Technical Report of the Voyageur Minerals Ltd.

Frances Creek Barite Exploration Project

Province of British Columbia, Canada

Prepared for: **Voyageur Minerals Ltd.**

Prepared by: **William R. Henkle, Jr., P. Geol.**
Henkle and Associates

Bradley Willis, P. Eng.
Voyageur Industrial Minerals Ltd.

July, 2018

HENKLE AND ASSOCIATES
230 Finch Way, Carson City, NV 89704
775-849-1683

July 11, 2018

CERTIFICATE OF AUTHOR

I, William R. Henkle, Jr., P. Geol., do hereby certify that:

1. I am President of Henkle and Associates, 230 Finch Way, Carson City, Nevada 89704

2. I graduated with a B.Sc. degree in Geology from the Ohio State University in 1969 and a M.Sc. degree in Geology from Northern Arizona University in 1974.

3. I am a Registered Member of the Society for Mining, Metallurgy and Exploration (# 1405850), and am also a member of the Association of Professional Engineers and Geoscientists of British Columbia, Canada.

4. I have worked as a geologist for 44 years since my graduation from university and have experience as a mining consultant throughout the United States, western Canada, the Andean region of Latin America and parts of Asia.

5. I have read the definition of "qualified person" set out in National Instrument 43-101 ("NI 43-101") and certify that, by reason of my education, affiliation with a professional association (as defined by NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.

A brief summary of my relevant experience with respect to being qualified to author this report is as follows:

- + 40 years experience as a geologist working in all levels of the economic geology profession (entry level exploration geologist to exploration manager - also mine geologist + M&A evaluations)
- Experience on three continents with multiple types of mineral deposits (Coal - Precious Metals - Base Metals - Uranium - Industrial Minerals)
- Barite specific experience includes work in the following provinces:

  Great Basin, USA - Miller Mine, Nevada - Project Manager for 120 hole evaluation drilling program @ resource estimation conducted in 2013, + $ 1M project

  Canadian Rockies - Frances Creek, Jubilee Mountain and Pedley Mountain projects - as explained in text

- Formal Resource / Reserve estimation experience includes the following commodities:

  Coal - numerous properties - USA - 1970 - 1980
  Precious Metals - 4 properties - USA, Canada, Peru - 1985 - 2010
  Base Metals - 3 properties / 5 estimates - Peru - 2007 - 2011
  Indust. Mins. - 2 properties (Limestone & Barite [Leapfrog 3D model] - US -1995 & 2014
  Uranium - 2 properties / 3 estimates - Peru (Macusani) & USA (Marysvale) - 2010 - 2014

6. I am the senior author and am responsible for the preparation of the technical report titled **" Technical Report of the Voyageur Industrial Minerals Ltd. Frances Creek Barite Exploration Project, Province of British Columbia, Canada".** Consequently, since I am the senior author of the report, I am thus responsible for all items in the report. I visited the Voyageur properties in August, 2014, for a total of seven days, and for four days in August of 2017. have not returned since that time. The time was spent reviewing property geology, mine data and examining and sampling drill core.

7. I have not had prior involvement with the companies that are the subject of the Technical Report and neither own nor control a beneficial interest in the mineral properties that are the subject of this report nor any adjacent or nearby properties.

8. I am independent of the issuer applying all the tests in section 1.5 of NI 43-101; since I have no financial interest in Voyageur Industrial Minerals Ltd. nor do I have an interest in the properties that are the subject of this report

9. I am not aware of any material fact or material change with respect to the subject matter of the Technical Report, the omission to disclose which makes the Technical Report misleading.

10. I have read NI 43-101 and Form 43-101F and the Technical Report has been prepared in compliance with that instrument and form.

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 on their websites accessible by the public, of the Technical Report.

Dated this 11th day of July, 2018

William R. Henkle, Jr., P. Geol.

July 11, 2018

CERTIFICATE OF AUTHOR

I, Bradley C Willis P. Eng. (APEGA 179825), do hereby certify that:

1. I am Vice President of Exploration for Voyageur Industrial Minerals Ltd, Suite 255, 335 50th Ave SE, Calgary, Alberta T2G 2B3.
2. I graduated with a B.Sc. degree in Mining Engineering from the South Dakota School of Mines in 1992.
3. I am a member of the Association of Professional Engineers, Geologists and Geophysicists of Alberta, Canada.
4. I have worked in mining and exploration as an engineer for 26 years since my graduation from university and have been President of Tiger Ridge Resources Ltd from 1997-2012, and have Vice President of Exploration at Voyageur Minerals, Ltd. From 2014 to present time.
5. I have read the definition of "qualified person" set out in National Instrument 43-101 ("NI 43-101") and certify that, by reason of my education, affiliation with a professional association (as defined by NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.

A brief summary of my relevant experience with respect to being qualified to assist the author of this report is as follows:

- 26 years experience as an engineer working in all levels of the mining industry from grass roots exploration projects to managing and designing underground mine operations.
- International experience in Latin America and Asia with barite mining and exploration for heavy mineral sands, titanium, bauxite and gold.
- Barite specific experience includes work in the following provinces:

British Columbia – President and Exploration manager for Tiger Ridge Resources Ltd overseeing the exploration and development of the Jubilee Mountain Barite, Frances Creek Barite and Pedley Mountain Barite properties. The exploration work ranged from prospecting, geophysics, over 12,000 meters of core drilling and mine manager for the Jubilee barite mine operations. The properties above are the focus of this 43101 Report and I bring 9 years of onsite experience on these properties exclusively from 1997-2005.

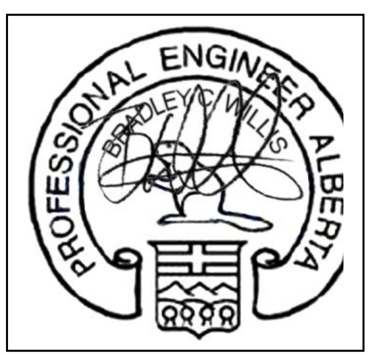
Mexico – La Revancha Mine, Vice President and Operations Manager for Blackfire Exploration Ltd. Brought the barite mine into production from small outcrop to 7000 tonne per month barite producing mine.

6. I assisted the senior author on various technical aspects for this technical report.

7. I have had extensive prior involvement with the companies that are the subject of the Technical Report and I am a majority owner in all three properties. I have worked on the Jubilee Mountain barite property from 1997-2005 and at various times up until present day. I have spent a total of 10 months of working days on the Frances Creek barite property and 3 months working days on the Pedley Mountain property.

Signed and sealed this 11th day of July, 2018

Bradley C Willis, P. Eng.



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1.0 Summary

The Voyageur Minerals, Ltd. Frances Creek barite project area, composed of three mining claims covering 838.6369 Ha, is located in the country of Canada, in the Province of British Columbia, as shown on **Figure 4.1**. The property is located 41 km North West of the town of Radium Hot Springs, B.C. Radium Hot Springs is located 144 km (airline) SW of Calgary, AB. and 530 km (airline) NE of Vancouver, B.C.

The Frances Creek Project Area is comprised of three mineral claims; the Frances Creek, Frances Creek2 and Frances Creek South claims. The claims are all joined together and comprise 838.6369 Ha in size, as shown on **Figure 4.2.** Individual areas of each property and the center points of the claim blocks using UTM coordinates: UTM Zone 11 – 540855E 5620317N

A listing of the individual claims is shown in **Table 4.1**. All registration fees for the claims are current.

Voyageur "went public" as a junior mining explorer focusing on industrial minerals projects, on the TSXV exchange in 4Q – 2016 (TSX-V:VM). Voyageur owns the claims, having acquired them from the former operator, Tiger Ridge Resources Ltd. (Tiger Ridge), a private company. Two of the principals of Voyageur are also principals of Tiger Ridge.

Tiger Ridge has retained a 3.5% net royalty on the milled barite sales price (includes a buy out clause), and a 3.5% net smelter return on any base or precious metals produced. In addition to the Tiger Ridge Royalty, the claims are also burdened by a previously existing royalty to the Estate of Arthur Louie of CD$ 2.00/tonne on finished barite and CD$ 2.00/tonne on metals concentrate production.

Mining claims in B.C. have no royalty to the government on production, nor are there any special mining taxes which must be paid.

Tiger Ridge explored the Frances Creek Property between 1998 and 2005. Consequently, the 2003 and 2005 series of drill hole data, as well as some of the baseline geologic data used in this report originated with Tiger Ridge during those years. The 2017 series of drill hole data was acquired during Q2 – Q3 of 2017 as the result of a 25 hole drill program financed and executed by Voyageur. During the summer of 2017 a NQ core drilling program was completed for a total of 25 holes and 1,231m by Voyageur Minerals Ltd. ('Voyageur')

Henkle and Associates was contracted to prepare two previous (February, 2015 and December 2016) National Instrument 43 – 101 compliant reports on all three of Voyageur's Properties, (which included Frances Creek). William R Henkle, Jr., P. Geol., is the Senior Author and Lead QP for the report. In mid – August, 2014, Mr. Henkle visited all three of the properties, accompanied by Mr. Bradley Willis P.Eng., the Junior Author. Both authors also visited Voyageur's core storage facility in Windemere, B.C. and spent four days examining and sampling cores from the 2003 - 2005 drilling programs at the Frances Creek and Jubilee Mountain Properties. The sampled core was sent for assay at an independent lab in Calgary.

At Voyageur's Calgary office, and at Henkle and Associates office in the US, Mr. Henkle reviewed the entire data package of the property. This included:

- Regional and property scale geologic maps
- Numerous Geochemical analyses from Frances Creek
- Geophysical survey results - Frances Creek Property
- Geologic report review – Frances Creek Property

On the basis of the work described above, Henkle and Associates concludes that Voyageur's Frances Creek Property is an advanced stage exploration project and a property of merit. A work program is proposed for the 2018 - 19 exploration season.

Since 2014, oil prices have declined significantly from ~ US $ 120/bbl to ~ US$ 43.50/bbl in mid-August, 2016. This has resulted in a decrease in the number of rigs drilling for oil and gas in Canada and the US and consequently, a decrease in the demand for drilling grade barite in Alberta. In the 2014 report, Voyageur contemplated exploring for and operating all three of their properties to produce drilling grade barite for the oil industry in the Western Canadian Basin.

The lab testing program undertaken for the 2014 Technical Report showed that the barite occurrences at the Frances Creek property were very high density and low in contaminants. The barite fraction of the breccia vein was nearly pure barite; very likely industrial grade. Industrial Grade barite (pharmaceutical grade, chemical grade and paint grade) has a much smaller market than drilling grade barite, but it also commands a significantly higher price. The October 2017 price for pharmaceutical barite FOB Qingdoa China is ~ US$ 2,800/tonne for large orders (CAD$3,700/tonne) and $7,700/tonne for small order (CAD$10,200/tonne) , (PC - B. Willis, 2018, direct quotes from supplier).

The current market for industrial grade barite in the US is ~ 400,000 tonnes - mostly sourced from China. Reportedly, there are quality problems with much of the imported barite, and most US and Canadian end users would be amenable to purchasing a high quality product from a North American mine (PC - B. Willis, 2018).

Because of the discovery that the Frances Creek barites are extremely pure, Voyageur is moving forward as pharmaceutical barite producer. In conjunction with the close of the 2017 drilling campaign, Henkle and Associates was again contracted to prepare this technical resource report. This report is focusing on the Frances Creek property, and includes a resource estimate, as well as a proposal for further work at the property.

For this report, the senior author has reviewed assay reports from 57 drill holes and several outcrop samples from the property as well as specifications for industrial grade barite. Based on that review, the senior author is of the opinion that barite produced in the future from the Frances Creek property would probably meet industrial grade specifications.

The estimates of potential quantity and grade for Voyageur's Frances Creek Property are the sole responsibility of the Senior Author; William R. Henkle, Jr. Details as to the basis on which these projections were made can be found in **Section 14**. A summation of the resource estimate can be found in Table 1.1, below.

The in – place resource estimate for the Frances Creek Barite Project follows:

INDICATED		MILL TONNES	BARITE TONNES
	A - ZONE	36,567.40	13,215.20
	B - ZONE	129,642.80	49,529.80
	A + B	**166,210.20**	**62,745.00**
	%BaSO4	**37.75**	

INFERRED		MILL TONNES	BARITE TONNES
	A - ZONE	42,872.60	14,159.40
	B - ZONE	152,705.50	55,070.40
	A + B	**195,578.10**	**69,229.80**
	%BaSO4	**35.40**	

TABLE 1.1 In-Place Resource Estimate – Frances Creek Barite Prospect

A 2 Phase work plan and cost estimate was prepared as part of this report, in order to move the Frances Creek Prospect towards production. Details of the work plan/cost estimate are discussed in Section 26. A synopsis of the work plan / budget proposed for the next phase of the project follows:

PROPOSED WORK – PHASE 1	ESTIMATED COST
Continued Exploration	
Gravity survey and LIDAR	$ 50,000
Expand Soils Geochem Sampling Grid	$ 25,000
Geological Mapping	$ 10,000
Additional Drilling	$ 350,000
Subtotal	**$ 435,000**
Bulk Sampling and Pre-Feasibility Study	
30 Tonne Processed Barite Sample	$ 80,000
10,000 Tonne Bulk Sample	$ 400,000
Metallurgical Testing	$ 100,000
Pre-Feasibility Study and Lab Work	$ 500,000
Subtotal	**$ 1,080,000**
Total - PHASE 1 – Exploration and Pre-Feasibility	**$ 1,515,000**

TABLE 1.2a PHASE 1 – Work Plan and Budget

PROPOSED WORK – PHASE 2	ESTIMATED COST
Product Development - Pharmaceutical	
Barium Contrast Formulation	$ 50,000
FDA and Health Canada	$1,500,000
Product Marketing	$ 75,000
Total – PHASE 2 – Product Development	**$ 1,625,000**

TABLE 1.2b PHASE 2 – Work Plan and Budget

Both Phase 1 and Phase 2 are proposed by the authors for the next stage of the project. Both authors acknowledge that the project is an advanced exploration stage project. However, both authors believe strongly, that it is appropriate to move the project into the pre – feasibility and product development stage once funding is accomplished. **The total monies required for Phases 1 and 2 is CD $ 3,140,000.**

2.0 Introduction and Terms of Reference

2.1 Purpose of the Report

This report was prepared for Voyageur Minerals, Ltd. (Voyageur), a Publicly listed exploration company on the TSX ventrure exchange. In 2017, Voyageur commenced a diamond core NQ drilling program on the Frances Creek Property to explore the known barite along the B zone and A zone. The purpose of the drilling was to delineate a resource of barite near surface. Operations began in late June and ended in mid October of 2017. A total of 1229.8 m of core drilling was completed. The main focus of drilling was on the high grade barite zone named the B zone located between elev. 1480 m and 1600 m at the property.

During drilling, all of the core was logged onsite by Brad Willis P.Eng and Katelynne Brown consulting geologist. The senior author of the report , William R. Henkle, P. Geol.,visited the Frances Creek project site approximately ½ way through the 2017 drilling program. During the visit, the senior author reviewed mapping, drilling and sampling protocols and also re-logged two drill holes. The senior author concluded that the project was being competently run and that drilling and sampling protocols meet CIM standards for exploration projects.

This report presents the results of VM's efforts, and is intended to fulfill the Standards of Disclosure for Mineral Projects according to Canadian National Instrument 43-101 ("NI 43-101"). This report was prepared in accordance with the requirements and guidelines set forth in Companion Policy 43-101CP and Form 43-101F1, and the mineral resources and reserves presented herein are classified according to Canadian Institute of Mining, Metallurgy and Petroleum ("CIM") Definition Standards - For Mineral Resources and Mineral Reserves, prepared by the CIM Standing Committee on Reserve Definitions and adopted by CIM Council on May 10, 2014. The mineral resource estimates reported here are based on all available technical data and information as of March 31, 2018.

The senior author of this report is William R. Henkle. Jr., P. Geol. (BC # 130112). Mr. Henkle is the President/Chief Geologist of Henkle and Associates, Inc., an independent geologic consulting firm. Mr. Henkle is an Independent Qualified Person as defined in Section 1.5 of National Instrument 43 - 101.

The co-author is Mr. Bradley Willis, P. Eng. (Alberta # 179825), Voyageur's Vice President of Exploration and Project Manager. Mr. Willis, was the project geologist and supervised all operations on site. Mr. Willis is a Qualified Person as defined in Section 1.5 of National Instrument 43 - 101, but he is not independent of the securities issuer.

2.2 Terminology

All technical terms of reference such as "resources", "reserves" or "mineralization", used in this report conform to standards of practice published by the Canadian Institute of Mining and Metallurgy. All geological terms used are in standard use within the geological consulting profession in Canada and the US.

It is emphasized that there is sufficient information upon which to determine a mineral resource but insufficient information upon which to determine reserves for this property and nothing in this report should be construed to suggest or imply otherwise. Unless otherwise stated all units are metric, and all coordinates are either expressed as degrees of Latitude and Longitude or as Universal Transverse

Mercator (UTM) with a NAD 83 base. Also, all monetary figures are in Canadian Dollars, unless otherwise stated.

2.3 Sources of Information

The results shown in this report are based on numerous sources of data provided both by Voyageur Minerals Ltd, and its predecessor in title to the claims, Tiger Ridge. These include the logs and accompanying assay reports of 22 core holes drilled from 2003 and 2005 at the Frances Creek property, as well as assay results of production run samples taken at Tiger Ridge's mill between 1999 and 2003. This data was acquired between 1998 and 2005, by Tiger Ridge, the previous operator of the projects. The assay work for the 2003 and 2005 Frances Creek core holes however, was undertaken in August and September, 2014, as part of the baseline work for an earlier Technical Report. The assay work for this report was conducted at the same lab as for the earlier reports. The analyses were conducted at Loring Laboratories in Calgary, AB., an ISO 9001 certified laboratory.

Other archival data which originated with Tiger Ridge includes geologic and engineering maps, numerous rock and soils geochemical assays, etc. which cover the Project Area. **Section 27.0, References**, lists the data sources used in this report some of which were generated by either Voyageur or its predecessor in title, Tiger Ridge Resources.

2.4 Extent of Field and Office Involvement

Mr. Henkle, accompanied by Mr. Willis, visited the, project from August 22 to August 25, 2017, Mr. Henkle and Mr. Willis jointly examined the drill core from 18 newly drilled core holes at Frances Creek. Mr. Henkle observed both the mineralized trends and the geology at the property. In addition, he also collected several hand samples of the barite mineralization at the property.

A total of 102 individual samples were collected from cores, surface trenching and grab samples. where they penetrated barite mineralization. The samples were transported to Loring Labs, in Calgary, Alberta by Mr. Willis for assaying and Specific Gravity determination. The results of the drill core sampling will be discussed in more detail in **Sections 10.0, 11.0 and 12.0** of this report.

The senior author's office involvement for this project involved approximately 12 weeks of report preparation and resource estimation between February and July of 2018.

3.0 Reliance on Other Experts

3.1 Technical Data

Henkle and Associates has prepared this report strictly in the role of an independent qualified person and our staff was not consulted as to the design of the data collection and analysis program.

Although we did not witness the entire program execution, at no time did we suspect the withholding of information. Henkle and Associates is of the opinion that the data is sufficient and reasonable for an assessment of the project at this stage of exploration. None of the information provided has been specified as being confidential and not to be disclosed in this report.

This report is based on the information provided by Voyageur, both verbal and documented, and on the writer's personal evaluation at Voyageur's project site and at the core storage facility in the field and on Henkle and Associate's knowledge of the mining exploration and development industry. The senior author has relied on and assumed the accuracy and fair representation of all technical information provided by Voyageur including geological notes, surface maps, geophysical data etc. Data of note will be listed in **Section 27.0** of the report – References.

Based on what has been observed of the 2017 drilling and analytical records and the attendant 2014 analytical work, Henkle and Associates is satisfied that the exploration programs conducted at the Frances Creek Property of Voyageur followed CIMM best practices for the exploration and evaluation of mineral occurrences.

3.2 Ownership, Permitting and Marketing Data

Based on the fact that significant drilling programs took place as recently as Q2 – Q3, 2017 and that the permits are both still active and have been expanded at the Frances Creek property, Henkle and Associates believes there are no significant environmental liabilities attached to the Frances Creek Property. However, Henkle and Associates has not contacted British Columbia mine permitting authorities to determine if there are any known environmental liabilities associated with the properties; we take Mr. Willis at his word with respect to these issues.

Henkle and Associates is aware (from review of on line BC governmental data), that Voyageur owns the mining claims in good standing and assumes that Voyageur has obtained an independent, legal opinion as to the prior ownership of the concessions and their registration with the appropriate governmental authorities.

Henkle and Associates has conducted no due diligence with regards to certain marketing and pricing data presented in later sections of this report. This data was provided to us by Voyageur. We take Mr. Willis and the staff of Voyageur at their word with respect to these issues.

Both Brad Willis (VP-Exploration and Mining - Voyageur) and Brent Willis (COO and Director - Voyageur) have been involved in the mining and marketing of barite for more than 25 years, so it is reasonable to assume that they are qualified to speak to these matters.

4.0 Property Description and Location

4.1 Description and Location

The Voyageur Minerals Frances Creek Barite Property is composed of three contiguous mineral claims. The claims are located in the country of Canada, in the Canadian Rocky Mountains. The property area is located in the SE portion of the province of British Columbia, near the town of Radium Hot Springs. The company also owns two additional barite properties, as can be seen on the map. (**FIGURE 4.2)**.

FIGURE 4.1 Location - Voyageur's Properties

The property is 838.63 hectares (composite) in size, as shown on **Figure 4-2.**

Using degrees of Latitude and Longitude, the centre of the claim block which comprises the property is located at: Frances Creek 50°44' 20" N 116°25' 26" W

All registration fees for the claims are current.

Title Number	Claim Name	Owner	Issue Date	Good To Date	Status	Area (ha)
571267	FRANCES CREEK	278693 (100%)	2007/DEC/04	2027/NOV/15	GOOD	388.5473
1054177	FRANCES CREEK SOUTH	278693 (100%)	2017/AUG/21	2028/AUG/21	GOOD	286.4331
1031568	FRANCES CREEK2	278693 (100%)	2014/OCT/14	2027/NOV/15	GOOD	163.6565

Table 4.1 Frances Creek Claims

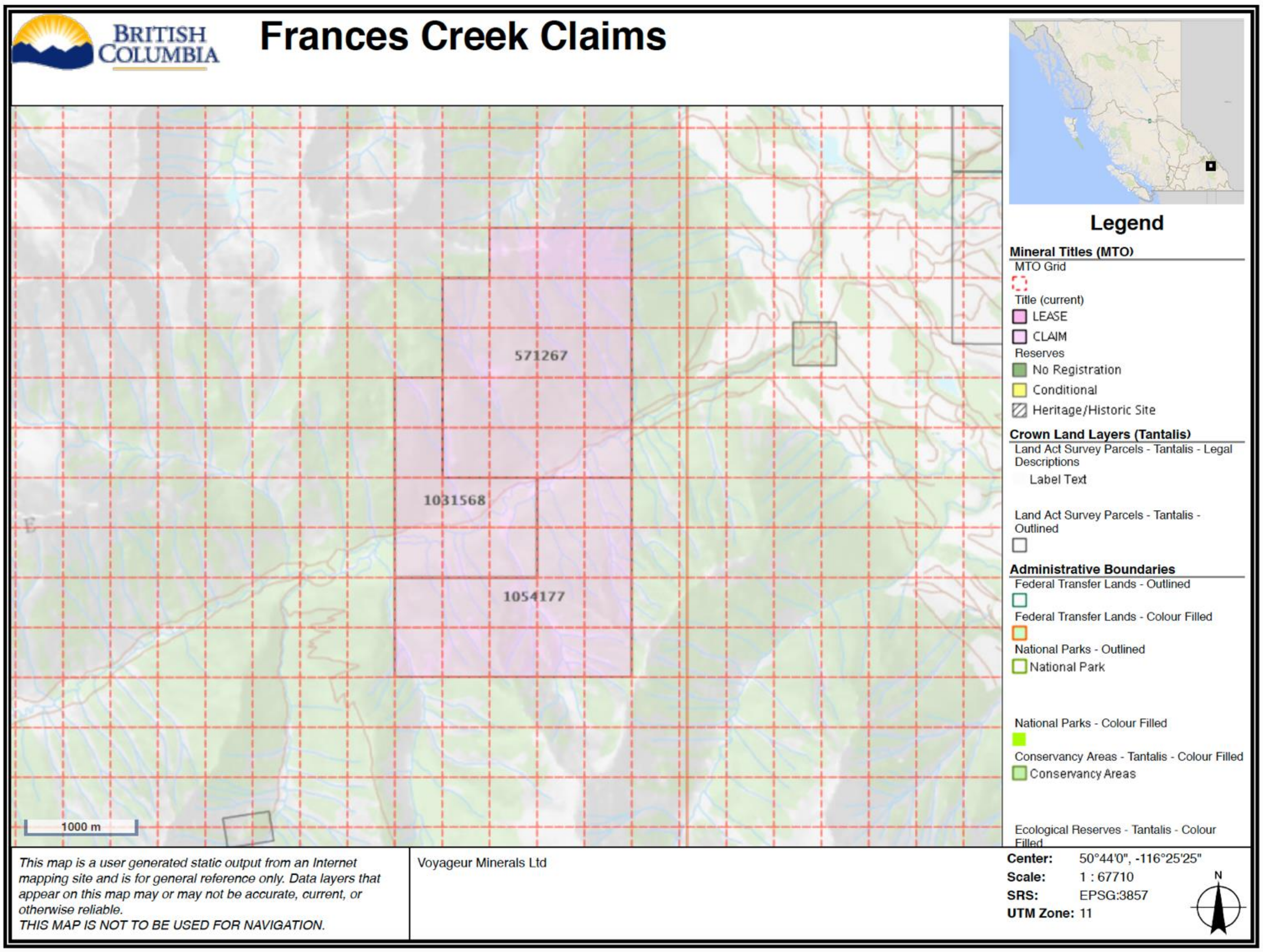


FIGURE 4.2 Frances Creek Claims

Claims are granted on a discovery priority basis, on government owned land, by the B.C. Ministry of Energy and Mines, for exploration, exploitation, beneficiation, auxiliary services and transportation. A mining claim grants its holder the right to explore and exploit minerals within its area and the key characteristics include:

- • Claims are exclusive, freely transferable and mortgage able
- • Location is based on a UTM grid system of min 21 ha to max of 21000 ha.
- • Granted on a first-come, first-served basis
- • Indefinite term but with restrictions with respect to annual payments or assessment work requirements to maintain title to the claim

Section 8 of the B.C. *Mineral Tenure Act Regulation* describes registering exploration and development for a claim. The value of exploration and development required to maintain a ***mineral claim*** for one year is $5.00 per hectare during each of the first and second anniversary years, $10.00 per hectare for each of the third and fourth anniversary years, $15.00 per hectare for each of the fifth and sixth anniversary years and $20.00 per hectare for subsequent anniversary years. Payment Instead of Exploration and Development; the cost is double the work requirement, $40.00 per hectare. For **mineral** it is also double the work requirement, $10.00 per hectare for anniversary years 1 and 2, $20.00 per hectare for anniversary years 3 and 4, $30.00 per hectare for anniversary years 5 and 6; and $40.00 per hectare for subsequent anniversary years.

Henkle and Associates has restricted our review of the Mineral Rights held by Voyageur to checking the individual license boundaries on plans to those depicted on the Mining Claims. No legal review of the validity of the process Voyager. went through to obtain the Mining Claims has been undertaken.

4.2 Ownership and Burdens

The claims listed above which make up the three property areas are 100% owned by Voyageur. Title to the claims was transferred from Tiger Ridge to Voyageur on September 16, 2013. It should be noted here, that Bradley Willis, junior author of this report is a substantial shareholder in both Tiger Ridge and Voyageur.

Tiger Ridge has retained a 3.5% net royalty on the milled barite sales price, and a 3.5% net smelter return on any base or precious metals produced from the properties. In addition to the Tiger Ridge Royalty, the claims are also burdened by a previously existing royalty to the Estate of Arthur Louie of CD$ 2.00/tonne on finished barite and CD$ 2.00/tonne on metals concentrate production.

Mining claims in B.C. have no royalty to the government on production, nor are there any special mining taxes which must be paid.

4.3 Permits and Environmental Considerations

At the time of this writing (March, 2018), exploration and mining permits are in place on the Frances Creek Permit details are:

Permit MX-5-519 Mine# 1630108

The permit is currently in year one of a 5 year Multi Year Area - Based Permit

4.3.1 Multi-Year Area-Based Permitting

The Mines Act (section 10(3)) provides the Chief Inspector of Mines (and delegated inspectors) with the authority to set the length of term for permits issued under section 10.

Multi-year area-based (MYAB) permitting is the practice of authorizing exploration activities, typically for up to five years within identified activity area(s) underlain by the mineral or coal tenure area of the project. Proponents have the flexibility to execute exploration programs over the entire area and through the life cycle of the authorization as field results and market conditions dictate.

Inspectors authorize annual activities on the site by reviewing and accepting a MYAB Work Program Annual Update that outlines planned activities for the coming year and an Annual Summary of Exploration Activities (ASEA) that outlines the activities conducted over the previous year.

The use of MYAB permitting remains at the discretion of the inspector based on the nature of the proposed work, including the geographic or geologic conditions of the work area, the inspectors experience with the proponent and wildlife or other values on the land base. Applicants should work closely with inspectors to determine whether MYAB permitting makes sense for their specific situation.

Initial permitting for the property is in the form of a 5 year multi year permit, which allows for all exploration work. A bulk sample of up to 10,000 tonnes production can be applied for additionally as well as an exploration drift. These are additional applications that fall under the MYAB permit. Since the conceptual production rate for the project is in the 2000 to 3000 tonnes per month range, this will allow for to 2-3 years production. Upon completion of the bulk sample a full mining permit will be applied for. These take approximately one year each to obtain and require a second permitting campaign. **Figure 4.3** is a map of the MYAB permit area at the property.

At the present time, the report authors are not aware of any environmental liabilities at either of the properties that may either preclude or slow down the permitting process.

4.4 Other Significant Factors and Risks

To the best of the authors' knowledge, there are no other significant factors and risks that may affect access, title, or the right or ability to perform work on the property.

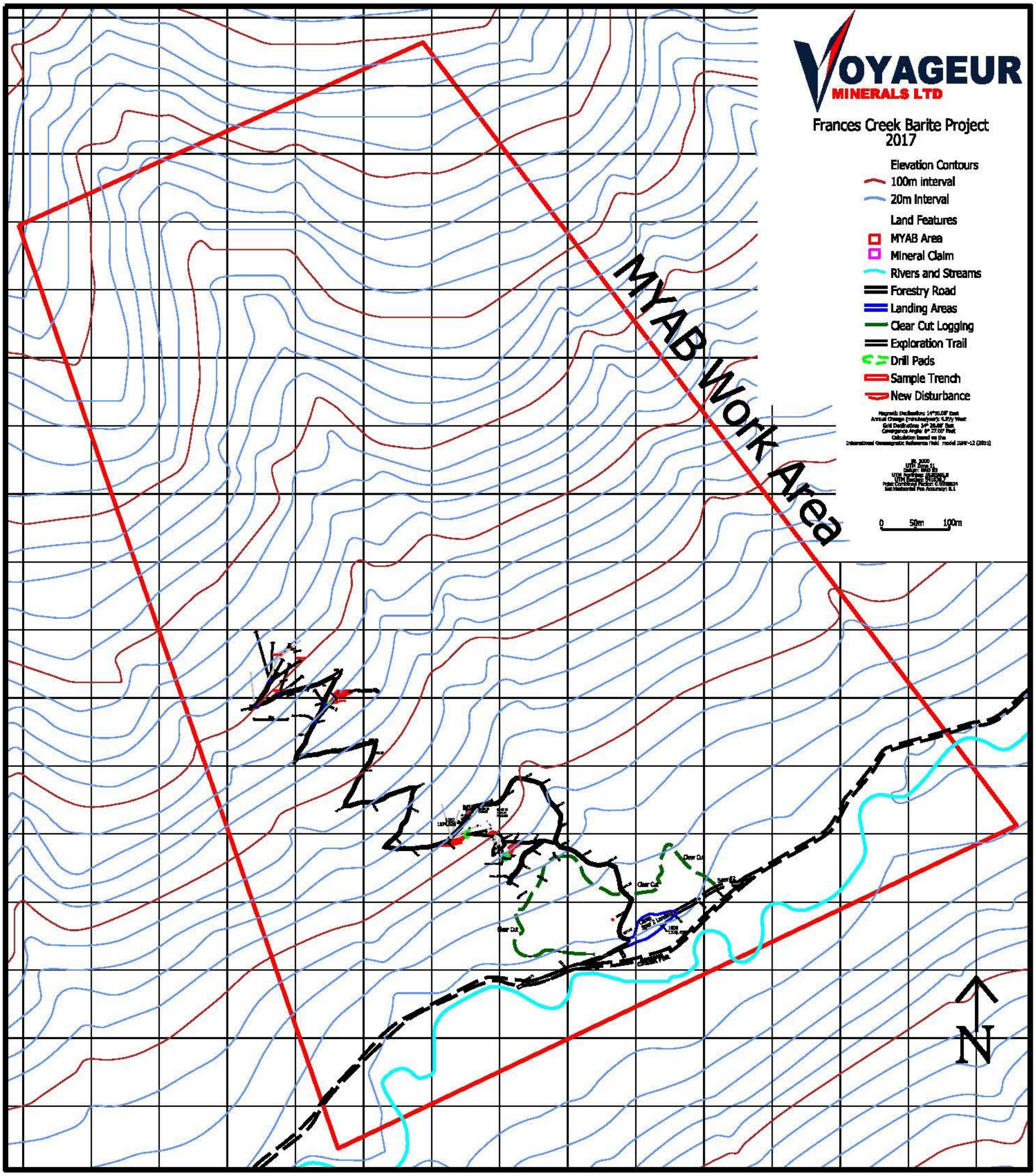


Figure 4.3 MYAB Permit Area – Frances Creek Property

5.0 Accessibility, Climate, Local Resources, Infrastructure and Physiography

5.1 Accessibility

Voyageur's Frances Creek barite property is located in the Columbia Mountains physiographic province of British Columbia. The property is located within a 50 km radius of the town of Radium Hot Springs, B.C. Radium Hot Springs is located 144 km (airline) SW of Calgary, AB. and 530 km (airline) NE of Vancouver, B.C. (**Figure 4.1**).

Access from Calgary to Radium Hot Springs is 151 km westward on the Trans-Canada Highway to Hwy 93 turnoff, then southwards on Hwy 93 for 94 km to Radium Hot Springs. The entire distance is on paved all weather highways; accessible by 2 wheel drive vehicles except during winter storm conditions.

Elevations in the region surrounding the properties range from ~ 800 m at Radium Hot Springs, to + 3900 m, on the mountain tops. Elevations at the properties range from ~ 1270 m to ~ 2400 m. The FC barite deposit is easily accessed from the Frances creek logging road. The deposit is within 100m of the road and has ample area to set up mining and processing equipment. This road connects with the west side road and ore can be easily transported from the site

Table 5.1 shows access information to the property in tabular format

5.1.1 Frances Creek Property - Access

Access to the Frances Creek property from Radium Hot Springs is via unpaved logging roads. First, travel 9 km west on the "Horsethief Creek Road"; then 25 km north-northwest on the "Westside Road"; then, turn west-southwest for 1.8 km on the "Lead Queen - Frances Road"; then turn west on the Frances Creek Forestry road and travel 6 km to the site (travel time ~ 45 min.). To this point, the roads, which are traveled regularly by logging trucks, can be navigated by a 2-wheel drive vehicle during non-snow/non-mud conditions (4-wheel drive is recommended however).

The outcrop zone of the Frances Creek barite deposit is found from elevation 1332 m to 1600 m along an erosional spur which is located on the SE face of Horeb Mountain. Access to the outcrop zone is via a steep switchback road constructed by a backhoe. This road was upgraded in Q-2, 2017 to allow access for a drill rig. The road is now accessible either by a 4X4 pickup truck or preferably, by a quad off terrain vehicle.

With respect to future underground mining operations, the lower elevations of this property can be accessed year round when logging is operational. However, snow clearance would be required in the winter months when there is no logging activity. The upper elevations of the property will probably be inaccessible from November through mid - May.

Property	From	To	Dist.	Direction	Via	Time	Elev. m
Frances Creek	Radium HS	Lead Queen Rd	34 km	NW	gravel	25 min	800 - 1050
	LQ & Fr Ck Road	Fr Ck Access Rd	7.8 km	WSW	gravel	20 min	1050 - 1300

TABLE 5.1 Physical Access Details

5.2 Climate

Climatologists assign a continental climate (inland) to the Southern Canadian Cordillera, in which Voyageur's Frances Creek Property, (the Project Area) is located. The climate in the Project Area is classified under the Koppen climate classification system as "Dfc" or a "cold, snowy forest climate with no distinct dry season and short, cool summers" (Gadd, 2009).

Elevations within the Project Area range from ~ 900 m at Radium Hot Springs to + 1600 m. This is a mountainous region, so weather conditions are altitude dependent. Higher elevations experience cooler temperatures and more rain and snow, than do lower elevations.

Continental climates are marked by a wide range of temperature variation over the year, 36° to 40° C variation between summer highs and winter lows are normal. Data from Environment Canada show that Radium HS (elevation 899 m) receives 424 mm precipitation yearly with 111 cm as snow; while Wapata Lake (elevation 1646 m) receives 884 mm precipitation yearly with 479 cm as snow (Gadd, 2009). Snow accumulations of 3 - 6 m in the higher portions of the three properties should be expected.

Snow season is normally from early November to early May. Voyageur's properties will be seasonal operations for exploration. If sufficient resources are delineated at the Frances Creek property to warrant opening an underground mine; the mine will run all year.

5.3 Local Resources

The project area is located in a timber harvesting area; a large lumber mill is located at Radium H S. An operating open pit magnesite mine is also located nearby. This means that ancillary services such as fuel stations, machine shops, tire shops, contract truck haulers, etc. are available. Excessive amounts of parts, tires, etc. will not have to be stocked at the mine warehouse; thus, inventory costs for these necessities will be reasonable. There is also a supply of semi-skilled labour available; the labourers already know how to operate many pieces of heavy equipment; staff training will be minimized.

5.4 Infrastructure

Over many years, the timber industry has constructed an existing network of well maintained haul roads in the Project Area. Access roads to the property are already constructed, but they will require some delayed maintenance attention prior to initiation of drilling or mining activity. A large logging landing was recently constructed at the lower entrance to the property. This provides a sizeable flat area suitable for mine and mill buildings (as yet unconstructed). This landing area was constructed by the timber company – it’s presence will result in a modest reduction in the capex for the project.

Haulage on mine owned/maintained roads will vary from approximately 1/2 km, and then logging roads and paved highways will be used for haulage. The nearest barite mill is located in Lethbridge, AB, some 225 airline km SE of the Project Area.

Due to the large amounts of snow received each year, the Project Area has abundant water resources which can support either drilling or mine development. Several large perennial streams drain the near vicinity of each of the three properties. In the lower elevations of each of the three properties, there is ample room available to construct mine site facilities such as tailings ponds, jig plants, etc. should an economic mineral occurrence be delineated by future drilling operations.

If sufficient resources are delineated at the Frances Creek property by the proposed exploration program (see **Section 14**), to warrant opening a mine, the mine will run all year, although snow clearance will be a significant cost.

5.5 Physiography

The Project Area is located in the central region of the Western Cordillera physiographic province of North America. The Sub province in which the property is situated is the Purcell Range of the Columbia Mountains. The topography of the property can be characterized as steep, rugged, forest covered mountains, drained by a small intermittent stream.

Frances Creek to which the property drains is part of the Columbia River drainage basin. The Columbia eventually drains south into the US, and empties into the Pacific Ocean at Astoria, Oregon.

6.0 History

Barite has been produced in British Columbia since 1940. Prospectors and geologists have been searching for barite in British Columbia since at least the mid 1930's. This persistent prospecting activity has resulted in the discovery of numerous barite occurrences. By 1997, the BC Geological Survey had located and described 188 barite deposits of various size and types throughout the province (Butrenchuk and Hancock, 1997).

6.1 Recent Ownership and Operational History

Most of the barite occurrences/deposits in the province are associated with base metals occurrences, where the barite mineralization (typically 15% - 65% by volume) occurs with the base metals mineralization in the same vein or bed. After WW II, intense oil and gas drilling in the Western Canadian Sedimentary Basin began. Prior to the war, barite was considered a gangue (waste) mineral that was associated with the base metal ores. After the war, barite production as a byproduct and often as a primary product started on a small to medium scale from several base metals mining properties. The American Petroleum Institute (API) created guidelines and specifications for barite in the 1980's. As a result of these new industry standards, barite could have only 1 ppm mercury (Hg) and only 3 ppm cadmium (Cd) associated with it. This new specification eliminated the majority of vein barite properties in North America.

6.1.1 Frances Creek Property

The Frances Creek Barite Property was a virgin discovery, discovered by prospector Arthur Louie in 1989. No previous base metals or barite occurrences had been reported from the property. Mr. Louie optioned his claims to Mountain Minerals, Ltd. from 1990 - 1992. A small adit (now caved) was driven into the vein at the 1335 m level and minor drilling (helicopter borne) was undertaken on the upper outcrop areas of the vein. Mountain Minerals dropped the option in 1992.

During 2003 Tiger Ridge optioned the property from Mr. Louie. Tiger Ridge drilled the property in 2003 and 2005. The option was fully paid out in 2005 and the claims were then owned 100% by Tiger Ridge; the claims were converted into a single claim in 2007.

In 2012 Tiger Ridge leased the claim to Voyageur, for a future royalty (see **Section 4.2).** The claim is currently owned 100% by Voyageur. Between 2005 and 2016, the only exploration activity which occurred at the property was limited channel sampling. In Q3 of 2016, a 17 tonne trench sample was excavated in the lower elevations of the property.

In 2Q and 3Q of 2017, a 1229.8m - 25 hole drilling program took place at the property and the results of both Voyageur's outcrop sampling and both the historic and the 2017 drilling programs at the Frances Creek Property will be discussed in greater detail in **Sections 9,10, 11, 12 and 14** of this report.

6.2 Historical Resources and Reserves

There have been no formal resource or reserve estimates prepared for the Frances Creek Property, prior to this report.

6.3 Production

The Frances Creek Property has no past production history of any consequence.

7.0 Geological Setting and Mineralization

7.1 Regional Geology

As was previously mentioned (**Section 4**) Voyageur's Frances Creek barite property is located in the central region of the Western Cordillera physiographic province of North America. Specifically, in the Columbia Mountains physiographic province of British Columbia.

As can be seen in **Figure 7.1**, the Frances Creek Property is located within the Omineca Geologic Belt, of British Columbia. Each geologic belt (often synonymous with the term "Terrane") contains a separate suite of rocks with a separate geologic history than the adjacent belt. The property is located at the eastern margin of the Belt, adjacent to the boundary of the Omnica and the Foreland Belt.

The Belts are separated from each other by a physiographic feature known as the Rocky Mountain Trench. The Trench is not shown on **Figure 7.1**, but it is located at the boundary of the two belts. The Trench is tens of km in width by approximately 1500 km in length and most of its length is coincident with the boundary of the Foreland-Omineca Belts, thus it would be difficult to show in **Figure 7.1**.

Except for the Foreland Belt, the belts shown in **Figure 7.1** were scraped off the subducting Pacific Plate and affixed to the overriding North American Plate at the western edge of the North American continent, by a process known as accretion. Each belt of rocks represents a separate period of accretion, the Omineca Belt having been accreted before the Intermontane Belt, and so on. This happened from about 220 - 140 million years ago.

The Foreland Belt formed by SW to NE compressive forces (also related to plate tectonic movement); it was not accreted on to the edge of the continent. This happened from about 100 - 50 million years ago and was accompanied by large scale over thrusting of the sediments above the basement crystalline rocks. The Rocky Mountain Trench was the youngest feature to form (about 60 - 50 million years ago). Modern earthquakes located along the trench may indicate that the orogenic forces that built the trench may be somewhat still active.

The depositional age of the Foreland Belt rocks is considerably younger than the depositional age of the Omineca Belt rocks. The Foreland Belt rocks are known as the "Middle Carbonate Unit"; predominately composed of limestone, dolostone and shale. The Middle Carbonate rocks are Middle Cambrian to Permian in age (513 to 250 million years), (Gad, 2009).

The Omineca Belt Rocks of the western Project Area (Frances Creek property) are known as the "Old Clastic Unit" These rocks are predominately composed of grit stone, slate, hardened till and quartzite, with minor limestone and dolostone. The limestones and dolostones were deposited towards the top (younger portion) of the sequence. The Old Clastic rocks are Neoproterozoic to Early Cambrian in age, from 458 to 513 million years (Gad, 2009).

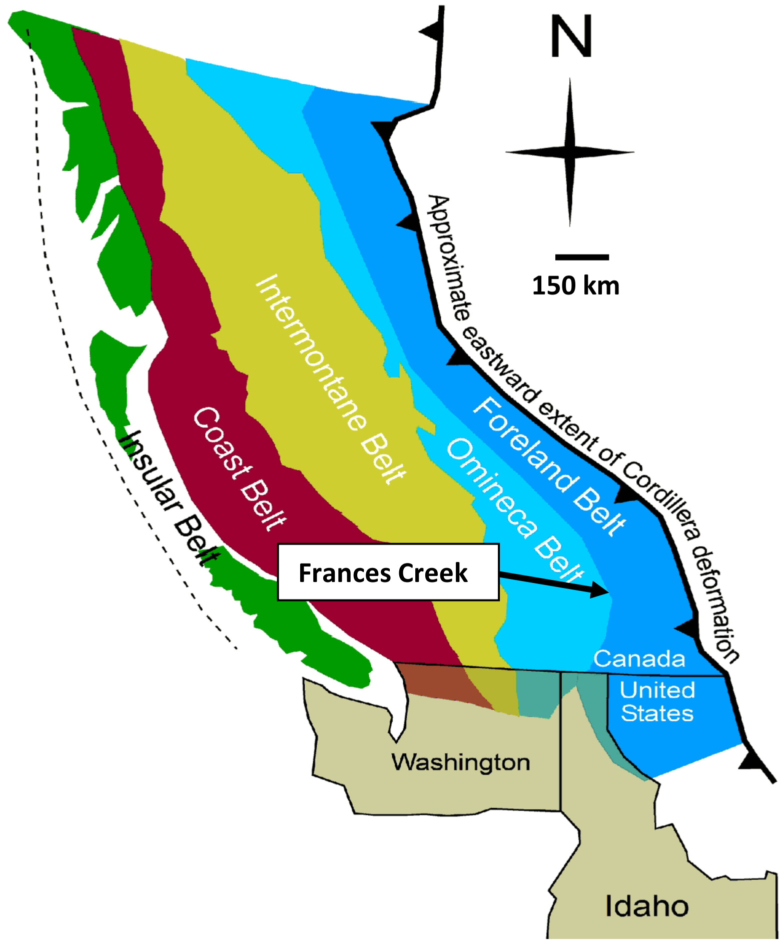


FIGURE 7.1 Property Location (approx.) vs. Geologic Belts - Western Canadian Cordillera (*after Digital Geology of Idaho*)

It is important that the reader understand that the above statements are generalized in nature, and that there is some mixing of the rock units along the boundary of the Omineca and Foreland Belts. For example, at the Jubilee Mountain Property, units that straddle the Cambrian - Ordovician boundary are found; likewise, the same Cambrian - Ordovician units are found near the Pedley Mountain property. The two properties are located on opposite sides of the Rocky Mountain Trench, the boundary of the two belts.

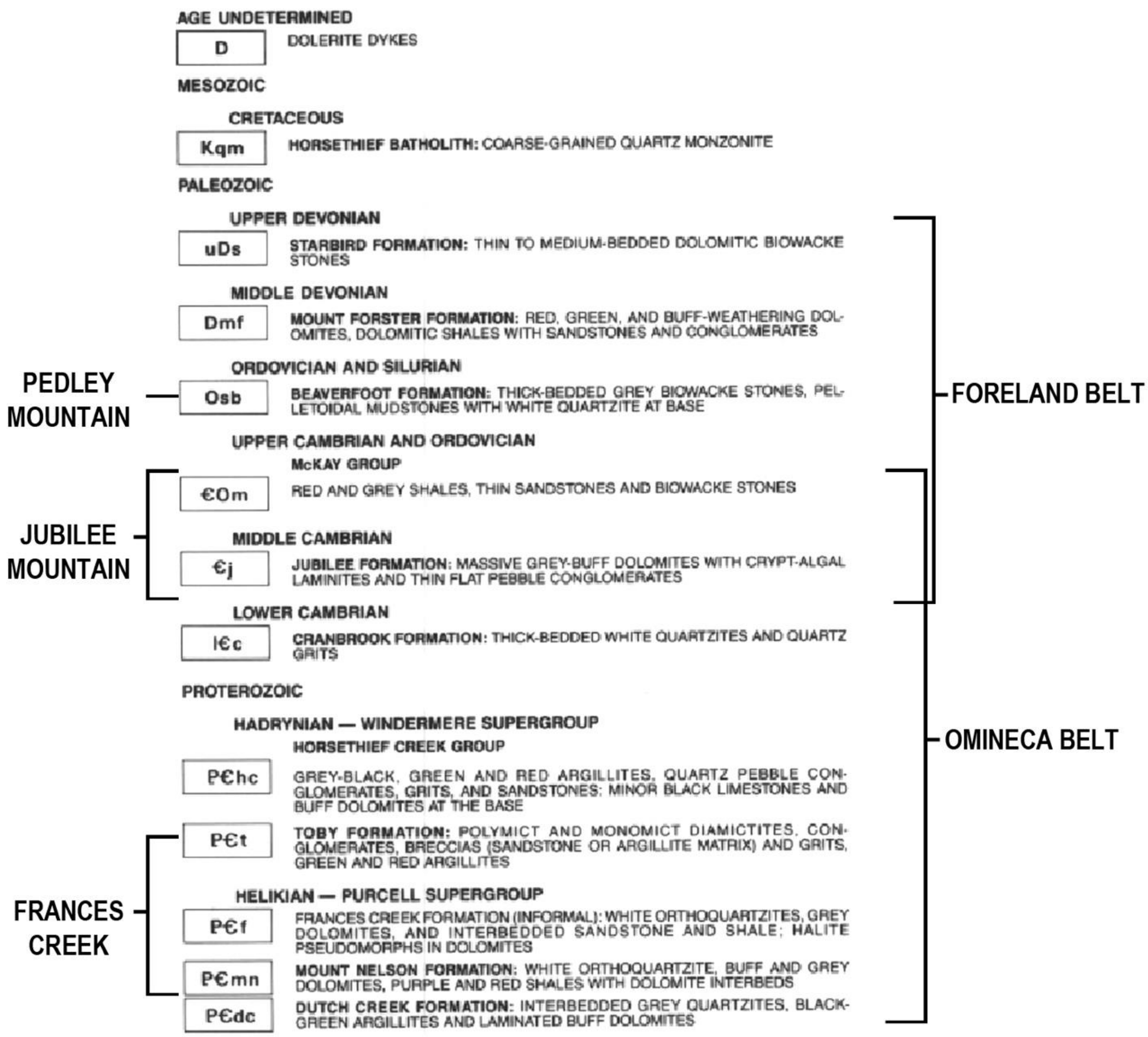


FIGURE 7.2 Age Relations of Formations - Voyageur Project Area (*modified from Pope, 1990*)

The dominant structural geologic feature in both the Foreland and the Omineca Belts are thrust faults. The thrusts in the Omineca Belt are somewhat steeper and do not displace the rock units to the east as far as the thrusts do in the Foreland Belt. Some thrust faults in the Foreland Belt have displaced strata in the hanging wall as much as 140 km. (Gadd, 2009).

7.2 Prospect Scale Geology

7.2.1 Frances Creek Property Geology

The Frances Creek Property is located along the eastern edge of the Omineca Geologic Belt, about 7 km east of the Rocky Mountain Trench Fault. Formations from two major Systems of the Precambrian Eon are found at the property. Both Purcell (Helikian System) and Windemere (Hadrynian System) Supergroup formations outcrop. The Purcell Supergroup rocks range in age from 1600 my to 850 my; the Windermere Supergroup rocks range in age between 850 my - 542 my (Wikipedia, 2014).

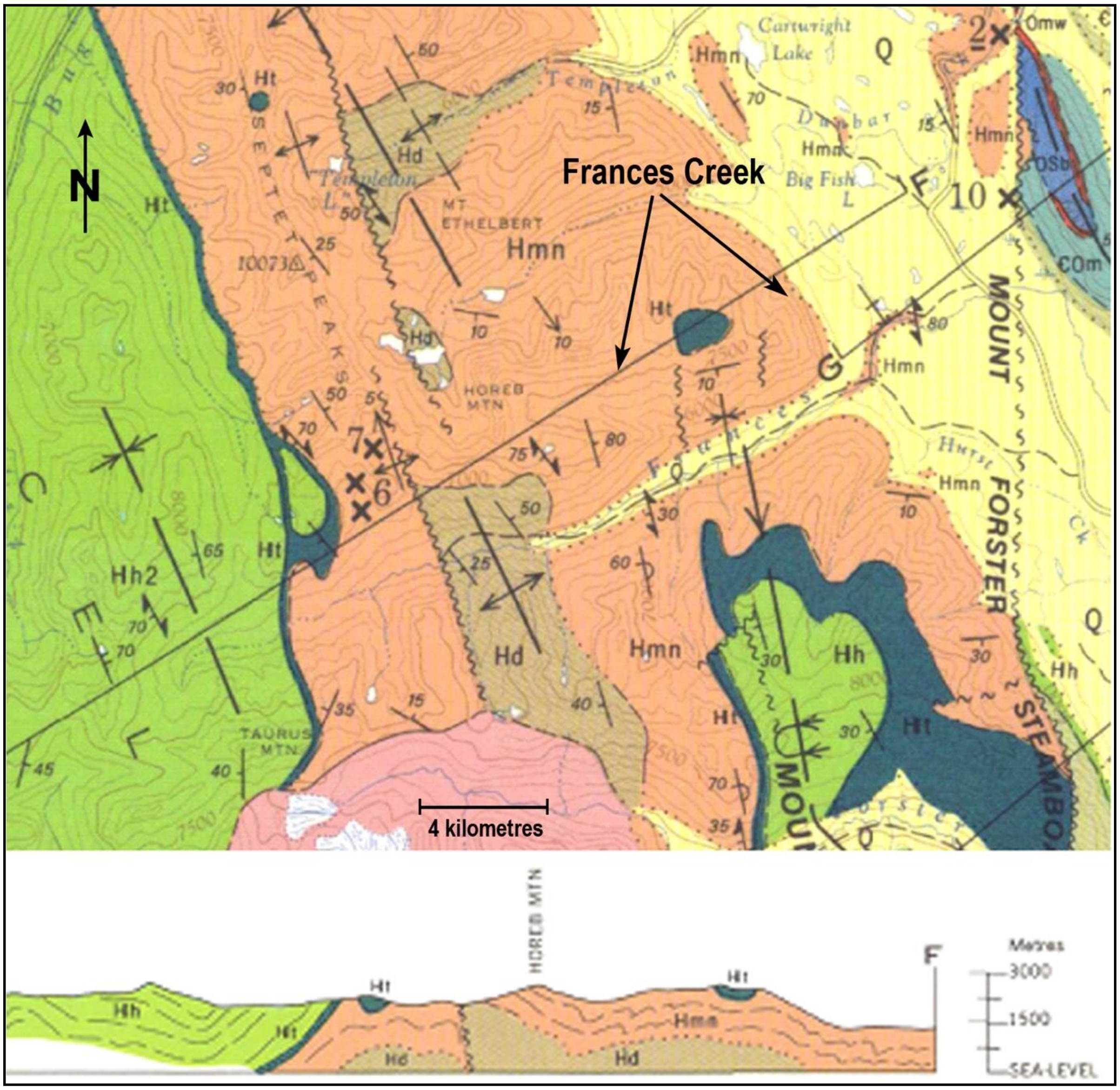


FIGURE 7.3 Geologic Map and Section - Frances Creek Property (*after Ressor, 1973*)

Rocks of the two systems are separated by an erosional unconformity. The amount of time represented by the unconformity is unknown; however it is widespread and cuts markedly into the Mt. Nelson rock units in the Project Area (Pope, 1990).

7.2.1.1 Prospect Stratigraphy - Frances Creek

The Mt. Nelson Formation of the Purcell Supergroup of the Helikian System is the oldest rock unit found at the property. The Purcell Supergroup is the equivalent of the Belt Supergroup (American terminology) found to the nearby south. Purcell Supergroup rock units in the Project Area are thought to be + 9.8 km in thickness. The Mt. Nelson Formation which is the youngest formation of the Supergroup is estimated to be about 1.2 km thick, in the Project Area (Ressor, 1973). The Mt. Nelson is predominately dolostone in composition and is a platform carbonate. It is economically significant in that it is the main host rock for barite mineralization at the property.

The Mt. Nelson has been subdivided into six stratigraphic units in the area adjacent to the property (Pope, 1990). Pope measured and described 1520 m of section about 18 km to the south of the property, during the field work for his report. Voyageur's exploration department reports that the upper three units described by Pope (**Figure 7.4**) are recognizable in drill core (B. Willis, P.C., 2014). These units are; Hmn - 6 - Upper Mt. Nelson Quartzite, Hmn - 5 - Upper Mt. Nelson Dolomite and Hmn - 4 - Purple Sequence.

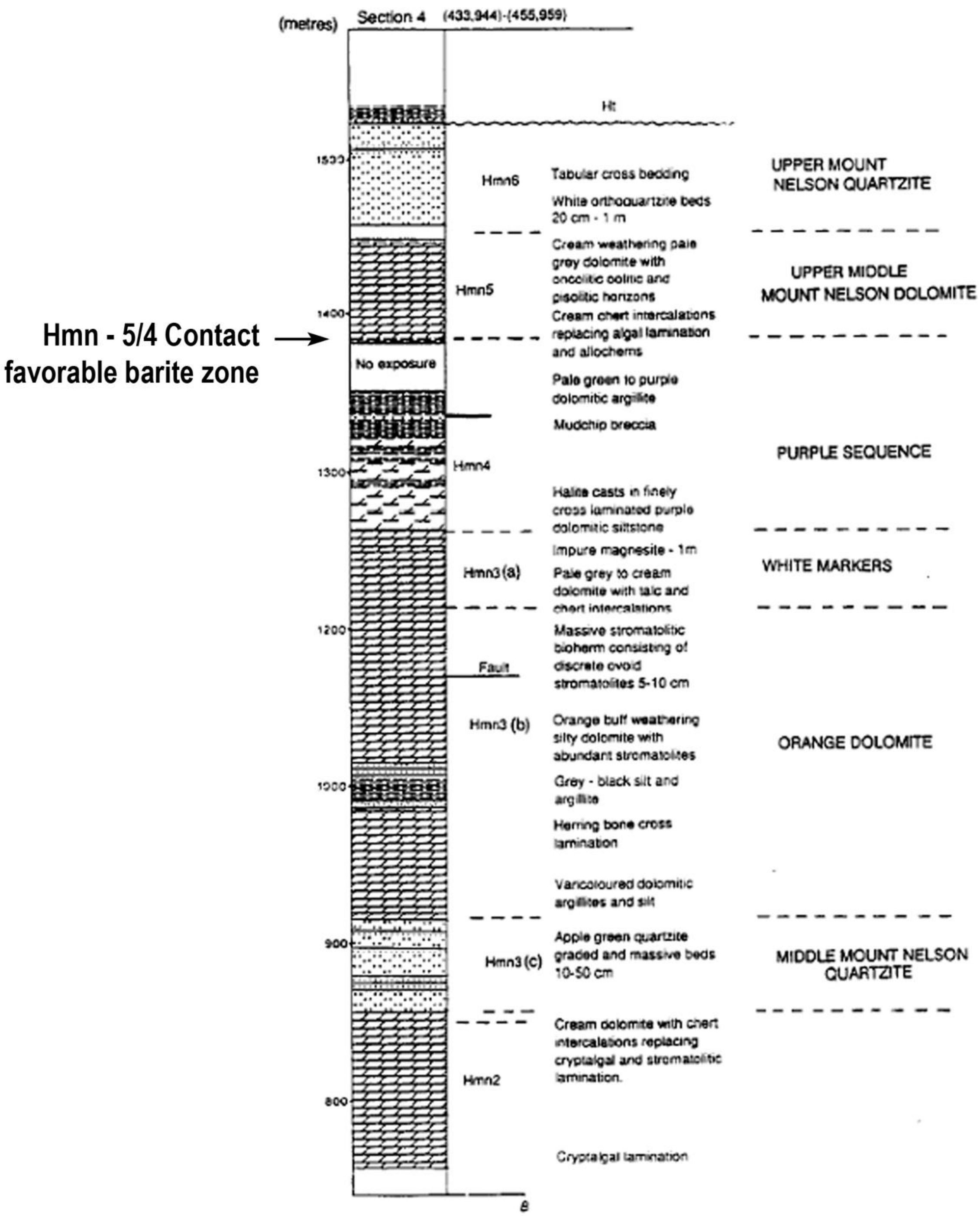


FIGURE 7.4 - Mt. Nelson Fm. Stratigraphy - Frances Creek Property Vicinity (after Pope, 1990)

The Upper Mt. Nelson Quartzite (Hmn - 6) outcrops at/near the upper drilling area (B – Zone), approx elev. 1570 m. The Purple Sequence dolomitic argillites (Hmn - 4) outcrop at/near the lower drilling area (A – Zone), approximate elevation 1335 m. Prior to the 2017 drill season, the contact between units Hmn -5 and Hmn - 4 was thought to be a zone favorable for barite deposition (B. Willis, P.C., 2014).

Review of the 2017 drill program results, has resulted in a re-thinking of this concept. The control on mineralization is now thought to be a thrust fault that cuts through the property that strikes at 295 degrees. Along the lower A Zone, the fault is 8 – 10 m wide with large voids within the zone. The barite within the A Zone is hosted within the fault zone and is mostly concentrated along the foot wall contact. The hanging wall is made up of silicious grey to green argillaceous dolomite. The footwall is primarily sort green and brown argillaceous dolomite.

The strata exposed at the upper B Zone is primarily a purple / maroon argillaceous dolomite. There, the hanging wall of the fault is a brown weathered rubbly brecciated dolomite. A beige – brown dolomitic breccia is the dominate rock type in the lower elevations of the B – Zone.

The Toby Formation conglomerates were found in the uppermost elevations above and outside of the property by Reesor in 1973. Outcrops of Toby Formation sandstones were mapped by Mountain Minerals geologist Butrenchuk at much lower elevations (1463 m to 1710 m) and within the property boundaries, in 1990. Voyageur's geologists have also mapped Toby outcrops at lower elevations within the property (**Figure 7.5**).

The Toby unconformably overlies the Mt. Nelson dolomites. Ressor's mapping shows a small outcrop of Toby about 1.5 km in a NE - SW orientation and about 1 km in width in a NW - SE direction. Thickness is shown to be ~ 100 m. Butrenchuck's mapping shows the Toby as being in fault contact with the Mt. Nelson Fm. in the SE portion of the property (Butrenchuk, 1990).

The fact that the Toby unconformably overlies the Mt. Nelson in the property area has economic significance. Unconformities are often favorable sites for mineral deposition. The Toby - Mt Nelson unconformity is a disconformity which means there was a period of uplift and erosion (time period unknown) after Mt. Nelson and before Toby depositional time. Karst topography may have formed on the Mt. Nelson surface; cavern systems are especially favorable loci for mineral deposition. The Toby - Mt. Nelson contact should be targeted for further prospecting, during the proposed exploration program.

7.2.1.2 Prospect Structural Geology - Frances Creek

Faulting - Reesor's 1973 regional scale (1:250,000) mapping shows two NNE striking but unnamed faults traversing northwards in the vicinity of the property near the southern boundary along Frances Creek **(Figure 7.5)**. He does not show the faults crossing the creek or outcropping in the hillside to the south of the creek. Pope's 1990 more detailed mapping (1:25,000 scale) shows the Forster Creek Thrust Fault outcropping on the hillside to the south of the creek, the alignment of the trace of the fault suggests that it is dipping steeply to the west.

Unfortunately, Pope's detailed map stops at the south side of Frances Creek; Reesor's regional scale mapping encompassed both sides of the creek. The location of the thrust mapped by Pope is more or less on strike with the easternmost fault mapped by Ressor. A valid assumption would be that the two faults are the same and that the Forster Creek Thrust traverses through the southwestern portion of the claim.

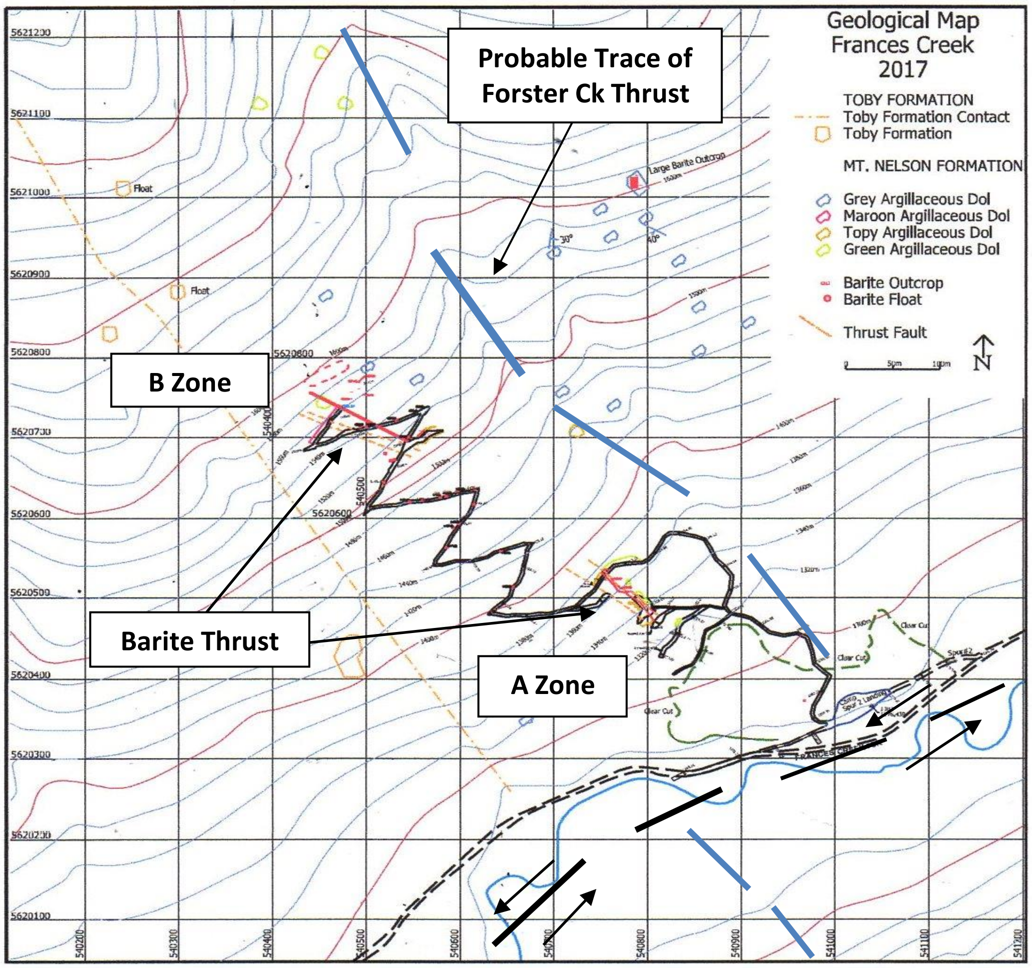


FIGURE 7.5 Geologic Map - SE Portion - Frances Creek Property (Willis. 2017)

The trace of the thrust as interpreted by both authors, coincides with a NW trending dry stream valley which is incised about 30 m into the SE face of Horeb Mountain in the SW portion of the Frances Creek Claim. This feature was also interpreted as a fault by Butrenchuk in 1990. The dip of the thrust plane is to the SW at an unknown angle, but, based on topographic relationships, is probably steeper than 55 degrees.

The trace of the Forester Creek Thrust as mapped by Pope intercepts Frances Creek about 0.5 km SW of where the trace of the thrust as mapped by the senior author and by Voyageur does. This implies the presence of a buried right lateral fault located along the bed of Frances Creek (**Figure 7-5**).

Butrenchuk mapped a NNW striking fault which places the Toby in contact with the Mt. Nelson, about 350 m west of the Forster Creek Thrust, in 1990. This fault outcrops in the very SW portion of the claim. It was not mapped by Reesor during his regional scale mapping in 1973 (1:250,000) the 1990 mapping was much more detailed (1:5,000); hence it's discovery at that time.

The 2017 drilling program was supervised by the second author. Mr. Willis' field mapping and drill hole logging led to the discovery of yet another thrust fault at the property. This is named the Barite Thrust, because it appears to control the barite mineralization at the property. The Barite Thrust has been mapped where it crosses the A Zone from elevation 1300m to 1380m and where it crosses the B Zone from elevation 1500m to 1600m. It crops out along the drill road cuts and at the drill pad excavations in the two zones. No doubt, it is continuous between the two zones, but the drill road cuts between the two zones are not as deep – so the structure is difficult to discern there.

The Barite Thrust crops out in the A Zone. Outcrop data shows the thrust fault dipping at -60° SW and striking 295°. The barite mineralization is located within the fault zone and this probably indicates that the fault was a conduit for the barite mineralization. Most likely, there are secondary zones along this fault where the fluids precipitated and filled secondary faults and open areas.

Where the Barite Thrust outcrops in the B zone, the main fault structure is striking 295° and is dipping steeply to the SW as indicated by drill hole data. The main barite zone appears to be an off shoot breccia that is striking 305° and dipping between -70° to -65° S.

Folding - Reesor's mapping also shows the Forster Creek Syncline crossing Frances Creek and dying out to the NW, about half way up the mountainside. Reesor's mapping shows the syncline crossing Frances Creek and outcropping in the mountain face, just to the west of the Forster Creek Thrust. It can be inferred from Reesor's mapping that the dip of the beds in the mineralized area of the property would be to the SW.

Reesor shows the syncline to be the dominant structural feature south of the creek; traversing about 40 km of territory. Interestingly, Pope who mapped the area to the south of Frances Creek in detail does show the presence of an overturned syncline in this area but it is not a dominant structural feature as shown by Reesor.

Detailed mapping by Tiger Ridge and by Butrenchuk shows that the beds strike to the WNW and dip SW at about 15 degrees in the B Zone mineralized area of the property, as well as in the lower A Zone. No major folds are indicted by the drilling to date. However, more detailed work will probably show that folding at the property is more complex than is presently known.

7.2.1.3 Prospect Mineralization - Frances Creek

Barite mineralization at the Frances Creek Property occurs as a complex breccia vein which strikes NW and dips SW at about 40 degrees at the lower A Zone and 60 degrees at the upper B Zone (**Figure 7.5**). At the B Zone, drilling has shown that the breccia vein has a strike continuity of 150m and an average dip continuity of 50m (indicated) to 75m (inferred) down the dip from outcrop. At the A Zone, drilling shows that the breccia has a strike continuity of 85m, and an average dip continuity of 35m (indicated) to 55m (inferred) down the dip from outcrop. The 300m zone between the A and B Zones has yet to be tested by drilling.

The breccia vein occurs in the upper plate of the Forster Creek Thrust Fault, in the SW portion of the Frances Creek Claim, and is sub parallel to the trace of the thrust which outcrops ~ 200 m to the NE. The breccia vein material fills a small fault which was probably caused by tensional forces related to thrust emplacement. The Barite Thrust (**Figure 7.5**) appears to act as an especially favorable host zone for barite mineralization emplacement Barite mineralization is also found as fracture fillings, in the other minor structures at the property however.

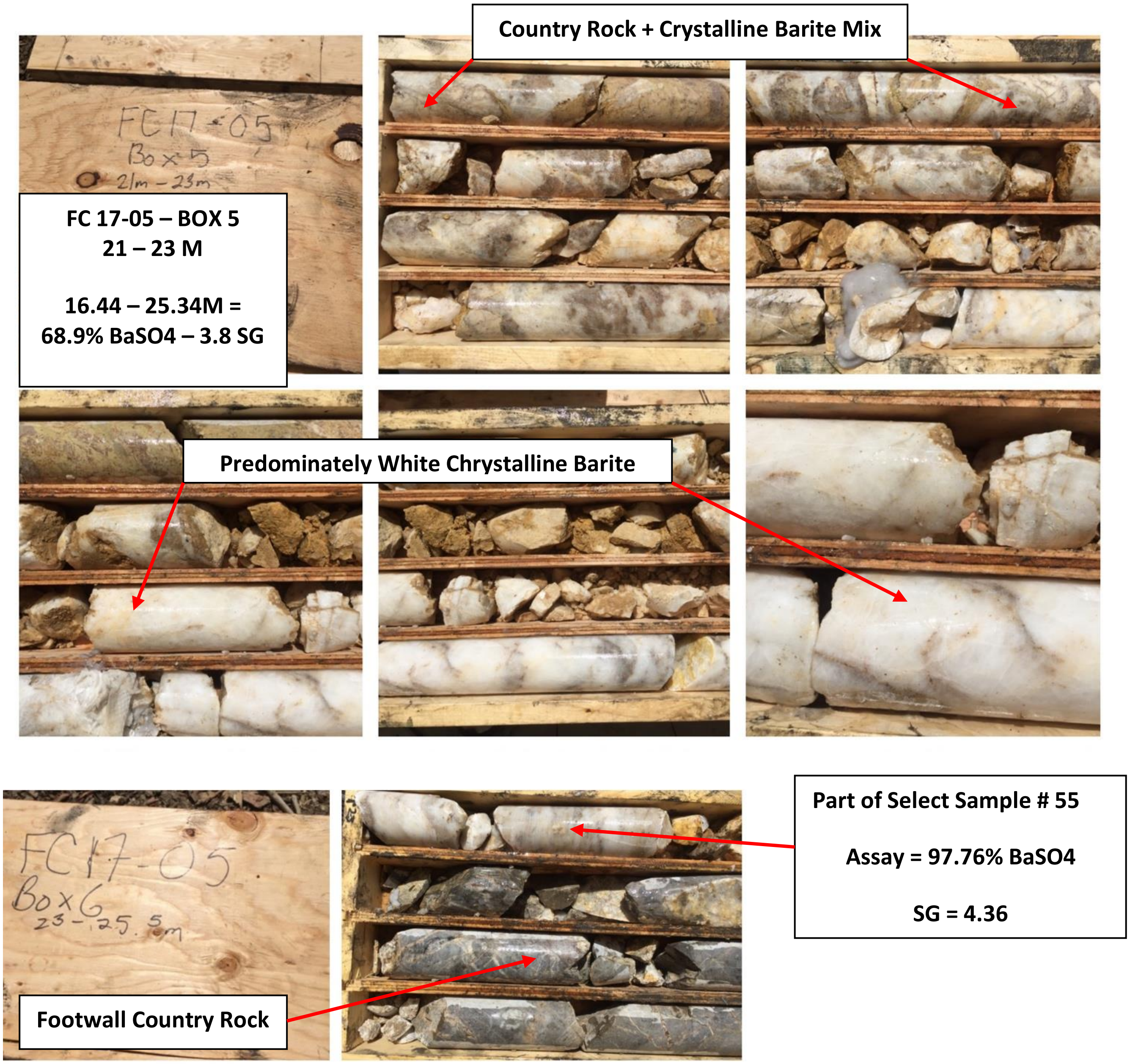


FIGURE 7.6 Barite Breccia Photos – DH – FC17-05

The breccia vein is composed of mixed percentages of country rock (argillaceous dolomite) and white crystalline barite, which was injected into the Frances Creek Fault Zone (**Figure 7.6**). Mineralized zones were encountered within the vein with as little as 8.9% $BaSO_4$ over 8.9m of core length and as high as 86.08% $BaSO_4$ over 5.25m of core which were recovered during the 2017 drill program. The weighted average of all drill intercepts (2003 – 05 – 17) for the B Zone is 7.95m @ 40.09% BaSO4 / 3.31 SG. The weighted average for the A Zone drill intercepts is 2.71m @ 35.85% BaSO4 / 3.29 SG.

7.2.1.3.1 Barite Mineralization Quality

Figure 7.6 shows core photos from drill hole FC17 – 05 and is intended to illustrate the non-homogeneous nature of the vein mineralization. The photos show that Crystalline barite in varying percentage concentrations is consistent though out the breccia zone of the vein. In order to test the purity of the crystalline barite portion of the breccia, a select sampling program was initiated. Eight drill holes were selectively re-sampled. These samples were selected from previously assayed intersections of barite breccia. The pure barite zones within the breccia intercepts were then split from the vein to determine the nature of the purity of the barite.

The true widths and assay results from the sampled zones are as follows:

FC17-5 TW - 8.17m @ 68.88% $BaSO_4$
FC17-7 TW - 21.29m @ 28.57% $BaSO_4$
FC17-8 TW - 36.63m @ 24.83% $BaSO_4$
FC17-9 TW - 36.03m @ 19.47% $BaSO_4$
FC17-10 TW - 11.86m @ 60.32% $BaSO_4$
FC17-11 TW - 23.88m @ 27.05% $BaSO_4$
FC17-12 TW - 18.7m @ 37.39% $BaSO_4$
FC17-15 TW - 15.22m @ 37.64% $BaSO_4$

The highlights of the sampling are shown in **Table 7.1**, below:

Hole Number	Crystalline Barite Zone Sampled	%BaSO4	Specific Gravity
FC17-5	23.7m-24.9m	97.76%	4.36
FC17-7	25.6m-25.8m	97.74%	4.46
FC17-7	32.4m-32.9m	99.12%	4.50
FC17-7	51.5m-53.4m	96.41%	4.44
FC17-8	24.5m-24.9m	97.02%	4.47
FC17-8	41.2m-43.8m	97.81%	4.39
FC17-9	16.9m-24.3m	97.58%	4.46
FC17-10	19.9m-33.5m	96.87%	4.36
FC17-11	33.0m-41.9m	97.26%	4.40
FC17-12	32.0m-48.6m	96.89%	4.40
FC17-15	29.7m-32.8m	95.32%	4.33

TABLE 7.1 Results of Select Sampling of 2017 Drill Core

Crystalline barite in varying percentage concentrations is consistent though out the breccia zone of the vein. The sampling shows a very high grade for the crystalline barite. This select sampling of the crystalline barite to date indicates that it is exceptionally pure and is possibly pharmaceutical grade.

8.0 Deposit Type

Voyageur's Frances Creek Property can be loosely classified as "Carbonate Hosted Barite - replacement deposits. This is a rather catch-all term meaning that they are barite deposits hosted in carbonate (in this case dolomite) rock units. They can be further sub classified as "Irish Type MVT (Mississippi Valley Type) Pb-Zn-Ag-Ba rich" replacement deposits. However, on Frances Creek there are no metals associated with the property.

These deposits are further described as "Irish Type carbonate-hosted deposits are strata bound, massive sphalerite, galena, iron sulfide and barite lenses with associated calcite, dolomite and quartz gangue in dolomitized platformal limestones." (Hoy, 1996). Interestingly, "normal" MVT deposits contain only minor barite, while Irish Type MVT deposits are barite rich, hence our interest in them.

Common features of "Irish Type" MVT deposit worldwide are:

- Epigenetic Origin - mineralization was after the host rock formed
- Unassociated with igneous activity
- Hosted by Dolostones and Limestones
- Dominant Minerals - sphalérite, galena, pyrite, marcasite, dolomite, barite, calcite
- Ore Fluids - basinal brines with 10 - 30 wt. percent salts
- Crustal sources for metals, barium and sulfur
- Mineralization Deposition Temperatures - 75^{o} C - 200^{o} C
- Mineralization Controls - faults, fractures, dissolution collapse breccias, lithological boundaries
- Timing of mineralization - Coincident with mountain building

The B. C. Geological Survey has further sub-classified the Irish Type-MVT barite deposits of British Columbia as to the mineralization controls responsible for barite deposition. These are fracture controlled, replacement and manto type deposits. These deposits formed after consolidation of the host rock. They occupy voids formed along faults and fractures and also replace the original minerals in favorable zones of rock by replacing the host rock molecule by molecule with barite molecules.

More specifically, Voyageur's Frances Creek Property is sub classified using the B.C. Geological Survey system as:

- **Frances Creek** - Fracture Controlled

Basis of Exploration Planning - The basis for which past exploration was planned for the Francis Creek Property is as follows:

- **Frances Creek** - Explore outlying barite outcrops using geochemical and geophysical means to obtain idea of development potential. Extend known occurrences by drilling down dip for depth extensions and on strike for lateral extension of known barite bodies (2017 Program).

These are common exploration methods in mineralized terrain, where the explorationist tries to extend known areas of mineralization. It is known in the trade as "Headframe Exploration". Chances of success are generally higher with this method as opposed to "Grassroots Exploration", which explores where no known mineralized areas exist.

9.0 Exploration

Voyageur became a public company in 1Q – 2017. Once funds were secured from the issue, Voyageur was able to initiate exploration work on the Frances Creek property. Prior to the 2017 drill program, almost, all exploration work undertaken on the property was by predecessor companies.

Prior to Voyageur's acquisition of the property, it was operated by Tiger Ridge, the immediate predecessor in title. Prior to that, the property was operated by Mountain Minerals, an industrial minerals exploration company (early 1990's). Since title to the properties is held by mining claims, the claimant is required by law to perform yearly "assessment work" on the claim block to maintain title. Usually, mining claimants choose to fulfill this requirement by performing some sort of exploration work on the claims.

Once the work is performed, the claimant must file an "assessment report" with the B.C. Ministry of Minerals. The reports are placed in a file at the Ministry and are available to interested parties. This results in a rather extensive geologic library for some properties; The Frances Creek Property being one of them. In this way, a current operator of the claim can review what was done in the past and incorporate that data into their geologic model of the property; thus allowing for a more cost effective exploration program going forward.

9.1 Pre-Tiger Ridge Exploration Campaign - Frances Creek

The Frances Creek Property was operated by Mountain Minerals, Inc. from 1990 - 1992. Work undertaken by Mountain Minerals on the property in 1990 consisted of:

Geological Mapping - 1/5000 scale
Soils Geochemical Survey - lines - 50 m, samples - 25 m, 184 samples
Exploration Trenching & Sampling - 4 total

Work undertaken in 1992 on the property consisted of:

Diamond Drilling - 304 m - 11 holes

Mountain Minerals work was reviewed by Tiger Ridge and was fundamental to their optioning the property. The knowledge base represented by Mountain Minerals work was instrumental in formulating Tiger Ridge's extensive drilling campaigns between 2000 and 2005. The soils geochemical survey was used to site several of Tiger Ridge's drill holes.

9.1.1 Mountain Minerals Geochemical Survey

The soils geochemical survey was completed using industry wide procedures and parameters (these are still in use today). A baseline (800 m) which transected the long axis of the deposit was surveyed and marked in the field. Cross lines were turned off at 80 m intervals. Soils samples were collected from the B horizon along lines that were spaced 50 m apart. Sample interval was 25 m; a total of 184 samples were collected. The samples were bagged and shipped to International Plasma Laboratory in Vancouver for analysis by ICP. Barium was the only element analyzed for.

It is standard practice to collect B horizon soils geochemical samples. B horizon soils samples are normally representative of the ion content of the soils, as they are free of organic debris. Organic debris is found in the A horizon, and the organic matter may have selectively concentrated various ions.

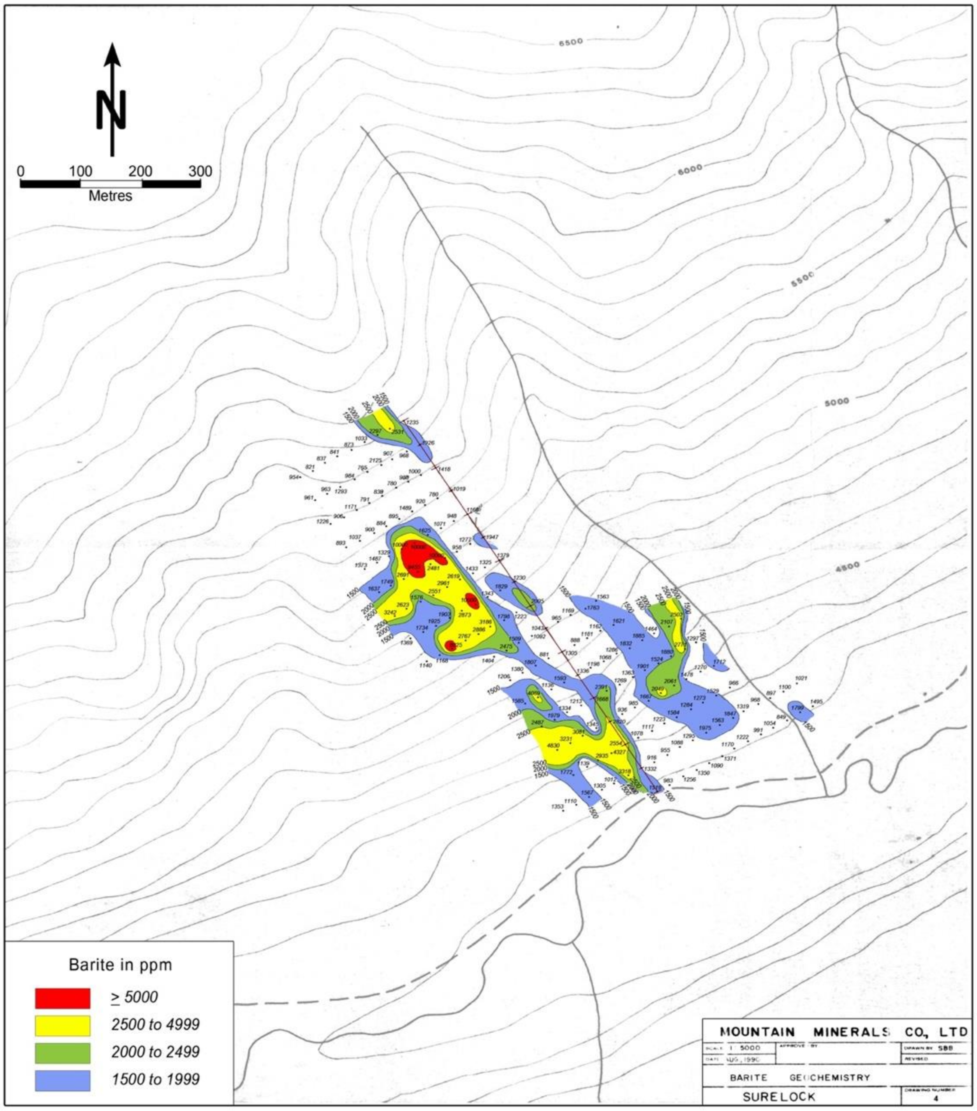


FIGURE 9.1 Soils Geochemistry - Frances Creek Property

The barium values for the samples ranged from 765 to greater than 10,000 ppm. Anomalous values were considered to those greater than 1,500 ppm (Butrenchuck, 1990). Once the lab values were received, they were plotted to scale on a topo map base and a contour map was prepared (**Figure 9.1**). It is the senior author's experience from the Nevada Barite fields that soils geochemical anomalies of + 1500 ppm Ba, are usually underlain by substantial barite bodies.

9.2 Tiger Ridge Resources Exploration Campaigns

Tiger Ridge's 2002 - 2005 exploration work at the Frances Creek Property consisted of limited outcrop mapping and sampling, a geophysical survey, and drilling. Drilling parameters and results will be discussed in **Section 10**. The geophysical survey results are shown in **Figure 9.2.**

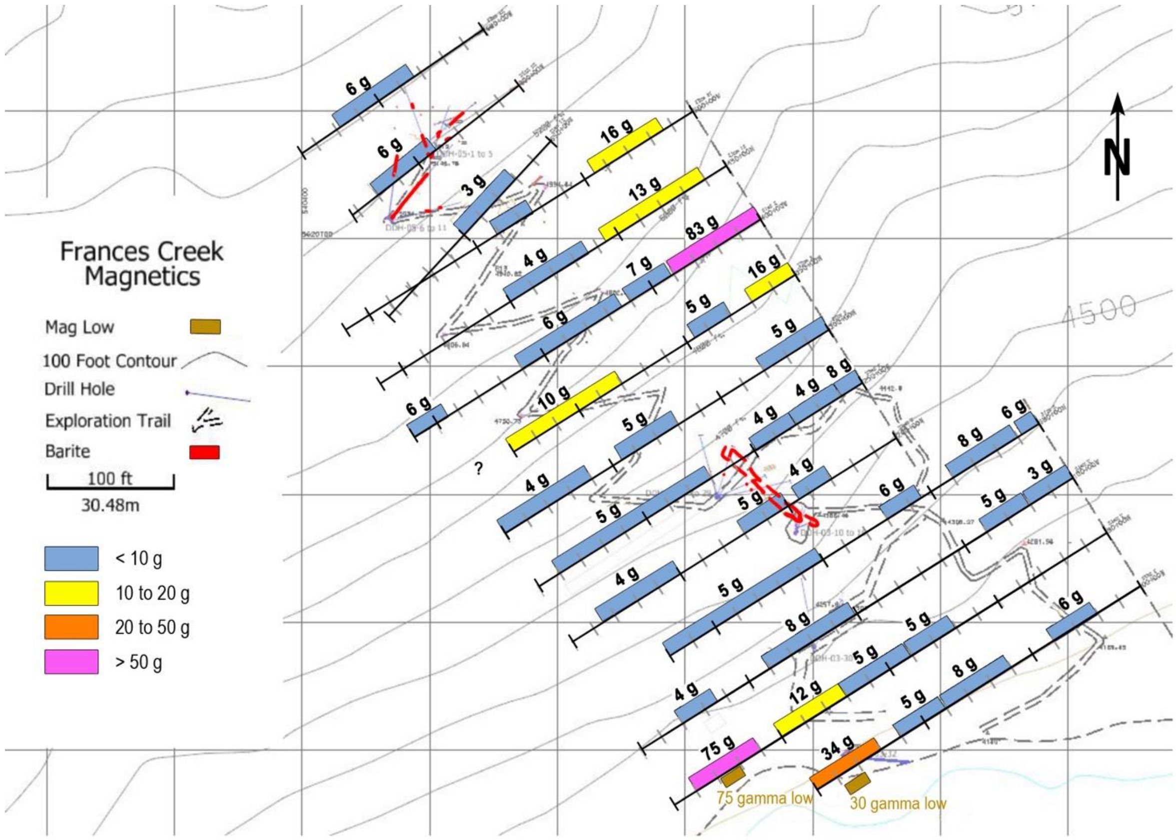


FIGURE 9.2 Magnetic Survey - Frances Creek Property

In 2003, Tiger Ridge drilled the lower zone outcropping barite occurrences (**Section 10**). In 2004, a geophysical survey was conducted over the property in order to try and extend the known occurrences upslope. A ground based magnetometer survey was conducted using a proton precession magnetometer; 14 lines were laid out in a SW - NE direction at 15 m intervals. Magnetic readings were acquired at 6 m spacing along each line.

The survey defined a broad magnetic low oriented NW - SE (blue areas) along the slope of the mountain. The known barite occurrences (lower zone) were located towards the center of the magnetic low. It was conjectured that the upslope extension of the barite would also be located in the center of the magnetic low. The survey was useful in selection of drilling locations for the 2005 program. The 2005 drill program extended the barite occurrences up slope (**Section 10**).

The senior author resampled three of the lower zone outcrops during the 2014 field visit to the property. These sampling results were shown in **Table 9.1.** The senior author's sampling as well as the drilling results (**Section - 10**) indicates that the Frances Creek Barite Zone is apparently + 4.2 SG and is apparently API compliant with respect to heavy metals.

SAMPLE #	SG (4.1 - min)	% BaSO4	Hg - ppm (1.0 max)	Cd - ppm (3.0 max)	SOLUABLE Ca - ppm (250 max)
8/12 - 1	**4.12**	**91.78**	**.019**	**<1**	**94**
8/12 - 2	**4.05**	**86.18**	**.006**	**<1**	**155**
8/13 - 1	**3.62**	**70.02**	**.014**	**<1**	**139**

TABLE 9.1 2014 Outcrop Sample Results – Chemical Testing - Frances Creek Property

9.3 Voyageur Minerals, Ltd. Exploration Campaigns

As was mentioned in **Sections 7.2.1.3.1, 7.2.2.3.1, 7.2.3.3.1 and Section 9.3.4.,** Voyageur conducted outcrop sampling and sampling of previously drilled core at the Frances Creek property in 2014. In 2015, Voyageur conducted an outcrop sampling campaign at the Frances Creek property. In 2016, Voyageur collected and partially processed a trench sample from the Frances Creek property. A synoptic discussion of these exploration activities is discussed below.

9.3.1. 2014 Sampling

The 2014 sampling program consisted of outcrop sampling at the property and sampling of archived previously drilled cores (2003 – 2005) at the core storage facility in Windemere, B.C. Both sampling exercises were supervised by the lead author, as part of the field portion of background research for preparation of the 2015 Technical Report on the three properties.

A total of three mineralized outcrop samples (**Table 9-1**) and 82 mineralized zones from 24 core holes were collected (**Tables 10.3, 10.4 – Section. 10**) and analyzed at Loring Labs in Calgary, an ISO – 9001 certified laboratory. Details of the results of this sampling are shown in the report sections and tables referenced above. Voyageur's expenditure for the 2014 exploration campaign at Frances Creek was Cdn $ 39,500.

9.3.2. 2015 Sampling

The 2015 sampling program consisted of outcrop sampling from hand dug exposures of the Frances Vein at the property. This sampling exercise was undertaken by the junior author; a total of four channel samples were collected.

The four samples were analyzed for chemical composition **(Table 9-2),** and SG at Loring Labs in Calgary, AB. and for whiteness and brightness **(Table 9-3)** at SGS Mineral Services' lab in Lakefield, ON. Both labs are ISO – 9001 certified and both labs enjoy a sterling reputation for accurate analyses throughout the Canadian mining industry.

The chemical testing showed positive results; high purity, high SG and acceptable levels of accessory and contaminate elements and compounds. The whiteness – brightness testing which was positive (+94.0 – Hunter L). Testing from both labs indicated that the Frances Vein barite is potentially filler (paint) grade. The filler market is an important segment of the industrial grade barite market.

Details of the results of this sampling are shown in the sections referenced above. Voyageur's expenditure for the 2015 exploration campaign at Frances Creek was Cdn $ 8,796.44.

SAMPLE #	SAMPLE WIDTH	BaSO4 %	SG	Ca ppm	Cd ppm	Hg ppb	Pb ppm	As ppm	Sr ppm	Al2O3 %	Fe2O3 %	SiO2 %
FC1 2015	1.41m	98.54	4.48	34	<1	7	6	2	8162	0.03	0.02	0.05
FC2 2015	1.25m	98.76	4.48	24	<1	6	4	1	5380	0.01	0.01	0.06
FC3 2015	0.92m	88.76	4.18	29	<1	7	4	<1	9023	0.27	0.53	0.54
FC4 2015	1.4m	97.86	4.47	24	<1	5	4	1	8864	0.06	0.03	0.10

TABLE 9.2 2015 Outcrop Sample Results – Chemical Testing - Frances Creek Property

	L*, u',v' – CIE 1976				Hunter L, a, b		
SAMPLE #	L*	u'	v'		L	a	b
FC1 2015	95.4	0.202	0.462		94.1	0.9	0.8
FC2 2015	95.8	0.202	0.460		94.6	1.4	-0.6
FC4 2015	95.6	0.203	0.462		94.4	1.4	1.1

TABLE 9.3 2015 Outcrop Sample Results – Brightness Testing - Frances Creek Property

9.3.3 2016 Sampling

The 2016 sampling program was supervised by the junior author and consisted of collection of a bulk sample of 17 tonnes of barite breccia from the Frances Vein. The vein was sampled at the portal of a small underground adit into the vein.

The 17 tonne sample was trucked to an off site location and washed and crushed, then trucked to a second off site location where it was ground to – 325 mesh. The powdered sample was drummed and was then shipped to ST Equipment and Technology in Needham, MA, USA, where it was tested in February 2017. ST has a dry separation machine that sorts ore from waste using electro static techniques.

A total of 36 representative samples were collected from the 20 barrel shipment. Average barite purity of the bulk sample was 17.46% BaSO4, Specific Gravity (SG) was not analyzed. Using the Barite Purity Curve **(Charts 10.1 & 11.1)**, the SG of the bulk sample can be estimated at ~ 2.95.

The sample was shipped to ST Equipment and Technology in Needham, MA, USA, where a 5 tonne sample was tested. ST Equipment has an electro-static separation machine that sorts mixed material by differing electrical properties. The objective of the test was to separate the powdered barite from the intermixed dolomite by using a dry method. Use of dry methods to clean the barite verses using a water based jig method (proven technology) would eliminate the need for a tailings pond at the future mill, and hopefully improve recovery of barite.

The electrostatic separation testing showed that a low grade – low SG (~3.0) powdered sample, such as the one that was shipped could not be upgraded by dry methods to the desired SG (4.3 – 4.4) needed to penetrate the higher end barite markets. Consequently, Voyageur will use conventional water jigging and tabling, to produce a clean industrial grade, high SG product.

9.3.4. Barite Trench Samples

There were three trench samples taken from breccia vein with samples #1 & #2 taken from the A Zone barite and sample #3 taken from the lower B Zone barite zone (**Figure 9.3**). An excavator was used to clear the overburden and expose the outcrop followed by washing the face with high pressure water to ensure a clean sample.

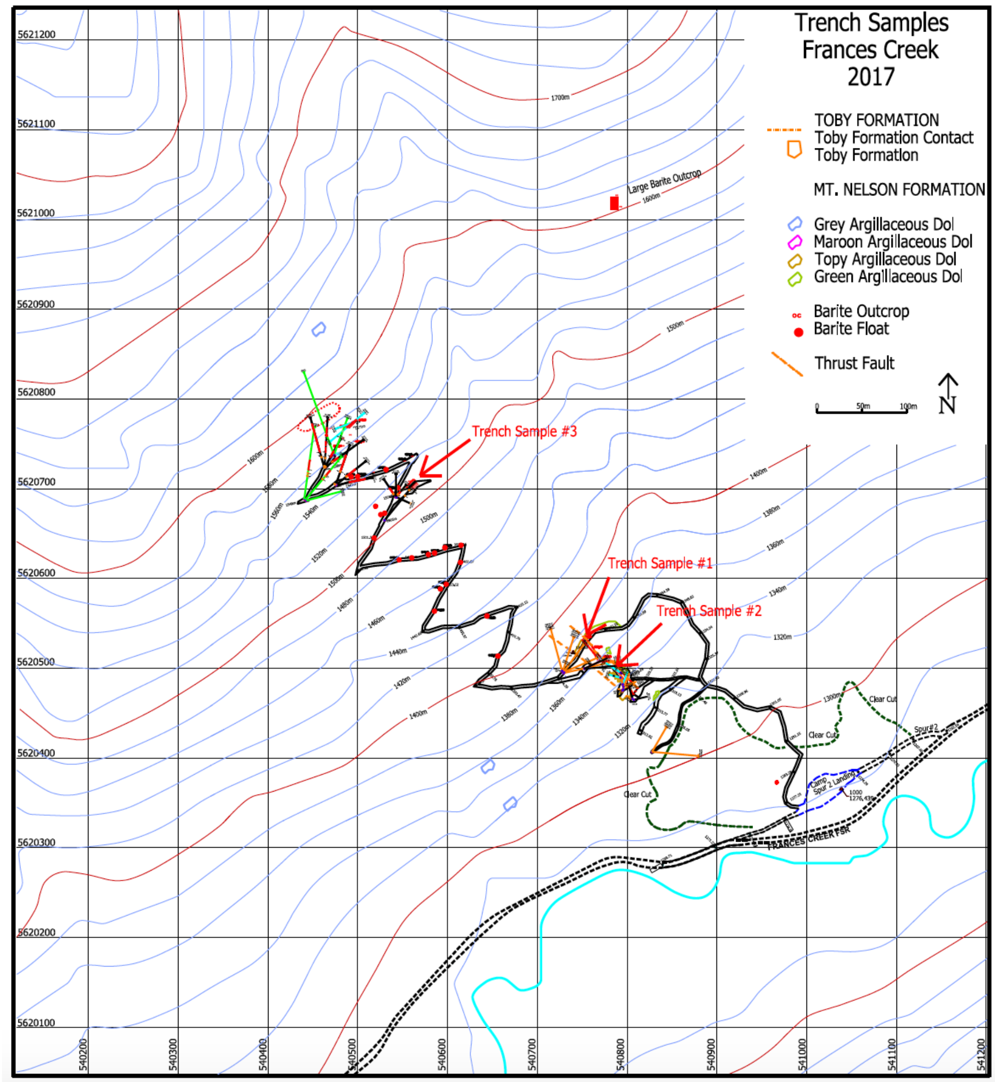


Figure 9.3. Trench Samples

Sample #1 was taken from alongside the trail located at an elevation of 1361m and UTM coordinates of 5620518N 540764E. The channel sample consisted of 3 individual samples within the zone. Samples were chipped by rock hammer and collected and bagged. A line was measured and painted running perpendicular to the dip of the vein. The line was broken into 3 intervals of 0-1m, 1-2m and 2-2.5m for a combined 3 sample bags. The average grade across 2.5m of exposed barite vein was 46% $BaSO_4$.

Channel Samples Frances Creek					%Ba & m	%Ba & m	%Ba & m
Trench sample1. (true width)		Coordinate	Coordinate	Elevation	0-1m	1-2m	2-2.5m
Above portal on trail	Foot wall	**5620518.43**	**540763.99**	**1361.81**	**20.34**	**81.14**	**27.5**
Sample taken across true dip	Hanging wall	**5620517.38**	**540762.71**	**1362.6**	**wt avg**	**46**	

Table 9.4 Trench Sample 1

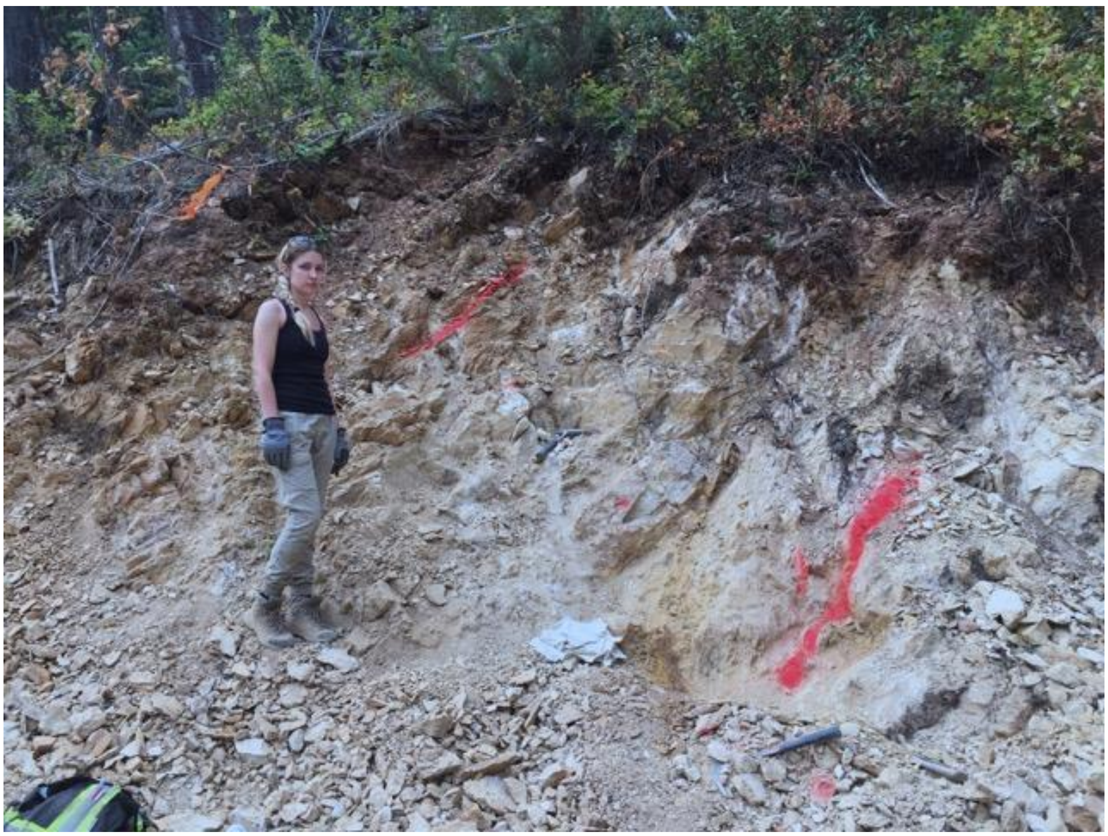


Figure 9.4 Trench Sample #1

Sample #2 was taken from the vein above the old (buried) Mountain Mineral Portal. This sample is located at an elevation of 1340m and UTM coordinates of 5620500N 540784E. The channel sample consisted of 4 individual samples within the zone. Samples were chipped by rock hammer and collected and bagged. A line was measured and painted running perpendicular to the dip of the vein. The line was broken into 4 intervals of 0-1m, 1-2m, 2-3m and 3-4m for a combined 4 sample bags. The average grade across 3m of breccia was 57.38% $BaSO_4$.

Channel Samples Frances Creek					%Ba & m	%Ba & m	%Ba & m	%Ba & m
Trench sample2 (true width)		Coordinate	Coordinate	Elevation	0-1m	1-2m	2-3m	3-4m
At portal area, excavated verti	Hanging wall	**5620500.16**	**540784.74**	**1342.37**	**65.34**	**48.38**	**58.41**	**0.41**
face, ba true width across dip	Foot wall	**5620503.21**	**540788.78**	**1339.61**	**3m wt avg**	**57.38**		

Table 9.5 Trench Sample #2

Figure 9.5 Trench Sample #2

Sample #3 was taken from the large barite outcrop located near drill holes FC17-20, 21, 22.& 23. This sample is located at an elevation of 1507m and UTM coordinates of 5620700N 540556E. The channel sample consisted of 9 individual samples within the zone. Samples were chipped by rock hammer and collected and bagged. A line was measured and painted running flat across the contour of the outcrop and is the only channel sample that was not taken across the true dip of the breccia. The line was broken into 9 intervals of 0-1m, 1-2m, 2-3m, 3-4m, 4-5m, 5-6m, 6- 7m, 7-8m & 8-8.4m for a combined total of 9 sample bags. The results of the channel indicated a total width of 8.4m averaging 51.4% $BaSO_4$.

Channel Samples Frances Creek								
Trench sample 3 (across contour/not TW)					Coordinate	Coordinate	Elevation	
Trench below switch, in front of FC17-21				SW side	**5620700.23**	**540556.21**	**1507.88**	
				NE side	**5620708.35**	**540564.54**	**1507.33**	
%Ba & m	%Ba & m	%Ba & m	%Ba & m	%Ba & m	%Ba & m	%Ba & m	%Ba & m	%Ba & m
0-1m	1-2m	2-3m	3-4m	4-5m	5-6m	6-7m	7-8m	8-8.4m
38.57	**22.68**	**56.51**	**44.19**	**60.25**	**65.27**	**52.05**	**68.93**	**58.97**
8.4m wt avg	**51.43**							

Table 9.6 Trench Sample #3

Figure 9.6 Trench Sample #3

9.3.4.1 Trench Sample Data Usage

The trench sample surveyed coordinates as well as % $BaSO_4$ and SG lab results were entered into the project database and were used to help calculate the resource estimate. Additional details are discussed in **Section 14**.

10.0 Drilling

Previous drilling was undertaken by both Mountain Minerals (1992) and Tiger Ridge (2003 – 2005) at the Frances Creek Property. The Mountain Minerals drilling at Frances Creek was apparently drilled down the dip of the vein and is not representative (P.C., Brad Willis, 2014). In addition, assay results from the 1992 campaign cannot be verified by lab certificates. Consequently, the data from the 1992 program could not be used in the resource model and thus was not used for this report. Only the drilling programs conducted by Tiger Ridge and the 2017 Voyageur drilling will be discussed here.

10.1 Frances Creek – Tiger Ridge Drilling Campaigns

Tiger Ridge drilled this property in 2003 and 2005, a total of 29 core holes were drilled from four separate platforms. Holes were drilled with a Diamec 251 diesel powered hydraulic wireline core drilling rig; core size was BQ - Wireline. A total of 1950.25 meters of core was collected during the two campaigns. Holes were drilled as arrays of drill fans, from prepared stations situated along a switch backing access road located about 30M to the SW of the outcrop of the vein. The azimuth of the initial drill hole at each drill station was aimed so as to intersect the vein perpendicular to strike at an angle of ~ - 35 degrees to horizontal. A second hole was then drilled with the same azimuth at an angle of ~ -60 degrees to horizontal. This completed one leg of the fan. At least two, sometimes three other similar fan legs were then drilled at azimuths which were 30 to 50 degrees either side of the initial bore. The drill rig was then moved to a different station and this drill sequence was repeated (**Figure 10.1 & 10.2**).

The core from these holes was logged by the junior author who was Tiger Ridge's exploration manager at the time. The core was logged for lithologic and structural data, but it was not assayed for SG (specific gravity). Detailed core examination resulted in visual estimates of percentage barite for prospective mining horizons. Tiger Ridge was able to use this technique to mine successfully at the Tiger Ridge Mine at Jubilee Mountain for several years. The thinking at the time was that since that technique worked well at the mine, that it was sufficient for this property.

Since Tiger Ridge was a private company, it did not have stringent resource reporting requirements such as Voyageur has. Consequently, there was no lab analyses performed on the drill core.

During the field investigation for the 2014 and 2016 reports, core boxes from 22 of the 29 holes drilled during the 2003 and 2005 campaigns were retrieved. The two authors then examined the core in detail and a total of 82 samples were collected from barite mineralized zones. These samples were logged and photographed and then taken to Loring Labs in Calgary for analyses; results are presented in **Tables 10.3, 10.4.** See **Figures 10.1 and 10.2** for maps showing the locations and azimuths of the core holes. This data was used in the resource model for this report.

During the 2003 campaign, all the holes were collared in Zone A, the lower zone at the property. During the 2005 campaign, all the holes were collared in Zone B, the topographically higher zone at the property.

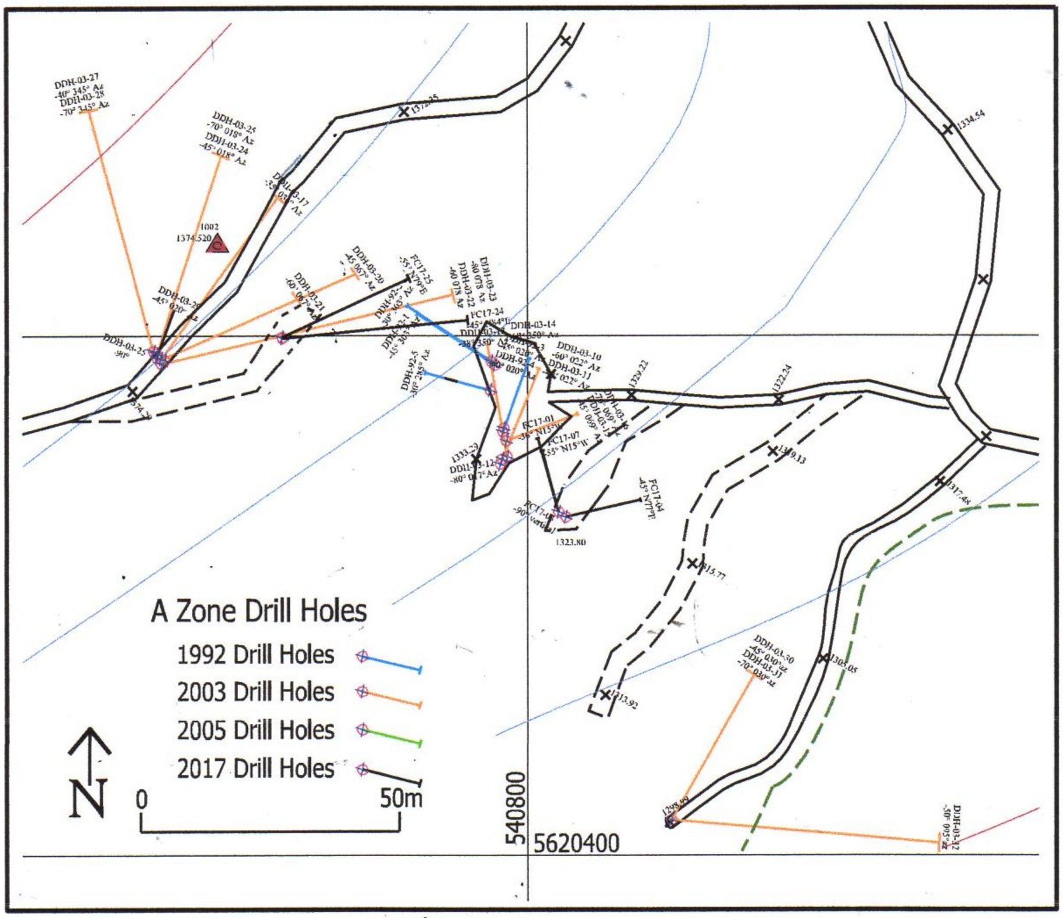


Figure 10.1 Drill Hole Map – Zone A

DDH	ELEVATION	EASTING	NORTHING	Bearing		Angle	Total Depth m.
FC03-10	1331.36	540786.50	5620470.50	N22E	22	-60	47.85
FC03-11	1331.36	540786.00	5620470.00	N22E	22	-40	27.4
FC03-12	1331.36	540786.00	5620469.50	N17E	17	-80	32.92
FC03-13	1331.00	540788.00	5620471.00	N10W	350	-38	28.04
FC03-14	1331.36	540788.40	5620470.00	N10W	350	-60	32.9
FC03-15	1331.36	540787.50	5620474.00	N69E	69	-45	25.9
FC03-16	1331.36	540786.00	5620473.70	N69E	69	-70	27.13
FC03-17	1375.25	540725.00	5620498.00	N36E	36	-35	46.9
FC03-18	1375.25	540725.00	5620498.00	N36E	36	-55	49.07
FC03-19	1375.25	540725.00	5620498.00	N36E	36	-69	55.78
FC03-20	1375.20	540725.00	5620498.00	N67E	67	-45	53.8
FC03-21	1375.20	540725.00	5620498.00	N67E	67	-60	56.7
FC03-22	1375.25	540725.00	5620498.00	N78E	78	-60	60.05
FC03-23	1375.25	540725.00	5620498.00	N78E	78	-80	61.87
FC03-24	1375.25	540725.00	5620498.00	N18E	18	-45	56.39
FC03-25	1375.25	540725.00	5620498.00	N18E	18	-80	57.3
FC03-27	1375.25	540725.50	5620498.00	N15W	345	-40	62.8
FC03-28	1375.25	540725.00	5620498.00	N15W	345	-70	63.4
FC03-30	1298.99	540846.86	5620417.93	N30E	30	-45	60.96
FC03-31	1298.99	540846.86	5620417.93	N30E	30	-70	57.6
FC03-32	1298.99	540846.86	5620417.93	N95E	95	-50	53.95

Table 10.1 – 2003 DH Survey Data

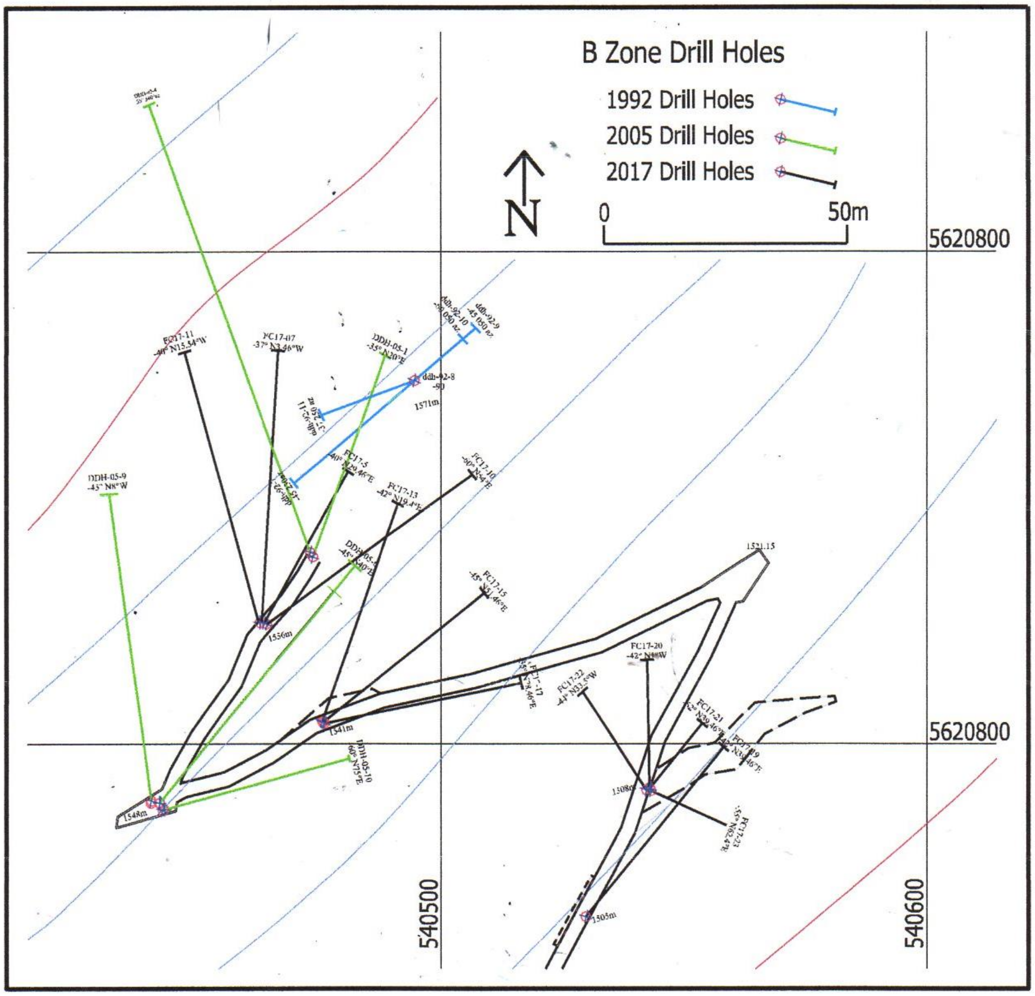


Figure 10.2 – Drill Hole Map – Zone B

DDH	ELEVATION	EASTING	NORTHING	Bearing		Angle	Total Depth m.
FC05-01	1561.34	540473.31	5620739.12	N20E	20	-35	53.04
FC05-02	1561.34	540473.31	5620739.12	N20E	20	-60	54.55
FC05-03	1561.34	540473.31	5620739.12	N20E	20	-90	86.26
FC05-04	1561.34	540473.31	5620739.12	N20W	340	-35	118.26
FC05-05	1561.34	540473.31	5620739.12	N20W	340	-50	19.81
FC05-06	1548.00	540445.65	5620689.88	N40E	40	-40	78.03
FC05-07	1548.00	540445.65	5620689.88	N40E	40	-60	122.53
FC05-08	1548.00	540445.65	5620689.88	N40E	40	-80	75.6
FC05-09	1548.00	540445.65	5620689.88	N8E	8.00	-45	81
FC05-10	1548.00	540445.60	5620689.88	N75E	75	-60	78.64
FC05-11	1548.00	540445.00	5620689.00	VERTICAL	0	-90	74

Table 10.2 – 2005 DH Survey Data

FRANCES CREEK BARITE PROSPECT 2003 DRILL CAMPAIGN - SAMPLE RESULTS					
Hole #	from (M)	to (M)	width(M)	%BaSO4	SG
FC03 - 10	19.82	21.04	1.22	31.42	3.31
FC03-11	17.53	19.21	1.68	29.20	3.18
FCO3-12	21.80	25.99	4.19	11.82	3.08
FC03-13	0.00	28.04	28.04	0.00	2.89
FC03-14	18.75	20.79	2.04	37.08	3.21
FC03-15	17.32	21.34	4.02	24.53	3.18
FC03-16	17.07	22.59	5.52	39.75	3.37
FC03-17	37.80	41.92	4.12	32.02	3.23
FC03-18	44.82	46.04	1.22	65.44	3.74
FC03-19	51.74	54.57	2.84	45.61	3.58
FC03-20	42.23	43.90	1.67	27.42	2.95
FC03-20	46.59	48.17	1.59	18.53	3.12
FC03-22	51.52	55.49	3.96	41.06	3.16
FC03-23	57.93	59.45	1.52	40.66	3.65
FC03-24	39.94	43.05	3.11	19.48	2.96
FC03-24	49.09	53.05	3.96	20.74	2.93
FC03-25	48.93	51.52	2.59	50.86	3.73
FC03-27	0.00	62.80	62.80	0.00	2.89
FC03-28	54.27	56.22	1.95	48.38	3.37

Table 10.3 – 2003 Drill Campaign – Barite Assay Results

FRANCES CREEK BARITE PROSPECT 2005 DRILL CAMPAIGN - SAMPLE RESULTS						
Hole #	**from (M)**	**to (M)**	**width(M)**	**%BaSO4**		**SG**
FC05-01A	**7.01**	**8.54**	**1.53**	**17.55**		**2.88**
FC05-01B	**37.20**	**39.94**	**2.74**	**16.50**		**3.17**
FC05-02A	**5.79**	**10.40**	**4.61**	**38.84**		**3.43**
FC05-02B	**30.18**	**32.30**	**2.12**	**65.47**		**3.99**
FC05-02C	**35.58**	**39.09**	**3.51**	**56.29**		**3.65**
FC05-03A	**5.95**	**12.20**	**6.25**	**52.15**		**3.60**
FC05-03A	**12.20**	**14.90**	**2.70**	**52.15**		**3.60**
FC05-03A	**14.09**	**19.05**	**4.96**	**52.15**		**3.60**
FC05-03B	**29.73**	**32.01**	**2.28**	**58.58**		**3.74**
FC05-03C	**38.41**	**41.16**	**2.75**	**53.30**		**3.60**
FC05-03D	**53.66**	**56.10**	**2.44**	**78.20**		**4.02**
FC05-04A	**7.47**	**8.50**	**1.03**	**33.59**		**3.35**
FC05-04A	**8.50**	**9.50**	**1.00**	**33.59**		**3.35**
FC05-04A	**9.50**	**20.27**	**10.77**	**33.59**		**3.35**
FC05-04B	**49.24**	**51.52**	**2.28**	**54.88**		**3.53**
FC05-05	0.00	19.81	19.81	**NO LAB DATA**		
FC05-06	**50.46**	**58.63**	**8.17**	**33.09**		**3.22**
FC-05-07	0.00	122.53	122.53	**NO LAB DATA**		
FC-05-08	0.00	75.60	75.60	**NO LAB DATA**		
FC05-09A	**46.52**	**49.39**	**2.87**	**42.28**		**3.45**
FC05-09B	**55.37**	**61.28**	**5.91**	**22.74**		**3.24**
FC05-09B	**67.07**	**69.51**	**2.44**	**17.47**		**3.16**
FC05-10	0.00	78.64	78.64	**NO LAB DATA - NO FAULTS**		
FC05-11	**29.88**	**32.32**	**2.44**	**48.44**		**3.49**

Table 10.4 – 2005 Drill Campaign – Barite Assay Results

10.2 Frances Creek – Voyageur Minerals, Ltd. 2017 Drilling Campaign

Exploration activities on the Frances Creek property were started at the end of June. The area was prepared by second author Brad Willis by clearing of the exploration trail and surveying the initial drill pad areas. Bertram Drilling was hired as the drilling contractor and they provided the excavator, drill and all equipment necessary to complete the drilling program. A Discovery II diamond core rig with NQ size core was used.

The drill was first located below the portal area to confirm the historical drilling and four shallow NQ drill holes were completed. Once the drill sites were prepared on the upper B Zone, the drill was moved and FC17-05 through FC17-23 were completed on the B Zone.

Operations were delayed by over one month due to forest fires in the area and the drilling operations were completed in late October.

The surface core holes were spaced and directed to intersect the zone perpendicular to the strike. The holes were drilled at angles from -40° to -55° with two holes per heading. Drill holes were spaced approximately with 10m distance between the barite hanging wall contact and fanned accordingly. The objective was to complete a resource study of the B Zone from surface down to a vertical depth of 50m.

All drilling was supervised by Brad Willis and Katelynne Brown and logging of core and collection of core was done by both Brad and Kate. The core was placed in plywood core boxes; the boxes were then labeled with depth information, etc. Upon completion of logging on site, the core was then split with a rock splitter and 50% of the core was bagged by both Brad and Kate and stored temporarily onsite. The remaining core was then transported to a storage locker located in Invermere, BC for safe keeping.

The drill holes were surveyed by WSP Canada and Brad Willis applied all data of the survey, mapping, sections and drawings into Microstation PC software. A drill log data base was created using Excel.

The drilling conditions were very tough due to the large fault zone on the footwall side of the barite zone. Drill bits were destroyed on a regular basis due to the ground conditions, in particular we drilled the soft maroon argillceous dolomite, entered the barite zone that consisted of soft pure barite and highly siliceous hard dolomite. The bits would be changed from a 5 series to an 11 series bit upon entering the zone. The holes would often create wedges within the barite zone of soft barite to hard dolomite creating high pressure squeeze on the bit. This would cause the teeth to disintegrate on many occasions. Drill hole FC17-10 was lost at 34m depth in the zone and FC17-12 was lost at 57m due to the hole diameter shrinking due to bit problems. Core recovery through the barite zone was also an issue in some holes due to washing out when not realizing the bit was deteriorating. Overall though, core recovery in the barite was an acceptable + 85%.

The 2017 holes were mostly collared in Zone B, as the barite breccia vein is thicker there. However, six of the 25 holes were collared in Zone A. A total of 1157.79M of core was drilled during the campaign. The drilling pattern used was similar to what was used in the earlier Tiger Ridge campaigns. That is arrays of fans were drilled from prepared stations along the same road used earlier.

In addition to the 25 holes that were drilled, three channel samples, totaling 13.9M length were cut from backhoe trenches constructed across prominent zones where the barite breccia vein outcropped. Details of the drill hole survey data as well as the assays from the drill holes are shown in **Tables 10.5** below:

VOYAGEUR MINERALS LTD.
FRANCES CREEK BARITE PROSPECT
2017 DRILL CAMPAIGN - SAMPLE RESULTS
PREPARED BY: Henkle and Assoc.

DRILL HOLE DATA - from Brad - 3/6/18

DDH	ELEVATION	EASTING	NORTHING	Bearing	Azimuth	Angle	Total Depth m.
FC17-01	1323.80	540805.84	5620465.94	N13W	347°	-36	18.29
FC17-02	1323.80	540805.84	5620465.94	N13W	347°	-50	19.00
FC17-03	1323.74	540807.38	5620465.02	N77E	77°	-87	24.00
FC17-04	1323.74	540807.38	5620465.02	N77E	77°	-45	21.00
FC17-05	1556.80	540463.50	5620724.71	N29E	29°	-40	46.00
FC17-06	1556.80	540463.50	5620724.70	N29E	29°	-57	64.00
FC17-07	1556.92	540462.70	5620725.00	N03.46W	365.54°	-37	69.00
FC17-08	1556.90	540462.70	5620725.00	N03.46W	365.54°	-60	66.00
FC17-09	1556.50	540464.04	5620724.49	N54E	54°	-45	73.50
FC17-10	1556.50	540464.04	5620724.49	N54E	54°	-60	34.00
FC17-11	1556.50	540462.60	5620725.00	N15.54W	344.46°	-40	74.00
FC17-12	1556.50	540462.60	5620725.00	N15.54W	344.46°	-61	57.00
FC17-13	1542.00	540475.00	5620704.00	N19.4E	19.4°	-42	63.00
FC17-14	1542.01	540475.42	5620704.54	N14.5E	14.5°	-60	63.00
FC17-15	1542.00	540475.40	5620704.50	N51.46E	51.46°	-45	60.00
FC17-16	1542.00	540475.42	5620704.54	N51.46E	51.46°	-67	60 - NO SPLS !
FC17-17	1541.80	540475.94	5620704.19	N78.46E	78.46°	-55	72.00
FC17-18	1564.05	540475.65	5620704.36	N41E	41°	-75	60 - FAULT
FC17-19	1505.53	540529.74	5620664.98	N39.46E	39.46°	-42	59.00
FC17-20	1508.42	540542.86	5620691.27	N01W	359°	-42	35.00
FC17-21	1509.80	540542.62	5620689.71	N39.46E	39.46°	-62	36.00
FC17-22	1508.27	540542.11	5620690.48	N33.5E	33.5°	-44	33.00
FC17-23	1507.99	540542.31	5620689.50	N62.4E	62.4°	-55	30.00
FC17-24	1360.80	540752.30	5620499.73	N84E	84°	-45	51.00
FC17-25	1360.80	540752.43	5620499.73	N65E	65°	-55	42.00
FC17-CHAN#3	1507.88	540556.21	5620700.23	N45E	45°	0	8.4
FC17-CHAN#2	1342.37	540784.74	5620500.16	N52E	52°	0	3
FC17-CHAN#1	1362.60	540762.71	5620517.38	N52.5E	52.5°	0	2.5

Table 10.5 2017 DH Survey Data

10.3 Results of Drilling

10.3.1. Mineralization - Frances Creek

Barite mineralization at the Frances Creek property occurs as a complex breccia vein which strikes NW and dips SW at about 40-50 degrees at the bottom zone and 65 degrees at the upper zone. The breccia vein occurs in the upper plate of the Forster Creek Thrust Fault, in the SW portion of the Frances Creek Claim, and is sub parallel to the trace of the thrust which outcrops ~ 200 m to the NE. The breccia vein material fills a small fault which was probably caused by tensional forces related to thrust emplacement. The Barite Thrust appears to act as an especially favorable host zone for barite mineralization emplacement Barite mineralization is also found as fracture fillings, in the other minor structures at the property however. The breccia vein is composed of mixed percentages of country rock (argillaceous dolomite) and white crystalline barite, which was injected into the Frances Creek Fault Zone (**Figure 7.6**).

As a consequence, zones were encountered within the vein with as little as 8.9% BaSO4 over 8.9m of core length and as high as 86.08% BaSO4 over 5.25m of core which were recovered during the 2017 drill program. The weighted average of all drill intercepts (2003 – 05 – 17) for the B Zone is 7.95m @ 40.09% BaSO4 / 3.31 SG. The weighted average for the A Zone drill intercepts is 2.71m @ 35.85% BaSO4 / 3.29 SG.

The calculated true widths and assay results from the 2017 drill holes across the B Zone are as follows:

FC17-5 TW - 8.17m @ 68.88% $BaSO_4$
FC17-7 TW - 21.29m @ 28.57% $BaSO_4$
FC17-8 TW - 36.63m @ 24.83% $BaSO_4$
FC17-9 TW - 36.03m @ 19.47% $BaSO_4$
FC17-10 TW - 11.86m @ 60.32% $BaSO_4$
FC17-11 TW - 23.88m @ 27.05% $BaSO_4$
FC17-12 TW - 18.70m @ 37.39% $BaSO_4$
FC17-15 TW - 15.22m @ 37.64% $BaSO_4$

Figure 7.6 shows core photos from drill hole FC17 – 05 and is intended to illustrate the non-homogeneous nature of the vein mineralization. The photos show that Crystalline barite in varying percentage concentrations is consistent though out the breccia zone of the vein. In order to test the purity of the crystalline barite portion of the breccia, a select sampling program was initiated. Eight drill holes were selectively re-sampled. These samples were selected from previously reported intersections of barite breccia. The pure barite zones within the breccia intercepts were then split from the vein to determine the nature of the purity of the barite.

Hole Number	**Crystalline Barite Zone Sampled**	**%BaSO4**	**Specific Gravity**
FC17-5	23.7m-24.9m	97.76%	4.36
FC17-7	25.6m-25.8m	97.74%	4.46
FC17-7	32.4m-32.9m	99.12%	4.50
FC17-7	51.5m-53.4m	96.41%	4.44
FC17-8	24.5m-24.9m	97.02%	4.47
FC17-8	41.2m-43.8m	97.81%	4.39
FC17-9	16.9m-24.3m	97.58%	4.46
FC17-10	19.9m-33.5m	96.87%	4.36
FC17-11	33.0m-41.9m	97.26%	4.40
FC17-12	32.0m-48.6m	96.89%	4.40
FC17-15	29.7m-32.8m	95.32%	4.33

TABLE 10.6 Results of Select Sampling of 2017 Drill Core

Crystalline barite in varying percentage concentrations is consistent though out the breccia zone of the vein. The sampling shows a very high grade for the crystalline barite. This select sampling of the crystalline barite to date indicates that it is exceptionally pure and is possibly pharmaceutical grade.

10.3.2 Reliability of Data

To the best of the writer's belief, there were no drilling, sampling or adverse recovery factors that could have materially impacted the accuracy or reliability of the assay results shown above. It should be noted, that true thickness are not shown for drill intercepts in **Tables 10.6, 10.7 and 10.8**; these are the actual drill intercepts. True thickness was calculated for a press release issued by Voyageur in December, 2017. However, the actual drill intercepts were entered into the Map Info program which was used to calculate the resource estimate for this report. The program adjusts for true thickness when the resource is calculated.

Chart 10.1, the Barite Purity Curve, shows a linear relation between barite purity and SG. This chart uses assay data from all 183 samples that were assayed during the program. The linear relation shows a continuous transition from low purity – low SG samples to high purity – high SG samples. Charts such as this are standard for barite deposits worldwide. The continuous transition from 0% BaSO4 – SG ~ 2.5 to 100% BaSO4 – SG ~ 4.5 is strong evidence, that the assay data is reliable. Similar charts with similar data relationships were published in both the 2014 and 2016 Technical Reports. This is strong evidence for data reliability.

10.3.3. Back Up Data

The actual drill logs, survey notes, assay reports, etc. from which the drill data presented in this section were derived is available from either Voyageur or the senior author. Interested parties can contact the senior author at henklewilliam@gmail.com or the second author at willycj@me.com, to arrange for verification copies of the back up data.

VOYAGEUR MINERALS, INC. FRANCES CREEK BARITE PROSPECT 2017 DRILL CAMPAIGN - SAMPLE RESULTS PREPARED BY: Henkle and Assoc.					2018-03-13 1 OF 2
Hole #	**from**	**to**	**width**	**%BaSO4**	**SG**
FC17-01	12	14.9	2.9	77.65	4.02
FC17-02	9	10.2	1.2	68.92	3.87
FC17-04	18	18.94	0.94	52.30	3.52
FC17-05	16.44	25.34	8.9	68.88	3.80
FC17-06	20.3	37.5	17.2	66.40	3.70
FC17-07A	20.2	33.73	13.53	23.38	3.15
FC17-07B	43.2	54.17	10.97	35.80	3.29
FC17-08A	24	30.51	6.51	26.47	3.08
FC17-08B	39	44.25	5.25	86.08	4.06
FC17-08C	52.2	64.5	12.3	32.13	3.18
FC17-09A	15	24.7	9.7	40.29	3.27
FC17-09B	35.5	38.3	2.8	20.80	3.05
FC17-09C	42.5	55.5	13	24.85	3.09
FC17-09C	50.5	55.5	5	24.85	3.09
FC17-10	17.6	19	1.4	60.32	3.49
FC17-10	19	32.5	13.5	60.32	3.49
FC17-10	32.5	33.6	1.1	60.32	3.49
FC17-11A	22.2	24.5	2.3	26.37	3.13
FC17-11A	24.5	25.7	1.2	26.37	3.13
FC17-11A	25.7	26.7	1	26.37	3.13
FC17-11B	32.7	40.7	8	35.38	3.26
FC17-11B	40.7	41	0.3	35.38	3.26
FC17-11B	41	53.2	12.2	35.38	3.26
FC17-11C	61.3	63.3	2	71.08	3.71
FC17-11C	63.3	64.1	0.8	71.08	3.71

Table 10.7 2017 Drill Campaign – Barite Assay Results – 1 of 2

VOYAGEUR MINERALS, INC. 2018-03-13
FRANCES CREEK BARITE PROSPECT
2017 DRILL CAMPAIGN - SAMPLE RESULTS 2 OF 2
PREPARED BY: Henkle and Assoc.

Hole #	from	to	width	%BaSO4	SG
FC17-12A	20.5	21.5	1	19.03	2.98
FC17-12B	25	32.7	7.7	41.46	3.29
FC17-12B	32.7	33.2	0.5	41.46	3.29
FC17-12B	33.2	57	23.8	41.46	3.29
FC17-13A	20.5	21.1	0.6	41.94	3.28
FC17-13A	21.1	30.8	9.7	41.94	3.28
FC17-13B	32.9	33.2	0.3	41.63	3.34
FC17-13C	41.4	42.2	0.8	34.38	3.38
FC17-13C	42.2	46.4	4.2	34.38	3.38
FC17-14A	27.9	29.4	1.5	55.11	3.38
FC17-14A	29.4	29.5	0.1	55.11	3.38
FC17-14A	29.5	33.3	3.8	55.11	3.38
FC17-14B	36.6	43.3	6.7	53.46	3.35
FC17-14C	45.9	47.5	1.6	57.92	3.40
FC17-15	21.5	24	2.5	37.79	3.27
FC17-15	24	38.4	14.4	37.79	3.27
FC17-16	35.7	44.6	8.9	8.91	2.91
FC17-17	26.6	56.7	30.1	28.83	3.15
FC17-20	5	8	3	22.73	3.02
FC17-20	8	10.5	2.5	22.73	3.02
FC17-21	7	13.3	6.3	61.16	3.78
FC17-22	6	9.1	3.1	27.09	3.16
FC17-22	9.1	16	6.9	27.09	3.16
FC17-24A	29	32	3	19.63	3.13
FC17-24B	45	48	3	52.54	3.48
FC17-25	32.7	36.9	4.2	30.06	3.17
FC17-CHN #3	0	8.4	8.4	51.29	3.47
FC17-CHN #2	0	3	3	57.38	
FC17-CHN #1	0	2.5	2.5	46.00	

Table 10.8 2017 Drill Campaign – Barite Assay Results – 2 of 2

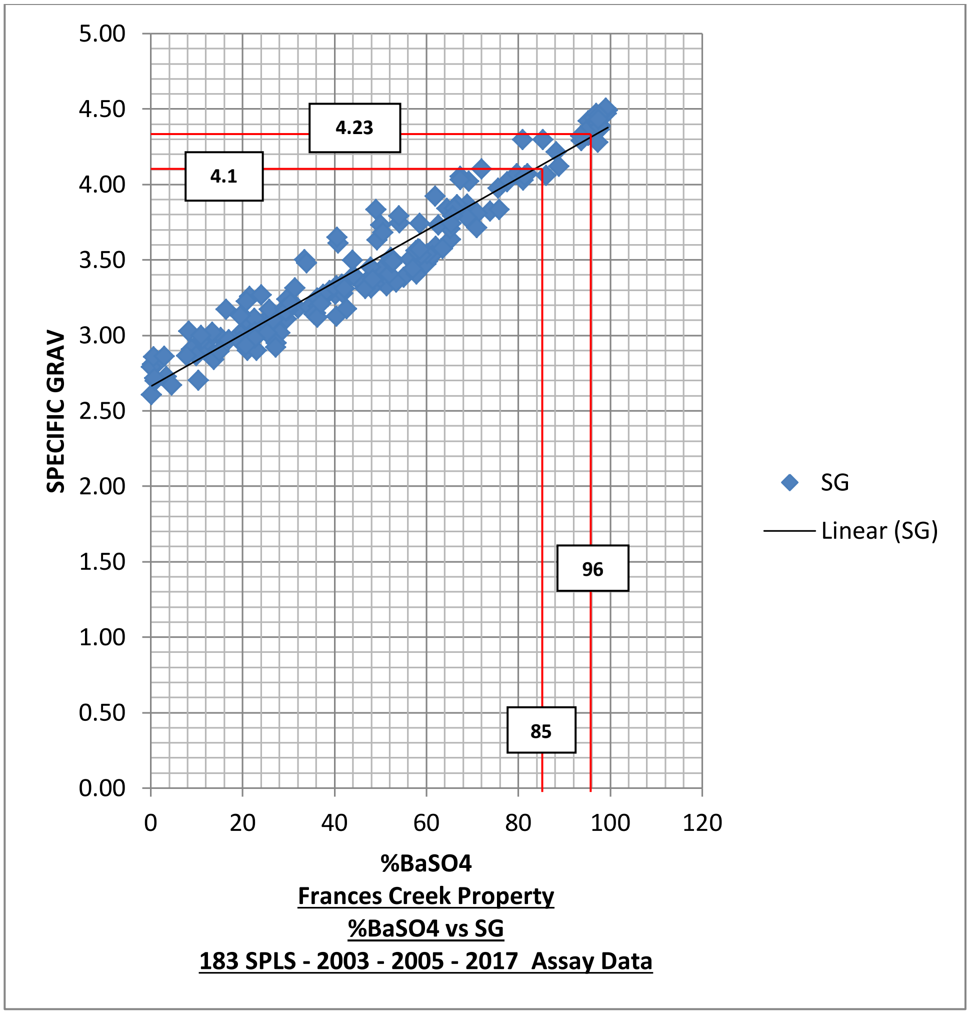


Chart 10.1 Barite Purity Curve

11.0 Sample Preparation, Analysis and Security

11.1 Sample Collection and Preparation

Two types of hand samples were taken from outcrops to get barite quality data for this report. These were targeted grab samples and rock chip samples. The goal of both sample techniques is to attempt to take a representative sample of the outcrop. Of the two, the rock chip sample is the more representative sample, but it is also somewhat more time consuming.

The senior author took a total of four targeted grab samples during the field portion of this investigation, the number being primarily due to time constraints. From 4 to 8 pieces of barite were chipped off of the outcrop with a geologist's rock hammer and placed in a labeled sample bag. The specific locations where each rock chip was taken were chosen so as to obtain as representative a sample of the outcrop as possible.

The junior author took four channel samples of nearly pure barite from the Frances Creek Vein during the 2015 exploration season and one large trench sample (17 tonnes) using an excavator during the 2016 exploration season at Frances Creek. During the 2017 drilling campaign, three channel samples were taken. For details of how these samples were taken, refer to **Section 9.3.4**.

During the three drilling campaigns discussed in **Section 10**, continuous core samples were collected from the drill holes. Drill core samples are recognized in the mining industry as the "gold standard" with respect to representative sampling of mineralized zones. This is because a cylinder of rock is collected which completely penetrates the mineralized body.

During the 2014 field portion of this investigation, the authors sampled core from 22 holes that had been drilled at Frances Creek during 2003 and 2005. Core boxes from each hole were examined and boxes containing intervals of interest, as per the geologist log, were examined in detail, and photographed. Barite rich sections of the core were taken from the core box and sealed in labeled zip lock bags. Notes were taken as to intervals sampled in each core box. Labeled sample bags were placed in containers labeled as to hole number and transported to Loring Laboratories (Alberta), Ltd., of Calgary, Alberta ("Loring Labs") for analysis. The junior author transported the core to the lab from the field.

During the 2017 drill campaign, the drilling crew placed the cores in a wooden, portioned, core box. The cores were extruded from the core barrel in depth sequence and the intervals were marked (**Figure 7.6**), by the crew. The core box was then taken to the field office where the geologist described, logged and photographed the core. The barite rich sections of the core were then taken from the box and split with a core splitter. One half of the split core was placed in a labeled plastic bag, the other half was returned to the core box. The labeled sample was then logged into the sample spread sheet and placed in temporary, secure storage.

Once a sufficient number of bagged and labeled samples were collected, the geologist (second author) then transported the samples to Loring Labs in Calgary, where they were submitted to the laboratory. At the laboratory, the samples were catalogued on a “Chain of Custody” form which was signed by a lab technician as well as by the sample submitter (second author). The samples were then taken into the lab for preparation and analysis.

11.2 Analysis

Loring Labs, an independent commercial analytical laboratory, was used as the laboratory for the samples taken for the 2014 and 2015 outcrop sampling campaigns, as well as for the samples taken during the 2017 drill campaign. Loring is an ISO 9001 certified lab. Three of the samples taken during the 2015 campaign were sent to SGS labs in Lakefield, ON, which is also an ISO 9001 certified lab. Both labs enjoy superb reputations for analytical accuracy and repeatability in the Canadian mining industry.

Samples were analyzed for Specific Gravity by the Le Chatelier bottle method, the official API recognized method for determination of SG for Barite. Samples were analyzed for Barium by gravimetric analysis using a fusion platinum crucible. Once the ppm value for Ba was obtained, % $BaSO_4$ was determined by a mathematical calculation (it was assumed that all the available SO_4 combined with the Ba to form Barite). Mercury content was determined by ASTM method D - 6722, which is a total mercury by direct combustion analysis.

Cadmium, lead, copper, silver and calcium analyses, as well as 39 other elements were determined by multi acid digestion - ICP methods. Soluble calcium was determined by the standard API test method to dissolve calcium and then by ICP to determine the amount of calcium dissolved.

The brightness – whiteness testing was done at SGS labs in Lakefield, ON., which is one of the only labs in Canada that does this type of work. The testing is a photovoltaic color analysis technique which measures the reflectance of light coming off of a powdered barite specimen. Several different readings are taken for each sample. Of these, the Hunter L value is the main brightness / whiteness number relied upon by the filler manufacturing industry to determine if a particular barite product makes specification. A Hunter L value of 94.0 or higher is usually required to make specification. The three samples tested from Frances Creek were all above 94.0; averaging at 94.36.

11.2.1 Laboratory Sample Preparation

Each rock chip and core sample was prepared by:

- logging the sample into the Laboratory's tracking system (assigning the sample a unique bar code number)
- drying and weighing the sample
- fine crushing the sample to > 70% passing 2 mm
- splitting off a 250 gm subsample
- pulverizing the sub sample to > 85% passing 75 micron

The sub sample was then analysed by the methods discussed in **Section 11.2**.

11.2.2. Laboratory Quality Assurance/Quality Control

Loring Labs and SGS Labs are both certified laboratories. Loring is certified through the ISO 9001:2008 standard and SGS through the ISO/IEC standard. To obtain these certifications, a rigorous in-house system to prevent cross contamination between samples is in place. Elements of the system include the use of barren wash material between sample preparation batches and where necessary between highly mineralized samples, through cleaning of all glassware and the tracking of samples with high mineral values. To ensure quality control and quality assurance, the lab employs, on a routine basis, a program that uses blanks, duplicates and standards.

Loring Lab's Quality Management System ISO certificate (Certificate # CERT - 0088592) issued by SAI Global, states that the lab has implemented and maintains a Quality Management System that fulfills the requirements of the ISO 9001:2008 standard. The certificate was issued on June 08, 2015 and is valid until July 12, 2018. SGS Canada's – Mineral Services – Lakefield Labs were assessed by the Standards Council of Canada(SCC) and were found to conform with the requirements of ISO/IEC 17025:2005 (CAN-P4E) and was recognized as an Accredited Testing Laboratory. The accreditation certificate for Laboratory #184 was issued on 2013-05-07 and is valid until 2017-03-06.

11.2.3 Adequacy of sampling, sample prep, security and analyses

Henkle and Associates is of the opinion that the samples taken are adequate for the purpose of this report which is to provide an independent assessment of Voyageur's Frances Creek Property, as well as an indication of the possible industrial grade quality of the barite from the Frances Creek Property. Sampling, sample prep and analyses techniques meet or exceed CIM standards. Security precautions as to sample integrity meet the standards of the industry.

11.3 Sample Security

The samples taken by both the senior and junior authors between 2014 and 2016 and the 2003, 2005 and 2017 core samples collected by both authors, were kept under the direction of either Henkle and Assoc. or Voyageur - Tiger Ridge personnel from the time of taking the sample until delivery to the laboratory. Neither author is aware of any security or chain of custody issues with respect to sample security.

12.0 Data Verification

Loring Labs of Calgary, Alberta, Canada did the bulk of the assay work on the drill core samples from the Frances Creek Project. A total of 68 individual assays from 43 core holes were used to calculate the resource estimate presented in this report. The analyates tested for by Loring Labs were Specific Gravity (SG), %BaSO4 and trace elements by the Inductively Coupled Plasma (ICP) technique.

ALS – Chemex Labs, of Reno, Nevada, USA was used as an umpire lab, to check Loring's work. A total of 14 samples (20.5%) were submitted to ALS for check testing. The samples submitted to ALS were pulps of the originals. This means that the crushing, splitting, grinding and other preparatory work prior to analysis was done at Loring Labs. Only the actual analysis work was done at the ALS umpire lab. It is the opinion of both authors, that the sample preparatory work did not need to be duplicated.

A listing of the check samples follows:

Check Sample #	Hole #	Intersection
1	FC17-01	12m-14.9m
12	FC17-08	39m-44.25m
15	FC17-09	28.8m-30.6m
16	FC17-09	35.5m-38.3m
22	FC17-11	45.3m-47.3m
31	FC17-13	32.9m-33.2m
50	FC17-17	39m-42m
66	HG FC17-17	48.7m-49m
67	FC17-17	56.3m-56.7m
53	HG FC17-07	32.4m-32.9m
55	HG FC17-05	23.7m-24.9m
57	HG FC17-08	41.2m-43.8m
58	HG FC17-09	16.9m-24.3m
60	HG FC17-11	33m-41.9m

Table 12.1 Check Samples For Lab Comparison

12.1 Specific Gravity SG

Specific Gravity is the most important specification for drilling grade barite and is also an important specification for the higher grade barites. The American Petroleum Institute (API) specifies that the LeChatlier Flask method as the default method to measure SG. Both labs used this method to determine SG, the comparison results are shown in **Chart 12.1**, below.

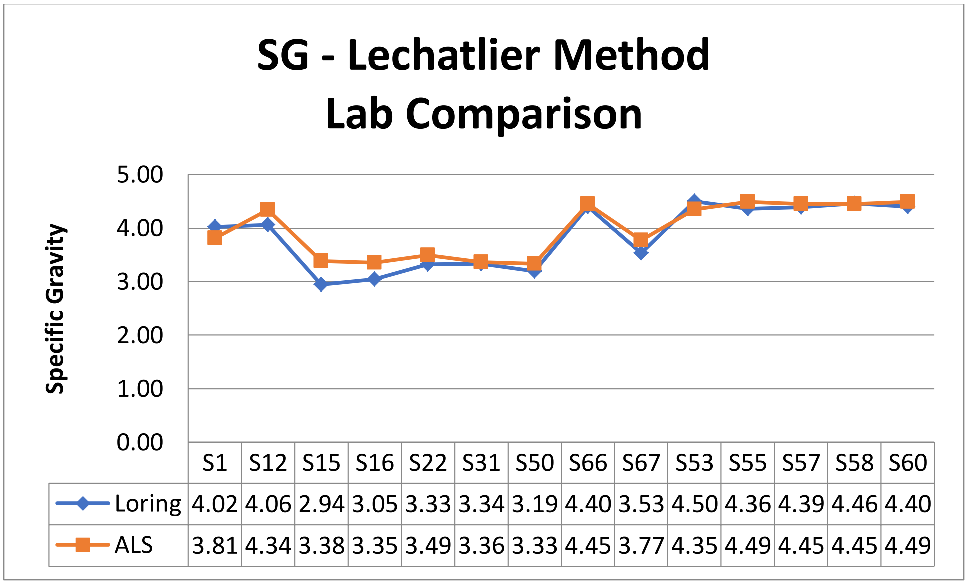


Chart 12.1 Lab Comparison – SG

Chart 12.1, shows that in 11 out of the 14 analyses, the SG determined by Loring was slightly lower than that determined by ALS. The differences between Loring and ALS ranged between 87.1% to 105.4% of the ALS reported value. The average Loring reported value was 97% of the reported ALS value. The authors accept this as good correlation between the two labs; the Loring data is acceptable to use for the resource estimate.

12.2 %BaSO4

Both labs use gravimetric methods to determine % BaSO4. Loring Labs uses a methodology first published in 1905. This method precipitates BaSO4 as a final analyses product and the result is reported as % BaSO4. ALS uses an in-house analytical method (Ba-GRA-81) which also precipitates BaSO4% as a final analyses product. The ALS result is reported as % Ba – stoichiometric equations must be used to convert to % BaSO4. The comparison results are shown as **Chart 12.2.**

Chart 12.2, shows that in 14 out of the 14 analyses, the % BaSO4 determined by Loring was slightly higher than that determined by ALS. The differences between Loring and ALS ranged between100.7% to 111.9% of the ALS reported value. The average Loring reported value was 104.5% of the reported ALS value.

Of the 14 samples selected for check analysis, 6 out of 14 analyzed + 94% BaSO4. These were hand selected samples of nearly pure barite, and are thought by the authors to be representative of the future finished barite products to be produced at the Frances Creek Property. These are samples 66-53-55-57-58-60; they are designated in **Table 12.1** by the initials HG.

When one considers only the 6 higher grade samples, differences are of lesser magnitude. **Chart 12.3**, shows that in 6 out of the 6 analyses, the % BaSO4 determined by Loring was still slightly higher than that determined by ALS. The differences between Loring and ALS ranged between 100.7% to 103% of the ALS reported value. The average Loring reported value was 102% of the reported ALS value. The authors accept this as good correlation between the two labs when restricted to the + 94% BaSO4 samples. We believe that the Loring data is acceptable to use for the resource estimate.

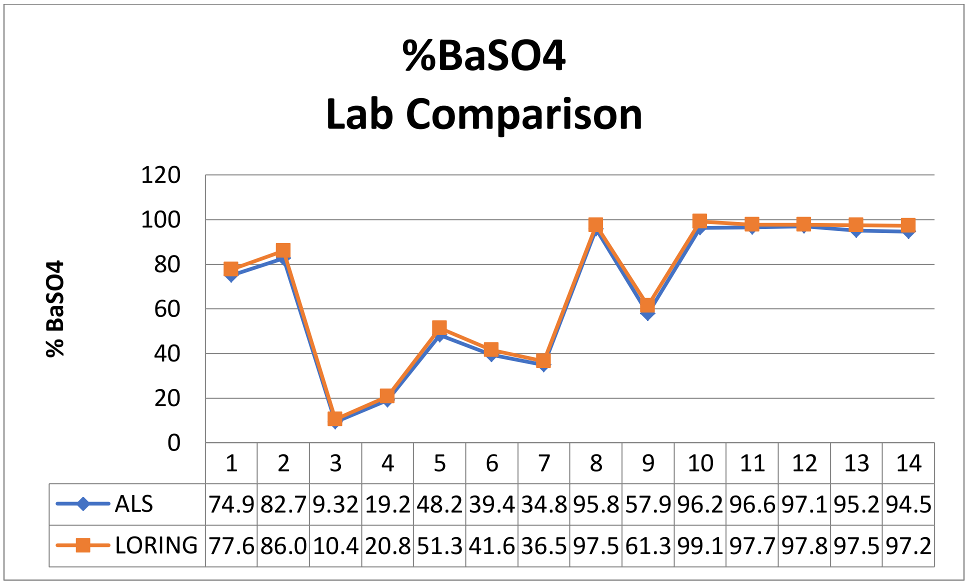


Chart 12.2 Lab Comparison – % BaSO4

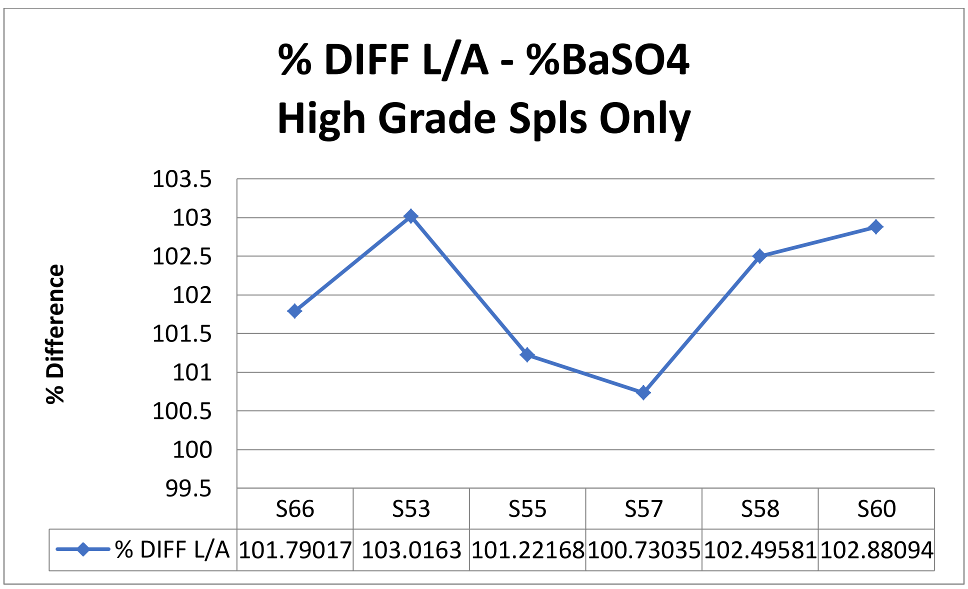


Chart 12.3 Lab Comparison – % BaSO4 – High Grade Samples

12.3 ICP

The ICP analysis method is used to determine trace element specifications for the Barite industry. Both labs offer various ICP analysis packages to their clients. Loring used it's standard 30 Element ICP analysis package for the Frances Creek program samples. This package uses 3 acids and aqua regia to dissolve the sample. Loring states on the analysis sheet, that the sample undergoes near total digestion. This means that near 100% of each analyate is available for the ICP analysis.

ALS offers its ME-ICP61 – 33 Element analysis, which we chose for the umpire analysis of the 14 submitted samples. Most, but not all of the 30 Elements analyzed for by Loring are also analyzed for in the ALS package; lower detection limits between the two packages are also considerably different. ALS uses an industry standard 4 acid digestion to prep the samples for analysis and does not use any other reagents to completely dissolve the sample.

Table 12.2, compares the analyses of 11 of the more important trace metals which determine the specifications for higher grades of barite products. The yellow shading indicates the 6 high grade samples discussed previously. The ALS results are shown in red font.

		As	Bi	Cd	Cu	Hg	Pb	Sb	Sn	Sr	Fe	Ca
		ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	%
LORING	S1	1	3	1	7	na	3	4	na	3705	0.30	2.40
ALS	S1	<5	<2	<0.5	1	0.015	3	<5	na	3550	0.25	1.6
LORING	S12	2	<1	<1	3	na	1	4	na	1313	0.30	2.37
ALS	S12	<5	<2	<0.5	<1	0.013	<2	<5	na	2590	0.3	2.53
LORING	S15	2	<1	1	19	na	32	<1	na	748	0.73	13.41
ALS	S15	5	<2	<0.5	6	0.032	6	5	na	1340	0.83	15.3
LORING	S16	1	<1	<1	13	na	23	1	na	1449	0.63	12.22
ALS	S16	<5	2	<0.5	6	0.022	3	<5	na	2060	0.7	13.75
LORING	S22	<1	1	1	8	na	8	<1	na	1257	1.01	8.60
ALS	S22	<5	2	<0.5	1	0.018	3	<5	na	2650	1.05	9.11
LORING	S31	1	<1	1	5	na	12	1	na	2390	0.81	9.04
ALS	S31	<5	<2	0.5	1	0.018	4	<5	na	3230	0.84	9.63
LORING	S50	2	<1	1	1031	na	78	2	na	1778	1.20	8.19
ALS	S50	<5	<2	<0.5	3	0.026	4	<5	na	1915	1.23	8.7
LORING	S66	121	<1	<1	23	na	5	<1	na	820	0.77	7.01
ALS	S66	<5	<2	<0.5	1	<0.005	<2	<5	na	2460	0.86	7.67
LORING	S67	36	<1	<1	9	na	<1	<1	na	1759	0.05	0.36
ALS	S67	<5	<2	<0.5	<1	0.005	<2	<5	na	2910	0.04	0.35
LORING	S53	1	<1	<1	9	na	5	<1	na	1780	0.06	0.09
ALS	S53	<5	<2	<0.5	1	0.005	<2	<5	na	3040	0.06	0.08
LORING	S55	<1	2	<1	20	na	5	<1	na	1799	0.02	0.25
ALS	S55	<5	<2	<0.5	<1	<0.005	<2	<5	na	3330	0.02	0.12
LORING	S57	<1	<1	<1	9	na	4	<1	na	1937	0.01	0.31
ALS	S57	<5	<2	<0.5	1	<0.005	<2	<5	na	3080	0.01	0.03
LORING	S58	<1	<1	<1	10	na	2	<1	na	1460	0.04	0.32
ALS	S58	<5	<2	<0.5	<1	<0.005	<2	<5	na	2730	0.04	0.33
LORING	S60	<1	<1	<1	25	na	2	<1	na	1711	0.05	0.44
ALS	S60	<5	<2	<0.5	1	<0.005	<2	<5	na	3300	0.05	0.4

Table 12.2 Lab Comparison – Trace Elements by ICP

As – Arsenic – The lower detection limit (LDL) for As for Loring is 1 ppm; for ALS, it is 5 ppm. ALS reports all samples as < 5ppm. Loring reports 9 out of 14 as 1 or <1 ppm. Loring reports samples S66 and S67 as 121 and 36 ppm respectively. These are probably statistical outliers; S67 is a low grade sample and the As probably resides in the gangue portion of the sample.

Bi – Bismuth – The LDL for Loring is 1 ppm while for ALS, it is 2 ppm. Both labs report very low concentrations for Bi in the samples tested.

Cd – Cadmium –. ALS reports 1 sample out of 14 at LDL (0.5 ppm) and 13 out of 14 at below LDL. Loring reports 5 samples out of 14 at the LDL (1.0 ppm) and 9 out of 14 below LDL for this metal.

Cu – Copper – The LDL for Loring was not attained, while for ALS, it is 1.0 ppm. ALS reports S15 and S16 at 6 ppm, while Loring reports the same samples at 19 and 13 ppm. ALS reports S50 at 3 ppm, while

Loring reports the same sample at 1031 ppm. The remaining 11 samples are reported at 1 or <1 by ALS and a range of 25 – 3 ppm by Loring.

This is the most glaring discrepancy between the two labs. The report by Loring of 1031 and ALS of 3 ppm can be explained away as a statistical outlier – also the sample only assayed at 36.5% $BaSO_4$ by Loring and 34.8% by ALS. Most likely, the anomalous Cu is with the gangue material and will drop out during milling. For the six high grade samples, ALS reports and average of ~ 1 ppm Cu, while Loring reports an average of 16 ppm Cu.

There is still a discrepancy between the two labs when reporting Cu however. The reason for the wide difference between the two labs is probably due to incomplete digestion of the sample before analysis. Since Loring's sample preparation procedure results in complete sample digestion, Loring's analyses are probably more exact for copper.

<u>Hg – Mercury</u> – ALS uses ICP methodology to assay for mercury, Loring uses the Teledyne mercury analyzer method. As per **Table 12-2**, ALS reports values of 0.026 ppm (26 ppb) - < .005 ppm (5 ppb) for Hg; Loring did not assay these samples for mercury. Consequently, a direct cross check for this element is not possible.

Since 2014 however, Loring has assayed four core samples and 7 outcrop channel samples assaying at + 95% $BaSO_4$ for mercury. Of the outcrop samples, three were collected by the senior author and 4 were collected by the junior author. The core samples were from the 2005 drill program; these were selected by the senior author and sent for assay during the 2014 field investigation at the property. These results are shown in **Table 12.3** below:

ALS reported Hg values of 26 ppb to < 5 ppb for 14 samples. Loring reported Hg values of 19 ppb to 1 ppb for a different set of 11 samples taken from the Frances Creek Property. These results are very similar. Even though the mercury assays from the two labs cannot be compared directly, an indirect comparison suggests good correlation between the two labs for this heavy metal. It should be noted, that the specification limit for mercury in commercial barite products is 1 ppm, several orders of magnitude higher than were found in any of these test samples.

<u>Pb – Lead</u> – Inspection of **Table 12.2** shows that Loring reported values of 78 ppm to 1 ppm vs. a max of 6 ppm - < 1 ppm for ALS for the 8 lower grade samples tested. For the + 94% $BaSO_4$ samples, Loring reported from 5 ppm to 2 ppm (average = 3.8 ppm) and ALS reported all 6 samples at < 2 ppm.

It is not possible to say, which lab is correct in this instance. We suspect that the reason for the wide difference between the two labs is probably due to incomplete digestion of the sample before analysis. Since Loring's sample preparation procedure results in complete sample digestion, Loring's analyses are probably more exact.

Sample #	Hole / Depth	% BaSO4	Hg – ppb	SG
BA – Dens 1	05-03/5.9-8.2m	98.58	2	4.48
BA – Dens 2	05-03/29.7-32m	95.86	3	4.42
BA – Dens 3	05-04/7.5-8.5m	99.26	1	4.48
BA – Dens 3	05-04/16.3-20.3m	97.86	2	4.47
FC 1 – 2015	CHAN – 1.41m	98.54	7	4.48
FC 2 – 2015	CHAN – 1.25m	98.76	6	4.48
FC 3 – 2015	CHAN – 0.92m	88.76	7	4.18
FC 4 – 2015	CHAN – 1.4m	97.86	5	4.47
8/12/14-1	Rock Chip – Nd	91.78	19	4.12
8/12/14-2	Rock Chip – Nd	86.18	6	4.05
8/13/14-1	Rock Chip – Nd	70.02	14	3.62

Table 12.3 Hg Assays – Loring Labs

Sb – Stibnite – The lower detection limit (LDL) for Sb for Loring is 1 ppm; for ALS, it is 5 ppm. ALS reports 13 out of 14 samples as < 5ppm, and one sample at 5 ppm. Loring reports 2 samples at 4ppm, 1 sample at 2 ppm, 2 samples at 1 ppm and 9 samples at <1 ppm. There is good correlation between the two labs for this trace metal.

Sn – Tin – Neither lab analyzed for this trace metal.

Sr – Strontium – Inspection of **Table 12-2** and **Chart 12.4**, reveals that there is very poor correlation between the two labs with respect to ICP analyses for this trace metal. Percent differences between the two labs for this analyate range from a low of + 4.18% to a high of – 199.85%. The reason for the wide difference between the two labs is probably due to incomplete digestion of the sample before analysis. Since Loring's sample preparation procedure results in complete sample digestion, Loring's analyses are probably more exact.

Fortunately, the maximum allowable SrSO4 percentage allowed in various grades of finished barite products varies from 2.0% to 2.5%, or 20,000 to 25,000 ppm SrSO4. This is an order of magnitude higher than the levels of Sr detected by either lab. The lowest Sr concentration detected was 748 ppm and the highest was 3705 (both detected by Loring). A stoichiometric calculation for SrSO4 using these two numbers ranges from 1570.8 ppm to 7780.5 ppm, well below these limits.

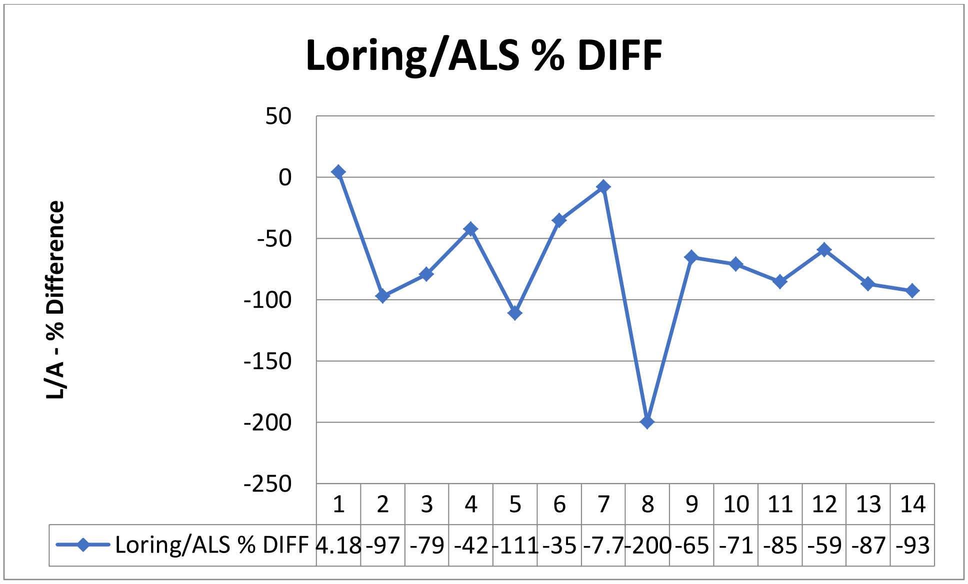


Chart 12.4 Comparison of % Difference Loring/ALS for Sr

<u>Fe – Iron</u> – Inspection of **Table 12.2** shows that 5 out of 14 samples (36%) analyzed for this metal showed noticeable differences between the two labs, while 9 out of 14 (64%) showed no or minimal difference between the two labs.

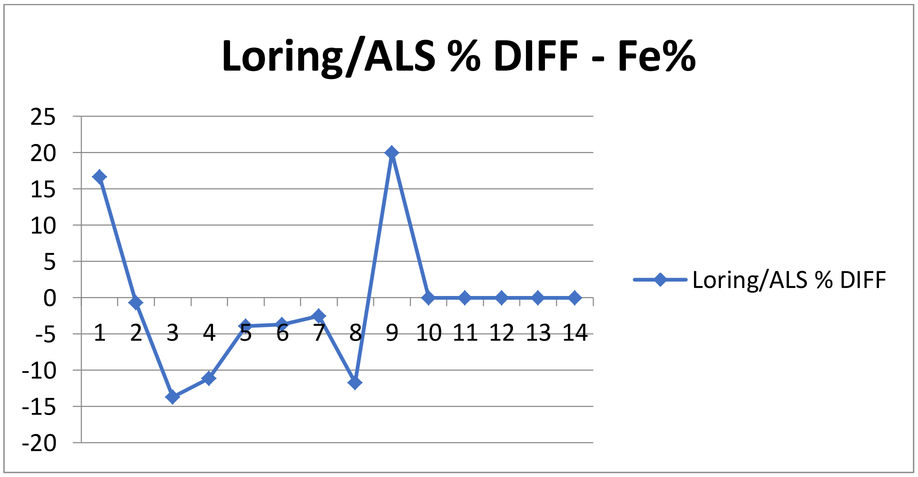


Chart 12.5 Comparison of % Difference Loring/ALS for Fe

Inspection of **Chart 12.5** shows that for the 9 samples with good correlation, the difference was less than 5% for 4 of the samples and 0% for 5 of the samples. For the six +94% $BaSO_4$ samples, which Voyageur believes will be representative of the finished barite products, one had a difference of 11.7% and five had a difference of 0%.

<u>Ca – Calcium</u> – Inspection of **Table 12.2**, shows that there is a wide variation between the two labs when analyzing for this metal. The divergence between the two labs was greater than 10% in 6 out of 14 samples analyzed (43%). For the +94% $BaSO_4$ samples, the differences varied from – 3.1 to + 90.3%. **Chart 12.6** shows this in graphical format.

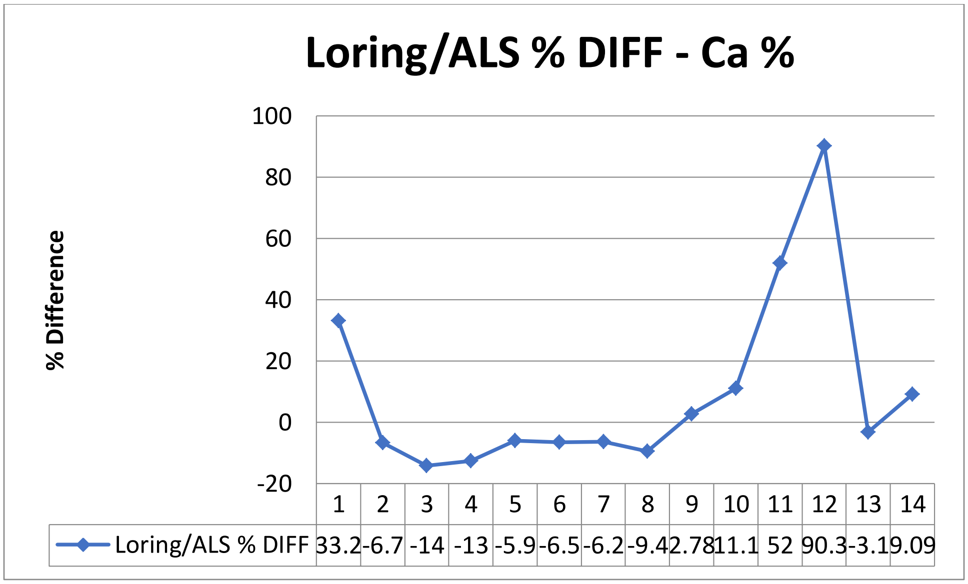


Chart 12.6 Comparison of % Difference Loring/ALS for Ca

The reason for the wide difference between the two labs is probably due to incomplete digestion of the sample before analysis. Since Loring's sample preparation procedure results in complete sample digestion, Loring's analyses are probably more exact.

Lot	Strontium (≤ 2.5%)	Silica (≤ 1.0%)	% BaSO4
Barite sample 1 200 mesh	0.59%	0.13%	97.80%
Barite sample 1 200 mesh 12% HCl	0.62%	0.18%	97.90%
Barite sample 2 >200 mesh	2.08%	0.17%	97.20%
Barite sample 2 >200 mesh 12% HCl	1.54%	0.15%	97.70%

Table 12.4 Results from 12% HCl Acid test

SAMPLE #	SAMPLE WIDTH	BaSO4 %	SG	Ca ppm	Cd ppm	Hg ppb	Pb ppm	As ppm	Sr ppm	Al2O3 %	Fe2O3 %	SiO2 %
FC1 2015	1.41m	98.54	4.48	34	<1	7	6	2	8162	0.03	0.02	0.05
FC2 2015	1.25m	98.76	4.48	24	<1	6	4	1	5380	0.01	0.01	0.06
FC3 2015	0.92m	88.76	4.18	29	<1	7	4	<1	9023	0.27	0.53	0.54
FC4 2015	1.4m	97.86	4.47	24	<1	5	4	1	8864	0.06	0.03	0.10

TABLE 12.5a- 2015 Outcrop Sample Results – Chemical Testing - Frances Creek Property

SAMPLE #	SG (4.1 - min)	% BaSO4	Hg - ppm (1.0 max)	Cd - ppm (3.0 max)	SOLUABLE Ca - ppm (250 max)
8/12 - 1	4.12	91.78	.019	<1	94
8/12 - 2	4.05	86.18	.006	<1	155
8/13 - 1	3.62	70.02	.014	<1	139

TABLE 12.5b - 2014 Outcrop Sample Results – Chemical Testing - Frances Creek Property

12.4 QP's Opinion as to Data Adequacy

It is the Senior Author's opinion, that the SG and % BaSO4 laboratory data from both Loring Labs and ALS Labs is adequate for the purposes of this report and can be used for the resource calculation. Both labs were in reasonable agreement with respect to these two analyses.

As discussed in **Section 12.3**, the ICP analyses for the same sample often showed wide differences between the two labs. As mentioned earlier, we suspect that the reason for the wide difference between the two labs is probably due to incomplete digestion of the sample before analysis. Since Loring's sample preparation procedure results in complete sample digestion, Loring's analyses are probably more correct.

Due to incomplete sample digestion during the ALS analyses, there really is not a valid comparison between the two labs. Most commercial labs do not do a complete digestion of the sample for ICP analysis work. Consequently, it is difficult to find a check lab to validate the Loring ICP analyses.

Both authors are of the opinion, that the Loring ICP analyses are sufficient for use in this report. This is primarily because complete digestion is required in order to do a complete analysis.

13.0 Mineral Processing and Metallurgical Testing

13.0.1 Test Analysis

In June and July of 2018, Voyageur initiated a laboratory metallurgical testing program for the Frances Creek Prospect. The purpose of the test program was to simulate the acid wash process, to see if the mineralized FC barites could be upgraded by relatively low cost acid wash techniques. Additional acid testing is planned for the near future. The additional testing will be used to determine the optimal acid types and treatments to produce the most beneficial metallurgical results.

Loring Labs recovered splits from 18 previously assayed core samples from storage. The splits were pulverized and then prepared for assay. Prior to assay, the samples underwent a simulated acid wash. After the acid wash, the samples were assayed by ICP analysis for the Whole Rock and ICP 30 assays and by gravimetric analysis for the BaSO4% assay. The techniques uses are listed below:

1. 10% HCl Leach – 20.0 of reserved sample from previous assays were submerged in 10% HCl solution, and brought to a boil on hotplate for approx. 30 minutes. All samples were then filtered and washed out with hot distilled water to remove all remaining HCl, and allowed to dry in low temp oven to remove moisture only.

2. Post-leach sample then underwent digestion via fusion digestion – 0.2 g sample mixed evenly with lithium metaborate, and incinerated at 900 C (turning sample into a fused molten button), dissolved into solution in 5% nitric acid. Solution was then submitted to ICP-OES for Whole Rock and ICP 30 element packages. Silica % was characterized separately via a gravimetric method, and Loss on Ignition was done by burning off the solid sample at 900 C.

   Fusion digestion method was used for post-leach samples since it allows for better recovery in strontium.

   It is worth noting that near-total digestion method was used originally for pre-leach samples. This is done by digesting 0.5 g of the solid sample overnight in HF, and then working it up with Aqua Regia, and then submitted to ICP for ICP 30 Element.

3. BaSO4 % was characterized by gravimetric method for both pre- and post-leach samples. There was no change in methodology used.

Both authors are of the opinion, that the 10% HCL leach was a reasonable lab scale test to simulate an industrial scale acid leach. The post leach assays give a reasonable picture of the effectiveness of the leach process when compared to the original assay results from the 2017 drill program testing. The results of the test are shown in **Tables 13.1, 13.2, 13.3, 13.4.**

The acid leach (simulated acid wash) testing was successful, in that it showed that BaSo4 % increased (0.7% Avg) slightly, due to dissolution of Fe2O3, CaCO3 and other acid soluble components. It also showed a marked decrease in Fe2O3 from an average of 0.31% to an average of 0.01%; which is well below the limit for all the higher end markets. Likewise, CaCO3 % was reduced to an average of 2.3% (too high for the paint grade market limit of 0.5%), to less than 0.5% for all 18 samples.

It was impossible to compare before and after results for SrSO4%, as the digestion method was not the same for the two assay runs. What the analyses did show though was that for the acid treated samples, SrSO4% will meet paint grade specifications of < 3.5%. The average of 2.395% SrSO4 for the 18 samples is just below the 2.5% cutoff for pharmaceutical grade barite. Half of the samples returned assays above

	BEFORE	AFTER	DIFF
	Reported	Reported	AFT - BEFORE
Sample #	% BaSO4	% BaSO4	% BaSO4
12	86.08	88.82	2.74
39	99.09	98.61	-0.48
41	95.27	96.69	1.42
53	99.12	97.72	-1.4
54	96.41	95.9	-0.51
55	97.76	96.96	-0.8
57	97.81	97.69	-0.12
58	97.58	97.29	-0.29
59	96.87	97.49	0.62
60	97.26	97.51	0.25
61	96.89	97.32	0.43
62	95.32	97.68	2.36
64	96.33	96.58	0.25
66	97.54	96.89	-0.65
69	97.34	97.88	0.54
73	88.23	92.43	4.2
74	93.83	95.56	1.73
76	94.88	97.23	2.35
	AVG % Diff = 0.70% - 18 samples		

Table 13.1 - % Difference After Leach – BaSO4%

ACID WASHING - REDUCTION IN Fe2O3					
	BEFORE			AFTER	
		Calculated	SPEC	Reported	
Sample #	ICP - Fe%	Fe2O3%	< 0.1%	Fe2O3%	Remarks
12	0.30	0.85228	Fail	<0.01	Spec
39	0.03	0.078078	Spec	<0.01	Spec
41	0.04	0.10439	Fail	<0.01	Spec
53	0.06	0.1716	Fail	<0.01	Spec
54	0.02	0.0572	Spec	<0.01	Spec
55	0.02	0.0572	Spec	<0.01	Spec
57	0.01	0.0286	Spec	<0.01	Spec
58	0.04	0.1144	Fail	<0.01	Spec
59	0.05	0.143	Fail	<0.01	Spec
60	0.05	0.143	Fail	<0.01	Spec
61	0.03	0.0858	Spec	<0.01	Spec
62	0.02	0.0572	Spec	<0.01	Spec
64	0.07	0.2002	Fail	<0.01	Spec
66	0.05	0.143	Fail	<0.01	Spec
69	0.61	1.7446	Fail	<0.01	Spec
73	0.29	0.8294	Fail	0.03	Spec
74	0.13	0.3718	Fail	0.01	Spec
76	0.12	0.3432	Fail	0.01	Spec
	NOTE: All Spls meet Paint, Glass & Filler Spec with Acid Wash				

Table 13.2 - % Fe2O3 - After Leach

ACID WASHING - REDUCTION IN CaCO3							
	BEFORE			AFTER			
		Calculated	Calculated	Reported	Calculated	Paint Spec	
Sample #	ICP - Ca%	CaO%	CaCO3%	CaO%	CaCO3%	CaCO3	Remarks
12	2.37	3.318	5.91789	0.02	0.0356	< 0.50%	Spec
39	0.09	0.126	0.22473	0.03	0.0534	< 0.50%	Spec
41	0.8	1.12	1.9976	0.01	0.0178	< 0.50%	Spec
53	0.09	0.126	0.22473	0.01	0.0178	< 0.50%	Spec
54	0.56	0.784	1.39832	0.01	0.0178	< 0.50%	Spec
55	0.25	0.35	0.62425	0.01	0.0178	< 0.50%	Spec
57	0.31	0.434	0.77407	0.01	0.0178	< 0.50%	Spec
58	0.32	0.448	0.79904	0.01	0.0178	< 0.50%	Spec
59	0.36	0.504	0.89892	0.01	0.0178	< 0.50%	Spec
60	0.44	0.616	1.09868	0.01	0.0178	< 0.50%	Spec
61	0.33	0.462	0.82401	0.01	0.0178	< 0.50%	Spec
62	1.87	2.618	4.66939	0.03	0.0534	< 0.50%	Spec
64	0.37	0.518	0.92389	0.01	0.0178	< 0.50%	Spec
66	0.36	0.504	0.89892	0.01	0.0178	< 0.50%	Spec
69	5.96	8.344	14.88212	0	0	< 0.50%	Spec
73	0.97	1.358	2.42209	0.01	0.0178	< 0.50%	Spec
74	0.58	0.812	1.44826	0.01	0.0178	< 0.50%	Spec
76	0.75	1.05	1.87275	0.01	0.0178	< 0.50%	Spec
		NOTE: All Spls meet Paint/Chem Spec with Acid Wash					

Table 13.3 - % Difference After Leach – CaCO3%

	ACID WASH		
	Reported	Fus - Digest	Calculated
Sample #	% BaSO4	Sr ppm	SrSO4%
12	88.82	10834	2.2708064
39	98.61	8878	1.8608288
41	96.69	7625	1.5982
53	97.72	10464	2.1932544
54	95.9	10909	2.2865264
55	96.96	12954	2.7151584
57	97.69	12942	2.7126432
58	97.29	10162	2.1299552
59	97.49	12712	2.6644352
60	97.51	12312	2.5805952
61	90.71	14799	3.1018704
62	97.68	10108	2.1186368
64	96.58	11152	2.3374592
66	96.89	12412	2.6015552
69	97.88	5271	1.1048016
73	92.43	13935	2.920776
74	95.56	14088	2.9528448
76	97.23	14200	2.97632
NOTE: All Spls meet Paint Spec (< 3.5%) with Acid Wash			

Table 13.4 - % SrSO4 - After Leach – yellow indicates too high for Pharma

and half below the cutoff. This means that the Blanc Fixe (AKA – Black Ash Process) precipitation technique will probably have to be used to produce a consistent product for the pharmaceutical market.

Gravity separation testing (jigging and tabling) is planned for the next phase of the project, Strontium assaying of the concentrates produced by this testing should be part of the test. It is possible that the crystalline barite may lose strontium during the gravity concentration process. This is because the SG of pure $BaSO_4$ is 4.5, while the SG of pure $SrSO_4$ is 4.0 (11% lower).

It was impossible to compare before and after results for Heavy metals, as the digestion method was not the same for the two assay runs.

In conclusion, the lab scale metallurgical testing program indicated that conventionally milled barite concentrates from Frances Creek should be able to be sold into the paint grade markets using only acid washing as an advanced metallurgical processing technique. The more expensive Blanc Fixe precipitation technique should not be necessary to access these markets.

Blanc Fixe techniques (AKA – Black Ash Process) will probably be required in order to produce pharmaceutical grade barite from the Frances Creek prospect however.

The acid tests reported on above are initial tests. Voyageur is in the process of testing multiple types of acids with various strengths. Upon completion of all acid testing, more advanced conclusions can be arrived at as to the methodology of using acid to high grade the barite concentrates for paint, filler and pharmaceutical markets.

14.0 Mineral Resource Estimate

The Cross Section – Area method was used in this analysis to formulate an in-place resource estimate for the Frances Creek Barite Property. Society of Economic Geologists Special Publication #3 – *Ore Reserve Estimates in the Real World*, states the following concerning Resource Estimates for vein type deposits: "*Estimation on cross-section has several advantages. The most important of these is that it should force the geologist or engineer to pay attention to both the geologic and engineering constraints that limit the estimate"* (p – 45).

Another advantage of this method is that it provides a cross sectional visual display of the relationships of the deposit geology and the distribution of metal grades and mineralization types. Even though, the Cross Section – Area method has been used for + 150 years to estimate resources and reserves in vein type deposits, it is still a very useful toll to use for early stage resource definition in vein type deposits, such as the Frances Creek Breccia Vein.

14.1 Resource Estimate

The first step in the formulation of the estimate was to enter the drill hole data into the project master computer. The datum and projection used for the drill hole collar locations and other spatial data is UTM NAD1983 zone 11 meters. The computer program used for this project was MAP INFO version 16.0.3, with the DISCOVER Drill Hole Module addition. The drill hole module addition allows for creation of cross sectional views of the deposit in multiple azimuths and eventual 3D visualization of the data.

In order for the program to accept the data, it was necessary to enter the data in the proper format. This involved a process called concantenization; the data was entered into an XL spread sheet in numerical form. Each drill hole was represented as a table showing thickness of non-mineralized and mineralized increments with associated % $BaSO_4$ and Specific Gravity. In most cases, weighted averages were used to obtain the %$BaSO_4$ and SG values for the mineralized zones. Once the data was entered into the program, plan view maps of the drill arrays were created (**FIGURES 14.1 and 14.2).** The generalized strike of the mineralized zone was then determined (N 50W)**.**

14.1.1 Topographic Model

A topographic model of the project area was generated with the MapInfo program by combining a web accessible Canadian Government Digital Elevation Model (DEM) digital surface with surveyed elevation/location data points. The Canadian DEM data was acquired by synthetic aperture radar measurements from a satellite (NASA's Aster and Terra platforms). Digital elevations were generated on a nominal 10 meter interval. The surficial survey data was acquired towards the end of the 2017 drill program by a contract surveying company which was hired by Voyageur. The surface topographical profiles generated from the DEM data were adjusted to match the surface surveyed elevations where necessary.

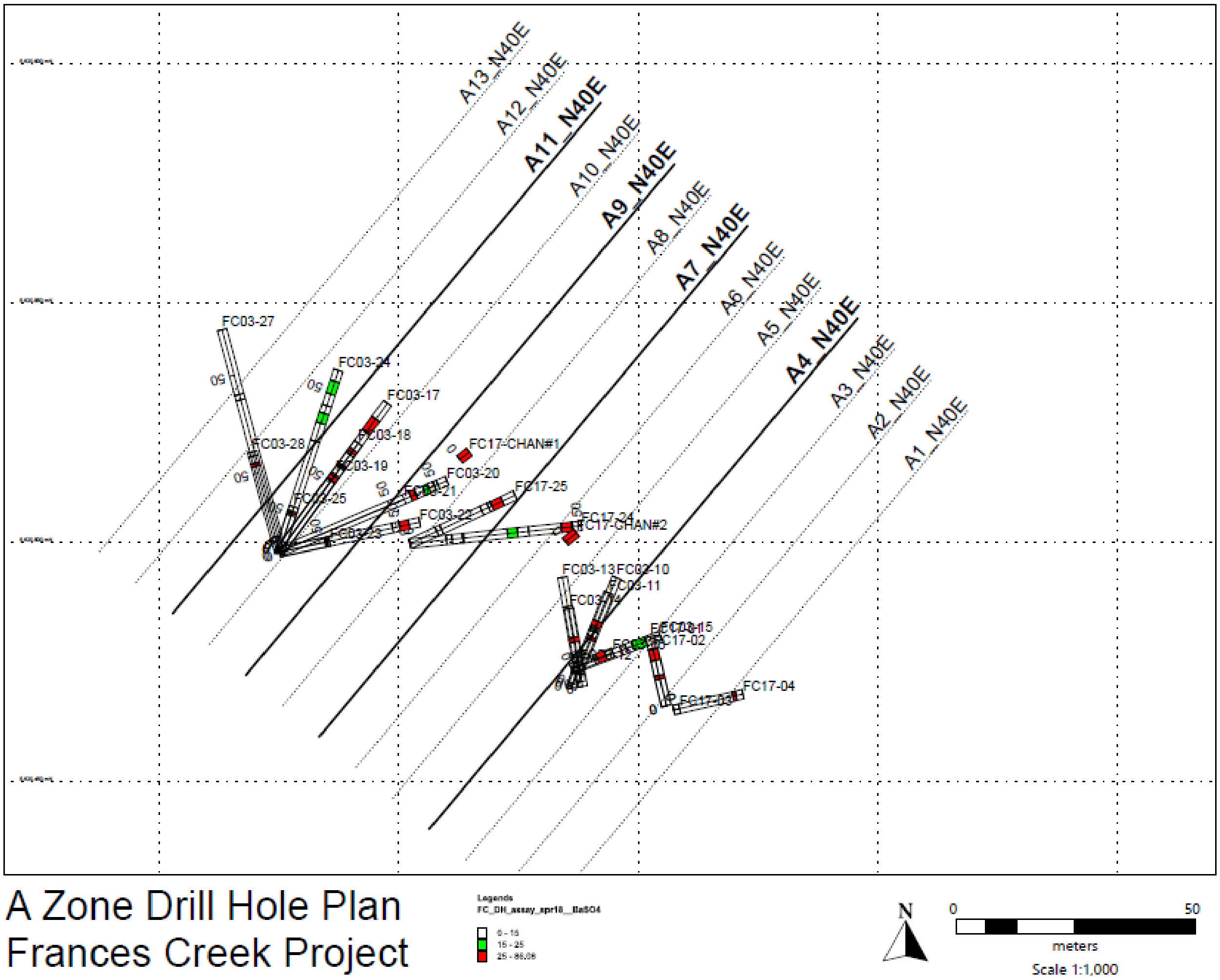


FIGURE 14.1 A – ZONE DRILL HOLE PLAN MAP

14.1.2 Estimation Methodology

The formulation of the estimate utilized a series of 30 structural geologic cross sections, which were drawn at right angles to the generalized strike of the mineralized zone (N 40E). Computer generated sections were generated every 10 meters along strike **(FIGURES 14.1 and 14.2).** Drill data and channel sample data was posted on individual cross sections, to allow for correlation of mineralized zones. Drill data was geometrically projected into the plane of the cross section, from 5M either side of where the trace of the drill hole crossed the section line. This allowed a 10M wide "view" of the mineralization intercepted by drill holes which crossed the plane of the section (**FIGURES 14.3.1 – 14.3.9).** Since each drill station had several fans of drill holes, and some of the holes were rather deep (50 – 75M), it is not unusual for an individual drill hole traces (and associated mineralized zones) to cross more than one section.

The first author used geologic intuition to correlate the barite mineralized zones on each section and assigned an alpha-numeric identifier to each polygon. The author's hand drafted polygons for each individual cross section were then digitized in the plane of each of the sections and individual polygon areas were then calculated. Each polygon was assigned a width of 5 M either side of the section (10 M total width), to arrive at a volume. The volume was then multiplied by the laboratory determined specific gravity (SG), to calculate tonnage for each polygon.

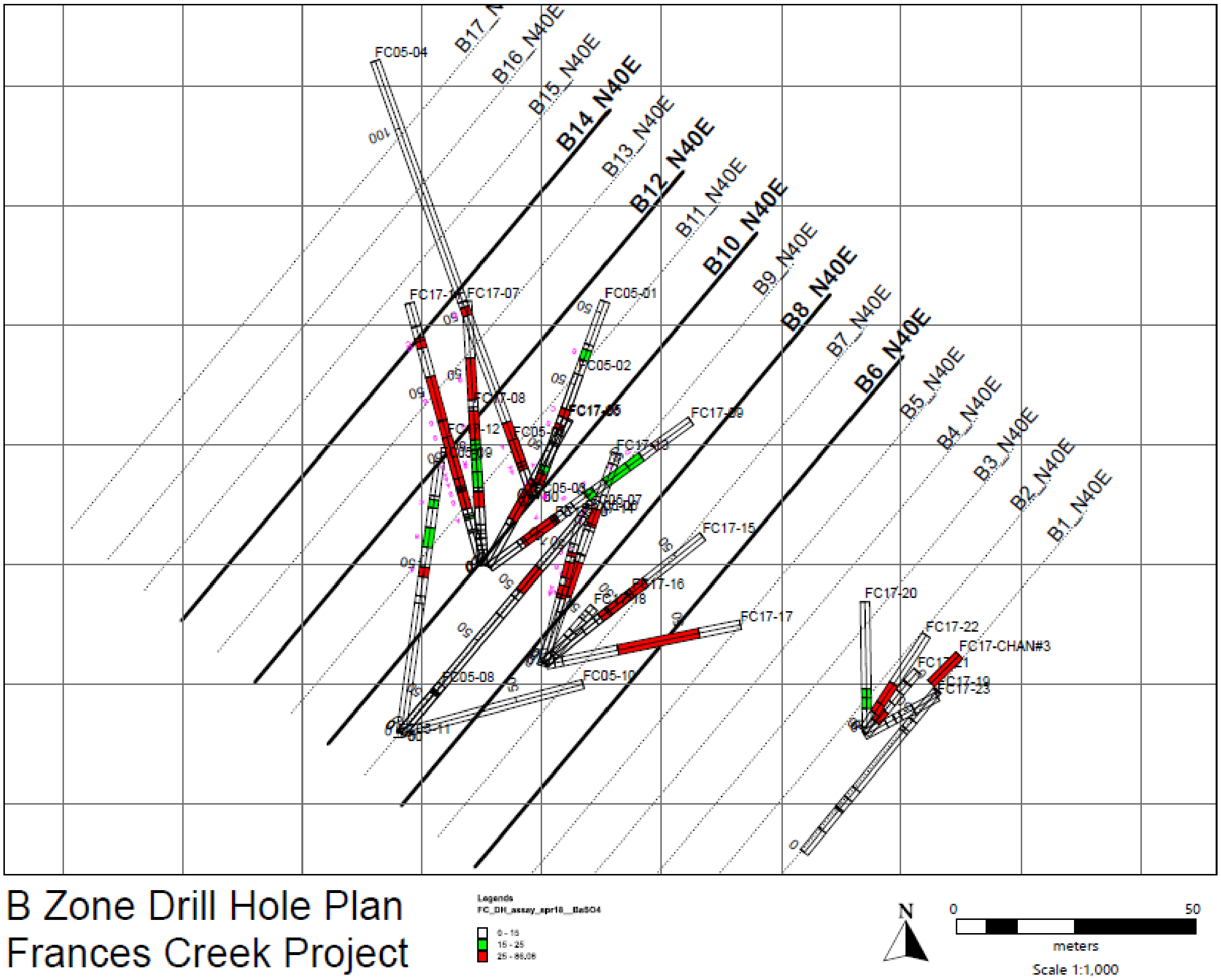


FIGURE 14.2 B – ZONE DRILL HOLE PLAN MAP

The process is further explained here by a graphical example. Only nine of the 30 cross sections used in the analysis are published in this report. These are Sections A-4, A-7, A-9, A-11,B-6, B-8, B-10, B-12 and B-14 (**FIGURES 14.3.1 – 14.3.9).** It is the writer's belief that an examination of these nine sections should give the reader an understanding of how the resource estimate was formulated. All 30 sections, as well as the mathematical calculations which were used to arrive at the estimate are available in both the writer's and the Company's files for future review by persons involved in due diligence investigations, etc.

<u>Cross Section Preparation</u> – Cross sections were prepared on 10M centers; the lithology shown on each section is projected 5 M to the SE and also to the NW. The lithology shown on each section represents a "slice" through the mineralized body that is 10 M wide. Volumes of the mineralized body are computed by measuring the area of the veins shown on the appropriate cross section and multiplying it by a standard 10M width. The grade of the barite rich polygons (%BaSO4 and SG) are then applied to the computed volume to obtain purity and tonnage represented by each slice. The tonnage is determined by multiplying the digitized area of the individual polygon by a 10M thickness and multiplying by SG.

<u>Section A – 9</u> – The reader is referred to Section A – 9 (**Fig 13.3.3**), which is located in the center portion of the upper A – Zone Mineralized Structure. This section is penetrated by four drill holes, but the traces of ten additional drill holes pass within 10M either side of the plane of this cross section. This analysis will start at the down dip extremities of the projected mineralization and progress up dip to the outcrop.

Polygon A-9-03/23-B - IND (40.66% - 3.65 SG) is defined by the B vein intercept of DH 03/23. This Indicated mineralization is projected 20M down dip almost to longitude 540,725E. It is projected up dip ~ 15M towards DH 03/21, for which no assay data is available due to very poor recovery (inclusive data). The polygon terminates ~ 5M short of the trace of DH 03/21.

Polygon A9-03/25 A -INF (50.96% - 3.73 SG), defined by an A vein intercept (projected from Section A – 10), is projected 10M SE to the section. This is a very small polygon of Inferred mineralization, and it is not correlated very far on the adjacent section A – 10.

Polygon A9-03/18 A -INF (45.6% - 3.58 SG), Inferred mineralization, is also defined by an A vein intercept (projected from Section A – 10), which is also projected 10M SE to the section.

Polygon A9-03/22-A-IND (41.06% - 3.16 SG), Indicated mineralization is defined by an A vein intercept that passes from the plane of Section A-9 to the plane of Section A-8, within the intercept. This is a very small polygon, that abuts on Polygon A9-03/19-INF on its down dip side and DH 03/21 (inconclusive data – no mineralization projected) on it's up dip side.

Polygon A9-03/18-A-INF (65.4% - 3.74 SG), an A vein intercept, is projected 10M SE to the section from Section A – 10. This small polygon of Inferred mineralization is projected only 3M down dip, due to the presence of inconclusive data from DH 03/21. It is projected only 4M up dip, where it abuts into a polygon defined by an adjacent drill hole.

Polygon A9-03/20-A-IND (27.4% - 2.95 SG), is defined by an A vein intercept. This small polygon of Indicated mineralization is projected 4M down dip and 5M up dip where it abuts on polygons of Inferred mineralization which are projected 10M SE from Section A-10.

Polygon A-9-03/17-A-INF (32.02% - 3.23 SG), A vein intercept, Inferred mineralization is projected 10 – 15M SE from Section A-10.

Polygon A9-Chan #1-A-INF (46.0% - 3.42 SG), is defined by an A vein channel sample taken from a trench at outcrop. It is projected 5M NW to the line of section and 13M down dip.

Polygon A9-03/23-B-IND (40.66% - 3.65 SG), is defined by a B vein intercept, which passes through Section A - 9. This polygon of Indicated mineralization is projected 20 M down dip and 20M up dip, towards the out crop.

Polygon A9-03/20-B-IND (18.53% - 3.12 SG), defined by a B vein intercept, which passes through Section A - 9. This polygon of Indicated mineralization is projected 12M down dip and 20M up dip, towards the out crop.

Polygon A9-03/20-B-INF (18.53% - 3.12 SG), defined by the same B vein intercept, is projected an additional 20M upwards towards the outcrop. This polygon stops 5M short of the surface, as there are no surveyed outcrops to project it to.

Section B – 10 - The reader is referred to Section B-10 (**Fig 13.3.7**), which is located in the center portion of the upper B – Zone Mineralized Structure. This section is penetrated by all or parts of eight drill holes. The discussion will start at the down dip extremities of the projected mineralization and progress up dip to the outcrop.

Veins A, B, and C were intersected in drill hole 05/09, the trace of which crosses through Sections B-9, B-10, B-11 and B-12. Veins A and B is intersected on and is plotted on Section B-11; Vein C is intersected on and is plotted on Section B-12. Veins A, B and C are projected between 8 to 15 M to the SE to Section B-10. These vein intersections are projected beyond the 5M "indicated envelope" represented by Section B-10. Consequently, mineralization associated with these polygons is assigned to Inferred (INF) status.

Polygon B-10-05/09-A-INF (42.28% - 3.45 SG), is projected only 10M in the down dip direction, but it is projected 16M in the up dip direction. Drill hole data from other nearby sections shows that the down dip mineralization often abruptly terminates between longitude 540,450E and 540,425E – hence only a 10M projection. The mineralized polygon is projected 16M up dip, which is ½ way to the next drill data location (Drill holes 17/06, 17/10 and 05/03). Similar projections were made for **Polygons B-10-05/09-B-INF (22.74% - 3.24 SG)** and **Polygon 05/09-C-INF (17.47% - 3.16 SG)**. The grade information assigned to each polygon was from the assay data from the A-B and C veins from drill hole 05/09.

Polygons 05/09-A-HYP (42.28% - 3.45 SG), 05/09-B-HYP (22.74% - 3.24 SG) and **05/09-C-HYP (17.47% - 3.16 SG)**, were projected 10M further down dip from the inferred mineralization discussed directly above. As the initials HYP would suggest, this represents hypothetical mineralization. Tonnage and grade for these polygons were calculated similar to the procedure mentioned above.

The parameters of **Polygon B-10-17/06+10-05/03-IND (60.12% - 3.63 SG)**, as the name suggests, are dependent on data from drill holes 17/06, 17/10 and 05/03. With the exception of 17/10, the data from these holes is within the "indicated envelope" of the section. The data from hole 17/10 is projected 9.5M to the NW to the section. Since 2/3 of the data was within the "indicated envelope", this mineralization is assigned Indicated status (no alpha designation on the cross sections). The grade of the polygon was determined by taking a weighted average of the three drill hole assay values.

This polygon was projected down dip ½ ways to the polygons defined by drill hole 05/09. Of interest is the "hole" in the polygon at the lower up dip corner. This is interpreted as a boulder within the breccia mineralization which shows up in the log of DH 05/03.

Polygon B-10-05/03-D (78.2% - 4.02 SG) IND, is defined by the D vein intercept of DH 05/03. The parameters of this mineralization were defined in a similar manner to as described above. This mineralization is also assigned Indicated status.

Polygon B-10-17/06+09+05-A-IND (59.9% - 3.62 SG), is bounded by the trace of DH 17/06 on the down dip side and DH 17/05 on the up dip side. The parameters of this Indicated mineralization were defined in a similar manner as described above. This polygon also has a "hole" in it, which was interpreted using the same reasoning as described earlier.

Polygon B-10-17/05 + (05/01+02+05)-A-IND (54.45% - 3.57 SG), is bounded on the down dip side by the trace of DH 17/05 and on the up dip side by the trace of DH 05/01. It's parameters were determined as described above, using data from the four drill holes involved with this Indicated mineralization.

Polygon B-10-05/02-B- INF (65.47% - 3.99 SG), is defined by the B vein intercept of DH 05/02. It was projected 5-15M to the SE, to the section. This Inferred mineralization is not projected down dip, as there is no correlating mineralization in DH 17/05, which is only 3M away. Likewise, it is only projected 6M up dip for the same reason. It's grade parameters were determined using data from only DH 05/02.

Polygon B-10-05/02-C-INF (56.29% - 3.3.65 SG), is defined by the C vein intercept of DH 05/02. It was also projected 5 – 15M to the SE, to the section. This Inferred mineralization was not projected down dip, for the same reason that the 05/02 B vein intercept was not. It was projected up dip more than the usual 20M limit for up dip projection. This is because it projects to a very strong surveyed (but not sampled), trenched barite outcrop. It's grade parameters were also determined using data from only DH 05/02, as the outcrop exposed in the trench was not channel sampled.

The parameters of **Polygon B-10-05/01-A (17.55% - 2.88 SG),** are defined by the A vein intercept of DH 05/01 on the down dip side and by the topographic surface on the up dip side. It was projected 5M up dip to outcrop, even though there is no mapped/surveyed outcrop to correlate it to.

Tonnage Calculations – The tonnage calculation for each mineralized Polygon was determined by measuring the area of each individual digitized Polygon. The area in square meters was then multiplied by 10 M (5 M southeast and 5 M northwest) to arrive at a volume. The volume was then multiplied by the assigned specific gravity of the grade of the mineralized Polygon, to arrive at a gross tonnage value. The gross tonnage value was then multiplied by the barite purity (%$BaSO_4$) to obtain the net barite tonnage value for each polygon.

The tonnage and grade values for the various mineralized polygons shown on **Section B – 10** are shown in **Table 14-1.**

The total tonnes represented on Section B - 10 are 33,471 Gross Tonnes / 16,365 Barite Tonnes @ 48.8% $BaSO_4$ (Indicated + Inferred + Hypothetical). The total reportable tonnes (hypothetical tonnes are not reportable, but are of interest to company management; hence they are tracked internally) represented by Section B - 10 are, 30,893 Gross Tonnes / 15,648 Barite Tonnes @ 50.6% $BaSO_4$.

The methodology mentioned above was repeated for all 30 cross sections in the Resource Mineralization model. The results were then summed to arrive at the Resource Tonnage Estimate, for both the A – Zone (lower) and the B – Zone (upper). The tonnages, grade and resource categories for all the resource blocks in the estimate are listed in **Tables 14.2.1 – 14.2.8.**

POLYGON	CATEGORY	Vol M3	SG	% BaSO4	Gross Tonnes	Barite Tonnes
17/06+10A	IND	2845.2	3.64	60.12	10,356.6	6,226.4
17/06+09+05-A	IND	593.7	3.63	59.9	2,155.1	1,290.9
17/05A	IND	853.5	3.56	54.45	3,038.5	1,654.5
05/01-A	IND	161.3	3.04	17.55	490.5	86.1
05/03-C	IND	353.5	3.9	78.2	1378.5	1078.0
TOTAL	**IND**			**59.3**	**17,419.2**	**10,336**
05/09-A-INF	INF	735.8	3.38	42.28	2,486.9	1,051.5
05/09-B-INF	INF	1,388.6	3.08	22.74	4,276.9	972.6
05/09-C-INF	INF	451.5	3.03	17.47	1,367.9	238.9
05/02-B-INF	INF	122.5	3.7	65.47	453.3	296.7
05/02-C-INF	INF	1,357.9	3.6	56.29	4,888.6	2,751.8
TOTAL	**INF**			**39.4**	**13,473.6**	**5,311.5**
05/09-A-HYP	HYP	257.1	3.38	42.28	869.1	367.4
05/09-B-HYP	HYP	313.6	3.08	22.74	966.1	219.7
05/09-C-HYP	HYP	245.3	3.03	17.47	743.4	129.9
TOTAL	**HYP**			**27.8**	**2,578.6**	**717.0**
TOTAL ALL	**IND+INF+ HYP**			**48.8**	**33,471.4**	**16,364.5**
TOTAL REPORTABLE	**IND+INF**			**50.6**	**30,892.8**	**15,647.5**

Table 14.1 Tonnage and % BaSO4 Represented by Section B – 10

14.1.3 Tonnage Summation

The in – place resource estimate for the Frances Creek Barite Project follows:

		MILL TONNES	BARITE TONNES
INDICATED			
	A - ZONE	36,567.40	13,215.20
	B - ZONE	129,642.80	49,529.80
	A + B	**166,210.20**	**62,745.00**
	%BaSO4	**37.75**	

Table 14.2 Indicated Resource Base – Frances Creek Barite Property

INFERRED		MILL TONNES	BARITE TONNES
	A - ZONE	42,872.60	14,159.40
	B - ZONE	152,705.50	55,070.40
	A + B	**195,578.10**	**69,229.80**
	%BaSO4	**35.40**	

Table 14.3 Inferred Resource Base – Frances Creek Barite Property

Mill Tonnes are the calculated tonnage from the individual polygons multiplied by the laboratory determined SG. These are the undiluted tonnes that will be mined and milled. Barite tonnes are the mill tonnes multiplied by the laboratory determined % BaSO4 and represent the + 4.4 SG barite hosted in the mill tonnes. There is no allowance for percentage recovery for the barite tonnes estimate.

Tables 14.3.1 – 14.3.4 Show detailed tonnage calculations for both the A – Zone and B – Zone resource areas at the Frances Creek Property.

14.1.4 Resource Classifications

Review of **Section 14.1.2** above, should give the reader an appreciation for the complexity of the large scale stratigraphy of the Frances Creek Barite Breccia Vein. The vein stratigraphy is complex and is challenging to correlate, even with closely spaced drill hole data. For this reason, the senior author, who is responsible for the resource estimate, assigned the Indicated and Inferred Categories to the resource base at Frances Creek. For this report, Measured Resources were not calculated for the Frances Creek Breccia Vein. Additional drilling, geologic and geostatistical work will have to be undertaken in order to upgrade the resource to Measured status.

14.1.4.1 Measured – Indicated – Inferred – Categories

As mentioned above, the senior author has classified the in-place mineral resource which resides in the Frances Creek Breccia Vein into Indicated and Inferred categories. At this point, a review of the Canadian Institute of Mining (CIM) resource definition standards is appropriate. The following, are direct quotes from the 2005 CIM Manual.

Mineral Resource – "*A Mineral Resource is a concentration or occurrence of diamonds, natural solid inorganic material, or natural solid fossilized organic material including base and precious metals, coal, and industrial minerals in or on the Earth's crust in such form and quantity and of such a grade or quality that it has reasonable properties for economic extraction. The location, quantity, grade, geological characteristics and continuity of a Mineral Resource are known, estimated or interpreted from specific geological evidence and knowledge***."**

VOYAGEUR MINERALS, LTD 6/15/2018
FRANCES CREEK PROSPECT
RESOURCE CALC - A-ZN - INDICATED
BY: Henkle and Assoc.

ID	Section	Zone	Class	Area_m2	Volume_m3	BaSO4_%	SG	MILL TONNES	BARITE TONNES
A1 17/04 A	A1	A	Ind	13.37534	133.7534094	52.3	3.52	470.812	246.23468
A2 17/01+0 A	A2	A	Ind	26.84856	268.485614	75.09	3.82	1025.615	770.13434
A3 03/15 A	A3	A	Ind	53.86059	538.6059242	39.75	3.18	1712.767	680.82482
A4 03/14+1 A	A4	A	Ind	14.57556	145.7556383	37.9	3.28	478.0785	181.19175
A4 03/11 A	A4	A	Ind	24.81647	248.1647298	31.42	3.31	821.4253	258.09182
A6 17/24 B	A6	B	Ind	64.70786	647.0786367	52.24	3.48	2251.834	1176.3579
A6 Chan2 B	A6	B	Ind	32.95311	329.5311232	57.38	3.58	1179.721	676.92415
A7 17/25 B	A7	B	Ind	107.0484	1070.483696	30.06	3.17	3393.433	1020.0661
A7 17/24 A	A7	A	Ind	40.85829	408.5828662	19.63	3.13	1278.864	251.04108
A8 03/22 A	A8	A	Ind	84.429	844.2899759	41.06	3.16	2667.956	1095.4629
A8 Chan 1	A8	A	Ind	54.72528	547.2528217	46	3.42	1871.605	860.93814
A9 03/23 B	A9	B	Ind	62.06823	620.6822602	40.66	3.65	2265.49	921.14834
A9 03/20 B	A9	B	Ind	45.69317	456.9317168	18.53	3.12	1425.627	264.16868
A9 03/23 A	A9	A	Ind	13.61906	136.1906184	27.42	2.95	401.7623	110.16323
A9 03/22 A	A9	A	Ind	7.138509	71.3850863	41.06	3.16	225.5769	92.621864
A10 03/25	A10	A	Ind	13.84994	138.4994352	50.86	3.73	516.6029	262.74423
A10 03/19	A10	A	Ind	28.37976	283.7976218	45.61	3.58	1015.995	463.39554
A10 03/18	A10	A	Ind	19.70797	197.079719	65.44	3.74	737.0781	482.34394
A10 03/17	A10	A	Ind	102.4165	1024.16503	32.03	3.23	3308.053	1059.5694
A11 03/24	A11	A	Ind	124.8082	1248.081584	19.48	2.96	3694.321	719.65383
A11 03/24	A11	B	Ind	145.0405	1450.404643	20.24	2.93	4249.686	860.13637
A12 03/28	A12	A	Ind	46.73795	467.3794856	48.38	3.37	1575.069	762.01832

A - ZONE IND	MILL TONNES	BARITE TONNES
TOTAL	36,567.37	13,215.23
%BaSO4	36.14	

Table 14.3.1 – A – Zone – Indicated Resource

VOYAGEUR MINERALS, LTD 6/15/2018
FRANCES CREEK PROSPECT
RESOURCE CALC - A-ZN - INFERRED
BY: Henkle and Assoc.

ID	Section	Zone	Class	Area_m2	Volume_m3	BaSO4_%	SG	MILL TONNES	BARITE TONNES
A3 03/16 A	A3	A	Inf	37.59596	375.959626	24.53	3.18	1195.552	293.26881
A5 03/10+1 A	A5	A	Inf	11.95093	119.509265	34.96	3.35	400.356	139.96447
A5 03/10 A	A5	A	Inf	24.1001	241.000988	31.42	3.31	797.7133	250.64151
A5 Chan2 B	A5	B	Inf	23.92261	239.226072	57.38	3.58	856.4293	491.41915
A6 17/24 B	A6	B	Inf	50.88715	508.871489	52.24	3.48	1770.873	925.10394
A6 17/24 A	A6	A	Inf	15.14121	151.412117	19.63	3.13	473.9199	93.030482
A7 17/25 B	A7	B	Inf	44.68736	446.873641	30.06	3.17	1416.589	425.82679
A7 Chan1 A	A7	A	Inf	19.98278	199.827768	46	3.42	683.411	314.36904
A7 03/23 A	A7	A	Inf	81.91455	819.145454	41.06	3.16	2588.5	1062.8379
A8 03/23 B	A8	B	Inf	72.87043	728.704327	40.06	3.65	2659.771	1065.5042
A8 11/25 B	A8	B	Inf	106.8233	1068.23313	30.06	3.17	3386.299	1017.9215
A8 17/24 A	A8	A	Inf	9.357862	93.5786227	19.63	3.13	292.9011	57.496484
A9 03/20 B	A9	B	Inf	30.61332	306.133232	18.53	3.12	955.1357	176.98664
A9 Chan1 A	A9	A	Inf	53.6112	536.112043	46	3.42	1833.503	843.41147
A9 03/17 A	A9	A	Inf	69.98885	699.888548	32.02	3.23	2260.64	723.85693
A9 03/18 A	A9	A	Inf	8.337624	83.3762354	65.44	3.74	311.8271	204.05967
A9 03/18 A	A9	A	Inf	19.17179	191.717868	45.61	3.58	686.35	313.04422
A9 03/25 A	A9	A	Inf	13.33035	133.303535	50.96	3.73	497.2222	253.38443
A10 03/23	A10	B	Inf	67.46773	674.677315	40.66	3.65	2462.572	1001.2819
A10 03/20	A10	B	Inf	8.140925	81.4092509	18.53	3.12	253.9969	47.065619
A10 03/17	A10	A	Inf	29.32801	293.2801	32.02	3.23	947.2947	303.32377
A11 03/28	A11	A	Inf	48.3467	483.467	48.38	3.37	1629.284	788.2475
A11 03/24	A11	A	Inf	80.89178	808.917844	19.48	2.96	2394.397	466.4285
A11 03/24	A11	B	Inf	71.77903	717.790312	20.24	2.93	2103.126	425.67262
A12 03/24	A12	A	Inf	124.6092	1246.09199	19.48	3.28	4087.182	796.183
A12 03/24	A12	B	Inf	144.1815	1441.81466	20.24	2.93	4224.517	855.04223
A13 03/28	A13	A	Inf	50.5421	505.420951	48.38	3.37	1703.269	824.04135

INF	MILL TONNES	BARITE TONNES
TOTAL	42,872.63	14,159.41
%BaSO4	33.03	

Table 14.3.2 – A – Zone – Inferred Resource

VOYAGEUR MINERALS, LTD 6/15/2018
FRANCES CREEK PROSPECT
RESOURCE CALC - B-ZN - INDICATED P 1 OF 2
BY: Henkle and Assoc.

ID	Section	Zone	Class	Area_m2	Volume_m3	BaSO4_%	SG	MILL TONNES	BARITE TONNES
B1 Chan3 A	B1	A	Ind	41.84628	418.4628184	51.29	3.47	1452.06598	744.764641
B2 17/22 A	B2	A	Ind	141.6959	1416.958821	27.09	3.16	4477.589873	1212.979097
B2 17/21 A	B2	A	Ind	75.75253	757.5252736	61.16	3.78	2863.445534	1751.283289
B6 17/17 A	B6	A	Ind	422.3258	4223.257718	28.83	3.15	13303.26181	3835.33038
B7 17/15 A	B7	A	Ind	313.5225	3135.224729	37.79	3.27	10252.18486	3874.30066
B8 17/14 A	B8	A	Ind	46.93542	469.3542041	55.46	3.38	1586.41721	879.8269845
B8 17/13 A	B8	A	Ind	124.7359	1247.359435	41.94	3.28	4091.338948	1715.907555
B9 05/06 A	B9	A	Ind	171.5036	1715.036328	33.09	3.24	5556.717704	1838.717888
B9 17/10 A	B9	A	Ind	112.2394	1122.394383	60.32	3.63	4074.291611	2457.6127
B9 17/09 A	B9	A	Ind	79.91819	799.1819307	40.29	3.38	2701.234926	1088.327552
B9 17/14 B	B9	B	Ind	32.748	327.4799519	53.46	3.52	1152.729431	616.2491537
B9 17/09 B	B9	B	Ind	60.8305	608.3049865	20.8	3.15	1916.160708	398.5614272
B9 17/14 C	B9	C	Ind	18.7704	187.704007	57.92	3.58	671.9803451	389.2110159
B9 17/13 C	B9	C	Ind	99.37237	993.7237362	34.38	3.28	3259.413855	1120.586483
B9 17/09 C	B9	C	Ind	269.5428	2695.427787	24.85	3.18	8571.460363	2130.0079
B10 17/05 A	B10	A	Ind	85.3519	853.5189922	54.45	3.56	3038.527612	1654.478285
B10 05/01 A	B10	A	Ind	16.13486	161.3486194	17.55	3.04	490.499803	86.08271542
B10 17/06+10 A	B10	A	Ind	284.5225	2845.22521	60.12	3.64	10356.61977	6226.399803
B10 17/06+09+05 A	B10	A	Ind	59.36804	593.6804131	59.9	3.63	2155.0599	1290.88088
B10 05/03 C	B10	C	Ind	35.34689	353.4688782	78.2	3.9	1378.528625	1078.009385
B11 05/09 A	B11	A	Ind	60.16331	601.6331041	42.28	3.45	2075.634209	877.5781436
B11 17/12+08 A	B11	A	Ind	25.55965	255.596536	38.9	3.32	848.5804994	330.0978143
B11 17/08+11+05/09 A	B11	A	Ind	113.4221	1134.220623	27.8	3.17	3595.479374	999.543266
B11 05/04 A	B11	A	Ind	166.092	1660.920452	33.59	3.35	5564.083514	1868.975652
B11 17/08+11+07 A	B11	A	Ind	38.47084	384.7084147	24.75	3.12	1200.290254	297.0718378
B11 17/12 B	B11	B	Ind	133.0323	1330.322845	41.46	3.29	4376.762161	1814.605592
B11 05/09 B	B11	B	Ind	100.5474	1005.473682	22.74	3.24	3257.734728	740.8088772
B11 05/02 B	B11	B	Ind	13.06433	130.6432938	65.47	3.99	521.2667421	341.2733361

VOYAGEUR MINERALS, LTD
FRANCES CREEK PROSPECT
RESOURCE CALC - B-ZN - INDICATED P 2 OF 2
BY: Henkle and Assoc.

ID	Section	Zone	Class	Area_m2	Volume_m3	BaSO4_%	SG	MILL TONNES	BARITE TONNES
B11 05/01 B	B11	B	Ind	90.53875	905.387523	16.5	3.17	2870.078448	473.5629439
B11 05/02 C	B11	C	Ind	26.16179	261.6178936	56.29	3.65	954.9053116	537.5161999
B11 05/09 C	B11	C	Ind	42.01352	420.1351935	17.47	3.06	1285.613692	224.596712
B12 17/07 A	B12	A	Ind	75.45888	754.5888093	23.38	3.15	2376.954749	555.7320204
B12 17/11+07 A	B12	A	Ind	40.39583	403.9583064	30.1	3.2	1292.66658	389.0926407
B12 17/11 A+B	B12	A	Ind	46.62502	466.2502402	33.76	3.22	1501.325773	506.8475811
B12 17/12 B	B12	B	Ind	67.87743	678.7742639	41.46	3.29	2233.167328	925.8711743
B12 05/09 C	B12	C	Ind	104.7013	1047.013099	17.47	3.16	3308.561394	578.0056755
B12 17/08 C	B12	C	Ind	64.09621	640.9621153	32.13	3.18	2038.259527	654.8927859
B13 17/11 B	B13	B	Ind	93.10936	931.0935767	35.38	3.26	3035.36506	1073.912158
B13 17/07 B	B13	B	Ind	50.60576	506.0576173	35.8	3.29	1664.929561	596.0447828
B14 05/04 B	B14	B	Ind	48.01608	480.1607675	54.88	3.53	1694.967509	930.1981691
B14 17/11 C	B14	C	Ind	16.08111	160.8110507	71.08	3.71	596.608998	424.0696758

IND	MILL TONNES	BARITE TONNES
TOTAL	129,642.76	49,529.81
%BaSO4	38.20	

Table 14.3.3 B – Zone – Indicated Resource

VOYAGEUR MINERALS, LTD
FRANCES CREEK PROSPECT
RESOURCE CALC - B-ZN - INFERRED
BY: Henkle and Assoc.

6/15/2018

ID	Section	Zone	Class	Area_m2	Volume_m3	BaSO4_%	SG	MILL TONNES	BARITE TONNES
B2 17/22 A	B2	A	Inf	12.42792	124.279194	27.09	3.16	392.7222539	106.3884586
B3 17/20 A	B3	A	Inf	149.2467	1492.46704	22.73	3.02	4507.250459	1024.498029
B5 17/17 A	B5	A	Inf	662.3448	6623.44845	28.83	3.15	20863.86263	6015.051595
B6 17/17 A	B6	A	Inf	286.1466	2861.46569	28.83	3.15	9013.616914	2598.625756
B7 17/17 A	B7	A	Inf	124.3484	1243.48443	28.83	3.15	3916.975958	1129.264169
B7 17/158 A	B7	A	Inf	229.6904	2296.90377	37.79	3.27	7510.875319	2838.359783
B8 17/13 A	B8	A	Inf	86.61821	866.182065	41.94	3.28	2841.077173	1191.547766
B8 17/14 B	B8	B	Inf	64.67964	646.796362	53.46	3.35	2166.767813	1158.354073
B8 17/09 B	B8	B	Inf	213.4094	2134.0937	20.8	3.05	6508.985794	1353.869045
B8 17/13 B	B8	B	Inf	84.84485	848.448539	41.63	3.34	2833.818119	1179.718483
B9 17/09 B	B9	B	Inf	3.929663	39.2966311	20.8	3.15	123.7843881	25.74715272
B9 17/09 C	B9	C	Inf	103.3528	1033.52805	24.85	3.18	3286.619214	816.7248746
B10 05/09 A	B10	A	Inf	73.5761	735.76097	42.28	3.38	2486.872079	1051.449515
B10 05/09 B	B10	B	Inf	138.8609	1388.60927	22.74	3.08	4276.91654	972.5708212
B10 05/02 B	B10	B	Inf	12.25024	122.502401	65.47	3.7	453.2588846	296.7485918
B10 05/09 C	B10	C	Inf	45.14839	451.483891	17.47	3.03	1367.99619	238.9889344
B10 05/02 C	B10	C	Inf	135.7933	1357.93265	56.29	3.6	4888.55754	2751.769039
B11 05/09 A	B11	A	Inf	26.87362	268.73617	42.28	3.45	927.1397851	391.9947011
B11 05/04 A	B11	A	Inf	146.3978	1463.97774	33.59	3.35	4904.325418	1647.362908
B11 17/07 A	B11	A	Inf	70.63882	706.388235	23.38	3.16	2232.186823	521.8852793
B11 05/09 B	B11	B	Inf	49.83528	498.352754	22.74	3.24	1614.662922	367.1743484
B11 17/12 B	B11	B	Inf	107.4003	1074.00317	41.46	3.29	3533.470425	1464.976838
B11 17/12+08 B	B11	B	Inf	67.32653	673.265327	47.75	3.45	2322.765378	1109.120468
B11 17/08+05/02 B	B11	B	Inf	233.3893	2333.8933	74.14	3.81	8892.133462	6592.627749
B11 05/09 C	B11	C	Inf	20.7625	207.625044	17.47	3.06	635.3326339	110.9926111
B12 05/09 A	B12	A	Inf	61.68241	616.824111	42.28	3.45	2128.043181	899.7366571
B12 17/12 B	B12	A	Inf	123.3995	1233.99534	41.46	3.29	4059.844655	1683.211594
B12 17/12+08 A	B12	A	Inf	25.13825	251.382502	38.9	3.32	834.5899081	324.6554743
B12 05/04 A	B12	A	Inf	205.7651	2057.65097	33.59	3.25	6687.365651	2246.286122
B12 05/09 B	B12	B	Inf	240.7307	2407.30685	22.74	3.24	7799.674196	1773.645912
B12 17/12+08 B	B12	B	Inf	67.87743	678.774264	38.9	3.32	2253.530556	876.6233863
B12 17/07 B	B12	B	Inf	34.25687	342.56871	35.8	3.35	1147.60518	410.8426543
B12 17/11+07	B12	B	Inf	77.14436	771.443587	35.52	3.28	2530.334966	898.7749799
B12 17/11 B	B12	B	Inf	67.30739	673.073862	35.38	3.26	2194.22079	776.3153155
B13 17/07 A	B13	A	Inf	38.92306	389.230605	23.38	3.15	1226.076407	286.656664
B13 17/12 B	B13	B	Inf	144.8283	1448.28255	41.46	3.29	4764.849595	1975.506642
B13 17/11 B	B13	B	Inf	24.05956	240.595605	35.38	3.26	784.3416719	277.5000835
B13 17/07 B	B13	B	Inf	16.33893	163.389304	35.8	3.29	537.5508089	192.4431896
B3 05/04 B	B13	B	Inf	51.44557	514.455735	54.88	3.53	1816.028745	996.6365754
B13 05/09 C	B13	C	Inf	44.01164	440.116439	17.47	3.16	1390.767948	242.9671606
B13 17/08 C	B13	C	Inf	76.58591	765.859131	32.13	3.18	2435.432038	782.5043138
B13 17/11 C	B13	C	Inf	17.17292	171.7292	71.08	3.71	637.1153338	452.8615792
B14 17/11 B	B14	B	Inf	92.36236	923.623636	35.38	3.26	3011.013052	1065.296418
B14 17/07 B	B14	B	Inf	51.34497	513.449695	35.8	3.29	1689.249497	604.7513199
B15 05/04 B	B15	B	Inf	47.27664	472.7664	54.88	3.53	1668.865393	915.8733276
B15 17/11 C	B15	C	Inf	16.36327	163.632693	71.08	3.71	607.0772914	431.5105387

INF	MILL TONNES	BARITE TONNES
TOTAL	152,705.55	55,070.41
%BaSO4	36.06	

Table 14.3.4 B – Zone – Inferred Resource

<u>Measured Mineral Resource</u> – "*A 'Measured Mineral Resource' is that part of a Mineral Resource for which quantity, grade or quality, densities, shape, and physical characteristics are so well established that they can be estimated with confidence sufficient to allow the appropriate application of technical and economic parameters, to support production planning and evaluation of the economic viability of the deposit. The estimate is based on detailed and reliable exploration, sampling and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes that are spaced closely enough to confirm both geological and grade continuity.*"

<u>Indicated Mineral Resource</u> – "*An 'Indicated Mineral Resource' is that part of a Mineral Resource for which quantity, grade or quality, densities, shape and physical characteristics, can be estimated with a level of confidence sufficient to allow the appropriate application of technical and economic parameters, to support mine planning and evaluation of the economic viability of the deposit. The estimate is based* *on detailed and reliable exploration and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes that are spaced closely enough for geological and grade continuity to be reasonably assumed."*

Inferred Mineral Resource – *"An 'Inferred Mineral Resource' is that part of a Mineral Resource for which quantity and grade or quality can be estimated on the basis of geological evidence and limited sampling and reasonably assumed, but not verified, geological and grade continuity. The estimate is based on limited information and sampling gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes."*

The writer's confidence in the projectability of each individual tonnage cell was the basic criteria used to distinguish between these three resource categories. The following criteria were used by the writer to categorize the resource contained within the Frances Creek Breccia Vein.

Category	**Min. Dip Projection**	**Max. Dip Projection**	**Min Strike Projection**	**Max Strike Projection**
Measured	NA	NA	NA	NA
Indicated	0 M	20.0 M	0 M	5.0 M
Inferred	20.0 M	40.0 M	5.0 M	15.0 M
Hypothetical	40 M	60M	15.0 M	25M

Table 14.4:Resource Categories – Distance Mineralization Projected Along Dip and Strike

14.1.5 Cutoff Grade

The Frances Creek Barite Prospect is a high grade mineralized resource. The in-situ grade (undiluted) for the resource estimate varies between 35.4% to 37.75% BaSO4 (SG – 3.25 – 3.32) (**Tables 14.2 and 14.3**). This was calculated by summing the tonnages estimates from 136 separate polygons generated by the cross section – area method. The lab determined % BaSO4 for these polygons ranged from a low of 16.5% to a high of 78.2%. By inference, this means that 16.5% (SG – 2.95), was the cutoff grade for the calculation.

Mining cutoff grades are dependent on the price for the mineral product being produced. Voyageur anticipates selling ground barite products from Frances Creek into the industrial, paint grade and pharmaceutical markets. The price per tonne for industrial and paint grade barite products in 2015, is reported by USGS as $ 434 per metric tonne. This is 2.38 X the reported 2015 price for drilling grade barite, which is reported by the USGS as $ 182 per metric tonne (McRae, M.E., 2018). Pharmaceutical grade barite products command prices which on a per tonne basis are several times the industrial – paint grade price.

The cutoff grade of 16.5% equates to a value of $ 30/tonne contained barite at the average 2015 price of $ 182 / tonne for drilling grade barite. The cutoff grade of 16.5% equates to a value of $ 71.61 / tonne contained barite at the average 2015 price of $ 434 / tonne for industrial and paint grade barite. As a point of reference, in 2014, the senior author was one of several authors of a technical report on a privately funded open pit drilling grade barite project located in Nevada, USA. A minimum cutoff grade of 10% BaSO4 (SG – 2.7) ($ 18.20) was used to calculate a mineral resource for that project. The cutoff grade of 16.5% BaSO4 (SG – 2.95) falls within the standards of the industry.

14.1.6 Other Factors Which Might Affect The Frances Creek Resource

Since the above estimate is an in-place geological resource estimate and not a reserve estimate, it should not be materially affected by any mining, metallurgical, infrastructure or other factors. Likewise, the estimate should also be unaffected by any known environmental, permitting, legal, title, taxation, socioeconomic, marketing or political issues. The writer knows of no such adverse factors that might affect the future of the Frances Creek Barite Project.

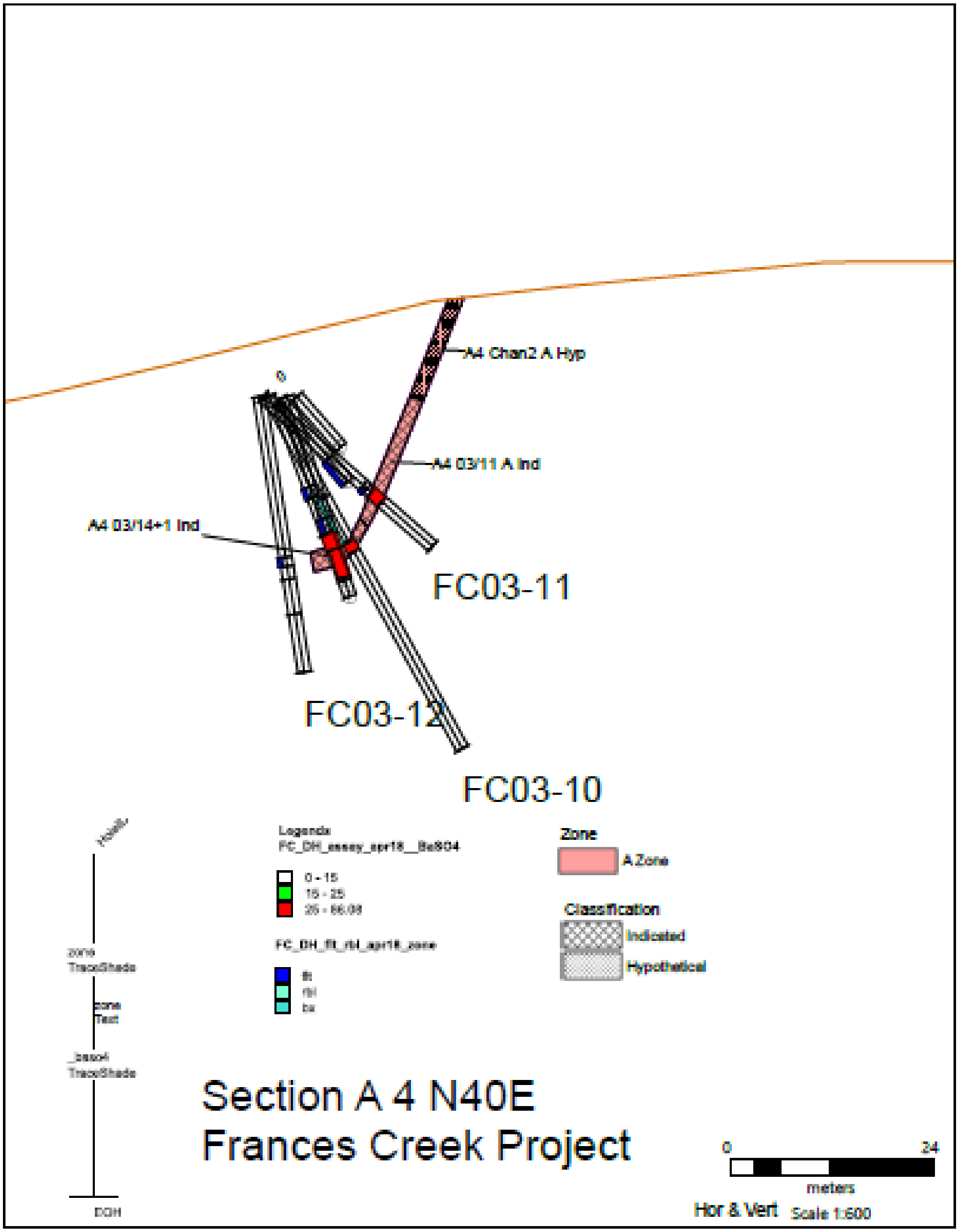


FIGURE 14.3.1 – CROSS SECTION A-4

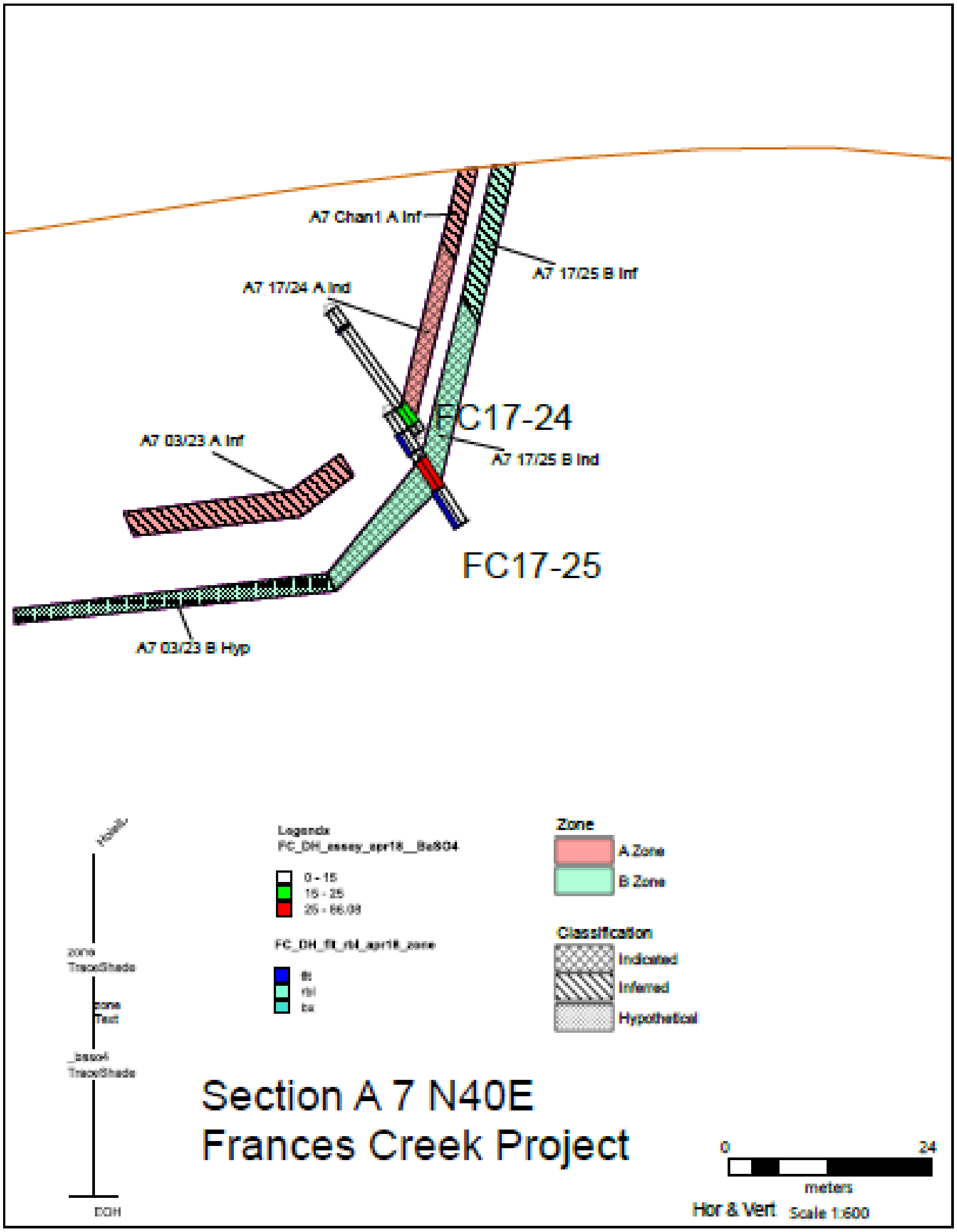


FIGURE 14.3.2 CROSS SECTION – A - 7

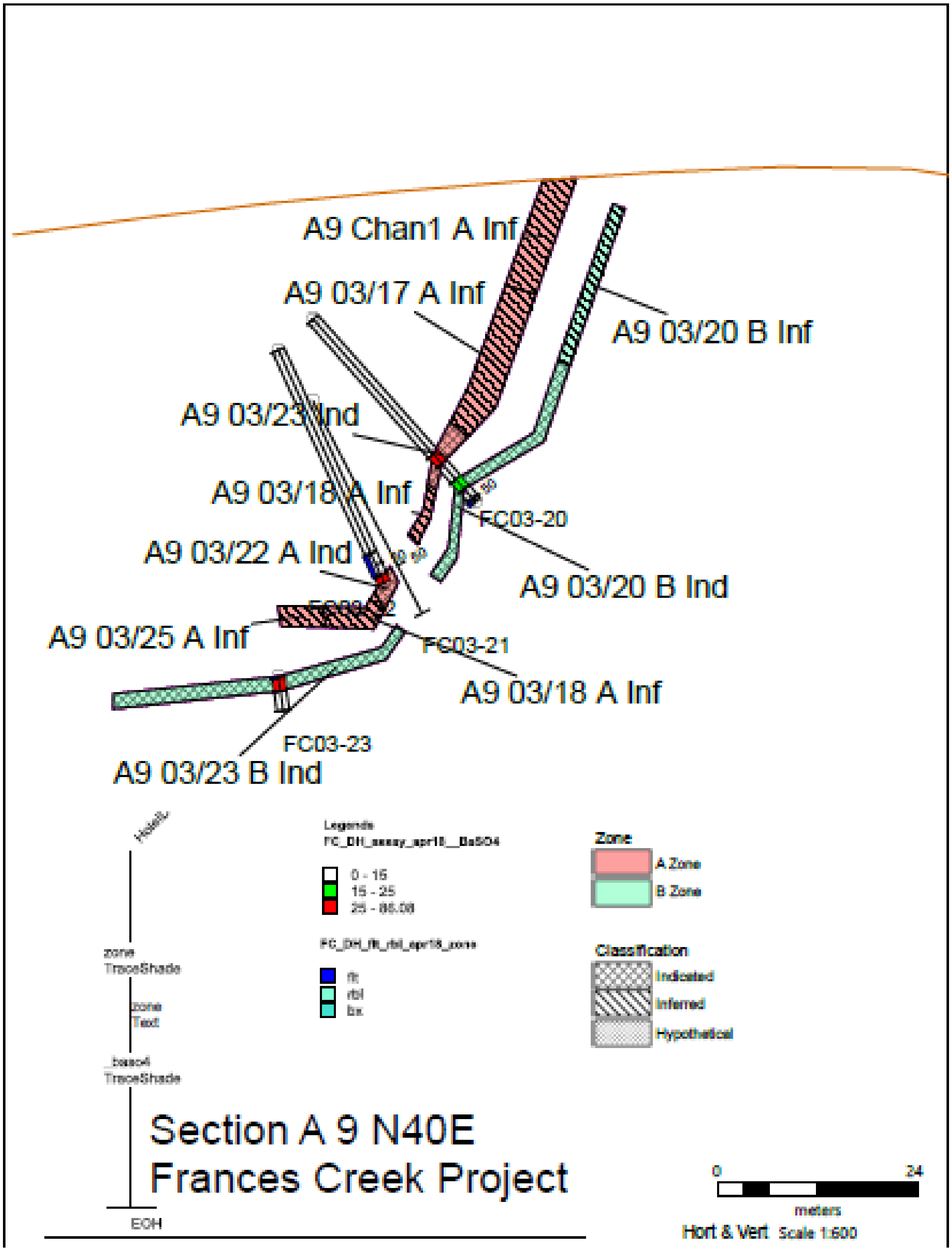


FIGURE 14.3.3 CROSS SECTION – A - 9

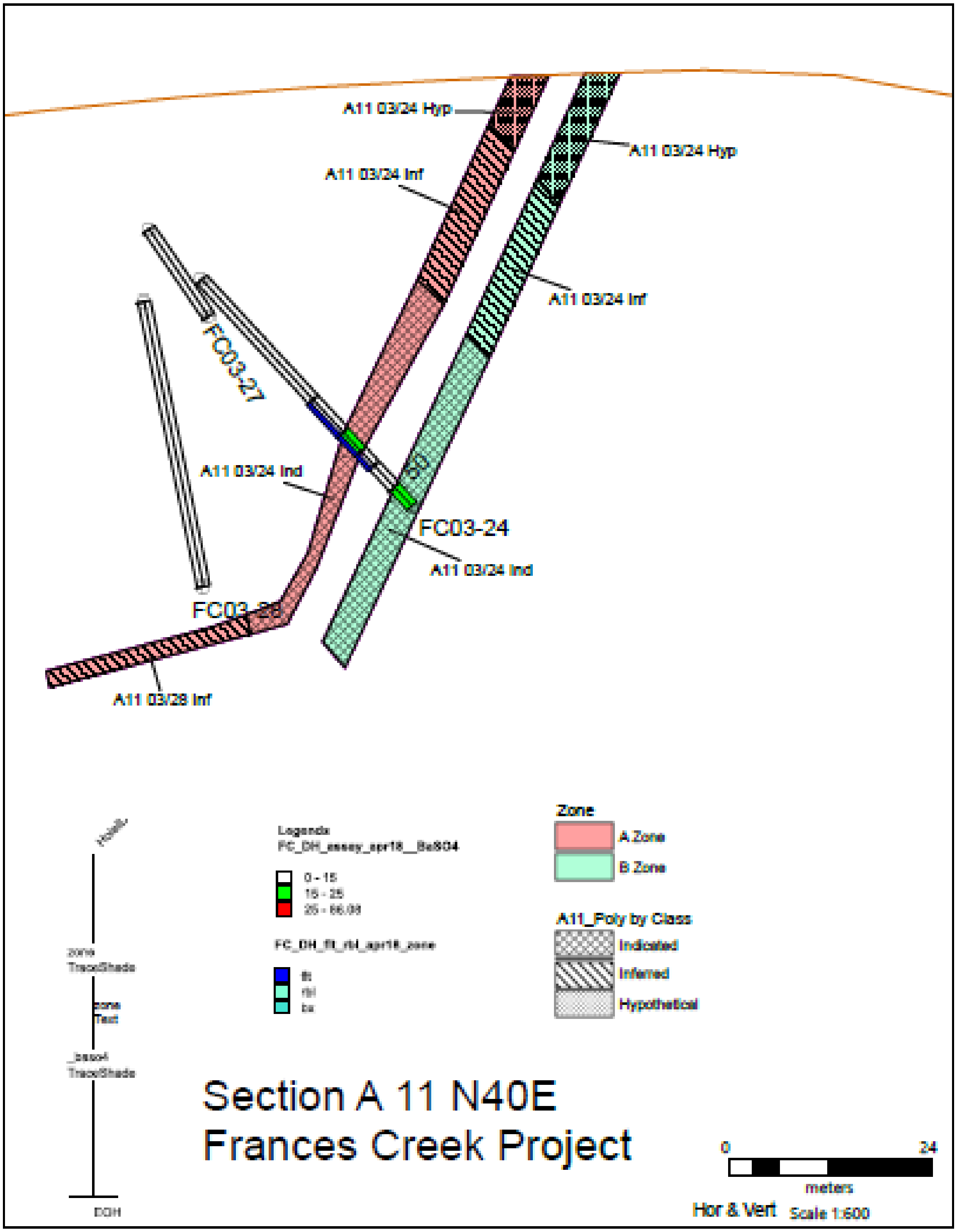


FIGURE 14.3.4 CROSS SECTION – A - 11

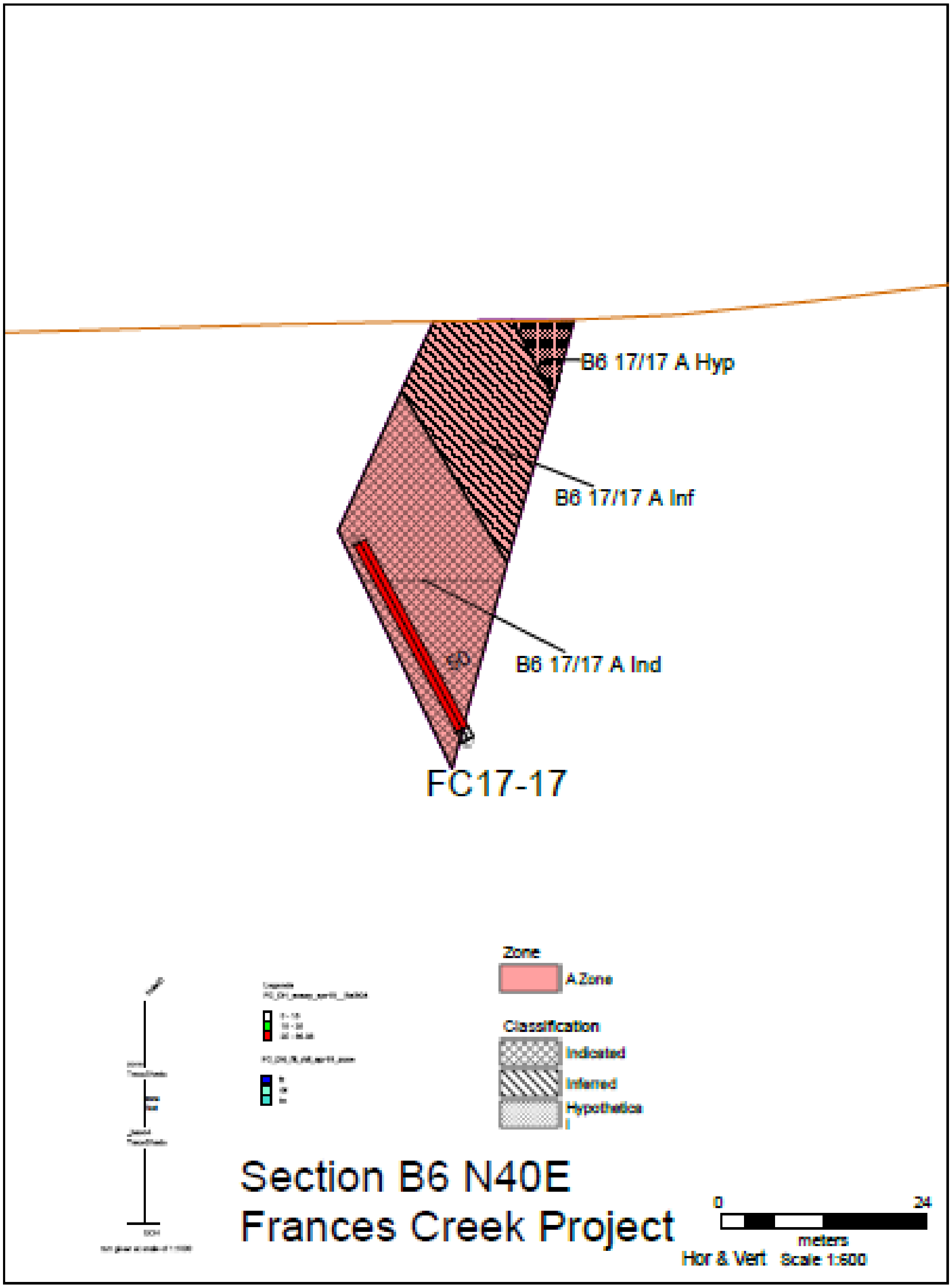


FIGURE 14.3.5 CROSS SECTION – B – 6

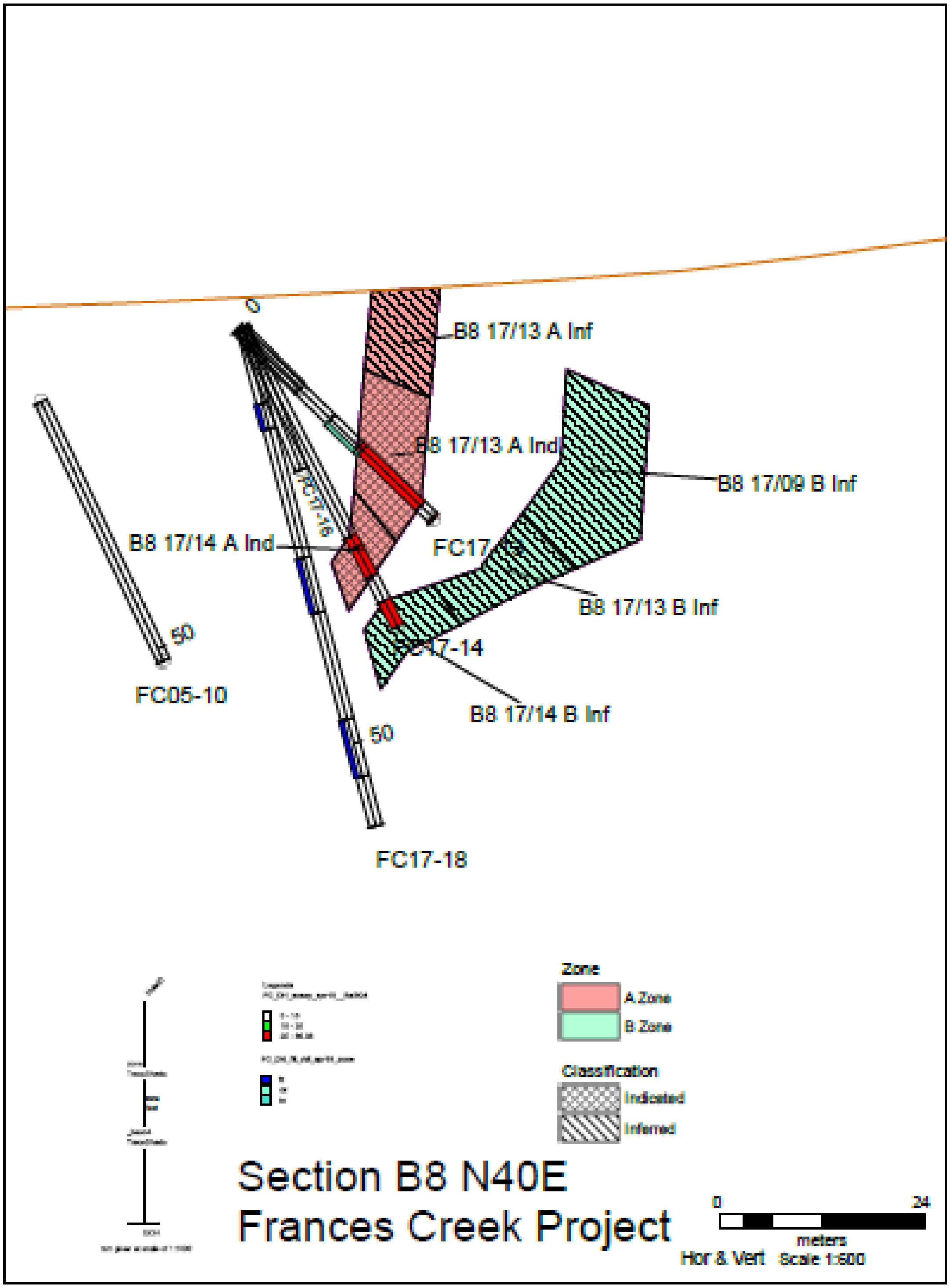


FIGURE 14.3.6 CROSS SECTION – B – 8

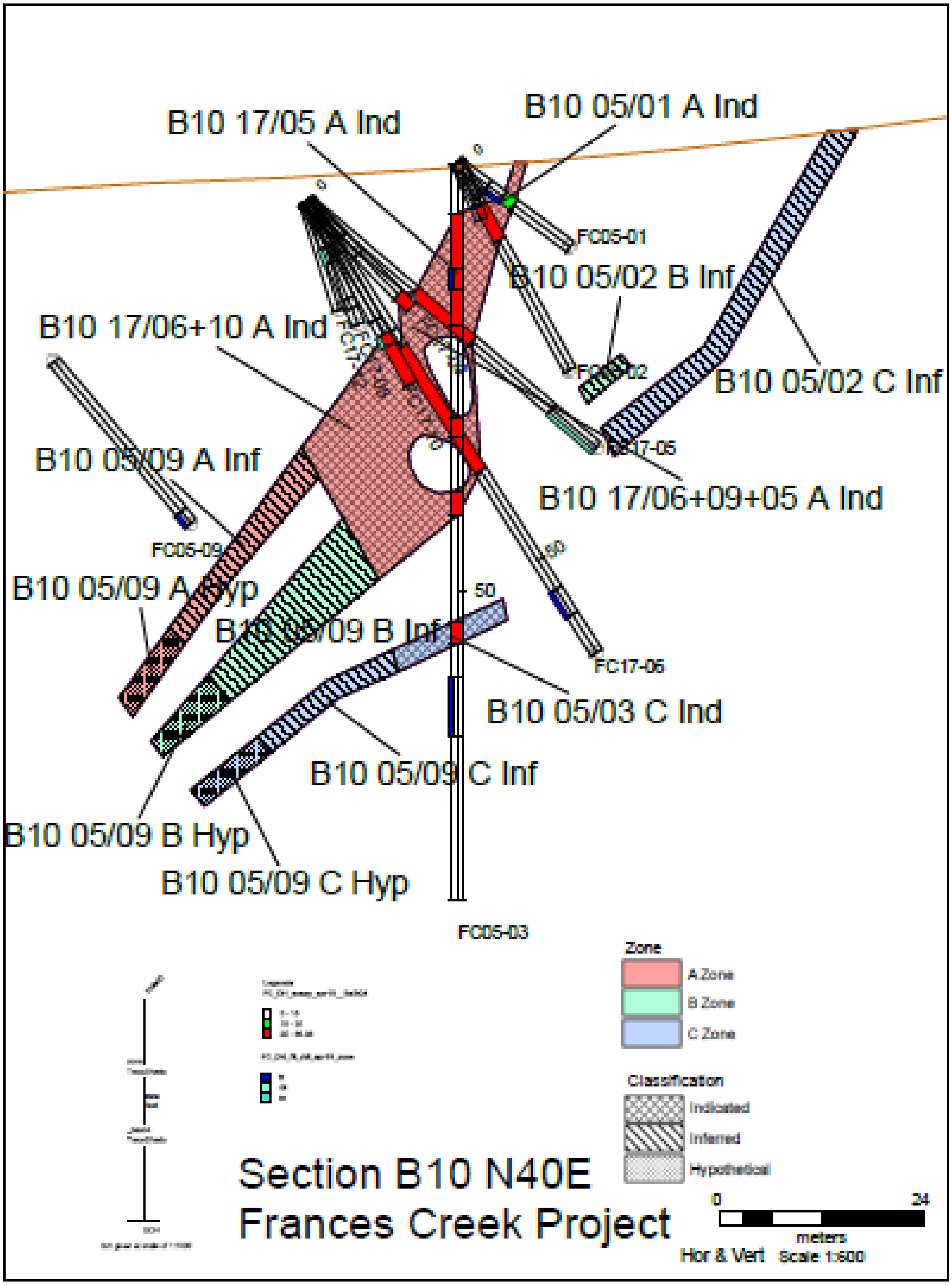


FIGURE 14.3.7 CROSS SECTION – B – 10

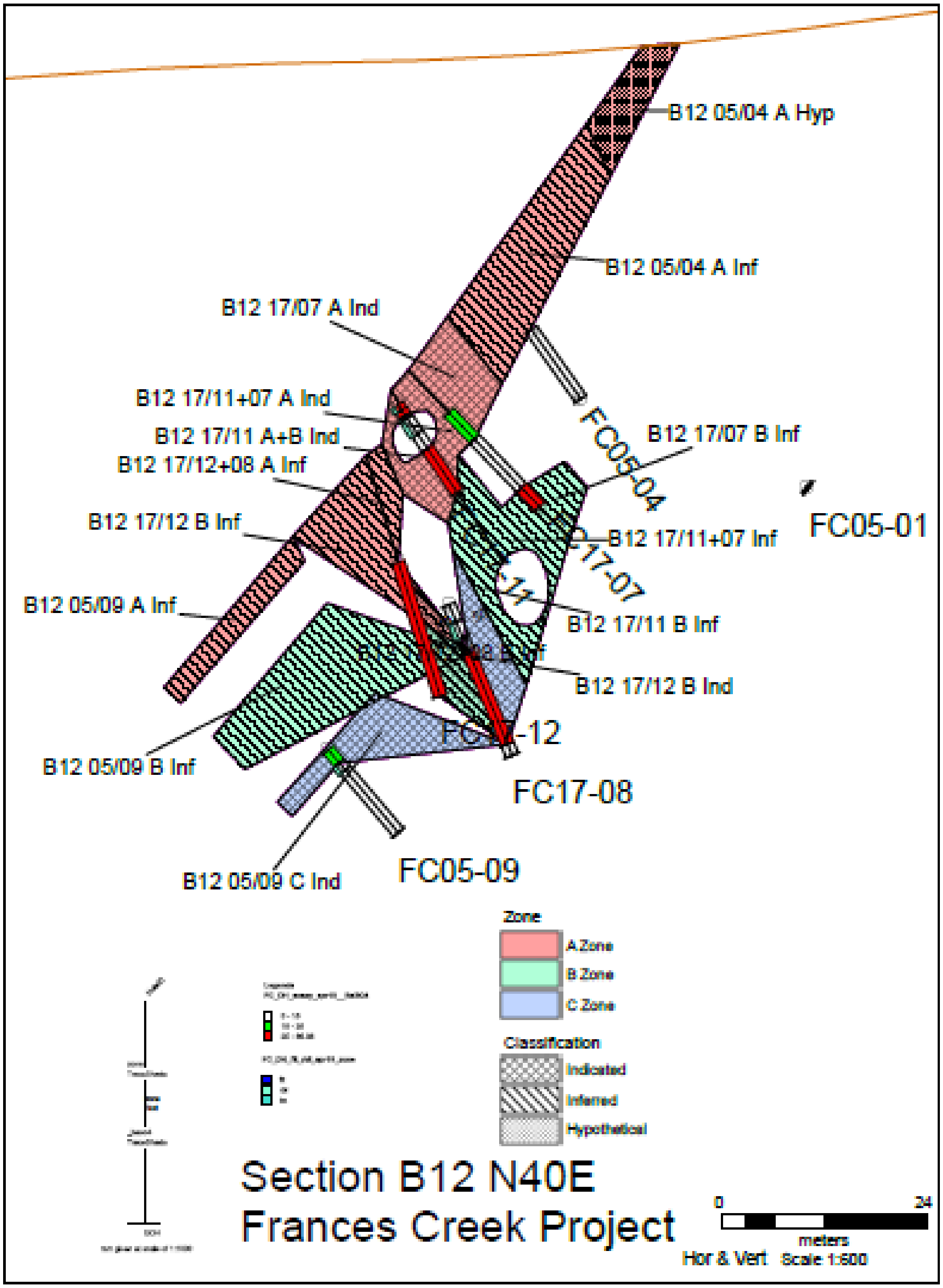


FIGURE 14.3.8 CROSS SECTION – B – 12

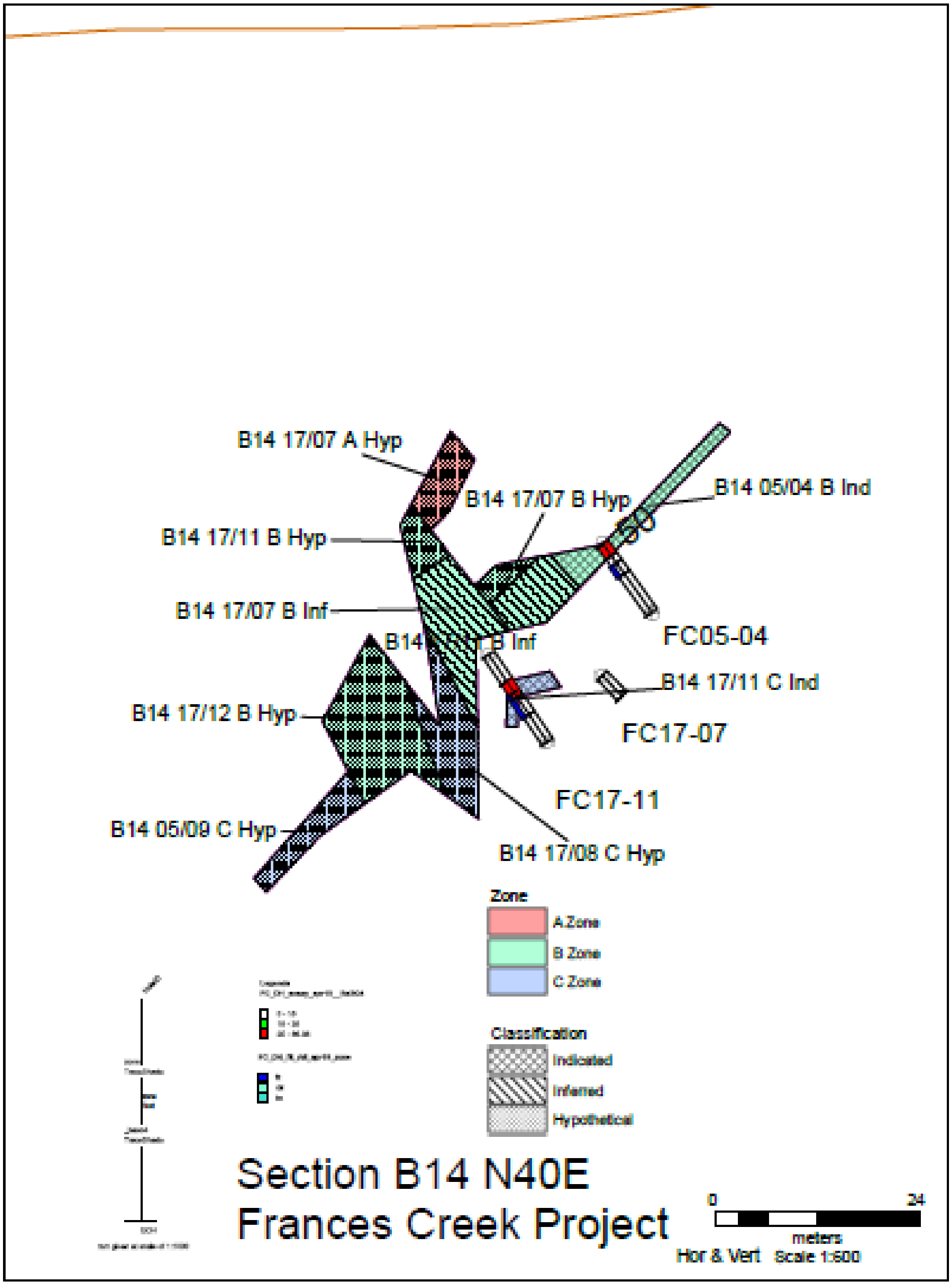


FIGURE 14.3.9. CROSS SECTION – B – 14

15.0 Mineral Reserve Estimates

No mineral reserves have been calculated as of yet; the Frances Creek Prospect is still classified as an exploration project (albeit – mature stage). A pre-feasibility study will be the next technical report to be filed and resources will be classified as reserves at that time.

16.0 Mining Methods

Technical reports for exploration stage projects are not required to report on **Section 16 – Mining Methods**. However, Voyageur's exploration and mining departments have expended considerable time, effort and expense formulating a Milling Plan for the Frances Creek Prospect. The authors fell that it might benefit potential investors to be able to review this work as completed to date, thus it is presented below. Much more detailed information will be prepared and presented in the next 43-101 report, which will be a Pre - Feasibility Study.

A bulk sample application will be submitted to the BC Chief Inspector of Mines, in 4th quarter of 2018. The bulk sample allows the exploration permit holder a onetime 10,000 tonne bulk sample. Upon successful mining and processing of the 10,000 tonne bulk sample, an application for a quarry permit will be submitted. Based on the drilled resource, Voyageur will have at a minimum of 5 years quarry mining of near surface barite.

The exploration trail will be expanded into a road that will allow excavators, 20 tonne articulated trucks and a dozer to access the B - Zone. An area 35m long x 30m wide will be cleared of overburden and foliage. This area will be washed and prepared for bench mining. There will be another area cleared next to the last switch back that will be used to store the topsoil for future reclamation of the disturbed area.

The 10,000 tonne sample will be mined using simple bench mining techniques and will be a small slope cut benched quarry operation. The sample will start at the top of the B - Zone at the 1580m elevation and mined down to the 1560m elevation. Three benches with wall height of 10m, bench face angle of 60° and catch bench width of 6.5m will be mined. The width of mining will be determined as mining progresses and is open to change. The maximum width planned for the bulk sample mining will be 20m and a minimum width of 5m. **Figure 16.1**

Estimated price per tonne for bench mining is $15-$20/tonne of ore and varies depending on strip ratio. This mine plan will allow for future mining down to the 1540m elevation on the same bench scale.

Voyageur expects the quarry permit to be issued in 2019 allowing for continuous yearly mining of 10,000 tonnes per year. Voyageur will be mining using conventional small side cut bench methods using a production cycle comprising of one eight hour shift delivering approximately 500 tonnes of ore to the crusher per day per shift. Voyageur anticipates an approximate 20 day cycle to mine a one year supply of barite.

		Surface mine	Surface mine	Surface mine	Surface mine	Surface mine
Production Year		1	2	3	4	5
Mine Ore Production		10,000	10,000	10,000	10,000	10,000
Mine Barite production		**2,170**	**2,170**	**2,170**	**2,170**	**2,170**
Dolomite production		7,830	7,830	7,830	7,830	7,830

Table 16.1 Estimated 5 year Mine Production

Time to Process	# of Days
Mining	20
Crushing/Gravity Seperation	28
Milling	28
Acid Washing	55
Bottleing Packaging	180

Table 16.2 Estimated Mine Production Time

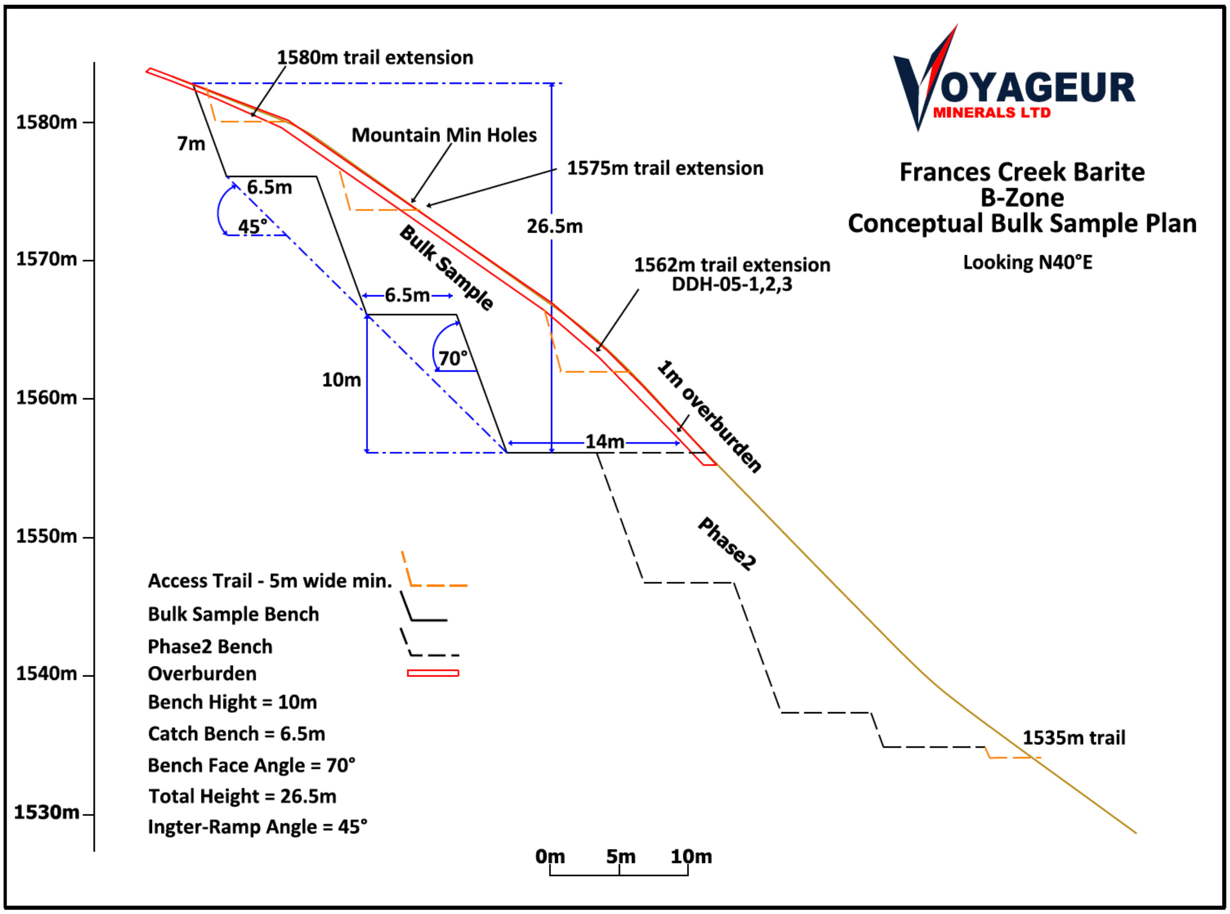


FIGURE 16.1 Conceptual Side Cut Bench Plan

17.0 Recovery Methods

Technical reports for exploration stage projects are not required to report on **Section 17.0 – Recovery Methods**. However, Voyageur's exploration and mining departments have expended considerable time, effort and expense formulating a Milling Plan for the Frances Creek Prospect. The authors felt that it might benefit potential investors to be able to review this work as completed to date, thus it is presented below. Much more detailed information will be prepared and presented in the next 43-101 report, which will be a Pre - Feasibility Study.

17.1 Mine Site Recovery Plant

Crushing and gravity separation of the barite will be done at the mine site and will cost an estimated $4/tonne.

Barite has been mined worldwide by many companies over the years and the majority of these deposits utilize gravity separation. The standard industry method is to crush the ore to 1"minus and run the material across mineral jigs. Mineral jigs will upgrade the barite to a 4.1- 4.3 density depending on the quality of the ore, however the fines that are 1/8" minus generally pass through the jig screens and are captured onto wilfley tables and concentrated. From past work at the Tiger Ridge mine, we believe recovery of coarse barite will be quite high at 95%. However, it is with the barite fines that recovery rates drop. Ultra fine barite is lost across the mine, crushing, jigging and table circuits due to the soft and fragile nature of high purity barite. When explosives are used, a portion of the barite is impacted into ultra fine dust and this is generally lost during processing. Voyageur's current estimate of fines recovered on the Frances Creek property are estimated conservatively at 70% recovery rate, based on past experience at the Tiger Ridge Mine. Blasting techniques will have to be experimented with to determine the least impactful blast method to reduce losses from the high purity Frances Creek mineralization.

All waste rock produced from mining will be sold as road gravel. Expected production will cover approximately 2-3 km of road per year. Estimated sales price based on local sales of road aggregate is $10-$20/tonne. Voyageur has discussed aggregate sales with local road constructors/maintainers and as a result estimates generating approximately $78,000 of revenue from road gravel sales per year.

17.2 Off Site Milling Plant

The barite concentrate will be trucked to a milling & acid washing plant. This location has not been determined at this time. The concentrate will be milled to 35 mesh and then sent through an acid treatment system and then tabled once more before drying and entering the micro grinding process.

Either a hammer mill or roller mill will be used; once milled, the barite will be ground to 35 mesh. This material is then run across wilfley tables for further upgrading to high purity barite. To ensure the highest grade and to eliminate any trace metals, the 35 mesh tabled concentrate is then sent to an HCl acid bath. This material is then returned and run across the wilfley tables for a final upgrade. Once the material is dried it is sent to a jet mill grinding facility. The jet mill will grind the 35 mesh material down to 1-10 micron. This final barite powder is then packaged and sold to the industrial, paint and pharmaceutical markets. See **Figure 17.1** below for a conceptual flow diagram of the planned barite production process at Frances Creek.

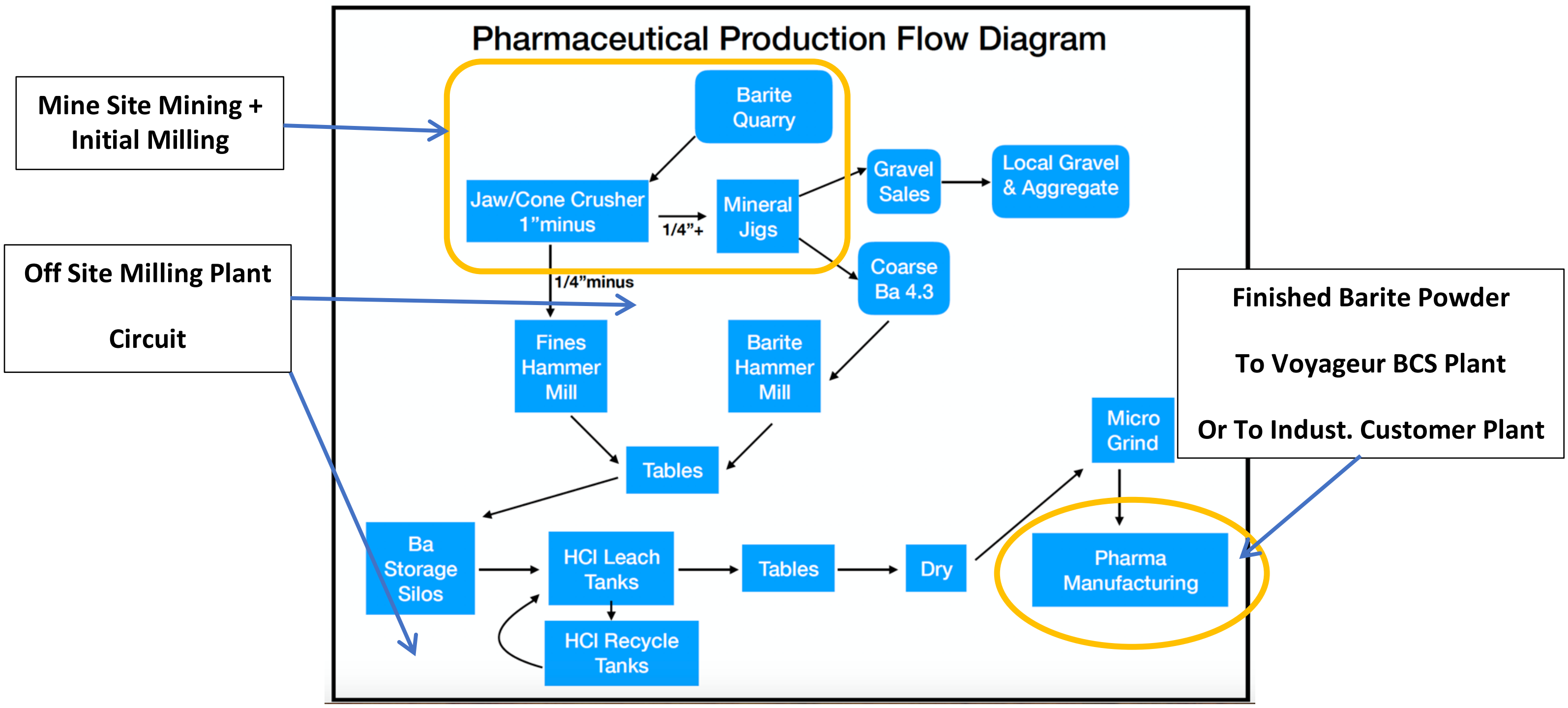


FIGURE 17.1 Frances Creek Barite Production Flow Diagram

17.3 Pharmaceutical Plant

Voyageur is studying the feasibility of producing Barium Contrast Suspension (BCS) to sell direct to medical end markets in N. America. BCS is used as a contrast medium that is ingested by the patient prior to receiving radiographic and magnetic imaging (CT Scan, MRI, etc.) of the gastrointestinal tract. The BCS allows doctors to see a higher contrast image of the patient's GI tract to allow for better identification of tumors, etc. If Voyageur is able to produce BCS, this would be the highest end use for barite products produced from the Frances Creek Prospect. **Figure 17.1**, shows the BCS Plant as a stand alone entity.

The contrast plant will mix the final barite powder produced at the off site milling plant with food additives and preservatives to create Voyageur's BCS. The other main ingredients are emulsifier, food grade starch, sugar, flavoring additives and water. Voyageur is contemplating manufacturing fluid and dry products.

Examples of BCS bottles:

(Source: E-Z-HD Barium Sulfate Bottles)

FIGURE 17.2 Barium Contrast Bottles

17.3.1 Precipitation

By utilizing the Blanc Fixe (AKA – Black Ash) precipitation process on Frances Creek barite, Voyageur should be able to produce a consistent pure grade of barite in excess of the current pharmaceutical grades in the industry. Almost all of the barium consumed commercially is obtained from barite sourced in China, which is often highly impure. Barite is processed by carbothermal reduction (heating with coke) to give barium sulfide:

$$BaSO_4 + 4\,C \rightarrow BaS + 4\,CO$$

In contrast to barium sulfate, barium sulfide is soluble in water and readily converted to the oxide, carbonate, and halides. To produce highly pure barium sulfate, the sulfide or chloride is treated with sulfuric acid or sulfate salts:

$$BaS + H_2SO_4 \rightarrow BaSO_4 + H_2S$$

Barium sulfate produced in this way is often called *blanc fixe*, which is French for "permanent white." Blanc fixe is the form of barium encountered in consumer products, such as paints (Wikipedia).

17.4 Energy, Water and Process Materials Requirements

Since the detailed design of both the on site and off site milling and finishing plants is still in the conceptual stage, details as to these requirements have not yet been estimated. Electrical energy will be generated for the on site mill, from diesel generators. Electrical energy for the off site milling and finishing plant will come from the grid. The detailed power requirements and attendant costs for power are yet to be determined. These details will be presented in the next 43-101 report, which will be a Pre - Feasibility Study.

Water and process materials requirements are also yet to be determined. It is assumed that on site water will come from Frances Creek and that off site water will come from municipal supply. Details on process materials are also yet to be determined. These details will be presented in the next 43-101 report, which will be a Pre - Feasibility Study.

18.0 Project Infrastructure

Technical reports for exploration stage projects are not required to report on **Section 18 – Infrastructure**. However, Voyageur's exploration and mining departments have expended considerable time, effort and expense creating the existing infrastructure for the Frances Creek Prospect. The authors feel that it might benefit potential investors to be able to review this work as completed to date, thus it is presented below.

Significant infrastructure already exists at the Francis Creek Property, in the form of mine access roads and drilling of exploration core holes. In addition, a large flat surface for mine offices, mineralized barite processing, parking, auxiliary equipment, etc. has already been constructed. This was constructed by a timber company to aid in timber harvest which coincided with the project claim boundaries. **Table 18.1** shows the estimated value of the infrastructure in place at the project.

INFRASTRUCTURE ITEM	DESCRIPTION	ESTIMATED VALUE
ACCESS ROAD	6 KM @ $ 20K/KM	$ 120,000
EXPLORATION TRAIL	1.8 KM @ $ 12K/KM	$ 21,600
LANDING AREA	APPROX 100M X 50M @ $ 5/SQ M	$ 25,000
A – ZONE MINE PORTAL	PORTAL FOR ADIT	$ 15,000
PROJECT DATA BASE – DRILL DATA	53 HOLES @ $ 12,000	$ 636,000
PROJECT DATA BASE – CHANNEL SAMPLE DATA	3 CHANNEL SPLS @ $ 3500	$ 10,500
	TOTAL EST VALUE	**$ 828,100**

Table 18.1 – Estimated Value of Infrastructure – Frances Creek Prospect

19.0 Market Studies and Contracts

Technical reports for exploration stage projects are not required to report on **Section 19.0 – Market Studies and Contracts**. However, Voyageur has expended considerable time, effort and expense to understand the potential markets for barite products from the prospect. The authors felt that it might benefit potential investors to be able to review this work as completed to date, thus it is presented below.

Voyageur initiated market studies and metallurgical processing upgrade studies in Q1 – 2018, for the Frances Creek Property. These studies are still underway, as this report is being written. A synoptic update on the status of these activities is presented in this report.

As was discussed previously, barite used in fillers, glasses, chemicals and paints and for pharmaceutical purposes commands a significantly higher price than barite used as an oil well drilling mud additive. Likewise, raw material specifications for barite used in these higher end applications are considerably more stringent than specifications for drilling mud barite.

The first step in any market study is to determine if your particular future mineral product will meet the specifications of the various markets to be sold into. **Tables 19.1a – b - c**, list the various finished barite markets and their key specifications. The data to produce the specification tables shown above were provided by the second author from various publications provided by various vendors of drilling grade, industrial grade and pharmaceutical grade barite. The first and second author worked together to compile the data presented in the tables.

From the data shown in **Section 7.2.1.3, Figure 8** and **TABLE 10.6**, it can be seen, that the crystalline barite portion of the Frances Creek Breccia Vein is a high purity (+95% $BaSO_4$), high specific gravity (+ 4.3 SG) barite. This suggests, that after conventional milling (crushing – jigging – tabling) a high purity, high SG product could be consistently produced from Frances Creek. However, a metallurgical testing program should be initiated in the next phase of exploration to verify this.

High purity and high SG are two of the major specifications for the higher end barite markets; the remaining specifications are mainly a function of the amount of trace elements and the physical properties of the high end finished products. These are briefly discussed in **Sections 19.1 – 19.6** below:

19.1 Drilling Grade Barite

For this market, the specification requirements are + 4.1 SG, < 250 mg/l Alkaline Earth Soluables, < 1ppm Hg and < 3 ppm Cd, particle size – 97% @ 200 mesh.

+ 4.1 SG – Inspection of **Chart 19.1,** shows that for this property, a barite purity of 85% is equivalent to a specific gravity of 4.1. This specification should be readily achieved with the standard milling circuit of crushing, jigging and tabling. When Tiger Ridge operated the Windemere, BC, barite mill in the late 1990 – early 2000 time frame, an SG of 4.2 was routinely achieved with run – of – mine ore (36 – 40% $BaSO_4$ / 3.2 – 3.3 SG) from Tiger Ridge's Jubilee Mt. Mine (B. Willis, PC, 2018). This is similar grade to the expected run-of-mine mineralized material at Frances Creek property (37.75% $BaSO_4$ – 3.27 SG – the grade of the indicated resource). Even though, there have been no milling tests conducted on the Frances Creek barites, similar results are anticipated.

INDUSTRY	PHYSICAL PROPERTY	SPECIFICATION	NOTES
19.1 - OIL & GAS DRILLING	SPECIFIC GRAV.	+4.1	Can easily jig to this spec.
	ALK EARTH – H20 SOLUABLE	<250mg/l	Assay data (7 spls) shows max of 198 mg/l Avg = 65 mg/l – should meet this spec
	CADMIUM	<3 ppm	Assay data (158 spls) shows 1 spl >3ppm - 157 spls 0 – 1 ppm – meets spec
	MERCURY	<1 ppm	Assay data (27 spls) shows max of 0.019 ppm Hg – meets spec
	PARTICLE SIZE	97% @ 200 mesh < 30% - 6 micron	Function of grinding – should easily meet spec
19.2 - GLASS MANUFACTURE	% BaSO4	96 – 98%	Jigs + tables should be able to meet this spec
	SiO2	< 2.5%	Assay data (4 Assays) show max of 0.54% - probably meets spec
	Fe2O3	< 0.15%	Once cleaned to 96% BaSO4 – should meet this spec
	PARTICLE SIZE	Min -30 mesh to 140 mesh	Function of grinding – should easily meet spec
19.3 - FILLER GRADE	% BaSO4	+ 95%	Jigs + tables should be able to meet this spec
	BRIGHTNESS	+ 94 Hunter L	Ground mineralized samples meet this spec – three samples
	Fe2O3	< 0.1%	Once cleaned to 96% BaSO4 – should meet this spec
	PARTICLE SIZE	Max – 325 mesh or finer	Function of grinding – should easily meet spec

TABLE 19.1a Product Specifications – Various Markets

INDUSTRY	PHYSICAL PROPERTY	SPECIFICATION	NOTES
19.4 - CHEMICAL INDUSTRY	% $BaSO_4$ / SG	+95/+96%% - + 4.3/+ 4.35	Jigs + tables will probably be able to meet this spec
	% SiO_2	Below/Equal – 1.5%	Assay data (4 Assays) show max of 0.54% - probably meets spec
	% Fe_2O_3	< 0.3%	Once cleaned to +95% $BaSO_4$ – should meet the Fe_2O_3 spec
	Particle Size	0 – 200mm, 90% min	Function of grinding – should probably meet spec
19.5 - PAINT INDUSTRY	% $BaSO_4$/SG	+ 96%/4.3-4.4	Jigs + tables should be able to meet this spec
	% $SrSO_4$	< 3.5%	Fusion digestion assay data (18 spls) shows Avg = 2.4% - with acid washing
	% Fe_2O_3	< 0.1%	After acid wash – avg @ 0.011% Fe_2O_3
	$CaCO_3$	< 0.5%	Assay data – 18 Spls Avg @ 96% $BaSO_4$ show Avg of 2.32% - After acid wash – avg @ 0.022%
	Mercury	<1 ppm	Assay data (27 spls) shows max of 0.019 ppm Hg – meets spec
	SiO_2	0.5 – 1.0%	After acid wash – avg @ 0.42% SiO_2 – 14 samples @ $BaSO_4$% @ +96%
	Al_2O_3	< 0.1%	After acid wash – avg @ 0.034% – 14 samples @ $BaSO_4$% @ +96%
	TiO_2	< 0.1%	After acid wash – avg @ 0.012% – 18 spls
	LOI	0.5 – 1.0%	After acid wash – avg @ 0.19% LOI – 18 spls
	BRIGHTNESS	+94% -Hunter L 2% Max – Hunter B	Ground mineralized samples meet this spec – three samples
	PARTICLE SIZE	.044mm - .149mm	Function of grinding – should easily meet spec

TABLE 19.1b Product Specifications – Various Markets - Note – specifications provided by authors from various industry sources

< 250 mg/l Alkaline Earth Sol. – The project database shows only seven barite samples were assayed for this specification. Two samples returned non-detect levels, one sample returned a maximum of 198 mg/l. The average for the seven samples was 92.6 mg/l as dissolved $CaCO_3$.

< 3 ppm Cd – The author reviewed 104 Cd assays from the 2017 drill program and 54 Cd assays from the 2003 – 05 drill programs (ICP-30). A total of 83 assayed at < 1 ppm, 63 assayed at 1 ppm, 11 assayed at 2 ppm (157 total). Only 1 assayed above the 3 ppm limit, and this was at 4 ppm. Cadmium content is not a problem for the Frances Creek Property barite.

19.6 - PHARMACEUTICAL INDUSTRY	**% $BaSO_4$**	**+97.5%**	**Jigs + tables should be able to meet this spec**
	% $SrSO_4$	**Below/Equal - 2.5%**	**Fusion digestion assay data (18 spls) shows 9@ + 2.5% - 9 @ - 2.5% Avg = 2.4% - Avg is just within Specification Limit - Most likely – precipitation will be required to meet spec.**
	% SiO_2	**Below/Equal – 1.0%**	**Assay data (18 Assays) show Avg = 0.81% - should meet spec**
	Heavy Metals	**Oral Daily Dose – Class 1 - Cd, Pb, As, Hg Class 2A – Co, Ni, V**	**Available ICP assay data indicates that the Heavy Metals specification might be met with acid washing alone. Most likely – precipitation will be required**
	Loss on Ignition	**< 2.0%**	**18 samples show a max of 0.39% Should meet Spec**
	Sulfide, Sol Ba salts, Sulphur Compounds, pH	**Various Limits**	**No USP Testing Data Available**
	Biological specifications	**6 individual specifications**	**Not Discussed in Text – No Avail USP Test Data**
	Particle Size	**Median Diam = 7.5 – 15.4 um**	**Function of grinding – should probably meet spec**

TABLE 19.1c Product Specifications – Various Markets

Note – specifications provided by authors from various industry sources

< 1 ppm Hg – The project database shows that 27 samples were assayed for mercury. The maximum value detected was 0.019 ppm.

Particle Size - Particle size is a matter of grinding to the correct mesh size, so barite from the property should meet this criterion fairly easily.

Conclusion - The Frances Creek barite should meet API drilling grade specifications easily, as can be seen by inspection of **Table 20.1a**. Available assay data indicates meeting specifications should not be a problem. The conclusion is that conventionally milled barite produced from the Frances Creek Property should be able to be sold into the drilling market.

19.2 Glass Manufacture

The key specifications for the glass market are; % $BaSO_4$ – 96 – 98%, SiO_2 = < 2.5% and Fe_2O_3 = < 0.15%, particle size - -30 to 140 mesh.

96 – 98% $BaSO_4$ – Inspection of **Chart 19.1,** below shows that a barite concentrates with SG = 4.3 – 4.4 should have a purity that matches this specification. Production from the Jubilee Mt. mine in the early 2000's routinely achieved a barite concentrate with an SG of 4.2 (similar breccia vein mineralization), using gravity concentration milling (crushing jigs and tables). It is assumed that upgrading the Frances Creek concentrates by an additional 4% – 5% would be achievable, although milling tests should be initiated during the next phase of exploration to verify this.

SiO_2 = < 2.5% - The assay database for Frances Creek only has four whole rock analyses for SiO_2, the highest for this constituent was 0.54%. This was for a sample that assayed 88.76% $BaSO_4$ and 4.18 SG. The other three samples which were purer in crystalline barite (+ 97.9% $BaSO_4$ / + 4.47 SG), showed a maximum of 0.1% SiO_2. SiO_2% at the Frances Creek Property does not appear to be a problem.

Fe_2O_3 = < 0.15% - There are 102 assays for Fe (ICP – 30 Element) in the 2017 data base for the project. By stoichiometric calculation, % of Fe X 2.859 = % Fe_2O_3. **Chart 19.2a** shows that Fe_2O_3 content for the samples in the data base ranges from a low of 0.028% to a high of 5.96%, and is related to barite purity. Higher purity samples have less Fe_2O_3 – the gangue (country rock) portion of the breccia contains most of the Fe_2O_3.

Chart 19.2b shows this relationship for the 15 samples in the data base with + 95% $BaSO_4$. All of the samples with a purity of + 95% $BaSO_4$ meet the specification of < 0.15% Fe_2O_3. The purity specification for the glass market is + 96% $BaSO_4$. If the barite from the property can be milled (jigs – tables) to meet the + 96% purity specification, then it should also meet the Fe_2O_3 specification.

Particle Size - Particle size is a matter of grinding to the correct mesh size, this criterion should be able to be met fairly easily.

Conclusion - Inspection of **Table 19.1a**, indicates that considering the available sample data, the Frances Creek property would probably meet specifications for this market. The conclusion is that conventionally milled barite produced from the Frances Creek Property should meet specifications for the glass manufacturing market.

19.3 Filler Grade

The key specifications for the filler market are; BaSO4 – +95%, Fe2O3 = < 0.10%, Brightness = + 94 Hunter L, Particle size – 325 mesh or finer.

BaSO4 – +95% - The reader is referred to **Section 20.2 - 96 – 98% BaSO4,** for discussion on this topic. It is assumed that filling this specification should be achievable, although milling tests should be initiated during the next phase of exploration to verify this.

Fe2O3 = < 0.10% - The reader is referred to **Section 20.2 - Fe2O3 = < 0.15%**, for discussion on this topic. **Chart 20.2b**, shows that only 4 out of 15 of the high purity samples tested contained more than the specification limit of 0.10% Fe2O3; 11 out of 15 meet this specification. Close attention to QA/QC procedures will probably allow for production of high purity barite concentrates that meet this tight Fe2O3 specification.

Brightness = + 94 Hunter L - A total of 3 outcrop samples collected during the 2015 exploration program were ground and were then tested for brightness at SGS Labs in Ontario (**Table 19.2**).

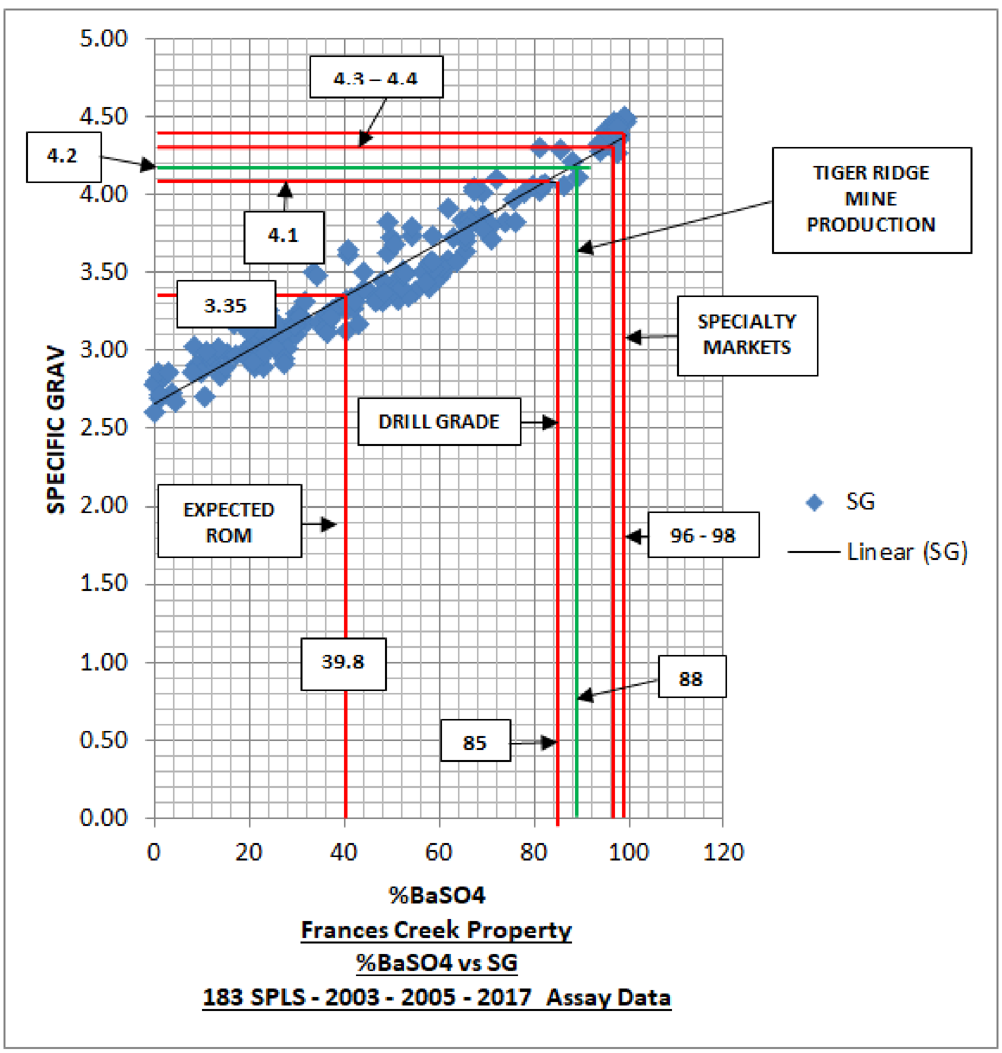


Chart 19.1 – Barite Purity vs Density Curve – 183 Samples

L*, u',v' – CIE 1976 Hunter L, a, b

SAMPLE #	L*	u'	v'		L	a	b
FC1 2015	95.4	0.202	0.462		94.1	0.9	0.8
FC2 2015	95.8	0.202	0.460		94.6	1.4	-0.6
FC4 2015	95.6	0.203	0.462		94.4	1.4	1.1

TABLE 19.2 - 2015 Outcrop Sample Results – Brightness Testing - Frances Creek Property

The three samples tested at SGS had a $BaSO_4$ content of + 97.9% - nearly pure crystalline barite and are considered to be representative of high grade milled barite concentrates. The Hunter L value for these samples was + 94; the ground samples meet this specification; most likely other high purity barite concentrates produced at the property would also.

Particle Size - As mentioned earlier, particle size is a matter of grinding to the correct mesh size, this criterion should be able to be met fairly easily.

Conclusion - The conclusion is that conventionally milled barite produced from the Frances Creek Property should be able to be sold into the filler market.

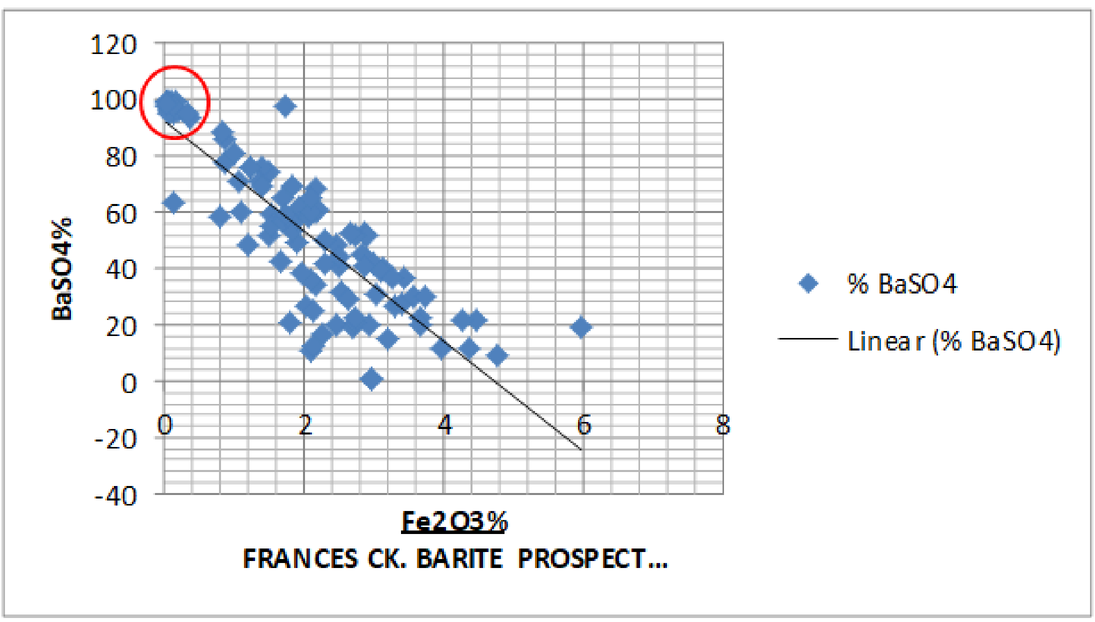


Chart 19.2a – Fe_2O_3% vs. Barite Purity – 102 Samples

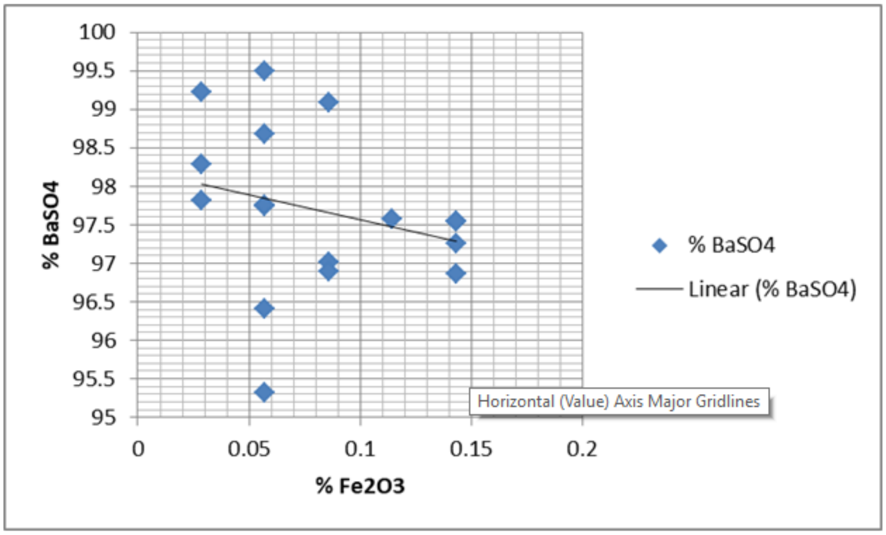


Chart 19.2b – Fe2O3% vs. Barite Purity – High Purity Barite – 15 Samples

19.4 Chemical Industry

The key specifications for the chemical markets are, BaSO4 = + 95/+96% - SG = + 4.30/+ 4.35, SiO2 < 1.5%, Fe2O3 < 0.3%, particle size – 0 – 200mm. Chemical grade barite is the feed stock for the Blanc Fixe (permanent white) / precipitation method. Chemical grade barite can be used as a feed stock to produce pharmaceutical grade barite, barium carbonate, barium hydroxide and many other types of barite chemicals.

BaSO4 = + 95/+96% - SG = + 4.30/+ 4.35 – The reader is referred to **Section 20.2 - 96 – 98% BaSO4,** for discussion on this topic. This specification should be achievable, although here again, milling tests should be initiated during the next phase of exploration to verify this.

SiO2 < 1.5% - The reader is referred to **Section 20.3 - SiO2 < 1.0%** for a discussion on this specification criteria. The available data indicates that conventionally milled Frances Creek barites should meet this specification.

Fe2O3 < 0.3% - The reader is referred to **Section 20.2 and Charts 20.2a and b,** for a discussion on this trace compound specification. The available data indicates that conventionally milled Frances Creek barites should meet this specification.

Particle Size - Particle size is a matter of grinding to the correct mesh size. This specification should be able to be met fairly easily

Conclusion - The conclusion is, that conventionally milled high purity barite concentrates from the Frances Creek Property should be able to meet specifications for the chemical industry. It is also important to note, that chemical grade barite is the feedstock material to produce Blanc Fixe. Blanc Fixe is a high end (99% BaSO4) precipitated barite powder used in the filler, paint and pharmaceutical industries. It is produced by the Blanc Fixe Precipitation process (AKA – Black Ash Process). See **19.5.1** for additional details.

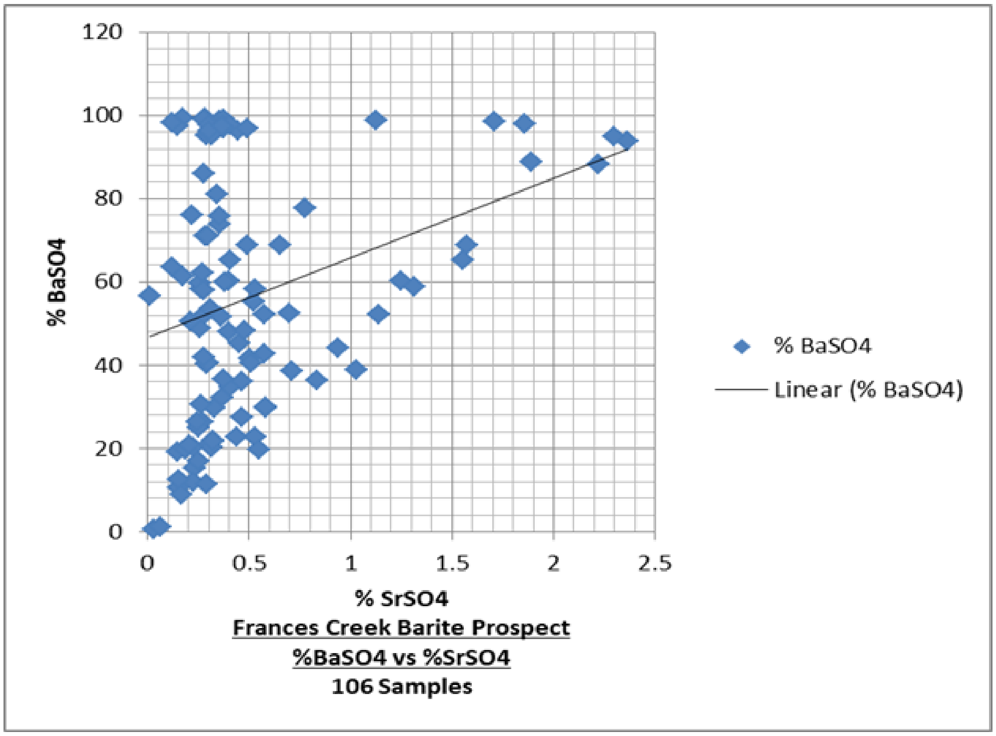


Chart 19.3a - %SrSO4 vs Barite Purity – 106 Samples

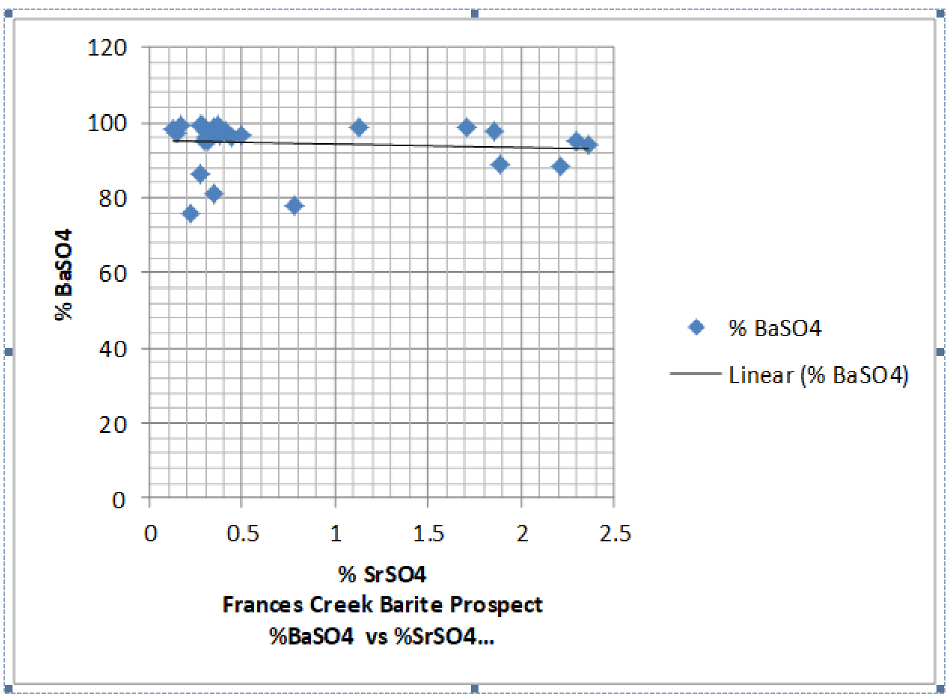


Chart 19.3b – SrSO4% vs. Barite Purity – High Purity Barite – 31 Samples

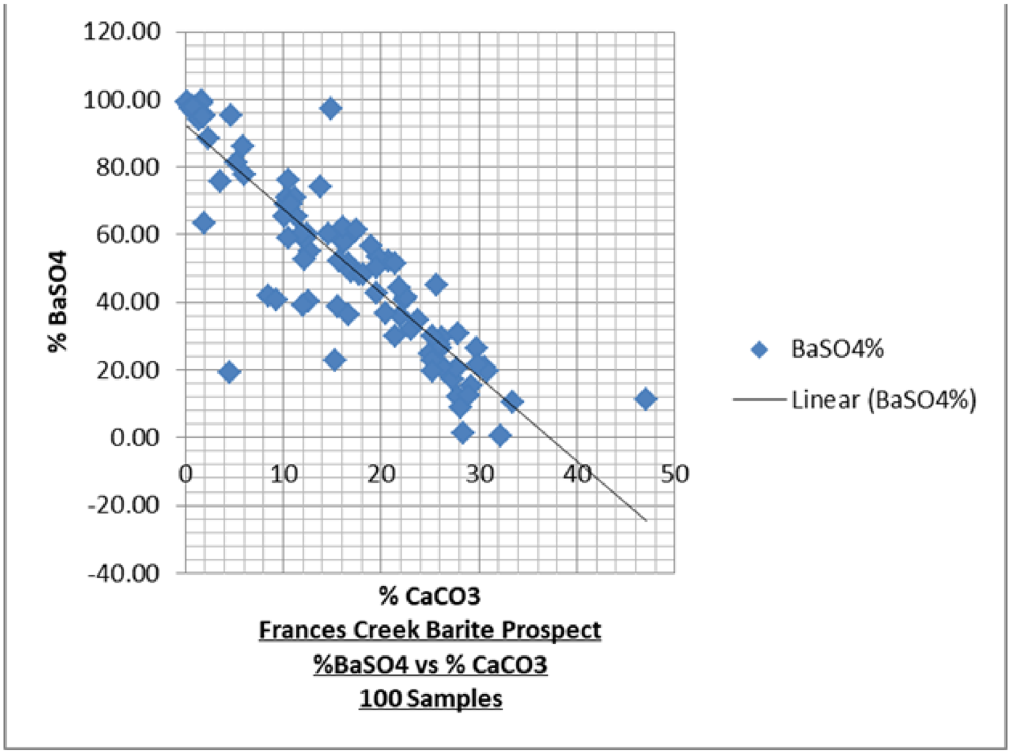


Chart 19.4a – Barite Purity vs. % CaCO3

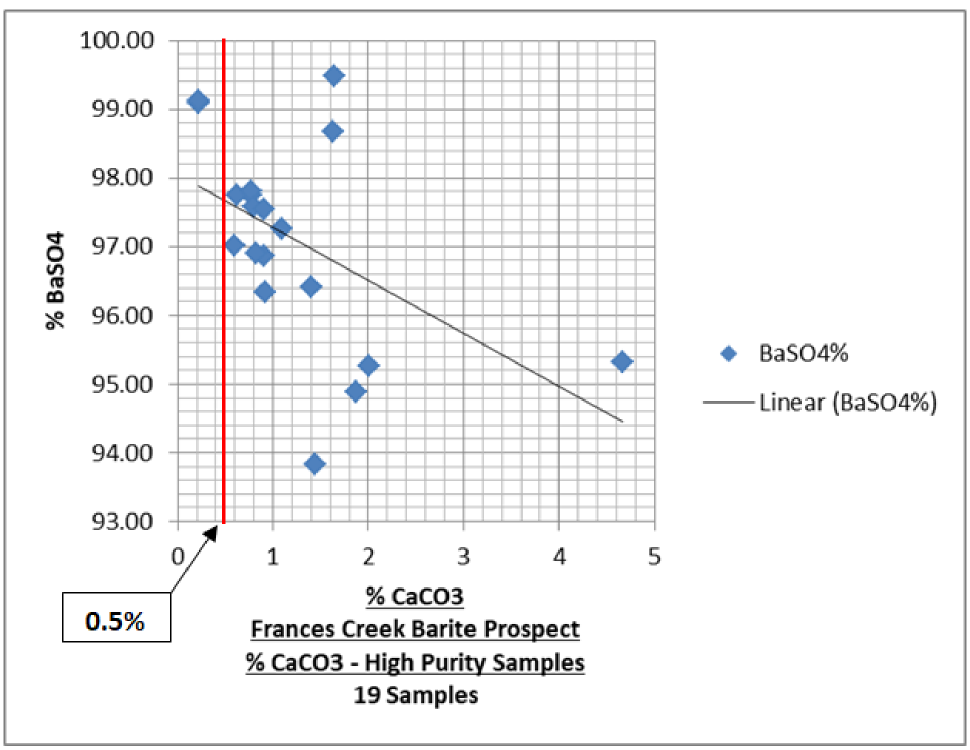


Chart 19.4b – CaCO3% vs. Barite Purity – High Purity Barite – 19 Samples

19.5 Paint Industry

The key specifications for the paint markets are, $BaSO_4$ = + 96% - SG = + 4.3, $SrSO_4$ < 3.5%, Fe_2O_3 - < 0.1, $CaCO_3$ - < 0.5%, Hg - < 1ppm, %SiO_2 < 0.5%, Al_2O_3 < 0.1%, TiO_2 < 0.1%, LOI - < 0.5%, Brightness + 94% (Hunter L), < 2% (Hunter B). Mercury specifications are the same as for the drilling mud industry. Moisture is capped at 1%, particle size = 0.044 – 0.149 mm.

BaSO4 = + 96% - SG = + 4.35 - The reader is referred to **Section 20.2 - 96 – 98% BaSO4,** for discussion on this topic. This specification should be achievable, although milling tests should be initiated during the next phase of exploration to verify this.

SrSO4 < 3.5% - Recent testing at Loring Labs, (discussed in **Section 13.0**), utilized fusion digestion with ICP finishing. This method is more accurate for Strontium analyses than the ICP methodology used for the 2017 drill sample testing. The 2018 testing was done on acid washed samples, results showed 9 samples above and nine samples below 2.5% $SrSO_4$ (stoichmetric calculation). The maximum $SrSO_4$% was 3.1% (0.4 % below the limit). The minimum $SrSO_4$% was 1.1% (2.4% below the limit). The average $SrSO_4$ % was 2.4%; which is below the 3.5% limit.

In order to meet the $SrSO_4$ specification for the paint industry, only acid washing of conventionally milled barite concentrates will probably be required

Fe2O3 = < 0.1% - The reader is referred to **Section 20.2 and Charts 20.2a and b,** for a discussion on this trace compound. Glass manufacture specifications for Fe_2O_3 (which are easily meet) are tighter than Paint specifications. The Frances Creek barites should probably meet this specification with only conventional milling. After acid washing, the average Fe_2O_3 content drops to an average 0.011%. This would easily meet this specification.

CaCO3 < 0.5% - The project data base from the 2017 sampling program has 100 samples that were assayed for Ca (ICP – 30). By stoichiometric calculation, % of Ca X 2.497 = % $CaCO_3$. Inspection of **Chart 19.4a**, shows that higher purity barites from the property have lower $CaCO_3$ contents than the lower purity barites.

Chart 19.4b, examines this relationship for 19 high purity barite samples (+ 93% $BaSO_4$). This chart shows that 18 out of 19 samples have a $CaCO_3$ content which exceeds the 0.5% maximum. This indicates that high purity barite concentrates produced from conventional milling (jigging, tabling) at the property will probably not meet the $CaCO_3$ specification. Additional, more advanced milling techniques will probably be required.

The 2018 acid wash testing indicates that acid washing reduces the average $CaCO_3$ content to an average of 0.022%. acid washing should easily allow the Frances Creek barites to meet the $CaCO_3$ specification.

Mercury – This specification is the same as for the drilling mud industry. See **Section 19.1** for a discussion on this criterion. Available data indicates that this specification should be met with conventional milling techniques.

SiO2 < 0.5% - The 2018 acid wash testing indicates that acid washing of 14 samples with + 96% $BaSO_4$ content, reduces the average SiO_2 content to an average of 0.42%. Acid washing should easily allow the Frances Creek barites to meet the SiO_2 specification.

<u>Al2O3 < 0.1%</u> - The 2018 acid wash testing indicates that acid washing of 14 samples with + 96% BaSO4 content, reduces the average Al2O3 content to an average of 0.034%. Acid washing of milled concentrates should easily allow the Frances Creek barites to meet the Al2O3 specification.

<u>TiO2 < 0.1%</u> - The 2018 acid wash testing indicates that acid washing of 18 samples with 86.08 - 99.12% BaSO4 content, reduces TiO2 to an average of 0.012%. Acid washing should easily allow the Frances Creek barites to meet the TiO2 specification.

<u>LOI < 0.5%</u> - The 2018 acid wash testing indicates that acid washing of 18 samples with 86.08 - 99.12% BaSO4 content, reduces the TiO2 content to an average of 0.019%. Acid washing should easily allow the Frances Creek barites to meet the LOI specification.

<u>Brightness = + 94% (Hunter L), < 2% (Hunter B)</u> – The reader is referred to **Section 19.4 - <u>Brightness = + 94 Hunter L</u>** , for a discussion on this specification. Available data indicates that this specification should be meet with conventional milling techniques.

<u>Moisture and Size</u> - Particle size is a matter of grinding to the correct mesh size, moisture is a function of product drying. This criterion should be able to be met fairly easily.

<u>Conclusion</u> - The conclusion is that conventionally milled barite produced from the Frances Creek Property will require acid washing in order to be sold into the paint market. Techniques such as acid washing should reduce both the CaCO3 and SrSO4 content of the conventionally milled high purity barite concentrates to meet these specifications. The acid wash testing also indicates It will reduce concentrations of Fe2O3, SiO2, Al2O3, TiO2 and LOI, thus adding to the quality of the product.

SAMPLE WIDTH	BaSO4 %	SG	Ca ppm	Cd ppm	Hg ppb	Pb ppm	As ppm	Sr ppm	Al2O3 %	Fe2O3 %	SiO2 %
1.41m	98.54	4.48	34	<1	7	6	2	8162	0.03	0.02	0.05
1.25m	98.76	4.48	24	<1	6	4	1	5380	0.01	0.01	0.06
0.92m	88.76	4.18	29	<1	7	4	<1	9023	0.27	0.53	0.54
1.4m	97.86	4.47	24	<1	5	4	1	8864	0.06	0.03	0.10

TABLE 19.3 - 2015 Outcrop Sample Results – Chemical Testing - Frances Creek Property

19.5.1 Blanc Fixe – Precipitated Barite – (AKA – Black Ash Process)

The term "blanc fixe" (permanent white) refers to the outstanding properties of the product as a filler and a pigment. Obtained by reacting chemical grade barite with heat and acid. The chemical precipitation process combines the barite with a carbon (petroleum coke) and heating the mixture with a rotary kiln. The high temperature breaks the bonds of the sulfide from the Ba and Sr and forms BaS upon completion of this reaction. The BaS is added to a precipitation tank utilizing sulfuric acid. The BaS is reacted and high purity BaSO4 is produced. Precipitated barite has purity of <u>98.0% - 99.99%</u> $BaSO_4$.

By various methods of agitation, the particle size can be controlled to produced various size micro particles.

Blanc fixe enhances brilliance in many coatings and acts as a pigment disperser both in coloured systems as a distancer between white and coloured particles and thus increased effectiveness of coloured pigments.

Due to the shortage in barite supply for pharmaceutical barite and due to the purity of the product, blanc fixe is currently being used to manufacture North American pharmaceutical barite products. Voyageur anticipates using the Blanc Fixe Precipitation Process (AKA – Black Ash Process) to produce pharmaceutical grade barite. This is discussed in more detail in **Sections 19.6 and 19.8 – 19.12**.

19.6 Pharmaceutical Grade

Pharmaceutical grade barite is exceptionally pure and has more rigid specification parameters than most other markets. In addition, laboratory test procedures for pharmaceutical grade barite must meet either US Pharmacopeia , European Pharmacopeia and Health Canada criteria. For example, the USP assay test for % $BaSO_4$ is substantially different from the test run for this criteria at Loring Labs (the main project lab).

There are only a few laboratories in either North America or the EU, that do testing for pharmaceutical barite. <u>Voyageuer has not yet had any pharmaceutical lab testing undertaken on Frances Creek barites</u>. The labs used for this report; Loring and ALS – Chemex are minerals exploration and mining test labs. Their methodology and equipment are not the same as pharmaceutical labs. However, they do test for many of the same analyates as the pharma labs, this allowed us to review several– but not all of the pharmaceutical grade specifications.

Voyageur has identified two labs (Intertek Labs and Maxxam Analytics), that are capable of testing pharmaceutical specifications as part of the next phase of developing the Frances Creek project.

The first author has listed the main pharmaceutical specifications in **Table 19.1c**. In the Notes column of the table, the first author's initial thoughts with respect to the Frances Creek barites either meeting or not meeting certain specifications are noted.

It appears that for several of the pharmaceutical specifications, where assay data from Loring Labs is available, the Frances Creek barites would meet the specification. This is especially true for the Class 1 Heavy Metals specification, where ICP analysis (required for USP 233) is available for Arsenic, Cadmium, Mercury and Lead.

The key specifications for the pharmaceutical markets are shown in **Tables 19.2, 19.3 and 19.4**. Voyageurs lab work only allows us to address four of these, they are; $BaSO_4$ = + 97.5%, $SrSO_4$ < 2.5%, SiO_2 < 1% and heavy metals (Class 1 only) – to meet USP 233.

<u>$BaSO_4$ = + 97.5%</u> - The reader is referred to **Section 19.2 - <u>96 – 98% $BaSO_4$,</u>** for discussion on this topic. This specification should be achievable, although milling tests should be initiated during the next phase of exploration to verify this.

<u>$SrSO_4$ < 2.5%</u> - Recent testing at Loring Labs, (discussed in **Section 13.0**), utilized fusion digestion with ICP finishing. This method is more accurate for Strontium analyses than the ICP methodology used for the 2017 drill sample testing (Jacob Ha – Loring Labs, P.C.). The 2018 testing was done on acid washed samples, results showed nine samples above and nine samples below 2.5% $SrSO_4$ (stoichmetric calculation). The maximum $SrSO_4$% was 3.1% (1.1% above the limit). The minimum $SrSO_4$% was 1.1% (1.4% below the limit). The average $SrSO_4$ % was 2.4%; which is just below the 2.5% limit.

The FDA specifications for pharmaceutical barite are as follows:

Limit of Sulfide	< 0.5 ppm
Limit of Acid Sol. Subst.	<0.3% w/w
Limit of Sol. Ba Salts	< .0001% w/w
Heavy Metals	USP <233>
pH (10% @ aqueous susp.)	3.5 – 7.0
Strontium Sulfate	< 2.5% w/w
Silicon Dioxide	< 1.0% w/w
Barium Sulfate	97.5 – 100.5%
Total aerobic microbial count	< 1000 cfu/g
Total combined yeasts and molds count	< 100 cfu/g
E. coli	Absence/g
Salmonella spp	Absence/10g
Sphylococcus aureus	Absence/g
Bile-Tolerant-gram-negative	< 100/g

Table 19.4 FDA USP Pharmaceutical Barite Specifications – yellow accented – discussed in text

The 2018 metallurgical testing indicates that after acid washing, on average, the Frances Creek Barites should meet this specification, although close attention to QA/QC would be required to meet this spec. Most likely, the Frances Creek barites will require sodium sulfate solution precipitation techniques in order to meet pharmaceutical grade specifications. The high purity of the conventionally milled barite concentrates will probably allow this step of the purification process to be accomplished more cost effectively than if lower purity barite concentrates were used.

SiO_2 < 1.0% - The 2018 metallurgical testing was conducted on 18 acid washed samples. The highest SiO_2 assay was 3.65%, the lowest was 0.01%. The average SiO_2 content for the acid washed samples was 0.81%. This suggests that with acid washing only, the Frances Creek Barites should meet this specification.

Heavy Metals – Heavy Metals must meet the new USP 233 criteria. Class 1 Heavy Metals are Cd, Pb, As and Hg. These are the heavy metals of most concern, though there are also Class 2 and Class 2a metals that are of lesser concern.

Heavy Metals – to meet USP 233 – Final Product – **Tables 19.3 and 19.4** show the USP 233 requirements for heavy metals.

Element	**Oral Daily Dose** **PDE (ug/day)**
Cd	**25**
Pb	**5**
As (inorganic)	**15**
Hg (inorganic)	**30**

Table 19.5 FDA USP Class 1 Heavy Metals

Sample #	**Before As ppm**	**After As ppm**	**Before Cd ppm**	**After Cd ppm**	**Before Pb ppm**	**After Pb ppm**
12	2	3	<1	<1	1	6
39	3	2	<1	<1	2	2
41	3	3	<1	<1	3	3
53	1	2	<1	<1	5	2
54	<1	3	<1	<1	5	3
55	<1	2	<1	<1	5	6
57	<1	2	<1	<1	4	<1
58	<1	2	<1	<1	2	2
59	<1	1	<1	<1	1	8
60	<1	3	<1	<1	2	<1
61	<1	2	<1	<1	3	1
62	<1	3	<1	<1	5	<1
64	6	4	<1	<1	<1	<1
66	36	3	<1	<1	<1	<1
69	3	3	1	<1	5	<1
73	<1	1	<1	<1	1	<1
74	<1	3	<1	<1	<1	<1
AVG	**<3.75**	**2.47**	**<1**	**<1**	**<2.76**	**2.4**

Table 19.6a – Comparison – Acid Wash Test Results – As, Cd, Pb – Loring Labs

		As ppm	Cd ppm	Hg ppm	Pb ppm		
FC	AVG	<3.75	<1	0.010	<2.76	ug/g	Raw
FC	AVG	2.47	< 1	N A	2.4	ug/g	Acid wash
FDA	LIMIT	15	25	30	5	ug/day	

Note: 1ug/g = 1 ppm

Note: Hg data from ALS – 14 spls (Table 12.2) and Loring – 11 spls (Table 12.3)

Note: As, Cd, Pb data from Table 19.6a

Table 19.6b – FDA Limits Compared With Fr Ck Averages for Class 1 Heavy Metals

As is shown in **Tables 19.6 a+b,** above, the average concentration of the four Class 1 Heavy Metals in raw – high grade barites from Frances Creek is < 7.51 ug/g (ppm). This is an extremely low concentration for these metals to be found in nature. When these samples were acid washed, the average concentration dropped to < 5.87 ug/g(ppm). This indicates that metallurgical treatment can upgrade the Frances Creek barite to meet the Class 1 Heavy Metals specifications for pharmaceutical grade.

The heavy metals specifications USP 233 (barium contrast Class 1, Class 2 & Class 2A) specifies that ICP-MS is the analytical method required for testing (this is the methodology used by both Loring and ALS – Chemex Labs). The USP Elemental Class system is explained as follows (Source FDA 2018):

Class 1: The elements arsenic (As), cadmium (Cd), mercury (Hg), and lead (Pb) are human toxicants that have limited or no use in the manufacture of pharmaceuticals. Their presence in drug products typically comes from commonly used materials (e.g., mined excipients). Because of their unique nature, these four elements should be evaluated during the risk assessment, across all potential sources of elemental impurities and routes of administration. The outcome of the risk assessment will determine those components that may require additional controls, which may in some cases include testing for Class 1 elements. It is not expected that all components will require testing for Class 1 elemental impurities; testing should only be applied when the risk assessment identifies it as the appropriate control to ensure that the PDE will be met.

Class 2: Elements in this class are generally considered as route-dependent human toxicants. Class 2 elements are further divided in sub-classes 2A and 2B based on their relative likelihood of occurrence in the drug product.

- **Class 2A** elements have relatively high probability of occurrence in the drug product, thus should be evaluated in the risk assessment across all potential sources of elemental impurities and routes of administration (as indicated). The class 2A elements are: cobalt (Co), nickel (Ni), and vanadium (V).

The reader should also note, that there is no data available for the USP tests for Sulfide, Soluable Ba Salts, Sulphur Compounds, LOI or pH. Also, there is no data available for the six biological tests shown in **Table 19.2**. These tests will be conducted on a micronized barite product that will be produced as part of the next phase of the project.

Voyageur will have to submit processed barite samples to a USP approved lab for testing in order to be able to meet specifications for the Pharmaceutical Industry. In order for the labs to run the tests, a proper sample must first be obtained. This is accomplished by obtaining a 20 – 40 tonne sample from the exposed mineralized zones at the prospect. That sample will then be crushed, jigged, ground and run through a wilfley table and then acidized and dried. This will produce a sample that is very similar to the anticipated pharmaceutical grade product. The sample will then be submitted to one or both of the labs for testing.

Conclusion - The conclusion is that advanced milling/processing techniques such as acid washing and precipitation from sodium sulfate solutions (the Blanc Fixe process – AKA – Black Ash Process) should produce a pharmaceutical grade product from the Frances Creek Prospect.

19.6.1 Advanced Milling / Processing Techniques – Higher End Barite Markets

As was stated in sections 19.5 and 19.6, advanced milling /processing techniques will be required to upgrade the Frances creek barites to meet specifications in the paint and pharmaceutical grade markets. The most common technique used world wide to upgrade barites for these markets is precipitation from sodium sulfate solutions. See **Section 19.8.1**, for a brief description of the process.

19.7 Prices for Varying Grades of Barite

Pricing data for the barite market is proprietary for each company. What little data is openly available usually comes from government reports and these data are educated guesses. One of the best sources of data is the USGS Minerals Yearbook, which we are using in this report for price information. The most recent data is for 2017, which was released in advance in 2018.

In 2017, the arithmetical average value for ground barite (drilling grade) ground in US mills was US $ 170.00/ton. The average value of barite used in the chemical, glass and filler (paint grade) market was US $ 434/ton. The import price of chemical grade barite (jigged, unground) from China, c.i.f, US Gulf Coast, was US $ 161 - $ 180/ton. The import price of paint-grade barite (jigged, unground) from China, c.i.f., US Gulf Coast was US $ 260 - $ 310/ton (McRae, M.E., 2018). The authors were not able to find any pricing data for glass grade barite.

Review of this data suggests the following for prices in 2017:

- The industrial grade barite price was ~ 255% higher than the drilling grade barite price
- The paint – grade (filler) barite price was ~ 161% to 172% higher than standard chemical grade barite

Prices for pharmaceutical grade barite are difficult to arrive at, as the data is usually held confidential between buyer and seller. However, prices that are 2X to 5X the price for paint grade are not uncommon ($ 868/ton - $ 2170/ton).

First Authors Note: ***Sections 19.8 – 19.12,*** *were researched by and authored by Bradley Willis, P.Eng., the second author of this report. Mr. Willis is a Vice President of Voyageur Minerals, Ltd.*

19.8 Pharmaceutical Business strategy and economics

19.8.1. Industry Standards

Voyageur is implementing a business plan of producing barium contrast suspension products for the health care industry. By utilizing the FC deposit, the company believes it may be a top competitor in the US and Canadian market place. By owning their own source has advantages over their current competitors in the pharmaceutical barite market.

The FC barite meets all specifications for chemical grade barium sulfate. Chemical grade required % $BaSO_4$ is 95%-96%. **(Table 19.8.1)** The FC barite falls well into this category. This allows Voyageur to utilize industry standard barium precipitation production. The current method is combining the barite with a carbon (petroleum coke) and heating the mixture with a rotary kiln. The barite forms BaS upon completion of this reaction. The BaS is added to a precipitation tank utilizing sulfuric acid. The BaS is reacted and high purity $BaSO_4$ is produced.

There are currently 14 barium precipitate plants in china producing barium sulfate grades that range from 98% $BaSO_4$ – 99.99% $BaSO_4$. In addition, there are 5 Surface Modified Barium Sulfate (SMBS) plants producing high end barium products from precipitated barium sulfate.

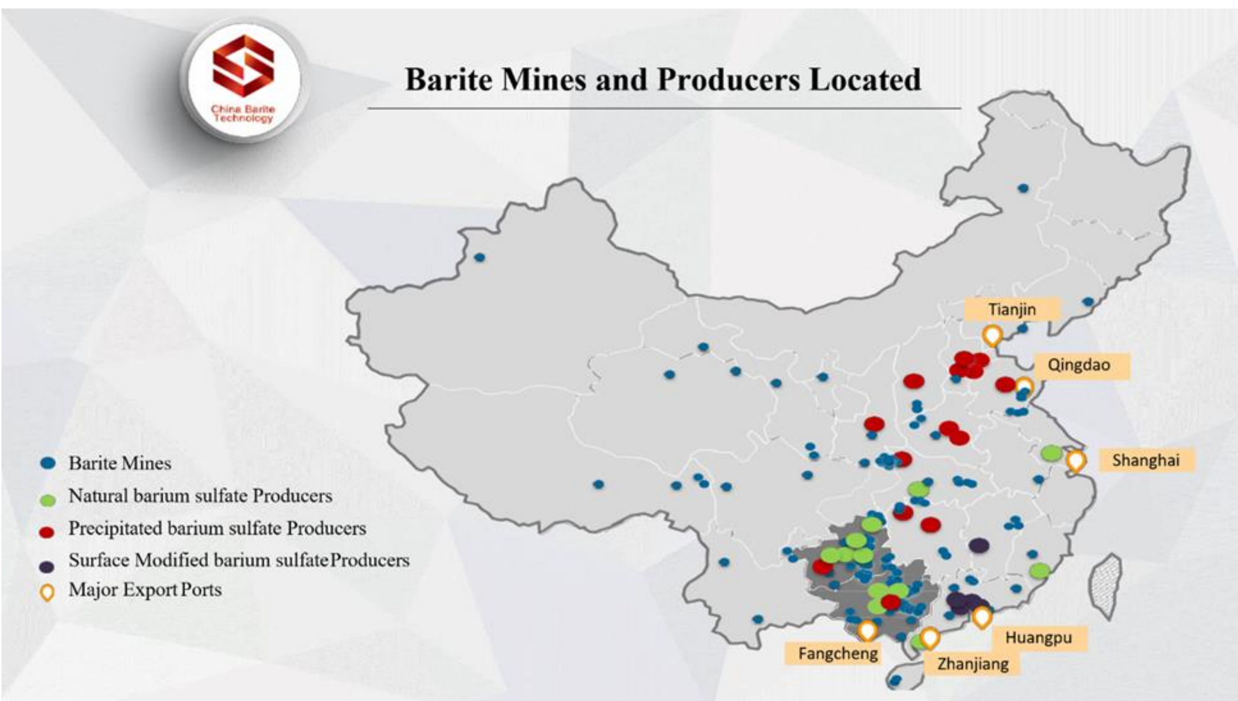


FIGURE 19.1 Barite Mines and Producers China

The specification for the barite used to make these products are the following:

Chemical specifications:

INDUSTRY	PHYSICAL PROPERTIES	SPECIFICATIONS
CHEMICAL INDUSTRY	%BaSO4/SG	95%/4.3 SG
Grade 1	% SiO2	Below/Equal - 1.5%
	% Fe2O3	<0.3%
	Particle size	0-200mm, 90% min
Grade 2	%BaSO4/SG	96%/4.35 SG
	% SiO2	Below/Equal - 1.5%
	% Fe2O3	<0.3%
	Particle size	0-200mm, 90% min

Table 19.8.1 Chemical Industry Specifications

First Authors Note: *Voyageur's lab testing to date indicates that the anticipated grade of raw conventionally milled barite concentrates will meet or exceed the **Table 19.8.1** specifications listed above.*

19.9 Pharmaceutical Grade Barite

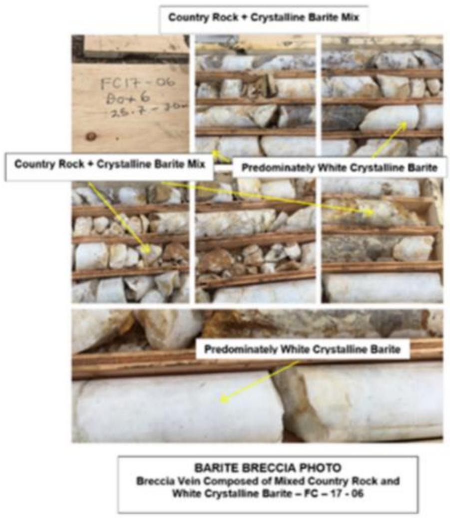
The Frances Creek deposit is very unique and contains grades of 96%+ $BaSO_4$. This is very unique in nature and will allow Voyageur to produce a high-grade product at lower costs than the current market. For example; the majority of barite deposits in the world grade 78% -85% $BaSO_4$.

Due to the deposit's exceptional grade, Voyageur plans to enter the highest margin market for its barite sales.

19.10 Pharmaceutical Specifications

Pharmaceutical grade barite is exceptionally pure and has more rigid specification parameters than most other markets. In addition, laboratory test procedures for pharmaceutical grade barite must meet either US Pharmacopedia , European Pharmacopedia or Health Canada criteria.

For most of the pharmaceutical specifications, where assay data from Loring Labs is available, the Frances Creek barites meet the specification. The reader should also note, that there is no data available for the USP tests for Sulfide, Soluble Ba Salts, Sulphur Compounds, or pH. Voyageur will be submitting Frances Creek barite samples to a USP approved lab for testing in order to confirm specifications for the Pharmaceutical Industry, during the next stage of testing.



Hole Number	Crystalline Barite Zone Sampled	%BaSO4	Specific Gravity
FC17-7	25.6m-25.8m	97.74%	4.46
FC17-7	32.4m-32.9m	99.12%	4.50
FC17-7	51.5m-53.4m	96.41%	4.44
FC17-5	23.7m-24.9m	97.76%	4.36
FC17-8	24.5m-24.9m	97.02%	4.47
FC17-8	41.2m-43.8m	97.81%	4.39
FC17-9	16.9m-24.3m	97.58%	4.46
FC17-10	19.9m-33.5m	96.87%	4.36
FC17-11	33.0m-41.9m	97.26%	4.40
FC17-12	32.0m-48.6m	96.89%	4.40
FC17-15	29.7m-32.8m	95.32%	4.33

Table 19.8.2. Barite Purity Frances Creek

19.11 The Barium Contrast Market

Contrast solutions, also referred to as contrast agents or contrast media, are used to improve internal imagery of the body produced by x-rays, computed tomography (CT), magnetic resonance (MR) imaging, and ultrasound. Barite contrast materials allow the radiologist to distinguish normal from abnormal conditions.

Contrast materials are not dyes that permanently discolor internal organs. They are substances that temporarily change the way x-rays or other imaging tools interact with the body.

When introduced into the body prior to an imaging exam, contrast materials make certain structures or tissues in the body appear different on the images than they would if no contrast material had been administered. Contrast materials help distinguish or “contrast” selected areas of the body from surrounding tissue. By improving the visibility of specific organs, blood vessels or tissues, contrast materials help physicians diagnose medical conditions.

Contrast materials that contain barite will enter the body in one of two ways. They can be: swallowed (taken by mouth or orally) or administered by enema (given rectally).

Following an imaging exam with contrast material, the contrast material is absorbed by the body and eliminated through urine or bowel movements.

Barium-sulfate is the most common contrast material taken by mouth, or orally. It is also used rectally and is available in several forms, including:

- powder, which is mixed with water before administration
- liquid
- paste
- tablet

The global contrast media market was valued at US$4,600,000,000 in 2017 and is projected to expand at a CAGR of 4% from 2018 to 2026 to reach over US$6,500,000,000 by 2026 (source: transparency market research). Voyageur estimates that barium makes up over 50% of this market.

Voyageur has analyzed the price of the seven listed products below, by $/gr of barite contained. The current products available in the market are listed in **Table 19.8.4**.

19.12 Market Outlook

Voyageur anticipates that it will utilize gravity separation followed by acid wash, sulfate precipitation (the Blanc Fixe Process), drying and micro grinding, to produce the products listed in **Table 19.8.4**. Limited initial testing indicates that Voyageur may be able to create pharmaceutical grade barite products at 97.5% - 99.9% $BaSO_4$.

Voyageur anticipates entering the market with a generic brand contrast agent and projects FDA approval for this process to occur in approximately 10-12 months. The generic branding of FDA approved drugs and contrast solutions is promoted by governments to allow people access to lower priced drugs and medicines. The FDA has recently (2018) implemented changes to their system to accommodate faster approval times for generic drugs.

Voyageur anticipates introducing the first generic barium product into the North American market. The current source for barite used in BCS [barium contrast solution] is China and Europe. Red Butterfly, Ltd., is a leading exporter and supplies 95% of the Chinese market with pharmaceutical grade barite powders**.** They sell pharmaceutical grade barite powder for USD $2,822/tonne (high volume orders) to USD $7,821/tonne (low volume orders) FOB Chinese port (source: direct quotes). Other sources of HPB (High

2017 Retail Contrast Products North America	Grams BaSO4/bottle
EZHD Barium Sulfate Suspension 98% (12oz)	334
Liquid E-Z-Paque Barium Sulfate Suspension 355ml	213
Any E-Z Paque powder or liquid 6.2 oz bottle or 1200g jug, 96% w/w, Each 100g contains 96g barium sulfate	176
Readi-Cat 2 Berry Smoothie barium sulfate suspension. 450ml	9
Tagitol Barium Sulfate Suspension	8
Varibar Honey 250ml	10

Table 19.8.4 Barium Contrast Product List (Bracco Imaging Inc)

Purity Barite) for pharmaceutical grade barite are Chinese barium precipitation plants; there are 14 plants in operation in China (**Figure 19.8.1**).

The main supplier of Chinese pharmaceutical barite was recently cut out of the supply chain. This is due to increased Chinese domestic demand and stricter environmental regulations in China, that have decreased supply. As a result, in North America and worldwide, producers have been forced into precipitation processing of lower grade barite to meet the market demands.

For example, Cimbar, one of the major North American suppliers of HPB, lost most of its Chinese HPB pharmaceutical barite sources. To combat this, Cimbar will use a proprietary chemical process to manufacture enhanced purity barite to supply their customers.
https://www.cimbar.com/products/barium-sulfate/chemicallypurifiedified-barium-sulfate/bariscan-usp/

Voyageur's barite is starting at a high purity level which should allow the company to produce a low cost HPB product. Voyageur's 100% ownership of its own Canadian source of barite, should allow the company to be highly competitive with most foreign sources of pharmaceutical grade barite.

Voyageur anticipates moving forward, subject to successful testing, with a production plan to produce pharmaceutical barium products using an acid wash and sulfate precipitation system. Voyageur anticipates that the HPB will be made into barium contrast solutions for the health care industry worldwide.

20.0 Environmental Studies, Permitting and Social or Community Impact

Formal studies of these types have not been undertaken for the Frances Creek Property as of yet; the property is still classified as an exploration project.

Technical reports for exploration stage projects are not required to report on **Section 20 – Environmental Studies, Permitting and Social or Community Impact.** However, the authors felt that it might benefit potential investors to be able to review this work as completed to date, thus it is presented below. This data is essentially a copy of what was presented in **Section 4.0** or the report.

As was mentioned in **Section 4.4**, exploration and mining permits are in place on the Frances Creek property. Permit details are:

Frances Creek	Permit MX - 5 - 519	Mine# 1630108

The permits are all in Voyageur Minerals, Ltd. Name.

It should be noted, that the Tiger Ridge Mine operated from 1999 to 2004, as a small scale (< 100 tpd) underground mine. The mine staff (now with Voyageur) was able to do all permitting work in house, because the mine had a small environmental foot print. Based on this past experience, the senior author does not anticipate that there will be major environmental, social or community impact issues that will adversely affect the project.

21.0 Capital and Operating Costs

Technical reports for exploration stage projects are not required to report on **Section 21.0 – Capital and Operating Costs.** Much more detailed information will be prepared and presented in the next 43-101 report, which will be a Pre - Feasibility Study.

22.0 Economic Analysis

Technical reports for exploration stage projects are not required to report on **Section 22.0 – Economic Analysis.** Much more detailed information will be prepared and presented in the next 43-101 report, which will be a Pre - Feasibility Study.

23.0 Adjacent Properties

No data from adjacent properties was used in the preparation of this report.

24.0 Other Relevant Data and Information

No other relevant data or information was used in preparing this report.

25.0 Interpretation and Conclusions

25.1 Interpretations

Based on considerable intermittent work at the Frances Creek Prospect since 2014, it is the interpretation of the senior author that the prospect contains an estimated in-place Indicated Resource of 166,210 tonnes at a $BaSO_4$ content of 37.75% - calculating to 62,745 tonnes of indicated barite mineralization. Likewise, an estimated Inferred Resource of 195,578 tonnes at a $BaSO_4$ content of 35.4% - calculating to 69,230 tonnes of inferred barite mineralization is also present. Even though both estimates must be reported separately, in reality – within each mineralized zone, they are interdigitated with and inseparable from each other.

The resource base at the project is currently separated into an A – Zone (lower elevations) and a B – Zone (upper elevations), on the south facing slope of Horeb Mountain. Both zones of mineralization are controlled and (primarily hosted) by a minor thrust fault (the Barite Thrust) which is found in the upper plate of a major regional thrust fault (the Forester Creek Thrust). Each mineralized zone has been explored by drilling and trenching for 150 – 200 meters on strike, with the central 50 – 75 meters of each zone being more intensely explored.

Potentially economic mineralization within each zone is open both to the NW (upslope) and the SE (downslope). Additional resources can probably be discovered by exploring on strike to the NW of the B – Zone and to the SE of the A – Zone. Likewise, the poorly explored area which lies on strike between the two mineralized zones probably hosts potential mineralization.

The Frances Creek breccia vein, which hosts the barite mineralization is a two component breccia vein. Drilling to date indicates that it the major component is a mix (~ 63%) of carbonate and argillaceous country rock, and crystalline barite (~ 37%). Representative sampling of cores which penetrate the mineralization indicate the above. Selective sampling of the barite mineralization within the vein indicates that the crystalline barite is of exceptional purity (94 to +98% $BaSO_4$). It is the interpretation of both authors, that the assays of the selective crystalline barite samples are representative of the grade of the crystalline barite throughout the entire breccia vein.

25.2 Conclusions

Conclusions reached by the authors, as a result of doing the research for and preparing this report are derived from the interpretations mentioned above and are reported below:

With limited fill-in drilling and some step out drilling, the resource base at the Frances Creek Prospect could be considerably increased.

Assay results from the select sampling of the crystalline barite, should be similar to expected grades of conventionally milled barite concentrates.

The geology of the mineral deposit appears amenable to open pit bench quarry mining, however a pre-feasibility study will be required to verify this tentative conclusion.

Selective sampling of the crystalline barite and the lab testing of these samples to date support the following conclusions as to market penetration of possible produced barite products from Frances Creek. These are listed below:

- Conventionally milled barite concentrates produced from the Frances Creek Property should be able to be sold into the drilling mud market without further processing.

- Conventionally milled barite concentrates produced from the Frances Creek Property should be able to be sold into the glass manufacturing market without further processing.

- Conventionally milled barite concentrates produced from the Frances Creek Property should be able to be sold into the filler market without further processing.

- Conventionally milled barite concentrates produced from the Frances Creek Property should be able to be sold into the chemical industry market without further processing.

- Conventional milling followed by acid washing of barite concentrates produced from the Frances Creek Property should allow various barite products to meet specifications for the paint markets. Acid washing should reduce the Fe_2O_3, $CaCO_3$ and $SrSO_4$ content of the conventionally milled high purity barite concentrates to meet these industry specifications. The acid wash testing also indicates It will reduce concentrations of SiO_2, Al_2O_3, and TiO_2, thus adding to the quality of the product. The more expensive Blanc Fixe precipitation technique will probably not be necessary to access the paint markets.

- Available lab testing data combined with knowledge of industry practices indicates that conventional milling followed by Blanc Fixe precipitation techniques will probably be required in order to produce pharmaceutical grade barite from the Frances Creek prospect. Additional testing by USP certified laboratories will be required to verify this tentative conclusion.

Additional Conclusions

The Frances Creek Project is a “Project of Merit” and it warrants further expenditure to bring it to the pre – feasibility stage and towards eventual production.

It is further concluded that the project has definite potential to become a profitable operation.

26.0 Recommendations

It is recommended that Voyageur take this project to the next stage of development by undertaking the 2 phase work program discussed below:

26.1 Phase 1 – Exploration and Pre-Feasibility

26.1a Continued Exploration

Gravity Survey and LIDAR – A detailed gravity survey is recommended for the project area. Because of the steep topography, complex structural geology and relatively small mineralization occurrences at Frances Creek, a multitude of closely spaced gravity survey stations will be required to define possible additional subsurface barite occurrences. A LIDAR to be conducted at the same time is also recommended. LIDAR allows for detailed topographic mapping through thick tree cover.

MWH Geosurveys, Ltd., of Vernon, BC has been selected to conduct both surveys. In 2013 – 14, MWH conducted a regional, detailed gravity survey in North Central Nevada for the Baker Hughes – Argenta Barite Mine. Several new gravity anomalies were discovered by that work. At least one of the MWH anomalies was drilled out and will be put into production soon. This is an exploration that works.

Expanded Geochemical Sampling – Voyageur should significantly expand the existing soils geochemical grid at Frances Creek. Detailed soils geochemical sampling is a proven and cost effective way to explore for shallow barite occurrences.

Geological Mapping – A structural geologist with experience in the Canadian Rockies should be retained to produce a large scale structural geology map of the project area.

Additional Drilling – Additional drill holes that will test cross section lines B 13 – B 17 to the NW of the B – Zone and cross section lines B 3 – B 5 to the SE of the B – Zone should be completed. A – Zone cross section lines that need additional drill testing are A 11 – A 13 and A 5. Favorable targets defined by the gravity survey and the geochemical survey should also be tested.

26.1b Bulk Sampling and Pre – Feasibility

30 Tonne Processed Barite Sample – A 20 – 40 tonne hand-picked sample of primarily crystalline barite should be collected from outcrop occurrences at the project area. The second author believes that this much barite could be collected with a small hydraulic excavator from existing trenches and cuts at the project. The sample should then be put through a bench scale metallurgical circuit. This should include crushing, screening, jigging, tabling and grinding. Extensive lab test at a USP certified lab should be part of the program, in order to monitor quality.

10,000 Bulk Sample – This sample should be collected as soon as permits allow. It should be put through the same metallurgical circuit as the 30 tonne sample was – though on larger scale equipment. Lab testing to support this activity should also be by a USP certified lab.

Metallurgical Testing – This part of the program can be designed to be supplemental to the two sampling projects mentioned above. The entire metallurgical circuit – crushing, screening, jigging, tabling and grinding, needs to be tested and thoroughly understood. The goal of this activity is to fully understand the metallurgy of the mineralization at the prospect.

Pre – Feasibility Study and Lab Work – A competent consulting engineer should be engaged to take this project through the pre – feasibility study. This will involve integrating the new drill information discussed above into the geologic model prepared for this report. A new mineralization model and resource/reserve estimate will be prepared.

26.2 Phase 2 – Product Development

The goal of Phase 2 is to develop a product or products to be sold into one or more of the HPB (high purity barite) end markets. For this report, it is assumed that the Frances Creek Barite will be sold into the pharmaceutical market to produce barium contrast solution (BCS). Both authors believe that this is a reasonable expectation for the project at this point in the learning curve for the project. The reader should recognize that information learned during Phase 1 may change expectations and re-direct the project. At this time however, it seems realistic.

Barium Contrast Formulation – Most of the components of BCS are various food additives, food colorants, flavors, etc. Barite powder is actually a minor component of most BCS products. Each component of the final bottled BCS product needs to be sourced and tested to prove that it meets USP criteria for drug manufacture. This also applies to the bottling and packaging media, etc.

FDA / Health Canada Application – Outside consultants and potential partners have told Voyageur that the FDA application process takes one years' time and has a fixed cost of US$ 1.5 million.

Product Marketing – This activity will certainly be required to place a new BCS product on the market. Hence this line item.

26.3 Proposed Budget

The budget estimate for a 2 Phase work plan was prepared as part of this report, in order to move the Frances Creek Prospect towards production. Details of the work plan/cost estimate are discussed in **Section 26.** A synopsis of the work plan / budget proposed for the next phase of the project follows:

PROPOSED WORK – PHASE 1	ESTIMATED COST
Continued Exploration	
Gravity survey and LIDAR	$ 50,000
Expand Soils Geochem Sampling Grid	$ 25,000
Geological Mapping	$ 10,000
Additional Drilling	$ 350,000
Subtotal	**$ 435,000**
Bulk Sampling and Pre-Feasibility Study	
30 Tonne Processed Barite Sample	$ 80,000
10,000 Tonne Bulk Sample	$ 400,000
Metallurgical Testing	$ 100,000
Pre-Feasibility Study and Lab Work	$ 500,000
Subtotal	**$ 1,080,000**
Total - PHASE 1 – Exploration and Pre-Feasibility	**$ 1,515,000**

TABLE 26.1a PHASE 1 – Work Plan and Budget

PROPOSED WORK – PHASE 2	ESTIMATED COST
Product Development - Pharmaceutical	
Barium Contrast Formulation	$ 50,000
FDA / Health Canada Application	$1,500,000
Product Marketing	$ 75,000
Total – PHASE 2 – Product Development	**$ 1,625,000**

TABLE 26.2a PHASE 2 – Work Plan and Budget

Both Phase 1 and Phase 2 are proposed by the authors for the next stage of the project. Both authors acknowledge that the project is an advanced exploration stage project. However, both authors believe strongly, that it is appropriate to move the project into the pre – feasibility and product development stage once funding is accomplished. **The total funds required for Phases 1 and 2 is CD $ 3,140,000.**

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