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: Dnieper-Donets Basin (1009)  
GEOLOGIST: G.F. Ulmishek

TOTAL PETROLEUM SYSTEM: Dnieper-Donets Paleozoic (100901)

ASSESSMENT UNIT: Carboniferous-Lower Permian Clastics (10090101)

DESCRIPTION: Assessment unit encompasses rocks of the postrift sag (Carboniferous-Lower Permian), and platform (Triassic-Tertiary) sequences over the entire basin area. The unit contains large hydrocarbon (mainly gas) reserves in more than 200 discovered fields.

SOURCE ROCKS: Two identified oil families demonstrate the presence of at least two source rock suites in the Upper Devonian and Lower Carboniferous sections. The latter are Visean organic-rich black shales and marls; Devonian source rocks occur deep and have not been penetrated by wells.

MATURATION: Source rocks are mature in the marginal areas and overmature throughout most of the basin. Maximum maturation was mainly reached by Late Permian time, but could have continued through early Mesozoic in the central part of the basin.

MIGRATION: Migration could have started as early as Early Carboniferous time, but an important stage of gas migration took place after deposition of Lower Permian salt.

RESERVOIR ROCKS: Carboniferous-Lower Permian sandstones contain almost all reserves. Most of undiscovered resources are expected in Lower Carboniferous rocks.

TRAPS: Structural traps are related either to plastic flow of Devonian salt (in deep areas) or to basement fault blocks (on basin margins). Stratigraphic traps are underexplored.

SEALS: Lower Permian salt directly seals reservoirs that contain more than half of reserves. Other seals are Carboniferous intraformational shales.

REFERENCES:


Carboniferous-Lower Permian Clastics
Assessment Unit - 10090101

EXPLANATION

- Hydrography
- Shoreline
- Geologic province code and boundary
- Country boundary
- Gas field centerpoint
- Oil field centerpoint

SEVENTH APPROXIMATION
NEW MILLENNIUM WORLDPETROLEUM ASSESSMENT
DATA FORM FOR CONVENTIONAL ASSESSMENT UNITS

Date:………………………….. 5/6/99
Assessment Geologist:…….. G.F. Ulmishek
Region:……………………….. Former Soviet Union
Province:……………………… Dnieper-Donets Basin
Priority or Boutique……….. Priority
Total Petroleum System:…….. Dnieper-Donets Paleozoic
Assessment Unit:…………… Carboniferous-Lower Permian Clastics
* Notes from Assessor Petroconsultants’ database is incomplete.

CHARACTERISTICS OF ASSESSMENT UNIT

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

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:.............
Established (>13 fields) X Frontier (1-13 fields)
Oil: 12 Gas: 63
Hypothetical (no fields)

Median size (grown) of discovered oil fields (mmboe):
1st 3rd 237.5 2nd 3rd 8.5 3rd 3rd
Median size (grown) of discovered gas fields (bcfg):
1st 3rd 400 2nd 3rd 100 3rd 3rd 60

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) 3 median no. 15 max no. 30
Gas fields:…………………………..min. no. (>0) 40 median no. 140 max no. 250

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 10 max. size 250
Gas in gas fields (bcfg):…………………..min. size 18 median size 50 max. size 2500
**AVERAGE RATIOS FOR UNDISCOVERED FIELDS, TO ASSESS COPRODUCTS**
(uncertainty of fixed but unknown values)

<table>
<thead>
<tr>
<th></th>
<th>minimum</th>
<th>median</th>
<th>maximum</th>
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<tbody>
<tr>
<td>Oil Fields:</td>
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<tr>
<td>Gas/oil ratio (cfg/bo)</td>
<td>1000</td>
<td>2000</td>
<td>3000</td>
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<tr>
<td>NGL/gas ratio (bngl/mmcfg)</td>
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<td>90</td>
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<td>Gas fields:</td>
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<td>Liquids/gas ratio (bngl/mmcfg)</td>
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<td>30</td>
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<tr>
<td>Oil/gas ratio (bo/mmcfg)</td>
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</table>

**SELECTED ANCILLARY DATA FOR UNDISCOVERED FIELDS**
(variations in the properties of undiscovered fields)

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<tr>
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<th>maximum</th>
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<tr>
<td>Oil Fields:</td>
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<tr>
<td>API gravity (degrees)</td>
<td>30</td>
<td>40</td>
<td>50</td>
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<tr>
<td>Sulfur content of oil (%)</td>
<td>0.1</td>
<td>0.2</td>
<td>0.3</td>
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<tr>
<td>Drilling Depth (m)</td>
<td>2500</td>
<td>3500</td>
<td>4500</td>
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<tr>
<td>Depth (m) of water (if applicable)</td>
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<td></td>
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<tr>
<td>Gas Fields:</td>
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<tr>
<td>Inert gas content (%)</td>
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<td>4</td>
<td>6</td>
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<tr>
<td>CO₂ content (%)</td>
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<td>Hydrogen-sulfide content (%)</td>
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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. **Ukraine** represents 93 areal % of the total assessment unit

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<th>Resource</th>
<th>Minimum</th>
<th>Median</th>
<th>Maximum</th>
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<tbody>
<tr>
<td>Oil in Oil Fields</td>
<td>Richness factor (unitless multiplier):</td>
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<td>Volume % in parcel (areal % x richness factor):</td>
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<tr>
<td>Portion of volume % that is offshore (0-100%):</td>
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<tr>
<td>Gas in Gas Fields</td>
<td>Richness factor (unitless multiplier):</td>
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<td>Volume % in parcel (areal % x richness factor):</td>
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<td>Portion of volume % that is offshore (0-100%):</td>
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2. **Russia** represents 7 areal % of the total assessment unit

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<th>Maximum</th>
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<tr>
<td>Oil in Oil Fields</td>
<td>Richness factor (unitless multiplier):</td>
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<tr>
<td>Volume % in parcel (areal % x richness factor):</td>
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<tr>
<td>Portion of volume % that is offshore (0-100%):</td>
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</tr>
<tr>
<td>Gas in Gas Fields</td>
<td>Richness factor (unitless multiplier):</td>
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<td>Volume % in parcel (areal % x richness factor):</td>
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<td>Portion of volume % that is offshore (0-100%):</td>
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Carboniferous-Lower Permian Clastics, AU 10090101

Undiscovered Field-Size Distribution

Minimum field size: 3 MMBO

Mean number of undiscovered fields: 15.4
Carboniferous-Lower Permian Clastics, AU 10090101
Undiscovered Field-Size Distribution

Minimum field size: 18 BCFG
Mean number of undiscovered fields: 141.6