

Preliminary Investigations of the Lower Cretaceous Mannville Group Coal Deposits in the Hudson Bay Area of Eastern Saskatchewan

Jason Berenyi

Saskatchewan Ministry of Energy and Resources, Regina, Saskatchewan

jason.berenyi@gov.sk.ca

and

Arden Marsh*

Saskatchewan Ministry of Energy and Resources, Regina, Saskatchewan

arden.marsh@gov.sk.ca

and

Ron Leray

University of Regina, Regina, Saskatchewan

Abstract

The geology of the Hudson Bay area of eastern Saskatchewan was not at all well understood, with only a few studies being done in the area over the years. At least this was the case until the discovery of anomalous thicknesses of coal in the Hudson Bay region of east-central Saskatchewan by Goldsource Mines Inc., in the spring of 2008. Subsequent drilling by the company has shown that these deposits are not only anomalous in thickness, but also in morphology and depositional environment. Unlike most other coal deposits in Saskatchewan, which are relatively thin (less than a few metres), regionally extensive paralic-type deposits, the Hudson Bay area coal discoveries are more localized and have far greater thicknesses of up to 100 m (including partings). Since the initial discovery, the company has identified a total of 15 discrete coal deposits within its 51,942 hectare Border Project area. In June of 2009, Saskatchewan Ministry of Energy and Resources staff commenced a program to study of the stratigraphy, sedimentology, and diagenetic history of the subsurface in and around these discoveries, in order to develop a geologic model for these anomalous deposits. Detailed core logging, combined with geophysical well log interpretation, provided the basis for the preliminary interpretations.

The coal in the Hudson Bay area of eastern Saskatchewan all occur in the Lower Cretaceous Cantuar Formation of the Mannville Group. The Cantuar Formation in this area can be seen infilling paleo-topographic lows on the Sub-Cantuar Unconformity surface. The mechanisms for the creation of these paleo-topographic lows are still unclear, but are most likely related to karsting, faulting, and/or paleo erosion. Also within these deposits, post-depositional subsidence appears to be affecting all units above the Cantuar Formation, which may partially be a result of coal compaction. The greatest accumulations of coal within the study area have been found to correspond to areas where the thickest intervals of the Cantuar Formation are preserved, most commonly in the centers of the coal deposits. Further study is required to fully understand the nature of these deposits.