

Overpressure Conditions and Reservoir Compartmentalization on the Scotian Margin – Study Overview

Inspiring Minds STUDY OBJECTIVE SELECT OVERPRESSURE SYSTEMS OF **ATLANTIC CONJUGATE MARGIN** vestigate and define overpressured systems of Scotian Margin: • Conditions that lead to development of overpressure Serious risk element in many basins including: • Map regional distribution and pressure gradient at high resolution Scotian Margin (Nova Scotia) • Develop a risk methodology for use in developing the resources • Jeanne d'Arc Basin (Newfoundland) • Porcupine Basin (Ireland) Northern North Sea Basin (UK & Norway) **RESERVOIR CONNECTIVITY & COMPARTMENTALIZATION** Atlantic Ocean Eastern Venezuela Basin Defined by: Structural features Stratigraphic features • Integrity and strength of seals (top and bottom) Jeanne d'Arc Basin Determine Reservoir Establish Describe Architecture Competence ompartments Connections of Seal Within between Reservoir Compartments **Scotian Margin** North America Fluvio-aeolian Basal unconformity Volcanic rocks Evaporitic playa lake deposits Shallow lake (rare evaporites) Carnian Salt (marine-origin) Gulf of Mexico Salt (unknown origin) Marine deposits Evaporitic marine-influenced playa Banquereau Fr Logan and Dawson Formation Basement 1000 km Canyon formations Eastern Vénezuela Basi Mic Mac, Baccaro, Misaine, Upper Missisauga and · Shelf edge can Figure 1: Seismic interpretation indicating structural compartmentalization on the Figure 4: Several basins on the Atlantic conjugate margin with overpressure systems. (Inset) Stratigraphy of select basins in the North Atlantic (modified from Leleu & Hartley, 2010) Scotian Margin (modified from CNSOPB, 2012). PRESSURE DISTRIBUTION PATTERNS **PRESSURE versus DEPTH** Abnormal pressures are above or below hydrostatic pressure. and cannot exceed lithostatic pressure. Linear Pressure System Stepped-Tiered Pressure Syste Hydrostatic Pressure: fluid pressure at given depth is a result Normal Pressure of the weight of the overlying fluid. CHATTIAN RUPELIAN Industry standard = 0.465psi/ft PRIABONIA Lithostatic Pressure: result of the weight of the overburden Normal Pressure BARTONIAN (fluid and matrix). YPRESIAN THANETH PALEOCENE SELAND MAASTRICHTIAN Normal Ove <0.433 0.433 - 0.510 > 0.510 Industry Standard = 0.465psi/ft TURONIAN Ledged-Tiered Pressure System Recessed-Tiered Pressure System CENOMANIAN ALBIAN Normal Pressure Normal Pressure APTIAN BARREMIAN HAUTERIVIAN VALANGINIAN REASIAN RYAZANIAN Normal or Underpressure Normal Pressure TITHONIAN VOLGIA Pressure Pressure Pressure OXFORDIAN CALLOVIAN Pressure Shale (or other low-permeability lithology) BATHONIAN Pressure curve BAJOCIAN Figure 2: Hydrostatic and Lithostatic pressure gradient curves indicating relationship between depth and pressure (modified from Figure 3: Pressure distribution patterns in sedimentary basins (modified from Tackett & AALENIAN Tackett & Puckette, 2012). TOARCIAN Puckette, 2012). PLIENSBACHIAN SINEMURIAN Acknowledgements References HETTANGIAN RHAETIAN I would like to thank the following for the NORIAN

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