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# Sub-Domanik Devonian Clastics Assessment Unit 10150103


Sub-Domanik Devonian Clastics Assessment Unit 10150103

Volga-Ural Region Geologic Province 1015

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Detailed map of this assessment unit

Exploration/Discovery-History Data

- Plots of Known Field Sizes
- Plots of Grown Resources
- Tables

Assessment Input Data

Assessment Results

- Assessment Unit Summary
- Detailed Assessment Results
- Undiscovered Field-Size Distributions

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

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

**ASSESSMENT UNIT:** Sub-Domanik Devonian Clastics (10150103)

**DESCRIPTION:** The unit encompasses the largest part of the petroleum system area north and east of the Zhigulev-Pugachev arch. Stratigraphically, it includes Middle Devonian and lower Frasnian section, which is composed of mainly clastic rocks, but with increasing participation of carbonates southeastward. The unit is maturely explored and contains very large oil reserves in several regional reservoir horizons.

**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:** Early expulsion of immature oil is probable because of the sulfurous nature of Domanik kerogen. Geologic data also indicate an important stage of migration in the Neogene related to intensive faulting and fracturing of source rocks.

**RESERVOIR ROCKS:** Almost all reserves are concentrated in five regional sandstone horizons (pays D-4 to D-0 of local nomenclature) that generally possess good reservoir properties. Minor reserves are in carbonates in the southern area.

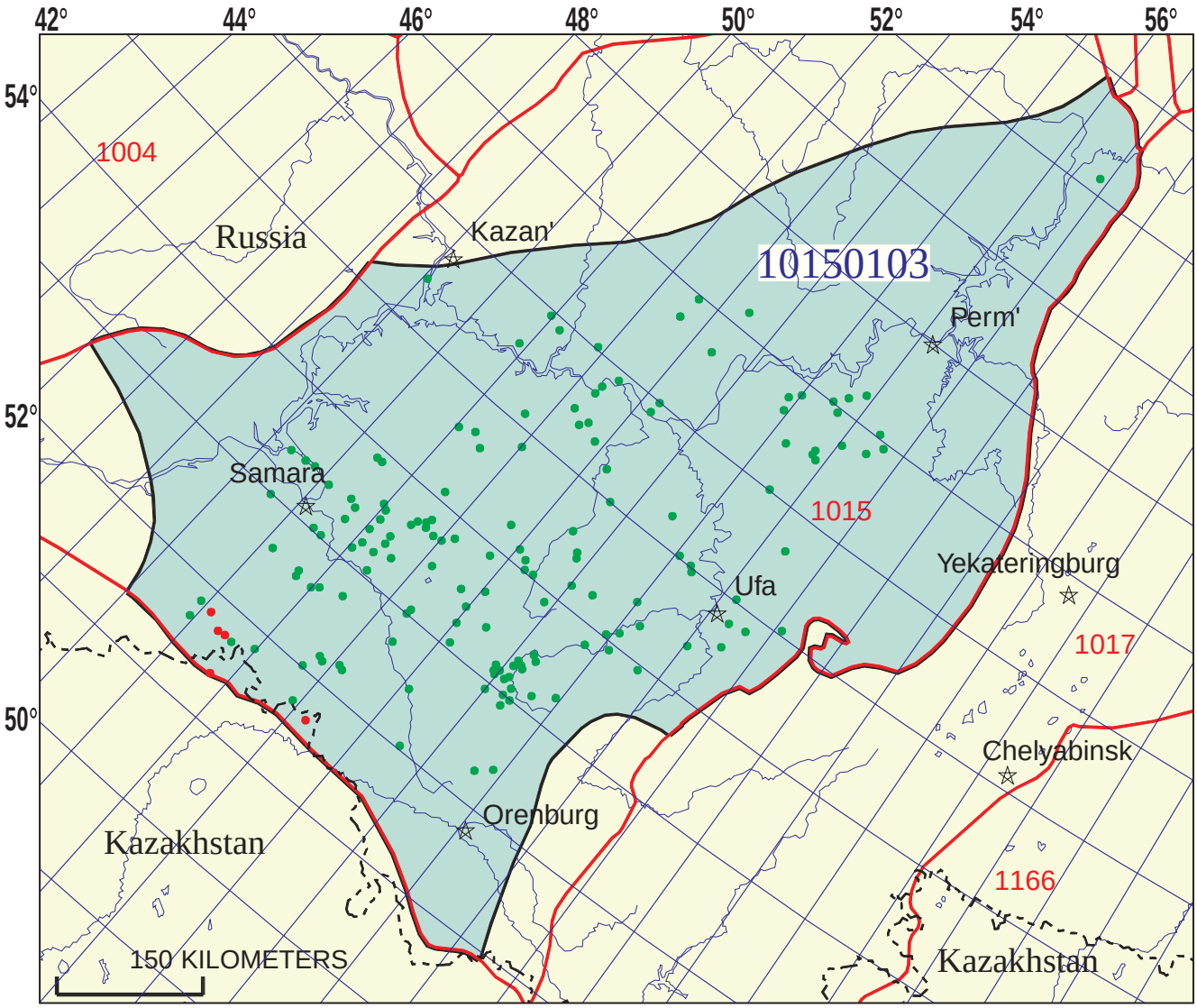
**TRAPS:** Almost all reserves are in structural traps, but many of them have a stratigraphic component that controls pool outlines.

**SEALS:** The productive section is overlain by the Kynov shale 10-20 m thick, but the principal seal is probably regionally overpressured Domanik source rocks. Particular pools are sealed by intraformational shale beds.

**REFERENCES:**

Khachatryan, R.O.,1979, Tectonic development and petroleum productivity of the Volga-Kama anteclise (Tektonicheskoye razvitiye i neftegazonosnost Volzhsko-Kamskoy anteklizy): Moscow, Nauka, 172 p.

Mkrtchyan, O.M., 1980, Regularities in distribution of structural features in the eastern Russian plate (Zakonomernosti razmeshcheniya strukturnykh form na vostoke Russkoy plity): Moscow, Nauka, 136 p.




# Sub-Domanik Devonian Clastics Assessment Unit - 10150103

EXPLANATION

- Hydrography
- Shoreline
- 1015 Geologic province code and boundary
- Country boundary
- Gas field centerpoint
- Oil field centerpoint
- 10150103 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:…….. | Sub-Domanik Devonian Clastics | Number: | 10150103 |
| * Notes from Assessor | Fields not grown. | | |

## CHARACTERISTICS OF ASSESSMENT UNIT

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

What is the minimum field size?……. 1 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: 121 Gas: 3
Established (>13 fields) X Frontier (1-13 fields) _____ Hypothetical (no fields) _____

Median size (grown) of discovered oil fields (mmboe):
1st 3rd 28 2nd 3rd 8 3rd 3rd 4
Median size (grown) of discovered gas fields (bcfg):
1st 3rd NA 2nd 3rd NA 3rd 3rd NA

**Assessment-Unit Probabilities:**

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

***Assessment-Unit GEOLOGIC Probability*** (Product of 1, 2, and 3):…….. 1.0

4. **ACCESSIBILITY:** Adequate location to allow exploration for an undiscovered field ≥ minimum size…… 1.0

## 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) | 30 | median no. | 100 | max no. | 180 |
| Gas fields:……min. no. (>0) | 1 | median no. | 6 | max no. | 15 |

**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 | 1 | median size | 3 | max. size | 200 |
| Gas in gas fields (bcfg):……min. size | 6 | median size | 40 | max. size | 1500 |

Assessment Unit (name, no.)
Sub-Domanik Devonian Clastics, 10150103

## AVERAGE RATIOS FOR UNDISCOVERED FIELDS, TO ASSESS COPRODUCTS

(uncertainty of fixed but unknown values)

| Oil Fields: | minimum | median | maximum |
|---|---|---|---|
| Gas/oil ratio (cfg/bo)…… | 200 | 300 | 400 |
| NGL/gas ratio (bngl/mmcfg)…… | 30 | 60 | 90 |

| Gas fields: | minimum | median | maximum |
|---|---|---|---|
| Liquids/gas ratio (bngl/mmcfg)…… | 30 | 50 | 80 |
| 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)…… | 20 | 33 | 48 |
| Sulfur content of oil (%)…… | 1.5 | 2 | 3 |
| Drilling Depth (m) …… | 1400 | 2600 | 5500 |
| Depth (m) of water (if applicable)…… | | | |

| Gas Fields: | minimum | median | maximum |
|---|---|---|---|
| Inert gas content (%)…… | | | |
| $CO_2$ content (%)…… | | | |
| Hydrogen-sulfide content (%)…… | | | |
| Drilling Depth (m)…… | 4500 | 5000 | 6000 |
| Depth (m) of water (if applicable)…… | | | |

Assessment Unit (name, no.)
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**ALLOCATION OF UNDISCOVERED RESOURCES IN THE ASSESSMENT UNIT TO COUNTRIES OR OTHER LAND PARCELS** (uncertainty of fixed but unknown values)

1. Russia represents 99 areal % of the total assessment unit

| Oil in Oil Fields: | minimum | median | maximum |
|---|---|---|---|
| Richness factor (unitless multiplier):…… | | | |
| Volume % in parcel (areal % x richness factor):… | | 98 | |
| Portion of volume % that is offshore (0-100%)…… | | 0 | |

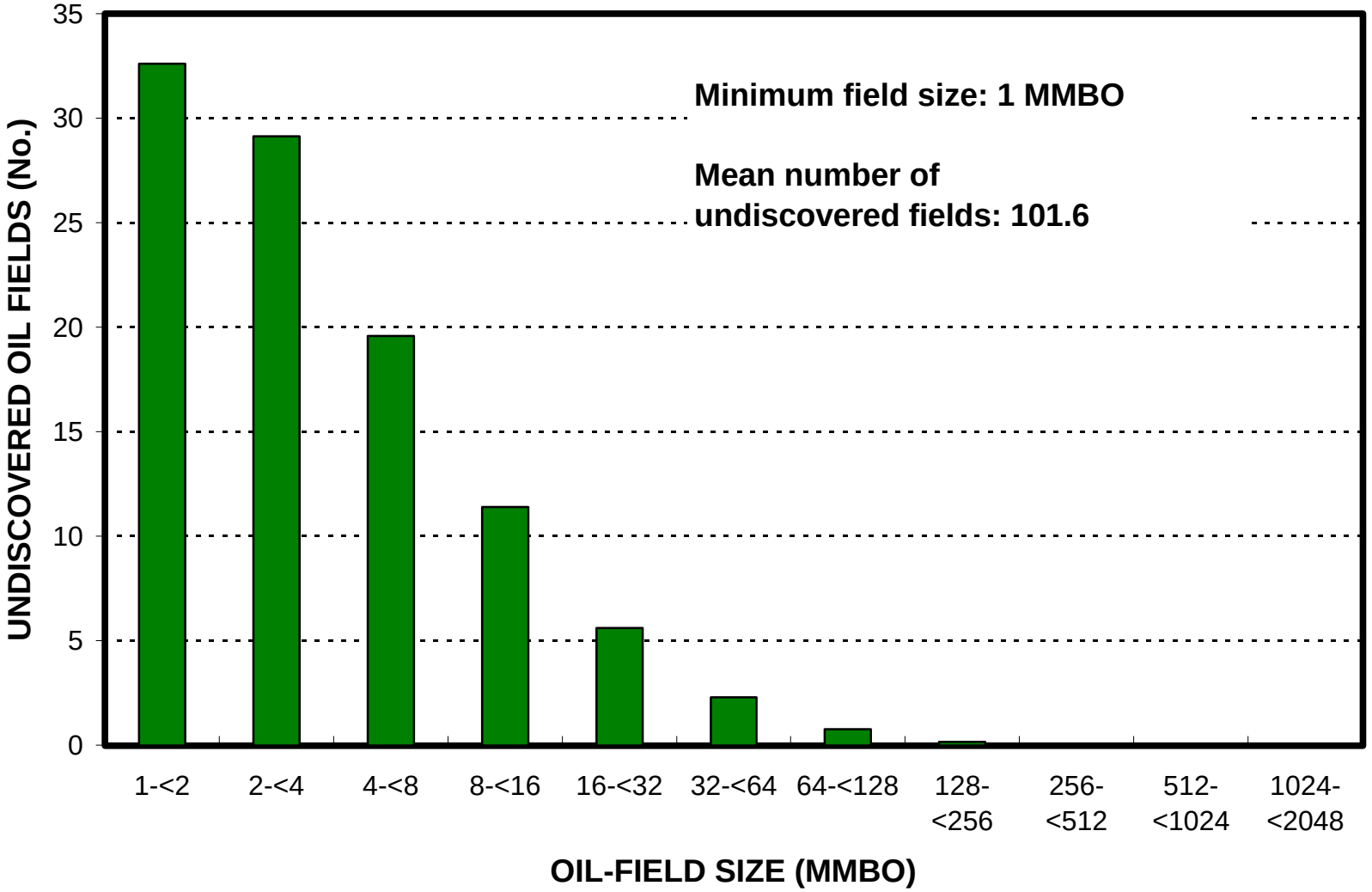
| Gas in Gas Fields: | minimum | median | maximum |
|---|---|---|---|
| Richness factor (unitless multiplier):…… | | | |
| Volume % in parcel (areal % x richness factor):… | | 98 | |
| Portion of volume % that is offshore (0-100%)…… | | 0 | |

2. Kazakhstan represents 1 areal % of the total assessment unit

| Oil in Oil Fields: | minimum | median | maximum |
|---|---|---|---|
| Richness factor (unitless multiplier):…… | | | |
| Volume % in parcel (areal % x richness factor):… | | 2 | |
| Portion of volume % that is offshore (0-100%)…… | | 0 | |

| Gas in Gas Fields: | minimum | median | maximum |
|---|---|---|---|
| Richness factor (unitless multiplier):…… | | | |
| Volume % in parcel (areal % x richness factor):… | | 2 | |
| Portion of volume % that is offshore (0-100%)…… | | 0 | |

# Sub-Domanik Devonian Clastics, AU 10150103
# Undiscovered Field-Size Distribution



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# Undiscovered Field-Size Distribution