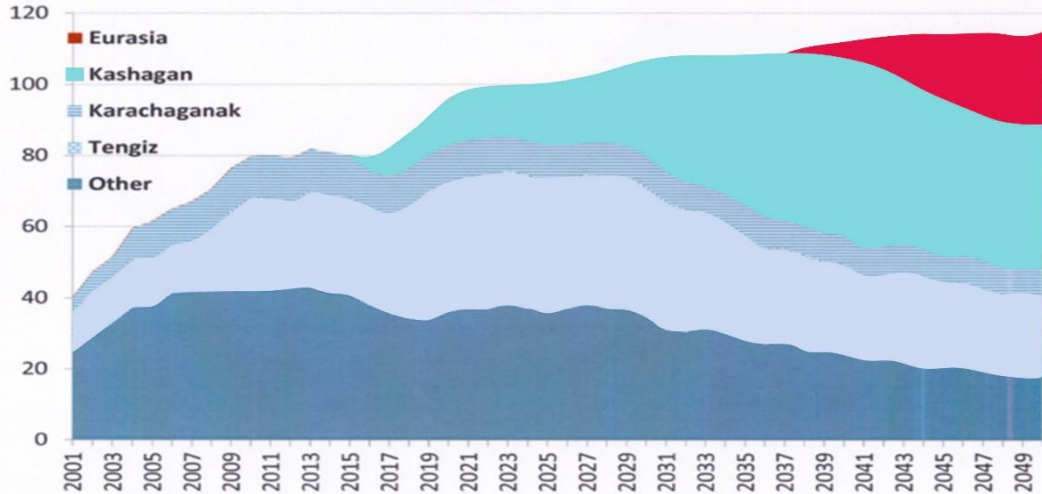




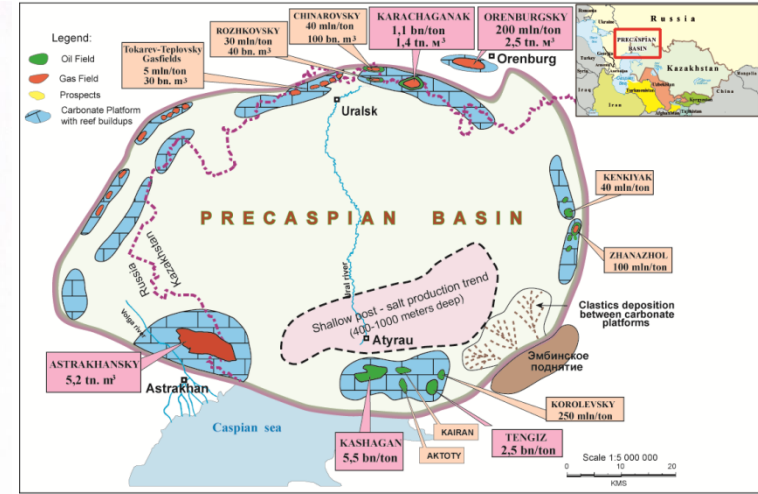
EURASIA PROJECT. RESULTS OF PHASE-1

Astana, November 25th 2022r

Oil Production profile for 2001-2050



Biggest oil fields of Pre-Caspian Basin



There have been no significant discoveries in Kazakhstan over the past 20 years. The main increase in production is provided by 3 giant fields – Tengiz, Karachaganak and Kashagan

Many oil and gas fields have long passed the peak of their production and are at a late stage of development

Oil and gas potential up to a depth of 4.5-5.0 km have been practically studied, the discovery of large deposits is not expected

In 15-20 years, production is expected to fall at giant fields and in Kazakhstan as a whole

To maintain the level of production and, accordingly, the sustainable development of the Republic of Kazakhstan, the Eurasia Project was initiated

Project History

- ❖ In November 2013 the KazEnergy Association and the Ministry of Energy came forward with the initiative to intensify the activities for geological study of deep horizons of the Pre-Caspian basin - the Eurasia project.
- ❖ The project was approved and the list of exemptions and concessions for the project participants was adopted at the meeting of the Intergovernmental Commission on development of oil and gas and energy industries under the RK Government (the Minutes № 17-24/I-623 dated 5.10.2015).
- ❖ The Memorandum of Understanding was signed between the RK Ministry of Energy and the Committee of Geology and potential participants of the Eurasia project such companies as Eni, Rosneft, CNPC, SOCAR, NEOS Geosolutions, KazMunaigas JSC on July 21, 2017. In view of the Memorandum expiration and all-round sequestering of geological exploration activities as a result of a considerable fall in oil prices and uncertainties with the Eurasia project implementation, the companies made a decision not to prolong the Memorandum leading to the suspension in the project execution for an indefinite term.
- ❖ The project was presented to the RK Prime Minister in February 2020 where a fundamental decision was taken on the start of operations under Phase 1 of the project with financing from the Republic's budget.
- ❖ A Consortium consisting of Meridian Eurasia LLP, PGSK LLP, Geoken LLP, GSS LLP, RCGI Kazgeoinform, Kazzarubezhgeologiya LLP, Gubkin Russian State University and a French company Beisip – Geotechnologies was created in February 2021.
- ❖ The work under the Project commenced on March 1, 2021 and completed on November 2022

Consortium Composition

SPC GEOKEN LLP (Leader)



Professional Geo Solutions Kazakhstan LLP



Subcontractors:

- RCGI Kazgeoinform LLP
- Meridian Eurasia LLP
- KazZarubezhGeologiya LLP
- Geophysical Support Services LLP
- Gubkin RSU of Oil and Gas
- Beisip GeoTechnologies (France)



Project Implementation Phases

Phase 1

Collection, reprocessing and re-interpretation of geoscience data using advanced technologies

State budget **\$6 million**

1.5 years



Phase 2

Conduct of regional seismic operations (geotraverses) together with non-seismic activities to study formations to the depth of 20-25 km

Investments **\$150 million**

2.5 years



Phase 3

Drilling of a deep parametric well

Investments **\$350 million**

3 years

1. The Phase-1 was started on Q1 2021 and finished on Q4 2022
2. A geological report is prepared according to international standards as a result of Phase 1
3. 25.11.22 The report presented to the Management of the Ministry of ecology, geology and natural resources, Ministry of energy and to the major oil and gas companies

Interested major international oil companies are invited to participate in Phase 2 or it will be implemented on the principles of “speculative seismic survey”

Implementation depends on the Phase 1 and Phase 2 results

Project Management

- Weekly update meetings by on-line conferences to discuss the status of work, issues of concern and ways of solving them
- Quarterly meetings attended by representatives of the Ministry of Ecology, Geology and Natural Resources, the Committee of Geology and its territorial subdivisions
- Involvement of supervisors for geoscience data systematization and collection in four cities (Nur-Sultan, Atyrau, Aqtobe, Uralsk and Almaty)
- Engagement of authoritative consultants (three local and two foreign) for methodical and scientific-technical support to the project and acceptance of final results of the work
- Continuous supervising and quality control of the work execution by Meridian Eurasia

Data gathering

Type of work	Total scope
RCGI Kazgeoinform	
Scanning and archiving of time sections of legacy regional CDP seismic lines in paper form, linear km	14 000
Demultiplexing of field records of seismic lines, linear km	8 000
Digitization of well logs from deep wells , pcs	32
Scanning and archiving of VSP reports, wells	20
Collection and copying of reports of regional seismic correlation refraction surveys, report	43
Scanning and archiving of field documentation on regional CDP seismic lines (8 000 linear km), linear km	1 359
Scanning and archiving of time sections of CDP lines (14 000 linear km) in paper form, linear km	1 184
Collection and copying of reports on non-seismic geophysical studies , report	24

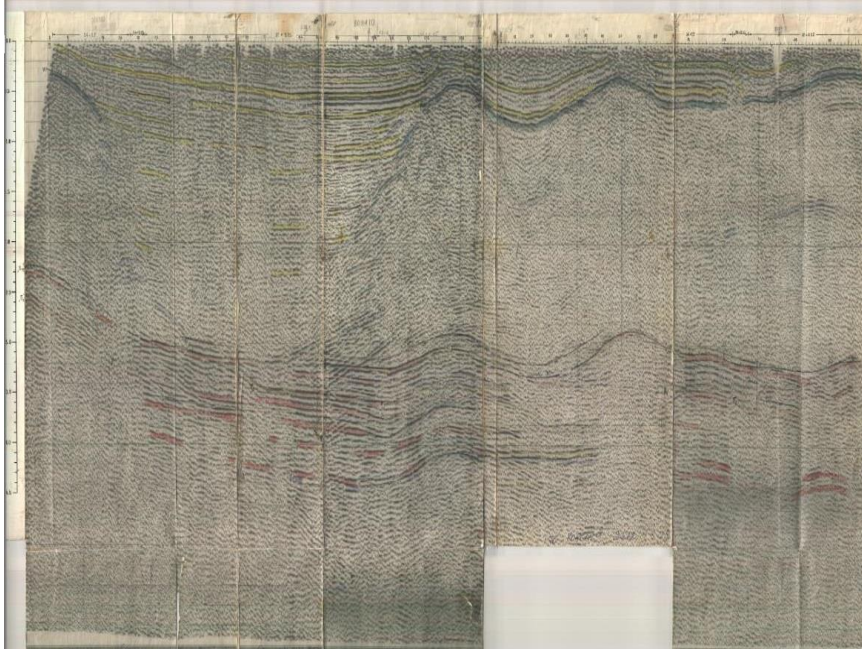
Archival data of past years



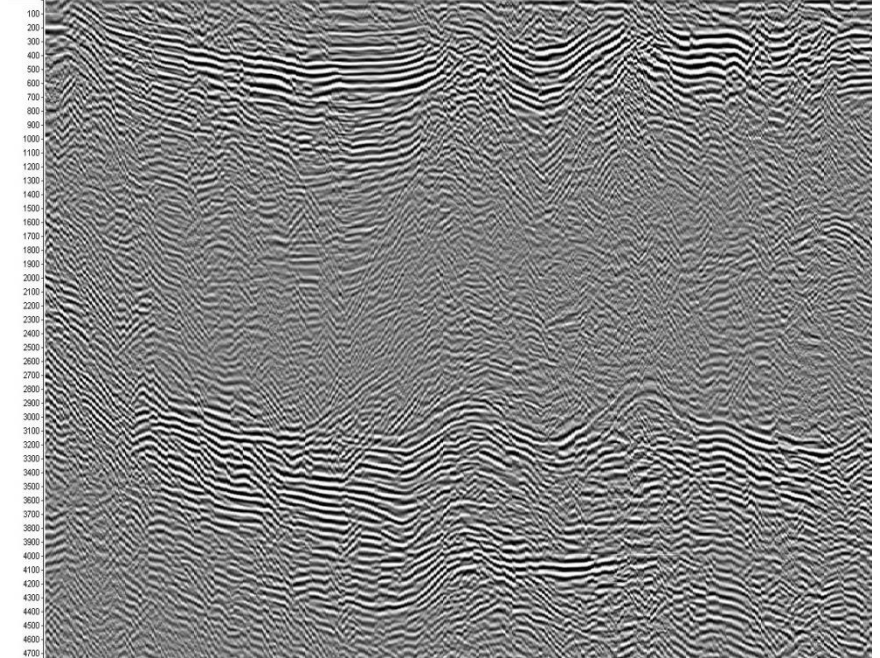
- Dilapidated condition of past years G/G data
- Data storage is not structured due to limited areas of funds in the regions (Aktobe, Atyrau, Uralsk)
- Lack of accompanying documentation
- Improper conditions for storing magnetic tapes
- The equipment on which the outdated magnetic field tapes (bobbins) were read is the only one in the Republic of Kazakhstan and worked intermittently due to the long service life
- Weak technical staffing of the RCGI (lack of equipment and software for analyzing and digitizing well data)
- All this led to a delay of work for two months

Digitization of old regional seismic lines

Initial seismic line (8086VIIa6)



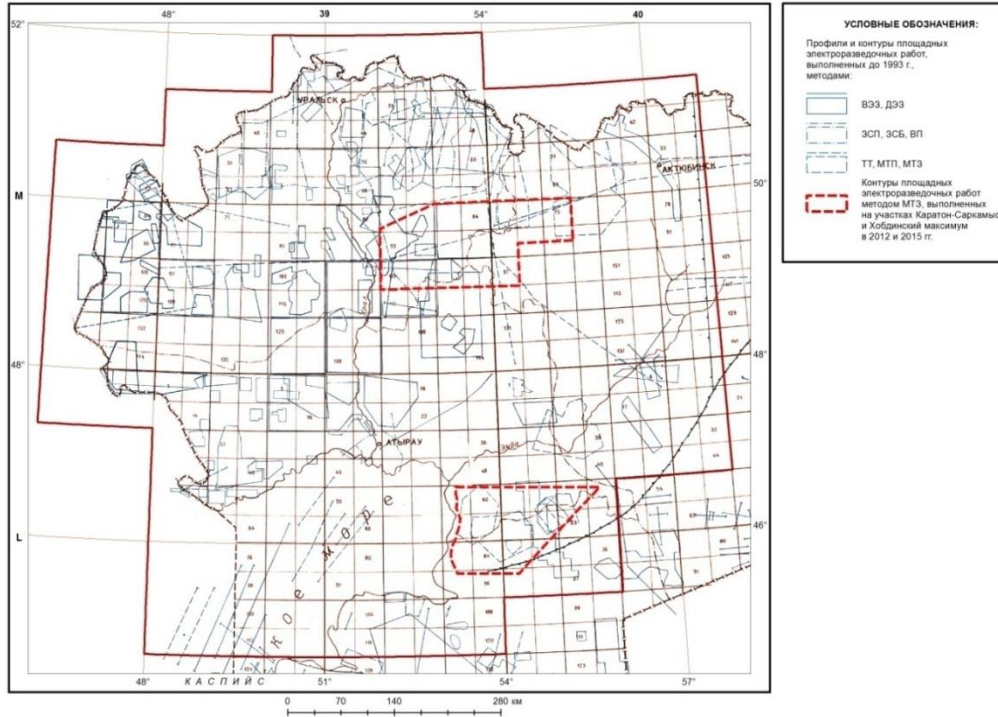
Digitized seismic line (8086VIIa6)



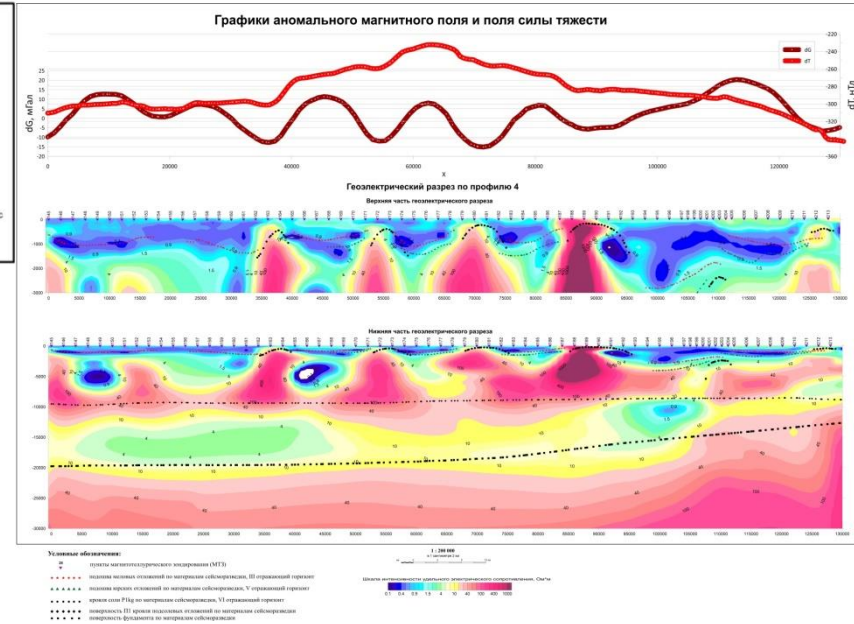
In total, 130 regional seismic lines on paper in the amount of 14,000 line.km were digitized

Electrical exploration works

Electrical exploration Base Map



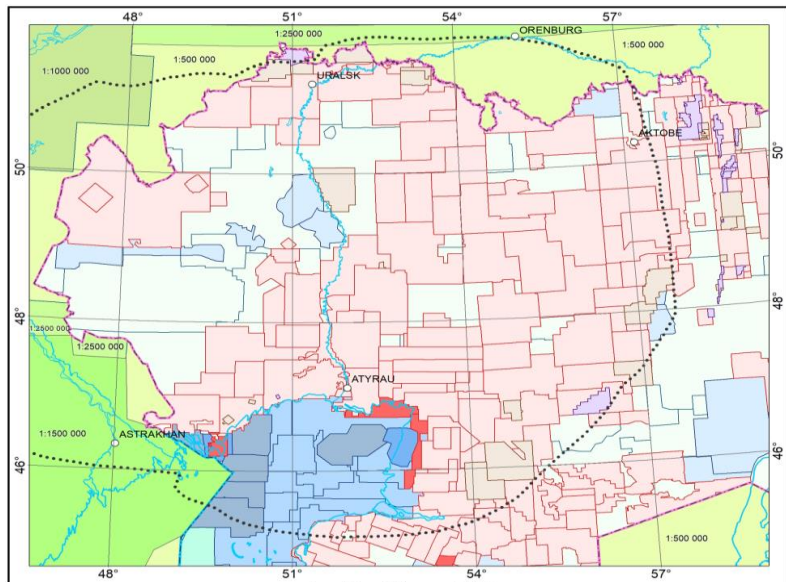
Graphs of the anomalous magnetic field and gravity



A database and a cartogram of Electrical exploration studies have been compiled for the area of the Caspian Basin, 250 cards have been processed. The MTZ data were re-processed and interpreted at the Karaton-Sarkamys (2012) and Hobdinsky (2015) sites, in the amount of 689 ph.points

Gravimetric work

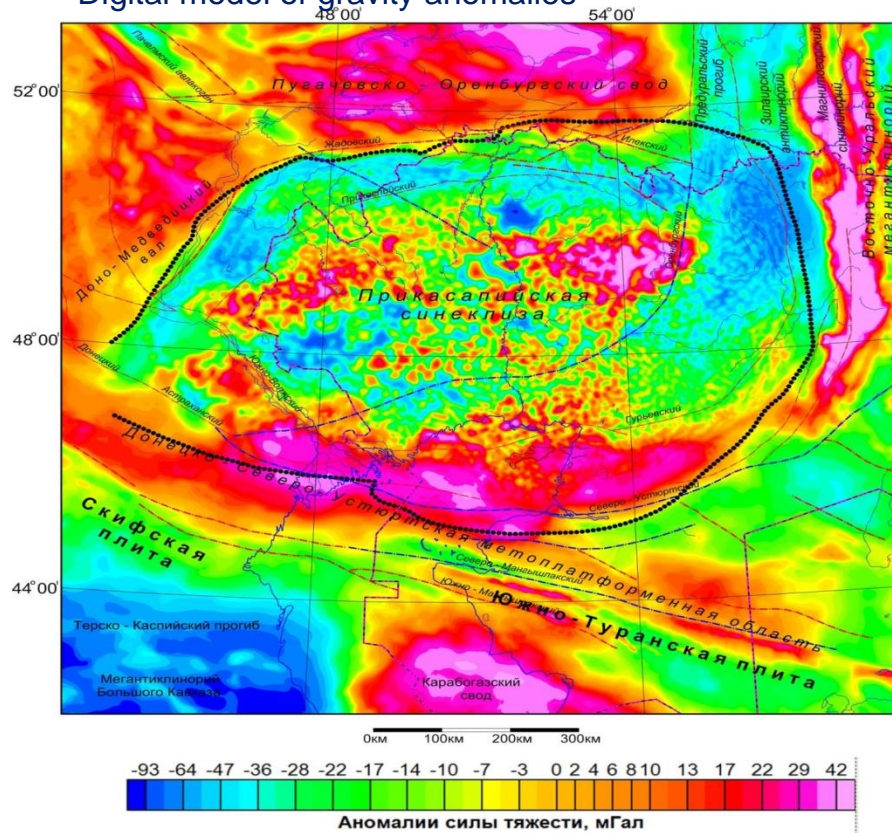
Gravimetric work Base map



LEGEND:

- | | |
|---|--|
| Land gravimetric surveys with report maps scale 1 : 10 000, performed in the period from 1965 to 2005 | Gravimetric surveys with report maps scale 1 : 100 000, performed in the period from 1984 to 1990 with the bottom gravimeter |
| Land gravimetric surveys with report maps scale 1 : 25 000, performed in the period from 1961 to 1998 | Marine gravimetric surveys with report maps scale 1 : 100 000, performed in the period from 2003 to 2011 |
| Land gravimetric surveys with report maps scale 1 : 50 000, performed in the period from 1962 to 1998 | Gravimetric survey on tripods in the transition zone with the report maps scale 1 : 100 000, performed in the period from 2001 to 2004 with gravimeter type CG |
| Land gravimetric surveys with report maps scale 1 : 50 000, performed in the period from 1999 to 2013 with gravimeter type CG | Land gravimetric surveys with report maps scale 1 : 200 000, performed in the period from 1950 to 1988 |
| Gravimetric survey on tripods in the transition zone with the report maps scale 1 : 50 000, performed in the period from 1999 to 2002 with gravimeter type CG | Marine gravimetric surveys with report maps scale 1 : 200 000, performed in the period from 2010 to 2011 |
| Land gravimetric surveys with report maps scale 1 : 100 000, performed in the period from 1959 to 1999 | |

Digital model of gravity anomalies

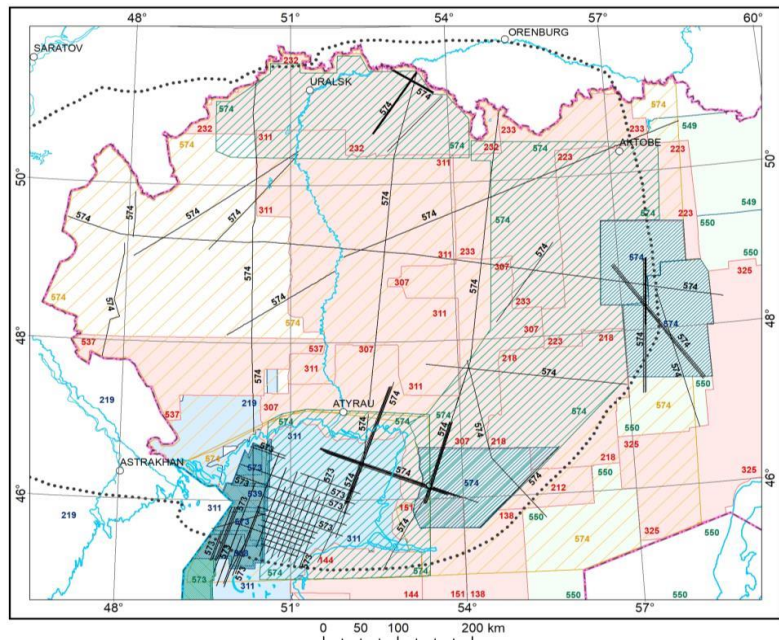


Data from 251 surveys were used to compile a digital model of gravity anomalies

A three-dimensional cube of changes in the density characteristics of the entire section of the Caspian depression has been created

Magnetometric work

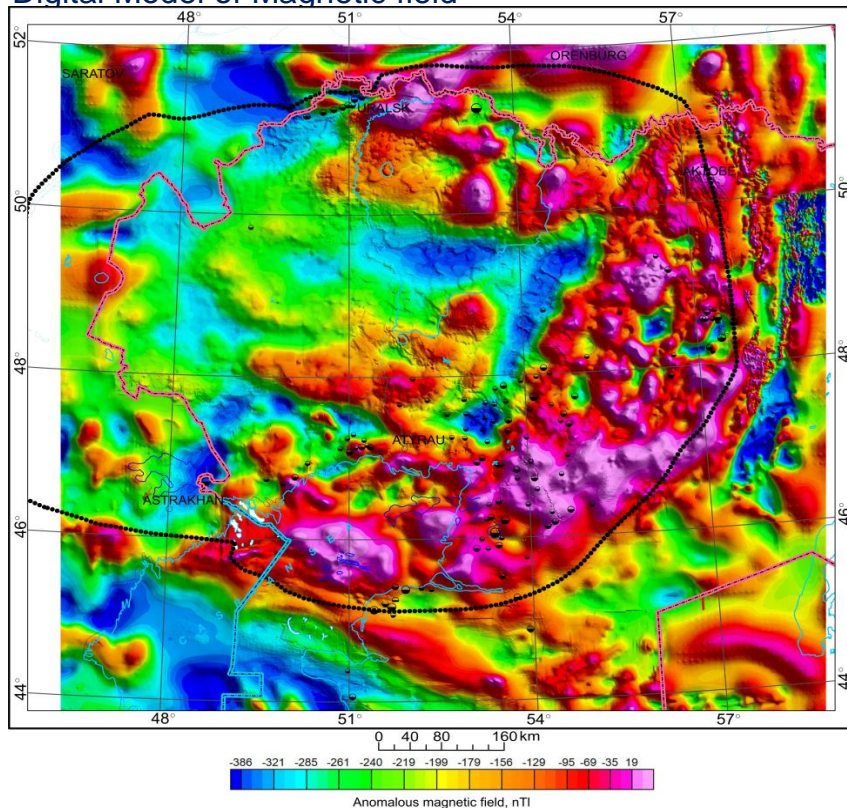
Magnetometric work Base Map



LEGEND:

- 232 Contours of aeromagnetic surveys at a scale of 1:50 000, performed in 1973-2006, and their numbers
- 311 Contours of aeromagnetic surveys at a scale of 1:100 000, performed in 1974 and 1989, and their numbers
- 232 Contours of marine magnetic surveys at a scale of 1:100 000, performed in 2006-2011, and their numbers
- 574 Contours of aeromagnetic surveys at a scale of 1:100 000, performed in 2011-2012, and their numbers
- 550 Contours of aeromagnetic surveys at a scale of 1:200 000, performed in 1957, and their numbers
- 573 Contours of marine magnetic surveys at a scale of 1:200 000, performed in 2011-2012, and their numbers
- 574 Contours of aeromagnetic surveys at a scale of 1:200 000, performed in 2011-2012, and their numbers
- 574 Contour of aeromagnetic survey at a scale of 1:1 000 000, performed in 2011-2012, and their number
- 573 Profiles of aerial and marine magnetometric survey 2010-2012 and their numbers

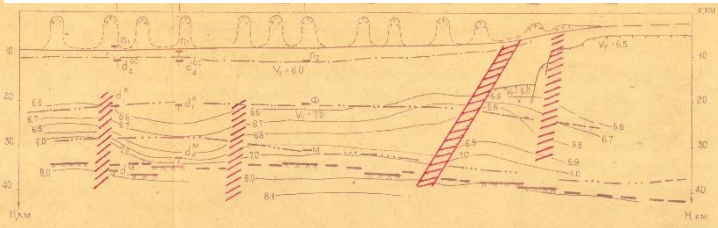
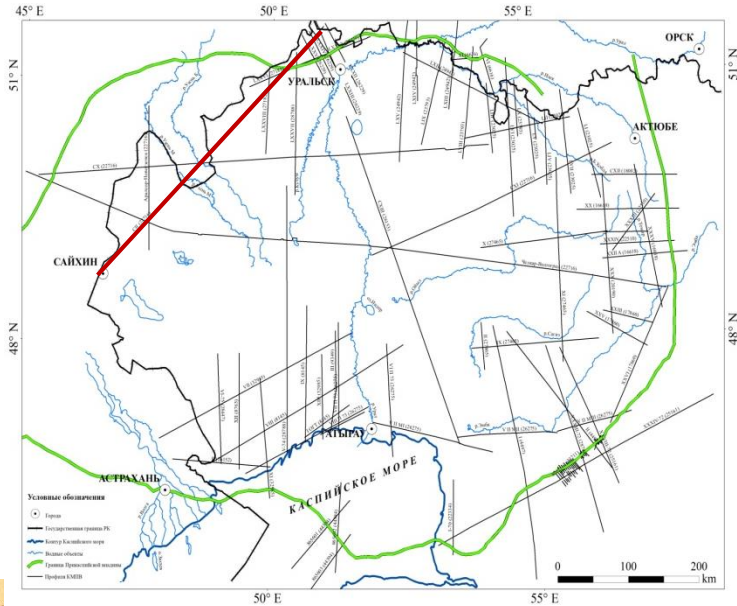
Digital Model of Magnetic field



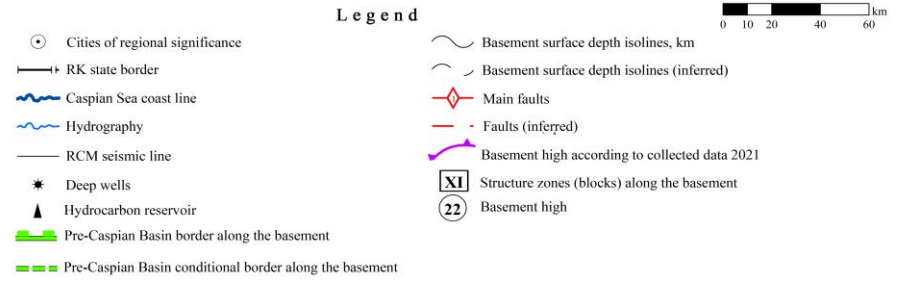
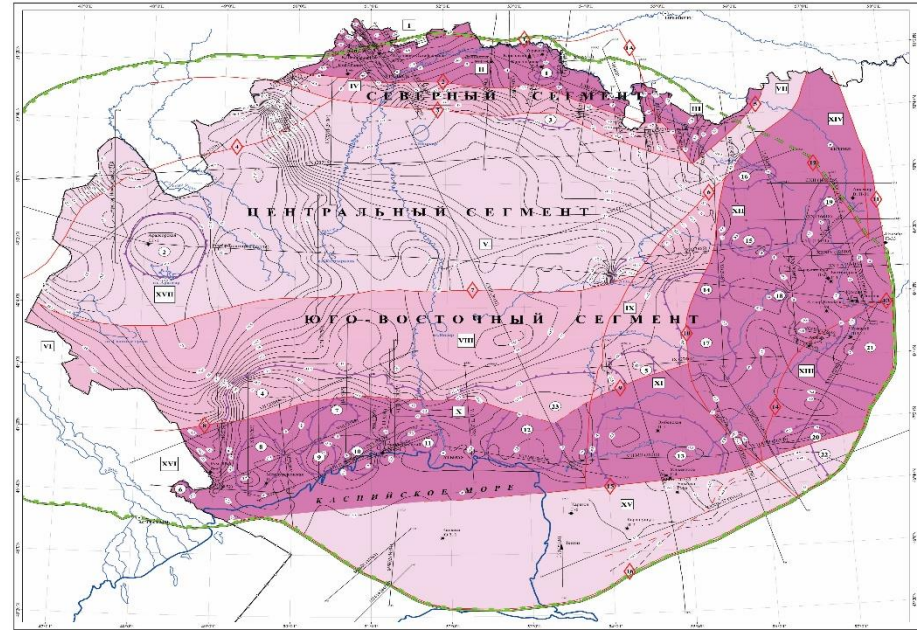
To compile a digital model of the magnetic field, data from magnetic surveys of 1974-2012 were used

Refraction seismic Data

Refraction seismic lines 1964-87 (In total 75 regional lines from 43 Reports)



The scheme of the foundation surface according to the Refraction seismic data



Eurasia Project Benefits

- ❖ All-new information about the presence of oil-and-gas in the territory, which will be a significant contribution to solving the fundamental scientific problem of world importance in the field of geology
- ❖ The possibility of discovering large gas and gas-condensate fields will help cover the growing level of natural gas consumption as part of the transition to a Green Economy
- ❖ Allow the country to receive significant financial benefits through the discovery and exploration of large-scale deposits
- ❖ Breakthroughs in the field of forecasting and prospecting technologies for hydrocarbon deposits at great depths
- ❖ It will allow to train a new cohort of highly-skilled professionals, and arrange an intelligent center and a modern and one-of-a-kind Bank of geological and geophysical data
- ❖ Occupying an advantageous position in Central Asia, having huge prospective resources of light oil and gas, and a well-developed infrastructure for hydrocarbons export, the Republic of Kazakhstan can play a key role among the oil-producing countries of the world in the future.