



Specialist Consultants to the Mining Industry

Bushveld Minerals Limited Competent Persons Report on the Brits Vanadium Project North West and Gauteng Provinces, South Africa

**Prepared by The MSA Group (Pty) Ltd for:
Bushveld Minerals Limited**



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This Competent Person's Report has been prepared in accordance with the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (The JORC Code) 2012 Edition.

IMPORTANT NOTICE

This report was prepared as a Competent Persons Report, prepared in accordance with the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (The JORC Code) 2012 Edition, for Bushveld Minerals Limited ("BMN") by The MSA Group (Pty) Ltd ("MSA"), South Africa. The quality of information, conclusions and estimates contained herein is consistent with the level of effort involved in MSA's services, based on: i) information available at the time of preparation, ii) data supplied by outside sources, and iii) the assumptions, conditions, and qualifications set forth in this report. This report is intended for use by BMN subject to the terms and conditions of its contract with MSA. Except for the purposes legislated under the United Kingdom Listing Authority in connection with the requirements of the London Stock Exchange, any other uses of this Report by any third party are at that party's sole risk.



EXECUTIVE SUMMARY

1.1 General

The MSA Group (Pty) Ltd (“MSA”) was commissioned by Bushveld Minerals Limited (“BMN”) to complete an Independent Competent Person’s Technical Report (“CPR” or “the Report”) and maiden Mineral Resource Statement on the Brits Vanadium Project (“the Project”) in accordance with the Australasian Code for Reporting of Exploration Results, Minerals Resources and Ore Reserves (the “JORC Code” or the “Code”), 2012 Edition. The Project comprises mineral properties located in the North West Province and Gauteng Province, South Africa. BMN is presently undertaking exploration on one of the mineral properties comprising the Brits Project, i.e. Uitvalgrond 431 JQ Portion 3.

Bushveld Minerals Limited (AIM:BMN), an integrated primary vanadium producer, is listed on the Alternative Investment Market (“AIM”) of the London Stock Exchange (“LSE”).

The Report has an effective date of 18 June 2019. The Mineral Resources herein have an effective date of 18 June 2019. The Competent Persons are not aware of any material information applicable to the Project after the effective date and up to the date of issue of this report. The delay in the issuing of the CPR is linked to confirmation of the status of the Prospecting and Mineral Rights.

The Competent Persons deem this Executive Summary to be a true and accurate reflection of the full CPR.

1.2 Project Outline

1.1.1 Property Description

The Brits Vanadium Project (the “Project”) comprises three properties:

- two contiguous properties located directly east of the Bushveld Vametco Vanadium Mine in the Bojanala Platinum District within the North-West Province. The village of Ga-Rankuwa is located between 3.5 and 5 km south and east of the two properties and the village of Kgabalatsane falls within the Syferfontein 430JQ farm boundary; and
- one property located in the Cullinan Administrative District within the Gauteng Province, approximately 25 km to the east of the aforementioned contiguous properties.. This property, which falls within the jurisdiction of the City of Tshwane Metropolitan Municipality, is bordered by residential and farming communities and straddles the National Road (N1 North). This property is located approximately 9 km to the north of the City of Tshwane (previously known as Pretoria).

The Project comprises prospecting rights and a mining right under application on farms adjacent to the Vametco Vanadium Mine and along strike from the Vametco Vanadium Mine:

- Portion 3 of Uitvalgrond 431 JQ (801.17 ha) – prospecting right;
- Portion 2 of Uitvalgrond 431 JQ and Syferfontein 430JQ (4,800.7463 ha) – mining right under application; and



- Remainder of Doornpoort 295 JR (2,779.6455 ha) located approximately 25 km to the east of Uitvalgrond – prospecting right under application.

BMN's interest in the asset ranges between 51 % and 74 % through three different subsidiary companies (Table 1).

Table 1 Brits Vanadium Project – summary of licences						
Type	DMR Reference	Interest (%)	Area (ha)	Licence Expiry Date	Holder	Farms
Prospecting Right	NW 30/5/1/1/2/11124PR	62.5 %	801.17	03/11/2019	Great 1 Line Invest (Pty) Limited (RSA)	Portion 3 of Uitvalgrond 431 JQ
Prospecting Right (renewal application submitted) ¹	NW 30/5/1/1/2/12677PR					
Prospecting Right ²	NW 30/5/1/1/2/11069PR	62.5 %	801.17		Great 1 Line Invest (Pty) Limited (RSA)	Portion 3 of Uitvalgrond 431 JQ
Mining Right (under application) ³	NW 30/5/1/2/2/10004MR	51 %	4,800.75	-	⁴ Caber Trade and Invest 1 (Pty) Limited	Portion 2 of Uitvalgrond 431 JQ and Syferfontein 430JQ
Prospecting Right	GP 30/5/1/1/2/10142PR	74 %	2,779.65	12/11/2018	Gembok Magnetite (Pty) Limited	Remainder of Doornpoort 295 JR
Prospecting Right (new application submitted) ⁵	GP 30/5/1/1/2/10576PR					

Note:

¹ A renewal application was submitted on 22 August 2019 and accepted on 17 September 2019 under a new reference number NW 30/5/1/1/2/12677PR

² An additional Prospecting Right application was submitted for iron ore and rutile on Portion 3 of Uitvalgrond 431 JQ, which was granted but not executed. Instead, Section 11 (change of ownership) and Section 102 (amendment of rights, permits, programmes or plans) applications were submitted to the DMR in respect of Prospecting Right NW 30/5/1/1/2/11124PR, with the Section 102 including the addition of iron ore and rutile in order to eliminate the need for two prospecting rights over the same property by the same Holder. As at the report date, both applications were still being processed.

³ Area reported in this CPR = Prospecting Right area (see ³ below)

⁴ The dispute between Caber Trade & Invest 1 (Proprietary) Limited ("Caber") and the local HDSA entity in connection with a mining right application (DMR ref: NW 30/5/1/2/2/10004MR) in respect of vanadium and iron over the farm Syferfontein 430JQ and Portion 2 of the farm Uitvalgrond 431 JQ has been resolved with a new shareholders agreement having been signed between the parties. The parties are currently liaising with the DMR with respect to next steps in proceeding with the processing of the mining right given the amount of time that has lapsed since the application was submitted.

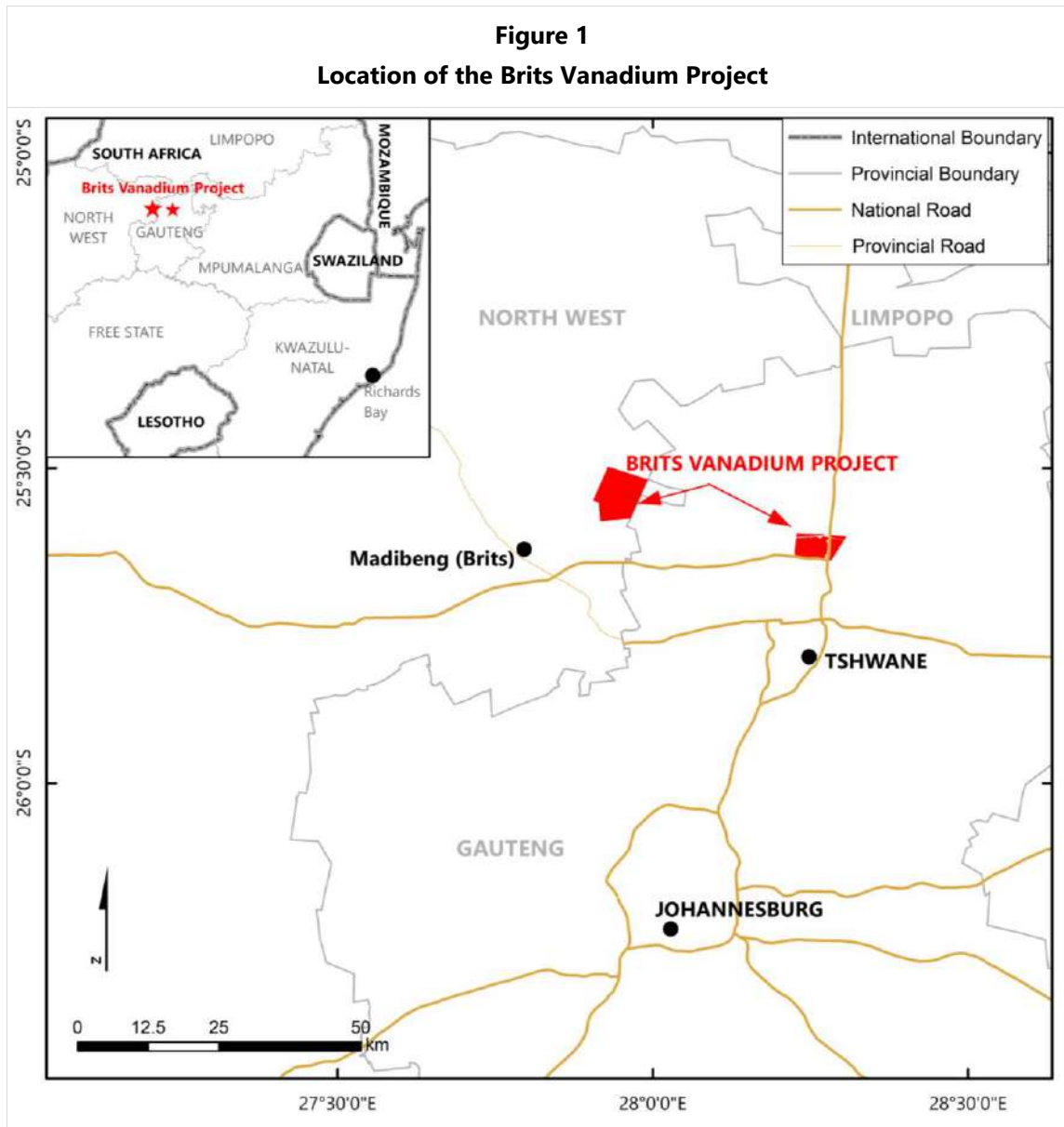
⁵ Due to delays in the processing of Section 11 and Section 102 applications for Prospecting Right GP 30/5/1/1/2/10142PR, the prospecting right expired. A new prospecting right application was submitted and accepted with reference number GP 30/5/1/1/2/10576PR on 14 January 2019.

All three properties are located on the Western Limb of the Bushveld Complex within which vanadium mineralisation is hosted in several magnetite layers occurring near the basal contact of



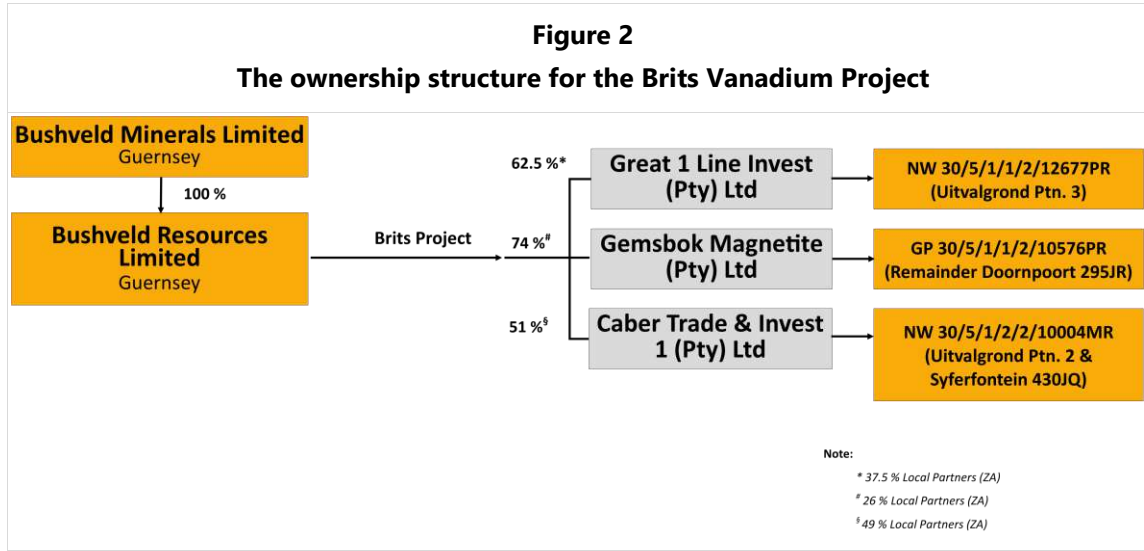
the Upper Zone of the Rustenburg Layered Suite (the mafic portion of the Bushveld Complex). The Brits Vanadium Project is an exploration project and exploration by BMN has only been undertaken on Portion 3 of Uitvalgrond 431 JQ. No work has been undertaken by BMN on the remaining properties.

The location of the Brits Vanadium Project is shown in Figure 1.



1.2.1 Ownership

The ownership structure for the Project is depicted in Figure 2.



Source: BMN (2019)

The Mmakau village (or Sekutlobyane Designated Landowners) is the designated landowner of Portion 3 Uitvalgrond 431 JQ.

Portion 2 Uitvalgrond 431 JQ and Syferfontein 430JQ are owned by the Bakwena Ba Mogopa Tribal Authority. The title deeds for both properties list the Government of South Africa as the landowner.

The Remainder of Doornpoort 295 JR is privately owned by First Land Developments (Pty) Ltd. The approved Environmental Management Plan (2013) states that no feedback regarding the status of any land claims on the property had been reported by the Regional Land Claims Commission Gauteng Province and North West Province. In addition, no Traditional Authority exists over the area.

1.3 Geological Setting, Deposit Type, Mineralisation

Vanadium mineralisation occurs in vanadium-bearing titaniferous magnetite-rich layers that occur within the Upper Zone of the Rustenburg Layered Suite of the Bushveld Complex. The magnetite-rich layers are part of the layered sequence and are concordant, continuous along strike and down-dip, although thickness variability occurs.

The Bushveld Complex intruded Pretoria Group meta-sedimentary rocks of the Transvaal Supergroup approximately 2,060 million years ago. The layered sequence of mafic rocks, known as the Rustenburg Layered Suite, comprises five distinct zones:

- the Marginal Zone,
- the Lower Zone,
- the Critical Zone,
- the Main Zone, and
- the Upper Zone.

Both the Main Zone and the Upper Zone of the Rustenburg Layered Suite sub-crop in the portion of the Project area adjacent to the Vametco Vanadium Mine (i.e. on Uitvalgrond 431 JQ Portion



3). The Upper Zone is identified from the underlying Main Zone by the occurrence of cumulus magnetite. The Main Zone in this area is comprised of gabbro-norite, pyroxenite and anorthosite layers. The lithologies in the Upper Zone include massive magnetite layers, magnetite-bearing gabbro, olivine-diorite and lesser anorthosite layers.

The magnetite layers are east-west striking with an average dip of 19° to the north. Groups of magnetite-rich layers are separated into three seams, namely the Upper, Intermediate and Lower Seams. The seams occur above a distinct anorthosite layer near the contact of the Upper Zone with the underlying Main Zone.

1.4 Exploration and Drilling, Sampling Techniques and Data

Twenty-six diamond drillholes were drilled by BMN in 2018 on Uitvalgrond 43 JQ Portion 3, the focus of the CPR, to verify the down-dip and along strike continuity of the magnetite-rich layers. The data from cores recovered from this drilling campaign were used to estimate the Mineral Resource.

The 2018 drilling campaign was subjected to external quality assurance quality control ("QAQC") protocols that included the insertion of blank and certified reference materials ("CRM"), and check assaying by a second laboratory.

1.5 Mineral Resource Estimates

The Mineral Resource presented herein has an effective date of 18 June 2019. The Mineral Resource estimate incorporates holes completed by BMN in 2018 on the property Uitvalgrond 431 JQ Portion 3.

The Mineral Resource estimate was conducted using Datamine Studio RM software, together with Microsoft Excel, JMP and Snowden Supervisor for data analysis, and Leapfrog Geo for geological modelling. The Mineral Resource estimate was completed by Mr Daniel Kock, a Senior Mineral Resource Consultant for MSA under the guidance and supervision of Mr Jeremy Witley, Head of Mineral Resources for MSA, who is the Competent Person for this Mineral Resource estimate.

Magnetite, contained in three magnetite-rich units, is the source of vanadium within the deposit. The magnetite-rich layers are strataform and defined by the presence of significant magnetite content (>20 %). Three dimensional models of the magnetite-rich layers were constructed by defining the top and bottom contacts and then creating models of the surfaces using Leapfrog Geo software.

Of the 26 diamond drillholes in the database, a total of 7 intersections of the Upper Seam, 13 of the Intermediate Seam and 24 of the Lower Seam were used to estimate the grade of the Mineral Resource.

Attributes were estimated into the individual mineralised zones using the 2 m composite drillhole sample data for each seam. Inverse distance to the power of two was used to estimate the grades into 20 mE by 20 mN by 5 mZ parent cells. Density was determined through regression of the density data collected in the 2018 drilling campaign using the strong relationship between magnetite grade and density. A waste model was constructed around the magnetite layers for mine planning purposes using the available drilling data.



A search of 200 mX by 200 mY by 10 mRL was used to select the sample composites for block estimation of the Upper, Intermediate and Lower Seams. A minimum number of six 2 m composites were required for a block to be estimated, up to a maximum of twelve 2 m composites. If a block was not estimated from the initial search ellipse, the ellipse size was doubled. Should a block still not be estimated, a larger search ellipse was used by expanding the search by ten times the original search ellipse extent.

The Mineral Resources were estimated and reported in accordance with the 2012 edition of the JORC Code and have an effective date of 18 June 2019 (Table 2 and Table 3). To the best of the CP's knowledge there are currently no title, legal, taxation, marketing, permitting, socio-economic or other relevant issues that may materially affect the Mineral Resource described in this report.



Table 2
Brits Mineral Resource (Uitvalgrond 431 JQ Portion 3) at a cut-off grade of 20 % magnetite, 18 June 2019 – Gross Basis

Class	Seam Name	Tonnes (millions)	V ₂ O ₅ grade of whole rock (%)	Magnetite grade of whole rock (%)	V ₂ O ₅ grade of magnetite concentrate (%)	Tonnes V ₂ O ₅ in magnetite concentrate (thousands)	Tonnes V in magnetite concentrate (thousands)
Indicated	Upper	2.0	0.66	43.64	1.51	13.4	7.5
	Intermediate	1.9	0.47	21.52	1.75	7.0	3.9
	Lower	41.0	0.56	28.54	1.59	185.9	104.2
	Total	44.9	0.56	28.94	1.59	206.3	115.6
Inferred	Upper	7.1	0.65	43.89	1.50	46.7	26.2
	Intermediate	0.4	0.44	21.13	1.85	1.4	0.8
	Lower	14.5	0.50	26.09	1.55	58.8	32.9
	Total	22.0	0.55	31.78	1.54	106.9	59.9
Indicated and Inferred	Upper	9.2	0.65	43.84	1.50	60.1	33.7
	Intermediate	2.2	0.46	21.46	1.76	8.4	4.7
	Lower	55.5	0.54	27.90	1.58	244.6	137.0
	Total	66.8	0.56	29.87	1.58	313.2	175.4

Notes:

1. All tabulated data have been rounded and as a result minor computational errors may occur.
2. Mineral Resources which are not Ore Reserves have no demonstrated economic viability.
3. Magnetite content (grade) is determined as the proportion of magnetite concentrate recovered using Davis Tube methodology.
4. Due to the magnetite grade being a recovered grade, differences will occur between whole rock V₂O₅ grades back-calculated from concentrate, versus those derived from whole rock assays.
5. The Mineral Resource is reported as 100 % of the Mineral Resource for the property (BMN has a 62.5 % ownership of the property (Uitvalgrond 431 JQ Portion 3)).

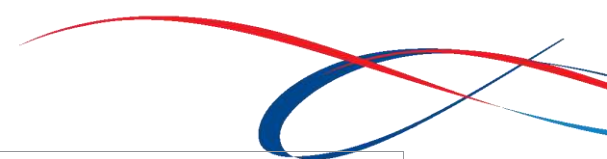


Table 3
Brits Mineral Resource (Uitvalgrond 431 JQ Portion 3) at a cut-off grade of 20 % magnetite, 18 June 2019 – Attributable Basis

Class	Seam Name	Tonnes (millions)	V ₂ O ₅ grade of whole rock (%)	Magnetite grade of whole rock (%)	V ₂ O ₅ grade of magnetite concentrate (%)	Tonnes V ₂ O ₅ in magnetite concentrate (thousands)	Tonnes V in magnetite concentrate (thousands)
Indicated	Upper	1.3	0.66	43.64	1.51	8.4	4.7
	Intermediate	1.2	0.47	21.52	1.75	4.4	2.4
	Lower	25.6	0.56	28.54	1.59	116.2	65.1
	Total	28.0	0.56	28.94	1.59	129.0	72.2
Inferred	Upper	4.4	0.65	43.89	1.50	29.2	16.3
	Intermediate	0.2	0.44	21.13	1.85	0.9	0.5
	Lower	9.1	0.50	26.09	1.55	36.7	20.6
	Total	13.7	0.55	31.78	1.54	66.8	37.4
Indicated and Inferred	Upper	5.7	0.65	43.84	1.50	37.6	21.0
	Intermediate	1.4	0.46	21.46	1.76	5.2	2.9
	Lower	34.7	0.54	27.90	1.58	152.9	85.6
	Total	41.8	0.56	29.87	1.58	195.8	109.7

Notes:

1. All tabulated data have been rounded and as a result minor computational errors may occur.
2. Mineral Resources which are not Ore Reserves have no demonstrated economic viability.
3. Magnetite content (grade) is determined as the proportion of magnetite concentrate recovered using Davis Tube methodology.
4. Due to the magnetite grade being a recovered grade, differences will occur between whole rock V₂O₅ grades back-calculated from concentrate, versus those derived from whole rock assays.
5. The Mineral Resource is reported on a net attributable basis (BMN has a 62.5 % ownership of the property (Uitvalgrond 431 JQ Portion 3)).



The Mineral Resource dips at approximately 19° to the north and strikes approximately west to east. The Upper Seam Mineral Resource extends for approximately 1,360 m along strike and approximately 680 m in the dip direction. The Intermediate Seam Mineral Resource extends for approximately 1,900 m along strike and approximately 660 m in the dip direction. The Lower Seam Mineral Resource extends for approximately 1,900 m along strike and approximately 610 m in the dip direction. The Mineral Resource estimate is limited to 150 m below surface. The mineralisation is open down-dip. The Upper Seam Mineral Resource Estimate is on average 4.9 m thick, the Intermediate Seam 28.7 m and the Lower Seam 57.0 m.

1.6 Technical Studies

1.6.1 Mining

To date no mining has taken place at the Brits Vanadium Project and the Competent Person is not aware of any mining related studies that have been completed to date. The mineralisation however extends near surface and could therefore lend itself to open pit mining. The Bushveld Vametco open pit mine, owned by Bushveld Vametco Alloys (Pty) Ltd ("Bushveld Vametco"), a subsidiary of BMN, lies immediately to the west of the Property along strike.

1.6.2 Processing

The Competent Person is not aware of any metallurgical studies that have been completed to date. The properties are all exploration projects.

Recovery of vanadium (Nitrovan™) by Bushveld Vametco, located to the west of Uitvalgrond 431 JQ Portion 3, is by a standard salt roast and leach process.

It is expected that any processing would be undertaken at the existing plant at the Bushveld Vametco integrated mine and plant, owned by BMN. Furthermore, it is expected there will be no further metallurgical or processing factors which could have a material impact on the eventual economic extraction.

1.6.3 Environmental and Social

Potential environmental impacts have been identified as part of the environmental permitting application processes in consultation with Interested and Affected Parties ("IAPs"), regulatory authorities and specialist consultants. A range of environmental issues were considered and are reported in the available environmental documentation made available to MSA.

As per the Mineral and Petroleum Resources Development Act ("MPRDA") and the National Environmental Management Act ("NEMA"), more detailed environmental studies are required when application is made for mining rights. The studies, including an Environmental Impact Assessment ("EIA"), are consolidated into a comprehensive EMP report.

The properties falling within the Brits Vanadium Project are held under prospecting rights, with the exception of Portion 2 of Uitvalgrond 431 JQ and Syferfontein 430JQ, where a Mining Right application has been made (the status of the rights for these properties is currently under discussion with the Department of Mineral Resources).



As per the requirements of the MPRDA, social studies are required when applications for mining rights are submitted. The study takes the format of a Social and Labour Plan (“SLP”).

As required in Section 3 of the MPRDA, a Public Participation Process with interested and affected parties (“IAPs”) must be conducted for the Project. A company requires approval of the SLP before the DMR can issue the mining right. With no social studies for the prospecting licences (Uitvalgrond 431 JQ Portion 3 and Remainder of Doornpoort 295 JR) having been commissioned at this stage, a SLP process will have to be followed should BMN apply for mining rights on either of these properties. The status of an SLP to accompany the mining right application for Uitvalgrond 431 JQ Portion 2 and Syferfontein 430 JQ was not confirmed at the time of reporting.

1.6.4 Market Outlook

The market outlook for Vanadium products (ferrovanadium and vanadium pentoxide) varies between different analysts, especially for the short to medium term. Long term forecasts vary from USD 33 to USD 50 /kg FeV, from which a consensus price of USD 40 /kg FeV is selected. Short to medium term forecasts may be as high as USD 54 to as low as USD 21 /kg FeV. MSA’s consensus prices vary between USD 41.58 /kg FeV (2020) and USD 46.06 /kg FeV (2022).

Research by Roskill (2019) has shown that there is a very strong linear relationship between ferrovanadium and V₂O₅ prices, indicating that one product may be used as a proxy for the other when analysing price data.

1.7 Estimation and Reporting of Ore Reserves

No Ore Reserves have been estimated.

1.8 Interpretation and Conclusions

The following interpretations and conclusions are made by the Competent Person regarding the Brits Project, specifically focussing on the main subject of this report, that is the property Uitvalgrond 431 JQ Portion 3:

- Geology and Mineral Resources
 - The geology of the area is well understood. In the CP’s opinion (Mr J Witley), the Mineral Resource reported herein has reasonable prospects for eventual economic extraction, given that it is located adjacent to an operating mine that processes the same mineralisation with similar (albeit lower) V₂O₅ grades and there is an established market for the vanadium product.
- Vanadium market outlook
 - The short, medium and long term market outlook, based on reviewing seven independent forecasts, appears stable and robust.

1.9 Recommendations

Further drilling is recommended east of boreholes BVL021 and BVL023 as these holes have anomalously high V₂O₅ grades in magnetite concentrate in the Intermediate Seam (2.1 % and



1.88 % respectively). Additional drilling is required to confirm the presence and extent of the potential high-grade zone.



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1 BACKGROUND

The Brits Vanadium Project (the "Project" or "Brits Vanadium") is an Exploration Project comprising three mineral properties in the Republic of South Africa:

- two contiguous properties located directly east of the Bushveld Vametco Vanadium Mine ("Bushveld Vametco Mine") in the Bojanala Platinum District within the North-West Province (i.e. the farms Uitvalgrond 431 JQ Portion 3, Uitvalgrond 431 JQ Portion 2 and Syferfontein 430 JQ). The village of Ga-Rankuwa is located between 3.5 km and 5 km south and east of the two properties and the village of Kgabalatsane falls within the Syferfontein 430JQ farm boundary; and
- one property (Remainder Doornpoort 295 JR) located in the Cullinan Administrative District within the Gauteng Province approximately 25 km to the east of the aforementioned contiguous properties. This property is located approximately 9 km to the north of the city of Tshwane (previously known as Pretoria).

1.1 Terms of Reference and Scope of Work

The MSA Group (Pty) Ltd ("MSA") was commissioned by Bushveld Minerals Limited ("BMN") to complete an Independent Competent Person's Technical Report ("CPR" or "the Report") and maiden Mineral Resource Statement on the Brits Vanadium Project ("the Project") in accordance with the Australasian Code for Reporting of Exploration Results, Minerals Resources and Ore Reserves (the "JORC Code" or the "Code"), 2012 Edition. The Project comprises mineral properties located in the North West Province and Gauteng Province, South Africa.

BMN is presently undertaking exploration on one of the mineral properties comprising the Project, i.e. Uitvalgrond 431 JQ Portion 3.

Bushveld Minerals Limited (AIM:BMN), an integrated primary vanadium producer, is listed on the Alternative Investment Market ("AIM") of the London Stock Exchange ("LSE").

The Report has an effective date of 18 June 2019. The Mineral Resources herein have an effective date of 18 June 2019. The Competent Persons are not aware of any material information applicable to the Project after the effective date and up to the date of issue of this report. The delay in the issuing of the CPR is linked to confirmation of the status of the Prospecting and Mineral Rights.

The Report is dated 01 November 2019. The Competent Persons are not aware of any material information applicable to the Project after the effective date and up to the date of issue of this report. The delay in the issuing of the CPR is linked to confirmation of the status of the Prospecting and Mineral Rights.

1.2 Principal Sources of Information

MSA has based its review of the Project on information provided by BMN, along with technical reports by its contractors and associates and other relevant published data. A full list of all sources of information is provided in Section 14 of this report. Drafts of this CPR have been provided to BMN, in order to identify and address any factual errors or omissions prior to finalisation. Any changes made as a result of these reviews did not involve any alteration to the conclusions made.



1.3 Units and Currency

The International System of Units (“SI”, abbreviated from the French *Système international (d’unités)*) are used throughout, and currency discussions are based on the South African Rand (“ZAR”).

A table summarising the units of measurement, acronyms and abbreviations used in this CPR included in Appendix 1.

It is noted that throughout the Report, columns and/or rows in tables may not add up due to rounding.

1.4 Site Inspection or Field Involvement of Competent Persons

MSA conducted independent site inspections of the Brits Vanadium Project in 2019, limited to Uitvalgrond 431 JQ Portion 3.

Mr Jeremy Witley (Competent Person (“CP”) Geology and Mineral Resources), Mrs Kaylan Bartlett (Contributing Author), and Mr Richard Garner (CP Environmental) undertook a site inspection of Uitvalgrond 431 JQ Portion 3 on the 28th May 2019. Mr Witley and Mrs Bartlett inspected the recent Brits Vanadium Project (Uitvalgrond 431 JQ Portion 3) drillhole cores and the general site and infrastructure. In addition, the onsite laboratory at the Bushveld Vametco Mine was inspected.

1.5 Disclaimers and Reliance on Other Experts or Third-Party Information

1.5.1 Statement of Independence

This Competent Persons Report has been prepared by MSA, an independent advisory company. Its advisors have extensive technical experience in preparing, reviewing and evaluating assets for mining and exploration companies. MSA’s advisors writing this report have, collectively, more than 100 years’ experience in the mining sector. They are registered as South African Council for Natural Scientific Professions (“SACNASP”) Professionals.

Neither MSA, nor the authors of this report, has or has had previously, any material interest in Bushveld Minerals Limited or its subsidiaries. The relationship with Bushveld Minerals Limited is solely one of professional association between client and independent consultant. This report is prepared in return for professional fees based upon agreed commercial rates and the payment of these fees is in no way contingent on the results of this report. Neither MSA, nor any of the authors of this CPR, hold any share capital in Bushveld Minerals Limited or its subsidiaries.

Except for these fees, MSA has not received and will not receive any pecuniary incentive or other benefit whether direct or indirect for, or in connection with, the preparation of this report.

1.5.2 Forward Looking Statements

This report contains forward-looking statements. These forward-looking statements are based on the opinions and estimates of MSA and BMN at the date the statements were made. The statements are subject to several known and unknown risks, uncertainties and other factors that may cause actual results to differ materially from those forward-looking statements anticipated by BMN. Factors that could cause such differences include changes in world markets, equity



markets, costs and supply of materials, and regulatory changes. Although MSA believes the expectations reflected in the forward-looking statements to be reasonable, MSA does not guarantee future results, levels of activity, performance or achievements.

1.5.3 Reliance on Other Experts

This CPR is limited to an assessment of the Brits Vanadium Project and the findings and conclusions presented herein represent the unbiased and independent opinion of MSA, based on the available source data as supplied by BMN as outlined above. MSA does not have any reason to believe that any material facts have been withheld.

MSA has relied on information provided by BMN personnel as follows:

- Mr Troth Saindi, Project Geologist at BMN. Mr Saindi supplied all data relating to the drilling (2018 exploration programme), in addition to other geological data including geological plans, exploration history, mineralisation, the drilling and sampling procedures, the sample analysis database and quality assurance quality control information.
- Ms Tania Mostert, Chief Financial Officer at Bushveld Vametco Mine, supplied exploration budgets, and related information.
- Ms Kate Bredin, Head of Compliance, BMN, provided information pertaining to the legal status of the Prospecting and Mining Rights, and any related applications, etc.
- Mr Sam Mtileni, Works Manager (Mining and Concentrator) at Bushveld Vametco Mine, provided information pertaining to environmental and social permitting and governance.
- Mr Frederick Mpephu, Group Environmental Specialist, BMN, provided information pertaining to the environmental and social permitting and governance.

1.6 Qualifications, Experience and Independence

MSA is an exploration, mineral resource and mining consulting and contracting firm, which has been providing services and advice to the international mineral industry and financial institutions since 1983.

This report has been compiled by:

- Mr Jeremy Witley, who is a Professional Geologist with more than 30 years' experience in Mineral Resource estimation, Exploration and Mine Geology. He has held several positions with consultancies and with mid-and large tier mining companies during his career. Jeremy has a strong background in orebody modelling, geostatistics, grade control and public reporting. Mr Witley is registered as a Professional Natural Scientist (Pr.Sci.Nat; Geological Science) with the South African Council for Natural Scientific Professions and is a Fellow of the Geological Society of South Africa ("GSSA") and a member of the Geostatistical Association of Southern Africa ("GASA").

Mr Witley has the appropriate relevant qualifications, experience, competent and independence to act as a Competent Person as that term is defined in the JORC Code (2012). Mr Richard David Garner, who is a professional Environmental Consultant with 20 years' experience, the majority of which has involved environmental management, regulatory compliance and water strategies at coal mines, primarily within South Africa, but also extending to other geographic regions and commodities. As such, his experience extends into



international work for multiple commodities across Australia, South America and Africa and in various sectors such as Water Efficiency training for the Association Energy Engineers (“AEE”). He is the Head of Department – Environmental Studies with MSA.

Mr Garner is a Member in good standing of the South African Council for Natural Scientific Professions (SACNASP; No. 116205) as well as a Member and Lead of the Water Institute of Southern Africa Mine Water Division (“WISA”), the Grassland Society of Southern Africa and the Association of Energy Engineers (“AEE”), where he is one of few Certified Water Efficiency Practitioner (“CWEP”) Trainers outside of the United States, and is a Certified Measurement and Verification Practitioner in training (“CMVP-IT”). He holds a MSc from the University of the Witwatersrand (South Africa), and has authored a number of published and unpublished academic articles ranging from ecology, impact assessment of exotic alien vegetation to the implementation of ISO14001 management systems and setting water efficiency targets in the mining sector. He regularly presents at several industry forums and conferences, is a reference group member for the Water Research Commission (“WRC”) and an advisor to the South African Minerals Council (“SAMC”) on Water Conservation and Demand Management in the Mining Sector. Mr Garner has marked several MSc Thesis for the University of Johannesburg in the area of environmental management.

Mr Garner has the appropriate relevant qualifications, experience, competence and independence to act as a “Competent Person” as that term is defined in the JORC Code (2012).

- Mr André J. van der Merwe, who is a Professional Geologist with more than 30 years’ experience in exploration, mining, project development, due diligence reviews and valuations of mineral assets. Mr van der Merwe has been Technical Consultant/Advisor to several successful listings on FTSE, AIM, TSX, ASX and JSE, as well as private fundraisings. Mr van der Merwe is registered as a Professional Natural Scientist (Geological Science) (SACNASP No 400329/04) and is a Fellow of the GSSA and a member in good standing of the Australasian Institute of Mining and Metallurgy (“AusIMM”) and the Society of Economic Geology (Member).

Mr van der Merwe has the appropriate relevant qualifications, experience, competence and independence to act as a “Competent Person” as that term is defined in the JORC Code (2012).



2 PROJECT OUTLINE

2.1 Property Description

The Brits Vanadium Project (the "Project") comprises three properties in South Africa:

- two contiguous properties located directly east of the Bushveld Vametco Mine in the Bojanala Platinum District within the North-West Province (i.e. Uitvalgrond 431 JQ Portion 3, Uitvalgrond 431 JQ Portion 2 and Syferfontein 430 JQ). The village of Ga-Rankuwa is located between 3.5 km and 5 km south and east of the two properties and the village of Kgabalatsane falls within the Syferfontein 430JQ farm boundary; and
- one property (Remainder Doornpoort 295 JR) located approximately 25 km to the east of the contiguous properties in the Cullinan Administrative District within the Gauteng Province. This property, which falls within the jurisdiction of the City of Tshwane Metropolitan Municipality, is bordered by residential and farming communities and straddles the National Road (N1 North). This property is located approximately 9 km to the north of the city of Tshwane (previously known as Pretoria).

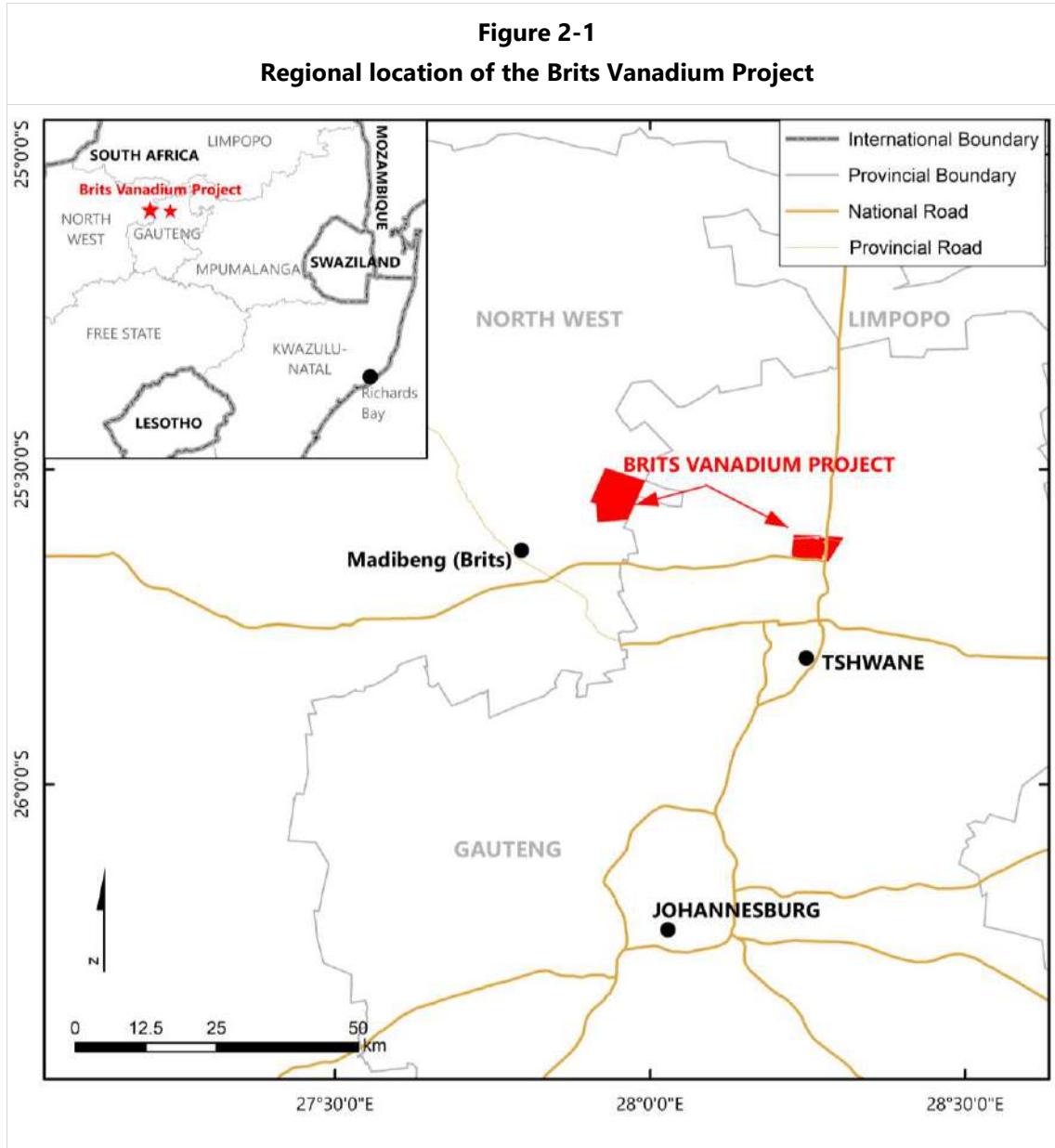
The Project is an Exploration Project targeting vanadium. The vanadium mineralisation is hosted in several magnetite layers occurring near the basal contact of the Upper Zone of the Bushveld Complex.

The Project comprises prospecting rights and a mining right under application on farms adjacent to the Vametco Vanadium Mine and along strike from the Vametco Vanadium Mine (Figure 2-2):

- Portion 3 of Uitvalgrond 431 JQ (801.17 ha) – prospecting right;
- Portion 2 of Uitvalgrond 431 JQ and Syferfontein 430JQ (4,800.7463 ha) – mining right under application; and
- Remainder of Doornpoort 295 JR (2,779.6455 ha) located approximately 25 km to the east of Uitvalgrond – prospecting right under application.

Exploration by BMN has only been undertaken on Portion 3 of Uitvalgrond 431 JQ; this CPR is limited to the reporting of current exploration results for this property only.

The location of the Brits Vanadium project is shown in Figure 2-1.



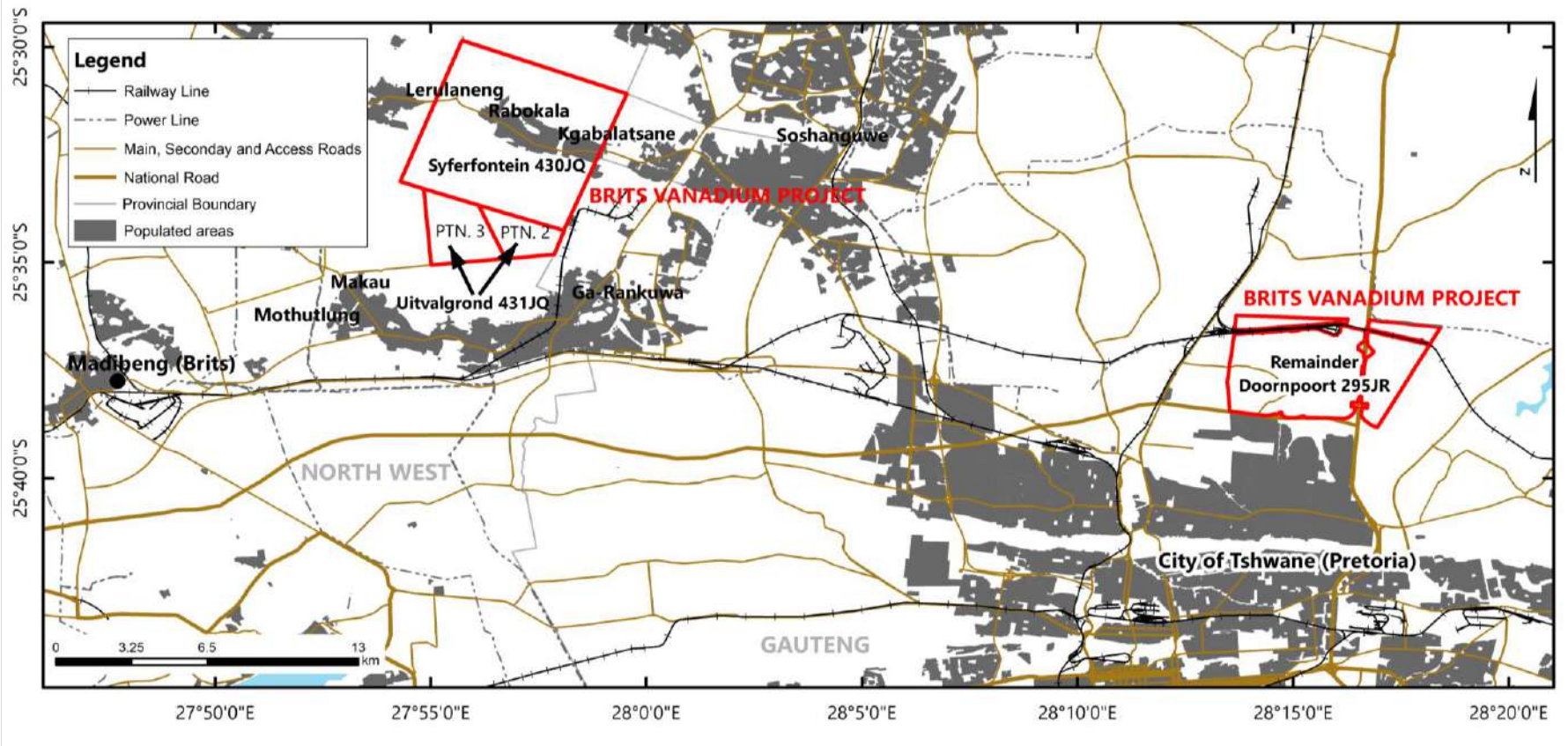
Source: Modified from BMN (2019)

The Project comprises prospecting rights and a mining right under application on farms adjacent to the Vametco Vanadium Mine and along strike from the Vametco Vanadium Mine (Figure 2-2):

- Portion 3 of Uitvalgrond 431 JQ (801.17 ha) – prospecting right;
- Portion 2 of Uitvalgrond 431 JQ and Syferfontein 430JQ (4,800.7463 ha) – mining right Application; and
- Remainder of Doornpoort 295 JR (2,779.6455 ha) located approximately 25 km to the east of Uitvalgrond – prospecting right under application.



Figure 2-2
Brits Vanadium Project location



Note: Background information sourced from the digital 1:50 000 topographic map sheet 2527DA&DB, and 2528CA&CB; Projection WGS84 LO27 (Surveys and Mapping, South Africa)



2.1.1 Uitvalgrond 431 JQ – Portion 3

The Uitvalgrond 431 JQ Portion 3 lies adjacent to Uitvalgrond 431 JQ Portion 1 to the west (Bushveld Vametco Mine) and Uitvalgrond 431 JQ Portion 2 to the east, and encompasses an area of 801.17 ha.

The topography is generally flat, with surface elevation ranging from 1,087 metres above mean sea level (“mamsl”) to 1,060 mamsl. The ground surface is gently sloping towards the south. The farm is located in the upper region of the Rosespruit catchment (drainage region A21J, as defined in WRC Report No. 298), a minor tributary (97.2 km²) of the Crocodile River. The confluence of these two rivers is approximately 16.5 km downstream from Portions 2 and 3 of Uitvalgrond 431 JQ.

The corner co-ordinates of the Uitvalgrond 431 JQ Portion 3 Prospecting Right are listed in Table 2-1.

ID	Y-Coordinate	X-Coordinate
A	-91,782.917	+2,827,821.093
B	-94,753.830	+2,827,815.757
C	-95,186.323	+2,830,885.104
D	-92,047.614	+2,831,116.870
Back to A	-91,782.917	+2,827,821.093

Source: Great 1 Line Invest (Pty) Ltd Prospecting Work Programme (Prospecting Right Application) (2017)

2.1.2 Uitvalgrond 431 JQ Portion 2 and Syferfontein 430 JQ

Uitvalgrond 431 JQ Portion 2 and Syferfontein 430 JQ lie to the east of Uitvalgrond 431 JQ Portion 3.

The topography is relatively flat across the properties, with an increase in altitude from approximately 1,180 mamsl in the southwest to 1,220 mamsl to the northeast. The property is located in the Rosespruit catchment and Pienaars River catchment areas (A21J and A23K respectively, as defined in WRC Report No. 298) of the Crocodile West Marico Water Management Area (“WMA”). The Rosespruit, which cuts across the properties, flows from east to west. A number of smaller tributaries and drainage lines are present. The co-ordinates of the Uitvalgrond 431 JQ Portion 2 and Syferfontein 430 JQ property are listed in Table 2-2.



Table 2-2
Uitvalgrond 431 JQ Portion 2 and Syferfontein 430 JQ property coordinates (WGS84 LO27)

ID	Y-Coordinate	X-Coordinate
1	27.87971	-25.51827
2	27.91222	-25.5327
3	27.90441	-25.55198
4	27.91321	-25.55502
5	27.91627	-25.58407
6	27.8806	-25.58743
7	27.94304	-25.56362
8	27.96804	-25.57103
9	27.96428	-25.58031
10	27.94778	-25.5819

Source: MKR Bakwena Tribal Minerals Prospecting Right (March 2006)

2.1.3 Remainder Doornpoort 295 JR

The Doornpoort property consists of the Remainder of the farm Doornpoort 295 JR, which is bordered to the south by the N4 national road and straddles the N1 national road (Figure 2-2). The property covers an area of approximately 2,779.6455 ha.

The area is relatively flat with undulating topography towards the southern boundary of the licence area. Communities located within the vicinity of the property include Doornpoort, Bon Accord, Rynoue, Mondustria, Wonderboom and Tshwane (previously known as Pretoria).

The property is located in Drainage Region A within the Crocodile West Marico Water Management Area. Several streams and watercourses pass through the property, as well as irrigation canals, which supply farmers in the surrounding area with water.

The Roodeplaat Dam Nature Reserve is located 5 km to the east of the property and the De Onderstepoort Private Nature Reserve is located 3 km to the west.

The corner co-ordinates of Remainder Doornpoort 295 JR Prospecting Right are listed in Table 2-3.

Table 2-3
Remainder Doornpoort 295 JR property coordinates (WGS84 LO29)

ID	Y-Coordinate	X-Coordinate	ID	Y-Coordinate	X-Coordinate
A	77,591.18	2,833,680.57	V"	76,417.65	2,837,152.37
B	77,016.05	2,833,628.89	W"	76,571.79	2,837,145.73
C	77 017.61	2,833,616.7	X"	76,619.32	2,837,139.71
D	76 671.18	2,833,607.45	Y"	77,742.14	2,836,974.21
E	76 530.49	2,833,593.40	Z"	77,842.09	2,835,673.57
F	76,529.09	2,833,608.86			
G	76 508.32	2,833,607.01			



ID	Y-Coordinate	X-Coordinate	ID	Y-Coordinate	X-Coordinate
H	76 505.55	2,833,633.93	a	77,482.26	2,832,818.75
J	76 469.41	2,833,630.86	b	73,145.87	2,832,951.48
K	76,473.29	2,833,588.68	c	73,225.02	2,833,237.57
L	75,424.06	2,833,494.30	d	73,375.83	2,833,197.93
M	75,421.62	2,833,517.49	e	73,551.30	2,833,183.45
N	75,410.17	2,833,516.26	f	76,596.06	2,833,444.95
P	75,403.75	2,833,535.97	g	77,109.78	2,833,496.35
Q	75,074.72	2,833,506.33	h	77,565.56	2,833,477.14
R	75,078.48	2,833,463.24			
S	74,600.39	2,833,418.22			
T	74,434.59	2,833,417.73	A1	72,402.14	2,833,511.58
U	74,233.26	2,833,480.63	B1	70,166.99	2,834,051.77
V	73,740.59	2,833,688.50	C1	70,120.54	2,834,070.17
W	73,619.47	2,833,668.87	D1	70,017.45	2,834,119.98
X	73,537.36	2,833,612.18	E1	72,005.81	2,837,613.79
Y	73,472.69	2,833,509.50	F1	72,119.81	2,837,572.18
Z	73,486.97	2,833,302.48	G1	72,228.96	2,837,513.16
A'	73,317.69	2,833,302.06	H1	72,353.91	2,837,435.37
B'	73,139.32	2,833,336.03	J1	72,441.56	2,837,373.79
C'	72,465.37	2,833,504.58	K1	72,524.49	2,837,292.95
D'	72,539.11	2,833,949.78	L1	72,593.76	2,837,188.48
E'	72,750.24	2,834,127.18	M1	72,634.04	2,837,084.62
F'	72,764.99	2,834,296.53	N1	72,609.19	2,836,784.72
G'	72,565.27	2,834,424.33	P1	72,414.70	2,836,801.63
H'	72,567.13	2,834,675.16	Q1	72,398.87	2,836,619.43
J'	72,680.86	2,835,983.10	R1	72,593.35	2,836,602.52
K'	72,723.63	2,836,355.63	S1	72,628.26	2,836,473.10
L'	72,750.77	2,836,455.29	T1	72,637.99	2,836,384.59
M'	72,810.79	2,836,583.63	U1	72,636.00	2,836,201.16
N'	73,005.26	2,836,566.72	V1	72,542.45	2,835,125.49
P'	73,021.10	2,836,748.91	W1	72,468.48	2,834,680.19
Q'	72,837.13	2,836,764.93	X1	72,12.73	2,834,453.22
R'	72,874.81	2,836,863.14	Y1	72,185.83	2,834,373.50
S'	72,917.64	2,836,959.49	Z1	72,431.39	2,834,080.97
T'	72,983.09	2,837,054.31	A1'	72,429.84	2,833,830.38
U'	73,046.58	2,837,112.98			
V'	73,144.03	2,837,176.60			
W'	73,257.05	2,837,222.06	j	72,361.82	2,833,048.23
X'	73,363.11	2,837,237.29	k	72,179.03	2,833,057.16
Y'	73,589.47	2,837,243.29	l	69,575.02	2,833,342.47
Z'	73,912.57	2,837,231.24	m	69,986.15	2,834,064.96
A''	74,089.30	2,837,213.55	n	70,163.70	2,833,98.43
B''	74,444.12	2,837,195.06	p	70,254.01	2,833,963.41
C''	74,721.16	2,837,193.58	q	70,244.91	2,833,919.13
D''	74,876.75	2,837,140.59	r	70,336.30	2,833,896.00



ID	Y-Coordinate	X-Coordinate	ID	Y-Coordinate	X-Coordinate
E"	74,935.23	2,837,142.53	s	70,350.01	2,833,941.13
F"	75,149.90	2,837,203.96	t	70,580.31	2,833,883.34
G"	75,316.56	2,837,207.30	u	71,115.67	2,833,757.71
H"	75,455.45	2,837,196.40	v	72,395.62	2,833,436.66
J"	75,9.11	2,837,165.52	w	74,653.37	2,836,193.98
K"	75,692.05	2,837,129.54	x	74,553.65	2,836,201.48
L"	75,711.00	2,837,085.52	y	74,561.15	2,836,301.20
M"	75,710.31	2,837,979.73	z	74,660.87	2,836,293.70
N"	75,791.56	2,837,975.25			
P"	75,844.97	2,837,035.45			
Q"	75,928.08	2,837,053.11			
R"	75,985.60	2,837,047.15			
S"	76,021.60	2,837,054.03			
T"	76,157.46	2,837,102.43			
U"	76,329.74	2,837,139.40			

Source: *Gemsbok Platinum (Pty) Ltd Prospecting Right (2013)*

The western portion of the property is an environmentally sensitive wetland area (Odendaal, 2015; Botha, 2014) (see Section 8.6).

2.2 Property Location

2.2.1 Uitvalgrond 431 JQ (portions 2 and 3) and Syferfontein 430 JQ

Portions 3 and 2 of Uitvalgrond 431 JQ and Syferfontein 430 JQ are situated about 20 km (by road) east-northeast of the town of Madibeng (formerly known as Brits), 1 km north of Mothutlung, 5 km northwest of Ga-Rankuwa and 4 km south of Lerulaneng (Figure 2-2). The properties are located in the Bojanala Platinum District within the North-West Province.

The communities of Kgabalatsane and Rabokala are located within the Syferfontein 430JQ property boundaries.

Additional communities within 5 km to 18 km of the properties include Mmakau (Makau), Rankothea, Lethlabile-E, Shoshanguwe South, Maboloka, Klipgat A, Makanyaneng, and Rosslyn.

The parent farms are located on Government 1:50,000 topo-cadastral sheets 2527DB and 2528CA, which are published by the Chief Directorate, Surveys and Mapping (Private Bag X10, Mowbray 7705, South Africa, Phone: +27 21 658 4300, Fax: +27 21 689 1351 or e-mail: cdsm@slu.wcape.gov.za).

2.2.2 Remainder Doornpoort 295 JR

The property comprising the Remainder of Doornpoort 295 JR is located approximately 9 km north of the city of Tshwane (previously known as Pretoria), within the jurisdiction of the City of Tshwane Metropolitan Municipality ("CTMM") (Figure 2-2). No communities are located on the



property. Neighbouring communities and their distance from the property are summarised in Table 2-4.

Town / Community	Distance (km)	Direction from property
Doornpoort	Directly adjacent	South
Bon Accord	Directly adjacent	West
Rynoue	Directly adjacent	East
Mondustria	1 km	South
Wonderboom	3 km	South
Tshwane	9 km	South

Source: *Gembok Platinum (Pty) Ltd - Approved EMP (2013)*

The Bon Accord Dam and the Onderstepoort Private Nature Reserve are located approximately 3 km to the west of the Doornpoort Prospecting Licence and the Roodeplaat Dam Nature Reserve lies approximately 5 km to the east.

The parent farms are located on Government 1:50,000 topo-cadastral sheets 2528CA and 2528CB which are published by the Chief Directorate, Surveys and Mapping (Private Bag X10, Mowbray 7705, South Africa, Phone: +27 21 658 4300, Fax: +27 21 689 1351 or e-mail: cdsm@sl.wcape.gov.za).

2.3 Country Profile

South Africa has a mixed economy, the second largest in Africa after Nigeria (IMF 2019). The country is a middle-income emerging market with an abundant supply of natural resources; well-developed financial, legal, communications, energy, and transport sectors; and a stock exchange that is Africa’s largest and among the top 20 in the world (CIA Factbook, 2019). Economic growth has decelerated, with unemployment, poverty and inequality among the highest in the world (CIA Factbook, 2019).

The current key economic indicators for South Africa are given in Table 2-5.

Interest Rate	GDP Growth Rate (YoY)	Unemployment Rate	Core Inflation Rate
6.75 %	1.1 %	27.6 %	4.4 %

Source: *www.tradingeconomics.com*

South Africa has a mature minerals industry and is the world’s largest producer of platinum, chrome and vanadium. South Africa ranks highly in the production of diamonds, coal, iron ore and base metals (PwC, 2018).



Challenges and risks associated with the minerals and mining industry in South Africa in 2018 included (PwC, 2018):

- Macro-economic fluctuations;
- cost pressures with risk being driven by:
 - labour relations and wage negotiations
 - maintenance and loss of critical skills
 - reliance on third party infrastructure with availability and costs of water and electricity highlighted as a concern;
- geopolitical and regulatory risk;
- safety, health and environmental; and
- public perception on social licence to operate (the socio-economic environment surrounding mines).

2.4 Legal Aspects and Permitting

The legislative framework, and nature of the issuer's rights and the right to use the surface of the properties to which the Brits Vanadium Project relates are described below. The farm boundaries are clearly defined by existing fencing and/or other boundary markers and are depicted on Surveyor General and topographical maps.

2.4.1 Legislative Framework

The South African Government has an extensive legal framework within which mining, environmental and social aspects are managed. Inclusive within the framework are international treaties and protocols, and national acts, regulations, standards and guidelines, which address international, national, provincial and local management areas.

The Department of Mineral Resources ("DMR"), with a head office in Tshwane and regional offices in each of the nine provinces of South Africa, administers the mining industry of South Africa.

South African statutory legislation and requirements relevant to the Project and considered as part of this CPR include:

- Mineral and Petroleum Resources Development Act (Act 28 of 2002) ("MPRDA");
- Mineral and Petroleum Resources Development Amendment Act 49 of 2008; and
- National Environmental Management Act (Act 107 of 1998) ("NEMA").

The most important of these, applicable to the Brits Project, are summarised in the following subsections. BMN's compliance in regard to the specific pieces of legislation are detailed in Table 2-7.

2.4.1.1 Mineral and Petroleum Resources Development Act (Act 28 of 2002) - MPRDA

The types of rights and permits applicable to the mining industry in South Africa are defined in the MPRDA and subsequent amendments. In addition, in terms of the MPRDA, mining and exploration companies must comply with additional responsibilities relating to environmental



management and to environmental damage, degradation or pollution resulting from their prospecting or exploration activities.

Section 37 of the MPRDA establishes the framework for the inclusion of environmental management principles. Section 39 defines the Environmental Management Programme (“EMP”) and EMP requirements. Requirements for the contents of exploration, scoping, Environmental Impact Assessment (“EIA”), EMPs and EMP reports (“EMPr”) are provided in Government Notice Regulations (“GNR”)s 49, 50, 51 and 52.

Sections 41 to 47 of the MPRDA address legislative closure requirements. Some of this has now been repealed and moved to under NEMA. GNR 527 of the MPRDA addresses the financial provision for mine rehabilitation and closure and requires that the quantum of financial provision, to be approved by the Minister, must be based on the requirements of the approved EMP and include a detailed itemisation of all actual costs required for:

- premature closure regarding:
 - the rehabilitation of the surface of the area,
 - the prevention and management of pollution of the atmosphere,
 - the prevention and management of pollution of water and the soil, and
 - the prevention of leakage of water and minerals between subsurface formations and the surface;
- decommissioning and final closure of the operation; and
- post closure management of residual and latent environmental impacts.

Recently published draft NEMA regulations (GNR 667) are out for comment. This new proposed regulation will both replace and repeal the existing regulations in place since 2015. Implications of these new regulations are still being assessed.

GNR527 defines the requirements for the social and labour plan (“SLP”). This, amongst other, aims, to show how the MPRDA strives to transform the mining and production industries. The Act requires the submission of the SLP as a prerequisite for the granting of mining or production rights. An SLP is not required for prospecting rights. The SLP requires applicants for mining and production rights to develop and implement comprehensive Human Resources Development Programmes including Employment Equity Plans, Local Economic Development Programmes and processes to protect jobs and manage downscaling and/or closure.

2.4.1.2 Mineral and Petroleum Resources Development Amendment Act 49 of 2008

In 2008, an Amendment Bill proposed to make significant changes to the MPRDA. The Bill was signed by the President in 2009 but had not come into force as at June 2019. While not an exhaustive list, the Amendment Act is noteworthy because it addresses the following issues pertinent to the environmental and social aspects of mining:

- it requires the prior written consent for disposal in various forms of a Prospecting or Mining Right or an interest in such a right;
- it allows the Minister to impose further conditions on an applicant for Mining Rights to include participation by the community;



- it allows for the cancellation or suspension of mineral rights if there is non-compliance with the MPRDA; and
- it has various forward-looking environmental provisions that were to come into effect 18 months after the promulgation of the Act. These include:
 - making the Minister of Mineral Resources responsible for environmental matters that relate to mining (now under the NEMA);
 - requiring the simultaneous application for environmental authorisation with mineral tenure applications (now managed under the “One Environmental System”); and
 - requiring a report on compliance with environmental authorisation with renewal applications known as an “EMPr Performance Assessment Report” (Legalbrief Today, 2013; Webber Wentzel, 2013).

2.4.1.3 National Environmental Management Act (Act No. 107 of 1998) - NEMA

NEMA was promulgated in 1998 to replace the Environmental Conservation Act 1989 (“ECA”), Act No. 73, as the overarching national environmental legislative framework. NEMA was promulgated to give effect to the Environmental Management Policy (published in 2007), and has been subsequently amended, including the National Environmental Management Amendment Act of 2003 and the National Environmental Management Second Amendment Act No. 8 of 2004.

As per the EIA Regulations, an application for environmental authorisation for certain listed activities must be submitted to the provincial environmental authority, the national authority, depending on the types of activities being applied for, or when mining and mineral processing activities are involved, the DMR.

The current EIA regulations, GN R.982, GN R.983, GN R.984 and GN R.985, promulgated in terms of Sections 24(5), 24M and 44 of the NEMA and subsequent amendments, commenced on 8 December 2014. In summary, the amendments have the following repercussions:

- NEMA will regulate all environmental related aspects;
- all environmental aspects have been repealed from the MPRDA;
- the Mineral Resources Minister will be responsible for the issuance of Environmental Authorisation (“EA”) in terms of NEMA;
- the Mineral Resources Minister will implement the provisions of NEMA and the subordinate legislation; and
- The ministries (Department of Mineral Resources (“DMR”) and Department of Environmental Affairs (“DEA”)) now undertake an integrated environmental authorisation under the “one Environmental System” as per the National Environmental Management Laws Amendment Act, Act No.25 of 2014 of NEMA. This gives powers to the Minister of Mineral Resources as the competent authority in terms of NEMA listed activities within mining or related extraction and primary processing of mineral activities.
- The issuing of mining related licenses and permits by the DMR will adhere to a defined time frame of a maximum of 300 days as per the regulation.

GN R.983 lists those activities for which a Basic Assessment is required, GN R.984 lists the activities requiring a full EIA (Scoping and Impact Assessment phases) and GN R.985 lists certain activities



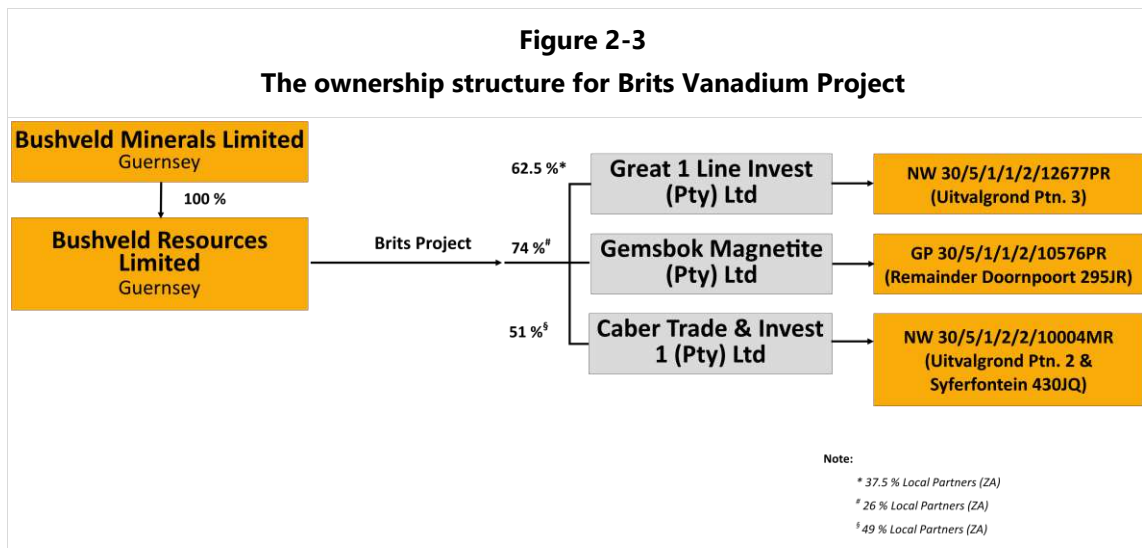
and competent authorities in specific identified geographical areas. GN R.982 defines the EIA processes that must be undertaken to apply for Environmental Authorisation.

2.4.2 Corporate Structure

The Project comprises prospecting rights and a mining right under application on farms adjacent to the Vametco Vanadium Mine and along strike from the Vametco Vanadium Mine:

- Portion 3 of Uitvalgrond 431 JQ (801.17 ha) – prospecting right;
- Portion 2 of Uitvalgrond 431 JQ and Syferfontein 430JQ (4,800.7463 ha) – mining right under application; and
- Remainder of Doornpoort 295 JR (2,779.6455 ha) located approximately 25 km to the east of Uitvalgrond – prospecting right under application.

BMN’s interest in the asset ranges between 51 % and 74 % through three different companies. The ownership structure is depicted in Figure 2-3.



Source: BMN, 2019

The adjacent Bushveld Vametco Mine is owned by Bushveld Vametco Alloys (Pty) Ltd, a subsidiary of Bushveld Minerals Limited (“BMN”). Resources, such as personnel and the Bushveld Vametco Mine core shed and laboratory, are made available to assist with BMN exploration activities, as and when required.

2.4.3 Mining and Prospecting Rights

MSA is not qualified to give opinion on the legal tenure of the licences in place for the Brits Vanadium Project. All information regarding the legal aspects of the Brits Project was received from BMN. MSA has not undertaken a due diligence on these aspects and has accepted the information in good faith as being accurate at the date of this report.

All mining and prospecting rights in the Republic of South Africa are issued by the DMR in accordance with MPRDA.



A summary of the types of licences, the names of the licence holders and the percentage interest held by BMN is presented in Table 2-6. See also Section 2.4.6.

<p style="text-align: center;">Table 2-6 Brits Vanadium Project – summary of licences</p>						
Type	DMR Reference	Interest (%)	Area (ha)	Licence Expiry Date	Holder	Farms
Prospecting Right	NW 30/5/1/1/2/11124PR	62.5 %	801.17	03/11/2019	Great 1 Line Invest (Pty) Limited (RSA)	Portion 3 of Uitvalgrond 431 JQ
Prospecting Right (renewal application submitted) ¹	NW 30/5/1/1/2/12677PR					
Prospecting Right ²	NW 30/5/1/1/2/11069PR	62.5 %	801.17		Great 1 Line Invest (Pty) Limited (RSA)	Portion 3 of Uitvalgrond 431 JQ
Mining Right (under application) ³	NW 30/5/1/2/2/10004MR	51 %	4,800.75	-	⁴ Caber Trade and Invest 1 (Pty) Limited	Portion 2 of Uitvalgrond 431 JQ and Syferfontein 430JQ
Prospecting Right	GP 30/5/1/1/2/10142PR	74 %	2,779.65	12/11/2018	Gembok Magnetite (Pty) Limited	Remainder of Doornpoort 295 JR
Prospecting Right (new application submitted) ⁵	GP 30/5/1/1/2/10576PR					

Note:

- ¹ A renewal application was submitted on 22 August 2019 and accepted on 17 September 2019 under a new reference number NW 30/5/1/1/2/12677PR
- ² An additional Prospecting Right application was submitted for iron ore and rutile on Portion 3 of Uitvalgrond 431 JQ, which was granted but not executed. Instead, Section 11 (change of ownership) and Section 102 (amendment of rights, permits, programmes or plans) applications were submitted to the DMR in respect of Prospecting Right NW 30/5/1/1/2/11124PR, with the Section 102 including the addition of iron ore and rutile in order to eliminate the need for two prospecting rights over the same property by the same Holder. As at the report date, both applications were still being processed.
- ³ Area reported in this CPR = Prospecting Right area (see ³ below)
- ⁴ The dispute between Caber Trade & Invest 1 (Proprietary) Limited ("Caber") and the local HDSA entity in connection with a mining right application (DMR ref: NW 30/5/1/2/2/10004MR) in respect of vanadium and iron over the farm Syferfontein 430JQ and Portion 2 of the farm Uitvalgrond 431 JQ has been resolved with a new shareholders agreement having been signed between the parties. The parties are currently liaising with the DMR with respect to next steps in proceeding with the processing of the mining right given the amount of time that has lapsed since the application was submitted.
- ⁵ Due to delays in the processing of Section 11 and Section 102 applications for Prospecting Right GP 30/5/1/1/2/10142PR, the prospecting right expired. A new prospecting right application was submitted and accepted with reference number GP 30/5/1/1/2/10576PR on 14 January 2019.

2.4.4 Surface Rights

The properties comprising the Brits Vanadium Project, i.e. Uitvalgrond 431 JQ Portion 3, Uitvalgrond 431 JQ Portion 2 and Syferfontein 431 JQ, and Remainder Doornpoort 295 JR, have different surface rights owners.



The Mmakau village (or Sekutlobyane Designated Landowners) is the designated landowner of Portion 3 Uitvalgrond 431 JQ. However, the title deed still reflects the property as State owned land. There are two title deeds, namely one from 1928 for Bakgatla and once from 1987 for Bophuthatswana. The Department of Land Affairs has indicated that they will assist the community in order to amend the title deeds and that they are aware of the Sekutlobyane village and that they signed ownership of the land (Great 1 Line EMP, 2014). No land claims have been registered for the property. No Traditional Authority has been identified and the land is not formally occupied.

Portion 2 Uitvalgrond 431 JQ and Syferfontein 430 JQ are owned by the Bakwena Ba Mogopa Tribal Authority. The title deeds for both properties list the Government of South Africa as the landowner.

The Remainder of Doornpoort 295 JR is privately owned by First Land Developments (Pty) Ltd. The approved Environmental Management Plan (Gemsbok Platinum (Pty) Ltd, 2013) states that no feedback regarding the status of any land claims on the Remainder of Doornpoort 295 JR had been reported by the Regional Land Claims Commission Gauteng Province and North West Province. In addition, no Traditional Authority exists over the area.

2.4.5 Servitude Rights

A water pipeline servitude runs north-south along the boundary between the farms Uitvalgrond 431 JQ Portions 2 and 3.

The Odi Aerodrome is located on Syferfontein 430 JQ. The aerodrome is no longer used as an airport.

Other than the servitudes related to the roads, railway line(s), the N1 Total Petroport, and the electrical transmissions lines, all of which are excluded from the Remainder of Doornpoort 295 JR prospecting right area, BMN has indicated that there are no further servitudes on the property.

2.4.6 Environmental and Social Compliance

Various environmental authorisations are required from governmental departments for BMN to operate lawfully. These include:

- a positive Record of Decision (“ROD”) from the DMR in terms of the MPRDA on the prospecting and/or mining right application(s); and
- an Environmental Authorisation from the applicable authority at the time of authorisation. Currently (2019) this is the Provincial North-West Department of Economic Development, Environment and Tourism (“NWDEDET”) in terms of NEMA for Uitvalgrond 431 JQ (portions 2 and 3) and Syferfontein 430JQ, and the Gauteng Department of Agriculture and Rural Development (“GDARD”) for the Remainder of Doornpoort 295 JR.

The environmental and social compliance status in relation to the South African legislative requirements for the Brits Project is summarised in Table 2-7.



Table 2-7
Brits Vanadium Project environmental authorisations

<i>Environmental Applications</i>						
NO.	ENVIRONMENTAL AUTHORISATION	PROPERTY	DATE ISSUED	EXPIRY DATE	STATUS	COMMENTS
1.	As per MPRDA, 2002 (Act 28 of 2002) - Environmental Management Plan (EMP) – Great 1 Line Invest (Pty) Ltd	Uitvalgrond 431 JQ Portion 3	November 2014	November 2019	Application for renewal of prospecting right submitted and accepted	A renewal application was submitted on 22 August 2019 and was accepted on 17 September 2019 under a new reference number NW 30/5/1/1/2/12677 PR.
2.	As per MPRDA, 2002 (Act 28 of 2002) - Environmental Management Plan (EMP) – Gemsbok Platinum Pty Ltd Ref. GP30/5/1/1/2/10142 PR	Doornpoort 295 JR	April 2013	April 2018	Expired New application submitted	The renewal was not submitted in time due to outstanding approvals for the Sections 11 and 102. A new application was submitted and accepted with reference number GP 30/5/1/1/2/10576 PR on 14 January 2019.
3.	As per MPRDA, 2002 (Act 28 of 2002) - Environmental Management Plan (EMP) – Sable Platinum Mining (Pty) Ltd	Uitvalgrond 431 JQ PTN 2 Syferfontein 431 JQ	No ROD provided, only scoping report (Quanto, 2012)	To be determined	-	The dispute between Caber Trade & Invest 1 (Proprietary) Limited (“Caber”) and the local HDSA entity in connection with a mining right application (DMR ref: NW 30/5/1/2/2/10004MR) in respect of vanadium and iron over the farm Syferfontein 430 JQ and Portion 2 of the farm Uitvalgrond 431J Q has been resolved with a new shareholders agreement having been signed between the parties. The parties are currently liaising with the DMR with respect to next steps in proceeding with the processing of the mining right given the amount of time that has lapsed since the application was submitted.



2.4.7 Environmental Liability

2.4.7.1 Environmental Liability and Costs

The Brits Vanadium Project exploration budget provided to MSA stated a total estimated prospecting cost for the drilling operations (on Uitvalgrond 431 JQ Portion 3 only) The budget was not broken down sufficiently to determine environmental costing. The environmental operational costs would typically include rehabilitation, waste management from the drilling, and water costs.

Provision will need to be made for the costs for future environmental authorisations, either relating to prospecting right extensions and/or the conversion of prospecting rights to mining rights in terms of environmental regulatory requirements.

MSA is not aware of any cost for compliance fees (i.e. fines or penalties) incurred by BMN for the environmental permits, authorisations and licences held at this time.

2.4.7.2 Reclamation and Closure Liability Provision

The Brits Vanadium Project prospecting closure cost provision is calculated for each prospecting programme individually, upon application for the prospecting right(s) and/or mining rights, and is based on the Prospecting Work Plan and/or Mine Works Programme.

According to the Prospecting Work Programme (ref NW30/5/1/1/2/11124PR) submitted to the DMR on 10 August 2017, the rehabilitation costs (closure amount) for Uitvalgrond 431 JQ Portion 3 is ZAR 182,660.00 (inclusive of VAT @ 14%), estimated on a proposed three to five year prospecting programme and based on the area to be affected by the prospecting activities, i.e. for general surface rehabilitation; two to three years of maintenance and aftercare; and a preliminary and general allocation (Great 1 Line Invest (Pty) Ltd, 2017). Information on the actual budgeting and provisioning for environmental rehabilitation and closure, including the vehicles to be used for the closure funding, were not made available to MSA at the time of reporting.

At the time of reporting, no information on either the quantum of the closure cost provisions for the Uitvalgrond 431 JQ Portion 2 and Syferfontein 430 JQ properties and for the Remainder of Doornpoort 295 JR, or on the financial provision vehicles used (trust or guarantee) was made available to MSA.

Collectively, i.e. for all three properties comprising the Project, the finance provided for by BMN for the closure liability is not apparent in the financial model.

2.4.7.3 Reclamation and Closure Methodology

Prospecting right closure relates directly to any disturbance created by implementing the prospecting work plan and the commitments made in the EMPs for each property. For the Brits Vanadium Project, this focuses mainly on the rehabilitation of contractor camps, drill sites, trenches (10 m long by 2 m wide and ~3 m deep) and drill rig access roads. As limited drilling has been done on only one of the properties, Uitvalgrond 431 JQ Portion 3, the current liability is minimal.



2.5 Royalties and Liabilities

2.5.1 Government Royalty – Mineral and Petroleum Resources Royalty Act (2008)

Royalties are payable for the duration of the mining right, as per Section 25 (2) (g) of the MPRDA.

The Mineral and Petroleum Resources Royalty Act (2008) ("Royalty Act") requires a royalty fee be paid to the National Revenue Fund in respect to the transfer of mineral resources extracted from within the Republic. According to Schedule 2 of the Royalty Act, vanadium > 1 % V₂O₅ equivalent and < 2 % calcium ("CaO") and silica ("SiO₂") bearing gangue minerals is classified as an unrefined mineral resource.

The royalty payable for an unrefined mineral resource is calculated as follows:

- $0.5 + [\text{earnings before interest and taxes} / (\text{gross sales in respect of unrefined mineral resource} \times 9)] \times 100$.

The royalty is required bi-annually with the deficit between forecast sales and actual sales payable in a third payment.

Royalties are not applicable for the Brits Vanadium Project as none of the properties are active mines.

2.5.2 Rehabilitation Guarantees

In terms of Regulation 54(2) of the MPRDA, BMN must make financial provision for the interim and final rehabilitation activities on the properties comprising the Brits Vanadium Project.

The reader is referred to Section 2.4.7.2 above.



3 ACCESSIBILITY, PHYSIOGRAPHY, CLIMATE, LOCAL RESOURCES AND INFRASTRUCTURE

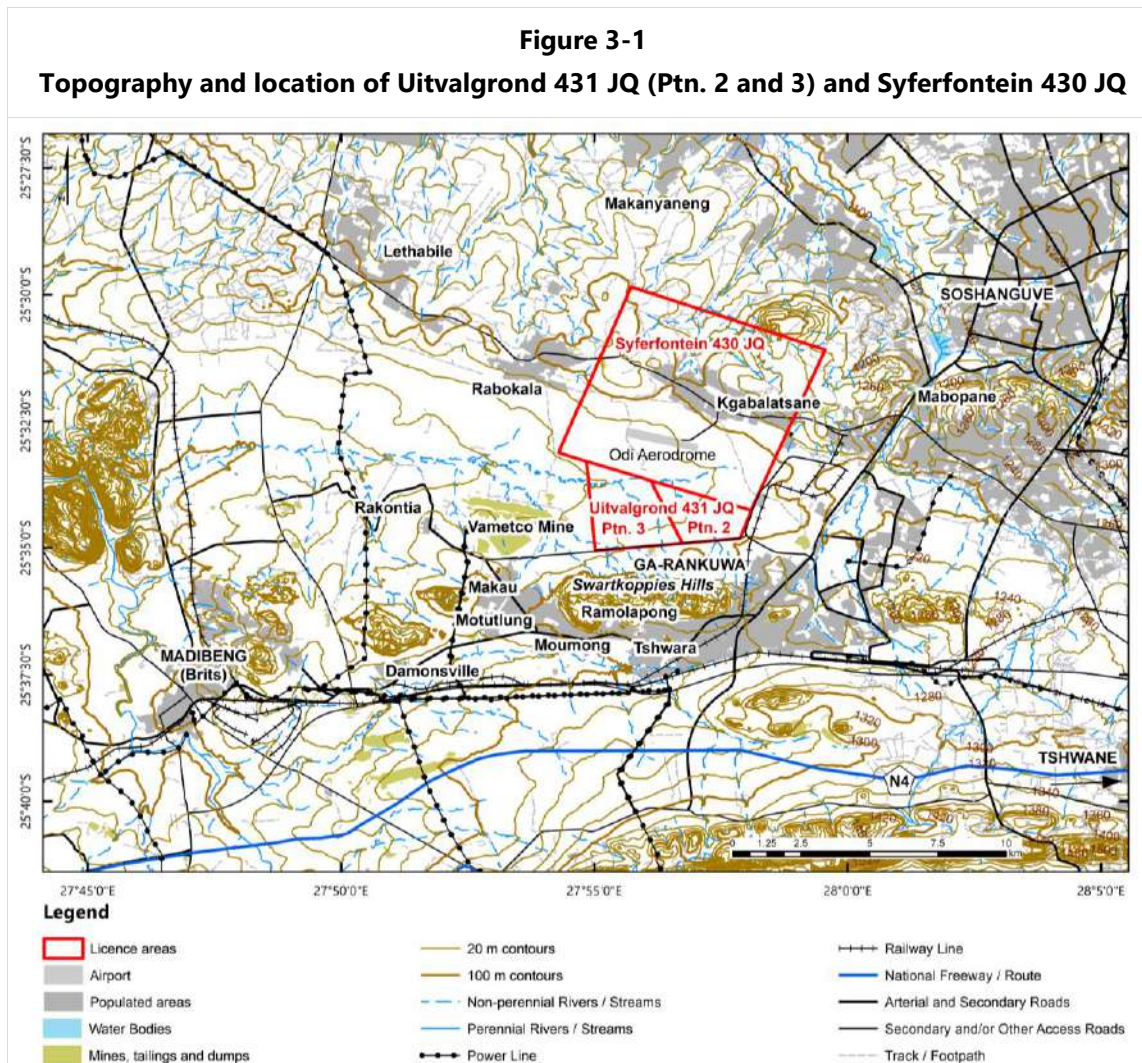
3.1 Topography, Elevation, Drainage, Flora and Fauna

3.1.1 Topography and Elevation

3.1.1.1 *Uitvalgrond 431 JQ – Portions 2 and 3 and Syferfontein 430JQ*

The topography of the area is characterised by slightly undulating plains as well as hills and lowlands. The topography of the Property is relatively flat, with elevations across the Property varying from ~1,160 metres above mean sea level (“mamsl”) to ~1,300 mamsl. The general slope of the area is towards the north, away from the Swartkoppies Hills located to the south of the properties.

Figure 3 1 indicates the regional topography.



Source: Background data sourced from combined digital 1:50 000 sheets (2527 and 2528), Surveyor General, South Africa, (obtained 2019)

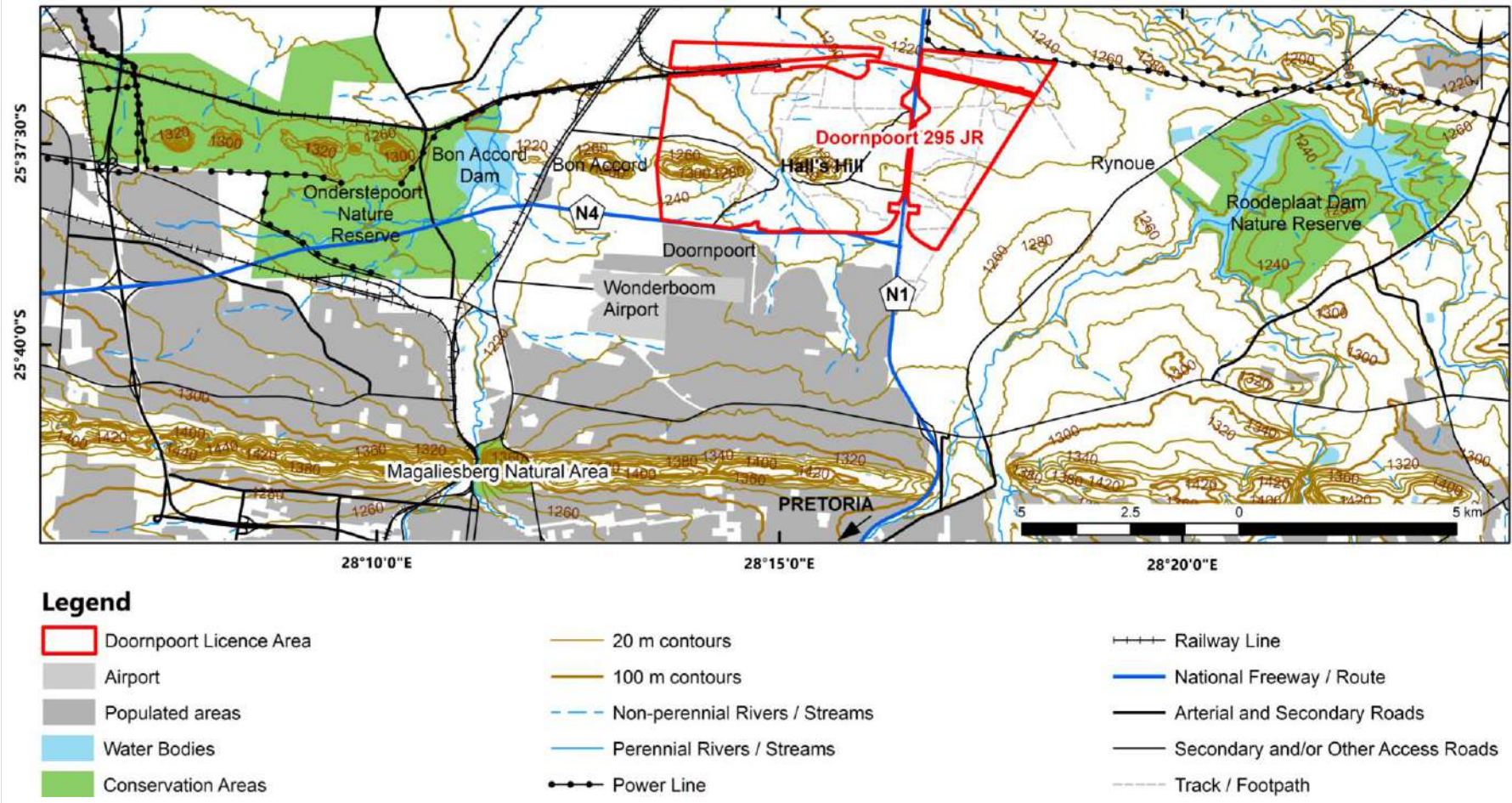


3.1.1.2 *Remainder Doornpoort 295 JR*

The area is relatively flat with topography undulating towards the southernmost boundary of the prospecting licence area. Elevations across the property range from 1,200 mamsl to 1,340 mamsl (unnamed small hill towards the southwest of the property) and ~1,300 mamsl (Hall's Hill) to the south of the property (Figure 3-2).



Figure 3-2
Topography and location of Doornpoort 295 JR



Source: Background data sourced from the combined digital 1:50 000 sheets comprising 2528 Pretoria, Surveyor General, South Africa (obtained 2019)



3.1.2 Drainage

3.1.2.1 *Uitvalgrond 431 JQ – Portion 3*

The surface water drainage with the property boundaries serves as an important source of water for plants and animals. The property falls within the Limpopo Water Management Area (WMA01) and is located in catchment A2H68. The Rosespruit and several unnamed streams drain the property, flowing towards the Crocodile River and eventually into the Limpopo River.

3.1.2.2 *Uitvalgrond 431 JQ Portion 2 and Syferfontein 430JQ*

The properties fall within the quaternary catchment areas A21J and A23K of the Crocodile West and Marico catchment area, located in the Limpopo Water Management Area. The Rosespruit and several unnamed streams drain the property, flowing towards the Crocodile River and eventually into the Limpopo River.

3.1.2.3 *Remainder Doornpoort 295 JR*

The Montana Spruit and tributaries, which drain towards the north, traverse the prospecting right area. Small farm dams are located along the flow of the streams and water courses.

The prospecting right is traversed by water irrigation canals which supply farmers in the surrounding areas with water.

The area falls within Drainage Area A within the Crocodile West Marico WMA and specifically within quaternary catchments A23B and A23E, which form part of the Apies-Pienaars River Sub-Catchment Area.

The western portion of the prospecting right has been identified as an environmentally sensitive wetland area.

3.1.3 Flora and Fauna

3.1.3.1 *Uitvalgrond 431 JQ (Portion 2 and 3) and Syferfontein 430 JQ*

The vegetation of the properties falls mainly within the Central Bushveld Bioregion with the vegetation described as the Marikana Thornveld vegetation type (Mucina and Rutherford, 2006). Vegetation is characterised by the presence of relatively short trees, including Acacia and broad-leaved species. Shrubs occur along the drainage lines, surrounding rocky outcrops and/or in other habitat areas protected from fire.

The area to the north on Syferfontein 430 JQ is classified as Central Sandy Bushveld.

Land use in the area is characterised by agriculture, which is dominated by crops and cattle farming.

No pans and/or marshlands have been identified on the properties.

At least 50 mammals potentially occur in the area, including four listed species (Brown Hyena, Honey Badger, Serval, and South African Hedgehog). None of these have been observed on the



properties and their presence is not considered likely as they do not occur in highly degraded or disturbed habitats (Naicker and Thomas, 2013).

Various reptiles, amphibians and insects are expected to occur in the area, as well as a significant number of bird species. Due to the current land use activities in the area, some of the naturally occurring animals have fled. Smaller rodent and mammal species may occur (Great 1 Line Invest EMP, 2014).

3.1.3.2 Remainder Doornpoort 295 JR

The prospecting right area is generally characterised by sparse vegetation cover. Relatively dense vegetation and tree cover occurs in the vicinity of the koppies area (Hall's Hill) towards the southwestern parts of the licence area and along the streams and watercourses (Gemsbok Platinum (Pty) Ltd, 2013).

The prospecting right falls within the Central Bushveld Bioregion and the Savanna Biome. Vegetation types in the area consist of the Marikana Thornveld vegetation type and the Gabbro-Norite Koppies Bushveld vegetation type (Mucina and Rutherford, 2006).

The Marikana Thornveld in the area is characterised by tall and large trees of the Acacia and Rhus species, and shrubs along drainage lines. Some wetlands have been identified on the property, but the sensitivity, condition and extent of these had not been fully assessed at the time of this report

The Gabbro-Norite Koppies Bushveld comprises low, semi-open to closed woodland up to 5 m tall, consisting of dense deciduous shrubs and trees with sparse undergrowth on shallow soils with large areas not covered by vegetation (Gemsbok Platinum (Pty) Ltd, 2013).

A number of mammal, reptile, amphibian, insect and bird species may occur on the property. Due to the presence of aquatic systems, the following species may be present: the African Clawless Otter; the African Marsh Mongoose, the Rough-Haired Golden Mole, the African March Rat; the Spotted Necked Otter; the Angoni Vlei Rat and the Vlei Rat.

3.2 Climate

3.2.1 Uitvalgrond 431 JQ (Portions 2 and 3) and Syferfontein 430 JQ

The Uitvalgrond 431 JQ portions 2 and 3, and Syferfontein 430 JQ area has a humid subtropical climate (Köppen: Cwa) with long rainy summers and short cool to cold dry winters. Summer (mid-October to mid-February) is characterised by hot sunny weather, often with afternoon thunderstorms of short duration. The average annual temperatures for nearby Madibeng (Brits) range from a summer maximum of 31°C (daytime) to a winter minimum of 1°C (night). Day time temperatures in spring and summer range from 25°C to 30°C. During the winter months (May to July), much cooler temperatures occur, ranging between 15°C and 24°C during the day. The region in general has an average maximum monthly temperature of 26.8°C and an average monthly minimum temperature of 13.4°C. Frost frequently occur in winter.

Annual rainfall varies between 600 mm and 700 mm. Precipitation records for the area record an average annual rainfall rate of 637 mm, with most rainfall occurring in the form of thunderstorms,



during summer between November and February. There is a distinct seasonal variation in rainfall and the evaporation follows the same seasonal trend (JMA, 2015). Recent rainfall data from the rainfall weather stations near the properties is available as well as at the adjacent Vametco Vanadium Mine. The highest rainfall is recorded between October and March (approximately 91 %), while about 9 % of rainfall is recorded from April to September. Table 3-1 shows the monthly distribution of rainfall for the area.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
%	21.7	14.3	14.7	2.8	1.5	2.05	-	0.95	1.2	7.9	17	15.8	100
Mean (mm)	138	91	93.7	18.7	9.63	13.1	-	6.04	7.8	50	109	100	637

The Mean Annual Evaporation ("MAE" (S-Pan)) is adopted from the Hartebeespoort Dam and the Rustenburg gauges and is calculated as 1,665 mm.

Climatic conditions are not a major hindrance, to exploration activities although delays due to rain and thunderstorms may occur.

3.2.2 Remainder Doornpoort 295 JR

The prospecting right area has a humid subtropical climate (Köppen: Cwa) with long rainy summers and short cool to cold dry winters.

Summer (October to March) is characterised by hot sunny weather, often with afternoon thunderstorms of short duration. The average annual temperatures for nearby Tshwane range from a summer maximum of ~29°C (daytime) to a winter minimum of ~2°C (night). Day time temperatures in spring and summer range from ~25°C to ~30°C. During the winter months (May to July), much cooler temperatures occur, ranging between ~15°C and ~24°C during the day. The Tshwane area in general has an average maximum monthly temperature of 24.7°C and an average monthly minimum temperature of 12.3°C. Frost frequently occurs in winter.

Annual rainfall varies between 400 mm and 800 mm. Precipitation records for the area record an average annual rainfall rate of ~673 mm, with most rainfall occurring during summer, usually in the form of thunderstorms between November and February. There is a distinct seasonal variation in rainfall and the evaporation follows the same seasonal trend. The highest rainfall averages in a year are between October and March (approximately 85 %), while about 15 % of rainfall is recorded from April to September.

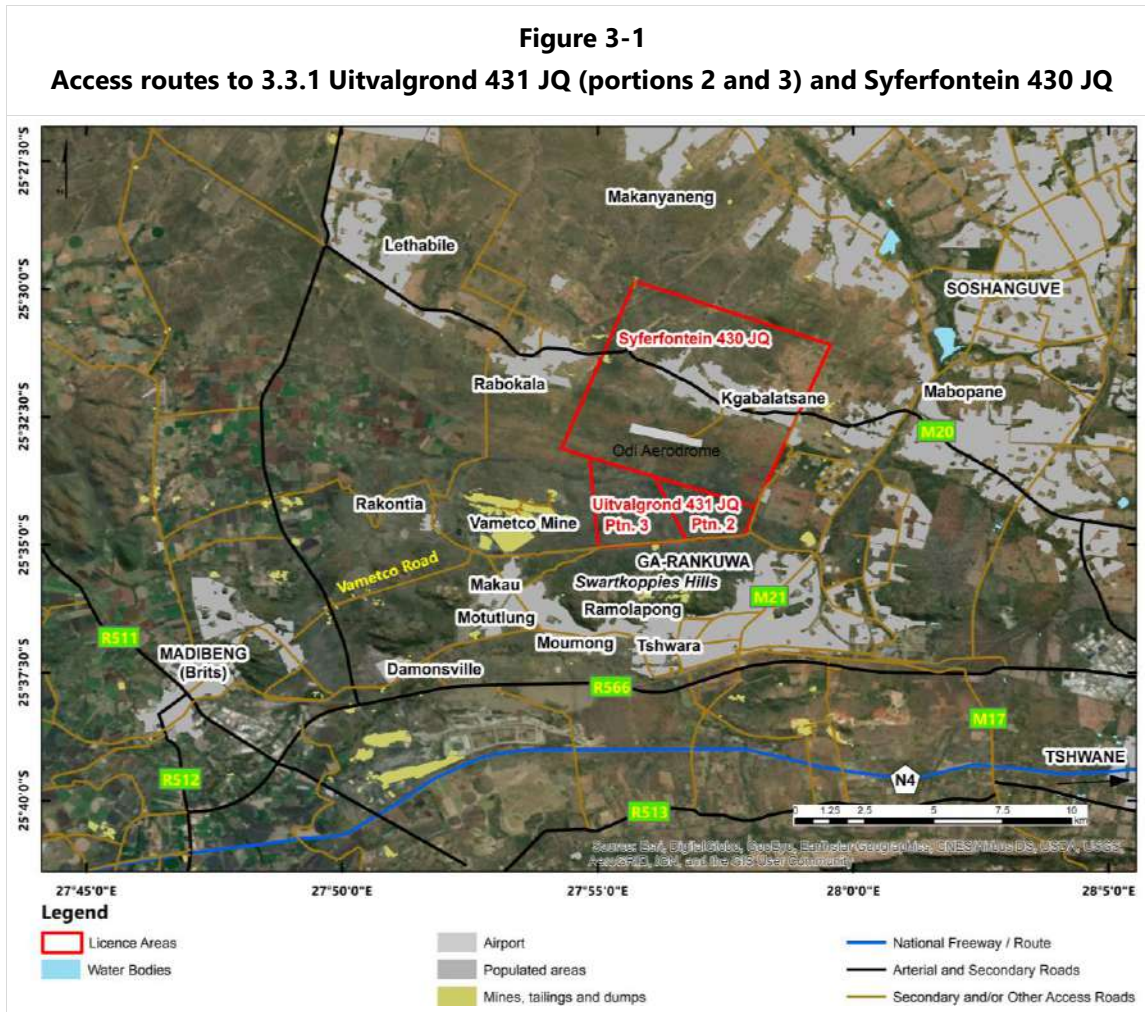
3.3 Access

3.3.1 Uitvalgrond 431 JQ (portions 2 and 3) and Syferfontein 430 JQ

The properties are located near urban developments of variable size. The main roads are predominantly tarred and undergo regular maintenance. The properties can be accessed by various tarred and/or maintained gravel roads from the surrounding towns and villages.



The major access routes to the properties are shown in Figure 3-1.



Source: Background image sourced from Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community (2019); topographic information obtained from combined digital 1:50 000 scale topographic sheets (2527 and 2528), Surveyor General, South Africa (obtained 2019)

3.3.2 Remainder Doornpoort 295 JR

Remainder Doornpoort 295 JR is located approximately 9 km north of the city of Tshwane (previously known as Pretoria) in the Gauteng Province. The Project is easily accessed via the N1 and N4 highways; the N1 highway cuts the property in a north-south direction and the N4 highway occurs just to the south of the property boundary (Figure 3-2). A major railway line crosses the northern portion of the property. Gravel roads and tracks cross the property, providing further access.



3.4 Proximity to Population Centres and Nature of Transport

3.4.1 Uitvalgrond 431 JQ (Portions 2 and 3) and Syferfontein 430 JQ

The closest urban area to the properties of Uitvalgrond 431 JQ (Portions 2 and 3) and Syferfontein 430 JQ is Madibeng (Brits), approximately 15 km to 20 km to the west-southwest. Other villages within a 5 km radius are listed below:

- Kgalalatsane;
- Mothutlung;
- Krokodilkraal / Rankotia;
- Uitvalgrond / Rabokala;
- Damonsville;
- Mothutlung-A;
- Moumong;
- Ramolapong;
- Tshwara; and
- Ga-Rankuwa.

Access to road transport is readily available.

3.4.2 Remainder Doornpoort 295 JR

The Remainder Doornpoort 295 JR is bordered by residential and farming communities. No community is located on the property. Communities located within the vicinity of the property include Doornpoort, Bon Accord, Rynoue, Mondustria, Wonderboom and Tshwane (previously known as Pretoria) (Figure 3-2).

3.5 General Infrastructure

3.5.1 Uitvalgrond 431 JQ (Portions 2 and 3), Syferfontein 430JQ and Remainder Doornpoort 295 JR

The electricity in the areas is supplied via the National Grid. Telecommunications in the area are provided by the major cell phone networks and Telkom.

3.5.2 Other Access

3.5.2.1 *Uitvalgrond 431 JQ (Portion 2) and Syferfontein 430JQ*

The Odi Aerodrome is located on Syferfontein 430JQ. The aerodrome is no longer used as an airport.

3.5.2.2 *Remainder Doornpoort 295 JR*

Major railway lines cross the northern portion of the property.



4 PROJECT HISTORY

Limited historical information exists for the properties.

4.1 Previous Ownership

The properties comprising the Brits Vanadium Project were originally owned by Sable Platinum Limited through various wholly and/or partially owned subsidiaries. Sable Platinum Limited changed its name to Sable Metals and Minerals Limited (“SPM”) in March 2014. Bushveld Minerals Limited completed the acquisition of SPM’s shares in Gemsbok Magnetite (Pty) Ltd, Caber Trade & Invest 1 (Pty) Ltd and Great 1 Line Invest (Pty) Ltd on 16 June 2016 (BMN, 2016).

4.1.1 Uitvalgrond 431 JQ – Portion 3

Prior to SPM ownership, a prospecting right for vanadium on Uitvalgrond 431 JQ was held by Ona ‘n Refi Construction (Sable Platinum, 2013).

Ochre Shimmer Trade and Invest 72 Proprietary Limited, a partially owned subsidiary of SPM, held a prospecting right (NW 30/5/1/1/2/1385PR) over Uitvalgrond 431 JQ Portion 3 for Platinum Group Metals, nickel ore, copper ore, cobalt, gold ore and chrome ore, issued on 29 June 2007 with an expiry date of 28 June 2011. The prospecting right was ceded to Ochre Shimmer Trade and Invest 72 (Pty) Ltd by Mineral Capital Assets (Pty) Ltd.

Great 1 Line Invest (Pty) Ltd, a partially owned subsidiary of SPM, was granted a prospecting right (NW 30/5/1/1/2/11069 PR) for iron and titanium and another (NW 30/5/1/1/2/11124PR) for vanadium. The latter expires on 3 November 2019. Great 1 Line Invest (Pty) Ltd (the holder of the prospecting right) was a subsidiary of SPM prior to the acquisition of the company by Bushveld Minerals Limited in 2016.

4.1.2 Uitvalgrond 431 JQ (Portion 2) and Syferfontein 430JQ

The Minerals Engineering Company South Africa Pty Ltd was awarded a mineral lease on the farm Syferfontein 430JQ (previously known as Cyferfontein / Syferfontein 310) for the exclusive right to mine, win and recover iron ore on the farm (Van der Walt, 2014). The lease was valid for a period of five years. In 1960 the company changed its name to the Transvaal Vanadium Co Pty Ltd. The lease was renewed for a further five years on 21 August 1962 and again on 31 December 1968 (Van der Walt, 2014). No information was sourced on the nature of exploration and/or other work carried out on the property at that time.

Caber Trade and Invest 1 Proprietary Limited (Caber), a partially owned subsidiary of SPM, held a prospecting right (NW 30/5/1/1/2/648 PR) over Uitvalgrond 431 JQ Portion 2 and Syferfontein 430 JQ for all minerals. The prospecting right expired on 17 March 2012. In August 2011, Caber submitted an application for a Mining Right (NW 30/5/1/1/2/10004 MR) in terms of the provisions of Section 19(1)(b) of the MPRDA. This application was stalled pending the outcome of litigation and/or negotiations between Caber and the MKR Bakwena Tribal Minerals NPC (“MKR”). This litigation and/or negotiation has only recently been resolved, between Bushveld Minerals Limited (which acquired Caber in 2016) and the MKR (see Section 2.4.3).



4.1.3 Remainder Doornpoort 295 JR

Roan Platinum (Pty) Ltd, a subsidiary of SPM, obtained a prospecting right (GP 30/5/1/1/2/546 PR) for platinum group metals, copper, nickel, chromium, cobalt and pyrite on the remaining extent of the farm Doornpoort 295 JR on 04 March 2010, valid until 03 March 2015.

Because of the presence of magnetite on the Property, Gemsbok Platinum (Pty) Ltd, a subsidiary of SPM, obtained a prospecting right (GP 30/5/1/1/2/10142 PR) for vanadium, iron ore and rutile (plus associated minerals) on the remaining extent of the farm Doornpoort 295 JR on 13 November 2012, valid until 12 November 2018.

4.2 Previous Exploration

4.2.1 Uitvalgrond 431 JQ – Portion 3

Odendaal (2015) reported that SPM were retrieving historical drillhole log information from the Council for Geoscience for six drillholes reportedly drilled on Uitvalgrond 431 JQ (Portions 1-3). In addition, evidence of historical trenching was noted; no further information is available on these trenches.

4.2.1.1 Ground Magnetic Survey

In October 2014, a ground magnetic survey was conducted by Bernie Green on a contractor basis for SPM. The aim was to detect and delineate the various magnetite layers of the Bierkraal Magnetite Gabbro.

A proton precession total field magnetometer was used to record magnetic readings at 10 m intervals (Odendaal, 2015). The 19 km survey comprised 12 north-south lines varying in length from 600 m to 2,000 m, 250 m apart. The survey defined a southern boundary with more continuous magnetite mineralisation in the west, which is less defined towards the east. A few fault blocks were identified over the strike length of the property. Faulting has resulted in the "movement" of the magnetite subcrops in a step-like fashion in a southerly direction (Green, 2014a; Odendaal, 2015).

4.2.1.2 Geological field work

Grab samples were collected by SPM at random outcrop positions and the co-ordinates captured using a handheld Global Positioning System ("GPS"). Samples were bagged with an in-house sample number / tag number and submitted to the Evraz Laboratory for analysis (now Vametco Laboratory) at the Vametco Vanadium Mine. The samples were delivered as a batch with chain of custody documents included. Analytical results were returned by email.

The photograph in Figure 4-1 shows magnetite outcrop on Portion 3 of Uitvalgrond 431 JQ.



Figure 4-1
Magnetite outcrop on Portion 3 of Uitvalgrond 431 JQ



Source: Odendaal (2015)

SPM identified two distinct mineralised zones (S1 and S2). S2 correlated with the Upper Seam as identified at the Vametco Vanadium Mine. S1 can be correlated with the Lower Seam at the Vametco Vanadium Mine.

4.2.1.3 Drilling

Three diamond drillholes (UUG 301-303) for a total drillhole length of 237.33 m were drilled on Uitvalgrond Portion 3. Excessive core loss and broken core was noted from the weathered zone (first ~20 m). The upper stratigraphy from drillhole UUG 302 is shown in Figure 4-2. Initial assays for the drillhole core samples were conducted at the Vametco Laboratory. The pulps of UUG 302 were sent to Set Point Laboratories (Pty) Ltd (“Setpoint”) (Odendaal, 2015) for further analysis.

The locations of the three drillholes were recorded by means of a handheld GPS and no downhole surveys were conducted due to the short length of the holes.



Figure 4-2
Upper stratigraphy intersected in diamond drillhole UUG 302



Source: Odendaal (2015)

4.2.2 Uitvalgrond 431 JQ (Portion 2) and Syferfontein 430JQ

No exploration has been undertaken on the properties due to litigation (see Section 2.4) which has only recently been resolved.

Desktop studies comprising historical literature research were undertaken by SPM. The focus of initial work on the properties was to undertake exploration for platinum group minerals, focussing on the Merensky Reef and UG2.

4.2.3 Remainder Doornpoort 295 JR

Exploration between 2013 and 2015 was undertaken by SPM personnel.

It was reported in the Sable Platinum Integrated Report (2013) that drilling was undertaken on the property by a previous permit holder. Core from the historical drilling programme was found on-site, however intersections of the mineralised horizons were missing. It could not be confirmed who undertook the historic drilling.

Odendaal (2015) reported that SPM were retrieving historical drillhole log information from the Council for Geoscience for six drillholes reportedly drilled on the remainder of the farm Doornpoort 295 JR.

4.2.3.1 Gravity and Ground Magnetic Surveys

During February and March 2012, the Phase 1 gravity and magnetic surveys were undertaken on the property aimed at identifying and delineating any major structural features (such as faults and folds). The gravity readings were obtained with a zero length spring survey instrument with X and Y coordinates being obtained using a WAAS -enabled 14 channel GPS whilst elevations were



obtained using a barometric micro-altimeter. A series of base stations were established to enable the various corrections to be made to correct the data to Bouguer gravity level (Green, 2012a). The survey comprised 18 line km and was carried out along various tracks on the property. The magnetic field strength was measured using a total field proton precession instrument. Drift was corrected for by using a series of base stations.

In May 2012, a second phase of the ground gravity and magnetic surveys was completed on a portion of the property to the east of the N1 using the same equipment as in February and March. The two phases of surveys were seamlessly integrated using the drift corrections (Green, 2012b). A number of northwest trending faults were confirmed by the magnetic survey.

A target specific ground magnetic survey was performed in February 2014 using a total field proton precession instrument whilst positions were obtained using the same GPS instruments as previously used. Drift was monitored by a system of base stations. A proton precession total field magnetometer was used to record magnetic readings at 10 m intervals (Odendaal, 2015). The 24 km survey comprised 17 north-south lines, 500 m apart. Continuous magnetite mineralisation on an east-west strike with inferred strike slip faults towards the western boundary of the property and minor faults in the eastern block were indicated. The presence of magnetite layers and mineralisation decreases near the boundary of the eastern block (Green, 2014b).

4.2.3.2 Geological field work

Grab samples were collected at random outcrop positions and the co-ordinates captured using a handheld GPS. Samples were bagged with an in-house sample number / tag number and submitted to the laboratory for analysis. The samples were then delivered as a batch with chain of custody documents included. Analytical results were returned by email.

One grab sample was taken from the main magnetite outcrop (S2) which returned a V_2O_5 grade of 1.82 % and a SG value of 4.58 g/cm^3 . During follow up sampling, four grab samples were taken from the S1 later (Lower Magnetite Layer; samples DP 1001-1004) and nine samples were taken from the S2 layer (Main Magnetite Layer; samples DP 2001-DP 2009). The initial grab sample was analysed by Setpoint Laboratory in Isando, Johannesburg and the second batch of samples by the Evraz Laboratory (now Vametco Laboratory) at the Vametco Vanadium Mine (Odendaal, 2015).

No blanks or reference standards were inserted. The sample(s) sent to Setpoint reported similar grades to those sent to the Vametco laboratory (Odendaal, 2015).

Figure 4-3 shows the outcrop of the S2 at Doorpoort.



Figure 4-3
S2 outcrop on Remainder Doornpoort 295 JR



Source: Odendaal (2015)

4.3 Previous Mineral Resource Estimates

Previous estimates of the grade and tonnage of the main magnetite layers of interest were completed by Minxcon Consulting (Pty) Ltd in 2015 for Uitvalgrond 431 JQ (Portion 3) and the Remainder of Doornpoort 295 JR (Odendaal, 2015). Estimates were of Exploration Targets at Remainder of Doornpoort 295 JR and the majority of Uitvalgrond 431 JQ (Portion 3), although Minxcon considered one area of Uitvalgrond 431 JQ (Portion 3) to be informed by sufficient data with which to estimate an Inferred Mineral Resource.

The Minxcon estimates were reported for whole rock V_2O_5 , Fe and TiO_2 content for three narrow massive magnetite layers at Uitvalgrond 431 JQ (Portion 3). At Remainder of Doornpoort 295 JR, estimates were only reported for two massive magnetite layers by Minxcon.



The Exploration Targets were estimated as a range of values, with strike lengths and thickness based on surface observations and the extent of magnetic anomalies. The minimum and maximum grades of grab samples taken from outcrops at Remainder of Doornpoort 295 JR were used for the maximum and minimum grade estimates. At Uitvalgrond 431 JQ Portion 3), the average of the UUG302 sample grades plus/minus 10 % was assigned as the minimum and maximum grade.

The Uitvalgrond 431 JQ (Portion 3) Inferred Mineral Resource reported by Minxcon was based on the sampling of one drillhole (UUG302) and logging of two drillholes (UUG301 and UUG303). Minxcon noted that poor core recovery in UUG03 may impact on the accuracy of the data. MSA considers that the data used for reporting the Inferred Mineral Resource at the time would not be consistent in quality or quantity with standards expected for a Mineral Resource with more recent reporting codes. The historical estimates for Uitvalgrond 431 JQ (Portion 3) are no longer relevant and cannot be compared directly with those completed by MSA that were based on significant numbers of recent drillholes and a different stratigraphic interpretation.

The Minxcon 2015 Exploration Target estimates are the only estimates of the V_2O_5 mineralisation at Remainder of Doornpoort 295 JR. The two magnetite seams have been assigned a thickness of 0.5 m and 1.0 m respectively and the grades are based on limited numbers of surface grab samples that are unlikely to represent the grades of the underlying mineralisation. Minxcon noted that the V_2O_5 sample grades of the S1 layer at Remainder of Doornpoort 295 JR are higher than expected.

The Exploration Targets for Remainder of Doornpoort 295 JR and Uitvalgrond 431 JQ (Portion 3) were reported by Minxcon as shown in Table 4-1 and Table 4-2 respectively. The Mineral Resource reported by Minxcon for Uitvalgrond 431 JQ (Portion 3) is shown in Table 4-3.



Table 4-1
Minxcon - Doornpoort Exploration Target (Remainder Doornpoort 295 JR) as 1 April 2015

Layer	Strike Length (m)		Dip°	Max Pit Depth (m)	True Thickness (m)	Dip Length (m)	Tonnes (millions)		V ₂ O ₅ (%)		Fe (%)		TiO ₂ (%)	
	Min	Max					Min	Max	Min	Max	Min	Max	Min	Max
S2 (upper)	1,700	5,500	20	200	1.0	585	3.70	11.96	1.73	2.02	53.40	55.30	13.00	13.70
S1 (lower)	1,700	5,500	20	200	0.5	585	1.85	5.98	2.13	2.21	50.70	52.00	14.00	14.30

Notes:

Minimum strike length based on observed outcrop

Maximum strike length is based on magnetic anomaly, float observation and known continuity of the magnetite layers

Geological loss of 20% applied

Magnetite layer thickness estimates based on field observations and float

Density of 4.3t/m³ used for tonnage

The minimum and maximum grades applied are the lowest and highest values from the grab samples.

Source: Odendaal (2015)

Table 4-2
Minxcon – Uitvalgrond 431 JQ (Portion 3) Exploration Target as 1 April 2015

Layer	Strike Length (m)		Dip°	Max Pit Depth (m)	True Thickness (m)	Dip Length (m)	Tonnes (millions)		V ₂ O ₅ (%)		Fe (%)		TiO ₂ (%)	
	Min	Max					Min	Max	Min	Max	Min	Max	Min	Max
Seam 2 (upper)	1,000	3,000	20	170	1.9	497	3.39	10.17	1.44	1.76	48.97	59.85	11.61	14.19
Seam 1b (intermediate)	250	750	20	150	1.0	439	0.41	1.22	1.04	1.27	38.27	46.77	8.71	10.65
Seam 1a	250	750	20	150	0.4	439	0.16	0.49	1.57	1.91	46.84	57.24	10.17	12.43
Disseminated Layer	250	750	20	200	29.1	585	10.88	32.64	0.41	0.50	16.08	19.66	3.70	4.52

Notes:

Minimum strike length based on observed outcrop

Maximum strike length is based on magnetic anomaly, float observation and known continuity of the magnetite layers

Geological loss of 20% applied

Magnetite layer thickness estimates based on field observations and float

Density of 4.3 t/m³ used for tonnage of magnetite seams. Density of 3.20 t/m³ applied to disseminated layer, which is the arithmetic mean of 7 core samples.

The minimum and maximum grades applied are the lowest and highest values from the grab samples

Source: Odendaal (2015)



Table 4-3
Minxcon – Uitvalgrond Portion 3 Inferred Mineral Resource as 1 April 2015

Layer	Strike Length (m)	True Thickness (m)	Dip Length (m)	Tonnes (millions)	V ₂ O ₅ (%)	Fe (%)	TiO ₂ (%)
Seam 2 (upper)	1,200	1.88	135	1.10	1.60	54.41	12.90
Seam 1b (intermediate)	550	1.01	210	0.42	1.15	42.52	9.68
Seam 1a	550	0.38	210	0.16	1.74	52.04	11.30

Notes:

S1a and S1b strike based on drillhole UUG302 and the outcrop of S2

S2 strike length based on drillhole UUG301, outcrop, float observation and general continuity of the S2 seam

Seam true thickness based on sampling thickness of the magnetite seam in drillhole UUG301 and corrected for a 20° dip.

Geological loss of 20% applied

Down dip extent is limited to the mid-point between UUG302 and UUG301 as Seam S2 did not continue to UUG301 and S1a had a reduced V₂O₅ grade.

Drill recoveries were very low which could affect the grades of the UUG302 samples.

Source: Odendaal (2015)



4.4 Previous Ore Reserve Estimates

No Ore Reserves have been stated for any of the properties..

4.5 Previous Production

All properties are currently at the exploration phase and no historical production has occurred.



5 GEOLOGICAL SETTING, MINERALISATION AND DEPOSIT TYPE

5.1 Geological Setting

5.1.1 Regional Geology

Vanadium mineralisation occurs in vanadium-bearing titaniferous magnetite-rich layers that occur within the Upper Zone of the mafic and ultramafic portion of the Bushveld Complex - the Rustenburg Layered Suite ("RLS"). The magnetite-rich layers are part of the layered sequence and are concordant and generally continuous along strike and down-dip, although thickness variability occurs.

The RLS comprises several lobes or limbs, known as the Far Western, Western, Eastern, Southeastern (or Bethal) and Northern Limbs, which together form an ellipse (in plan) of approximately 200 km by 370 km in extent (Figure 5-1). All four properties forming the Brits Vanadium Project occur on the Western Limb.

The Bushveld Complex comprises, from oldest to youngest (Cawthorn *et al.*, 2006):

- the ~3.5 km thick felsite dominated volcanic Rooiberg Group;
- the RLS comprised of mafic and ultramafic units; and
- the Lebowa Granite Suite ("LGS") and the Rashedoop Granophyre Suite ("RGS").

The RLS and LGS were intruded into the Transvaal Supergroup sequence along an unconformity between the Magaliesburg quartzites and the overlying Rooiberg felsites approximately 2,060 Ma (million years) ago.

The rocks of the Bushveld Complex are interpreted to underlie an area of approximately 66,000 km² from Zeerust in the west to Burgersfort in the east, and from Bethal in the south to Villa Nora in the north, approximately 55 % of which is covered by younger formations (Cawthorn *et al.*, 2006; Viljoen and Schürmann, 1998). The maximum vertical thickness of the layered rocks approaches 8 km. Some layers can be traced for over 150 km along strike (Cawthorn *et al.*, 2006).

The rock types of the RLS range from dunite, pyroxenite and chromitite, through norite, gabbro, gabbro-norite, anorthosite and magnetite to apatite-rich quartz diorite. The Bushveld Complex contains the world's largest known deposits of platinum group metals ("PGMs"), chromium and vanadium. The regional geology of the Bushveld Complex is shown in Figure 5-1 and the zonal stratigraphy of the RLS is summarised in Table 5-1.

The RLS consists of five distinct zones, namely the Upper Zone, Main Zone, Critical Zone, Lower Zone and Marginal Zone. The Upper and Main Zones of the RLS are known to occur on all the Brits Vanadium Project properties.



The Upper Zone comprises dominantly gabbro, magnetite bearing gabbro and olivine diorite with subordinate anorthosite layers and magnetite layers. The base of the Upper Zone is identified by the first occurrence of cumulus magnetite. The Upper Zone has a sharp basal contact and a gradational upper contact. The Upper Zone has been divided into three different sub-zones, namely:

- Subzone A - at the base;
- Subzone B - cumulus Fe-rich olivine appears; and
- Subzone C - where apatite appears as an additional cumulus phase.

A total of 25 layers of cumulus magnetite exist within the Upper Zone. The fourth layer, known as the Main Magnetite layer, is the most prominent.

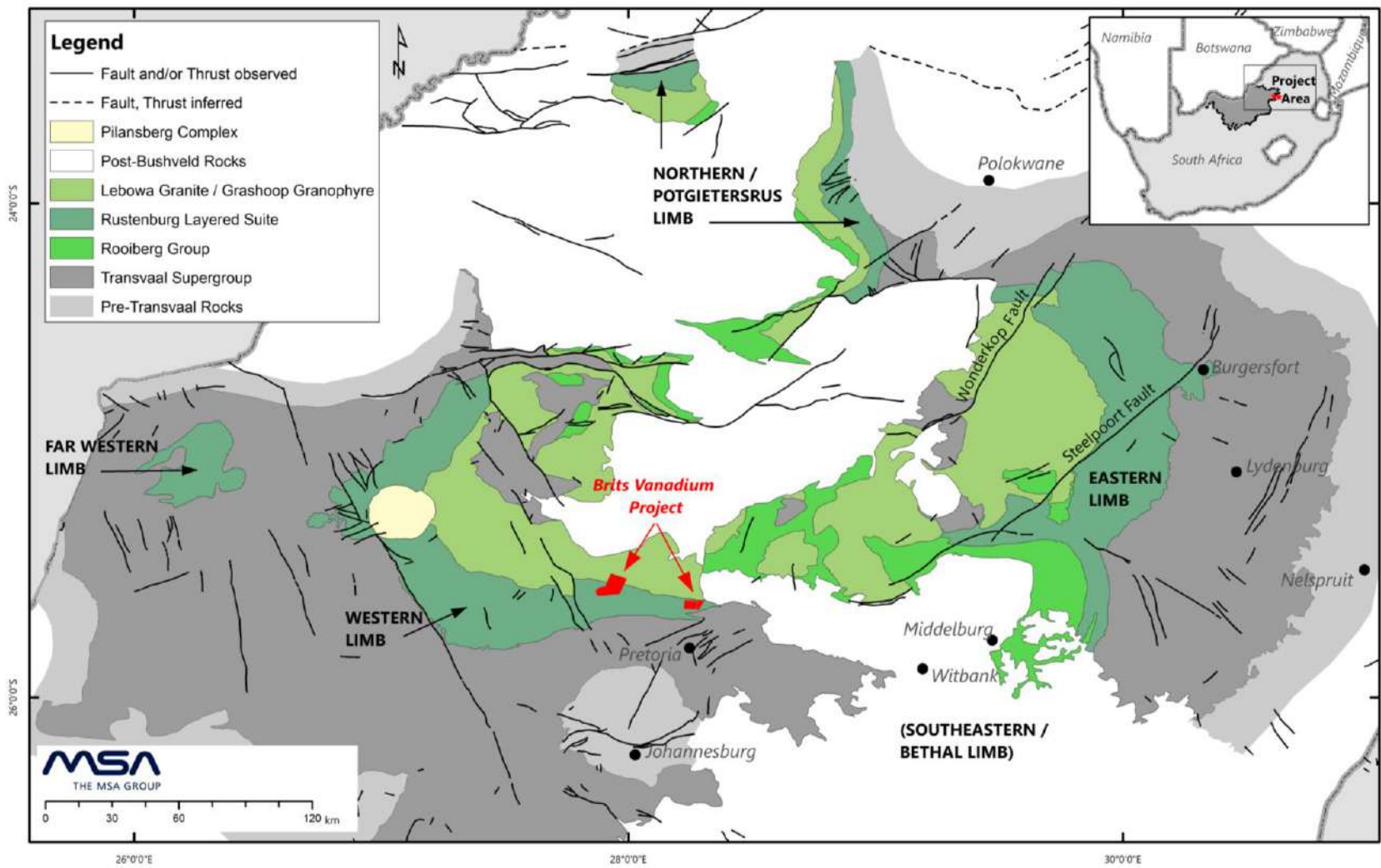
The magnetite layers extend from north of Tshwane (previously known as Pretoria) westwards towards Rustenburg, and then north-westwards to the Pilanesberg complex. North of the Pilanesberg, the magnetite layers trend in a north-easterly direction through Northam to near the town of Thabazimbi (Odendaal, 2015).

The magnetite-rich layers vary considerably in thickness, as well as concentrations of magnetite, vanadium pentoxide (V_2O_5) and titanium dioxide (TiO_2). The highest vanadium contents occur in the lowermost layers, which are characterised by grades of around 1.6 % V_2O_5 . This concentration decreases to about 0.25 % higher up in the stratigraphy. The titanium content varies and has an inverse relationship to the vanadium content. Titanium dioxide contents vary from about 11 % in the lowest layer to about 18 % in the top layer. Most of the vanadium is present in the magnetite grains, where it substitutes for trivalent iron.

The vanadium bearing magnetite deposits that are mined by Bushveld Vametco (to the west of Portions 2 and 3 of Uitvalgrond 431 JQ and Syferfontein 430 JQ) occur in the Upper Zone close to the contact with the underlying Main Zone.



Figure 5-1
Simplified geology of the Bushveld Complex



Source: Modified from Cawthorn et al. (2006)



Table 5-1
Stratigraphic zones of the Rustenburg Layered Suite

Unit	Sub-unit	Average Thickness	Dominant Lithology	Description
Upper Zone		~1,500 m	Gabbros with banded anorthosite and magnetite layers	Divided into three distinct sub-zones. The base of the Upper Zone is defined as the first appearance of cumulus magnetite. No chilled contact with the hangingwall rocks, which consist of rhyolites and granophyres.
Main Zone		3,500 m	Norite, gabbro-norite, anorthosite and minor pyroxenite	Comprises half of the RLS. Banding and layering not well developed.
Critical Zone	Upper Critical Zone ("UCZ")	1,400 m	Layered feldspathic pyroxenite, norite, anorthosite and chromitite	The base of the UCZ is marked by the first appearance of cumulus plagioclase. Norites dominate the UCZ, with subordinate feldspathic pyroxenite and anorthosite layers present at regular intervals through the UCZ. Economic chromite mineralisation is hosted in the Middle Group ("MG") chromitite layers. The MG series straddles the boundary between the LCZ and UCZ. The PGM-rich Merensky Reef and UG2 occur within the UCZ.
	Lower Critical Zone ("LCZ")		Feldspathic pyroxenite inter-layered with harzburgite and chromitite	Economic chromite mineralisation is hosted in the MG1 and MG2 seams and the Lower Group ("LG") chromitite layers. The LG contains seven chromitite layers.
Lower Zone		Varies – reaches a maximum of 1,700 m	Cyclically layered units of dunite-harzburgite and pyroxenite	Thickness varies and thins over basement highs. The most complete sequence is in the northeastern part of the Eastern Limb of the RLS where a series of dunite-harzburgite-pyroxenite cyclically layered units are well-exposed.
Marginal Zone		Several metres to hundreds of metres	Unlayered, heterogeneous ultramafic rocks, mostly norites	Contamination of the basic magmas by the enclosing host rocks. Sedimentary rock fragments are contained as xenoliths in the lower portions. Exposures of this zone are poor.

Source: Modified after Clay et al. (2014)



5.1.2 Project Geology

5.1.2.1 *Uitvalgrond 431 JQ – Portion 3*

Both the Main Zone (Pyramid Gabbro-norites) and the Upper Zone (Bierkraal Magnetite Gabbros) occur on the Brits Vanadium Project properties, including Portion 3 of Uitvalgrond 431 JQ which is the focus of the exploration work undertaken by BMN to date.

Underlying the northern regions of the farm are the Bierkraal Magnetite Gabbros, whilst the southern part is underlain by Pyramid Gabbro-Norites. The mafic layers are east-west striking and north dipping, with an average dip of 19°. The lithologies associated with the Main Zone are gabbro-norite, and locally anorthosite and pyroxenite bands. The lithologies in the Upper Zone, that occurs on the northern part of the Property, include magnetite-bearing gabbro, olivine-diorite and some anorthosite and magnetite layers.

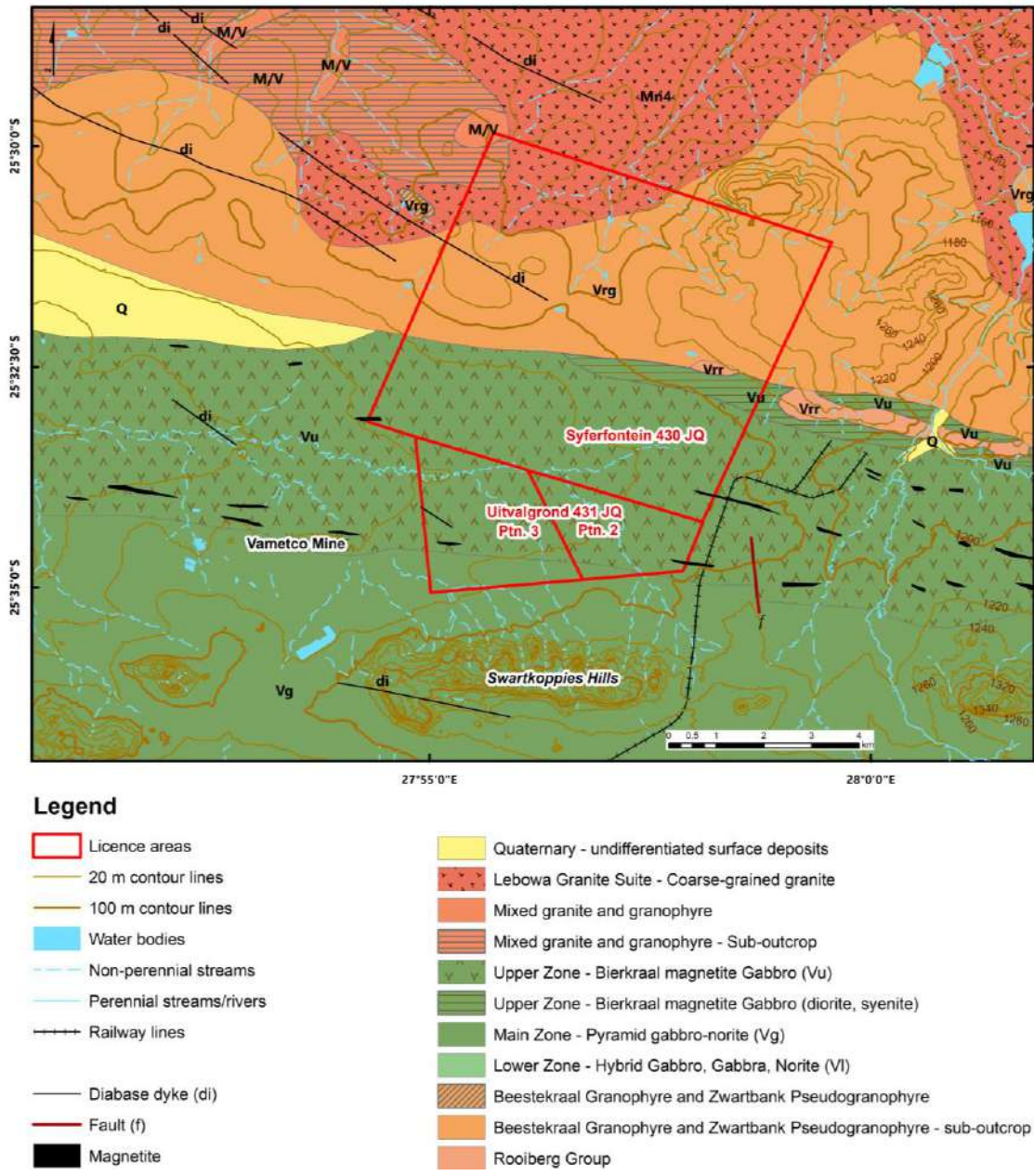
The magnetite bearing layers are grouped into three seams, namely the Upper, Intermediate and Lower seams, all of which dip to the north at approximately 19°. The seams occur just above the lower contact of the Upper Zone with the Main Zone and the Lower Seam rests on a prominent anorthosite layer.

A generalised geological map of Uitvalgrond 431 JQ (Portions 2 and 3) and Syferfontein 430 JQ is shown Figure 5-2.

The interpreted geological map, based on exploration undertaken on Uitvalgrond 431 JQ Portion 3, is shown in Figure 5-3. Figure 5-4 shows a schematic cross section through the stratigraphy. A schematic geological log is illustrated in Figure 5-5.



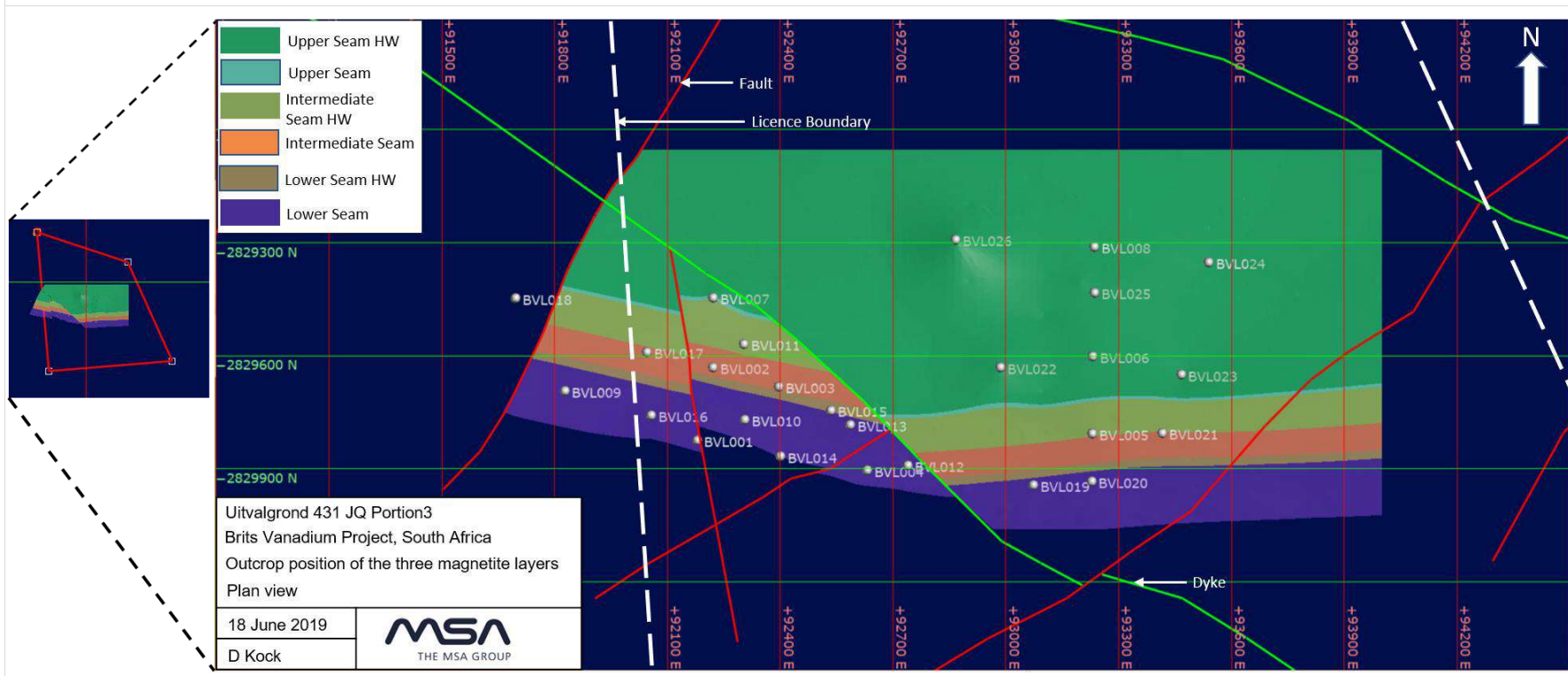
Figure 5-2
Geological map of Uitvalgrond 431 JQ (Portions 2 and 3) and Syferfontein 430 JQ



Source: Modified from the 2526 Rustenburg and 2528 Pretoria 1:250 000 geological maps (Council for Geoscience, South Africa)



Figure 5-3
Interpretation of the geology of Uitvalgrond 431 JQ – Portion 3



Source: The MSA Group (2019)

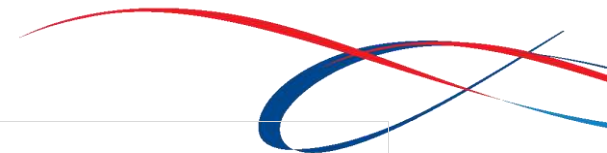
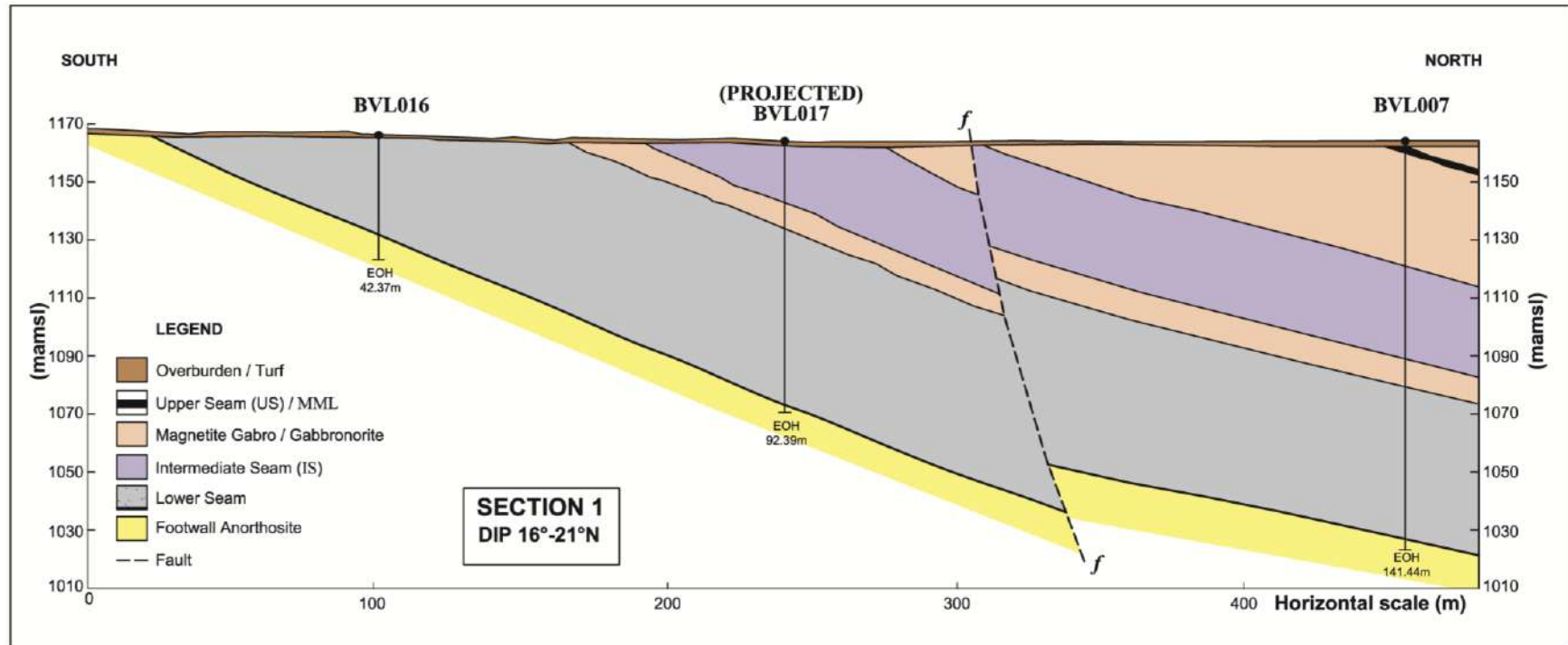


Figure 5-4

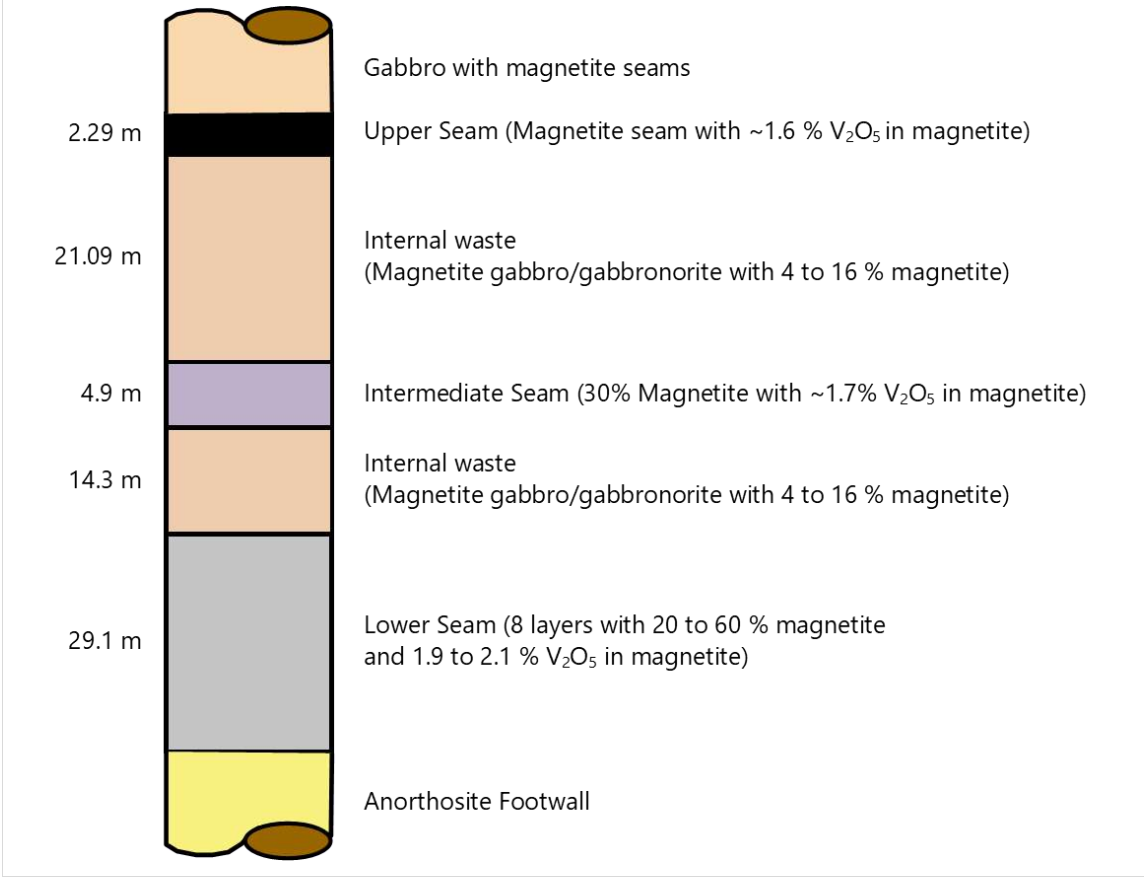
Schematic interpreted cross section through the stratigraphy of the magnetite-rich seams at Uitvalgrond 431 JQ Portion 3



Source: BMN (2019)



Figure 5-5
Schematic drillhole log depicting the typical stratigraphy at Uitvalgrond 431 JQ Portion 3



Source: Modified from JMA (2015)

The magnetite layers are mostly covered by a black organic soil and outcrops are easily identifiable in the field. The weathering has destroyed the original structure of the mafic rocks for a couple of metres below the surface where after the weathering is seen as calcium and silica fill in fractures.

Structure and intrusions

At least five faults have been identified, three of which have significant throws. The fault towards the far west of the property forms the western limit of the geological model. The two faults just to the east of the most western fault have significant throws and are both truncated by a northwest-southeast striking dyke. Significant displacement is indicated by layers occurring to the north and south of the dyke (Figure 5-3). The faults and dykes have been identified during geological mapping, magnetic surveys and in the cores of several drillholes.

Vanadium Mineralisation

Vanadium-rich magnetite bearing layers occur at the base of the Upper Zone and have a cumulative thickness of over 125 m. The layers of magnetite-bearing rocks have been classified into five major units, then further subdivided into 22 seams. The local stratigraphy with corresponding thicknesses and magnetite grade is provided in Table 5-2.



Table 5-2
Thickness and magnetite grade of the interpreted vanadium-rich magnetite layers

Seam Zone	Seam Sub-division	Thickness Range (m)	Magnetite Grade Range (%)
C-Zone	C-2	10.23-12.7	25-38
	C-1	12.0-23.2	14-19
Upper Seam ("US")	US-4	1.5-4.3	26-54
	US-3	2.4-4.8	11-19
	US-2	4.2-6.1	33-44
	US-1	1.8-3.8	72-89
B-Zone	B	21.0-51.4	1-4
Intermediate Seam ("IS")	INT-3	0.6-8.9	32-48
	INT-2	1.2-5.8	8-21
	INT-1	1.2-3.7	30-48
A-Zone	A-4	1.2-4.0	12-23
	A-3	2.7-7.9	1-7
	A-2	3.0-12.8	10-16
	A-1	7.0-15.5	14-20
Lower Seam ("LS")	LS-8	1.5-9.0	18-27
	LS-7	7.0-13.7	33-42
	LS-6	1.8-7.0	21-30
	LS-5	3.0-6.7	7-22
	LS-4	2.6-5.3	25-46
	LS-3	0.8-2.4	46-78
	LS-2	1.5-3.7	23-38
	LS-1	0.9-1.5	64-96

Source: Botha and Botes (2016)

At Uitvalgrond 431 JQ Portion 3, the Seam sub-division was simplified to Seam Zones for ease of reference. All Mineral Resource estimates are based on the Seam Zones. The Upper Seam as determined for the Mineral Resource comprises only US-1.

Geological Models

The long history of mining platinum group elements and chrome from the Bushveld Complex has led to thorough understanding of the geology. The origin of the concordant magnetite layers is a subject of debate with the currently most widely accepted theory being as follows:

- introduction of magma to the magma chamber resetting the crystallisation phase;
- decrease in the magma chamber pressure;
- settling and sorting of crystals through gravity; and
- change in oxygen content of the chamber.

Although their genesis is not fully understood, the occurrence of these magnetite layers in the same stratigraphic units is well documented throughout the Bushveld Complex.



Nature of Deposits on the Property

The magnetite layers are continuous over large distances. The layers strike in an east-west direction for 2.3 km and dip northwards at 19° within the property. The lower layers have been intersected at a depth of 276 m below surface, which equates to 810 m down-dip from outcrop on the plane of mineralisation.

Layer thicknesses are variable. The range of thicknesses for each layer is shown in Table 5-3.

Table 5-3			
Layer thicknesses of mineralised layers			
Magnetite Layer	Minimum thickness (m)	Maximum thickness (m)	Average thickness (m)
Upper Seam (US-1)	3.52	7.00	4.94
Intermediate Seam	16.14	38.00	28.74
Lower Seam	36.48	68.68	57.06

5.1.2.2 *Uitvalgrond 431 JQ Portion 2 and Syferfontein 430 JQ*

The surface geology of the property is represented by the Main and Upper Zones of the RLS. The Lower, Middle and Upper magnetite seams modelled on Uitvalgrond 431 JQ Portion 3 are assumed to continue along strike onto Uitvalgrond 431 JQ Portion 2. No detailed geological mapping or exploration has been undertaken on these properties. Figure 5-2 shows a simplified geological map of the area. The magnetite layers are thought to dip at between 10° and 40° to the north, with a general east-west strike (Quanto, 2012).

5.1.2.3 *Remainder Doornpoort 295 JR*

The surface geology of the property is represented by the Main and Upper Zones of the RLS (Figure 5-6). The RLS is disrupted by an outlier of Magaliesberg Quartzite of the Transvaal Supergroup,

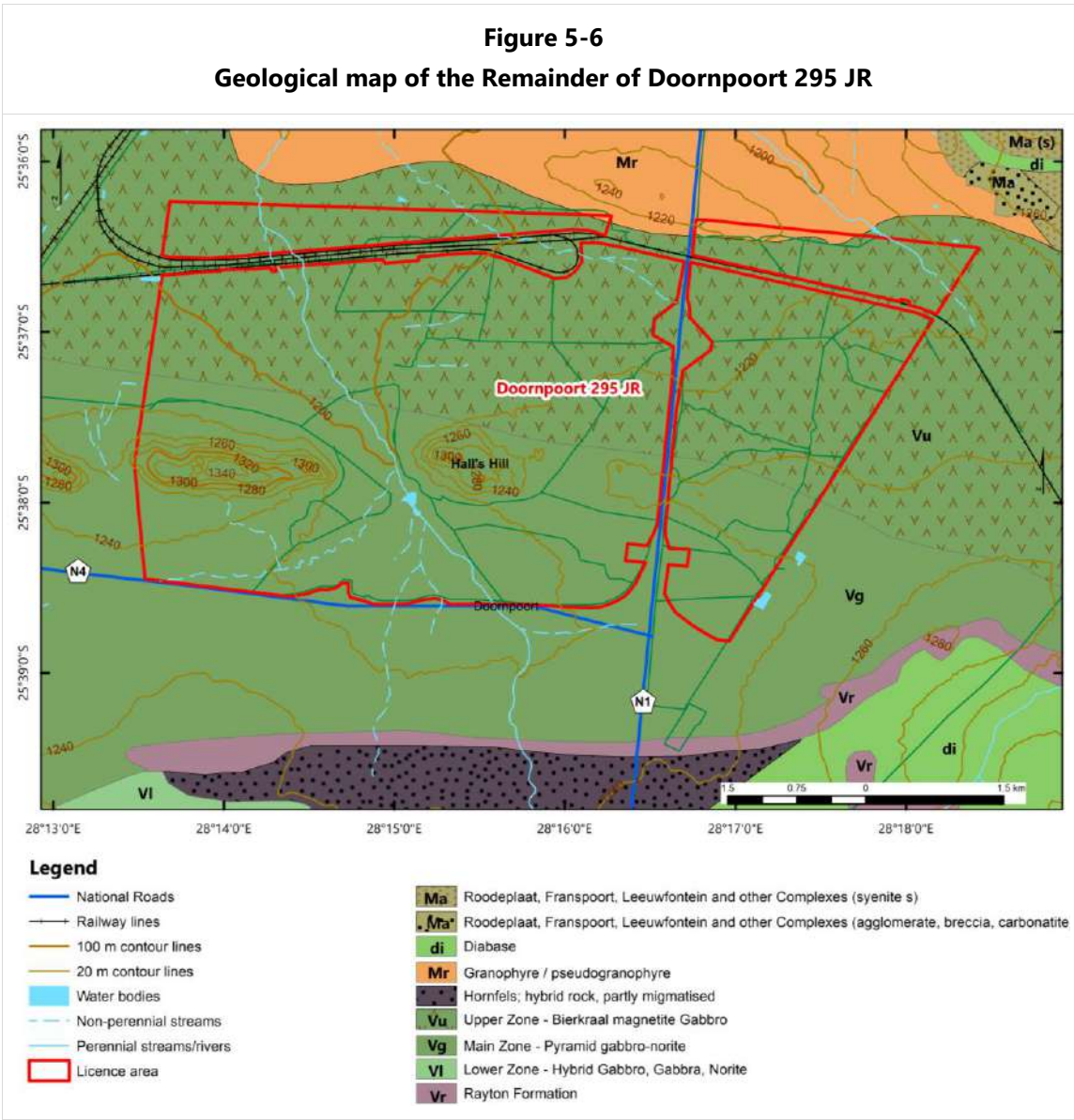
King and Odendaal (2012) extrapolated the location of the Merensky Reef and UG2 from publicly available information. Based on a review of the geology of the area, they concluded that Merensky Reef and UG2 may subcrop in the southern part of the property. The positions of the subcrop are conceptual in nature and are not based on any field mapping and/or exploration.

An average dip of 23° was estimated by Minxcon (King and Odendaal, 2012) for the Critical Zone, with local steepening of the dips against the outlier.

SPM extrapolated the location of the Main Magnetite Layer from visible outcrop and by interpretation of the magnetic survey, which indicated the presence of these outcrops and sub-outcrops to the north of Hall’s Hill. The Main Magnetite Layer outcrops on the western block of the property, with an east-west strike and an apparent dip of approximately 20° to the north. The inferred strike length covers a total of approximately 5.5 km, with an estimated thickness of 1 m (Odendaal, 2015). A thinner magnetite layer with a thickness of approximately 50 cm runs parallel and approximately 150 m to the south of the Main Magnetite Layer. Odendaal (2015) indicated



that this layer could be correlated with the Lower Magnetite contact, as indicated by the high vanadium content near the base of the Upper Zone of the RLS.



Source: Modified from the 1:250 000 2528 geological map (Council for Geoscience, South Africa)



6 EXPLORATION DATA/INFORMATION

BMN has undertaken exploration on Uitvalgrond 431 JQ Portion 3 only. This property is the subject of the Mineral Resource estimate and reporting on the exploration data and information is limited to this work only.

6.1 Desktop Studies

A desktop study was undertaken on available literature pertinent to Uitvalgrond 431 JQ Portion 3 by BMN personnel.

BMN personnel undertook a review of available hand-drawn hard copy cross-sections for the adjacent Vametco Vanadium Mine compiled in the 1970s as part of the historical drilling campaigns with a view to obtaining a better understanding of the stratigraphy, consistency and continuity of the magnetite deposits in the Uitvalgrond 431 JQ Portion 3 area. As the stratigraphy should not change across the fault that separates this property from the Vametco Vanadium Mine, the same understanding could be used for the interpretation of the stratigraphy.

6.2 Geological Mapping

A geological mapping programme was undertaken by BMN to delineate the contacts of the Upper and Main Zone of the RLS on the property. The desktop studies undertaken were used to inform the mapping programme.

Mapping included the identification of major fault zones on Uitvalgrond 431 JQ Portion 3.

An interpretation of the geology, based on the 2018 drilling programme (see Section 6.3) is shown in Figure 5-3.

6.3 Drilling

A drilling plan for the 2018 exploration programme was compiled based on the results of the desktop studies and geological mapping. Twenty-six diamond drillholes were drilled and considered for the estimation of the Mineral Resource for Uitvalgrond 431 JQ Portion 3.

Diamond drilling extracts a continuous cylinder of core by cutting the rock with a diamond impregnated drilling bit with a central opening. The cut core is pushed up through the opening into a core barrel through the downward force of the diamond drill rig. Once the core barrel is filled, the core is extracted via a wireline or manual extraction by removing each rod manually up to the core barrel. The core is then placed into core trays for storage and processing.

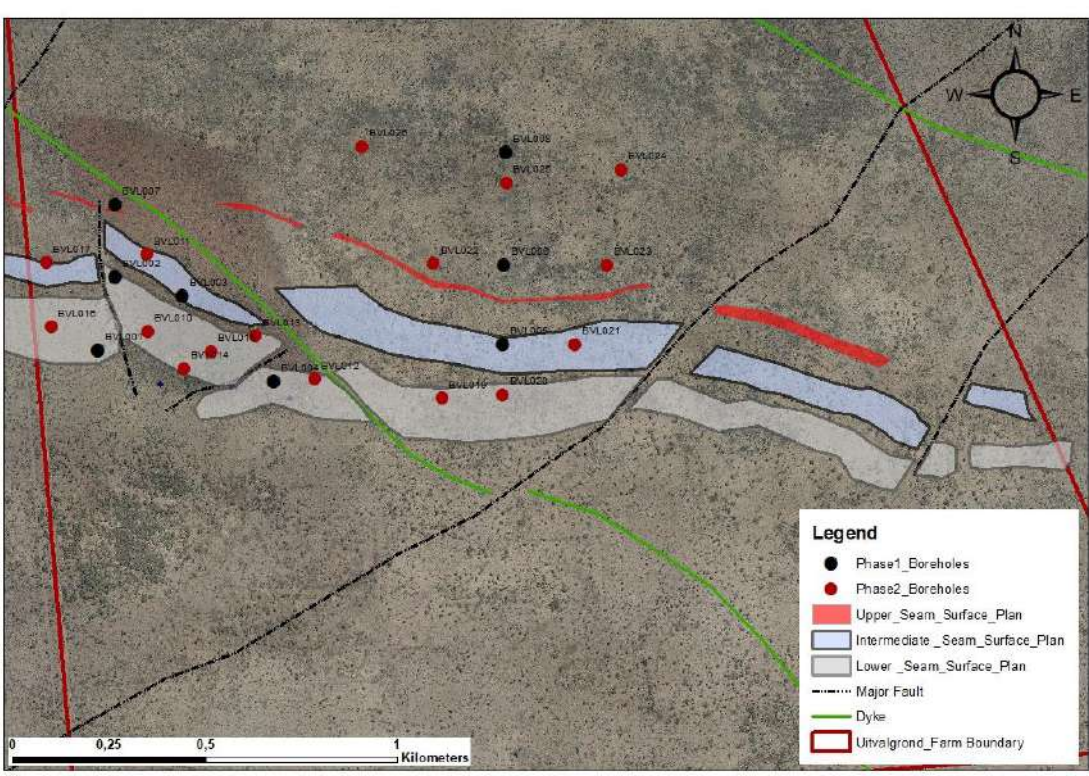
The 2018 drilling plan was designed to target the mineralisation of three main magnetite-rich seams; the Lower, Intermediate, and Upper Seams, with an objective to confirm the down-dip continuity and along strike extent of the seams.

The drilling (2018) was carried out by a specialised contractor, Diabor Geotechnical & Exploration Drilling (Pty) Ltd mobilized out of Rosslyn town, South Africa. All drilling was undertaken by diamond drill coring and the holes are near vertical at their collars. Generally, drillholes were drilled using NQ core (47.6 mm core size). No drillhole cores were oriented.



Twenty six exploration diamond drillholes (BVL001 to BVL026) were drilled by BMN from 08 March 2018 to 04 September 2018, as depicted in Figure 6-1. A total of 2,970.78 m of drill core were recovered during this drilling programme. Twenty-five of the twenty-six drillholes, were used to update the Mineral Resource Estimates for Uitvalgrond 431 JQ Portion 3. One drillhole was excluded as it was drilled on the western side of the large fault that separates the adjacent Vametco Vanadium Mine Property from the area of interest on Uitvalgrond 431 JQ Portion 3. It is recommended that the drillhole be added to the drillhole database for the Bushveld Vametco Mine. Diamond drillhole core is stored in the Bushveld Vametco core shed, located on the Vametco Vanadium Mine Property (to the west of Uitvalgrond 431 JQ Portion 3).

Figure 6-1
Drillhole collars for the 2018 Brits Vanadium exploration programme undertaken on
Uitvalgrond 431 JQ Portion 3



Source: Background imagery from ESRI World Imagery (sourced from Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community)

6.3.1 Logging of the 2018 Drillholes

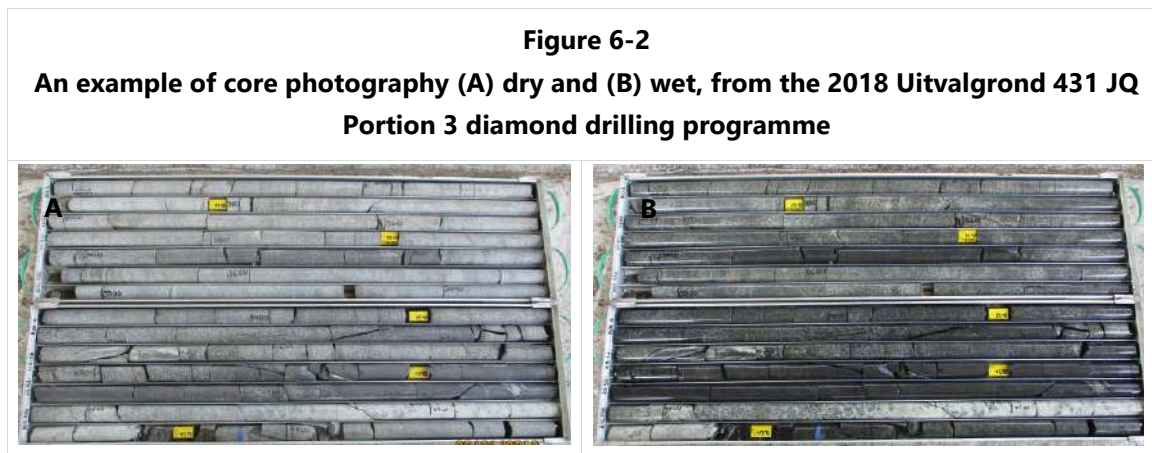
Detailed geological logging of core from the 2018 exploration drilling undertaken on Uitvalgrond 431 JQ Portion 3 was by qualified geologists who captured the information onto proforma capture sheets under supervision of the project geologist. The core was logged according to lithology, stratigraphic units; and mineralisation (visual percentage estimate of magnetite content of the rock). All cores were logged from the collar to end of hole (“EOH”). The total length of core in the 25 drillholes used for both the geological model and the Mineral Resource estimate is 2,750.27 m.



Once the geological logging was completed, the logs were captured in Microsoft Excel spreadsheets and the logs were printed. A qualified geologist then checked the core against the captured logs to verify that the data were recorded and captured correctly. The printed logs were then signed off and stored in the drillhole file. Each drillhole has an individual physical file in which all the hardcopy information relating to that drillhole is stored; this includes geological logs, survey certificates, collar certificates, sampling sheets, assay certificates etc. This hardcopy file is kept in addition to the electronic copies of all the drillhole data which is stored on local computers and the company's central computer server.

6.3.1.1 Core Photography – 2018 drilling

Photographs of all the drill core (dry and wet) were taken before splitting of the core for sampling (Figure 6-2). Photos were taken per two 1.5 m core trays in sequence and the complete drillhole was photographed from collar to EOH.



Source: BMN (2019)

6.3.2 Orientation of Data in Relation to Geological Structure

All drillholes were drilled vertically. The vanadium-rich magnetite-gabbro layers dip at an average of 19° to the north. The drilling intersected the various magnetite layers at an angle, but, given the thickness of the magnetite layers and reasonably high intersection angle, the angle of intersection will not introduce any bias in the Mineral Resource estimation.

6.3.3 Drillhole Sample Recovery

Drillhole core sample recoveries for new exploration drillholes included recording interval length, core recovered, total solid core, number of fractures, frequency of fractures and Rock Quality Designation ("RQD").

No discernible relationship exists between core recovery and grade.

6.3.4 Sample storage and security

All 2018 drillhole core is stored in the core shed at the Bushveld Vametco Mine.

Samples were not removed from the secured storage location without completion of a chain-of-custody document; this forms part of a continuous tracking system for the movement of the



samples and persons responsible for their security. Ultimate responsibility for the secure and timely delivery of the samples to the chosen analytical facility rests with the Project Geologist and samples were not transported in any manner without the Project Geologist's permission.

During the process of transportation between the Project site and analytical facility, the samples were inspected and signed for by each person or company handling them. It is the mandate of both the Supervising and Project Geologist to ensure secure transportation of the samples to the analytical facility. The original chain-of-custody document always accompanied the samples to their destination. The Supervising Geologist ensured that the analytical facility was aware of the BMN standards and requirements.

It is the responsibility of the analytical facility to inspect for evidence of possible contamination of, or tampering with, the shipment received from Bushveld Vametco Mine. A photocopy of the chain-of-custody document, signed and dated by an official of the analytical facility, was e-mailed back to the dispatching Project Geologist.

The analytical facility's instructions are that if they suspect the sample shipment was tampered with, they will immediately contact the Supervising Geologist, who will arrange for someone in the employment of Bushveld Vametco Mine to examine the sample shipment and confirm its integrity prior to the start of the analytical process.

Bushveld Vametco Mine's procedures are that if, upon inspection, the supervising Geologist has any concerns whatsoever that the sample shipment may have been tampered with or otherwise compromised, the responsible Geologist will immediately notify the Bushveld Vametco Mine Management in writing and will decide, with the input of Management, how to proceed. In most cases, analyses may still be completed, although the data must be treated, until proven otherwise, as suspect and unsuitable as a basis for a news release until additional sampling, quality control checks and examination prove their validity. Should there be evidence or suspicions of tampering or contamination of the sampling, Bushveld Vametco Mine will immediately undertake a security review of the entire operating procedure. The investigation will be conducted by an independent third party, whose report is to be delivered directly and solely to the directors of Bushveld Vametco Mine, for their consideration and drafting of an action plan. In cases such as above, exploration activities are required to be suspended until the review is complete and the findings are conveyed to the directors of the company and acted upon.

A chain of custody is in place for the entire sample handling process from the sample preparation point to and from the laboratory.

6.4 Sampling and Assaying

6.4.1 Sampling of the 2018 Drillholes

Sampling of the 2018 drillhole core was carried out at the core shed at the Bushveld Vametco Mine.



Technical Personnel from Bushveld Vametco Mine were responsible for:

- sample collection;
- core splitting;
- sample dispatch to the analytical laboratory;
- sample storage; and
- sample security.

When the geological logging of the drillhole core was completed and validated, the qualified geologist identified the units to be sampled based on stratigraphic, lithological and visible magnetite mineralisation criteria. The cores were continuously sampled from the top of the mineralised zone to well below footwall contacts. Not all drillhole core was sampled, but all core with visually identifiable magnetite mineralisation was sampled.

The geologist varied the thickness of sampling intervals according to changes in stratigraphy, lithology and mineralisation in order to ensure that samples did not cross-cut these boundaries. The sampling start and end positions were based on the lithological contacts and/or the occurrence of significant magnetite concentration. High grade zones (magnetite concentration >20%) were identified and the sample interval was limited to a maximum interval of 0.5 m and minimum interval of 0.3 m, whilst the low-grade zones (magnetite concentration < 20%) were sampled to a maximum of 1.0 m. Where the magnetite concentration fell below 10%, the sample interval was increased to a maximum of 2.0 m. 95 % of all samples taken were equal to or less than 1.0 m in length. The intervals were varied to respect geological boundaries. Areas of core loss were recorded, and depths of the samples carefully noted to exclude these intervals.

The geologist prepared the sampling instruction sheet for the samples, which included sample depths and sample numbers together with the depths where blank and standard samples were to be inserted.

Before any sampling took place, the core was orientated and secured together with buffing tape in places where it was broken to ensure the core splitting line remained the same from the start to the end of the samples (Figure 6-3 A). A continuous line, marking the estimated plane of symmetry, was drawn on the core by the sampling geologist to ensure that all cores were split correctly. Drill core was cut longitudinally in half using a rotating diamond saw blade (Figure 6-3 B). The split core was placed back in the core tray (Figure 6-3 C) and put in the sun to dry. When the core was dry, samplers marked the sample intervals and the sample number on the core. The cores were marked on both the section of core to be sampled and the core to remain in the tray as per instructions on the sample sheet. All drillhole core was sampled dry. It was the responsibility of the sampler to ensure that representative samples were taken, i.e. one side of the core was sampled for all samples (Figure 6-3 D), to ensure that the correct ticket was allocated to the sample as stated on the sample sheet, and that the sample plastic bags were properly labelled (Figure 6-3 D and E).

For the first eight drillholes (BVL001 to BVL008) a Certified Reference Material; ("CRM") (AMIS0368) standard sample was inserted after every 20th sample and a blank sample (AMIS0439) was inserted every alternate 10th sample so that a QAQC sample was inserted after every 10th sample within the sample stream.



For the last 18 drillholes (BVL009 to BVL026) a CRM (AMIS0368) standard sample was inserted after every 10th sample and a blank sample (AMIS0439) was inserted every alternate 5th sample so that a QAQC sample was inserted after every 5th sample within the sample stream.

The section of core to be sampled was placed in a plastic bag by the sampler or their assistant after any tape was removed. A sample ticket from the ticket book was inserted and the sample bags were stapled closed. For CRM's, the label identifying the standard was removed and stored in a separate bag for reference purposes. The sample number assigned to the CRM was written on the standard label itself. The sachet was then placed in a sample bag with the sample ticket. For blank samples, material was placed in the sample bag with the corresponding sample ticket. The sample number was also written on the bag itself. Samples were placed together into a bigger bag (Figure 6-3 F) and sealed prior to dispatch.



Note: A) Sample preparation; B) drillcore splitter; C) split drillcore; D) sample bagging; E) sample stream in small bags; F) big bag containing small sample bags ready for submission to the laboratory.

Source: Vametco (2019)

A total of 2,088 core samples were prepared from the 2018 drilling programme. One hundred and sixty six AMIS0368 CRMs and 171 AMIS0439 blank samples were inserted into the sample stream.

6.4.1.1 Quality control prior to dispatch

The Project Geologist was responsible for timely delivery of the samples to the Bushveld Vametco Mine onsite laboratory. The supervising and project geologists ensure that samples were transported by designated BMN and/or Bushveld Vametco Mine drivers, depending on staff availabilities.



When the samples were prepared for shipment to the analytical facility, the following procedure was followed:

- samples are sequenced within the secure storage area (Figure 6-3 E) and the sample sequences examined to determine if any samples were out of order or missing;
- The sample sequences and numbers shipped are recorded both on the chain-of-custody form and on the analytical request form;
- the samples are placed according to sequence into large plastic bags (Figure 6-3 F) (the numbers of the samples were enclosed on the outside of the bag with the shipment, waybill or order number and the number of bags included in the shipment);
- the chain-of-custody form and analytical request sheet are completed, signed and dated by the project geologist before the samples are removed from secured storage. The project geologist keeps copies of the analytical request form and the chain-of-custody form on site; and
- once the above is completed and the sample shipping bags are sealed, the samples may be removed from the secured area. The method by which the sample shipment bags were secured must be recorded on the chain-of-custody document so that the recipient can inspect for tampering of the shipment.

6.4.2 Assaying

Once at the laboratory, the samples were assayed. Typical analyses include:

- whole rock vanadium pentoxide (V_2O_5);
- percentage of magnetic material by Davis Tube test;
- percentage vanadium pentoxide (V_2O_5) in the magnetic material;
- whole rock calcium percentage; and
- whole rock silica percentage.

6.4.2.1 2018 Drillhole Samples

The primary laboratory used for the analyses was Bushveld Vametco Mine's onsite laboratory (see Section 2.4.2) located at the Bushveld Vametco Mine, just outside of Brits. ALS Global (Edenvale, Johannesburg, South Africa) ("ALS") was used for the analysis of the umpire samples.

X-ray fluorescence ("XRF") spectroscopy using the fusion technique was used for analysis of whole rock and concentrate. Davis Tube wet magnetic separation was used to separate the magnetic portion (concentrate) from the head sample.

Blank and standard samples were inserted in the sample stream by the laboratory for QAQC purposes. Five per cent of samples (duplicates) using different sample IDs were assayed as duplicated by the primary laboratory. QAQC plots were completed on assay results received to ensure they are acceptable.

The Bushveld Vametco Mine laboratory analysed a total of 1,655 whole rock samples and 1,627 magnetic portion samples (wet magnetic separation from the whole rock samples). ALS analysed approximately 7 % of the total whole rock samples, i.e. 120 umpire samples were analysed.



6.5 Digital Terrain Model and Orthophoto

Premier Mapping CC carried out a Drone survey of the Brits Vanadium Project area on the 29th March 2019 in order to produce a digital terrain model (“DTM”). This DTM was used to limit the surface extensions of the Mineral Resource model.

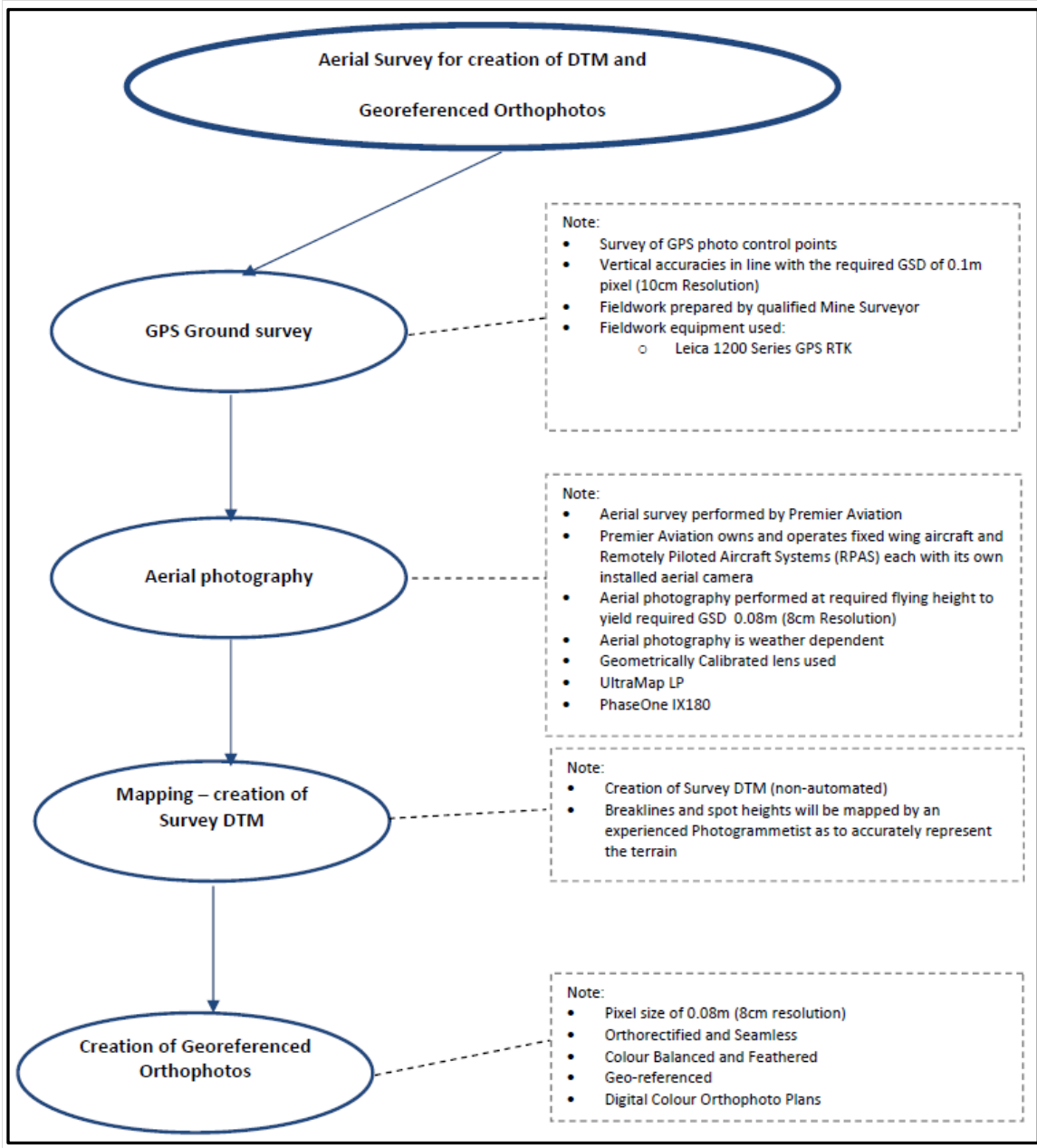
Methodology:

- The Project Geologist provided Premier Mapping CC with a Google Earth KML file for the target area.
- Premier Mapping CC established a control point in the area of interest and a number of pre-marks (white crosses) were placed around the borders of the requested area.
- The area was then surveyed.
- A drone with a large format camera and calibrated lens was used to capture an image of the target area.
- The images were processed to create an intense point cloud, which was then intelligently filtered to a more manageable data size (100's of millions of points were reduced down to 2 to 3 million points).
- An experienced operator checked all the data visually in stereo and added in additional break lines or survey points where required. Any points identified as having been incorrectly filtered were removed.
- An orthophoto was created from the completed DTM.

The diagram in Figure 6-4 summarises the methodology employed for the creation of a DTM and/or orthophoto.



Figure 6-4
Methodology employed in the creation of a digital terrain model and/or orthophoto



Source: Vametco (2019)

6.6 Database Management

All drilling information was captured and validated in a Microsoft Excel™ spreadsheet. Information includes the collar position of the drillhole, drillhole number, logging geologist and depth intervals of various lithologies. The samples taken from the various magnetite layers were captured into a second Microsoft Excel™ spreadsheet. The data were then saved on a central computer network for future access.



6.7 QAQC Analyses

6.7.1 QAQC for the 2018 exploration drillholes

The laboratories used for the analysis of the Brits Vanadium 2018 exploration programme samples are listed below together with their associated certifications:

- Bushveld Vametco Mine onsite laboratory is a SANAS accredited analytical laboratory with ISO17025 and ISO9001. This facility was used as the primary laboratory for Brits Vanadium exploration samples; and
- ALS is an ISO 17025 accredited analytical chemistry laboratory (SANAS Accreditation Number T0387). This facility was used as a secondary laboratory for check samples (“umpire” analyses).

Commercial mineralised and blank CRMs, obtained from African Mineral Standards (“AMIS”), were inserted in the field by the samplers to assess the quality of the assays. The details of those CRMs are shown in Table 6-1.

CRM	Description	Fe (%)	Ti (%)	V (%)
AMIS0368	Vanadium bearing titaniferous magnetite ore reference material	53.01	8.26	0.84
AMIS0439	Blank silica chips			

At least one blank and one CRM sample were inserted alternatively every ten samples resulting in approximately 5 % of the assays being from the CRM and 5% from the blank sample.

Four per cent of the total sample rejects submitted to the primary laboratory were selected and resubmitted as duplicates to compare the results with the original.

A further 51 % of total sample rejects were randomly selected and sent to a secondary laboratory as “umpire samples” to check the results from the primary laboratory.

6.7.1.1 Results of the QAQC assays

QAQC plots for the assay data sets were completed and the assay data received from the secondary laboratory was compared with that of the primary laboratory. The blanks sample results indicate that no material contamination took place during the assaying process (Figure 6-5), although some contamination has occurred up to levels of 0.04% V₂O₅. The CRM results demonstrate that the assays tend to be slightly higher than the CRM. Assays regularly fell outside the two standard deviation warning limit of 0.04% V and 18 failures (12 %) outside the three standard deviation (0.06 % V) tolerance limit occur (Figure 6-6), which shows that the laboratory can produce less than satisfactory assays at times.



Figure 6-5
Blank sample analyses for Uitvalgrond 431 JQ Portion 3 2018 drillhole samples

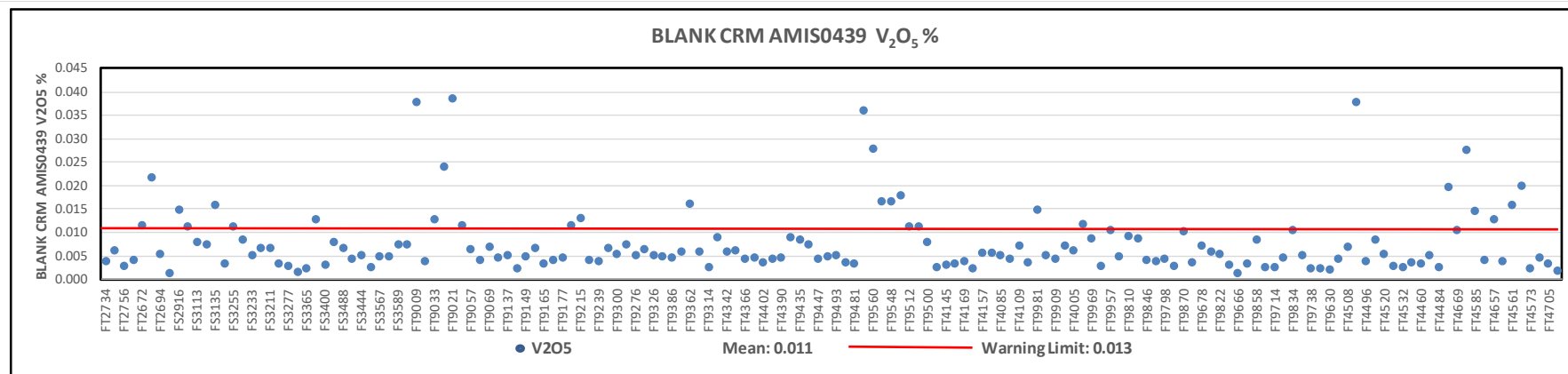
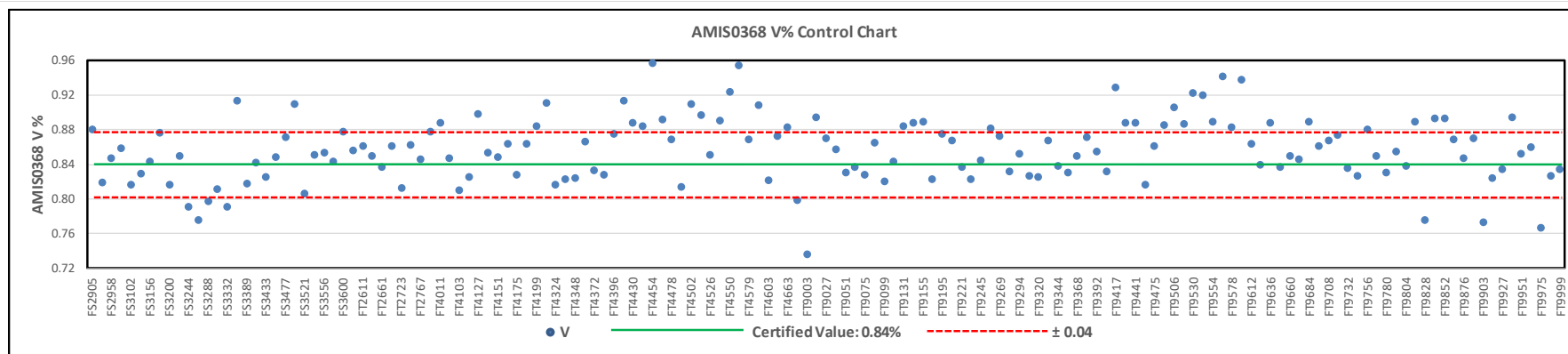
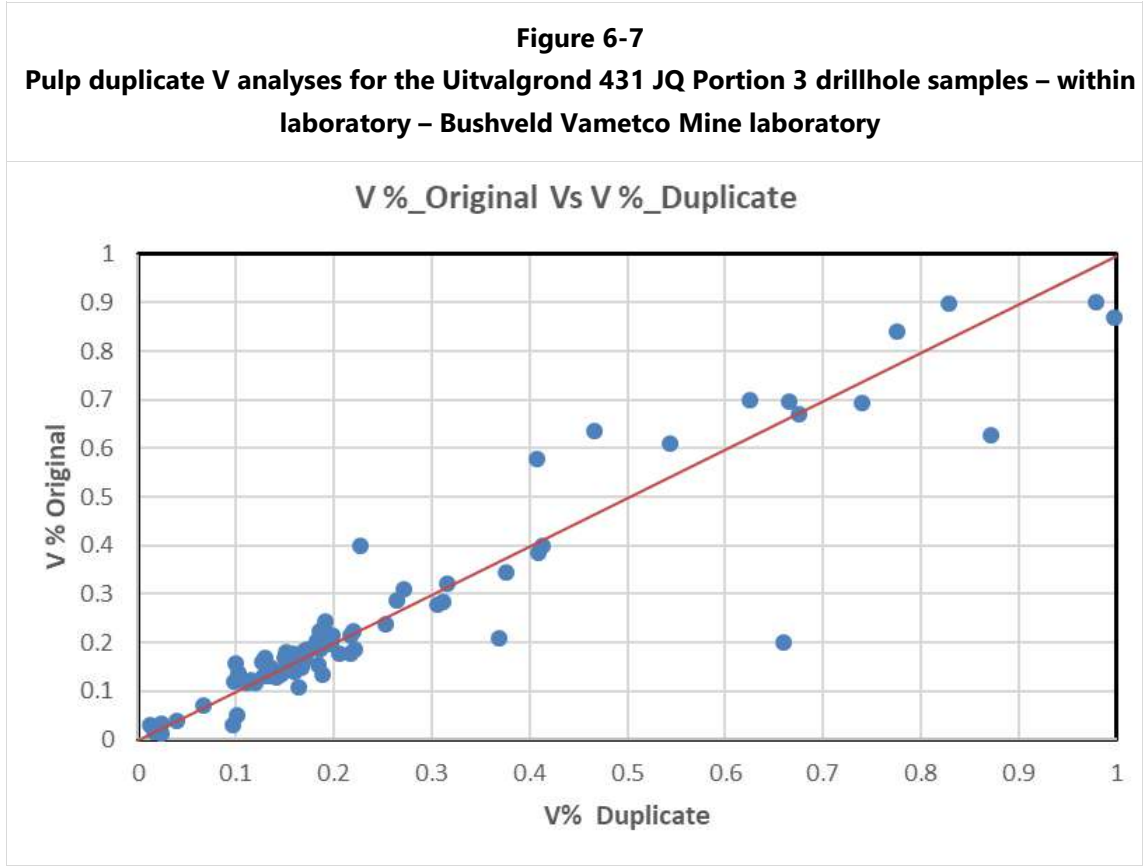


Figure 6-6
CRM sample analyses for the Uitvalgrond 431 JQ Portion 3 drillhole samples





The within laboratory pulp duplicates show that most of the time the Bushveld Vametco Mine laboratory was able to repeat the original analyses with a high degree of precision although four samples were outside normal; acceptable limits of 5 % (Figure 6-7).

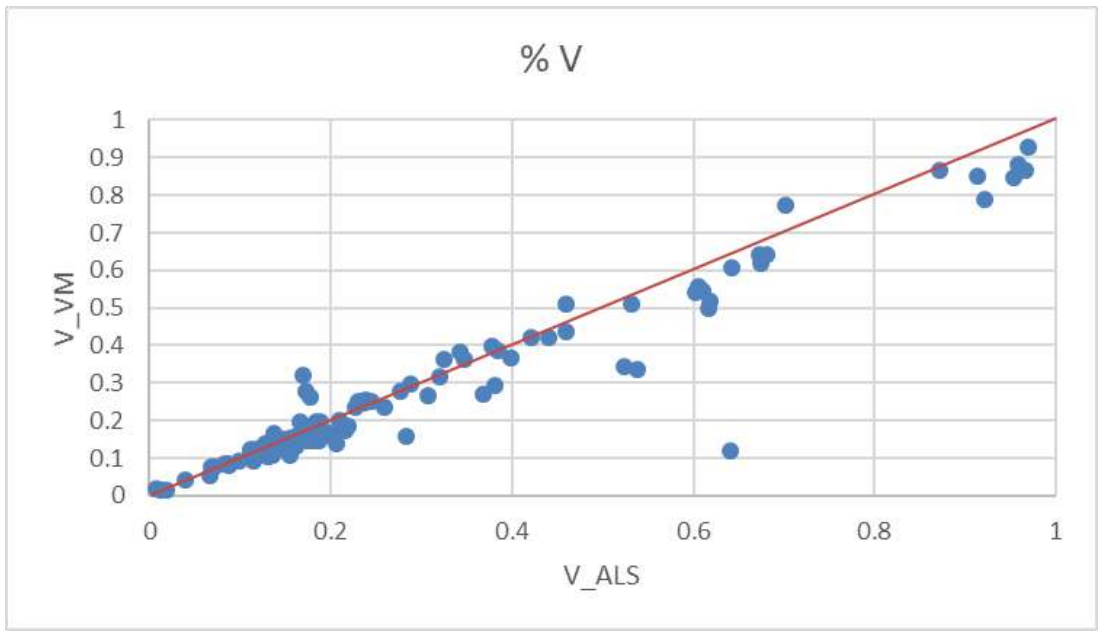


The analysis of duplicate samples by the second laboratory (ALS) compared well with the original assays by the primary laboratory. This is with the exception of four samples where a difference was noted outside of the normally acceptable 10% limits (Figure 6-8). The secondary laboratory had a tendency to produce slightly higher assays than the primary laboratory, which is contradictory to the slight high bias tendency noted with the CRM assays.

The Competent Person (Mr J Witley) considers that the 2018 exploration sample V_2O_5 assays for Brits Project were completed with a reasonable degree of accuracy and precision with generally minor amounts of contamination. The V assays by the primary laboratory (Bushveld Vametco Mine laboratory) were confirmed within reasonable limits by analysis at a second laboratory (ALS). The high number of CRM failures is a concern, which is to some degree lessened by the results of the second laboratory assay.



Figure 6-8
Pulp duplicate V analyses for the Uitvalgrond 431 JQ Portion 3 2018 drillhole samples – between laboratories: Bushveld Vametco Mine laboratory vs ALS



6.8 Location of Data

The grid system for the Project is WGS84 LO27.

All the drillholes completed during the 2018 exploration campaign were surveyed by the Bushveld Vametco Mine Surveyor using DGPS survey equipment. All holes were drilled vertically. No downhole surveys were conducted, and all holes were assumed as being drilled as collared for their entire length.

The depths of drilling range between 39 m and 280 m.

The survey methods applied are sufficient to spatially locate topography and drillholes for use in Mineral Resource estimation to a reasonable level of confidence.

6.9 Data Verification, Audits and Reviews

6.9.1 2018 Exploration Drilling, Sampling and Assaying

No twin drillholes were drilled. Assays were confirmed by a second laboratory (ALS).

The Competent Person examined the cores and verified the presence of the magnetite mineralisation during a site visit to the property on 28 May 2019. The CP found that the sampling and logging were of reasonable quality for the purposes of Mineral Resource estimation.



6.10 Exploration Budget and Programme

Exploration expenditure (Table 6-2) for the Uitvalgrond 431 JQ Portion 3 for 2018 was ZAR 3,674,020.

Table 6-2 Exploration expenditure (FY2018)	
Description	Amount (ZAR)
Drilling and Sampling, sample analysis	2,781,098.64
Field Work	821,422.19
Ground Magnetics	71,500.00

Source: BMN (2019)

An exploration budget of approximately ZAR 6,282,870 for infill drilling and sampling has been estimated for the remainder of 2019 through to 2024 (as of 31 May 2019). A summary of the budget is presented in Table 6-3.

Table 6-3 Exploration budget for Uitvalgrond 431 JQ Portion 3 (FY2019 to FY2024)	
Description	Amount (ZAR)
Consumables	391,700
Drilling	4,730,000
Laboratory Costs	390,000
Field and Camp Expenditure	220,000
Site Establishment and Consumables	15,000
Contingency	551,170
Total Estimated Budget	6,282,870

Source: BMN (2019)



7 MINERAL RESOURCE ESTIMATES

The Mineral Resources presented herein have an effective date of 18 June 2019. The Mineral Resource estimate incorporates drilling data from holes completed by BMN in 2018.

The Mineral Resource was prepared in accordance with the guidelines of the 2012 Edition of the JORC Code. To the best of the CP's knowledge there are currently no title, legal, taxation, marketing, permitting, socio-economic or other relevant issues that may materially affect the Mineral Resource described in this report.

The Mineral Resource estimate was conducted using Datamine Studio RM software, together with Microsoft Excel, JMP and Snowden Supervisor for data analysis, and Leapfrog Geo for geological modelling. The Mineral Resource estimate was completed by Mr Daniel Kock, a Senior Mineral Resource Consultant for MSA under the guidance of Mr Jeremy Witley, Head of Mineral Resources for MSA.

7.1 Input Data

The database provided by BMN for the Mineral Resource estimate consists of information from 26 diamond drillholes ("DD"), and includes information for:

- collar surveys,
- sampling and assay data,
- geology logs, containing rock type and seam name.
- a DTM completed on 29 March 2019.

The 2018 BMN drilling campaign provided density data for the magnetite-rich seams as well as for the waste zones between the magnetite-rich layers.

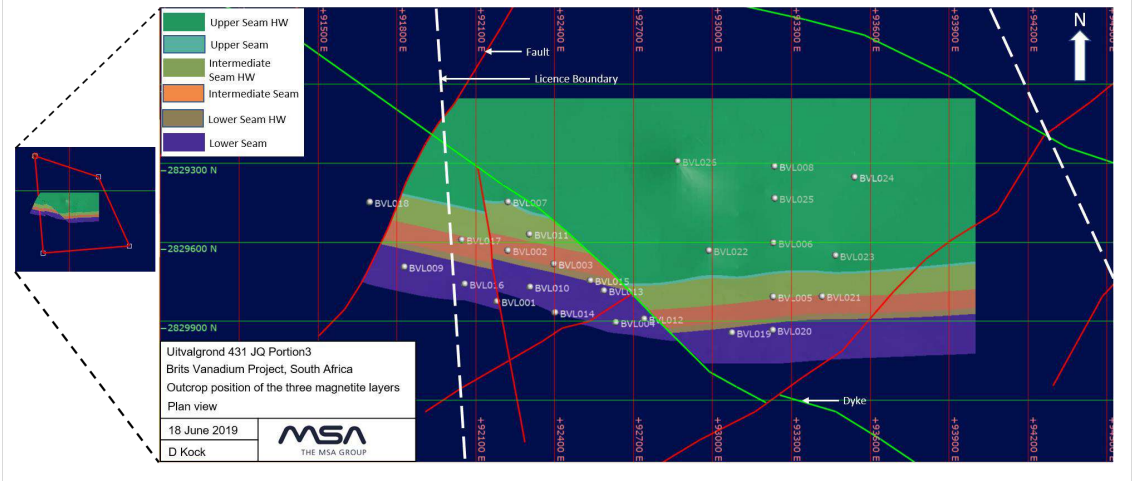
The drillhole data were provided in a Microsoft Excel spreadsheet. A summary of the drillhole data in the Excel database provided to MSA is shown in Table 7-1. The drillhole spacing at Uitvalgrond 431 JQ Portion 3 is not based on a fixed grid pattern (Figure 7-1).



Table 7-1
Summary of the drillhole data provided to MSA

Drillhole name	End of hole depth (m)	Drillhole collar coordinates (m) WGS84 LO29		
		X	Y	Z
BVL001	70.76	92179.3	-2829824.3	1166.2
BVL002	79.35	92220.7	-2829630.7	1164.2
BVL003	77.32	92396.0	-2829682.1	1165.8
BVL004	40.35	92631.1	-2829903.9	1170.6
BVL005	99.36	93229.5	-2829806.4	1171.6
BVL006	172.35	93230.5	-2829601.4	1169.9
BVL007	141.44	92221.2	-2829445.7	1162.8
BVL008	151.40	93235.0	-2829310.6	1167.8
BVL009	45.40	91827.1	-2829693.2	1162.7
BVL010	33.02	92305.2	-2829769.6	1166.2
BVL011	101.62	92303.0	-2829568.9	1164.1
BVL012	42.23	92739.1	-2829891.1	1170.8
BVL013	72.75	92586.0	-2829783.2	1168.4
BVL014	39.86	92400.4	-2829866.6	1168.4
BVL015	77.56	92534.8	-2829745.1	1167.5
BVL016	42.37	92056.5	-2829758.0	1164.6
BVL017	92.39	92045.0	-2829590.2	1162.9
BVL019	54.40	93072.9	-2829943.3	1172.4
BVL020	49.52	93228.3	-2829933.4	1172.7
BVL021	103.77	93415.9	-2829805.3	1172.5
BVL022	234.63	92985.2	-2829630.5	1168.5
BVL023	164.30	93466.7	-2829649.7	1171.6
BVL024	251.03	93539.3	-2829351.8	1168.8
BVL025	232.74	93235.7	-2829432.6	1168.6
BVL026	279.47	92866.3	-2829291.8	1166.0

Figure 7-1
Brits Vanadium (Uitvalgrond 431 JQ Portion 3) surface plan of the three vanadiferous magnetite enriched layers as geologically modelled with drill hole localities highlighted





The holes were drilled vertically downwards through the magnetite layers. The drillhole intersections of the mineralised zones are spaced between approximately 50 m and 250 m apart on the plane of mineralisation. Not all the layers were intersected in each hole, some of the holes being collared within the footwall of the Upper and Intermediate Seams.

7.2 Exploratory Analysis of the Raw Data

The data provided by BMN consist of sampling and logging data from 26 DD holes. The following attributes are of direct relevance to the estimate:

- whole rock and magnetite concentrate vanadium pentoxide (V_2O_5), whole rock calcium (Ca), and whole rock silicon (Si) assays, and magnetite content (Mag) in percent. The magnetite content is the result of Davies Tube tests;
- V_2O_5 grade of the magnetic concentrate;
- density; and
- seam names – Upper (“US”), Intermediate (“IS”) and Lower Seam (“LS”).

V_2O_5 mineralisation is known to occur within continuous layers of magnetite-rich gabbro in the Upper Zone of the RLS. Drilling intersected magnetite mineralisation in all the holes drilled along approximately 1.9 km of strike within the mining license area. The maximum depth below surface of the intersections of the Upper, Intermediate and Lower Seams is at approximately 130 m, 200 m and 270 m respectively.

One hole (BVL018) was drilled on the western side of a large fault that separates the adjacent Vametco Vanadium Mine deposit from this area, and this hole was excluded from the geological modelling and subsequent Mineral Resource estimation. A fault occurs towards the east of the property which forms the eastern limit of the Mineral Resource area, there being no drillholes completed east of this fault.

The Upper Seam drilled thickness is between 3.52 m and 7.00 m with an average thickness of 4.94 m. This zone is a well disseminated to massive magnetite layer and has the highest magnetite content of the three seams, but the V_2O_5 grade of the magnetite tends to be the lowest.

The Intermediate Seam drilled thickness is between 16.14 m and 38.00 m with an average thickness of 28.74 m. The magnetite content in this seam is the lowest of the three layers and the V_2O_5 grade of the magnetite is the highest.

The Lower Seam drilled thickness is between 36.48 m and 68.68 m with an average thickness of 57.06 m. This zone is the thickest of the three magnetite layers and has a magnetite content and V_2O_5 magnetite grade in between that of the Upper and Intermediate Seams.

The general trend in the V_2O_5 grade of magnetite in the adjacent Vametco Vanadium Mine deposit shows an increase from the Upper Seam downwards to the Lower Seam and thus the general grade trend through the stratigraphy at Uitvalgrond 431 JQ Portion 3 is considered uncharacteristic.



7.2.1 Validation of the data

The validation process consisted of:

- examining the sample assay, collar survey and geology data to ensure that the data are complete for all drillholes;
- examining the de-surveyed data in three dimensions to check for spatial errors;
- examining the assay data to ascertain whether they are within expected ranges;
- checks for "From-To" errors, to ensure that the sample data do not overlap one another or that there are no unexplained gaps between samples; and
- examining the consistency of the different seam thickness.

The data validation exercise revealed the following:

- as at the effective date of this report, there were no outstanding drilling data;
- SG measurements were supplied for drillhole samples but not for every sample;
- there are no unresolved errors relating to missing intervals and overlaps in the drillhole logging data;
- no default values were found;
- the position where sampling of the core commenced and ended for each layer was based on the occurrence of significant magnetite concentration – greater than 20 %. Within the individual layers, zones of low-grade are apparent. The low-grade zones were analysed for magnetite content but were not always assayed for V₂O₅, Si or Ca unless the magnetite was greater than 20 %;
- examination of the drillhole data in three dimensions shows that the collar coordinates of the drillholes plot in their expected positions;
- high-grade assays were checked, and none were found that are outside of expected limits for the style of mineralisation at Uitvalgrond 431 JQ Portion 3; and
- anomalous Intermediate Seam thicknesses were found in BVL 022 (67 m) and BVL 026 (85 m), which were not consistent with the regional and local seam thickness for the Intermediate Seam. The two drillholes were examined by MSA and recoded to conform with the Intermediate Seam thickness displayed by other drillholes based on the top and bottom contacts of surrounding drillholes on the property (Uitvalgrond 431 JQ Portion 3). The final thickness used in the geological model was 38 m for BVL 022 and 36 m for BVL 026.

A further check was made by comparing the V₂O₅ magnetite concentrate assays with the magnetite content, as it is expected that the V₂O₅ magnetite concentrate grade should not vary considerably between holes within an individual layer. The majority of the intersections were as expected except in the south eastern area. In this area two holes (BVL021 and BVL023) have a relatively high V₂O₅ grade of magnetite of 2.1 % and 1.88 % respectively for the Intermediate Seam. These high grade values resulted in an anomalously high grade zone in the grade block model estimate (Figure 7-2 and Figure 7-3). The mean V₂O₅ in magnetite grade is 1.63 %. For all holes excluding drillholes BVL021 and BVL023, the mean V₂O₅ in magnetite grade is 1.56 % and for drillholes BVL021 and BVL023, the mean V₂O₅ in magnetite grade is 2.01 %.

Further drilling is recommended east of these intersections to confirm the extent of the high grade zone in the southeast.



Figure 7-2
Plan view of the high grade zone in the grade block model estimate for the Intermediate Seam

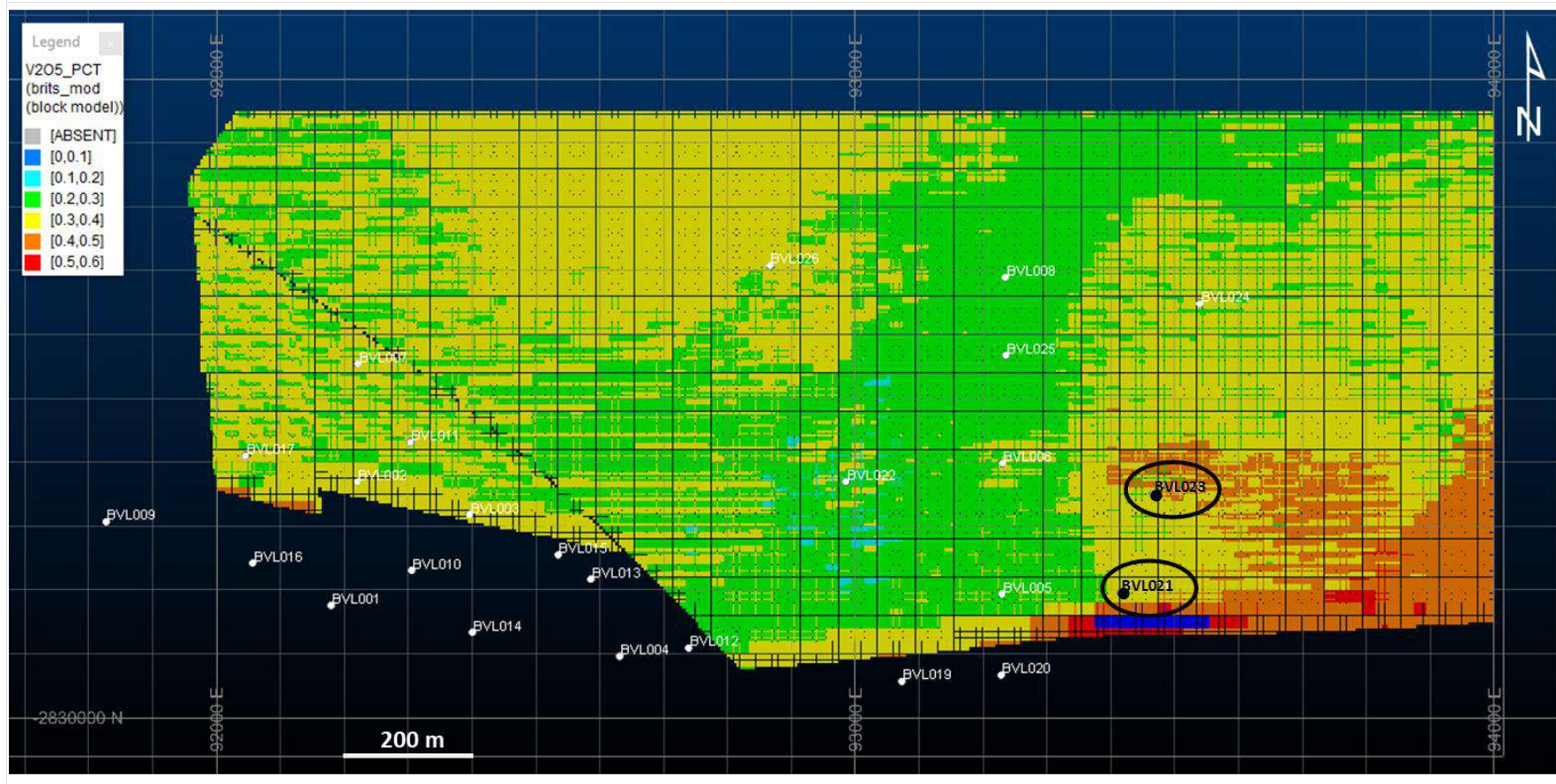
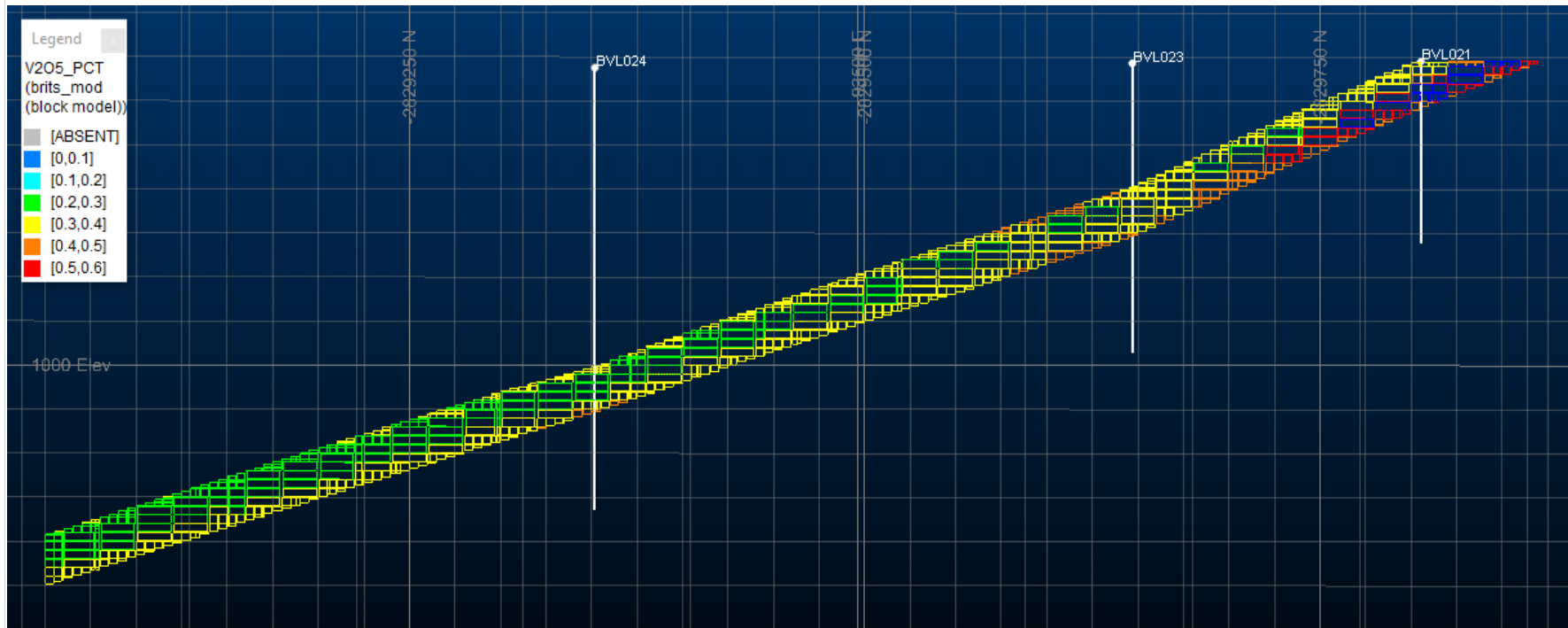




Figure 7-3
Sectional view of the high grade zone in the grade block model estimate for the Intermediate Seam





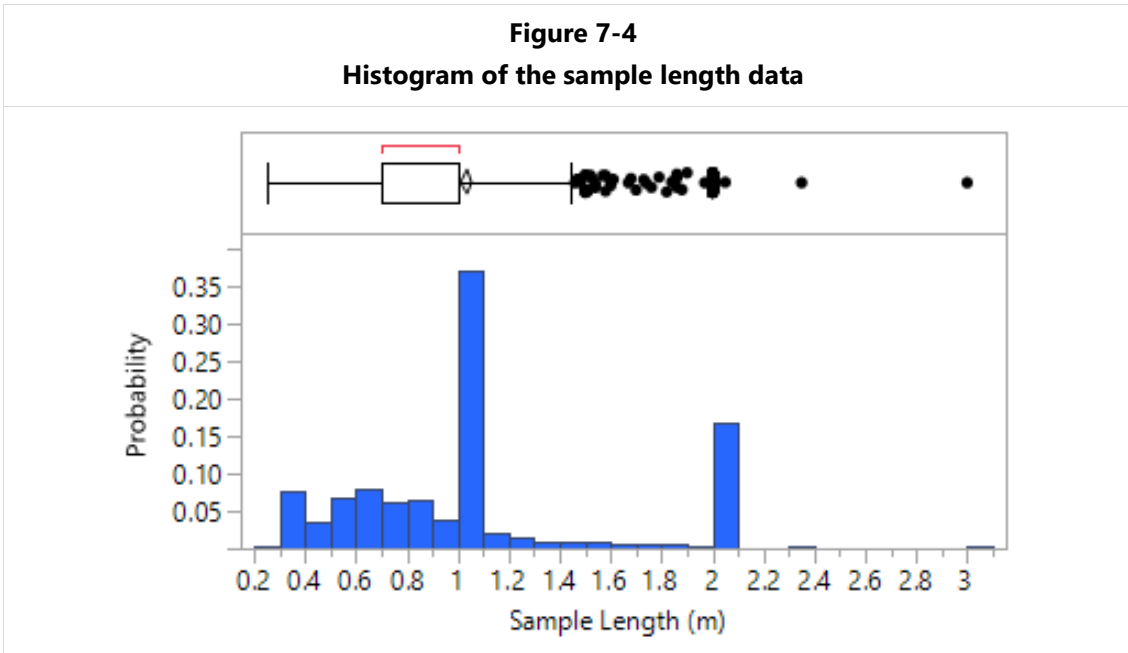
The samples not assayed for V_2O_5 within the mineralised layers were left as null values rather than zero values, as the estimate is for the grade in magnetite and these values are relatively constant. This allows for estimation into the un-assayed data using the surrounding assay data. Assigning a zero value would bias the estimate of V_2O_5 in magnetite. Although samples were not always assayed for V_2O_5 they were assayed for magnetite content, so no bias was introduced in this respect.

The assay data for one drillhole in the database provided were excluded as the hole was collared in a fault block to the west and is not within the Mineral Resource area. All other the data passed validation and were used in the estimation.

7.2.2 Statistics of the Sample Data

A total of 2,088 validated sample assays occur in the database for Uitvalgrond 431 JQ Portion 3.

A histogram of the accepted sample lengths is presented in Figure 7-4. 95 % of the sample lengths are 1.0 m or less. No relationship between sample length and V_2O_5 grade is apparent. The longer samples (greater than 2 m in length) are from sampling of the Lower Seam parting.



7.2.3 Statistics of the Assay Data

7.2.3.1 Univariate analysis

A summary of the assay data statistics for the raw data at the Brits Vanadium Project is shown in Table 7-2.



Table 7-2
Summary of the raw validated sample assay data at Brits Vanadium (length-weighted mean)

Variable	Number of assays	Mean value (%)	Minimum value (%)	Maximum value (%)
Mag	1,627	25.55	0.03	96.85
WR V ₂ O ₅	1,655	0.48	0.01	1.85
M V ₂ O ₅	989	1.57	0.90	2.61
WR SiO ₂	1,656	18.58	0.16	49.35
WR CaO	1,652	5.93	0.01	16.87
Density	210	3.63	2.95	4.82

Note: WR – Whole rock analysis, M – Within magnetite concentrate

7.2.3.2 Bivariate analysis

Scatterplots were constructed that compare the grades of each variable with one another in order to understand any relationships that may exist in the data that should be preserved in the Mineral Resource estimate. A weak linear relationship between Si and Ca grade was observed, with the grade of Si increasing with increasing grade of Ca.

7.2.4 Summary of the Exploratory Analysis of the Raw Dataset

- Most sample lengths are 1 m or less.
- The host rock to the vanadium mineralisation is magnetite-rich gabbro contained within three layers or seams.
- The magnetite-rich seams are defined by areas where the magnetic content is greater than 20 %.
- Low magnetite content samples were not assayed for V₂O₅.
- SG data were provided for 10 % of drillhole samples.

7.3 Geological Modelling

7.3.1 Topography

A high-resolution DTM of the topography, dated 29 March 2019, was supplied to MSA by BMN for the mine area. The exploration site is relatively flat across the entire area.

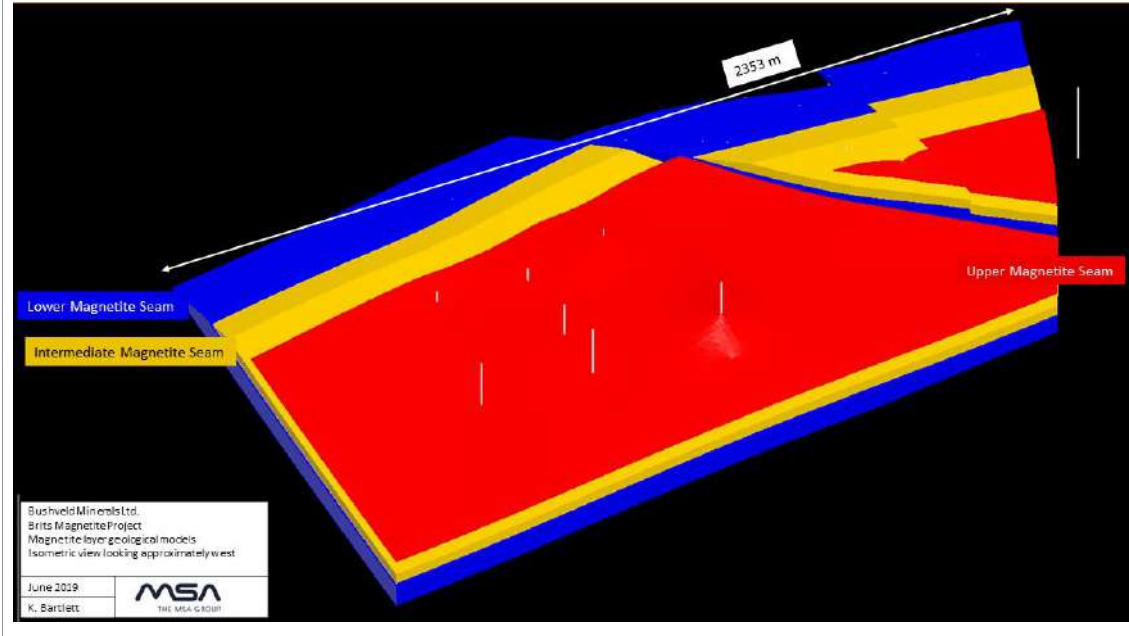
7.3.2 Mineralised Zones

The geological model was based on information obtained from the cores of 25 DD holes.

A geological model of three magnetite layers was constructed based on the sampling and logging of the drillholes (Figure 7-5). Internal waste zones within the three layers were not separately defined.

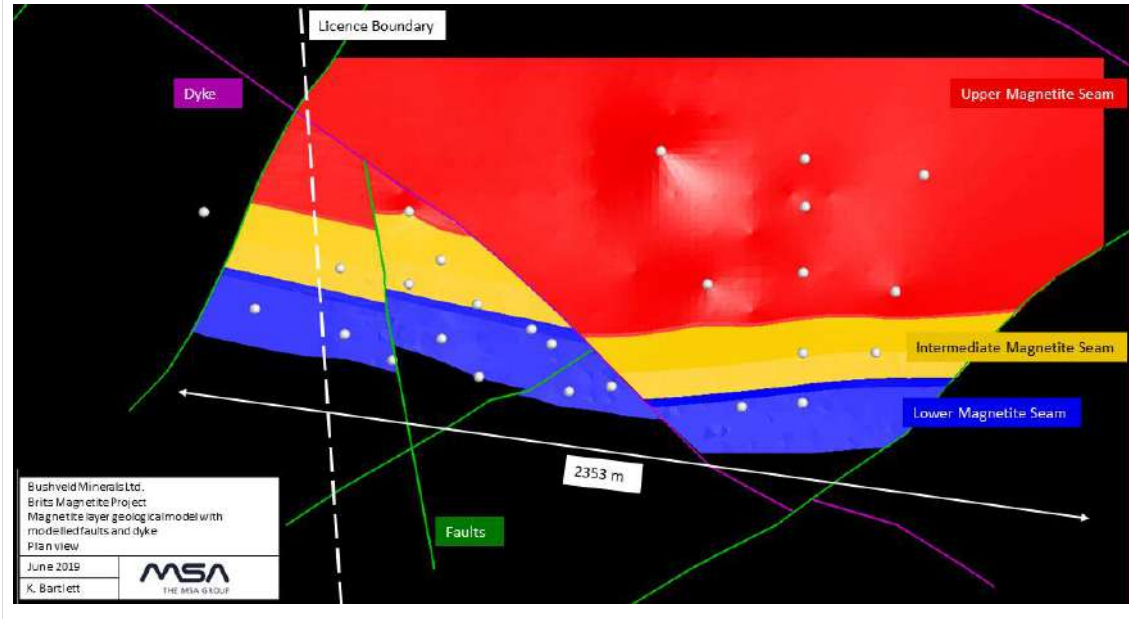


Figure 7-5
Isometric view of the magnetite layers geological model, looking approximately to the west



Five faults within the area of interest have been modelled. The location and extent of the faults was defined by geological mapping and geophysical surveys, completed by BMN, as well as the drillhole intersections. The faults have different throws and strikes. One of the faults is occupied by a dyke. Three fault blocks occur in the geological model and the model is bound by faults to the east and west (Figure 7-6).

Figure 7-6
Plan view of the modelled faults and dyke in the geological model





7.3.3 Oxidation/Weathering Surfaces

No overburden/weathering horizon has been modelled. The area is covered by approximately 5 m of black cotton soil.

7.4 Statistical Analysis of the Composite Data

The data within each magnetite layer were composited to 2 m lengths and summary statistics were compiled for each mineralised zone (Table 7-3).

Table 7-3						
Summary statistics of the 2 m composite assay data						
Variable	Number of composites	Minimum (%)	Maximum (%)	Mean (%)	CV	Skewness
Upper Seam						
Mag	19	25.54	55.56	42.95	0.23	-0.25
V₂O₅ Magnetics	19	1.21	1.75	1.47	0.11	0.07
V₂O₅ whole rock	19	0.34	0.92	0.63	0.24	-0.38
Ca	19	3.08	7.37	4.79	0.26	0.66
Si	19	9.61	23.25	15.18	0.25	0.55
Intermediate Seam						
Mag	137	0.90	37.16	15.76	0.55	0.51
V₂O₅ Magnetics	89	1.11	2.40	1.63	0.15	1.20
V₂O₅ whole rock	136	0.09	0.80	0.33	0.44	0.93
Ca	137	3.11	14.52	7.12	0.19	0.62
Si	136	11.03	37.14	21.83	0.13	-0.47
Lower Seam						
Mag	500	0.40	89.53	22.74	0.70	1.93
V₂O₅ Magnetics	388	0.99	2.62	1.56	0.12	0.85
V₂O₅ whole rock	500	0.07	1.78	0.45	0.63	2.28
Ca	500	0.04	14.66	6.11	0.28	-1.29
Si	500	0.52	33.94	19.35	0.25	-1.76

The statistical analysis revealed:

- most of the data are in the Lower Seam as it is the thickest;
- the Upper Seam has the highest average magnetite concentration;
- the average V₂O₅ grade of the magnetite is highest in the Intermediate Seam and lowest in the Upper Seam; and
- the coefficient of variation ("CV") is low for magnetite content for the Upper Seam (0.23) but higher for the Intermediate and Lower Seam (0.55 and 0.70) due to there being multiple magnetite layers with low grade partings. The variability of whole rock V₂O₅ is similar to that of magnetite, as expected. The CVs are low for V₂O₅ in magnetic concentrate (0.11 to 0.15), Ca (0.19 to 0.29) and Si (0.13 to 0.25).



7.4.1 Cutting and Capping

The log probability plots and histograms of the composite data were examined for outlier values that have a low probability of re-occurrence. There are no distributions that exhibit outlier data.

7.5 Geostatistical Analysis

7.5.1 Semi-variograms

An attempt was made to model variograms for both magnetite grade and whole rock V₂O₅ but they show poor structure due to the limited amount of data. The variography indicated a range of approximately 210 m in the plane of mineralisation.

7.6 Block Modelling

The block model prototype parameters are shown in Table 7-4. A block size of 20 mX by 20 mY by 5 mZ was used, which is small relative to the drillhole spacing. As the mineralisation dips at 19° a larger block size would not retain the layering within the seam without rotating the block model. The cells were split to a minimum sub-cell of 5 mX by 5 mY by 1 mZ in order to fill the wireframe model boundaries accurately.

Table 7-4								
Block model prototype parameters for Brits Vanadium								
Block size (m)			Model origin			Number of cells		
X	Y	Z	X	Y	Z	X	Y	Z
20	20	5	91,234	-2,830,060	800	139	60	90

Block models were created by filling within the geological model for the Upper, Intermediate and Lower Seams. The model volume above the topography was removed after grade estimation was complete.

7.6.1 Validation of the Block Model Volumes with the Wireframe Volumes

The volume of the block model was validated by comparing it to the volume of the wireframe (Table 7-5).

Table 7-5			
Volume validation comparison of wireframes and block models			
	Geological model wireframe	Block model	Percentage difference
Upper Seam	4,746,174	4,755,854	0.22
Intermediate Seam	42,975,300	43,035,326	0.13
Lower Seam	107,370,000	107,573,245	0.18

The model volumes compare well with the corresponding wireframe volumes and are thus acceptable for use in estimation.



7.7 Estimation

Of the 25 holes in the database, a total of 7 intersections of the Upper Seam, 13 of the Intermediate Seam and 24 of the Lower Seam were used to estimate the grade of the Mineral Resource.

Attributes were estimated into the individual mineralised zones using the 2 m composite drillhole sample data for each seam. Inverse distance to the power of two was used to estimate the grades into parent cells.

SG data are available for samples within the magnetite-rich seams. As not all samples were analysed for SG, a statistical comparison was made between magnetite content and SG. A strong relationship between SG and magnetite grade of the samples was found, which was modelled using a regression formula:

$$DENSITY = [3.02050883 + (0.00515305 * MAGPCT)] + [0.00028375 MAGPCT^2] - [0.00000169 * MAGPCT^3]$$

No density measurements were available for the waste zones, which were assigned an average density value of 2.8 g/cm³ for the Lower Seam footwall, the strata between the Lower Seam and Intermediate Seam, the strata between the Intermediate Seam and Upper Seam and the hanging wall strata of the Upper Seam.

A search of 250 m strike by 250 m dip by 10 m across strike was used to select the sample composites for block estimation. The minimum number of composites required for a block to be estimated is 6 while a maximum of 12 composites was used. These criteria were applied to the Upper, Intermediate and Lower Seams. If a block was not estimated from the initial search ellipse, the ellipse size was doubled. Should a block still not be estimated, a larger search ellipse was used by expanding the search by ten times the original search ellipse extent. The percentage of cells filled by each search is shown in (Table 7-6).

Table 7-6			
Search volume grade estimation summary for Uitvalgrond 431 JQ Portion 3			
Seam Name	Blocks filled within each search volume as a per cent		
	First search volume	Second search volume	Third search volume
Upper Seam	3.20	36.30	60.50
Intermediate Seam	25.02	59.76	15.22
Lower Seam	47.84	51.02	1.14

7.7.1 Validation of the Estimates

The models were validated by:

- visual examination of the input data against the block model estimates; and
- comparison of the input data statistics against the model statistics.

The block model was examined visually in sections to ensure that the drillhole grades were locally well represented by the model. The model validated well against the data and identified internal



low-grade strataform zones as expected in the layered style of deposit. Examples of sections showing the block model and drillholes shaded by percent magnetite content are shown in Figure 7-7 and for V_2O_5 in magnetite in Figure 7-8.

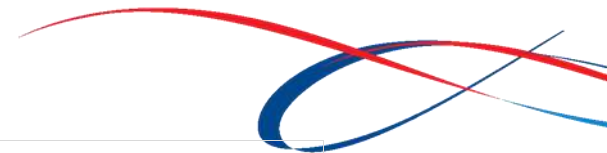


Figure 7-7

Sections through block models and drillhole data illustrating correlation between model and data – percent magnetite

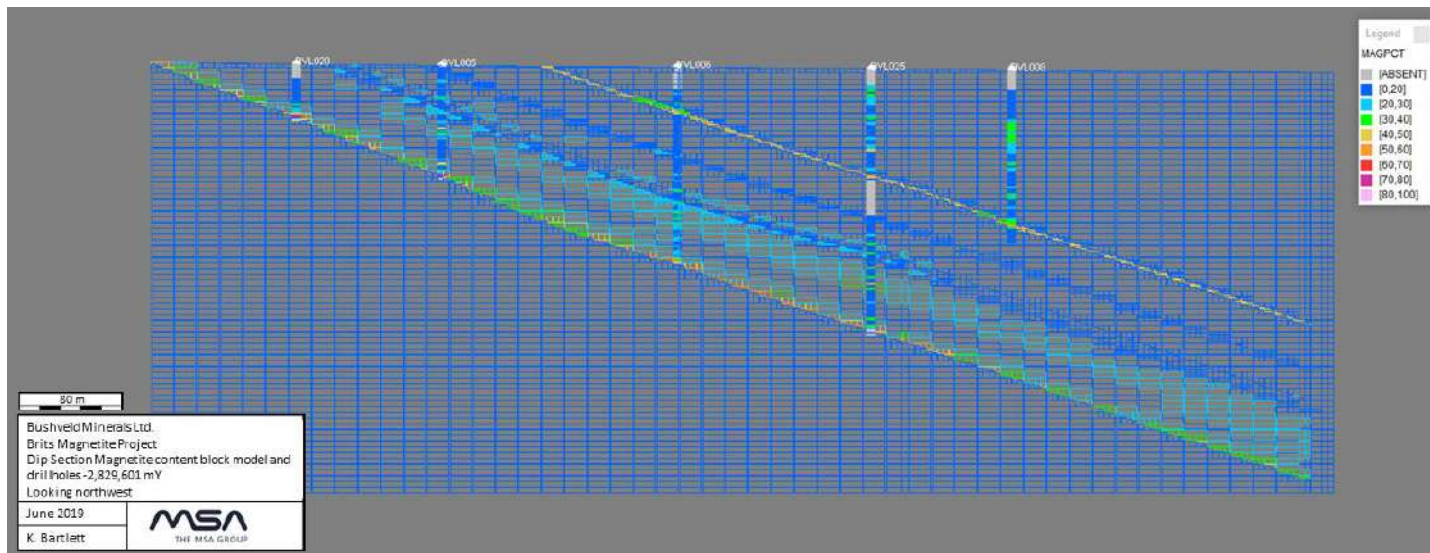
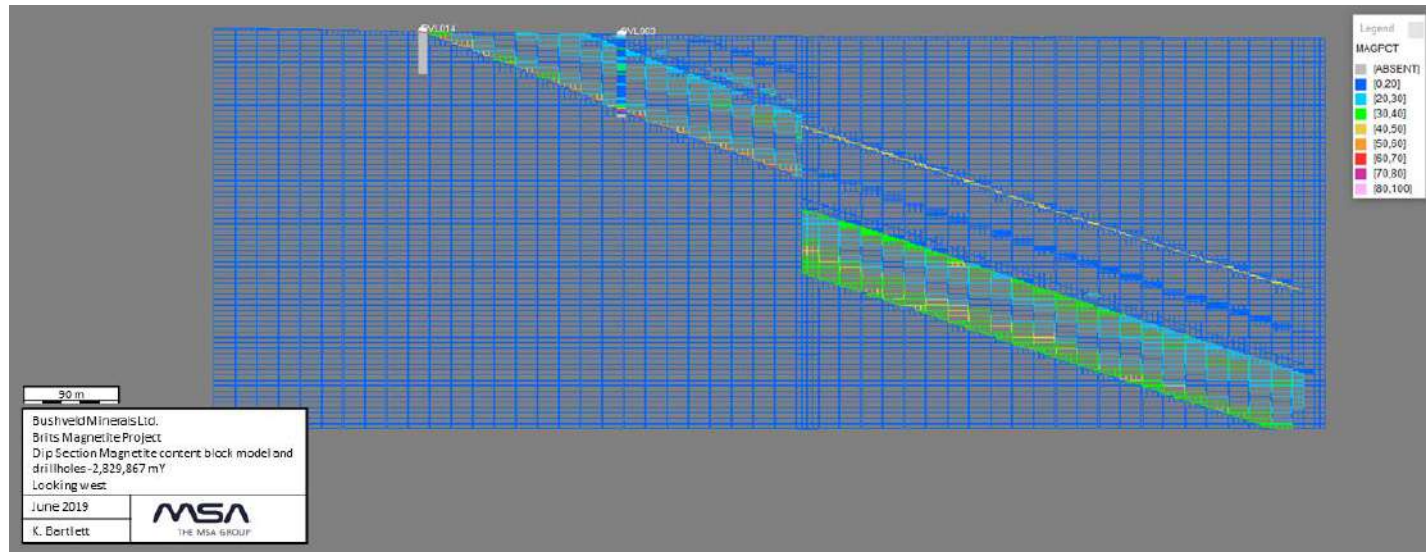
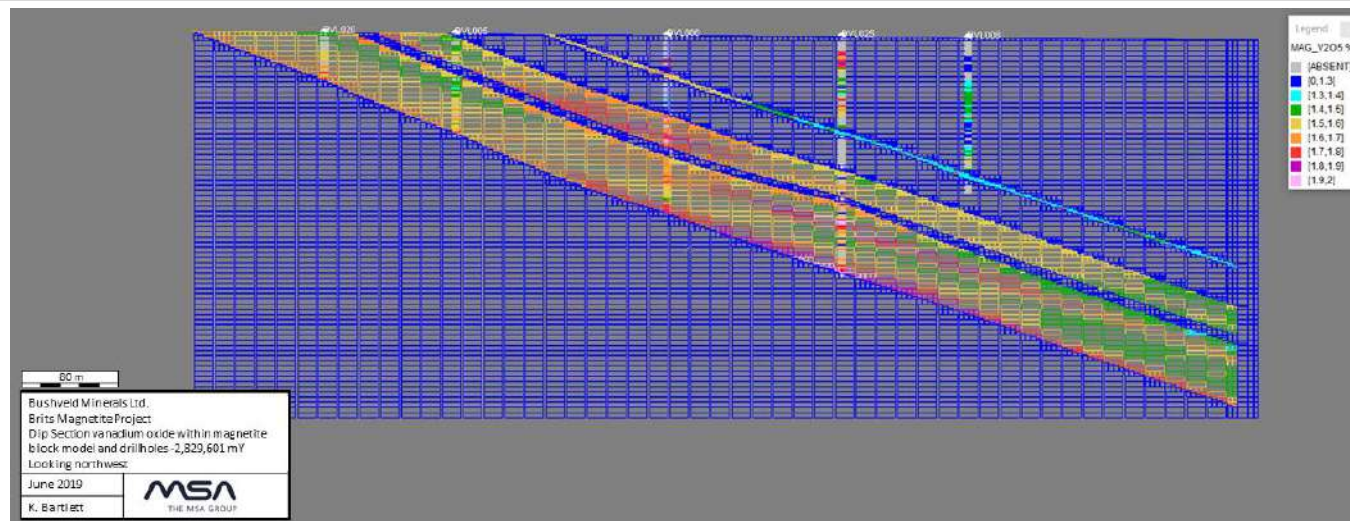
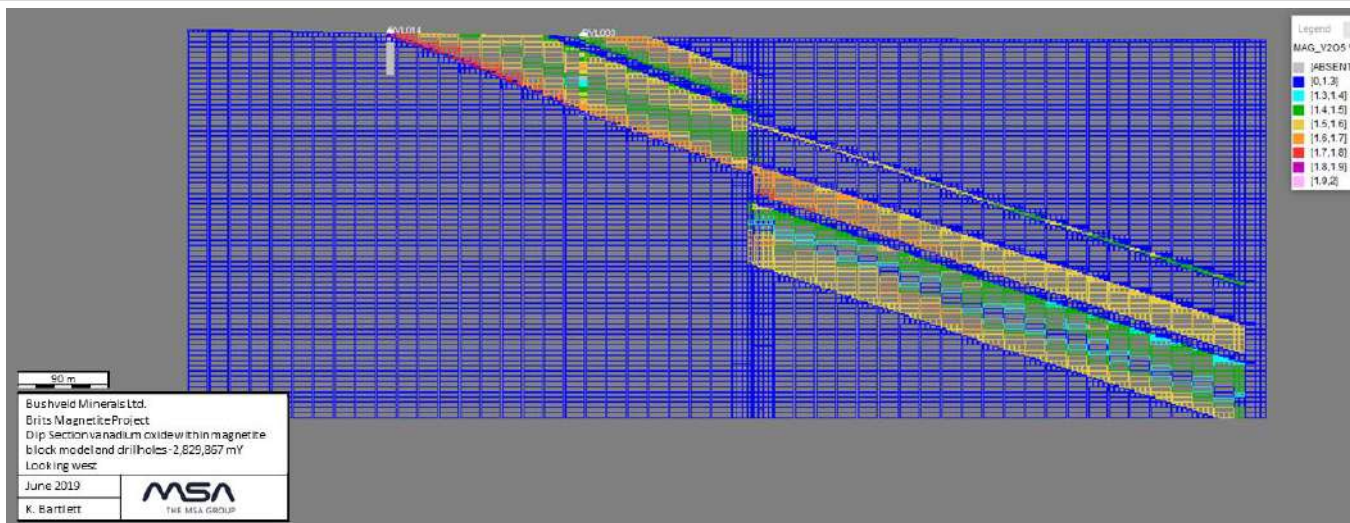




Figure 7-8

Sections through block models and drillhole data illustrating correlation between model and data – V₂O₅ grade (%) of magnetite





The mean composite grades of the drillholes were compared with the model grades (Table 7-7). The model and the data averages compare well for most areas and attributes, the comparison being influenced by the irregular drilling and the extrapolation.

Table 7-7		
Comparison between drillhole and model data values		
Variable	Mean model (%)	Mean 2 m composite data with top cap (%)
Upper Seam		
Mag	43.91	42.95
V₂O₅ in Magnetite	1.49	1.47
V₂O₅ whole rock	0.65	0.63
Ca	4.65	4.79
Si	14.70	15.18
Intermediate Seam		
Mag	15.89	15.76
V₂O₅ in Magnetite	1.63	1.63
V₂O₅ whole rock	0.33	0.33
Ca	7.16	7.12
Si	21.78	21.83
Lower Seam		
Mag	23.76	22.76
V₂O₅ in Magnetite	1.53	1.56
V₂O₅ whole rock	0.46	0.45
Ca	6.05	6.11
Si	19.00	19.35

7.8 Mineral Resource Classification

Classification of the Brits Vanadium Mineral Resource (for Uitvalgrond 431 JQ Portion 3) was based on confidence in the data, confidence in the geological model, geological continuity and the spacing of drilling data. The main considerations in the classification of the Mineral Resource are as follows:

- all the data that inform the Mineral Resource have been collected by BMN. These data have been validated and no erroneous data were found. The data for the BMN 2018 drilling campaign were collected based on industry best practice principles and QAQC was performed on the assay data;
- the anomalous data for drillholes BVL022 and BVL026 has been taken into account during classification and, irrespective of other classification considerations, areas around these holes are considered to be of lower confidence. The units between and including the US, IS and LS are thickened in these drillholes. The reasoning for this thickening should be investigated in later drilling programmes;



- the interpretation of the geological framework of the mineralisation as three magnetite layers gently dipping to the northeast at approximately 19° with V₂O₅ mineralisation within the magnetite layer is sound;
- the extent of the mineralisation along strike towards the east away from the drillholes in the dip direction, is uncertain and potential exists for further faulting limiting as well as affecting the geological model;
- pit optimisation carried out for the Ore Reserve conversion at the adjacent Bushveld Vametco mine indicates an economic pit depth of 150 m below the original land surface for Vametco. This principle has been applied on the Uitvalgrond 431 JQ Portion 3 exploration site; and
- the drillhole spacing is between 50 m and 250 m apart. The drillhole spacing confirms the geological continuity of all three seams.

In consideration of the aforementioned points, the Mineral Resource was classified as follows:

- the Upper Seam estimate is informed by 7 holes. The well drilled portions of the Upper Seam were classified as Indicated Resources up to a distance of 125 m from the drillhole grid. The remainder of the model to the 150 m depth extent was classified as Inferred Resources up to 400 m along strike from the nearest drillhole;
- the Intermediate Seam estimate is informed by 13 holes. The well drilled portions of the Intermediate Seam were classified as Indicated Resources up to a distance of 125 m from the drillhole grid. The remainder of the model to the 150 m depth extent was classified as Inferred Resources up to 400 m along strike from the nearest drillhole; and
- the Lower Seam estimate is informed by 24 holes. The well drilled portions of the Lower Seam were classified as Indicated Resources up to a distance of 125 m from the drillhole grid. The remainder of the model to the 150 m depth extent was classified as Inferred Resources up to 400 m along strike from the nearest drillhole.

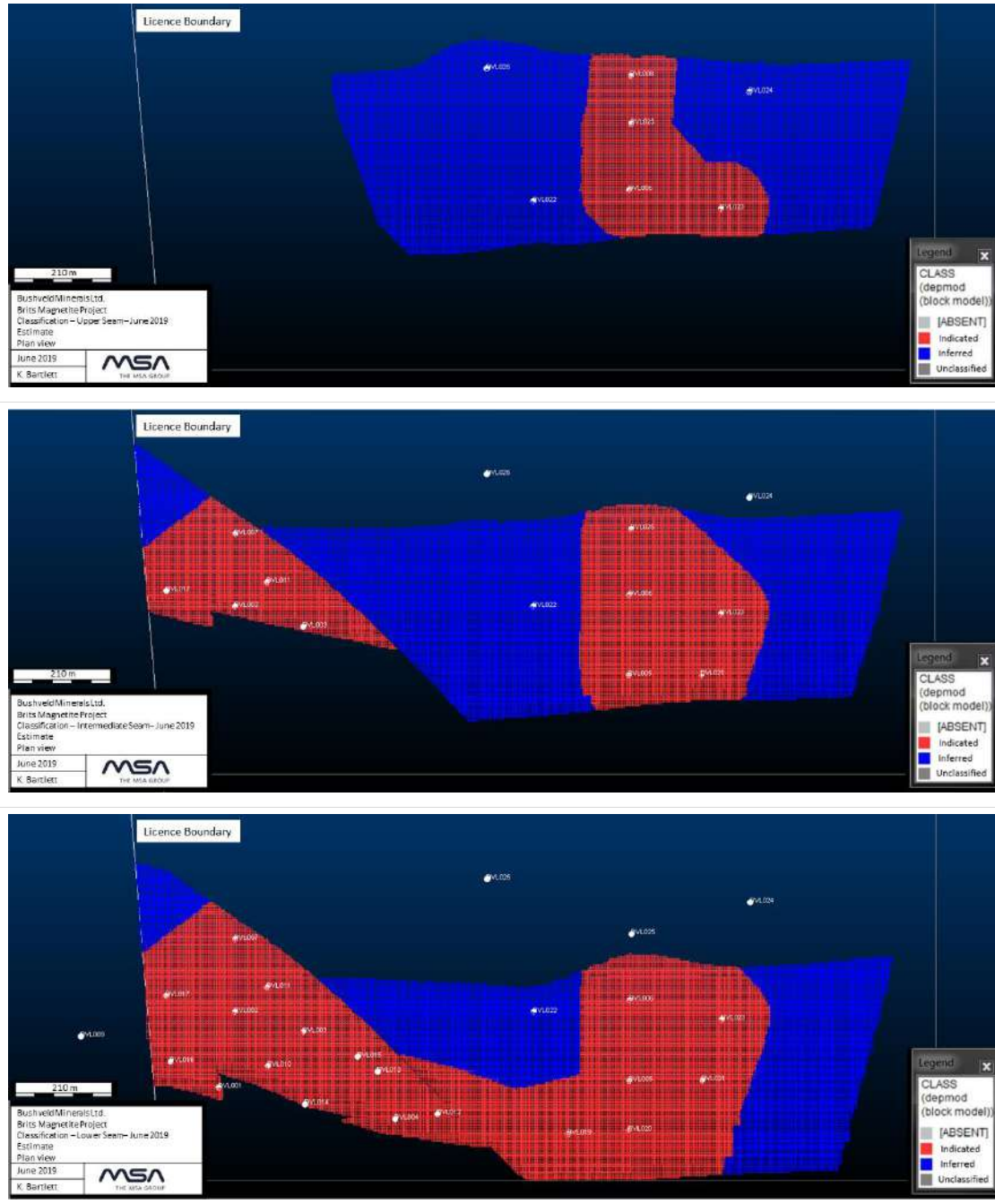
The classified areas are shown in Figure 7-9 for the Upper, Intermediate and Lower Seams.

To the best of the CP's knowledge there are no environmental, permitting, legal, tax, socio-political, marketing or other relevant issues which may materially affect the Mineral Resource estimate as reported in this Competent Persons Report.

The Mineral Resource will be affected by further infill and exploration drilling which may result in increases or decreases in subsequent Mineral Resource estimates. Inferred Mineral Resources are considered to be low confidence estimates that may change significantly with additional data. It cannot be assumed that all or part of an Inferred Mineral Resource will necessarily be upgraded to an Indicated Mineral Resource as a result of continued exploration. The Mineral Resource may also be affected by subsequent assessments of mining, environmental, processing, permitting, taxation, socio-economic and other factors.



Figure 7-9
Plan view of the classification of Brits Vanadium Upper, Intermediate and Lower Seams (Uitvalgrond 431 JQ Portion 3)



Note: Drillhole intersection positions shown in white. North is to the top of the figures.

7.9 Mineral Resource Statement

The Mineral Resource estimate has been completed under the supervision of Mr J. C. Witley who is a professional geologist with more than 30 years' experience in base and precious metals exploration and mining as well as Mineral Resource evaluation and reporting. He is Head of Mineral Resources for MSA, is registered with SACNASP and is a Fellow of the GSSA. Mr Witley



has the appropriate relevant qualifications, experience, competence and independence to be considered a "Competent Person" under the definitions provided in the 2012 Edition of the JORC Code.

The Mineral Resource estimate as at 18 June 2019 is presented in Table 7-8 on a gross basis and Table 7-9 on an attributable to BMN basis. In the CP's opinion, the Mineral Resource reported herein has reasonable prospects for eventual economic extraction.

The Mineral Resource dips at approximately 19° to the northeast and strikes approximately west to east. The Upper Seam Mineral Resource extends for approximately 1,360 m along strike and approximately 680 m in the dip direction. The Intermediate Seam Mineral Resource extends for approximately 1,900 m along strike and approximately 660 m in the dip direction. The Lower Seam Mineral Resource extends for approximately 1,900 m along strike and approximately 612 m in the dip direction. The Mineral Resource estimate is limited to 150 m below surface. The mineralisation is open down-dip. The Upper Seam Mineral Resource Estimate is on average 4.9 m thick, the Intermediate Seam 28.7 m and the Lower Seam 57.0 m.



Table 7-8
Brits Vanadium Mineral Resource (Uitvalgrond 431 JQ Portion 3) at a cut-off grade of 20 % magnetite, 18 June 2019 – Gross Basis

Class	Seam Name	Tonnes (millions)	V ₂ O ₅ grade of whole rock (%)	Magnetite grade of whole rock (%)	V ₂ O ₅ grade of magnetite concentrate (%)	Tonnes V ₂ O ₅ in magnetite concentrate (thousands)	Tonnes V in magnetite concentrate (thousands)
Indicated	Upper	2.0	0.66	43.64	1.51	13.4	7.5
	Intermediate	1.9	0.47	21.52	1.75	7.0	3.9
	Lower	41.0	0.56	28.54	1.59	185.9	104.2
	Total	44.9	0.56	28.94	1.59	206.3	115.6
Inferred	Upper	7.1	0.65	43.89	1.50	46.7	26.2
	Intermediate	0.4	0.44	21.13	1.85	1.4	0.8
	Lower	14.5	0.50	26.09	1.55	58.8	32.9
	Total	22.0	0.55	31.78	1.54	106.9	59.9
Indicated and Inferred	Upper	9.2	0.65	43.84	1.50	60.1	33.7
	Intermediate	2.2	0.46	21.46	1.76	8.4	4.7
	Lower	55.5	0.54	27.90	1.58	244.6	137.0
	Total	66.8	0.56	29.87	1.58	313.2	175.4

Notes:

1. All tabulated data have been rounded and as a result minor computational errors may occur.
2. Mineral Resources which are not Ore Reserves have no demonstrated economic viability.
3. Magnetite content (grade) is determined as the proportion of magnetite concentrate recovered using Davis Tube methodology.
4. Due to the magnetite grade being a recovered grade, differences will occur between whole rock V₂O₅ grades back-calculated from concentrate, versus those derived from whole rock assays.
5. The Mineral Resource is reported as 100 % of the Mineral Resource for the property (BMN has a 62.5 % ownership of the property (Uitvalgrond 431 JQ Portion 3)).



Table 7-9
Brits Vanadium Mineral Resource (Uitvalgrond 431 JQ Portion 3) at a cut-off grade of 20 % magnetite, 18 June 2019 – Attributable Basis

Class	Seam Name	Tonnes (millions)	V ₂ O ₅ grade of whole rock (%)	Magnetite grade of whole rock (%)	V ₂ O ₅ grade of magnetite concentrate (%)	Tonnes V ₂ O ₅ in magnetite concentrate (thousands)	Tonnes V in magnetite concentrate (thousands)
Indicated	Upper	1.3	0.66	43.64	1.51	8.4	4.7
	Intermediate	1.2	0.47	21.52	1.75	4.4	2.4
	Lower	25.6	0.56	28.54	1.59	116.2	65.1
	Total	28.0	0.56	28.94	1.59	129.0	72.2
Inferred	Upper	4.4	0.65	43.89	1.50	29.2	16.3
	Intermediate	0.2	0.44	21.13	1.85	0.9	0.5
	Lower	9.1	0.50	26.09	1.55	36.7	20.6
	Total	13.7	0.55	31.78	1.54	66.8	37.4
Indicated and Inferred	Upper	5.7	0.65	43.84	1.50	37.6	21.0
	Intermediate	1.4	0.46	21.46	1.76	5.2	2.9
	Lower	34.7	0.54	27.90	1.58	152.9	85.6
	Total	41.8	0.56	29.87	1.58	195.8	109.7

Notes:

1. All tabulated data have been rounded and as a result minor computational errors may occur.
2. Mineral Resources which are not Ore Reserves have no demonstrated economic viability.
3. Magnetite content (grade) is determined as the proportion of magnetite concentrate recovered using Davis Tube methodology.
4. Due to the magnetite grade being a recovered grade, differences will occur between whole rock V₂O₅ grades back-calculated from concentrate, versus those derived from whole rock assays.
5. The Mineral Resource is reported on a net attributable basis (BMN has a 62.5 % ownership of the property (Uitvalgrond 431 JQ Portion 3)).



7.10 Assessment of Reporting Criteria

Criteria for assessing this Mineral Resource estimate are presented in Appendix 2, which references the relevant aspects of Table 1 of the JORC Code (2012) to the pertinent sections in this report.



8 TECHNICAL STUDIES

8.1 Study Level

The Brits Vanadium Project is currently in exploration phase.

8.1.1 Modifying Factors used to convert Mineral Resources to Ore Reserves

No Ore Reserves have been estimated for this project.

8.2 Geotechnical and Geohydrology

No geotechnical or geohydrological information has been considered at this stage of the study.

8.3 Mine Design and Schedule

The properties are all exploration projects. To date (June 2019) no mining has occurred at any of the properties. This CPR is intended as a Mineral Resource report and does not investigate or consider mining parameters other than the consideration mentioned below.

Pit optimisation carried out for the Ore Reserve conversion at the adjacent Bushveld Vametco Mine indicates an economic pit depth of 150 m below the original land surface. This principle has been applied on the Uitvalgrond 431 JQ Portion 3 exploration site for the estimation of the Mineral Resources.

8.4 Metallurgical (Processing / Recovery)

The properties are all exploration projects. No mineral processing or metallurgical testwork has been undertaken for any of the properties.

Recovery of vanadium (Nitrovan™) by Bushveld Vametco Mine located to the west of Uitvalgrond 431 JQ Portion 3, is done using a standard salt roast and leach process. The process involves the following stages (<https://www.bushveldminerals.com/vametco/>):

- Step 1: crushing, milling and magnetic separation to produce a magnetite concentrate with average grades of approximately 2 % V₂O₅ in magnetite;
- Step 2: salt-roasting of concentrate, involving roasting of the concentrate with sodium salts in a kiln at approximately 1,150°C to form a water-soluble sodium vanadates material;
- Step 3: leaching and purification involving dissolution of roasted vanadium concentrate in water, purification and precipitation of vanadium through the addition of ammonium sulphate followed by drying and then processing in a reducing environment to produce an MVO product; and
- Step 4: Nitrovan™ production: the MVO is briquetted and fed into a shaft induction furnace in a nitrogen atmosphere to produce Nitrovan™, a trade-mark vanadium product used in the steel industry, and MVO.

It is expected that any processing would be undertaken at the existing plant at the Bushveld Vametco Mine, owned by BMN. Furthermore, it is expected there will be no further metallurgical or processing factors which could have a material impact on the eventual economic extraction.



8.5 Infrastructure

The properties are all exploration projects. No infrastructure studies have been undertaken for any of the properties.

It is assumed that infrastructure for Uitvalgrond 431 JQ Portion 3 would be shared with the adjacent Bushveld Vametco Mine and that the required infrastructure would be easily accessible.

8.6 Environmental and Social

The legislative framework, environmental and social compliance status and environmental liability are discussed in Sections 2.4.1, 0, and 2.4.7 respectively.

8.6.1 Environmental Aspects and Management Practices

A site visit was conducted on 28 May 2019 and included the following:

- a briefing and discussion with BMN personnel;
- an inspection of the Uitvalgrond 431 JQ Portion 3 site (the main subject of this report); and
- a review of all relevant documentation, inclusive of licences, internal and external audits and mitigation measures currently being undertaken at site.

Potential environmental impacts have been identified as part of the environmental permitting application processes in consultation with Interested and Affected Parties ("IAPs"), regulatory authorities and specialist consultants. A range of environmental issues were considered and are reported in the available environmental documentation made available to MSA. More detail regarding the environmental permits for the Project can be found in Table 2-7.

As per the MPRDA, more detailed environmental studies are required when application is made for mining rights. The studies, including an Environmental Impact Assessment ("EIA") are consolidated into a comprehensive EMP report.

8.6.2 Environmental Factors

All exploration work executed followed the guidelines, specification and limitations as indicated in the Environmental Management Plan ("EMP") for Uitvalgrond 431 JQ Portion 3. Before exploration commences, all related staff and contractors are made aware of the contents of the EMP and what actions are required. Photographs are taken and compared to the rehabilitated site after drilling and rehabilitation is completed. Monitoring of the EMP commences from initiation of the exploration programme, from the selection of the drillhole sites, the drilling and the subsequent rehabilitation.



8.6.2.1 Environmental factors which could have a material effect on the Project

Wetlands

The Remainder of Doornpoort 295 JR is covered by a wetland in the western portion of the property. As such, a portion of the property may not be accessible for mining because of the wetland. Studies will be required to determine if the area impacted by the wetland can be reduced.

No pans or wetlands were identified on the remaining properties, i.e. Uitvalgrond 431 JQ (portions 2 and 3) and Syferfontein 430 JQ.

Cultural Features

Fifteen heritage sites were recorded on the Remainder of Doornpoort 295 JR. These include Late Iron Age stone walled settlements, historical stone ruins, farming infrastructure and graves (comprising an informal cemetery and stone cairns). Should exploration work be undertaken, the areas will need to be demarcated prior to exploration to avoid accidental damage to the sites. Where required, mitigation measures may be required.

Three stone walled Iron Age Settlements were recorded on Uitvalgrond 431 JQ Portion 3. Of these, two are located to the far south of the exploration focus area. Should mining occur in the future, the impact of the heritage sites on operations will need to be considered.

Community Proximity

All properties are surrounded by communities and/or villages.

Makau village and Ga-Rankuwa, amongst other communities and villages, will fall within the direct line of site should a mine be developed on Uitvalgrond 431 JQ Portion 3. Management of community and social aspects will be important.

Two communities are located within the farm boundaries of Uitvalgrond 431 JQ Portion 2 and Syferfontein 430 JQ, i.e. Kgabalatsane and Kelebogile. Ga-Rankuwa located to the southeast and has grown since the Scoping Study by was done (Quanto, 2012). Ga-Rankuwa Unit 20 and 24 lie directly adjacent to the properties on the eastern side, with informal elements encroaching onto both the Uitvalgrond and Syferfontein farms.

There are several communities surrounding the Remainder of Doornfontein 295 JR property. The formal Doornpoort Community (to the south), Bon Accord (to the west) and Rynoue (to the east) are all directly adjacent the property. In the prospecting right EMP it was noted that there were several landowner objections to potential mine development on the property.

8.6.3 Social Aspects and Management Practices

8.6.3.1 Social and Labour Plan

The properties falling within the Brits Vanadium Project are held under prospecting rights (see Section 2.4.3), with the exception of Portion 2 of Uitvalgrond 431 JQ and Syferfontein 430JQ (the status of the rights for these properties is currently under discussion with the DMR).

As per the requirements of the MPRDA, social studies are required when applications for mining rights are submitted. The study takes the format of a Social and Labour Plan ("SLP").



As required in Section 3 of the MPRDA, a Public Participation Process with interested and affected parties (“IAPs”) must be conducted for the Project. A company requires approval of the SLP before the DMR can issue the mining right. With no social studies for the prospecting licences (Uitvalgrond 431 JQ Portion 3 and Remainder of Doornpoort 295 JR) having been commissioned at this stage, a SLP process will have to be followed should BMN apply for mining rights on either of these properties. The status of an SLP to accompany the mining right application for Uitvalgrond 431 JQ Portion 2 and Syferfontein 430 JQ was not confirmed at the time of reporting.

8.7 Market Studies and Economic Criteria

Vanadium is a grey, soft and ductile metal that is valued for its high strength-to-weight ratio, corrosion resistance and weldability. Marketable forms are typically ferrovandium (an alloy of iron and vanadium) and vanadium pentoxide (V_2O_5) concentrate ('flakes').

Vanadium is used mainly in the steel industry as an alloy component in the manufacturing of enhanced strength steel. Secondary uses include non-ferrous alloys, chemicals and power storage (batteries).

This review is partially informed by bespoke and confidential market research reports by BMO Global Commodities Research (BMO, 2019), Macquarie Capital (Europe) Limited and Macquarie Capital Limited (collectively Macquarie, 2019), and Roskill (Roskill, 2019). Information and data from these confidential sources cannot be quoted directly and are used in a generic fashion, together with other public sources, to give a view on the overall consensus of the state of the vanadium market.

8.7.1 Vanadium Market Summary

8.7.1.1 Supply

Over recent years, China has been the predominant producer and consumer of vanadium to the world market. During 2016, China is estimated to have produced some 57 % of the world total (SP Angel, 2018), with Russia contributing approximately 11 % and South Africa 10 %. Global production over the period 2011 to 2017 varied within a range of approximately 70,000 t and 90,000 t.

Global reserves of vanadium are also dominated by China, amounting to nearly 50 % of total reserves. Russia holds approximately 25 %, and South Africa nearly 20 %.

Approximately 73 % of vanadium production is derived from co-production in the form of steel slag as a result of blast furnace smelting of vanadium-bearing titaniferous magnetite ores. This supply is seen as fairly inelastic.

Continued tightening of environmental regulations in China could result in significant pressure being placed on the more polluting magnetite operations. Economic pressures associated with mining and processing of low-grade magnetite ores, relative to high-grade hematite ores, caused many vanadium-titanium-magnetite operations to close. It is considered that these conditions have diminished the likelihood of significant growth of vanadium from such sources.



Only some 17 % of vanadium supply is from primary vanadium ores, with approximately 10 % coming from secondary sources.

The general consensus is that vanadium supply will be constrained for the foreseeable future.

Since China is tightening environmental regulations and many operations are closing, the resultant decrease in supply may well be offset by increased production in South Africa.

8.7.1.2 Uses and demand

Vanadium consumption largely mirrors global steel production, since the steel industry accounts for more than 90 % of total vanadium use. Other uses include non-ferrous alloys, chemicals and energy storage.

Global crude steel production has been relatively flat since 2013 with annual growth in the region of approximately 1.2 % per annum. Uptake of vanadium for energy storage, mainly in the form of vanadium redox flow batteries ("VRFB") has potential for significant growth but is unlikely to have significant impact in the next decade.

Vanadium consumption in the steel industry is dominated by high-strength, low-alloy ("HSLA") steel (approximately 48 % of total steel use) and full alloy steel (approximately 35 % of total steel use).

Changes in Chinese steel specifications for structural use, which propose elimination of 335 MPa rebar and replacing it with 600 MPa strength rebar caused a rapid rise in vanadium prices through 2016. This rapid increase ushered in a period of "tolerance" in the Chinese industry which allowed vanadium prices to cool down and retract to levels closer to the long-term average. Nonetheless, it is likely that pressure will remain to increase the vanadium content of Chinese rebar.

Production of HSLA outside of China has remained fairly static since 2012, varying between approximately 55 Mt and 60 Mt per annum. In contrast, Chinese production saw a steep increase from approximately 60 Mt in 2010 to approximately 180 Mt in 2014. Between 2014 and 2018, Chinese production of HSLA varied between approximately 170 Mt and 195 Mt per annum.

Both manganese and niobium pose substitution challenges to vanadium. There are no readily available substitutions for vanadium in non-ferrous and chemical applications, but it can be replaced by niobium and manganese in some steel applications. Niobium and vanadium are not direct substitutes, since switching requires operational adjustments to the steel plants to ensure product quality. Various analyses of the operational cost of substitution indicate that sustained ferrovanadium prices of more than approximately 55 % of the price of ferroniobium may bring substitution pressure to bear on vanadium use in steel production.

A consensus view of vanadium demand prospects forecasts growth over the next six years to increase by approximately 2.75 % per annum (nominal).

8.7.1.3 Market Outlook

The market outlook for Vanadium products (ferrovanadium and vanadium pentoxide) varies between different analysts, especially for the short to medium term. Vametco has access to forecast data from seven industry sources. The specific forecast information is confidential to the



relevant sources and may not be disclosed here. MSA's interpretation of consensus forecasting in real terms is as follows:

- 2020: USD 41.58 /kg FeV,
- 2021: USD 44.13 /kg FeV,
- 2022: USD 46.06 /kg FeV,
- 2023: USD 43.64 /kg FeV,
- 2024: USD 44.00 /kg FeV,
- 2025: USD 44.00 /kg FeV,
- Long term: USD 40.00 /kg FeV.

Research by Roskill (2019) has shown that there is a very strong linear relationship between ferrovanadium and V₂O₅ prices, indicating that one product may be used as a proxy for the other when analysing price data.

8.7.2 Contracts

BMN does not have any current contracts in place regarding the Brits Vanadium project.

8.8 Risk Analysis

Owing to the stage of development, MSA did not perform a detailed risk analysis of the properties comprising the Brits Vanadium Project.

Bushveld magnetite deposits are highly continuous and generally of relatively low risk. However, they are impacted by faulting which can affect future mine planning.

Should Uitvalgrond 431 JQ Portion 3 be considered for future development, with resources being shared with the adjacent Bushveld Vametco Mine, any movement of materials between the properties will need to consider the crossing of an ecologically sensitive drainage line running between the properties.

8.9 Economic Analysis

This report is intended as a Mineral Resource CPR and as such no capital and operating costs have been determined.



9 ORE RESERVE ESTIMATES

No Ore Reserves have been estimated.



10 OTHER RELEVANT INFORMATION

10.1 Adjacent Properties

The Bushveld Vametco Mine, comprising an integrated open pit mine and plant, is located immediately to the west of Uitvalgrond 431 JQ Portion 3.

The operation owns the new order mining rights for vanadium and other associated minerals over Portion 1 of the farm Uitvalgrond 431 JQ and Portion 1 of the farm Krokodilkraal 426 JQ in Brits. The Bushveld Vametco Mine is an open pit mine supplying ore to a vanadium processing plant located on the same properties.

The open pit mine at Bushveld Vametco Mine is approximately 3.54 km long, extending in a west-east direction. The Mineral Resource is well-defined, continuous and dips in a north-northeast direction at approximately 19 to 20 degrees. The mine is based on a JORC compliant Mineral Resource of 186.7 Mt, including 48.4 Mt Ore Reserves with in-magnetite vanadium grades averaging 2.02 % V_2O_5 . The Bushveld Vametco Mine is targeting to grow production to a sustainable level of more than 4,200 metric tonnes vanadium per annum Nitrovan™.

The Eland Platinum Mine is situated to the south of Uitvalgrond 431 JQ, Portions 2 and 3. The mine was purchased by Northam Platinum Limited from Glencore Operations South Africa (Pty) Ltd in February 2017. Eland mine was placed on care and maintenance in 2015. Northam plans to restart mining at the Kukama Shaft in 2020, following the undertaking of a feasibility study on the Kukama Shaft. The Mineral Resource is estimated at 19.3 Moz 4E PGE (30 June 2018, SAMREC Code (2016)) (Northam, 2018).

10.2 Audits and Reviews

With the exception of the procedures as described in Section 6 of this CPR, the Competent Person is not aware of any audits or reviews that have been conducted for any aspect of the properties which make up the Brits Vanadium Project.

10.3 Risk Assessments

The risk analysis for the Brits Vanadium Project is summarised in Section 8.8



11 INTERPRETATION AND CONCLUSIONS

The following interpretations and conclusions are made by the Competent Person regarding the Brits Vanadium Project, specifically focussing on the subject of this report, that is the property Uitvalgrond 431 JQ Portion 3:

- Geology and Mineral Resources
 - The geology of the area is well understood. In the CP's opinion (Mr J Witley), the Mineral Resource reported herein has reasonable prospects for eventual economic extraction, given that it is located adjacent to an operating mine that processes the same mineralisation with similar (albeit lower) V_2O_5 grades and there is an established market for the vanadium product.
- Vanadium market outlook
 - The short, medium and long term market outlook, based on reviewing seven independent forecasts, appears stable and robust.

12 RECOMMENDATIONS

Further drilling is recommended east of the drillholes BVL021 and BVL023. The two holes have a relatively high V_2O_5 in magnetite grade of 2.1 % and 1.88 % respectively for the Intermediate Seam. These high-grade values resulted in an anomalously high grade zone in the grade block model estimate. Further drilling will confirm the extent of the high-grade zone.



13 QUALIFICATIONS OF COMPETENT PERSONS', AND DATE AND SIGNATURE PAGE

This report titled "Competent Persons' Report on the Brits Vanadium Project, North West and Gauteng Provinces, South Africa" with an effective date of 18 June 2019, prepared by MSA on behalf of Bushveld Minerals Limited (BMN) dated 01 November 2019 was prepared and signed by the Competent Persons:

- | | |
|---|---|
| Dated at Johannesburg, South Africa
01 November 2019 | "Signed"

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APPENDIX 1: UNITS OF MEASURE, ACRONYMS AND ABBREVIATIONS



Units of measure, acronyms and abbreviations

AEE	Association Energy Engineers
ALS	ALS Global (Edenvale, Johannesburg, South Africa)
AMIS	African Mineral Standards
AMV	Ammonium Metavanadate
AusIMM	Australasian Institute of Mining and Metallurgy
BMN	Bushveld Minerals Limited
Brits Vanadium	The Brits Vanadium Project
Bushveld Vametco Mine	Bushveld Vametco Vanadium Mine
CaO	Calcium
Caber	Caber Trade & Invest 1 (Proprietary) Limited
cm	centimetre
CMVP-IT	Certified Measurement and Verification Practitioner in training
CP	Competent Person
CPR	Competent Persons Report
CRM	Certified Reference Material
CTMM	City of Tshwane Metropolitan Municipality
CV	Coefficient of Variation
CV	Competent Mineral Asset Valuator
CWEP	Certified Water Efficiency Practitioner
DD	Diamond Drilling
DCF	Discounted Cash Flow
DMR	Department of Mineral Resources
DTM	Digital terrain model
EA	Environmental Authorisation
ECA	Environmental Conservation Act 1989
EIA	Environmental Impact Assessment
EMP	Environmental Management Programme
EMPr	Environmental Management Programme Report
ESG	Environmental and Social Governance
EOH	End of Hole
GASA	Geostatistical Association of Southern Africa
GDARD	Gauteng Department of Agriculture and Rural Development
GNR	Government Notice Regulations
GPS	Global Positioning System
GSSA	Geological Society of South Africa
ha	hectare
HDSA	Historically Disadvantaged South Africans
HSLA	high-strength, low-alloy
IAPs	Interested and Affected Parties
IS	Intermediate Seam
kt	Kilo tonne
LCZ	Lower Critical Zone



LG	Lower Group
LGS	Lebowa Granite Suite
LS	Lower Seam
m	metre
Ma	Million years
MAE	Mean Annual Evaporation
mamsl	Metres above mean sea level
MG	Middle Group
MKR	MKR Bakwena Tribal Minerals NPC
mm	millimetre
MPRDA	Mineral and Petroleum Resources Development Act (Act 28 of 2002)
MSA	The MSA Group (Pty) Ltd
Mt	Million tonnes
mtV	Metric tonnes vanadium
NEMA	National Environmental Management Act (Act 107 of 1998)
NPV	Net present value
NWDEDET	North-West Department of Economic Development, Environment and Tourism
PEM	Prospectivity Enhancement Multiplier
PGM	Platinum Group Metals
Pr.Sci.Nat.	Professional Natural Scientist
Ptn.	Portion
QAQC	Quality Assurance Quality Control
The Report	CPR or the Competent Persons Report
RGS	Rashoop Granophyre Suite
RLS	Rustenburg Layered Suite
ROD	Record of Decision
Royalty Act	The Mineral and Petroleum Resources Royalty Act (2008)
RQD	Rock Quality Designation
RSA / ZA	Republic of South Africa
SACNASP	South African Council for Natural Scientific Professions
SAMC	South African Minerals Council
SAMREC Code	The South African Code for Reporting of Exploration Results, Mineral Resources and Mineral Reserves (2016 Edition)
SANAS	South African National Accreditation System
SI	Système international (d'unités) or International System of Units
SiO ₂	Silica
SLP	Social and Labour Plan
SPM	Sable Metals and Minerals Limited
t	tonnes



The Project	The Brits Vanadium Project comprising three separate licence areas
µm	Micrometre
UCZ	Upper Critical Zone
US	Upper Seam
USD	United States Dollars
VRFB	Vanadium redox flow batteries
WISA	Water Institute of Southern Africa Mine Water Division
WMA	Water Management Area
WRC	Water Research Commission
XRF	X-ray fluorescence
ZA / RSA	Republic of South Africa
ZAR	South African Rand



APPENDIX 2: JORC CODE 2012, TABLE 1



Section 1 Sampling Techniques and Data

(Criteria in this section apply to all succeeding sections.)

Criteria	JORC Code explanation	Commentary
Sampling techniques	<ul style="list-style-type: none"> • <i>Nature and quality of sampling (e.g. cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheld XRF instruments, etc). These examples should not be taken as limiting the broad meaning of sampling.</i> • <i>Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.</i> • <i>Aspects of the determination of mineralisation that are Material to the Public Report.</i> • <i>In cases where 'industry standard' work has been done this would be relatively simple (e.g. 'reverse circulation drilling was used to obtain 1 m samples from which 3 kg was pulverised to produce a 30 g charge for fire assay'). In other cases more explanation may be required, such as where there is coarse gold that has inherent sampling problems. Unusual commodities or mineralisation types (e.g. submarine nodules) may warrant disclosure of detailed information.</i> 	<ul style="list-style-type: none"> • 26 diamond cored drillholes were completed on the project by BMN. Two of these (BVL018 and BVL009) were drilled within the Bushveld Vametco Mine licence boundary. BVL009 was used in the geological modelling and in the Resource estimate as it was drilled within the most eastern fault block of the Project. • The sampling start and end positions of the samples were based on the lithological contacts and / or the occurrence of significant magnetite concentration. High grade zones (magnetite concentration >20%) were identified and the sample interval was limited to a maximum interval of 1 m and minimum interval of 0.3 m. The low-grade zones (magnetite concentration < 20%) were sampled to a maximum of 2.0 m intervals. • 75% of all samples taken were equal to or less than 1 m in length. The intervals were varied to respect geological boundaries. • Cores were cut longitudinally in half using a rotating diamond saw blade and one half was submitted for analysis. • The mineralisation was sampled using diamond cored drillholes. A total of 26 holes were drilled in a south-easterly direction. 25 drillholes were used in the geological model and grade estimation. 7 drillholes intersected and were used for the Upper seam, 13 drillholes for the Intermediate Seam and 24 drillholes for the Lower Seam. • The position where sampling of the core commenced and ended for each layer was based on the occurrence of significant magnetite concentration defined as greater than approximately 20%. Low grade zones (magnetite concentration < 20%) were identified and analysed for magnetite content but were not always assayed for V₂O₅, SiO₂ and CaO.
Drilling techniques	<ul style="list-style-type: none"> • <i>Drill type (e.g. core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc) and details (e.g. core diameter, triple or standard tube, depth of diamond tails, face-sampling bit or other type, whether core is oriented and if so, by what method, etc).</i> 	<ul style="list-style-type: none"> • 26 diamond drillholes using NQ core size. No drillhole cores were oriented.



Criteria	JORC Code explanation	Commentary
Drill sample recovery	<ul style="list-style-type: none"> • Method of recording and assessing core and chip sample recoveries and results assessed. • Measures taken to maximise sample recovery and ensure representative nature of the samples. • Whether a relationship exists between sample recovery and grade and whether sample bias may have occurred due to preferential loss/gain of fine/coarse material. 	<ul style="list-style-type: none"> • Drillhole core sample recoveries for exploration drillholes included recording interval length, stratigraphy, total solid core, number of fractures, frequency of fractures and Rock Quality Designation (RQD). • Core is competent and core recovery is good (>95%) except for the overlying 5 m of soil. • No sample bias expected given that recovery is good.
Logging	<ul style="list-style-type: none"> • Whether core and chip samples have been geologically and geotechnically logged to a level of detail to support appropriate Mineral Resource estimation, mining studies and metallurgical studies. • Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc) photography. • The total length and percentage of the relevant intersections logged. 	<ul style="list-style-type: none"> • All core has been logged for lithology, stratigraphy and seam units. • All cores were geologically logged from the collar to end of hole (EOH). The total length of core in the 25 drillholes used for both the geological model and the estimate is 2,750.27 m. The one borehole excluded, was drilled outside of the licence boundary and all fault blocks within the Brits Vanadium Project. • All cores were logged for number of fractures, frequency of fractures and Rock Quality Designation (RQD). • Core photography was completed per core tray from collar to end of each drillhole.
Sub-sampling techniques and sample preparation	<ul style="list-style-type: none"> • If core, whether cut or sawn and whether quarter, half or all core taken. • If non-core, whether riffled, tube sampled, rotary split, etc and whether sampled wet or dry. • For all sample types, the nature, quality and appropriateness of the sample preparation technique. • Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples. • Measures taken to ensure that the sampling is representative of the in situ material collected, including for instance results for field duplicate/second-half sampling. • Whether sample sizes are appropriate to the grain size of the material being sampled. 	<ul style="list-style-type: none"> • Drillhole cores were sampled by splitting longitudinally in half using diamond saw splitter. • Fractured portions of core were aligned, and buffing tape used to ensure core splitting lines are the same from the start to the end of each sample. • Drillhole cores were sampled dry. • Minimum and maximum core sample intervals of 0.30 m and 2.00 m respectively appropriate for the style of mineralisation. • No field duplicates or second half core samples were taken. • The mineralisation is clearly visible in the cores and equally distributed between one side of the core and the other and therefore it is considered that the sample sizes are appropriate to the material being sampled.



Criteria	JORC Code explanation	Commentary
Quality of assay data and laboratory tests	<ul style="list-style-type: none"> <i>The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.</i> <i>For geophysical tools, spectrometers, handheld XRF instruments, etc, the parameters used in determining the analysis including instrument make and model, reading times, calibrations factors applied and their derivation, etc.</i> <i>Nature of quality control procedures adopted (e.g. standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (i.e. lack of bias) and precision have been established.</i> 	<ul style="list-style-type: none"> Primary laboratory was Bushveld Vametco Alloys, South Africa. X-ray fluorescence (XRF) spectroscopy using the fusion technique for analysis of whole rock and concentrate. This is a total digest method. Davis Tube wet magnetic separation used to separate the magnetic portion (concentrate) from the head sample. The assaying methods are appropriate for the style and type of mineralisation. Blanks and standards inserted in the sample stream for quality assurance and quality control. A standard and blank were inserted for every 10 samples assayed. QAQC information indicates that acceptable levels of accuracy and precision have been achieved.
Verification of sampling and assaying	<ul style="list-style-type: none"> <i>The verification of significant intersections by either independent or alternative company personnel.</i> <i>The use of twinned holes.</i> <i>Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.</i> <i>Discuss any adjustment to assay data.</i> 	<ul style="list-style-type: none"> No twin drillholes have been drilled. 5% of assays were confirmed by a second laboratory (ALS Global – Johannesburg). All data are stored in a Microsoft Excel database. No statistical adjustments to data have been applied.
Location of data points	<ul style="list-style-type: none"> <i>Accuracy and quality of surveys used to locate drill holes (collar and down-hole surveys), trenches, mine workings and other locations used in Mineral Resource estimation.</i> <i>Specification of the grid system used.</i> <i>Quality and adequacy of topographic control.</i> 	<ul style="list-style-type: none"> All of the drillhole collars were surveyed by the Vametco mine surveyor using differential global positioning system (DGPS) survey equipment. All holes were drilled vertically. The grid system for the Project is WGS84 LO27. The high-resolution topography digital terrain model (DTM) was completed by Premier Mapping on behalf of BMN.
Data spacing and distribution	<ul style="list-style-type: none"> <i>Data spacing for reporting of Exploration Results.</i> <i>Whether the data spacing and distribution is sufficient to establish the degree of geological and grade continuity appropriate for the Mineral Resource and Ore Reserve estimation procedure(s) and classifications applied.</i> <i>Whether sample compositing has been applied.</i> 	<ul style="list-style-type: none"> Due to the structure on the Project being confidently interpreted by magnetic surveys, the drillhole spacing was not based on a set grid. The drillholes have a spacing of between 50 m and 250 m. The drillhole spacing is sufficient to assume and/or confirm geological continuity for this type of mineralisation, which is highly continuous. Grade continuity is less well established than geological continuity and is assumed. 2 m composites were applied during estimation.



Criteria	JORC Code explanation	Commentary
Orientation of data in relation to geological structure	<ul style="list-style-type: none"> Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type. If the relationship between the drilling orientation and the orientation of key mineralised structures is considered to have introduced a sampling bias, this should be assessed and reported if material. 	<ul style="list-style-type: none"> Drillholes were drilled vertically into the 19° dipping layer. No sampling bias due to the drilling orientation is expected.
Sample security	<ul style="list-style-type: none"> The measures taken to ensure sample security. 	<ul style="list-style-type: none"> Chain of custody used in the whole sample handling process from the sample preparation point to and from the laboratory. Sample bags properly sealed in small bags and again placed in a sealed large bag containing a number of samples.
Audits or reviews	<ul style="list-style-type: none"> The results of any audits or reviews of sampling techniques and data. 	<ul style="list-style-type: none"> QAQC Plots conducted on the assay data reviewed internally by BMN and externally reviewed by MSA The sampling and logging of a selection of cores was reviewed by the CP during a site visit on 28 May 2019.

Section 2 Reporting of Exploration Results

(Criteria listed in the preceding section also apply to this section.)

Criteria	JORC Code explanation	Commentary
Mineral tenement and land tenure status	<ul style="list-style-type: none"> Type, reference name/number, location and ownership including agreements or material issues with third parties such as joint ventures, partnerships, overriding royalties, native title interests, historical sites, wilderness or national park and environmental settings. The security of the tenure held at the time of reporting along with any known impediments to obtaining a licence to operate in the area. 	<ul style="list-style-type: none"> Prospecting Right, No: NW/5/1/1/2/11124 PR, which consists of portion 3 of the farm Uitvalgrond 431 JQ. The Prospecting right is valid for a period of 5 years and has an expiry date of 03 November 2019.
Exploration done by other parties	<ul style="list-style-type: none"> Acknowledgment and appraisal of exploration by other parties. 	<ul style="list-style-type: none"> Three holes were completed by the previous owner of the project (Sable Metals and Minerals Limited). This information was not used in the Mineral Resource estimate as it was not available.



Criteria	JORC Code explanation	Commentary
Geology	<ul style="list-style-type: none"> • <i>Deposit type, geological setting and style of mineralisation.</i> 	<ul style="list-style-type: none"> • The deposit occurs within the Rustenburg Layered Suite of the Bushveld Complex, which is a layered mafic intrusion. Magnetite- rich gabbro and massive magnetite layers occur in the Upper Zone. Locally these are grouped into units known as the Upper Seam, Intermediate Seam and Lower Seam. • The deposit is a tabular magmatic deposit formed during crystallisation of the mafic magma. • The vanadium occurs as vanadiferous magnetite.
Drill hole Information	<ul style="list-style-type: none"> • <i>A summary of all information material to the understanding of the exploration results including a tabulation of the following information for all Material drill holes:</i> <ul style="list-style-type: none"> – <i>easting and northing of the drill hole collar</i> – <i>elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar</i> – <i>dip and azimuth of the hole</i> – <i>down hole length and interception depth</i> – <i>hole length.</i> • <i>If the exclusion of this information is justified on the basis that the information is not Material and this exclusion does not detract from the understanding of the report, the Competent Person should clearly explain why this is the case.</i> 	<ul style="list-style-type: none"> • Exploration results not being reported • All drillholes are orientated vertically. • Intersection thicknesses described for the Mineral Resource.
Data aggregation methods	<ul style="list-style-type: none"> • <i>In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (e.g. cutting of high grades) and cut-off grades are usually Material and should be stated.</i> • <i>Where aggregate intercepts incorporate short lengths of high grade results and longer lengths of low grade results, the procedure used for such aggregation should be stated and some typical examples of such aggregations should be shown in detail.</i> • <i>The assumptions used for any reporting of metal equivalent values should be clearly stated.</i> 	<ul style="list-style-type: none"> • Exploration results not being reported



Criteria	JORC Code explanation	Commentary
Relationship between mineralisation widths and intercept lengths	<ul style="list-style-type: none"> • <i>These relationships are particularly important in the reporting of Exploration Results.</i> • <i>If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported.</i> • <i>If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (eg 'down hole length, true width not known').</i> 	<ul style="list-style-type: none"> • Holes were drilled vertically into the layers that have a near constant dip of 19°. • A correction of 5% will apply to calculate true thickness of intersections from vertical holes drilled into a 19° dipping layer.
Diagrams	<ul style="list-style-type: none"> • <i>Appropriate maps and sections (with scales) and tabulations of intercepts should be included for any significant discovery being reported These should include, but not be limited to a plan view of drill hole collar locations and appropriate sectional views.</i> 	<ul style="list-style-type: none"> • Exploration results not being reported
Balanced reporting	<ul style="list-style-type: none"> • <i>Where comprehensive reporting of all Exploration Results is not practicable, representative reporting of both low and high grades and/or widths should be practiced to avoid misleading reporting of Exploration Results.</i> 	<ul style="list-style-type: none"> • Exploration results not being reported
Other substantive exploration data	<ul style="list-style-type: none"> • <i>Other exploration data, if meaningful and material, should be reported including (but not limited to): geological observations; geophysical survey results; geochemical survey results; bulk samples – size and method of treatment; metallurgical test results; bulk density, groundwater, geotechnical and rock characteristics; potential deleterious or contaminating substances.</i> 	<ul style="list-style-type: none"> • Ground magnetometer surveys were carried out, which located the sub-outcrop of the major magnetite-rich layers and enabled the interpretation of faults.
Further work	<ul style="list-style-type: none"> • <i>The nature and scale of planned further work (e.g. tests for lateral extensions or depth extensions or large-scale step-out drilling).</i> • <i>Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.</i> 	<ul style="list-style-type: none"> • Infill drilling is planned on the property to increase the proportion of Indicated Mineral Resources.



Section 3 Estimation and Reporting of Mineral Resources

(Criteria listed in section 1, and where relevant in section 2, also apply to this section.)

Criteria	JORC Code explanation	Commentary
Database integrity	<ul style="list-style-type: none"> Measures taken to ensure that data has not been corrupted by, for example, transcription or keying errors, between its initial collection and its use for Mineral Resource estimation purposes. Data validation procedures used. 	<ul style="list-style-type: none"> The database was managed by BMN and underwent data checks by BMN and MSA. The validation process consisted of: <ul style="list-style-type: none"> Examining the sample assay, collar survey and geology data to ensure that the data were complete for all drillholes, examining the de-surveyed data in three dimensions to check for spatial errors, examining the assay data to ascertain whether they were within expected ranges, examining the whole rock versus concentrate assays and yield to ensure values were in expected ranges, checks for "From-To" errors, to ensure that the sample data did not overlap one another or that there were no unexplained gaps between samples, statistical checks to validate the generations of data.
Site visits	<ul style="list-style-type: none"> Comment on any site visits undertaken by the Competent Person and the outcome of those visits. If no site visits have been undertaken indicate why this is the case. 	<ul style="list-style-type: none"> A visit was undertaken by Jeremy Witley (CP) and Kaylan Bartlett to the Brits Vanadium Project farm (Uitvalgrond Portion 3) and Bushveld Vametco's core storage facility on the 28th of May 2019 to examine the recent drilling.



Criteria	JORC Code explanation	Commentary
Geological interpretation	<ul style="list-style-type: none"> • Confidence in (or conversely, the uncertainty of) the geological interpretation of the mineral deposit. • Nature of the data used and of any assumptions made. • The effect, if any, of alternative interpretations on Mineral Resource estimation. • The use of geology in guiding and controlling Mineral Resource estimation. • The factors affecting continuity both of grade and geology. 	<ul style="list-style-type: none"> • The confidence in the geological interpretation of the Upper, Intermediate and Lower Seam is considered good. Bushveld Complex layered deposits are highly continuous. • Diamond drilling was used along with a magnetic survey. • Minor faults and dykes occur as well as local slumps in the layering. Two boreholes had anomalous total package thicknesses. This could be due to minor faulting, although this has not been confirmed. • No alternative interpretations are likely as the exploration drilling confirmed the local stratigraphy that is well understood due to nearly 50 years of mining on the adjacent property. • The three magnetite-rich zones intersected in drillhole core are clearly discernible. The magnetite-rich layers are the host to V₂O₅ mineralisation. • The deposit is continuous along strike, although is interrupted by several faults and a small dyke.
Dimensions	<ul style="list-style-type: none"> • The extent and variability of the Mineral Resource expressed as length (along strike or otherwise), plan width, and depth below surface to the upper and lower limits of the Mineral Resource. 	<ul style="list-style-type: none"> • The area defined as the Upper Seam Mineral Resource extends for approximately 1,360 m in the strike direction and for approximately 680 m in the dip direction. The Upper Seam Mineral Resource varies between approximately 3 m and 7 m thick. • The area defined as the Intermediate Seam Mineral Resource extends for approximately 1,900 m in the strike direction and for approximately 660 m in the dip direction. The thickness of the Intermediate Seam Mineral Resource varies generally between approximately 24 m and 38 m. • The area defined as the Lower Seam Mineral Resource extends approximately 1,900 m in the strike direction and for approximately 612 m in the dip direction. The Lower Seam is between 53 m and 69 m thick. • The mineralisation has been demonstrated by drilling to continue beyond the 150 m depth limit applied to the Mineral Resource.



Criteria	JORC Code explanation	Commentary
<p>Estimation and modelling techniques</p>	<ul style="list-style-type: none"> • <i>The nature and appropriateness of the estimation technique(s) applied and key assumptions, including treatment of extreme grade values, domaining, interpolation parameters and maximum distance of extrapolation from data points. If a computer assisted estimation method was chosen include a description of computer software and parameters used.</i> • <i>The availability of check estimates, previous estimates and/or mine production records and whether the Mineral Resource estimate takes appropriate account of such data.</i> • <i>The assumptions made regarding recovery of by-products.</i> • <i>Estimation of deleterious elements or other non-grade variables of economic significance (e.g. sulphur for acid mine drainage characterisation).</i> • <i>In the case of block model interpolation, the block size in relation to the average sample spacing and the search employed.</i> • <i>Any assumptions behind modelling of selective mining units.</i> • <i>Any assumptions about correlation between variables.</i> • <i>Description of how the geological interpretation was used to control the resource estimates.</i> • <i>Discussion of basis for using or not using grade cutting or capping.</i> • <i>The process of validation, the checking process used, the comparison of model data to drill hole data, and use of reconciliation data if available.</i> 	<ul style="list-style-type: none"> • Block model estimates were completed using Datamine Studio RM. <ul style="list-style-type: none"> • 20 mX by 20 mY by 5 mRL block models. • Coefficients of variation are low. • The estimates were completed using Inverse Distance Squared. • A search distance of 250 mX by 250 mY by 10 mRL was used to source between 6 and 12 two metre composites for estimation. Searches were expanded two and ten times to estimate all the model cells. A maximum of four composites were allowed from a single hole. • Density data were available for the drillholes but not for each sample. Density were regressed as a strong relationship exists between magnetite percent and density. • The grade estimates are globally similar to the data. No mining has been executed to test the estimate against production data. • No bi-products were estimated. • Both the whole rock and Davis Tube concentrate V₂O₅ grades were estimated. • 20 mX by 20 mY by 5 mRL block models in relation to drillholes generally between 50 m and 250 m apart. Block size is more a function of layer orientation than drillhole spacing in this case. CV is low which justifies a small block size. • No selective mining units estimated. • Search ellipses aligned with dip and strike of layers. Estimates used hard boundaries between the seams modelled. Dynamic anisotropy was used during estimation that ensures that the estimation search ellipse follows the modelled layering orientation. • Capping and cutting were not necessary as no outlier values were identified. • Model was validated by visual examination, swath plots and global averages of model versus the data.
<p>Moisture</p>	<ul style="list-style-type: none"> • <i>Whether the tonnages are estimated on a dry basis or with natural moisture, and the method of determination of the moisture content.</i> 	<ul style="list-style-type: none"> • Tonnages were estimated on a dry basis.



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Cut-off parameters	<ul style="list-style-type: none"> The basis of the adopted cut-off grade(s) or quality parameters applied. 	<ul style="list-style-type: none"> A 20% magnetite cut-off grade was used for the Mineral Resource, which is slightly lower than the 26% currently used at Bushveld-Vametco Mine.
Mining factors or assumptions	<ul style="list-style-type: none"> Assumptions made regarding possible mining methods, minimum mining dimensions and internal (or, if applicable, external) mining dilution. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential mining methods, but the assumptions made regarding mining methods and parameters when estimating Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the mining assumptions made. 	<ul style="list-style-type: none"> Mining will occur through open-pit methods. The Mineral Resource is reported to a depth of 150 m below surface. High level mining studies (pit optimisation) on the adjacent Bushveld-Vametco Mine indicate that the potential economic pit depth could be at least 150 m below surface.
Metallurgical factors or assumptions	<ul style="list-style-type: none"> The basis for assumptions or predictions regarding metallurgical amenability. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential metallurgical methods, but the assumptions regarding metallurgical treatment processes and parameters made when reporting Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the metallurgical assumptions made. 	<ul style="list-style-type: none"> The Brits Vanadium project is adjacent to the neighbouring operating Bushveld-Vametco Mine, which produces a saleable product. It is assumed that the Brits Vanadium mineralisation is amenable to the same process given that it is also vanadiferous magnetite that occurs in the same stratigraphic unit.
Environmental factors or assumptions	<ul style="list-style-type: none"> Assumptions made regarding possible waste and process residue disposal options. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider the potential environmental impacts of the mining and processing operation. While at this stage the determination of potential environmental impacts, particularly for a greenfields project, may not always be well advanced, the status of early consideration of these potential environmental impacts should be reported. Where these aspects have not been considered this should be reported with an explanation of the environmental assumptions made. 	<ul style="list-style-type: none"> Brits Vanadium Project is an exploration project and all environmental permissions are in-place. The CP is not aware of any environmental impediments.



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Bulk density	<ul style="list-style-type: none"> • Whether assumed or determined. If assumed, the basis for the assumptions. If determined, the method used, whether wet or dry, the frequency of the measurements, the nature, size and representativeness of the samples. • The bulk density for bulk material must have been measured by methods that adequately account for void spaces (vugs, porosity, etc), moisture and differences between rock and alteration zones within the deposit. • Discuss assumptions for bulk density estimates used in the evaluation process of the different materials. 	<ul style="list-style-type: none"> • 200 density measurements, excluding BVL018 were completed across the different magnetite layer stratigraphy. • The density measurements were taken using a gas pycnometer which does not account for porosity. The fresh igneous rocks at Brits Vanadium are not porous. • Density was assigned to samples that did not have density measurements, based on the strong relationship between density and magnetite concentration. • Density was estimated into the block model using inverse distance squared.
Classification	<ul style="list-style-type: none"> • The basis for the classification of the Mineral Resources into varying confidence categories. • Whether appropriate account has been taken of all relevant factors (ie relative confidence in tonnage/grade estimations, reliability of input data, confidence in continuity of geology and metal values, quality, quantity and distribution of the data). • Whether the result appropriately reflects the Competent Person's view of the deposit. 	<ul style="list-style-type: none"> • The Mineral Resources were classified as Indicated when they occur within an area drilled to at least than 200 m spacing. Indicated Mineral Resources were extended 125 m along strike and down-dip from the drillhole grid. • The Mineral Resources were classified as Inferred when they occur within the geological model but outside the area drilled to at least 200 m spacing. Inferred Resources are sparsely drilled and mostly extrapolated (to a maximum of 400 m along strike and 250 m down dip). The Mineral Resource has been reported to a maximum depth of 150 m. • The classification appropriately reflects the CP's view of the deposit.
Audits or reviews	<ul style="list-style-type: none"> • The results of any audits or reviews of Mineral Resource estimates. 	<ul style="list-style-type: none"> • The Mineral Resources have been internally reviewed by the BMN geologists. • No external audits have taken place.



Criteria	JORC Code explanation	Commentary
<i>Discussion of relative accuracy/ confidence</i>	<ul style="list-style-type: none">• <i>Where appropriate a statement of the relative accuracy and confidence level in the Mineral Resource estimate using an approach or procedure deemed appropriate by the Competent Person. For example, the application of statistical or geostatistical procedures to quantify the relative accuracy of the resource within stated confidence limits, or, if such an approach is not deemed appropriate, a qualitative discussion of the factors that could affect the relative accuracy and confidence of the estimate.</i>• <i>The statement should specify whether it relates to global or local estimates, and, if local, state the relevant tonnages, which should be relevant to technical and economic evaluation. Documentation should include assumptions made and the procedures used.</i>• <i>These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.</i>	<ul style="list-style-type: none">• The Indicated Mineral Resources are of sufficient accuracy to allow for Life of Mine planning.• Bushveld magnetite deposits are highly continuous and generally of relatively low risk. However, they are impacted by faulting which can affect mine planning.• Inferred Mineral Resource estimates should be considered global in nature.• No production records are available as no mining has taken place on the property.