



## Updated Business Plan & Chief Joint Venture November 2018

### New Joint Venture

Voyageur Minerals Ltd. (“Voyageur” or “VM”) and Chief Medical Supply Ltd. (“Chief”) of Calgary, Alberta, Canada have signed a Joint Venture Agreement (“JV”) to produce barium Sulfate contrast solution for the human and veterinary pharmaceutical markets. The JV combines



the abilities of VM and Chief to forge a substantial position in this expanding business. Voyageur owns barite resources at its



Frances Creek property near the town of Radium Hot Springs, British Columbia, with the potential to produce a

secure, long term supply of pharmaceutical-grade barium sulfate (USP). As confirmed in a recent 43-101<sup>1</sup>, Frances Creek is a high-quality resource and initial indications are that it can be delivered at a lower cost than other third-party sources.

Chief has the pharma experience and a formulation and bottling facility already supplying drugs approved by Health Canada with a GMP rating. Their current bottling capacity at their Mississauga plant is 500 bottles per minute.

### Joint Venture Structure

The structure of the JV is simple. Voyageur provides barium sulfate USP from the Frances Creek property and Chief provides pharma expertise and formulation and bottling capacity at their Calgary plant. The JV markets the barium sulfate and each party receives 50% of the revenue less the regulatory, marketing and sales costs attributable to the JV. Neither of the assets (bottling plant or mine) reside in the JV.

### Business Model

The business model for the JV is fashioned on the EZ-E-M Canada development of the unique barite deposit at Brookfield in Nova Scotia<sup>2</sup>. This was a high-grade barite deposit with many similarities to Voyageur’s Frances Creek property: the barite crystals were extremely fine, the whole deposit was virtually free of heavy metals, and the deposit was on the side of a hill, so the ore was mined employing low-cost quarrying methods. Although high quality, the deposit was not large enough for conventional uses, such as the production of drilling mud. Instead EZ-E-M Canada implemented a novel but simple processing plant to produce U.S.P. grade



<sup>1</sup> Technical Report of the Voyageur Minerals Ltd. Frances Creek Barite Exploration Project Province of British Columbia, Canada. 43-101 July 2018, Authored by Henkle and Associates

<sup>2</sup> X-ray Barium Sulfate for North America, CIM Bulletin, Vol. 73, No. 820, 1980, W.J.D. STONE, President, J.D. NYE, Vice-President, and I.R. FARR, Development Manager, Magstone Development Inc., Lachine, Quebec. Patent <https://patents.google.com/patent/US4119700A/en>



pharmaceutical barium Sulfate. This high-grade product was fed directly to a contrast manufacturing facility owned by EZ-E-M, similar to the Chief plant in Calgary. Total production from the Brookfield deposit from the early 1980's to 2005 was around 125 000 t of >97.5% purity barite. The Brookfield project estimated that 2000 tonnes per year would service 15% of the USA and Canadian Markets<sup>2</sup>. The Brookfield mine allowed EZ-E-M Canada to be one of the most competitive contrast companies in the world and was acquired by Bracco Worldwide in 2008 for 240 million US\$. The mine is now depleted. Voyageur and Chief intend to repeat the EZ-E-M experience.

### Start-up Strategy

The JV plans to begin production of barium Sulfate contrast products using small orders of barium sulfate USP sourced from third parties. This strategy will quickly prove the JV's capacity to make contrast products and establish a customer base prior to investment in the mine. Preliminary quotes from overseas suppliers of barium sulfate USP indicate that the JV could generate positive cash flow during the start-up period.

During the "start-up" period Voyageur will use cash flow from the sales of contrast solution together with investment funds to carry out additional exploration work, laboratory tests and engineering work to produce the final feasibility report described in the next section. Bringing the Frances Creek property on stream replaces the third-party barium Sulfate and ensures a long term, low cost quality product for the pharmaceutical venture.

### Commercial Development

As soon as the JV has established a market for contrast solution, Voyageur intends to bring the Frances Creek property into commercial production. To facilitate this, the feasibility study is required and with the economics of the contrast business the resource will be re classified to establish sufficient *measured mineral resources*<sup>3</sup> for the detailed mine planning and the final evaluation of the economic viability of the deposit. Current exploration by Voyageur has identified *indicated mineral resources*<sup>4</sup> of 166,210 tonnes of ore with an average grade of 37.5%, resulting in approximately 62,745 tonnes of barium sulfate. To put this resource into context, it could supply the Chief bottling plant with enough barium Sulfate for 20 million bottles of contrast solution or approximately 30 years supply. With further drilling, Voyageur expects to increase both the quality and quantity of this resource base.

In addition, the final feasibility study requires additional laboratory work to confirm the design of the process plant. Based on the current analysis of the barite ore at France Creek, Voyageur expect

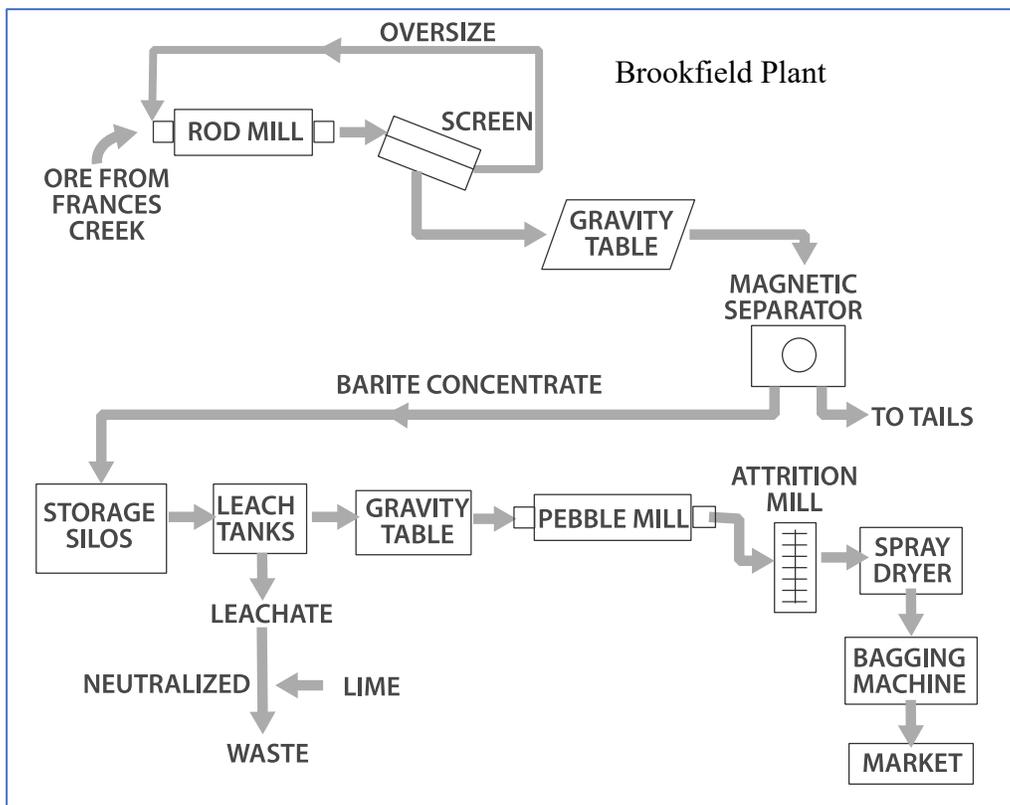
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<sup>3</sup> A *Measured Mineral Resource* is that part of a Mineral Resource for which quantity, grade or quality, densities, shape, and physical characteristics are estimated with confidence sufficient to allow the application of Modifying Factors to support **detailed** mine planning and **final** evaluation of the economic viability of the deposit.

<sup>4</sup> An *Indicated Mineral Resource* is that part of a Mineral Resource for which quantity, grade or quality, densities, shape and physical characteristics are estimated with sufficient confidence to allow the application of Modifying Factors in sufficient detail to support mine planning and evaluation of the economic viability of the deposit.

that a plant similar to the Brookfield<sup>5</sup> barite mine will process the ore to the required quality. More work is required to confirm that this process is applicable.

If this low-cost option is not suitable, Voyageur has a second option under consideration which is production of precipitated barium sulfate (commonly known as *Blanc Fixe*). This process is a higher cost option based on using the Black Ash method to manufacture 99.9% BaSO<sub>4</sub>. This method is used as a standard process throughout the world and based on other companies success in using this method of *Blanc Fixe* production, the economics look vary favorable due to using VM's high grade barite as the feed stock product for this process.

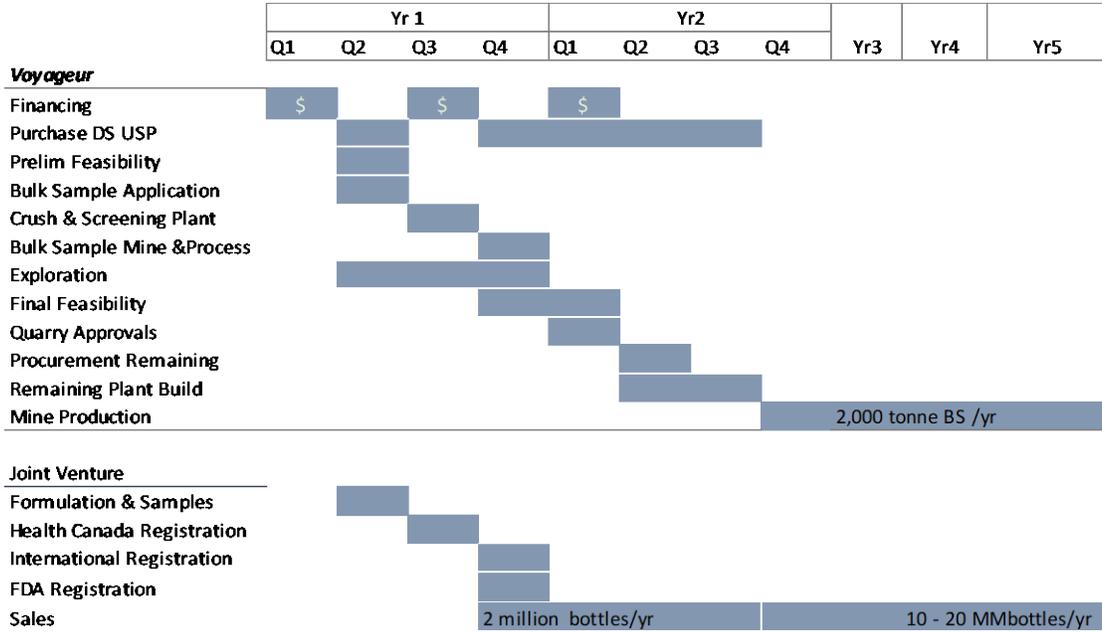


<sup>5</sup> [Brookefield Mine Nova Scotia](#)



**Preliminary Schedules**

The following schedule covers the acquisition of funds, JV start-up, exploration and engineering for the final feasibility study, procurement and construction leading to commercial operations.



**Chief Medical Bottle Line in Mississauga Ontario, 500 per minute**





Voyageur will be advancing forward with two phases of financing:

1. Phase one financing required to move forward with feasibility and the start up of the joint venture barium contrast business.
2. Phase two financing required for equipment selection, plant and mine construction. Voyageur will be exploring all options of financing looking for the most beneficial path forward to maximise shareholder value.

**Use of Funds:**

	2018	2019	
	Q4	Q1	Q2
<b>Feasibility</b>	\$ 42,373	\$375,000	\$ 600,000
<b>JV Start Up</b>	\$ 25,000	\$ 50,000	
<b>Administration</b>	\$ 40,000	\$ 40,000	\$ 50,000
<b>Bulk Sample</b>			\$ 300,000
<b>Sub total</b>	\$ 107,373	\$465,000	\$ 950,000
<b>Total</b>			\$1,522,373

**Additional Voyageur Revenues**

The JV specifically excludes the physical assets of Voyageur or Chief; its sole function is to market and distribute contrast solution. While the Frances Creek property will supply barium sulfate USP to the JV, Voyageur has the option to sell other high-quality barium sulfate products into the international market place. These products have important applications in the manufacture of powder coatings, plastics, primers, paints, porcelain enamel, paper and other chemicals. These pure barium Sulfate products command high prices in an ever-expanding market. To facilitate entry into this market Voyageur will investigate the suitability of Frances Creek for the production of precipitated barium sulfate, commonly known as “Blanc Fixe”.

**Cautionary Note Regarding Forward-Looking Statements**

*This document contains forward-looking statements relating to the, statements regarding the acquisition of future assets, the discovery and commercialization of commercial quantities of industrial minerals, the successful commercialization of the Company’s assets, expected operational activities, cost and financial projections and other statements that are not historical facts. Readers are cautioned not to place undue reliance on forward-looking statements, as there can be no assurance that the plans, intentions or expectations upon which they are based will occur. By their nature, forward-looking statements involve numerous assumptions, known and unknown risks and uncertainties, both general and specific, that contribute to the possibility that the predictions, forecasts, projections and other forward-looking statements will not occur, which may cause actual performance and results in future periods to differ materially from any estimates or projections of future performance or results expressed or implied by such forward-looking statements. These assumptions, risks and uncertainties include, among other things: the risk that the assets do not provide commercial quantities or grades of marketable minerals, that even if they do contain commercial quantities of marketable minerals that the Company will not be able to economically produce such discoveries, the existence of commercial grades of commercial minerals, timing of obtaining required approvals, state of the economy in general and capital markets in particular, investor interest in the business and future prospects of the Company.*

*The forward-looking statements contained in this document are made as of the date of this news/presentation release. Except as required by law, the Company disclaims any intention and assumes no obligation to update or revise any forward-looking statements, whether as a result of new information, future events or otherwise, except as required by applicable securities law. Additionally, the Company undertakes no obligation to comment on the expectations of, or statements made, by third parties in respect of the matters discussed above. This document and its contents may change upon conclusion of the feasibility study.*

*Cautionary note to United States Investors Regarding Estimates of Resources: This document uses the terms “Measured Resources”, “Indicated Resources”, “Measured & Indicated Resources” and “Inferred Resources”. We advise U.S. investors that while these terms are defined in and required by Canadian regulations under NI 43-101, these terms are not defined terms under United States Securities and Exchange Commission (“SEC”) Industry Guide 7 and are normally not permitted to be used in reports and registration statements filed with the SEC. Under SEC Industry Guide 7 standards, a “final” or “bankable” feasibility study is required to report reserves, the three-year historical average price is used in any reserve or cash flow analysis to designate reserves and all necessary permits and governmental authorizations must be filed with the appropriate governmental authority. Investors are cautioned not to assume that any part or all of mineral deposits in these categories will ever be converted into reserves. “Inferred mineral resources” have a great amount of uncertainty as to their existence, and great uncertainty as to their economic and legal feasibility. It cannot be assumed that all or any part of an inferred mineral resource will ever be upgraded to a higher category. Under Canadian rules, estimates of inferred mineral resources may not form the basis of feasibility or pre-feasibility studies, except in rare cases. Investors are cautioned not to assume that all or any part of an inferred mineral resource exists or is economically or legally mineable. Disclosure of “contained tonnes” in a resource is permitted disclosure under Canadian regulations; however, the SEC normally only permits issuers to report mineralization that does not constitute “reserves” by SEC Industry Guide 7 standards as in place tonnage and grade without reference to unit measures.*