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# Drilling Deeper into the Leduc: From hydrocarbons to lithium, an evolutionary resource

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## Summary

The Leduc formation, historically one of Alberta's prolific oil and gas reservoirs, is now a major player for bringing a lithium brine extraction resource to Canada. It has been known since the 1990's that elevated lithium concentrations in the Leduc brine exist, and advancements in direct lithium extraction technologies in recent years have made concentrating lithium out of these brine waters a reality. The Leduc conventional oil traps, which set the stage for the oil boom in Alberta in 1947, are the same traps, where now the water leg/brines that lie below the hydrocarbon window are being produced for lithium extraction. In addition, the brines in the reservoir are deeper structurally and vertically in the Leduc, providing information on a very understudied portion of the Leduc reefs. Leduc cores, typically intersect the top 50-100 meters of the Leduc, leaving 150+ m below, heavily understudied in comparison. Changes in carbonate sedimentology can be interpreted by offsetting logs and drill cuttings to deeper targets. This is currently part of E3's current methodology in delineating areas in the reservoir with highest porosity and permeabilities to maximize flow rates and extraction deliverability.

E3's upcoming drilling program initiates the first steps for our pilot program to prove a commercial lithium resource and technology in Alberta. The protocols and planning, for these evaluation wells follow similar steps to permitting and obtaining licenses for oil and gas wells, however it focuses on a much different resource type, brine, and how to extract lithium from the aquifer of a conventional trap, in its most pristine form. The vast number of Devonian intersections of petrophysical logs in the basin provide a wealth of information for delineating resource volumes, particularly when focused on reservoir parameters. Integration with seismic has been essential for basic understanding of the reservoir thickness, continuity, and facies development. Additional data such as image logs and geochemical analyses can only further Alberta's understanding of extracting not only lithium, but potentially other critical metals and minerals in the basin. Making the bulk of this data publicly available industry wide would be beneficial in the development of critical metals in Alberta.

Momentum is picking up for producing a lithium resource in Alberta and bringing lithium to the domestic and global markets. As E3 develops this resource, we are incredibly grateful for the support from industry, particularly operators in our resource area who make sampling and understanding the resource possible and look forward to sharing more as we develop this resource.

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