



Ultimate Potential for Unconventional Petroleum in the Bakken Formation of Saskatchewan

**Peter Budgell*, Mike Johnson,
Chao Yang, Dan Kohlruss,
Melinda Yurkowski, Paul
Mortensen**

April 30, 2015

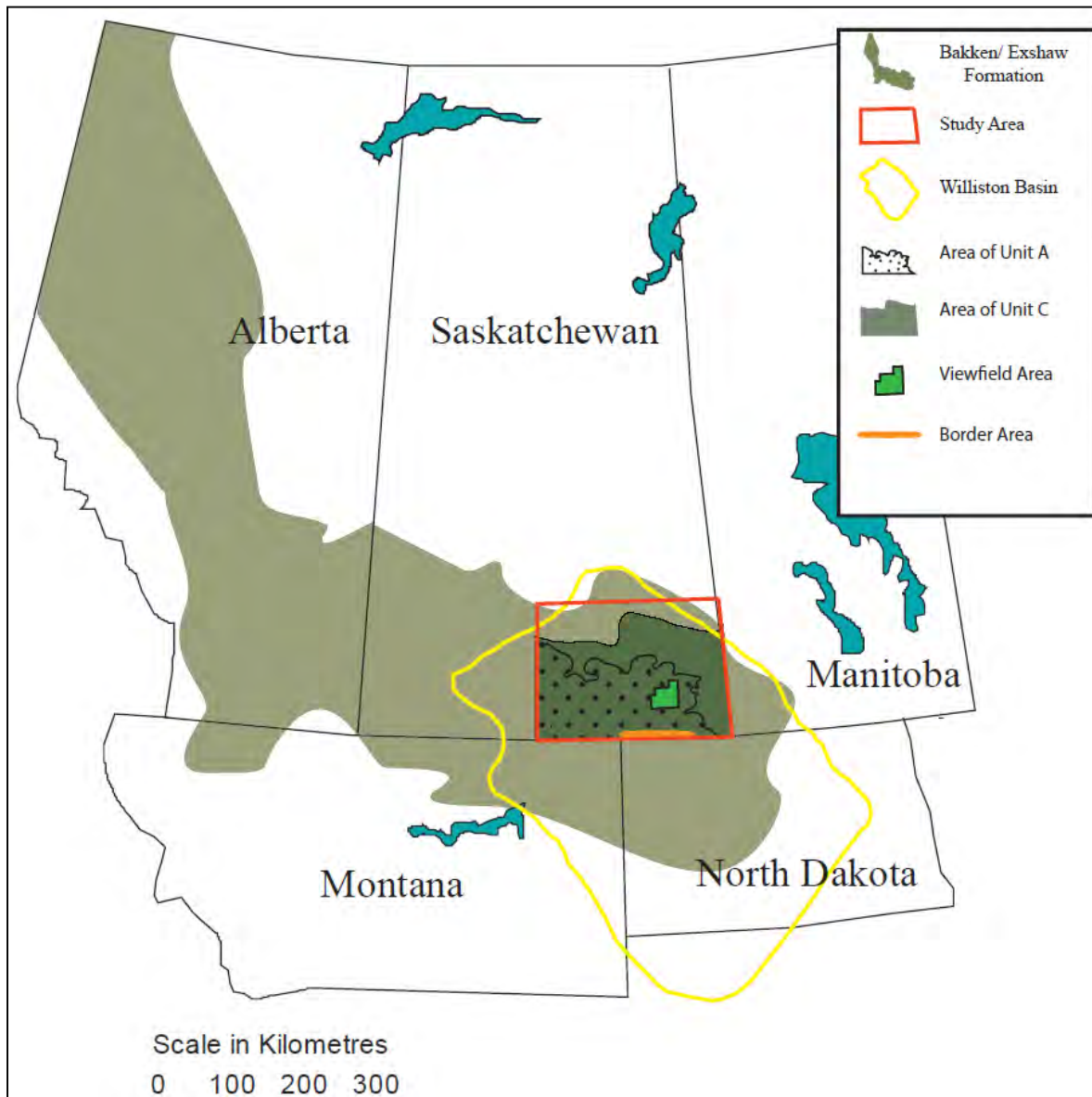


National Energy
Board



Office national
de l'énergie

Canada 

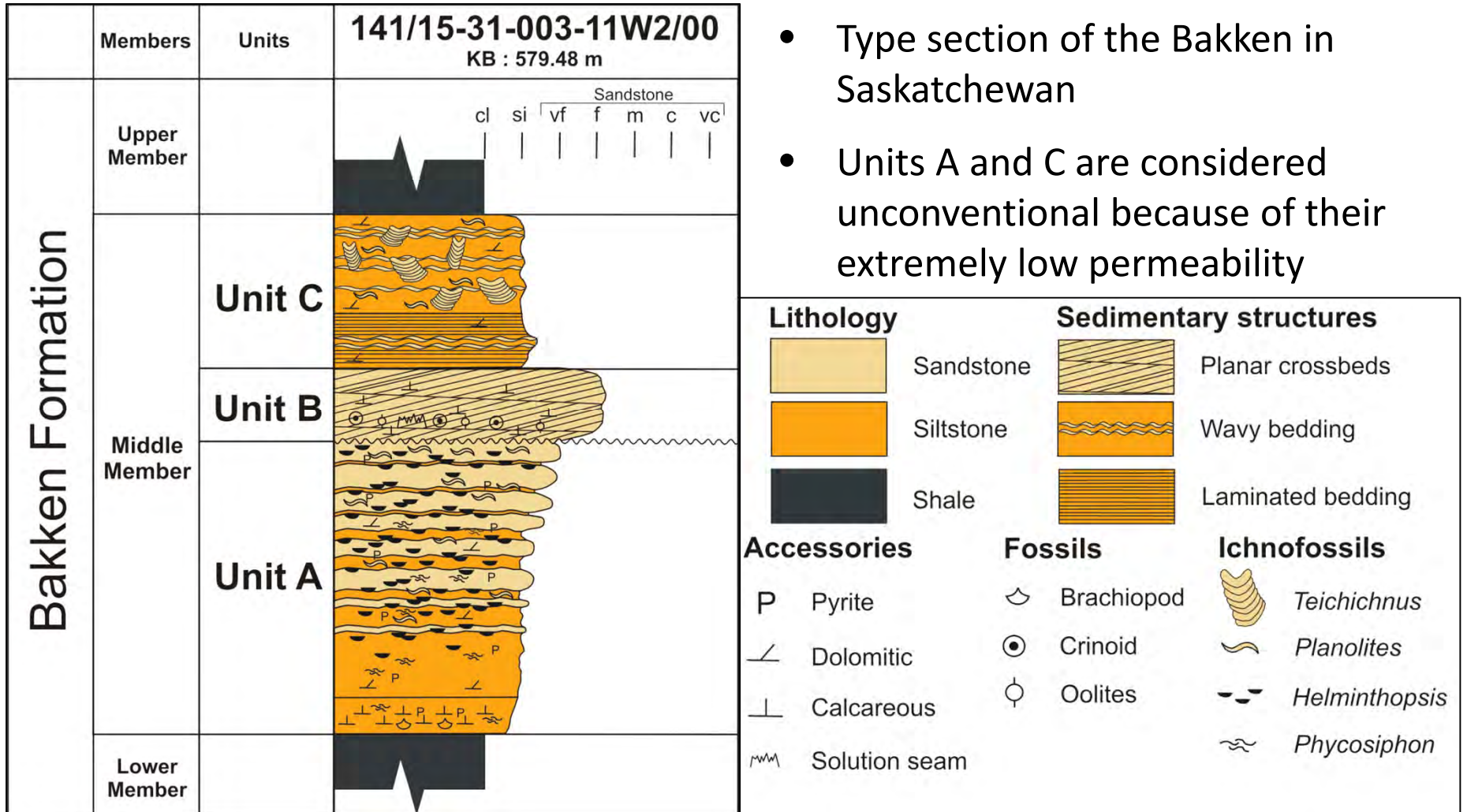


The Bakken Formation

- Stretches from Montana and North Dakota to Manitoba and Saskatchewan.
- Stratigraphically equivalent to the Exshaw which extends through Alberta and into northeastern B.C.

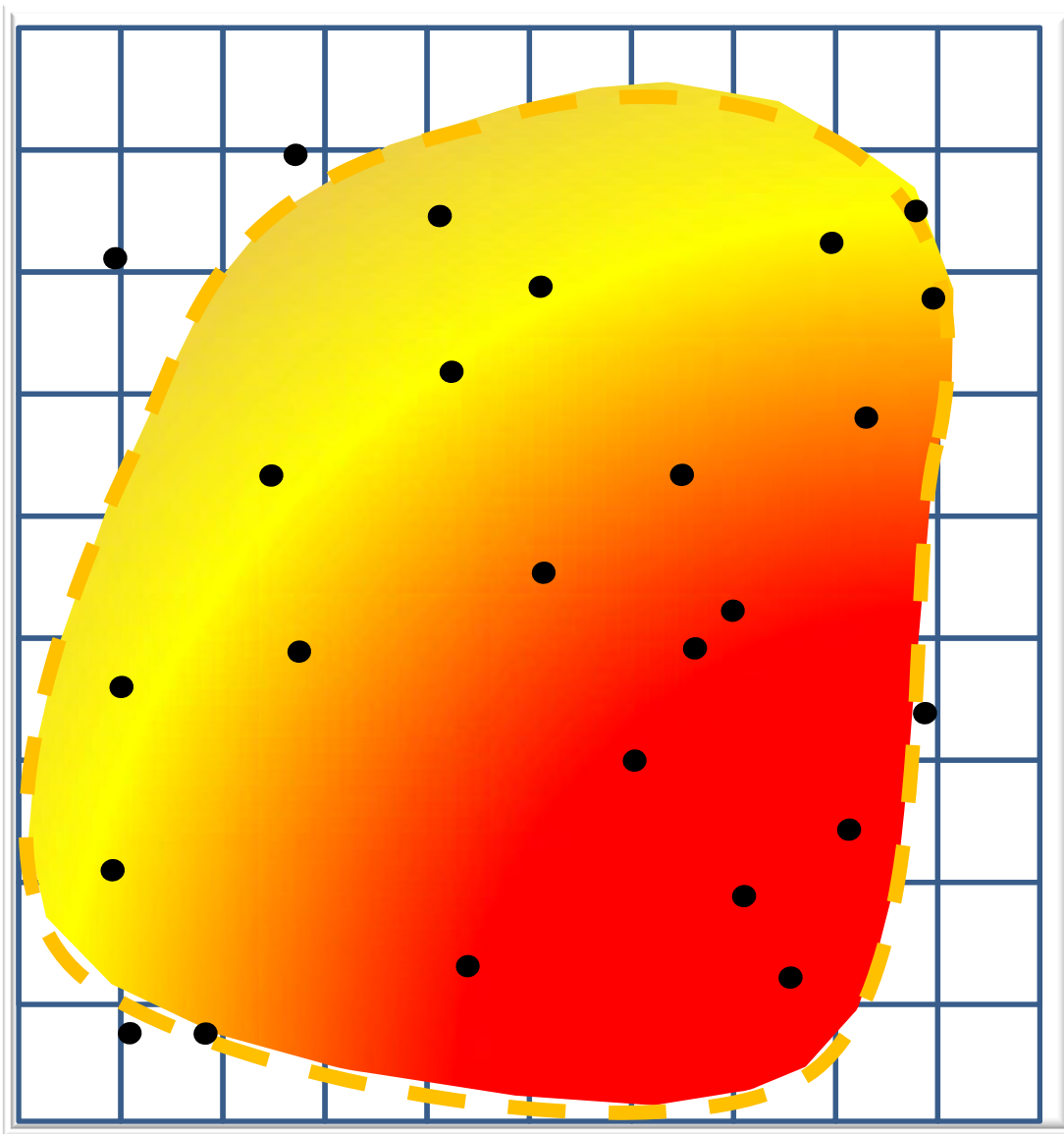
Geology

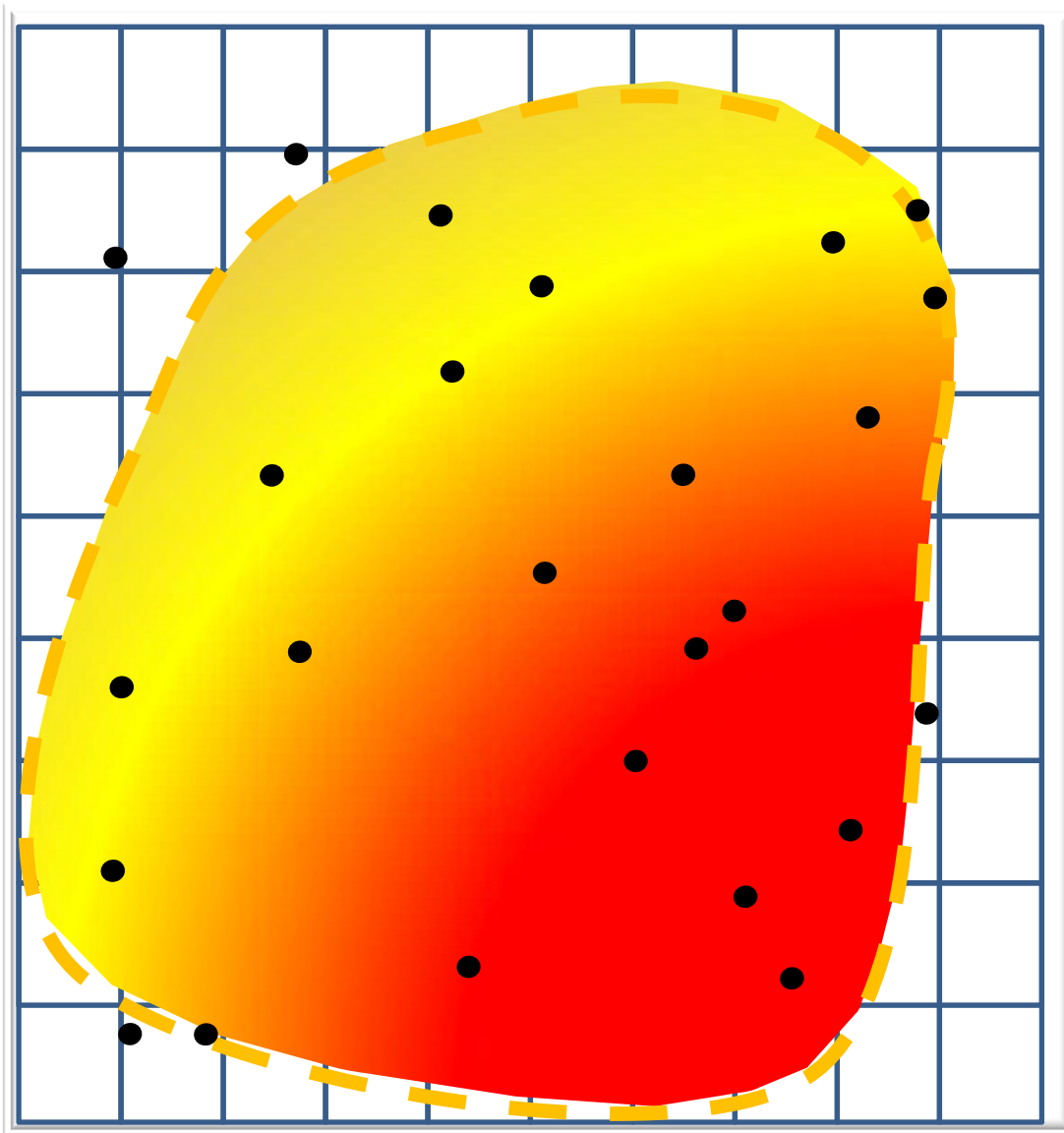
- Type section of the Bakken in Saskatchewan
- Units A and C are considered unconventional because of their extremely low permeability



Assessment of Continuous Resources

- We know there is petroleum everywhere...
- But reservoir conditions change from place to place

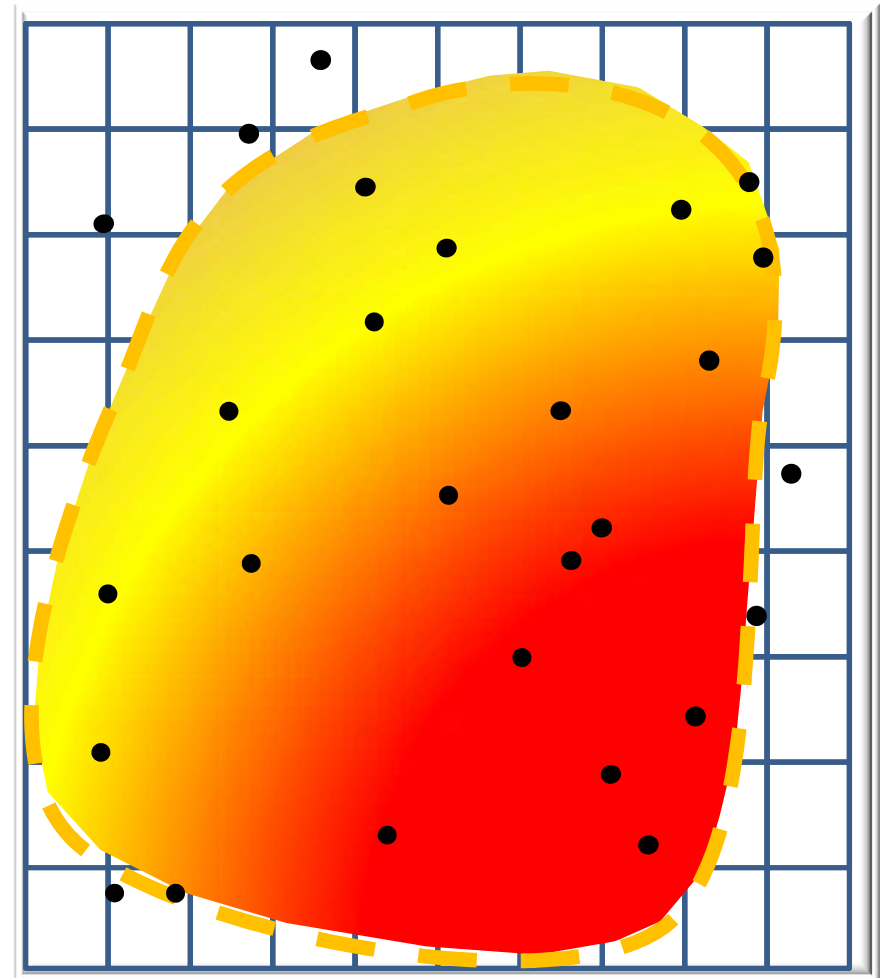
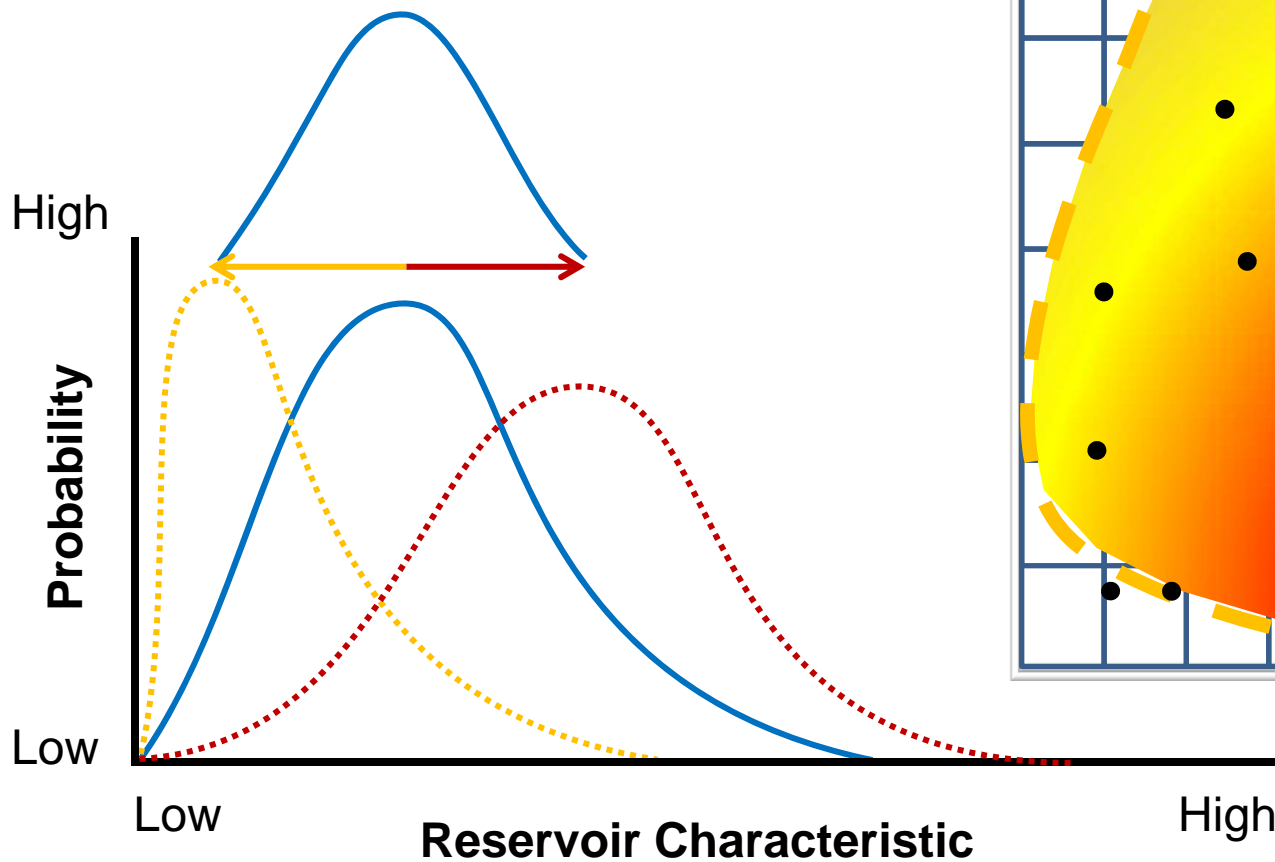




Assessment of Continuous Resources

- Calculate PIP
 - Mix of real data and Monte Carlo simulations
- Two scales
 - Local
 - Basin scale (distribution of distributions)

“Distribution of Distributions”



National Energy Board

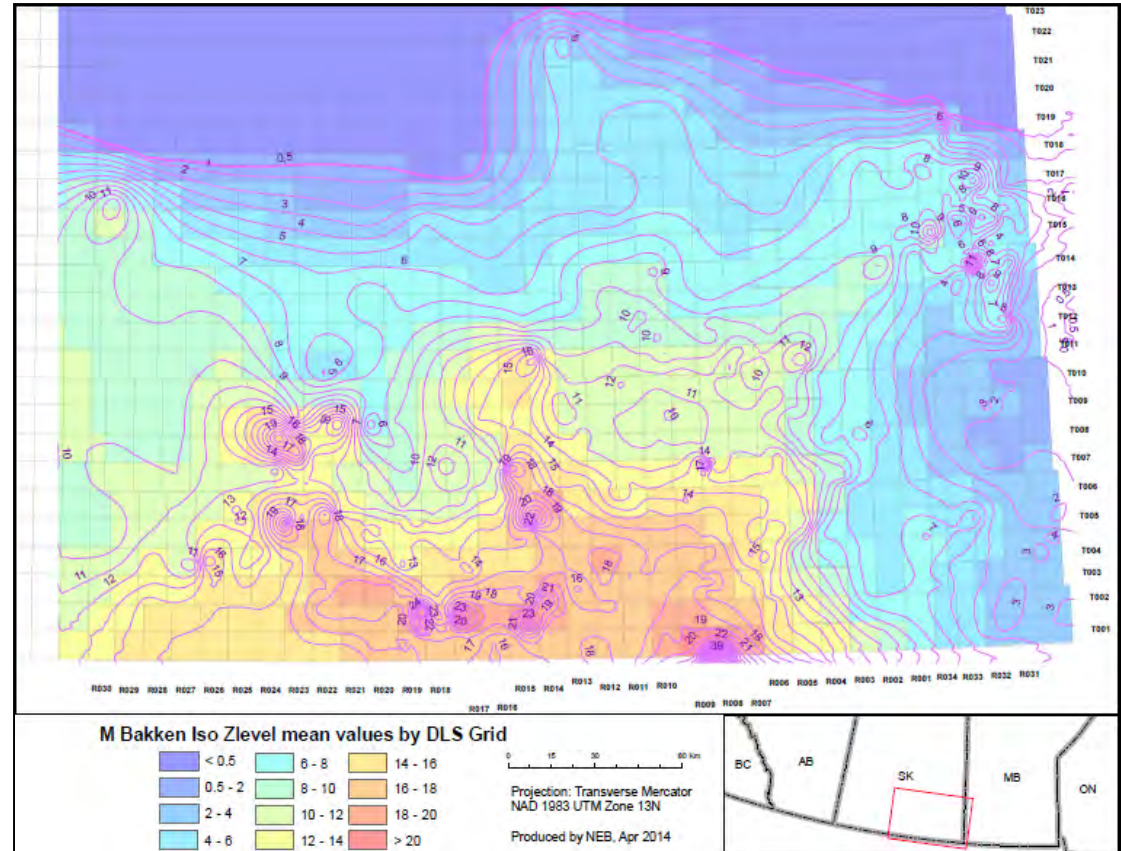
Office national de l'énergie



Ministry of Natural Gas Development

In-place and Marketable Resources

- Oil
 - Volumetric Equation
- Mapped Variables
 - Thickness, Porosity, Water Saturation, FVF,
- Gas
 - Gas to Oil Ratios



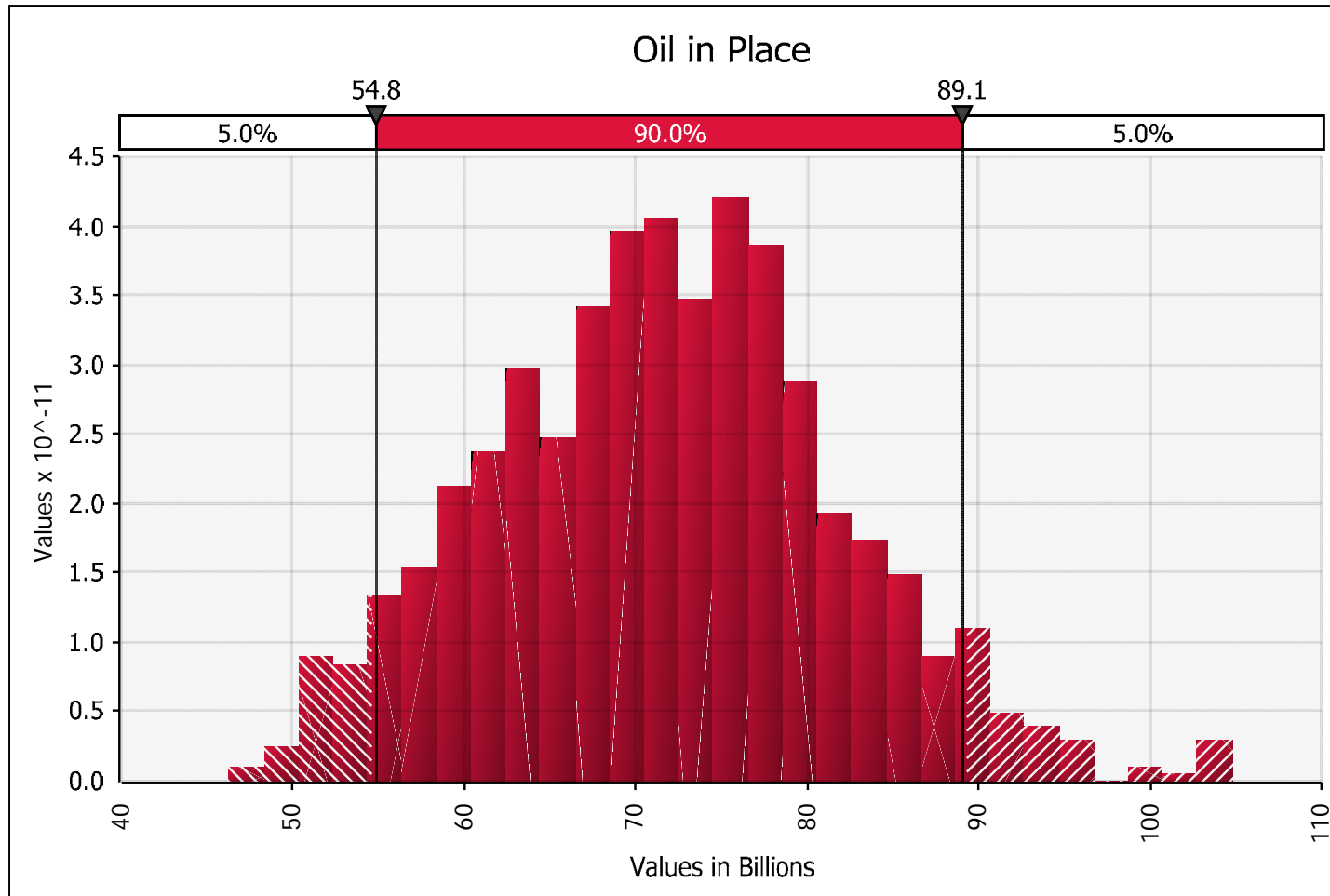
Results of the Assessment

Oil – million m ³ (million barrels)	In-Place			Marketable		
	Low	Expected	High	Low	Expected	High
Viewfield	838 (5,429)	1,144 (7,200)	1,487 (9,359)	43 (273)	74 (464)	114 (717)
Border Continuous	414 (2,604)	573 (3,606)	750 (4,717)	22 (139)	38 (240)	61 (385)
Transition	7,144 44,951	9,562 60,164	12,390 (77,957)	67 (423)	111 (697)	170 (1,071)

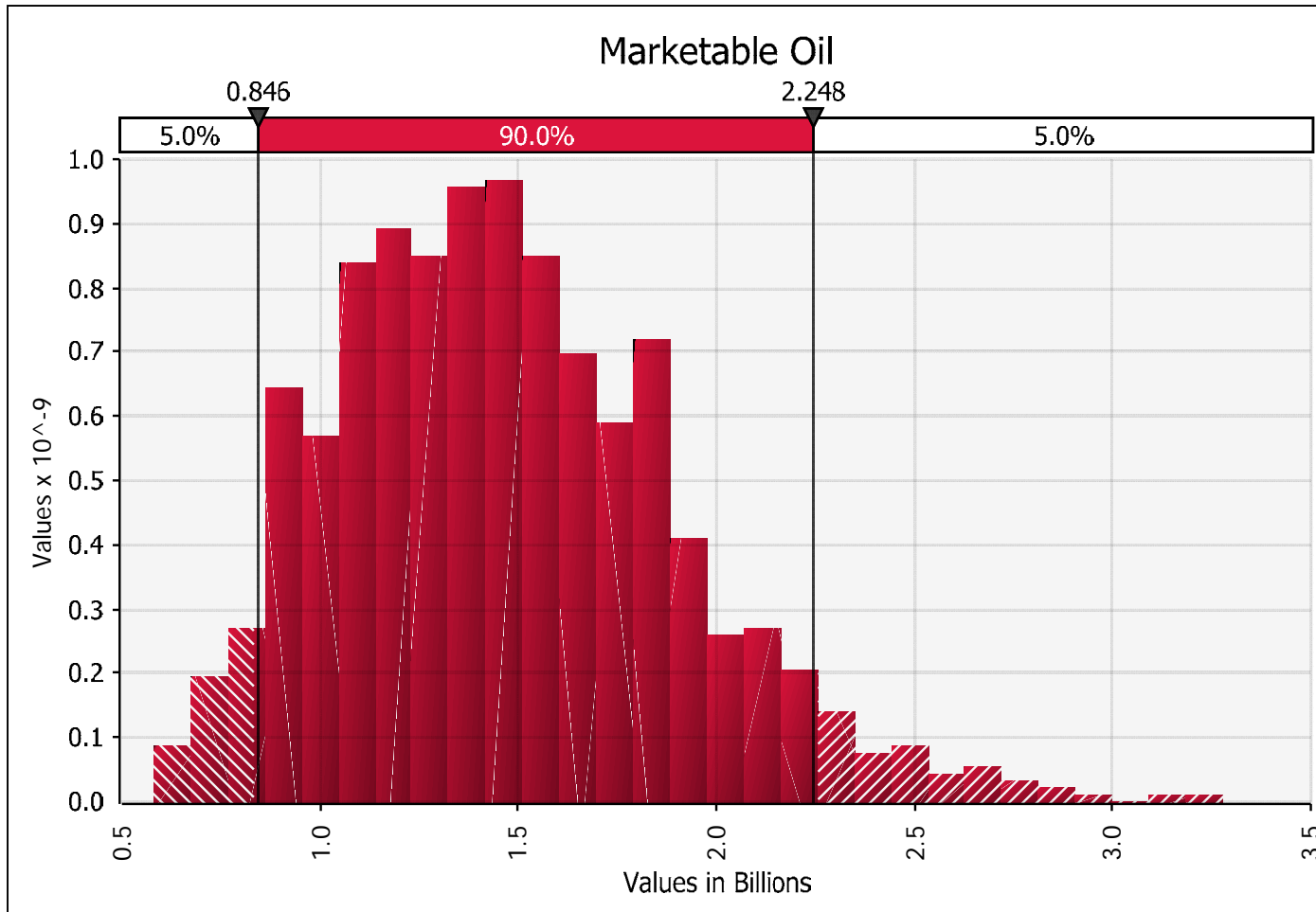
Oil – million m ³ (million barrels)	In-Place			Marketable		
	Low	Expected	High	Low	Expected	High
	8,420 (52,984)	11,279 (70,970)	14,627 (92,033)	132 (835)	223 (1,401)	345 (2,173)



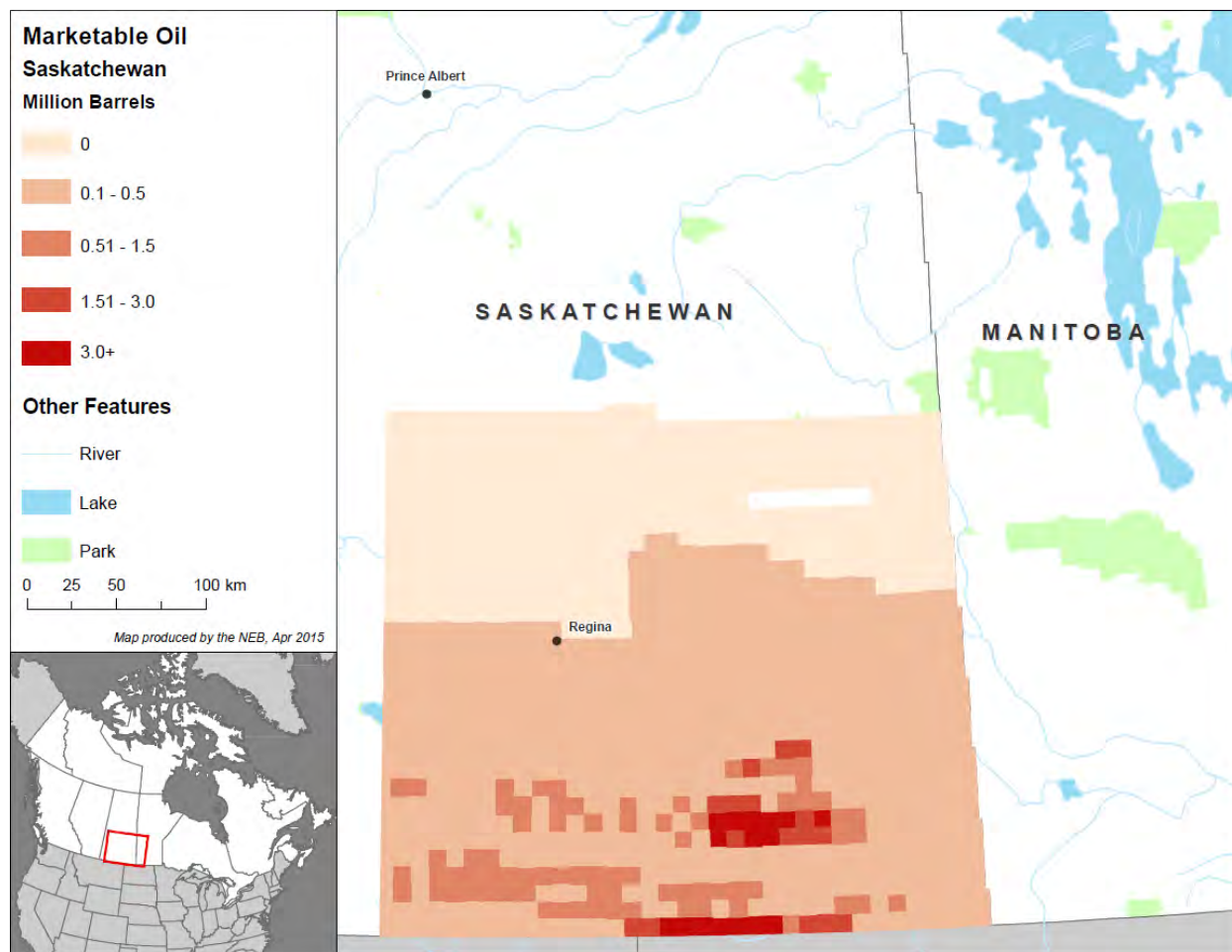
Oil in Place (bbls)



Marketable Oil (bbls)



Resource Map



Conclusions

- Cumulative production to year-end 2014 of 160 million barrels from unconventional Bakken leaves 1.2 billion barrels for future
- Associated Marketable Natural Gas is expected to be 2.89 Tcf
- The Bakken is likely one of the largest accumulations of tight oil in Canada.



Thank You

- Peter.Budgell@neb-one.gc.ca
- Mike.Johnson@neb-one.gc.ca
- Chao.Yang@gov.sk.ca
- Dan.Kohlruss@gov.sk.ca
- Melinda.Yurkowski@gov.sk.ca
- Paul.Mortensen@neb-one.gc.ca

