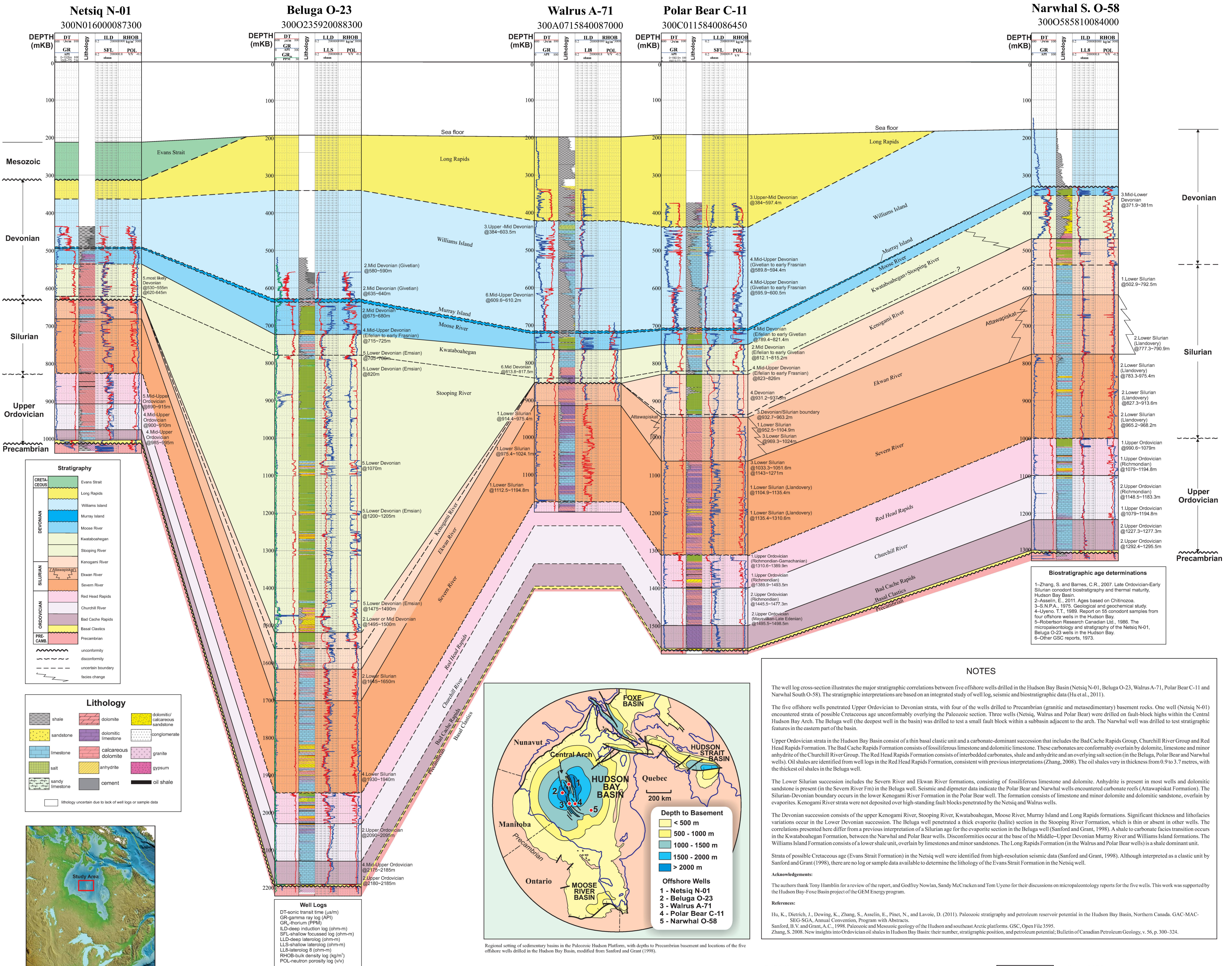


STRATIGRAPHIC CORRELATIONS FOR FIVE OFFSHORE WELLS IN THE HUDSON BAY BASIN, NORTHERN CANADA

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**Biostratigraphic age determinations**

- 1-Zhang, S. and Barnes, C.R., 2007. Late Ordovician-Early Silurian conodont biostratigraphy and thermal maturity, Hudson Bay Basin.
- 2-Asselin, E., 2011. Ages based on Chitinozoa.
- 3-S.N.P.A., 1975. Geological and geochemical study.
- 4-Uyeno, T.T., 1989. Report on 55 conodont samples from four offshore wells in the Hudson Bay.
- 5-Robertson Research Canadian Ltd., 1986. The micropaleontology and stratigraphy of the Netsiq N-01, Beluga O-23 wells in the Hudson Bay.
- 6-Other GSC reports, 1973.

NOTES

The well log cross-section illustrates the major stratigraphic correlations between five offshore wells drilled in the Hudson Bay Basin (Netsiq N-01, Beluga O-23, Walrus A-71, Polar Bear C-11 and Narwhal South O-58). The stratigraphic interpretations are based on an integrated study of well logs, seismic and biostratigraphic data (Hu et al., 2011).

The five offshore wells penetrated Upper Ordovician to Devonian strata, with four of the wells drilled to Precambrian (granitic and metasedimentary) basement rocks. One well (Netsiq N-01) encountered strata of possible Cretaceous age unconformably overlying the Paleozoic section. Three wells (Netsiq, Walrus and Polar Bear) were drilled on fault-block highs within the Central Hudson Bay Arch. The Beluga well (the deepest well in the basin) was drilled to test a small fault block within a subbasin adjacent to the arch. The Narwhal well was drilled to test stratigraphic features in the eastern part of the basin.

Upper Ordovician strata in the Hudson Bay Basin consist of a thin basal clastic unit and a carbonate-dominated succession that includes the Bad Cache Rapids Group, Churchill River Group and Red Head Rapids Formation. The Bad Cache Rapids Formation consists of fossiliferous limestone and dolomite. These carbonates are conformably overlain by dolomitic limestone and minor anhydrite of the Churchill River Group. The Red Head Rapids Formation consists of interbedded carbonates, shale and anhydrite and an overlying shale section (in the Beluga, Polar Bear and Narwhal wells). Oil shales are identified from well logs in the Red Head Rapids Formation, consistent with previous interpretations (Zhang, 2008). The oil shales vary in thickness from 0.9 to 3.7 metres, with the thickest oil shales in the Beluga well.

The Lower Silurian succession includes the Severn River and Ekwan River formations, consisting of fossiliferous limestone and dolomite. Anhydrite is present in most wells and dolomitic sandstone is present in the Severn River Fm in the Beluga well. Seismic and dipmeter data indicate the Polar Bear and Narwhal wells encountered carbonate reefs (Attawapiskat Formation). The Silurian-Devonian boundary occurs in the lower Kenogami River Formation in the Polar Bear well. The formation consists of limestone and minor dolomite and dolomitic sandstone, overlain by evaporites. Kenogami River strata were not deposited over high-standing fault blocks penetrated by the Netsiq and Walrus wells.

The Devonian succession consists of the upper Kenogami River, Stopping River, Kwatabohegan, Moose River, Murray Island and Long Rapids formations. Significant thickness and lithofacies variations occur in the Lower Devonian succession. The Beluga well penetrated a thick evaporite (halite) section in the Stopping River Formation, which is thin or absent in other wells. The correlations presented here differ from a previous interpretation of a Silurian age for the evaporite section in the Beluga well (Sanford and Grant, 1998). A shale to carbonate facies transition occurs in the Kwatabohegan Formation, between the Narwhal and Polar Bear wells. Disconformities occur at the base of the Middle-Upper Devonian Murray River and Williams Island formations. The Williams Island Formation consists of a lower shale unit, overlain by limestones and minor sandstones. The Long Rapids Formation (in the Walrus and Polar Bear wells) is a shale dominant unit.

Strata of possible Cretaceous age (Evans Strait Formation) in the Netsiq well were identified from high-resolution seismic data (Sanford and Grant, 1998). Although interpreted as a clastic unit by Sanford and Grant (1998), there are no log or sample data available to determine the lithology of the Evans Strait Formation in the Netsiq well.

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Sanford, B.V. and Grant, A.C., 1998. Paleozoic and Mesozoic geology of the Hudson and southeast Arctic platforms. GSC, Open File 3595.  
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