

Transylvanian Neogene Suprasalt Gas Assessment Unit 40570101



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- Transylvanian Basin Geologic Province 4057

USGS PROVINCE: Transylvanian Basin (4057), Romania **GEOLOGIST:** M.J. Pawlewicz

TOTAL PETROLEUM SYSTEM: Transylvanian Composite (405701)

ASSESSMENT UNIT: Transylvanian Neogene Suprasalt Gas (40570101)

DESCRIPTION: This assessment unit is defined by the entire thickness of Badenian to Pliocene sediments. The Transylvanian Basin is in the main gas-producing province in Romania with two thirds of the total gas reserves and 80 percent of all the gas fields.

SOURCE ROCKS: Badenian-Sarmatian shales are considered to be the source rocks. The gas consists of 98 percent CH₄ and negligible amounts of CO₂ and N₂.

MATURATION: Presently at highest thermal maturation; with the young age of the sediments and cool geothermal gradient (3°C/100 m in deepest part of the basin) biogenic gas is possible.

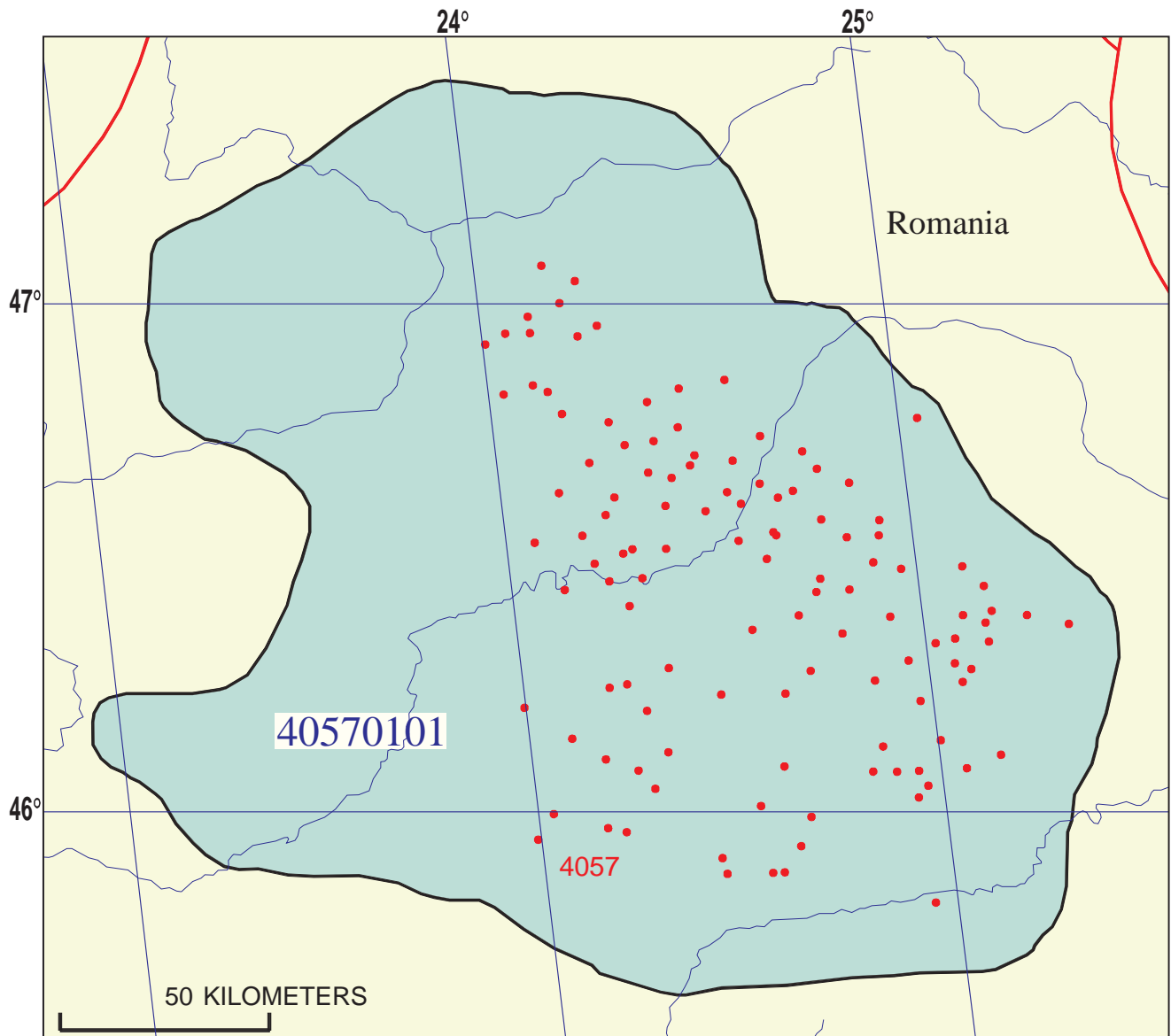
MIGRATION: Considered to be short vertical and lateral migration.

RESERVOIR ROCKS: Represented by sands and siltstones, with porosities of 5 to 35 percent for the middle Miocene; and 25 to 30 percent for the Miocene-Pliocene, and permeabilities of 10 to 900 mD for the Miocene-Pliocene. Distribution of reservoirs is Badenian, 54 pools; Buglovian, 43 pools; Sarmatian, 45 pools; and Pliocene, 2 pools.

TRAPS AND SEALS: The fields are grouped in the central part of the basin that is characterized by the intensive development of salt domes and of anticlinal folds and controlled by Badenian salt diapirism. Facies changes are common.

REFERENCES:

- Ionescu, Nelu, 1994, Exploration history and hydrocarbon prospects in Romania, *in* Popescu, B.M., ed., Hydrocarbons of Eastern Central Europe—Habitat, exploration and production history: Berlin, Springer-Verlag, 255 p.
- Visarion, M., and Veliciu, S., 1981, Some geological and geophysical characteristics of the Transylvanian Basin: *Earth Evolution Sciences*, v. 3-4, p. 212-217.



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EXPLANATION

- Hydrography
- Shoreline
- 4057 Geologic province code and boundary
- - - Country boundary
- Gas field centerpoint
- Oil field centerpoint
- 40570101 — Assessment unit code and boundary

Projection: Robinson. Central meridian: 0

**NEW MILLENNIUM WORLD PETROLEUM ASSESSMENT
DATA FORM FOR CONVENTIONAL ASSESSMENT UNITS**

Date:..... 4/5/99
 Assessment Geologist:..... M.J. Pawlewicz
 Region:..... Europe Number: 4
 Province:..... Transylvanian Basin Number: 4057
 Priority or Boutique..... Priority
 Total Petroleum System:..... Transylvanian Composite Number: 405701
 Assessment Unit:..... Transylvanian Neogene Suprasalt Gas Number: 40570101
 * Notes from Assessor Lower 48 growth factor.

CHARACTERISTICS OF ASSESSMENT UNIT

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

What is the minimum field size?..... 1 mmmboe 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: 0 Gas: 85
 Established (>13 fields) X 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 315 2nd 3rd 78 3rd 3rd 28

Assessment-Unit Probabilities:

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

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) _____ median no. _____ max no. _____
 Gas fields:.....min. no. (>0) 10 median no. 43 max no. 120

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 6 median size 18 max. size 1500

AVERAGE RATIOS FOR UNDISCOVERED FIELDS, TO ASSESS COPRODUCTS

(uncertainty of fixed but unknown values)

<u>Oil Fields:</u>	minimum	median	maximum
Gas/oil ratio (cfg/bo).....	_____	_____	_____
NGL/gas ratio (bnl/mmcf).....	_____	_____	_____
<u>Gas fields:</u>	minimum	median	maximum
Liquids/gas ratio (bnl/mmcf).....	2	3	5
Oil/gas ratio (bo/mmcf).....	_____	_____	_____

SELECTED ANCILLARY DATA FOR UNDISCOVERED FIELDS

(variations in the properties of undiscovered fields)

<u>Oil Fields:</u>	minimum	median	maximum
API gravity (degrees).....	_____	_____	_____
Sulfur content of oil (%).....	_____	_____	_____
Drilling Depth (m)	_____	_____	_____
Depth (m) of water (if applicable).....	_____	_____	_____
<u>Gas Fields:</u>	minimum	median	maximum
Inert gas content (%).....	1	2	3
CO ₂ content (%).....	1	4	25
Hydrogen-sulfide content (%).....	_____	_____	_____
Drilling Depth (m).....	335	1100	4300
Depth (m) of water (if applicable).....	_____	_____	_____

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

1. Romania represents 100 areal % of the total assessment unit

<u>Oil in Oil Fields:</u>	minimum	median	maximum
Richness factor (unitless multiplier):.....	_____	_____	_____
Volume % in parcel (areal % x richness factor):...	_____	_____	_____
Portion of volume % that is offshore (0-100%):.....	_____	_____	_____
 <u>Gas in Gas Fields:</u>	 minimum	 median	 maximum
Richness factor (unitless multiplier):.....	_____	_____	_____
Volume % in parcel (areal % x richness factor):...	_____	100	_____
Portion of volume % that is offshore (0-100%):.....	_____	0	_____

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Undiscovered Field-Size Distribution

