TANDO RESOURCES

ASX ANNOUNCEMENT

18 December 2018

Massive Maiden High Grade Inferred JORC Resource at SPD Vanadium of 588Mt at 0.78% V_2O_5

Including 80 Mt at 1.07% V_2O_5 surface component - the focus of a near term low capex production opportunity

Key Points

- **Maiden Inferred JORC Resource at SPD of 588Mt at a grade of 0.78% V_2O_5**
- **Significant increase in size of Resource and improved delineation of high grade zones compared with historic SAMREC resource**
- **Resource includes high grade, surface component (80 Mt at 1.07% V_2O_5)**
- **Potential for vanadium pipes to enrich high grade feed**
- **High grade surface zones and pipes the focus of immediate metallurgical and engineering studies as Tando fast tracks its near-term low capex production opportunity based on simple beneficiation**
- **Phase 2 infill drilling complete, enabling updated Mineral Resource to be published in Q1 2019 following receipt of assays**
- **Scoping Study to be accelerated during Q1 2019 with vanadium prices continuing at US$30/lb**

Tando Resources (ASX: TNO, **Tando** or **the Company**) is pleased to announce the maiden JORC Resource at its SPD Vanadium Project.

The resource comprises **588 million tonnes at 0.78% V_2O_5** which is wholly classified in the Inferred category.

Significantly the resource includes coherent high-grade, near surface zones of mineralisation which totals **80 million tonnes at 1.07% V_2O_5** (defined above a cut off grade of 0.9% V_2O_5, within 100m of surface).

Tando Managing Director Bill Oliver said the maiden JORC resource confirmed the quality of the SPD Vanadium Project as a potential tier 1 asset and provided an important spring board for the next phase of activities.

> "*The delineation of high grade, near surface mineralisation provides an immediate focus for our metallurgical and mining studies," Mr Oliver said.*
>
> *"Our aim is to fast track a robust, viable near term low capex production opportunity. Work during early 2019 will be focussed on development of this high grade zone, in addition to the potential high grade DSO contribution from the pipes."*

***Figure 1**. Oblique view from the south showing block model (resource blocks in pink), drillhole traces (black lines) and topography. Note outcropping mineralisation at surface.*

Phase 2 Drilling Completed

The Phase 2 infill drilling programme at the SPD Project has now been completed with Tando drilling a total of 83 holes for 6002 metres in 2018 (51 RC holes and 32 diamond core holes, Figure 2). Samples from the diamond core holes in the Phase 2 drilling programme will continue to be delivered to the laboratory until mid-January, with results from these samples to be used to update the Mineral Resource for the SPD Vanadium Project in Q1 2019.

This updated Mineral Resource should contain a high proportion of material in the Indicated category if assay results for Phase 2 are consistent with adjacent holes. In addition, the increased detail from the infill drilling will enable the higher-grade massive magnetite layers to be better delineated, increasing the potential for selective mining to meet offtake specifications.

The Company is also pleased that the 2018 drilling programme was able to engage a number of local businesses to provide support services to the drilling programme along with workers from the communities receiving employment and training from the drilling contractor and other contractors.

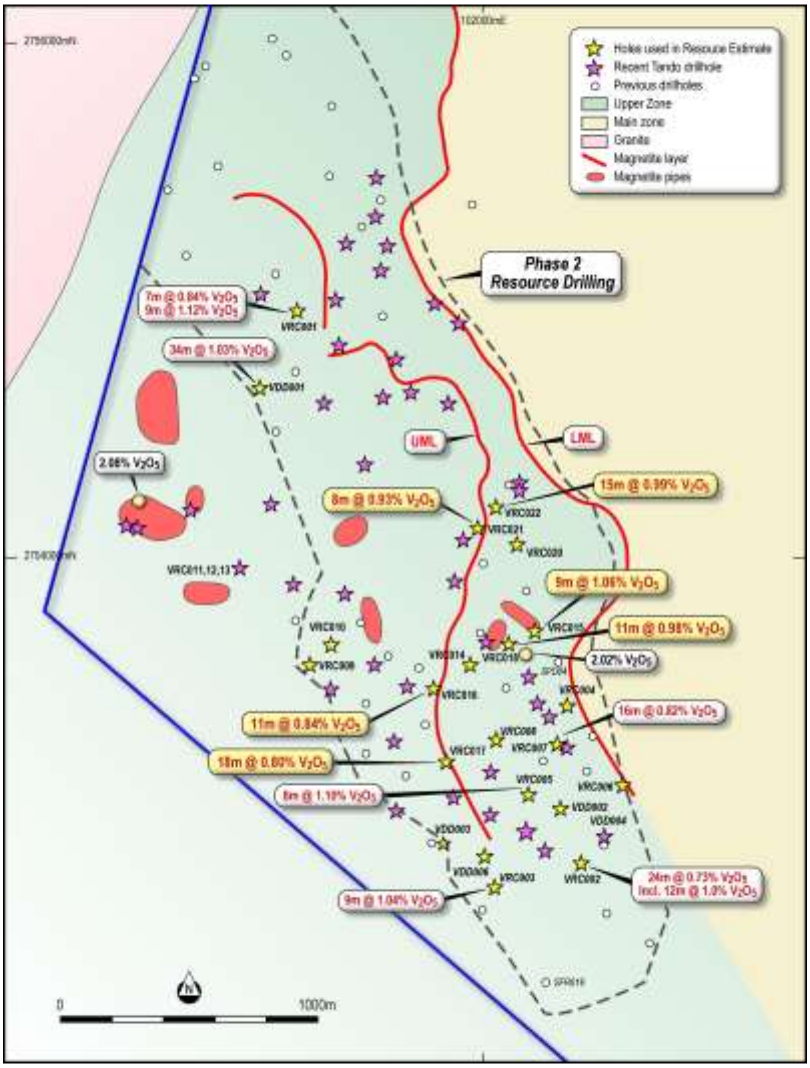

Figure 2. *Plan showing Tando's 2018 drilling at SPD as well as historical drilling.*

Scoping Study

The updated Mineral Resource will then form the basis of a Scoping Study on the SPD Vanadium Project. This Scoping Study will consider both the larger project, which would produce vanadium pentoxide, and a near term low capex production option which would produce a precursor product to vanadium pentoxide. The near term production option would seek to generate a magnetic concentrate from the high grade portions of the Mineral Resource via simple beneficiation (using magnetic separation).

It is anticipated that the high grade vanadium pipes within the project area will be blended with the higher grade portions identified within the resource to enrich the feed to the magnetic separator in the early phases of production. Drilling will continue on these pipes in 2019 with assays still awaited from the Cluster 1 pipes drilled last month.

Historical drilling of the SPD Mineral Resource returned magnetic concentrate grades above 2.2% V_2O_5 (refer ASX release 17 September 2018). Tando is awaiting concentrate analyses from drill samples submitted for magnetic separation by Davis Tube.

Metallurgical testwork is currently underway on wide diameter drill core samples from the project and results will be reported in Q1 2019.

In addition, preliminary pit optimisation work will commence immediately, with mine designs to be completed on the update Mineral Resource in Q1 2019.

The Company is fully funded for the drilling programme and resource work as well as the metallurgical and mining studies which will follow completion of the drilling programme.

Background on the SPD Vanadium Project

Global vanadium projects are summarised in Figure 3. Currently approximately 85% of the world's vanadium is produced in China, Russia and South Africa. The SPD Vanadium Project is located in one of these producing regions and has the potential to be globally significant based on its tonnage and grade in concentrate (Figure 3).

The SPD Vanadium Project is located in a similar geological setting to the mining operations of Rhovan (Glencore), Vametco (Bushveld Minerals) and Mapochs in the Gauteng and Limpopo provinces of South Africa (Figure 4). Both the Rhovan and Vametco processing plants include refining to generate products used in the global steel making industry and aim to develop downstream processing to produce materials used in the battery market.

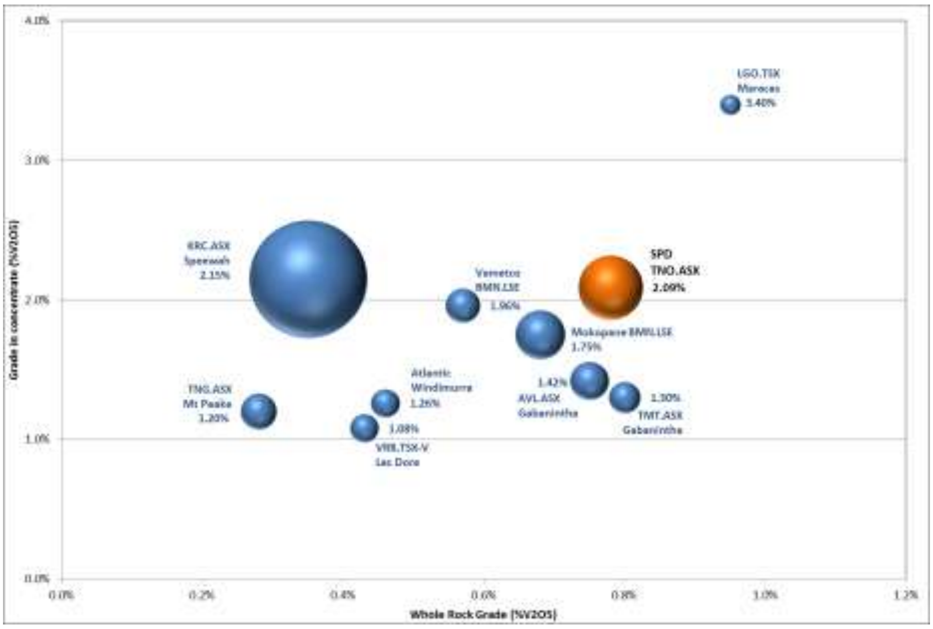

***Figure 3**. Global vanadium projects categorised by resource grade and grade in concentrate.*
Label states concentrate grade based on reported testwork. Bubble size denotes tonnage. Tonnes and grade based on reported total resources, due to different host exchanges these are reported under differing reporting regimes (JORC, 43-101 or SAMREC).
Source: Company websites, ASX / TSX / LSE announcements.

The region around the SPD Vanadium Project contains critical infrastructure such as:

- High voltage power lines and sub stations operated by the state provider ESKOM,
- Water resources including the De Hoop Dam 15km south of the project,
- Rail links,
- Sealed roads around the project area,
- Mining service companies and support business in the immediate area,
- Available skilled workforce within the local community and the region.

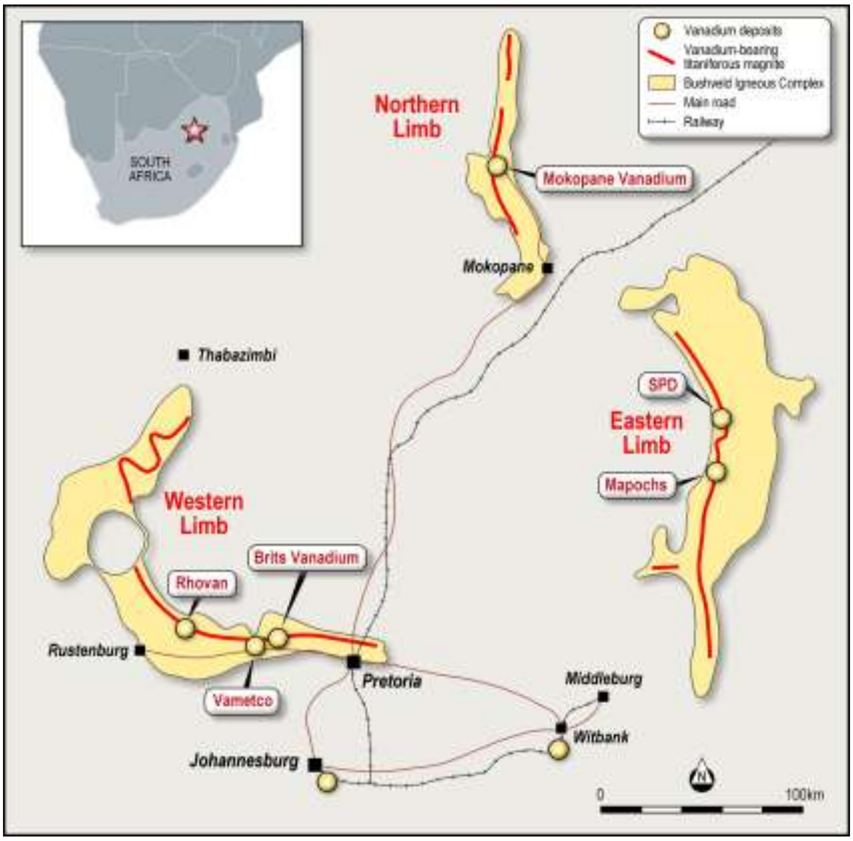

***Figure 4**. Location of the SPD Vanadium Project and other vanadium deposits in the Bushveld Igneous Complex.*

Background on Vanadium

The Company has targeted vanadium as a commodity of interest due to its usage in energy storage, specifically vanadium redox flow batteries (**VRFB**). It is anticipated that forecast increase in battery usage for large scale energy storage will lead to a significant increase in the demand for vanadium. VRFB technology was developed in Australia and has the following advantages:

- a substantially longer lifespan than most current batteries (up to 20 years),
- being able to hold charge for a substantial time (up to 12 months),
- the ability to discharge 100% of its charge without damage,
- scalability to enable larger scale storage facilities to be constructed, and
- greater chemical stability as only a single element is present in the electrolyte.

These features make VRFBs attractive for household or small town sized energy storage requirements. According to research conducted by Lazard (NYSE.LAZ) VRFB's already have a levelised cost of storage that exceeds Li-ion battery storage by 26% to 32% on a comparative basis (full report available at https://www.lazard.com/perspective/).

Current VRFB facilities in usage or in development are located in China and Japan with development of further facilities constrained by an absence of supply of "battery grade" V_2O_5.

The price for >98% Vanadium Pentoxide (V_2O_5), a more commonly traded intermediate product, has increased from US$3.50/lb at the start of 2017 and approximately US$10/lb at the start of 2018 to current prices which remain around US$30/lb (fob China, source: Metal Bulletin).

Current day demand for vanadium arises from its use in steel making. Vanadium is principally used to add strength via various alloys as well as other speciality uses. This usage accounts for over 90% of current vanadium demand in today's market (with the balance supplying chemical usages). Demand from steel makers is forecast to increase with the recent implementation of stricter standards on the strength of steel to be used in construction (specifically rebar).

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Competent Persons Statement

The information in this announcement that relates to Exploration Results and other technical information relating to drilling, sampling and the geological interpretation derived from the Exploration Results complies with the 2012 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (**JORC Code**) and has been compiled and assessed under the supervision of Mr Bill Oliver, the Managing Director of Tando Resources Ltd. Mr Oliver is a Member of the Australasian Institute of Mining and Metallurgy and the Australasian Institute of Geoscientists. He has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration and to the activity being undertaken to qualify as a Competent Person as defined in the 2012 Edition of the JORC Code. Mr Oliver consents to the inclusion in this announcement of the matters based on his information in the form and context in which it appears. The Exploration Results are based on standard industry practises for drilling, logging, sampling, assay methods including quality assurance and quality control measures as detailed in Appendix 3.

The information in this announcement that relates to Mineral Resources complies with the 2012 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (**JORC Code**) and that has been compiled, assessed and created under the supervision of Mr Kell Nielsen BSc.(Geology), MSc.(Mineral Econ.) and a Member of the Australasian Institute of Mining and Metallurgy and the Principal of Mannika Resources Group Pty Ltd a consultant to the Company. Mr Nielsen has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration and to the activity being undertaken to qualify as a Competent Persons as defined in the 2012 Edition of the JORC Code. Mr Nielsen is the competent person for the estimation and has relied on provided information and data from the Company, including but not limited to the geological model, database and expertise gained from site visits. Mr Nielsen consents to the inclusion in this announcement of matters based on his information in the form and context in which it appears. The Mineral Resource is based on standard industry practises for drilling, logging, sampling, assay methods including quality assurance and quality control measures as detailed in Appendix 3.

Disclaimer

Some of the statements appearing in this announcement may be in the nature of forward looking statements. You should be aware that such statements are only predictions and are subject to inherent risks and uncertainties. Those risks and uncertainties include factors and risks specific to the industries in which Tando operates and proposes to operate as well as general economic conditions, prevailing exchange rates and interest rates and conditions in the financial markets, among other things. Actual events or results may differ materially from the events or results expressed or implied in any forward looking statement. No forward looking statement is a guarantee or representation as to future performance or any other future matters, which will be influenced by a number of factors and subject to various uncertainties and contingencies, many of which will be outside Tando's control.

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APPENDIX 1: Mineral Resource Statement for the SPD Vanadium Project

Table 1. *SPD Vanadium Project Global Mineral Resource (JORC 2012, classified as Inferred, quoted above a 0.45% V_2O_5 cut-off to 200m depth).*

Layer	SG	Tonnes (Mt)	Whole Rock V_2O_5%
Upper Layer	3.5	211	0.84
Intermediate Layer	3.1	188	0.55
Lower Layer (disseminated)	3.5	137	0.77
Lower Layer (massive)	3.5	52	1.37
Total		**588**	**0.78**

Table 2. *SPD Vanadium Project Mineral Resource to 100m depth (0.45% V_2O_5 cut-off).*

Layer	Tonnes (Mt)	Whole Rock V_2O_5%
Upper Layer	155	0.84
Intermediate Layer	36	0.55
Lower Layer (disseminated)	70	0.77
Lower Layer (massive)	24	1.30
Total	**364**	**0.77**

Table 3. *SPD Vanadium Project Mineral Resource to 100m depth (0.9% V_2O_5 cut-off).*

Layer	Tonnes (Mt)	Whole Rock V_2O_5%
Upper Layer	55	1.00
Lower Layer (disseminated)	7	0.95
Lower Layer (massive)	24	1.30
Total	**87**	**1.07**

Table 4. *SPD Vanadium Project Mineral Resource to 50m depth (0.9% V_2O_5 cut-off).*

Layer	Tonnes (Mt)	Whole Rock V_2O_5%
Upper Layer	27	1.01
Lower Layer (disseminated)	4	0.93
Lower Layer (massive)	11	1.30
Total	**42**	**1.09**

Notes to Tables 1 - 4:

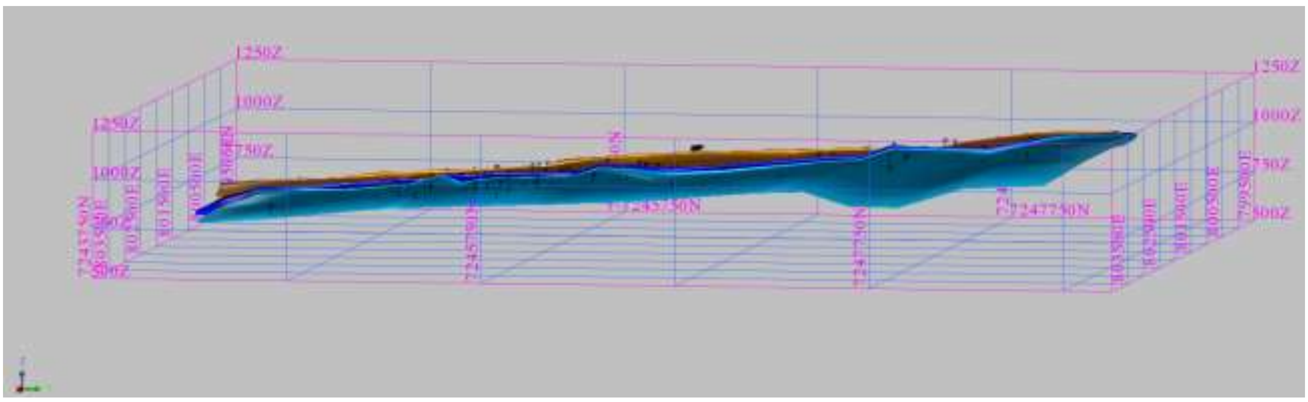
The Mineral Resource Estimate was completed using the following parameters:

- The SPD Vanadium Resource extends over a strike length of 4000m and has been drilled up to 150m vertically below surface (1100m down-dip);
- Mineralisation is hosted in a series of magnetite bearing layers at the contact between the Upper and Main Zone of the Bushveld Igneous Complex. These layers have been denoted the Upper, Intermediate and Lower Layers with average thicknesses of 19, 14 and 12m respectively. At the base of the Lower Layer there is a marker horizon of massive magnetite (the "MML") which is 1 – 2m thick.

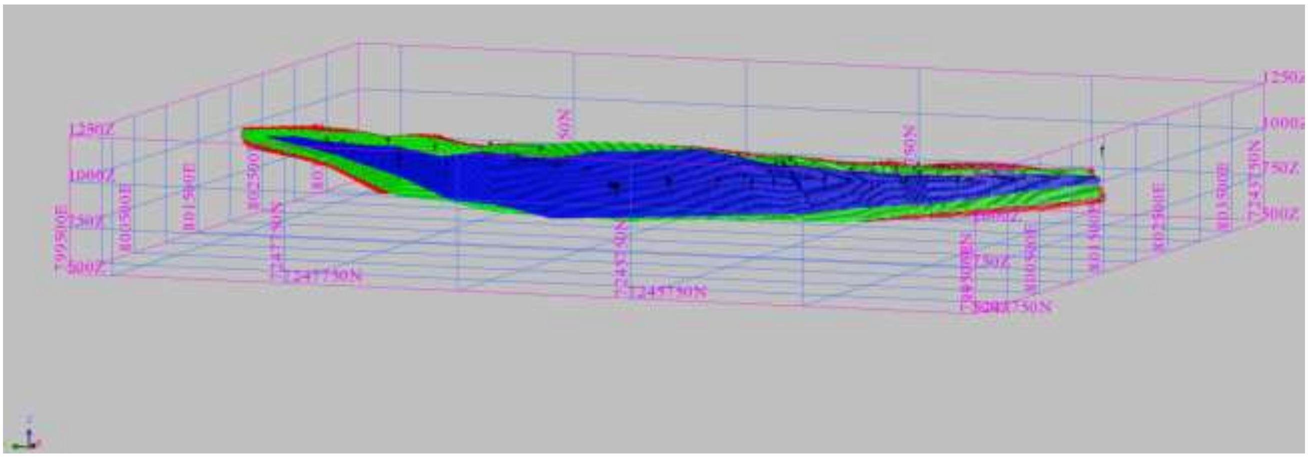
- 64 drillholes (43 RC and 21 diamond core holes) were used in the resource estimate representing a total of 4018.8m of drilling. 22 RC holes and 7 diamond core holes drilled by Tando were included along with 21 RC holes and 1 diamond core hole drilled previously by Vanadium Resources (Pty) Ltd (**Vanres**) and 13 DD holes drilled by Vanadium Technology (Pty) Ltd, a subsidiary of Xstrata (**Vantech**). Drilling was carried out on sections spaced approximately 300m apart, with mineralisation intersected at approximately 150m intervals on section.
- RC drilling by Tando and Vanres was sampled via face sampling hammer, collected by a rig mounted cyclone and split using a riffle. Diamond core drilling by Tando sampled NQ core by splitting the core in half. Historical drilling also sampled diamond core, predominantly BQ size, by sawing in half.
- Samples were analysed at commercial laboratories (SGS, ALS) using pressed disc XRF.
- Quality control protocols for all drilling included the use of certified reference materials (CRMs), blanks and duplicates. For Tando drilling control samples were inserted every 20 samples for RC drilling and every 10 samples for DD drilling.
- All drillholes were surveyed in both South Africa LO29 grid (WGS84 projection) and UTM Zone 35S.
- All holes were vertical. Downhole surveys have been carried out on selected holes to confirm no excessive deviation.
- Geological domains were constructed using a 0.25% V = 0.45% V_2O_5 cut-off grade. Intersections used in the interpretation are listed in Appendix 2.
- 4 wireframe solids were constructed based on the geological interpretation (refer images below: UML = blue, IML = green, LML = red). Samples within the wireframe were composited to 1m intervals.
- Block grades were estimated using interpolation of the 1m composite data by the Ordinary Kriging method. Search ellipses were set based on geostatistics with search distances ranging from 315 to 945m along strike. A first pass search of 315m with a minimum of 14 samples and maximum of 22 samples was used. A second pass search of 473m with a minimum of 10 samples and maximum of 22 samples was then used. A third pass search of 945m with a minimum of 6 samples and maximum of 22 samples was finally used. Refer below for comparison of blocks vs drilling on section.
- The model was constrained to a depth of 200m below surface.
- A Surpac block model was used for the estimate with a block size of 20m X by 20m Y by 5m Z, with sub-blocking to 10mX by 10m Y by 2.5m Z.
- Bulk density values used for mineralisation are detailed in the table above. These were sourced from SG data measurements on core.
- The deposit has been classified as an Inferred Mineral Resource based on data quality and sample spacing. Modelling of other elements (including Fe, Ti, Si, Al, P amongst others) is recommend so that their impact on the economics of the project can be determined. Infill drilling to reduce the reliance on historical drill data, to better delineate geological features such as massive magnetite layers and later structures is recommended to improve the confidence of the model.

These notes should be read in conjunction with the information detailed in Appendix 3.

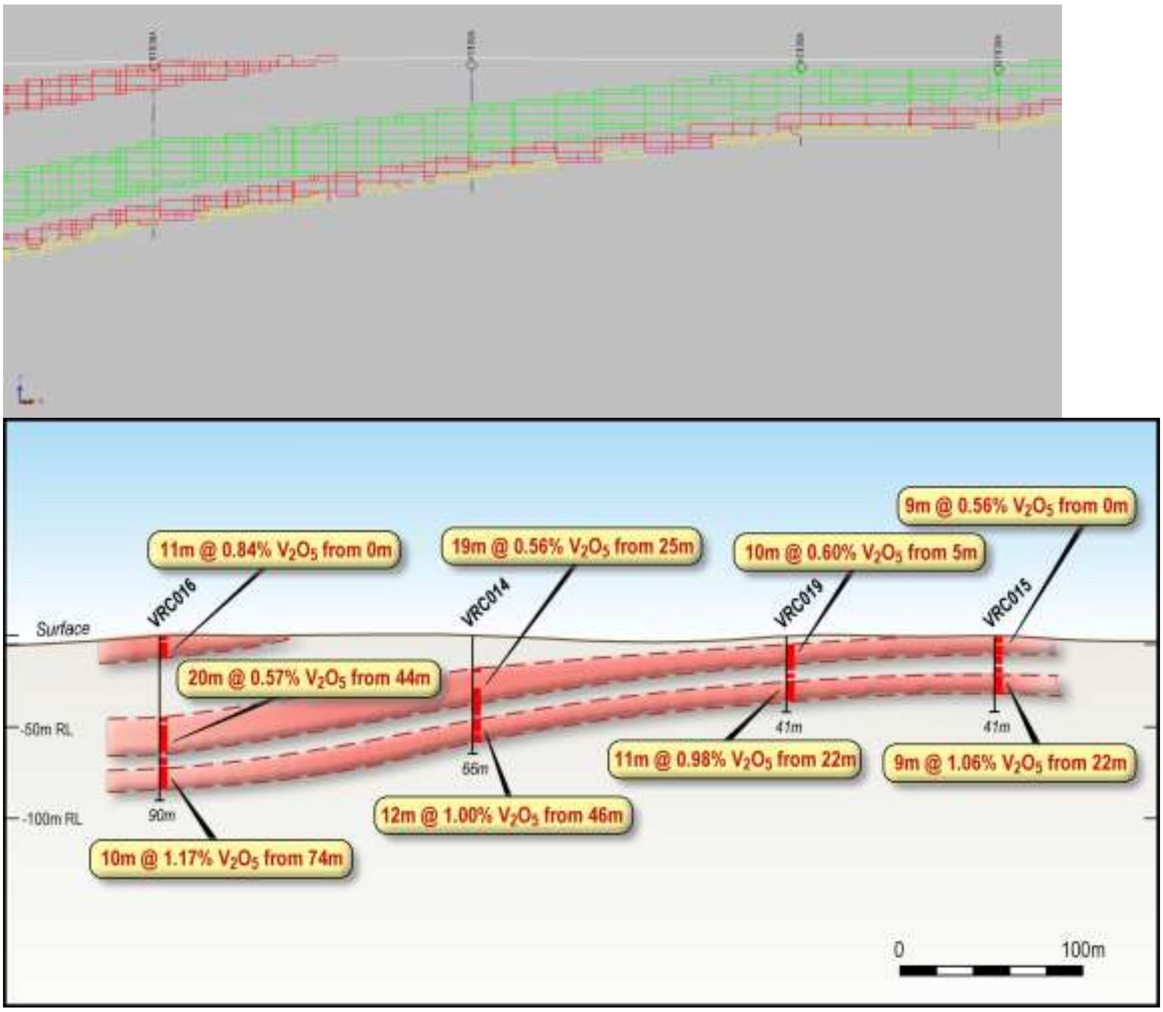
Long section view of wireframes (from NE)



Long section view of wireframes (from SW)



Section view of block model (top) vs drilling (bottom)



APPENDIX 2: Drillhole Intercepts Used in Mineral Resource Estimate

HOLE ID	COMPANY	Drill Type	EAST	NORTH	EOH (m)	UNIT	INTERSECTION (whole rock)			
							From (m)	To (m)	Width (m)	V_2O_5 %
VDD001	Tando	DD	801358	7246865	135	UML	21.00	55.00	34.00	1.03
						LML	108.57	117.11	8.54	1.02
VDD002	Tando	DD	802477	7245218	56.8	IML	3.77	16.66	12.89	0.56
						LML	17.66	23.32	5.66	0.84
VDD003	Tando	DD	802040	7245103	131.7	IML	69.00	83.96	14.96	0.57
						LML	94.00	102.43	8.43	0.80
						LMLM	102.43	104.50	2.07	1.39
VDD006	Tando	DD	802185	7245045	101.8	UML	2.90	22.34	19.44	0.76
						IML	51.00	71.28	20.28	0.54
						LML	73.39	83.11	9.72	0.82
						LMLM	83.11	84.98	1.87	1.75
VDD007	Tando	DD	801760	7245770	134.6	UML	16.00	53.04	37.04	0.74
						IML	107.00	108.52	1.52	0.68
						LML	111.52	121.26	9.74	0.79
						LMLM	121.26	123.52	2.26	1.72
VRC001	Tando	RC	801520	7247155	90	UML	0	11	11	0.69
						IML	40	63	23	0.52
						LML	70	80	10	0.83
						LMLM	80	82	2	1.62
VRC002	Tando	RC	802548	7245002	39	IML	0	6	6	0.51
						LML	12	22	10	0.85
						LMLM	22	24	2	1.72
VRC003	Tando	RC	802414	7245050	69	IML	22	39	17	0.56
						LML	46	56	10	0.84
						LMLM	56	58	2	1.29
VRC004	Tando	RC	802503	7245603	46	LML	18	21	3	0.62
VRC005	Tando	RC	802351	7245271	62	IML	5	32	27	0.53
						LML	39	48	9	0.81
						LMLM	48	50	2	1.56
VRC007	Tando	RC	802495	7245445	38	IML	0	1	1	1.31
						LML	14	22	8	0.86
						LMLM	22	24	2	1.54
VRC008	Tando	RC	802230	7245480	76	IML	23	36	13	0.56
						LML	38	46	8	0.84
						LMLM	46	48	2	1.29
VRC009	Tando	RC	801520	7245793	156	UML	45	83	38	0.75
						IML	111	131	20	0.57
						LML	134	143	9	0.82
						LMLM	143	146	3	1.29

VRC010	Tando	RC	801600	7245869	134	UML	32	66	34	0.75
						IML	87	112	25	0.52
						LML	120	129	9	0.81
						LMLM	129	131	2	1.61
VRC014	Tando	RC	802138	7245775	66	IML	22	46	24	0.54
						LML	46	56	10	0.86
						LMLM	56	58	2	1.74
VRC015	Tando	RC	802394	7245898	41	IML	0	19	19	0.50
						LML	21	29	8	0.86
						LMLM	29	31	2	1.58
VRC016	Tando	RC	801990	7245688	90	UML	0	12	12	0.80
						IML	40	64	24	0.54
						LML	72	81	9	0.85
						LMLM	81	83	2	1.74
VRC017	Tando	RC	802033	7245403	93	UML	0	20	20	0.77
						IML	46	68	22	0.54
						LML	76	85	9	0.82
						LMLM	85	88	3	1.46
VRC018	Tando	RC	802203	7245863	56	IML	12	29	17	0.57
						LML	36	44	8	0.73
						LMLM	44	47	3	1.32
VRC019	Tando	RC	802289	7245855	41	IML	0	18	18	0.53
						LML	24	33	9	0.83
						LMLM	33	35	2	1.65
VRC020	Tando	RC	802333	7246231	56	LML	20	40	20	0.61
						LMLM	40	42	2	1.42
VRC021	Tando	RC	802185	7246300	86	IML	46	65	19	0.53
						LML	72	79	7	0.80
						LMLM	79	81	2	1.34
VRC022	Tando	RC	802242	7246395	116	IML	55	77	22	0.55
						LML	88	107	19	0.79
						LMLM	107	109	2	1.44
SFDD01	Vanres	DD	801467	7245977	141.0	UML	43.06	60.32	17.26	0.88
						IML	122.86	124.33	1.47	0.63
						LML	127.18	136.52	9.34	0.75
						LMLM	136.52	139.35	2.83	1.41
SFR001	Vanres	RC	801663	7247958	83	IML	26.00	44.00	18.00	0.52
						LML	54.00	66.00	12.00	0.76
SFR002	Vanres	RC	801439	7248229	44	IML	21.00	23.00	2.00	0.45
						LMLM	35.00	39.00	4.00	1.32
SFR004	Vanres	RC	801946	7245770	96	IML	51.00	71.00	20.00	0.58
						LML	79.00	89.00	10.00	0.92
						LMLM	89.00	91.00	2.00	1.32
SFR005	Vanres	RC	801219	7247738	41	UML	25.00	29.00	4.00	1.07

SFR007	Vanres	RC	801436	7247314	29	UML	5.00	27.00	22.00	0.84
SFR008	Vanres	RC	801496	7246933	81	IML	33.00	59.00	26.00	0.55
						LML	65.00	75.00	10.00	0.85
						LMLM	75.00	79.00	4.00	1.18
SFR009	Vanres	RC	801837	7247140	59	IML	21.00	41.00	20.00	0.56
						LML	49.00	55.00	6.00	0.89
						LMLM	55.00	57.00	2.00	1.42
SFR010	Vanres	RC	802182	7245903	45	IML	19.00	21.00	2.00	0.78
						LML	31.00	41.00	10.00	0.83
						LMLM	41.00	43.00	2.00	1.77
SFR011	Vanres	RC	801729	7245642	34	UML	11.00	31.00	20.00	0.96
SFR012	Vanres	RC	801871	7245367	30	UML	13.00	30.00	17.00	0.92
SFR013	Vanres	RC	802395	7245601	23	LML	9.00	21.00	12.00	0.83
						LMLM	17.00	21.00	4.00	1.28
SFR014	Vanres	RC	801971	7245097	35	UML	11.00	35.00	24.00	0.88
SFR015	Vanres	RC	802575	7245356	47	LML	22.00	34.00	12.00	0.67
SFR016	Vanres	RC	802148	7244835	45	UML	22.00	45.00	23.00	0.62
SFR017	Vanres	RC	802635	7245064	23	LML	10.00	18.00	8.00	1.07
						LMLM	18.00	20.00	2.00	1.38
SFR018	Vanres	RC	802808	7244686	26	LML	8.00	22.00	14.00	0.86
SFR019	Vanres	RC	802394	7244550	27	LMLM	22.00	23.00	1.00	1.74
SFR020	Vanres	RC	802641	7244803	39	UML	9.00	18.00	9.00	1.34
						LML	23.00	35.00	12.00	0.72
SFR021	Vanres	RC	803901	7244650	49	LMLM	35.00	39.00	4.00	1.49
						UML	30.00	49.00	19.00	0.85
SFR022	Vanres	RC	801650	7247681	65	IML	28.00	48.00	20.00	0.54
						LML	50.00	62.00	12.00	0.82
SFR023	Vanres	RC	801178	7248125	85	LML	68.00	78.00	10.00	0.81
						LMLM	78.00	82.00	4.00	1.46
SPD01	Vantech	DD	801721	7245452	166.4	UML	55.00	73.50	18.50	0.67
						IML	127.00	130.00	3.00	0.49
						LML	147.00	155.00	8.00	0.93
SPD02	Vantech	DD	801724	7245955	45.6	UML	10.00	27.50	17.50	0.74
SPD04	Vantech	DD	802477	7245787	50.7	LML	15.00	22.50	7.50	0.68
						LMLM	22.50	24.50	2.00	1.56
SPD05	Vantech	DD	802357	7246062	37.4	IML	18.00	19.00	1.00	0.46
						LML	23.00	29.50	6.50	0.79
SPD06	Vantech	DD	802203	7246169	47.5	IML	15.50	25.00	9.50	1.16
						LML	37.00	44.50	7.50	0.65
						LMLM	44.50	46.00	1.50	1.67
SPD07	Vantech	DD	802402	7245403	59.2	IML	30.00	33.00	3.00	0.54
						LML	49.00	56.00	7.00	0.72
						LMLM	57.00	58.00	1.00	1.64

SPD08	Vantech	DD	802270	7245694	50.2	IML	27.00	33.00	6.00	0.47
						LML	43.00	47.50	4.50	0.74
						LMLM	47.50	50.00	2.50	1.62
SPD09	Vantech	DD	801958	7245558	106.0	UML	7.00	26.00	19.00	0.64
						IML	76.00	84.00	8.00	0.44
						LML	97.00	104.00	7.00	0.74
						LMLM	104.00	105.00	1.00	1.71
SPD10	Vantech	DD	801821	7245828	34.2	UML	13.00	27.00	14.00	0.77
SPD11	Vantech	DD	802304	7246477	60.3	IML	15.00	28.00	13.00	0.49
						LML	28.00	41.00	13.00	1.03
SPD12	Vantech	DD	801082	7247400	181.2	UML	80.50	101.00	20.50	0.76
SPD14	Vantech	DD	801407	7246713	45.9	UML	18.00	37.00	19.00	0.72
SPD16	Vantech	DD	801842	7247587	31.3	IML	0.00	10.00	10.00	0.46
						LML	21.00	29.00	8.00	0.78
						LMLM	29	30.5	1.50	1.58

Notes:

- All coordinates are in UTM Zone 35S (WGS 84).
- All holes are vertical (-90 dip).
- Intervals used in modelling may differ from significant intersections previously quoted to aid continuity
- Results should be read in conjunction with the data provided in Appendix 3.

APPENDIX 3.

The following Tables are provided to ensure compliance with the JORC Code (2012 Edition) requirements for the reporting of Exploration Results and Mineral Resources at the SPD Vanadium Project.

Section 1: Sampling Techniques and Data

(Criteria in this section applies to all succeeding sections)

Criteria	JORC Code explanation	Commentary
Sampling techniques	*Nature and quality of sampling (eg 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.*	SPD and SFDD series = diamond core drilling using BQ sized core. VDD series = Diamond core drilling using NQ sized core. VRC and SFR series = RC drilling using 5 ¼" face sampling hammer.
	Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.	SPD series holes sampled at 1m intervals. SFDD and SFR series sampled at 2m intervals VDD and VRC series sampled at 1m intervals except where these are adjusted for geological features (core only). VDD series core will be cut in half, with all core being photographed for reference. VRC RC drilling split on site using a riffle splitter.
	Aspects of the determination of mineralisation that are Material to the Public Report. In cases where 'industry standard' work has been done this would be relatively simple (eg '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 (eg submarine nodules) may warrant disclosure of detailed information.	All aspects of the determination of mineralisation are described in this table. Diamond core drilling and RC drilling using these methods are considered appropriate for sampling the vanadiferous titanomagnetite unit which hosts the mineralisation. All of the drill samples have been sent to a commercial laboratory for crushing, pulverising and chemical analysis by industry standard practises.
Drilling techniques	*Drill type (e.g. core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic etc) and details (e.g. core diameter, triple of standard tube, depth of diamond tails, face-sampling bit or other type, whether core is orientated and if so, by what method, etc).*	SFDD and SPD series diamond drilling from surface using BQ core sizes. VDD diamond drilling uses HQ and NQ2 core sizes. Coring was from surface using HQ. Core was changed to NQ2 when ground conditions were competent. All diamond core is stored in industry standard core trays labelled with the drill hole ID and core interval. RC drilling (VRC, SFR series) uses face sampling hammer and 5 ¼" bit sizes.
Drill sample recovery	*Method of recording and assessing core and chip sample recoveries and results assessed.*	Diamond drill core recovery is recorded as a percentage of measured recovered cores versus drilled distance. Recoveries have been high to date. RC drill samples are weighed to give a quantitative basis to estimation of recovery.
	Measures taken to maximise sample recovery and ensure representative nature of the samples.	Diamond drilling - coring only changed to NQ2 when ground conditions were competent. RC – consistent drilling technique, cleaning of cyclone.

Criteria	JORC Code explanation	Commentary
	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.	No relationship observed between recovery and grade. There is no known or reported relationship in historical drilling between sample recovery and grade.
Logging	*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.*	SFDD and SPD series holes were qualitatively logged for the total length of the hole. Logging recorded lithology, mineralogy, alteration, veining, grainsize, mineralisation and weathering. SFR series holes (RC chips) were logged on a metre basis with an allocation of colour, grain size, and rock name to each metre. VDD drill core and VRC RC drill chips are being geologically logged for the total length of the hole. Logging is recording lithology, mineralogy, alteration, veining, structure, mineralisation and weathering. Logs are coded using the company geological coding legend and entered into Excel worksheets prior to being loaded into the company database. All core is being photographed with images to be stored on the company server. Logging is appropriate and sufficiently detailed to support Mineral Resource estimates.
	Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc) photography.	Logging of chips and diamond core is both qualitative (eg. colour) and quantitative (eg. minerals percentages).
	The total length and percentage of the relevant intersections logged.	100% of all drilling to date by the Company has been logged.
Sub-sampling techniques and sample preparation	*If core, whether cut or sawn and whether quarter, half or all core taken.*	Sampling for all diamond core samples has been undertaken on split core, halved via a core saw.
	If non-core, whether riffled, tube sampled, rotary split, etc and whether sampled wet or dry.	For the SFR series RC holes the entire recovered sample for each metre was collected and riffle split down to a 1kg sub sample. Samples were then combined to form a 2m composite For the VRC series RC holes the entire recovered sample for each metre was collected and split through a riffle splitter.
	For all sample types, the nature, quality and appropriateness of the sample preparation technique.	The sampling techniques for both diamond drilling and RC drilling are of consistent quality and appropriate.
	Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.	To ensure representivity core was taken from the same side of the hole each time, with field duplicates taken and inserted. For the RC drilling the entire metre of sample was collected and split. Certified Reference Materials (CRMs) were selected to be similar in chemistry to the mineralisation being targeted.
	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.	One field duplicate is collected per 20 samples in addition to laboratory duplicates which were also reported.
	Whether sample sizes are appropriate to the grain size of the material being sampled.	The material and sample sizes are considered appropriate given the magnetite unit being sampled.
Quality of assay data and laboratory	*The nature, quality and appropriateness of the assaying and laboratory procedures used and whether*	Samples from VDD and VRC holes were sent to ALS Johannesburg, an ISO accredited commercial

Criteria	JORC Code explanation	Commentary
tests	*the technique is considered partial or total.*	laboratory, for preparation and analysis. All samples were analysed by XRF fusion for Al2O3, As, Ba, CaO, Cl, Co, Cr2O3, Cu, Fe, K2O, MgO, Mn, Na2O, Ni, P, Pb, S, SiO2, Sn, Sr, TiO2, V, Zn and Zr as well as loss on ignition. For the SPD series holes the split core was crushed to <10mm then split down to a 200g sample. Two 20g sub samples were taken with one passed through a Davis Tube set at 4350 gauss to obtain a magnetic separate sample. A pressed briquette from both samples (whole rock and magnetic separate) were then analysed by XRF for SiO_2, Al_2O_3, CaO, V_2O_5, Fe (total), TiO_2 and Cr_2O_3. For the SFDD and SFR series holes the 2kg composite samples were riffle split to form an A samples and a B sample. The B sample was milled to <106micron and passed through a Davis Tube to obtain a magnetic separate sample. Both samples (whole rock and magnetic separate) were then analysed by full fusion XRF, the whole rock for SiO_2, Al_2O_3, CaO, Na_2O, K_2O, P_2O_5, MgO, MnO, V_2O_5, Fe_2O_3, TiO_2 and Cr_2O_3 and the magnetic separate for V_2O_5, Fe_2O_3, TiO_2, Al_2O_3, MgO, MnO, and Cr_2O_3.
	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.	Hand held assay devices have not been reported.
	Nature of quality control procedures adopted (eg standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (ie lack of bias) and precision have been established.	For RC drilling QA/QC samples are inserted every 10 samples. These alternate between a CRM & blank, and a field duplicate. For diamond core drilling QA/QC samples, being a CRM and a blank, are inserted every 20 samples. CRM are sourced from an accredited source and are of similar material to the mineralisation being sampled. QA/QC samples are checked following receipt of each assay batch to confirm acceptable accuracy and precision. For historical holes industry standard quality control procedures were utilised including the use of CRMs and blanks inserted blind into the sample stream
Verification of sampling and assaying	*The verification of significant intersections by either independent or alternative company personnel.*	Assay results and intersections have been reviewed by independent geological consultants.
	The use of twinned holes.	Twinned holes are being drilled as part of the drilling programme.
	Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.	Primary data is collected in the field and entered into Excel worksheets prior to being loaded into a database managed by an independent consultant. All core is being photographed with images to be stored on the company server.
	Discuss any adjustment to assay data.	Analytical result for V converted to V_2O_5 by multiplying by 1.785.

Criteria	JORC Code explanation	Commentary
Location of data points	*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.*	All VRC and VDD holes have been surveyed by a licensed surveyor, following initial pickup using a handheld GPS (+/- 5m accuracy). Drillhole deviation for drilling is being measured via in-rod surveys during drilling.
	Specification of the grid system used.	The grid system for the SPD Vanadium Project is UTM Zone 35 S (WGS 84 Datum).
	Quality and adequacy of topographic control.	Good, based on recent UAV survey.
Data spacing and distribution	*Data spacing for reporting of Exploration Results.*	Drilling to date over the SPD Vanadium Prospect is on approximately 150m - 300m centres east-west and 300m centres north-south over the mineralised body.
	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.	Data spacing is deemed sufficient to establish geological and grade continuity to establish a mineral resource estimate.
	Whether sample compositing has been applied.	No sample compositing has been applied.
Orientation of data in relation to geological structure	*Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.*	The majority of the drilling at the SPD Vanadium Project is vertical which is considered appropriate given the regional and local geological stratigraphy.
	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.	To date, orientation of the mineralised domain has been favourable for perpendicular drilling and sample widths are not considered to have added a significant sampling bias.
Sample security	*The measures taken to ensure sample security.*	Samples are stored at a secure yard. Samples are then delivered to the assay laboratory in Johannesburg by representatives of the Company.
Audits or reviews	*The results of any audits or reviews of sampling techniques and data.*	No independent audits have been undertaken.

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	*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 SPD Project comprises a Mining Right covering the farm Steelpoortdrift 365 KT.
	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.	The tenure is in good standing.
Exploration done by other parties	*Acknowledgment and appraisal of exploration by other parties.*	The Project has previously been explored for magnetite-hosted Fe-V-Ti deposits.
Geology	*Deposit type, geological setting and style of mineralisation.*	Vanadium mineralisation at the SPD Project is located close to the contact between the Upper Zone and Main Zone of the Bushveld Igneous Complex and adjacent to the Steelpoort Fault. Mineralisation is hosted in two layers, the Upper Magnetite Layer (UML) and Lower Magnetite Layer (LML), which dip shallowly (10-12deg) to the west.
Drill hole Information	*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:* • *easting and northing of the drill hole collar* • *elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar* • *dip and azimuth of the hole* • *down hole length and interception depth* • *hole length.*	Refer Appendix 2.
	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.	Not applicable, information has been included.
Data aggregation methods	*In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (eg cutting of high grades) and cut-off grades are usually Material and should be stated.*	All results > 0.5% V_2O_5 have been averaged weighted by downhole length, and inclusive of a maximum of 2m internal waste.
	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.	High grade intervals > 1% V_2O_5 and 1.5% V_2O_5 have also been reported. No internal waste used for these.
	The assumptions used for any reporting of metal equivalent values should be clearly stated.	No metal equivalent values are being used for reporting exploration results.
Relationship between mineralisation widths and intercept lengths	*These relationships are particularly important in the reporting of Exploration Results. If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported. 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').*	Downhole lengths reported, true widths not known at this time.

Criteria	JORC Code explanation	Commentary
Diagrams	*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.*	Appropriate diagrams are shown in the text.
Balanced reporting	*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.*	All results > 0.5% V_2O_5 included.
Other substantive exploration data	*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.*	Exploration data is contained in previous ASX Announcements.
Further work	*The nature and scale of planned further work (eg tests for lateral extensions or depth extensions or large-scale step-out drilling).* *Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.*	As detailed in the text.

Section 3 Estimation and Reporting of Mineral Resources

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

Criteria	JORC Code explanation	Commentary
Database integrity	• *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.*	• The database is managed by an external, independent database consultant. Data imported to the database goes through a series of visual and digital checks before being accepted. Exports from this database were used for the Mineral Resource estimation. • Following importation into the modelling software the data was also checked by the software's inbuilt validation tools followed by manual validation and checks by the competent person
Site visits	• *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.*	• The Competent Person for the Mineral Resource did not complete a site visit. • This was not felt necessary as the geological model has been created by independent geological consultants based on a well understood and well documented geological setting (the Bushveld Complex) including a substantial number of peer reviewed academic papers. The mineralisation model is based on relatively simple geological constraints and interpreted layers, again well documented in independent and publicly available papers as well as previous

		historic resource estimates completed under the South African SAMREC Code • The Competent Person for the Exploration Results (including all drilling and sampling) managed the 2018 drilling campaign on site. All QA/QC checks and database imports were completed by an independent geological consultant. • Personnel who supervised the sampling of the 2010 drilling programme and the estimation of the previous SAMREC Resource were on site during the 2018 drilling campaign and have verified there is no new or material data that would have an adverse effect on the acceptance of the historical drilling, modelling and interpreted geology.
Geological interpretation	• *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.*	• The confidence in the geological interpretation is considered to be moderate to high. The geological setting is relatively straight forward and mineralisation is outcropping. • A geological model was established based on surface mapping and drilling. • Results from additional, ongoing drilling will improve the detail of the sub surface geology.
Dimensions	• *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.*	• The UML and LML have been mapped along strike (NW-SE) for approximately 4km and intersected in drilling for approximately 1.7km to the SW (distance from outcrop to furthest drilling). At this point the UML is 45m below surface and the LML is 125m below surface. The thickness of the layers is shown in Appendix 1 and ranges from 5m to 37m (not true thickness).
Estimation and modelling techniques	• *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.* • *The availability of check estimates, previous estimates and/or mine production records and whether the Mineral Resource estimate takes appropriate account of such data.* • *The assumptions made regarding recovery of by-products.* • *Estimation of deleterious elements or other non-grade variables of economic significance (eg sulphur for acid mine drainage characterisation).* • *In the case of block model interpolation, the block size in relation to the average sample spacing and the search employed.* • *Any assumptions behind modelling of selective*	• Interpolation of V_2O_5 grade was undertaken using Gemcom Surpac software. Basic statistical investigations were completed on the captured estimation data set (1m composites). • No extreme grades or magnetite contents were observed therefore no top cuts were required. • The magnetite layers were modelled as hard boundaries based on logging, with drill intersections assigned to Upper, Intermediate or Lower layer (refer Appendix 1). • No previously released JORC compliant Mineral Resource Estimates have been completed on the SPD Vanadium Deposit. The previous resource was estimated under the SAMREC Code and is documented in the ASX Announcement of 22 March 2018. • No assumption of mining selectivity has been incorporated into the estimate. • Visual validation was completed and show reasonable correlation between estimated grades and drill sample grades.

	mining units. • *Any assumptions about correlation between variables.* • *Description of how the geological interpretation was used to control the resource estimates.* • *Discussion of basis for using or not using grade cutting or capping.* • *The process of validation, the checking process used, the comparison of model data to drill hole data, and use of reconciliation data if available.*	• No reconciliation data is available as no mining has taken place.
Moisture	• *Whether the tonnages are estimated on a dry basis or with natural moisture, and the method of determination of the moisture content.*	• Tonnages have been estimated on a dry in situ basis. No moisture values were reviewed.
Cut-off parameters	• *The basis of the adopted cut-off grade(s) or quality parameters applied.*	• The cut-off grade is based on likely economic concentrations of V_2O_5 based on review of similar projects. Mining studies will be carried out to determine a more precise cut-off grade and marketing studies will be used to refine this based on payability of other metals (or presence of deleterious elements).
Mining factors or assumptions	• *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.*	• The resource model assumes open cut mining is completed and a reasonable level of mining selectivity is achieved in mining. It has been assumed that grade control will be applied to ore/waste delineation processes.
Metallurgical factors or assumptions	• *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.*	• No detailed metallurgical data exists; where required area analogues (e.g. Rhovan, Mapochs, Vametco) were used to determine the prospects of eventual economic extraction. • Metallurgical testwork is currently being carried out with results to be fed into future Mineral Resource Estimations.
Environmental factors or assumptions	• *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*	• No assumptions have been made regarding environmental factors. The Company will work to mitigate environmental impact as a result of any future mining or mineral processing.

	this should be reported with an explanation of the environmental assumptions made.	
Bulk density	• *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.*	• Bulk density measurements were completed on both core (water displacement method) and RC chips (using a pyncometer) from the 2018 and historical drilling. • Values for Bulk Density were obtained from an average weighted value of the measurements for each layer and are consistent with the previous SAMREC Resource. This level of precision is deemed appropriate for the a Mineral Resource at an Inferred level of confidence.
Classification	• *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.*	• The resource for the SPD Project was classified as inferred based on data quality and sample spacing. • Significant factors that should be addressed to increase confidence in the resource include additional infill and extensional drilling (along strike and down-dip) and twinning/confirmation of historical holes. • In addition, a more complete suite of elements (such as Fe, Al, Si, Ti, P) should be estimated in future resource estimations so that the contribution of these elements to the economics of the project can be determined, whether potential credits or deleterious elements. • The input data is comprehensive in its coverage of the mineralisation and does not favour or misrepresent in-situ mineralisation. The definition of mineralised zones is based on a good geological understanding producing a robust model of mineralised domains. This model has been confirmed by infill and extensional drilling which supported the interpretation. • The resource estimate appropriately reflects the view of the Competent Person, that the data quality and validation criteria, as well as the resource methodology and check procedures, are reliable and consistent with criteria as defined by the JORC Code.
Audits or reviews	• *The results of any audits or reviews of Mineral Resource estimates.*	• No audits or review of the Mineral Resource estimate has been conducted.
Discussion of relative accuracy/ confidence	• *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.*	• The lode geometry and continuity has been adequately interpreted to reflect the level of Inferred Mineral Resource. • The data quality is good and all drill holes have detailed logs produced by qualified geologists. A recognized laboratory has been used for all analyses. • The Mineral Resource statement relates to global estimates of tonnes and grade. • The deposits are not currently being mined.

	• *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.* • *These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.*	