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Self-Sourced Domanik Assessment Unit 10150104

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Volga-Ural Region Geologic Province 1015

Geologic Summary

Detailed map of this assessment unit

Assessment Input Data

Assessment Results

☐ This assessment unit was not
☐ assessed quantitatively.

USGS PROVINCE: Volga-Ural Region (1015) **GEOLOGIST:** G.F. Ulmishek

PETROLEUM SYSTEM: Volga-Ural Domanik-Paleozoic (101501)

ASSESSMENT UNIT: Self-Sourced Domanik (10150104)

DESCRIPTION: This assessment unit encompasses the largest part of the petroleum system area north and east of the Zhigulev-Pugachev arch. The unit includes fractured reservoirs in carbonate and siliceous rocks of the Frasnian Domanik Formation, which is also a source rock for the accumulations. Oil is produced in several fracture zones, which may be considered sweet spots in continuous unconventional accumulation. Although in this project the unit did not receive quantitative assessment, it may have high future potential associated with application of modern drilling and completion technologies.

SOURCE ROCKS: The principal source rock is the middle Frasnian Domanik Formation, which stratigraphically widens into the Tournaisian in the Kama-Kinel basins. The formation is 25 to 40 m thick and contains as much as 25 percent TOC.

MATURATION: The Domanik Formation is in the oil window over most of the assessment unit area and dips into the gas window to the southeast. Probably, maturation was reached mainly during deposition of thick Upper Permian-Triassic orogenic clastics, but could have slightly advanced in Jurassic-Paleogene time, which was followed by regional uplift and erosion.

MIGRATION: Only primary migration from generation sites in the source rocks to fractures is characteristic of the assessment unit.

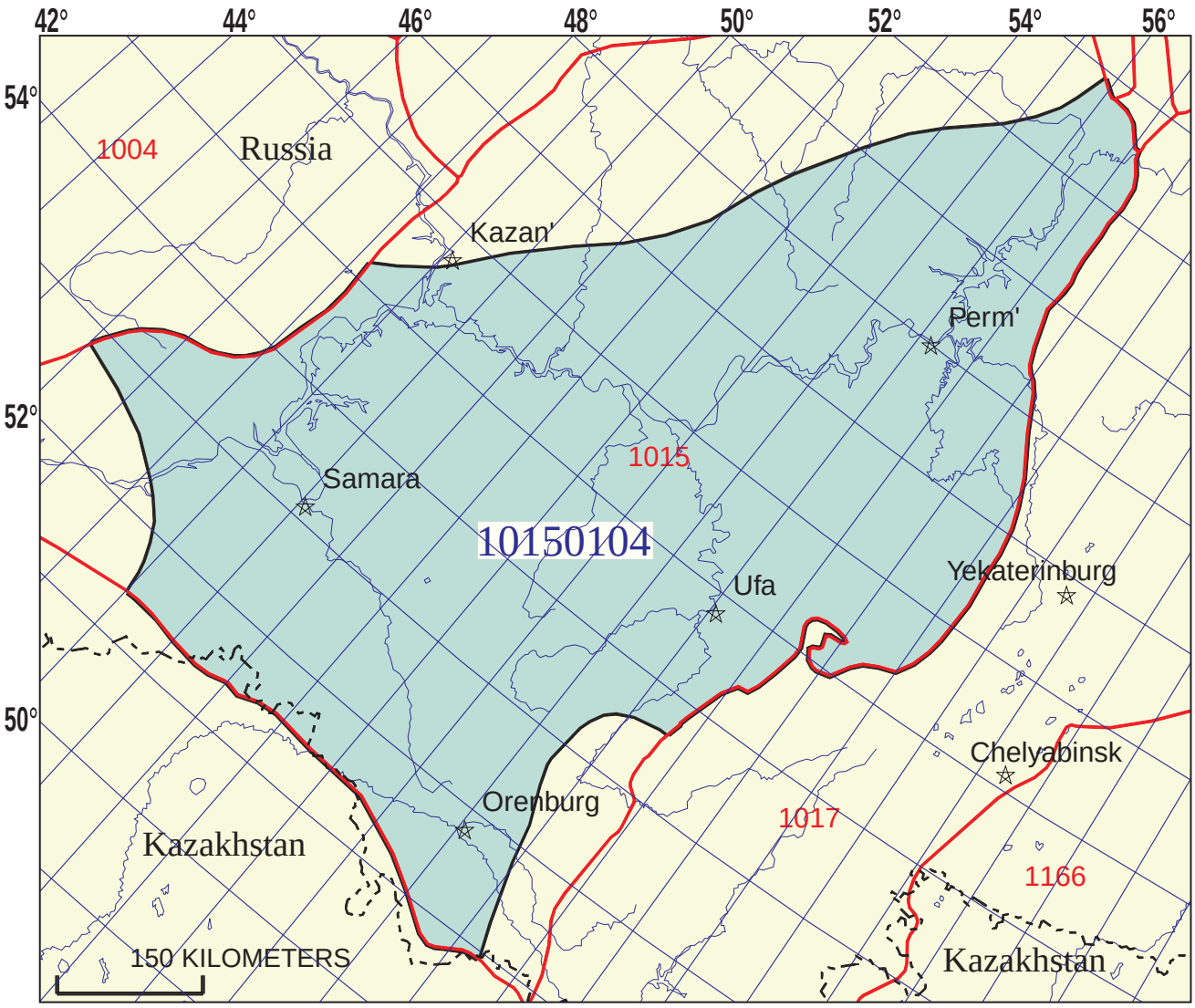
RESERVOIR ROCKS: Matrix porosity of Domanik carbonate and siliceous rocks is low and the rocks are essentially tight. Oil production is controlled by development of fractures. Probably, fractures formed due to both tectonic deformations with associated faulting and overpressure related to hydrocarbon generation.

TRAPS AND SEALS: Traps are formed by zones of fracturing. Although presently production is established on local structural uplifts, these zones can be found in various structural settings. Oil accumulations are sealed by the Kynov shale bed directly overlying the Domanik Formation. In central areas of the Kama-Kinel depressions where the entire Upper Devonian-Tournaisian sequence is formed by Domanik-type facies, thick lower Visean shales seal oil pools in underlying fractured reservoirs.

REFERENCES:

Ulmishek, G.F., 1988, Upper Devonian-Tournaisian facies and oil resources of the Russian craton's eastern margin, in McMillan, N.J., Embry, A.F., and Glass, D.J., eds., Devonian of the world, Volume I--Regional syntheses: Calgary, Alberta, Canadian Society of Petroleum Geologists, p.527-549.

Zaydelson, M.I., Surovikov, E.Ya., Kazmin, L.L., Vaynbaum, S.Ya., and Semenova, E.G., 1990, Generation, migration, and accumulation of hydrocarbons in Domanik-type formations: Geologiya Nefti i Gaza, no. 6, p. 2-5.



Self-Sourced Domanik Assessment Unit - 10150104

EXPLANATION

- Hydrography
- Shoreline
- 1015 Geologic province code and boundary
- Country boundary
- Gas field centerpoint
- Oil field centerpoint
- 10150104 Assessment unit code and boundary

Projection: Equidistant Conic. Central meridian: 100. Standard Parallel: 58 30

SEVENTH APPROXIMATION
NEW MILLENNIUM WORLD PETROLEUM ASSESSMENT
DATA FORM FOR CONVENTIONAL ASSESSMENT UNITS

Date:…….. 6/3/99
Assessment Geologist:…….. G.F. Ulmishek
Region:…….. Former Soviet Union Number: 1
Province:…….. Volga-Ural Region Number: 1015
Priority or Boutique…… Priority
Total Petroleum System:…… Volga-Ural Domanik-Paleozoic Number: 101501
Assessment Unit:…… Self-Sourced Domanik Number: 10150104
* Notes from Assessor

CHARACTERISTICS OF ASSESSMENT UNIT

Oil (<20,000 cfg/bo overall) **or** Gas (≥20,000 cfg/bo overall):… _____

What is the minimum field size?……. _____ mmboe grown (≥1mmboe)
(the smallest field that has potential to be added to reserves in the next 30 years)

Number of discovered fields exceeding minimum size:…… Oil: _____ Gas: _____
Established (>13 fields) _____ Frontier (1-13 fields) _____ Hypothetical (no fields) _____

Median size (grown) of discovered oil fields (mmboe):
1st 3rd _____ 2nd 3rd _____ 3rd 3rd _____
Median size (grown) of discovered gas fields (bcfg):
1st 3rd _____ 2nd 3rd _____ 3rd 3rd _____

Assessment-Unit Probabilities:

Attribute	Probability of occurrence (0-1.0)
1. **CHARGE:** Adequate petroleum charge for an undiscovered field ≥ minimum size……	
2. **ROCKS:** Adequate reservoirs, traps, and seals for an undiscovered field ≥ minimum size……	
3. **TIMING OF GEOLOGIC EVENTS:** Favorable timing for an undiscovered field ≥ minimum size	

Assessment-Unit GEOLOGIC Probability (Product of 1, 2, and 3):…….. _____

4. **ACCESSIBILITY:** Adequate location to allow exploration for an undiscovered field ≥ minimum size…… _____

UNDISCOVERED FIELDS

Number of Undiscovered Fields: How many undiscovered fields exist that are ≥ minimum size?:
(uncertainty of fixed but unknown values)

Oil fields:……min. no. (>0) _____ median no. _____ max no. _____
Gas fields:……min. no. (>0) _____ median no. _____ max no. _____

Size of Undiscovered Fields: What are the anticipated sizes (**grown**) of the above fields?:
(variations in the sizes of undiscovered fields)

Oil in oil fields (mmbo)……min. size _____ median size _____ max. size _____
Gas in gas fields (bcfg):……min. size _____ median size _____ max. size _____

Assessment Unit (name, no.)

_____

AVERAGE RATIOS FOR UNDISCOVERED FIELDS, TO ASSESS COPRODUCTS

(uncertainty of fixed but unknown values)

Oil Fields:	minimum	median	maximum
Gas/oil ratio (cfg/bo)……			
NGL/gas ratio (bngl/mmcfg)……			

Gas fields:	minimum	median	maximum
Liquids/gas ratio (bngl/mmcfg)……			
Oil/gas ratio (bo/mmcfg)……			

SELECTED ANCILLARY DATA FOR UNDISCOVERED FIELDS

(variations in the properties of undiscovered fields)

Oil Fields:	minimum	median	maximum
API gravity (degrees)……			
Sulfur content of oil (%)……			
Drilling Depth (m) ……			
Depth (m) of water (if applicable)……			

Gas Fields:	minimum	median	maximum
Inert gas content (%)……			
CO_2 content (%)……			
Hydrogen-sulfide content (%)……			
Drilling Depth (m)……			
Depth (m) of water (if applicable)……			

Assessment Unit (name, no.)

_____

ALLOCATION OF UNDISCOVERED RESOURCES IN THE ASSESSMENT UNIT TO COUNTRIES OR OTHER LAND PARCELS (uncertainty of fixed but unknown values)

1. _____ represents _____ areal % of the total assessment unit

Oil in Oil Fields:	minimum	median	maximum
Richness factor (unitless multiplier):……			
Volume % in parcel (areal % x richness factor):…			
Portion of volume % that is offshore (0-100%)……			

Gas in Gas Fields:	minimum	median	maximum
Richness factor (unitless multiplier):……			
Volume % in parcel (areal % x richness factor):…			
Portion of volume % that is offshore (0-100%)……			