

## PUBLICATION OF INDEPENDENT TECHNICAL ASSESSMENT REPORT

Variscan Mines Limited ("Variscan" or the "Company") (ASX:VAR) is pleased to attach an Independent Technical Assessment Report ("ITAR") prepared by CSA Global Pty Ltd ("CSA Global") who have reviewed the leading projects in Variscan's tenement holdings in France.

The projects are primarily situated in Brittany, western France with an additional project (Couflens) under a joint venture with Apollo Minerals (ASX:AON) in the Midi-Pyrénées, southern France.

#### Highlights

#### Brittany

- Serittany is part of the Armorican Massif, which forms part of the Variscan Orogen, a Palaeozoic accretionary terrain that hosts a range of significant mineral deposits of various styles in Europe.
- The Armorican Massif hosts significant volcanogenic massive sulphide (VMS), orogenic gold, and tin-tungsten deposits that have supported historical mining operations.
- Significant mineralisation has been identified at all three of the Company's leading projects, with two sites having been mined in the 20<sup>th</sup> Century.

#### Merléac Project - Porte-aux-Moines Zinc deposit

- The geological setting a continental back arc, is the same age as the Iberian Pyrite Belt. Continental back arc VMS deposits tend to be, on average, the largest VMS deposits, and those in the Iberian Pyrite Belt are amongst the largest in the world.
- CSA Global agrees with the general approach adopted towards the maiden Porte-aux-Moines Mineral Resource estimation and classification (as announced on 20 June 2016) and concludes that this is appropriate for the data and current level of knowledge about the deposit.
- Gossan samples from Porte-aux-Moines and other VMS prospects have geochemistry consistent with derivation from VMS mineralisation, which helps to confirm that iron-rich rocks at surface are likely to be the weathered equivalents of mineralised massive sulphides at depth.
- A VTEM airborne electromagnetic survey has been completed and has identified new targets for follow-up and drill testing.

- W Exploration potential is considered very high for the Merléac Project.
- It is CSA Global's opinion that the exploration strategy is appropriate, and the planned work is technically sound.

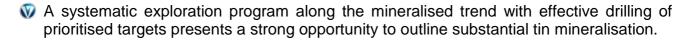
#### Couflens Project – Tungsten

- W The Couflens Project covers the historical Salau tungsten mine in southern France.
- Tungsten mineralisation is particularly high-grade (1.5 to >2% WO<sub>3</sub>) and is supported by potentially economically significant gold grades (historical sampling reported grades up to 10 g/t Au, see ASX Announcement 25 October 2016)<sup>1</sup>.
- The deposit is largely open at depth, and there are a number of near-mine exploration targets.
- W CSA Global regard exploration potential on the Couflens Project as high.
- It is CSA Global's opinion that the exploration strategy (as announced by Apollo Minerals on 14 March 2017) is appropriate, and the planned work is technically sound.
- St Pierre Project Gold
- W The St Pierre Project is centred on the largest gold mine in Brittany at La Bellière.
- CSA Global view the St Pierre Project as highly prospective for orogenic gold mineralisation similar to the known deposit at La Bellière.
- Orogenic gold deposits are typically vertically extensive, suggesting that there is very good potential for further gold mineralisation to be discovered below existing workings at La Bellière and on peripheral targets, especially considering the very limited past exploration and drilling.
- There are good-quality exploration targets at the mine, near-mine and semi-regional scales.

#### Beaulieu Project - Tin

- Abbaretz-Nozay in the Beaulieu Project is the largest hard rock tin mining district in France, where the Bois-Vert mine produced 2,700 t of tin from east-striking sheeted veins
- Past mining operations demonstrate the presence of significant and extensive tin mineralisation in a productive historical tin province.
- Previous exploration has been limited, with little drilling below 50 m and indications that historical drilling has under-reported tin values due to inappropriate drilling and analytical methods.

<sup>&</sup>lt;sup>1</sup> Variscan is not aware of any new exploration information or data that materially affects the information presented in the October announcement.



#### Work Programme

- Although further exploration expenditure is currently under review (due to political uncertainty), planned exploration could include detailed mapping, alteration studies, surface geochemistry, electromagnetic geophysics, and drilling.
- SA Global is of the opinion that the proposed work programmes are appropriate to advance the projects.

#### Background

CSA Global was appointed to prepare an independent technical assessment report (ITAR) to provide a Competent Persons Report in connection with the Company's possible duallisting on the AIM Market of the London Stock Exchange. This remains a strategic objective of the Company under appropriate circumstances and conducive market conditions.

CSA Global is a privately owned, mining industry consulting company headquartered in Perth, Western Australia. CSA Global provides geological, resource, mining, management and corporate consulting services to the international resources sector and has done so for more than 30 years.

The ITAR has been prepared by a team of consultants sourced principally from CSA Global's Perth, Western Australia office. The individuals who have provided input to the ITAR have extensive experience in the mining industry.

The ITAR has been prepared in accordance with the JORC and VALMIN Codes.

#### Availability

The ITAR is attached and is also available to download from the Company's website at: <u>http://www.variscan.com.au</u>

Discussing the ITAR, Stewart Dickson, CEO of Variscan said,

'We are pleased to publish this Independent Technical Assessment Report which has been prepared by CSA Global. This independent report validates the highly prospective mineral deposits in France that Variscan has acquired and the potential for value creation through their development. We are extremely frustrated at the lack of political clarity to facilitate further development of the Merléac Project. As a result, the Company is advancing with the identification of new opportunities outside of France to mitigate operational delays and rebalance sovereign exposure. Simultaneously we will take all possible steps to ensure the preservation and enhancement of the economic value of our assets and investment made in France to date'.

variscan mines



ENDS

#### For further information:

Variscan Mines Limited P: +61 9906 5220 E: info@variscan.com.au

The information in this announcement that relates to the ITAR is based on and fairly and accurately reflects, in the form and context in which it appears, the ITAR which was prepared CSA Global Pty Ltd. The announcement has been reviewed by Mr Graham Jeffress, Principal Geologist and Manager–Corporate for CSA Global. Mr Jeffress is a full time employee of CSA Global Pty Ltd. He has consented to the inclusion of ITAR summary information in this announcement in the form and context in which it appears, and confirms it is in accordance with the ITAR content, and it does not omit anything likely to affect the import of such information.

0.90	217 83.68	10044	245.3	9,33%	4900	-
636	278 56.39	+7436 A	075	6.35%	375.69	320
	356 2435	-45.23 🔻		4.25%	248.36	655
235	458 65.36	-95.36 🔺	61.4		35 🔺 614	45/2243
6.33	354 3223	+5.33 🔺	3.35	5.36%	896.33	5.38% 896.38 354
3	78 4445	-2.55 🔻	6.35	8.35%	896.33	8 <b>5663</b> 88 78 4
280	217 8368	+80.25 🔺	1221	1.20%	25.A-1221	
538	278 58.39	+7400	245.2	1.2076	282.80	8 30 1 158.36 210 55.
389	\$56 2435	-40 00 -	245.3	9.33%	256.36	



**CSA Global** Mining Industry Consultants

# Independent Technical Assessment

# Variscan Mines Limited French Projects

CSA Global Report Nº R288.2017

6<sup>th</sup> September 2017

www.csaglobal.com





#### **Report prepared for**

Client Name	Variscan Mines Ltd
Project Name/Job Code	VARCPR01
Contact Name	Greg Jones
Contact Title	Executive Technical Director
Office Address	Level 1, 80 Chandos Street, St Leonards NSW 2065, Australia

#### Report issued by

CSA Global Office	CSA Global Pty Ltd         Level 2, 3 Ord Street         West Perth, WA 6005         AUSTRALIA         PO Box 141,         West Perth WA 6872         AUSTRALIA         T +61 8 9355 1677         F +61 8 9355 1977
Division	E csaaus@csaglobal.com Corporate

#### **Report information**

File name	R288.2017 VAR Technical Review.docx
Report Status	Final

#### Author and Reviewer Signatures

Author:	Carl Brauhart PhD, MAIG, MSEG	Signature:	Electronic signature not for duplication. Electronic signature not for duplication. Electronic signature not by duplic pan. Electronic signature not for duplication. Electronic signature not for duplication. Electronic signature not for duplication.		
Peer Reviewer	Neal Reynolds PhD, MAIG, FAusIMM, FSEG	Signature:	Electronic signature not for duplication, extends signature not for duplication. Electronic signature and for suplication. Extrinoi, for duplication, the must be supported by the supervised of the supervised o		
CSA Global Authorisation	Graham Jeffress BSc(Hons), FAIG, RPGeo, FAusIMM, FSEG	Signature:	Betronic sensure not for duplication. Betronic represente not for duplication. Betronic signature and for duplication. Electronic partners not for duplication. Control and the sensure of		

© Copyright 2017



# **Executive Summary**

CSA Global has reviewed the leading projects in Variscan Mines' tenement holding in France.

The projects are primarily situated in Brittany, western France with an additional project (Couflens) under joint venture in the Midi-Pyrénées, southern France. Figure 1 shows the location of the Variscan tenements in Brittany; while the location of Couflens is shown in Figure 30.

The projects situated in Brittany that discussed in this report are the Merléac (zinc-copper-lead), St Pierre (gold) and Beaulieu (tin) Projects. Brittany is part of the Armorican Massif, which forms part of the Variscan Orogen, a Palaeozoic accretionary terrain that hosts a range of significant mineral deposits and deposit styles in Europe.

The Armorican Massif hosts significant volcanogenic massive sulphide (VMS), orogenic gold, and tintungsten deposits that have supported historical mining operations. Variscan Mines has secured tenure over a number of these historical projects in a country that has seen very little exploration or mining activity in the last 50 years. Significant bodies of mineralisation have been identified at all three of the leading projects and two of them have been mined in the 20<sup>th</sup> Century (334,000 Oz of gold from La Bellière mine at St Pierre, and 2,700 tonnes of tin from Bois-Vert at Beaulieu).

#### **Merléac Project**

The Porte-aux-Moines VMS Deposit is part of a cluster of base metal anomalous prospects in the Châteaulin Basin that comprise the Merléac Project. The host strata are about 350 Ma, which is approximately coeval with the Iberian Pyrite Belt, a major VMS mining district which is interpreted to have formed in a similar continental back arc setting as the Châteaulin Basin. Zinc-rich massive sulphide at Porte-aux-Moines is hosted in fine-grained clastic sediments that overlie felsic volcanic rock and these strata can be traced over several kilometres to other VMS prospects such as La Pris Mallard, Les Essarts and Gausson. Clustering of VMS deposits along a "favourable horizon" is typical of VMS districts around the world, which typically contain multiple economic deposits. Gossan samples from Porte-aux-Moines and other VMS prospects have elevated lead, copper, silver, gold, bismuth and arsenic values, which helps to confirm that iron-rich rocks at surface are likely to be the weathered equivalents of massive sulphides at depth.

The maiden Porte-aux-Moines Mineral Resource estimate of 2.2 Mt grading 6.0% Zn, 1.3% Pb, 0.8% Cu, 80.6 g/t Ag and 0.9 g/t Au, based on historical drilling by BRGM, was reported by QG Consulting under the 2012 JORC Code in June 2016 (Indicated Resource, 0.3 Mt at 6.1% Zn, 1.2% Pb, 0.8% Cu, 76.5 g/t Ag, 0.9 g/t Au); Inferred Resource 1.9 Mt at 5.9% Zn, 1.3% Pb, 0.8% Cu, 81.2 g/t Ag, 0.9 g/t Au. CSA Global agrees with the general approach adopted towards estimation and classification, and our review supports our conclusion that this is appropriate for the data and current level of knowledge about the deposit. CSA Global notes that the resource cut-off grade of 8% Zn Equivalent should be revised with a fine-tuned zinc equivalent calculation when more detailed recovery studies are available and to take account of changing metal prices.

VMS exploration on the Merléac Project area was completed by BRGM in the 1970s and 1980s included drilling of Porte-aux-Moines, but limited drill testing of other targets. This work provides a solid foundation for further exploration using an improved understanding of geochemical and alteration vectors and improved geophysical surveying and processing techniques. VMS exploration combining these approaches can be highly effective and presents a discovery opportunity for Variscan, as extensions to the Porte-aux-Moines system and at other targets on the prospective trend. An airborne electromagnetic survey has already been completed and has generated new targets for follow-up and drill testing.



Exploration potential is considered very high for the Merléac Project. The project is covers a volcanosedimentary basin that is demonstrated to be fertile for VMS mineralisation and includes two extensive strike trends of a stratigraphic horizon with known VMS mineralisation.

#### **St Pierre Project**

The St Pierre Project is centred on the largest gold mine in Brittany at La Bellière. 20<sup>th</sup> Century workings extend to about 170 m below surface and over a strike length of about 2,000 m. East-northeast striking structures control the orientation of auriferous quartz vein arrays at La Bellière and surrounding prospects. La Bellière is a high-grade quartz vein-hosted deposit within a shear zone and shows typical characteristics of orogenic gold mineralisation associated with As ± Pb-Zn-Cu metal enrichment and white mica alteration of sedimentary host rocks. Orogenic gold deposits also tend to cluster in camps where major hydrothermal fluid conduits (large structures) control the distribution of mineralisation. Orogenic gold deposits are typically vertically extensive, suggesting that there is very good potential for further gold mineralisation to be discovered below existing workings at La Bellière and on peripheral targets, especially considering the very limited past exploration and drilling. Rock chip and soil sampling by Variscan Mines has identified gold anomalies within 2 km of La Bellière and regional mapping suggests that the mineralised structures extend at least 6 km either side of La Bellière.

CSA Global view the St Pierre Project as highly prospective for orogenic gold mineralisation similar to the known deposit at La Bellière. It is very likely that this mineralisation continues below existing mine workings at La Bellière. Surface geochemistry by Variscan has demonstrated anomalous gold at other prospects within 2 km of La Bellière, along strike and on parallel trends. Thus, there are good-quality exploration targets at the mine-, near-mine and semi-regional scales.

#### **Beaulieu Project**

Abbaretz-Nozay in the Beaulieu Project is the largest hard rock tin mining district in France where the Bois-Vert mine produced 2,700 t of tin from east-striking sheeted veins. Other tin prospects are distributed over a strike length of 15 km, closely coincident with the east-southeast striking Nozay Granite.

Previous exploration has been limited, with little drilling below 50 m and it indications that historical drilling has under-reported tin values due to inappropriate drilling and analytical methods. A systematic exploration program along the mineralised trend with effective drilling of prioritised targets presents a strong opportunity to outline substantial tin mineralisation.

At Beaulieu, ancient and modern mining operations demonstrate the presence of significant and extensive tin mineralisation in a productive historical tin province that has been poorly tested by modern exploration.

#### **Couflens Project**

The Couflens Project covers the historical Salau tungsten mine in southern France. The deposit was discovered in 1964 by the BRGM. Les Mines d'Anglade (LMA) operated the mine from April 1971 to November 1986, during which time it is reported to have produced 0.93 million tonnes of ore at an average grade of 1.5% WO<sub>3</sub>. Tungsten-bearing skarn mineralisation is developed at the contact between Devonian pelites and calcareous sediments and the Variscan-aged Forque granodiorite intrusion. Prograde skarns contain modest tungsten grades, but the bulk of production came from more sulphiderich retrograde skarns, which have substantially higher tungsten, copper and gold grades. The deposit is largely open at depth, and there are a number of near-mine exploration targets.

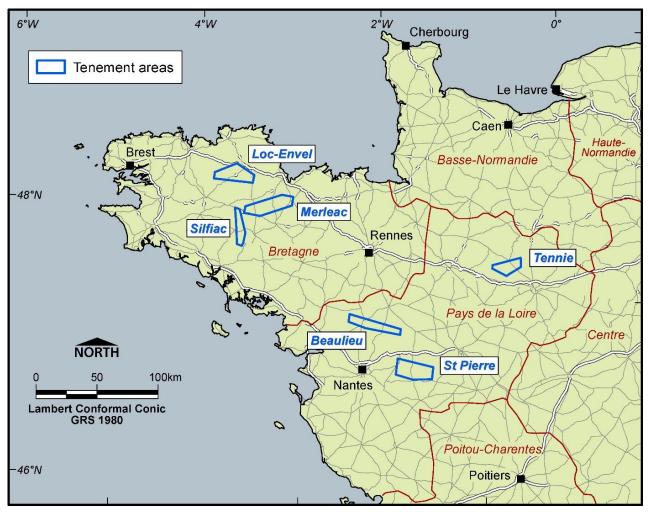
CSA Global regard exploration potential on the Couflens Project as high. Tungsten mineralisation is particularly high-grade and is supported by potentially economically significant gold grades



The Couflens Project is fully funded by Apollo Minerals Limited in a JV with Variscan where Apollo can earn 80% interest with Variscan free carried at 20% until a DFS is completed or €25 million total expenditure is reached.

#### Conclusions

Variscan has invested significantly in exploration in France to date. Further exploration expenditure is currently under review. Planned exploration under consideration includes mapping, surface geochemistry, geophysics and drilling. CSA Global are of the opinion that the proposed work programs are appropriate and that the warrants further exploration.



*Figure 1: Location of Variscan tenements in Brittany, France.* 



# Contents

I	Report p	repared for	II
I	Report is	sued by	II
I	Report ir	Iformation	II
	Author a	nd Reviewer Signatures	II
-			
ΕX	ECUTIVE	SUMMARY	III
I	Merléac	Project	III
	St Pierre	Project	IV
I	Beaulieu	Project	IV
(	Couflens	Project	IV
(	Conclusio	ons	V
2	PROJE	CT OVERVIEW	12
	2.1 L	ocation and Tenure	12
		egional Geology	
•	2.2.1	Early Palaeozoic History	
	2.2.2	Late Palaeozoic Variscan Orogeny	
		egional Metallogeny	
	2.3.1	VMS Mineralisation	
	2.3.2	Granitoid-associated Mineralisation	
	2.3.3	Orogenic Gold Mineralisation	
•		-	
3		CAN PROJECTS	
3	3.1 N	Ierléac Project	
	3.1.1	Local Geology	
	3.1.2	Exploration History	
	3.1.3	Mineralisation	
	3.1.4	Mineral Resource Estimate	
	3.1.5	Exploration Potential and Targets	
	3.1.6	Exploration Strategy	
		aint Pierre Project	
	3.2.1 3.2.4	Local Geology Exploration Potential and Targets	
	3.2.4	Exploration Potential and Pargets	
		eaulieu Project	
	3.3.1	Local Geology	
	3.3.2	Exploration and Mining History	
	3.3.3		41
	3.3.4	Resources	
	3.3.5	Exploration Potential and Targets	
	3.3.6	Exploration Strategy	
	3.3.7	Overview	
3	3.4 C	ouflens	
	3.4.1	Exploration and Mining History	48
	3.4.2	Mineralisation	48
	3.4.3	Resources	49
	3.4.4	Exploration Potential and Targets	49
	3.4.5	Exploration Strategy	51
4	OTHEF	R PROJECTS	52
	4.1 Lo	oc Envel	52
		ilfiac	
		ennie	
5	TECHN	NICAL RISKS	56



6	REFERENCES	57
7	GLOSSARY	.59

### **Figures**

Figure 1.	Location of Variagon tanoments in Drittony, France	V
Figure 1:	Location of Variscan tenements in Brittany, France	
Figure 2:	Location of Variscan tenements in Brittany, France.	
Figure 3:	Different domains of the Variscan Orogen	
Figure 4:	Different models for collision between the cratonic blocks	
Figure 5:	Granite belts of the Armorican Massif:	
Figure 6:	Summary of the metallogenic history of the France (from Lescuyer et al., 1994).	
Figure 7:	Lithostratigraphic table	
Figure 8:	Geology and location of main VMS prospects and VTEM anomalies at Merléac	
Figure 9:	Plan view of Porte-aux-Moines deposit	
Figure 10:	High-grade massive sulphide mineralisation dominated by sphalerite (pale brown).	
Figure 11:	Vertical long section of the Main Zone surface at Porte-aux-Moines	
Figure 12:	Cross section through Porte-aux-Moines showing interpreted mineralised zones	
Figure 13:	Steeply south-dipping volcaniclastic strata on the hill above Porte-aux-Moines deposit	
Figure 14:	Massive spongy gossan texture after pyritic sulphide mineralisation	25
Figure 15:	Surface rock chip samples	
Figure 16:	Indicated portion of the Porte-aux-Moines deposit	
Figure 17:	'Tier 1' VMS targets over Channel 40 VTEM image at Merléac	31
Figure 18:	Section 260,350E highlighting un-tested potential.	32
Figure 19:	Sample of orogenic gold mineralisation from La Bellière Gold Mine.	35
Figure 20:	Location of Saint Pierre PER overlain on regional geology map (BRGM 1:50,000 series)	36
Figure 21:	Plan and long section view of the La Bellière gold mine	37
Figure 22:	Rock chip sample results around the La Bellière gold mine	38
Figure 23:	Gridded soil sampling plan highlighting high gold values over the Belleville Prospect	38
Figure 24:	Reverse circulation drilling at the Belleville gold prospect south of La Bellière gold mine	39
Figure 25:	Waste dumps from the Abbaretz open cut tin mine	41
Figure 26:	Geology map of the Beaulieu Project - Abbaretz open cut tin workings (red) and Nozay	
Figure 27:	Location of tin prospects in and around the village of Abbaretz and depth of drill holes.	43
Figure 28:	Variscan XRF soil data east of Abbaretz for arsenic	45
Figure 29:	Variscan XRF soil data east of Abbaretz for arsenic and tin.	46
Figure 30:	Location of the Salau mine in the Pyrenees region, southern France.	49
Figure 31:	Map of geology and scheelite occurrences around the Salau tungsten mine	50
Figure 32:	Schematic east-west section through Salau tungsten mine	
Figure 33:	Local geology and mineralisation at the Coat-an-Noz prospect	
Figure 34:	Schematic long section of the Plélauff deposit showing underground development by BRGM	
Figure 35:	High-grade galena-sphalerite ore from Plélauff deposit, -130 m level (Maund, 2015b)	
Figure 36:	Cross section through the Rouez deposit (Icart and Safa, 1981).	

### Tables

Table 1:	Grant and Expiry Date and Area for Variscan	13
Table 2:	Merléac Rockchip Summary statistics	25
Table 3:	PAM Mineral Resource Estimate as at 31 May 2016	26

### Appendices

Appendix 1:	Legal Opinion in Reference to Variscan Mines
Appendix 1	



# **1** Introduction

#### 1.1 Context, Scope and Terms of Reference

CSA Global Pty Ltd (CSA Global) was requested by Variscan Mines Limited (Variscan or "the Company") to prepare an independent technical review of its key projects in France.

The Company holds significant exploration tenure with six Permis Exclusif de Recherche (Exclusive Exploration Permits or PERs) located in Brittany (western France) and one in Midi-Pyrénées (southern France) covering a total of 1,825 km<sup>2</sup>. The tenements were selected principally on the basis of their potential to host economic gold, base metal and tin-tungsten mineralisation.

The Report is an Independent Technical Assessment Report (ITAR) subject to the Code for the Technical Assessment and Valuation of Mineral and Petroleum Assets and Securities for Independent Expert Reports 2015 ("VALMIN<sup>1</sup> Code"). In preparing this ITAR, CSA Global:

- Adhered to the VALMIN Code.
- Relied on the accuracy and completeness of the data provided to it by Variscan, and that Variscan made CSA Global aware of all material information in relation to the projects.
- Relied on Variscan's representation that it holds adequate security of tenure for exploration and assessment of the projects to proceed.
- Required that Variscan provide an indemnity to the effect that Variscan would compensate CSA Global in respect of preparing the report against any and all losses, claims, damages and liabilities to which CSA Global or its Associates may become subject under any applicable law or otherwise arising from the preparation of the Report to the extent that such loss, claim, damage or liability is a direct result of Variscan or any of its directors or officers knowingly providing CSA Global with any false or misleading information, or Variscan, or its directors or officers knowingly withholding material information.
- Required an indemnity that Variscan would compensate CSA Global for any liability relating to any consequential extension of workload through queries, questions, or public hearings arising from the reports.

#### 1.2 Compliance with the VALMIN and JORC Codes

The report has been prepared in accordance with the VALMIN Code, which is binding upon Members of the Australian Institute of Geoscientists (AIG) and the Australasian Institute of Mining and Metallurgy (AusIMM), the JORC<sup>2</sup> Code and the rules and guidelines issued by such bodies as the Australian Securities and Investments Commission (ASIC) and ASX that pertain to Independent Expert Reports (IER).

#### **1.3** Principal Sources of Information and Reliance on Other Experts

CSA Global has based its review of the Projects on information made available to the principal authors by Variscan along with technical reports prepared by consultants, government agencies and previous tenements holders, and other relevant published and unpublished data. CSA Global has also relied upon

<sup>&</sup>lt;sup>1</sup> Australasian Code for Public Reporting of Technical Assessments and Valuations of Mineral Assets (The VALMIN Code), 2015 Edition, prepared by the VALMIN Committee of the Australasian Institute of Mining and Metallurgy and the Australian Institute of Geoscientists. < http://www.valmin.org >

<sup>&</sup>lt;sup>2</sup> Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves. The JORC Code, 2012 Edition. Prepared by: The Joint Ore Reserves Committee of The Australasian Institute of Mining and Metallurgy, Australian Institute of Geoscientists and Minerals Council of Australia (JORC). < http://www.jorc.org >



discussions with Variscan's management for information contained within this assessment and a two-day field visit to the St Pierre, Beaulieu and Merléac Projects. This report has been based on information available up to and including 6<sup>th</sup> September 2017.

CSA Global has endeavoured, by making all reasonable enquiries, to confirm the authenticity, accuracy, and completeness of the technical data upon which this report is based. Unless otherwise stated, information and data contained in this technical report or used in its preparation has been provided by Variscan in the form of documentation.

Variscan was provided with a final draft of this report and requested to identify any material errors or omissions.

Descriptions of the mineral tenure; tenure agreements, encumbrances and environmental liabilities were provided to CSA Global by Variscan or its technical consultants. Variscan has warranted to CSA Global that the information provided for preparation of this report correctly represents all material information relevant to the Project.

#### 1.4 Authors of the Report

CSA Global is a privately owned, mining industry consulting company headquartered in Perth, Western Australia. CSA Global provides geological, resource, mining, management and corporate consulting services to the international resources sector and has done so for more than 30 years.

This ITAR has been prepared by a team of consultants sourced principally from CSA Global's Perth, Western Australia office. The individuals who have provided input to the ITAR have extensive experience in the mining industry and are members in good standing of appropriate professional institutions. The Consultant preparing this ITAR is a specialist in the field of geology, exploration, in particular relating to orogenic gold.

The following individuals, by virtue of their education, experience and professional association, are considered Competent Persons, as defined in the JORC Code (2012), for this report. The Competent Persons' individual areas of responsibility are presented below:

Principal author – Dr Carl Brauhart (Principal Consultant Geologist with CSA Global in Perth, Western Australia) responsible for the entire report.

Field review – Mr Thomas Branch (Senior Consultant Geologist with CSA Global in Horsham, England)

Peer reviewer – Dr Neal Reynolds (Director with CSA Global in Perth, Western Australia) responsible for the entire report.

Carl Brauhart has 25 years of mineral exploration experience. He is highly experienced in target generation, exploration program implementation and geochemical exploration for gold and base metals He has a strong understanding of many deposit styles with particular strengths in volcanic-hosted massive sulphide, orogenic gold and porphyry copper-gold systems.

Thomas Branch has over ten years' in the exploration and evaluation of resources. Experienced in the early stage modelling of data, target generation and project evaluation, his strong background in resource estimation ensures that project assessment is contextualized economically. Thomas is a practical and hands-on exploration geologist who is driven to optimise systems and enjoys motivating people and mentoring staff. He also has extensive operational and project management experience across numerous parts of Africa.

Peer review was completed by Neal Reynolds, a geologist with more than 25 years' experience in mineral exploration and evaluation; project generation and management; project audit and optimisation from exploration to resources; exploration models and targeting studies; independent and expert reporting; project due diligence. Neal has global experience in a wide range of cultural and geological environments



and in effective exploration methodologies in tropical, arid, and glaciated terrains. He has specialist expertise in the integrated targeting of mineral systems; structural geology; lithostratigraphy, sedimentology and basin analysis; and supergene mineralisation processes.

#### 1.5 Independence

Neither CSA Global, nor the authors of this report, has or has had previously, any material interest in Variscan or the mineral properties in which Variscan has an interest. CSA Global's relationship with Variscan is solely one of professional association between client and independent consultant.

CSA Global is an independent geological consultancy. Fees are being charged to Variscan at a commercial rate for the preparation of this report, the payment of which is not contingent upon the conclusions of the report.

No member or employee of CSA Global is, or is intended to be, a director, officer or other direct employee of Variscan. No member or employee of CSA Global has, or has had, any shareholding in Variscan.

There is no formal agreement between CSA Global and Variscan as to Variscan providing further work for CSA Global.

#### 1.6 Declarations

#### 1.6.1 Purpose Of This Document

This report has been prepared by CSA Global at the request of, and for the sole benefit of Variscan. Its purpose is to provide an ITAR on Variscan's key projects in France

The statements and opinions contained in this report are given in good faith and in the belief that they are not false or misleading. The conclusions are based on the reference date of 6<sup>th</sup> September 2017 and could alter over time depending on exploration results, mineral prices and other relevant market factors.

#### 1.6.2 Competent Person's Statement

The information in this report that relates to Technical Assessment of the Mineral Assets, Exploration Targets, or Exploration Results is based on information compiled and conclusions derived by Dr Carl Brauhart, a Competent Person, who is a Member the Australian Institute of Geoscientists.

Dr Brauhart is employed by CSA Global.

Dr Brauhart has sufficient experience that is relevant to the Technical Assessment of the Mineral Assets under consideration, the style of mineralisation and types of deposit under consideration and to the activity being undertaken to qualify as a Practitioner as defined in the 2015 edition of the 'Australasian Code for the public reporting of technical assessments and Valuations of Mineral Assets', and as a Competent Person as defined in the 2012 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'. Dr Brauhart consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.

#### 1.6.3 Site Inspection

Mr Thomas Branch, an employee of CSA Global, visited Variscan's St Pierre, Beaulieu and Merléac Projects over two days from 6–7<sup>th</sup> April 2017.



#### 1.7 About this Report

This report describes the prospectivity of the Variscan tenements, located in the Variscan Orogen of western and southern France. The regional geology of this area is reviewed with a particular emphasis on the timing and geological setting of major mineralisation styles.

The geology and mineralisation for each tenement or project area are discussed, as well as the exploration work done and the results obtained there from. Three projects (St Pierre, Baillieu and Couflens) include significant mining operations that were active in the 20<sup>th</sup> Century. A fourth, Merléac, has resources that have been reported under JORC 2012.

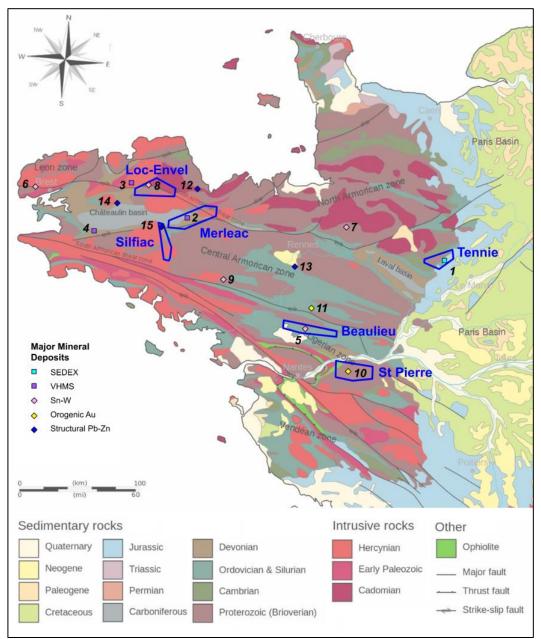
No valuation has been requested or completed for the Project.



# 2 Project Overview

#### 2.1 Location and Tenure

Variscan Mines Limited hold six granted Permis Exclusif de Recherche (Exclusive Exploration Permits or PERs) in Brittany, western France (Figure 2), totalling 1,789 km<sup>2</sup>. Additionally, Variscan has a joint ventures interest in a 42 km<sup>2</sup> granted PER centred on the recently active Salau tungsten mine in Midi-Pyrénées, southern France. They largely overlie rural districts including villages and small towns. Transport and other infrastructure are highly developed throughout France. All of the projects are within 200 km of a major port such as Nantes or Brest (Figure 2).



#### Figure 2: Location of Variscan tenements in Brittany, France.

Regional geology is after 1:1,000,000 Geological Map of France re-drafted by Woudloper (2009). Significant mineral deposits: 1. Rouez, 2. Port Aux Moines, 3. Bodennec, 4. Menez-Albot, 5. Abbaretz, 6. Saint Renan, 7. Montbelleux, 8. Coat-an-Noz, 9. La Villeder, 10. La Bellière, 11. Saint-Aubin-des-Châteaux, 12. Trémuson, 13. Pontpéan, 14. Huelgoat-Poullaouen, 15. Plélauff.



Tenement details are compiled in Table 1 and the independent legal report on the tenements is presented in Appendix 1.

In summary,

- the licences are validly issued with five-year terms;
- that Variscan is the beneficial holder of the licences;
- each of the licences is in full force and effect, and are free from liens and encumbrances<sup>3</sup>; and
- the Exploration Agreement is valid under French Law, and will bind the Licence holders to its terms.

Permis Exclusif de Recherche in Brittany and Mildi-Pyrenees, France.							
Name	Granted	Expires	Area (km²)				
Loc Envel	01/10/2015	30/09/2020	335.7				
Tennie	17/06/2013	16/06/2018	204.1				
Silfiac	01/10/2015	30/09/2020	173.2				
Beaulieu	30/04/2015	29/04/2020	277.3				
Merléac	21/08/2014	20/08/2019	407.4				
St Pierre	04/02/2014	03/02/2019	385.4				
Couflens <sup>3</sup>	21/10/2016	20/10/2021	42.1				

 Table 1:
 Grant and Expiry Date and Area for Variscan

 Permis Exclusif de Recherche in Brittany and Midi-Pyrénées, France.

#### 2.2 Regional Geology

Brittany is part of the Armorican Massif which comprises Neoproterozoic to Permian rocks that form part of the Variscan Orogenic Belt (or Variscides: Figure 2) and are correlated with Variscan rocks of the Iberian Peninsula and central Europe (Ballèvre et al., 2009). The Variscides represent a complex accretionary orogen developed between Gondwanaland to the south and the Baltica to the north over a long time span from the Silurian to the Permian. The Variscides are typical of accretionary orogens, encompassing small cratonic blocks, volcanic arc and back arc belts, and sedimentary basins; this tectonic setting is very favourable for a range of mineral deposits, including VMS (volcanogenic massive sulphide) deposits and orogenic gold deposits (Bierlein et al., 2009).

#### 2.2.1 Early Palaeozoic History

The oldest rocks in the Armorican Massif are the Brioverian Supergroup, deformed during the 650 to 550 Ma Cadomian Orogeny (Nance and Murphy, 1994; Gumiax et al., 2004) representing collision between the Avalonian terrane and the West African Craton on the northern margin of Gondwana. Rifting in the Cambrian and Ordovician broke Armorica and other microplates away from Gondwana. Continental rifts include voluminous Early Ordovician subaerial and submarine volcanic rocks (Le Hèbel et al., 2007), but were dominated by marine sedimentation between the Ordovician and Mid Devonian (Paris et al., 1994). Rift basins that evolved to oceanic crust are now evidenced by oceanic sutures (Figure 3) where fault-bound slivers of ophiolite mark boundaries between microplates (Ballèvre et al., 2009).

#### 2.2.2 Late Palaeozoic Variscan Orogeny

Extensional, convergent and collisional events between various Variscan microplates and Laurasia (Baltica) occurred over an extended period between the Early Silurian (440 Ma) and Early Permian

<sup>&</sup>lt;sup>3</sup> Apart from the Couflens Licence which is under a process of transfer

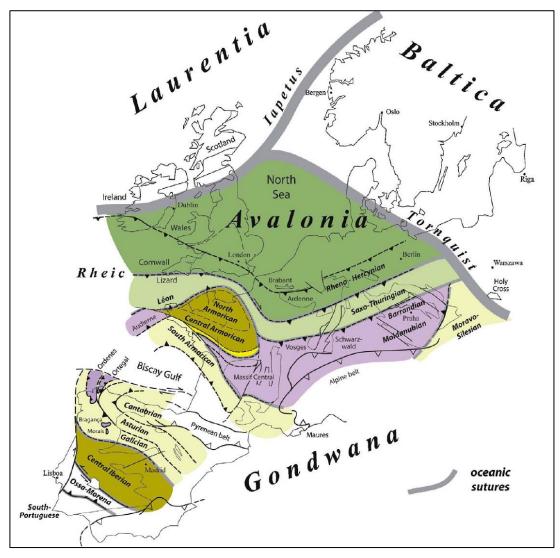


(280 Ma). The Variscan Orogeny has been subdivided into two phases (Ledru et al., 1994; Marignac and Cuney, 1999):

- Meso-Variscan (440– 345 Ma), and
- Neo-Variscan (345–280 Ma) phase

In the Armorican Massif, the Meso-Variscan saw collision and overthrusting of Gondwana in the south, accompanied by granitoid intrusions, and collision and overthrusting of Avalonia to the north (Figure 2 and Figure 3), with oceanic basins represented by four oceanic sutures from north to south (Ballèvre et al., 2009):

- 1. The Lizard suture where an intermediate continent, Leon, is thrust north over Avalonia,
- 2. the Conquet suture where Leon is thrust south over Armorica,
- 3. a southern suture zone with northward vergence corresponding to the closure of the Siluro-Devonian back arc St Georges Sur Loire basin (Nort-sur-Endre Fault between the northern and southern branch of the SASZ), and
- 4. a southernmost suture with southward vergence where Armorica is thrust over Gondwanaland (SASZ).



*Figure 3:* Different domains of the Variscan Orogen with interpreted major structures and likely correlations between domains according to colour (Ballèvre et al., 2009).



Towards the end of the Meso-Variscan, a period of extension (ca 350 Ma) saw deposition of submarine and subaerial volcano-sedimentary sequences in extensional basins in Armorica (Châteaulin Basin), Massif Central (France), Spain-Portugal (Iberian Pyrite Belt) and Morocco (Lescuyer et al., 1998). These basins host important Late Devonian to Early Carboniferous VMS deposits, notably in the Iberian Pyrite Belt and the Western Meseta of Morocco. The tectonic setting has been interpreted as a continental back arc or as post-collisional successor basins related to strike-slip movement.

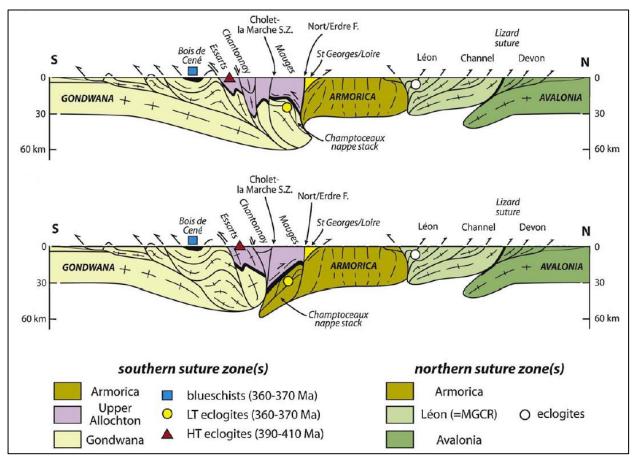


Figure 4: Different models for collision between the cratonic blocks as shown in Figure 3 (Ballèvre et al., 2009).

During the Neo-Variscan Orogeny, the North Armorican Domain, north of the NASZ, which is dominated by Neoproterozoic rocks (Figure 1) acted as a rigid buttress. Rocks in the Central Armorican Domain (Figure 1) may be strongly deformed, but are generally low metamorphic grade suggesting limited crustal thickening (Gumiax et al., 2004). The South Armorican Domain and the Leon Zone (Figure 2) are dominated by high-grade metamorphic rocks where lower crust has been exhumed after substantial crustal thickening.

The Neo-Variscan stage was the dominant period of granitoid intrusion and felsic volcanic eruption in the Armorican Massif. The peak of granitoid intrusion around 340–330 Ma was accompanied by dextral wrenching which focused these intrusion along the NASZ and particularly the SASZ. Intrusions along the SASZ tend to young from northeast to southwest down to an age of about 300 Ma (Carron et al., 2004). Three main granitoid belts are recognised:

- 1. South Armorican leucogranites;
- 2. Red granites; and
- 3. Middle Armorican Batholith (Figure 5).



Peak Neo-Variscan deformation was followed by orogenic collapse from 300–260 Ma with basin and range-type faulting, sedimentation and volcanism. In the Mesozoic, the Armorican Massif was unconformably overlain by sediments of the Paris Basin.

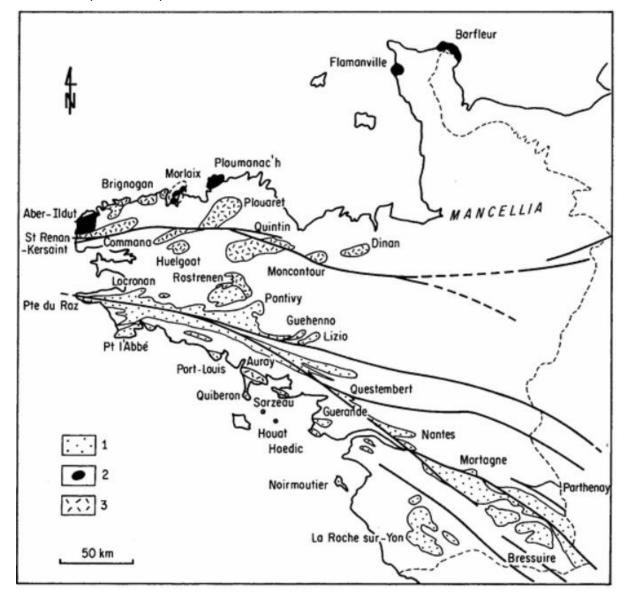


Figure 5: Granite belts of the Armorican Massif:
1. South Armorican leucogranites, 2. Red granites and 3. Middle Armorican Batholith (Carron et al., 1994).

#### 2.3 Regional Metallogeny

Variscan are targeting mineral deposit styles including:

- Volcanogenic Massive Sulphide (VMS) at Merléac (Variscan ASX Announcement 10 Nov. 2014)
- Orogenic Gold at St Pierre (Variscan ASX Announcement 14 Feb. 2014)
- Granite-Associated Tin at Beaulieu (Variscan ASX Announcement 9 June 2015)
- Skarn Tungsten at Couflens and Loc Envel (Variscan ASX Announcement 25 Oct. 2016 and 16 October 2016)
- Zinc-lead Veins at Silfiac (Variscan ASX Announcement 16 Oct. 2016)
- SEDEX zinc-lead at Tennie (Platsearch ASX Announcement 23 Jun. 2013)



Mineral deposit types form at discrete time intervals and in specific settings in the tectonic evolution of a convergent accretionary orogen like the Variscan Orogen. Reviews of how different mineral deposit types form in different tectonic settings have been compiled by many authors (e.g., Cox and Singer, 1986; Solomon and Groves, 2000; Hedenquist et al., 2005; Pirajno, 2009; Jaireth and Huston, 2010). So too, French mineral deposits have been interpreted in a plate tectonic framework (e.g., Chauris and Marcoux, 1994; Marignac and Cuney, 1999).

Chauris and Marcoux (1994) summarised the metallogenic history of the Armorican Massif and this work was refined for the neighbouring Massif Central (Marignac and Cuney, 1999) and across France (Figure 6; Lescuyer et al., 1994; Lescuyer et al., 1998). Apart from the large, but low-grade, sediment-hosted zinclead deposit at Rouez (Tennie Project; Figure 2), Neoproterozoic mineralisation is generally minor and largely associated with granitoid rocks (e.g., small tin-tungsten deposits, Chauris and Marcoux 1994). The key Phanerozoic metallogenic events are:

- 1. VMS deposit formation between 370–340 Ma just prior to the Neo-Variscan orogeny (Lescuyer et al., 1998),
- 2. Various styles of granitoid-related mineralisation (tin, tungsten, zinc-lead) around 345–300 Ma in the Neo-Variscan thickening and strike-slip stages (Marignac and Cuney, 1999), and
- 3. Orogenic Gold around 310–300 Ma towards the end of the strike-slip stage of the Neo-Variscan Orogeny (Gloaguen et al., 2007).

Marignac and Cuney (1999) interpret low-pressure high-temperature metamorphism, extensive granitoid intrusion and granulitisation of the lower crust as features that formed in response to lithospheric delamination. The heat released from this process is also considered a key driver for intrusion related tin-tungsten and orogenic gold mineral systems. Orogenic gold and intrusion related tin-tungsten deposits are absent in similar tectonic settings such as the modern-day Himalayan and Alpine collisional zones where lithospheric delamination is not interpreted to have occurred.

#### 2.3.1 VMS Mineralisation

Lescuyer et al. (1998) identified a peak period of massive sulphide deposition between 370–340 Ma in the Variscan Orogen where they correlate mineralisation in Armorica (including Porte au Moines in the Merléac Project) with that in the Massif Central, Iberian Pyrite Belt and Morocco (Figure 7). Each district, apart from the Massif Central, is interpreted as a continental back arc basin (Lescuyer et al., 1998). Continental back arc basin VMS deposits are typically associated with abundant sedimentary rock and have a lead isotope signature that has no evidence of mantle-derived lead, as is the case for Porte-aux-Moines and the Iberian Pyrite Belt (Lescuyer et al., 1998).

CSA Global considers the sediment-associated continental back arc setting of the Armorican VMS deposits to be particularly prospective because the average size of this type of VMS deposit (7.1 Mt) is larger than any other. The VMS deposits in the Iberian Pyrite Belt, with which they have been correlated, are amongst the largest in the world (Franklin et al., 2005).



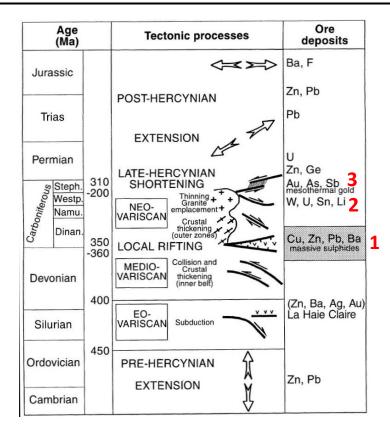


Figure 6:Summary of the metallogenic history of the France (from Lescuyer et al., 1994).Key metallogenic events numbered 1–3 (see text).

		More	0000	South Iberia		France		
					Brittany	Central Massif		
		Haja	ar	Rio Tinto Neves-Corvo	Porte-aux- Moines	Brévenne Chessy	Morvan Chizeuil	
Stephanian							1	
Westphalian								
Namurian				Culm				
	Late	Teqs	sim		Culm	Anthra- ciferous	Anthra- ciferous	
Visean		Serie	es			Tuff Syntectonic	Tuff	
	Early	Hajar				Granite		
		Sagh	lef	Volcano- Sedimentary		Goujet Formation		
	Late	Series		Formation	Volcano- Sedimentary			
Tournaisian	Middle				Formation	Volcano-		
	Early		Rhira			Sedimentary Formation		
	Late	Forma	ition				Volcano- Sedimentary	← ← Massive
Famennian	Middle			Phyllite Ouartzite			Formation	$\leftarrow$ Sulphid
	Early			Formation	Sedimentary Formation			$\leftarrow$
Early Devonian to Erasnian		Skhirat	Unit		Formation		Limestone	
Pre-Devonian	1	(Ordovic Late Dev				Gneiss		

*Figure 7: Lithostratigraphic table.* 

Showing the position of the West Hercynian successions hosting volcanic-hosted massive sulphide deposits (Lescuyer et al., 1998).



#### 2.3.2 Granitoid-associated Mineralisation

Tin-tungsten mineralisation in the Armorican Massif is very closely associated with late-orogenic S-type granitoid intrusions of the Neo-Variscan stage and is hosted within the intrusions or in proximal country rock. Cassiterite-bearing tin mineralisation without significant tungsten occurs in the Leucogranite belt and is hosted in quartz vein stockworks and pegmatites, for example, Abbaretz (Beaulieu Project) and La Villeder (Figure 2). Tungsten ± tin deposits are best developed in the Middle Armorican Batholith as breccias, stockworks and skarns, e.g. Coat-an-Noz (Loc Envel Project; Figure 2) (Chauris and Marcoux, 1994).

Structurally-controlled vein-hosted base metal mineralisation (e.g. Plélauff, Pontpéan, Huelgoat-Poullaouen and Trémuson; Figure 1) is also interpreted to be related to Variscan granitoids (Marignac and Cuney, 1999) and may have a zonal association with tin-tungsten mineralisation.

#### 2.3.3 Orogenic Gold Mineralisation

La Bellière (St Pierre Project; Figure 1) is the largest orogenic gold deposit in Brittany and the only mine with significant production in the 20<sup>th</sup> Century (334,000 Oz; Maund 2014b). Chauris and Marcoux (1994) interpreted orogenic gold deposits in Armorica as postdating the youngest Variscan granitoid intrusions at ca 290 Ma, however Gloaguen et al. (2007) interpreted auriferous veins at the Saint-Aubin-des-Châteaux deposit to have formed during regional dextral shear between 310–300 Ma. This timing for gold mineralisation is consistent with findings in the Massif Central (Bouchot et al., 2005; Marignac and Cuney, 1999).



# 3 Variscan Projects

#### 3.1 Merléac Project

The Merléac PER covers 411 km<sup>2</sup> at the eastern end of the Châteaulin Basin and encompasses several VMS deposits and prospects including the advanced Porte-aux-Moines zinc-lead-copper-silver-gold deposit (Figure 8; Maund, 2014a, Maund and Audion, 2015).

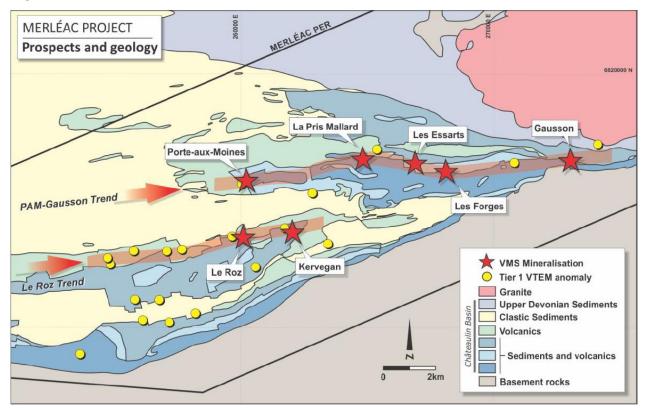


Figure 8: Geology and location of main VMS prospects and VTEM anomalies at Merléac (Variscan ASX Announcement 6 June 2016).

#### 3.1.1 Local Geology

The Châteaulin Basin, which comprises a Cambrian to Carboniferous sequence of sedimentary and volcanic rocks, rests unconformably on Neoproterozoic basement rocks (Figure 8). VMS deposits are in Carboniferous strata on the Le Roz and Porte-aux-Moines – Gausson Trends (Figure 8; Variscan ASX Announcement 6<sup>th</sup> June 2016). A concentration of VMS mineralisation on a "favourable" stratigraphic horizon is typical of VMS camps around the world. At Merléac, the favourable horizon is described as pyritic and chloritic grey-green and black shales underlain by felsic volcanic and volcaniclastic rocks and overlain by mafic volcanic rocks (Maund and Audion, 2016).

#### 3.1.2 Exploration History

At Porte-aux-Moines and several other VMS prospects, there are ancient iron workings (possibly Roman through to 19<sup>th</sup> Century) where gossan outcrops (the weathered surface expression of massive sulphide mineralisation) were mined to recover hematite, goethite and magnetite iron ore. These old workings have proved to be an excellent guide to the location of outcropping VMS mineralisation (Maund, 2014a).



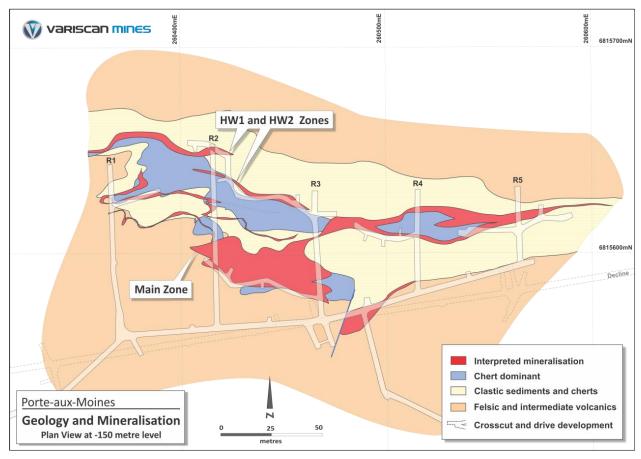
From 1968–1970 the French Bureau de Recherche Géologique Miniéres (BRGM) conducted a regional geochemical sampling program that outlined an anomaly over the Porte-aux-Moines VMS Deposit (Maund and Audion, 2015). Further exploration by BRGM through to 1987 included:

- Ground-based geophysics to define drill targets;
- 6,843 m of reverse circulation percussion (RCP) and core drilling from surface;
- Excavation of a 915m decline into the mineralisation 150 m below surface and a further 990 m of underground drives and cross cuts to further explore mineralisation; and,
- Drilling 2,830m of core holes from underground to better define a resource.

Based on this work, the BRGM estimated a "resource" of 1.9 Mt at 7.8% Zn, 1.6% Pb, 0.76% Cu and 97 g/t Ag (Maund and Audion, 2015).₄

#### 3.1.3 Mineralisation

The Porte-aux-Moines deposit is the best-understood VMS deposit on the Merléac Project owing to extensive drilling and underground development by BRGM. High-grade zinc-rich massive sulphide forms a lens up to 20 m thick in the main zone of the deposit at the contact between felsic volcaniclastic rocks and black shale (Figure 9 and Figure 10). Mineralisation has been defined over a strike length of more than 250 m and down to a depth of about 300 m (Maund and Audion, 2015).



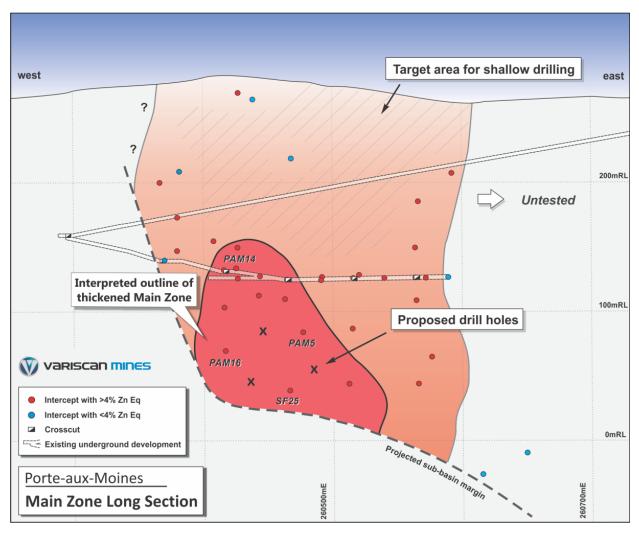
#### *Figure 9:* Plan view of Porte-aux-Moines deposit showing interpreted mineralised zones and underground development completed by the BRGM (Variscan ASX Announcement 26 April 2016).

<sup>&</sup>lt;sup>4</sup> This is a historical resource and is not classified in accordance with the 2012 JORC Code



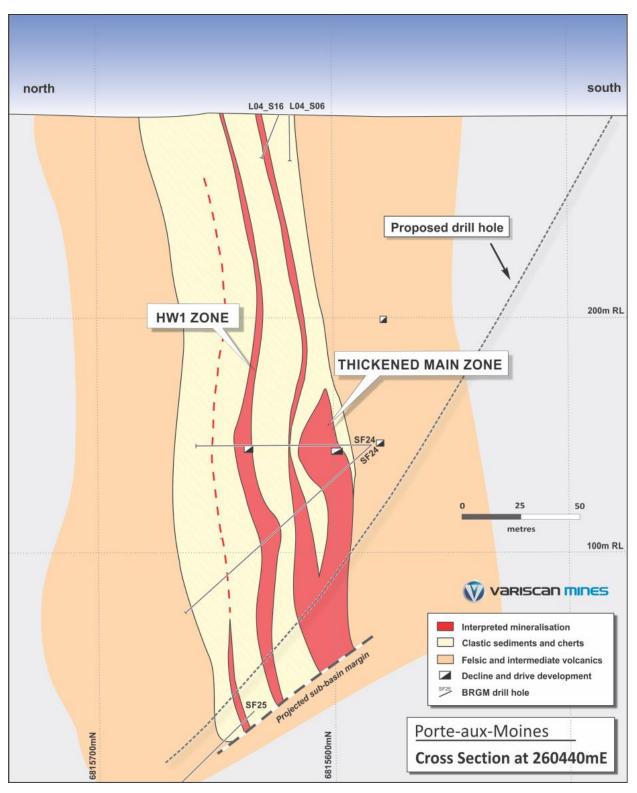


Figure 10:High-grade massive sulphide mineralisation dominated by sphalerite (pale brown).From BRGM waste dump at Porte-aux-Moines prospect.



*Figure 11:* Vertical long section of the Main Zone surface at Porte-aux-Moines showing the interpreted thickened zone and flanking mineralisation (Variscan ASX Announcement 26 April 2016).





*Figure 12:* Cross section through Porte-aux-Moines showing interpreted mineralised zones (Variscan ASX Announcement 26 April 2016).

The thick part of the main zone (Figure 11) is interpreted to have been deposited in a shallow depression on the sea floor. It is flanked by thinner mineralisation at the same stratigraphic level and stratigraphically overlain by the HW1 and HW2 massive sulphide lenses within the black shale and chert package (Figure 9–Figure 12; Variscan ASX Announcement 6 June 2016).



Massive sulphide and enclosing rocks are steeply inclined (Figure 13) owing to folding during the Variscan Orogeny and, although the rocks are strongly deformed in places, delicate sulphide textures that formed on the seafloor are extensively preserved in other parts of the deposit.

VMS mineralisation has also been drilled by BRGM at La Pris Mallard and Les Essarts prospects (Figure 8), e.g., 1.25 m at 7.0% Zn, 3.04% Pb, 0.22% Cu, from 80 m in LSS2 at Les Essarts (Maund and Audion 2016), but these prospects have been tested by far fewer drill holes than Porte-aux-Moines.



*Figure 13:* Steeply south-dipping volcaniclastic strata on the hill above Porte-aux-Moines deposit. Photograph by CSA Global geologist, Thomas Branch.

A reconnaissance of ancient iron workings by Variscan led to the discovery and geochemical sampling of further gossans (Figure 16) both along the Le Roz and Porte-aux-Moines – Gausson Trends and north of the Porte-aux-Moines – Gausson Trend (Figure 8 and Figure 14; Maund 2014a).

# CSA Global considers that the geochemistry of the ironstone gossan samples is consistent with VMS mineralisation.

VMS mineralisation commonly contains highly anomalous in Pb, Zn, Cu, Ag, Au, Sn, Bi, In, Hg, As, Sb, Ba, Te and Se (Franklin et al., 2005) and most of these elements apart from Zn (due to high mobility in the weathering environment) will remain enriched in weathered rocks at surface. An additive index designed to highlight VMS mineralisation was calculated for Variscan's Merléac Project rock chip data as follows:

 $INDEX_6 = log(Pb) + log(Cu) + log(Ag) + log(Au) + log(Bi) + log(As)$ 

where all values are in parts per million (ppm).

# High INDEX\_6 scores highlight the gossan at Porte-aux-Moines as well as six other prospects on the Merléac Project, particularly the Pris Mallard and Les Essarts prospects (Figure 15).

Raw element values are closely correlated to INDEX\_6 scores for Pb and Cu and reasonably well correlated for Ag, Au and As. Summary statistics for the key elements are presented in Table 2.



	Pb	Cu	As	Au	Ag	Bi			
	ppm	ppm	ppm	ppm	ppm	ppm			
Count	157	157	157	153	157	157			
Minimum	1	1	3	0.00	0.25	1.0			
Maximum	60,900	9,740	2,920	3.67	121.00	116.0			
Mean	975	269	264	0.09	3.28	13.8			
Median	33	74	90	0.01	0.25	4.0			
Range	60,899	9,740	2,918	3.67	120.75	115.0			
InterquartileRange	190	248	221	0.03	0.65	10.5			
StandardDeviation	5,296	848	450	0.35	13.14	22.8			
1percentile	1	1	3	0.00	0.25	1.0			
5percentile	1	1	3	0.00	0.25	1.0			
10percentile	1	1	3	0.00	0.25	1.0			
25percentile	5	13	34	0.00	0.25	1.0			
75percentile	195	261	255	0.03	0.90	11.5			
90percentile	920	568	807	0.09	5.66	50.0			
95percentile	4,580	831	1,392	0.53	11.17	61.0			
99percentile	36,540	6,138	2,787	2.42	97.05	112.5			

Table 2: Merléac Rockchip Summary statistics



Figure 14: Massive spongy gossan texture after pyritic sulphide mineralisation. Notre Dame Iron Workings in far south-east of project (Maund, 2014a)

#### 3.1.4 Mineral Resource Estimate

The BRGM completed a considerable amount of drilling and underground development between 1975 to 1981, summarised in Gisement De Porte-Aux-Moines (France) Bilan Au 30/06/81 Des Études Techniques Et Économiques, Département des études miniéres, B.P. 6009 - 45060 Orléans, Rapport du BRGM 81 RDM 035 DEM (not sighted by CSA Global). Based on this work, BRGM calculated a "resource" of 1.9 Mt at 7.8% Zn, 1.6% Pb, 0.76% Cu and 97 g/t Ag (Maund and Audion, 2015). <sup>5</sup>

Variscan Mines Limited commissioned QG Consulting ("QG", now Aranzgeo Consulting Services) in May 2016 to complete a Mineral Resources estimation based on the historical drilling. The combined Indicated and Inferred Mineral Resource estimate in three zones was 2.2 Mt at 6.0% Zn, 1.3% Pb, 0.8% Cu, 80.6 g/t Ag and 0.9 g/t Au (Table 3); the work is summarised in by Jobs (2016) who is the Competent Person for

<sup>&</sup>lt;sup>5</sup> This resource is not classified in accordance with the 2012 JORC Code



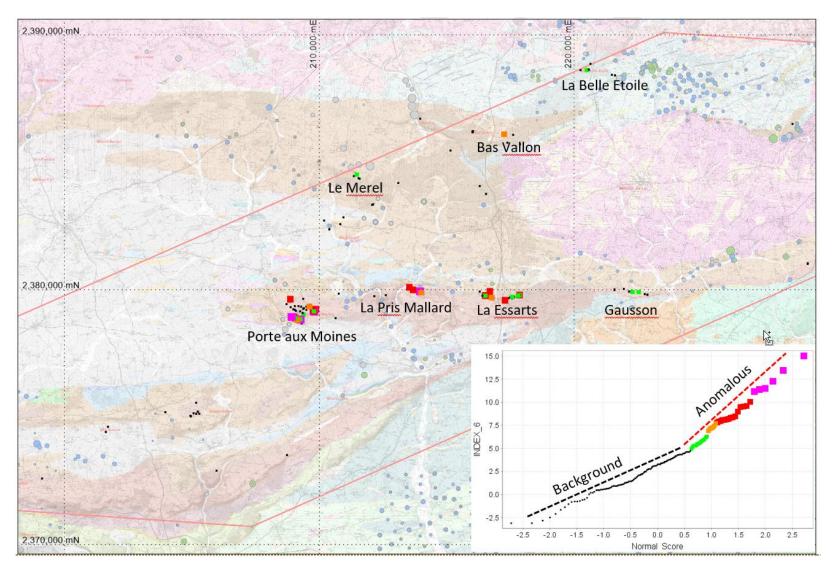
this Mineral Resource estimate. The JORC Table 1 for the PAM MRE was provided in the maiden announcement by Variscan (2016c).

	Tonnes	Zinc %	Lead %	Copper %	Silver g/t	Gold g/t
INDICATED						
Main	291,000	6.1	1.2	0.8	7.65	0.9
HW1	-	0.0	0.0	0.0	0.0	0.0
HW2	-	0.0	0.0	0.0	0.0	0.0
Total	291,000	6.1	1.2	0.8	7.65	0.9
INFERRED						
Main	1,505,000	6.1	1.3	0.9	86.0	0.9
HW1	361,000	5.1	1.3	0.3	61.3	0.8
HW2	44,000	5.4	2.0	0.1	82.3	0.0
Total	1,910,000	5.9	1.3	0.8	81.2	0.9
TOTAL						
Main	1,796,000	6.1	1.3	0.9	84.4	0.9
HW1	361,000	5.1	1.2	0.3	61.3	0.8
HW2	44,000	5.4	2.0	0.1	82.3	0.0
Total	2,201,000	6.0	1.3	0.8	80.6	0.9

#### Table 3: PAM Mineral Resource Estimate as at 31 May 2016

Source: Variscan (2016c)





#### *Figure 15: Surface rock chip samples*

highlighting samples with anomalous INDEX\_6 scores over background of local geology map. Inset: probability plot of INDEX\_6 scores.



CSA Global was provided with the QG report together with a Micromine database, block model, and mineralisation and void wireframes to review. Based on this review, it is CSA Global's opinion that the Mineral Resource estimate is appropriate to the data provided and the classification appropriately reflects the level of confidence in the estimate expressed by the Competent Person.

The following summarises the work completed as reported by QG.

Variscan provided wireframes representing mineralisation domains for the MZ, HW1 And HW2 zones to QG; these wireframes were validated by QG and any self-intersecting triangles were fixed to ensure wireframe volumetric integrity, and accuracy against drill hole intersections. These wireframes were then used to constrain the estimation domains and flag estimation data.

The estimation data was derived from 58 surface and underground diamond drill holes, mapping and assays from underground development to the -150 m level, as well as data from a number of shallow percussion drill holes completed by the BRGM. Variscan resampled mineralised zones from three surface diamond holes (selected to represent the Main and HW zones), and were satisfied that this provided sufficient confirmation of the quality and accuracy of the assaying work completed by the BRGM during its exploration of the deposit from 1976 to 1985. CSA Global endorses this verification technique in principle, and notes that the Main and HW zones were represented, and recommends that QAQC continues to be monitored as further development of the PAM deposit by Variscan progresses.

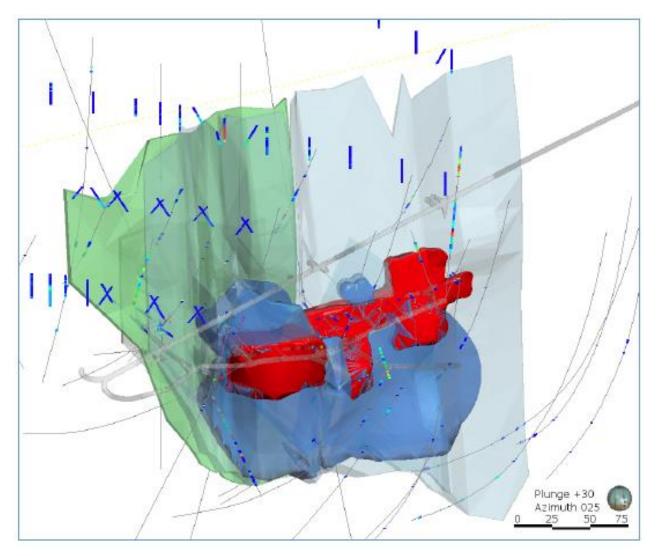
QG reviewed the statistical distributions of the five elements, and concluded that the metal grade distributions showed reasonable log-normal behaviour, with moderate coefficients of variation (CV) indicating a limited occurrence of high-grade outliers. QG found zinc, silver and lead to be statistically well correlated with gold and copper showing lower correlations with zinc. The metals all exhibited similar semi-variogram behaviour, with a significant nugget effect (up to 30% of total sill) and the balance of the variance represented by two structures, the first structure with a range of up to 50 metres and a second structure with a range up to 180 m. QG applied a common orientation of the search and variogram ellipses to maintain interpreted spatial correlation.

QG used Ordinary Kriging (OK) to estimate five elements (Zn, Pb, Cu, Ag and Au). The estimates were then verified for reasonableness using inverse distance squared (ID2) and nearest neighbour(NN) estimates. QG concluded that any danger of smearing in the estimates was minimal. The search strategy (following Kriging neighbourhood analysis) applied a minimum of seven composites, with the majority of narrow mineralised zones estimated using more than 25 composites.

QG reviewed the available density data and concluded that 33 samples were too few to attempt any spatial estimation of density. An average density of  $3.7 \text{ t/m}^3$  was applied to mineralised blocks. CSA Global agree with this conclusion and endorse this approach, as the low number of samples is not viable to adequately represent the spatial distribution of density, or even draw any conclusions about the relationship of grade and density in the form of a regression equation. However,  $3.7 \text{ t/m}^3$  represents a reasonable average density to a sphalerite rich VMS hosted mineralisation, as the density of sphalerite generally ranges between  $3.9-4.2 \text{ t/m}^3$ .

The model was further validated by QG visually, examining block model grades against drilling data as well as swath plots of the composited OK, ID2 and NN estimates in easting (X), northing (Y) and elevation (Z). The correlations between the estimations were acceptable, and appropriately reflect the data available.





*Figure 16:* Indicated portion of the Porte-aux-Moines deposit. (Note: The remaining wireframes depicted - dark blue, pale blue and green, are Inferred) Source: Job, 2016

The model was classified on the basis of confidence in the available data, with the majority considered Inferred. Indicated blocks in the central region reflect additional support from historic underground development and a higher drilling density. Figure 16 illustrates the Indicated portion of the MRE.

CSA Global agrees with the general approach adopted towards estimation and classification of the Mineral Resource and our review supports our conclusion that it is appropriate for the data and current level of knowledge about the deposit.

QG reported the MRE at an 8 % Zinc Equivalent cut-off to satisfy the requirement for reasonable prospects of eventual economic extraction and provided a recent comparison with Canadian Zinc Corporation (CZC) at an effective date 31st March 2016, where the underground VMS Mineral Resources for the Prairie Creek Property Prefeasibility Update was declared at a zinc equivalent grade of 8%.

CSA Global notes that the prices applied by QG and supplied by Variscan (2016c) are conservative, compared to current commodity prices, as indicated by the comparison with current commodity prices:

- zinc US\$1,800 per tonne (approx.US\$ 2600 as at 27 Mar 2017),
- lead US\$1,800 per tonne (approx.US\$ 2200 as at 27 Mar 2017),
- copper US\$5,600 per tonne (approx.US\$ 5700 as at 27 Mar 2017),



- silver US\$15 per ounce (approx.US\$ 17 as at 27 Mar 2017), and
- gold US\$1,150 per ounce (approx.US\$ 1260 as at 27 Mar 2017).

The zinc equivalent calculation is based on metal content and price alone and takes no account of mining or metallurgical recovery, of smelter charges, or other factors. CSA Global endorses Variscan's cautionary note that the zinc equivalent calculation should be read as an indicative value only, used primarily to report the estimate and recommend revision as soon as metallurgical recovery studies are completed.

#### 3.1.5 Exploration Potential and Targets

**Exploration potential is considered very high for the Merléac Project.** The project covers a volcanosedimentary basin that is demonstrated to be fertile for VMS mineralisation and includes two extensive strike trends of a stratigraphic horizon with known VMS mineralisation. Key positive features for the project include:

- Continental back arc setting, coeval with the Iberian Pyrite Belt, which suggests that discoveries at Merléac may be larger than average; continental back arc VMS deposits are, on average, the largest of the five VMS classes defined by Franklin et al. (2005) and VMS deposits in the Iberian Pyrite Belt are amongst the largest in the world.
- Clustering of prospects along a favourable stratigraphic horizon is particularly encouraging for a VMS exploration project; multiple economic deposits commonly occur at a specific stratigraphic level in VMS camps.
- Surface rock chip samples from Porte-aux-Moines and six other prospects have elevated Pb, Cu, Ag, Au, Bi and As, typical of VMS gossans.

The only modern exploration done in the area is that by BRGM between 1968 and 1987 that led to the discovery of high-grade Zn-Pb-Ag-Cu-Au VMS mineralisation at Porte-aux-Moines. Exploration by BRGM and Variscan has defined several other VMS targets, many of which are interpreted to lie on the same stratigraphic horizon ("favourable horizon") as the Porte-aux-Moines deposit. Most of these targets have had little or no drill testing.

Modern exploration for VMS deposits in fertile terrains can be extremely effective and is based on recognition of the target stratigraphic position, a good understanding of alteration and geochemical vectors and supported by geophysical detection methods that have advanced greatly since the previous work by BRGM, notably airborne and ground EM (electromagnetic) surveys.

An airborne VTEM (Versatile Time Domain Electromagnetic) survey completed by Variscan Mines in 2015 identified multiple conductors that might reflect massive sulphide mineralisation (Figure 19). The Porteaux-Moines VMS Deposit generated a discrete VTEM anomaly and the survey also identified 14 highpriority 'Tier 1' targets with moderate to strong, early to late time electromagnetic responses. In addition, the survey identified approximately 50 other conductors possibly due to sulphide zones, but close to buildings, power lines or other 'conductive' infrastructure, requiring field checks to confirm the source of the anomalism (Variscan ASX Announcement 28 September 2015). The PAM deposit is the only VMS deposit or prospect with a known gossan that is closely coincident with a 'Tier 1' VTEM target.



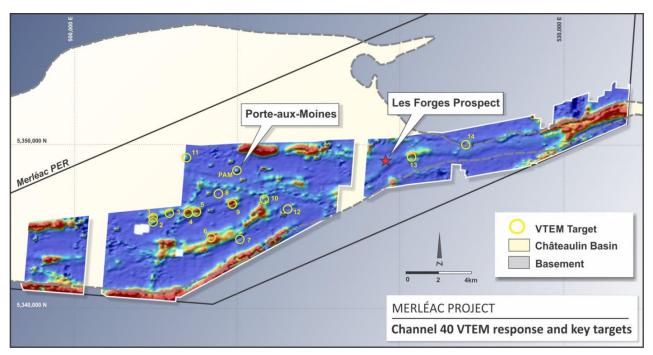


Figure 17: 'Tier 1' VMS targets over Channel 40 VTEM image at Merléac (Variscan ASX Announcement 28 September 2015).

CSA Global consider that high-priority VMS exploration targets on the Merléac Project should be ranked as follows:

- 1. Porte-aux-Moines. Surface rock chip samples are the most anomalous on the Project (Figure 15) and the deposit is coincident with a Tier 1 VTEM anomaly (Figure 17). Although the Main Zone massive sulphide lens terminates at depth (Figure 12), favourable palaeo-seafloor positions may exist down-dip, east, and particularly west of Porte-aux-Moines where mineralisation has not been properly closed off (Figure 18).
- La Pris Mallard and Les Essarts have strongly anomalous rock chip geochemistry (Figure 15) and thin VMS mineralisation tested by very limited drilling (Maund and Audion, 2016). They lie along strike from Porte-aux-Moines at the same stratigraphic level. There is a very high chance that further drilling at these prospects, guided by EM and geochemical targeting, will identify additional VMS mineralisation.
- 3. Bas Vallon, Gausson, Le Merel and La Belle Etoile. Although rock chip samples are less anomalous (Figure 15), gossans may represent the low-grade fringe of a deeper massive sulphide body. These targets warrant follow-up sampling, geological mapping and ground EM surveys.
- 4. Tier 1 VTEM targets that are not coincident with known prospective strata or anomalous surface geochemistry are planned to be mapped and sampled so that conductors in favourable geological settings for VMS mineralisation and with favourable geochemistry can be prioritised for ground EM and drilling.



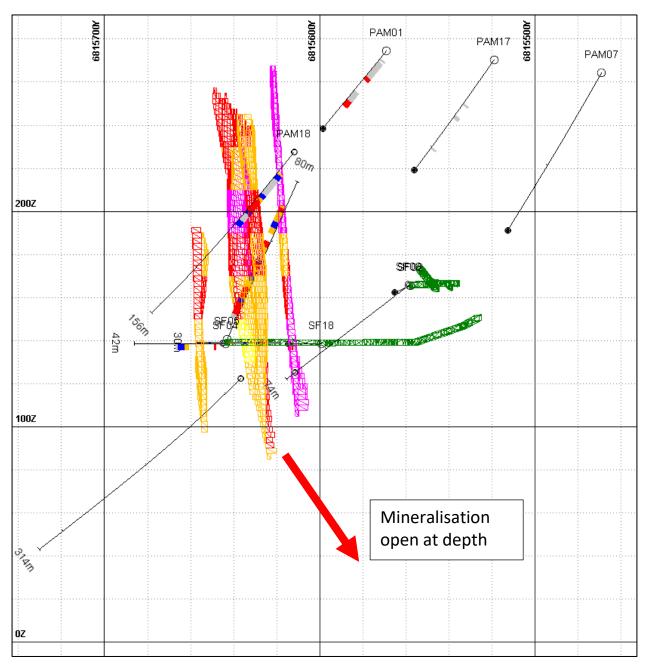


Figure 18:Section 260,350E highlighting un-tested potential.Green wireframe: underground workings. Multicoloured wireframe: resource model. (facing east<br/>through Porte-aux-Moines VMS Deposit)

#### 3.1.6 Exploration Strategy

Planned exploration activities and forecast expenditures have been provided by Variscan. It is intended to cover:

- Geological mapping;
- Rock chip and soil samples better constrain VMS targets such as Les Essarts, Les Forges, La Pris Mallard and Gausson;
- Ground and down-hole EM surveys. Two EM surveys are planned, including one at Les Essarts; and,
- 1,900 m of diamond core drilling including for two deep holes (500 m each) to test the down-dip and deeper western potential of the PAM system.



Diamond drilling is planned in stages allowing time to interpret results from the most recent round of drilling and plan the next holes more effectively. Down-hole geophysics will be used to search for off-hole conductors (potentially related to massive sulphide) which will also be used to guide further drilling. Systematic rock chip and soil sampling will quantify the surface expression of mineralisation at less-explored prospects and provide a focus for initial drilling at these targets.

It is CSA Global's opinion that Variscan's exploration strategy is suitable for the stage of the projects, and that the planned work is appropriate and technically valid.



#### 3.2 Saint Pierre Project

The Saint Pierre permit covers 386 km<sup>2</sup> centred on the historical La Bellière gold mine (Figure 2) which lies underneath the village of Saint Pierre Montlimart, and produced 334,000 oz of gold in the 20<sup>th</sup> Century (Maund, 2014b).

#### 3.2.1 Local Geology

The permit is largely underlain by 600 Ma Brioverian greywackes and pelites (submarine sedimentary rocks; Figure 20), intercalated with mafic volcanic rock, that were strongly deformed during the Variscan Orogeny and metamorphosed at lower greenschist facies. Gold mineralisation at the La Bellière mine is hosted in east-northeast striking structural zones (Figure 21) that are interpreted to have formed during the Variscan Orogeny.

#### 3.2.2 Exploration History

Gold has been mined at La Bellière gold mine periodically from before Roman occupation in 55–420 through to 1952. Systematic evaluation and gold production commenced in 1907 and most mining occurred from 1907–1917 and 1926–1938 with production post-1945 from stockpiles. The mine produced 334,000 ounces of fine gold from 989,000 tonnes of ore at an average recovered grade of 10.5 g/t Au (Maund, 2014b).

Two holes were drilled by BRGM at the far western end of the mine workings (Ville Tirard prospect) around the time the mine closed in 1952 (Figure 21) and intersected substantial mineralisation (15–20 m true thickness at 3–4 g/t Au were reported in the historical reports, see Variscan ASX Announcement, 19 January 2017). A further six holes were drilled in 1983–1986 during the BRGM-Societe Nationale Elf Aquitaine Petroliers (SNEAP) JV, but these later holes do not appear to have been well-targeted at mineralisation (e.g., two holes collared in footwall and others failed to intersect the target shear zone Maund (2014b)). One problem was uncertainty over the exact location of the 1952 drill collars. Drilling by Variscan in 2017 attempted to repeat the results of the 1952 drilling but failed to intersect significant gold mineralisation. Thus, further work is required to pinpoint the main gold-bearing structure at the far western end of the mine workings.

Systematic soil sampling and minor drilling by the BGRM-SNEAP JV identified a number of prospects close to La Bellière, but there is no record of any systematic mineral exploration on the Saint Pierre PER more than 5 km away from the mine (Maund 2014b). Digital data have not yet been fully captured from the BGRM-SNEAP JV.

#### 3.2.3 Mineralisation

Gold mineralisation at La Bellière is a typical example of an orogenic or "lode-style" gold deposit (Figure 19) where gold is closely associated with quartz veins, disseminated sulphide minerals and white mica alteration.

Gold is hosted in quartz veins in a thick mylonite zone that may be a splay off the SASZ. Sulphide minerals at La Bellière are dominantly pyrite but also include sphalerite, galena, chalcopyrite, and arsenopyrite. Gold has been mined over about 2 km of strike length (along the fault/lode) and down to a depth of up to 170 m (Figure 21). About 80% of production was from the Verger shoot (centred on Emmanuel Shaft; Figure 21; Maund, 2014b) where quartz sulphide lodes are 1–16m true thickness and dip steeply to the south with variable plunge. It is not clear whether variations in host rock lithology control the location of ore shoots, but they coincide with sigmoidal jogs in the shear zone that indicate sinistral fault movement (Blouin, 1990).



Variscan has completed reconnaissance rock chip (Figure 22) sampling within 5 km of the La Bellière gold mine and soil sampling over the Bègrolle and Belleville targets (Figure 23). Rock chip sampling has highlighted several mineralised structures along strike and to the south of La Bellière with values higher than 1 g/t Au (Figure 22). Soil values are anomalous (> 20 ppb Au) over a strike length of 800 m at Belleville (Figure 23). Interestingly, the anomalous gold in soils at Belleville (Figure 23) is not strictly coincident with shear zones interpreted by BRGM (Figure 22) Discrepancies like these required detailed field mapping to resolve.



Figure 19:Sample of orogenic gold mineralisation from La Bellière Gold Mine.Quartz-arsenopyrite-pyrite-sphalerite vein held by CSA Global geologist, Thomas Branch.



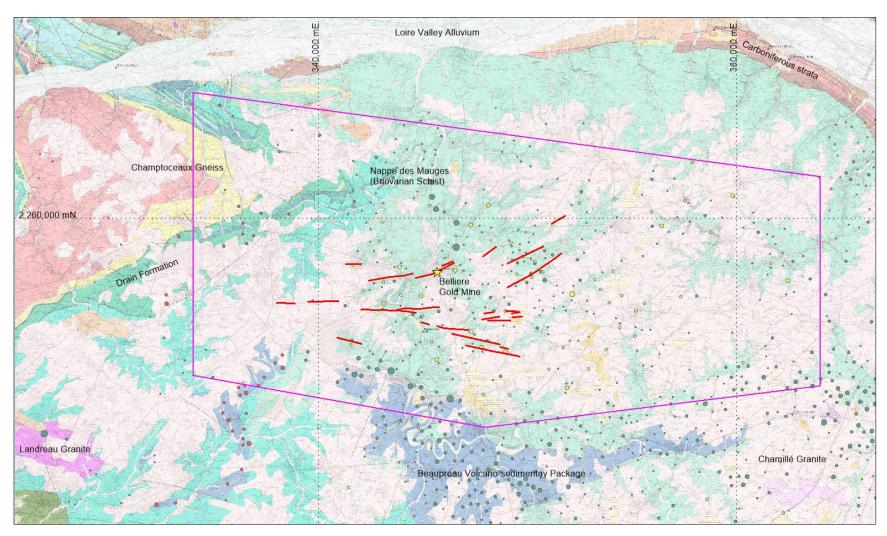
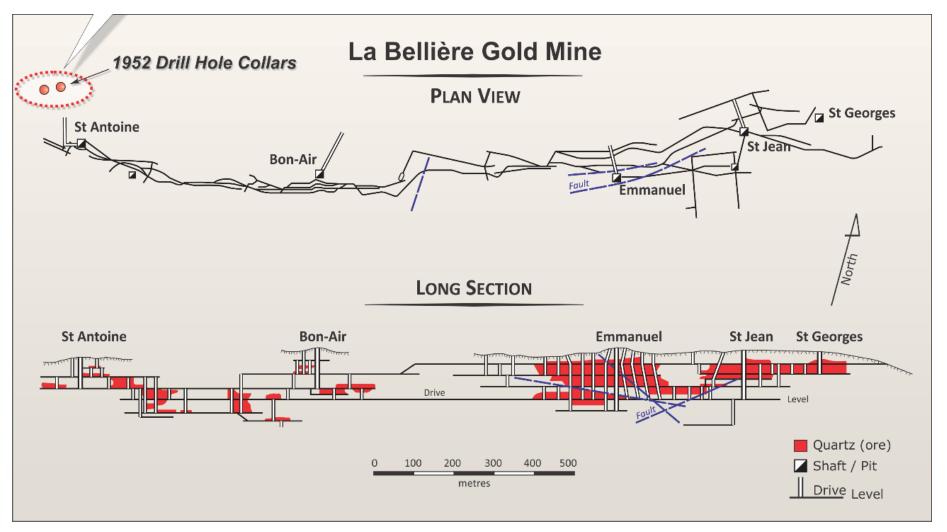


Figure 20: Location of Saint Pierre PER overlain on regional geology map (BRGM 1:50,000 series). Key features include east-north east-striking faults (red lines) and labelled geological units. Coloured circles are surface samples graduated according to gold (yellow), As (green) and Ti (red).





*Figure 21:* Plan and long section view of the La Bellière gold mine also highlighting the location of two BRGM drill holes (Variscan ASX Announcement, 19 January 2017).



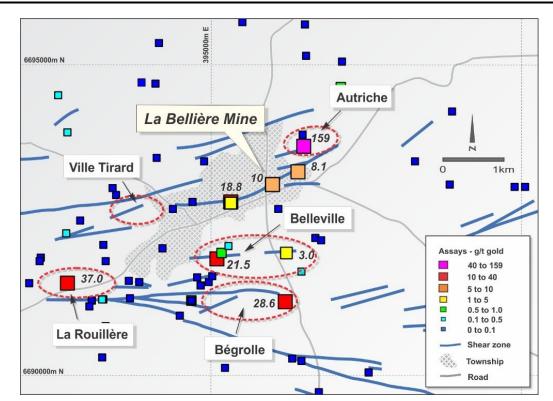
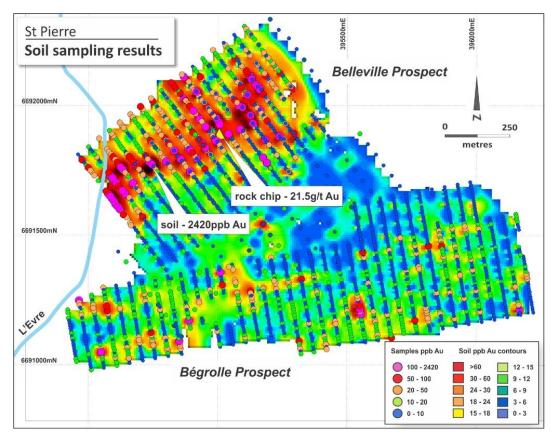


Figure 22: Rock chip sample results around the La Bellière gold mine (Variscan ASX Announcement, 19 January 2017).



*Figure 23:* Gridded soil sampling plan highlighting high gold values over the Belleville Prospect south of the La Bellière gold mine (Variscan ASX announcement, 19 January 2017).



No Mineral Resource estimate has been reported in accordance with JORC 2012 for the St Pierre Project.

#### 3.2.4 Exploration Potential and Targets

The La Bellière gold deposit is typical of Phanerozoic orogenic gold deposits formed in greenschist facies accretionary sedimentary terrains dominated by flysch sediments. Typical examples include the Victorian slate-belt gold deposits in Australia (Ballarat, Bendigo etc.) and the Tien Shan deposits of central Asia (e.g. Kumtor). The European Variscides host many historical but few active gold mines, including Salsigne, the largest gold deposit in France located in the southern Massif Central.

La Bellière was a significant historical producer (334,000 Oz of Au) based on high-grade (10.5 g/t Au recovered grade) gold mineralisation in structurally-controlled veins. According to Maund (2014b) the six holes drilled at La Bellière by the BGRM-SNEAP JV failed to test below the mine workings. He says that there is uncertainty over collar locations and drill logs do not show any evidence that the target structure was intersected. Data to confirm this is not available and needs to be compiled if possible. Orogenic gold systems are typically vertically continuous over hundreds of metres to more than 2 km, therefore mineralisation is very likely to continue below existing mine workings, and, at best, La Bellière is very lightly tested below 170 m.

The Belleville soil anomaly (Figure 25) and rock chip sampling (Figure 24) demonstrate that other goldbearing structures around the La Bellière gold mine are present that have not been effectively tested by intermittent BRGM exploration; drill testing by Variscan is now underway (Figure 26). In addition, geological mapping by BRGM suggests that structures of a similar orientation to those that host gold mineralisation at La Bellière extend at least 6 km east-northeast and west-southwest of the mine (Figure 21).



*Figure 24:* Reverse circulation drilling at the Belleville gold prospect south of La Bellière gold mine.

On this basis, *CSA Global view the St Pierre Project as highly prospective for orogenic gold mineralisation similar to the known deposit at La Bellière*. It is very likely that this mineralisation continues below existing mine workings at La Bellière (Figure 21). Surface geochemistry by Variscan has demonstrated anomalous gold at other prospects within 2 km of La Bellière (Belleville, La Roullière and Bègrolle; Figure 22), along strike and on parallel trends. Thus, there are good-quality exploration targets at the mine-, near-mine and semi-regional scales.



Exploration potential over the rest of the Saint Pierre Project more difficult to constrain. Based on existing data, the most prospective areas are likely to be close to east and east-northeast striking faults mapped up to 6 km away from Saint Pierre Montlimart.

#### 3.2.5 Exploration Strategy

Planned exploration activities and forecast expenditures has been provided by Variscan.

It is intended to cover:

- Geological mapping;
- Soil sampling on prospects around the La Bellière mine that have not already been sampled by Variscan; and,
- 1,000 m of reverse circulation percussion drilling at the Belleville prospect with a further 500 m of RCP drilling to follow-up results at Belleville or drill at other prospects.

Surface soil sampling will extend the existing grid sampled by Variscan and provide focus for any future drilling on these targets. Reverse circulation drilling at Belleville will be sufficient to test the prospect with two or three holes on multiple drill sections.

It is CSA Global's opinion that the exploration strategy is appropriate, and the planned work is technically sound.



#### 3.3 Beaulieu Project

The Beaulieu PER covers an area of 278 km<sup>2</sup>, 40 km north of the port city of Nantes (Figure 2).

#### 3.3.1 Local Geology

The Beaulieu PER is underlain by Lower Ordovician (about 480 Ma) to Middle Silurian (about 425 Ma) metasedimentary rocks of the Nozay Syncline that have been intruded by the 315 Ma S-type Nozay Granite, an irregular broadly linear intrusion that is sub-parallel to the strike of the sedimentary rocks (Figure 26). Metasedimentary rocks include quartzite, sandstone and schist after shale-siltstone. These rocks were folded at around the time of granite intrusion during the Variscan Orogeny (Le Boutilliere, 2016).

#### 3.3.2 Exploration and Mining History

Nozay-Abbaretz is the largest historical tin mining district in France where tin has been mined from Bronze Age and Roman times as evidenced by a series of ancient linear pits and trenches. There was little to no mining from then until 1910 when the Nantes Western Minerals Company (SNMO) began exploring the ancient workings. Mining was largely underground from 1910–1921 but was dominated by the Bois-Vert open pit (Figure 25 and Figure 26) from 1942–1958 (Le Boutilliere, 2016). The Bois-Vert open pit which is 900 m long, 70 m deep and produced ca 2,700 tonnes of tin metal. Other significant workings include Bé (45 m deep shaft and 1,700 m of underground galleries) and Beaulieu (45 m deep shaft with two adits).



#### *Figure 25: Waste dumps from the Abbaretz open cut tin mine.*

During the 1960s to 1980s, the BRGM undertook various research and exploration programs in the Nozay-Abbaretz District including:

- Reviewing the various SNMO mining operations
- 488 Auger holes in various campaigns
- 572 open percussion holes in various campaigns
- Different estimates of tin resources based on that drilling

*Critically, it has been concluded that many of the drilling methods used may not have properly sampled the targeted material leading to a serious under reporting of tin grades.* Modern drilling methods (triple tubed diamond core drilling Le Boutilliere (2016)) and reverse circulation percussion drilling are recommended to return representative samples.

#### 3.3.3 Mineralisation

Cassiterite (tin-oxide) is disseminated in and around swarms of quartz veins within and just beyond the margins of the Nozay Granite (Figure 27) consistent with the interpretation that tin mineralisation was emplaced during and immediately after intrusion of the granite. Tin-bearing quartz veins have alteration



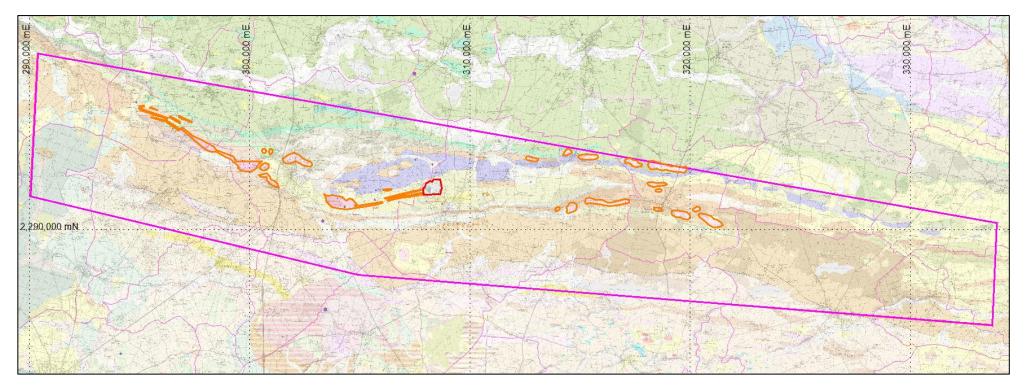
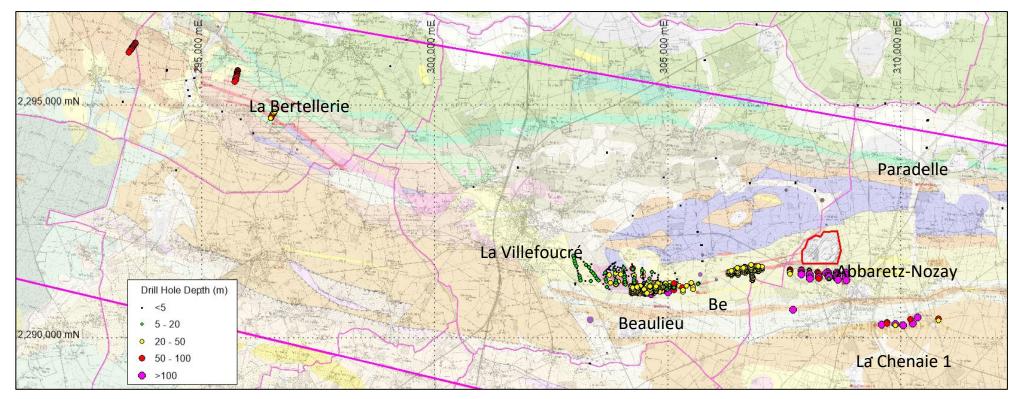


Figure 26: Geology map of the Beaulieu Project - Abbaretz open cut tin workings (red) and Nozay Granite outcrops (pink with orange outline). Sedimentary rocks (brown, purple, green) are intruded by granitoids including Nozay Granite. All units are overlain by recent alluvium (pale yellow).





*Figure 27:* Location of tin prospects in and around the village of Abbaretz and depth of drill holes.



halos of muscovite and carry tourmaline, minor arsenopyrite and pyrite with rare chalcopyrite, molybdenite and beryl (Le Boutilliere, 2016).

Underground and open pit workings are elongate in an east-northeast direction parallel to the swarms of quartz veins that control tin mineralisation.

#### 3.3.4 Resources

No Mineral Resource estimates in accordance with JORC 2012 have been reported for the Beaulieu Project. Previously, the BRGM have estimated tin resources at Beaulieu, but these have not been reported in accordance with the JORC Code. Variscan have considered these numbers internally, and regard the estimates as positive indication of significant mineralisation. Mineral resource definition, estimation and reporting in accordance with the JORC Code will be completed in due course as exploration and drilling progress.

#### 3.3.5 Exploration Potential and Targets

The European Variscides host extensive tin deposits that provided a key ingredient for the development of Bronze Age civilisation. Notable ancient mining districts include the Armorican Massif as well as Cornwall in England, the northern Iberian Massif, and the Erzgebirge/Krusné Hory of Germany and the Czech Republic. Modern exploration and mining has been limited, though projects are currently under evaluation in Spain, Portugal, England and Germany.

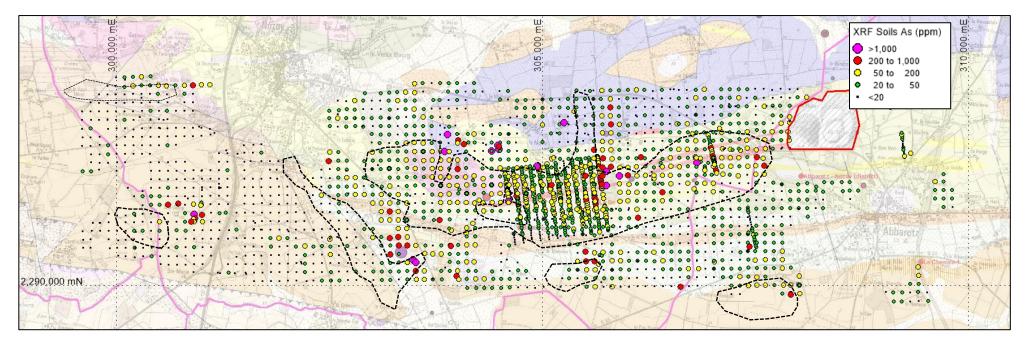
# At Beaulieu, ancient and modern mining operations demonstrate the presence of significant and extensive tin mineralisation in a productive historical tin province that has been poorly tested by modern exploration.

Previous exploration and evaluation at Beaulieu has been limited in scope and hampered by sampling and analytical approaches. Although there have been more than 1,000 holes drilled on the tenement, only 31 of them are more than 100 m deep and most of these deep holes are under the Bois-Vert open pit (Figure 27). Drill holes were sampled over very wide intervals (typically tens of metres) and analysed by methods that may well have led to substantial under reporting of tin grades. Therefore, new drilling is required to test the tenor of mineralisation at the known prospects. Assaying samples by 4-Acid and Fusion digest techniques will provide more reliable analytical data.

Previous exploration by SNMO and BRGM shows that although tin values are dispersed across a wide area between Nozay and Abbaretz, the highest recorded grades and most continuous mineralisation are at Beaulieu and Bé. Variscan have taken 3,115 soil samples over this area east of the Bois-Vert pit and analysed them with a hand-held XRF analyser. This technique is effective for some base metals, including arsenic (Figure 28), but is unreliable for other metals like tin (Figure 29) at low levels required for exploration. Higher values of arsenic outline several coherent anomalies that are interpreted to be related to tin mineralisation, but almost all tin values are lower than a reliable value of about 200 ppm Sn (Figure 29 and Figure 29). Assaying surface samples by 4-Acid and Fusion digest techniques will provide more reliable analytical data.

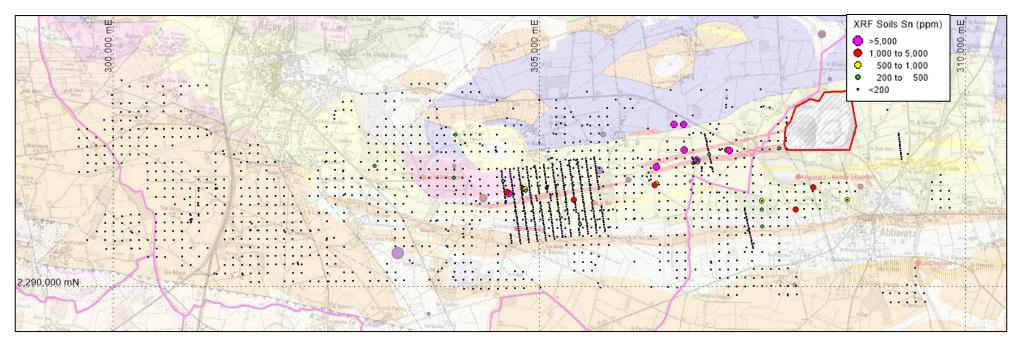
The tenor of tin mineralisation at Beaulieu is not well constrained and the target trend has been poorly tested by past exploration. Considering the size and tenor of the previously mined mineralisation, the extent of the anomalous target zone, and the limitations of past exploration, it is considered that a focused exploration program including well-targeted drilling has good potential to identify economic tin mineralisation on the Beaulieu Project.





*Figure 28:* Variscan XRF soil data east of Abbaretz for arsenic. *Waste dump north of Abbaretz open cup outline in red. Arsenic anomalies outlined with black stipple.* 





*Figure 29:* Variscan XRF soil data east of Abbaretz for arsenic and tin. Waste dump north of Abbaretz open cup outline in red.



#### 3.3.6 Exploration Strategy

Planned exploration activities are intended to cover up to 1,200 m of RCP drilling.

Reverse circulation drilling will return a reliable sampling to assay the tenor of tin mineralisation at the Beaulieu and Be prospects. Approximately twelve, 100 m deep, drill holes would provide a critical initial test of the tenor of tin mineralisation that can be expected in this mineral system.

It is CSA Global's opinion that the exploration strategy is appropriate, and the planned work is technically sound.



#### 3.3.7 Overview

The Couflens Project is fully funded by Apollo Minerals Limited in a JV with Variscan where Apollo can earn 80% interest with Variscan free carried at 20% until a DFS is completed or €25 million total expenditure is reached.

The 42 km<sup>2</sup> project covers the historical Salau tungsten mine in southern France (Figure 30, Figure 31).

#### 3.4 Couflens

#### 3.4.1 Exploration and Mining History

The deposit was discovered in 1964 by the BRGM. Les Mines d'Anglade (LMA) operated the mine from April 1971 to November 1986, during which time it is reported to have produced 0.93 million tonnes of ore at an average grade of 1.5% WO<sub>3</sub> to yield approximately 11,500 tonnes of WO<sub>3</sub> in concentrate. Notwithstanding the existence of remaining resources, the discovery of promising mineralised zones elsewhere and the much higher grade production from the last years of production (up to 2.48% WO<sub>3</sub>), the precipitous fall in the tungsten price in 1986 led to mine closure.

#### 3.4.2 Mineralisation

Tungsten-bearing skarn mineralisation is developed at the contact between Devonian pelites and calcareous sediments and the Variscan-aged Forque granodiorite intrusion (Figure 31 and Figure 32). Prograde skarns contain modest tungsten grades but the bulk of production came from more sulphide-rich retrograde skarns which have substantially higher tungsten, copper and gold grades (Variscan ASX Announcement 25 October 2016). The deposit is largely open at depth; testing such targets will be part of the initial work by Apollo which will be aimed at producing a Mineral Resource reportable under the JORC Code 2012.

A detailed study of the Salau tungsten mine (Fonteilles et al., 1989) concluded that the causative granitoid intrusions were emplaced after sedimentary rocks had been isoclinally folded and strongly sheared, but largely before (but also during) late brittle faulting. Late brittle faults include north-dipping reverse faults that displace ore zones. The shape of the granitoid intrusions at Salau are closely controlled by the architecture of the strongly folded and sheared sedimentary pile and local apophyses and embayments in the granitoid contact are important controls on the orebodies. Fonteilles et al. (1989) document two hydrothermal fluids associated with the tungsten-rich retrograde skarn event; a high-temperature high-salinity magmatic fluid and a lower salinity fluid with higher CO<sub>2</sub> and CH<sub>4</sub> contents. They regard this retrograde overprint as critical to the formation of economic grade tungsten ore at Salau.

Alteration minerals associated with the high-grade tungsten mineralising event include epidote, grossularite-almandine-spessartine garnet (as opposed to pure grossularite garnet in the prograde skarn), amphibole, chlorite, quartz and calcite. Grades can reach 10 g/t Au in high-grade tungsten mineralisation but gold was not recovered during previous mining (Variscan ASX Announcement 25 October 2016).



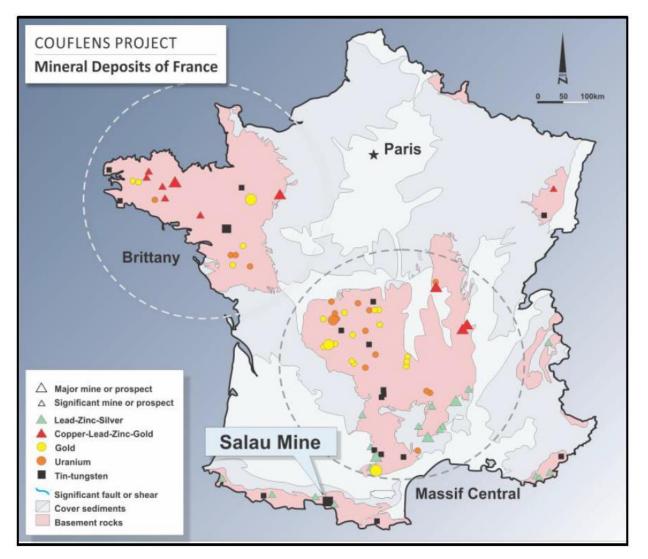


Figure 30: Location of the Salau mine in the Pyrenees region, southern France. (Variscan ASX Announcement 25 October 2016)

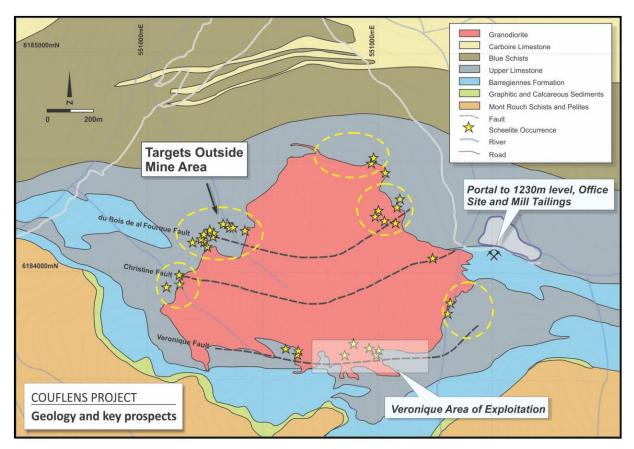
#### 3.4.3 Resources

No Mineral Resource estimates in accordance with JORC 2012 have been reported for the Couflens Project. Previously, the BRGM have estimated tungsten resources at Couflens, but these have not been reported in accordance with the JORC Code. Variscan have considered these numbers internally, and regard the estimates as positive indication of significant mineralisation. Mineral resource definition, estimation and reporting in accordance with the JORC Code will be completed in due course as exploration and drilling progress.

#### 3.4.4 Exploration Potential and Targets

**CSA Global regard exploration potential on the Couflens Project as high. Tungsten mineralisation is particularly high-grade and is supported by potentially economically significant gold grades**. Getting a better understanding of the distribution of gold in the Salau mineral system will be a key part of initial exploration work. Mineralisation is open at depth (Figure 32) and there are a number of near-mine exploration targets centred on scheelite occurrences (Figure 31).





*Figure 31:* Map of geology and scheelite occurrences around the Salau tungsten mine. (Variscan ASX Announcement 25 October 2016)

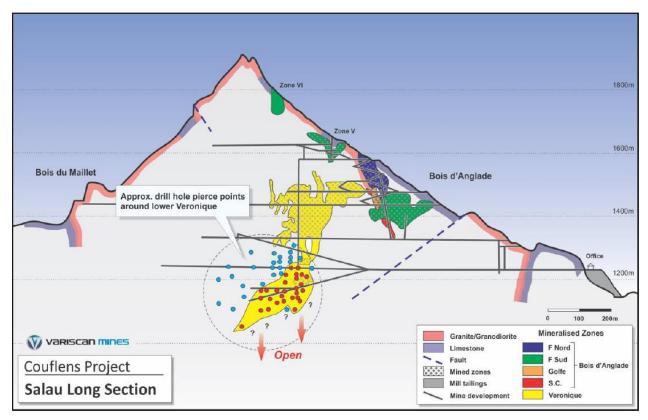


Figure 32: Schematic east-west section through Salau tungsten mine



(Variscan ASX Announcement 25 October 2016).

#### 3.4.5 Exploration Strategy

Planned exploration activities have been stated by Apollo Minerals (ASX Announcement 14 March 2017). It is intended to cover:

- Acquisition and digitisation of available mine and exploration data
- Mine area and old tailings area risk assessments
- Initial access and assessment of existing mine development and stoping areas
- Mapping and sampling of mineralisation exposed in previously developed mine areas
- Generation of a 3D model of the geology, zones of mineralisation and principal controls on mineralisation
- Underground drilling to confirm known zones of mineralisation and test for extensions of these zones
- Estimation and reporting of a Mineral Resource in accordance with the JORC Code
- Surface exploration programs to further assess identified prospects and generating new targets within the broader project area
- A second phase of exploration may include the development of an underground incline to provide access below the existing mine workings and to allow more extensive drill testing of the down plunge continuation of the high-grade Veronique system and parallel structural positions

Initial work will focus on defining sufficient high-grade tungsten mineralisation to justify commencement of mine feasibility studies, as well as testing the gold potential within and adjacent to the Salau mine area.

It is CSA Global's opinion that the exploration strategy is appropriate, and the planned work is technically sound.



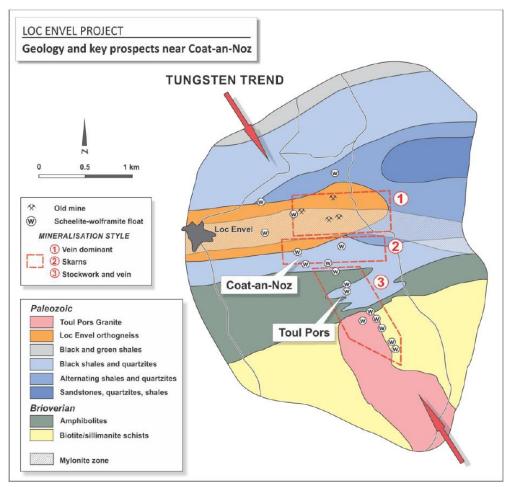
# 4 Other Projects

The remaining Variscan projects in France do not have budgeted work programs at this stage and are only briefly described below.

#### 4.1 Loc Envel

The 336 km<sup>2</sup> Loc Envel PER is centred on the Coat-an-Noz tungsten-copper deposit which lies very close to the NASZ (Figure 2). Scheelite-bearing tungsten skarn mineralisation has been defined over a strike length of 2 km (Figure 33) by the BRGM and SNEAP from 1960-1977. Chauris and Marcoux (1994) briefly describe Coat-an-Noz as an "economically significant" grossular (garnet)-vesuvianite skarn with scheelite, molybdenite and late sulphides including chalcopyrite, sphalerite and Bi minerals. It is closely associated with intrusions of the "Biotite Granite Belt" (Chauris and Marcoux 1994 (Middle Armorican Batholith on Figure 5)) which are dated around 330–320 Ma (Maund, 2015a). Basement rocks include Brioverian schist and amphibolite south of the NASZ and Devonian sedimentary rocks to the north (Figure 33).

Much of the data for the Loc Envel Project is still with the BRGM and is yet to be compiled by Variscan. This work needs to be completed before programs and budgets can be finalised and major on-ground activities can commence.

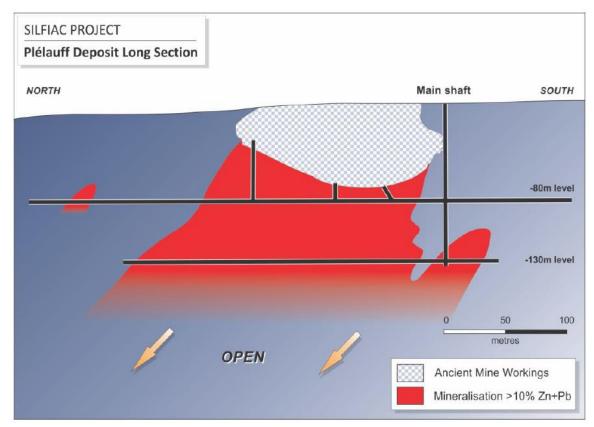


*Figure 33:* Local geology and mineralisation at the Coat-an-Noz prospect Source: Variscan ASX Announcement, 16 October 2015



#### 4.2 Silfiac

The Silfiac Project is 173 km<sup>2</sup> and lies immediately east of the Merléac Project (Figure 2). The main body of known mineralisation on the tenement is the Plélauff zinc-lead-silver-germanium deposit, believed to have been mined around the 8<sup>th</sup> Century. The BRGM explored the Plélauff deposit from 1961–1963 by sinking a shaft and driving two adits along the deposit 80 and 130 m below surface (Figure 34).



*Figure 34:* Schematic long section of the Plélauff deposit showing underground development by BRGM. (Variscan ASX Announcement, 16 October 2015).

It is the largest known local example of shear zone hosted zinc-lead mineralisation and by analogy with deposits in Brittany and the Massif Central, it is likely to be Permian granite-related mineralisation (Chauris and Marcoux, 1994; Marignac and Cuney, 1999; Maund 2015b). The Plélauff shear zone strikes between 140 and 160° and mineralised shoots appear to be controlled by jogs in the trace of the shear zone (Maund, 2015b).

Much of the data for the Silfiac Project is still with the BRGM and is yet to be compiled by Variscan. This work needs to be completed before programs and budgets can be finalised and major on-ground activities can commence.

#### 4.3 Tennie

The Tennie Project covers 204 km<sup>2</sup> centred on the Rouez gold and base metal deposit in far eastern Brittany (Figure 2). Although no major work is planned immediately for the Tennie Project it does cover one of the largest base metal deposits in Europe.

Rouez is the only known significant Neoproterozoic deposit in Brittany where low-grade sediment-hosted zinc-copper-lead-gold mineralisation has been defined over 60–70 m widths (Figure 36) and a strike length of 800 m. Turbiditic host rocks comprise wacke, pelite and argillite with minor conglomerate but there are no volcanic rocks in the immediate area (Chauris and Marcoux, 1994).





Figure 35: High-grade galena-sphalerite ore from Plélauff deposit, -130 m level (Maund, 2015b)

Although the primary sulphide body has thus far proved subeconomic, gold has been recovered from supergene ore in two shallow open cut pits from 1988 to 1992 (Platsearch NL ASX Announcement, 28 June 2013). Enrichments in gold, copper and tin have led Platsearch and Variscan geologists to speculate that the Rouez mineralisation might be more closely related to a VMS style than a sediment-hosted SEDEX style.



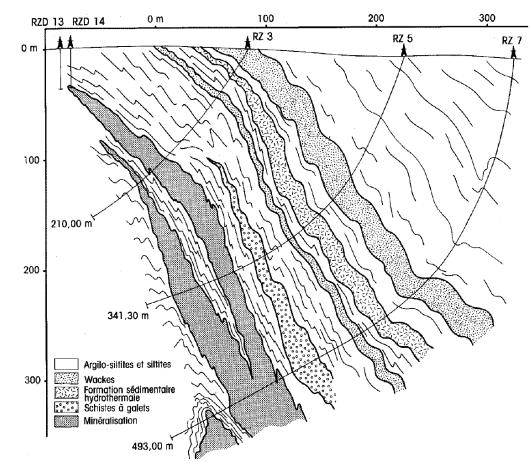


Figure 36: Cross section through the Rouez deposit (Icart and Safa, 1981).



# 5 Technical Risks

A key risk, common to all exploration companies, is that the expected mineralisation may not be present or that it may be too small to warrant commercial exploitation.

The interpretations and conclusions reached in this Report are based on current scientific understanding and the best evidence available to the authors at the time of writing. It is the nature of all scientific conclusions that they are founded on an assessment of probabilities and, however high these probabilities might be, they make no claim for absolute certainty.

The ability of any person to achieve forward-looking production and economic targets is dependent on numerous factors that are beyond CSA Global's control and that CSA Global cannot anticipate. These factors include, but are not limited to, site-specific mining and geological conditions, management and personnel capabilities, availability of funding to properly operate and capitalise the operation, variations in cost elements and market conditions, developing and operating the mine in an efficient manner, unforeseen changes in legislation and new industry developments. Any of these factors may substantially alter the performance of any mining operation.



### 6 References

- Ballèvre, M, Bosse, V, Ducassou, C and Pitra, P, 2009, "Palaeozoic history of the Armorican Massif: Models for the tectonic evolution of the suture zones" *Comptes Rendus Geoscience* 341, pp. 174-201.
- Bierlein, FP, Groves, DI and Cawood, PA 2009 "Metallogeny of accretionary orogens The connection between lithospheric processes and metal endowment" *Ore Geology Reviews* 36 pp. 282-292.
- Blouin JP 1990 "Travaux réalisés sur le PER de Gesté entre 1987 et 1989" Unpublished BRGM Report 123 pp.
- Carron, JP, Le Guen de Kerneizon, M and Nachit H 1994, "Variscan granites from Brittany" In: Keppie, JD (ed) *Pre-Mesozoic geology in France and related areas.* Springer, Berlin Heidelberg New York, pp. 231–239.
- Chauris, L, Marcoux, E 1994, "Metallogeny of the Armorican Massif" In: Keppie, J (ed) *Pre-Mesozoic geology in France* and related areas. Springer-Verlag, Berlin Heidelberg, pp. 243-264.
- Cox, DP and Singer, DA 1986. Mineral deposit models US Geological Survey Bulletin 1693, 379 pp.
- Fonteilles, M, Soler, P, Demange M, Derré C, et al. 1989 "The Scheelite Skarn Deposit of Salau (Ariège, French Pyrenees)" *Economic Geology* 84, pp. 1172 1209.
- Franklin, JM, Gibson, HL, Jonasson, IR and Galley AG 2005 "Volcanogenic massive sulfide deposits" In: Hedenquist JW, Thompson JFH, Goldfarb RJ, and Richards JP (eds.) *100th Anniversary Volume of Economic Geology* Littleton, Colorado, Society of Economic Geologists pp. 523–560.
- Gloaguen, E, Branquet, Y, Boulvais, P, Moëlo, Y, Chauvel, JJ, Chiappero, PJ and Marcoux, E 2007 "Palaeozoic oolitic ironstone of the French Armorican Massif: a chemical and structural trap for orogenic base metal–As–Sb– Au mineralisation during Hercynian strike-slip deformation" *Mineralium Deposita* 42 pp. 399–422.
- Gumiaux, C, Gapais, D, Brun, JP, Chantraine, J and Ruffet, G 2004 "Tectonic history of the Hercynian Armorican Shear belt (Brittany, France)" Geodinamica Acta 17 pp. 289–307.
- Hedenquist, JW, Thompson, JFH, Goldfarb, RG, and Richards, JP (eds) 2005 *Economic Geology 100th anniversary volume*: Littleton, Colorado, Society of Economic Geologists 1136 pp.
- Icart, JC and, Safa P, 1981 "Rouez: environnement geologique et mineralisation" *Chronique de la Recherche Minière* 458 pp. 12-32.
- Jaireth, S and Huston, D 2010 "Metal Endowment of Cratons, Terranes and Districts: Insights from a Quantitative Analysis of Regions with Giant and Super-giant Deposits" *Ore Geology Reviews* 38 pp. 288-303.
- Job, M, 2016 "Mineral Resource Estimate for the Merleac Deposit, Brittany" report prepared by QG (now known as Aranzgeo) for Variscan Mines Limited, 46pp.
- Le Boutillier NG 2016 "The Exploration of The Beaulieu Tin District Licence Area, Loire Atlantique, France: A Field Visit Report" Unpublished report to Variscan Mines Limited 54 pp.
- Le Hébel, F, Fourcade, S, Boiron, MC, Cathelineau, M, Capdevila, R and Gapais, D 2007, "Fluid history during deep burial and exhumation of oil-bearing volcanics, Hercynian belt of southern Brittany, France" *American Journal of Science* 307, pp. 1096–1125.
- Ledru, P, Costa, S and Echtler, H 1994, "The Massif Central: Structure" In: Keppie, JD (ed) *Pre-mesozoic geology in France and related areas*. Springer-Verlag, Berlin Heidelberg, pp. 305-323.
- Lescuyer JL, Bouchot V and Milési JP 1994, "Metallogenic events related to the Variscan orogeny in France: new aspects on the 360 Ma (massive sulphide) and 300 Ma (gold) events" In: Foster RP (ed) *Economic geology in Europe and beyond II with special reference to models for mineral deposits in sedimentary basins*. BGS, IMM and University of Southampton, Keyworth 13-14 April 1994, Abstract volume pp. 36-37.
- Lescuyer, JL, Leistel, JM, Marcoux, E, Milési, JP and Thiéblemont, D 1998, "Late Devonian-Early Carboniferous peak sulphide mineralization in the Western Hercynides" *Mineralium Deposita* 33 pp. 208-220.
- Marignac, C and Cuney, M 1999 "Ore deposits of the French Massif Central: insight into the metallogenesis of the Variscan collision belt" *Mineralium Deposita* 34 pp. 472-504.



- Maund, NH 2014a "A report on the gossan sampling program May 2014 Permis de Recherche Miniére Merléac Brittany, France" Unpublished report to Variscan Mines Limited 14 pp.
- Maund, NH 2014b "A review of the Saint Pierre Montlimart PERM Maine Et Loire NW France" Unpublished report to Variscan Mines Limited 18 pp.
- Maund, NH 2015a "A brief technical report: Permis de Recherche Miniére "Loc Envel" north central Brittany France" Unpublished report to Variscan Mines Limited 18 pp.
- Maund, NH 2015b "A brief report Permis de Recherche Miniére "Silfiac" Brittany France" Unpublished report to Variscan Mines Limited 21 pp.
- Maund, NH and Audion, AS 2015 "Re–logging of drill core of drill hole PAM5 Porte-Aux-Moines VHMS Project Brittany" Unpublished report to Variscan Mines Limited 17 pp.
- Maund, NH and Audion, AS 2016 "Memorandum: A field review of the airborne VTEM targets Permis De Recherche Miniere "Merléac" Brittany – NW France" Unpublished report to Variscan Mines Limited 45 pp.
- Nance, RD and Murphy, JB 1994, Contrasting basement isotopic signatures and the palinspastic restoration of peripheral orogens: Example from the Neoproterozoic Avalonian-Cadomian belt", *Geology* 22, pp. 617–620.
- Paris, F and Robardet, M 1994 "The Variscan Paleogeographic Synthesis" In: Keppie, JD. (ed) *Pre-Mesozoic geology in France and related areas*. Springer-Verlag, Berlin Heidelberg, pp. 173-176.
- Platsearch NL 2013 "Platsearch secures its first exploration licence in France" Announcement to Australian Stock Exchange 28 June 2013.
- Pirajno, F 2009 *Hydrothermal Processes and Mineral Systems* Springer/Geological Survey of Western Australia 1250 pp.
- Solomon, M, and Groves, DI 2000 *The Geology and Origin of Australia's Mineral Deposits* Centre for Ore Deposit Research and Centre for Global Metallogeny Pun. No. 32, 1002 pp.
- Variscan Mines Limited 2014a "Variscan Secures the St Pierre gold exploration licence" Announcement to Australian Stock Exchange 14 February 2014.
- Variscan Mines Limited 2014b "Variscan Secures the Merléac exploration licence" Announcement to Australian Stock Exchange 10 November 2014.
- Variscan Mines Limited 2015a "Variscan secures significant tin district" Announcement to Australian Stock Exchange 9 June 2015.
- Variscan Mines Limited 2015b "VTEM survey identifies 14 new high-priority massive sulphide targets at Merléac" Announcement to Australian Stock Exchange 28 September 2015.
- Variscan Mines Limited 2015c "Variscan secures two new exploration licences" Announcement to Australian Stock Exchange 16 October 2015.
- Variscan Mines Limited 2015d "High-grade tungsten project secured: joint venture agreement signed" Announcement to Australian Stock Exchange 25 October 2015.
- Variscan Mines Limited 2016a "Porte-aux-Moines zinc deposit update" Announcement to Australian Stock Exchange 26 April 2016.
- Variscan Mines Limited 2016b "High-grade maiden resource for Porte-aux-Moines zinc deposit" Announcement to Australian Stock Exchange 6 June 2016.
- Variscan Mines Limited 2016c "Amended Announcement: High-grade maiden resource for Porte-aux-Moines zinc deposit" Announcement to Australian Stock Exchange 20 June 2016.
- Variscan Mines Limited 2017 "Drill rigs to mobilise to the St Pierre gold project" Announcement to Australian Stock Exchange 19 January 2017.
- Woudloper, 2009. Wikipedia: Geologic map Armorican Massif available <<u>https://commons.wikimedia.org/wiki/File:Geologic\_map\_Armorican\_Massif\_EN.svg</u>> viewed 31 March 2017.



# 7 Glossary

For further information or for terms that are not described here, please refer to internet sources such as Wikipedia <u>www.wikipedia.org</u>



### Appendix 1: Legal Opinion in Reference to Variscan Mines



Australia • Canada • Indonesia • Russia Singapore • South Africa • United Kingdom

### csaglobal.com

