

# CLEAR HILLS LITHIUM PROJECT

*Lithium Carbonate and Performance Elements*

# CLEAR HILLS LITHIUM PROJECT

**LithAlta**

**ironstone**  
RESOURCES

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# COMPANY BACKGROUND

*LithAlta*

**ironstone**  
RESOURCES

- Clear Hills Lithium Project to be operated by LithAlta Ltd. 100% wholly-owned by Ironstone Resources Ltd.
- Ironstone Resources established in 2007, private
  - Over 250 shareholders, 3 UK-based institutional investors
  - 100% owner of over 800,000 Ha of mineral permits and leases
  - Over 550mt of NI 43-101 iron and vanadium resource
  - Developing iron, vanadium and clay mine and steel mill works
- Strong stakeholder support within the Peace region
- Well established provincial and federal government support
  - Alberta Energy, Economic Development & Trade, Infrastructure, Environment
  - Western Economic Diversification, Natural Resources Canada, SDTC, NSERC
  - Associated with regional college research and innovation
- Demonstration Site located near existing production wells
- Ironstone Resources to be renamed "Prism Diversified Ltd."



# CLEAR HILLS PROJECT – STEEL, VANADIUM, CLAY PRODUCTS

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- Defined a NI 43-101 557 million tonne indicated polymetallic resource
- Bulk sample pit, 11,000 tonnes of ore stockpiled for commercial process pilot tests
- Long open pit mine life defined (>50 years), rapid environmental reclamation
- Estimated 240mt coal and natural gas pipeline nearby, to be used as carbon reductant for direct reduced iron processing
- Significant clay overburden for “concrete” building products
- Acquired 120 acre Hines Creek site for Production-Demonstration Pilot Plant and integrated Centre of Innovation
- Annual production plan: 1.0 million tonnes of steel, 10,000 tonnes of vanadium
  - H<sub>2</sub> and CO<sub>2</sub> to be used to create products (fertilizer, biofuel, chemicals, etc.)
  - Waste heat to be converted electricity and sold into deregulated grid
  - Overburden consists of expandable clays suited to create building products



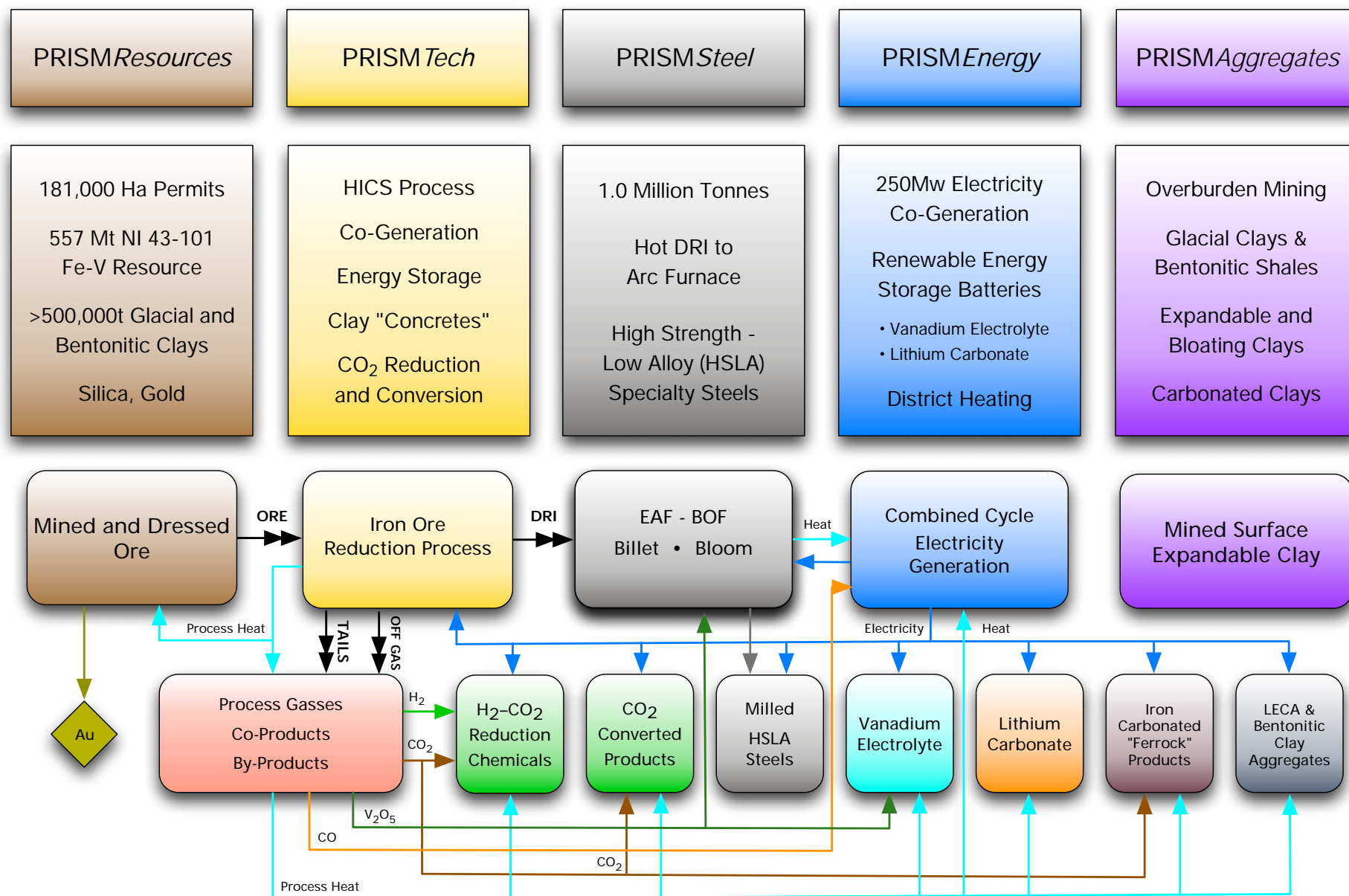


# CLEAR HILLS PROJECT – SAMPLE PIT & DEMONSTRATION SITE

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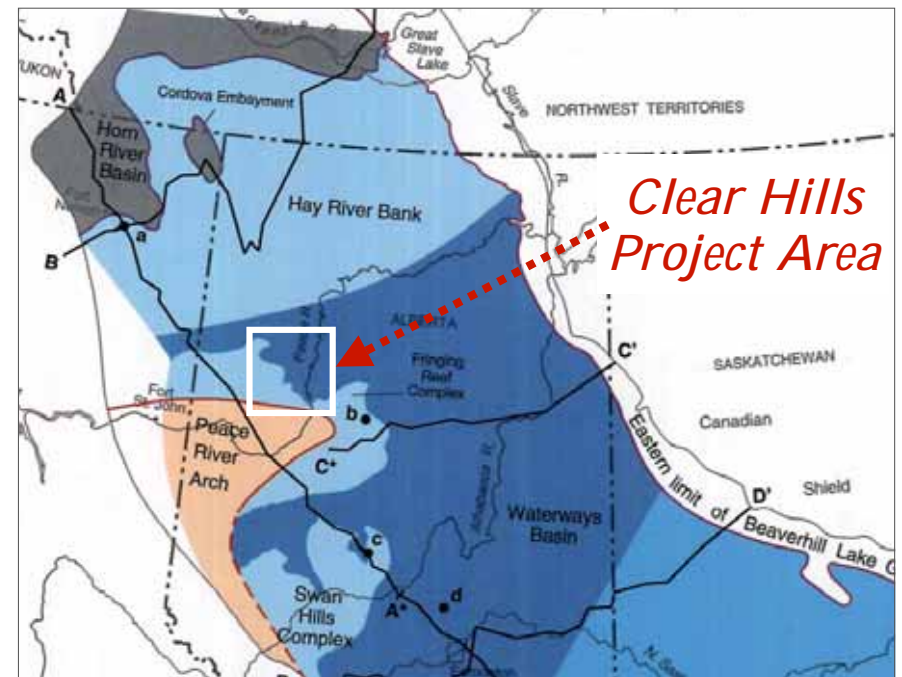
# PRISM DIVERSIFIED LTD. – DIVISIONS & PRODUCT SYNERGIES



# ALBERTA DEVONIAN FORMATION WATER RESERVOIRS

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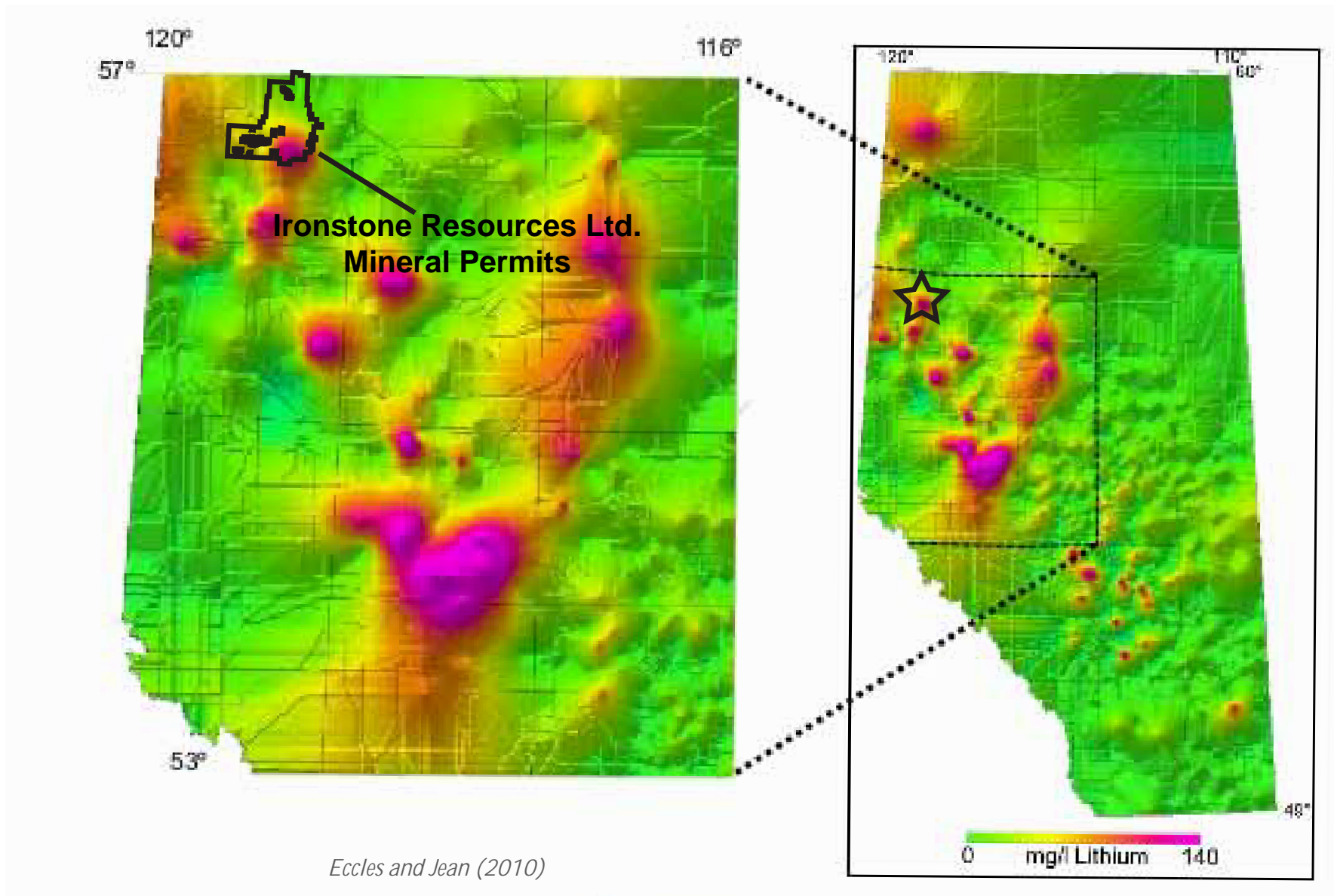
- Lithium exists in Devonian age (Leduc and Beaverhill Lake) formation waters
- Porous reservoirs will produce significant volumes of formation water (brine)
- Alberta government evaluated 130,000 water tests, estimated 515,000t of Li
- Clear Hills has elevated lithium concentration in brines (>100 Mg/L range)
  - Alberta MIM Permits held by Ironstone in good standing through 2022
  - Three potential reservoirs – Leduc and BHL fringing reefs and BHL platform
  - Performance chemicals include: potash, bromine, boron, magnesium, calcium
  - New commercial brine technologies in operation to produce lithium (i.e. Posco)
  - Initial brine extraction evaluations to be conducted at Hazen Research USA





# LITHIUM-ENRICHMENT MAP OF ALBERTA'S DEVONIAN BRINES

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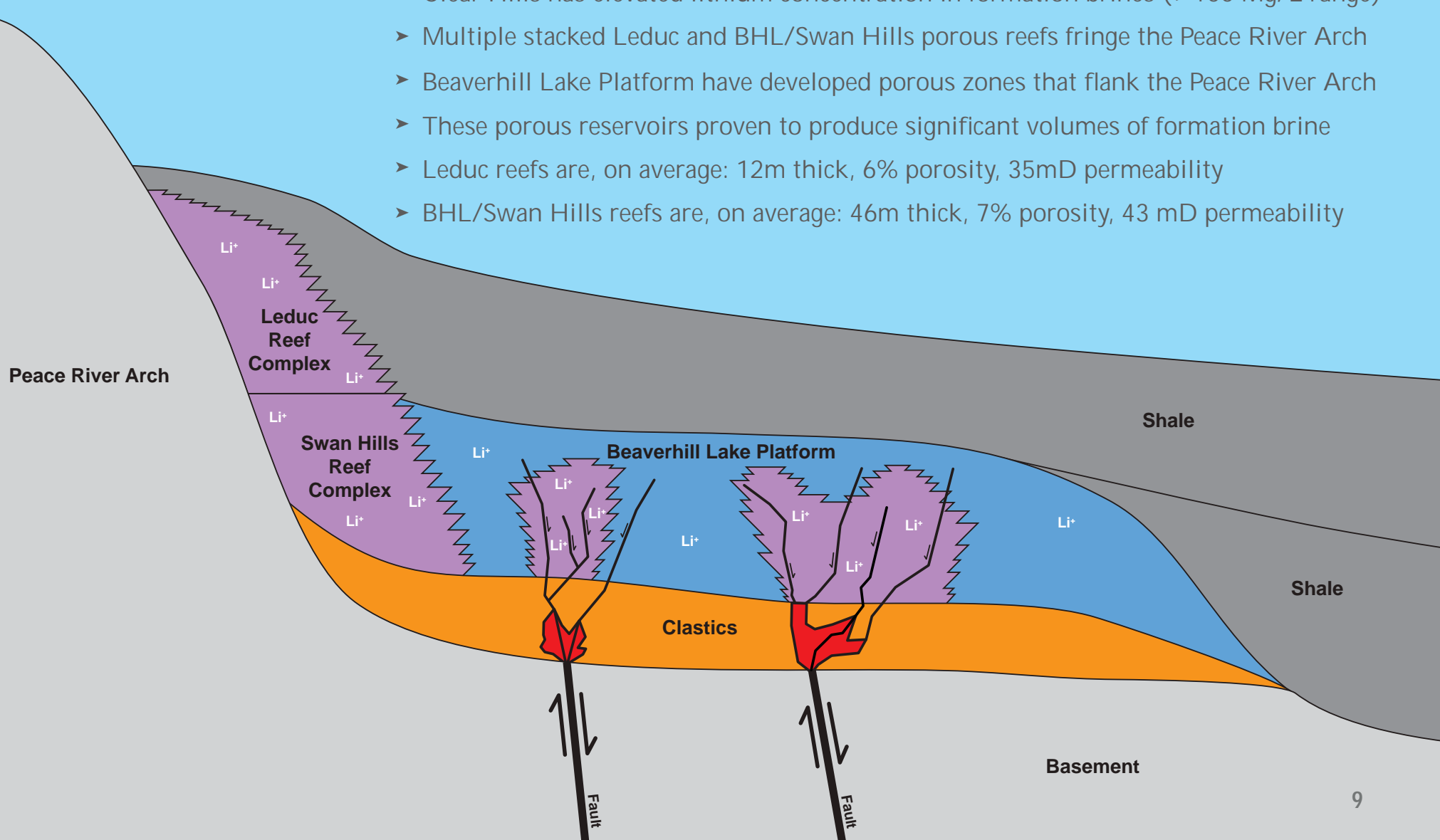




# NW ALBERTA - MULTIPLE DEVONIAN BRINE RESERVOIRS

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- Clear Hills has elevated lithium concentration in formation brines (>100 Mg/L range)
- Multiple stacked Leduc and BHL/Swan Hills porous reefs fringe the Peace River Arch
- Beaverhill Lake Platform have developed porous zones that flank the Peace River Arch
- These porous reservoirs proven to produce significant volumes of formation brine
- Leduc reefs are, on average: 12m thick, 6% porosity, 35mD permeability
- BHL/Swan Hills reefs are, on average: 46m thick, 7% porosity, 43 mD permeability





# CLEAR HILLS LITHIUM – LITHALTA'S PROJECT DIFFERENTIATORS

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- Extensive mineral permits, all in good standing beyond 2022, to be converted to mineral leases
- Demonstration plant site ideally located at Hines Creek in lithium brine trend
- Well-developed local infrastructure (roads, airports, rail, energy, labour force)
- Excellent track record of support by regional stakeholders, governments and First Nations
- Successful history of collaboration with HATCH, Hazen Research and other top-tier companies
- Research & Development funding support to be provided by provincial and federal governments
- Formal alliance for research, innovation and commercialization programs with Regional College



# CLEAR HILLS LITHIUM - PROPOSED DEVELOPMENT TIMELINE

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Activity	Timing
Engineering study of potential lithium pre-concentration technologies	Q4 2016
Evaluation of potential extractive technologies for lithium from concentrate	Q4 2016
Analyze brine samples from Clear Hills well bores	Q1 2017
Evaluate solvent extraction efficacy of brines samples	Q1 2017
Hydrogeological and engineering evaluation of Devonian reservoirs	Q2 2017
Preliminary economic assessment scoping study	Q3 2017
Demonstration pilot to evaluate element recoveries	Q4 2017
Environmental impact assessment and Feasibility Study	Q3 2018
Build, equip and commission commercial production plant	Q2 2019



# LITHALTA / IRONSTONE RESOURCES – OUR PEOPLE

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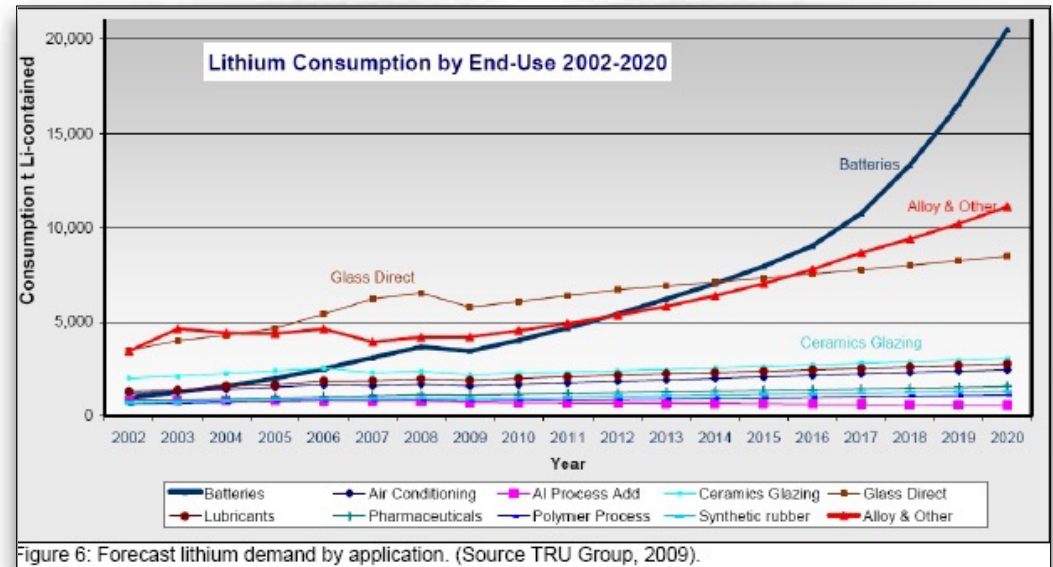
- Ironstone Resources principals are Alberta energy industry professionals
- Over 150 years of collective industry experience (founders and board members)
- Geology, engineering, finance, research and administration expertise
- Raised and managed over \$30 million of private investment
- Broad community, industry and government relationships established
- Research and development support achieved from provincial and federal governments



# CLEAR HILLS LITHIUM – STRATEGIC ALLIANCE OPPORTUNITY

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- Seeking a strategic partner in developing energy minerals for EV and grid storage applications
- Strategic partner(s) to have technology and experience in lithium development
- Ironstone Resources / LithAlta to establish a private-public partnership with provincial and federal government support for energy storage investment
- LithAlta offers mineral permits containing lithium-rich reservoir fluids, demonstration plant land and infrastructure, management and technical expertise, positive development track record, strong stakeholder and government relations
- Timeline to commercial startup expected to be 30 months



# CONTACT

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