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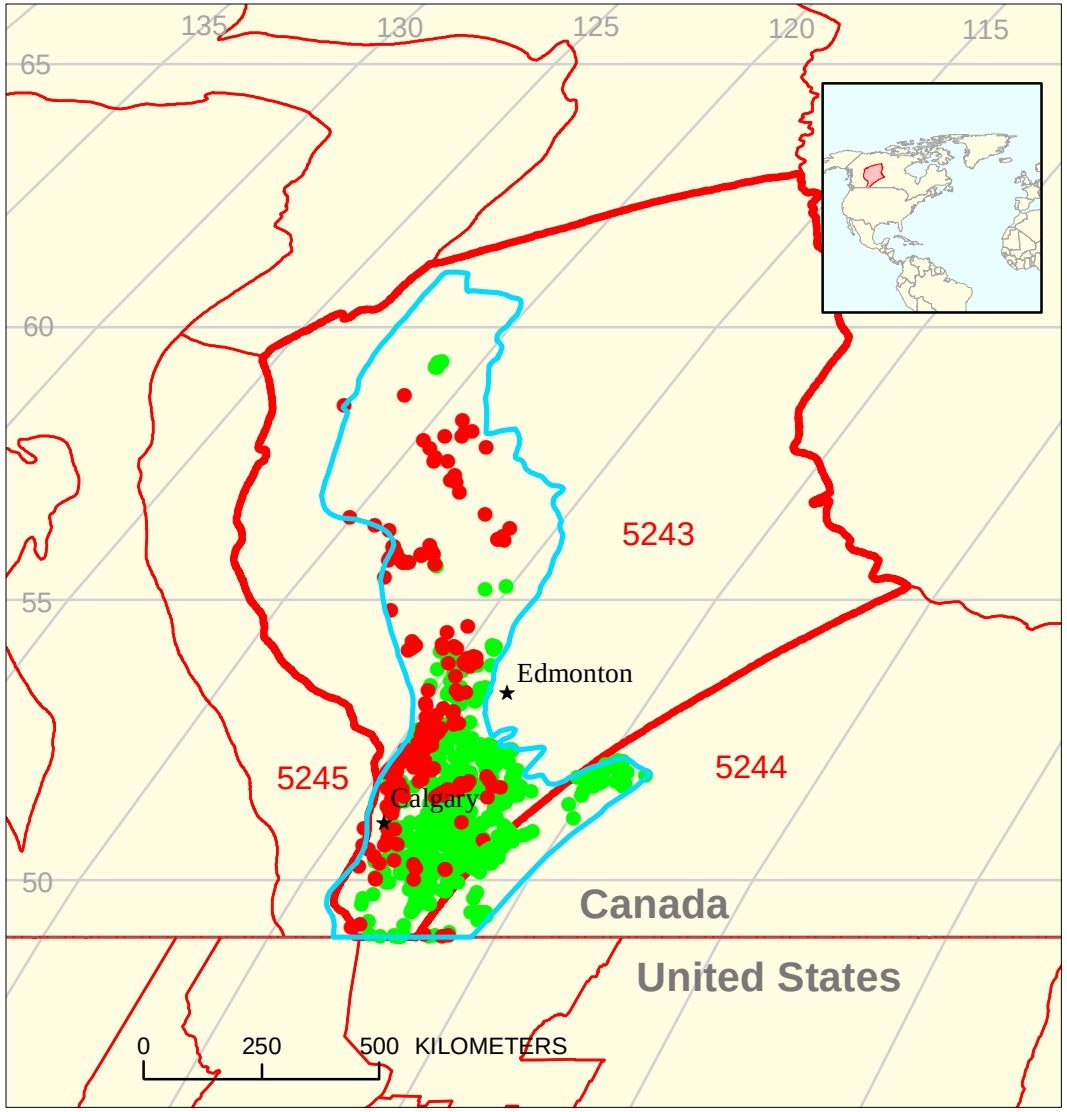
# Exshaw-Rundle Oil and Gas Assessment Unit 52430302




Exshaw-Rundle Oil and Gas Assessment Unit 52430302
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 5344)

**GEOLOGIST:** M.E. Henry

**TOTAL PETROLEUM SYSTEM:** Exshaw-Rundle (524303)

**ASSESSMENT UNIT:** Exshaw-Rundle Oil and Gas (52430302)

**DESCRIPTION:** This oil and gas assessment unit includes a very small area in the southern part of the deformed belt, the southern and southwestern part of the Alberta Basin where thermally mature, organic-rich rocks of the Late Devonian to Early Mississippian Exshaw Formation are known or are likely to exist, and the western most portion of the Williston Basin. The area is bounded by the Exshaw-Rundle Gas Assessment Unit to the west, the Canadian-United States International Boundary to the south, the Tathlina High to the north and a line representing the estimated eastward limit of migration of Exshaw sourced oils.

**SOURCE ROCKS:** The principal source rock is the Late Devonian to Early Mississippian Exshaw Formation.

**MATURATION:** This unit lies in or near the area where the Exshaw is mature with respect to liquid petroleum generation except for the southern part of the unit. In that area, pools assigned to this system are as much as 250 km away from areas where the Exshaw is considered thermally mature for liquid hydrocarbon generation.

**MIGRATION:** The distribution of pools assigned to this unit in relation to the distribution of mature source rocks suggests that long distance lateral migration has occurred in the southern part of the unit. If Exshaw oils contributed to the bitumen deposits, even greater migration distances were involved to the north, in central Alberta.

**RESERVOIR ROCKS:** Because many pools that produce from Lower Cretaceous reservoirs were assigned to this assessment unit, sandstone is the principal reservoir type. Carbonate reservoirs are most common in Mississippian reservoirs.

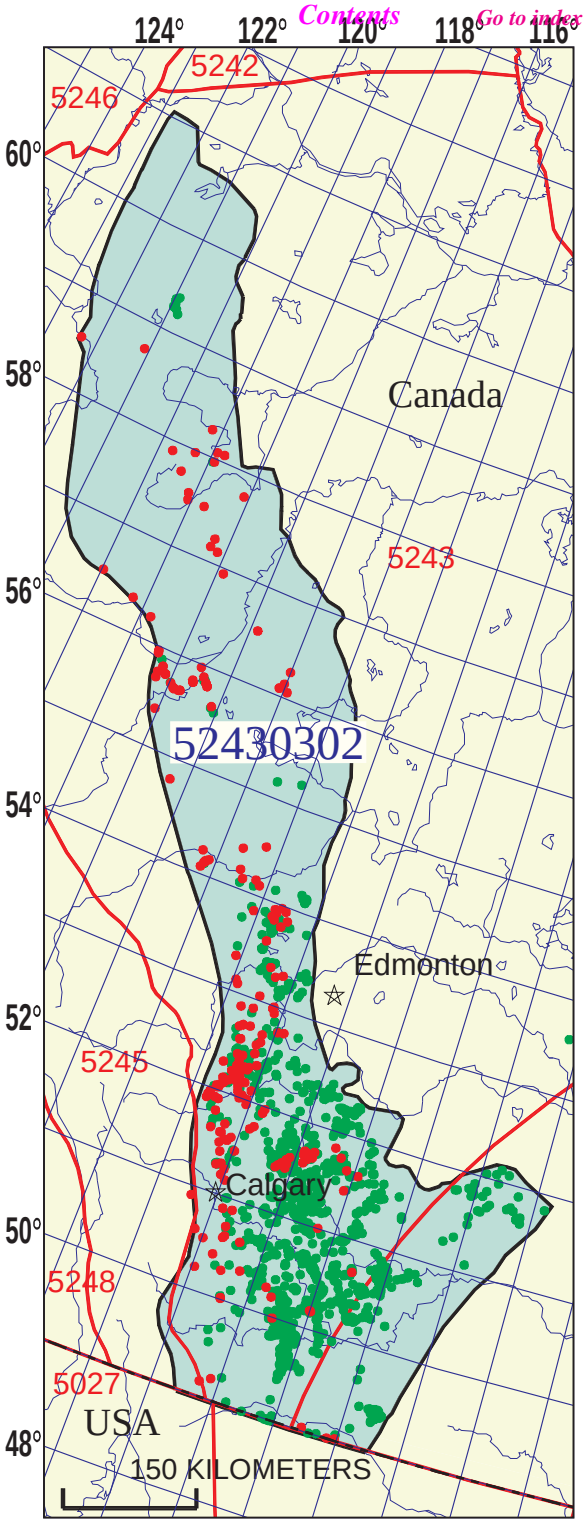
**TRAPS AND SEALS:** The most common trap types are stratigraphic followed by combination and structural in the approximate proportion of 20 to 12 to one, respectively. Seals result from shale or pinchout of reservoir quality rocks.

**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 - 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.




# Exshaw-Rundle Oil and Gas Assessment Unit - 52430302

EXPLANATION

- Hydrography
- Shoreline
- 5243 Geologic province code and boundary
- Country boundary
- Gas pool centerpoint
- Oil pool centerpoint
- 52430302 Assessment unit code and boundary

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

**SEVENTH APPROXIMATION**
**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:…… | Exshaw-Rundle | Number: | 524303 |
| Assessment Unit:…….. | Exshaw-Rundle Oil and Gas | Number: | 52430302 |
| * 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):… Oil

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: 288 Gas: 181
Established (>13 fields) X Frontier (1-13 fields) _____ Hypothetical (no fields) _____

Median size (grown) of discovered oil fields (mmboe):
1st 3rd 2.5 2nd 3rd 1.4 3rd 3rd 0.98
Median size (grown) of discovered gas fields (bcfg):
1st 3rd 10.7 2nd 3rd 6.3 3rd 3rd 6.1

**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) | 25 | median no. | 90 | max no. | 220 |
| Gas fields:……min. no. (>0) | 20 | median no. | 60 | max no. | 150 |

**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 | 0.5 | median size | 0.8 | max. size | 25 |
| Gas in gas fields (bcfg):……min. size | 3 | median size | 5 | max. size | 50 |

Assessment Unit (name, no.)
Exshaw-Rundle Oil and Gas, 52430302

## AVERAGE RATIOS FOR UNDISCOVERED FIELDS, TO ASSESS COPRODUCTS

(uncertainty of fixed but unknown values)

| Oil Fields: | minimum | median | maximum |
|---|---|---|---|
| Gas/oil ratio (cfg/bo)…… | 225 | 450 | 675 |
| NGL/gas ratio (bngl/mmcfg)…… | 30 | 60 | 90 |

| 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)…… | 12 | 28 | 43 |
| Sulfur content of oil (%)…… | | | |
| Drilling Depth (m) …… | 700 | 1100 | 2800 |
| Depth (m) of water (if applicable)…… | | | |

| Gas Fields: | minimum | median | maximum |
|---|---|---|---|
| Inert gas content (%)…… | 0.02 | 1 | 15 |
| $CO_2$ content (%)…… | 0 | 3 | 17 |
| Hydrogen-sulfide content(%)…… | 0 | 0 | 13 |
| Drilling Depth (m)…… | 450 | 1800 | 3400 |
| Depth (m) of water (if applicable)…… | | | |

Assessment Unit (name, no.)
Exshaw-Rundle Oil and Gas, 52430302

**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):... | | 100 | |
| Portion of volume % that is offshore (0-100%)..... | | 0 | |

| 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 85 areal % of the total assessment unit

| Oil in Oil Fields: | minimum | median | maximum |
|---|---|---|---|
| Richness factor (unitless multiplier):..... | | | |
| Volume % in parcel (areal % x richness factor):... | | 93 | |
| Portion of volume % that is offshore (0-100%)..... | | 0 | |

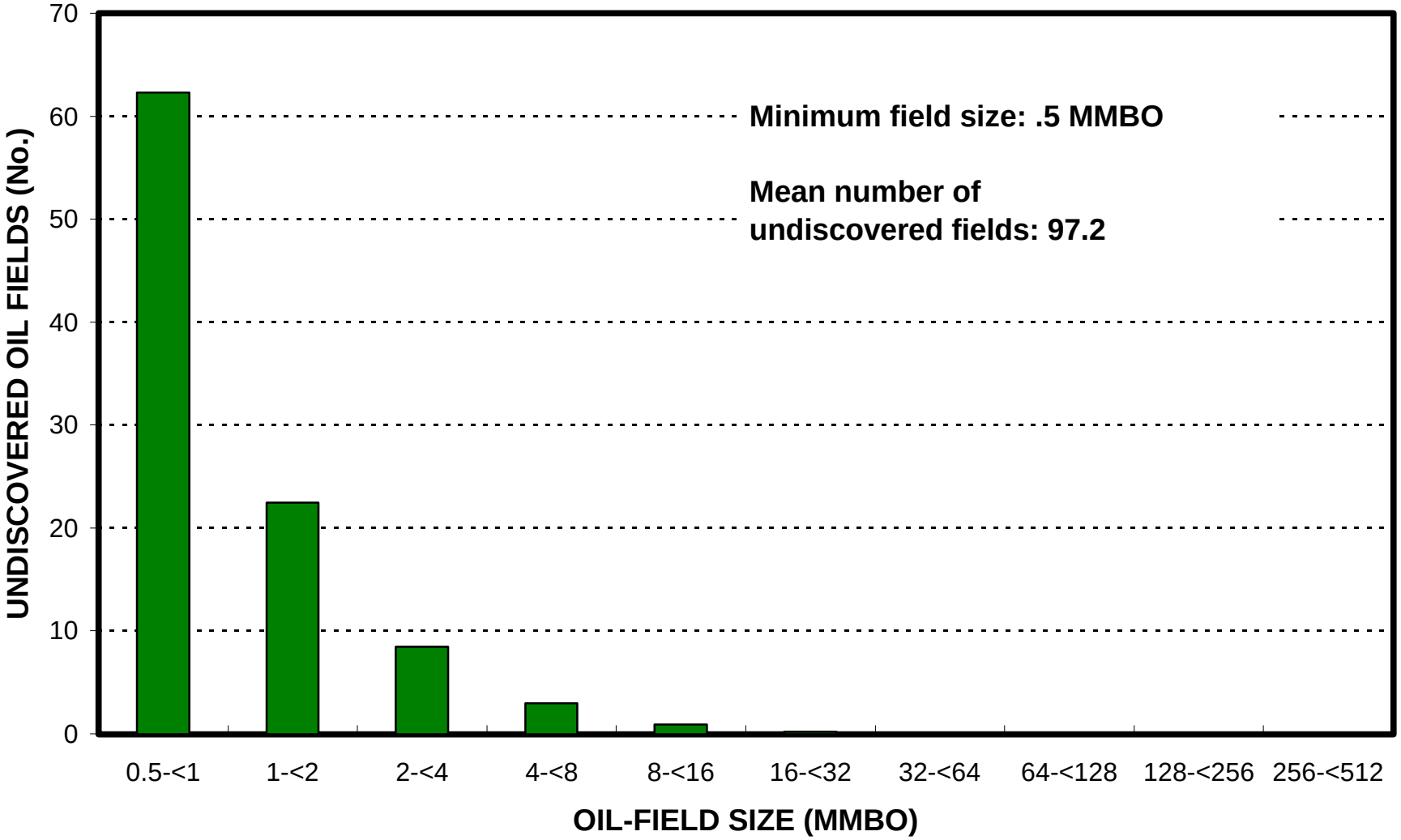
| Gas in Gas Fields: | minimum | median | maximum |
|---|---|---|---|
| Richness factor (unitless multiplier):..... | | | |
| Volume % in parcel (areal % x richness factor):... | | 99 | |
| Portion of volume % that is offshore (0-100%)..... | | 0 | |

3. Province 5244 represents 15 areal % of the total assessment unit

| Oil in Oil Fields: | minimum | median | maximum |
|---|---|---|---|
| Richness factor (unitless multiplier):..... | | | |
| Volume % in parcel (areal % x richness factor):... | | 7 | |
| Portion of volume % that is offshore (0-100%)..... | | 0 | |

| Gas in Gas Fields: | minimum | median | maximum |
|---|---|---|---|
| Richness factor (unitless multiplier):..... | | | |
| Volume % in parcel (areal % x richness factor):... | | 1 | |
| Portion of volume % that is offshore (0-100%)..... | | 0 | |

# Exshaw-Rundle Oil and Gas, AU 52430302
## Undiscovered Field-Size Distribution



# Exshaw-Rundle Oil and Gas, AU 52430302
# Undiscovered Field-Size Distribution