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Mesozoic Sandstone Reservoirs
Assessment Unit 11500101

Mesozoic Sandstone Reservoirs Assessment Unit 11500101

North Ustyurt Basin Geologic Province 1150

Geologic Summary

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: North Ustyurt Basin (1150) **GEOLOGIST:** G.F. Ulmishek

PETROLEUM SYSTEM: Buzachi Arch and Surrounding Areas Composite (115001)

ASSESSMENT UNIT: Mesozoic Sandstone Reservoirs (11500101)

DESCRIPTION: The assessment unit includes Mesozoic clastic reservoirs of the Buzachi Peninsula and adjacent offshore area. The unit occupies the entire petroleum system, which is poorly understood and defined conditionally. The unit contains several shallow fields with significant reserves of largely heavy, partially biodegraded, viscous oils. The oils are produced by steam injection.

SOURCE ROCKS: Source rocks for oil have not been found in drilled sections of the assessment unit. The discovered oils possibly migrated laterally updip from the adjacent North Caspian basin on the north where source rocks are present in the subsalt Paleozoic section. Alternatively, oil could have migrated northward from Triassic source rocks of the Mangyshlak rift system or source rocks may be present in undrilled Paleozoic rocks of the Buzachi arch.

MATURATION: The composition of oils suggests biodegradation of medium mature source rocks. No further data are available.

RESERVOIR ROCKS: Reservoir rocks are Middle Jurassic to Neocomian marine and continental sandstones. The sandstones occur at shallow depths and commonly possess high porosity and permeability.

TRAPS: All known fields are contained in structural traps. The traps are asymmetric anticlines developed over leading edges of thrust plates in underlying Paleozoic and Triassic rocks. Formation of traps in Jurassic-Cretaceous rocks was due to compressional pulses in pre-Neocomian, pre-Paleogene, and pre-Middle Miocene times.

SEALS: Intraformational shale beds seal oil pools in Jurassic and Neocomian rocks. The Aptian section is composed of shales 80 to 100 m thick that constitute the regional seal.

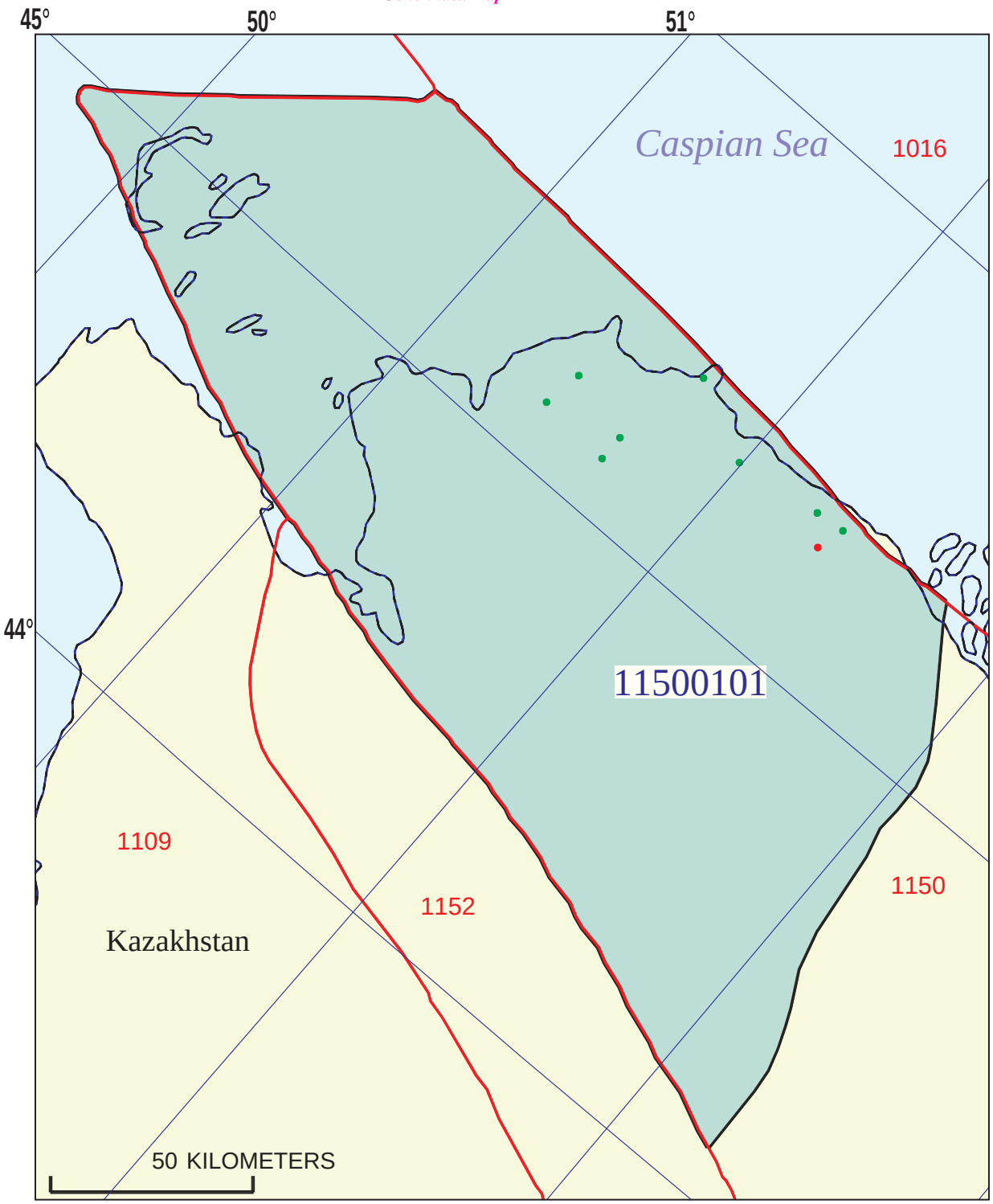
REFERENCES:

Golov, A.A., Dolitskaya, I.V., Kartseva, O.A., Kanevskaya, R.I., and Kondratyev, A.N., 1978, Geologic framework and petroleum potential of the Buzachi-Prorva area, in Kiryukhin, L.G., ed., Prognosis of petroleum potential of Kazakhstan and adjacent regions (Prognoz neftegazonosnosti Kazakhstana i sopredelnykh territoriy): Moscow, All-Russia Research Geological Oil Institute (VNGNI), Trudy, v. 212, p. 103-126.

Popkov, V.I., 1991, Thrusting and formation of folds on the Buzachi Peninsula: Sovetskaya Geologiya, no. 2, p. 50-57.

Popkov. V.I., Rabinovich, A.A., and Dosmukhambetova, G.D., 1991, Geological bases for exploration in the northern part of the Buzachi Peninsula: Geologiya Nefti i Gaza, no. 2, p.2-4.

U.S. GEOLOGICAL SURVEY WORLD PETROLEUM ASSESSMENT 2000— DESCRIPTION AND RESULTS
U.S. Geological Survey World Energy Assessment Team



Mesozoic Sandstone Reservoirs
Assessment Unit - 11500101

EXPLANATION

- Hydrography
- Shoreline
- 1150 Geologic province code and boundary
- Country boundary
- Gas field centerpoint
- Oil field centerpoint
- 11500101 Assessment unit code and boundary

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

USGS science for a changing world

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

Date:……..	12/29/99		
Assessment Geologist:……..	G.F. Ulmishek		
Region:……..	Former Soviet Union	Number:	1
Province:……..	North Ustyurt Basin	Number:	1150
Priority or Boutique……	Priority		
Total Petroleum System:……	Buzachi Arch and Surrounding Areas Composite	Number:	115001
Assessment Unit:……	Mesozoic Sandstone Reservoirs	Number:	11500101
* Notes from Assessor	No growth factor applied.		

CHARACTERISTICS OF ASSESSMENT UNIT

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

What is the minimum field size?……. 3 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: 8 Gas: 1
Established (>13 fields) _____ Frontier (1-13 fields) X Hypothetical (no fields) _____

Median size (grown) of discovered oil fields (mmboe):
1st 3rd 508 2nd 3rd 12.5 3rd 3rd _____
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)	2	median no.	15	max no.	40
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	3	median size	18	max. size	1800
Gas in gas fields (bcfg):……min. size	_____	median size	_____	max. size	_____

Assessment Unit (name, no.)
Mesozoic Sandstone Reservoirs, 11500101

AVERAGE RATIOS FOR UNDISCOVERED FIELDS, TO ASSESS COPRODUCTS

(uncertainty of fixed but unknown values)

Oil Fields:	minimum	median	maximum
Gas/oil ratio (cfg/bo)……	70	110	150
NGL/gas ratio (bngl/mmcfg)……	10	20	30

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)……	15	21	30
Sulfur content of oil (%)……	1.5	2.2	3.5
Drilling Depth (m) ……	400	800	1600
Depth (m) of water (if applicable)……	0	15	40

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.)
Mesozoic Sandstone Reservoirs, 11500101

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

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

Oil in Oil Fields:	minimum	median	maximum
Richness factor (unitless multiplier):……			
Volume % in parcel (areal % x richness factor):…		100	
Portion of volume % that is offshore (0-100%)……		60	

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%)……			

Mesozoic Standstone Reservoirs, AU 11500101
Undiscovered Field-Size Distribution