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Review of Nova Scotia's Deepwater Drilling and Its Effect on the 2002 Resource Assessment

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Abstract

The Scotian Slope is 850km long with an area of 80,000km^2 and has been tested by only ten wells clustered into two narrow areas. Four deep water wells drilled between 1982 and 1986 were Shubenacadie, Shelburne, Evangeline and Tantallon. These wells were dry and abandoned. Between 2002 and 2004 industry drilled six deepwater wells on the Scotian Slope resulting in one gas discovery (Annapolis), one gas show (Newburn), and four dry wells (Balvenie, Crimson, Weymouth and Torbrook).

The Scotian Basin is a passive margin with proven petroleum systems and past production from the Cohasset-Panuke oil fields, ongoing gas production from the Sable Project and probable future production from Deep Panuke gas field. This activity is all on the shallow Scotian Shelf. Around 2000, the exploration focus shifted to the deepwater Scotian Slope because of the impressive hydrocarbon discoveries and high success rates in the deepwater of other circum-Atlantic basins such as the Gulf of Mexico, offshore Brazil and West Africa, and recently Northwest Africa (Mauritania).

In 2002 the CNSOPB completed a deepwater resource assessment prior to results from the recent six wells. The assessment consisted of 12 geostatistical computation runs to capture the diversity of play areas and play types. The recent drilling results affect three of those twelve runs by altering input parameters addressing the presence and quality of reservoir.

Gas in Annapolis and Newburn proves that an active petroleum system is working. Annapolis found 27m of generally thin gas-bearing sands and Newburn encountered several thin (2-3m) gas-bearing sands. Furthermore, many of the gas-bearing sands were encountered unexpectedly below 5000m with average porosities from 14-19% which expands the zone of prospectivity.

In 2006 the CNSOPB revised the 2002 assessment. The impact of the deepwater well results on the undiscovered gas and oil potential was found to be minimal. The comparison is shown in Table 1, with gas potential reduced only by several Tcf and oil potential by fractions of billions of barrels.

Assessment	Potential GAS (Tcf)	Potential OIL (BB)
2002	15 – 41	1.7 – 4.7
2006 Revision	12 - 39	1.3 – 4.5

Table 1. – Assessment Results

Introduction

The deepwater slope offshore Nova Scotia extends from the shelf break at 200m of water to almost 4000m. The slope area under study is defined by the seaward limit of the Argo salt and industry seismic coverage generally within the 3000 to 4000m range. A highly exaggerated three-dimensional perspective of the offshore bathymetry, with the original four slope wells, is shown in Figure 1.

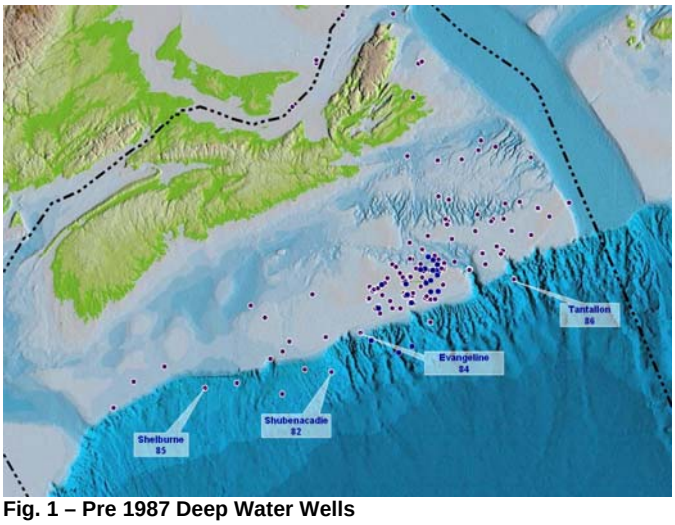

Fig. 1 – Pre 1987 Deep Water Wells

This area was the subject of the CNSOPB's 2002 report; "Offshore Hydrocarbon Potential Deepwater Slope" (Kidston, A.G., Brown D.E., Smith B.M., and Altheim, B., 2002). This study included a basin analysis and numerical assessment of