

# HIGH GRADE MAIDEN RESOURCE FOR PORTE-AUX-MOINES ZINC DEPOSIT

- Maiden JORC 2012 compliant Mineral Resource estimate for the high-grade Porteaux-Moines (PAM) zinc-lead-copper-silver-gold deposit within the Merléac exploration licence completed.
- Total Indicated and Inferred Mineral Resource of 2.2 million tonnes grading 6.0% zinc, 1.3% lead, 0.8% copper, 80.6 g/t silver and 0.9 g/t gold.
- Overall resource grade is equivalent to 13.6% zinc\*, or just over 300,000 tonnes zinc metal equivalent.
- Deposit is within the top grade quartile of zinc deposits world-wide on a total zinc equivalent percentage basis.
- Potential to expand the resource is apparent, notably within the hanging-wall zones at depth and to the west, where previous work indicated the possible continuation of the mineralised system.
- Diamond drilling is planned to commence shortly once approvals have been obtained to infill zone of thick, high grade mineralisation to confirm geological interpretation and increase tonnages of the Indicated category.
- PAM deposit is part of a highly prospective 15 kilometre long trend containing at least four additional centres of VMS mineralisation which may contain new high grade deposits.

Variscan Mines Limited (ASX: VAR) is pleased to advise that it has completed a maiden resource calculation to JORC 2012 standard for the zinc-rich Porte-aux-Moines (PAM) volcanogenic massive sulphide (VMS) deposit within the Merléac exploration licence in Brittany, France.

The JORC Mineral Resource is 2.2 million tonnes grading 6.0% zinc, 1.3% lead, 0.8% copper, 80.6 g/t silver and 0.9 g/t gold. The overall resource grade is equivalent to 13.6% zinc\*, (for just over 300,000 tonnes zinc metal equivalent) which places the deposit within the first grade quartile for zinc-rich deposits worldwide (see Figure 1).

The robust and high grade PAM Resource has been defined from the extensive and high quality exploration and underground development work completed by the French BRGM. Potential to expand the resource is apparent, particularly within the hanging wall zones (e.g. HW1) at depth and to the west, where previous work indicated the possible continuation of the mineralised system.

Within the Merléac licence, there is strong evidence that additional new VMS deposits will be discovered within the same rock sequences that host PAM, notably to the east where previous exploration defined four other distinct centres of VMS mineralisation within a 15 kilometre long corridor.

**ASX Code:** VAR **Web -** www.variscan.com.au



#### **Resource Estimate**

The Mineral Resource estimate for the PAM deposit was completed by QG Australia Pty Ltd, an independent consultancy group that specialises in resource estimation for deposits like PAM, from mineralisation domains and wireframes supplied by Variscan geologists. The geological model and Mineral Resource estimate were based on 58 surface and underground diamond drill holes, mapping and assays from underground development to the -150 metre level as well as data from a number of shallow percussion drill holes completed by the BRGM.

Data density for the deposit is variable with drilling completed on nominal 100 metre centres in the upper parts of PAM, down to 20 metre spacings (or less) in areas of combined underground development and drilling (see Figure 2 long section).

As noted within earlier ASX announcements (19 May, 20 and 29 July 2015), resampling of mineralised zones by Variscan from the three remaining surface diamond holes provided confirmation of the quality and accuracy of the assaying work completed by the BRGM during its exploration of the deposit from 1976 to 1985. This provided Variscan with strong confidence of the veracity of the assays for the remaining drill holes and underground development for use in the calculation of the resource to JORC standards. Additional technical aspects of the resource calculation are set out in Table 1 at the back of this announcement.

The maiden PAM Mineral Resource estimate reported by Variscan is set out in Table A.

Table A: Porte-aux-Moines Mineral Resource as at 31 May 2016

	Tonnes	Zinc %	Lead %	Copper %	Silver g/t	Gold g/t
INDICATED						
Main	291,000	6.1	1.2	0.8	76.5	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	76.5	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

Note: Mineral Resource is based on a zinc cut-off of 8.0% Zn Eq. Calculations have been rounded to the nearest 1000 t, 0.1 % zinc, lead and copper grade, 0.1 g/t gold and silver grade.

<sup>\*</sup> The Zinc Equivalent is based on zinc (US\$1,800 per tonne), lead (US\$1,800 per tonne), copper (US\$5,600 per tonne), silver (US\$15 per ounce) and gold (US\$1,150 per ounce). The zinc equivalent calculation represents the total metal value for each metal, multiplied by a price based conversion factor, summed and expressed in equivalent zinc percent per tonne. These results are exploration results only and no allowance is made for recovery losses that may occur should mining eventually result. Nevertheless, it is the Company's opinion that all the elements included in the metal equivalents calculation have good potential to be recovered as is commonly the case for similar VMS deposits worldwide. The zinc equivalent calculation is intended as an indicative value only.



The overall resource grade is equivalent to 13.6% zinc\*, or just over 300,000 tonnes zinc metal equivalent. This resource grade places the deposit within the first quartile of zinc-rich deposits world-wide (Figure 1), indicating good potential for economic extraction provided sufficient tonnage can be defined.

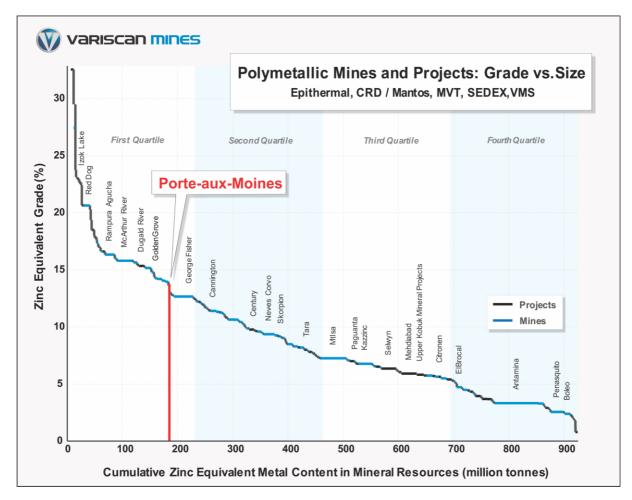


Figure 1 - Global ranking of projects and mines by grade and size compared to the mineral resources of about 300 zinc and polymetallic mines and projects worldwide. Polymetallic deposits contain at least 100,000 tonnes of zinc metal. For each project or mine, a zinc equivalent grade and zinc equivalent metal content has been calculated using the same metal prices assumptions. The zinc equivalent grade of the Porte-aux-Moines Mineral Resource compares favourably to other deposits. Source: Terra Studio

Despite the large amount of previous exploration and the relatively well defined nature of mineralisation within the central section of the deposit, much of the resource has been classified as Inferred, primarily reflecting the uncertainty of the precise density (SG) of mineralisation due to the modest number of density measurements completed by the BRGM. In addition, drill hole spacings, particularly in the shallow parts of PAM are wide (Figure 2) and require infill work to upgrade confidence levels. These will be addressed in future drilling programmes.

## Geology

The mineralisation at PAM is volcanogenic massive sulphide style (VMS) and is broadly contained within a sequence of sediments and volcanics. Mineralisation occurs as multiple, disrupted sulphide lenses, mainly hosted by black shales and cherts. Massive sulphides are very pyritic, with three main zones of mineralisation modelled to date from the data.



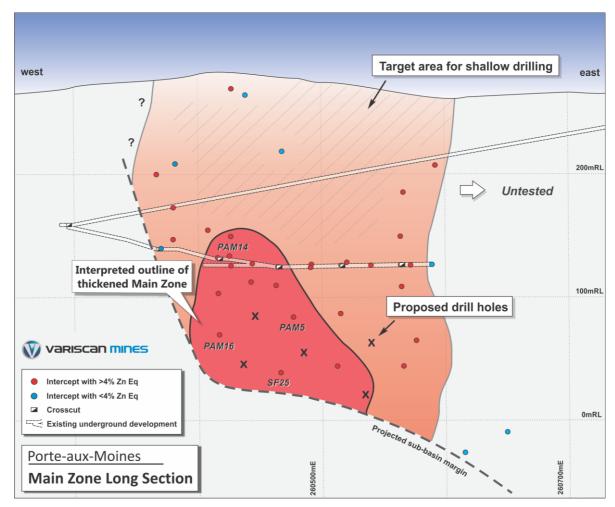


Figure 2 - Vertical long section at PAM of the Main Zone surface showing the interpreted thickened zone and flanking mineralisation. Proposed deeper drilling pierce points shown as well as the target area for shallow drilling (hatched).

**Main Zone**: This is the lowest stratigraphic horizon and is generally located at the interface between the volcanics and overlying host sediments, but is modelled to migrate into a more hanging-wall position to the east. It contains the bulk of the resource (82% - Table A). The Main Zone can be subdivided into a thick zone of high grade mineralisation that appears to have been deposited on the sea floor within a shallow depression, and thinner flanking mineralisation lateral to the thickened zone (Figures 2 and 3).

The thick (greater than 8 metres true width) pod of mineralisation is estimated to contain approximately 1.1 million tonnes of higher grade material with an approximate zinc equivalent grade of 15.4% Zn Eq\* (Table B). The average true thickness of this zone is estimated at 16.3 metres.

**Table B: Main Zone Resource** 

	Tonnes	Zinc %	Lead %	Copper %	Silver g/t	Gold g/t	Zn Eq%
Main Zone							
MZ Thick	1,118,000	6.9	1.4	0.9	89.8	0.9	15.4
MZ Flank	677,000	4.9	1.0	0.9	75.6	0.9	12.5
Total	1,795,000	6.1	1.3	0.9	84.5	0.9	14.3



**HW1 Zone**: This zone is located up to 20 metres into the hanging wall of the Main zone and is smaller (16% of total tonnages) and lower grade. However, the HW1 zone is laterally extensive and appears to have potential to extend to the west and down-dip.

HW2 Zone: A small zone centred at the western end of the deposit.

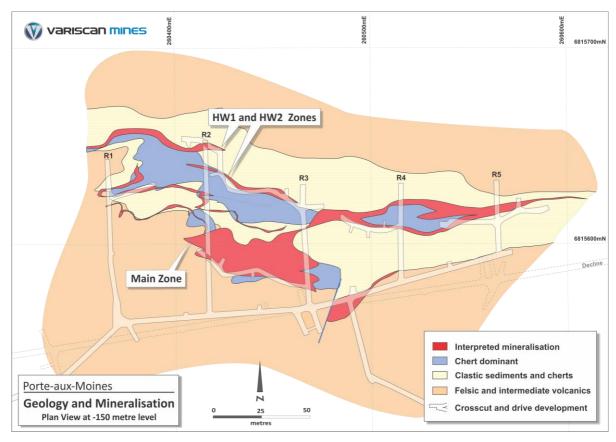


Figure 3 – Plan view of Porte-aux-Moines deposit showing interpreted mineralised zones and underground development completed by the BRGM.

#### **Planned Future Work**

Further work is required to confirm the geological interpretation, increase the tonnage of Indicated Resource and provide additional samples for confirmatory density measurements and gold assays. In the short term deeper drilling (three holes) is planned to test the thickened Main Zone and deeper parts of the HW1 zone during the September quarter (Figures 2 and 3), once programme designs are finalised, local approvals gained and access agreements signed.

In addition, later drilling may also infill the thinner, but shallower section of the Main Zone close to the surface, which has had little exploration in the past (Figure 2 - hatched area). There is good potential in this area to expand the Indicated Resource above the level of the former underground development.

Within the Merléac exploration licence, there is strong evidence that additional new VMS deposits will be discovered within the same rock sequences that host PAM, notably to the east where previous exploration including VTEM geophysics and shallow drilling has defined four additional distinct centres of VMS mineralisation within a 15 kilometre long corridor.



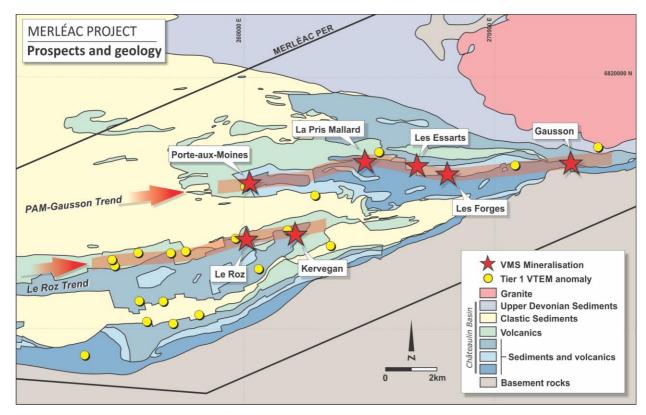


Figure 4 – Key VMS prospects within the Le Roz and PAM-Gausson mineralised trends.

Of note are the results from previous exploration at the Les Essarts prospect, where drilling recorded a number of zinc-lead-copper intersections of stratiform VMS mineralisation including -

- 1.25 metres @ 7.0% zinc, 3.04% lead, 0.22% copper from 80 metres in LSS2, and
- 1.0 metre @ 5.49% zinc, 2.72% lead and 0.26% copper from 66 metres in LSS3

The BRGM work has clearly identified another centre of VMS mineralisation broadly analogous to Porte-aux-Moines. This will be one of the priority targets for additional Variscan exploration work including surface geochemistry and EM geophysics to outline drill targets.

Yours faithfully

**Greg Jones** 

## **Managing Director**

The information in this report that relates to Exploration Results is based on information compiled by Greg Jones, BSc (Hons), who is a member of the Australasian Institute of Mining and Metallurgy. Mr Jones is a Director of Variscan Mines Limited and has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity which he is undertaking to qualify as a Competent Person as defined in the 2012 Edition of the "Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves". Mr Jones consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.



# JORC Code - Table 1

# **Section 1 - Sampling Techniques and Data**

Criteria	Commentary
Sampling techniques	<ul> <li>Original drill samples (1976-1984) were taken from sawn quarter core by the BRGM (Bureau de Recherches Géologiques et Minières - the French geological survey).</li> <li>Recent samples for PAM5, 8 and 16 were taken from remaining quarter core.</li> <li>The mineralised core size is NQ for surface holes and EX/BQ? sized for underground core.</li> <li>BRGM sampling was taken at between 0.5 to 2 metre intervals.</li> <li>Quarter core samples for PAM5, 8 and 16 were bagged and sample prepped by the BRGM and assayed by ALS Geochemistry for direct comparison against BRGM assays. 115 samples taken.</li> <li>Quarter core and underground development samples for all other holes were bagged, sample prepped and assayed by the BRGM.</li> <li>Sulphur was estimated by the BRGM, using a formula, assuming sulphur was related to copper, lead and zinc sulphide species (Sulphur = Pb/0.866 + Zn/0.67 +Cu/0.345). This is not industry standard practice. Independent sulphur assays will be carried out in future.</li> <li>Bulk density was estimated using a linear regression based on 33 measured densities compared to corresponding densities based on lead, zinc and copper percentages. This is not standard industry practice. Independent immersion density determinations on cores using Archimedes principle will be carried out on new drilling samples to more accurately define densities in each of the mineralised horizons.</li> </ul>
Drilling techniques	<ul> <li>All surface and underground holes were diamond core.</li> <li>Surface drill holes were collared and drilled with "PQ" diameter core before switching over to "HQ" diameter core to generally around 200 m and then to thin wall "NQ" core for the balance of the hole.</li> <li>Core was not oriented.</li> </ul>
Drill sample recovery	The drill core was stored in wooden trays and was logged for core recoveries. Most mineralised intercepts recorded >95% recoveries, but this was variable dependent on ground conditions.
Logging	<ul> <li>Holes PAM5,8 and 16 were re-logged by Variscan geologists and entered into an electronic database</li> <li>All other holes were logged by BRGM geologists onto paper log sheets</li> <li>Details, including survey information, geological logs (converted to Variscan legend), assay data and recoveries were entered into an electronic database by Variscan geologists</li> <li>Underground development was mapped by BRGM geologists. Mapping was used to assist in construction of geological model and mineralisation wireframes.</li> <li>Electronic versions of geotechnical logging were not viewed by QG.</li> </ul>
Sub-sampling techniques and sample preparation	For holes PAM5, 8 and 16 –  • Samples were collected by BRGM personnel, bagged and tagged with unique sample numbers.  • Sample numbers were entered against down-hole depths and sent to Variscan geologists  • Average weight per sample was around 2kg  • Samples were prepared by the BRGM  • Samples were dried and crushed to -2 mm  • Samples were then split down with riffle box to recover 100 g  • The sample splits were pulverized in a hammer mill to -80 µm  • Samples were transported to ALS Geochemistry Ireland for analysis  For all other holes and underground development face samples –  • Samples were collected, bagged and sent for sample prep and analysis at the BRGM laboratories from 1976 to 1984 by BRGM personnel.
Quality of assay data and laboratory tests	<ul> <li>For holes PAM5, 8 and 16 -</li> <li>ALS assay method used for base metals was ME-ICPORE (multi element analysis of base metal ores and mill products by atomic emission spectrometry using inductively coupled plasma spectrometer) which uses a highly oxidizing attack designed for high grade sulphides (the sample is dissolved with HNO3, KCIO4 and HBr and the final solution in dilute aqua regia).</li> <li>Gold was analysed using a 30 g fire assay and AA finish (AA23). When high grade gold results were recorded, additional gold assays were completed with fire assay and a gravimetric finish. (Au-GRA21)</li> <li>10% of samples were analysed as duplicates for QA/QC control.</li> </ul>



Criteria	Commentary
Verification of sampling and assaying	<ul> <li>Variscan data storage is in Excel spreadsheets, MicroMine and GIS databases.</li> <li>For PAM5, PAM8 and PAM16, logging and assay checks against visible sulphide mineralisation completed by Variscan geologists.</li> <li>ALS assays checked against approximately 115 BRGM assays (1970/80's) from identical sample intervals. Overall repeatability between the ALS and BRGM assays was considered very good for all elements and provides strong confidence in the accuracy of all previous BRGM assays.</li> <li>BRGM blanks and standards were included within the samples submitted to ALS.</li> </ul>
Location of data points	<ul> <li>Collar positions and downhole surveys were provided by the BRGM.</li> <li>Some collars for BRGM surface holes and the position of the PAM decline portal were located and coordinates checked using hand held GPS.</li> <li>Projection and recording of data points into the GIS database (RGF93 projection) by Variscan.</li> </ul>
Data spacing and distribution	<ul> <li>BRGM quarter core sampling at a maximum downhole intervals of 3 metres defined by geology.</li> <li>Variscan core resampling in holes PAM5, 8 and 16 used 1 to 2 metre sample compositing for comparison work against the original BRGM samples.</li> </ul>
Orientation of data in relation to geological structure	<ul> <li>The majority of core holes were drilled at reasonably high angles to the interpreted sub-vertical to very steeply north dipping mineralisation.</li> <li>In holes PAM5, 8 and 16 Variscan logging noted that the core angles of sulphide and host rock bedding were consistently high to the core axis throughout, providing a reasonable test through the mineralised zones.</li> <li>Shallow percussion holes were vertical to sub-vertical and on average are not considered effective tests for mineralisation.</li> <li>Wall and face samples for underground development were horizontal (generally almost perpendicular to the average dip of mineralisation) with sample boundaries defined by geology.</li> </ul>
Sample security	<ul> <li>Samples for PAM5, 8, 16 were prepared at the BRGM prep facilities and transported to ALS Geochemistry Ireland by commercial carrier.</li> <li>Sample prep for all other holes (1976-84) was completed at BRGM lab facilities in France.</li> </ul>
Audits or reviews	There has been no external audit or review of the Company's techniques or data.

# **Section 2 Reporting of Exploration Results**

Criteria	Commentary
Mineral tenement and land tenure status	<ul> <li>Merléac PERM (Permis Exclusif de Recherche de Mine, a French exploration licence)</li> <li>No known impediments for future exploration and development</li> </ul>
Exploration done by other parties	<ul> <li>Last significant exploration in area is believed to have been conducted by BRGM in the 1980s.</li> <li>VMS potential of the region was recognised by the BRGM who conducted regional stream sediment programmes during the mid-1970s. The Porte-aux-Moines deposit was discovered in 1976 when follow-up soil sampling and shallow drilling intersected massive sulphides.</li> <li>Subsequently the BRGM conducted substantial core drilling (+9km) and underground development on Porte-aux-Moines.</li> <li>In addition, the BRGM conducted significant mapping, geochemical and geophysical programmes as well as drilling around Porte-aux-Moines and regionally.</li> <li>Much of the exploration data is now with Variscan and will be compiled and assessed by the Company.</li> </ul>
Geology	Volcanogenic Massive Sulphide (VMS) deposits
Drill hole Information	<ul> <li>Three full core holes (PAM5, PAM8, PAM16) have been accessed and logged by Variscan geologists at the BRGM core facility, Orleans.</li> <li>Original BRGM logs, coordinate/downhole data and assays have been complied by Variscan geologists.</li> </ul>
Data aggregation methods	<ul> <li>No aggregation or high grade cuts have been applied to the data reported</li> <li>4% zinc equivalent grade used to help define mineralisation wireframes for the resource estimate.</li> </ul>
Relationship between mineralisation widths and intercept lengths	<ul> <li>The orientation of the holes and underground development is considered a reasonable test of the high grade mineralised zones which appear to dip from sub vertical to very steeply north.</li> <li>Based on the BRGM interpretation of the mineralised envelops and the core angles of sulphide layering as recorded by Variscan geologists in PAM5, 8 and 16, the average true widths of the intersections are estimated to be around 40-90 % of the downhole lengths. This has been</li> </ul>



Criteria	Commentary
	confirmed by wireframes of interpreted mineralised envelopes generated by Variscan geologists for use in the JORC resource estimate.
Diagrams	<ul> <li>Diagrams for the Porte-aux-Moines deposit have been generated from BRGM data and interpretations from Variscan geologists.</li> <li>Regional prospect diagrams are taken from BRGM reports.</li> </ul>
Balanced reporting	•
Other substantive exploration data	<ul> <li>Previous exploration data has been received by the Company from the BRGM and will be reported as it is compiled and evaluated.</li> </ul>
Further work	<ul> <li>Drilling within Porte-aux-Moines to infill interpreted mineralised zones to increase confidence limits and provide density information.</li> <li>Possible follow-up ground EM surveys to more accurately define significant anomalies defined from the recent VTEM survey and to follow-up former BRGM prospects.</li> <li>Follow-up diamond drilling along strike and down dip at Porte-aux-Moines and into new regional targets</li> </ul>

## **Section 3 Estimation and Reporting of Mineral Resources**

Criteria	Commentary
Database integrity	Overall database integrity is considered good. Checks were completed in-house and some partially by QG during resource estimation. Minor database issues were identified and have been corrected.
Site visits	<ul> <li>No site visit was undertaken by QG Pty Ltd.</li> <li>Site visits were undertaken by Variscan geologists who completed the geological interpretations and wireframe construction for the mineralisation envelopes.</li> </ul>
Geological interpretation	<ul> <li>Historic BRGM reports indicate a high level of complexity and variability in the mineralized zones.         Alternative independent models generated by QG showed differences between -6 and +34% for portions of the mineralized zones. However, the wireframe models are considered fit for the purpose of a preliminary estimate.     </li> </ul>
Dimensions	Overall dimension of the mineralised system defined to date is 300x300x50 metres.
Estimation and modelling techniques	<ul> <li>Ordinary kriging has been applied with nearest neighbour and inverse distance to the second power as referee estimates. Capping grades were not applied as the metal grade distributions did not show extreme outliers, with moderate coefficients of variation.</li> <li>CAE Studio 3® was used for estimation.</li> <li>No assumptions made regarding recovery of by-products.</li> <li>QG has made no estimation of deleterious elements or other non-grade variables of economic significance.</li> <li>Block model unit size was 20m (easting) x 5m (northing) x 20m (elevation). Average drill hole spacing is 80 metres. Search was out to 160 metres.</li> <li>Zinc, silver and lead are statistically well-correlated. Gold and copper are less well correlated with zinc. The metals showed similar semi-variographic behaviour, significant nugget effect (up to 30% of total sill) and the balance of the variance comprised by two structures, one with long range up to 50 metres and a longer range structure with a range up to 180 metres. A common orientation of the search and variogram ellipses was used to try to preserve spatial correlation.</li> <li>The grade distributions showed reasonable lognormal behaviour with a few outliers. As the search strategy, based on Kriging neighbourhood analysis using a minimum of seven composites, with most of the narrow mineralized zones estimated with more than 25 composites, it was judged that the risk of high grade 'smearing' was negligible.</li> </ul>
Moisture	Estimation was carried out on a dry basis and no moisture information was available.
Cut-off parameters	<ul> <li>Mineralisation wireframes were generated at 4% zinc metal equivalent cut-off.</li> <li>The resource is stated at an 8% zinc equivalent cut-off to satisfy the requirement for reasonable prospects of eventual economic extraction.</li> </ul>
Mining factors or assumptions	• nil
Metallurgical factors or	• nil



Criteria	Commentary
assumptions	
Environmental factors or assumptions	• nil
Bulk density	The modest number of historic density measurements (33) in two of the three identified zones does not accord with current industry practice. An average TCM of 3.7 was applied to estimate tonnages for blocks. This compares to a TCM of 4.0 used by the BRGM in their original resource estimation and metallurgical work.
Classification	The broad drill spacing, notably in the upper sections of the deposit, the geological complexity of mineralisation, as well as the aforementioned uncertainty associated with the exact densities of mineralisation results in an elevated level of Inferred classification.
Audits or reviews	None completed.
Discussion of relative accuracy/ confidence	There is a level of uncertainty in the sampling database and drill core since active drilling and exploration ceased on the property more than 30 years ago. Recent reassay work by Variscan from three diamond holes through the deposit has mitigated much of the risk associated with old BRGM assays.