

Comparing Opportunities in a Mature Basin: Examples from the Western Canada Sedimentary Basin*

By

Dave A. Russum¹ and Andrew R. Botterill¹

Search and Discovery Article #10098 (2006)

Posted February 8, 2006

*Modified from extended abstract prepared for presentation at AAPG Annual Convention, Calgary, Alberta, June 19-22, 2005

¹AJM Petroleum Consultants, (drussum@ajma.net; abotterill@ajma.net)

Introduction

Gas production from the Western Canada Sedimentary Basin (WCSB) grew rapidly after de-regulation in the 1980's. This rapid growth has accelerated the maturity of the Basin and steadily eroded the reserve base, providing challenges for future production.

Certain areas and formations in the WCSB still have considerable growth potential for natural gas. The decision of where to focus activity and the developing of realistic expectations of results require careful, consistent analysis of up-to-date data.

Canadian Gas production

Canada is the third largest gas producer and second largest gas exporter in the World; however, Canada's proved gas reserves represent less than 1% of the World reserves. Production has been dominated by conventional gas production from the Western Canada Sedimentary Basin (WCSB), particularly the Province of Alberta that has historically provided 80% of all Canada's gas production (Figure 1),

Alberta's conventional gas production peaked in 2000 (Russum, 2002, 2003) and Canada's gas production probably peaked in 2001. Extraordinary levels of drilling are required to sustain Canadian gas production with Canada having nearly 20% of the World's drilling rigs (Russum, 2004).

Current Opportunities in the WCSB

A recent study of production in the WCSB showed that 35 out of 128 play areas in the WCSB showed production growth in the past five years (PetroCube, 2005), in addition to the coalbed methane (now called Natural Gas from Coal – NGC in Canada) from the Horseshoes Canyon of the Upper Cretaceous Edmonton Group.

Some of this production growth can be accounted for by down-spacing or acceleration of existing production; however, there are still many true growth opportunities in plays in the WCSB.

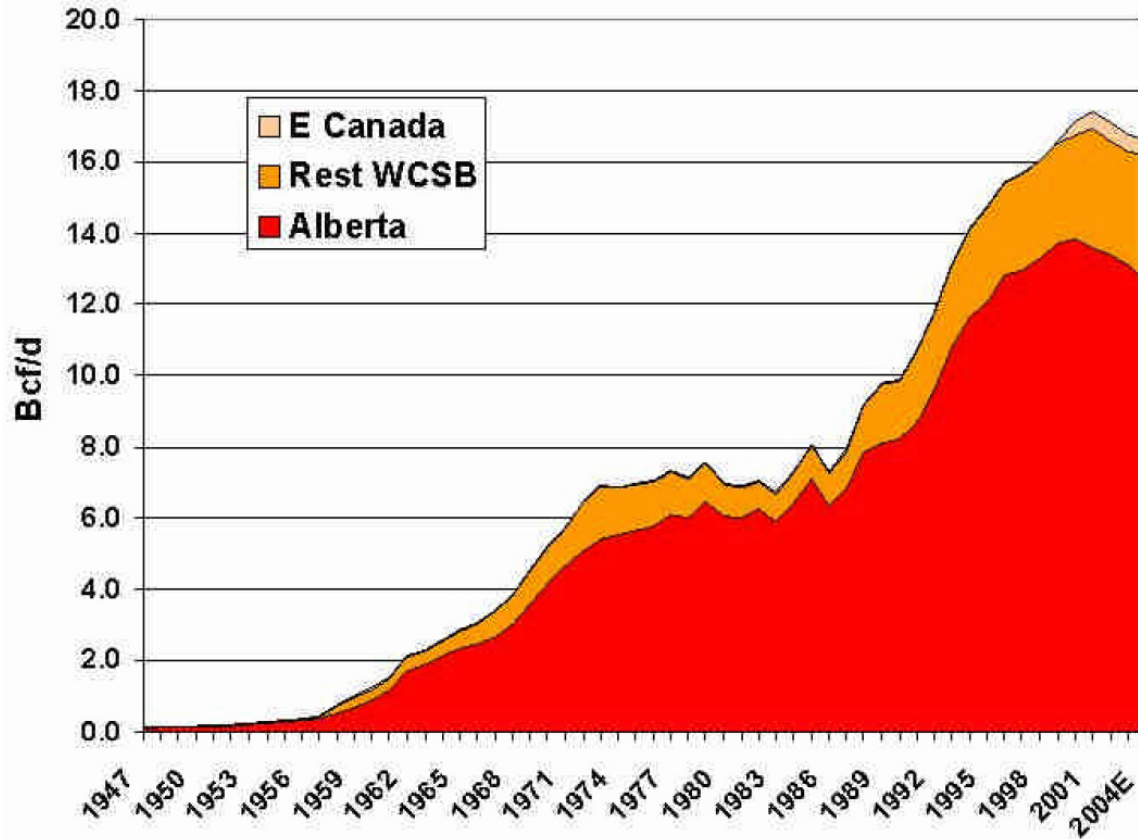


Figure 1. Canadian gas production by area in Bcf/day, 1947 to Present.

Location of the Growth Plays

Figure 2 shows the distribution of formations with production growth by Play Area. It is clear that these opportunities are scattered throughout the Basin. Understanding these plays and developing realistic expectations for results are key to developing and executing successful strategies.

Four gas opportunities are compared in the oral presentation using very current data; these are:

‘Resource’ plays in northeastern British Columbia.

‘Deep basin’ gas in west-central Alberta.

Coalbed methane in central Alberta.

Shallow gas in southwestern Saskatchewan.

In addition a number of new gas developments are highlighted (in the oral presentation) that may be regarded as emerging plays.

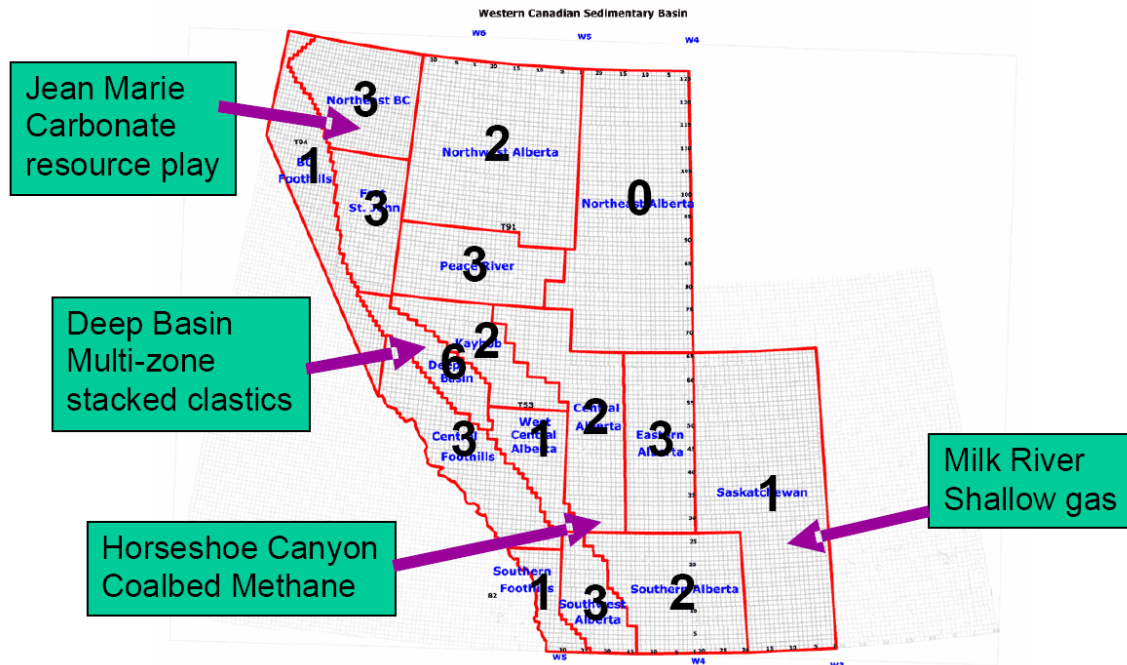


Figure 2. Map of the WCSB showing number of Play Areas with Production Growth since 2000 and the areas reviewed in this article.

Best Plays

The reserves, productivity, success rates, and relative economic impact provide important guidance for the expected results from pursuing the various plays. However, it is clear that every play has certain threshold requirements and requires specific expertise both technical and operational to be economical successful.

The importance of using current data cannot be understated since the average well productivity in virtually every play has declined significantly over recent years. Very current information can be obtained using PetroCube. Please contact the authors for more information.

References

PetroCube, 2005, www.petrocube.com.
 Russum, D., 2002, Exploration in the 21st Century - the end of elephant hunting?: CSPG Convention
 Russum, D., 2003, Is Canada running out of gas – the need for more and better exploration: CSPG Convention
 Russum, D., 2004, Canadian natural gas: Past, present and A new model for predicting the future: TC-IRIS Seminar Series, Haskayne Business School, University of Calgary.
 Russum, D., 2004, “The urgent need for unconventional gas to sustain Canada’s gas production: CSUG/PTAC.