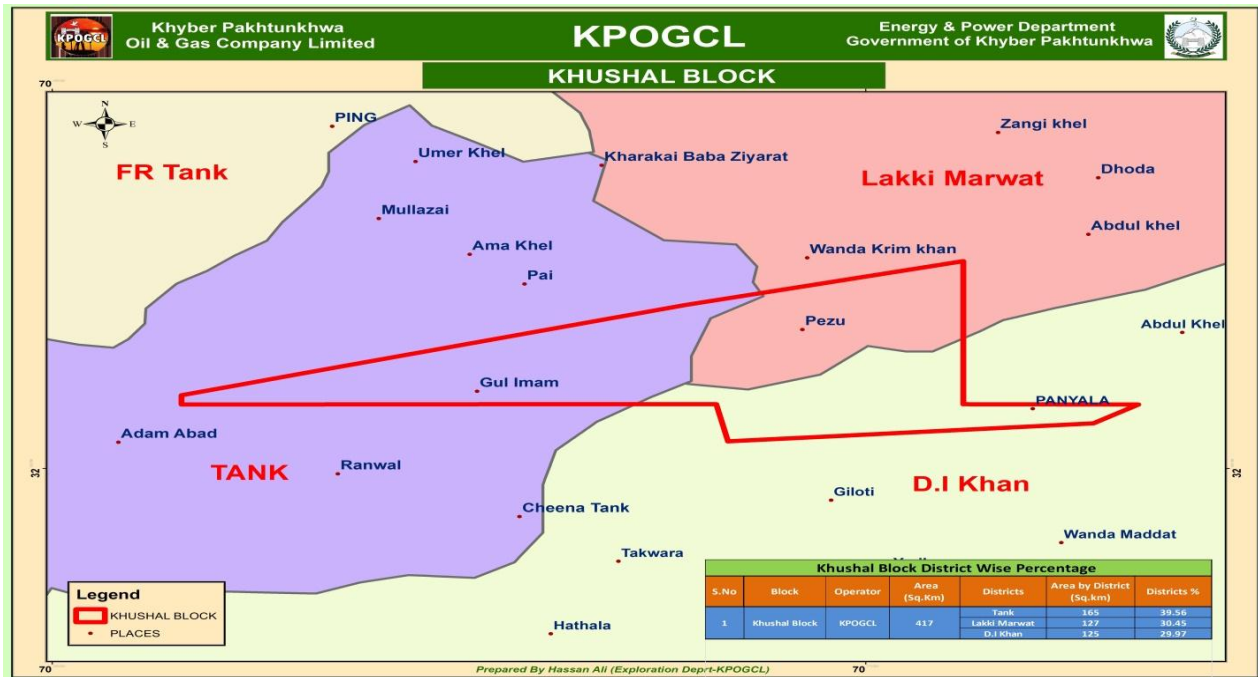
The Block is located about 250 Kilometers South west of Peshawar and 350 km southwest of Islamabad. It is easily approachable by a network of highways and concrete roads from District Peshawar, Kohat, Karak, Bannu and Lakki Marwat.

Investment Opportunity in Khushal Block

Opportunities available for both national and international E&P Companies, who are interested for Joint Venture in the Block. Farming out its 49% working interest to other E&P Companies to assist KPOGCL regarding Geological, Geophysical and Engineering studies and an initial 1st Exploratory wells drilling program. Work has already started in 2017 leading to the drilling activities in 2018-19. Full program cost (Capex) is estimated at US\$ 49 million.

Geological Probability = 0.8 (Source) × 0.7 (Reservoir) × 0.6 (Seal) × 0.5 (Trap) = 16.8%

Location Map of Khushal Block



Silent Features of Khushal Block

- Situated in already proven Kohat-Bannu Basins, which is currently producing 55 % of overall Pakistan's Crude Oil;
- Overall drilling success ratio is 1:2.8 in this region;
- IRR is estimated in the vicinity of 35%-40% considering reservoir reserves;
- Full proof security with other necessary security clearances for expats working in the province along with all logistics support;
- Full commitment to facilitate in Exploration & Production activities in shape of technical and Non-Technical.

Economic Modeling & Financial Indicators

The Khushal Block project economics has been calculated on a 15 year projected time frame, which is a norm for Khyber Pakhtunkhwa and Potwar basins. The IRR over this period is expected to be 24.5%, whereas the NPV is US\$ 24 million at a discount rate of 15%. Key assumptions are taken for being at a sound economical state are as follow: This economic calculation based on a sustained rate from day 1 till the end of 15 years is not in line with the production of any field.

- Petroleum Policy 2012 will be in vogue.
- 10% success Probability of Oil production of 4,650 Barrels Per Day but only 1/3 of the production (i.e. 1628 BPD) has been taken for economic analysis. Lowered production is assumed to be on a very conservative side.
- 10% success Probability Gas production of 30 MMCFD but only 1/3 of production (11 mmcf) is taken for economic analysis.
- LPG (Liquefied Petroleum Gas or Cylinder gas) production not included in the economic analysis. Although Khyber Pakhtunkhwa Oil and Gas is very rich is Pentane/Butane (LPG)
- Success ratio of 35% assumed.

Oil prices are assumed at \$40/Barrel and Gas price \$3/MMBTU for the economic analysis, which are highly conservative. Although KPOGCL has taken low oil prices but the prices should rise by 2018. At one time the price of oil was over \$ 100 per barrel and gas prices were \$6.8 per MMBTU.

Khushal Block Project Economics for 15 years	US \$ Million
Revenue	535
Gas	180
Oil	355
CAPEX	49
OPEX	68
Royalty	67
Tax	160
Total Expenses	344
Net Cash Flow	192
Present Value @ 10%	51
Present Value @ 12.5%	35
Present Value @ 15%	24
IRR	24
NPV	24.5%

~ Current indicators does not include LPG's Production

Project Highlights

- Oil and Gas producing fields nearby
- Block area: 417 Sq. km
- Capital Expenses \$ 49 Million (3 years)
- Surface Facilities Cost \$ 10 Million (4th year @ production start)
- Expected Oil: 1628 / 4650 BBL/D (35% taken for IRR/NPV)
- Expected Gas: 11 / 30 MMSCFD (35% taken for IRR/NPV)
- Expected LPG: 100 Tons/D (not included in economics)
- IRR: 24.5% | NPV: MM US\$ 24 Million @ 15% Discount Rate
- E&P life-cycle ~15 Years

Petroleum System of the Block

Since the Khushal Block is adjacent to Tal and Nashpa Blocks of MOL and OGDCL which are highly prolific (productive) blocks, it is further substantiated by the occurrence of active Gas Seepages (Malgin Gas and Bain Pass Gas Seep in Pezu-Bitani Range) around the block. Therefore, there is high probability of significant discoveries in the Khushal Block. Both oil & gas discoveries are expected from this block.

The Petroleum System of Khushal Block is based on Pezu-01 drilled by PPL in 1998 and Chonia-01 drilled by Petro Canada in 1990 respectively, adjacent to the Khushal Block and other pertinent information gathered from LMKR Data Base working as data repository for Director General Petroleum Concession DGPC and LMKR. The components of Petroleum System as per Oil industry practice are as follow:

Source Rocks

Primary Source: Patala & Chichali and Salt Range Formations, Secondary/ Potential. Source: Jatta Gypsum.

Reservoir Rocks

Reservoirs rocks include Lockhart, Datta, Lumshiwai and Chichali Formation as primary reservoirs while Tobra and Khewra Sandstone are considered as secondary reservoirs. In this area these petroleum systems are already producing Oil & Gas. All 4 primary reservoir rocks are promising systems and have delivered oil & gas in Khyber Pakhtunkhwa and Potwar.

Seal Rocks

Seal rocks; include Bahadur Khel salt and intra-formational shale.

Traps

Existence of structural traps

Khushal Block Petroleum System

Rock	0.50 Encouraging	0.60 Very Encouraging	0.70 Favorable	0.80 Very Favorable
Source Rock				x
Reservoir Rock			x	
Seal Rock		x		
Trap Rock	x			

$$\text{Probability of Success (POS)} = 0.8 \times 0.7 \times 0.6 \times 0.5 = 16.8 \%$$

Based on the information gathered during Geological Fieldwork and data review, probability of Success has been estimated to be over 16%.

Generalized Stratigraphic Column

AGE	Northern Sulaiman Range	Bhittani Range	Khisor- Marwat
PLIESTOCENE	CHAUDWAN	MALAGAN	SIWALIK GROUP
PLIOCENE	LITRA VIHOWA	DHOK PATHAN NAGRI CHINJI	
MIOCENE OLIGOCENE	CHITRAWATA		
EOCENE	KIRTHAR GROUP DRAZINDA FM. PERKOH FM. DOMANDA FM. HABIB RAHI FM.		
	BASKA SHALE GHAZI FM.	SURGHAR LIMESTONE	
PALEOCENE	DUNGHAN FM.	LOCKHART FM.	
	RANIKOT FM.	HANGU FM.	
CRETACEOUS	PAB FM. MUGHAL KOT FM. PARH FM. SEMBAR FM. CHILTAN FM.	KAWAGARH FM. LUMSHIWAL FM. CHICHALI FM.	
JURASSIC	LORALAI FM	SAMANA FM. SHINAWARI FM. DATTA FM.	
TRIASSIC	WUGAI FM	KINGRIALI FM. TREDIAN FM. MIANWALI FM.	
PERMIAN	?-? ?-?	CHIDRU FM. WARGAL FM. AMB FM. SARDHAI FM. WARCHA FM. DANDOT FM. TOBRA FM.	
Ordovician- Carboniferous			
CAMBRIAN	KHIGORI FM. JUTANA FM. KUSSAK FM. KHEWRA FM.		
PRE-CAMBRIAN	SALT RANGE FORMATION.		



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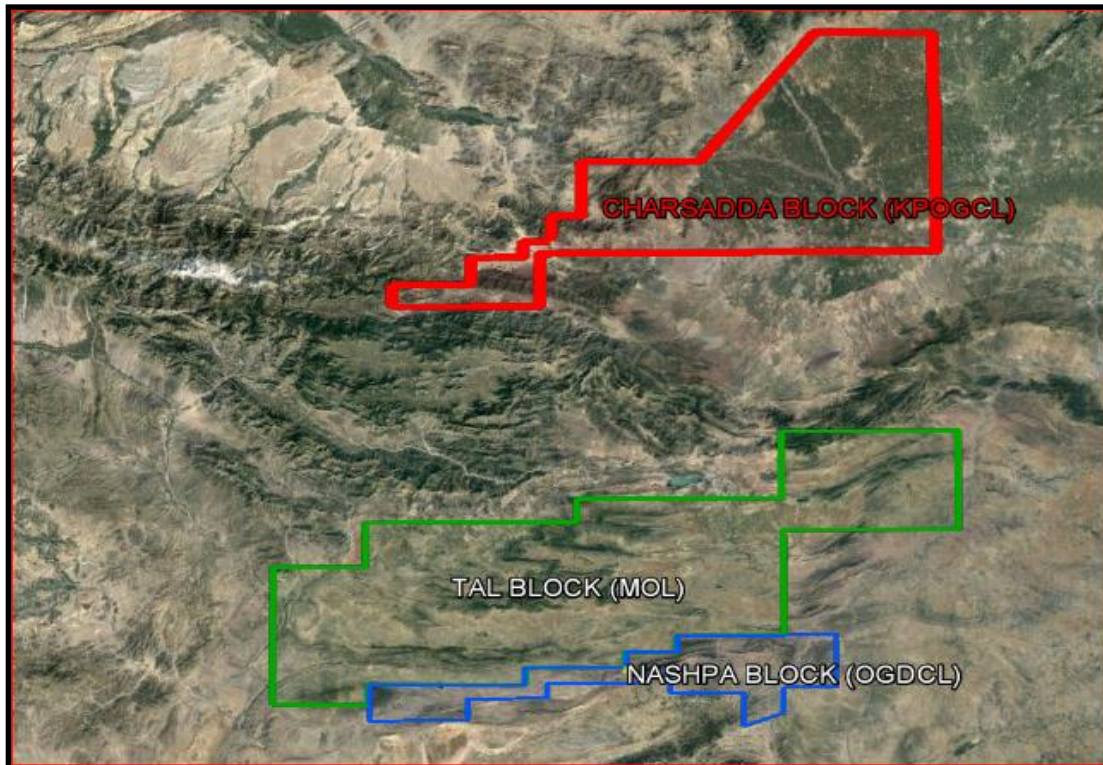


**KPOGCL IS SEEKING EXPRESSIONS OF INTEREST
FROM NATIONAL/ INTERNATIONAL E&P
COMPANIES INTERESTED IN PARTICIPATING AS
JOINT VENTURE PARTNERS WITH KPOGCL**

IN

CHARSADDA EXPLORATION BLOCK

KHYBER PAKHTUNKHWA, PAKISTAN



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Brief On Charsadda Block

Charsadda Exploration Block has an area of 2,436 Sq. km, located in Charsadda (38 %), Peshawar (22.07%), Nowshera (7.55%), Mardan (4.63%) and Malakand (0.9%), Districts of Khyber Pakhtunkhwa Province, Khyber Agency (26%) and Mohmand Agency (0.85%) of FATA, Pakistan (Figure 1). The Block lies prospectively in Zone-I. Based on surrounding discoveries in Kohat-Bannu basin i.e. Chanda, Mela, Nashpa, Makori, Maramzai and Mamikhel, Charsadda Block is considered to be a successful project.

The Block is located about 30 Kilometers from Peshawar towards North and 200 km North West from Islamabad. It can be easily approachable by a network of highways and metaled roads from Districts Peshawar, Charsadda, Mardan and Nowshera, where modern facilities are available.

Investment Opportunity in Charsadda Block

Opportunities available for both national and international E&P Companies, who are interested for Joint Venture in the Block. Farming out its 49% working interest to other E&P Companies to assist KPOGCL regarding Geological, Geophysical and Engineering studies and an initial 1st Exploratory wells drilling program. Work has already started in 2017 leading to the drilling activities in 2018-19. Full program cost (Capex) is estimated at US\$ 47 million.

Geological Probability = 0.7 (Source) × 0.65 (Reservoir) × 0.6 (Seal) × 0.5 (Trap) = 13.65%

Salient Features of Charsadda Block

- Situated in Already Proven Kohat-Bannu Basins, which is currently producing 55 % of overall Pakistan's crude Oil;
- Overall drilling success ratio is 1:2.8 in this region;
- IRR is estimated in the vicinity of 35%-40% considering reservoir reserves;
- Full proof security with other necessary security clearances for expats working in the province along with all logistics support;
- Full commitment to facilitate in Exploration & Production activities in shape of technical and Non-Technical.

Economic Modeling & Financial Indicators

The Charsadda Block project economics has been calculated on a 15 year projected time frame, which is a norm for Khyber Pakhtunkhwa and Potwar basins. The IRR over this period is expected to be 25.1%, whereas the NPV is US\$ 24 million at a discount rate of 15%. Key assumptions are taken for being at a sound economical state are as follow: This economic calculation based on a sustained rate from day 1 till the end of 15 years is not in line with the production of any field.

- Petroleum Policy 2012 will be in vogue.
- 10% Success Probability of Oil production of 4,200 Barrels Per Day but only 1/3 of the production (i.e. 1,470 BPD) has been taken for economic analysis. Lowered production is assumed to be on a very conservative side.
- 10% Success Probability of Gas production of 35 MMCFD but only 1/3 of production (12 mmcf) is taken for economic analysis.
- LPG (Liquefied Petroleum Gas or Cylinder gas) production not included in the economic analysis. Although Khyber Pakhtunkhwa Oil and Gas is very rich is Pentane/Butane (LPG)
- Success ratio of 35% assumed.

Oil prices are assumed at \$40/Barrel and Gas price \$3/MMBTU for the economic analysis, which are highly conservative. Although KPOGCL has taken low oil prices but the prices should rise by 2018. At one time the price of oil was over \$ 100 per barrel and gas prices were \$6.8 per MMBTU.

Charsadda Block Project Economics for 15 years	US \$ Million
Revenue	523
Gas	203
Oil	321
CAPEX	47
OPEX	62
Royalty	65
Tax	159
Total Expenses	333
Net Cash Flow	190
Present Value @ 10%	51
Present Value @ 12.5%	36
Present Value @ 15%	24
IRR	25.1%
NPV	

~ Current indicators does not include LPG's Production

Project Highlights

- Oil and Gas producing fields nearby
- Block area: 2,436 Sq. km
- Capital Expenses \$ 47 Million (3 years)
- Surface Facilities Cost \$ 10 Million (4th year @ production start)
- Expected Oil: 1470/ 4200 BBL/D (35% taken for IRR/NPV)
- Expected Gas: 12/35 MMSCFD (35% taken for IRR/NPV)
- Expected LPG: 50 Tons/D (not included in economics)
- IRR: 25.1% | NPV: MM US\$ 24 Million @ 15% Discount Rate
- E&P life-cycle ~15 Years

Petroleum System of the area

Source Rocks

Hangu, Patala, Chichali & Shales of Datta Formation are the regional Source Rocks in the Block

Reservoir Rocks

Lockhart Limestone, Samanasuk, Lumshiwai Formations are the possible Reservoir in the Block

Seal Rocks

Top Shale and intra-formational shale and rest are yet to be established after GFW

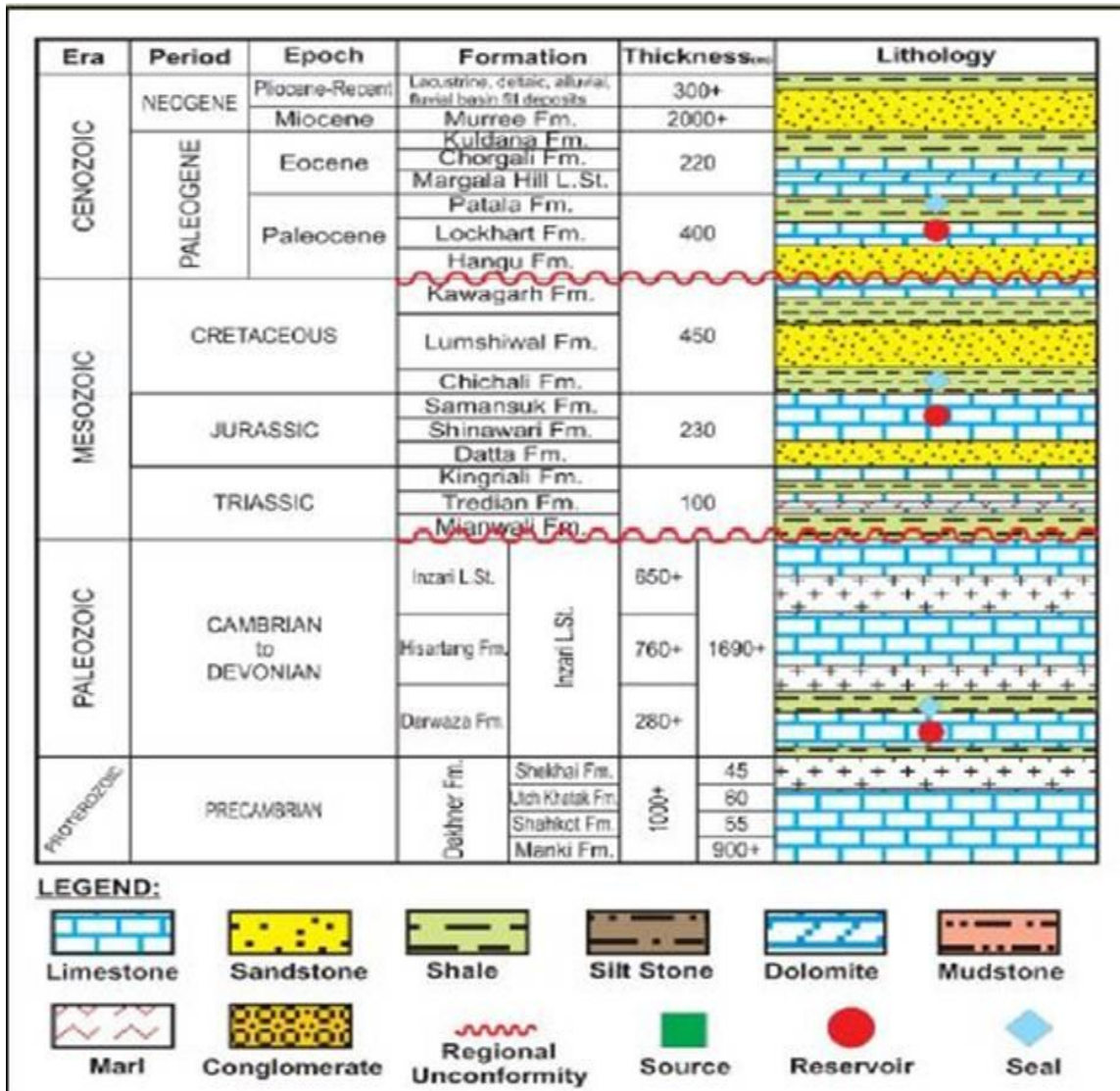
Traps

Fault bounded anticline and 4W Dip Closures

Charsadda Block Petroleum System

	0.50 Encouraging	0.60 Very Encouraging	0.70 Favorable	0.80 Very Favorable
Source Rocks			X	
Reservoir Rocks		X		
Seal Rocks		X		
Traps	X			

Probability $0.7 \times 0.65 \times 0.6 \times 0.5 = 13.65\%$



JURASSIC TECHNICAL LAB

- **Introduction of the project**

Government of Khyber Pakhtunkhwa, realizing the importance of oil & gas situation, has undertaken various initiatives to overcome the current crisis which includes investment in oil and gas Exploration & Production and now establishment of “Technical Laboratory” to facilitate the Exploration & Production companies working in Khyber Pakhtunkhwa. The Laboratory will be equipped with the state of art equipment, where different test will be performed to determine the technical aspects of the exploration and production phase. The Project is expected to open avenues of EOR (Enhanced Oil Recovery) and IOR (Increased Oil Recovery).

1) Project: Establishment of “Technical Lab”

2) Location: District Kohat, Khyber Pakhtunkhwa

3) Administrative Authorities Responsible:-

i) Sponsoring: Energy & Power Department, Government of Khyber Pakhtunkhwa

ii) Execution: Khyber Pakhtunkhwa Oil & Gas Company Limited (KPOGCL)

iii) Operation and Maintenance: Project Management Unit (PMU)

4) Plan Provision:

The project is prepared to be financed from Annual Development Plan (ADP FY 2017-18, FY 2018-19 & FY 2019-20) under allocated scheme name of “Technical Lab” and Code No. 150254 under ADP Scheme No.314 (FY 2017-18). Project will be done in Phases. The Phase one is acquisition of Land & Procurement of software’s & capacity building. The second includes the construction of building & procurement of equipment’s.

- Benefits of the project to company, local oil & gas companies & KP Province:

A. Our Pride:

1. Quality Services
2. Fast Track

3. Subsidized Rates
4. Building will be equipped with professional facilities

B. Technical Services:

1. All kinds of Core Analysis
2. Elemental Analysis.
3. Phase Behavior & PVT Analysis
4. Relative Permeability's
5. Porosity Determination
6. Compositional Analysis
7. Thin Sections & Analysis
8. Micro-CT Scan
9. Rock Properties
10. EOR – options

C. G&G & Seismic Services

1. Geological and Geophysical Studies
2. Geophysical Surveys (Gravity, Resistivity, Magnetic & Micro-seismic)
3. Seismic Data Acquisition & Processing
4. Interpretation, Prospect Generation
5. E&P Blocks Evaluation: start from planning Phase to drilling well(s), Development and Production phases
6. QA/QC, QHSE
7. Consultancy and Related Services

D. Drilling & Work Over Services

1. Shallow/Deep/Ultra Deep Drilling
2. Well Re-entry , Stimulation
3. Pumps Installation
4. Replacing Tubing, Packers, etc.
5. Fracturing and Well Cleaning

Project details:

Following are the specific Objectives of the project

1. Establishment of Infrastructural facilities to provide technical back up support to the Exploration and Production companies working in Khyber Pakhtunkhwa, FATA and FR regions.
2. Establishment of prospectively of Un-explored/under-explored areas, depths and horizons of Khyber Pakhtunkhwa by undertaking detailed geological, geochemical and geophysical studies directly and through national and international consultants of repute.
3. Integration, processing and Interpretation of existing geological, geochemical and geophysical information.
4. Development of geological and Tectonic Models and classification of basins of Khyber Pakhtunkhwa.
5. To establish state-of-the-art and centralized geological & geophysical database system.
6. To create a competitive, well facilitated and business environment in order to attract national and foreign investors.
7. To establish complete and comprehensive geochemical service, which includes sample preparation, analysis, interpretation and to do Organic Petrography by measuring TOC (Total Organic Content).
8. To carry out the Reservoir and Source rocks studies to evaluate the Hydrocarbons quality and potential of these rocks in Khyber Pakhtunkhwa.
9. To analyze, correlate the core samples of different wells of Khyber Pakhtunkhwa and to improve and increase the production of Oil and Gas from these wells by adopting different strategies.
10. To perform micro-level Basin studies.
11. To assist KPOGCL in oil and gas Exploration & Production.
12. To train fresh graduates to generate skilled workforce in the province.

- Project economics:

KPOGCL	
Establishment of Technical lab Project Economics for 15 years	
	US \$ Million
Revenue	86
Processing	26
Geochemical	1
Softwares (G&G Services)	54
Sedimentological	2
Interpretation	3
Expenses	
Capex	10
Opex	1.91
Tax	33
Total Expenses	46
Net Cash Flow	\$ 40
Present Value @ 10%	\$ 11
Present Value @ 12.5%	\$ 8
Present Value @ 15%	\$ 5
IRR	25.9%

Assumptions	
Prices	US\$ Per
Processing	350 L.km
Geochemical	100 Sample
Softwares Services	1500 project
Sedimentological	100 sample
Interpretation	270 L.km
Opex	US\$ Per
O & M expense	0.10 Sample/Lkm
Human Resource	0.20
Success Ratio	35%
	<i>Revenues calculated at 35% Success Ration</i>
Production Start year	2,017
Production days	350
Discount Rate	10.0%
	12.5%
	15.0%
Taxation	Yes

- Modes of Investment models

The Potential Business Development options

- i. JV – direct 60 / 40 – with equal share in Profit /Loss*
- ii. BOOT – Build operate own and transfer*
- iii. BOO – Build Operate and Own*
- iv. PPP – Private Public Partnership.*

SEEPAGES

Introduction to Oil & Gas Seepages in Khyber Pakhtunkhwa

Seepage of Oil & Gas is defined as '*naturally oozing oil & gas from the earth crust*'. There are 24 Oil & Gas Seepages reported in Khyber Pakhtunkhwa. In some locations seeps are utilized by the locals, using non-scientific and very dangerous ways. Proper scientific methods must be used to mitigate the hazard to health, environment, agriculture lands, livestock and properties of the local. These natural resources can be utilized in professional way to provide maximum benefits to the local communities. This Project is aimed to contribute in the overall objective of Khyber Pakhtunkhwa Government to make KP self-sufficient in energy sector, generate revenues and employment.

Three Major Oil & Gas Seepages in Khyber Pakhtunkhwa

24 seepages have been reported in the KP province till date (18 Oil and 6 Gas). Initially, the following three Oil & Gas Seepages have been selected for further development on pilot project basis:

1. AZAKHEL GAS SEEP (G-003)

Located about 40 km Northwest of Peshawar near Azakhel village, in District Peshawar (GPS Location Latitude/Longitude: 33.48°20.61"N, 71.36°58.53" E).

2. QAMAR DHOK (GUMBAT) OIL SEEP (L-008)

Qamar Dhok seep is Located about 65 Km Southeast of Kohat city, District Kohat and 115 Km from Peshawar (GPS Location Latitude/Longitude: 33.50°, 71.66°N and 33.48°, 71.87°E).

3. MUGHAL KOT OIL SEEP (L-018)

Located in Suleiman ranges near the Town of Mughalkot, about 130 Km from D.I Khan and 430 Km from Peshawar (GPS Location Latitude /Longitude: 31°26'24.46"N 70°4'32.07"E).

Details of Oil & Gas Seepages in Khyber Pakhtunkhwa

There are 24 Oil & Gas Seepages identified in different areas of Khyber Pakhtunkhwa. In the table, highlighted seeps are the major Oil & Gas Seepages selected for further development. Also attached is the map of oil and gas seepages in KPK.

S No.	Seepages Area	Seepages Code	Status	District	Coordinates	Block	Operator
1	Matwani	G-001	Gas	Buner	34° 29' 7.30"N 72° 36' 48.60" E	No Block	
2	Inzari Kandao	L-001	Oil	Khyber Agency	34° 9'13.03"N 71° 8'30.00"E	No Block	
3	Landi Kotal Bazar	G-002	Gas	Khyber Agency	34° 6'14.00"N 71° 8'59.50"E	No Block	
4	Azza khel Bala	L-002	Oil	Nowshera	33°59'37.94"N 71°51'36.35"E	Peshawar Block	Hycarbex
6	Pabini	L-003	Oil	Swabi	33° 35.33' N 71°26.57' E,	Peshawar Block	Hycarbex
5	Azza Khel Matani	G-003	Gas	Peshawar	33°48'9.00"N 71°37'8.00"E	Peshawar Block	Hycarbex
7	Jainu Malgin	L-004	Oil	Kohat	33°37'60.00"N 71°32'60.00"E	Kohat Block	OGDCL
8	Panoba	L-004	Oil	Kohat	33°36'0.00"N 71°54'0.00"E	Tal Block	MOL
9	Chorlakk	L-005	Oil	Kohat	33°36'21.63"N 71°57'5.26"E	Sogri Block	OGDCL
10	Khushal Gar	L-006	Oil	Kohat	33°37'30.77"N 71°57'50.00"E	Sogri Block	OGDCL
11	Qamar Dhok	L-008	Oil	Kohat	33°30'0.00"N 71°39'36.00"E	Tal Block	MOL
12	Jatta	L-009	Oil	Karak	33°19'0.00"N 71°18'60.00"E	Tal Block	MOL
13	Dharangi	L-010	Oil	Karak	33°16'60.00"N 71°13'0.00"E	Tal Block	MOL
14	Lakoni Algad	L-011	Oil	Karak	33°13'60.00"N 71°15'60.00"E	Nashpa	OGDCL
15	Kutal Seepage	L-012	Oil	Karak	33° 7'12.00"N 71° 5'41.00"E	Karak Block	MPCL
16	Koja Kalay	G-004	Gas	FR Bannu	33° 6'9.00"N 70°45'15.00"E	Karak Block	MPCL
17	Domail	L-013	Oil	Bannu	33° 2'30.00"N 70°45'49.00"E	Karak Block	MPCL
18	Malla Khel	L-014	Oil	Karak	32°55'60.00"N 71° 8'0.00"E	Karak Block	MPCL
19	Mitha Khattak	L-015	Oil	Karak	32°49'0.00"N 71° 6'60.00"E	Karak Block	MPCL
20	Manglin	G-005	Gas	Tank	32°27'41.18"N 70°30'54.91"E	Marwat Block	OPL
21	Kundal	L-016	Oil	D.I Khan	32°32'17.80"N 71°18'.14.80"E	Zindan Block	PPL
22	Bain Pass	G-006	Gas	Tank	32°26'27.33"N 70°35'40.55"E	Marwat Block	OPL
23	Saiduwali	L-017	Oil	D.I Khan	32°12'0.00"N 71° 0'0.00"E	Paharpur Block	KUFPEC
24	Mughal Kot	L-018	Oil	FR D.I khan	31°26'33.74"N 70° 4'34.37"E	Baska Block	Zenhua

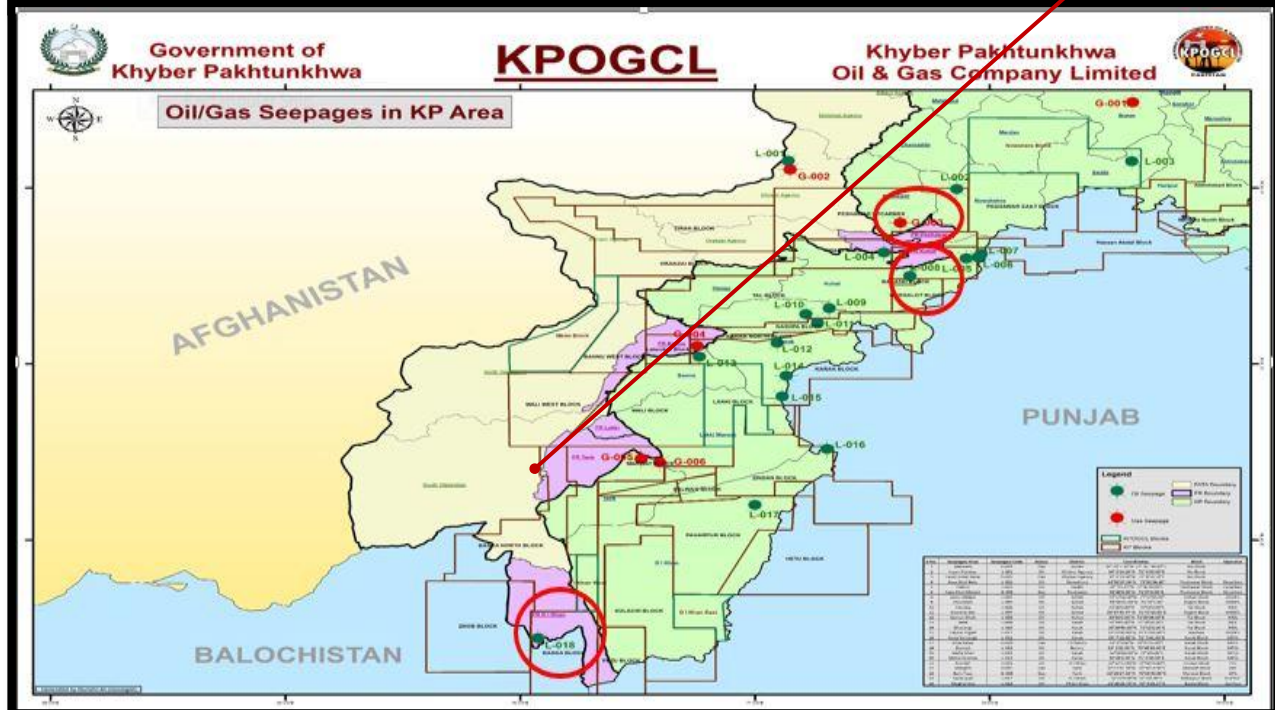


Figure 1 - List & Map of Seepages in KPK

Scope of Work

1. Drilling vertical wells with standard logs to identify potential hydrocarbon bearing zones.
 - a. Azakhel Gas Seep up to 300 meters.
 - b. Qamar Dhok (Gumbat) Oil Seep up to 500 meters.
 - c. Mughal Kot Oil Seep up to 500 meters.
2. Seismic (micro seismic) survey will be conducted to identify shallow subsurface structures. Magnetic, gravity and resistivity surveys could also be conducted along with the seismic survey.
 - a. The 3D refraction tomography will be used to map subsurface structures and estimate volumes.
 - b. Identification of subsurface geology and potential hydrocarbon bearing zones, using Gravity and Resistivity survey.
 - c. This pilot project may lead to a full Gravity and 2D/3D seismic reflection survey on entire seepages in KP, to further delineate the structural configurations.
3. Prepare Field Development plan, including well design, drilling, completion, installation of surface facilities (hydrocarbon treatment) and transportation.

Although both (1&2) of these options could be executed, but based on available resources, our priority would be drilling the vertical well(s) first. The valuable information from drilling and well logs will not only enable us to identify the productive intervals which will enable us to properly design well completion, but also the reservoir conditions and properties. Generally, to identify the lateral extent and correlate the formations in wells, VSP (Vertical Seismic Profiling) is used. However, P-waves from the sonic log could also be used as a replacement for VSP. The lateral extension of the formations is not only important to identify the continuity of a reservoir; it also aids to design the path of a horizontal well. Drilling a horizontal well is an expensive practice; due to limited resources it is not possible at this stage, but it could be considered a possibility in the future once we have better and more precise geological data and reservoir potential.

If the seismic survey is conducted initially, the interpretation of this data will not only allow us to correctly identify the depositional systems associated with the locality, but it will also enable us to identify the potential traps (structures and faults) and any possible stratigraphic plays. This information will help us to locate sweet spots on the structure(s) for drilling. Moreover, the calculated thickness from seismic data will help us evaluate the possible hydrocarbon resources, as well as identify the commercial viability of the project.

Reasons for Study & Development

1. To carry out regional geological study of Khyber Pakhtunkhwa seepages which will identify parameters that control the occurrence of hydrocarbons in subsurface i.e. source rocks, reservoir rocks, cap rocks, tectonic events and the time of migration and accumulations.
2. To study the flow mechanism of seepages.
3. Configuration of the basins with diagenetic, resources estimation, reserves in place and preliminary layout design to undergo the exploitation of hydrocarbons.
4. Interpretation/re-interpretation of existing data (if available) to generate regional geological models.
5. To identify and locate sweet spot for drilling.
6. To develop the seeps in a cost effective and professional manner.

Benefits to KP Province, Company and Local Community

1. Preventing illegal extraction and sale of this national resource.
2. Overcoming the energy shortage in the province.
3. Boosting economic activities and generating jobs for the local community.
4. Utilizing gas for domestic use and power generation.
5. Helping mitigate the danger being posed to
 - a. Local population
 - b. Biota
 - c. Ground Water
 - d. Preserve forests-which are used for fuel in the local communities.
6. KPOGCL will generate revenue from this project. Details of the economics are given in the next section.

Project Economics for 10 Years

The Oil & Gas Seepages pilot project economics have been calculated for projected time frame of 10 years. The IRR over this period is expected to be 32.2%, 36.9% and 26.0% for Azakhel gas seep, Gumbat oil seep and Mughal Kot oil seep respectively. Key assumptions are:

1. Gas production of 6 MMCFD from Azakhel gas seep.
2. Oil production of 120 BOPD from Gumbat oil seep.
3. Oil production of 100 BOPD from Mughal Kot oil seep.
4. Wells were flowed at constant rate for three years. Thereafter 15 % decline rate is applied for the next four years and for the rest of years 10% decline rate is applied.

KPOGCL Azakhel Gas Seep	
Seepages Development Project Economics for 10 years	
	US \$ Million
Revenue	14
Gas	14
Oil	0
Expenses	
Capex	1.92
Opex	3.10
Royalty	2
Tax	4
Total Expenses	11
Net Cash Flow	\$ 4
NPV @ 10%	\$ 2
NPV @ 12.5%	\$ 1
NPV @ 15%	\$ 1
IRR	32.2%
Not Including LPG	

Table 1 - Azakhel Gas Seep Economics

KPOGCL	
Gumbat Oil Seep	
Seepages Development Project Economics for 10 years	
	US \$ Million
Revenue	15
Gas	-
Oil	15
Expenses	
Capex	2.03
Opex	3.10
Royalty	2
Tax	4
Total Expenses	11
Net Cash Flow	\$ 4
NPV @ 10%	\$ 2
NPV @ 12.5%	\$ 1
NPV @ 15%	\$ 1
IRR	36.9%

Table 2 - Gumbat Oil Seep Economics

KPOGCL	
Mughal Kot Oil Seep	
Seepages Development Project Economics for 10 years	
	US \$ Million
Revenue	12
Gas	-
Oil	12
Expenses	
Capex	2.03
Opex	3.10
Royalty	2
Tax	3
Total Expenses	10
Net Cash Flow	\$ 3
NPV @ 10%	\$ 1
NPV @ 12.5%	\$ 1
NPV @ 15%	\$ 1
IRR	26.0%

Table 3 - Mughal Kot Oil Seep Economics

Modes of Investment Models

Following are the different Potential Business Development options:

1. **KPOGCL to invest 100%** of the project via Provincial Govt. Fund
2. **JV** – farm-out up to 49% shares
 - a. JV via Cash Investment
 - b. JV via Technical Services
3. **BOOT** – Build, Operate, Own and Transfer
4. **BOO** – Build Operate and Own
5. **PPP** – Private Public Partnership.

For investment in Seepages project we will prefer option 1 or option 2.

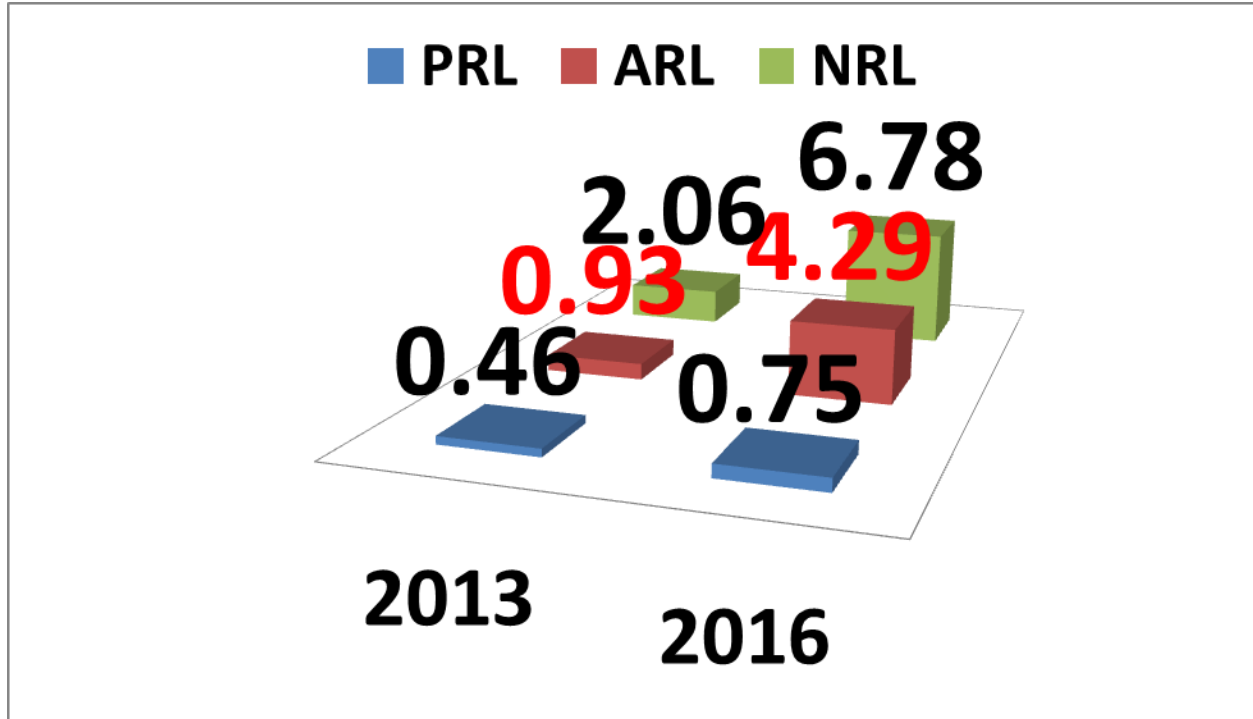
REFINERY CAPACITIES & MARKET SCENARIO

Today, Pakistan has a total refining capacity to process around 400,000bpd or about 19MTPA of crude oil, against the current demand of 24MTPA. Total global refining capacity is 97 million bpd, and Pakistan, with nominal world share of 0.4 percent, is ranked 48th. Demand for oil products in the country is expected to grow steadily at seven percent on year-on-year basis, according to recent studies, in particular for the furnace oil, motor spirit, diesel and aviation fuel, which accounts for 78 percent of total oil demand. Thus, the demand-supply gap will continue to strain heavily on the imports in future, if oil refining capacity is not added at a large scale.

Due to exponential increase in Economic Development of the world at large, the Global refining capacity is expected to reach 115 million bpd by 2020 despite low crude oil prices and consequently the gloomy scenario for the oil and gas sector. It is however speculated that the global trend of declining oil prices would be arrested in the near future. Pakistan should therefore be no exception as future energy consumption poses a serious challenge for the nation, and refining margins are high.

Currently, there are seven oil refineries operating in the country. Major players in the sector are Pak-Arab Refinery Co Ltd (Parco) of 100,000bpd (4.5MTPA), National Refinery Ltd (NRL) of 64,000bpd (2.9MTPA), Pakistan Refinery Ltd (PRL) of 47,000bpd (2.1MTPA), Attock Refinery Ltd (ARL) of 43,000bpd (1.9MTPA), Byco Petroleum Pakistan Ltd (BPPL) of 35,000bpd (1.6MTPA) and Byco Oil Pakistan Ltd (BOPL) of 120,000bpd (5.4MTPA) output capacity, which was commissioned in June 2015.

To overcome this tight supply and demand dilemma, Chinese investors have shown interest in setting up oil refineries in Pakistan. Also, the first refinery to be established in Khyber Pakhtunkhwa is on cards based on indigenous crude oil, of initial capacity 20,000. Study for selection of a suitable site for the refinery in Kohat where oil wells are located are in progress. The nation keenly looks towards further progress in this direction; this would break the shackles of tight supply/demand gap.



Petroleum Refinery District Karak

- **Introduction of the project**

Government of Khyber Pakhtunkhwa, realizing the importance of oil & gas situation, has undertaken various initiatives to overcome the current crisis which includes investment in oil and gas Exploration & Production and now establishment of “State of Art Modern Petroleum Crude Oil Refinery” with the capacity of 40,000 BPD to facilitate the Production companies working in Khyber Pakhtunkhwa and Pakistan Particularly. The Refinery will be equipped with the state of art equipment, where different test, Analysis, Crude Distillation, Processing, will be performed for production phase. The Project is expected to open avenues of socio-economic uplift. The Details of project are as follows:

- 1) Project: Establishment of “State of Art Modern Petroleum Crude Oil Refinery”
- 2) Location: District Karak, Khyber Pakhtunkhwa
- 3) Administrative Authorities Responsible:-

- i) Sponsoring: Frontier Works Organization under the Constitutional Umbrella of Energy & Power Department, Government of Khyber Pakhtunkhwa
- ii) Execution: Frontier Works Organization (FWO) Lead Role
Khyber Pakhtunkhwa Oil & Gas Company Limited (KPOGCL)
- iii) Operation and Maintenance: Project Management Unit (PMU) Frontier Works Organization. The Project is being executed on Built, Own & Operate Basis.

4) Plan Provision:

The project is to be financed from Viable Means allocated by (FWO) Project will be done in Phases. The Phase one is acquisition of Land & Procurement & Construction of Infrastructure building.

- Benefits of the project to company, local oil & gas companies & KP Province:

A. Our Pride:

1. Quality Services
2. Fast Track
3. Subsidized Rates
4. Building will be equipped with professional facilities

B. Technical Services:

1. All kinds of Crude Oil Analysis
2. Elemental Analysis.
3. Fuel Quality & Quantitative Analysis

- **Project details:**

Following are the specific Objectives of the project

1. Establishment of Infrastructural facilities to provide technical back up support to the Exploration and Production companies working in Khyber Pakhtunkhwa, FATA and FR regions.

2. Establishment of prospectively of Un-explored/under-explored areas, depths and horizons of Khyber Pakhtunkhwa by undertaking detailed geological, geochemical and geophysical studies directly and through national and international consultants of repute.
3. Integration, processing and Interpretation of existing geological, geochemical and geophysical information.
4. Development of geological and Tectonic Models and classification of basins of Khyber Pakhtunkhwa.
5. To establish state-of-the-art and centralized geological & geophysical database system.
6. To create a competitive, well facilitated and business environment in order to attract national and foreign investors.
7. To establish complete and comprehensive geochemical service, which includes sample preparation, analysis, interpretation and to do Organic Petrography by measuring TOC (Total Organic Content).
8. To carry out the Reservoir and Source rocks studies to evaluate the Hydrocarbons quality and potential of these rocks in Khyber Pakhtunkhwa.
9. To analyze, correlate the core samples of different wells of Khyber Pakhtunkhwa and to improve and increase the production of Oil and Gas from these wells by adopting different strategies.
10. To assist KPOGCL in oil and gas Exploration & Production.
11. To train fresh graduates to generate workforce in the province.

Policy Focus

Investment Protection & Mechanism in place to ensure consistency

The Government of Pakistan has adopted consistent Policies & Rules, aimed at promoting foreign investment in upstream petroleum sector, with the view to exploit indigenous hydrocarbon resources in an optimal manner with lucrative incentives for the investors as specified in the following Petroleum Policies.:

- Pakistan Petroleum Policy 1994 to 2012
- Pakistan Onshore Petroleum Exploration & Production Rules 2009 & 2013.

Foreign investment is fully protected under foreign investment protection law of 1976 passed by the Parliament, under which the Government guarantees full security to foreign investments in Pakistan. The Governments have been providing policy package of liberal incentives to enhance exploration activities in the country, the latest of which was introduced in 2012.

Policy Incentives offered by Government of Pakistan

The country has been zone based on their relative prospect and Geological risk. Onshore areas are sub-divided in three zones; ZONE-I high risk - high cost areas, ZONE-II medium risk - high to medium cost areas and ZONE-III low risk - low cost areas.

Moreover, the following policies are in place to incentivize the investors in special circumstances.

- Low BTU Gas Pricing Policy 2012
- Tight Gas (Exploration & Production) Policy 2011
- Marginal/ Stranded Gas Fields: Gas Pricing & Criteria and Guidelines 2013

Facilitation offered by Government of Khyber Pakhtunkhwa via KPOGCL

- Coordination and Execution of Concession and JV Agreements
- Provision of Petroleum Technical Data (access to Data Rooms)
- Office setup and Manning in Pakistan
- Hiring of G&G, Seismic and Drilling Rig Services

Security

Owing to the needs of the province, the law and order situation in the province has been much improved. Confidence level has increased for National and International Oil companies thus a number of E&P companies are now working in Khyber Pakhtunkhwa due to relentless efforts of both Federal and Provincial Governments. The local and foreign investors are enjoying safe and secure law & order environment, 07 Seismic crews and 10 rigs are presently working in Khyber Pakhtunkhwa. Expats are frequently visiting KPK, wherein they work and supervise their exploration and production operations. Security & logistics coordination is one of the mandates of KPOGCL. KPOGCL help operations in once dormant Exploration Blocks like Kohat, Marwat, Orakzai, Tirah, Paharpur, Baska North, Latambar, Pezu, Kulachi, Karak North, Baratai & Peshawar etc. These blocks are now active.

The following major steps are taken to ensure adequate security

Energy Apex Committee headed by Chief Minister Government of Khyber Pakhtunkhwa;

Energy Security Steering Committee (ESSC) headed by Home Secretary;

Process in place for Security Clearance from Ministry of Interior, Board of Investment, Home Department and Security Risk Analysis;

Focal Person in 11 Corps Headquarters;

Process for NOCs to KPOGCL from 11 Corps;

1. Quarterly meeting with 11 Corps by KPOGCL;
2. Provide security coverage to Foreigners and local official of the Energy & Power companies operating in the province.

Management Team

Raziuddin (Razi)

Chief Executive Officer (CEO)

Masters in engineering from Michigan and MBA from New York, USA. More than 45 years' experience in national & international Upstream, Midstream and Downstream Oil & Gas Industry,. He held top management positions in large public & private energy sector companies. More than 15 years of experience as CEO/MD/Advisor in major/large energy companies. Worked as advisor of energy & power for Orion group bangladesh. He has also worked as MD/CEO NLC Energy, OGDCL and Attock Refinery, Advisor- Royal Commission, Chief Energy Wing.

- Chairman, Vision-2025 Government of Pakistan Working Group Energy
- Chairman, 11th 5-Year Plan, Government of Pakistan Working Group Energy

Synopsis of his experiences as follows:

- Crisis, Change & Contingency Management.
- National Policy Development & Budgeting, National Energy Security Plan & Vision.
- Financial engineering/re-structuring, structuring, Financial Close, Privatization & Deregulation, Energy Economics, Pricing.
- Oil & Gas Exploration and Production, Crude Oil Refinery, Petroleum Products & Oil Marketing and Trading, Petroleum Products & Oil Logistics & Storage.
- Joint Venture formations, Interaction/hired international legal advisors, financial advisors and insurance advisors.
- Interaction/hired international PMC and Owners Engineers, Project Management, EPC LSTK of mega projects on fast track.
- International Investment Induction (Debt & Equity).

Also Worked as International Energy Consultant

- Exploration & Production (on shore, off-shore, swamps).
- Oil Refining (BMRE, Greenfield), Petroleum products marketing, IPPs.
- LNG Terminal with Power Plant, Mega-Projects development.
- National policies/studies/Plans.

Muhammad Haneef

GM Petroserve

Experienced Geophysicist Master Degree in Geophysics, from Quaid e Azam University Islamabad Pakistan-1989

Professional Certificate in Computer Application – 1989

25 years of versatile experience in oil & gas exploration, Services/ Operations. More than 15 Years of Experience on key management positions. Setup, Supervised and Worked on several oil exploration Services Projects for local and International E& P Companies in Pakistan, Egypt, Saudi Arabia, Nigeria, UK & UAE. Worked with OGDCL, LMKR, Landmark Graphics, Hampson & Russell, TGS/Guide, Spectrum Geo UK, Fecto-LPEB/CNPC China, POL Pakistan and KJO Saudi Arabia for Project Management, seismic services setup/operations. Key Expertise include: Seismic Data Processing, Data Acquisition, Data Management, Interpretation, E&P Blocks Evaluations, Prospect Generation, Advisory role, QA & QC, etc. He is an accomplished team player with successful proven track record at offices/ fields and at remote projects while managing multi-tasking teams. Help almost all E&P companies in Pakistan for many success wells.

Nasir Riaz (CSOT) Geologist

Master degree in Geology from Azad Jammu Kashmir

MS in Energy Management from COMSAT University, Islamabad, Pakistan.

More than 15 years' of experience in national & international companies in upstream oil & gas Industry.

Amjad Ali Manager Exploration – (PG)

Geologist

Master degree in Geology from University of Peshawar, Pakistan -1998. More than 16 years of experience in oil & gas industry and worked for RDC International Islamabad. Mineral Testing Laboratory, Nativus Resources Islamabad, Petro-services Islamabad, Ministry of Petroleum & Natural Resources, Islamabad, Integrated Petroleum Consultant Islamabad. He had been team leader of a group of G & G experts while working for PAIGE in Pashin Basin. He has also worked as Operations / Wellsite geologist for Couple of years with OGDCL. He is a successful negotiator regarding Oil and Gas Exploration Business. Well experienced in Government affairs and concession management. Experienced in HSE related matters in field operations.

Hamid Hussain
(Manager Field Geology) - Geologist

Master degree in Geology from University of Peshawar, Pakistan- 2002

More than 14 years of experience in upstream Oil & Gas Industry (Yemen, Iraq & UAE). He has also worked in leading Oil & Gas industry companies in Pakistan.

MR. SADAQAT SAID
GM RESERVOIR MANAGEMENT DEPARTMENT & DRILLING DEPARTMENT

Masters in Petroleum Engineering from University of Calgary

Petroleum Engineer with over 18 years of diverse experience in oil and gas exploration & operations. Conducted reservoir engineering analysis on oil and gas pools, including reserve management, production forecasting and enhanced recovery optimization. Knowledge of reservoir engineering, proficient with CMG/Eclipse Reservoir Simulation, Petrel RE and RTA. Performed Reservoir characterization and modeling of Canadian unconventional (shale/tight gas and oil) reservoirs, simulation of commingled gas production and multi stage hydraulic fracture from various tight horizons using CMG, Petrel RE and Eclipse. Recommended strategies for depletion or enhanced oil recovery for conventional/unconventional hydrocarbon reservoirs. Strong communication skills, with extensive technical report writing and presentation experience. Strong analytical and problem solving skills developed through education, training and professional experience. Demonstrate ability to build positive collaborative relation with other professionals in a multi-cultural environment. Completed different software courses for solving problems specifically in the oil and gas industry. APEGA registered member Professional Engineer (P.Eng.) in Alberta Canada.

CONTACT US



For further information, please contact:

Raziuddin (Razi)

CEO

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