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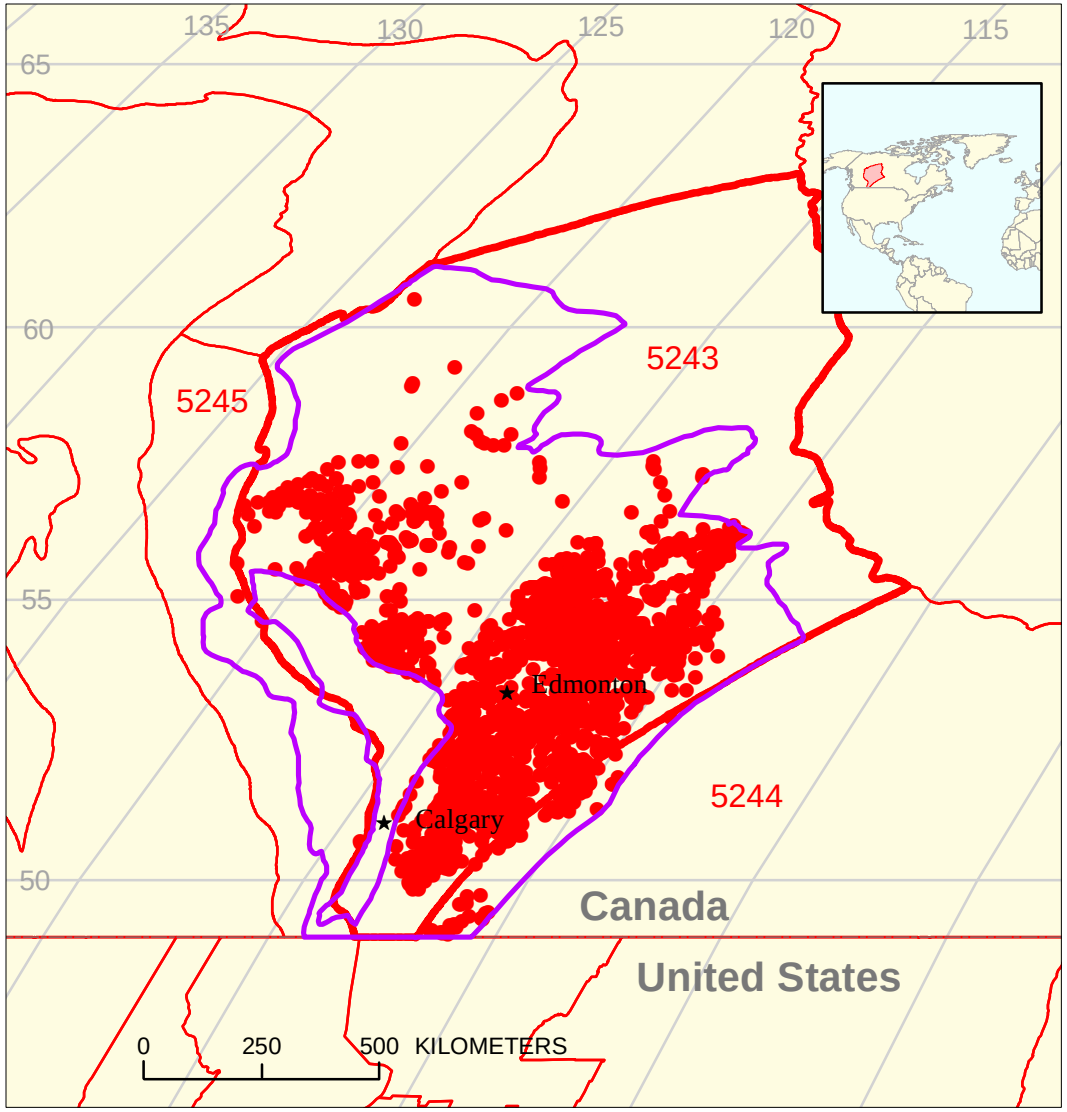
Mannville Gas
Assessment Unit 52430501



Mannville Gas Assessment Unit 52430501

Alberta Basin Geologic Province 5243

Other geologic province boundary

Geologic Summary

Detailed map of this assessment unit

Exploration/Discovery-History Data

- Plots of Known Field Sizes
- Tables

Assessment Input Data

Assessment Results

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

USGS PROVINCES: Alberta Basin, Rocky Mountain Deformed Belt and Williston Basin (5243, 5245 and 5244)

GEOLOGIST: M.E. Henry

TOTAL PETROLEUM SYSTEM: Mannville-Upper Mannville (524305)

ASSESSMENT UNIT: Mannville Gas (52430501)

DESCRIPTION: This gas assessment unit includes most of the southern Alberta Basin, parts of the northern Rocky Mountain Deformed Belt, and part of the western portion of the Williston Basin. The Canadian-United States International Boundary forms the southern boundary and the western boundary is the eastern border of the Mannville Continuous (Basin-Center) Gas Assessment Unit.

SOURCE ROCKS: Source rocks for this unit are believed to be Jurassic through Lower Cretaceous coals and Lower Cretaceous gas prone carbonaceous shales.

MATURATION: Probable source rocks range from immature in the northeastern part of the unit to mature in the western part with regard to liquid petroleum generation.

MIGRATION: The location of pools assigned to this unit with regard to the thermal maturity pattern suggests that either long distance lateral migration of hydrocarbon gases has occurred or that some of the gas is not thermogenic.

RESERVOIR ROCKS: Reservoir rocks are numerous sandstones of the Mannville Group. Reservoir sands were generally deposited by fluvial systems in the south and shoreline and deltaic systems in the central and northern parts.

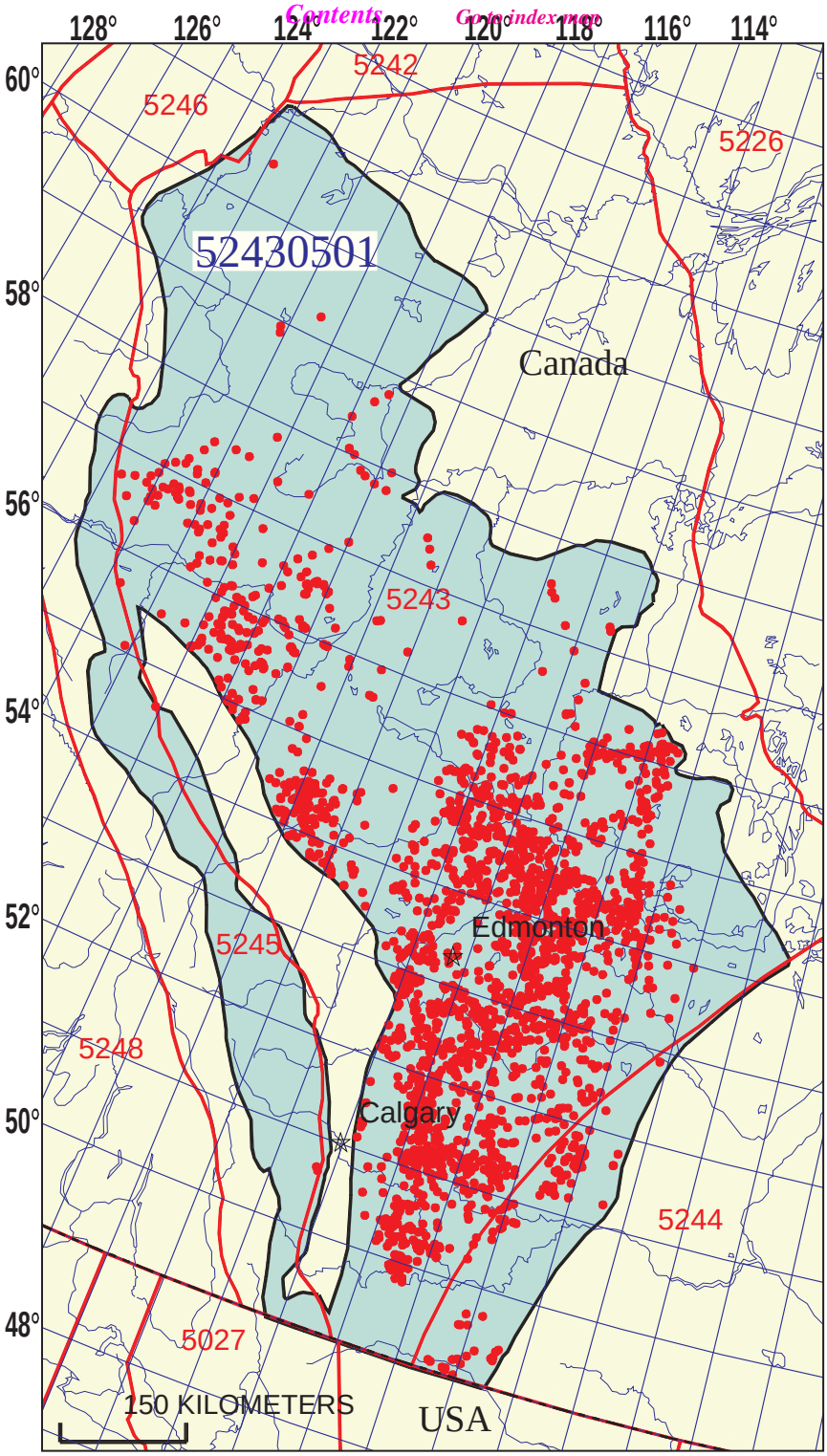
TRAPS AND SEALS: About 50 percent of known traps are stratigraphic and about 40 percent are combination. Seals are generally shales and mudstones.

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.



Mannville Gas
Assessment Unit - 52430501

EXPLANATION

- Hydrography
- Shoreline
- 5243 Geologic province code and boundary
- Country boundary
- Gas pool centerpoint
- Oil pool centerpoint
- 52430501 Assessment unit code and boundary

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

USGS science for a changing world

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

Date:……..	7/14/99		
Assessment Geologist:……..	M.E. Henry		
Region:……..	North America	Number:	5
Province:……..	Alberta Basin	Number:	5243
Priority or Boutique……	Priority		
Total Petroleum System:……	Mannville-Upper Mannville	Number:	524305
Assessment Unit:……..	Mannville Gas	Number:	52430501
* Notes from Assessor	All oil and oil and gas pools were removed from the Mannville reservoirs and assigned to the subcropping petroleum system at the pools location. Data 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: 1869
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 8.4 2nd 3rd 5.5 3rd 3rd 4.4

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)	200	median no.	600	max no.	1200

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	4.2	max. size	200

Assessment Unit (name, no.)
Mannville Gas, 52430501

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)……	10	20	30
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	2	32
CO_2 content (%)……	0	0.5	21
Hydrogen-sulfide content(%)……	0	0.6	10
Drilling Depth (m)……	200	900	3000
Depth (m) of water (if applicable)……			

Assessment Unit (name, no.)
Mannville Gas, 52430501

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 80 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):...		75	
Portion of volume % that is offshore (0-100%).....		0	

3. Province 5244 represents 7 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):...		8	
Portion of volume % that is offshore (0-100%).....		0	

4. Province 5245 represents 13 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):...		17	
Portion of volume % that is offshore (0-100%).....		0	

Mannville Gas, AU 52430501
Undiscovered Field-Size Distribution