

Tethys Petroleum Limited & BGS (NERC) PETEX 2008

PETROLEUM EXPLORATION IN SOUTHERN TAJIKISTAN USING GEOVISIONARY SOFTWARE FOR 3D VISUALISATION

(Report No. OR/08/077)

Petroleum exploration in southern Tajikistan Outline



- Licence status and work obligations
- South Tajik petroleum geology
- Database and progress so far
- Geovisionary – why use BGS
- 3D view of southern Tajikistan



Petroleum exploration in southern Tajikistan



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- LB,RAE,AJN and JB publish with permission of the Executive Director, British Geological Survey (NERC). The visualisation was carried out using Geovisionary software developed by the BGS in association with Virtualis.
- Fugro/NPA supplied Tethys with original Landsat DEM interpretation
- Tethys operates the Bokhtar PSC for Kulob Petroleum Limited

Petroleum exploration in southern Tajikistan Licence



- Tethys holds Licence to 34,785sq kms
- Operating Agreement 2007
- PSC June 2008
- Exploration obligation
- 18 months for geological studies, seismic acquisition and processing
- Exploration drilling required by 2010
- Well re entry

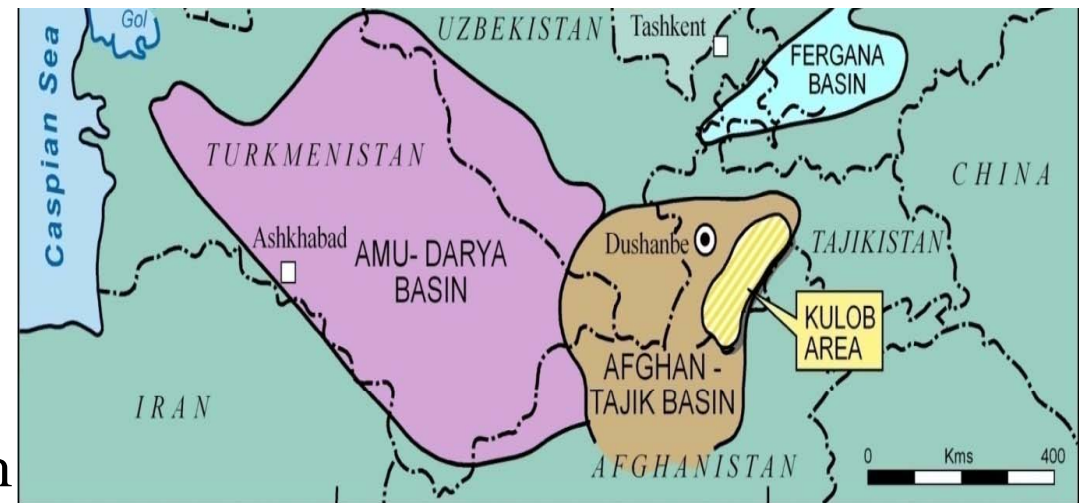


Petroleum exploration in southern Tajikistan

Petroleum geology



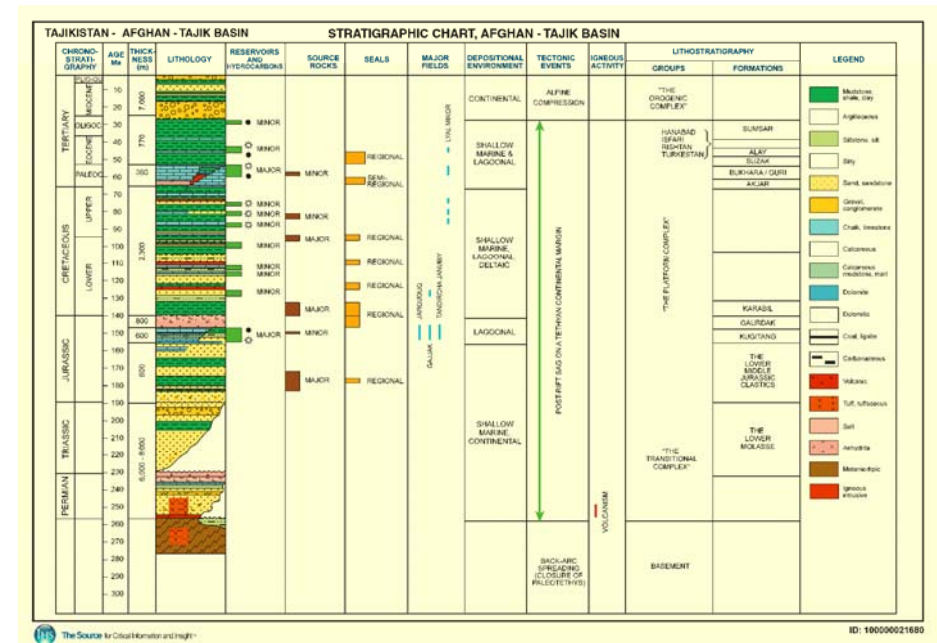
- Oil discovered in 1909 but no real investment for last 20 years
- Tethys PSC=(Afghan) Tajik Basin an extension of the gas prone Amu Darya Basin of Uzbekistan and Turkmenistan
- Low current production from Beshtentyak oil and gas Field near Kulob



Petroleum exploration in southern Tajikistan Geology



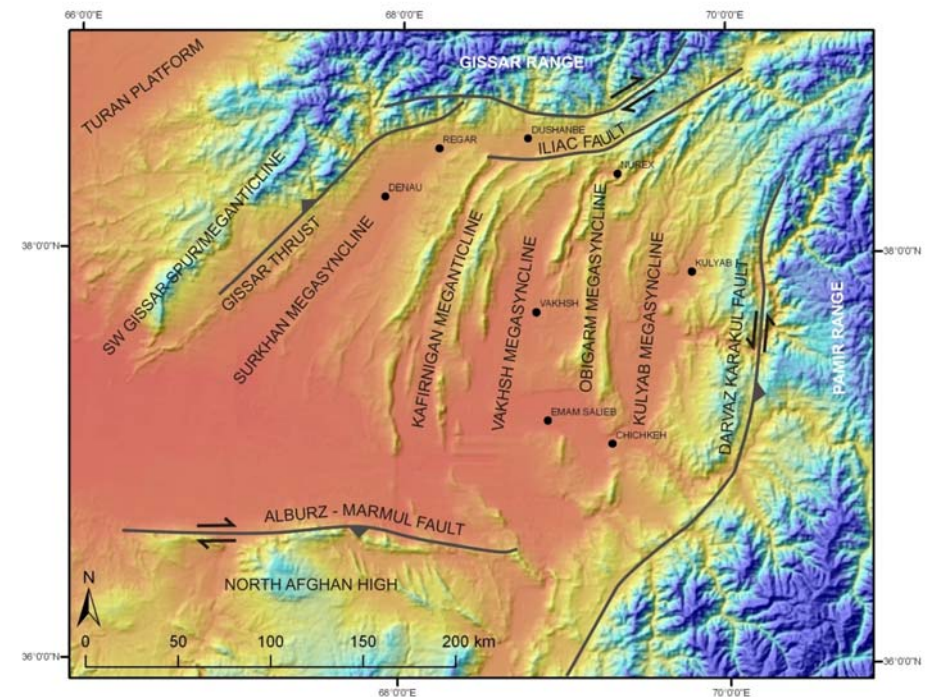
- Palaeozoic basement and Permo Trias
- Tethyan Sea – Jurassic continental gas source, (undrilled) carbonate reservoirs and finally evaporites, salt tectonics
- Cretaceous continental Hauterivian reservoir
- Palaeocene marine carbonates
- Bukhara producing reservoir



Petroleum exploration in southern Tajikistan

Structural geology

- Miocene deformation , Indian plate into Asia, compression
- Thrusts from Pamirs and Gissar range, right lateral strike slip
- N-S anticlinal ridges associated with thrust faults root into salt
- Pre Miocene deposition thickens into Kulab basin
- Salt diapirs in Kulab related to domes and thrusts

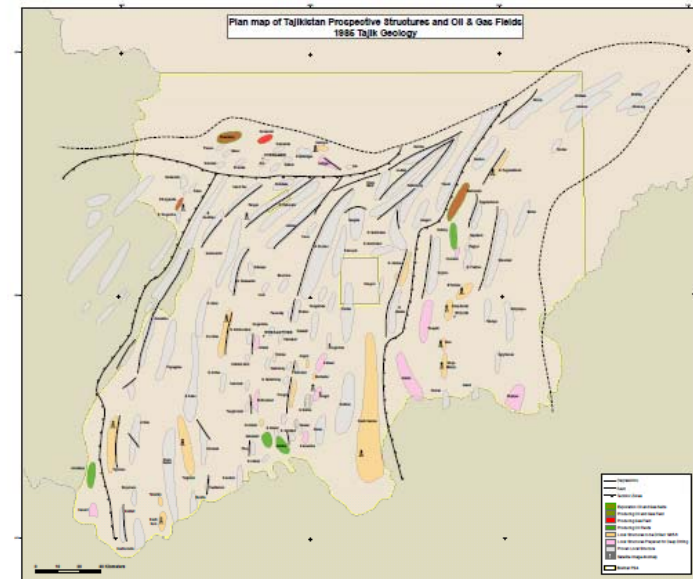


Petroleum exploration of southern Tajikistan Database



Tethys has right to historical 20-40 yr old dataset ; well logs and passports , scanned seismic lines ,on paper .These are arriving slowly

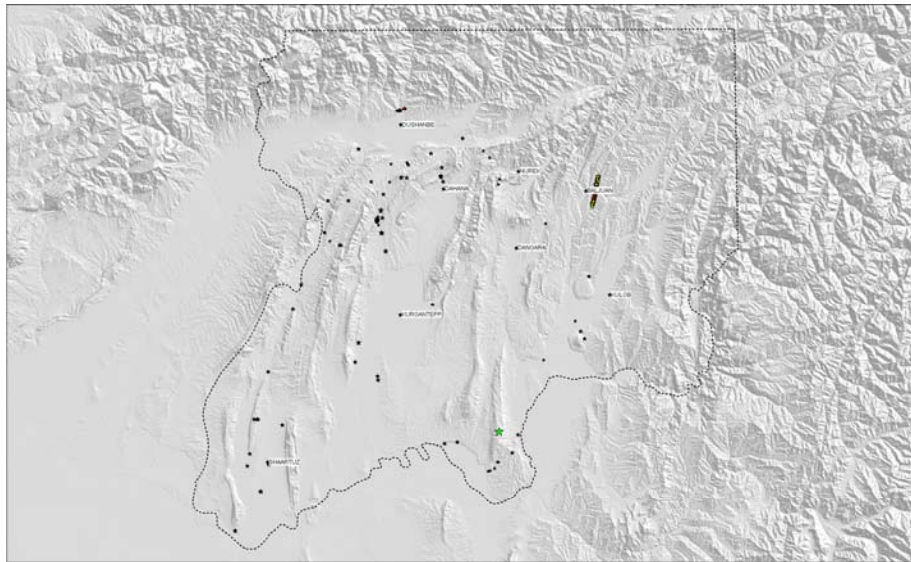
Soviet geological maps good quality , prospect mapping based on surface structure



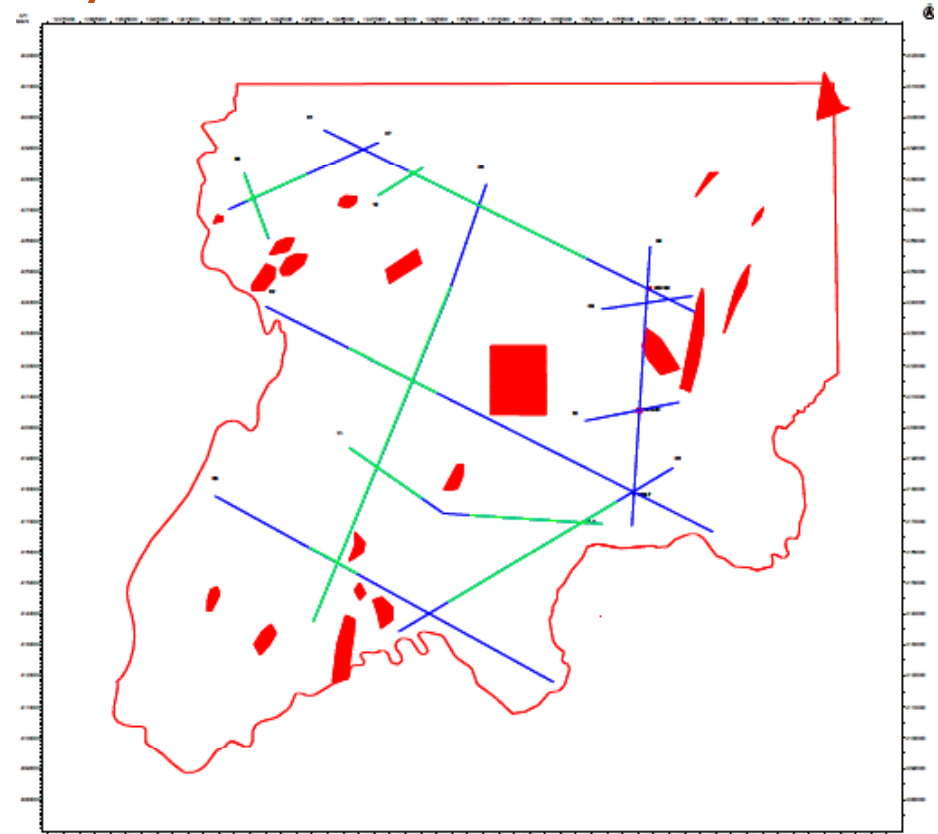
Petroleum exploration in southern Tajikistan Progress since 3D



Field work has targeted structure, stratigraphy, palaeontology, oil samples, georeference

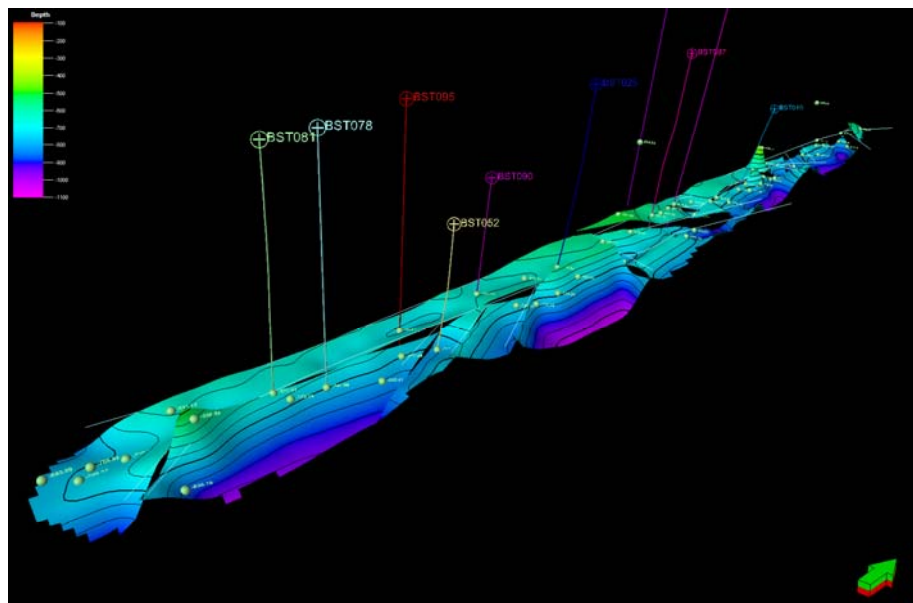


Phase 1 programme
1000kms seismic planned
dynamite and vibroseis



Petroleum exploration in southern Tajikistan Progress since 3D

Petrel model of Beshtentyak built



Re entering old gas well 180 Komsomol field



Using Geovisionary software for 3D visualisation



- Geovisionary has been developed by BGS and Virtualis as a virtual environment for Geologists who need a 3D concept model prior to field work
- The 3D model is built from aerial photographs and elevation models and can include shape files and geoline work such as well data & cross sections
- We used SRTM DTM satellite imagery, a 75m grid elevation dataset and the pre-existing Soviet era geological model
- Then added 21 ASTER scenes for high spectral resolution geologically sensitive data. SWIR infrared can be interpreted for a region knowing the weathering pattern. 15m grid.
- Geovisionary uses Virtual Terrain Streaming

3d Geovisionary Presentation

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- Remote understanding of the geological model was
- Needed to give phase one Exploration a quick start
- Needed to acquaint the Tethys team with geology before undertaking field work
- Needed to help plan 1000kms seismic acquisition ,now about to mobilise



British Geological Survey
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