Abstract

For over more than a decade, wells drilled by the Soviet Union in the 1960s and 1980s were abandoned and left out in the open as an icon of exploration and hydrocarbon existence and potential. We estimate over 962 mbo, 52 tcf of natural gas, and 582 million barrels of natural gas liquids in Amu Darya Basin including 946 mbo, 7 tcf of natural gas and 85 million barrels of natural gas liquids for the Afghan Tajik Basin. Both basins fall in three different countries of Central Asia and are one of the prolific hydrocarbon basins in region. Afghanistan hydrocarbon resources are important for the redevelopment of Afghanistan’s infrastructure. One of the results of more than two decades of strife in Afghanistan is a shortage or absence of energy required to improve living conditions. The presence of petroleum resources has long been known in Afghanistan and from the recent exploration activity and 2D seismic survey; the basins have shown promising structure in the Afghanistan region. Both basins lie in the northern areas of Afghanistan where we have low security threat. The Government of Afghanistan and Ministry of Mines have already initiated work on exploration and are moving forward to appraise and develop the fields. The US Geological Survey cooperated with the Afghanistan Ministry of Mines and Industry in assessing the potentially undiscovered technically recoverable conventional petroleum resources of Afghanistan. Much of the petroleum resource potential of Afghanistan and all of the known crude oil and natural gas reserves are in northern Afghanistan, located in parts of two petroliferous geologic basins — the Amu Darya Basin to the west and the Afghan-Tajik Basin to the east.

The paper briefly discusses the hydrocarbon potential of Afghanistan and its geological study including exploration and production opportunities.
Afghanistan-Under Explored Basins and Hydrocarbon Potential Study

**Afghan Tajik Basin**
- **Geologic Location**: The Afghan Tajik Basin occupies desert and semi-desert area of South-East Turkmenistan, South-West Uzbekistan and North-West Afghanistan, a small part of the basin is located in Iran. The basin area exceeds 400,000 km² of which 360,000 km² are in Turkmenistan and Uzbekistan.
- **Exploration**
  - Fifteen fields have been discovered in the Amu Darya part of Afghanistan since 1957 amongst which 7 are oil fields and 8 gas fields.
  - Oil fields include:
  - Gas fields include (all situated in Sheberghan city of Afghanistan):
  - Jer Quduq and Khoja Gogerdaq are the largest gas field discovered in Afghan.
  - Only about 3 of the gas fields are currently producing. As a result of the discovery of petroleum accumulations in neighboring Uzbekistan and Turkmenistan some oil companies began geologic studies of Northern Afghanistan beginning in the 1930s.
  - About 370 wells have been drilled in Amu Darya Basin.

**Katawaz Basin**
- **Geologic Location**: The Katawaz Basin, located in the mountainous regions of northern Afghanistan, consists of accreted terrane in the collision zone of the Helmand and Indian tectonic plates. The area extent of the entire basin is approximately 45,000 Km², it is bounded on the North-West by the Chaman Fault Zone and on South and East by the Muslimabad Phiolite zone.
- **Exploration**
  - Twenty-one wells have been drilled in the Katawaz Basin since 1957, none of which penetrated Jurassic rocks.
  - No discoveries have been made in the main part of the Afghan Tajik Basin.

**Amu Darya Basin**
- **Geologic Location**: The Amu Darya Basin occupies desert and semi-desert area of South-East Turkmenistan, South-West Uzbekistan and North-West Afghanistan, a small part of the basin is located in Iran. The basin area exceeds 400,000 km² of which 360,000 km² are in Turkmenistan and Uzbekistan.
- **Exploration**
  - Fifteen fields have been discovered in the Amu Darya part of Afghanistan since 1957 amongst which 7 are oil fields and 8 gas fields.
  - Oil fields include:
  - Gas fields include (all situated in Sheberghan city of Afghanistan):
  - Jer Quduq and Khoja Gogerdaq are the largest gas field discovered in Afghan.
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  - About 370 wells have been drilled in Amu Darya Basin.

**Recoverable Gas Estimates**: 75 Million Barrels with deposit levels 0.2 Million Barrels products

**Recoverable Oil Estimates**: Approximately 5 Trillion cubic feet.