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Geological Carbon Storage Atlas of Eastern Canada

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Introduction

Canadian Discovery Ltd. (CDL) is pleased to announce the release of the Geological Carbon Storage Atlas of Eastern Canada, an atlas commissioned by Natural Resources Canada, with support from carbon removal project developer Deep Sky and done in conjunction with CanmetENERGY. Natural Resources Canada has stated that effective CO2 storage will be critical to achieving Canada's climate change objectives and anticipates that 95% of all captured CO2 will need to be permanently stored to achieve net-zero emissions. The development of robust carbon capture, transportation and sequestration knowledge is fundamental to the investment in infrastructure that will decarbonize industry, and the future of industrial development in Eastern Canada is dependent on the success of Carbon Capture and Storage (CCS).

The Atlas is intended to serve as a guide to high level, regional identification and assessment of two types of carbon storage opportunities — saline aquifers and depleted and nearly depleted oil and gas reservoirs. It focuses on preliminary reconnaissance mapping to identify prospective zones, provides a high-level look at geology, reservoir quality and conditions, and provides a preliminary estimate of the prospective CO2 storage resource along with injectivity estimates. A key outcome of the project will be an economic model of capital costs and operating costs including CO2 capture, transportation, and storage across Eastern Canada.

There are 37 basins (or other geological entities) in Eastern Canada that Canadian Discovery Ltd. considered for inclusion in this Atlas. Geographically, the basins range from the St. Lawrence Lowlands (Québec) to the Salar Basin (offshore Nova Scotia), and north to the Saglek Basin (offshore Newfoundland and Labrador). Each basin was assessed to determine whether it should undergo:

- Quantitative analysis (7 basins): calculate prospective CO2 storage resource for one or more storage complexes.
- Qualitative analysis (11 basins): overview of geology and possible storage complexes. These basins often have some well and seismic control, but the subsurface data are insufficient to calculate prospective CO_2 storage resource.
- Exclusion from any analysis (19 basins). These basins have no or minimal well and seismic control.

Deep Saline Aquifers

Deep saline aquifers are the focus of the prospective CO_2 storage resource calculations as there are only a handful of depleted hydrocarbon pools

To calculate the prospective CO_2 storage resource for deep saline aquifers, the rock volume must be calculated first. True vertical depth surfaces and isopachs were generated from a variety of

sources, including provincial and federal tops databases and literature. Porosity was calculated by generating porosity-depth curves using available log and core data. Net-to-gross ratio maps were hand-contoured and applied to the isopach to derive net sand maps. Pressure and temperature maps were generated from literature or well data and used to determine the density of CO2. The methodology for one of the basins will be summarized in the presentation.

The project outcomes are intended to help industry fast-track CCS strategies and focus investments into the most favorable storage reservoirs, while supporting regulatory reviews, policy decisions and public discussions about the opportunities and risks associated with CO2 storage. This initiative has the potential to provide Eastern Canada with a competitive edge in attracting investments and partnerships for CCS in Canada and internationally. The Project can also facilitate collaboration between industry and academia to develop innovative solutions that can further enhance the efficiency, effectiveness, and development of CCS projects across Canada.

Results presented will include summarizing the methodology for CO2 calculations for one of the basins; the distribution of prospective CO_2 storage resources across the Atlas area; and the cost per tonne of CO2 injected across the Atlas area.