Second White Specks-Cardium Gas Assessment Unit 52430601

135   130   125   120   115

65

60

5245

5243

55

Edmonton

Calgary

50

Canada

United States

0   250   500   KILOMETERS

☐ Second White Specks-Cardium Gas Assessment Unit 52430601
☐ Alberta Basin Geologic Province 5243
☐ Other geologic province boundary

USGS PROVINCES: Alberta Basin and Rocky Mountain Deformed Belt (5243 and 5245)

GEOLOGIST: M.E. Henry

TOTAL PETROLEUM SYSTEM: Second White Specks-Cardium (524306)

ASSESSMENT UNIT: Second White Specks-Cardium Gas (52430601)

DESCRIPTION: This gas assessment unit generally occupies the eastern part of the Rocky Mountain Deformed Belt. The area is bounded by the expected extent of thermally mature source rocks to the west and north, the Canadian-United States International Boundary to the south, and a line generally separating Upper Cretaceous oil and gas production to the east from mainly gas production to the west.

SOURCE ROCKS: The principal source rocks are probably the Upper Cretaceous First and Second White Speckled Shale and the Fish Scales zone. Because most of this assessment unit lies within the deformed belt, it may have also received hydrocarbons from older source rocks.

MATURATION: Most of the source rock for this unit is in or near areas that are overmature for liquid hydrocarbon generation.

MIGRATION: Pools assigned to this unit are in the same area where the expected source rocks exist. Long distance lateral migration has probably not occurred, but vertical migration may have been important.

RESERVOIR ROCKS: Reservoir rocks are generally marine and marginal marine sandstones of the Cardium, Cadotte, Paddy and Dunvegan Formations.

TRAPS AND SEALS: Stratigraphic traps are most common for discovered accumulations. If successful exploration continues westward in the unit, the importance of structure in trap formation will likely increase. Seals are generally formed by interbedded mudstones but may result from juxtaposition of low permeability rocks over reservoir rocks by thrusting.

REFERENCES:

Creaney, S. and Allen, J., 1990, Hydrocarbon generation and migration in the Western Canada sedimentary basin, *in* Brooks, J., ed., Classic petroleum provinces: Geological Society of London Special Publication No. 50, p. 189-202.

Creaney, S., Allen, J., Cole, K.S., Fowler, M.G., Brooks, P.W., Osadetz, K.G., Macqueen, R.W., Snowden, L.R., and Riediger, C.L., 1994, Petroleum generation and migration in the Western Canada Sedimentary Basin, *in* Mossop, G.D. and Shetsen, I., comps., Geological atlas of the Western Canada sedimentary basin: Calgary, Canadian Society of Petroleum Geologists and Alberta Research Council, p. 455-468.

NRG Associates, Inc., 1994, The significant oil and gas pools of Canada: Colorado Springs, Colo., NRG Associates, Inc. Database available from NRG Associates, Inc., P.O. Box 1655, Colorado Springs, CO 80901.
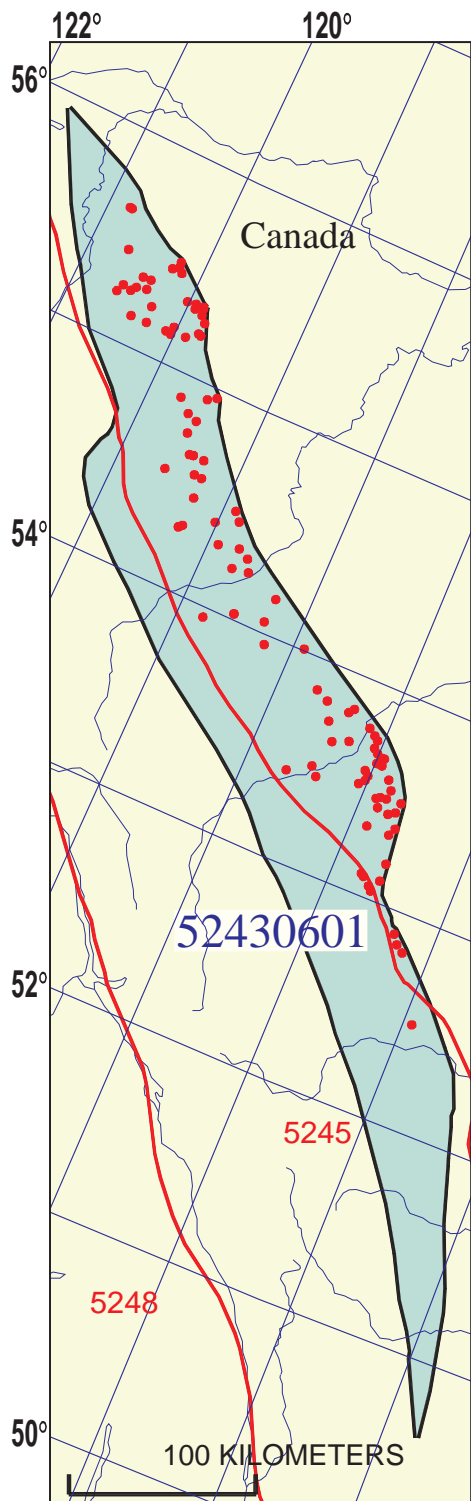
Second White Specks-Cardium Gas
Assessment Unit - 52430601

EXPLANATION

— Hydrography

— Shoreline

5243 — Geologic province code and boundary

- - - Country boundary

• Gas pool centerpoint

• Oil pool centerpoint

52430601 — Assessment unit code and boundary

Projection: Lambert. Standard parallels: 49 and 77. Central meridian: -92

NEW MILLENNIUM WORLD PETROLEUM ASSESSMENT
DATA FORM FOR CONVENTIONAL ASSESSMENT UNITS

Date:…………………….. 8/10/99
Assessment Geologist:…….. M.E. Henry
Region:………………….. North America   Number: 5
Province:…………………. Alberta Basin   Number: 5243
Priority or Boutique………… Priority
Total Petroleum System:…… Second White Specks-Cardium   Number: 524306
Assessment Unit:………….. Second White Specks-Cardium Gas   Number: 52430601
* Notes from Assessor   Field sizes were not grown.
                             Assessing pools, not fields to conform to NRG data set.

CHARACTERISTICS OF ASSESSMENT UNIT

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

What is the minimum field size?……….   0.5   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: 0   Gas: 92
        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   5.9   2nd 3rd   6   3rd 3rd   6

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) _____ median no. _____ max no. _____
Gas fields:……………………………min. no. (>0)   10   median no.   40   max no.   90

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   3   median size   5   max. size   70

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)………………..……	15	30	45
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 (%)……………………......……	0	0.6	5
CO_2 content (%)……………………………......…	0	0.1	3
Hydrogen-sulfide content(%)………………..……..	0	0	0.01
Drilling Depth (m)……………………………………	1000	2100	3300
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. Canada   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):…			
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):…		100	
Portion of volume % that is offshore (0-100%)……		0	

2. Province 5243   represents   60   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):…		80	
Portion of volume % that is offshore (0-100%)……		0	

3. Province 5245   represents   40   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):…		20	
Portion of volume % that is offshore (0-100%)……		0	

Second White Specks-Cardium Gas, AU 52430601
Undiscovered Field-Size Distribution

Minimum field size: 3 BCFG

Mean number of
undiscovered fields: 42.5

UNDISCOVERED GAS FIELDS (No.)

GAS-FIELD SIZE (BCFG)