

**Exploring  
the Sisters Mountain anomalous  
Rare Earth and Associated Elements Discovery**

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## **An Exciting Development in New Brunswick, Canada**

### **Exploring the Sisters Mountain anomalous Rare Earth and Associated Elements Discovery**

#### **The Sisters Mountain Property-Outlook-Monetization-Government Support**

**The Sisters Mountain Property represents an exceptional exploration opportunity based on New Brunswick Geological Survey exploration reconnaissance results and 100% private ownership of the properties by private stakeholders.**

Exploration geologist/pro prospector **Mr. W. Lockhart** through 2020-2022 staked a portfolio of 975 claim units covering 243 square kilometers in central New Brunswick. The claims described as the Sisters Mountain Properties are contained in a broader region surveyed by the **New Brunswick Geological Survey (NBGS)** in the late 1990's for critical minerals and Rare Earth Elements (REE). The survey results were released in 2005 and 2012.

**Mr. Lockhart concluded that in reviewing reports provided by the New Brunswick Geological Survey that the Sisters Mountain Property is believed to potentially host any one or four distinct mineral deposit types: tin, tungsten, molybdenum and Platinum Group Metals (PGE), and REE (Rare Earth Elements) and Base Metals<sup>1</sup>.**

**Wayne Lockhart "The Sisters Mountain area has now been proven by government surveys and research to be extremely anomalous for and to have great potential to contain, economic deposits of many metals and Rare Earth Elements. The government of New Brunswick published maps (Yrs. 2005 and 2012) of this area showing extensive anomalies for: tin and tungsten; precious metals; base metals; including maps of anomalous areas for a variety of Rare Earth Elements". A very large mineral exploration programme is justified, and recommended, to commence immediately to explore this area that is both so highly anomalous, and unusually large for so many metals and elements, materials that are now in high demand throughout the world"**<sup>2</sup>.

1,2 W. Lockhart

#### **New Brunswick**

The province of New Brunswick, Canada covers an area of 72,907 square kilometers (28,150 mi<sup>2</sup>) or about 0.80% of Canadian territory. As of 2022, the population represented approximately 820,000 people or 2.1% of Canada's population. New Brunswick is a relatively small province with a rich mining history and an important province for the potential production of **critical minerals**.

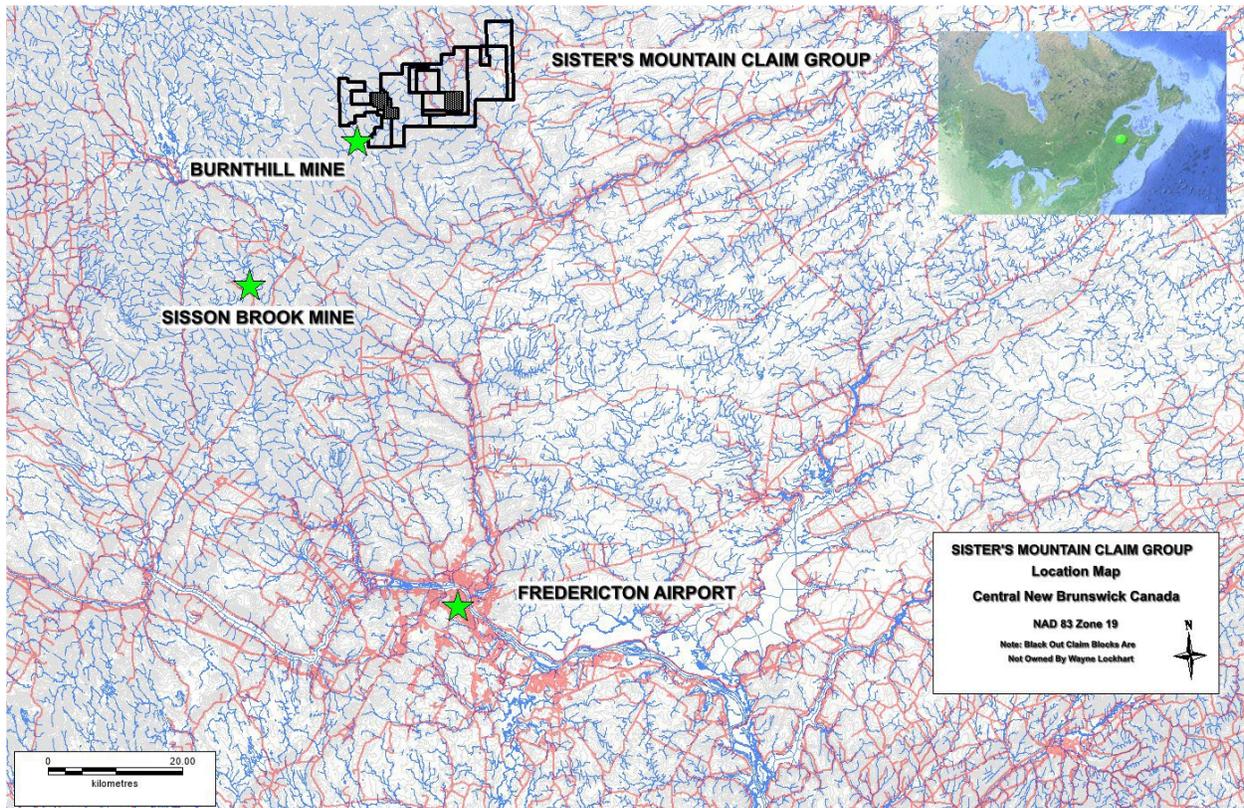
The provincial government supports mineral exploration by providing geoscience in the form of geological maps, regional geophysical surveys, scientific assessment, and data information. In addition, the province provides financial grants for qualified prospectors and junior mining exploration companies.

The Sisters Mountain anomalous discovery occurred primarily because of such provincial surveys.

**Property Description, Location and Access**

The Sisters Mountain Properties are in York and Northumberland Counties, near the geographic center of the Province of New Brunswick, Canada approximately seventy kilometers due north of the capital city of Fredericton. The Sisters Mountain Project is located within 100 km of a major city and international airport. The property is accessed by Provincial highways, secondary roads and woodlands roads that lead to the property area. Privately owned claims are blacked out.

Figure 1 below<sup>1</sup> indicates the location of the Sisters Mountain Properties close to the geographical center of New Brunswick.



<sup>1</sup> Figure by R. Fritzgerald P.Geo.

**Mineral Claims**

Please see Table 1 below

Mr. W. Lockhart a resident of New Brunswick, acquired the mineral rights in 2020 by way of map staking of mineral claims consisting of two contiguous claim groups (9503,9671)

comprising a total of 91 units encompassing 22.5 square kilometers and Little Dunvargon with 15 claim units 9276 comprising 3.5 square kilometers. Total claim area amounts to twenty-six square kilometers.

In 2022, Mr. Lockhart staked an additional 869 claim units totaling 217 square kilometers in which claim blocks 10365 and 10366 (Table 2) surrounds privately owned property. These surrounding claims had remained un-staked from time of the NBGS release of data in 2005 and 2012 until 2022 when Mr. Lockhart completed his staking program.

**Table 1** Tabulates specific details pertaining to the above claims including the claim holder's name.

Tables 1 and 2 provides a ready reference in ensuing literature.

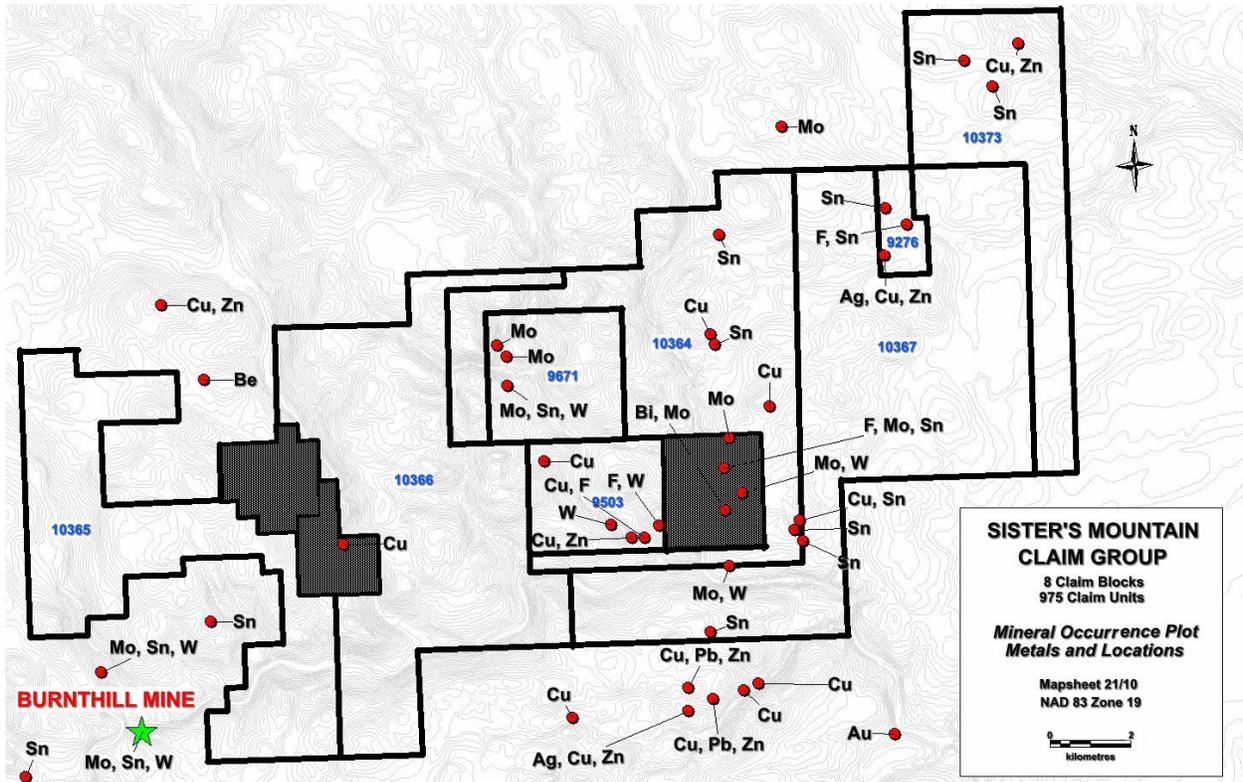
<b>Table 1</b>	<b>Claim</b>	<b>Area</b>		<b>NB</b>	
<b>Claim #</b>	<b>Units</b>	<b>sq. km</b>	<b>Staking Date</b>	<b>Claim Holder</b>	<b>License</b>
Sisters West 9503	42	10.5	6 May 2020	Wayne Lockhart	07822
Sisters North 9671	49	12	31 Aug. 2020	Wayne Lockhart	07822
Little Dunganvon 9276	15	3.5	18 Sept. 2019	Wayne Lockhart	07822
<b>Total 3 Blocks</b>	<b>106</b>	<b>26</b>			

<b>Table 2</b>	<b>Claim</b>	<b>Area</b>		<b>NB</b>	
<b>Claim #</b>	<b>Units</b>	<b>sq. km</b>	<b>Staking Date</b>	<b>Claim Holder</b>	<b>License</b>
10364	165	41	7 Feb.2022	Wayne Lockhart	07822
10365	150	37.5	10 Feb.2022	Wayne Lockhart	07822
10366	203	51	11 Feb.2022	Wayne Lockhart	07822
10367	253	63	11 Feb.2022	Wayne Lockhart	07822
10373	98	24.5	15 Feb.2022	Wayne Lockhart	07822
<b>Total 5 Blocks</b>	<b>869</b>	<b>217</b>			

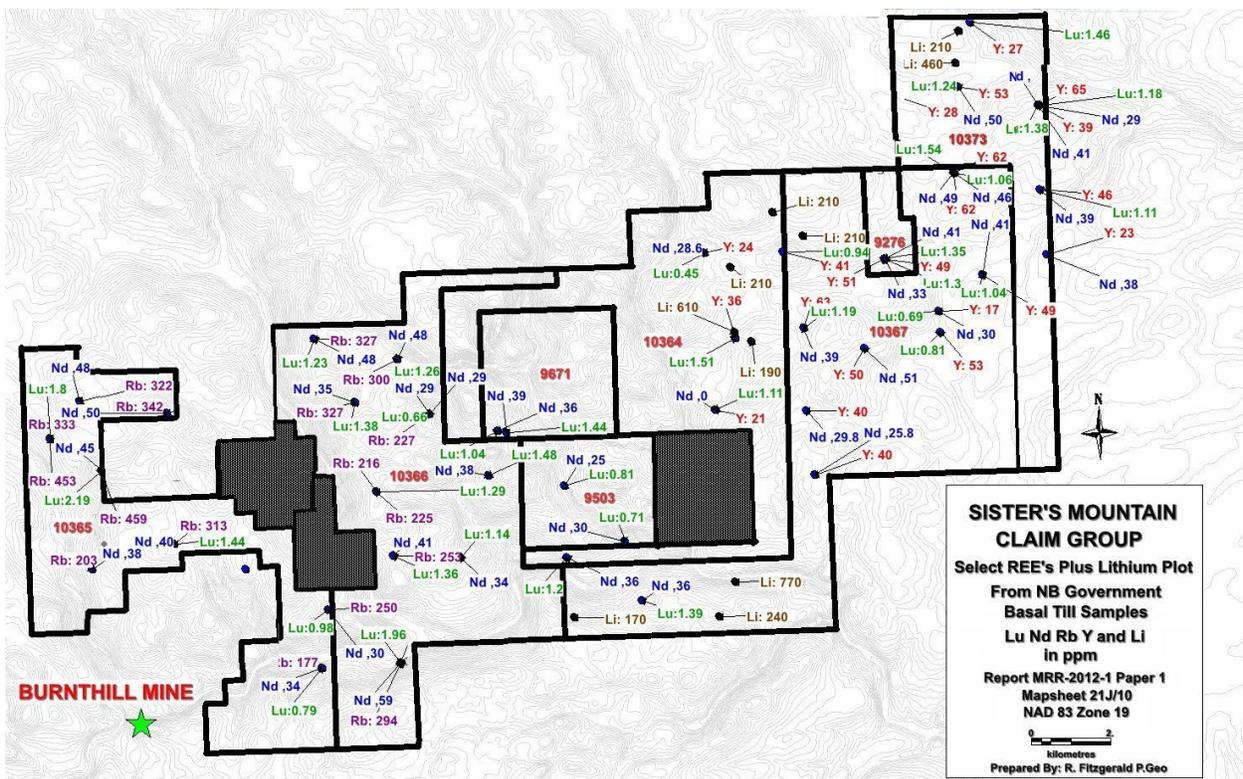
**In total, Mr. Lockhart currently owns 100% of 975 claim units covering 243 square kilometers representing highly prospective exploration targets for discovery of critical minerals.**

Figure 2 below illustrates the contiguous relationship between claims 9503 and 9671, Sisters West and Sisters North, respectively. In addition, Figure 2 illustrates mineral occurrences on the Lockhart claim blocks. Note the proximity of claim blocks 10365 and 10366 to the Burnt Hill mine site<sup>2</sup>. Readers may refer to Appendix 2 for clarification of mineral symbols.

Figure 3 below mirrors the above Figure 2 and plots **Rare Earth** occurrences on the claim blocks owned by Wayne Lockhart<sup>3</sup>. Privately owned claims are blacked out.



<sup>2,3</sup> Map figures by R. Fitzgerald P. Geo.



## Land Tenure

Mr. W. Lockhart confirms:

- He currently owns 100% of the 106 claim units 9503,9671,9276 (Table 1) located on private land owned by Miramichi Timber Holdings, a subsidiary of J.D. Irving Ltd.
- and currently owns 100% of 869 claim units (Table 2) located on private land owned by Miramichi Timber Holdings, a subsidiary of J.D. Irving Ltd.
- that he has an Agreement to conduct exploration work on the J.D. Irving lands.
- that there are no royalties, back-in rights, payments, or other agreements or encumbrances to which the Sisters Mountain licenses may be subject, other than standard Crown royalty obligations on minerals situated within the Province.
- that exploration and any development on the property is subject to damage liability covered by a liability insurance policy.

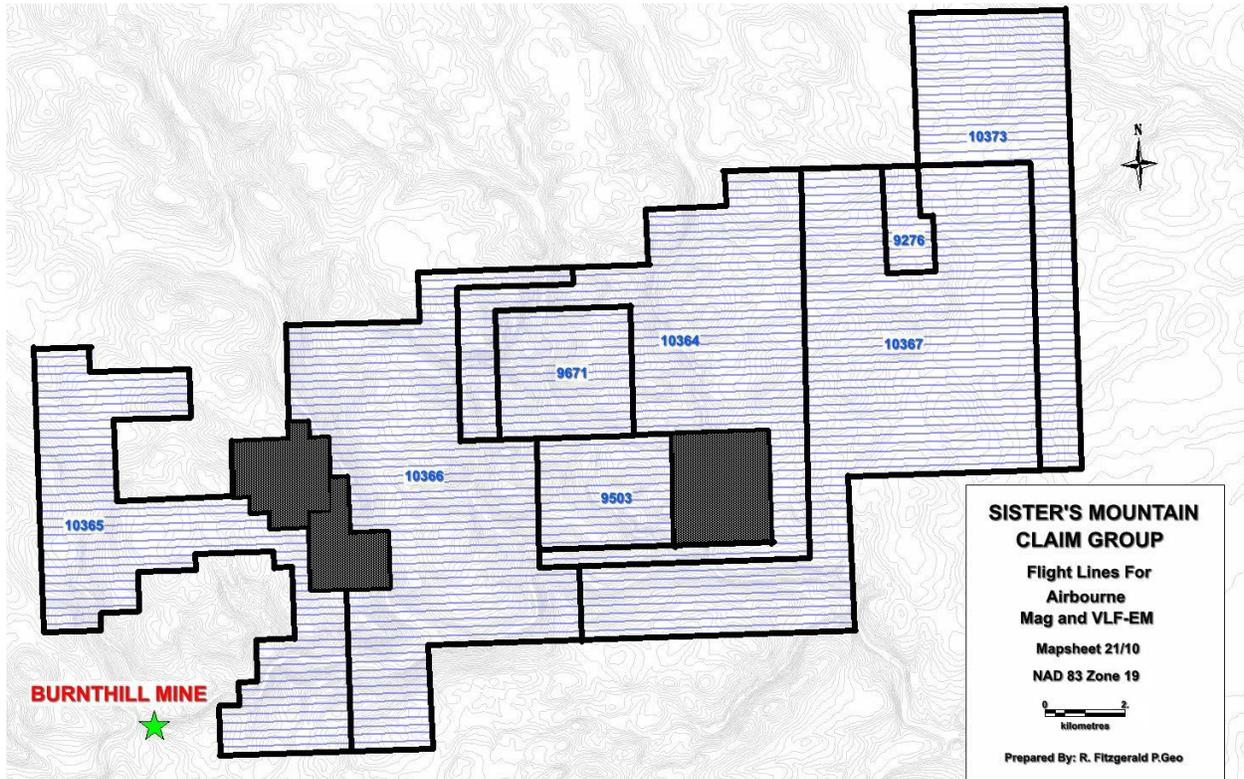
## Monetization

Since release of the survey, limited or no exploration has taken place on the Sisters Mountain Properties owned by W. Lockhart due to restricted access by the private owner. To advance the property, Mr. Lockhart has completed an earn-in agreement with private venture capital insiders to finance exploration of the claims. The venture capital insiders may earn 100% interest by meeting expenditure and administrative commitments over a five-year period. With further de-risking of the property, a vend-in to a publicly listed Canadian company may occur in due course. A NI 43-101 report by an independent professional geologist will be prepared as part of the work and regulatory requirements to meet a vend-in arrangement. We believe that the 43-101 compliant Report will be completed during the first quarter of 2023.

## Work Program

Under the optionee earn-in agreement, W. Lockhart will function as an adviser in planning a \$250,000 work program in the upcoming season. The work program will include an aeromagnetic VLF-em helicopter survey on 15-kilometer lines with two hundred meters spacing over the entire claim block property<sup>4</sup>. The airborne survey hopes to identify gabbro-granite pluton/sedimentary contact zones that could identify elevated temperature formation of nickel and tin/tungsten mineralization along these zones. Follow up would include trenching, mapping, and geo-chemical prospecting of such zones with particular attention to the highest anomalous values released by the Geological Survey in 2005 and 2012. Mr. Lockhart plans to utilize a rapid assay mineral detector SCI/APS XRF X-555 to read anomalous surface values. High value samples would be subject to further whole rock analysis. This approach reduces unnecessary assay costs by quickly determining high or low anomalous readings in the field before transport for whole rock assays.

<sup>4</sup> Figure 4 illustrates the proposed flight plan. Each line on the diagram is a flight path line. Privately owned claims are blacked out.



<sup>4</sup> Figure by R. Fitzgerald P. Geo.

**Property History**

**The Sisters Mountain Property A Multi-Metals Site**

In the late 1990’s, the **New Brunswick Geological Survey (NBGS)** conducted a mapping and basal till geochemical survey. The purpose of this survey was to identify areas in Southwestern New Brunswick with potential for deposits of Base Metals (copper, zinc, lead); of nickel, copper, PGE (Platinum Group Metals); of tin, tungsten, molybdenum and of Precious Metals.

**Results of the Geological Survey<sup>5</sup>**

In 2005, the New Brunswick Geological Survey (NBGS) released the results of their survey. The survey suggested that the Sisters Mountain Property could host four distinct mineral deposit types:

- Tin (Sn), Tungsten (W), Molybdenum (Mo)
- Precious Metals
- REE (Rare Earth Elements)
- Base Metals

**The Sisters Mountain Area was identified by the New Brunswick survey to have the highest**

metal values in basal till soil samples within the entire survey area of southwestern New Brunswick for Tin and Tungsten, Base Metal, and Precious Metal indicators. In 2012, the NBGS released two additional reports of their work within this area, Open File Report 2012-3 and MRR 2012-1A. These reports show the Sisters Mountain area to be extremely anomalous for Rare Earth Elements (REE). The Geological Survey noted that the region exhibited higher or equal values than in the areas hosting other well-known discoveries such as: **Burnt Hill, Sisson Brook, St. Stephen Nickel, Clarence Stream Gold deposits and Mount Pleasant Tin/Tungsten, Indium deposits. The Burnt Hill and Sisson Brook properties are near the Sisters Mountain Property claim blocks. (Map figure 1)**

The province of New Brunswick is no stranger to the discovery and production of critical metals and exhibits a mining-friendly jurisdiction with excellent infrastructure and highly experienced workforce. One of the largest zinc mines in the world was located in the Bathurst Mining Camp district in NE New Brunswick. Its primary commodity was zinc but the massive ore body also produced lead, copper, silver, gold, bismuth, antimony and cadmium. More than 137 million tonnes of ore was produced from the No 12 deposit before closure in 2013.

It is worthwhile to review a few of the discoveries, development projects and former producers in southern New Brunswick where geological surveys have taken place and which are near to the Sisters Mountain Property. A discussion of three properties of significance to the Sisters Mountain Property is discussed below. The selected three properties are: **Burnt Hill, Sisson Brook and Little Dunvargon.**

5. Referenced from W. Lockhart reports

**A brief discussion of other important claims staked by W. Lockhart are highlighted.**

### **Burnt Hill**

1. Of particular interest is the well-known **Burnt Hill tungsten** deposit located only 10 km to the southwest of the Sisters Mountain Property. Some of Wayne Lockhart's claims tie on to the Burnt Hill mine property.

Between 1912-1918, 52 tons of tungsten concentrate (65%  $WO_3$ ) was produced from an underground mine to supply the war effort. Between 1953-1954 a further 22,379 kg of tungsten concentrate (69%  $WO_3$ ) was produced with tin (3.5% Sn).

An historical 43-101 Resource Estimate figures for Indicated and Inferred categories of the Burnt Hill site were released on Sedar August 29, 2013<sup>6</sup>. Total Indicated Open pit and Underground resources amounted to 1.761 million mt grading 0.292%  $WO_3$ , 0.007%  $MoS_2$ , 0.008%  $SnO_2$ . Total Inferred Open pit and Underground resources amounted to 1.520 million mt grading 0.263%  $WO_3$ , 0.008%  $MoS_2$ , 0.005%  $SnO_2$ .

<sup>6</sup>The information regarding the Burnt Hill deposit was derived from the technical report prepared by Southampton Associates Inc. titled Deposit Modelling & NI 43-101 Resource Estimate for the Burnt Hill Tungsten-Molybdenum-Tin Property Stanley Parish, York County, New Brunswick. Dated August 1, 2013. The estimates above represent historical estimates for informational purposes only. The Report was filed on Sedar August 29, 2013.

### **Sisson Brook**

The Sisson tungsten-molybdenum project is located approximately 100 kilometers northwest of Fredericton, near the communities of Napadogan, Juniper, and Stanley. The project is within 50 km of the Sisters Mountain claims. (Map Figure 1)

Sisson Brook a tungsten-molybdenum system is related to early Devonian plutonism near the town of Stanley and consists of two tungsten-copper zones and one larger tungsten-molybdenum zone.

Useful exploration geological indicators are described in the following Northcliffe Resources presentation. *“Resources Tungsten and molybdenum mineralization mostly occurs in narrow, sheeted, northwest-trending quartz-sulphide veins which surround larger, north-trending shear veins. Tungsten occurs predominantly in the mineral scheelite, and locally in wolframite, with molybdenum occurring in molybdenite. The near-surface Sisson deposit is amenable to open pit mining”*<sup>6</sup>.

<sup>6</sup>Northcliffe Resources Ltd.

This project is currently held by Northcliff Resources Ltd who intend to take the project to production. Readers may access further information concerning the Sisson Brook project by visiting the Northcliffe Resources web site.

### Little Dungarvon

Claim Block 9276

**The Little Dungarvon property covers much of the claim unit 9276 owned by W. Lockhart (Table 1). Please refer to Figure 2 to locate claim unit 9276.**

The tungsten-molybdenum project lies about 30 km NE of Burnt Hill and is linked to the middle Devonian Dungarvon pluton which is related to the Burnt Hill pluton (A source of heat potentially activating the formation of tungstate minerals).

The tungsten is primarily carried by scheelite (Scheelite is a calcium tungstate mineral with the chemical formula  $\text{CaWO}_4$ . It is an important ore of tungsten known as wolfram). Mineralization has been found within granitoid-related quartz veining as well as in two extensive boulder fields on surface with a presumed local source.

The Little Dungarvon tin/tungsten/molybdenum property is identified as significantly anomalous for tin/tungsten/molybdenum on Plate 2005-1B, Hayesville Map Sheet NTS 21J/10, Province of New Brunswick (EMP) Basal Till Survey of 2005.

This is further affirmation of the potential of this property that earlier exploration by Kidd Creek, (1981 to 1985) had shown with a *“boulder sample in the area of the Dungarvon Vein 13 (near the west region of the Lower Dungarvon claim) returned 28.8% tin over 27 cm width”*, and *“grab samples were previously reported up to 1.44% copper, 0.26% lead, 6.84%*

zinc, and 0.1% tin". A rock sample collected by Kidd Creek returned >20,000 ppm zinc, 3,275 ppm copper, 321 ppm tin and 17.5 ppm silver <sup>7</sup>.

Previous exploration on the Little Dungarvon tin/tungsten/molybdenum property has identified targets that Wayne Lockhart believes justify continued exploration to further develop this tin/tungsten/molybdenum deposit.

<sup>7</sup>W. Lockhart

### **Significant Highlight**

#### **Shell Canada Resources Limited** <sup>8</sup>

Claim Block 9671 Table 1

**Shell Canada Resources Limited**, in 1979 to 1981 explored for tin on their claim group of about eight square kilometers that straddled northern portions of Sisters Brook. This is the area of current **claim 9671 owned by Wayne Lockhart** (Sisters North-Table 1).

World-wide economic events caused the cessation of exploration for tin by Shell Canada after 1981. The price of tin dropped to a third of its earlier value. Shell reported that broad tin anomalies were located that are "open to the east of the reconnaissance grid." Intense tin anomalies, (maximum value 2061 ppm Sn) on the detail grid are "open to the south".

#### **Shell Canada recommended:**

1) staking additional claims on the east and detailed grid soil and till sampling following the intense tin anomaly beyond the southern claim boundary.

2) the area to the south (the current Sisters North Claim 9671) should be subject to stripping and trenching and detailed structural and stratigraphic mapping of the stripped and trenched areas be performed. None of this recommended work was undertaken. Shell terminated the project. Claim 9671 was staked by W. Lockhart to cover the area explored by Shell Canada and to include the area recommended for further exploration by Shell Canada.

### **Significant Highlight**

#### **Deep Induced Polarization Geophysical Survey**

**Sisters Claims 9503** <sup>9</sup>

Preliminary exploration by W. Lockhart on the Sisters Mountain claims 9503 (Table 1) included a deep IP survey to determine if electrically conductive mineralization existed at that location. The survey results were very positive continuing to indicate potential for a nickel deposit.

After completing this exploration, Mr. Lockhart located Reports of Work, done by the New Brunswick government, within this area. These reports were: **Open File Report 2012-3 and**

**MRR 2012-1A. These two publications highlight the Sisters Mountain Area to be extremely anomalous for Rare Earth Elements and Associated Elements.**

<sup>8,9</sup> Source W. Lockhart

Below is a brief discussion about critical minerals adopted from:  
**CANADA'S CRITICAL MINERALS STRATEGY: DISCUSSION PAPER Appendix 1**

### **Canadian Federal Government and Province of New Brunswick focus on Critical Minerals**

#### **Definition**

Interestingly, there is no global definition of critical minerals. The definition is considered country specific and varies with supply and demand, technological developments, and societal demands. However, there are accepted international views that critical minerals:

- have few or no substitutes,
- have strategic value and represent limited commodities,
- are concentrated in certain geographic locations,
- may be subject to limited processing facilities.

#### **Canadian definition of a Critical Mineral<sup>10</sup>**

- essential to Canada's economic security,
- its supply is threatened,
- required for transition to a low carbon economy,
- represents a sustainable source of highly strategic critical minerals for partners and allies.

Specific Uses (Please see Appendix 1 for a tabulation of Critical Minerals and applications)

<sup>10</sup> Source: CANADA'S CRITICAL MINERALS STRATEGY: DISCUSSION PAPER OPPORTUNITIES FROM EXPLORATION TO RECYCLING

#### **Financing the Critical Metals Industry<sup>11</sup>**

Critical minerals are essential inputs for renewable energy and clean technology applications, such as advanced batteries, permanent magnets, solar panels, wind turbines, and small modular reactors, as well as advanced manufacturing applications, including defense and security technologies, semiconductors, consumer electronics, and critical infrastructure.

**The Canadian government is committed towards decreasing reliance on Chinese and Russian critical minerals. Canada is developing a Critical Minerals Strategy, backed by an approximate \$4 billion 2022 Budget addressing the entire value chain of exploration, extraction, intermediate processing, advanced manufacturing, and recycling.**

From 2010 to 2020, a total of \$66.4 billion was invested on critical minerals exploration and development projects in Canada, accounting for 45% of total spending. However, except for base metals and uranium, critical minerals, especially battery minerals, account for a small but recently growing share of total exploration spending.

- Federal budget incentives included: \$79.2 million for public geoscience and exploration to better assess and identify mineral deposits.
- A 30% Critical Mineral Exploration Tax Credit for targeted critical minerals (i.e., nickel, lithium, cobalt, graphite, copper, rare-earth elements, vanadium, tellurium, gallium, scandium, titanium, magnesium, zinc, platinum group metals, and uranium)
- \$47.7 million for targeted critical mineral R&D through Canada's research labs
- \$144.4 million for critical mineral research and development, and the deployment of technologies and materials to support critical mineral value chains.

As an example of provincially support, geologist W. Lockhart was able to utilize the data base of the New Brunswick Geological Survey to focus attention on specific anomalous targets that included advanced geoscience capabilities, geological mapping, geophysical surveying, and scientific assessments data. **Mr. Lockhart rapidly moved to claim stake the large parcels that make up 975 claim units covering 243 square kilometers tabulated in Tables 1 and 2.**

<sup>11</sup>Source: Excerpt from CANADA'S CRITICAL MINERALS STRATEGY: DISCUSSION PAPER

### **Concluding Remarks**

**This opinion ranks the Sisters Mountain Properties highly in terms of exploration potential towards discovery and potential development of Critical and Rare Earth Elements. The NBGS reconnaissance in southern New Brunswick in the late 1990's provided a plethora of information concerning identification and distribution of such elements now considered essential to the technological advancement and national security of Canada in this modern age.**

**Exploration of the reconnaissance area released in 2005 and 2012 in the Sisters Mountain region remained a challenge due to limited access to lands controlled by private interests, world economic conditions, and a general lack of interest in such exotic elements as Rare Earths.**

**Mr. W. Lockhart recognized the opportunity to claim-stake 975 claim units comprising 243 square kilometers. Agreements have been reached with private land holders with exploration planned for the first quarter of 2023.**

**The Federal Government of Canada and the New Brunswick provincial government is fully dedicated to support exploration and development of potential Critical Mineral and Rare Earth Elements by generous availability of scientific data bases, grants, and tax benefits.**

**At the right time, monetization of this early-stage exploration project is a vend-in to a Canadian public company listed on a Canadian exchange backed by experienced, and successful venture capitalists.**

**Disclaimer**

- **This opinion is not a solicitation to buy or sell securities.**
- **Anthony Garson is not a registered investment advisor.**
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**Anthony Garson B.Sc., MBA**

**Toronto, Canada**

**January 2023**

## Appendix 1

The source for the following extracts is from **CANADA’S CRITICAL MINERALS STRATEGY: DISCUSSION PAPER: OPPORTUNITIES FROM EXPLORATION TO RECYCLING: Powering the green and digital economy for Canada and the world.**

Canada has released a list of 31 minerals (March 2021) considered critical for the sustainable economic success of Canada and its allies—minerals that can be produced in Canada, are essential to domestic industry and security and have the potential to support secure and resilient supply chains to meet global demand.

### Canada’s Critical Minerals List

Aluminum	Helium	Scandium
Antimony	Indium	Tantalum
Bismuth	Lithium	Tellurium
Cesium	Magnesium	Tin
Chromium	Manganese	Titanium
Cobalt	Molybdenum	Tungsten
Copper	Nickel	Uranium
Fluorspar	Niobium	Vanadium
Gallium	Platinum group metals	Zinc
Germanium	Potash	
Graphite	Rare earth elements	

The critical minerals list is a result of collaboration with other federal departments, exploration, mining and manufacturing industries, and extensive consultation with the provinces and territories over a period of five months.

Canada is the only Western nation that has an abundance of cobalt, graphite, lithium, and nickel, essential to creating the batteries and electric vehicles of the future.

Among the critical minerals essential for these priority supply chains, six hold significant potential for Canadian economic growth. These include the following minerals in **bold** print.

Critical Minerals	Value Chains	Major Applications	Examples of Specific Products
<b>Lithium</b>	Clean technologies	<b>Batteries, glassware, ceramics</b>	Rechargeable batteries (phones, computers, cameras and EVs), hydrogen fuel storage, metal alloys (military ballistic armour, aircraft, bicycle, and train components), specialized glass and ceramics, drying and air conditioning systems.
<b>Graphite</b>	Clean technologies	<b>Batteries, fuel cells for EVs</b>	Metal foundry lubricants, vehicle brake linings, metal casting wear, crucibles,

			rechargeable battery anodes, EVs fuel cells, electrical motor components, frictionless materials, pencils
Nickel	Clean technologies	Stainless steel, solar panels, batteries	Metal alloys (steel, superalloys, non-ferrous alloys), jet and combustion engine components, rechargeable batteries (phones, computers, EVs), industrial manufacturing machines, construction beams, anti-corrosive pipes, cookware, medical implants, power plant components
Cobalt	Clean technologies	Batteries	Battery electrodes, metal alloys, turbine engines components, automobile airbags, catalysts in petroleum and chemical industries, drying agents for paints, varnishes and inks, magnets.

Critical Minerals	Value Chains	Major Applications	Examples of Specific Products
Copper	Clean technologies and advanced manufacturing	Electrical and electronics products	Power transmission lines, electrical building wiring, vehicle wiring, telecommunication wiring, electronic components.
Rare Earth Elements	Zero-emission vehicles	Permanent magnets for electricity generators and motors	Flat screens, touch screens, LED lights, permanent magnets, electronic components, EV drive trains, wind turbines, airplane components, vehicle components, speakers, steel manufacturing, battery anodes, chemical catalysts, glass manufacturing, specialized glass lenses.

Critical Minerals	Value Chains	Major Applications	Examples of Specific Products
Vanadium	Clean technologies and advanced manufacturing	Alloys, batteries	Metal alloys (steel), military armour plating, vehicle axles, piston rods and crankshafts, nuclear reactor components, manufacturing superconducting magnets, pigments for ceramics and glass.
Gallium	Information and communications	Semiconductors, optoelectronics	Electronic circuit boards, LED devices, semiconductors, specialized thermometers, barometer sensors, solar panels, blue-ray technology, pharmaceuticals
Titanium	Clean technologies	Defence applications, chemicals	Colour pigments in paint, plastics, and paper, metal alloys (aluminum, steel, molybdenum), military aircraft, spacecraft, missiles and rockets, non-corrosive pipes, ship and submarine hulls, medical implants, sunscreen.

Critical Minerals	Value Chains	Major Applications	Examples of Specific Products
Scandium	Clean technologies and advanced manufacturing	Advanced alloys (aerospace & defence), fuel cells	Metal alloys (aluminum), commercial and military airplanes, rockets and vehicle components, high-end sports equipment, specialized light bulbs, solid oxide fuel cells, laser research.
Magnesium	Clean technologies and advanced manufacturing	Aluminum alloys	Aluminum alloys (airplane and automobile components), iron manufacturing, flares and fireworks, lightweight consumer goods (laptops, cameras, power tools), fertilizer, animal feed, pharmaceuticals

Tellurium	Clean technologies	Solar power, thermoelectric devices	Metal alloys (copper and steel), solar cells, semiconductors, CDs/DVDs, vulcanized rubber, chemical catalysts in oil refining.
Zinc	Clean technologies and advanced manufacturing	Galvanizing	Rust proofing, manufacturing of automobiles, paints, rubber, cosmetics, pharmaceuticals, plastics, inks, soaps, batteries, textiles, electronics, baby creams, sunscreen
Niobium	Clean technologies and advanced manufacturing	Construction, transportation	Metal alloys (steel), jet engines, rockets, construction beams, building girders, oil rigs and pipelines, superconducting magnets, MRI scanners, NMR equipment, eyeglasses.
Germanium	Information and communications, clean technologies, and advanced manufacturing	Optical fibres, satellites, solar cells	Fibre-optic communication networks, camera and microscope lenses, infrared night vision systems, polymerization catalysts.

**Appendix II** After Roger Fitzgerald P. Geo.

<b>Metals and Critical Elements</b>
Map 3 Index Key
All Plots in PPM
<b>Rare Earth Elements</b>
Lu Lutetium
Nd Niobium
Rb Rubidium
Y Yttrium
<b>Critical Metals</b>
Li Lithium
Sn Tin
W Tungsten
Mo Molybdenum
Cu Copper
Zn Zinc
<b>Other</b>
F Fluorite
Ag Silver
Bi Bismuth
Pb Lead