NATIONAL INSTRUMENT 43-101 TECHNICAL REPORT

INITIAL INFERRED LITHIUM-BRINE RESOURCE ESTIMATIONS FOR HIGHWOOD ASSET MANAGEMENT LTD.'S DRUMHELLER PROPERTY IN SOUTH-CENTRAL ALBERTA, CANADA

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1 Summary

1.1 Issuer and Purpose

This technical report has been prepared for the issuer, Highwood Asset Management Ltd. (Highwood or the Company) of Calgary, Alberta. Highwood has amassed 100% mineral ownership of 236 mineral permits and mineral titles (1,543,393 hectares) that are located throughout Alberta (n=222 mineral permits) and in northeastern British Columbia (n=14 mineral titles; Figure 2.1). Highwood is exploring the mineral permits/titles as part of their Lithium-Brine and Ironstone Iron-Vanadium projects.

The focus of this technical report is on Highwood's Drumheller Lithium-Brine Property in south-central Alberta, which comprises a portion of the Companies overall land package (23.5%) and consists of 50 approved mineral permits encompassing 362,522 hectares.

Highwood is investigating the Drumheller Property for its lithium-brine (Li-brine) potential. Highwood proposes to assess stratigraphically deep (e.g., >1,500 m below surface) hypersaline formation water, or brine, from oil and gas reservoirs, or aquifers, associated with Devonian-aged reef complexes for the brine's lithium potential.

During 2021, Highwood conducted 2 separate brine assay geochemical sampling programs at the Drumheller Property to collect brine samples for lithium assay testing and mineral processing test work at independent laboratories. In addition, Highwood commissioned the authors of this report to independently complete 1) a three-dimensional geological model of the Devonian aquifers of interest, 2) geological and hydrogeological characterization studies, 3) a review of the laboratory geochemical and mineral processing test work, and 4) mineral resource modelling and estimations.

The purpose of this technical report, therefore, is to present 1) the geological, geochemical exploration and mineral processing test work results, and 2) maiden inferred Li-brine mineral resource estimations for Highwood's Drumheller Property.

The technical report has been prepared in accordance with the Canadian Securities Administration's (CSA's)Definition Standards and Guidelines (2014, 2019), and National Instrument 43-101 with an Effective Date of 21 February 2022.

Highwood's other Li-Brine projects located throughout Alberta and northeast British Columbia and the Company's Ironstone Iron-Vanadium project in northwest Alberta are still material to Highwood.

1.2 Author and Qualified Person Site Inspection

This technical report has been prepared by a multi-disciplinary team of authors that includes Mr. Roy Eccles M.Sc. P. Geol. of APEX Geoscience Ltd., Mr. James (Jim) Touw, B.Sc., P. Geol. of Hydrogeological Consultants Ltd., and Mr. Charles Edwards M.Sc., P.

Eng. of Chuck Edwards Extractive Metallurgy Consulting. The authors are independent of Highwood, the Drumheller Property, and are Qualified Persons as defined in National Instrument 43-101.

Mr. Eccles visited Highwood's Li-brine Drumheller Property on May 28, 2021, as part of a National Instrument 43-101 personal site inspection. The inspection enabled the author to independently collect and analyze Devonian brine samples from actively producing petro-operations and verify the Li-brine mineralization underlying Highwood's Drumheller Property.

1.3 Property Location, Description and Access

Highwood's Drumheller Property is part of a larger Highwood land package that includes 236 mineral permits/titles that encompass 1,543,393 hectares. The permits are located throughout Alberta (n=222) and in northeastern British Columbia. The land position forms 28 separate, non-contiguous sub-properties, 25 sub-properties in Alberta and 3 sub-properties in British Columbia.

The Drumheller Property, which is the focus of this technical report, is defined by 50 approved mineral permits encompassing 362,522 hectares.

The Drumheller Property is located directly north and east of the Town of Drumheller, AB, and is approximately 110 km northeast of the City of Calgary, AB, and 90 km southeast of the City of Red Deer, AB.

Highwood's Drumheller Property is easily accessed via major and secondary access routes; this includes any individual oil and gas wells or facilities within the sub-properties. The roads are well-maintained either by the province, or by the petro-operators that own the lease. Access is year-round. There are no temporal accessibility restrictions and exploration can be conducted year-round.

1.4 Tenure Maintenance, Permitting, Surface Rights, and Royalties

The Drumheller mineral permits/titles were acquired directly via on-line staking from the Government of Alberta. Consequently, there are no known back-in rights, payments, or other agreements and encumbrances to which the Property is subject. Rights to metallic and industrial minerals, to bitumen (oil sands), to coal and to oil/gas are regulated under separate statutes, which collectively make it possible for several different rights to coexist and be held by different grantees over the same geographic location.

In Alberta, the mineral permits grant Highwood the exclusive right to explore for metallic and industrial minerals for seven consecutive two-year terms (total of 14 years), subject to submission and approval of biannual assessment work. Work requirements for maintenance of permits in good standing are $5.00/hectare for the first term, $10.00/hectare for each of the second and third terms, and $15.00/hectare for each the fourth, fifth, sixth and seventh terms.

At the early exploration stage, Highwood is reliant on the petro-operators permission for access to their lease permits to acquire brine for test purposes. Any permits and licences associated with the oil and gas lease including land use, rigs, pipelines, processing facilities, road permits, water permits, injection wells, surface rights, reservoir rights, etc., have been granted exclusively to the oil and gas company. Upon approval from the petro-operator, the collection of the brine is conducted under the rules and guidance of the petro-operator lease protocols.

Other than approval from the petro-operator, Highwood's brine sampling methodology does not require additional permits, or surface and access approval beyond the actual mineral permits because brine sampling for assay or mineral processing test work does not disturb the surface by mechanical means. Access to private lands in Alberta, including the use of private roads, does not require a permit, only a written approval by the landowner.

Government royalty rates associated with any potential future lithium-production in Alberta, as administrated by the Department of Energy, would be subject to 1% gross mine-mouth revenue before payout, and after payout, the greater of 1% gross mine-mouth revenue and 12% net revenue.

1.5 Brine Access Agreement

A formal brine access agreement between Highwood and an active petro-operator producing petroleum from Devonian-aged fields/pools at the Drumheller Property was executed on May 25, 2021. The agreement permits Highwood access to deep subsurface brine via active oil and gas infrastructure for the purpose of analyzing and testing the brine samples offsite.

1.6 Environmental and Property-Related Uncertainties

Highwood's Li-brine Alberta properties represent an early-stage exploration project. To the best of the author's knowledge, there are no significant factors and risks that may affect access, title or right, or ability to perform minerals exploration work at this stage of the project, which includes non-surface disturbing brine sampling for assay and mineral processing test work.

Environmental licences, factors, and issues – as they pertain to minerals exploration – are administered by Alberta Environment and Parks. If Highwood was going to conduct an exploration program with ground disturbance, the program would be subject to sensitive species guidelines for burrowing owl, sensitive raptor, and sharp-tailed grouse. All mineral activities are reserved from disposition in ecological reserves and Provincial Parks situated within, or adjacent to, the Drumheller Property (ranging in size from 1.1 km^2 to 33.5 km^2).

As with any early-stage exploration project there exists potential risks and uncertainties. Highwood will attempt to reduce risk/uncertainty through effective project management, engaging technical experts, and developing contingency plans.

Because Highwood is reliant on pre-existing oil and gas wells that are managed and operated by current petro-companies, there is some risk associated with a dependency on the petro-operation and continued brine access. It is possible that situations could arise where the petro-companies shut down well production – for example – due to poor commodity prices, depletion of petroleum product reserves, and/or production well performance of the reservoir. As a mitigation strategy, Highwood could permit and drill their own wells or consider options such as purchasing the well, renting the operation of the well, etc.

1.7 Geology, Hydrogeology, and Mineralization

Prospective Li-brine-bearing Devonian-aged reservoir clastic sedimentary rock units and reef formations in the Drumheller Property region are defined by, in part, by oil and gas exploration and production as a means to access the brine from depths of greater than 1,500 m below the earth's surface. Devonian petro-production in the Drumheller Property occurs predominantly within the Ghost Pine and Wayne-Rosedale oilfields, which are producing from the Late Devonian Woodbend-Winterburn Groups of the Leduc and Nisku formations, respectively. The Middle Devonian Beaverhill Lake Group, which underlies the Leduc Formation, is also considered prospective for Li-brine mineralization, but petro-operators in the Drumheller Property are currently not producing petroleum from the Beaverhill Lake Group.

The collective Beaverhill Lake, Leduc and Nisku Devonian units are hydrostratigraphically bound by the underlying Elk Point Group and overlying Ireton Formation whose evaporite and shale horizons form aquitards, and therefore, define the prospective reservoirs as confined Li-brine aquifer deposit types.

Unique Leduc-aged reef features represent major carbonate shelves and buildups within the Drumheller property and include, from east to west, the Ghost Pine Embayment, the Killam Barrier Reef, and the Ghost Pine Embayment. The Leduc East Platform Shelf underlies most of the eastern, southern, and central portions of the Property. The widespread shelf ends abruptly in the western part of the Property at a linear northeast-trending, dolomitized, stacked pinnacle reef buildup known as the Killam Barrier. The barrier reef can reach a maximum thickness of 240 m when it comprises all 3 distinct reef buildup stages, the Lower Leduc, Middle Leduc, and Upper Leduc. The linear alignment of the Killam Barrier reef and Leduc shelf edge are believed to reflect the influence of deep-seated basement fault trends. The northwestern side of the barrier reef, and the northwest corner of the Property, is characterized by an area of carbonate-rich basin-fill called the Ghost Pine Embayment (also know as the East Duvernay Shale Basin).

With respect to the hydrogeological conditions, the values for brine resource in place and recoverable brine resource are considered reasonable estimates on a regional scale based on the data available; additional data are required to provide more definitive answers. In summary,

- The Leduc Resource Aquifer Domain has an average effective porosity of 9.6% (n=127 measurements), total porosity of 7.6% (16,199 calculations), core plug effective KMax permeabilities geomean of 22.0 mD (n=119) and KVert geomean of 4.6 mD (n=117), drill stem permeability geomean of 10.6 mD (n=4), hydraulic conductivity of 0.0109 m/day, transmissivity of 2.4 m^2/day, specific storage estimated to be approximately 5.6 x 10^{-5} m^{-1}, and estimated yield of 2,101 m^3/day.

- The Nisku Killam Barrier Reef Resource Aquifer Domain has an average effective porosity of 6.1% (n=772 measurements), total porosity of 5.9% (7,545 calculations), core plug effective KMax permeabilities geomean of 23.9 mD (n=737) and KVert geomean of 2.8 mD (n=306), drill stem permeability geomean of 47.4 mD (n=5), hydraulic conductivity of 0.0482 m/day, transmissivity of 2.3 m^2/day, specific storage estimated to be approximately 4.1 x 10^{-5} m^{-1}, and estimated yield of 2,171 m^3/day.

- The Nisku Platform/Basin Resource Aquifer Domain has an average effective porosity of 6.8% (n=653 measurements), total porosity of 5.0% (17,166 calculations), core plug effective KMax permeabilities geomean of 6.5 mD (n=622) and KVert geomean of 1.1mD (n=574), drill stem permeability geomean of 21.9 mD (n=9), hydraulic conductivity of 0.0225 m/day, transmissivity of 1.0 m^2/day, specific storage estimated to be approximately 4.1 x 10^{-5} m^{-1}, and estimated yield of 872 m^3/day.

With respect to mineralization, the Li-brine mineralization at the Drumheller Property is defined as Li-enriched (22-49 mg/L Li), Na-Ca hypersaline brine that is hosted within subsurface, confined, aquifers of Upper Devonian age.

1.8 Historical Oil and Gas Infrastructure and Brine Geochemistry

A review of publicly available oil and gas well data within the Drumheller Property shows there are 5,175 wells – regardless of reservoir depth (or producing reservoir age). Of these 3,675 wells are of Devonian age or older. Active wells (n=approximately 1,100 wells) are situated in the west part of the Drumheller Property within the Ghost Pine and Wayne-Rosedale oilfields.

Historical Devonian brine samples within these oilfields, and within the boundaries of the Drumheller Property, include:

- Three Leduc Formation brine samples from the Ghost Pine oilfield that yielded between 44 mg/L and 77 mg/L Li (average 58 mg/L Li), and

- One Nisku Formation brine sample from the Wayne-Rosedale oilfield with 33 mg/L Li.

Accordingly, Highwood conducted 2021 brine sample programs to verify the historical Li-brine samples at the Drumheller Property.

1.9 Highwood's 2021 Geochemical Brine Sampling Exploration Work

During 2021, Highwood commissioned 3 Alberta-based commercial petro-laboratories to 1) conduct brine sampling on behalf of the Company from select petro-operations within their sub-properties, 2) maintain chain-of-custody of the samples, and 3) analyze the brine for lithium and trace metals using industry standard analytical techniques. The labs are independent of Highwood, accredited, and specialized in the field of collecting and analyzing petroleum fluid products including hypersaline brine.

During March-April 2021, Highwood completed a preliminary brine sampling program and collected a total of 20 brine samples from 5 of the 28 Company's Alberta sub-properties. With respect to the Drumheller Property, brine samples from the Leduc and Nisku formation brine aquifers yielded 47.9 to 52.6 mg/L Li (n=3 samples) and 29.7 to 32.3 mg/L Li (n=4 samples), respectively.

Based on these sample results, Highwood completed a secondary May 2021 brine sampling program on Nisku- and Leduc-aged brine within the Drumheller Property's Wayne-Rosedale and Ghost Pine oil and gas fields. A total of 34 brine samples were collected, which included brine assay samples, quality assurance – quality control samples, and 2 mini-bulk brine samples for mineral processing test work. The analytical assay results of this work showed:

- Nisku Formation brine from the Wayne-Rosedale oilfield yielded between 22 and 29 mg/L Li (average 24.5 mg/L Li).

- Nisku and Leduc Formation brine from the Ghost Pine oilfield yielded between 37 and 49 mg/L Li (average 43 mg/L Li).

- The analytical results of individual oil and gas wells correlated with multi-well proration battery Facilities. This is important because the Facilities represent brine collection sites that could yield a continuous and high-volume flow of brine for any future lithium extraction test work.

1.10 Highwood's 2021 Mineral Processing Test Work

During 2021, Highwood conducted preliminary mineral processing test work by collecting two 20-litre brine samples from well 100/13-35-029-21W4, which produces petroleum and Nisku Formation aquifer brine from the Ghost Pine oilfield within the Drumheller Property. The brine samples were delivered to two separate and independent laboratories for mineral processing test work. The labs included the Saskatchewan

Research Council (SRC) in Saskatoon, Saskatchewan, and Recion Technologies Inc. (Recion) of Edmonton, Alberta.

The preliminary lithium extraction process development testing at both SRC and Recion indicate that an ion exchange process holds reasonable prospects for eventual economic extraction of battery-grade lithium product from Highwood's petro-lithium brine. The SRC lithium IX resin results showed a good lithium loading capacity and a good selectivity for lithium. The Recion demonstrated optimized Li extraction results of 98.3%. Further testing for process development and process design is justified and recommended.

1.11 Mineral Resource Estimates

Highwood's Drumheller Li-Brine Project is an early-stage exploration project. The mineral, or Li-brine, resource area defined in this Technical Report is constrained stratigraphically to the subsurface Devonian Leduc and Nisku formation aquifers underlying the Drumheller Property. Based on geological and geochemical reasoning, 3 resource domains were evaluated:

1. Leduc Aquifer Domain: The Leduc Formation aquifer, which underlies most of the Property – apart from the area northwest of the Killam Barrier Reef where the Leduc abruptly transitions to Duvernay Formation shale.

2. Nisku Killam Barrier Reef Aquifer Domain: A wireframed zone of the Nisku Formation aquifer within the northeast-trending, linear Killam Barrier Reef and an area that extends 10 km east of the reef edge. This domain is uniquely modelled as a zone in which the Nisku and Leduc formation aquifers are in hydro-communication with one another.

3. Nisku Platform/Basin Aquifer Domain: The area of remaining Nisku Formation aquifer volume that occurs outside of the Nisku Killam Barrier Reef Aquifer Domain. The domain includes Nisku Formation within the East Platform Shelf (east and southeast Property) and East Shale Basin (uppermost northwest corner of the Property). It is assumed that the Nisku in this domain is not in hydro-communication with the Leduc aquifer.

Critical steps in the determination of the Highwood lithium-brine resource estimation include:

- Definition of the geology and geometry of the subsurface Leduc and Nisku formations underlying Drumheller Property based on 1,975 wells and 1,181 surface top horizon formation picks, respectively. Wireframes of the 3 resource domains were then clipped to the extents of the Drumheller Property to ensure the resource volumes and estimations were contained within the boundaries of the property. Numerous small private landholdings within the Drumheller Property outline were removed from the estimation process.

- Hydrogeological characterization and a historical compilation and assessment of average porosity within the 3 resource domains were based on 1,761 effective porosity and permeability measurements, 126,590 calculated total porosity records and 811 drill stem tests:
    - Leduc Aquifer Domain porosity: 9.9%.
    - Nisku Killam Barrier Reef Domain Aquifer Domain porosity: 6.1%.
    - Nisku Platform/Basin Aquifer Domain porosity: 6.8%.

- Determination of the lithium-in-brine concentration within the 3 resource domains were based on 27 brine analytical results:
    - Leduc Aquifer Domain porosity: 48.3 mg/L Li.
    - Nisku Killam Barrier Reef Domain Aquifer Domain porosity: 41.4 mg/L Li.
    - Nisku Platform/Basin Aquifer Domain porosity: 25.2 mg/L Li.

- Definition of the pore space volume of brine within the 3 resource domains were based on 122 petro-fluid production records over the last 3-years of production:
    - Leduc Aquifer Domain porosity: 98%.
    - Nisku Killam Barrier Reef Domain Aquifer Domain porosity: 98%.
    - Nisku Platform/Basin Aquifer Domain porosity: 98%.

- Estimate of the *in-situ* lithium resources of the 3-resource domain aquifers underlying the Drumheller Property using the relation:

    Lithium Resource = Total Volume of the Brine-Bearing Aquifer X Average Effective Porosity X Percentage of Brine in Pore Space x Average Concentration of Lithium in the Brine.

The Drumheller Leduc Formation Li-brine resource estimate is classified as an 'Inferred Mineral Resource' in accordance with guidelines established by the CIM "Estimation of Mineral Resources and Mineral Reserves Best Practice Guidelines" dated November 29th, 2019, and the CIM "Definition Standards for Mineral Resources and Mineral Reserves" amended and adopted May 10th, 2014.

Mineral resources are not mineral reserves and do not have demonstrated economic viability. There is no guarantee that all or any part of the mineral resource will be converted into a mineral reserve.

The Li-brine resource was estimated using a cut-off grade of 20 mg/L lithium. The in-situ Drumheller Li-brine inferred resources are globally (totally) estimated – within the 3 domains – as presented in Table 1.1 and described as follows:

1. The Leduc Aquifer Domain is estimated to contain 3.14 million tonnes of elemental Li. The global (total) lithium carbonate equivalent (LCE) for the main resource is 16.73 million tonnes LCE

2. Nisku Killam Barrier Reef Aquifer Domain is estimated to contain 59,000 tonnes of elemental Li. The global (total) LCE for the main resource is 312,000 tonnes LCE.

3. Nisku Platform/Basin Aquifer Domain is estimated to contain 207,000 tonnes of elemental Li. The global (total) lithium LCE for the main resource 1.10 million tonnes LCE (Table 1.1).

Table 1.1 Drumheller Leduc and Nisku Formation Li-brine inferred resource estimations presented as a global (total) resource.

Inferred Resource Estimations

Reporting parameter	Leduc Aquifer Domain	Nisku Killam Barrier Reef Aquifer Domain	Nisku Platform/Basin Aquifer Domain
Aquifer volume (km^3)	670.559	23.669	123.323
Brine volume (km^3)	65.058	1.415	8.218
Average lithium concentration (mg/L)	48.3	41.4	25.2
Average porosity (%)	9.9	6.1	6.8
Average brine in pore space (%)	98.0	98.0	98.0
Total elemental Li resource (tonnes)	3,142,000	59,000	207,000
Total LCE (tonnes)	16,726,000	312,000	1,102,000

Note 1: Mineral resources are not mineral reserves and do not have demonstrated economic viability. There is no guarantee that all or any part of the mineral resource will be converted into a mineral reserve. The estimate of mineral resources may be materially affected by geology, environment, permitting, legal, title, taxation, socio-political, marketing, or other relevant issues.
Note 2: The weights are reported in metric tonnes (1,000 kg or 2,204.6 lbs).
Note 3: Tonnage numbers are rounded to the nearest 1,000 unit.
Note 4: In a 'confined' aquifer (as reported herein), effective porosity is a proxy for specific yield.
Note 5: The resource estimation was completed and reported using a cutoff of 20 mg/L Li.
Note 6: To describe the resource in terms of the industry standard, a conversion factor of 5.323 is used to convert elemental Li to Li_2CO_3, or Lithium Carbonate Equivalent (LCE).

1.12 Conclusions

Highwood's Drumheller Li-brine project is an early-stage exploration project. During 2021 Highwood formalized a brine access agreement with an active petro-operator producing petroleum from Devonian-aged fields/pools at the Drumheller Property and collected 38 Nisku and Leduc formation aquifer brine samples. The results of Highwood's 2021 exploration work allowed the Company to verify 4 historical Li-brine analyses documented at the Drumheller Property.

Based on the lithium analytical results of brine samples collected by Highwood in conjunction with the Qualified Person's verification of Li-brine mineralization, and a review of labs sample collection methods, brine preparation, and analytical results, it is the senior author and Qualified Person's opinion that the exploration work conducted by Highwood is reasonable and within standard practices of Li-brine evaluation as presented in this technical report.

The technical report has been prepared by a multi-disciplinary team that include geologists, hydrogeologists, and chemical engineers with relevant experience in the geology of the Western Canada Sedimentary Basin, brine geology/hydrogeology, and Li-brine processing. There is collective agreement that the Highwood lithium-brine project at the Drumheller Property has reasonable prospects for eventual economic extraction of lithium from brine, and the senior author and Qualified Person takes responsibility for this statement.

Three separate resource domains were assessed and include the Leduc Aquifer Domain, the Nisku Killam Barrier Reef Aquifer Domain, and the Nisku Platform/Basin Aquifer Domain. Using a lower cutoff of 20 mg/L Li, and collectively, the *in-situ* Drumheller Li-brine inferred resources are globally (totally) estimated – within the 3 domains – to comprise 3.41 million elemental tonnes of lithium (or 18.14 million tonnes LCE; Table 1.1).

Mineral resources are not mineral reserves and do not have demonstrated economic viability. There is no guarantee that all or any part of the mineral resource will be converted into a mineral reserve.

1.13 Risks and Uncertainties

As with any early-stage exploration project there exists potential risks and uncertainties. There is some risk associated with a dependency on petro-operators to maintain continued brine access. There is no guarantee that Company's can successfully extract lithium from Alberta's Devonian petroleum system in a commercial capacity. The extraction technology is still at the developmental stage. Finally, there is a risk that the scalability of any initial mineral processing bench-scale and/or demonstration pilot test work may not translate to a full-scale commercial operation. Highwood will attempt to reduce risk/uncertainty through effective project management, engaging technical experts, and developing contingency plans.

With respect to the mineral resource, the inferred Li-brine resource estimations presented in this technical report are subject to change as the project achieves higher levels of confidence in the spatial extent of the aquifers, mineralization, lithium-from-brine recovery process development, and the Li-brine cutoff value.

1.14 Recommendations

The Highwood Drumheller Property is a property of merit. A two-phased program is recommended that continues to assess the Li-brine potential at Drumheller to increase the confidence level of the data and lithium-extraction test work. The total estimated cost of Phase 1 and Phase 2 of the recommended exploration work, with a 10% contingency, is CDN$2,777,500 and CDN$1,595,000. The total estimated cost of the recommended exploration work, with a 10% contingency, is CDN$4,372,500 (Table 1.2).

Phase 1 work recommendations include activities intended to advance the mineral resource potential of the Property and continue to refine the DLE mineral processing technology. The Phase 2 work recommendations are subject to the positive results of the Phase 1 work initiatives. Phase 2 work recommendations are intended to refine the lithium recovery processes toward a demonstration pilot plant, conduct community consultation and environmental studies, and prepare updated mineral resource estimations and a Preliminary Economic Assessment technical report.

Table 1.2 Future work recommendations.

Phase	Description	Cost estimate (CDN$)	Sub-Total (CDN$)
Phase 1	Target wells (including suspended wells) and/or drill a new well \in other parts of the Drumheller property and/or wells that penetrate into the Beaverhill Lake Group (or older) for brine sample collection for assay testing.	$2,250,000	
	Conduct additional bulk brine sample collection to advance the mineral processing test work.	$275,000	$2,525,000
Phase 2	Refinement of hydrogeological model and lithium recovery process flowsheet toward development of a demonstration pilot plant.	$1,150,000	
	Community consultation and environmental studies.	$50,000	
	Resource esimtation updates (if necessary) and Preliminary Economic Assessment technical reporting.	$250,000	$1,450,000
		Sub-total	$3,975,000
		10% contingency	$397,500
		Total	**$4,372,500**

2 Introduction

2.1 Issuer and Purpose

This This technical report has been prepared for the issuer, Highwood Asset Management Ltd. (Highwood or the Company). Highwood is a Canadian-owned, public asset management entity headquartered in Calgary, Alberta (AB) and oversees metallic minerals, oil, and oil midstream activities. During 2021, Highwood acquired 100% mineral ownership of 236 mineral permits and mineral titles (1,543,393 hectares; ha) that are located throughout Alberta (n=222 mineral permits) and in northeastern British Columbia (n=14 mineral titles; Figure 2.1). Highwood is exploring the mineral permits/titles as part of their Lithium-Brine and Ironstone Iron-Vanadium (Fe-V) projects.

The focus of this technical report is on Highwood's Drumheller Li-Brine Property, which comprises a portion of the Companies overall land package (23.5%) and consists of 50 approved mineral permits encompassing 362,522 ha (Figure 2.1).

Highwood is investigating the Drumheller Property for its lithium-brine (Li-brine) potential. More specifically, Highwood proposes to assess stratigraphically deep (e.g., >2,000 m below surface) hypersaline formation water, or brine, from oil and gas reservoirs, or aquifers, in Devonian-aged reef complexes for its lithium potential. The brine is currently pumped from the deep aquifers as a wastewater product associated with hydrocarbon production (e.g., oil, gas, and condensate). The extracted fluid is treated by petro-companies to separate and remove petroleum products and then the brine is reinjected back down into the subsurface aquifer. It is conceivable that Direct Lithium Extraction (DLE) technologies could be developed to extract lithium from the brine circuit.

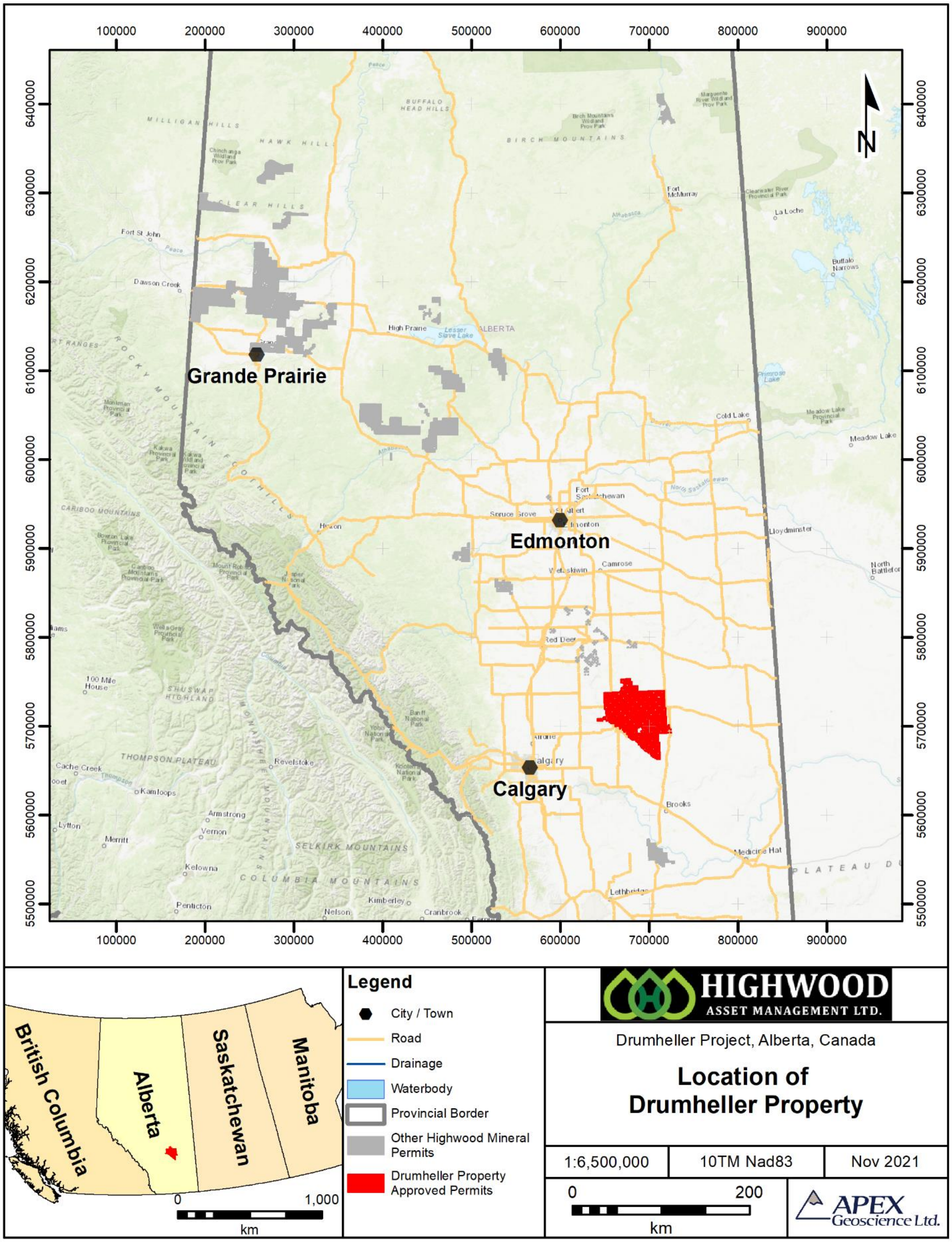
Highwood has obtained permission to access brine from petro-operators at the Drumheller Property for the purpose of early exploration stage test work. During April-May 2021, Highwood initiated 2 brine assay geochemical sampling programs at the Drumheller Property to collect brine samples for lithium assay testing and mineral processing, or DLE, test work at independent laboratories.

The purpose of this technical report is to present 1) exploration and mineral processing test work results, and 2) maiden inferred Li-brine mineral resource estimations for Highwood's Drumheller Property.

The technical report has been prepared in accordance with the Canadian Securities Administration's (CSA's) Definition Standards and Guidelines (2014, 2019), and National Instrument 43-101 (NI 43-101) with an Effective Date of 21 February 2022.

Highwood's other Li-brine projects in Alberta and British Columbia and the Company's ironstone Fe-V project in Alberta are still material to Highwood. These projects were introduced in previous geological introduction reports, and are discussed briefly in this, the current technical report for Highwood.

Figure 2.1 Location of Highwood Asset Management Ltd.'s Drumheller Property in south-central Alberta.



2.2 Authors and Site Inspection

A multi-disciplinary team of authors prepared this report and include Mr. Roy Eccles M.Sc. P. Geol. of APEX Geoscience Ltd., Mr. James (Jim) Touw, B.Sc., P. Geol. of Hydrogeological Consultants Ltd., and Mr. Charles Edwards M.Sc., P. Eng. of Chuck Edwards Extractive Metallurgy Consulting. The authors are independent of Highwood, the Drumheller Property, and are Qualified Persons (QPs)as defined in NI 43-101.

Mr. Eccles is a Professional Geologist with the Association of Professional Engineers and Geoscientists of Alberta (APEGA) and has worked as a geologist for more than 35 years since his graduation from university. Mr. Eccles has been involved in all aspects of mineral exploration and mineral resource estimations for metallic, industrial, and specialty mineral projects and deposits in North America. Mr. Eccles technical experience with respect to Li-brine includes 1) government geological studies (e.g., Eccles and Jean, 2010; Eccles and Berhane, 2011) and 2) Li-brine exploration and resource estimations in the Western Canada Sedimentary Basin, southeastern and southwestern United States, and central Europe. Mr. Eccles talks QP responsibility for Sections 1-12, 14, and 23-27 of this Technical Report.

Mr. Eccles visited Highwood's Drumheller Property on May 28, 2021, as part of a NI 43-101 personal site inspection. The inspection confirmed or validated 1) actively pumping oil and gas infrastructure at the Ghost Pine and Wayne-Rosedale oil and gas fields within Highwood's Drumheller Property), 2) Highwood's permission from the petro-operator to collect brine samples, and 3) independent validation of lithium mineralization within the Devonian Nisku and Leduc formations brine underlying the sub-property.

Mr. Touw is a Professional Geologist with the Association of Professional Engineers and Geoscientists of Alberta (APEGA) and has worked as a geologist and hydrogeologist for more than 30 years since his graduation from university. As a Senior Hydrologist with Hydrogeological Consulting Ltd. (HCL) of Edmonton, AB, Mr. Touw has been involved in mineral exploration and hydrology in Alberta, Northwest Territories and British Columbia with technical experience that includes the collection, processing and interpretation hydrogeological data, project management of hydrogeological programs, and the preparation and review of hydrogeological reports. Mr. Touw is taking QP responsibility for the hydrogeological characterization of the Drumheller Property (Section 14.3).

Mr. Edwards is a Professional Engineer with the Association of Professional Engineers and Geoscientists of Saskatchewan (APEGS) and has worked as an extractive metallurgical Engineer for more than 50 years since his graduation from university. Mr. Edwards is Principal with Chuck Edwards Extractive Metallurgy Consulting in Saskatoon. Mr. Edwards has experience in R&D, operations, government service, consulting, and engineering management, and process design experience for uranium, aluminum, nickel, oilsands, silver, copper, lithium, potash, and specialty chemicals. Mr. Edwards is taking QP responsibility for the mineral processing test work conducted on brine collected from the Drumheller Property (Section 13).

2.3 Sources of Information

The sources of information and data used in this technical report are based on the compilation of publicly available geological and geochemical data as they pertain to Highwood's sub-properties and the surrounding area.

Government reports include those that depict the Devonian bedrock stratigraphy of Alberta and the brine geochemistry of Alberta (e.g., Green and Mellon, 1970; Hitchon, 1984; Bloy and Hadley, 1989; Connolly et al., 1990a,b; O'Connell et al., 1990; Hitchon et al., 1993, 1995; Meijer Drees, 1994; Mossop et al., 1994; Switzer et al., 1994; Oldale and Munday, 1994; Bachu et al., 1995; Garrett, 2004; Eccles and Jean, 2010; Eccles and Berhane, 2011; Huff et al., 2011, 2012; Rokosh et al., 2012; Huff, 2016, 2019, Huff et al., 2019; Lopez et al., 2020). Miscellaneous journal articles, company news releases, and NI 43-101 Technical Reports were used to corroborate the stratigraphy and formation water potential of Alberta (e.g., Banks, 2017; Hauck et al., 2018; Highwood Asset Management Ltd., 2021).

The data compilation includes original, historical oil field formation water data. Oil and gas well fluid and stratigraphic data presented in this technical report were acquired by searching the Alberta Energy Regulator (AER) database; the AER regulates and acts as the custodian for oil and gas data in the province. The oil and gas data are made available via numerous standard oil and gas industry software programs such as GeoSCOUT™ and AbaData (v. 2.0). These data were validated and interpreted by Mr. Eccles.

The author of this Technical Report, Mr. Eccles, has reviewed all government and miscellaneous reports, and historical oil and gas stratigraphic horizon picks and well fluid geochemical data. Good judgment is required to assess the quality and validity of data and information obtained. The oil and gas stratigraphic data have been reviewed in conjunction with current three-dimensional (3-D) basin modelling performed by the Alberta Geological Survey. The historical fluid geochemical data were prepared via the Alberta Geological Survey. The government reports and journal papers were prepared by a person, or persons, holding post-secondary geology or related degrees.

Geochemical data collected in 2021 by Highwood and the QP, and presented in this Technical Report, were analysed at independent and accredited laboratories: 1) AGAT Laboratories (AGAT) in Calgary, AB, 2) Core Laboratories (Core Lab) in Calgary, AB, and 3) Bureau Veritas Laboratories (Bureau Veritas) in Edmonton, AB. The commercial geochemical laboratories cite national index recognition, governance, and accreditations (e.g., ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc., Standards Council of Canada, and ASTM: American Society for Testing and Materials).

Mineral processing test work was conducted by independent companies that include the Saskatchewan Research Council (SRC) in Saskatoon, Saskatchewan, and Recion Technologies Inc. (Recion) of Edmonton, Alberta. The SRC is accredited in accordance with ISO/IEC 17025:2017 and has applied technology resources and expertise in lithium (and potassium) recovery from brine. Recion is focused on technology development and commercialization of a proprietary and patent-pending process that it has developed to extract, purify, and produce lithium products from a variety of lithium-bearing saline waters including oilfield brines found in Western Canada.

Based on the QPs review of these documents and/or information, the senior author and QP has deemed that these reports and information, to the best of his knowledge, are valid contributions to this technical report, and therefore takes ownership of the ideas and values as they pertain to the current technical report.

2.4 Units of Measure

With respect to units of measure, unless otherwise stated, this Technical Report uses:

- Abbreviated shorthand consistent with the International System of Units (International Bureau of Weights and Measures, 2006).
- 'Bulk' weight is presented in metric tonnes (tonnes; 1,000 kg or 2,204.6 lbs.).
- Geographic coordinates are projected in the Universal Transverse Mercator (UTM) system relative to Zones 11 and 12 of the North American Datum (NAD) 1983. Because Alberta is divided into 2 UTM zones, the GIS has been created in NAD 1983 10TM AEP Forest projection.
- Currency in Canadian dollars (CDN$), unless otherwise specified (e.g., U.S. dollars, US$; Euro dollars, €).

3 Reliance of Other Experts

The authors are not qualified to provide an opinion or comment on issues related to legal agreements, royalties, permitting and environmental matters, and therefore, disclaim certain portions associated with Section 4, Property Description and Location.

The senior author has not attempted to verify the legal status of the Drumheller Property mineral permits; however, the author has reviewed the Alberta Energy mineral rights management system, which show that the 50 approved mineral permits at Drumheller are active and in good standing as of 21 February 2022. All mineral permits were listed as having 100% ownership by Highwood. The assessment of mineral permit ownership is described in Section 4.1.

A copy of a 2021 brine access agreement between Highwood and a petro-operator was provided to the QP by Highwood's management on June 14, 2021. The agreement is for the purpose of collecting brine samples for offsite testing. The QP has not verified the agreement with the petro-operators and is reliant on the executed agreement together with knowledge that Highwood collected brine samples with the assistance of the petro-operator. The brine access agreement is discussed in Section 4.6.

4 Property Description and Location

4.1 Description and Location

Highwood's Drumheller Property is part of a larger Highwood land package that includes 236 mineral permits/titles that encompass 1,543,393 hectares (ha). The permits are located throughout Alberta (n=222) and in northeastern British Columbia (n=14; Figure 4.1). The inclusive Highwood land position is still material to Highwood, and therefore, a summary of all 236 permits/titles is presented in Table 4.1.

Within this expansive land position, Highwood's Drumheller Li-brine Property accounts for 23.5% of Highwoods total land position. The Drumheller Property is in south-central Alberta and is defined by 50 approved mineral permits encompassing 362,522 ha (Figure 4.2). The individual Drumheller Property permit descriptions, including mineral tenure permit/title ID, term date, expiry date, and area (ha) is highlighted in Table 4.1.

Within the outline of the Drumheller Property, there are numerous, interspersed quarter sections (or smaller) that are not owned by the Crown. These private lands have been removed from the resource estimation work completed in this technical report.

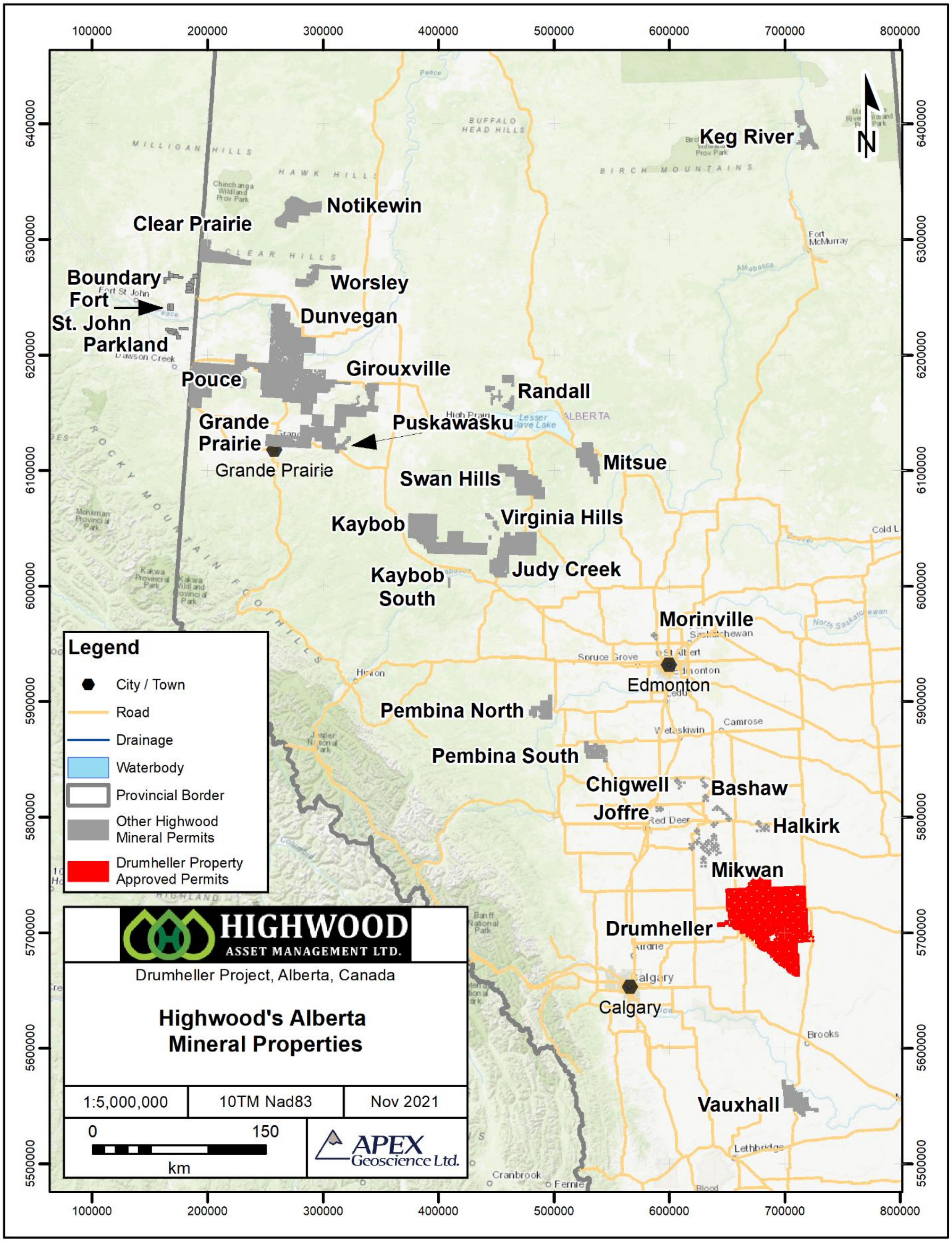
The Drumheller Property is located directly north and east of the Town of Drumheller, AB. The Property is approximately 110 km northeast of the City of Calgary, AB, and 90 km southeast of the City of Red Deer, AB. The Property is within National Topographic System (NTS) 1:250 000 map-area 82P. Approximately 35 townships define the property, ranging from Townships 025 to 034 and from Ranges 15W4 to 20W4. The centroid of the Drumheller Property (in 10TM, NAD83) is 679200 m Easting and 5715220 m Northing.

4.2 Property Rights and Maintenance

Alberta mineral exploration permitting, and work, are defined in the Alberta *Mines and Minerals Act* and Regulations (www.qp.alberta.ca/Laws_Online.cfm). At the Effective Date of this technical report, the designated 100% owner of all 49 Drumheller Property mineral permits is Highwood Asset Management Ltd. The status of all permits is listed as "Active". The Alberta mineral permits grant Highwood the exclusive right to explore for metallic and industrial minerals for seven consecutive two-year terms (total of fourteen years), subject to traditional biannual assessment work.

Work requirements for maintenance of permits in good standing are $5.00/ha for the first term, $10.00/ha for each of the second and third terms, and $15.00/ha for each the fourth, fifth, sixth and seventh terms. The kinds of work that may be submitted to the Department as assessment work include prospecting, stripping/trenching, drilling, geological survey, geochemical survey, geophysical survey, transporting drill core to core storage facility, reclamation of disturbed sites, assay, and analytical work.

Figure 4.1 Location of Highwood's Alberta and British Columbia mineral permits and titles. Table 4.1 provides corresponding mineral permit/title descriptions for each sub-property.



APEX Geoscience Ltd.

Table 4.1 Description of Highwood's mineral permits.

A) Alberta mineral permits.

No.	Mineral Permit number	Permit area	SubProperty name	Centroid of SubProperty: Easting (m) [10TM, NAD83]	Centroid of SubProperty: Northing (m) [10TM, NAD83]	Status	Designated representative (% ownership)	Approved Permits: Term date	Approved Permits: Expiry date	Area (ha)	Sub-property area (ha)
1	9321060183	South	Vauxhall			Active	Highwood Asset Management Ltd. (100%)	2021-06-25	2035-06-25	8,794.41	
2	9321060184	South	Vauxhall			Active	Highwood Asset Management Ltd. (100%)	2021-06-25	2035-06-25	9,185.01	
3	9321060185	South	Vauxhall	851800	5565150	Active	Highwood Asset Management Ltd. (100%)	2021-06-25	2035-06-25	9,301.63	
4	9321060186	South	Vauxhall			Active	Highwood Asset Management Ltd. (100%)	2021-06-25	2035-06-25	8,748.67	
5	9321060187	South	Vauxhall			Active	Highwood Asset Management Ltd. (100%)	2021-06-25	2035-06-25	4,537.74	**40,567.46**
6	9321060124	South	Drumheller			Active	Highwood Asset Management Ltd. (100%)	2021-06-25	2035-06-25	3,106.28	
7	9321060182	South	Drumheller			Active	Highwood Asset Management Ltd. (100%)	2021-06-25	2035-06-25	4,194.34	
8	9321070098	South	Drumheller			Active	Highwood Asset Management Ltd. (100%)	2021-07-02	2035-07-02	6,008.25	
9	9321070099	South	Drumheller			Active	Highwood Asset Management Ltd. (100%)	2021-07-02	2035-07-02	2,905.98	
10	9321080123	South	Drumheller			Active	Highwood Asset Management Ltd. (100%)	2021-08-09	2035-08-09	8,803.83	
11	9321080124	South	Drumheller			Active	Highwood Asset Management Ltd. (100%)	2021-08-09	2035-08-09	8,811.24	
12	9321080125	South	Drumheller			Active	Highwood Asset Management Ltd. (100%)	2021-08-09	2035-08-09	8,803.27	
13	9321080126	South	Drumheller			Active	Highwood Asset Management Ltd. (100%)	2021-08-09	2035-08-09	8,758.64	
14	9321080127	South	Drumheller			Active	Highwood Asset Management Ltd. (100%)	2021-08-09	2035-08-09	8,834.67	
15	9321080128	South	Drumheller			Active	Highwood Asset Management Ltd. (100%)	2021-08-09	2035-08-09	8,829.23	
16	9321080129	South	Drumheller			Active	Highwood Asset Management Ltd. (100%)	2021-08-09	2035-08-09	8,828.06	
17	9321080130	South	Drumheller			Active	Highwood Asset Management Ltd. (100%)	2021-08-09	2035-08-09	8,835.29	
18	9321080131	South	Drumheller			Active	Highwood Asset Management Ltd. (100%)	2021-08-09	2035-08-09	8,187.62	
19	9321080132	South	Drumheller			Active	Highwood Asset Management Ltd. (100%)	2021-08-09	2035-08-09	8,765.63	
20	9321080133	South	Drumheller			Active	Highwood Asset Management Ltd. (100%)	2021-08-09	2035-08-09	8,007.20	
21	9321080134	South	Drumheller			Active	Highwood Asset Management Ltd. (100%)	2021-08-09	2035-08-09	9,281.20	
22	9321080135	South	Drumheller			Active	Highwood Asset Management Ltd. (100%)	2021-08-09	2035-08-09	840.79	
23	9321100064	South	Drumheller			Active	Highwood Asset Management Ltd. (100%)	2021-10-01	2035-10-01	5,420.68	
24	9321100065	South	Drumheller			Active	Highwood Asset Management Ltd. (100%)	2021-10-01	2035-10-01	7,001.53	
25	9321100066	South	Drumheller			Active	Highwood Asset Management Ltd. (100%)	2021-10-01	2035-10-01	6,996.49	
26	9321100067	South	Drumheller			Active	Highwood Asset Management Ltd. (100%)	2021-10-01	2035-10-01	8,089.58	
27	9321100068	South	Drumheller			Active	Highwood Asset Management Ltd. (100%)	2021-10-01	2035-10-01	8,825.66	
28	9321100069	South	Drumheller			Active	Highwood Asset Management Ltd. (100%)	2021-10-01	2035-10-01	8,235.05	
29	9321100070	South	Drumheller			Active	Highwood Asset Management Ltd. (100%)	2021-10-01	2035-10-01	1,459.38	
30	9321100071	South	Drumheller			Active	Highwood Asset Management Ltd. (100%)	2021-10-01	2035-10-01	8,883.98	
31	9321100072	South	Drumheller	687800	5712450	Active	Highwood Asset Management Ltd. (100%)	2021-10-01	2035-10-01	8,884.61	
32	9321100073	South	Drumheller			Active	Highwood Asset Management Ltd. (100%)	2021-10-01	2035-10-01	7,604.28	
33	9321100074	South	Drumheller			Active	Highwood Asset Management Ltd. (100%)	2021-10-01	2035-10-01	8,782.12	
34	9321100075	South	Drumheller			Active	Highwood Asset Management Ltd. (100%)	2021-10-01	2035-10-01	8,780.68	
35	9321100076	South	Drumheller			Active	Highwood Asset Management Ltd. (100%)	2021-10-01	2035-10-01	8,682.35	
36	9321100077	South	Drumheller			Active	Highwood Asset Management Ltd. (100%)	2021-10-01	2035-10-01	8,809.13	
37	9321100078	South	Drumheller			Active	Highwood Asset Management Ltd. (100%)	2021-10-01	2035-10-01	8,821.86	
38	9321100079	South	Drumheller			Active	Highwood Asset Management Ltd. (100%)	2021-10-01	2035-10-01	8,864.45	
39	9321100080	South	Drumheller			Active	Highwood Asset Management Ltd. (100%)	2021-10-01	2035-10-01	1,134.81	
40	9321100085	South	Drumheller			Active	Highwood Asset Management Ltd. (100%)	2021-10-04	2035-10-04	2,192.06	
41	9321100086	South	Drumheller			Active	Highwood Asset Management Ltd. (100%)	2021-10-04	2035-10-04	8,876.08	
42	9321100087	South	Drumheller			Active	Highwood Asset Management Ltd. (100%)	2021-10-04	2035-10-04	7,508.59	
43	9321100088	South	Drumheller			Active	Highwood Asset Management Ltd. (100%)	2021-10-04	2035-10-04	6,576.42	
44	9321100089	South	Drumheller			Active	Highwood Asset Management Ltd. (100%)	2021-10-04	2035-10-04	7,955.96	
45	9321100090	South	Drumheller			Active	Highwood Asset Management Ltd. (100%)	2021-10-04	2035-10-04	1,616.26	
46	9321100091	South	Drumheller			Active	Highwood Asset Management Ltd. (100%)	2021-10-04	2035-10-04	8,859.55	
47	9321100092	South	Drumheller			Active	Highwood Asset Management Ltd. (100%)	2021-10-04	2035-10-04	8,857.26	
48	9321100093	South	Drumheller			Active	Highwood Asset Management Ltd. (100%)	2021-10-04	2035-10-04	8,851.05	
49	9321100094	South	Drumheller			Active	Highwood Asset Management Ltd. (100%)	2021-10-04	2035-10-04	8,777.33	
50	9321120111	South	Drumheller			Active	Highwood Asset Management Ltd. (100%)	2021-12-14	2035-12-14	8,883.20	
51	9321120112	South	Drumheller			Active	Highwood Asset Management Ltd. (100%)	2021-12-14	2035-12-14	8,662.67	
52	9321120113	South	Drumheller			Active	Highwood Asset Management Ltd. (100%)	2021-12-14	2035-12-14	8,701.40	
53	9321120114	South	Drumheller			Active	Highwood Asset Management Ltd. (100%)	2021-12-14	2035-12-14	8,555.40	
54	9321120115	South	Drumheller			Active	Highwood Asset Management Ltd. (100%)	2021-12-14	2035-12-14	8,496.69	
55	9321120116	South	Drumheller			Active	Highwood Asset Management Ltd. (100%)	2021-12-14	2035-12-14	2,074.04	**362,522.09**
56	9321070180	Central	Halkirk	817500	5799600	Active	Highwood Asset Management Ltd. (100%)	2021-07-02	2035-07-02	4,130.57	**4,130.57**
57	9321070174	Central	Mikwan			Active	Highwood Asset Management Ltd. (100%)	2021-07-02	2035-07-02	1,550.73	
58	9321070181	Central	Mikwan			Active	Highwood Asset Management Ltd. (100%)	2021-07-02	2035-07-02	1,548.69	
59	9321070182-01	Central	Mikwan	768900	5784100	Active	Highwood Asset Management Ltd. (100%)	2021-07-02	2035-07-02	1,295.62	
60	9321070182-02	Central	Mikwan			Active	Highwood Asset Management Ltd. (100%)	2021-07-02	2035-07-02	5,886.42	
61	9321060178	Central	Mikwan			Active	Highwood Asset Management Ltd. (100%)	2021-06-25	2035-06-25	6,688.40	
62	9321060179	Central	Mikwan			Active	Highwood Asset Management Ltd. (100%)	2021-06-25	2035-06-25	2,314.23	**19,284.09**
63	9321070175	Central	Bashaw			Active	Highwood Asset Management Ltd. (100%)	2021-07-02	2035-07-02	4,154.40	
64	9321070176	Central	Bashaw	767650	5824400	Active	Highwood Asset Management Ltd. (100%)	2021-07-02	2035-07-02	2,081.69	
65	9321070197	Central	Bashaw			Active	Highwood Asset Management Ltd. (100%)	2021-07-14	2035-07-14	1,806.89	**8,042.98**
66	9321060117	Central	Joffre	727000	5816600	Active	Highwood Asset Management Ltd. (100%)	2021-06-25	2035-06-25	1,811.12	**1,811.12**
67	9321070177	Central	Chigwell	743400	5836150	Active	Highwood Asset Management Ltd. (100%)	2021-07-02	2035-07-02	1,287.98	
68	9321070198	Central	Chigwell			Active	Highwood Asset Management Ltd. (100%)	2021-07-14	2035-07-14	1,302.32	**2,590.30**
69	9321060116	Central	Pembina South			Active	Highwood Asset Management Ltd. (100%)	2021-06-25	2035-06-25	4,253.89	
70	9321070109	Central	Pembina South	670650	5862200	Active	Highwood Asset Management Ltd. (100%)	2021-07-02	2035-07-02	6,448.58	
71	9321070110	Central	Pembina South			Active	Highwood Asset Management Ltd. (100%)	2021-07-02	2035-07-02	7,486.18	
72	9321070111	Central	Pembina South			Active	Highwood Asset Management Ltd. (100%)	2021-07-02	2035-07-02	2,907.25	**21,095.90**
73	9321070200	Central	Pembina North			Active	Highwood Asset Management Ltd. (100%)	2021-07-14	2035-07-14	7,778.28	
74	9321070112	Central	Pembina North	624500	5897100	Active	Highwood Asset Management Ltd. (100%)	2021-07-02	2035-07-02	9,315.37	
75	9321070113	Central	Pembina North			Active	Highwood Asset Management Ltd. (100%)	2021-07-02	2035-07-02	6,334.25	**23,427.90**
76	9321070199	Central	Morinville	718900	5963900	Active	Highwood Asset Management Ltd. (100%)	2021-07-14	2035-07-14	1,471.04	**1,471.04**
77	9321060115	West-central	Kaybob South	540000	6003450	Active	Highwood Asset Management Ltd. (100%)	2021-06-25	2035-06-25	1,282.22	**1,282.22**
78	9321060113	West-Central	Kaybob			Active	Highwood Asset Management Ltd. (100%)	2021-06-25	2035-06-25	6,425.76	
79	9321060114	West-Central	Kaybob			Active	Highwood Asset Management Ltd. (100%)	2021-06-25	2035-06-25	5,134.53	
80	9321060159	West-Central	Kaybob			Active	Highwood Asset Management Ltd. (100%)	2021-06-25	2035-06-25	8,980.61	
81	9321060168	West-Central	Kaybob			Active	Highwood Asset Management Ltd. (100%)	2021-06-25	2035-06-25	6,174.90	
82	9321060167	West-Central	Kaybob			Active	Highwood Asset Management Ltd. (100%)	2021-06-25	2035-06-25	9,258.86	
83	9321060166	West-Central	Kaybob			Active	Highwood Asset Management Ltd. (100%)	2021-06-25	2035-06-25	4,629.77	
84	9321060180	West-Central	Kaybob			Active	Highwood Asset Management Ltd. (100%)	2021-06-25	2035-06-25	8,598.19	
85	9321070157	West-Central	Kaybob	533190	6035400	Active	Highwood Asset Management Ltd. (100%)	2021-07-09	2035-07-09	4,358.75	
86	9321070158	West-Central	Kaybob			Active	Highwood Asset Management Ltd. (100%)	2021-07-09	2035-07-09	6,904.15	
87	9321070159	West-Central	Kaybob			Active	Highwood Asset Management Ltd. (100%)	2021-07-09	2035-07-09	9,190.26	
88	9321070160	West-Central	Kaybob			Active	Highwood Asset Management Ltd. (100%)	2021-07-09	2035-07-09	7,682.22	
89	9321070161	West-Central	Kaybob			Active	Highwood Asset Management Ltd. (100%)	2021-07-09	2035-07-09	9,231.86	
90	9321070162	West-Central	Kaybob			Active	Highwood Asset Management Ltd. (100%)	2021-07-09	2035-07-09	7,682.31	
91	9321070163	West-Central	Kaybob			Active	Highwood Asset Management Ltd. (100%)	2021-07-09	2035-07-09	6,165.14	
92	9321070212	West-Central	Kaybob			Active	Highwood Asset Management Ltd. (100%)	2021-07-14	2035-07-14	9,264.32	
93	9321070213	West-Central	Kaybob			Active	Highwood Asset Management Ltd. (100%)	2021-07-14	2035-07-14	9,139.90	**118,821.53**
94	9321060121	West-Central	Virginia Hills			Active	Highwood Asset Management Ltd. (100%)	2021-06-25	2035-06-25	2,044.42	
95	9321060122	West-Central	Virginia Hills	578100	6056000	Active	Highwood Asset Management Ltd. (100%)	2021-06-25	2035-06-25	2,301.97	
96	9321060123	West-Central	Virginia Hills			Active	Highwood Asset Management Ltd. (100%)	2021-06-25	2035-06-25	512.83	**4,859.22**
97	9321060188	West-Central	Swan Hills			Active	Highwood Asset Management Ltd. (100%)	2021-06-25	2035-06-25	9,221.48	
98	9321060189	West-Central	Swan Hills			Active	Highwood Asset Management Ltd. (100%)	2021-06-25	2035-06-25	9,231.08	
99	9321060170	West-Central	Swan Hills			Active	Highwood Asset Management Ltd. (100%)	2021-06-25	2035-06-25	9,214.29	
100	9321060171	West-Central	Swan Hills	603800	6095700	Active	Highwood Asset Management Ltd. (100%)	2021-06-25	2035-06-25	9,208.39	
101	9321060172	West-Central	Swan Hills			Active	Highwood Asset Management Ltd. (100%)	2021-06-25	2035-06-25	9,189.52	
102	9321060173	West-Central	Swan Hills			Active	Highwood Asset Management Ltd. (100%)	2021-06-25	2035-06-25	7,670.46	
103	9321060174	West-Central	Swan Hills			Active	Highwood Asset Management Ltd. (100%)	2021-06-25	2035-06-25	3,070.22	**56,805.44**
104	9321060175	West-Central	Mitsue			Active	Highwood Asset Management Ltd. (100%)	2021-06-25	2035-06-25	9,080.61	
105	9321060176	West-Central	Mitsue			Active	Highwood Asset Management Ltd. (100%)	2021-06-25	2035-06-25	9,253.35	
106	9321060177	West-Central	Mitsue	658100	6115500	Active	Highwood Asset Management Ltd. (100%)	2021-06-25	2035-06-25	8,717.65	
107	9321070214	West-Central	Mitsue			Active	Highwood Asset Management Ltd. (100%)	2021-07-14	2035-07-14	7,676.35	
108	9321070215	West-Central	Mitsue			Active	Highwood Asset Management Ltd. (100%)	2021-07-14	2035-07-14	3,597.28	**38,325.24**
109	9321060118	West-Central	Randall			Active	Highwood Asset Management Ltd. (100%)	2021-06-25	2035-06-25	4,859.68	
110	9321060119	West-Central	Randall			Active	Highwood Asset Management Ltd. (100%)	2021-06-25	2035-06-25	4,118.87	
111	9321060120	West-Central	Randall	579200	6167600	Active	Highwood Asset Management Ltd. (100%)	2021-06-25	2035-06-25	6,210.28	
112	9321060165	West-Central	Randall			Active	Highwood Asset Management Ltd. (100%)	2021-06-25	2035-06-25	3,328.49	
113	9321060181	West-Central	Randall			Active	Highwood Asset Management Ltd. (100%)	2021-06-25	2035-06-25	1,789.36	**20,306.68**
114	9321070216	West-Central	Judy Creek			Active	Highwood Asset Management Ltd. (100%)	2021-07-14	2035-07-14	8,728.56	
115	9321070217	West-Central	Judy Creek			Active	Highwood Asset Management Ltd. (100%)	2021-07-14	2035-07-14	9,260.60	
116	9321070218	West-Central	Judy Creek			Active	Highwood Asset Management Ltd. (100%)	2021-07-14	2035-07-14	9,264.05	
117	9321070219	West-Central	Judy Creek			Active	Highwood Asset Management Ltd. (100%)	2021-07-14	2035-07-14	9,236.67	
118	9321070220	West-Central	Judy Creek			Active	Highwood Asset Management Ltd. (100%)	2021-07-14	2035-07-14	9,239.96	
119	9321070221	West-Central	Judy Creek	595250	6036300	Active	Highwood Asset Management Ltd. (100%)	2021-07-14	2035-07-14	7,782.66	
120	9321070092	West-Central	Judy Creek			Active	Highwood Asset Management Ltd. (100%)	2021-07-02	2035-07-02	7,711.80	
121	9321070093	West-Central	Judy Creek			Active	Highwood Asset Management Ltd. (100%)	2021-07-02	2035-07-02	8,111.11	
122	9321070094	West-Central	Judy Creek			Active	Highwood Asset Management Ltd. (100%)	2021-07-02	2035-07-02	4,114.61	
123	9321070095	West-Central	Judy Creek			Active	Highwood Asset Management Ltd. (100%)	2021-07-02	2035-07-02	4,771.14	
124	9321070096	West-Central	Judy Creek			Active	Highwood Asset Management Ltd. (100%)	2021-07-02	2035-07-02	3,577.52	**81,798.67**
125	9321060160	Northwest	Puskawasku	443000	6121100	Active	Highwood Asset Management Ltd. (100%)	2021-06-25	2035-06-25	5,946.56	
126	9321070097	Northwest	Puskawasku			Active	Highwood Asset Management Ltd. (100%)	2021-07-02	2035-07-02	1,293.30	**7,239.86**
127	9321070135	Northwest	Girouxville			Active	Highwood Asset Management Ltd. (100%)	2021-07-02	2035-07-02	7,996.83	
128	9321070186	Northwest	Girouxville			Active	Highwood Asset Management Ltd. (100%)	2021-07-12	2035-07-12	9,321.89	
129	9321070187	Northwest	Girouxville	468400	6158000	Active	Highwood Asset Management Ltd. (100%)	2021-07-12	2035-07-12	9,220.89	
130	9321070188	Northwest	Girouxville			Active	Highwood Asset Management Ltd. (100%)	2021-07-12	2035-07-12	7,555.75	
131	9321070211	Northwest	Girouxville			Active	Highwood Asset Management Ltd. (100%)	2021-07-14	2035-07-14	9,119.16	
132	9321070233	Northwest	Girouxville			Active	Highwood Asset Management Ltd. (100%)	2021-07-19	2035-07-19	5,320.95	**48,535.49**

Table 4.1, continued.

A) Alberta mineral permits, continued.

No.	Mineral Permit number	Permit area	SubProperty name	Centroid of SubProperty: Easting (m) [10TM, NAD83]	Centroid of SubProperty: Northing (m) [10TM, NAD83]	Status	Designated representative (% ownership)	Approved Permits: Term date	Approved Permits: Expiry date	Area (ha)	Sub-property area (ha)
133	9321060161	Northwest	Grande Prairie			Active	Highwood Asset Management Ltd. (100%)	2021-06-25	2035-06-25	1,808.44	
134	9321060162	Northwest	Grande Prairie			Active	Highwood Asset Management Ltd. (100%)	2021-06-25	2035-06-25	2,711.70	
135	9321060163	Northwest	Grande Prairie			Active	Highwood Asset Management Ltd. (100%)	2021-06-25	2035-06-25	2,129.35	
136	9321060164	Northwest	Grande Prairie			Active	Highwood Asset Management Ltd. (100%)	2021-06-25	2035-06-25	5,153.26	
137	9321070100	Northwest	Grande Prairie			Active	Highwood Asset Management Ltd. (100%)	2021-07-02	2035-07-02	9,312.99	
138	9321070101	Northwest	Grande Prairie			Active	Highwood Asset Management Ltd. (100%)	2021-07-02	2035-07-02	9,302.91	
139	9321070102	Northwest	Grande Prairie			Active	Highwood Asset Management Ltd. (100%)	2021-07-02	2035-07-02	8,182.68	
140	9321070103	Northwest	Grande Prairie	413250	6130600	Active	Highwood Asset Management Ltd. (100%)	2021-07-02	2035-07-02	9,271.82	
141	9321070104	Northwest	Grande Prairie			Active	Highwood Asset Management Ltd. (100%)	2021-07-02	2035-07-02	9,323.55	
142	9321070105	Northwest	Grande Prairie			Active	Highwood Asset Management Ltd. (100%)	2021-07-02	2035-07-02	6,460.80	
143	9321070106	Northwest	Grande Prairie			Active	Highwood Asset Management Ltd. (100%)	2021-07-02	2035-07-02	8,011.40	
144	9321070107	Northwest	Grande Prairie			Active	Highwood Asset Management Ltd. (100%)	2021-07-02	2035-07-02	8,010.21	
145	9321070108	Northwest	Grande Prairie			Active	Highwood Asset Management Ltd. (100%)	2021-07-02	2035-07-02	4,124.01	
146	9321070201	Northwest	Grande Prairie			Active	Highwood Asset Management Ltd. (100%)	2021-07-14	2035-07-14	986.69	
147	9321070189	Northwest	Grande Prairie			Active	Highwood Asset Management Ltd. (100%)	2021-07-12	2035-07-12	6,837.66	**91,627.47**
148	9321070234	Northwest	Pouce			Active	Highwood Asset Management Ltd. (100%)	2021-07-19	2035-07-19	9,251.43	
149	9321070235	Northwest	Pouce			Active	Highwood Asset Management Ltd. (100%)	2021-07-19	2035-07-19	8,361.76	
150	9321070236	Northwest	Pouce			Active	Highwood Asset Management Ltd. (100%)	2021-07-19	2035-07-19	9,237.25	
151	9321070237	Northwest	Pouce			Active	Highwood Asset Management Ltd. (100%)	2021-07-19	2035-07-19	8,367.01	
152	9321070238	Northwest	Pouce			Active	Highwood Asset Management Ltd. (100%)	2021-07-19	2035-07-19	9,225.53	
153	9321070239	Northwest	Pouce			Active	Highwood Asset Management Ltd. (100%)	2021-07-19	2035-07-19	6,674.86	
154	9321070240	Northwest	Pouce			Active	Highwood Asset Management Ltd. (100%)	2021-07-19	2035-07-19	4,613.98	
155	9321070241	Northwest	Pouce			Active	Highwood Asset Management Ltd. (100%)	2021-07-19	2035-07-19	9,208.04	
156	9321080117	Northwest	Pouce	333100	6186600	Active	Highwood Asset Management Ltd. (100%)	2021-08-05	2035-08-05	8,383.09	
157	9321080118	Northwest	Pouce			Active	Highwood Asset Management Ltd. (100%)	2021-08-05	2035-08-05	9,215.53	
158	9321080119	Northwest	Pouce			Active	Highwood Asset Management Ltd. (100%)	2021-08-05	2035-08-05	4,532.16	
159	9321080120	Northwest	Pouce			Active	Highwood Asset Management Ltd. (100%)	2021-08-05	2035-08-05	1,552.22	
160	9321070203	Northwest	Pouce			Active	Highwood Asset Management Ltd. (100%)	2021-07-14	2035-07-14	9,242.68	
161	9321070204	Northwest	Pouce			Active	Highwood Asset Management Ltd. (100%)	2021-07-14	2035-07-14	8,232.49	
162	9321070129	Northwest	Pouce			Active	Highwood Asset Management Ltd. (100%)	2021-07-02	2035-07-02	7,793.87	
163	9321070130	Northwest	Pouce			Active	Highwood Asset Management Ltd. (100%)	2021-07-02	2035-07-02	3,908.51	
164	9321070131	Northwest	Pouce			Active	Highwood Asset Management Ltd. (100%)	2021-07-02	2035-07-02	8,730.80	
165	9321070132	Northwest	Pouce			Active	Highwood Asset Management Ltd. (100%)	2021-07-02	2035-07-02	9,254.45	**135,785.65**
166	9321070155	Northwest	Dunvegan			Active	Highwood Asset Management Ltd. (100%)	2021-07-09	2035-07-09	4,415.45	
167	9321070156	Northwest	Dunvegan			Active	Highwood Asset Management Ltd. (100%)	2021-07-09	2035-07-09	4,654.26	
168	9321070114	Northwest	Dunvegan			Active	Highwood Asset Management Ltd. (100%)	2021-07-02	2035-07-02	7,791.45	
169	9321070115	Northwest	Dunvegan			Active	Highwood Asset Management Ltd. (100%)	2021-07-02	2035-07-02	7,964.08	
170	9321070116	Northwest	Dunvegan			Active	Highwood Asset Management Ltd. (100%)	2021-07-02	2035-07-02	8,711.99	
171	9321070117	Northwest	Dunvegan			Active	Highwood Asset Management Ltd. (100%)	2021-07-02	2035-07-02	7,723.13	
172	9321070118	Northwest	Dunvegan			Active	Highwood Asset Management Ltd. (100%)	2021-07-02	2035-07-02	4,660.94	
173	9321070119	Northwest	Dunvegan			Active	Highwood Asset Management Ltd. (100%)	2021-07-02	2035-07-02	8,787.46	
174	9321070120	Northwest	Dunvegan			Active	Highwood Asset Management Ltd. (100%)	2021-07-02	2035-07-02	4,655.69	
175	9321070121	Northwest	Dunvegan			Active	Highwood Asset Management Ltd. (100%)	2021-07-02	2035-07-02	8,865.24	
176	9321070122	Northwest	Dunvegan			Active	Highwood Asset Management Ltd. (100%)	2021-07-02	2035-07-02	9,020.26	
177	9321070138	Northwest	Dunvegan			Active	Highwood Asset Management Ltd. (100%)	2021-07-02	2035-07-02	6,994.38	
178	9321070139	Northwest	Dunvegan			Active	Highwood Asset Management Ltd. (100%)	2021-07-02	2035-07-02	7,901.16	
179	9321070202	Northwest	Dunvegan			Active	Highwood Asset Management Ltd. (100%)	2021-07-14	2035-07-14	8,943.11	
180	9321070140	Northwest	Dunvegan			Active	Highwood Asset Management Ltd. (100%)	2021-07-02	2035-07-02	9,291.83	
181	9321070141	Northwest	Dunvegan			Active	Highwood Asset Management Ltd. (100%)	2021-07-02	2035-07-02	9,339.88	
182	9321070142	Northwest	Dunvegan			Active	Highwood Asset Management Ltd. (100%)	2021-07-02	2035-07-02	8,609.06	
183	9321070143	Northwest	Dunvegan			Active	Highwood Asset Management Ltd. (100%)	2021-07-02	2035-07-02	7,355.54	
184	9321070144	Northwest	Dunvegan	393800	6205600	Active	Highwood Asset Management Ltd. (100%)	2021-07-02	2035-07-02	9,377.68	
185	9321070145	Northwest	Dunvegan			Active	Highwood Asset Management Ltd. (100%)	2021-07-02	2035-07-02	8,758.03	
186	9321070126	Northwest	Dunvegan			Active	Highwood Asset Management Ltd. (100%)	2021-07-02	2035-07-02	8,862.61	
187	9321070127	Northwest	Dunvegan			Active	Highwood Asset Management Ltd. (100%)	2021-07-02	2035-07-02	8,565.25	
188	9321070128	Northwest	Dunvegan			Active	Highwood Asset Management Ltd. (100%)	2021-07-02	2035-07-02	4,654.06	
189	9321070133	Northwest	Dunvegan			Active	Highwood Asset Management Ltd. (100%)	2021-07-02	2035-07-02	3,417.61	
190	9321070190	Northwest	Dunvegan			Active	Highwood Asset Management Ltd. (100%)	2021-07-12	2035-07-12	8,780.41	
191	9321070191	Northwest	Dunvegan			Active	Highwood Asset Management Ltd. (100%)	2021-07-12	2035-07-12	9,289.01	
192	9321070192	Northwest	Dunvegan			Active	Highwood Asset Management Ltd. (100%)	2021-07-12	2035-07-12	8,676.92	
193	9321070193	Northwest	Dunvegan			Active	Highwood Asset Management Ltd. (100%)	2021-07-12	2035-07-12	9,195.44	
194	9321070194	Northwest	Dunvegan			Active	Highwood Asset Management Ltd. (100%)	2021-07-12	2035-07-12	9,094.87	
195	9321070195	Northwest	Dunvegan			Active	Highwood Asset Management Ltd. (100%)	2021-07-12	2035-07-12	6,107.01	
196	9321070205	Northwest	Dunvegan			Active	Highwood Asset Management Ltd. (100%)	2021-07-14	2035-07-14	7,276.45	
197	9321070206	Northwest	Dunvegan			Active	Highwood Asset Management Ltd. (100%)	2021-07-14	2035-07-14	9,320.68	
198	9321070207	Northwest	Dunvegan			Active	Highwood Asset Management Ltd. (100%)	2021-07-14	2035-07-14	8,218.19	
199	9321070208	Northwest	Dunvegan			Active	Highwood Asset Management Ltd. (100%)	2021-07-14	2035-07-14	9,155.76	
200	9321070209	Northwest	Dunvegan			Active	Highwood Asset Management Ltd. (100%)	2021-07-14	2035-07-14	3,103.71	
201	9321070210	Northwest	Dunvegan			Active	Highwood Asset Management Ltd. (100%)	2021-07-14	2035-07-14	2,781.65	
202	9321080115	Northwest	Dunvegan			Active	Highwood Asset Management Ltd. (100%)	2021-08-05	2035-08-05	8,893.12	
203	9321080116	Northwest	Dunvegan			Active	Highwood Asset Management Ltd. (100%)	2021-08-05	2035-08-05	6,610.99	**285,824.37**
204	9321070154	Northwest	Worsley			Active	Highwood Asset Management Ltd. (100%)	2021-07-09	2035-07-09	9,005.13	
205	9321070136	Northwest	Worsley	412850	6262400	Active	Highwood Asset Management Ltd. (100%)	2021-07-02	2035-07-02	6,898.49	
206	9321080087	Northwest	Worsley			Active	Highwood Asset Management Ltd. (100%)	2021-08-05	2035-08-05	2,667.35	
207	9321080088	Northwest	Worsley			Active	Highwood Asset Management Ltd. (100%)	2021-08-05	2035-08-05	5,009.59	**23,580.56**
208	9321070137	Northwest	Notikewin			Active	Highwood Asset Management Ltd. (100%)	2021-07-02	2035-07-02	9,244.04	
209	9321070134	Northwest	Notikewin			Active	Highwood Asset Management Ltd. (100%)	2021-07-02	2035-07-02	7,706.60	
210	9321070232	Northwest	Notikewin			Active	Highwood Asset Management Ltd. (100%)	2021-07-19	2035-07-19	4,037.27	
211	9321080084	Northwest	Notikewin	397400	6320700	Active	Highwood Asset Management Ltd. (100%)	2021-08-05	2035-08-05	7,745.96	
212	9321080085	Northwest	Notikewin			Active	Highwood Asset Management Ltd. (100%)	2021-08-05	2035-08-05	8,090.50	
213	9321080086	Northwest	Notikewin			Active	Highwood Asset Management Ltd. (100%)	2021-08-05	2035-08-05	8,323.52	
214	9322020033	Northwest	Notikewin			Active	Highwood Asset Management Ltd. (100%)	2022-02-07	2036-02-07	6,487.00	**51,634.89**
215	9321080089	Northwest	Clear Prairie			Active	Highwood Asset Management Ltd. (100%)	2021-08-05	2035-08-05	3,718.86	
216	9321080090	Northwest	Clear Prairie			Active	Highwood Asset Management Ltd. (100%)	2021-08-05	2035-08-05	6,383.38	
217	9321080091	Northwest	Clear Prairie	208050	6284700	Active	Highwood Asset Management Ltd. (100%)	2021-08-05	2035-08-05	8,849.00	
218	9321080092	Northwest	Clear Prairie			Active	Highwood Asset Management Ltd. (100%)	2021-08-05	2035-08-05	9,205.79	
219	9321080093	Northwest	Clear Prairie			Active	Highwood Asset Management Ltd. (100%)	2021-08-05	2035-08-05	8,063.47	
220	9321080114	Northwest	Clear Prairie			Active	Highwood Asset Management Ltd. (100%)	2021-08-05	2035-08-05	4,916.41	**41,136.90**
221	9321070178	Northeast	Keg River			Active	Highwood Asset Management Ltd. (100%)	2021-07-02	2035-07-02	4,686.89	
222	9321070179	Northeast	Keg River	833150	6414800	Active	Highwood Asset Management Ltd. (100%)	2021-07-02	2035-07-02	7,468.38	
223	9321080121	Northeast	Keg River			Active	Highwood Asset Management Ltd. (100%)	2021-08-05	2035-08-05	6,592.19	
224	9321080122	Northeast	Keg River			Active	Highwood Asset Management Ltd. (100%)	2021-08-05	2035-08-05	8,256.82	**27,004.28**
			Number of approved (active) Alberta mineral permits			222			**Total Alberta mineral permit area (ha)**		**1,519,511.93**

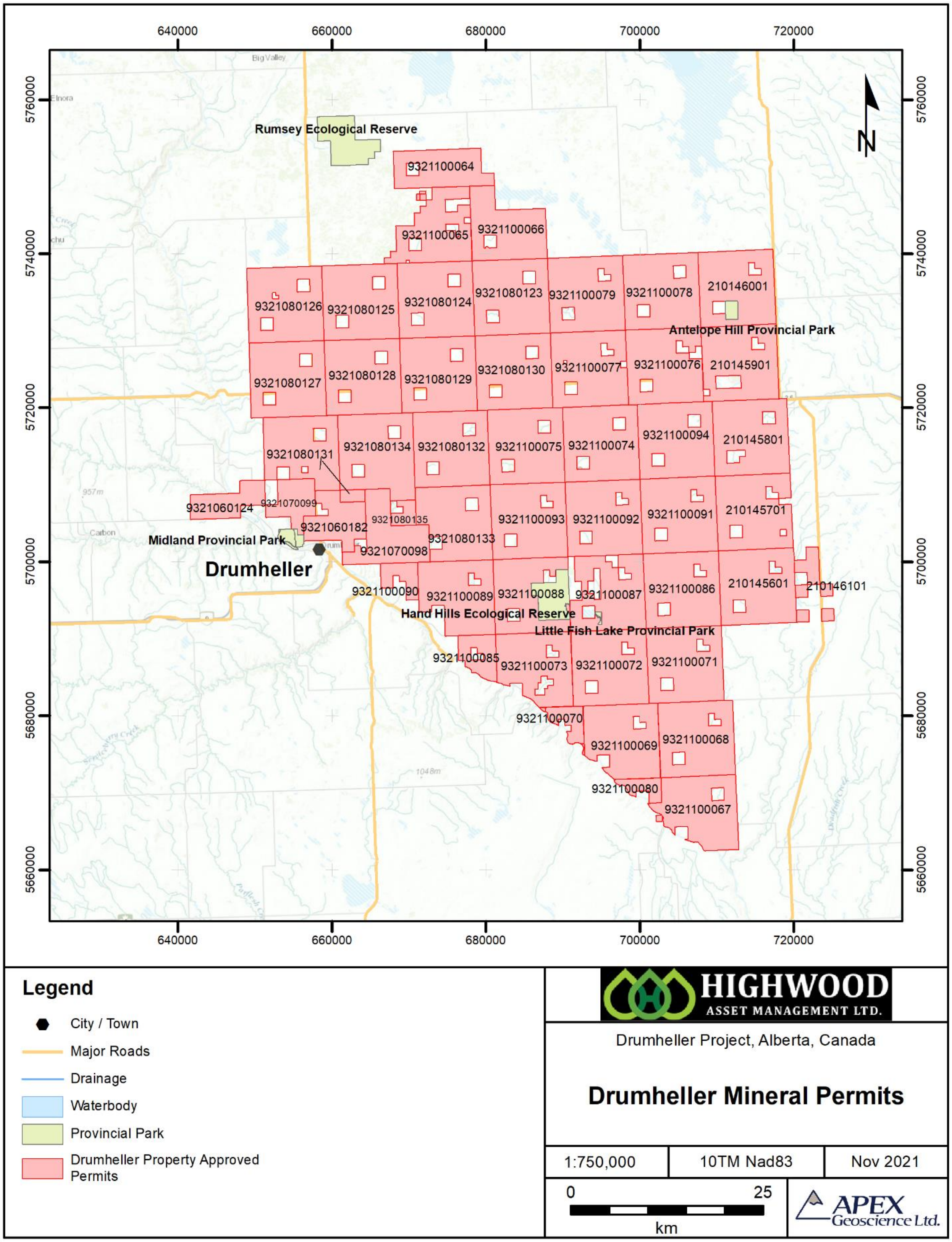
B) British Columbia mineral titles.

No.	Mineral title number	Claim Name	Permit area	SubProperty name	Centroid of SubProperty: Easting (m) [10TM, NAD83]	Centroid of SubProperty: Northing (m) [10TM, NAD83]	Status	Designated representative (% ownership)	Issue Date	Good To Date	Area (ha)	SubProperty area (Ha)
1	1081623	Parkland 1	BC	Parkland			Good	Highwood Asset Management Ltd. (100%)	2021/Mar/11	2022/Mar/11	1,517.06	
2	1081624	Parkland 2	BC	Parkland	294900	6214900	Good	Highwood Asset Management Ltd. (100%)	2021/Mar/11	2022/Mar/11	1,806.86	
3	1081625	Parkland 3	BC	Parkland			Good	Highwood Asset Management Ltd. (100%)	2021/Mar/11	2022/Mar/11	1,807.75	
4	1081626	Parkland 4	BC	Parkland			Good	Highwood Asset Management Ltd. (100%)	2021/Mar/11	2022/Mar/11	1,808.88	**6,940.55**
5	1081694	FSJ 1	BC	Fort St. John	291400	6236500	Good	Highwood Asset Management Ltd. (100%)	2021/Mar/17	2022/Mar/17	1,726.49	
6	1081695	FSJ 2	BC	Fort St. John			Good	Highwood Asset Management Ltd. (100%)	2021/Mar/17	2022/Mar/17	1,079.06	**2,805.55**
7	1081696	Boundary Lake 1	BC	Boundary			Good	Highwood Asset Management Ltd. (100%)	2021/Mar/17	2022/Mar/17	1,738.62	
8	1081697	Boundary Lake 2	BC	Boundary			Good	Highwood Asset Management Ltd. (100%)	2021/Mar/17	2022/Mar/17	1,791.30	
9	1081698	Boundary Lake 3	BC	Boundary			Good	Highwood Asset Management Ltd. (100%)	2021/Mar/17	2022/Mar/17	1,790.12	
10	1081699	Boundary Lake 4	BC	Boundary	307600	6258500	Good	Highwood Asset Management Ltd. (100%)	2021/Mar/17	2022/Mar/17	1,788.80	
11	1081701	Boundary Lake 5	BC	Boundary			Good	Highwood Asset Management Ltd. (100%)	2021/Mar/17	2022/Mar/17	1,733.24	
12	1081702	Siphon 1	BC	Boundary			Good	Highwood Asset Management Ltd. (100%)	2021/Mar/17	2022/Mar/17	1,717.44	
13	1081704	Siphon 2	BC	Boundary			Good	Highwood Asset Management Ltd. (100%)	2021/Mar/17	2022/Mar/17	1,787.18	
14	1081705	Siphon 3	BC	Boundary			Good	Highwood Asset Management Ltd. (100%)	2021/Mar/17	2022/Mar/17	1,787.47	**14,134.17**
									Total BC mineral permit area (Ha)			**23,880.26**

C) Summary of Alberta and British Columbia mineral permits/titles.

	Number		Area (ha)
Approved (active) Alberta mineral permits	222	Total Alberta mineral permit area (ha)	1,519,511.9
Total British Columbia mineral titles	14	British Columbia mineral titles area (ha)	23,880.3
Total mineral permits/titles (Alberta and British Columbia)	**236**	Total Alberta and British Columbia mineral permit/title area (ha)	**1,543,392.2**

Figure 4.2 Drumheller Property mineral permits.



The statutes also provide for conversion of Alberta Permits to Metallic Minerals Leases once a mineral deposit has been identified. Leases are granted for a renewable term of 15 years and require annual payments of $3.50/ha for rent to maintain them in good standing. There are no work requirements for the maintenance of leases, and they confer rights to minerals.

4.3 Royalties and Agreements

Government royalty rates associated with any metallic mineral production in Alberta, as administrated by the Department of Energy, would be subject to 1% gross mine-mouth revenue before payout, and after payout, the greater of 1% gross mine-mouth revenue and 12% net revenue.

The Drumheller Property mineral permits were acquired directly via on-line staking from the Government of Alberta. Consequently, there are no known back-in rights, payments, or other agreements and encumbrances to which the Property is subject.

4.4 Coexisting Oil, Gas and Oil Sands Rights

Rights to metallic and industrial minerals, to bitumen (oil sands), to coal and to oil/gas are regulated under separate statutes, which collectively make it possible for several different 'rights' to coexist and be held by different grantees over the same geographic location.

4.5 Surface Rights

Prospecting for Crown minerals using hand tools is permitted throughout Alberta without a licence, permit, or regulatory approval, if there is no surface disturbance. Prospecting on privately owned land or land under lease is permitted without any departmental approval. However, the prospector must obtain consent from the landowner or leaseholder before starting to prospect.

When prospecting, the prospector can use a vehicle on existing roads, trails, and cutlines. If the work is on public land, the prospector can live on the land in a tent, trailer, or other shelter for up to 14 days. For periods longer than 14 days, approval should be obtained from the Land Administration Division. If the land is privately owned or under lease, the prospector must formulate arrangements with the landowner or leaseholder.

4.6 Brine Access Agreements

With respect to brine access agreements, Highwood does not own or operate any subsurface reservoir leases or deep subsurface well(s) and equipment that is capable of pumping brine from Devonian to Precambrian aquifer depths to the surface for testing. Highwood has no plans to convert their mineral permits to reservoir leases, drill their own well(s) to >1,500 m depth, or purchase a petro-company along with the petro-companies oil and gas infrastructure, leases, permits, and licence approvals.

Highwood is therefore reliant on existing petro- or geothermal-operators to gain access to brine to conduct early-stage exploration work that involves brine assay testing and/or mineral processing technological test work. In Alberta, access to Devonian or older brine is usually acquired through a request to, and/or an agreement with, the petro-operator.

To date, Highwood has sampled brine from 5 of the Company's 28 sub-properties. A formal brine access agreement between Highwood and an active petro-operator producing petroleum from Devonian-aged fields/pools at the Drumheller Property was reviewed by the QP. The agreement, which was executed on May 25, 2021, permits access to deep subsurface brine via active oil and gas infrastructure for the purpose of analyzing and testing the samples offsite. Highwood has also been permitted brine access for early exploration stage test work via verbal agreements formed between the Company and individual petro-operators. None of the agreements – documented or verbal – include stipulations related to any potential future operation of a commercial Li-brine facility.

4.7 Environmental Liabilities, Permitting and Significant Factors

The author has not documented environmental liabilities as they pertain to the oil and gas leases and licences and petroleum production, which are owned and operated by petro-operators under the conditions of their lease. Environmental aspects of oil and gas are regulated by the AER – who review energy-related land management, air quality, water management, wildlife protection, consultation, etc. in accordance with their respective legislation (e.g., Alberta: *Environmental Protection and Enhancement Act*, *Public Lands Act*, and the *Water Act*).

Environmental licences, factors, and issues – as they pertain to minerals exploration – are administered by Alberta Environment and Parks (AEP). Before companies proceed with exploration and development, they will be made aware of any environmental concerns in their area of interest. All applications for metallic mineral exploration are referred to relevant departments for review. The departments will assess potential or existing environmental concerns on the land outlined in the application.

If Highwood conducts an exploration program with ground disturbance, the program would be subject to all sensitive species guidelines that are in place for the Drumheller Property area and are subject to specific restrictions (Alberta Government, 2013). Sensitive species in the Drumheller Property area include burrowing owl range (SHA 0098 01), sensitive raptor range (SHA 0103 01), and sharp-tailed grouse (SHA 0104 01).

The Rumsey Ecological Reserve (33.5 km^2) and Midland Provincial Park (6.3 km^2) occur directly adjacent to the north and southwest parts of the Property. The Hand Hills Ecological Reserve (22 km^2) and Little Fish Lake Provincial Park (1.1 km^2) are situated within the south-central part of the Property and the Antelope Hill Provincial Park (3.8 km^2) is within the northeast corner of the Property. All mineral activities are reserved from disposition in these areas.

With respect to exploration permits, in Alberta, a permit is required for exploration activities that involve any work on a permit that disturbs the surface by any mechanical means including drilling, trenching, excavating, blasting, construction or demolishment of a camp or access, induced polarization surveys using exposed electrodes and site reclamation (e.g., drilling). Hence, permitting is not required for non-surface disturbances such as brine sampling for lithium exploration.

Highwood's Li-brine Alberta properties represent an early-stage exploration project. To the best of the author's knowledge, there are no other significant factors and risks that may affect access, title or right, or ability to perform minerals exploration work at this stage of the project, which includes brine sampling for assay and mineral processing test work.

4.8 Property-Related Risks and Uncertainties and Mitigation Strategies

As with any early-stage exploration project there exists potential risks and uncertainties. Highwood will attempt to reduce risk/uncertainty through effective project management, engaging technical experts, and developing contingency plans.

Because Highwood is reliant on pre-existing oil and gas wells that are managed and operated by current petro-companies, there is some risk associated with a dependency on the petro-operation and continued brine access. It is possible that situations could arise where the petro-companies shut down well production – for example – due to poor commodity prices, depletion of petroleum product reserves, and/or production well performance of the reservoir. As a mitigation strategy, Highwood could permit and drill their own wells or consider options such as purchasing the well, renting the operation of the well, etc.

It is assumed by the QP that the Li-brine underlying the protected areas could be extracted because the brine is situated within an expansive, stratigraphically deep, aquifer and the liquid resource would essentially be extracted via lateral drawdown (i.e., in the same fashion that petroleum is extracted). However, it is recommended that Highwood clarifies this with the Alberta Energy Regulator in advance of any potential future production scenario.

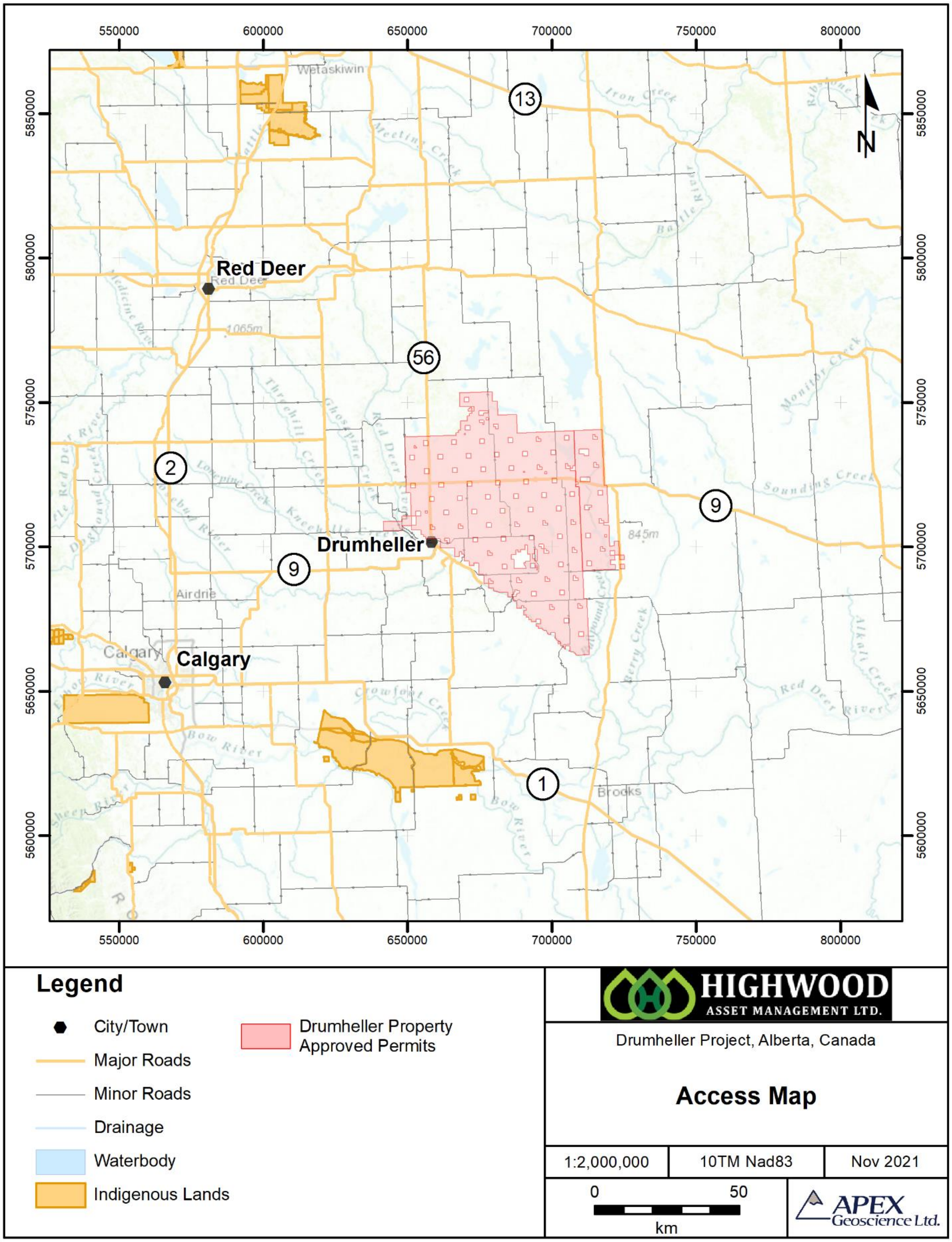
5 Accessibility, Climate, Local Resources, Infrastructure and Physiography

5.1 Accessibility

The Property is located directly adjacent to the Town of Drumheller, AB, a Town of approximately 8,000 persons situated on the Red Deer River in the badlands of south-central Alberta, Canada (Figure 5.1).

Drumheller is located 110 km northeast of Calgary. The Town Drumheller is an intriguing tourist destination to visit the Canadian Badlands, learn about dinosaurs at the world-famous Royal Tyrrell Museum, is a part of the Hoodoo Trail and the Dinosaur Trail, and offers plenty of hiking and other outdoor activities across its dramatic landscape.

Figure 5.1 Access to the Drumheller Property.



The closest international airport to Town of Drumheller is from the City of Calgary International Airport (YYC). The driving distance from Calgary to Drumheller is 135 km and takes approximately one hour and thirty minutes. Specific direction from Calgary to Drumheller including Highway 2 (Deerfoot Trail) north out of the city → Township Road 566 east → Highway 9 north and east into Drumheller. From central Alberta (e.g., City of Edmonton), the quickest route is Highway 14 east → Highway 21 south that merges with Highway 53 → Highway 56 south to Drumheller.

Highwood's Drumheller Property is easily accessed via major and secondary access routes; this includes any individual oil and gas wells or facilities within the sub-properties. The roads are well-maintained either by the province, or by the petro-operators that own the lease. Access is year-round. Active petroleum lease regions are often monitored with private security forces that monitor, for example, speed, load-requirements, and access permissions. There are no temporal accessibility restrictions and exploration can be conducted year-round.

5.2 Climate

Alberta has a continental climate, with more sunshine than any other Canadian province. Winters are dry, sunny, and cold. Summers are moderately short and warm. The distribution of seasonal precipitation is an extreme variable ranging from about 250 mm in grassland regions to slightly less than 700 mm in humid warm regions of the Prairies.

Drumheller has a semi-arid climate (BSk; Figure 5.2). The highest temperature ever recorded in Drumheller was 40.6 °C on 18 July 18, 1941. The coldest temperature ever recorded was −43.9 °C on January 29, 1996. Summer (June to August) and winter (November to February) average between 22 °C and 27 °C, and -3 °C to -6 C, respectively. Average rainfall and snowfall per year is 301 mm and 71 mm, respectively.

Figure 5.2 Drumheller normal climate data from 1981-2010 (extremes are reported in brackets from 1923 to present). Source: Environment Canada.

Climate data for Drumheller, 1981−2010 normals, extremes 1923−present [hide]													
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Record high °C (°F)	15.5 (59.9)	18.0 (64.4)	28.0 (82.4)	33.9 (93.0)	37.0 (98.6)	39.4 (102.9)	40.6 (105.1)	38.1 (100.6)	37.2 (99.0)	33.3 (91.9)	25.9 (78.6)	17.3 (63.1)	40.6 (105.1)
Average high °C (°F)	−6.0 (21.2)	−0.4 (31.3)	3.7 (38.7)	12.9 (55.2)	18.4 (65.1)	22.1 (71.8)	26.7 (80.1)	26.1 (79.0)	20.0 (68.0)	13.2 (55.8)	3.1 (37.6)	−2.5 (27.5)	11.4 (52.5)
Daily mean °C (°F)	−12.3 (9.9)	−7.5 (18.5)	−2.7 (27.1)	5.9 (42.6)	11.5 (52.7)	15.8 (60.4)	19.4 (66.9)	18.3 (64.9)	12.5 (54.5)	5.9 (42.6)	−3.0 (26.6)	−8.8 (16.2)	4.5 (40.1)
Average low °C (°F)	−18.6 (−1.5)	−14.6 (5.7)	−9.2 (15.4)	−1.1 (30.0)	4.5 (40.1)	9.4 (48.9)	12.0 (53.6)	10.4 (50.7)	4.9 (40.8)	−1.4 (29.5)	−9.1 (15.6)	−15.1 (4.8)	−2.3 (27.9)
Record low °C (°F)	−43.9 (−47.0)	−41.4 (−42.5)	−37.8 (−36.0)	−26.7 (−16.1)	−9.4 (15.1)	−2.8 (27.0)	−2.8 (27.0)	−6.7 (19.9)	−11.7 (10.9)	−22.5 (−8.5)	−35.1 (−31.2)	−42.8 (−45.0)	−43.9 (−47.0)
Average precipitation mm (inches)	12.3 (0.48)	10.2 (0.40)	15.0 (0.59)	25.7 (1.01)	47.7 (1.88)	69.3 (2.73)	64.4 (2.54)	51.4 (2.02)	41.2 (1.62)	13.4 (0.53)	11.2 (0.44)	10.4 (0.41)	372.1 (14.65)
Average rainfall mm (inches)	0.0 (0.0)	0.1 (0.00)	1.5 (0.06)	20.5 (0.81)	43.6 (1.72)	69.3 (2.73)	64.4 (2.54)	51.0 (2.01)	40.5 (1.59)	9.7 (0.38)	1.1 (0.04)	0.0 (0.0)	301.7 (11.88)
Average snowfall cm (inches)	12.2 (4.8)	10.1 (4.0)	13.5 (5.3)	5.2 (2.0)	4.0 (1.6)	0.0 (0.0)	0.0 (0.0)	0.4 (0.2)	0.7 (0.3)	3.8 (1.5)	10.1 (4.0)	10.4 (4.1)	70.5 (27.8)

5.3 Infrastructure

The traditional focus of Canada's petroleum production has been the Western Canada Sedimentary Basin (WCSB), which stretches from northeast British Columbia, across most of Alberta, the southern portions of Saskatchewan to Manitoba, and a small portion of the Northwest Territories (Figure 5.3). Apart from nuclear energy (i.e., uranium production), Alberta is Canada's energy resource leader with a diverse abundance petro-products that include crude oil, coal, nuclear energy, renewable energy, natural gas (Figure 5.4).

Since the discovery of oil in Alberta on February 13, 1947, in what became to be known as the Devonian Winterburn Group, Nisku Formation, Alberta has undergone over 70-years of infrastructure development in relation to petro-development and -production. As a result, Alberta represents one of the largest hydrocarbon infrastructure development areas in North America.

Critical infrastructure includes pipeline transport, rail, water, and roads. Pipelines are a critical part of Canada’s oil and natural gas transportation infrastructure. Transport of petroleum product via pipelines represents the safest and most efficient way to move large volumes of oil and natural gas from development areas to refineries, petrochemical plants, to homes and businesses, and for export.

Rail complements pipeline transport capacity and provides an alternative for markets without pipeline connections and allows producers the flexibility to move products to different markets in response to demand. In recent years, rail transport of oil has grown as an alternative mode of product transportation to accommodate oil production growth that has exceeded available pipeline capacity. In the first half of 2019, about 237,000 barrels per day (b/d) of oil was moved by rail (Canadian Association of Petroleum Producers, 2021).

With respect to road infrastructure, various oil booms over the 7 plus decades of Alberta’s oil and gas production have made it easier for governments to build roads in relation to, and to support, the energy industry. Today, nearly a quarter of Canada's total roadway infrastructure has been built in Alberta — some 473,000 km of single-lane equivalent roads. All the wells referenced in this technical report are road accessible by means of Provincial multi-lane highways, single lane highways, and year-round secondary roads.

The energy industry has the relevant infrastructure and personnel in place to continually manage the petro-operations, which include pumping the brine from depths of >1,500 m below the surface, processing the petroleum product, and pumping the brine back down into the subsurface reservoir. Accordingly, the Drumheller project area has sufficient power, mining personnel, processing facilities, leases, permits/licences, etc. if Highwood were ever to advance the project to a trial-mining, or commercially viable operation.

Figure 5.3 Oil and gas well distribution in the Western Canada Sedimentary Basin. Source: Energy Consulting Group (2021).

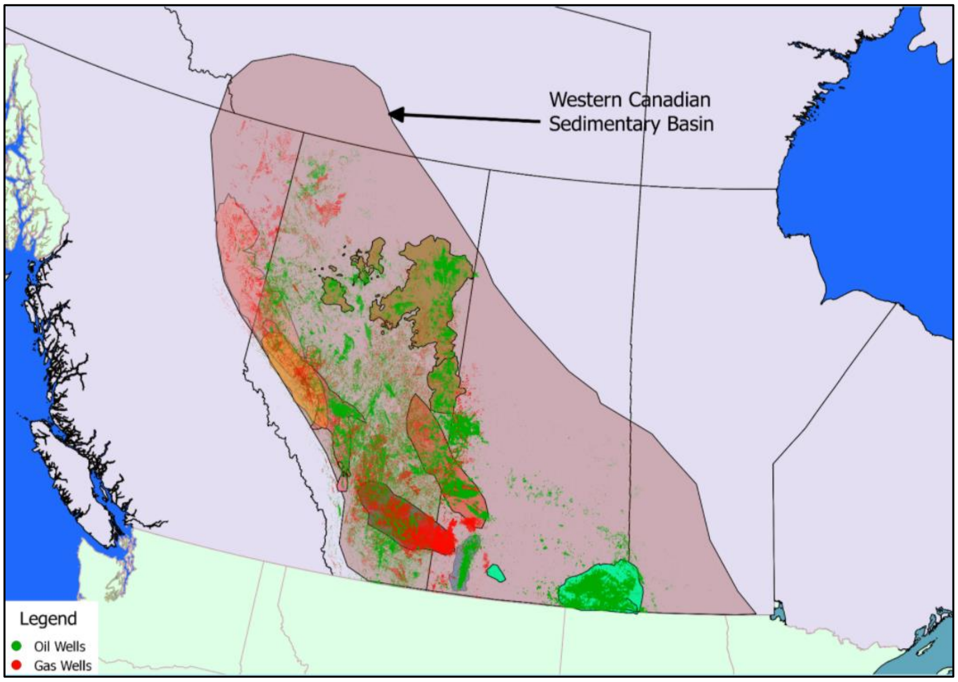
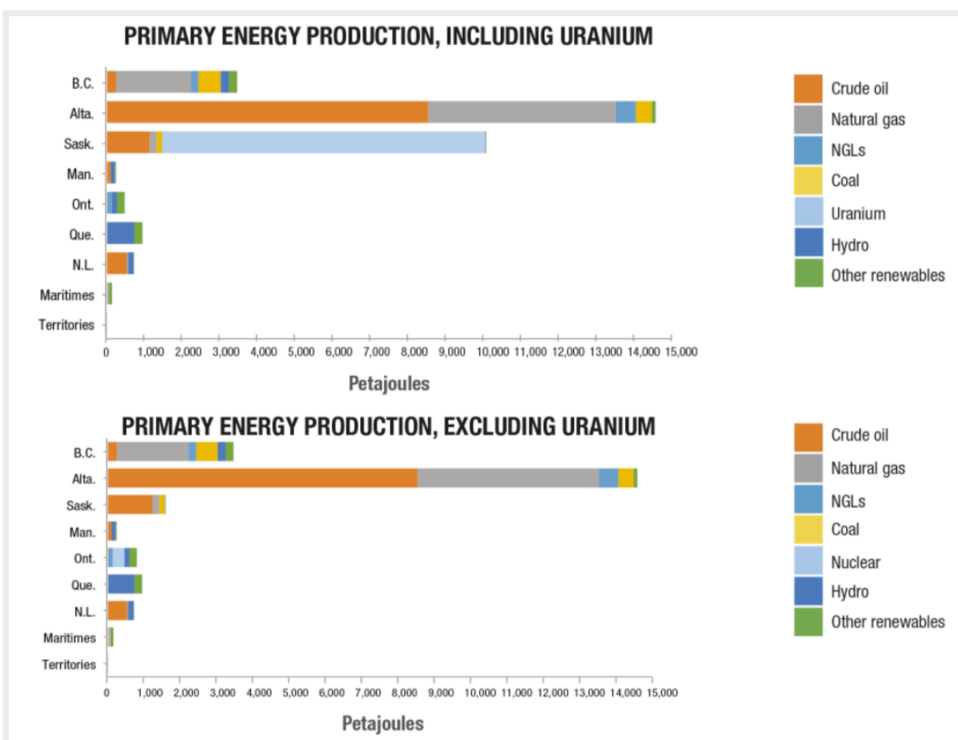


Figure 5.4 Canada’s energy production by region and source. Source: Government of Canada (2020).



5.4 Local Resources

Drumheller was once the largest coal producing city in western Canada, with the Atlas Coal Mine. The mine operated between 1936 to 1979 and Drumheller boomed until the end of the Second World War when coal lost some of its value. Coal mining was eventually replaced by energy development, including natural gas and oil. Drumheller has Alberta's second largest natural gas field, the West Drumheller Field. In 2018 and 2019,

- Canada's energy sector directly employed more than 282,000 people and indirectly supported over 550,500 jobs.
- Canada's energy sector accounted for over 10% of the nominal Gross Domestic Product. Government revenues from energy were over $17.9 billion in 2018.
- More than $1.1 billion was spent on energy research, development, and deployment by governments in 2018-19 (Government of Canada, 2020).

Drumheller is now planning to transition away from fossil fuels and emphasize renewable energy sources, such as wind power, in its economy. Amid global efforts to transition away from fossil fuel, Alberta is challenged to find jobs for petro-workers but also to carve out a future in a low-emissions world that supports employment and communities for decades to come. Hence the development of a co-product, or new, industry such as extracting lithium from oilfield wastewater, could extend the life of mature oilfields and provide new green renewable products, that could help put thousands of petro-workers back to work while helping to develop a future low-emission world.

5.5 Site Topography, Elevation and Vegetation

In broad terms, the Drumheller area is situated predominantly within Plain's region of the WCSB in a sub-region called the Grassland Natural Region. The Grassland Natural Region in southern Alberta is defined by flat to gently rolling landscapes. Most of the region is defined by cropland that provides some of the most productive land in Alberta for farming and ranching. Only 1-2% of the natural region is covered by water (major rivers or small, shallow lakes).

About 125 (25%) of Alberta's rare vascular plant species occur in the Grassland Natural Region, and about 55 of these are restricted to this region. Wildlife includes fox, sage-grouse, mountain plover, painted turtle, short-horned lizard, western rattlesnake, and ground rodents (gopher, badger).

Along the Red Deer River system, the Badlands are characterized by a dry terrain where softer sedimentary rocks are extensively eroded forming a very large number of deep drainage channels, separated by short, steep ridges (interfluves) with ravines, gullies, buttes, hoodoos, and other interesting geologic forms.

5.6 Operating Season

Highwood's Drumheller Property Li-brine project is an early-stage exploration project. Access to Li-brine for assay work and mineral processing test work is dependent on brine access agreements with petro-operators at their various sub-properties. Consequently, and with respect to length of operating season and relevant infrastructure, the oil and gas energy industry in Alberta represents a 70-year plus established industry. The length of the oil and gas operating season is year-round. All road access to oil and gas facilities and individual wells are maintained year-round. Hence there are no time restrictions on when Highwood could collect brine for test work.

6 History

Highwood's sub-properties were acquired to assess their Li-brine potential. The lithium-enriched brine is historically known to occur in Devonian or older oil and gas reservoirs, or aquifers, that include, for example, the Elk Point Group (Winnipegosis Formation), Beaverhill Lake Group (Swan Hills Formation), Woodbend Group (Leduc Formation), and Winterburn Group (Nisku Formation).

The brine is accessible because it is pumped to the surface as waste material associated with oil and gas production. Highwood and other companies interested in testing deep-seated, confined aquifer Li-brine are therefore reliant on being able to access brine that is produced by the energy companies (unless of course the future economics are such that a mineral exploration company can fund energy-type drilling programs that is capable of penetrating to depths of 1,500 m or greater).

Accordingly, the intent of this history section is to 1) summarize the oil and gas infrastructure and well status at the Drumheller Property, and 2) provide an historical evaluation of the geochemical lithium concentrations of the deep aquifer brine at Highwood's Drumheller Property.

6.1 Summary of Oil and Gas Wells in Highwood's Permit Areas

This section presents an historical overview of the oil and gas wells in the vicinity of Highwood's Drumheller Property. Regional information presented adjacent to Highwood mineral permits is included for regional context. In the case of energy- or mineral-focused exploration work that was conducted on neighboring properties not belonging to Highwood, the QP has been unable to verify the information, and accordingly, this information is not necessarily indicative to the mineralization on the Highwood mineral permits that are the subject of the Technical Report.

6.1.1 Well Data Acquisition Methodology

The oil and gas wells presented and discussed in this sub-section were acquired during April-May 2021 via AbaData (version 2.0), an oil and gas mapping software tool. With respect to deep-seated lithium-enriched brine aquifers, the compilation placed emphasis on Devonian and older strata using the following methodology, which is also displayed graphically in Figure 6.1:

1. APEX created a single 3-D geological polygon representative of all strata located between the top of Devonian and top of the Precambrian basement in MicroMine.

   The polygon was extended horizontally throughout Alberta (where the strata is present); vertically, the polygon includes all strata of Devonian age and older).

   The top Devonian and top Precambrian grid files were acquired from the Alberta Geological Survey's 3-D provincial geological framework model of Alberta (Alberta Geological Survey, 2019).

2. Individual end of well x,y,z spatial coordinates and elevations were inserted into the 3-D model. The end of well elevation used the Total Vertical Depth (TVD) of the well, or the Vertical Depth (VD) if the TVD was not included or listed as "zero" in the AbaData dataset.

3. All wells that had end of well elevations plotting above the top of the Devonian surface were clipped out of the dataset. The remaining wells included all holes that plot between the top of the Devonian and the top of the Precambrian. These wells are referred to in the figures in this section as Devonian-Precambrian wells.

Most of the Devonian-Precambrian wells focus on select set of world-class hydrocarbon-bearing units that include, from stratigraphic top to bottom:

- Upper Devonian: Wabamun Group dolomitic limestone and calcareous dolomite, Winterburn Group (Nisku Formation carbonate reefs), and Woodbend Group (Leduc Formation carbonate reefs)

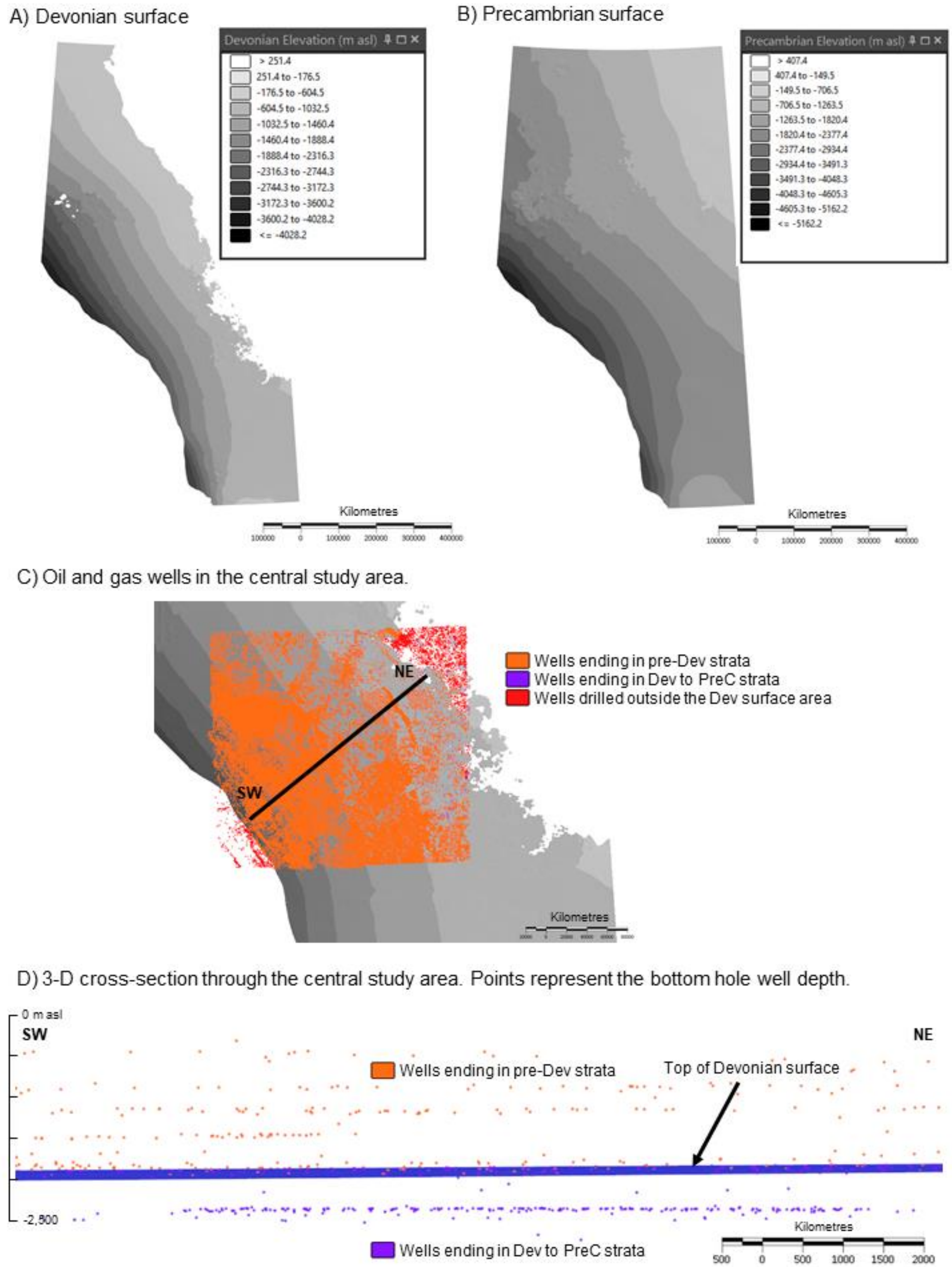
- Middle to Upper Devonian: Beaverhill Lake Group (Swan Hills carbonate reef)

- Middle Devonian: Elk Point Group (Keg River Formation)

- Cambrian to Devonian: Granite Wash fluvial deltaic sandstone, Gilwood arkosic sandstone (see Section 7.0, Geological Setting).

The authors did not review the individual wireline geophysical log information to confirm the end of well stratigraphic horizon nomenclature. The methodology used to select the Devonian-Precambrian wells did include some pre-Devonian wells (e.g., Mississippian Pekisko Formation; Permo-Triassic strata; and Cretaceous Mannville Formation). This is likely a result of the coarse density of the top of Devonian surface grid created by the Alberta Geological Survey and/or misidentification of the strata in the well log, etc. In these instances, the author left the errant data picks in the historical Devonian-Precambrian dataset as the data are only used as a historical reference.

Figure 6.1 Summary of the workflow used to acquire Devonian to Precambrian wells in the Highwood permit areas. A grid of the top of the Devonian (A) and Precambrian surface (B), and oil and gas wells (C) were imported into a 3-D model (D). All wells penetrating to depths below the top horizon of Devonian strata were selected for this study.



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6.1.2 Oil and Gas Well Data Summary for Within the Highwood Property

The senior author has reviewed the well data within the boundaries of the Drumheller Property using the data acquisition strategy disclosed in Section 6.1.1.

The total number of wells – regardless of reservoir depth (or producing reservoir age) – is 5,175 wells. Of these 3,675 wells are of Devonian age or older, and therefore, of interest to Highwood (Figure 6.2). The well status of the petroleum wells is provided by the operator to the Alberta Energy Regulator. The well status of the 3,675 Devonian or older wells is presented in Figure 6.3 and summarised as follows:

- 1,470 wells are abandoned.
- 1,108 wells are active.
- 744 wells are suspended.
- 264 wells are water-related (source, injection, or disposal).
- 89 wells are drilled and cased.

Oilfields within the Drumheller Property – with their general producing unit(s) – include Delia (Banff-Upper Mannville-Ellerslie production), Rowley (Mannville, Pekisko, Viking production), Ghost Pine (Leduc, Nisku, Pekisko, Ellerslie, Mannville, Belly River, Viking production), Wayne-Rosedale (Nisku, Banff, Mannville, Pekisko, Ellerslie, Viking production), Aerial (Mannville, Viking production), Connorsville (Ellerslie, Mannville, Viking production), Coyote (Mannville, Ellerslie production), Watts (Banff, Mannville, Viking production), Michichi (Banff, Mannville, Viking production), Dowling Lake (Banff, Mannville production), and Craigmyle (Banff, Ellerslie, Mannville, Viking, Edmonton production) fields. Current Devonian-aged reservoir production is in the Ghost Pine (Nisku and Leduc production production) and Wayne-Rosedale (Nisku production production) oilfields, which are in the southwest corner of the Property.

A summary of the pipeline network in the Drumheller Property area is presented in Figure 6.4 with brine flow highlighted in blue. Not surprisingly, the key brine pipeline infrastructure occurs in the west part of the Property within the Ghost Pine and Wayne-Rosedale oilfields.

A summary of the current petro-companies operating in the Drumheller Property area is presented in Figure 6.5. Petro-companies in the Ghost Pine oilfield include Bearspaw Petroleum Ltd., BP Canada Energy Group ULC, Prairie Provident Resources Canada Ltd., Pine Cliff Energy Ltd., Canadian Natural Resources Limited, etc. Petro-companies in the Wayne-Rosedale oilfield include Bearspaw Petroleum Ltd. followed several other companies such as Taga North Ltd., Repsol Oil & Gas Canada Inc., BP Canada Energy Group ULC, Surge Energy Inc., Husky Oil Operations Limited, etc.

Figure 6.2 Oil and gas wells in the Drumheller Property area with Devonian wells highlighted in red circles.

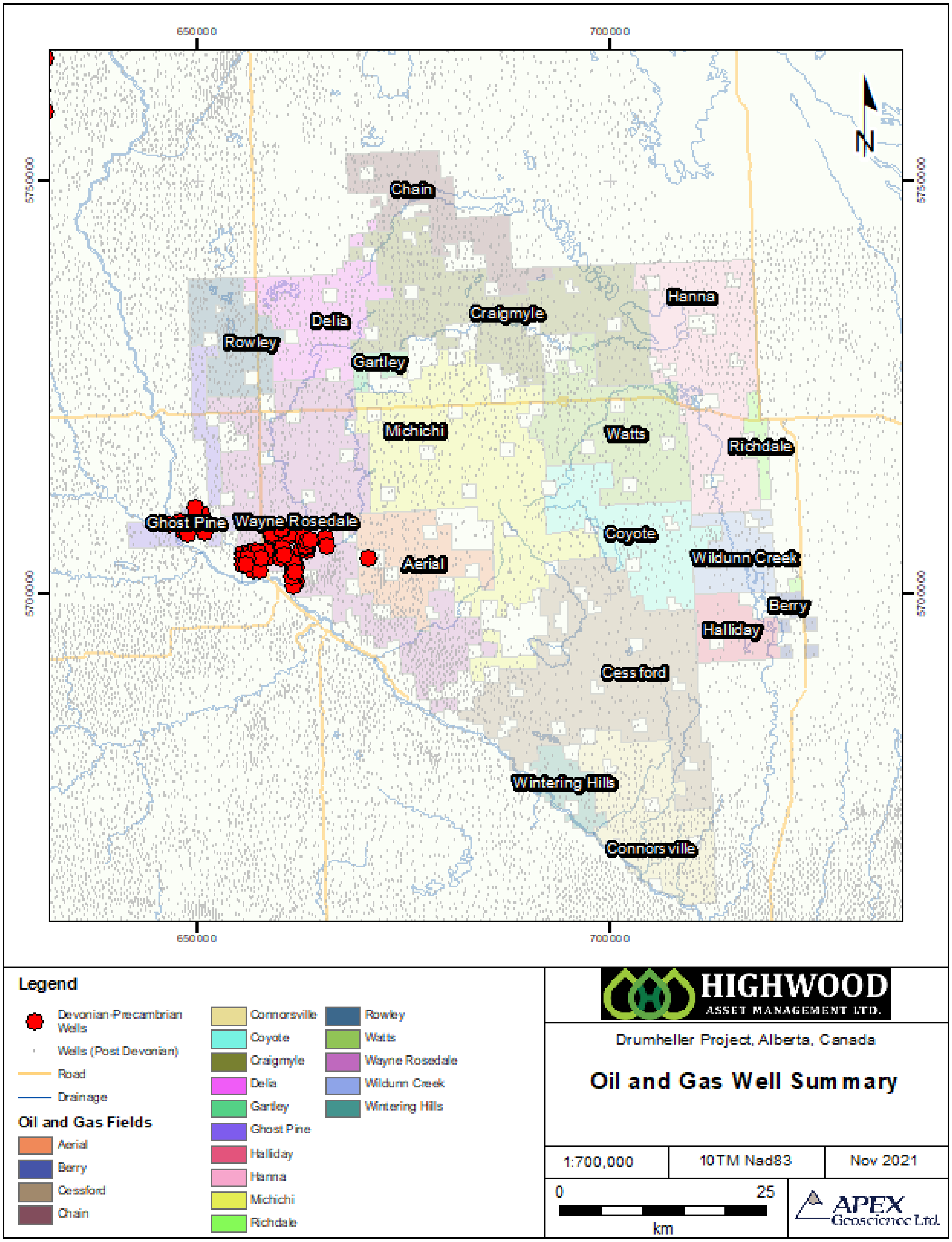

Figure 6.3 Well status of Devonian-aged oil and gas wells at the Drumheller Property.

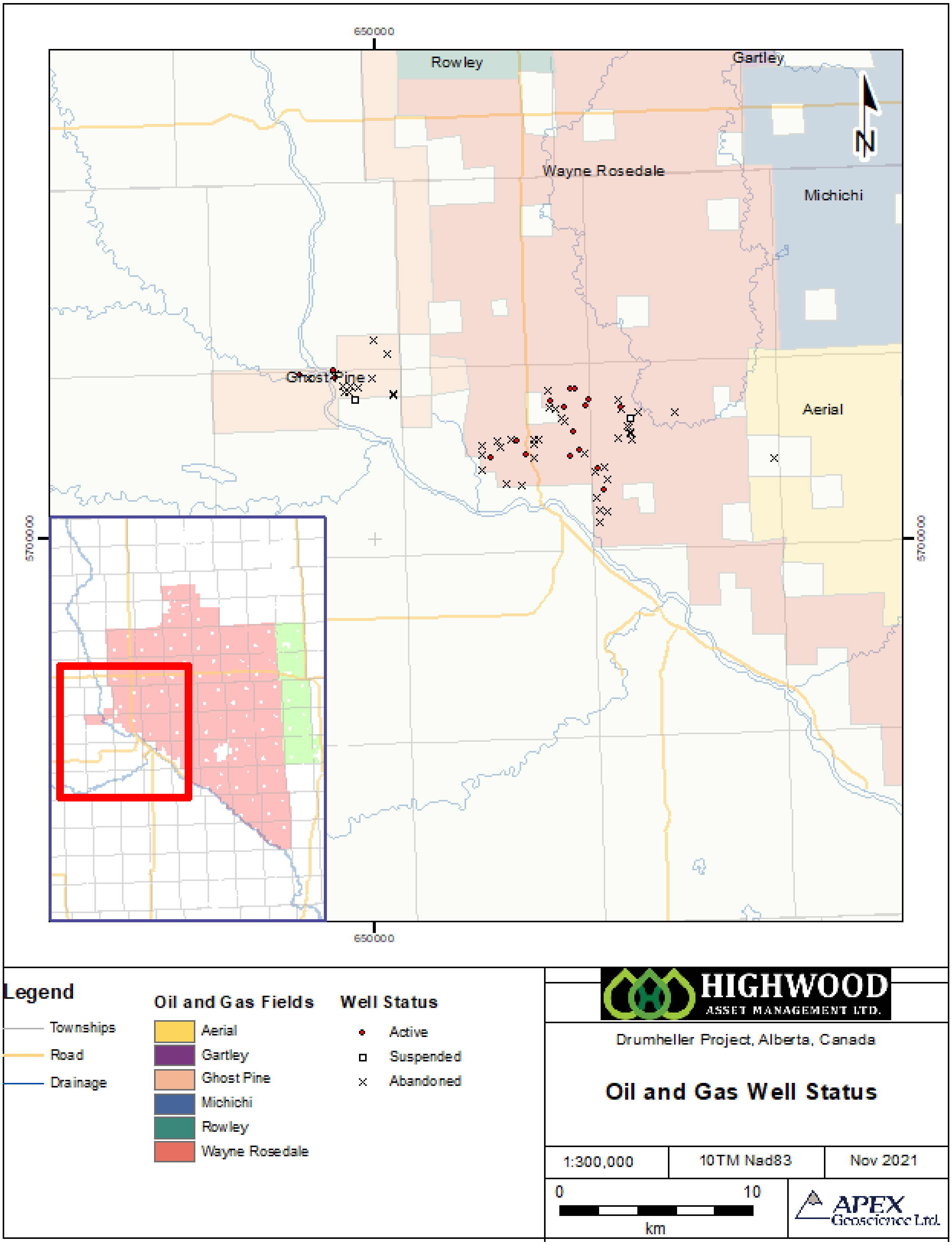

Figure 6.4 Summary of the pipeline network in the Drumheller Property area with brine flow highlighted in blue.

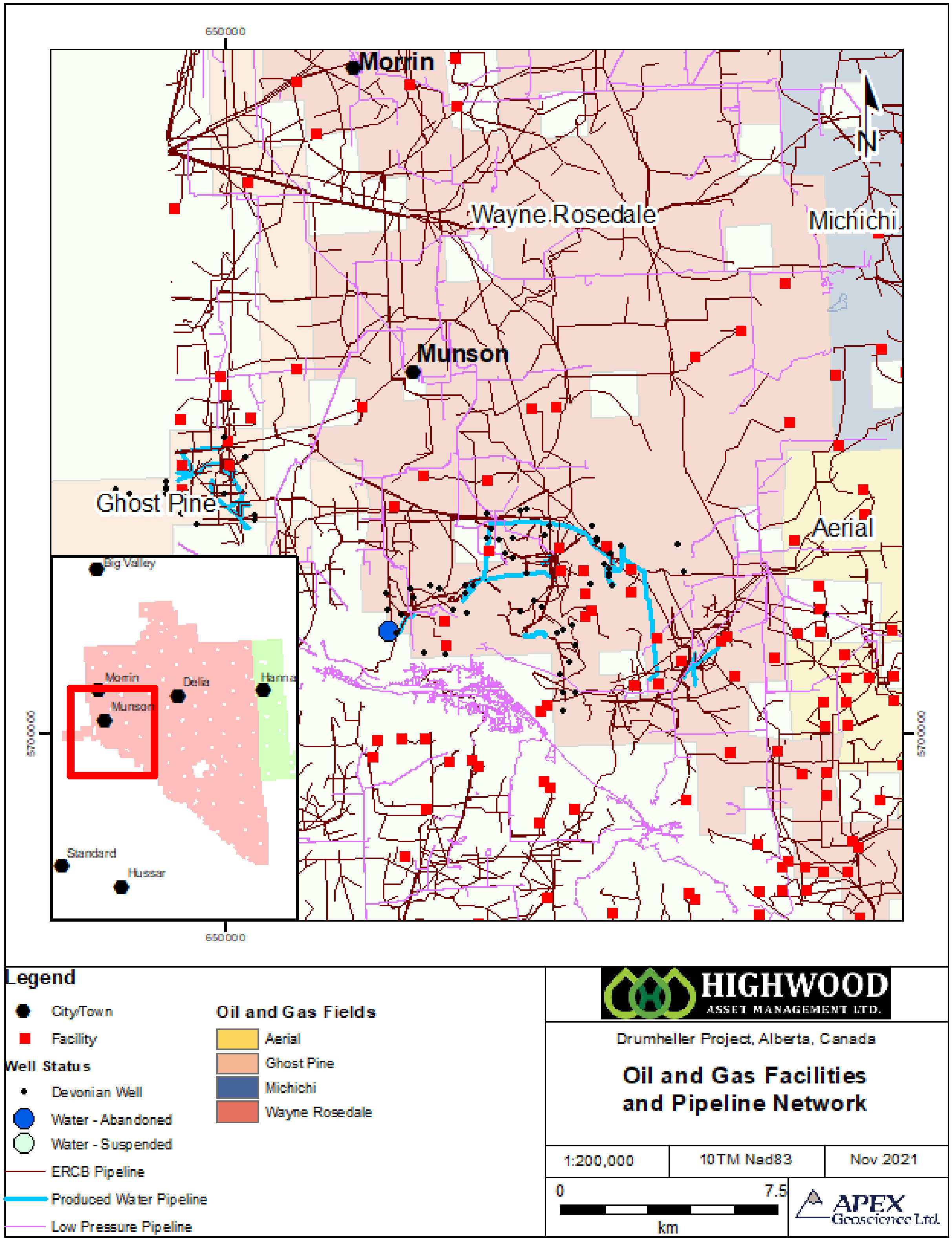

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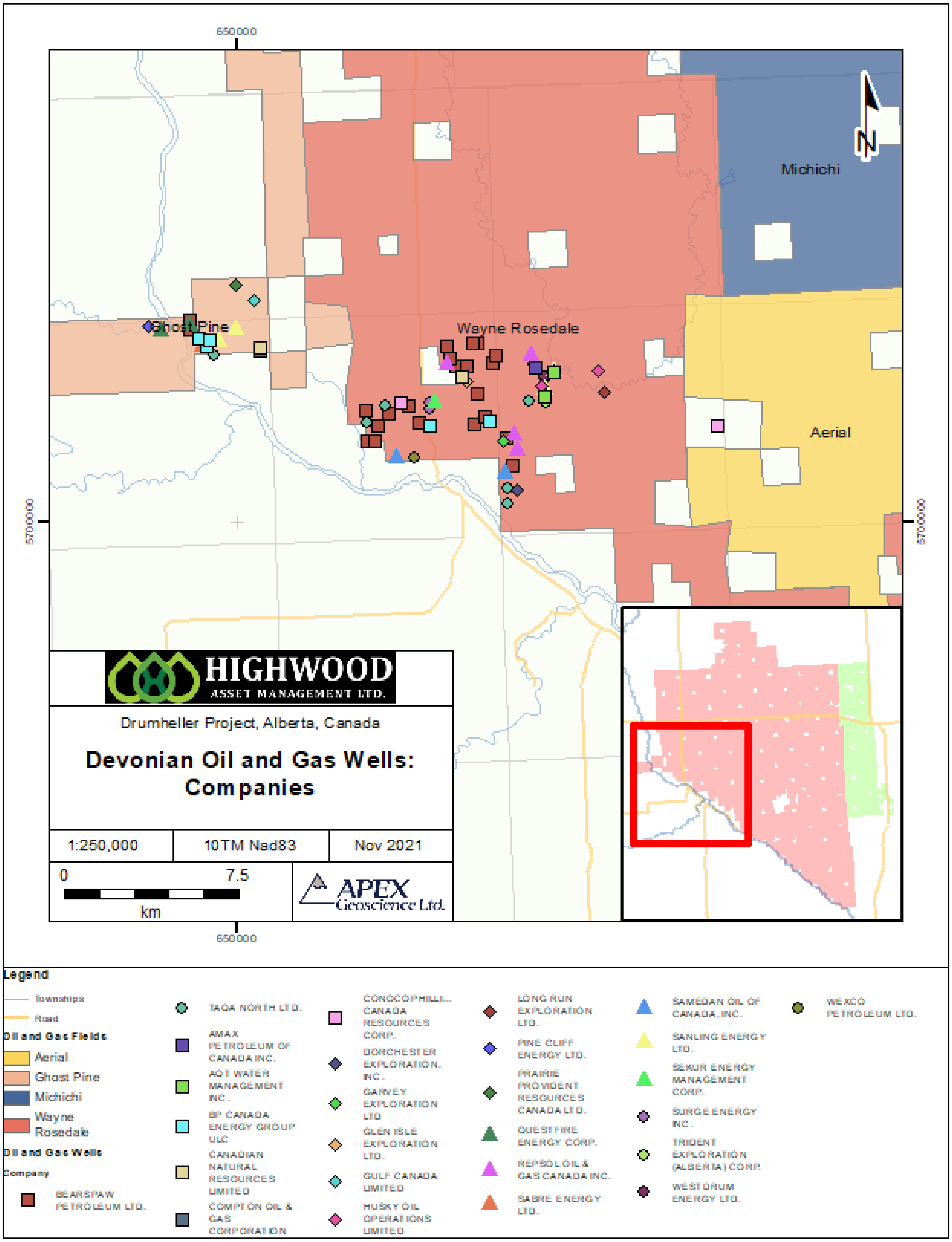
Figure 6.5 Summary of oil and gas companies in the Drumheller Property.



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6.2 Historical Lithium Geochemical Summary

The fluid geochemical data presented in this sub-section are from publicly available well data that were 1) submitted to the AER and are made available via various third-party oil and gas database companies, and 2) created and/or compiled in various government reports (e.g., Hitchon et al., 1995; Eccles and Jean, 2010; Eccles and Berhane, 2011; Huff et al., 2011, 2012, 2019; Huff 2016, 2019; Lopez, 2020).

The first comprehensive overview of Alberta's mineral potential from subsurface formation water was compiled by the Government of Alberta (Hitchon et al., 1995). These authors compiled nearly 130,000 analyses of brine across Alberta (e.g., Hitchon et al., 1971; 1989; Connolly et al., 1990a,b and unpublished detailed analyses collected by the Government of Alberta). Hitchon et al. (1995) showed the highest concentrations of Li in formation water occurred within the Beaverhill Lake (Swan Hills) and/or Woodbend (Leduc) aquifers: 130 mg/L and 140 mg/L, respectively (Note: one mg/L is equal to one ppm).

In 2010, an expanded Li-brine dataset (n=1,511 analyses) was used to show Li-brine anomalies throughout Alberta (Eccles and Jean, 2010). Of the 1,511 analyses, 19 analyses/wells contained >100 mg/L Li (up to 140 mg/L), all of which were sampled from within the Middle to Late Devonian carbonate complexes. The distribution of lithium occurrences in Alberta from Eccles and Jean (2010) is presented with an overlay of Highwood's sub-properties in Figure 6.6. Note: The historical Li-brine data results presented in Figure 6.6 include Li-brine anomalies that occur outside of Highwood's properties. In these instances, the QP has been unable to verify the information, and accordingly, this information is not necessarily indicative to the lithium mineralization that occurs within the Devonian to Precambrian aquifers situated beneath Highwood's mineral permits that are the subject of the Technical Report.

A recent government compilation by Lopez et al. (2020) has been evaluated by the senior author with respect to the Drumheller Property, the results of which are presented in Figure 6.7 and Table 6.1. A total of 20 water samples have been historically collected within the Property with only 4 of the 20 brine samples being derived from Devonian-aged aquifers including the Nisku Formation (n=1 samples) and the Leduc Formation (n=3 samples). The remaining 16 water samples are from stratigraphically younger aquifers that are not known for the lithium content including the Carboniferous Banff, Cretaceous Mannville and Viking formations, and ground water samples.

The historical Devonian brine samples include:

- Three Leduc Formation brine samples from the Ghost Pine oilfield that yielded between 44 and 77 mg/L Li (average 58 mg/L Li), and

- One Nisku Formation brine sample from the Wayne-Rosedale oilfield with 33 mg/L Li (Figure 6.7 and Table 6.1).

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Figure 6.6 Distribution of lithium in Alberta formation waters. Source: Eccles and Jean (2010). Highwood's sub-properties are outlined in black.

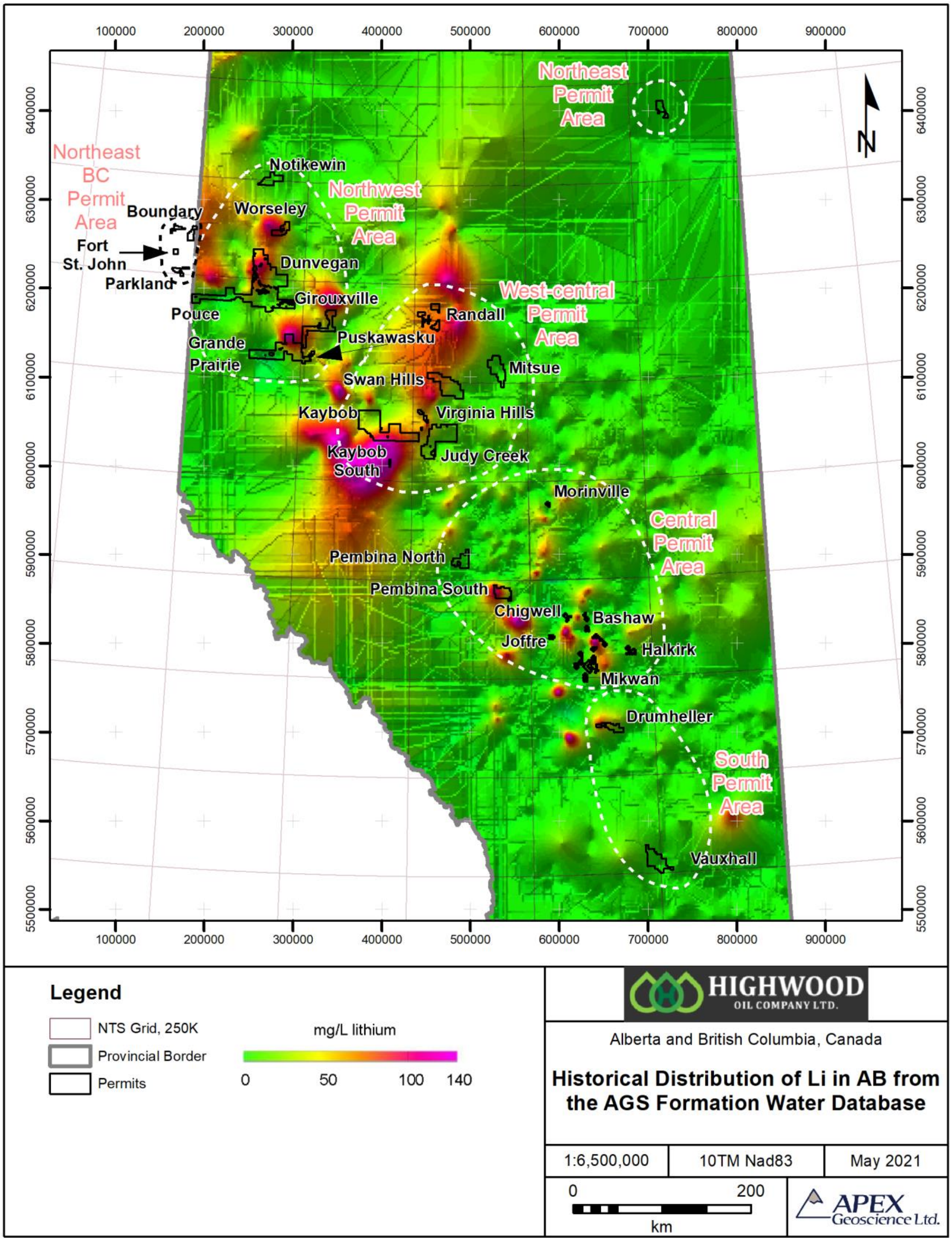


Figure 6.7 Distribution of historical brine assays within Highwood's Drumheller Property.

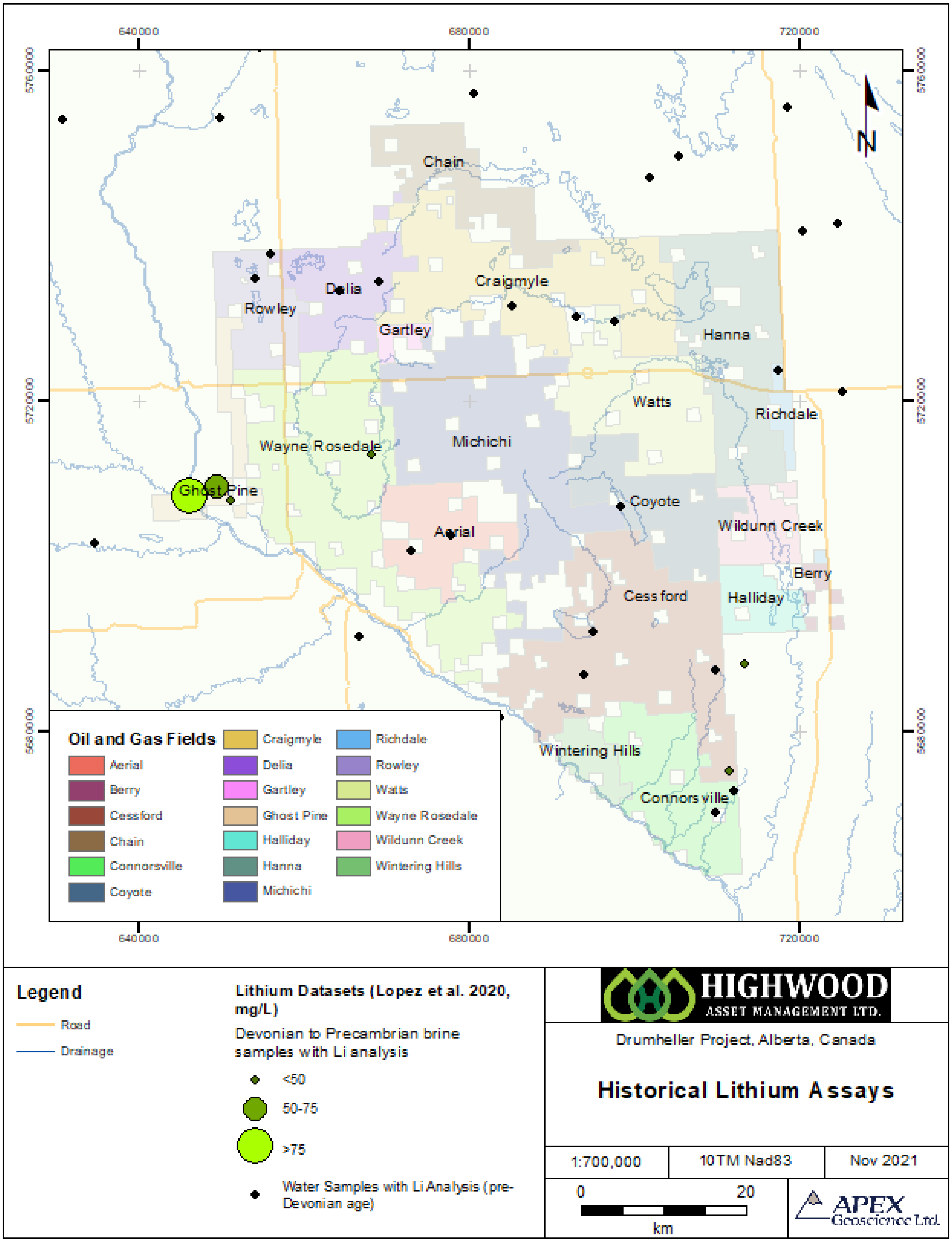


Table 6.1 Historical water lithium analytical results within Highwood's Drumheller Property. The Devonian-aged Nisku and Leduc formations brine samples are highlighted in grey.

Unique well ID	Well name	Latitude (NAD83)	Longitude (NAD83)	Total depth (m)	Oilfield	Pool	Li (mg/L)
100/16-33-029-21W4/0	WESTDRUM DRUMW 16-33-29-21	51.529252	-112.892031	1,738.9	Ghost Pine	Leduc D-2A	77.0
100/08-02-030-21W4/0	BEARSPAW ET AL DRUMW 8-2-30-21	51.537793	-112.844148	1,729.7	Ghost Pine	Leduc D-2A	52.0
100/08-36-029-21W4/0	BEARSPAW ET AL DRUMW 8-36-29-21	51.522675	-112.820689	1,690.1	Ghost Pine	Leduc D-2A	44.0
100/06-14-030-19W4/0	BAYSEL MICHICHI 6-14-30-19	51.568021	-112.573058	1,676.4	Wayne-Rosedale	Nisku	33.0
100/11-12-026-15W4/0	AK EAG BAYSEL CESSFORD 11-12-26-15	51.208590	-111.971026	1,435.6	Cessford	Banff	17.0
100/11-35-032-20W4/0	TEAC DELIA 11-35-32-20	51.789586	-112.737995	1,435.6	Delia	Banff	0.5
100/11-15-032-19W4/0	SULPETRO MCKEE 11-15-32-19	51.746185	-112.620780	1,385.9	Delia	Banff	2.5
100/06-19-032-18W4/0	SULPETRO ANADARKO DELTA 6-19-32-18	51.755521	-112.549870	1,365.5	Delia	Banff	2.6
100/04-08-029-18W4/0	SOC AERIAL 4-8-29-18	51.461528	-112.509977	1,293.0	Aerial	Commingled Pool 011	2.0
100/07-20-027-16W4/0	KEWANEE B CESS 7-20-27-16	51.319680	-112.217206	1,292.4	Cessford	Banff	1.8
100/10-36-031-16W4/0	RENAISSANCE ET AL WATTS 10-36-31-16	51.702882	-112.139433	1,234.0	Watts	Banff	1.0
100/06-24-027-15W4/0	KEWANEE A CESS 6-24-27-15	51.319577	-111.988673	1,162.8	Cessford	Viking C	1.8
100/07-01-026-15W4/0	AMOCO CONNORS 7-1-26-15	51.187368	-111.964917	1,127.8	Connorsville	Lower Mannville B	2.6
100/11-26-025-15W4/0	CNRL CONNORS 11-26-25-15	51.165010	-111.998858	1,115.6	Connorsville	Commingled MFP9514	2.6
/	/	51.361549	-112.203496	100.0	/	/	0.1
/	/	51.475975	-112.439952	53.3	/	/	0.2
/	/	51.709009	-112.205081	47.2	/	/	0.2
/	/	51.763494	-112.766019	27.4	/	/	0.2
/	/	51.723620	-112.317270	15.2	/	/	0.3
/	/	51.501539	-112.141166	0.0	/	/	0.0

7 Geological Setting and Mineralization

7.1 Regional Geology

Geological units of Alberta range in age from Archean to Recent and are exposed as broad northwesterly trending belts, which decrease in age toward the southwest (Hamilton et al., 1999). Precambrian rocks are exposed in the northeast and form the basement for a thickening wedge of Phanerozoic strata of the Western Canada Sedimentary Basin (WCSB) that reaches a maximum thickness of about 6,000 m in front of the Cordilleran fold-and-thrust belt to the southwest. Phanerozoic strata have been deposited in the WCSB in two fundamentally different tectono-sedimentary environments: 1) Late Proterozoic to Middle Jurassic passive continental margin; and 2) Middle Jurassic to Oligocene foreland basin. The WCSB contains one of the world's largest reserves of petroleum and natural gas, bitumen (oil sands) and coal.

With respect to crystalline basement, the Drumheller Property occurs within the Archean Hearne Province and is north of the intersection of juxtaposed Hearne crustal blocks, the Matzhiwin High and the Loverna Block (Ross et al., 1994; Figure 7.1a). This boundary coincides with a distinct geophysical domain boundary that divides the Vulcan Anomaly Zone to the south from the Red Deer Magnetic High to the north (Lyatsky et al. (2005; Figure 7.1b). The curvilinear magnetic lows are interpreted to have lost magnetization during shearing while the magnetic highs are interpreted as magmatic belts (Ross et al., 1994).

The 2.71 to 1.78 Ga Loverna Block crustal domain has well-defined potential-field fabric orientation with distinct northwest to northeast trending anomalies. Of the few drill intersections to penetrate basement, it is apparent that granitoid rocks coincide with local, subcircular magnetic highs (Villeneuve et al. (1993). The Loverna Block domain is overprinted by Proterozoic magmatic activity, large-scale crustal imbrication and pervasive Paleoproterozic reworking (Ross et al., 1995; Eaton et al., 1999).

The basement is overlain by a Paleozoic to Jurassic platformal succession, which is dominated by carbonate rocks, and can be summarized as 2 periods of continental margin sedimentation separated by cratonic inundations from the west, southeast and northwest (Kent, 1994). During this period, marine inundation, sedimentation, and erosion were strongly influenced by epeirogenic movements on intracratonic arches and structures that episodically differentiated the WCSB into a complex array of sub-basins and uplifts (Mossop and Shetsen, 1994). As a result, much of the Paleozoic succession consists of unconformity-bounded, thin to thick sequences of carbonate rocks interlayered with predominantly fine- to medium-grained clastic marine sedimentary rocks.

Of the various types of carbonates, reef facies are deemed most favourable for aquifer porosity, permeability, and hydrocarbon storage. Devonian reefal strata in southern Alberta are represented by, from oldest to youngest, the Lower Devonian strata, the Elk Point Group, the Beaverhill Lake Group, the Woodbend Group, the Winterburn Group, and the Wabamun Group (Table 7.1).

Figure 7.1 Inferred tectonic basement domains and a map of gravity and magnetic anomaly domains superimposed on a total-field magnetic map. Sources: Ross et al. (1994) and Lytasky et al. (2005).

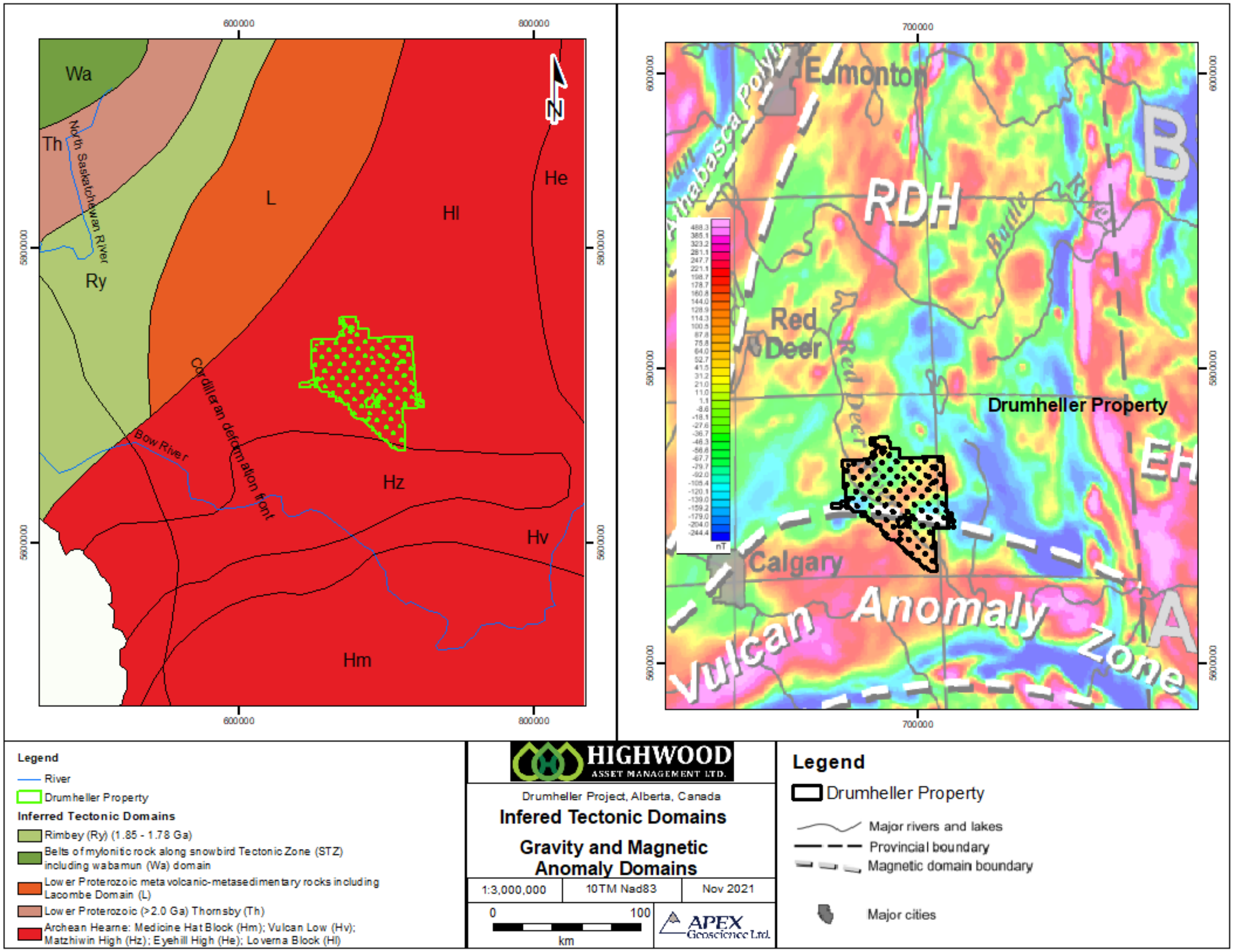
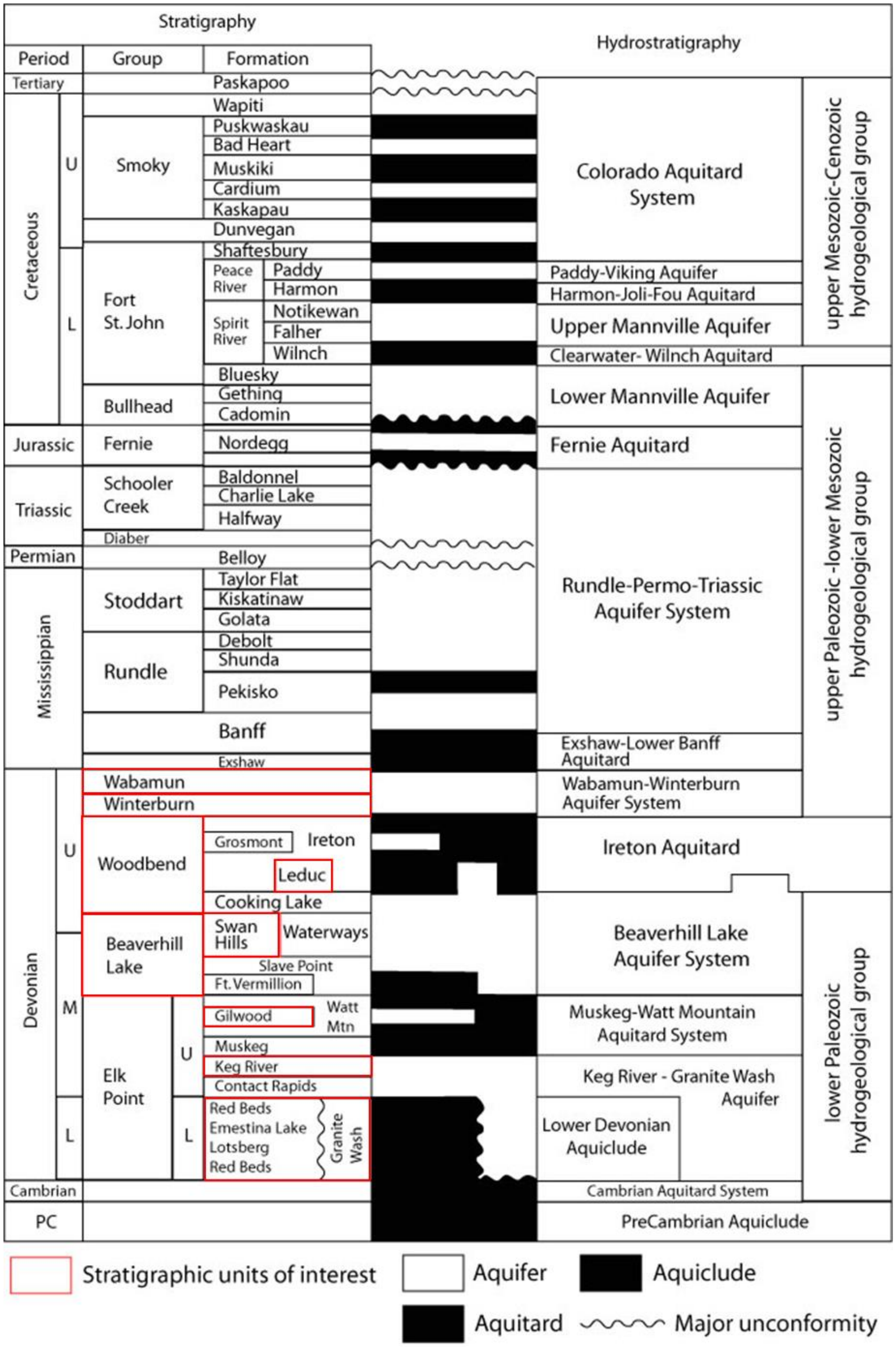


Table 7.1 Devonian to Precambrian stratigraphic and hydrostratigraphic columns. Source: Hitchon et al. (1993).



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Unique Leduc-aged reefal features represent major carbonate shelves and buildups within the Drumheller property and include, from east to west, the Ghost Pine Embayment, the Killam Barrier Reef, and the Ghost Pine Embayment (Figure 7.2). The Leduc East Platform Shelf underlies most of the eastern, southern, and central portions of the Property. The massive shelf ends abruptly in the western part of the Property at a linear northeast-trending, dolomitized, stacked pinnacle reef buildup known as the Killam Barrier. The barrier reef reaches a maximum thickness of 240 m when it comprises all 3 distinct reef buildup stages, the Lower Leduc, Middle Leduc, and Upper Leduc (Edwards, 1997). Many workers have suggested the linear alignment of the Killam Barrier reef and Leduc shelf edge reflect the influence of deep-seated fault trends. The northwestern side of the barrier reef, and the northwest corner of the Property, is characterized by carbonate-rich basin-fill called the Ghost Pine Embayment (also know as the East Duvernay Shale Basin).

7.2 Property Geology

This section provides a geological summary of the Devonian-aged reservoir carbonate sedimentary rock units and reef formations that occur in the Drumheller Property region. North-South and West-East stratigraphic cross-sections are presented in Figure 7.3 and Figure 7.4 for reference and as a discussion point throughout this section.

Prospective Li-brine-bearing Devonian-aged reservoir carbonate sedimentary rock units and reef formations in the Drumheller Property region are defined by, in part, by oil and gas exploration and production as a means to access the brine from depths of greater than 1,500 m below the earth's surface. Devonian petro-production in the Drumheller Property occurs predominantly within the Ghost Pine and Wayne-Rosedale oilfields, which are producing from the Late Devonian Woodbend-Winterburn Groups of the Leduc and Nisku formations, respectively. The Middle Devonian Beaverhill Lake Group, which underlies the Leduc Formation, is also considered prospective for Li-brine mineralization, but the unit is currently not producing petroleum.

The collective Beaverhill Lake, Leduc and Nisku Devonian units are hydrostratigraphically bound by the underlying Elk Point Group and overlying Ireton Formation whose evaporite and shale horizons form aquitards, and therefore, define the prospective reservoirs as confined Li-brine aquifer deposit types.

7.2.1 Lowermost Devonian Elk Point Group Strata and Granite Wash

The Lower Devonian has been almost entirely eroded away in the Alberta portion of the WCSB (Glass, 1990; Meijer Drees, 1994). When present, these strata were deposited because of the second major North American transgression, the Tippecanoe Sequence. The Tippecanoe transgression ended a period of early–Appalachian erosion that deposited siliciclastic and carbonate sediments across the North American Craton during the middle Ordovician to the early Devonian (Glass, 1990; Meijer Drees, 1994). This event was followed by a period of erosion during which most of the Lower Devonian in Alberta strata were destroyed.

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Figure 7.2 Overview of major Devonian oil and gas fields/pools underlain with the outline of the Devonian reef complexes of the Woodbend Group – Leduc Formation. (Sources: Halbertsma, 1994; Meijer Drees, 1994; Oldale and Munday, 1994; and Switzer et al., 1994).

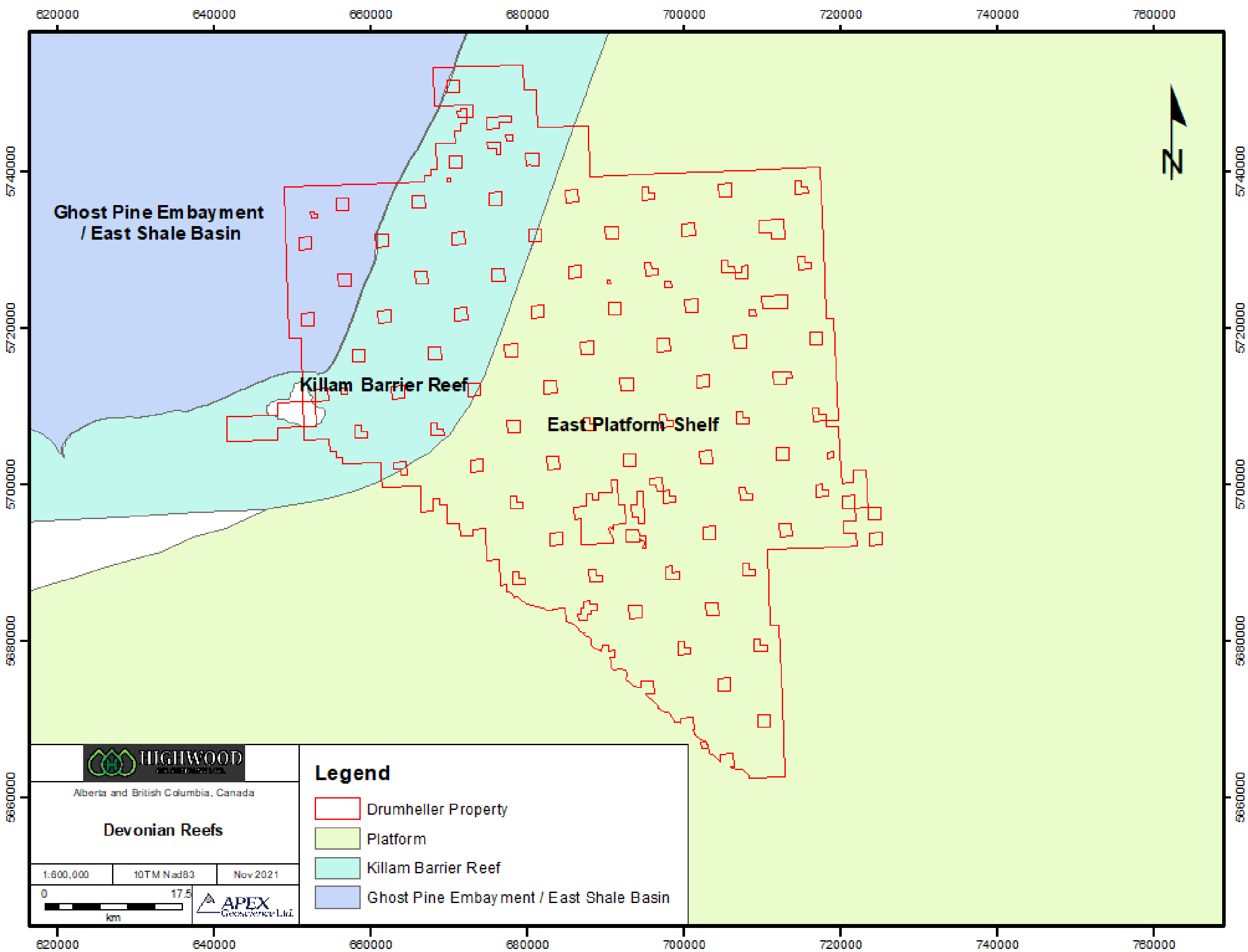

Figure 7.3 North-South stratigraphic cross section through the west-central portion of the Drumheller Property.

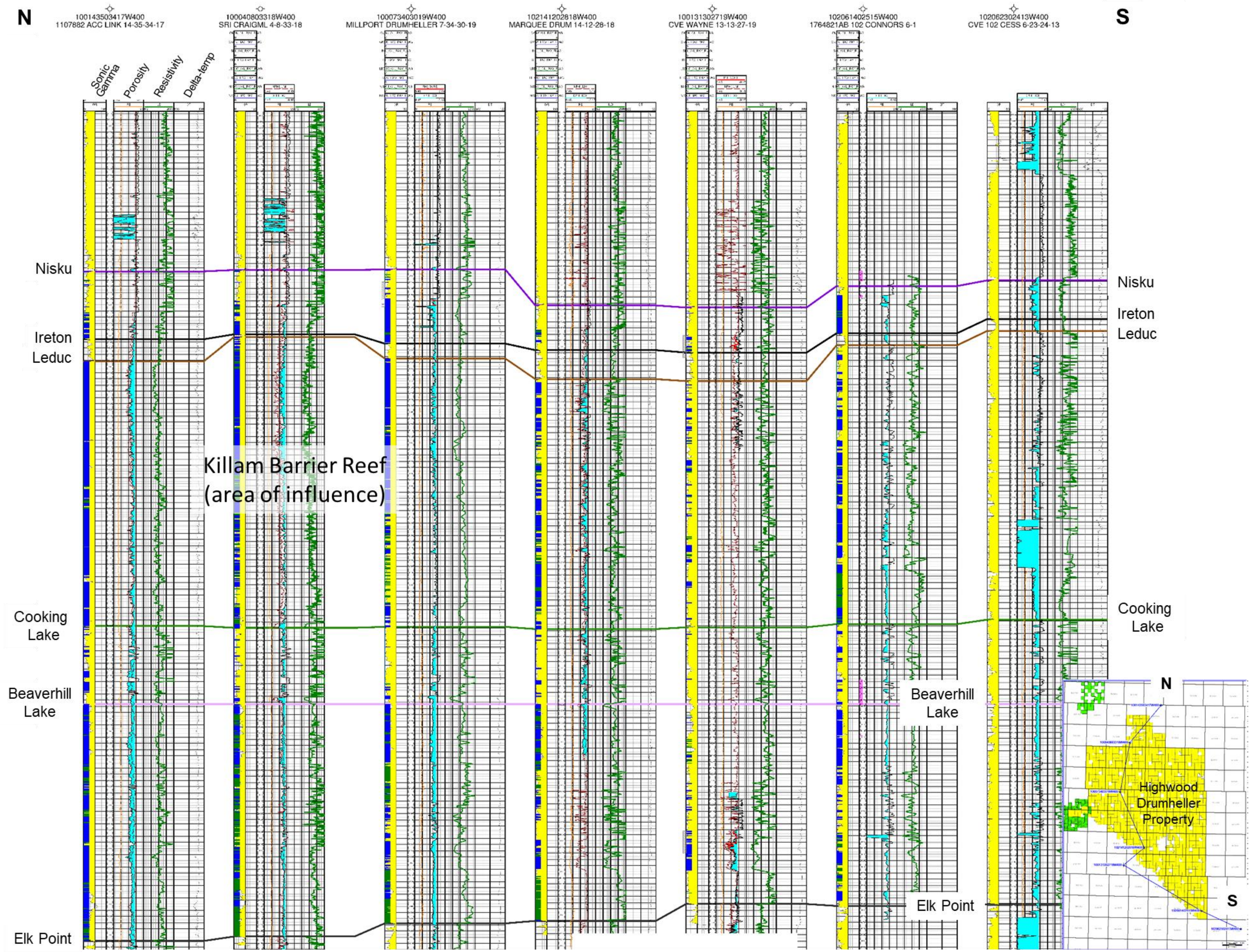

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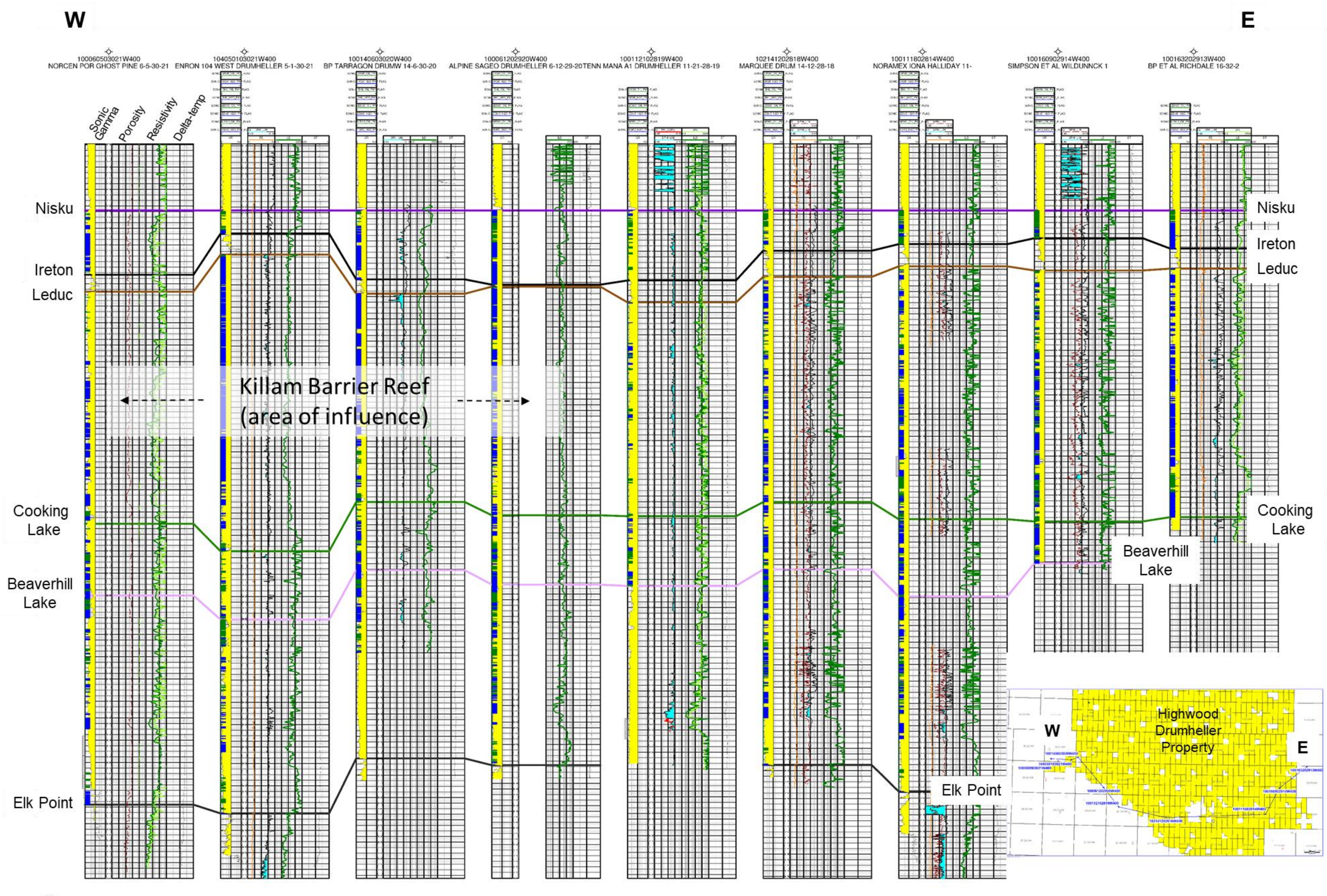
Figure 7.4 West-East stratigraphic cross section through the southern portion of the Drumheller Property.



Remnants of the Lower Devonian are nonetheless found in various regions of Alberta, most notably in the north-central and northwest Alberta, in the form of the Granite Wash sandstone (Rottenfusser and Oliver 1977; Meijer Drees, 1994; Dec et al., 1996). The Granite Wash is an informal term applied to the Paleozoic basal siliciclastic unit that generally sits on top of the Precambrian basement. The Granite Wash includes highly porous and permeable sandstone with minor conglomerate. The unit generally formed by the erosion of rock units associated with the uplifted Peace River Arch and the resulting detritus was deposited locally on Precambrian basement unconformities through a series of alluvial and shallow marine events.

7.2.2 Early to Middle Devonian Elk Point Group

The Lower Elk Point Group was deposited in a restricted-marine environment on top of the pre-Devonian erosional unconformity, and therefore, variously overlies Ordovician and Silurian carbonate, Precambrian igneous and metamorphic rocks, and Cambrian clastic rocks and carbonate (James and Leckie, 1988; Glass, 1990; Meijer-Drees, 1994).

The Elk Point aquifer is defined as those aquifers lying between 1) the Prairie Evaporite aquiclude and the Lotsberg and Cold Lake aquicludes; 2) the Contact Rapids and Keg River aquifers; and 3) the Granite Wash aquifer, which overlies the Precambrian basement (Hitchon et al., 1995). The upper units of the Elk Point group form an aquitard and consist of the Ft. Vermillion, Muskeg and Watt Mountain Formations.

Arkosic sandstone of the Gilwood Member (part of the Watt Mountain Formation) were deposited in a fluvial-deltaic complex along the Peace River Arch (Rottenfusser and Oliver 1977). The Gilwood is a promising sandstone reservoir in the northwest Alberta and northeast British Columbia.

The Upper Elk Point subgroup comprises regionally extensive stratigraphic units, which mark a change from evaporite deposition and a return to normal-marine conditions across the basin. The Keg River Formation carbonates were deposited as an extensive lower platform ramp member and less widespread upper member consisting of reefal buildups (Campbell, 1992; Moore, 1993; Meijer Drees, 1994; Chow et al., 1995). Precambrian basement paleotopography played a large role in the distribution and type of late-stage Keg River buildups, which ultimately controlled the distribution and type of overlying evaporite deposits (Hauck et al., 2017). In northwest Alberta and northeast British Columbia, the Keg River Formation consists of a prominent barrier reef known as the Presqu'ile Barrier.

7.2.3 Middle to Late Devonian Beaverhill Lake Group (Swan Hills Formation)

A rise in relative sea level initiated the beginning of the Beaverhill Lake Group resulted in open marine conditions that marked a significant change in conditions across the Alberta Basin and formed thick accumulations of carbonate and calcareous, fine-grained siliciclastic rocks (Glass, 1990). The Beaverhill Lake Group consists of anhydrite and carbonate rocks at the base (the Fort Vermillion Formation), overlain by interbedded sequences of calcareous shale, argillaceous micritic limestone, limestone, and dolomite.

The Beaverhill Lake Group reaches a maximum thickness of about 220 m in central Alberta (Oldale and Munday, 1994) and 6 paleogeographic areas are recognized for the Beaverhill Lake Group: Horn River Basin; Hay River Basin; Peace River Arch Fringing Reef Complex; Swan Hills Complex; Waterways Basin; and Souris River Shelf.

The Beaverhill Lake Group is divided across northern Alberta. On the east side of the basin, the Eastern Shelf complex (Wendte and Uyeno, 2005) of the is separated from the western Swan Hills Formation carbonate complex by the Waterways sub-basin. The biostromal carbonates of this system form the carbonate-rich members (Calumet and Moberly) of the Waterways Formation

The Swan Hills Complex was deposited on the flank of the West Alberta Ridge and consists of dolomitic shallowing-upward reef cycles (Oldale and Munday, 1994). The Swan Hill Complex is characterized by a stromatoporoid reef composed of micritic and pelletoidal limestone facies or coarse, porous, bioclastic limestone facies that reaches a maximum thickness of 152 m. Porosity development in the Swan Hills area is associated with the high-energy reef margin facies (Wendte and Stoakes, 1982).

The Beaverhill Lake Group in Southeastern Alberta was deposited as a series of northwestern prograding carbonate ramps (i.e., the Souris River Shelf). The ramp complex is time equivalent to the aggrading and backstopping Swan Hills platform which developed to the north and west. At the base of the system, a salt basin was deposited and is surrounded by evaporitic platform interior sediments.

7.2.4 Late Devonian Woodbend- Winterburn Groups (Leduc and Duvernay Formations; Nisku Formation)

The Woodbend Group, which overlies the Beaverhill Lake Group, represents a period of relative sea level rise upward from the Cooking Lake, through the Majeau Lake, Leduc and Duvernay formations (Glass, 1990; Switzer et al., 1994). A number of notable changes occur during deposition of the Woodbend-Winterburn strata, which include 1) an apparent increase in the rate of accumulation and preservation of sediment; 2) a dramatic increase in the occurrence of basin-filling shale; 3) the development of thick and extensive reef complexes; 4) the deposition of widespread and prolific hydrocarbon source rocks; and 5) the significant accumulation of economic reserves of hydrocarbons hosted largely by numerous reefal carbonate reservoirs (Switzer et al., 1994).

The Woodbend Group reaches a maximum thickness of 700 m in northern Alberta (owing to significant reef development), with a typical thickness of 300 m in southern and central Alberta. The two most distinctive features in the Woodbend include the stacked reef complexes of the Leduc Formation, which exceed 275 m in thickness, and the highly bituminous source rocks (Duvernay and Muskwa formations; Switzer et al., 1994). The Leduc Formation sub-unit is comprised of shallow water reef deposits that include mostly dolomitized: stromatoporoid limestone, skeletal mudstone, boundstone, floatstone, packstone and wackestone. The basal Leduc Formation is characterized by dolomitic carbonate from multiple cycles of reef growth, including back-stepping reef rimmed complexes and isolated reefs (Switzer et al. 1994). The Leduc Formation is well known as a host to prolific reserves of oil and gas within Alberta. In the northwest corner of the Property and on the northwest side of the Killam Barrier Reef, the Leduc Formation interval is replaced by the Duvernay Formation shale as part of the Ghost Pine Embayment / East Shale Basin (Figure 7.5).

The Majeau Lake and Duvernay Formations surround the Leduc reefs. The Majeau Lake Formation consists of isolated reefs and deep-water deposits (shale and limestone). The Duvernay interval is a unique depositional unit within the Woodbend Group. The conditions resulting in its deposition signalled a profound change in the basin. Deposition of the Duvernay is characterized by extensive basinal deposits, synchronous with a significant stage of Leduc reef growth. The Duvernay Formation consists of dark brown bituminous shale and limestone and represents a period of great accumulation and preservation of organic carbon. Consequently, Allan and Creaney (1991) suggested that the Duvernay generated most of the hydrocarbons found within the Upper Devonian reservoirs of the Alberta Basin.

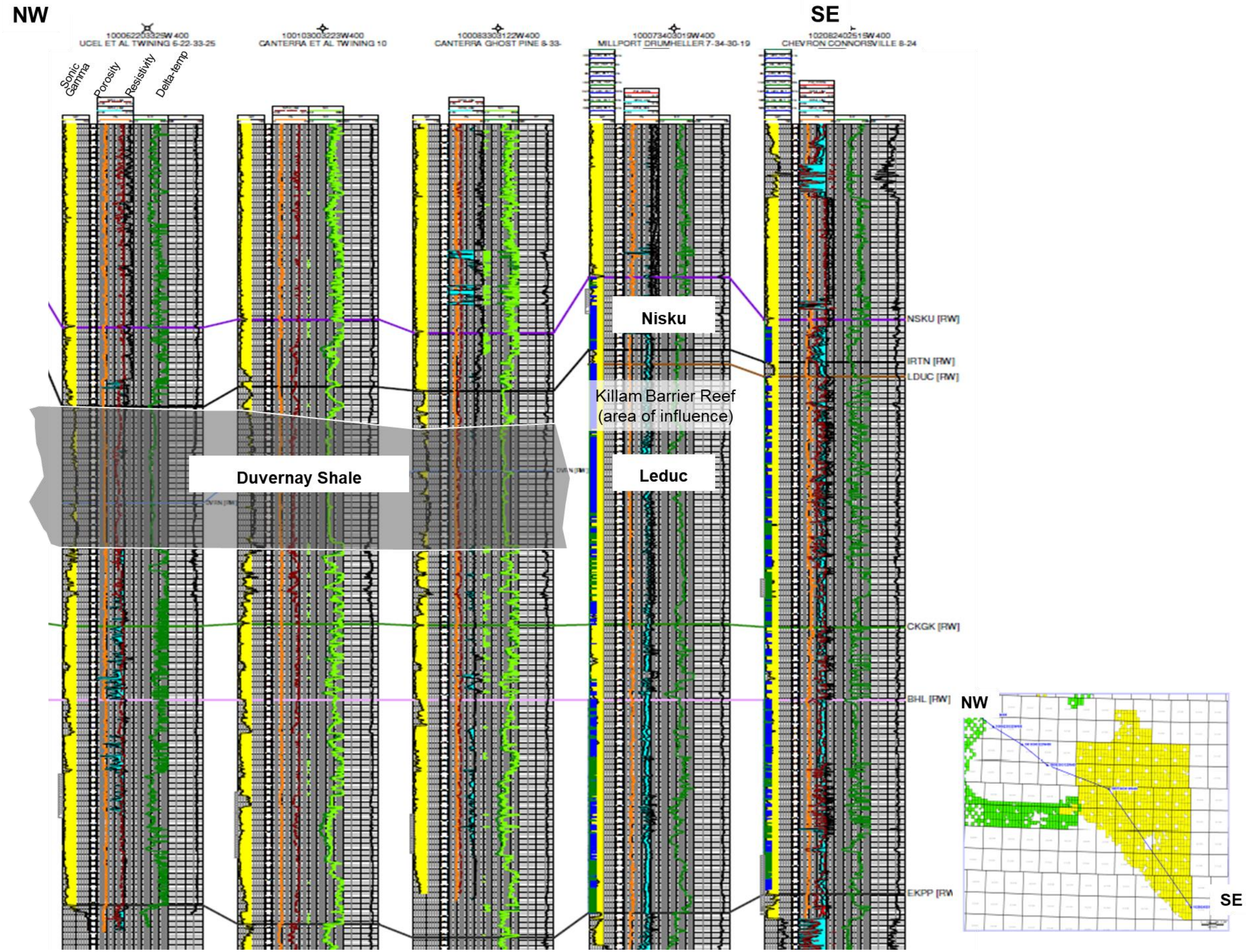
By the end of Woodbend deposition was mostly filled by mudstone and carbonate, and the Winterburn interval began with an apparent relative rise in sea level. This marine transgression resulted in deposition of a widespread carbonate ramp. The Winterburn succession thickens from less than 20 m in Saskatchewan to more than 380 m in northeast British Columbia. The Winterburn Group is composed, from bottom to top of the Nisku, Calmar, and Graminia Formations. Pinnacle reefs develop in the Nisku Formation.

In northwest Alberta, the Winterburn Group reaches a maximum thickness of 150 m west of the Leduc reef system. In west-central Alberta the Nisku has been subdivided into four off-reef members (Lobstick, Bigoray, Cynthia and Wolf Lake members) and one reefal member (the Zeta Lake Member). The Zeta Lake "pinnacle" reefs are approximately 180 km long by 65 km wide. Porosity and permeability of the Nisku Formation is controlled by a complex sequence of diagenetic processes. The occurrence or absence of intermediate burial dolomitization is the most important factor governing porosity and permeability of the Zeta Lake Member (Watts, 1987; Machel, 1983, 1985; Anderson, 1985).

7.2.5 Late Devonian Wabamun Group

The Late Devonian (Famennian) Wabamun Group lies conformably on the Graminia Formation siltstone of the Winterburn Group. The Wabamun consists of a series of stacked cyclical ramp and shelf carbonates and associated evaporates. It has a stratigraphic thickness of about 50 m in Saskatchewan, thickening to over 200 m in large parts of Alberta (Halbertsma, 1994). The Wabamun Formation reaches a maximum thickness of 240 m in the sub-surface of central Alberta. It thins out and wedges toward the east and thickens toward the Canadian Rockies foothills.

Figure 7.5 Northwest-southeast stratigraphic cross section through the Drumheller Property to show how the Duvernay shale replaces the Leduc Formation northwest of the Killam Barrier Reef.



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Lithofacies intervals reflect the following generalized trends: shale and argillaceous carbonate in the northwest; limestone in north and west-central Alberta; dolomite and evaporite in southern Alberta; and red bed shale and dolomitic siltstone in southern Saskatchewan and Manitoba (Halbertsma, 1994). Sedimentation represents an overall regressive sequence punctuated by several important transgressive pulses. In the Peace River Arch area of northwestern Alberta, Wabamun Group oil and gas fields occur in and/or are associated with faulted horst structures.

The Wabamun Group is characterized as a regional aquifer but is confined at its base by siliciclastics and carbonates of the underlying Calmar and Graminia formations of the Winterburn Group (Bachu et al., 2008). Locally, the Graminia Formation may act as an aquifer and provide hydraulic communication with the Nisku Formation (Winterburn Group).

The Wabamun Formation is disconformably overlain by the Exshaw Formation in southern Alberta, by the Blairmore Group in western Alberta and by the Mannville Group in eastern Alberta. The Mississipian shale units (Exshaw and Lower Banff formation) form an aquitard at the top of the Wabamun Group.

7.2.6 Tectonic Geology

The Vulcan Anomaly Zone is a major tectonic boundary between the Medicine Hat and Loverna Blocks (Figure 7.1). The distinct gravity and magnetic anomalies extend on an east-trending angle for over 350 km and has been described as a Proterozoic collisional suture between the Wyoming and Hearne Provinces of the Laurentian craton (Eaton et al., 1999). These authors interpreted seismic images across the zone, in conjunction with gravity and magnetic data, and implied:

1. Crustal delamination and south-directed subduction of the lower crust of the Loverna Block.

2. The corresponding gravity low and magnetic anomalies originate from a large granitic pluton, while prominent gravity highs on the flanks represent collision-thrusted slices of lower-crustal and/or mantle material.

3. The Vulcan structure is the most likely location, if any, for the collisional suture between the Hearne and Wyoming Provinces.

7.2.7 Association Between the Killam Barrier Reef and Crystalline Basement

The linear, northeast trending Killam Barrier Reef is a major feature in the Drumheller Property area. The reef is extensively dolomitized (Switzer et al., 1994) and forms a 'barrier' between the Leduc carbonate shelf to the east and an abrupt termination of the Leduc Formation in the upper northwest corner of the Property – giving way to Duvernay Formation shale as part of the Ghost Pine Embayment / East Shale Basin (Figure 7.5).

The Central Alberta Transect (CAT) Lithoprobe seismic study has been used by numerous authors to study basement-sedimentary cover relationships and basement control on Upper Devonian reefs and shelf margins in southern Alberta (e.g., Nowlan et al., 1998; Eaton et al., 1995; Dietrich, 1999). The CAT study crosses the Killam Barrier at reflection profiles lines 9 and 10 (Figure 7.6). This portion of the Killam Barrier is approximately 45 km north of the Drumheller Property. Although clear seismic evidence is lacking, some hypotheses suggest:

- Deep crust thrust faults identified by Ross et al. (1995) at line 9/10, the Killam Barrier, may propagate upward to the shallow basement and may even intersect the basement-sediment interface.

- If this is the case, then these structures may have been instrumental in the formation of a large basement topographic high that occurs north of the Drumheller Property with 125 m of vertical relief and extends for approximately 25 km or more along the CAT line.

- The uplift could be related to the formation of the Leduc reefs on seismic line 9/10, which comprise 3 distinct reef stages: the Lower, Middle and Upper Leduc. A full buildup comprising all 3 stages is found in the eastern part of this line, where it reaches a maximum thickness of about 240 m (Figure 7.6).

Apart from the Lithoprobe data, and based on reef morphology, many workers have suggested that the distinctive north-northeast linear alignment of the Rimbey-Leduc-Meadowbrook reef chain, Bashaw-Malmo-New Norway-Duhamel group of reefs, and the Killam Barrier reef and Leduc shelf edge reflect the influence of deep-seated fault trends (e.g., Haites, 1960; Mountjoy, 1980; Edwards, 1997; Edwards and Brown, 1999).

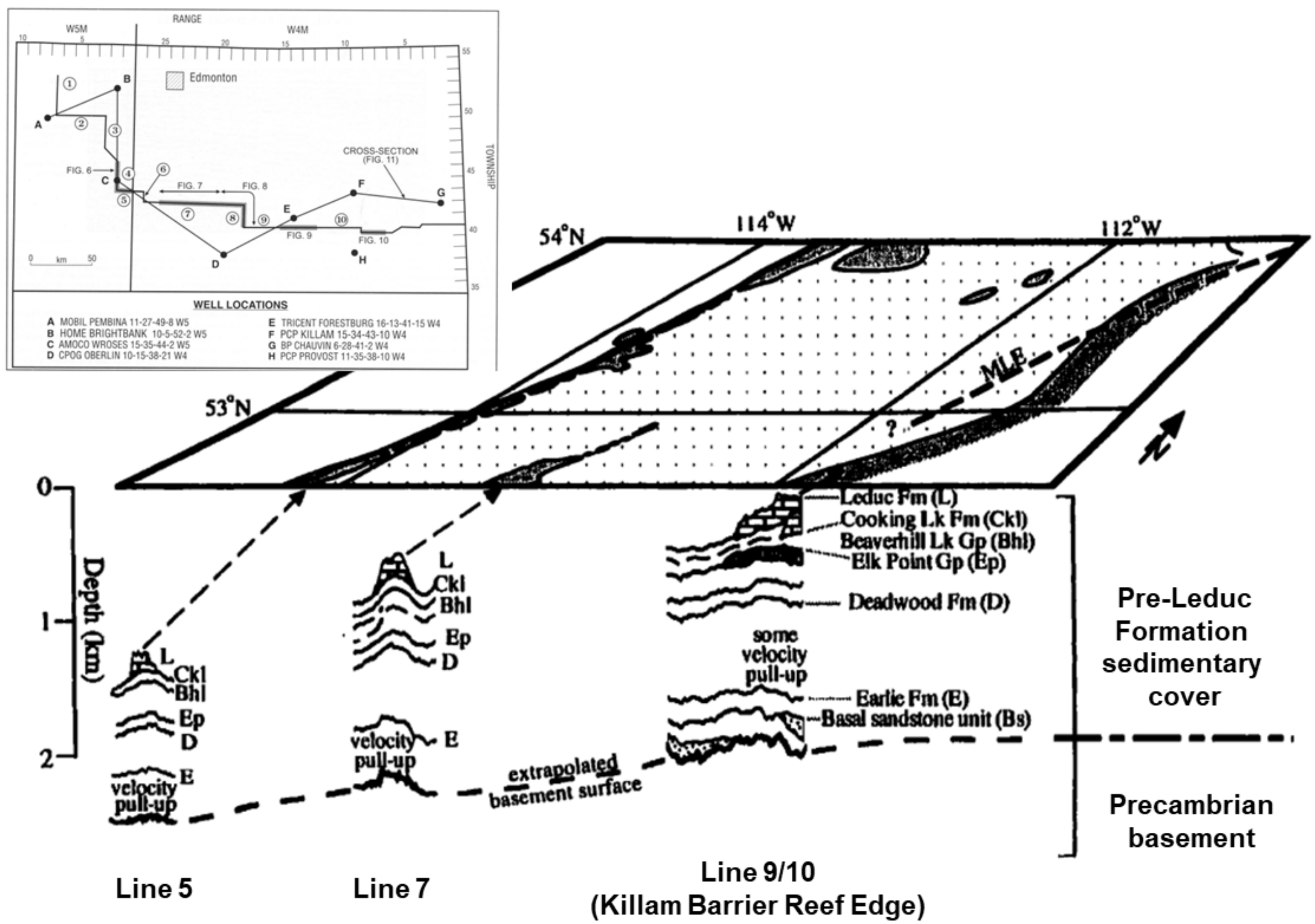
This contention is supported by the presence of sphalerite in faults associated with the Rimbey-Leduc-Meadowbrook reef chain (Haites, 1960; Turner and McPhee, 1994). The lead-zinc mineralization was likely mobilized upward into the Leduc Formation from the crystalline basement along fault planes and conduits into the Leduc carbonate.

These structures most likely reflect recurrent movement on basement zones of weakness that were established prior to the Leduc Formation (Haites, 1960; Arestad et al., 1995; Eaton et al., 1995). For example, in the vicinity of the Drumheller Property:

- Evidence for fault reactivation was documented by Arestad et al. (1995) who identified several northeast-trending fault zones in a 3-D seismic survey across the Nisku-producing Joffre Field, which is located approximately 90 km northeast of the Drumheller Property.

- Southwest of the property, near the southern Alberta Leduc shelf margin, the Drumheller fault delineated in well Michichi Creek 14-29-20W4 trends northeast and is believed to separate the north and south pools within the Drumheller Field (Haites, 1960).

Figure 7.6 Schematic depiction of the basement surface and Cambrian to Devonian sedimentary cover across the southern Alberta Lithoprobe Central Alberta Transect. Vertical exaggeration is approximately 30-times. Source: Edwards (1977).



The presence and potential reactivation of basement faults in Alberta, and the Drumheller Property area, is an important observation. These faults may have created conduits not only for the migration of hydrocarbons to suitable reservoirs, but also as a mechanism for the influx of hydrothermal fluids that may have induced dolomitization associated with the Killam Barrier and mobilization of lithium-bearing fluids into Leduc and Nisku carbonates.

7.3 Mineralization

Lithium-brine mineralization within Alberta is defined as Li-enriched, Na-Ca hypersaline brine that is hosted within subsurface, confined, aquifers of Devonian or older ages. The mineralization is emphasised in Figure 7.7, which has been created using publicly available historical brine geochemical data lithium results.

Figure 7.7a and 7.7b show a clear distinction between the lithium in Devonian to Precambrian brine (average 53.8 mg/L Li; n=318 analyses) in comparison to lithium in younger Mississippian to Recent formation water samples (average 8.3 mg/L Li; n=768 analyses).

A further review of this dataset that compares Li-brine within the major stratigraphic groups (see Table 7.1) shows that the Beaverhill Lake and Woodbend groups have the highest average values of lithium (63.8 and 62.0 mg/L Li), followed by the Winterburn Group (50.8 mg/L Li), Elk Point Group (40.8 mg/L Li), Granite Wash (34.3 mg/L Li), and Wabamun Group (34.1 mg/L Li; Figure 7.7c).

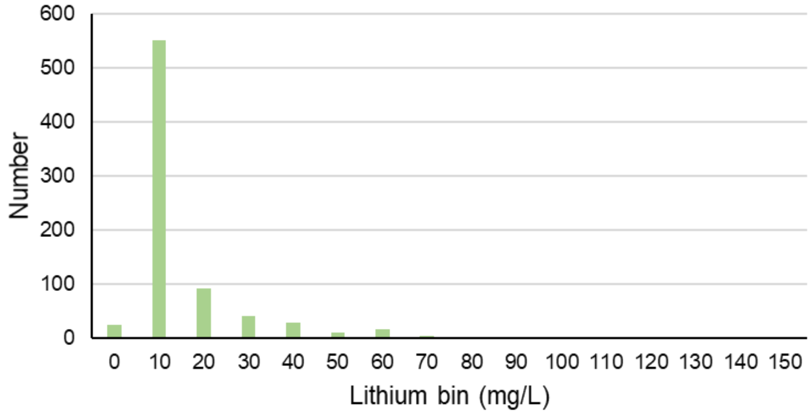
8 Deposit Types

The average crustal abundance of lithium is approximate 17-20 parts per million (ppm) with higher abundances in igneous (28-30 ppm) and sedimentary rocks (53-60 ppm; Evans, 2014; Kunasz, 2006). It should be noted that 1 mg/L lithium is equal to 1 ppm and 0.0001%. Lithium does not occur in elemental form in nature because of its reactivity. There are over 100 minerals that contain lithium, but only a few of these are currently economic to extract. Lithium can be described, priced, and quoted as lithium content, lithium oxide (Li_2O; 0.464 lithium content; conversion is lithium x 2.153), lithium carbonate (Li_2CO_3; 0.188 lithium content) and lithium carbonate equivalent (LCE; conversion is lithium x 5.323). Resource estimates and production quantities of lithium are often expressed as LCE.

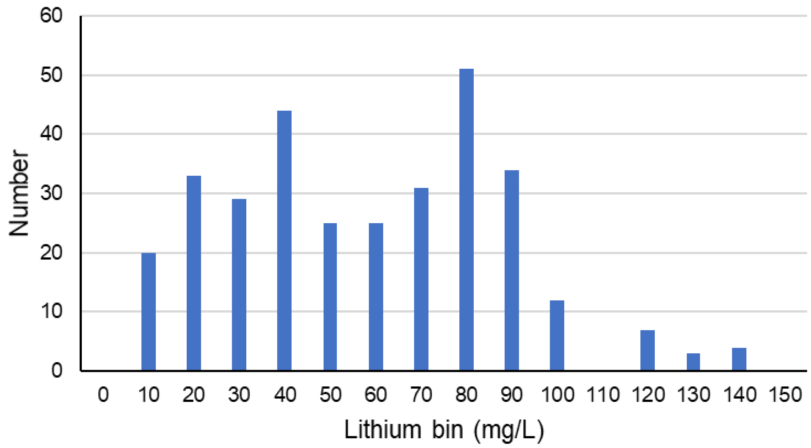
Lithium is extracted from two main categories of deposits: mineral and brine. With respect to mineral deposits, lithium is extracted primarily from pegmatite deposits. Pegmatite lithium deposits are found globally and account for half of the lithium produced today (Benson et al., 2017). Spodumene is the most abundant lithium-bearing mineral found in economic deposits.

Figure 7.7 Summary of historical and publicly available brine geochemistry in Alberta.

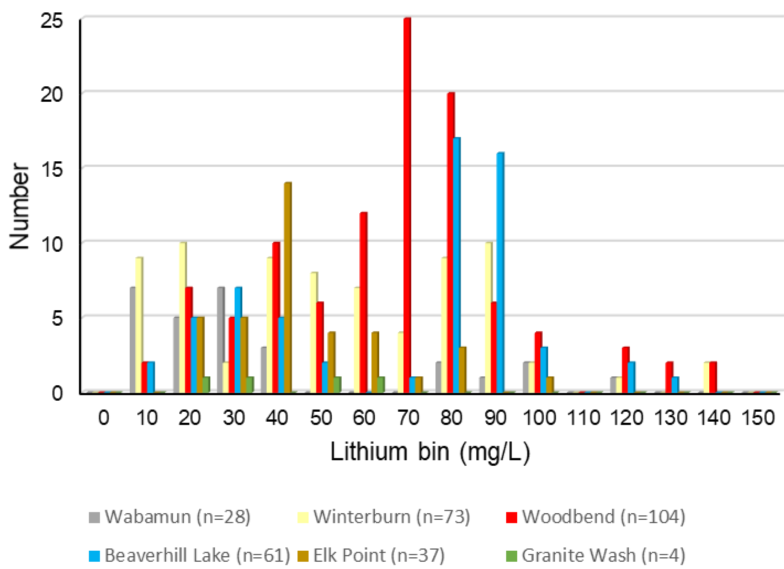
A) Lithium geochemical results in Mississippian to Recent water (n=768 analyses).



B) Lithium geochemical results in Devonian to Precambrian brine (n=318 analyses).



C) Lithium geochemical results for Devonian stratigraphic groups.



Brine deposits can be separated into 1) surface or near-subsurface continental deposits, and 2) confined aquifer deposits that occur in deep, subsurface basial aquifers. Continental brine occurs in endorheic basins where inflowing surface and groundwater is moderately enriched in lithium. All producing lithium brine operations are unconfined (or partially confined), continental deposits.

Economic continental brine aquifers typically occur in areas where high solar evaporation results in beneficiating the brine to higher concentrations of lithium. Geothermal and/or volcanic associations are the favoured mechanisms for introducing lithium into continental basins because lithium-rich brines often exist in areas of volcanic activity (e.g., Imperial Valley, California; Reykjanes field, Iceland; Taupo Volcanic Zone, New Zealand). Typical lithium concentrations in commercially developed continental brine deposits are 200 to 1,500 mg/L.

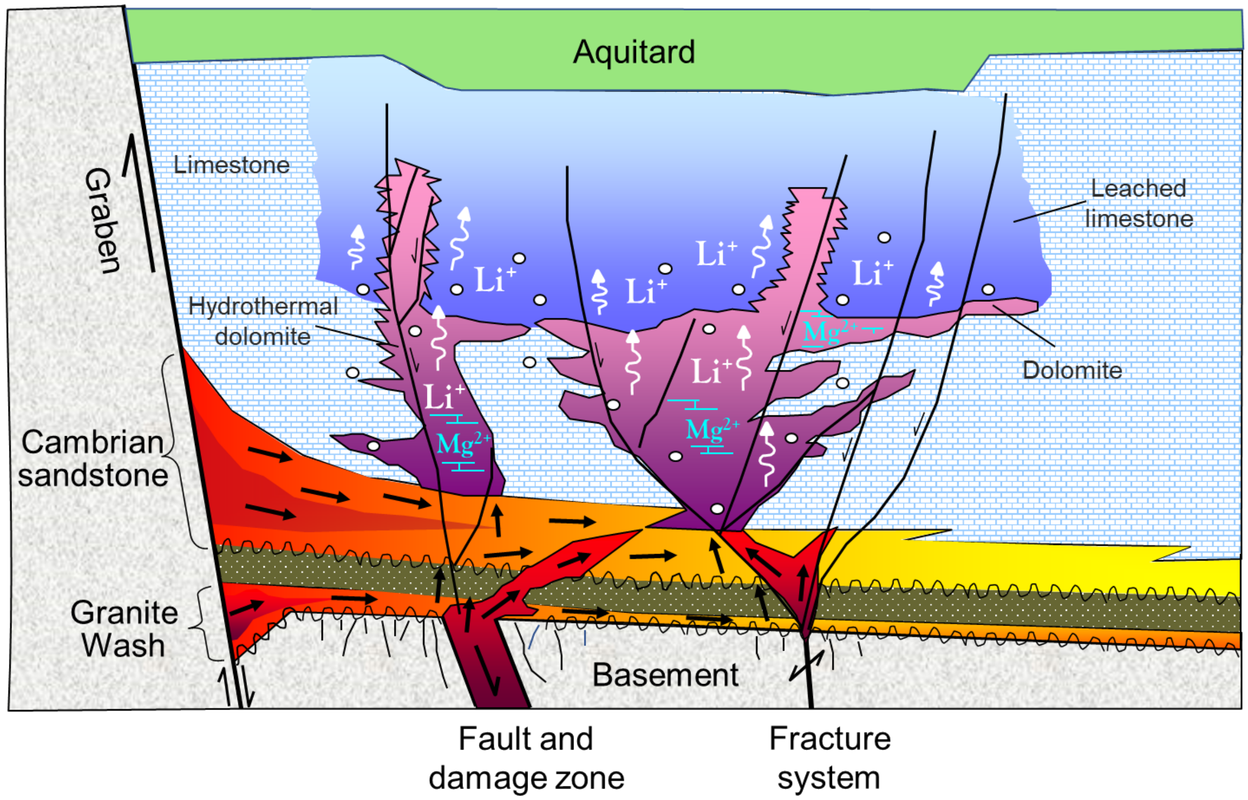
Selected continental brine deposit examples include: Salar de Uyuni in Bolivia Salar de Atacama in Chile, Salar de Hombre Muerto in Argentina; Salar del Rincon and the Salar del Olaroz in Argentina, and the Zhabuye Salt Lake in the Tibetan Plateau, the DXC Salt Lake, and the Qaidam Basin in China (e.g., Shengsong, 1986; Garrett, 2004; Pavlovic and Fowler, 2004; Bradley et al., 2017; Zheng et al., 2007).

Confined aquifer brine deposits occur in sedimentary basins occur at typical depths of >2,000 m beneath the Earth's surface in deep-seated, near-basement, pressurized aquifers (>1,500 m at the Drumheller Property). The lithium is derived from either the crystalline basement or the immature siliciclastic material deposited above the basement, to deep-seated aquifers situated directly above, or proximal to, the underlying basement, and/or were formed through halite dissolution and mixing with Li-enriched fluids possibly expelled from Precambrian crystalline basement rocks via hydrothermal fluids (Eccles and Berhane, 2011; Huff, 2019).

The aquifers are typically confined in that the aquifer is bound by aquitards, but in some instances, several aquifers can commingle within a larger confined aquifer system. As such the mobilization and accommodation of lithium-enriched brine can occur in different aquifer settings that could include, for example, pervasively altered and fractured basement, granite wash sediments, near-basement sandstone horizons, and fault induced reef complexes (Figure 8.1; Eccles et al., 2011; Eccles, 2012).

Lithium enrichment of deep saline to hypersaline brine is known to occur worldwide in sedimentary basins of various age, including: the Cambrian Siberian Platform, Russia, Devonian Michigan Basin; Mississippian–Pennsylvanian reservoirs of the Illinois Basin; Pennsylvanian Paradox Basin, Utah, Triassic strata of the Paris Basin, France, Jurassic Smackover strata from the Gulf Coast, Arkansas, and Texas, and Permo-Triassic Rotliegend-Buntsandstein strata in the Upper Rhine Valley, Germany (e.g., Moldovanyi and Walter, 1992; Stueber et al., 1993; Wilson and Long, 1993; Fontes and Matray, 1993; Garrett, 2004; Shouakar-Stash et al., 2007; Eccles et al., 2018, 2020).

Figure 8.1 Schematic geological model to illustrate a theory on how lithium might be derived from crystalline basement, basement fault zones, and/or immature siliciclastic material deposited above the basement and mobilized into porous Devonian aquifer systems. Source: Eccles et al. (2011) and Eccles (2012).



The deep confined aquifer brine can be accessed through agreements with petro-or geothermal-operators that pump the brine to surface as a wastewater product of hydrocarbon production or as part of the geothermal brine circuit. Additionally, the Li-brine company can drill their own production wells.

Geological concepts being applied in the investigation and/or exploration of deep-seated, confined Li-brine deposits include a compilation and review of historical oil and gas, or geothermal, geochemical fluid data, and target selection of deep-seated, porous, large-scale aquifers. Conventional brine assays are then accomplished by collecting brine from sample points with the existing oil and gas, or geothermal, infrastructure (e.g., wellhead, separator unit, pipelines, and reinjection points).

In addition to assay samples to assess the lithium content of the brine, mini-bulk brine samples are collected to define mineral processing methods that can recover lithium from the brine using a quicker extraction technology. Brine sample quantities of 10's liters to 1,000's litres are applicable in bench-scale test work prior to expanding the operation to the pilot plant, and potential commercial application stage.

9 Exploration

To date, Highwood has conducted 2 separate brine geochemical sampling programs at 5 of the Company's 28 Li-brine sub-properties. The brine was collected for lithium assay testing and mineral processing test work.

9.1 Preliminary March-April 2021 Brine Assay Sampling Program

During March-April 2021, Highwood commissioned two Calgary, AB based laboratories to conduct brine sampling from select petro-operations in Alberta, maintain chain-of-custody of the samples, and analyze the brine for lithium using industry standard techniques. The labs included Highwood's primary lab: AGAT Laboratories (AGAT) and a check lab: Core Laboratories (Core Lab). AGAT Laboratories is a specialized science and laboratory service provider with 12 scientific divisions that offer full-service solutions to multiple industry types within the Environmental, Energy, Mining, Industrial, Transportation, Agri-Food and Life Sciences sectors. Core Labs specializes in reservoir description and production enhancement services.

Both laboratories routinely sample and analyze petro-fluids including waste production water, or brine. A description of the sample collection and security, analytical work conducted, and Quality Assurance – Quality Control is described in Section 11. In general, the samples were taken from brine sample points associated with oil and gas wellheads and/or multi-well collection facilities. The brine is representative of the production reservoir from which the well is pumping petro-products and wastewater brine as part of the petro-operation.

A total of 20 brine samples were collected from a variety of Devonian- to Granite Wash-aged aquifers situated at depths of between 1,222 m and 3,208 m beneath the earth's surface. Brine from 5 of the 28 sub-properties were sampled and include Vauxhall, Drumheller, Kaybob, Judy Creek, and Randall sub-properties (Table 9.1, Figure 9.1).

Because of the large spatial distribution between sample points, and knowledge that the samples are from different reservoirs (fields) and geological formations (pools), the lithium analytical results have a wide range of values from 10.7 mg/L to 52.60 mg/L Li.

A summary of the sampling program analytical results to date include:

- Leduc and Nisku formations brine in the Drumheller Property yielded 47.9-52.6 mg/L Li (n=3 samples) and 29.7-32.3 mg/L Li (n=4), respectively (Figure 9.2).

- Gilwood Formation brine in the Randell sub-property yielded 13.5-28.2 mg/L Li (n=4; Figure 9.3).

- Beaverhill Lake Group brine in the Judy Creek and Kaybob sub-properties yielded 24.3-29.9 mg/L Li (n=3 samples) and 10.7-13.6 mg/L Li (4 samples), respectively (Figure 9.3).

Table 9.1 Lithium geochemical results of Highwood's March-April preliminary 2021 brine sampling program.

Sample ID	Highwood sub-property mame	Highwood Permit area	Operator	Well ID	Well name	Lat	Long	Total depth (m)	True vertical depth (m)	Field	Pool	Lithium (mg/L) AGAT	Lithium (mg/L) Core Lab
02/05-01-030-21W4	Drumheller	South	Bearspaw	102 / 05-01-030-21 W4 / 0	Bearspaw Et Al 102 Drumw 5-1-30-21	51.537933	-112.838289	1,720.00	n/a	Ghost Pine	D-3 A		52.6
13-35-029-21W4	Drumheller	South	Bearspaw	100 / 13-35-029-21 W4 / 0	Bearspaw Et Al Drumw 13-35-29-21	51.530392	-112.861559	1,699.60	n/a	Ghost Pine	D-2 A		49.7
09-34-029-21W4	Drumheller	South	Bearspaw	100 / 09-34-029-21 W4 / 0	Bearspaw Et Al Drumw 9-34-29-21	51.527122	-112.866605	1,688.60	1,688.54	Ghost Pine	D-2 A		47.9
15-07-029-19W4	Drumheller	South	Bearspaw	100 / 15-07-029-19 W4 / 0	Bearspaw Et Al Drum 15-7-29-19	51.473409	-112.664564	1,655.00	n/a	Wayne-Rosedale	Nisku H		29.7
02/02-36-029-20W4	Drumheller	South	Bearspaw	102 / 02-36-029-20 W4 / 0	Bearspaw 102 Drum 2-36-29-20	51.518725	-112.687117	1,700.00	1,699.84	Wayne-Rosedale	Nisku G		32.3
06-19-029-19W4	Drumheller	South	Bearspaw	100 / 06-19-029-19 W4 / 0	Bearspaw Et Al Drum 6-19-29-19	51.494513	-112.667538	1,676.70	n/a	Wayne-Rosedale	Nisku G		30.2
08-21-013-16W4	Vauxhall	South	CNRL	100 / 08-21-013-16 W4 / 0	Norcen Et Al Enchant 8-21-13-16	50.095771	-112.122962	1,425.00	n/a	Enchant	Commingled Pool 006		33.8
13-02-013-14W4	Vauxhall	South	CNRL	100 / 13-02-013-14 W4 / 0	Anadarko Hays 13-2-13-14	50.059694	-111.820327	1,612.00	n/a	Grand Forks	ARCS T		14.2
05-35-078-11W5	Randell	West-central	Summerland	100 / 05-35-078-11 W5 / 0	Summerland Gift 5-35-78-11	55.800460	-115.601487	1,875.00	n/a	Gift	Gilwood H		13.5
09-19-078-11W5	Randell	West-central	Summerland	100 / 09-19-078-11 W5 / 0	Summerland Gift 9-19-78-11	55.776043	-115.683716	2,031.70	1,944.97	Gift	Gilwood K	18.3	
11-02-076-11W5	Randell	West-central	Kinmerc	100 / 11-02-076-11 W5 / 0	Kin Merc Randell 11-2-76-11	55.558096	-115.597815	2,025.00	n/a	Randell	Gilwood D		28.2
08-10-076-11W5	Randell	West-central	Kinmerc	100 / 08-10-076-11 W5 / 0	Kin Merc Randell 8-10-76-11	55.567088	-115.608608	2,028.60	n/a	Randell	Gilwood I		28.2
16-11-076-11W5	Randell	West-central	Kinmerc	16-11-076-11 W5	Randell 16-11-76-11 Multiwell Facility	55.575791	-115.582876	n/a	n/a	Randell	n/a		25.3
16-18-064-011W5	Judy Creek	West-central	Crescent Point	100 / 16-18-064-11 W5 / 0	CPEC Hz Judyck 16-18-64-11	54.543171	-115.641310	4,510.00	2,656.17	Judy Creek	Beaverhill Lake T		24.8
08-17-064-10W5	Judy Creek	West-central	Crescent Point	100 / 08-17-064-10 W5 / 0	CPEC Hz Judyck 8-17-64-10	54.535558	-115.466902	5,298.00	2,580.64	Judy Creek	n/a		24.3
12-02-65-10W5	Judy Creek	West-central	Crescent Point	102 / 12-02-065-10 W5 / 0	CPEC Hz Swanhs 12-2-65-10	54.598651	-115.381534	4,302.00	2,461.78	Judy Creek	n/a		29.9
Kaybob 8-9 Gas Plant	Kaybob	West-central	Paramount	08-09-064-19 W5	Trilogy Kaybob BHL Unit1 Facility 8-9-64-19	54.521604	-116.802140	n/a	n/a	Kaybob	Beaverhill Lake	11.6	
2-9-64-19W5	Kaybob	West-central	Paramount	100 / 02-09-064-19 W5 / 0	Trilogy Kaybob 2-9-64-19	54.517989	-116.808376	3,031.80	n/a	Kaybob	Beaverhill Lake A	13.6	
4-21-64-19W5	Kaybob	West-central	Paramount	100 / 04-21-064-19 W5 / 0	Trilogy Kaybob 4-21-64-19	54.547081	-116.820840	3,029.70	n/a	Kaybob	Beaverhill Lake A	13.2	
10-22-64-19W5	Kaybob	West-central	Paramount	100 / 10-22-064-19 W5 / 2	Trilogy NT Kaybob 10-22-64-19	54.554303	-116.783189	2,984.00	n/a	Kaybob	Commingled Pool 010	10.7	
											Minimum	**10.7**	**13.5**
											Maximum	**18.3**	**52.6**

Figure 9.1 Location of Alberta brine samples collected by Highwood during the first phase of their 2021 brine sampling programs.

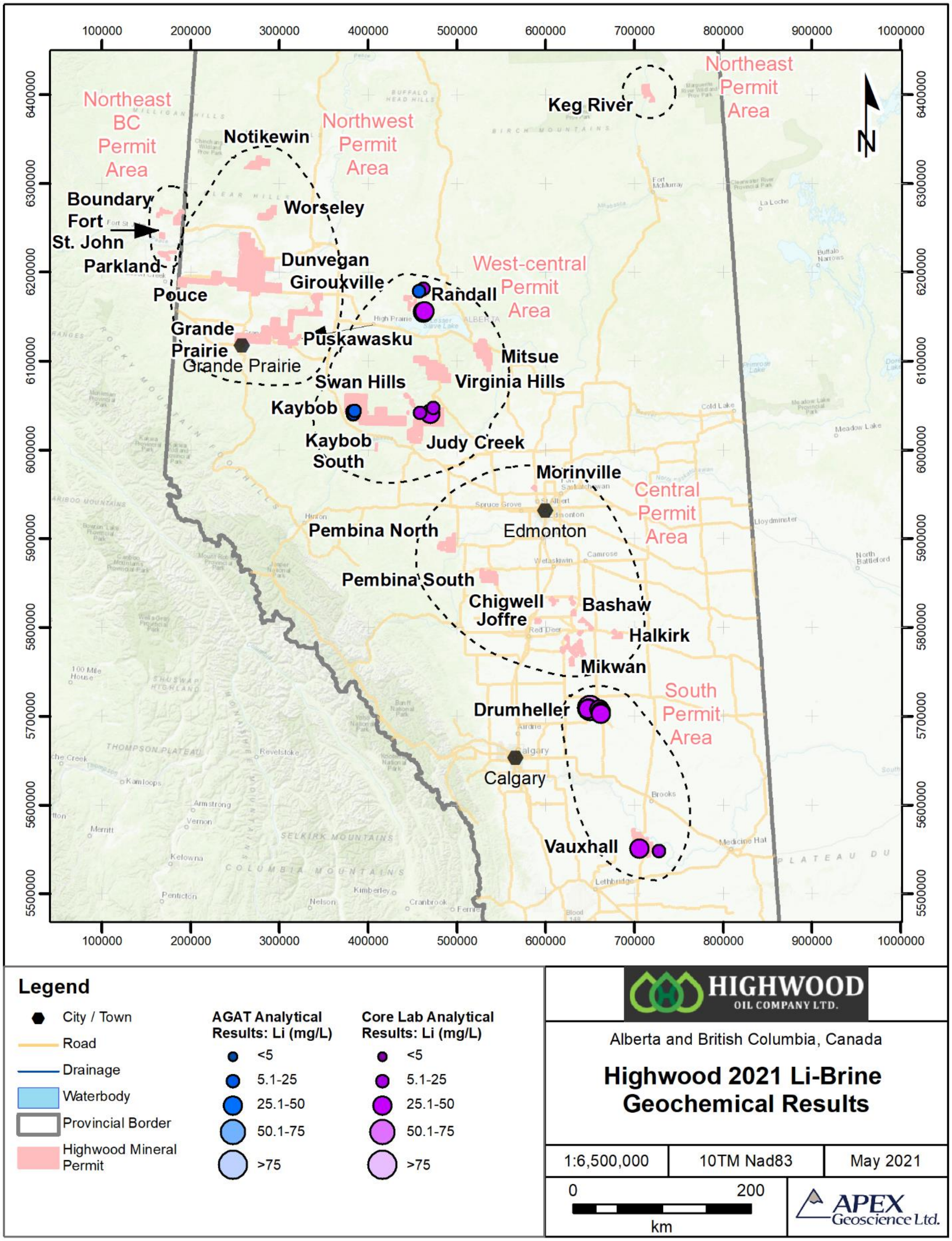


Figure 9.2 Lithium geochemical results of Highwood's 2021 brine samples collected in the South Permit Area (Drumheller and Vauxhall sub-properties).

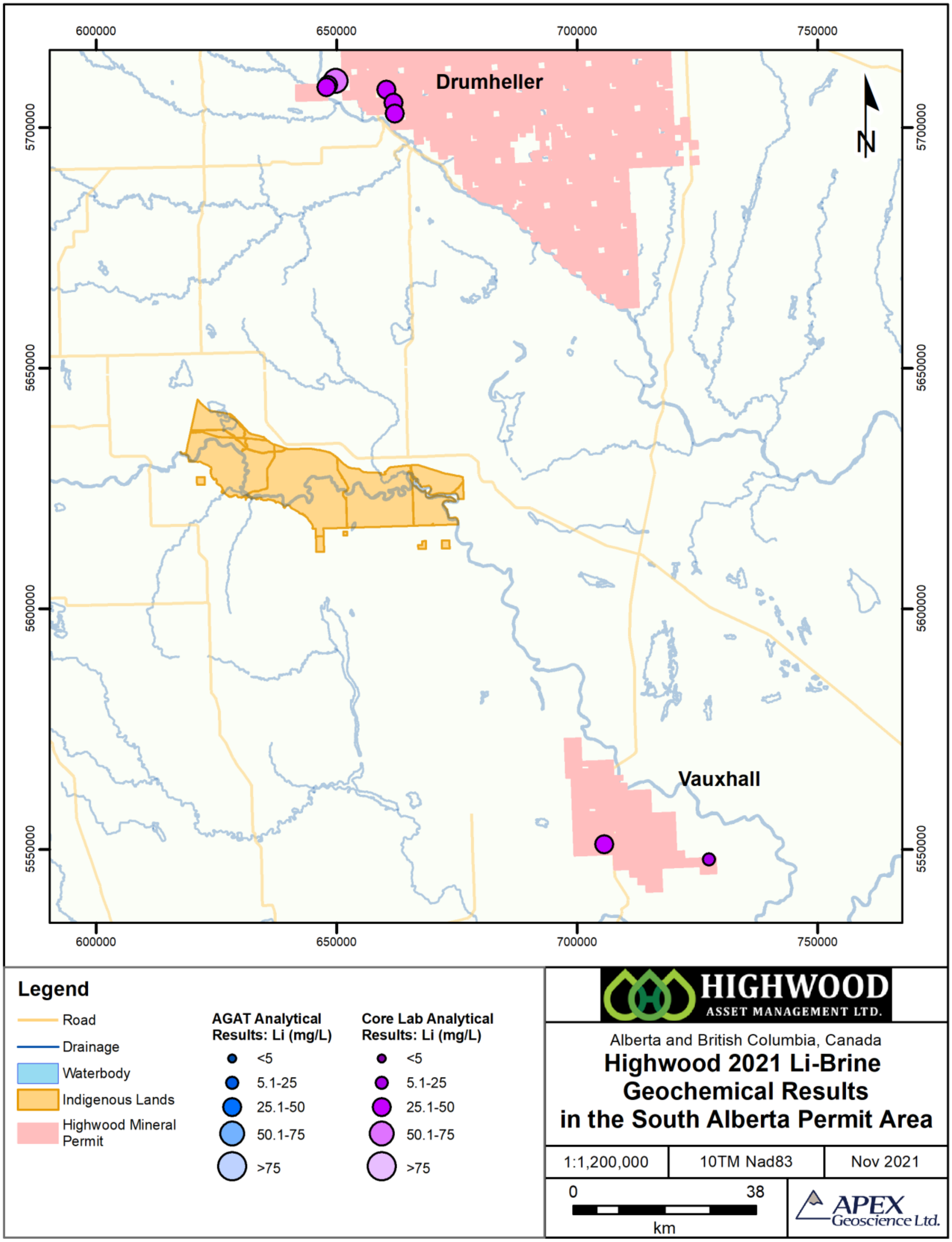
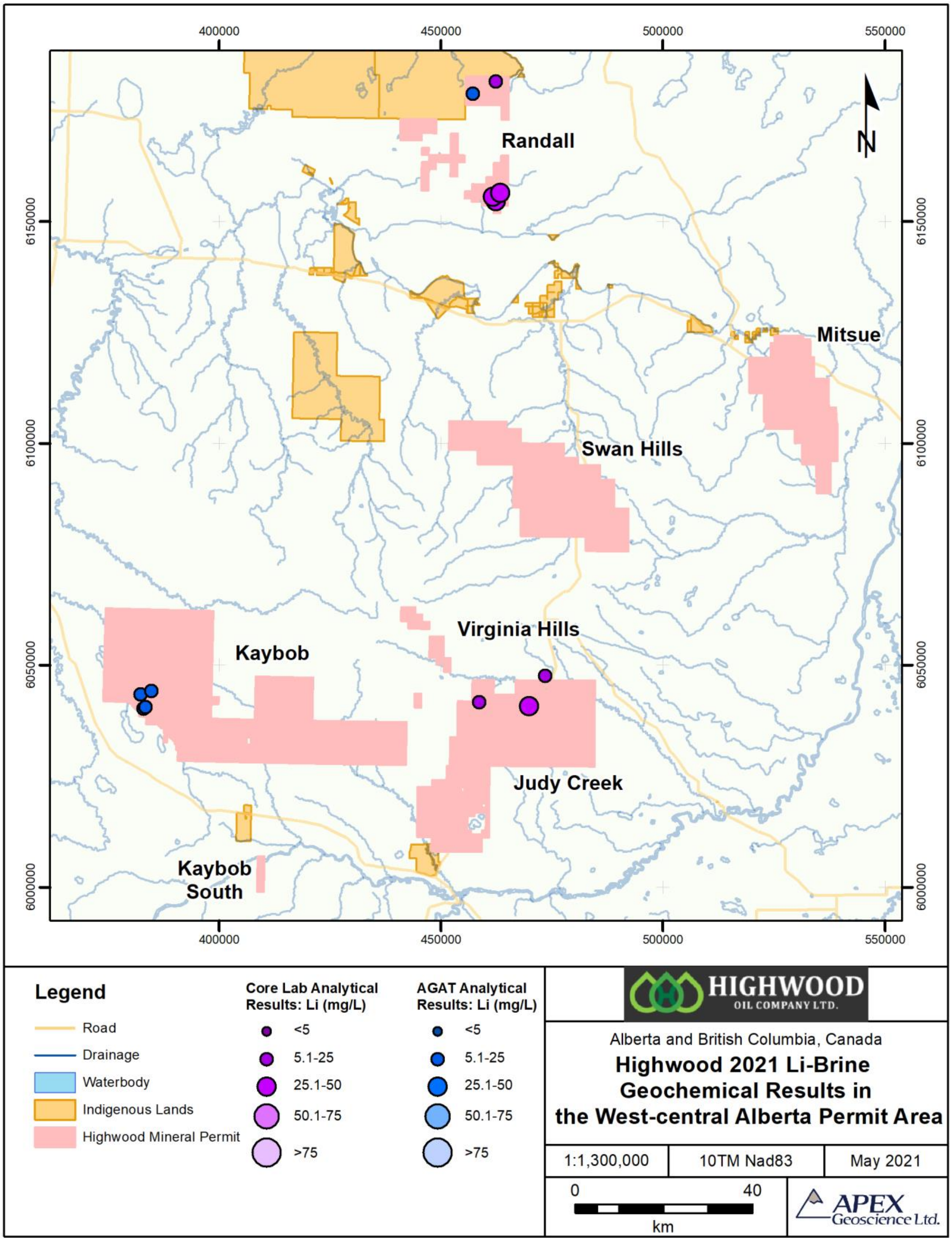


Figure 9.3 Lithium geochemical results of Highwood's 2021 brine samples collected in the West-Central Permit Area (Randall, Kaybob, and Judy Creek sub-properties).



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9.2 Follow-Up May 2021 Brine Assay Sampling Program: Drumheller Property

On May 28, 2021, Highwood completed a follow-up brine sampling program at the Drumheller Property with the objective to 1) sample additional wells in the Wayne-Rosedale and Ghost Pines oil and gas fields for assay testing, and 2) collect mini-bulk brine samples (40-litres) for mineral processing test work to assess the extractability of lithium from the Nisku- and Leduc-aged brines.

A total of 10 oil and gas wells or Facilities were selected for brine assay testing and include Nisku- and Leduc-aged brines from the Wayne-Rosedale and Ghost Pine oil and gas fields (Table 9.2). In addition to 8 oil and gas wells, the Facilities included 1) the Crude Oil Multi-Well Proration Battery and Gas Plant (Wayne-Rosedale) at 04-30-029-19W4, and 2) the Crude Oil Multi-Well Proration Battery (Ghost Pine) at 03-02-030-21W4. One well, 100/07-15-029-20W4/0, was shut-in at the time of the sampling program and no brine was collected at this site. The wells are producing from depths of <1,500 m below the earth's surface.

A total of 34 brine samples were collected, which included 32 brine assay samples and 2 mini-bulk brine samples. The brine assay samples included original samples from each of the wells/facilities (n=10), duplicate samples (n=8 sites), blank standard samples (n=3), lab-prepared certified standard samples (n=6), and lab-check samples (n=5).

The mini-bulk mineral processing samples included 20-litre samples (n=2). The mineral processing samples were delivered to metallurgical laboratories, the results of which are not available at the Effective Date of this technical report. The sample preparation, security, analyses, and QA-QC procedures are described in detail in Section 11.

All samples were collected from wellheads or brine sample nipple points at the facilities. The brine assay samples were collected in 1-litre, plastic, screw-cap sample bottles, which were labelled and sealed with electrician tape. The initial appearance of the brine collected in most of the well samples was slightly oily; when the sample jug remained undisturbed for about 30 minutes, the fluids separated, and it became evident that there was only between <1% and approximately 5% oil in the samples with the remaining fluid being brine.

Two separate mini-bulk samples were collected from well 100/13-35-029-21W4/0. The mineral processing samples were collected in 20-litre, steel, bung-sealed pails. The brine assay samples were analyzed by ICP-OES at AGAT Laboratories in Calgary, AB and Bureau Veritas Laboratories in Edmonton, Alberta.

The geochemical assay results of the original, duplicate, and lab check samples are presented in Table 9.3 and Figure 9.4. The Nisku Formation brine from the Wayne-Rosedale oilfield yielded between 22 and 29 mg/L Li (average 24.5 mg/L Li). This includes brine from the fields multi-well proration battery, which yielded between 23 and 28 mg/L Li.

Table 9.2 Drumheller Property well descriptions. Two mini-bulk brine samples (40-litres total) were collected from well 13-35 for mineral processing test work (highlighted).

UWI	Licensee and operator	Surface hole Latitude (NAD27)	Surface hole Longitude (NAD27)	True Vertical Depth (m)	Producing Zone	Field Name	Pool Name
04-30-029-19W4	Bearspaw Petroleum Ltd.	51.504727	-112.673389	Crude Oil Multiwell Proration Battery and Gas Plant (Wayne-Rosedale)			
100/11-07-029-19W4/0	Bearspaw Petroleum Ltd.	51.470902	-112.667835	1575.4	Nisku	Wayne-Rosedale	Nisku H
100/07-30-029-19W4/0	Bearspaw Petroleum Ltd.	51.508287	-112.661981	1675.0	Nisku	Wayne-Rosedale	Nisku G
100/11-24-029-20W4/0	Bearspaw Petroleum Ltd.	51.498888	-112.688513	1683.2	Nisku	Wayne-Rosedale	Nisku G
102/02-36-029-20W4/0	Bearspaw Petroleum Ltd.	51.518844	-112.687260	1699.8	Nisku	Wayne-Rosedale	Nisku G
100/09-34-029-21W4/0	Bearspaw Petroleum Ltd.	51.527135	-112.866595	1688.5	Nisku	Ghost Pine	Nisku A
100/13-35-029-21W4/0	Bearspaw Petroleum Ltd.	51.530392	-112.861559	1699.6	Nisku	Ghost Pine	Nisku A
100/14-35-029-21W4/0	Bearspaw Petroleum Ltd.	51.530387	-112.855758	1709.0	Nisku	Ghost Pine	Nisku A
03-02-030-21W4	Bearspaw Petroleum Ltd.	51.534186	-112.855754	Crude Oil Multiwell Proration Battery (Ghost Pine)			
102/05-01-030-21W4/0	Bearspaw Petroleum Ltd.	51.537933	-112.838289	1720.0	Leduc	Ghost Pine	Leduc A

Table 9.3 Selected geochemical results from follow-up brine assay testing at the Drumheller Property. Sample RE21-HOC-WR-008 was not collected because the well was shut-in. Samples RE21-HOC-GP-007 and RE211-HOC-GP-008 were collected for mineral processing test work.

A) Wayne-Rosedale Oilfield

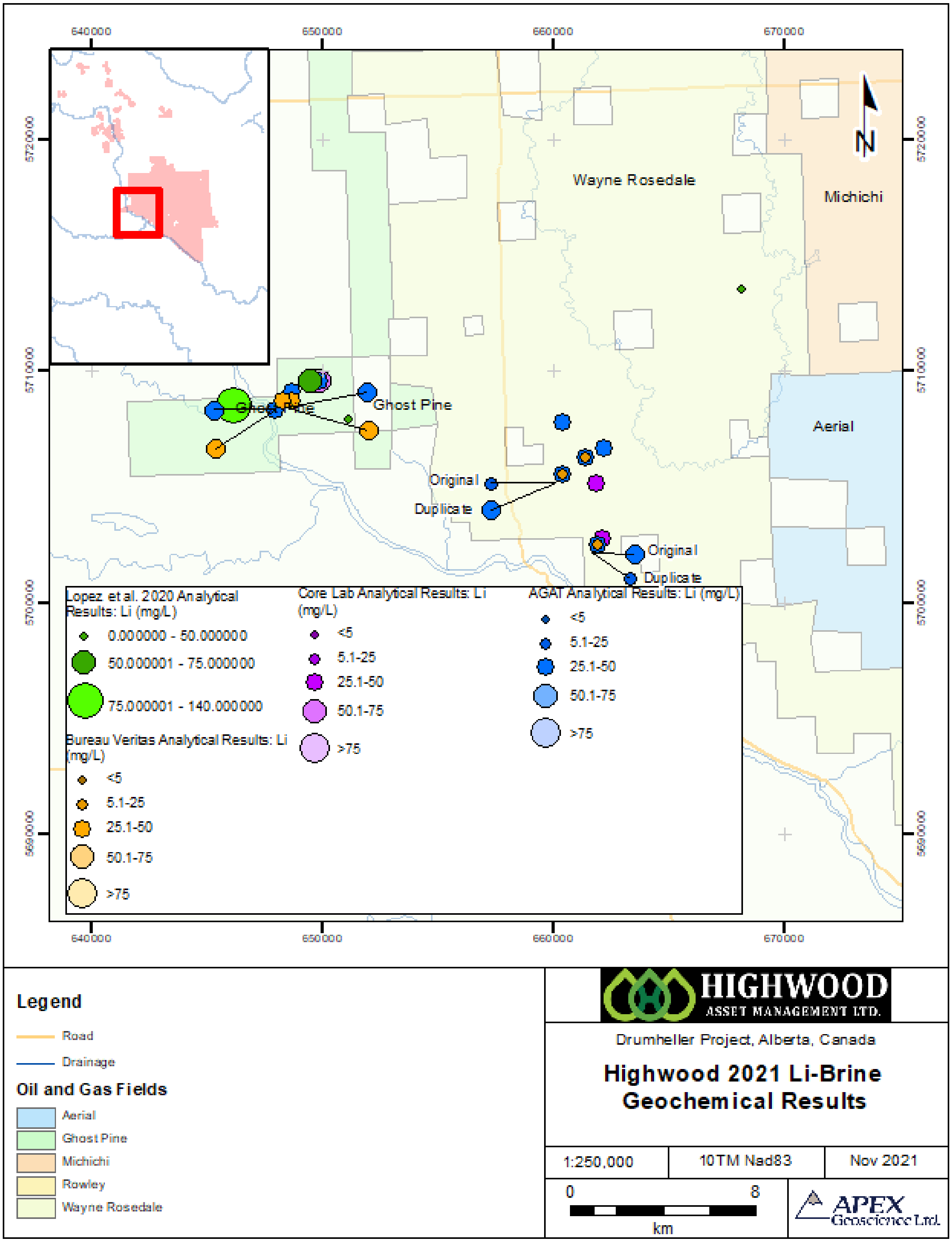
Sample ID	UWI	Sample type	Lab	Total Li (mg/L)	Total B (mg/L)	Total Ca (mg/L)	Total Mg (mg/L)	Total Na (mg/L)	Total K (mg/L)
RE21-HOC-WR-001	100/11-07-029-19W4/0	Original	AGAT	25.7	59.0	3,700	851	15,300	1,450
RE21-HOC-WR-002	100/11-07-029-19W4/0	Duplicate	AGAT	24.3	62.0	3,590	814	14,500	1,410
RE21-HOC-WR-003	100/11-07-029-19W4/0	Original	Bureau Veritas	21.7	55.0	3,310	692	14,200	1,540
RE21-HOC-WR-004	100/11-07-029-19W4/0	Duplicate	Bureau Veritas	22.1	56.1	3,380	682	14,300	1,580
RE21-HOC-WR-005	100/07-30-029-19W4/0	Original	AGAT	28.7	64.0	4,460	1,050	16,800	1,690
~~RE21-HOC-WR-008~~	~~100/07-15-029-20W4/0~~	No sample taken: well down		/	/	/	/	/	/
RE21-HOC-WR-011	100/11-24-029-20W4/0	Original	AGAT	24.3	59.0	3,830	834	14,500	1,410
RE21-HOC-WR-012	100/11-24-029-20W4/0	Duplicate	AGAT	26.9	62.0	4,250	921	16,000	1,570
RE21-HOC-WR-013	100/11-24-029-20W4/0	Original	Bureau Veritas	22.0	55.8	3,670	738	14,100	1,570
RE21-HOC-WR-014	100/11-24-029-20W4/0	Duplicate	Bureau Veritas	22.5	55.4	3,620	764	15,400	1,600
RE21-HOC-WR-016	102/02-36-029-20W4/0	Original	AGAT	25.2	62.0	3,900	893	15,000	1,450

B) Ghost Pine Oilfield

Sample ID	UWI	Sample type	Lab	Total Li (mg/L)	Total B (mg/L)	Total Ca (mg/L)	Total Mg (mg/L)	Total Na (mg/L)	Total K (mg/L)
RE21-HOC-GP-001	100/09-34-029-21W4/0	Original	AGAT	43.7	113.0	10,400	1,940	25,800	2,530
RE21-HOC-GP-003	100/13-35-029-21W4/0	Original	AGAT	46.6	117.0	11,000	2,420	30,500	2,960
RE21-HOC-GP-004	100/13-35-029-21W4/0	Duplicate	AGAT	42.1	125.0	10,100	2,230	27,300	2,770
RE21-HOC-GP-005	100/13-35-029-21W4/0	Original	Bureau Veritas	37.0	111.0	10,500	2,040	24,400	2,750
RE21-HOC-GP-006	100/13-35-029-21W4/0	Duplicate	Bureau Veritas	36.5	108.0	10,600	2,090	24,600	2,690
RE21-HOC-GP-007	100/13-35-029-21W4/0	Mineral processing	SRC	/	/	/	/	/	/
RE21-HOC-GP-008	100/13-35-029-21W4/0	Mineral processing	Recion	/	/	/	/	/	/
RE21-HOC-GP-010	100/14-35-029-21W4/0	Original	AGAT	43.4	110.0	9,410	1,810	26,000	2,480
RE21-HOC-GP-011	100/14-35-029-21W4/0	Duplicate	AGAT	45.8	101.0	9,830	1,900	27,500	2,590
RE21-HOC-GP-012	100/14-35-029-21W4/0	Original	Bureau Veritas	38.9	104.0	10,300	1,910	27,400	2,840
RE21-HOC-GP-013	100/14-35-029-21W4/0	Duplicate	Bureau Veritas	38.4	103.0	10,200	1,890	27,100	2,820
RE21-HOC-GP-016	03-02-030-21W4	Original	AGAT	48.2	105.0	10,300	2,000	30,200	2,870
RE21-HOC-GP-017	102/05-01-030-21W4/0	Original	AGAT	49.0	107.0	9,830	1,930	30,800	2,930
RE201-HOC-BPF-001	04-30-029-19W4	Original	Bureau Veritas	22.8	56.7	4,150	778	15,700	1,590
RE201-HOC-BPF-002	04-30-029-19W4	Original	AGAT	28.3	63.0	4,530	1,030	17,400	1,670

	Total Li (mg/L)	Total B (mg/L)	Total Ca (mg/L)	Total Mg (mg/L)	Total Na (mg/L)	Total K (mg/L)
Wayne-Rosedale Oilfield: Original and duplicate brine samples						
Minimum	21.7	55.0	3,310.0	682.0	14,100.0	1,410.0
Maximum	28.7	125.0	11,000.0	2,420.0	30,800.0	2,960.0
Mean	24.5	83.2	6,907.0	1,400.3	21,078.3	2,120.0
Median	24.3	64.0	4,530.0	1,050.0	17,400.0	1,690.0
Ghost Pine Oilfield: Original and duplicate brine samples						
Minimum	36.5	101.0	9,410.0	1,810.0	24,400.0	2,480.0
Maximum	49.0	125.0	11,000.0	2,420.0	30,800.0	2,960.0
Mean	42.7	109.5	10,224.5	2,014.5	27,418.2	2,748.2
Median	43.4	108.0	10,300.0	1,940.0	27,300.0	2,770.0

Figure 9.4 Summary of historical and Highwood's 2021 Devonian brine assay sampling programs and analytical results at the Drumheller Property.



The Nisku-Leduc Formation brine from the Ghost Pine oilfield yielded between 37 and 49 mg/L Li (average 43 mg/L Li). This includes brine from the fields multi-well proration battery, which yielded between 49 mg/L Li. The Nisku and Leduc formations in the Drumheller Property are generally believed to be in hydrogeological communication. Similarities in the geochemical data between the Nisku and Leduc brine as presented in Table 9.3 suggest the 2 aquifers are connected, but it is worth noting that the Leduc brine samples from well 102/05-01-030-21W4/0 does yield the highest Li-brine value, albeit only slightly, in this dataset (49.0 mg/L Li).

9.3 Brine Mineral Processing Sampling Program: Drumheller Property

As part of the follow-up Drumheller Property brine sampling program, Highwood collected two 20-litre brine samples from well 100/13-35-029-21W4.

The brine samples were sent to independent laboratories for mineral processing test work, the results of which, are discussed in Section 13 of this Technical Report.

10 Drilling

Highwood has not drilled any wells at the Drumheller Property and is reliant on current petro-operators and infrastructure associated with their petro-operations and petroleum production to access deep Devonian to Precambrian aquifer brine.

11 Sample Preparation, Analyses and Security

Highwood's preliminary March-April 2021 brine sampling programs were conducted by AGAT Laboratories (AGAT) and Core Laboratories (Core Lab) from Calgary, AB – both labs of which, completed sample collection and analytical work. Highwood's follow-up May 2021 sampling program at the Drumheller Property was commissioned to Bureau Veritas, who collected the brine samples with AGAT and Bureau Veritas analyzing the samples as the primary and check laboratories.

A description of AGAT, Bureau Veritas, and Core Labs sample collection, preparation, security, and analytical procedures is summarized in the text that follows. The QP ensured QA-QC procedures were included in Highwood's brine sampling programs and these results are also included in this section.

11.1 Sample Collection, Preparation and Security

The brine samples were collected from oil and gas well produced water sample points that include the wellhead, test separator, and the operator's facilities such as multi-well proration batteries, free-water knockouts, etc. The first procedure is to ensure the sample point is associated with flowing brine and that the brine sample point is not representative of stagnant brine. Typically, a one-litre, plastic, screw top sample bottle, or jug, is used to collect the brine. The sample jug is then secured by wrapping electrical tape around the screw top. The sample jug is labelled by using black permanent marker and laboratory prepared one-sided sticky sample labels. The top lid of the jug is also labelled.

The 20-litre brine samples for mineral processing are collected using the sample methodology, except: 1) the sample vessel is a 20-litre, metal, bung-seal pail, and 2) the brine is mitigated of H_2S using a Zinc Acetate Reagent. One hundred grams of Zn Acetate powder was measured and applied to each 20-litre pail.

The brine sample for assay and mineral processing test work is not filtered, and no acid is added to the sample as per typical routine water analysis sample collection procedure. The idea is to collect – and then analytically measure or perform Li extraction technologies – on as representative of a brine sample as possible.

The brine assay samples, which were collected by the respective laboratories, were transported by vehicle directly to the labs. Hence the only chain of custody person was the laboratory technician who collected the brine samples. The mineral processing brine samples were shipped by the laboratory to the respective commercial laboratories for mineral extraction test work. The appropriate Chain of Custody sheets, and sign-off date and times, has been reviewed by the author with no apparent issues.

11.2 Analytical Procedures

AGAT, Bureau Veritas, and Core Labs are independent of Highwood and are well-known and reputable laboratories within the energy sector. AGAT is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC). Bureau Veritas is accredited to ASTM: American Society for Testing and Materials ISO/IEC 17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories. Core Labs is certified in Quality Management System, which complies with the requirements of ISO 9001:2015. Accreditations and certificates for AGAT and Core Labs are for the provision of specific drinking water tests and rock and fluid analyses related to the oil and gas industry.

The 3 laboratories performed the following analytical techniques on the brine samples:

- Routine water analysis for cations and anions, measured and calculated total dissolved solids (TDS), observed pH, relative density, resistivity, salinity, and total alkalinity as $CaCO_3$.

- At AGAT, a total of 27 metallic elements were analyzed as total metals by ICP-OES after an acid digestion procedure. Reported elements include aluminum, antimony, arsenic, barium, beryllium, bismuth, boron, cadmium, calcium, chromium, cobalt, copper, iron, lead, lithium, manganese, magnesium, molybdenum, potassium, phosphorous, nickel, selenium, silicon, silver, sodium, strontium, thallium, tin, titanium, uranium, vanadium, and zinc. The minimum limit of detection for lithium at AGAT is 1.0 mg/L Li.

- At Core Labs the metallic analytical results included the same elements listed above (for the AGAT metal results) plus cesium, rubidium, tellurium, tungsten, and zirconium. The analysis was conducted as total metals by ICP-mass spectrometry (ICP-MS) after the brine sample was digested with nitric and hydrochloric acids. The Certificate of Analysis indicates the analysis was performed by ALS Environmental.

- At Bureau Veritas the metallic analytical results include a suite of 32 metal elements. The analysis was conducted as total metals by Total Acid Digestion for Metals (ASTM D5708) followed by ICP-OES 32 element scan for total metals (EPA SW-846 6010C).

- The analytical procedures followed nitric acid digestion (SM 3030 E), Metals by Plasma Emission Spectroscopy, Inductively Coupled Plasma (ICP) Method (SM 3120 B), Procedure for Spectrochemical Determination of Total Recoverable Metals (EPA 200.2), and ICP-mass spectrometry (EPA 6020A).

11.3 Quality Assurance – Quality Control

Initially, Highwood QA-QC procedures were limited to 7 lab-check samples collected during the March-April 2021 brine sampling program. These samples were analyzed at AGAT and Core Labs, the results of which are presented in sub-section 11.3.4.

Upon commissioning APEX, the QA-QC brine sampling protocol included the random insertion of duplicate samples, sample blanks, and pre-lab-prepared brine standard samples. The duplicate samples, sample blanks and lab-prepared standard samples were inserted as part of the Drumheller Property brine sampling program in which a total of 34 brine samples were collected (32 brine assay samples and 2 mini-bulk brine samples). The brine assay sample stream for the Drumheller Property program included:

- Original samples from each of the wells/facilities (n=10).

- Duplicate samples (n=8 sites).

- Blank standard samples (n=3).

- Lab-prepared certified standard samples (n=6).

- Lab-check samples (n=5).

- Mini-bulk mineral processing samples included 20-litre samples (n=2; Table 11.1).

The Drumheller Property assay sample set was sent to Highwood's primary lab (AGAT) and their secondary lab (Bureau Veritas). The results of the QA-QC data analyses are presented in the text that follows.

Table 11.1 Summary of QA-QC samples entered into the Drumheller Property sample stream. Colour code: Grey – duplicate samples (n=8); blue – Sample Blanks (n=3); red – lab-prepared Sample Standards (n=6); and yellow – lab check samples (n=5).

Sample ID	UWI	Sample type	Lab
RE21-HOC-WR-001	100/11-07-029-19W4/0	Original	AGAT
RE21-HOC-WR-002	100/11-07-029-19W4/0	Duplicate	AGAT
RE21-HOC-WR-003	100/11-07-029-19W4/0	Lab check	Bureau Veritas
RE21-HOC-WR-004	100/11-07-029-19W4/0	Duplicate	Bureau Veritas
RE21-HOC-WR-005	100/07-30-029-19W4/0	Original	AGAT
RE21-HOC-WR-006	Blank	Blank standard	AGAT
RE21-HOC-WR-007	Blank	Blank standard	Bureau Veritas
~~RE21-HOC-WR-008~~	~~100/07-15-029-20W4/0~~	No sample taken: well down	
RE21-HOC-WR-009	Certified Standard	Certified Standard	AGAT
RE21-HOC-WR-010	Certified Standard	Certified Standard	Bureau Veritas
RE21-HOC-WR-011	100/11-24-029-20W4/0	Original	AGAT
RE21-HOC-WR-012	100/11-24-029-20W4/0	Duplicate	AGAT
RE21-HOC-WR-013	100/11-24-029-20W4/0	Lab check	Bureau Veritas
RE21-HOC-WR-014	100/11-24-029-20W4/0	Duplicate	Bureau Veritas
RE21-HOC-WR-015	Certified Standard	Certified Standard	AGAT
RE21-HOC-WR-016	102/02-36-029-20W4/0	Original	AGAT
RE21-HOC-GP-001	100/09-34-029-21W4/0	Original	AGAT
RE21-HOC-GP-002	Blank	Blank standard	AGAT
RE21-HOC-GP-003	100/13-35-029-21W4/0	Original	AGAT
RE21-HOC-GP-004	100/13-35-029-21W4/0	Duplicate	AGAT
RE21-HOC-GP-005	100/13-35-029-21W4/0	Lab check	Bureau Veritas
RE21-HOC-GP-006	100/13-35-029-21W4/0	Duplicate	Bureau Veritas
RE21-HOC-GP-007	100/13-35-029-21W4/0	Mineral processing	SRC
RE21-HOC-GP-008	100/13-35-029-21W4/0	Mineral processing	Recion
RE21-HOC-GP-009	Certified Standard	Certified Standard	AGAT
RE21-HOC-GP-010	100/14-35-029-21W4/0	Original	AGAT
RE21-HOC-GP-011	100/14-35-029-21W4/0	Duplicate	AGAT
RE21-HOC-GP-012	100/14-35-029-21W4/0	Lab check	Bureau Veritas
RE21-HOC-GP-013	100/14-35-029-21W4/0	Duplicate	Bureau Veritas
RE21-HOC-GP-014	Certified Standard	Certified Standard	AGAT
RE21-HOC-GP-015	Certified Standard	Certified Standard	Bureau Veritas
RE21-HOC-GP-016	03-02-030-21W4	Original	AGAT
RE21-HOC-GP-017	102/05-01-030-21W4/0	Original	AGAT
RE201-HOC-BPF-001	04-30-029-19W4	Lab check	Bureau Veritas
RE201-HOC-BPF-002	04-30-029-19W4	Original	AGAT

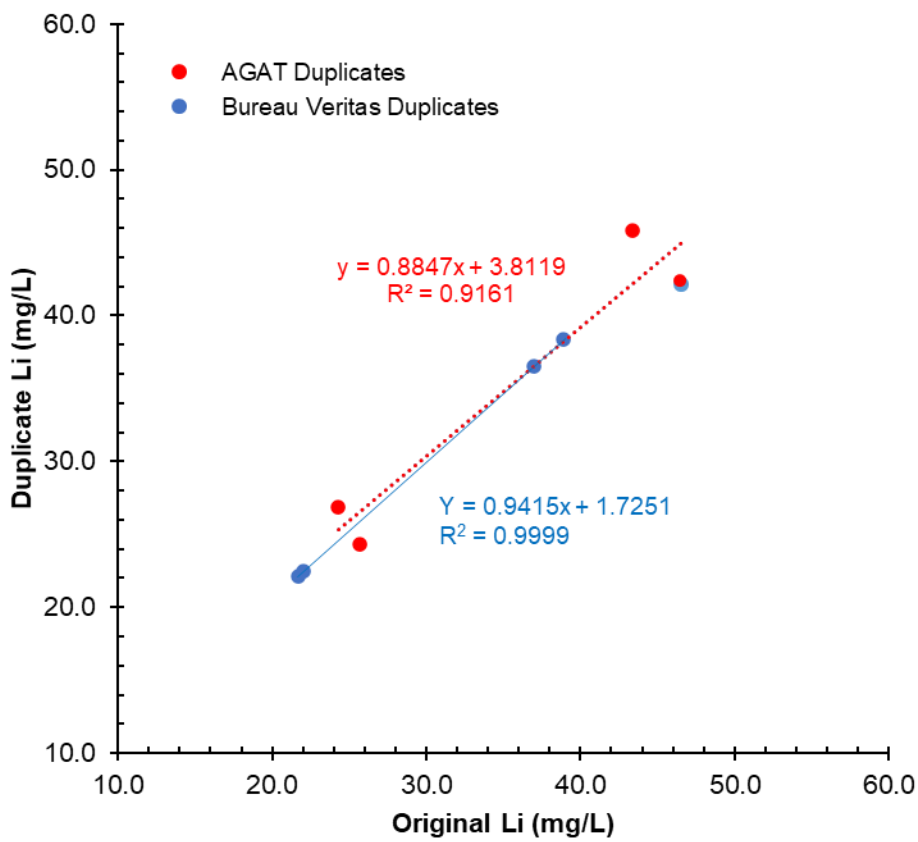
11.3.1 Results of Duplicate Samples

During Highwood's Drumheller Property brine sampling program, a total of 8 duplicate brine samples were collected with 4 duplicate pairs being analyzed at both AGAT and Bureau Veritas. The analytical results for the duplicate pairs are presented in Figure 11.1 and described in the text that follows.

The quality of the duplicate pair data from AGAT and Bureau Veritas is assessed using average percent relative standard deviation (% coefficient of variation), or average RSD% as an estimate of precision or reproducibility of the analytical results. The RSD% value is calculated using the formula: *RSD% = standard deviation/mean x 100*. It is the author's opinion that average RSD% values below 30% are considered to indicate very good data quality; between 30 and 50%, moderate quality and over 50%, poor quality.

The RSD% values for AGAT and Bureau Veritas range between 3.8% and 7.2%, and 0.9% and 1.3%, respectively. It is concluded that there is very good data quality for Highwood's 2021 Li-brine analytical results at both of these independent laboratories. This positive analytical relationship between the duplicate samples pairs for both labs is shown graphically on Figure 11.1 with best-fit reliability trends of 0.9161 (AGAT) and 0.9999 (Bureau Veritas).

Figure 11.1 Comparison of duplicate samples.



11.3.2 Results of Sample Blank Samples

Sample Blanks composed of distilled water were inserted into the sample stream (n=3 samples). The analytical results for all 3 sample blanks yielded lithium at below the minimum detection. This is an accurate result as the sample standard blanks contained no lithium.

11.3.3 Results of Lab-Prepared Brine Standard Samples

To further evaluate brine analytical accuracy, a laboratory prepared Sample Standard prepared by the University of Alberta was randomly inserted into the sample stream of the 2021 brine sampling program. Highwood commissioned the University of Alberta to prepare a laboratory prepared Sample Standard by adding a measured amount of elemental lithium to an assimilated hypersaline brine concoction.

Components of the Highwood's Sample Standard include pre-measured powdered quantities of LiCl, $CaCl_2.2H_2O$, $MgCl_2.6H_2O$, NaCl, KCl, Na_2SO_4, $FeCl_3.6H_2O$, $Na_2SiO_3.9H_2O$ together with 9.8 L MilliQ water; and 0.200 L 70% HNO_3.

All chemical reagents were weighed and mixed in a bucket. Ultrapure water (9.8-litres) was added to the bucket followed by stirring at room temperature for several minutes. Once thoroughly mixed, 200 ml of 70% HNO_3 was added to the bucket and the solution was re-mixed. Adding acid to water/brine samples is routine in aqueous geochemistry as it prevents adsorption of metal ions and their precipitation.

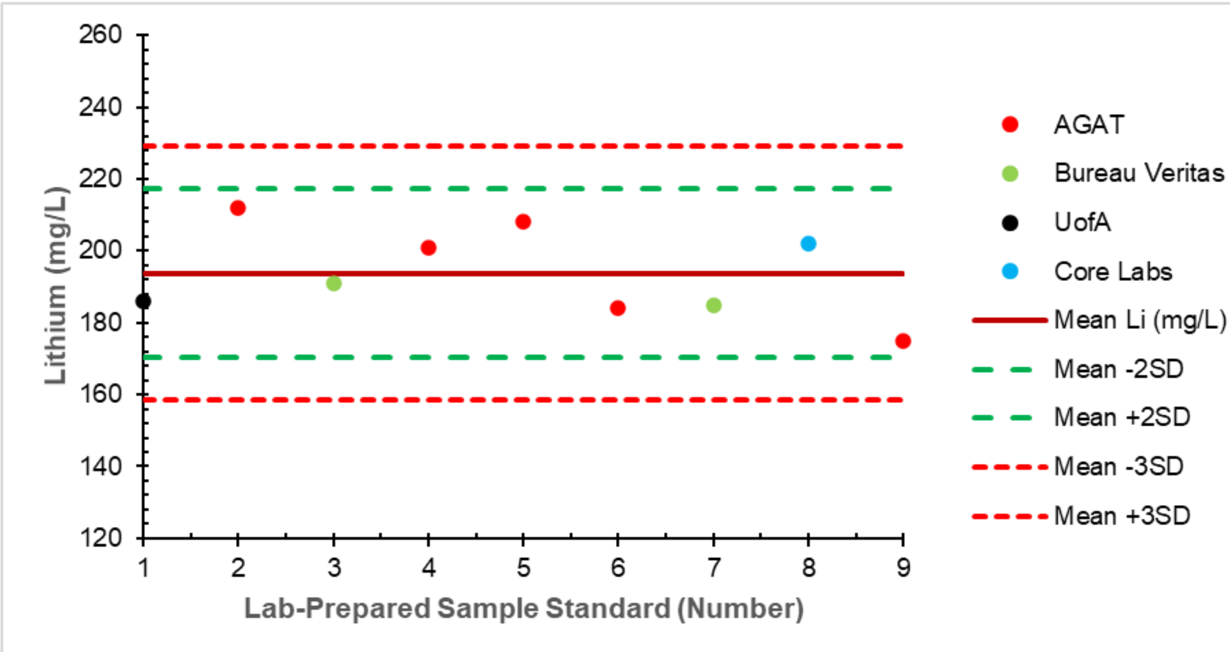
The Sample Standard has a conceived mean of 186±7 mg/L Li. This value is derived from the University of Alberta using ICP-MS instrumentation after routine calibration of the instrument.

A total of 8 lab-prepared Sample Standard samples were submitted as part of the brine sample stream to AGAT (n=5 samples), Bureau Veritas (n=2 samples), and Core Labs (n=1 sample). The analytical results ranged between 175 and 212 mg/L Li (average 194 mg/L Li), which within the analytical error of the University of Alberta CIP-MS measured value (186±7 mg/L Li).

The RSD% of the 8 Sample Standard analysis is 6.1% indicative of very good data quality. The Sample Standard analytical results from all laboratories plot within 2 standard deviations of the mean (194 mg/L Li) and within the University of Alberta measured value of 186±7 mg/L Li (Figure 11.2).

It is concluded that the laboratories used by Highwood are within error of the lab-prepared brine standard and therefore, the analytical data presented are suitable for reporting purposes in this technical report and for use in potential future resource estimation reporting.

Figure 11.2 Sample Standard analytical results.



11.3.4 Laboratory Check Samples

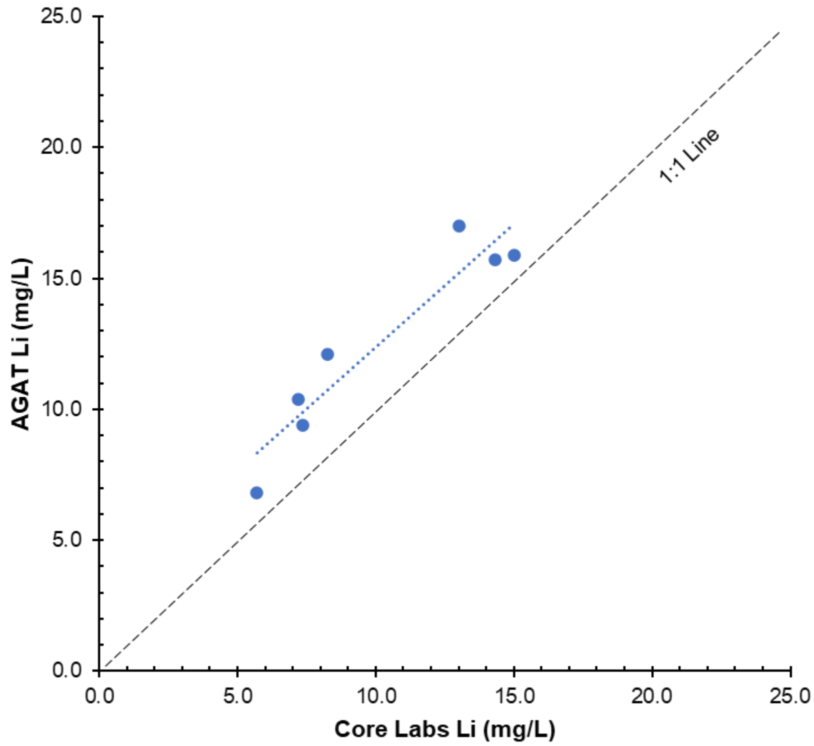
During the March-April 2021 preliminary sampling program, a total of 7 sample sites were duplicated with samples sent to both AGAT and Core Lab. Comparative results are presented in Figure 11.3a and show that the AGAT brine analysis consistently yielded higher lithium results in comparison to the Core Lab results. The senior author and QP investigated this discrepancy and concluded that the difference between the two labs is a result of analytical technique. AGAT analyzed the brine by ICP-OES while Core Lab used ICP-MS.

Presently, ICP-OES is the technique of choice for liquids including hypersaline brine. The advantages of using ICP-OES over other elemental analysis techniques such as ICP-MS or atomic absorption spectrometry (AAS) include its wide linear dynamic range, high matrix tolerance, and the enhanced speed of analysis that can be achieved.

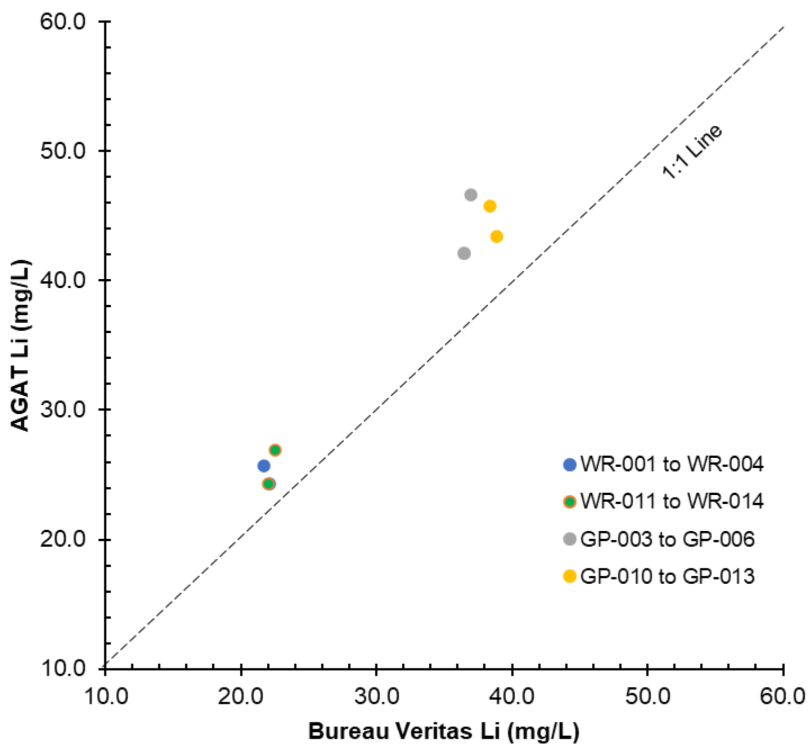
During the May 2021 follow-up sampling program at the Drumheller Property, a total of 4 (of 10) sample sites were duplicated with samples sent to both AGAT and Bureau Veritas. Comparative results are presented in Figure 11.3b and show a similar trend in that the AGAT lab analyses continue to yield higher lithium results in comparison to both Bureau Veritas and Core Labs.

Figure 11.3 Comparison of lithium from duplicate field brine samples that were analyzed at AGAT, Core Lab and Bureau Veritas.

A) AGAT versus Core Labs



B) AGAT versus Bureau Veritas



11.4 Adequacy of Sample Collection, Preparation, Security and Analytical Procedures

These analytical brine data were prepared by independent and accredited third-party laboratories. The analytical methods carried out by the laboratories is standard and routine in the field of Li-brine geochemical analytical test work. All work conducted has been done using accepted standard protocols, and generally accepted practices and methods.

The author and QP has reviewed the adequacy of the sample preparation, security, and analytical procedures and found no significant issues or inconsistencies that would cause one to question the validity of the data. The QP is satisfied with the adequacy of the procedures as implemented by Highwood.

It is the QP's opinion that Highwood should continue to use laboratories that implement ICO-OES for total metals. This would include AGAT as Highwood's primary lab with check samples being analyzed at a secondary laboratory such as Bureau Veritas. It is the QP's opinion that the analytical results produced from these laboratories are sufficient for any future resource estimation work conducted by Highwood in accordance with NI 43-101 and CIM Definition Standards and Guidelines (CIM, 2014, 2019).

12 Data Verification

Highwood's Drumheller Li-brine Project represent an early-stage exploration project. The primary datasets evaluated by the author in the preparation of this geological introduction technical report include publicly available oil and gas well data, and brine geochemical data related to Highwood's initial 2021 brine sampling programs. The author and QP completed a site inspection at Highwood's Drumheller Property on May 28, 2021.

12.1 Oil and Gas Well Data Verification Procedure

The well data were acquired from a third-party oil and gas data management company AbaData, who was developed Abacus Datagraphics and has managed and supplied WCSB petroleum data and maps to industry for over 25 years. AbaData features more than 100 data layers displaying information on energy, forestry, government, the environment, property, utilities, and many others. The AbaData data update cycles range from yearly, monthly, weekly, daily and in some cases, data is updated multiple times a day.

Under AER Directive 059: Well Drilling and Completion Data Filing Requirements, oil and gas companies exploring/producing in Alberta must record and submit data to the AER throughout the drilling phase of any well and update the well's status throughout its life cycle. These data are available in general well data reports generated by the AER, which is also used by third-party oil and gas data management companies to build their respective databases.

As a data verification step, the author compared the well status between AbaData and the AER's general well data reports for a select number of wells (approximately 30 wells) within Highwood's sub-properties. There were no issues to indicate that there is a discrepancy between the well status datasets and the AbaData are deemed appropriate and reliable by the QP for the context of the background geological information used in this technical report.

12.2 Geochemical Data Verification Procedure

The QP reviewed a geochemical dataset provided by Highwood against the original AGAT and Core Labs Certificate of Analysis, which are not produced without the approval of the respective laboratories. Apart from one sample (RE21-HOC-WR-014), no discrepancies were observed.

With respect to the discrepancy mentioned in the text above, upon reviewing the initial analytical results, a single sample (RE21-HOC-WR-014) yielded a lithium value of below the limit of detection ("0") in comparison to its duplicate pair, which had 22.0 mg/L Li. Accordingly, Highwood instructed Bureau Veritas to reanalyze this sample, which returned 22.5 mg/L Li indicative of an original lab error.

The QP participated in a meeting with AGAT laboratory lab managers and asked questions related to accreditation, experience, and laboratory methodologies and techniques. AGAT is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC), and ASTM: American Society for Testing and Materials. The lithium content (and trace elements) of the brine samples were analyzed by ICP-OES, which is a standard analytical technique and industry standard for the measurement of lithium-in-brine.

12.3 Qualified Person Site Inspection

The QP conducted a site inspection of the Drumheller Property on May 28, 2021. The author drove to, stepped on the Sub-Property, observed active oil and gas wells that were producing from the Nisku and Leduc reservoirs/aquifers, and acquired independent brine samples to validate the lithium content of the brine.

A total of 32 1-litre brine samples were collected by the QP in conjunction with Highwood's commissioned brine sample hander, a technician from Bureau Veritas. The samples were transported from the field, and on the same day, to AGAT and Bureau Veritas. Both labs routinely process high TDS brine and perform trace element analysis for lithium. The labs comply with the data quality objectives of the industry, Canadian Regulators, U.S. EPA, and the International Standards Organization (ISO/IEC 17025). The lithium content (and trace elements) of the brine samples were analyzed by ICP-OES, which is a standard analytical technique and industry standard for the measurement of lithium-in-brine.

A summary of the QP brine sample analytical results is presented in Section 9.3. the QA-QC measures applied by the QP on the Drumheller Property brine samples are discussed in Section 11.3. The analytical results of the brine samples collected by the QP confirm that the Nisku- and Leduc-aged brine at the Drumheller Property is enriched in lithium. The Nisku Formation brine from the Wayne-Rosedale oilfield yielded between 22 and 29 mg/L Li (average 24.5 mg/L Li). The Nisku-Leduc Formation brine from the Ghost Pine oilfield yielded between 37 and 49 mg/L Li (average 43 mg/L Li).

12.4 Validation Limitations

Apart from using a check lab, there were minimal QA-QC protocols established by Highwood, or the laboratories commissioned by Highwood, to collect the Company's March-April 2021 preliminary brine samples. Hence the number of QA-QC comparative sample data are minimal from this time-period and represent an initial limitation of the Highwood dataset.

As the sampling program developed, and APEX was commissioned to prepare this technical report, the QP made QA-QC recommendations as part of a sub-property site inspection that included unique sample ID's together with the random insertion of sample duplicates, sample blanks, and sample standards into the sample stream. While this work was conducted during the preparation of this technical report, the resulting QA-QC information did help the QP to evaluate and validate the laboratory data.

Future brine sampling programs initiated by Highwood should adhere to the new QA-QC protocol. This would enable a higher-level confidence in the data in the event Highwood wants to advance the sub-properties and/or evaluate Li-brine resources in accordance with NI 43-101 and CIM Definition Standards and Best Practice Guidelines (2014, 2019).

12.5 Adequacy of the Data

The senior author and QP has reviewed the adequacy of the information presented in this technical report, including oil and gas well data and geochemical data, and found no significant issues or inconsistencies that would cause one to question the validity of the data. The QP is satisfied to include the information and data as presented in this geological introduction technical report.

13 Mineral Processing and Metallurgical Testing

Highwood has conducted preliminary 2021 test work to determine the potential for extraction development processes to extricate lithium from Nisku Formation aquifer brine at their Drumheller Property.

On May 28, 2021, Highwood initiated mineral processing test work by collecting two 20-litre brine samples from well 100/13-35-029-21W4, which produces petroleum and Nisku Formation aquifer brine from the Ghost Pine oilfield within the Drumheller Property.

The brine samples were delivered to two separate and independent laboratories for mineral processing test work. The labs included the Saskatchewan Research Council (SRC) in Saskatoon, Saskatchewan, and Recion Technologies Inc. (Recion) of Edmonton, Alberta. The SRC is accredited in accordance with ISO/IEC 17025:2017 and has applied technology resources and expertise in lithium (and potassium) recovery from brine. Recion is focused on technology development and commercialization of a proprietary and patent-pending process that it has developed to extract, purify, and produce lithium products from a variety of lithium-bearing saline waters including oilfield brines found in Western Canada.

The results of this test work show the ion exchange process holds promise for producing a battery-grade lithium product from Highwood's Drumheller Li-brine project. Mr. Edwards, P. Eng. has reviewed the resulting laboratory mineral processing reports, conducted follow-up interviews with the respective laboratories, and as QP, has prepared and takes responsibility for the preparation of this section of the technical report.

13.1 Confirmation of Brine Representativeness

The brine was collected in the same time interval as the 1-litre assay sampling program presented in Section 9. The mineral processing sample process was observed by QP, Mr. Eccles P. Geol. as part of a NI 43-101 personal site inspection. Hence, the brine samples for mineral processing test work are representative of the Nisku Formation aquifer brine being pumped from well 100/13-35-029-21W4.

The SRC and Recion samples were labelled RE21-HOC-GP-007 and RE21-HOC-GP-008, respectively. The corresponding brine assay test samples, as presented in Table 9.3, yielded between 42.1 mg/L and 46.6 mg/L Li at AGAT and between 36.5 mg/L and 37.0 mg/L Li at Bureau Veritas. In comparison the SRC and Recion head samples yielded 35.9 mg/L and 43.0 mg/L Li. Collectively, the brine samples analyzed at the 4 separate laboratories had an average lithium content of 40.2 g/L Li with an RSD% of 10.8, which indicates good analytical reproducibility.

In the context of 2021 mineral processing test work, it is concluded that the brine samples submitted for testing are representative of the Nisku Formation aquifer brine underlying the Drumheller Property.

13.2 Saskatchewan Research Council

At SRC, the first action was to deal with the "rotten egg" odour (assumed to be from dissolved hydrogen sulphide gas) emanating from the as-received brine. This was done through a pre-treatment process of mixing lime (CaO) into the brine to obtain a pH of 8.0, and then filtering out the precipitated solids to obtain a clear brine solution. Assays of the pre-treated brine are shown in Table 13.1.

Table 13.1 Pre-treated brine assays.

Li (ppm)	Cao (%)	MgO (%)	K_2O (%)	Na_2O (%)
35.91	1.45	0.33	0.20	3.37

Four ion exchange (IX) resins developed and prepared by and at SRC were tested to determine the lithium adsorption capacity of each resin. Based on previous SRC experience, the tests were carried out at room temperature (22°C) with a resin-solution contact time of 20 hours. Test results are shown in Table 13.2.

Table 13.2 IX Resins adsorption capacity.

Test Number	Brine (g)	IX Resin Used		IX Resin Adsorption Capacity (mg per gram of resin)				
		ID	Mass (g)	Li	CaO	MgO	K_2O	Na_2O
1	506.3	1	0.25	23.72	0.00	0.00	0.04	0.00
2	500.0	2	0.22	19.80	0.00	0.00	0.05	0.05
3	514.0	3	0.24	19.72	0.00	o.00	0.04	0.13
4	513.0	4	0.23	20.99	0.00	0.00	0.02	0.25

Resins 1 and 4 showed the highest Li adsorption capacity. Each of these resins was used in a room temperature Li extraction rate and extraction efficiency test, with a brine:resin mass ratio of 165:1. Test results are shown in Table 13.3.

Table 13.3 Li Extraction rate and extraction efficiency.

Test Number	Resin Used		Brine Mass (g)	Retention Time (h)	Brine Sample ID	Li (ppm)	Li Extraction (%)
	ID	Mass (g)					
5	1	1.21	200.0	0	5-1	35.91	0
				2	5-2	0.28	99.2
				3	5-3	0.12	99.7
				4	5-4	0.11	99.7
6	4	1.21	200.0	0	6-1	35.91	0
				2	6-2	1.34	96.3
				3	8-3	0.11	99.7
				4	6-4	0.07	99.8

Resin 1 showed a slightly faster Li initial extraction rate, but both resins had a comparable Li extraction efficiency after 3 hours.

A single room temperature, two-stage Li elution test was done using the loaded resin 1 from test 5. Based on previous SRC experience, the eluant was 0.5 M HCl. Test results are shown in Table 13.4.

Table 13.4 Li Elution from loaded Resin 1.

Test Number	Loaded Resin 1 (g)	Eluate per Stage (g)	Stage Duration (h)	Lithium in Eluate (ppm)	Lithium Elution (%)
7	9.4	51.8	3	1289	40.82
		51.5	4	1384	43.84
		Total: 103.3	Total: 7	Average: 1337	Total: 84.66

The selectivity of the IX process is determined by calculating the change in the ratio of impurity cation concentration/Li^+ concentration from feed brine to product eluate. The relevant ratios are shown in Table 13.5.

Table 13.5 IX Process selectivity.

Sample	Li^+ (ppm)	Ca^{++} ratio	Mg^{++} ratio	K^+ ratio	Na^+ ratio	Total Impurities Ratio
Feed Brine	35.9	10,366	1,982	2,367	25,038	1107
Eluate	1337	526	39	0	147	0.53

The total impurities ratio was reduced from 1107 in the feed brine to 0.53 in the eluate after one loading plus elution cycle.

The SRC lithium IX resins showed a good lithium loading capacity and a good selectivity for lithium.

13.3 Recion Technologies, Inc.

At Recion, upon receipt, the brine was noted to contain ~4% oil floating on the top and to be slightly emulsified. Its pH at room temperature was 4.9 ± 0.1. The concentrations of major cations and Li were determined by ICP-MS and are shown in Table 13.6.

Table 13.6 Received brine assays, mg/L.

Li	Na	Mg	K	Ca	Sr
43±2	26810±1758	1960±60	2810±87	9250±260	282±9

To conduct a Li recovery kinetics batch experiment, 100 mL of the brine was heated to 35 °C (temperature prior to Li extraction in the field) and the pH was measured to be 4.9. Following, 1 mL NaOH solution (1 M) was added to the brine after which the pH reached 7.5. 400 mg Recion's DLE media was added to the brine and mixed for 30 min. Fluid samples were taken after 5, 15, and 30 min for ICP analysis. At the end, the brine was separated from the media using filtration and the media was rinsed with deionized water. The media was suspended in 1 mL acid for 15 min followed by centrifugation. A sample of the acid was taken for ICP analysis. Test results are shown in Table 13.7 and Table 13.8.

Table 13.7 Lithium extraction kinetics results.

Extraction Time (minutes)	Li Extraction (%)	Li Uptake (mg/g)	pH of Brine
0	0	0	7.5
5	55.3	5.9	5.5
15	56.3	6	5.3
20	56.6	6	5.2

Table 13.8 Chemistry of the Li concentrate solution.

Cation	Na	Mg	K	Ca	Sr
Concentration (mg/L)	257	100	100	567	69

To conduct batch isotherm experiments, three 100 mL samples of the brine were heated to 35 °C (temperature prior to Li extraction in the field) and the pH was measured to be 4.9.

Following, 1 mL NaOH solution (1 M) was added to each sample, after which the pH reached 7.5. Recion's media was then added to the brines at loadings of 2, 4 and 6 g/L and mixed for 15 min. At the end of each extraction test, brine was separated from the media using filtration and subsequently fluid samples were taken for ICP analysis. The results are shown in Table 13.9.

Table 13.9 Li Extraction isotherms results.

Loading (g/L)	Li Extraction (%)	Li Uptake (mg/g)	Final pH
4	30	6.5	6.6
4	56	6	5.3
6	68	4.9	5

To optimize the batch extraction for Highwood's brine sample, 100 mL of the brine was heated to 35 °C (temperature prior to Li extraction in the field) and the pH was again measured to be 4.9. After, 1 mL NaOH solution (1 M) was added to the brine and the pH rose to 7.5. Then 600 mg of Recion's DLE media was added to the brine and mixed for 15 min. The pH was maintained at about 7 by adding additional NaOH during the extraction process to increase the Li uptake, as evidenced from the isotherm results. At the end, the brine was separated from the media using filtration and the media was rinsed with deionized water. The media was then suspended in 1 mL acid for 15 min to recover the Li, followed by centrifugation. A sample of the acid was taken for ICP analysis. The optimized extraction test results are shown in Table 13.10. and demonstrate optimized Li extraction results of 98.3%, The results for Li selectivity of the sorbent are shown in Table 13.11.

Table 13.10 Optimized Li extraction results.

Li Extraction	Li Uptake	Li in the concentrate (ppm)	Na in the concentrate (ppm)	Mg in the concentrate (ppm)	K in the concentrate (ppm)	Ca in the concentrate (ppm)	Sr in the concentrate (ppm)
98.3%	7 mg/g	2075	405	245	97	320	52

Table 13.11 Li Selectivity of the sorbent.

$\alpha_{Li/Li}$	$\alpha_{Li/Na}$	$\alpha_{Li/Mg}$	$\alpha_{Li/K}$	$\alpha_{Li/Ca}$	$\alpha_{Li/Sr}$
1	6350	784	2690	1970	372

To end, and in the opinion of the QP responsible for this section of the technical report, the results of the preliminary lithium extraction process development testing at both SRC and Recion indicate that an ion exchange process holds reasonable prospects for eventual economic extraction of battery-grade lithium product from Highwood's petro-lithium brine. The SRC lithium IX resin results showed a good lithium loading capacity and a good selectivity for lithium. The Recion demonstrated optimized Li extraction results of 98.3%. Further testing for process development and process design is justified and recommended.

14 Mineral Resource Estimates

14.1 Introduction and Resource Estimation Steps

Highwood's Drumheller Li-Brine Project is an early-stage exploration project. The mineral, or Li-brine, resource area defined in this Technical Report is constrained stratigraphically to the subsurface, confined Devonian Leduc and Nisku formation aquifers underlying the Drumheller Property. Through geological review and interpretation, Mr. Eccles has defined 3 resource domains, which are presented in Figure 14.1, and include:

1. Leduc Aquifer Domain: The Leduc Formation aquifer, which underlies most of the Property – apart from the area northwest of the Killam Barrier Reef where the Leduc abruptly transitions to Duvernay Formation shale.

2. Nisku Killam Barrier Reef Aquifer Domain: A wireframed zone of the Nisku Formation aquifer within the northeast-trending, linear Killam Barrier Reef and an area that extends 10 km east of the reef edge. This domain is uniquely modelled as a zone in which the Nisku and Leduc formation aquifers are in hydro-communication with one another.

3. Nisku Platform/Basin Aquifer Domain: The area of remaining Nisku Formation aquifer volume that occurs outside of the Nisku Killam Barrier Reef Aquifer Domain. The domain includes Nisku Formation within the East Platform Shelf (east and southeast Property) and East Shale Basin (uppermost northwest corner of the Property). It is assumed that the Nisku in this domain is not in hydro-communication with the Leduc aquifer.

Statistical analysis, three-dimensional (3-D) modelling and resource estimation was prepared by Mr. Black, M.Sc. P. Geo. of APEX.

The modelling and estimation work were performed in direct collaboration and supervision of Mr. Eccles, M.Sc. P. Geol. who takes responsibility for the resource estimation presented in this Technical Report. The workflow implemented for the calculation of the Drumheller lithium-brine resource estimations were completed using: the commercial mine planning software MicroMine (v 21). Critical steps in the determination of the Highwood lithium-brine resource estimation include:

- Definition of the geology and geometry of the subsurface Leduc and Nisku formations underlying Drumheller Property.

- Hydrogeological characterization and a historical compilation and assessment of mean porosity within the Leduc and Nisku formation aquifers.

- Determination of the lithium-in-brine concentration in the Leduc and Nisku resource domain aquifers.

- Definition of the pore space volume of brine within the Leduc and Nisku aquifers.
- Demonstration of reasonable prospects of eventual economic extraction.
- Estimate of the *in-situ* lithium resources of Leduc and Nisku formation aquifers brine underlying the Drumheller Property using the relation:

> *Lithium Resource = Total Volume of the Brine-Bearing Aquifer X Average Effective Porosity X Percentage of Brine in Pore Space x Average Concentration of Lithium in the Brine.*

The Drumheller Li-Brine Resource estimations is reported in accordance with NI 43-101 and has been estimated using the CIM "Estimation of Mineral Resources and Mineral Reserves Best Practice Guidelines" dated November 29th, 2019, and CIM "Definition Standards for Mineral Resources and Mineral Reserves" amended and adopted May 10th, 2014. Mineral resources are not mineral reserves and do not have demonstrated economic viability. There is no guarantee that all or any part of the mineral resource will be converted into a mineral reserve.

The Li-brine resource is also reported in compliance with the CIM Best Practice Guidelines for Resource and Reserve Estimation for Lithium Brine (1 November 2012). This guideline provides specific criteria for Li-brine modelling and estimation that include definition of the aquifer boundaries; brine chemistry; and depiction of the hydrology of the brine aquifer. These guidelines are somewhat dated in that the focus is on 'unconfined' continental brine deposits (i.e., salars). Accordingly, the authors have considered all criteria of the CIM Best Practice for Resource and Reserve Estimation for Lithium Brine and used professional judgement in applying them to a 'confined' subsurface aquifer.

The Effective Date of the Drumheller Li-Brine Resource estimations is 21 February 2022.

14.2 Data

14.2.1 Subsurface Three-Dimensional Geological Model

Highwood used the AccuMap (IHS Markit, 2021) system to acquire well data and the top surface horizons picks for the 6 formations in the vicinity of the Drumheller Property. The data search extended approximately 10 km in all directions around the property to ensure geological continuity of the units. The 6 formations were used to create the 3-D geological model utilized in the resource estimation process. The pick units were defined as Total Vertical Depth (TVD) in metres. The number of well penetrations, and user top-defined surface horizon picks for each of the formations is presented in Table 14.1.

Figure 14.1 Mineral resource aquifer domains used in the resource modelling and estimation process.

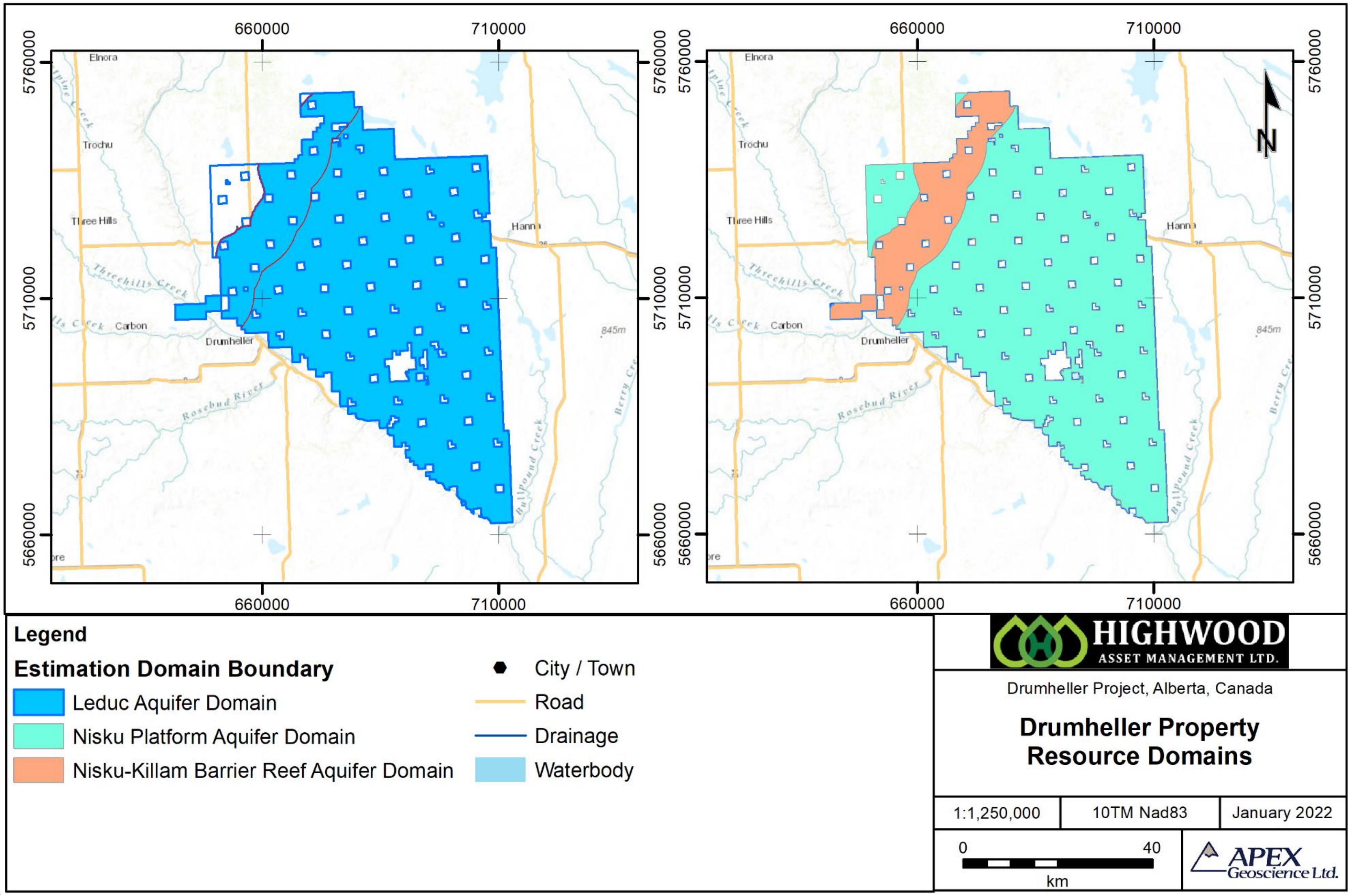


Table 14.1 Summary of Devonian well penetrations and user top-defined surface horizon picks for each of the formations used to create the 3-D geological model.

Formation or Group	Well penetrations	Top surface picks defined
Nisku	862	409
Ireton	489	374
Leduc	424	224
Cooking Lake	106	90
Beaverhill Lake	59	50
Elk Point	35	34
Totals	**1,975**	**1,181**

Using these picks, separate surface grids were prepared for all 6 formations using Petra™ (IHS Markit, 2021b) kriging algorithm with a 100 m x 100 m grid spacing. Other than entering null values for those wells that did not contain specific top surface horizon picks, the data set was not subject to capping or removal of low, or high, values. The resulting grid file was exported in several formats (e.g., DXF, shapefiles) and forwarded to APEX to insert into MicroMine, validate the surface files, and prepare a 3-D geological model of the Devonian strata underlying the Drumheller Property.

The Highwood surface grids were validated by comparing the surface grids with data derived from a well database of over 3,500 Devonian picks (see Section 6.1.1). In addition, APEX utilized the 3-D geological information for the Elk Point to Nisku formations from the 3D Provincial Geological Framework Model of Alberta (Alberta Geological Survey, 2019). In the opinion of the Mr. Eccles, the various test surfaces plotted within reason of one another, and it was concluded that the surface files were sufficient for 3-D resource modelling with the intent of preparing mineral resource estimations.

14.2.2 Hydrogeological Data

Hydrogeological and petroleum well data are submitted to the Alberta Energy Regulator by the petro-companies and are compiled by third-party petro-database-vendors (e.g., AccuMap). These historical unfiltered well data were compiled and form the basis of the hydrogeological assessment. The various datasets include:

- 741 absolute pressure measurements.
- 436 routine water geochemical analytical analyses.
- 1,761 effective core plug porosity and permeability measurements.
- 126,590 total porosity measurements as calculated from electric wireline logs.

- 811 drill stem test (DST) measurements
- 7,188 annual fluid production statistics.

14.2.3 Lithium Analytical Data

Li-brine assay data pertinent to calculating an average lithium value for the Drumheller Li-brine resource estimations is culled from:

- Historical oil and gas industry company reports compiled by the Government of Alberta (Eccles and Jean, 2010; Lopez et al., 2020).
- A total of 29 Leduc and Nisku aquifer brine samples collected by Highwood during the Company's 2021 brine sampling campaigns at the Ghost Pine and Wayne-Rosedale oilfields within the boundaries of the Drumheller Property.

14.2.4 Data QA/QC

The May 28, 2021, site inspection allowed the Mr. Eccles to confirm the geological interpretations made in support of mineral resource estimation. The validation of oil and gas well data conducted by the senior author during the preparation of the mineral resource estimates presented in Chapter 14 have shown the data to be reliable and accurate.

Further, results of the independent QP analytical test work and QA-QC work including an assessment of sample duplicates, blanks, and standards, and a primary-secondary lab check (see Section 11.3), conducted by the senior author demonstrate that the Highwood assay dataset is valid and appropriate to be used in the resource estimations.

The QP therefore considers that the data is adequate for the estimation of mineral resources in accordance with CIM definitions and guidelines (2014, 2019) and the NI 43-101 disclosure rule.

14.3 Hydrogeological Characterization of the Leduc and Nisku Formation Aquifers

This Drumheller Property hydrogeological characterization study (hydro study) was prepared by Mr. Touw of Hydrogeological Consultants Ltd. (HCL), Edmonton, AB. Mr. Touw takes responsibility for this hydrogeological sub-section, is independent of Highwood Asset Management (Highwood), and specializes in groundwater consulting services, including hydrogeological NI 43-101 reporting in relation to lithium-enriched, Devonian-aged, confined aquifer brine deposits.

The hydro study pertains to the Upper Devonian Woodbend Group Leduc Formation and Winterburn Group Nisku Formation in the region of the Highwood Drumheller Property. The data was derived from historical oil and gas exploration and production work and acquired by Highwood through third-party energy data compilation companies (e.g., AccuMap, Petra).

Per CIM Best Practice Guidelines for Li-Brine Resources (1 November 2012), the intent of this subsection is to provide an understanding of the hydrogeology of the Devonian brine underlying the Drumheller Property. Confined aquifer hydrostratigraphic characteristics such as porosity, permeability, fluid production, transmissivity, storativity and long-term yield, are imperative to the Li-brine resource estimation process.

Abbreviations in this section include:

DPHI LIM	Porosity calculation from density based on a limestone matrix
Kpaa	Kilopascal (absolute pressure)
PHI.H	Porosity multiplied by aquifer thickness
RSD	Residual standard deviation
KMax	Maximum horizontal permeability at a particular depth, derived by flowing air through the core in various directions and recording the maximum value
K90	Horizontal permeability measured at 90 degrees to the Kmax direction
KVert	Permeability measured vertically through the core

The author includes the geometric mean of a data set, or geomean, which is calculated by multiplying the numbers in the data set, and taking the n^{th} root of the result, where "n" is the total number of data points in the set. In reservoir modelling, geometric means are used in cases where the differences among data points are logarithmic or vary by multiples of 10 and the effects due to data outliers are greatly dampened (e.g., permeability).

14.3.1 Relationship Between the Leduc Formation and Nisku Formation Aquifers and Hydrogeological Support for the Three Resource Aquifer Domains

As stated in Section 14.1, the senior author, Mr. Eccles, proposes that three separate resource aquifer domains occur within the Drumheller Property; these include the:

1) Leduc Aquifer Domain,

2) Nisku Killam Barrier Reef Aquifer Domain, and

3) Nisku Platform/Basin Aquifer Domain.

A delineation of the aquifer domains (Figure 14.1) was made by the authors based on a review of historical pressure elevation surveys and fluid chemical data as provided by the petro-companies, and derived from AccuMap, to substantiate the '3-resource aquifer domain' theory from the hydrogeological perspective; these pressure and chemical assessments are discussed below.

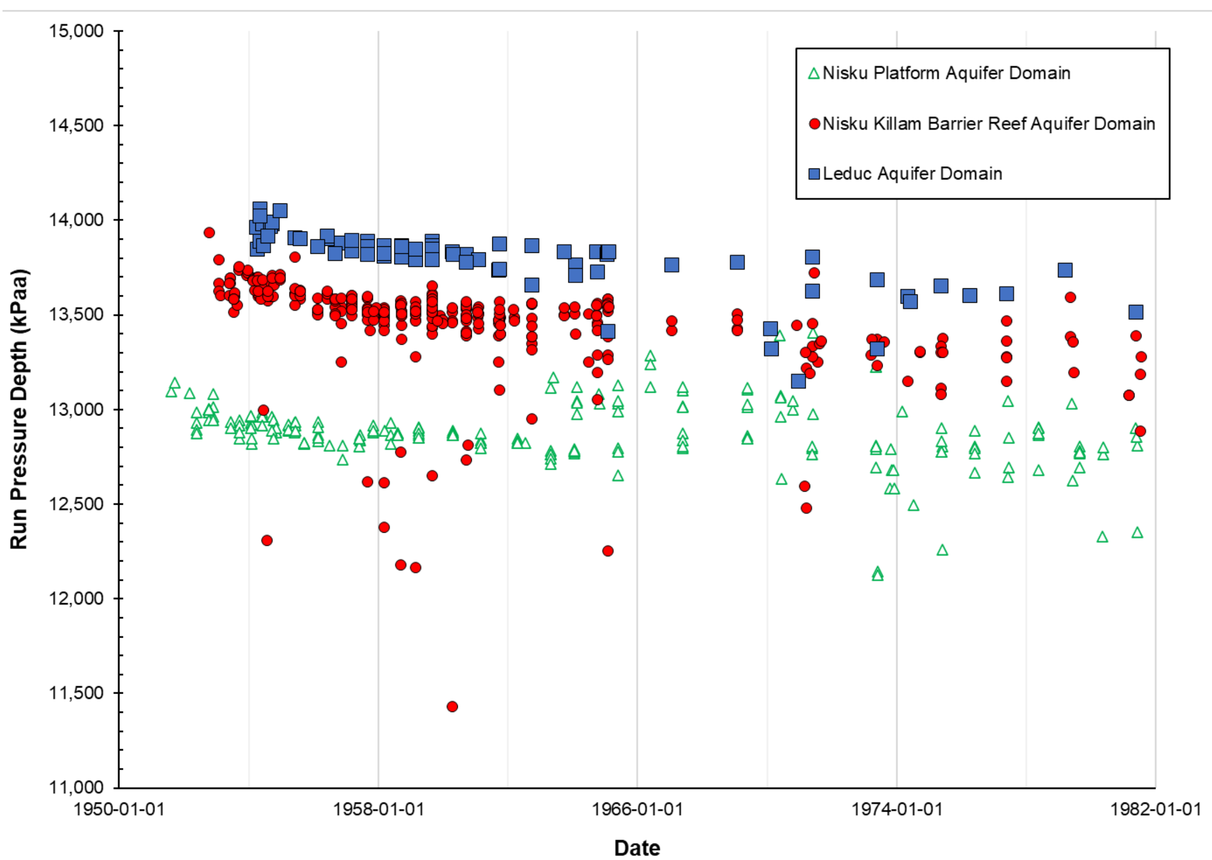
14.3.1.1 Reservoir Pressure

The oil run pressure depth fluid levels within the three resource domains are presented in Figure 14.2. Consistent testing between the early 1950s and early 1980s shows that the three resource aquifer domains can typically be differentiated by formation pressure.

- Leduc Aquifer Domain = approximate absolute pressure of 13,900 kilopascals (kPaa).
- Nisku Killam Barrier Reef Aquifer Domain = approximately 13,500 to 13,700 kPaa.
- Nisku Platform/Basin Aquifer Domain = approximately 12,800 kPaa.

The pressure elevation data are slightly more scattered after the mid-1980s, but for an approximate 35-year period, the data variation described in the text above is generally the same in that the Leduc Aquifer Domain has the highest elevation of fluid pressure, the Nisku Platform/Basin Aquifer Domain has the lowest elevation, and the Nisku Killam Barrier Reef Aquifer Domain plots in the middle and more-or-less mimics the Leduc Aquifer Domain absolute pressure trend.

Figure 14.2 Pressure-Survey Results of the 3 Resource Aquifer Domains.



APEX Geoscience Ltd.

14.3.1.2 Geochemistry

Formation water analyses data were extracted from AccuMap for Leduc- and Nisku-aged fluid geochemical measurements from wells within the Drumheller Property and analyzed in order to select samples representative of formation water chemistry. The analytical data generally includes routine water analyses (i.e., cations/anions). Total dissolved solids (TDS) values were calculated by summing the major chemical constituents (Ca^{2+}, Mg^{2+}, Na^{+}, K^{+}, CO_3^{-}, HCO_3^{-}, Cl^{-}, and SO_4^{2-}) as reported in the dataset.

The dataset was culled by removing data that had:

1. Poor ionic balance.

2. Poor water sample quality comments such as "contamination", "incomplete analysis", and "analytical error".

3. Unrealistically low Total Dissolved Solids (TDS; e.g., <25,000 mg/L TDS).

In addition, the fluid geochemical data were accepted with water sample quality comments that included "possible formation water" "possible formation water, acceptable TDS", "possible formation water, low TDS", and "possible formation water, diluted".

A total of 98 fluid geochemical analyses passed the data culling criteria out of an initial dataset of 436 analyses. The culled data of the 98 remaining analyses included representative analytical results from all three resource aquifer domains (Figure 14.3):

- 18 analyses from wells within the Leduc Resource Aquifer Domain (average TDS concentration of 120,000 milligrams per litre [mg/L]).

- 26 analyses from wells within the Nisku Killam Barrier Reef Resource Aquifer Domain (average TDS concentration of 94,000 mg/L).

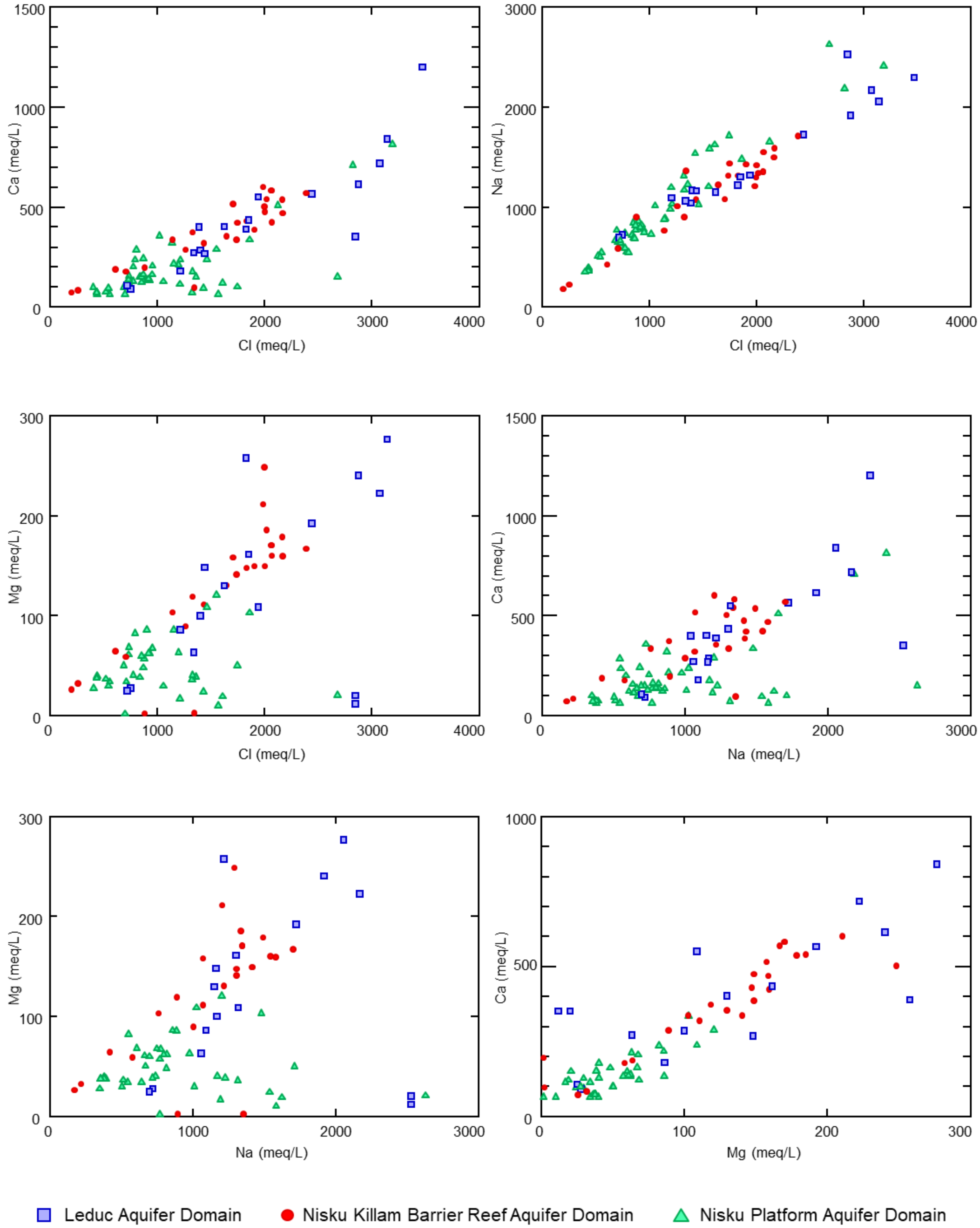
- 54 analyses from wells within the Nisku Platform Resource Aquifer Domain (average TDS concentration of 76,000 mg/L).

Using these culled data, the selected bi-variate plots show a consistently increasing trend in Ca, Cl, Mg, and Na. The elemental values increase from the Nisku Platform/Basin Aquifer Domain (lowest) to the Nisku Killam Barrier Reef Aquifer Domain and through to the Leduc Aquifer Domain (highest). The geochemical data shows:

1. A distinct variation in the chemistry of the 3 resource aquifer domains.

2. An elemental continuum that suggests a relationship exists between the resource aquifer domains.

Figure 14.3 Fluid Geochemistry of the 3 Resource Aquifer Domains.



In conclusion, the variations in the pressure elevation and fluid geochemistry support the designation of three separate Devonian-aged resource aquifer domains at the Drumheller Property as presented in Figure 14.1. It is therefore interpreted that:

- The Leduc and Nisku Platform resource aquifer domains are separate hydrogeological units and should be characterized as such in this hydrogeological characterization sub-section.

- In contrast, the Nisku Barrier Reef Resource Aquifer Domain consistently has pressure elevation and fluid geochemical characteristics that plot in-between the data from the Leduc Resource Aquifer Domain and Nisku Platform Resource Aquifer Domain. It is implied, therefore, that the Nisku Barrier Reef Resource Aquifer Domain represents a unique hydrostratigraphic unit in which the Leduc and Nisku aquifers are in hydrogeological communication at this resource domain locale.

This conclusion is further supported by:

1. The Devonian geology in which the Killam Barrier Reef represents a major reef buildup feature in the northwest corner of the Drumheller Property (see Section 7),

2. The variation of lithium in the brine acquired from the Ghost Pine (Nisku Killam Barrier Reef Resource Aquifer Domain) and Wayne-Rosedale oilfields (Nisku Platform Resource Aquifer Domain; see Section 9.3), and

3. The 3D geological modelling as presented throughout the mineral resources Section 14.

14.3.2 Porosity

Effective porosity values are determined by laboratory-analyzed porosity measurements of core plug samples. Total porosity values are determined from analysis of wireline logs, typically density and sonic logs. The results of both methodologies for the Drumheller property are discussed below.

14.3.2.1 Effective Porosity from Core

Effective porosity values are determined by measuring porosity on individual core plug samples. The dataset only contains data from analyses that were originally submitted by industry. Dominantly reservoir units are cored by industry and only specific intervals are analyzed for permeability and porosity, hence core analyses may be biased towards higher permeability and porosity values when considering the entire sedimentary column. Each core plug is not necessarily analyzed for all parameters, i.e., for some plugs only porosity may have been measured.

A total of 1,761 core plug samples were collected from the Leduc and Nisku Formations historically, by companies other than Highwood. Of these samples, effective porosity measurements were completed on 1,552 cores plugs.

A summary of the effective porosity measurements is presented in Table 14.2; the locations of the wells from which the core plug samples were collected are shown in Figure 14.4, and summarized in the text that follows:

- Leduc Resource Aquifer Domain: A total of 146 core plug samples, with a total core interval of 106.3 m, was collected from 7 wells. Of these samples, 127 were measured for effective porosity from a total core interval thickness of 51.7 m. With null values removed from the dataset (n=21), the measured effective porosities yielded between 0.5% and 21.7% porosity (average of 9.6% and a geomean of 8.4%).

- Nisku Killam Barrier Reef Resource Aquifer Domain: A total of 846 core plug samples, with a total core interval of 333.7 m, was collected from 22 wells. Of these samples, 772 were measured for effective porosity from a total core interval thickness of 240.9 m. With null values removed from the dataset (n=74), 772 measured effective porosities yielded between 0.2% and 22.5% porosity (average of 6.1% and a geomean of 4.7%).

- Nisku Platform Resource Aquifer Domain: A total of 769 core plug samples, with a total core interval of 425 m, was collected from 29 wells. Of these samples, 653 were measured for effective porosity from a total core interval thickness of 191 m. With null values removed from the dataset (n=116), 653 measured effective porosities yielded between 0.1% and 44.5% porosity (average of 6.8% and a geomean of 4.8%).

14.3.2.2 Total Porosity from Wireline Logs

To validate the effective core porosity values, the authors acquired electric wireline log information from wells located within the Drumheller Property to calculate total porosity, as discussed below.

An analysis of well wireline logs, including density log porosity (DPHI LIM) and sonic log porosity (DPHI SONIC), was conducted to determine total porosity in the Devonian strata underlying the Drumheller Property. Wireline information from the logs was converted to per cent porosity using the following techniques:

1. Implementation of a cross correlation of core data (>0%) and density porosity (Limestone Matrix, i.e., DPHI LIM) to obtain the average porosity adjustment. This was done independently for each of the 3 resource aquifer domains within the Leduc and Nisku formations. The "adjusted porosity" measurement was then applied across the entire isopach of each respective formation on a 20 cm increment. The total per cent calculation adds up to a total PHI.H calculation.

Table 14.2 Summary of effective porosity from core.

A) Leduc Resource Aquifer Domain

	Sample Upper Depth (m)	Sample Lower Depth (m)	Sample Thickness (m)	Effective Porosity (%)
Count [1]	146	146	146	127
Mimimum	1,574.0	1,574.2	0.1	0.5
Maximum	1,828.6	1,830.0	18.0	21.7
Average or Total	1,658.9	1,659.6	106.3	9.6
Geomean				8.4
Standard deviation	/	/	/	4.2
RSD%	/	/	/	44.2

B) Nisku-Killam Barrier Reef Resource Aquifer Domain

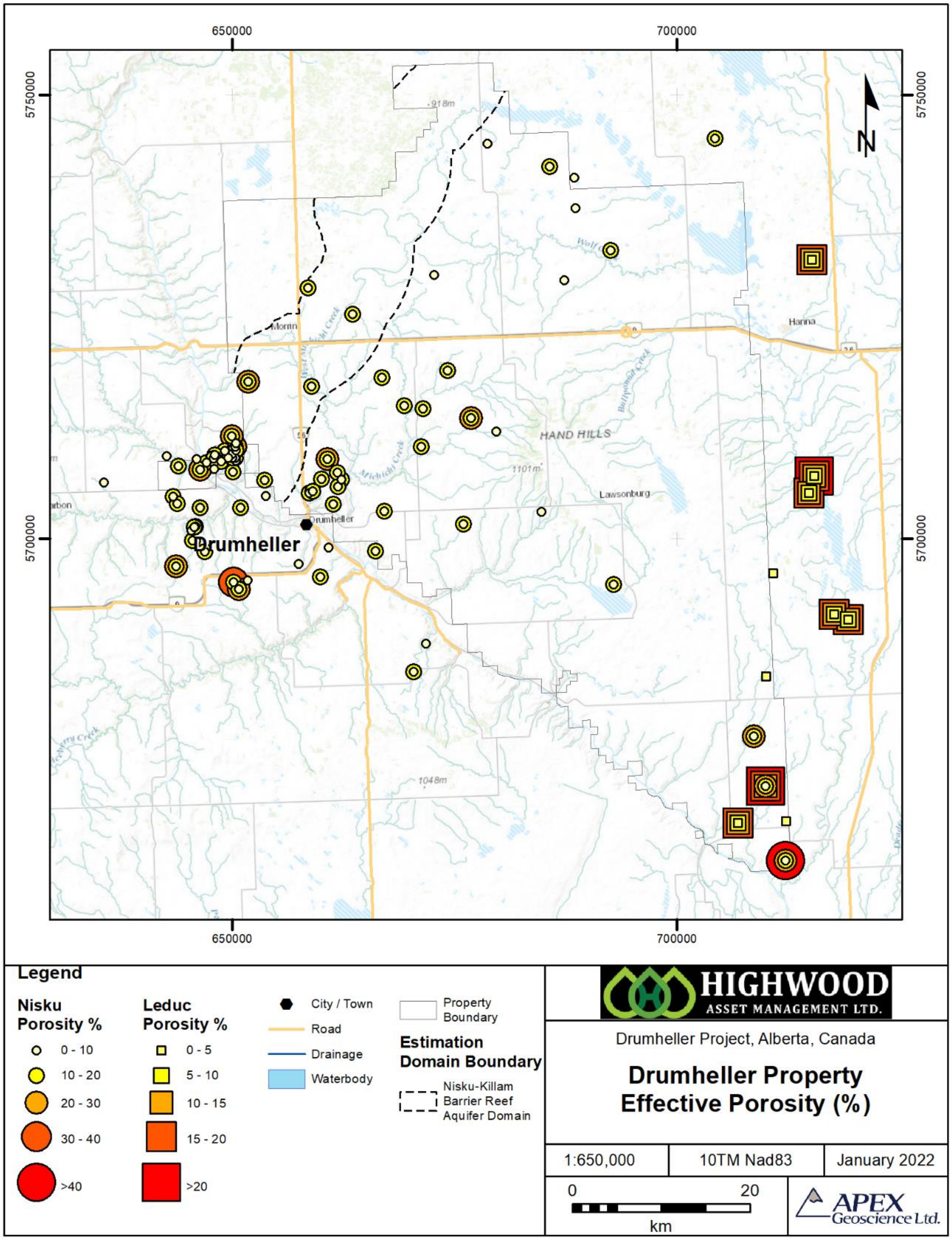
	Sample Upper Depth (m)	Sample Lower Depth (m)	Sample Thickness (m)	Effective Porosity (%)
Count [1]	846	846	846	772
Mimimum	1,578.0	1,578.2	0.0	0.2
Maximum	1,746.7	1,749.6	15.2	22.5
Average or Total	1,680.7	1,681.1	333.7	6.1
Geomean				4.7
Standard deviation	/	/	/	4.0
RSD%	/	/	/	65.2

C) Nisku Platform/Basin Resource Aquifer Domain

	Sample Upper Depth (m)	Sample Lower Depth (m)	Sample Thickness (m)	Effective Porosity (%)
Count [1]	769	769	769	653
Mimimum	1,352.0	1,357.1	0.0	0.1
Maximum	1,670.3	1,675.2	16.8	44.5
Average or Total	1,580.5	1,581.1	425.0	6.8
Geomean				4.8
Standard deviation	/	/	/	5.5
RSD%	/	/	/	79.7

[1] Number count vary because null values are removed.

Figure 14.4 Location of the calculated core-plug (effective) porosity measurements.



2. Secondly, the authors cross correlated DPHI LIM and Sonic-log data to obtain a best fit line that accommodates the data. This technique determines the best fit line and then utilizes the porosity adjustment (from point 1 above) to determine the per cent porosity measurement.

The log data values were calculated every 20 cm downhole through the Nisku and Leduc formations. The total porosity was derived from a merged data set of density log porosity (DPHI LIM) and sonic log porosity (DPHI SONIC) with the DPHI LIM values given a priority over the sonic log calculated porosities. Based on the initial total porosity data file:

- Log data from 61 wells was assessed for the Leduc Formation and included 57,785 records, of which, there were 35,770 DPHI LIM values (61.4%) and 52,493 records (90.8%) with DPHI SONIC values. Of these total porosity calculations, 39,617 values were from wells located adjacent to the Drumheller Property leaving 18,167 (or 31.4%) total porosity measurements within the boundaries of the Drumheller Property.

- Log data from 283 wells was assessed for the Nisku Formation and included 68,805 combined records, of which, there were 25,768 DPHI LIM values (37.5%) and 49,341 records (71.7%) with DPHI SONIC values. Of these total porosity calculations, 40,733 values were from wells located adjacent to the Drumheller Property leaving 28,072 (or 40.7%) total porosity measurements within the boundaries of the Drumheller Property.

The total porosity values as calculated from electric wireline logs within the Leduc and Nisku resource aquifer domains underlying the Drumheller Property are summarized in Table 14.3 and presented in Figure 14.5.

Null values (zero) were removed from the dataset. In summary,

- Leduc Aquifer Domain: A total of 16,199 calculated total porosities, observed in 18 wells, yielded between 0.1% and 28.4% porosity (average of 7.6% and a geomean of 5.8%).

- Nisku Killam Barrier Reef Aquifer Domain: A total of 7,545 calculated total porosities, observed in 36 wells, yielded between 0.1% and 31.4% porosity (average of 5.9% and a geomean of 4.7%).

- Nisku Platform/Basin Aquifer Domain: A total of 17,166 calculated total porosities, observed in 79 wells, s yielded between 0.1% and 65.5% porosity (average of 5.0% and a geomean of 3.9%).

Table 14.3 Summary of total porosity from wireline logs.

	Leduc Resource Aquifer Domain	Nisku Killam Barrier Reef Resource Aquifer Domain	Nisku Platform/Basin Resource Aquifer Domain
Count [1]	16,199	7,545	17,166
Minimum	0.1	0.1	0.1
Maximum	28.4	31.4	65.5
Average	7.6	5.9	5.0
Geomean	5.8	4.7	3.9
Standard deviation	4.5	4.0	4.1
RSD%	59.8	67.3	81.8

[1] Number count vary because null values are removed.

The total porosity average values mimic those of the effective core porosity in that the Leduc Aquifer Domain has the highest porosity of the three aquifer domains; however, the total porosity values of the Nisku Killam Barrier Reef Aquifer Domain are higher than the total porosity values from the Nisku Platform/Basin Aquifer Domain, which is the reverse of the effective core porosity values for these two aquifer domains.

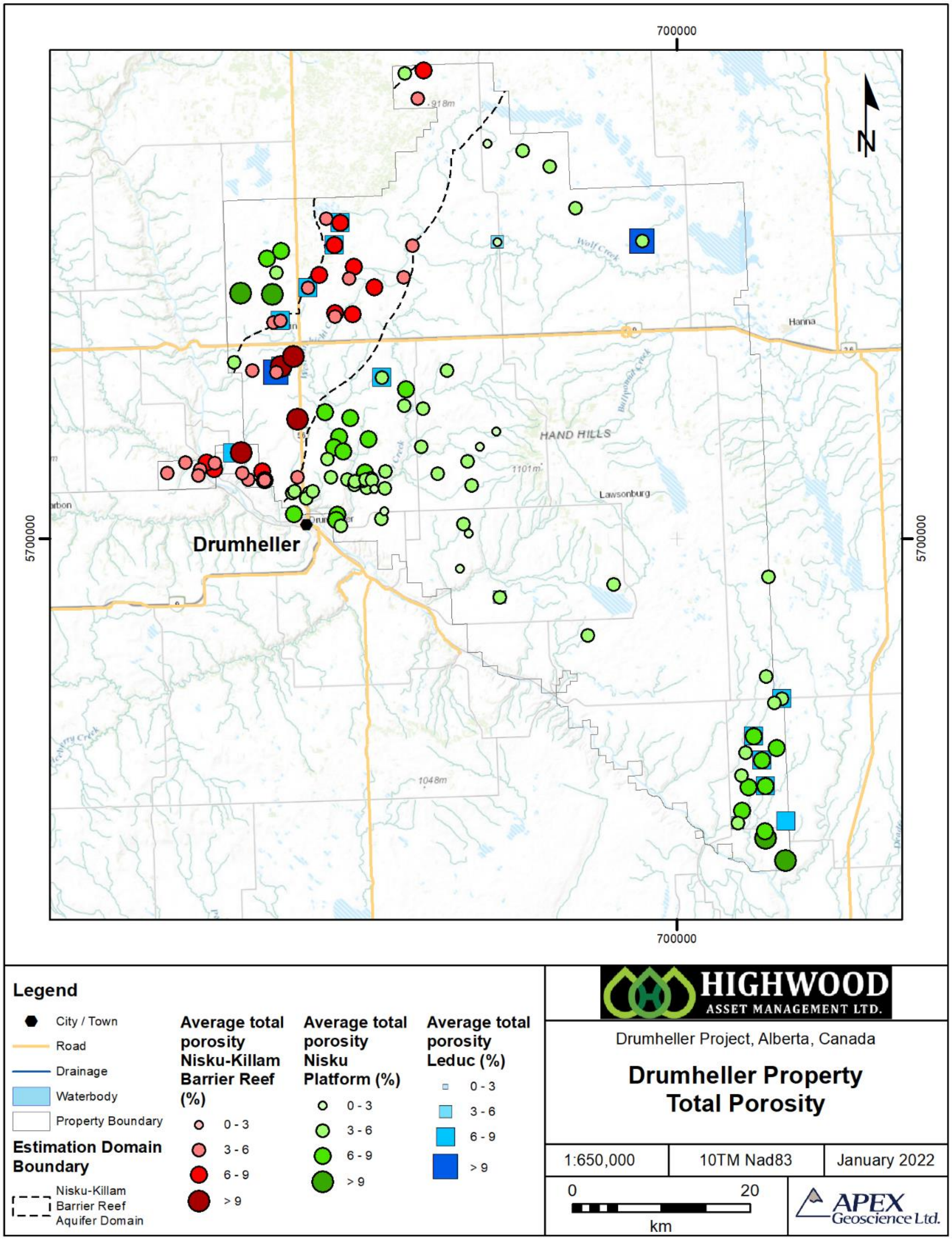
Generally, the total porosities values are lower in comparison to the effective core porosities. Total porosity in the Leduc Aquifer Domain is 31% lower than the effective core porosity and is 26% lower than effective porosity in the Nisku Platform/Basin Aquifer Domain; however, the total porosity and effective porosity values are equal in the Nisku Killam Barrier Reef Aquifer Domain, based on the porosity values. The authors credit this difference due to variations in the Leduc and Nisku lithologies. That is, application of the limestone matrix in the calculations for the entire Leduc and Nisku stratigraphy introduces a bias in the conversion of the log profiles to per cent porosity.

In the opinion of the QP, the effective core porosity provides the best estimate of porosity in the Leduc and Nisku formations underlying the Drumheller Property and that the effective porosities be used in the mineral resource estimation process.

14.3.3 Permeability

Effective Core permeability values are determined by laboratory-analyzed permeability measurements of core plug samples. The core analysis reports from third-party providers include three permeability measurements labelled KMax, K90, and KVert. KMax is the maximum measured permeability in the core perpendicular to the core axis. This direction is determined by measuring the pressure drop across the core and then rotating the core horizontally along its axis until the minimum pressure drop is achieved. K90 is measured after rotating the core 90 degrees horizontally from the direction of KMax; K90 must be less than or equal to Kmax. KVert is then measured by flowing fluid through the vertical direction of the core. KVert is often less than KMax in sandstones and shaly sandstones; however, KVert may be greater than KMax if vertical fractures exist, as they do in many carbonate reservoirs.

Figure 14.5 shows the locations of wells used to determine total porosity as calculated from electric wireline logs within the Leduc, Nisku Killam Barrier Reef and Nisku Platform Resource Aquifer Domains underlying the Drumheller Property.



Drill-stem tests (DST) provide the petroleum industry information on three critical properties of subsurface formations: pressure head, permeability, and water geochemistry. During the DST, the stratigraphic interval of interest is isolated in the hole by the use of packers attached to the drill string and is allowed to yield fluid into the drilling pipe under the influence of the formation head. Horner (1951) suggested a method to analyze the pressure recovery measurements collected during a DST based upon the following equation:

$$p_w = p_0 - \frac{2.3q\mu}{4\pi kh} log \frac{t_0 + \Delta t}{\Delta t}$$

Where:

p_w = pressure at the well bore (F/L^2)

p_0 = undisturbed formation pressure (F/L^2)

q = the rate of production (L^3/T)

μ = viscosity of the fluid (FT/L^2)

k = permeability of the producing formation (L^2)

h = thickness of formation being tested (L)

t_0 = interval of time of production (T)

Δt = time elapsed since closing in the well after period of production (T)

In general, core plug permeabilities reflect permeability on a small-scale (centimetre-scale) while permeabilities derived from DST analyses reflect estimates of permeability on a larger scale (metre-scale), based on the tested interval. Given the larger scale of the DST permeability estimates, these were preferred for the characterization of the hydrostratigraphic units.

The results of both methodologies for the Drumheller property are discussed below.

14.3.3.1 Core Permeability

Core permeability values for the Drumheller property are determined by measuring the KMax and KVert on individual core plug samples. A total of 1,761 core plug permeability measurements were completed, historically, by companies other than Highwood.

A summary of the core permeability measurements is presented in Table 14.4, and Figure 14.6, and summarized in the text below as follows:

- Leduc Aquifer Domain: A total of 146 core plug samples from 6 wells were measured for effective permeability for a total core interval of 106.3 m. With null values (0.00) removed from the dataset (n=27), 119 effective KMax permeabilities measured yielded between 0.08 mD and 5,680.0 mD permeability (average of 264.3 mD and a geomean of 22.0 mD).

  The geomean KVert, based on 117 samples, is 4.6 mD; when the KVert is compared to the geomean KMax value, it equates to a vertical anisotropy of 0.21.

  Note: Vertical anisotropy was calculated by dividing the geomean value for vertical permeability (KVert) by the geomean value of horizontal permeability (KMax).

- Nisku Killam Barrier Reef Aquifer Domain: A total of 846 core plug samples from 21 wells were measured for effective permeability for a total core interval of 333.7 m. With null values (0.00) removed from the dataset (n=109), 737 effective KMax permeabilities measured yielded between 0.01 mD and 26,600 mD permeability (average of 454.8 mD and a geomean of 23.9 mD).

  The geomean KVert, based on 306 samples, is 2.8 mD; when the KVert is compared to the geomean KMax value, it equates to a vertical anisotropy of 0.12.

- Nisku Platform/Basin Aquifer Domain: A total of 769 core plug samples from 29 wells were measured for effective permeability for a total core interval of 425 m. With null values (0.00) removed from the dataset (n=147), 622 effective permeabilities measured yielded between 0.01 mD and 30,000 mD permeability (average of 484.2 mD and a geomean of 6.5 mD).

  The geomean KVert, based on 574 samples is 1.1 mD; when the KVert is compared to the geomean KMax value, it equates to a vertical anisotropy of 0.17.

The wide range in effective permeabilities, from 0.01 to 30,000 mD, demonstrates the high degree of lithological variability in the Leduc and Nisku formations, evidenced by residual standard deviation (RSD%) values ranging from 211% to over 1,200%.

Therefore, the use of the geomean permeability values from each of the three aquifer domains is likely the most representative value. In the opinion of the QP, the use of the geomean of the permeability values provide the best estimation of effective core permeabilities in the Leduc and Nisku formations underlying the Drumheller Property.

Table 14.4 Core permeability summary.

A) Leduc Resource Aquifer Domain

	Sample Upper Depth (m)	Sample Lower Depth (m)	Sample Thickness (m)	Effective KMax (mD)	Effective KVert (mD)
Count [1]	146	146	146	119	117
Mimimum	1,574.0	1,574.2	0.1	0.08	0.01
Maximum	1,828.6	1,830.0	18.0	5,680	1,350
Average or Total	1,658.9	1,659.6	106.3	264.3	64.6
Geomean				22.0	4.6
Standard deviation	/	/	/	838.0	211.5
RSD%	/	/	/	317.0	327.2

B) Nisku-Killam Barrier Reef Resource Aquifer Domain

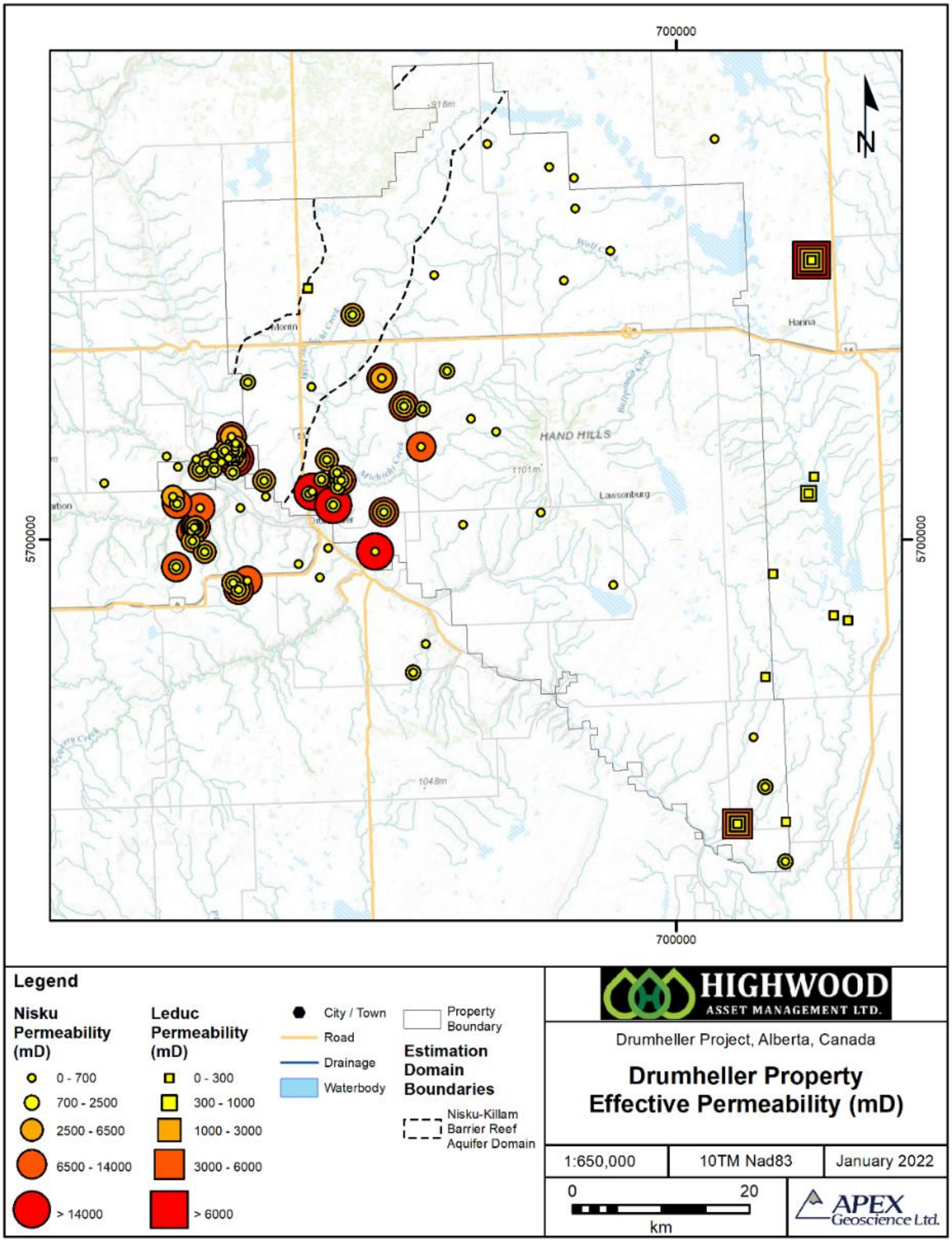
	Sample Upper Depth (m)	Sample Lower Depth (m)	Sample Thickness (m)	Effective KMax (mD)	Effective KVert (mD)
Count [1]	846	846	846	737	306
Mimimum	1,578.0	1,578.2	0.03	0.01	0.01
Maximum	1,746.7	1,749.6	15.2	26,600	5,320
Average or Total	1,680.7	1,681.1	333.7	454.8	62.3
Geomean				23.9	2.8
Standard deviation	/	/	/	1,516.4	363.9
RSD%	/	/	/	333.5	583.8

C) Nisku Platform/Basin Resource Aquifer Domain

	Sample Upper Depth (m)	Sample Lower Depth (m)	Sample Thickness (m)	Effective KMax (mD)	Effective KVert (mD)
Count [1]	769	769	769	622	574
Mimimum	1,352.0	1,357.1	0.0	0.01	0.01
Maximum	1,670.3	1,675.2	16.8	30,000	30,000
Average or Total	1,580.5	1,581.1	425.0	484.2	100.2
Geomean				6.5	1.1
Standard deviation	/	/	/	2,310.4	1,264.5
RSD%	/	/	/	477.2	1,262.1

[1] Number count vary because null values are removed for effective permeability.

Figure 14.6 Core permeability map.



14.3.3.2 Drill Stem Test Permeability

Data were collected for 155 DSTs from 106 wells completed within the Leduc Resource Aquifer Domain and 656 DSTs from 370 wells within the two Nisku Resource Aquifer Domains. Of these tests, 18 DSTs from wells within and adjacent to the Drumheller property were analyzed after culling the dataset to those tests suitable for analysis. Figure 14.7 shows the wells that had DSTs that were used to determine permeability.

A spreadsheet called META/DST from Crain's Petrophysical Handbook was used to analyze DST data based on the Horner method using tests that passed the culling criteria. The results are provided in Table 14.5.

Table 14.5 Drill Stem Test permeability summary.

Resource Aquifer Domain	Count	Extrapolated Shut-in Pressure (kPa) *	DST Mid-Point (m AMSL) **	Permeability (mD) ***
Leduc	4	14,400	-801	10.6
Nisku Killam Barrier Reef	5	14,000	-939	47.4
Nisku Platform/Basin	9	12,596	-795	21.9

* Average; ** Average; *** Geomean

Because of the wide range of permeabilities derived from core data, and because the DST data represent a larger depth interval than individual core plugs, the geomean of the DST-derived permeability data is considered to be the representative permeability for each of the three aquifer domains.

14.3.4 Hydraulic Conductivity

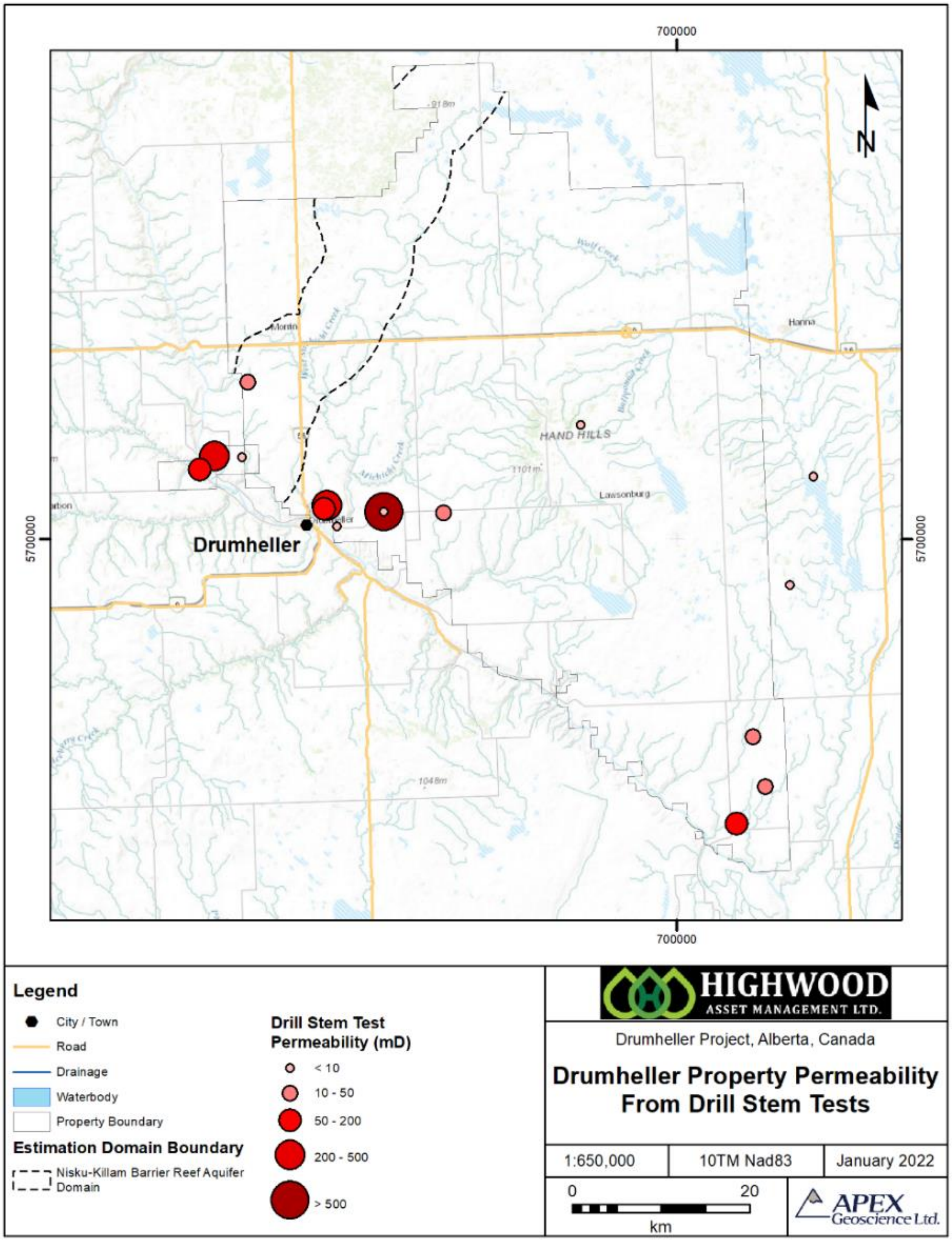
Hydraulic conductivity of each of the three aquifer domains was determined from the representative aquifer permeability and the properties of the water (viscosity of 0.9 centipoise [cm-gram-sec], and a density of 1.075 kg/m^3), which gives a coefficient of 0.001026.

Table 14.6 below is a summary of hydraulic conductivity for each of the three resource aquifer domains calculated by multiplying the geomean of the DST permeability values by the coefficient.

Table 14.6 Hydraulic conductivity summary.

Resource Aquifer Domain	Permeability (mD)	Hydraulic Conductivity (m)
Leduc	10.6	0.0109
Nisku Killam Barrier Reef	47.4	0.0486
Nisku Platform/Basin	21.9	0.0225

Figure 14.7 Drill Stem Test permeability map.



14.3.5 Transmissivity

Transmissivity is determined by multiplying the hydraulic conductivity by the aquifer thickness. The mean aquifer thickness of each of the three aquifer domains was calculated from the isopach maps for the Leduc and Nisku Formations, within the Drumheller property, using Surfer software. The resulting transmissivities are presented in Table 14.7.

Table 14.7 Transmissivity summary.

Resource Aquifer Domain	Hydraulic Conductivity (m)	Aquifer Thickness* (m)	Transmissivity (m^2/day)
Leduc	0.0109	220.0	2.4
Nisku Killam Barrier Reef	0.0486	48	2.3
Nisku Platform/Basin	0.0225	44	1.0

* Aquifer Thickness is the mean isopach thickness of the formation beneath the Drumheller property.

14.3.6 Specific Storage and Storativity

The relationship between specific storage (Ss) and compressibility is described by Domenico and Schwartz (1990, page 113). $Ss = \rho w\ g\ (\beta p + n\beta w)$ Where: ρ w = density of water (M/L3) g = acceleration due to gravity (L/t2) β p = bulk compressibility (L2/Force) n = porosity β w = compressibility of water (L2/Force).

Storativity of the aquifer was determined by multiplying the mean value of the aquifer thickness (Table 14.7) by the representative specific storage.

Table 14.8 below summarizes the calculated values for specific storage and storativity for each of the three aquifer domains.

Table 14.8 Specific storage and storativity summary.

Resource Aquifer Domain	Porosity (%)	Aquifer Thickness* (m)	Specific Storage	Storativity
Leduc	9.6	220	5.56E-05	1.22E-02
Nisku Killam Barrier Reef	6.1	48	3.68E-05	1.77E-03
Nisku Platform/Basin	6.8	44	4.07E-05	1.79E-03

* Aquifer Thickness is the mean isopach thickness of the formation beneath the Drumheller property.

Based on the effective core porosities presented in Table 14.2, a water density of 1,150 kg/m^3, a rock compressibility of 3.3 x 10^{-10} m^2/N, and a water compressibility of 4.8 x 10^{-10} m^2/N, the specific storage in is estimated to be approximately 5.6 x 10^{-5} m^{-1} for the Leduc Resource Aquifer Domain and approximately 4.1 x 10^{-5} m^{-1} for both Nisku Resource Aquifer Domains.

14.3.7 Formation Water in Pore Space

Three different fluids are produced from hydrocarbon wells: oil, gas (converted to cubic metres), and formation water, or brine. A summary the production fluid pumped from wells within the Nisku Platform and the Nisku Killam Barrier Reef Resource Aquifer Domains is presented in Table 14.9.

Production data are not available for the Leduc Resource Aquifer Domain, and hence, the QP is unable to verify or quantify the water production from the Leduc Formation within the Drumheller Property.

Table 14.9 provides a summary of the fluid pumped from wells within the Nisku Platform and the Nisku Killam Barrier Reef Resource Aquifer Domains over the lifetime of the well (Table 14.9a) and over the last 3 years of production (Table 14.9b).

Between 1962 and 2021, the Nisku domain production ranged between 70.7% brine (Nisku Killam Barrier Reef Resource Aquifer Domain) and 90.7% (Nisku Platform Resource Aquifer Domain).

As fluid production volumes change over the lifetime of the well, Table 14.9b) presents the last 3-years of production. Between 2019 and 2021, both the Nisku Killam Barrier Reef and the Nisku Platform resource aquifer domains produced approximately 98% brine.

The combined cumulative production has averaged approximately 2,300 cubic metres per month over the last 3 years. These brine in pore space values represent the most recently documented fluid analyses, and are therefore, recommended for use within the resource estimation process.

The normalized average monthly brine production of wells within the Drumheller Property boundaries is presented in Figure 14.8.

Table 14.9 Fluid production summary.

A) Petroleum production for the lifetime of the well.

				Cummulative Production					
Resource Aquifer Domain	*Production Timeline*	*Producing Wells*	*Total Months of Production*	*Oil (m^3)*	*Gas ($E^3 m^3$)*	*Gas $_{Reservoir}$ (m^3)* [1]	*Water (m^3)*	**Total of Gas$_{Reservoir}$ + Oil + Water (m^3)**	**Water in pore space (%)**
Nisku Killam Barrier Reef Aquifer Domain	1962-2021	26	6,028	998,519.0	125,445.5	644.8	2,455,649.2	3,454,813.0	**71.1**
Nisku Platform/Basin Aquifer Domain	1962-2021	11	1,160	128,974.5	24,199.4	124.4	1,258,127.2	1,387,226.1	**90.7**

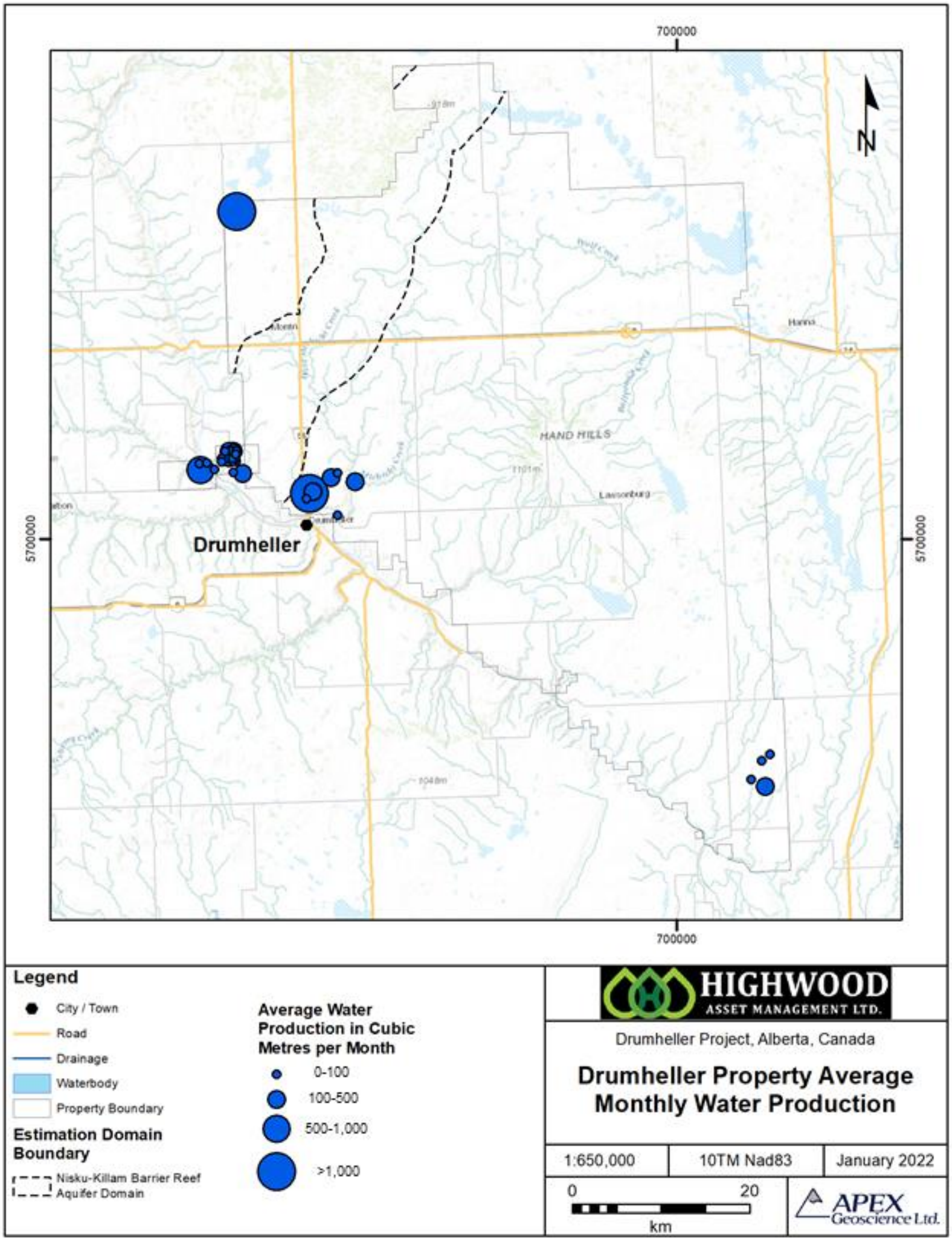
[1] A global conversion factor of 0.00514 was used to convert gas to the cubic metres fluid phase.

B) Petroleum production for the last 3-years.

				Cummulative Production					
Resource Aquifer Domain	*Production Timeline*	*Producing Wells*	*Total Months of Production*	*Oil (m^3)*	*Gas ($E^3 m^3$)*	*Gas $_{Reservoir}$ (m^3)* [1]	*Water (m^3)*	**Total of Gas$_{Reservoir}$ + Oil + Water (m^3)**	**Water in pore space (%)**
Nisku Killam Barrier Reef Aquifer Domain	2019-2021	3	60	344.0	63.1	0.3	17,479.1	17,823.4	**98.1**
Nisku Platform Aquifer Domain	2019-2021	1	34	1,255.5	250.7	1.3	60,976.3	62,233.1	**98.0**

[1] A global conversion factor of 0.00514 was used to convert gas to the cubic metres fluid phase.

Figure 14.8 Normalized Average Monthly Brine Production.



14.3.8 Available Drawdown and Estimated Well Yield

When an aquifer is fully confined, the available drawdown is the linear distance from the non-pumping fluid level to the top of the aquifer. For the purposes of this calculation, the structure contours for the Leduc and Nisku Formations are considered to be the top of the respective aquifer domain.

The available drawdown for each of the three aquifer domains can be determined by converting the extrapolated pressures from the interpreted DSTs, as shown in Figure 14.7, to equivalent freshwater hydraulic head (hydraulic head). Pressure data were converted to equivalent freshwater hydraulic heads using the relationship:

Hydraulic Head = DST Completion Mid-Point Elevation + Pressure / ρ g

, where:

ρ = fluid density (1,000 kg/m3 for freshwater),
g = gravitational acceleration (9.81 m/s2),
pressure is measured in Pa (kg/ms2), and
hydraulic head and DST mid-point elevation are measured in metres above sea level (m asl).

The hydraulic head was then converted to elevation above mean sea level by subtracting the hydraulic head value from the ground surface elevation for each of the wells. The available drawdown is the distance between the elevation of the water level and the top of the formation.

Pressure data, as shown in Figure 14.2, were not used for the calculation of hydraulic head, as mid-point pressures were not provided in the available dataset.

The theoretical long-term yield can then be calculated using the Farvolden method (Government of Alberta, 2011) and is based on the maximum rate that water can theoretically be removed from a water well so that the water level in the pumped well will be lowered by 70% of the available drawdown after 20 years of fluid diversion. For the purposes of this inferred resource calculation, and because any groundwater diverted from either of the three resource aquifer domains would not be subjected to Water Act licensing restrictions, the long-term yield values provided in Table 14.10, are not restricted to using 70% of the available drawdown; the values represent utilization of 100% of the available drawdown in the aquifer at the location of the theoretical pumped well.

The theoretical long-term yield is based on an aquifer that is homogeneous and isotropic, with no recharge, and does not include the effects of interference from existing pumping wells. The estimated yields are in the 2,100 m^3/day range for both the Leduc and Nisku Killam Barrier Reef Resource Aquifer Domains while the Nisku Platform/Basin Resource Aquifer Domains is approximately 900 m^3/day.

Table 14.10 Available drawdown and estimated well yield.

Resource Aquifer Domain	Fluid Elevation (m AMSL)	Average Formation Top * (m AMSL)	Available Drawdown (m)	Transmissivity (m^2/day)	Estimated Yield (m^3/day)
Leduc	632	-661	1,293	2.4	2,101
Nisku Killam Barrier Reef	487	-878	1,365	2.3	2,171
Nisku Platform/Basin	561	-734	1,295	1.0	872

* Average Formation Top is as observed at the location of the DST

14.3.9 Summary of Hydrogeological Conditions

Table 14.11 includes a summary of the calculated hydrogeological parameters as presented in the previous sub-sections.

For the present hydrogeological review, the analysis has been based on calculations of the transmissivity, porosity and storativity of the porous media containing the formation water. This approach is to provide the basis for a professional opinion regarding the resource in place (formation water) and the recoverable resource, based on the data that are publicly available. The values for resource in place and recoverable resource are considered reasonable estimates on a regional scale based on the data available; additional data are required to provide more definitive answers.

Only limited data were available for the present review and if the project is to proceed, it will be necessary for significant data gaps to be addressed. At this time, values for aquifer parameters can at best be considered rough estimates but are suitable for inferred resource estimate calculations.

Additional data to be collected to refine any resource estimate should include the results of analyzing detailed fluid-level response to fluid diversion.

Table 14.11 Summary of aquifer parameters.

Summary of Aquifer Parameters			
Parameter	Leduc Aquifer Domain	Nisku Killam Barrier Reef Aquifer Domain	Nisku Platform/Basin Aquifer Domaim
Effective Porosity (%) - average	9.6	6.1	6.8
Effective Porosity (%) - geomean	8.4	4.7	4.8
Total Porosity (%) - average	7.6	5.9	5.0
Total Porosity (%) - geomean	5.8	4.7	3.9
Core Permeability KMax (mD) - average	264.3	454.8	484.2
Core Permeability KMax (mD) - geomean	22.0	23.9	6.5
Core Permeability KVert (mD) - average	64.6	62.3	100.2
Core Permeability KVert (mD) - geomean	4.6	2.8	1.1
DST Permeability (mD) - geomean	10.6	47.4	21.9
Hydraulic Conductivity from DSTs (m/day) - geomean	0.0109	0.0486	0.0225
Formation Thickness (m)	220	48	44
Transmissivity (m^2/day)	2.4	2.3	1.0
Specific Storage	5.56E-05	3.68E-05	4.07E-05
Storativity	1.22E-02	1.77E-03	1.79E-03
Average Available Drawdown (m)	1,293	1,365	1,295
Estimated Well Yield (m^3/day)	2,104	2,171	868
Total Historical Brine Production (m^3)	n/a	2,455,649	1,258,127
Historical Brine in Pore Space (%)	n/a	71.1	90.7
Brine in Pore Space for the last 3 Years(%)	n/a	98.1	98.0

Transmissivity is based on the geomean of hydraulic conductivity using DST data and the formation thickness

14.4 Geometry and Volume of the Drumheller Property's Leduc and Nisku Aquifer Domains

14.4.1 Three-Dimensional Geological Model

The digital elevation model (DEM) for the Drumheller Property surface area was derived from publicly available Shuttle Radar Topography Mission (SRTM) 1-Arc Second data. The 1-Arc Second dataset has a grid size of 30 m. The surface data was captured between February 11 and 22, 2000 by the Space Shuttle Endeavour.

The top of the Leduc and Nisku formations were defined by utilizing surface top horizon pick data from 633 oil ang gas wells. Formation picks, or control points, within the Drumheller Property area and specific to the Leduc and Nisku formations, which included 224 and 409 control points, respectively (Figure 14.9).

The bottom of the Nisku Formation was defined by the either the top of the Ireton Formation shale horizon or the top of the Leduc Formation. That is, reef buildups and associated depositional, angle of repose, and/or weathering processes in the vicinity of the Killam Barrier Reef complex have removed the Ireton in places such that the Leduc and Nisku carbonates are in direct contact with one another.

The top of the Cooking Lake Formation, which directly underlies the Leduc Formation, was used to represent the base of the Leduc Formation.

A total of 435 Ireton/Leduc and 90 Cooking Lake picks were used as control points to construct the base of Nisku and Leduc formation grids (Figure 14.9).

A 3-D oblique view of the geological model used in the resource work is presented in Figure 14.10. A cross-section of the model is presented in Figure 14.11. Geological observations within the 3-D geological model include:

- The Leduc Formation carbonate thickens, significantly, in the northwest portion of the Drumheller Property in association with Leduc reefal buildups at the Killam Barrier Reef complex.

- The Ireton Formation shale, which typically acts as an aquitard between the Leduc and Nisku aquifers, is locally absent within and/or adjacent to the Killam Barrier Reef complex such that the Leduc and Nisku aquifers are in direct hydro-communication with each other (i.e., not separated by the Ireton shale aquitard).

- South and east of the Killam Barrier Reef, the Leduc and Nisku units are fairly uniform in thickness and are generally flat lying.

- In the lowermost southeast corner of the Property, the Leduc Formation begins to thicken slightly, which results in Ireton and Nisky thinning. This association is likely related to the building of another Leduc reef complex within the Drumheller Property albeit significantly smaller in dimensions in comparison to the Killam Barrier Reef. Note: The subsurface detail in the southeast corner of the Property is lacking in comparison the Killam Barrier Reef area (northwest) because many of the southeast wells were dry holes.

The 3-D model observations are generally supported by the stratigraphic well sections presented in Figures 7.3 to 7.5.

It is the QP's opinion that the results of the formation top and base picks – and subsequent 3-D geological model – are reasonable and do not over- or under-estimate the regional Leduc and Nisku geological units in the Drumheller Property area. The dimensions of the Leduc and Nisku aquifers, are therefore, reasonable, and suitable for calculating volumes as part of the resource estimations reported in this Technical Report.

Figure 14.9 Summary of oil and gas wells used to create the 3-D geological model. Surface horizon picks from wells from outside were used to ensure stratigraphic continuity.

A) Leduc aquifer domain

B) Nisku Killam Barrier Reef (orange) and Nisku Platform/Basin (green) aquifer domains

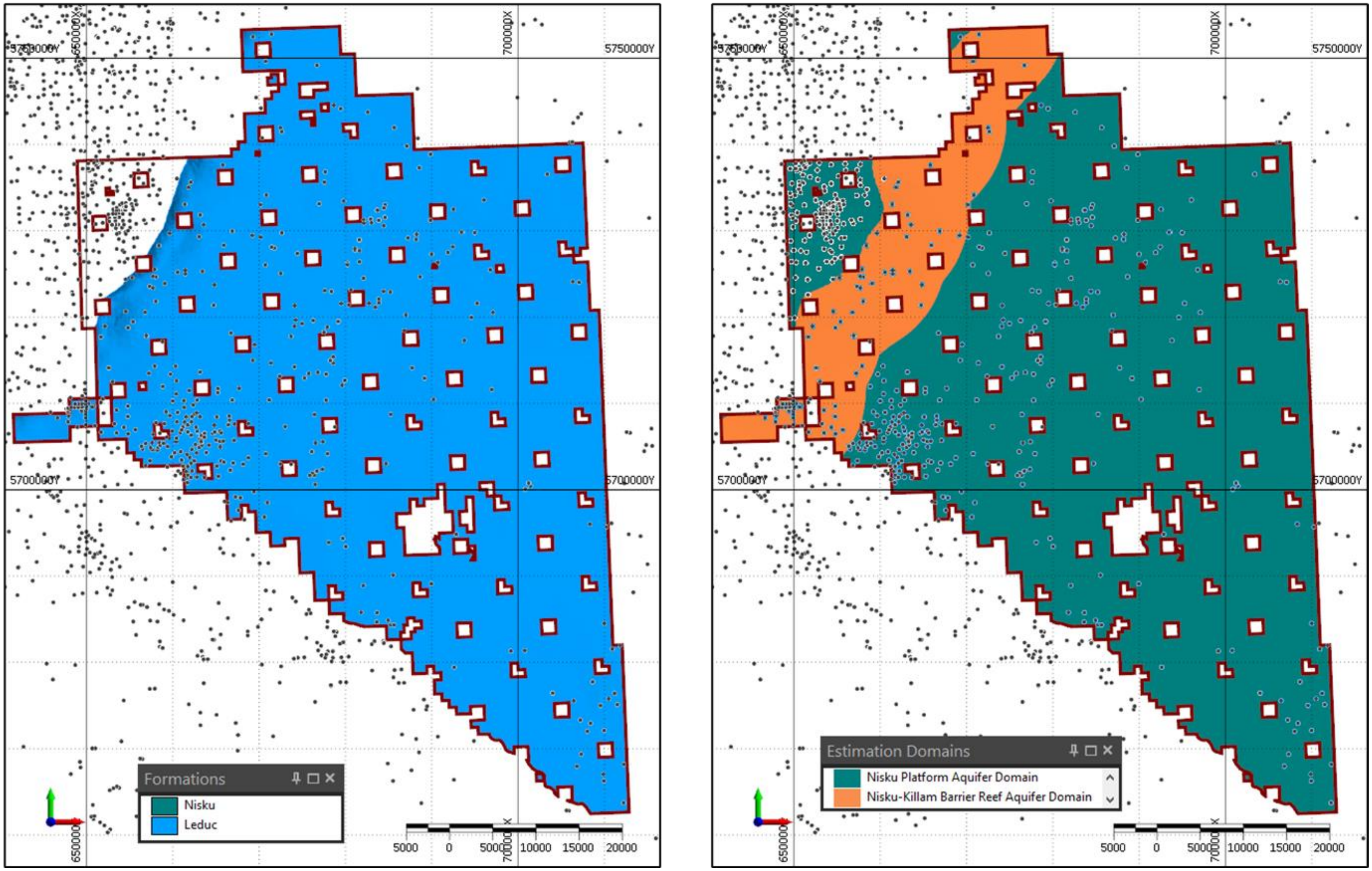


Figure 14.10 Oblique 3-D view of the Leduc and Nisku formation aquifers within the Drumheller Property. Vertical exaggeration of 15:1.

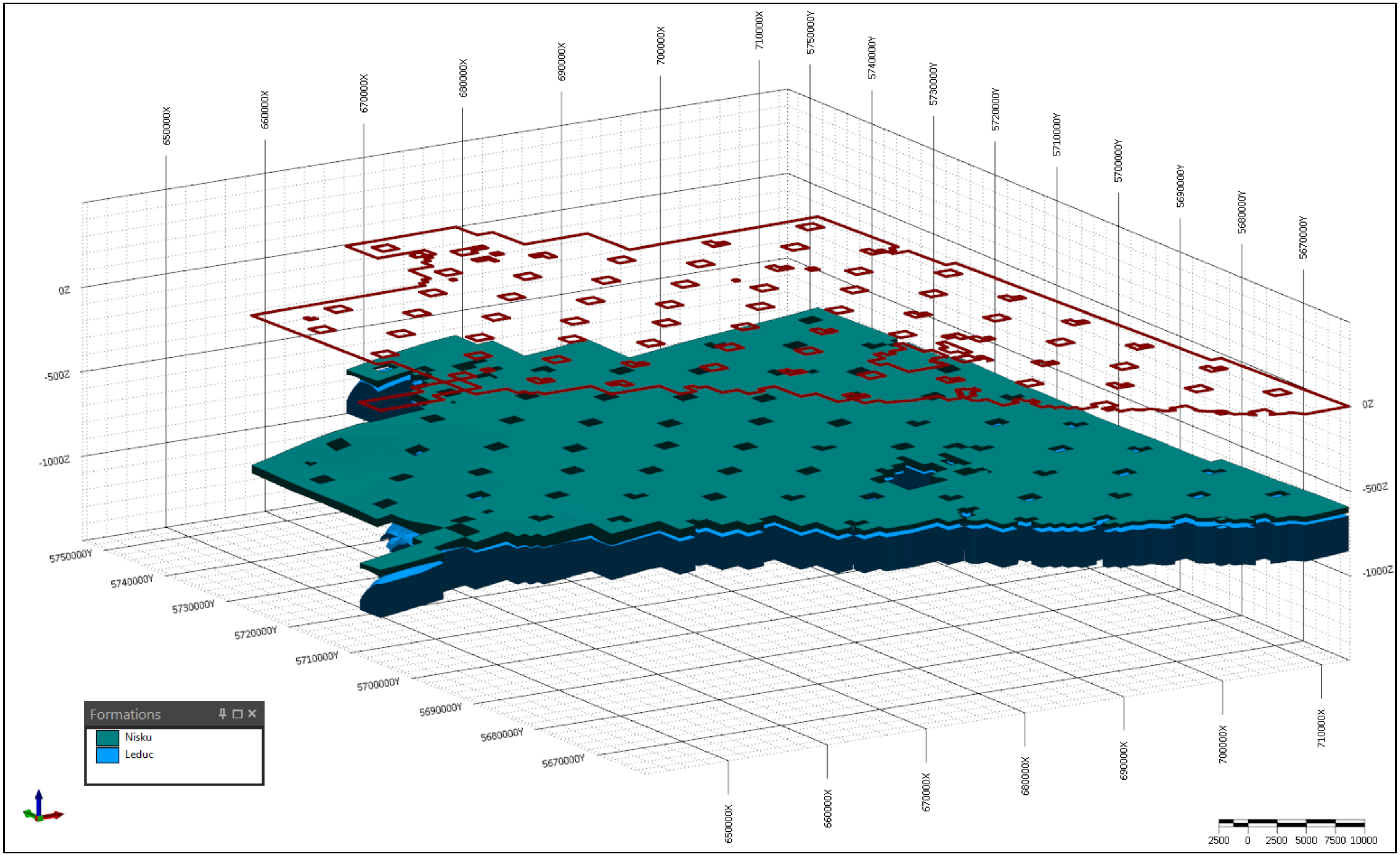
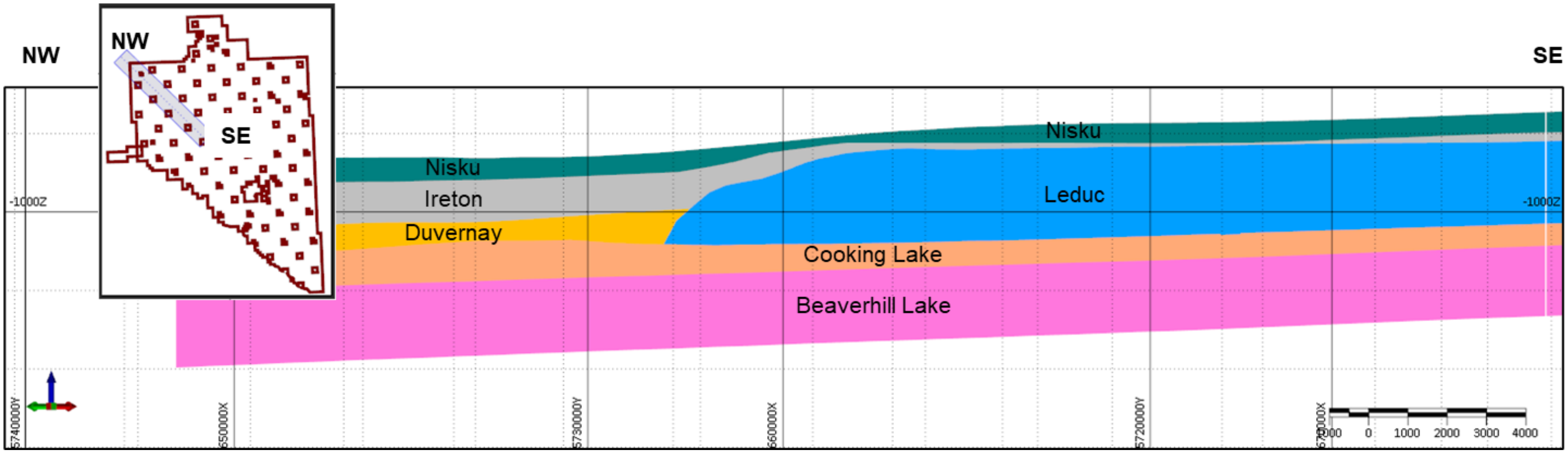


Figure 14.11 Northwest-southeast cross-section along 5728900N looking north illustrating the Leduc and Nisku formation aquifers at the Drumheller Property. Here, the Killam Barrier Reef edge forms the southeast boundary of the East (Duvernay) Shale Basin. Vertical exaggeration of 15:1.



14.4.2 Leduc and Nisku formation aquifers Domain Wireframe and Volume Calculations

Multiple 3-D wireframes solids were created within the geological model including from stratigraphic base to top: Elk Point Group, Beaverhill Lake Formation, Cooking Lake Formation, Leduc Formation, Ireton Formation, and Nisku Formation. These geo-units form the basis for isolating the Leduc and Nisku aquifer domains.

The Devonian geological unit top and bottom surface grids created in PetraTM were originally extended beyond the property boundary to ensure continuity of the 3-D geological model. Once imported into Micromine the surface grids were converted to wireframes and converted to 3-D wireframe solids. The 3-D solids were then clipped to the extents of the Drumheller Property to ensure the resource volumes and estimations were contained within the boundaries of the property.

In addition, the Leduc reef buildup associated with the Killam Barrier Reef complex was identified as a unique feature within the model. Based on stratigraphic cross-sections (see Figures 7.3 to 7.5) and porosity measurements (see Section 14.3), the zone of influence, or disturbance, caused by the reef complex was wireframed at a distance of 10 km southeast of the edge of the Killam Reef Complex. This zone is interpreted to be equivalent to the area of hydro-communication between the Leduc and Nisku aquifers.

The objective of the 3-D model wireframing exercise was to depict 3 specific aquifer domains for volume calculation and Li-brine resource estimations. The 3 domains, along with a brief explanation, include:

1. Leduc Aquifer Domain: Leduc Formation aquifer, which apart from the area northwest of the Killam Barrier Reef, underlies most of the Property.

2. Nisku Killam Barrier Reef Aquifer Domain: A 10 km wide zone of Nisku Formation aquifer volume that is located within, and adjacent to, the Killam Barrier Reef. This area was uniquely identified as the area in which the Nisku and Leduc formation aquifers are in hydro-communication. Separation of this domain area is supported by Li-brine geochemical data, hydrogeological information, and the formal Killam Barrier Reef complex feature within the 3-D model.

3. Nisku Platform/Basin Aquifer Domain: The area of remaining Nisku Formation aquifer volume sitting outside of the Nisku – Killam Barrier Reef Aquifer Domain. This area is predominantly east-southeast of the Killam Barrier Reef where the Leduc and Nisku are separated by the Ireton Formation shale and are not in hydro-communication with each other.

The Leduc formation wireframe solid clipped to the Property's boundary represents the "Leduc Aquifer Domain" as-is. The Nisku formation wireframe is separated into two estimation domains by a line that represents a 10 km buffer from the intersection between the top surfaces of the Nisku and Leduc formation (Figures 14.1 and 14.9).

The wireframes of the Devonian geological units were originally extended beyond the property boundary to ensure continuity of the 3-D geological model. The wireframes were then clipped to the extents of the Drumheller Property to ensure the resource volumes and estimations were contained within the boundaries of the property.

The 3-D closed solid wireframes were used to calculate the volume of each aquifer estimation domain. The aquifer volume underlying the Drumheller Property is summarized as:

1. Leduc Aquifer Domain volume: The Leduc Formation domain aquifer has an aquifer volume of 670.6 km^3.

2. Nisku Killam Barrier Reef Aquifer Domain: The Nisku Formation aquifer domain within/adjacent to the Killam Barrier Reef has an aquifer volume of 23.7 km^3.

3. Nisku Platform/Basin Aquifer Domain: The area of remaining Nisku Formation aquifer volume sitting outside of the Nisku – Killam Barrier Reef Aquifer Domain is 123.3 km^3.

14.5 Leduc and Nisku formation aquifers Domain Brine Volume

The brine volume is calculated for the Leduc and Nisku aquifer domains, or resource areas, by multiplying the aquifer volume (in km^3) times the average porosity for each domain, times the percentage of brine assumed within the pore space (see Section 14.3). A brine pore space volume of 98% within the Leduc and Nisku aquifers was assigned in all 3 domains. Unique values of porosity were defined in each of the 3 domains. The resulting brine volume of each domain is summarized as:

1. Leduc Aquifer Domain volume: Using an average porosity value of 9.9%, the Leduc Aquifer Domain has a brine volume of 65.1 km^3.

2. Nisku Killam Barrier Reef Aquifer Domain: Using an average porosity value of 6.1%, the Nisku-Barrier Reef Aquifer Domain has a brine volume of 1.6 km^3.

3. Nisku Platform/Basin Aquifer Domain: Using an average porosity value of 6.8%, the Nisku Platform/Basin Aquifer Domain has a brine volume of 7.4 km^3.

14.6 Lithium-Brine Concentration

A total of 27 Devonian aquifer brine analytical results from Highwood's 2021 brine sampling program (n=23 analyses) and Government of Alberta compilations (n=4 analyses) were considered in assessing the lithium concentration values used in this resource estimation (Table 14.12). The 27 analyses include brine samples collected from within the Leduc and Nisku aquifers and from within the Ghost Pine and Wayne-Rosedale oilfields.

Table 14.12 A summary of Nisku and Leduc Li-brine analytical results within the Drumheller Property.

A) Historical industry lithium geochemical data.

Sample ID	Unique well ID	Latitude (NAD83)	Longitude (NAD83)	Total depth (m)	Oilfield	Pool	Li (mg/L)
/	100/16-33-029-21W4/0	51.529252	-112.892031	1,738.9	Ghost Pine	Leduc D-2A	77.0
/	100/08-02-030-21W4/0	51.537793	-112.844148	1,729.7	Ghost Pine	Leduc D-2A	52.0
/	100/08-36-029-21W4/0	51.522675	-112.820689	1,690.1	Ghost Pine	Leduc D-2A	44.0
/	100/06-14-030-19W4/0	51.568021	-112.573058	1,676.4	Wayne-Rosedale	Nisku	33.0

B) Highwood 2021 sampling program: Wayne-Rosedale Oilfield lithium geochemical data.

Sample ID	UWI	Latitude (NAD83)	Longitude (NAD83)	Total depth (m)	Oilfield	Pool	Li (mg/L)
RE21-HOC-WR-001	100/11-07-029-19W4/0	51.470902	-112.667835	1575.4	Wayne-Rosedale	Nisku H	25.7
RE21-HOC-WR-002	100/11-07-029-19W4/0	51.470902	-112.667835	1575.4	Wayne-Rosedale	Nisku H	24.3
RE21-HOC-WR-003	100/11-07-029-19W4/0	51.470902	-112.667835	1575.4	Wayne-Rosedale	Nisku H	21.7
RE21-HOC-WR-004	100/11-07-029-19W4/0	51.470902	-112.667835	1575.4	Wayne-Rosedale	Nisku H	22.1
RE21-HOC-WR-005	100/07-30-029-19W4/0	51.508287	-112.661981	1675.0	Wayne-Rosedale	Nisku G	28.7
RE21-HOC-WR-011	100/11-24-029-20W4/0	51.498888	-112.688513	1683.2	Wayne-Rosedale	Nisku G	24.3
RE21-HOC-WR-012	100/11-24-029-20W4/0	51.498888	-112.688513	1683.2	Wayne-Rosedale	Nisku G	26.9
RE21-HOC-WR-013	100/11-24-029-20W4/0	51.498888	-112.688513	1683.2	Wayne-Rosedale	Nisku G	22.0
RE21-HOC-WR-014	100/11-24-029-20W4/0	51.498888	-112.688513	1683.2	Wayne-Rosedale	Nisku G	22.5
RE21-HOC-WR-016	102/02-36-029-20W4/0	51.518844	-112.687260	1699.8	Wayne-Rosedale	Nisku G	25.2

C) Highwood 2021 sampling program: Ghost Pine Oilfield lithium geochemical data.

Sample ID	UWI	Latitude (NAD83)	Longitude (NAD83)	Total depth (m)	Oilfield	Pool	Li (mg/L)
RE21-HOC-GP-001	100/09-34-029-21W4/0	51.527135	-112.866595	1688.5	Ghost Pine	Nisku A	43.7
RE21-HOC-GP-003	100/13-35-029-21W4/0	51.530392	-112.861559	1699.6	Ghost Pine	Nisku A	46.6
RE21-HOC-GP-004	100/13-35-029-21W4/0	51.530392	-112.861559	1699.6	Ghost Pine	Nisku A	42.1
RE21-HOC-GP-005	100/13-35-029-21W4/0	51.530392	-112.861559	1699.6	Ghost Pine	Nisku A	37.0
RE21-HOC-GP-006	100/13-35-029-21W4/0	51.530392	-112.861559	1699.6	Ghost Pine	Nisku A	36.5
RE21-HOC-GP-010	100/14-35-029-21W4/0	51.530387	-112.855758	1709.0	Ghost Pine	Nisku A	43.4
RE21-HOC-GP-011	100/14-35-029-21W4/0	51.530387	-112.855758	1709.0	Ghost Pine	Nisku A	45.8
RE21-HOC-GP-012	100/14-35-029-21W4/0	51.530387	-112.855758	1709.0	Ghost Pine	Nisku A	38.9
RE21-HOC-GP-013	100/14-35-029-21W4/0	51.530387	-112.855758	1709.0	Ghost Pine	Nisku A	38.4
RE21-HOC-GP-016	03-02-030-21W4	51.534186	-112.855754	Multi-well battery: Ghost Pine			48.2
RE21-HOC-GP-017	102/05-01-030-21W4/0	51.537933	-112.838289	1720.0	Ghost Pine	Leduc A	49.0
RE201-HOC-BPF-001	04-30-029-19W4	51.504727	-112.673389	Multi-well battery: Wayne-Rosedale			22.8
RE201-HOC-BPF-002	04-30-029-19W4	51.504727	-112.673389	Multi-well battery: Wayne-Rosedale			28.3

Table 14.13 Statistical lithium data summary within the 3 brine aquifer domains. The recommended average lithium values for each aquifer domain are highlighted in grey.

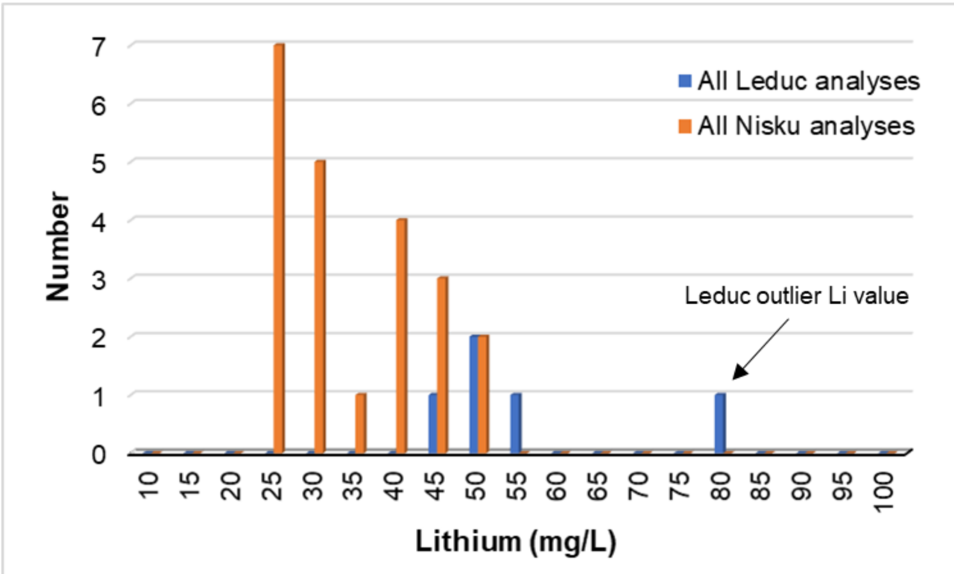
	Leduc Aquifer Domain [1]	Leduc Aquifer Domain [2]	Nisku-Barrier Reef Aquifer Domain	Nisku Platform Aquifer Domain
Count	5	4	9	13
Minimum	44.0	44.0	36.5	21.7
Maximum	77.0	52.0	46.6	33.0
Average	54.0	48.3	41.4	25.2
St. Dev.	13.1	3.3	3.8	3.3
RSD%	24.3	6.8	9.2	13.2

[1] Leduc aquifer domain with outlier lithium value of 77.0 mg/L Li included.

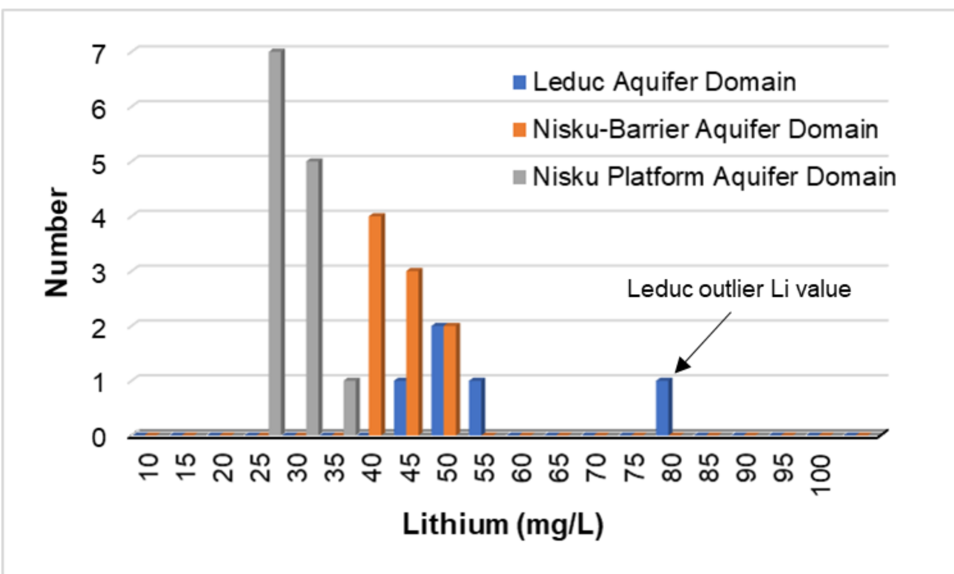
[2] Leduc aquifer domain with outlier lithium value of 77.0 mg/L Li removed.

Figure 14.12 Histograms to show the unimodal nature of all lithium analytical results versus the lithium data grouped into their interpreted aquifer domains.

A) All Li-brine, including Leduc and Nisku analytical results.



B) Analytical results grouped by the interpreted aquifer domains.



The quality of these analytical data is assessed using average percent relative standard deviation (also known as the % coefficient of variation), or average RSD%, as an estimate of precision or reproducibility of the analytical results.

When the lithium geochemical results were analyzed, collectively, for the Leduc and Nisku aquifers underlying the Drumheller Property,

- 5 Leduc Formation brine samples yielded an RSD% of 24.3% and the histogram presented in Figure 14.12a shows a distinct outlier value of 77.0 mg/L Li. Note: When the outlier value of 77.0 mg/L Li is removed from the Leduc lithium analytical results, the RSD% value improves significantly to 6.8%.

- 22 Nisku Formation brine samples yielded an RSD% of 27.8% and the histogram in Figure 14.12a shows a bimodal Li-brine population is present.

In the QP's experience, lithium brine content within an aquifer is fairly homogeneous – so the issue of bimodal lithium populations, especially in the Nisku aquifer – requires further thought. To resolve this dilemma, the QP considered Li-brine analytical results from the 2 separate oilfields, Ghost Pines and Wayne-Rosedale. The 5 Leduc samples are all from the Ghost Pine oilfield, and hence, the outlier of 77 mg/L Li is not explained.

The 22 Nisku brine samples, however, were collected from the Ghost Pine and Wayne-Rosedale oilfields. When the Nisku lithium analytical results are separated, by oilfield, the resulting RSD%'s is lowered to 13.2% for Wayne-Rosedale Nisku brine analyses (n=13) and 9.2% for Ghost Pine Nisku brine analyses (n=9).

Accordingly, the QP reviewed the 2 oilfields within the context of the 3-D geological model. The Wayne-Rosedale oilfields is situated within the East Platform Shelf. In contrast, the Ghost Pine oilfield occurs within the Killam Barrier Reef. Hence the QP proposes that:

- The Nisku aquifer in the Wayne-Rosedale oilfield in the East Platform Shelf yields what might be expected to be 'true' lithium concentrations within the Nisku aquifer underlying the Drumheller Property.

- In contrast, the Nisku aquifer in the Ghost Pine oilfield is in the Killam Barrier Reef, and because the Nisku and Leduc formation aquifers are in hydro-communication within, and adjacent to, the reef complex – the Nisku lithium concentrations at this locale are higher because they have mixed with the underlying, Li-enriched, Leduc aquifer brines.

This geochemical observation and hypothesis formed the initial reason for creating 3 domain areas for the resource estimation process (Leduc Aquifer Domain; Nisku-Barrier Reef Aquifer Domain; and Nisku Platform/Basin Aquifer Domain). Subsequent hydrogeological assessment added reasonable support to the hypothesis.

A revised geochemistry compilation table and histogram demonstrates the change in lithium concentration as a continuum through the 3 aquifer domains (Table 14.13; Figure 14.12b). The Nisku-Barrier Reef Aquifer Domain exhibits a transitional Li-brine between the higher and lower lithium content of the underlying Leduc Aquifer Domain and uncontaminated Nisku Platform/Basin Aquifer Domain.

Additionally, the histogram in Figure 14.12b) shows the unimodal lithium concentration within each domain. It is concluded that the division of the 3 aquifer domains, and the geological reasoning behind the variations in lithium values represents a best-case scenario for the resource modelling and estimation process. Hence, it is recommended that the following average Li-brine concentrations – on an aquifer domain basis – be used within the resource estimation calculation:

1. Leduc Aquifer Domain volume: 48.3 mg/L Li (n=4 analyses with an outlier value of 77.0 mg/L Li removed)

2. Nisku Killam Barrier Reef Aquifer Domain: 41.4 mg/L Li (n= 9 analyses).

3. Nisku Platform/Basin Aquifer Domain: 25.2 mg/L Li (n= 13 analyses).

14.7 Top Cuts and Capping

No top cuts or capping upper limits have been applied to the lithium assay values or are deemed to be necessary. Confined Li-brine deposits typically do not exhibit the same extreme values as precious metal deposits. It is the opinion of the QP that this statement is applicable to the Leduc and Nisku formation aquifers Li-brine data and capping is not required.

However, and to improve the reproducibility of the analytical results, a single outlier value of 77.0 mg/L Li was removed from the assay data (see Section 14.6). The histogram of assay results presented in Figure 14.12 shows that a single sample of Leduc with 77.0 mg/L Li is not representative of the Leduc Formation aquifer brine population at the Drumheller Property.

It is the opinion of Mr. Eccles that removing the single assay value is acceptable in the context of the resource estimations presented in this Technical Report.

14.8 Market Conditions and Pricing

Historical (pre-2000s) uses for lithium include glass and ceramics, grease, air conditioning; pharmaceuticals to treat bi-polar disorder; and specialised aluminum-lithium alloys. Growth in the lithium industry post-2000 resulted from the rapidly increased adoption of rechargeable lithium-ion batteries in personal electronics (e.g., cell phones, laptops, etc.).

Currently, growth forecasts for lithium usage over the coming 15 to 30 years relate to the increasing use of lithium-ion batteries (and future derivations therefrom) in transportation (e.g., fully electric, or plug-in hybrid cars, bikes, commercial trucks, busses etc.) and in stationary storage applications. The requirement for stationary storage relates to the increasing penetration of intermittent renewable energy sources into many regulated electric grids, and the desire to store excess electric generation, for use later in the day to balance generation and demand.

The pricing of lithium chemicals is somewhat opaque, as lithium is not a tradeable commodity, and there is no current trading reference price that is publicly available. Lithium chemicals are typically sold in private supply contracts between producer and industrial user, and these contracts are for a specific chemical composition, and are set for a period that may vary between weeks to several years (though generally for between 3 months to 1 year). The most traded lithium chemicals are spodumene concentrate (the low-value intermediate mineral concentrate that is typically produced by hard rock miners), lithium carbonate and lithium hydroxide monohydrate; the latter two often quoted as 'Technical' or 'Battery' grade.

Historically, lithium carbonate pricing has:

- Increased from 2009 (US$6,000 to US$8,000 per tonne) through to 2017-2018 reaching global pricing highs of US$16,000 to US$20,000 per tonne (Benchmark Mineral Intelligence, 2017, 2018a,b).

- During 2019-2020, lithium carbonate prices dipped to between US$5,000 to US$8,000 per tonne.

- The metal has rebounded in 2021 with average pricing for EXW China technical and battery grade lithium carbonate at US$11,700 and US$12,600 per tonne, respectively with lithium hydroxide at US$9,600 per tonne (Mining Journal, 2021).

Longer term, further additions to lithium production capacity for mined and refined lithium products will be required to keep pace with demand growth, led by battery applications (Roskill, 2020). Future pricing predictions suggest that battery-grade lithium materials will remain a leading input of raw material in battery producing regions. In 2021, Benchmark Mineral Intelligence and Roskill are forecasting that total lithium demand for all applications will increase accounting to the gradual emergence from the COVID-19 pandemic and demand generally remains strong for both battery-grade carbonate and hydroxide (Barrera, 2021).

14.9 Reasonable Prospects

Critical matters likely to influence the prospect of economic extraction of Li-brine from the Devonian Leduc and Nisku formation aquifers include aquifer dimensions, brine composition, fluid flow, brine access and mining methods, recovery extraction technology and environmental factors. These issues are discussed in point form below and summarized at the end of the discussion by a concluding opinion of the QP.

- Aquifer dimensions: The top of the Leduc and Nisku formations were defined by utilizing surface top horizon pick data from 633 oil ang gas wells. Formation picks, or control points, within the Drumheller Property area and specific to the Leduc and Nisku formations, which included 224 and 409 control points, respectively. The base of the Leduc and Nisku formation aquifers was defined using 435 and 90 stratigraphic horizon picks. It is the senior author's opinion that the results of the formation top and base picks are reasonable and do not over- or under-estimate the regional Leduc or Nisku aquifers underlying the Drumheller Property area. The subsequent Leduc and Nisku aquifer volumes are therefore suitable for resource estimations as reported in this Technical Report.

- Brine lithium composition: A total of 27 Leduc and Nisku aquifer brine samples were evaluated including 4 historical analyses) and 23 brine samples collected by Highwood during 2021. It is the opinion of the QP that the lithium geochemical data yield reasonable and representative lithium values of the Leduc and Nisku formation aquifer brine underlying the Drumheller Property.

- Hydrogeological characterization and fluid flow: The values for brine resource in place and recoverable brine resource are considered reasonable estimates on a regional scale based on the data available; additional data are required to provide more definitive answers. In summary,

    - The Leduc Resource Aquifer Domain has an average effective porosity of 9.6% (n=127 measurements), total porosity of 7.6% (16,199 calculations), core plug effective KMax permeabilities geomean of 22.0 mD (n=119) and KVert geomean of 4.6 mD (n=117), drill stem permeability geomean of 10.6 mD (n=4), hydraulic conductivity of 0.0109 m/day, transmissivity of 2.4 m^2/day, specific storage estimated to be approximately 5.6 x 10^{-5} m^{-1}, and estimated yield of 2,101 m^3/day.

    - The Nisku Killam Barrier Reef Resource Aquifer Domain has an average effective porosity of 6.1% (n=772 measurements), total porosity of 5.9% (7,545 calculations), core plug effective KMax permeabilities geomean of 23.9 mD (n=737) and KVert geomean of 2.8 mD (n=306), drill stem permeability geomean of 47.4 mD (n=5), hydraulic conductivity of 0.0482 m/day, transmissivity of 2.3 m^2/day, specific storage estimated to be approximately 4.1 x 10^{-5} m^{-1}, and estimated yield of 2,171 m^3/day.

    - The Nisku Platform/Basin Resource Aquifer Domain has an average effective porosity of 6.8% (n=653 measurements), total porosity of 5.0% (17,166 calculations), core plug effective KMax permeabilities geomean of 6.5 mD (n=622) and KVert geomean of 1.1mD (n=574), drill stem permeability geomean of 21.9 mD (n=9), hydraulic conductivity of 0.0225 m/day, transmissivity of 1.0 m^2/day, specific storage estimated to be approximately 4.1 x 10^{-5} m^{-1}, and estimated yield of 872 m^3/day.

- Brine access: Highwood has formed a brine access agreement with a principal petro-operator at the Drumheller Property to access brine for the initial exploration stage test work (i.e., assay testing and mineral processing).

- Recovery extraction technology: Preliminary lithium extraction process development testing at both SRC and Recion indicate that an ion exchange process holds reasonable prospects for eventual economic extraction of battery-grade lithium product from Highwood's petro-lithium brine. The SRC lithium IX resin results showed a good lithium loading capacity and a good selectivity for lithium. The Recion demonstrated optimized Li extraction results of 98.3%. Further testing for process development and process design is justified and recommended.

- Environmental factors or assumptions: With respect to early-stage exploration for lithium, and to the best of the author's knowledge, there are no other significant factors and risks that may affect access, title or right or ability to perform minerals exploration work at the Drumheller Property. It is not expected that the brine access agreement would put Highwood in a position where the Company is environmentally responsible for any liabilities or damage inflicted because of, or associated with, the production of petroleum products or the oil and gas lease(s).

To conclude, this Li-brine Technical Report has been prepared by a multi-disciplinary team that include geologists, hydrogeologists, and chemical engineers with relevant experience in the geology of the Western Canada Sedimentary Basin, brine geology/hydrogeology, and Li-brine processing.

There is collective agreement that the Highwood lithium-brine project at the Drumheller Property has reasonable prospects for eventual economic extraction of lithium from brine, and the senior author and QP takes responsibility for this statement.

14.10 Cutoff

In establishing a cutoff grade, the QP must realistically reflect on the location, deposit scale, continuity of mineralization, assumed mining method, metallurgical processes, costs, and reasonable long-term metal prices appropriate for any deposit. The cutoff value must be relevant to the grade distribution modelled for the mineral resource, and represent the lowest grade, or quality, of mineralized material that qualifies as being economically mineable.

With respect to lithium concentrations, a growing number of laboratories (commercial, academia, independent) are attempting to develop modern DLE technology that will beneficiate and recover lithium from unconfined aquifer deposits in real time (as solar evaporation is typically not a beneficiation option). The developers are aware that the technology must incorporate lower source concentrations of lithium and are therefore testing at low lithium concentrations (e.g., Mroczek et al., 2015; McEachern, 2017a,b; Xu et al., 2017; Snydacker, 2018; MacMillan et al., 2021).

The lithium content of the Leduc and Nisku aquifer brines at the Drumheller Property ranges between 44 and 52 mg/L Li, and 22 and 47 mg/L Li, respectively. Representative assay values of the brine sample collected for mineral processing test work were between 36.5 mg/L and 46.6 mg/L (see sections 9.2 and 13).

Until the DLE technology improves to a stage where the production of low-Li-concentration brine from confined aquifer deposits is commercially viable, it is recommended that the cutoff value enables the testing of lithium-enriched brine within the aquifer. In this case, it is the opinion of the QPs that a lower cutoff of 20 mg/L lithium is acceptable when assessing the Drumheller Li-brine resources, which accounts for lower Li-brine values within the Nisku Platform/Basin Aquifer Domain. Furthermore, the reader is referred to Section 13 to review mineral processing test work that was completed using Nisku Formation brine collected by Highwood from the Drumheller Property.

The author recommends that the cutoff value continues to be evaluated as Highwood advances their Li-brine Project and the lithium DLE recovery process. It is possible that the lower cutoff will be adjusted in future Technical Reports and with higher levels of technological development and resource/reserve classification.

14.11 Mineral Resource Estimate

14.11.1Resource Classification

The Drumheller Leduc Formation Li-brine resource estimate is classified as an 'Inferred Mineral Resource' in accordance with guidelines established by the CIM "Estimation of Mineral Resources and Mineral Reserves Best Practice Guidelines" dated November 29th, 2019, and the CIM "Definition Standards for Mineral Resources and Mineral Reserves" amended and adopted May 10th, 2014.

By definition,

> *"An Inferred Mineral Resource is that part of a Mineral Resource for which quantity and grade or quality are estimated on the basis of limited geological evidence and sampling. Geological evidence is sufficient to imply but not verify geological and grade or quality continuity".*

It is the opinion of Mr. Eccles that the project requires further detail to elevate the resource to a higher classification level. This work includes additional brine sampling and ongoing brine processing test work toward the development of a modern lithium extraction technology.

14.11.2 Mineral Resource Reporting

The Effective Date of the Drumheller Leduc Formation Li-brine resource estimate is 21 February 2022.

The resource estimations are based on the classical lithium-brine equation, *Lithium Resource* = *A* × *T* × *P* × *C,* where *A* = area of aquifer; *T* = thickness of aquifer; *P* = porosity of aquifer; and *C* = concentration of lithium in brine (e.g., Collins, 1976; Gruber et al., 2011). Where possible, due diligent effort was considered to obtain the best-use values for these parameters.

The inferred Drumheller Leduc Formation lithium-brine resource estimation is presented as a total (or global value), was estimated using the following relation in consideration of the Leduc and Nisku formation aquifers brine:

Lithium Resource = Total Brine Aquifer Volume X Average Porosity X Percentage of Brine in the Pore Space X Average Concentration of Lithium in the Brine.

Three 3-D closed solid polygon wireframes were designed during the resource estimation process. These wireframes, or domains, include the 1) Leduc Aquifer Domain, 2) Nisku-Barrier Reef Aquifer Domain, and 3) Nisku Platform/Basin Aquifer Domain. The calculated volume of rock, or aquifer volume with each of these domains is 670.6 km^3, 23.7 km^3, and 123.3 km^3, respectively.

Using specific average porosity values for each domain, and a global average modal abundance of brine in the Leduc formation pore space percentage of 98%, the following brine volumes were calculated

- Using an average porosity value of 9.9%, the Leduc Aquifer Domain has a brine volume of 65.1 km^3.
- Using an average porosity value of 6.1%, the Nisku-Barrier Reef Aquifer Domain has a brine volume of 1.6 km^3.
- Using an average porosity value of 6.8%, the Nisku Platform/Basin Aquifer Domain has a brine volume of 7.4 km^3.

Average Li-brine concentrations of 48.3 mg/L Li, 41.4 mg/L Li, and 25.2 mg/L Li were used for the resource estimation calculations of the respective Leduc Aquifer Domain, Nisku-Barrier Reef Aquifer Domain, and Nisku Platform/Basin Aquifer Domain.

The Li-brine resource was estimated using a cut-off grade of 20 mg/L Li. With respect to units of measurement, 1 mg/L = 1g/m^3. If concentration is in mg/L and volume in m^3, then the calculated resource has units of grams. (1 g/m^3 x 1 m^3 = 1 gram or 0.001 kg).

Mineral resources are not mineral reserves and do not have demonstrated economic viability. There is no guarantee that all or any part of the mineral resource will be converted into a mineral reserve.

The in-situ Drumheller Li-brine inferred resources are globally (totally) estimated – within the 3 domains – as follows:

1. The Leduc Aquifer Domain is estimated to contain 3.14 million tonnes of elemental Li. The global (total) lithium carbonate equivalent (LCE) for the main resource is 16.73 million tonnes LCE.

2. Nisku Killam Barrier Reef Aquifer Domain is estimated to contain 59,000 tonnes of elemental Li. The global (total) LCE for the main resource is 312,000 tonnes LCE.

3. Nisku Platform/Basin Aquifer Domain is estimated to contain 207,000 tonnes of elemental Li. The global (total) lithium LCE for the main resource 1.10 million tonnes LCE (Table 14.14).

Table 14.14 Drumheller Leduc and Nisku Formation Li-brine inferred resource estimations presented as a global (total) resource.

Inferred Resource Estimations

Reporting parameter	Leduc Aquifer Domain	Nisku Killam Barrier Reef Aquifer Domain	Nisku Platform/Basin Aquifer Domain
Aquifer volume (km^3)	670.559	23.669	123.323
Brine volume (km^3)	65.058	1.415	8.218
Average lithium concentration (mg/L)	48.3	41.4	25.2
Average porosity (%)	9.9	6.1	6.8
Average brine in pore space (%)	98.0	98.0	98.0
Total elemental Li resource (tonnes)	3,142,000	59,000	207,000
Total LCE (tonnes)	16,726,000	312,000	1,102,000

Note 1: Mineral resources are not mineral reserves and do not have demonstrated economic viability. There is no guarantee that all or any part of the mineral resource will be converted into a mineral reserve. The estimate of mineral resources may be materially affected by geology, environment, permitting, legal, title, taxation, socio-political, marketing, or other relevant issues.
Note 2: The weights are reported in metric tonnes (1,000 kg or 2,204.6 lbs).
Note 3: Tonnage numbers are rounded to the nearest 1,000 unit.
Note 4: In a 'confined' aquifer (as reported herein), effective porosity is a proxy for specific yield.
Note 5: The resource estimation was completed and reported using a cutoff of 20 mg/L Li.
Note 6: To describe the resource in terms of the industry standard, a conversion factor of 5.323 is used to convert elemental Li to Li_2CO_3, or Lithium Carbonate Equivalent (LCE).

Collectively, the *in-situ* Drumheller Li-brine inferred resources are globally (totally) estimated – within the 3 domains – to comprise 3.41 million elemental tonnes of lithium (or 18.14 million tonnes LCE; Table 14.14).

**** NI 43-101 Items 15 to 22 are not included in this technical report because Highwood's sub-properties do not represent advanced project ****

23 Adjacent Properties

This section discusses mineral properties that occur outside of the Highwood sub-properties. The QP has been unable to verify information pertaining to mineralization on the competitor properties, and therefore, the QP and Highwood advocate that the information is not necessarily indicative to the mineralization on the sub-properties that are the subject of the Technical Report.

Competitor mineral permits located near, or adjacent to, the Highwood permits are presented in Figure 23.1 and include 1975293 Alberta Ltd., a wholly owned subsidiary of E3 Metals Corp. (MacMillan et al., 2021); 2098849 Alberta Ltd.; Ryan Berthold Kalt; and Redrock Products Inc. Of the companies that have websites and/or public technical disclosure, it is apparent E3 Metals Corp. has a similar interest in Devonian Li-brine (E3 Metals Corp., 2021a) and Redrock Products Inc.'s interest is in the red shale aggregate market (Redrock Products Inc., 2021).

E3 Metals Corp. was awarded a $1.8 million Alberta innovates grant for development of a Direct Lithium Extraction technology and announced the opening of their Calgary Testing Facility as the Company works toward their objective of a field pilot plant (E3 Metals Corp., 2021b, 2021c).

24 Other Relevant Data and Information

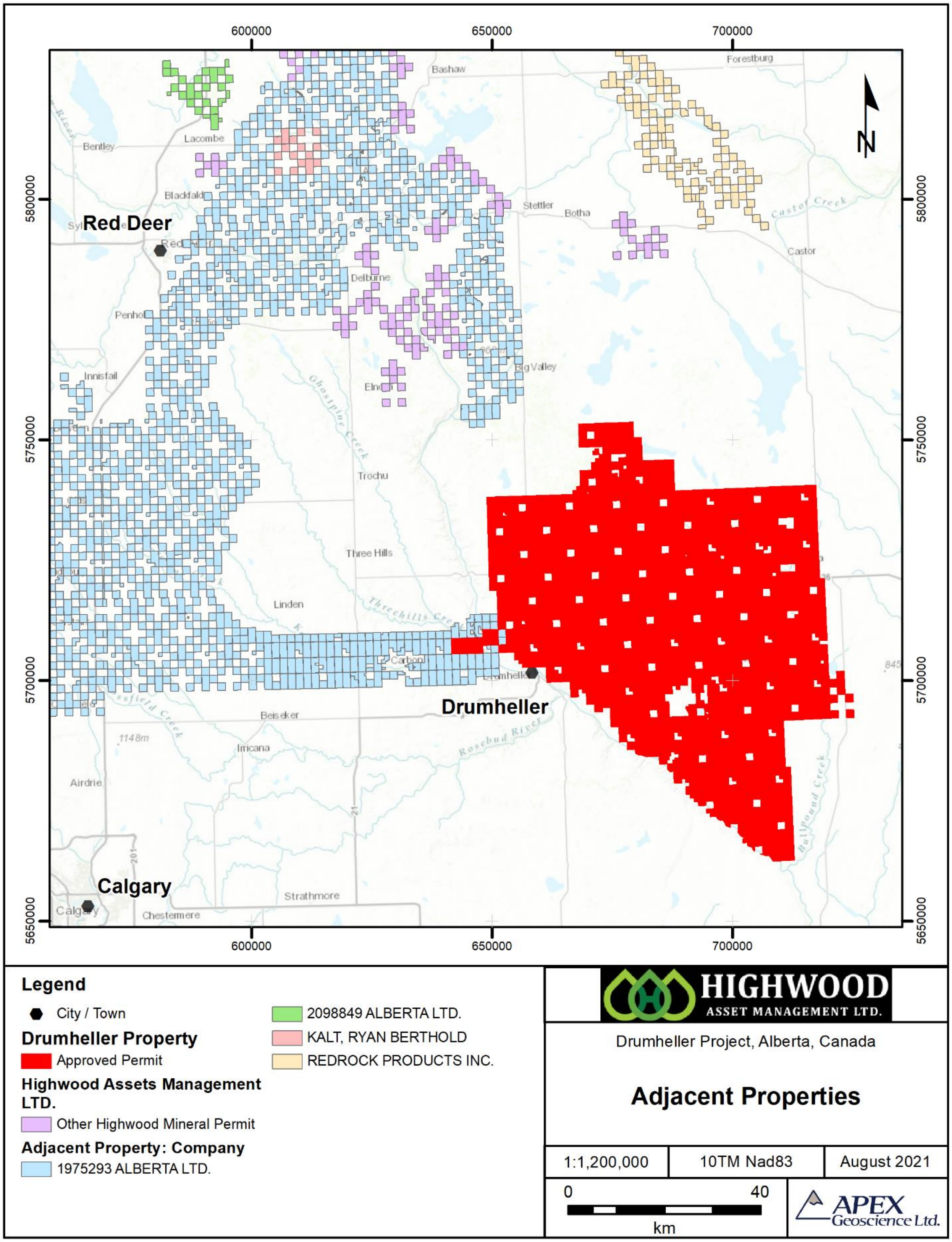
None to report at the Effective Date of this technical report.

25 Interpretation and Conclusions

25.1 2021 Brine Geochemical Sampling Exploration Program

Highwood's Drumheller Li-brine project is an early-stage exploration project. During 2021 Highwood formalized a brine access agreement with an active petro-operator producing petroleum from Devonian-aged fields/pools at the Drumheller Property. The agreement permitted Highwood access to deep subsurface brine via active oil and gas infrastructure for the purpose of analyzing and testing the samples offsite.

Figure 23.1 Adjacent mineral permits in the vicinity of Highwood's Drumheller Property.



In a preliminary March-April 2021 sampling program, Highwood collected 7 brine samples at the Drumheller Property that included 3 samples of Leduc Formation brine that yielded 47.9 to 52.6 mg/L Li, and 4 samples of Nisku Formation brine that contained 29.7 to 32.3 mg/L Li.

Highwood conducted a May 2021 follow-up brine sampling program at the Drumheller Property, in which the Company collected 32 brine samples for assay and QA-QC testing. The analytical results of this work showed:

- Nisku Formation brine from the Wayne-Rosedale oilfield yielded between 22 and 29 mg/L Li (average 24.5 mg/L Li).
- Nisku Formation and Leduc Formation brine from the Ghost Pine oilfield – and proximal to the Killam Barrier Reef – yielded between 37 and 49 mg/L Li (average 43 mg/L Li).
- The analytical results of individual oil and gas wells correlated with multi-well proration battery Facilities. This is important because the Facilities represent brine collection sites that could yield a continuous and high-volume flow of brine for any future lithium extraction test work.

The analytical results verified the historical Li-brine mineralization in the region, in which Leduc Formation brine samples from the Ghost Pine oilfield yielded between 44.0 and 77.0 mg/L Li (n=3 samples), and a single Nisku Formation sample from the Wayne-Rosedale oilfield had 33.0 mg/L Li.

It is the QP's opinion that the exploration work conducted by Highwood is reasonable and within the standard practices of Li-brine evaluation with deep-seated confined aquifers. This contention is based on 1) the QP's site inspection and independent verification of Li-brine mineralization, 2) a review of Highwood's QA-QC sampling protocol and results, and 3) a review of the analytical results in conjunction with the laboratory certificates.

25.2 2021 Mineral Processing Test Work

During 2021, Highwood conducted preliminary mineral processing test work by collecting two 20-litre brine samples from well 100/13-35-029-21W4, which produces petroleum and Nisku Formation aquifer brine from the Ghost Pine oilfield within the Drumheller Property. The brine samples were delivered to two separate and independent laboratories for mineral processing test work. The labs included the Saskatchewan Research Council (SRC) in Saskatoon, Saskatchewan, and Recion Technologies Inc. (Recion) of Edmonton, Alberta.

In the opinion of the QP responsible for Section 13, the preliminary lithium extraction process development testing at both SRC and Recion indicate that an ion exchange process holds reasonable prospects for eventual economic extraction of battery-grade lithium product from Highwood's petro-lithium brine. The SRC lithium IX resin results showed a good lithium loading capacity and a good selectivity for lithium. The Recion demonstrated optimized Li extraction results of 98.3%. Further testing for process development and process design is justified and recommended.

25.3 Mineral Resource Estimation

The Drumheller Li-Brine Resource estimations is reported in accordance with NI 43-101 and has been estimated using the CIM "Estimation of Mineral Resources and Mineral Reserves Best Practice Guidelines" dated November 29th, 2019, and CIM "Definition Standards for Mineral Resources and Mineral Reserves" amended and adopted May 10th, 2014.

The technical report was prepared by a multi-disciplinary team that include geologists, hydrogeologists, and chemical engineers with relevant experience in the geology of the Western Canada Sedimentary Basin, brine geology/hydrogeology, and Li-brine processing. There is collective agreement that the Highwood lithium-brine project at the Drumheller Property has reasonable prospects for eventual economic extraction of lithium from brine, and the senior author and QP takes responsibility for this statement.

Through geological review and interpretation, 3 resource domains were assessed, which include the Leduc Aquifer Domain, the Nisku Killam Barrier Reef Aquifer Domain, and the Nisku Platform/Basin Aquifer Domain. Two separate Nisku domains were implemented because the geological, hydrogeological, and geochemical information and data suggested that the Nisku and Leduc formation aquifers are in hydro-communication within and adjacent to the Killam Barrier Reef, and in contrast, the remaining Nisku Formation aquifer within the platform shelf is isolated from the Leduc aquifer by the Ireton Formation shale. Hence, the estimation parameters including aquifer and brine volume, porosity, average lithium concentration, and pore space volume was assessed, separately, for each of the 3 resource domains.

No top cuts or capping upper limits have been applied to the lithium assay values or are deemed to be necessary. However, and to improve the reproducibility of the analytical results, a single historical outlier value of 77.0 mg/L Li was removed from the assay data. It is the opinion of the QP that the historical analytical value of 77.0 mg/L Li is not representative of the Leduc Formation aquifer brine population at the Drumheller Property and removing the single assay value is acceptable in the context of the resource estimations presented in this technical report.

The Drumheller Li-brine resource estimate is classified as an Inferred Mineral Resource and the project requires further work to elevate the resource to a higher classification level. The inferred Li-brine resource estimation is presented as a total (or global value), and was estimated using the following relation in consideration of the Leduc and Nisku formation aquifers brine:

Lithium Resource = Total Brine Aquifer Volume X Average Porosity X Percentage of Brine in the Pore Space X Average Concentration of Lithium in the Brine.

Until the DLE technology improves to a stage where the production of low-Li-concentration brine from confined aquifer deposits is commercially viable, it is recommended that the cutoff value enables the testing of lithium-enriched brine within the aquifer. In this case, it is the opinion of the QPs that a lower cutoff of 20 mg/L Li is acceptable when assessing the Drumheller Li-brine resources, which accounts for lower Li-brine values within the Nisku Platform/Basin Aquifer Domain.

Mineral resources are not mineral reserves and do not have demonstrated economic viability. There is no guarantee that all or any part of the mineral resource will be converted into a mineral reserve.

The in-situ Drumheller Li-brine inferred resources are globally (totally) estimated – within the 3 domains – as follows:

1. The Leduc Aquifer Domain is estimated to contain 3.14 million tonnes of elemental Li. The global (total) lithium carbonate equivalent (LCE) for the main resource is 16.73 million tonnes LCE

2. Nisku Killam Barrier Reef Aquifer Domain is estimated to contain 59,000 tonnes of elemental Li. The global (total) LCE for the main resource is 312,000 tonnes LCE.

3. Nisku Platform/Basin Aquifer Domain is estimated to contain 207,000 tonnes of elemental Li. The global (total) lithium LCE for the main resource 1.10 million tonnes LCE (Table 14.14).

Collectively, the *in-situ* Drumheller Li-brine inferred resources are globally (totally) estimated – within the 3 domains – to comprise 3.41 million elemental tonnes of lithium (or 18.14 million tonnes LCE; Table 14.14).

25.4 Risks and Uncertainties

As with any early-stage exploration project there exists potential risks and uncertainties. Highwood will attempt to reduce risk/uncertainty through effective project management, engaging technical experts, and developing contingency plans.

Because Highwood is reliant on pre-existing oil and gas wells that are managed and operated by current petro-companies, there is some risk associated with a dependency on the petro-operation and continued brine access. It is possible that situations could arise where the petro-companies shut down well production – for example – due to poor commodity prices, depletion of petroleum product reserves, and/or production well performance of the reservoir. As a mitigation strategy, Highwood could permit and drill their own wells or consider options such as purchasing the well, renting the operation of the well, etc.

With respect to the mineral resource, the inferred Li-brine resource estimations presented in this technical report are subject to change as the project achieves higher levels of confidence in the spatial extent of the aquifers, mineralization, lithium-from-brine recovery process development, and the Li-brine cutoff value.

At present the resource is dependent on Li-brine data, and a large portion of the hydrogeological data, that was acquired from the Leduc and Nisku formation aquifers within the Ghost Pine and Wayne-Rosedale oilfields only; these fields represent only a small western portion of the overall Drumheller Property. Access to similar aged brine from oilfields within other parts of the Property and/or access to older brine within the Cooking Lake and Beaverhill Lake formation aquifers, could potentially change the resource estimation presented in this technical report.

Finally, there is no guarantee that Company's can successfully extract lithium from Alberta's Devonian petroleum system in a commercial capacity. The extraction technology is still at the developmental stage. There is also the risk that the scalability of any initial mineral processing bench-scale and/or demonstration pilot test work may not translate to a full-scale commercial operation.

26 Recommendations

The Highwood Drumheller Property is a property of merit. A two-phased program is recommended that continues to assess the Li-brine potential at Drumheller and defines advanced work intended to increase the confidence level of the data and lithium-extraction test work toward updated mineral resource estimation(s) and/or a Preliminary Economic Assessment scoping study.

The total estimated cost of Phase 1 and Phase 2 of the recommended exploration work, with a 10% contingency, is CDN$2,777,500 and CDN$1,595,000. The total estimated cost of the recommended exploration work, with a 10% contingency, is CDN$4,372,500 (Table 26.1).

Phase 1 work recommendations include the following activities intended to advance the mineral resource potential of the Property and continue to refine the DLE mineral processing technology:

- Highwood has collected brine from the Nisku and Leduc formation aquifers underlying the Drumheller Property. These wells are situated within the Ghost Pine and Wayne-Rosedale oilfields. The authors are aware that the oil and gas industry has drilled wells targeting Nisku-Leduc reservoirs in other parts of the property and have drilled deeper wells that extend downward to the Beaverhill Lake Group. These wells are currently suspended or abandoned, likely as dry, or sub-economic, holes. It is recommended that Highwood consider re-opening some of these holes and/or drilling a new well(s) to test Nisku, Leduc, and older-sourced brine from throughout the Drumheller Property. At least 5 wells should be targeted with the brine sampled for assay work. The cost of this work is estimated at CDN$2,525,000 and assumes a cost of between $1.5-$2.0 million to drill a well. The cost could also be significantly higher depending on the integrity of the wells and unforeseen difficulties associated with the re-entry process.

- It is recommended that Highwood conduct ongoing mineral processing test work that includes 1) adjustments to the initial benchtop extract process, 2) develop additional confidence in the development of a Li concentrate, and 3) take the concentrate to a lithium hydroxide form to evaluate the brine and the lithium extraction process to produce battery grade lithium product. Several 1,000 totes of brine are recommended with the mineral processing work conducted at accredited commercial and/or private laboratories that are knowledgeable in petroleum produced waters and chemicals. The estimated cost of this phase of laboratory-scheduled mineral processing test work is CDN$275,000.

The Phase 2 work recommendations are subject to the positive results of the Phase 1 work initiatives. Phase 2 work recommendations include the following activities intended to refine the lithium recovery processes and conduct mineral resource modelling and estimations and economic valuations:

- Refinement of 1) the hydrogeological model that includes analyzing detailed fluid-level response to fluid diversion and 2) the lithium recovery process flowsheet toward the development and construction of a demonstration pilot plant. The cost of this work is estimated at CDN$1,150,000.

- Community consultation and environmental studies. The Town of Drumheller and area is interested in renewable energy, and it is recommended that Highwood talk with community leaders and provide educational sessions to the public. The Company should also be aware of sensitive species restrictions in the Drumheller area and follow the guidelines in the event of any exploration that causes ground disturbance. The estimated cost of the community consultation and environmental work is CDN$50,000.

- Preparation of technical reporting and disclosure that is compliant with Canadian Institute of Mining and Metallurgy definition standards and best practice guidelines (2014, 2019) and National Instrument 43-101. The estimated cost for an updated mineral resource estimation and Preliminary Economic Assessment technical report is CDN$250,000.

Table 26.1 Future work recommendations.

Phase	Description	Cost estimate (CDN$)	Sub-Total (CDN$)
Phase 1	Target wells (including suspended wells) and/or drill a new well \in other parts of the Drumheller property and/or wells that penetrate into the Beaverhill Lake Group (or older) for brine sample collection for assay testing.	$2,250,000	
	Conduct additional bulk brine sample collection to advance the mineral processing test work.	$275,000	$2,525,000
Phase 2	Refinement of hydrogeological model and lithium recovery process flowsheet toward development of a demonstration pilot plant.	$1,150,000	
	Community consultation and environmental studies.	$50,000	
	Resource esimtation updates (if necessary) and Preliminary Economic Assessment technical reporting.	$250,000	$1,450,000
		Sub-total	$3,975,000
		10% contingency	$397,500
		Total	**$4,372,500**

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28 Certificate of Author

I, **D. Roy Eccles**, P. Geol., do hereby certify that:

1. I am a Senior Consulting Geologist and Chief Operations Officer of APEX Geoscience Ltd., 100 11450-160 Street, Edmonton, Alberta T5M 3Y7.
2. I graduated with a B.Sc. in Geology from the University of Manitoba in Winnipeg, Manitoba in 1986 and with a M.Sc. in Geology from the University of Alberta in Edmonton, Alberta in 2004.
3. I am and have been registered as a Professional Geologist with the Association of Professional Engineers and Geoscientists of Alberta (APEGA) since 2003, and Newfoundland and Labrador Professional Engineers and Geoscientists (PEGNL) since 2015.
4. I have worked as a geologist for more than 35 years since my graduation from university and have been involved in all aspects of mineral exploration, mineral research, and mineral resource estimations for metallic, industrial, specialty, and rare-earth element mineral projects and deposits.
5. I have read the definition of "Qualified Person", as set out in National Instrument 43-101 Standards of Disclosure for Mineral Projects (NI 43-101). By reason of my education, affiliation with a professional association and past relevant work experience, I fulfill the requirements to be a "Qualified Person" for the purposes of NI 43-101. My technical experience includes exploration and preparation of mineral resource estimates for lithium-brine projects in western Canada, southeastern and southwestern United States, central Europe, and other global locales.
6. Apart from items 13 and 14.3, I prepared and accept responsibility for all items in "*NI 43-101 Technical Report, Initial inferred lithium-brine resource estimations for Highwood Asset Management Ltd.'s Drumheller Property in south-central Alberta, Canada*, with an effective date of 21 February 2022 (the "Technical Report). I performed a site inspection at the Drumheller Property on 28 May 2021 and verified the land position, active oilfield infrastructure, brine access, and the lithium-brine mineralization.
7. To the best of my knowledge, information and belief, the Technical Report contains all relevant scientific and technical information that is required to be disclosed, to make the Technical Report not misleading.
8. I have read NI 43-101 and Form 43-101F1, and the Technical Report has been prepared in compliance with that instrument and form.
9. I am independent of Highwood Asset Management Ltd., applying all the tests in section 1.5 of NI 43-101 and Companion Policy 43-101CP.
10. I have not had any prior involvement with Highwood Asset Management Ltd.'s Drumheller Property that is the subject of the Technical Report.
11. I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication by them for regulatory purposes, including electronic publication in the public company files or their websites.

Effective Date: 21 February 2022
Signing Date: 21 February 2022
Edmonton, Alberta, Canada

PERMIT TO PRACTICE
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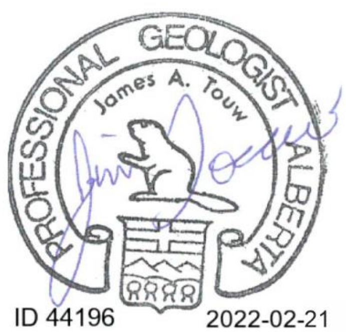
D. Roy Eccles, M.Sc., P. Geol. P. Geo.

I, **James (Jim) Touw**, P. Geol., do hereby certify that:

1. I am a Senior Hydrologist with Hydrogeological Consulting Ltd., #17740 - 118 Avenue NW, Edmonton, Alberta, T5S 2W3.
2. I graduated with a B.Sc. in Geology from the University of Alberta in 1983.
3. I am and have been registered as a Professional Geologist with the Association of Professional Engineers and Geoscientists of Alberta (APEGA) since 1992 and with the Engineers & Geoscientists of British Columbia since 2016.
4. I have worked as a geologist and hydrogeologist for more than 30 years since my graduation from university and have been involved in mineral exploration and hydrology in Alberta, Northwest Territories and British Columbia.
5. I have read the definition of "Qualified Person", as set out in National Instrument 43-101 Standards of Disclosure for Mineral Projects (NI 43-101). By reason of my education, affiliation with a professional association and past relevant work experience, I fulfill the requirements to be a "Qualified Person" for the purposes of NI 43-101. My technical experience includes the collection, processing and interpretation hydrogeological data, project management of hydrogeological programs, and the preparation and review of hydrogeological reports.
6. I prepared, and accept responsibility, for Section 14.3 Hydrogeological Characterization of the Leduc and Nisku Formation Aquifers, in "*NI 43-101 Technical Report, Initial inferred lithium-brine resource estimations for Highwood Asset Management Ltd.'s Drumheller Property in south-central Alberta, Canada*, with an effective date of 21 February 2022 (the "Technical Report). I have not performed a site inspection at the Drumheller Property.
7. To the best of my knowledge, information and belief, the Technical Report contains all relevant scientific and technical information that is required to be disclosed, to make the Technical Report not misleading.
8. I have read NI 43-101 and Form 43-101F1, and the Technical Report has been prepared in compliance with that instrument and form.
9. I am independent of Highwood Asset Management Ltd. and the Drumheller Property, applying all the tests in section 1.5 of NI 43-101 and Companion Policy 43-101CP.
10. I have not had any other prior involvement with the Property that is the subject of this Technical Report.
11. I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication by them for regulatory purposes, including electronic publication in the public company files or their websites.

Effective Date: 21 February 2022
Signing Date: 21 February 2022
Edmonton, Alberta, Canada



Jim Touw, B.Sc., P. Geol.

I, **Charles R. Edwards**, P. Eng., do hereby certify that:

1. I am Principal of Chuck Edwards Extractive Metallurgy Consulting, 136 – 320 Heritage Crescent, Saskatoon, Saskatchewan, S7H 5P4.
2. I graduated with a B.Sc. in Engineering Chemistry and a M.Sc. in Chemical Engineering from Queen's University in Kingston, Ontario in 1965 and 1969, respectively.
3. I am and have been registered as a Professional Engineer with the Association of Professional Engineers and Geoscientists of Saskatchewan (APEGS) since 1986.
4. I have worked as an extractive metallurgy Engineer for more than 50 years since my graduation from university and have been involved in consulting to global clients on process development and design for extractive metallurgy plants.
5. I have read the definition of "Qualified Person", as set out in National Instrument 43-101 Standards of Disclosure for Mineral Projects (NI 43-101). By reason of my education, affiliation with a professional association and past relevant work experience, I fulfill the requirements to be a "Qualified Person" for the purposes of NI 43-101. My technical experience includes experience in R&D, operations, government service, consulting, and engineering management. Mr. Edwards has process design experience for uranium, aluminum, nickel, oilsands, silver, copper, lithium, potash, and specialty chemicals.
6. I prepared, and accept responsibility, for Section 13 Mineral Processing and Metallurgy, in "*NI 43-101 Technical Report, Initial inferred lithium-brine resource estimations for Highwood Asset Management Ltd.'s Drumheller Property in south-central Alberta, Canada*, with an effective date of 21 February 2022 (the "Technical Report). I have not performed a site inspection at the Drumheller Property.
7. To the best of my knowledge, information and belief, the Technical Report contains all relevant scientific and technical information that is required to be disclosed, to make the Technical Report not misleading.
8. I have read NI 43-101 and Form 43-101F1, and the Technical Report has been prepared in compliance with that instrument and form.
9. I am independent of Highwood Asset Management Ltd. and the Drumheller Property, applying all the tests in section 1.5 of NI 43-101 and Companion Policy 43-101CP.
10. I have not had any other prior involvement with the Property that is the subject of this Technical Report.
11. I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication by them for regulatory purposes, including electronic publication in the public company files or their websites.

Effective Date: 21 February 2022
Signing Date: 21 February 2022
Edmonton, Alberta, Canada

PROFESSIONAL ENGINEER
C.R. EDWARDS
SASKATOON
SASKATCHEWAN

Charles R. Edwards, M.Sc., P. Eng. FCI