RICHMOND - JULIA CREEK VANADIUM PROJECT UPDATE

HIGHLIGHTS

- Highly successful infill drilling completed at the Lilyvale deposit, part of the Richmond - Julia Creek Vanadium Project in Central North Queensland 400km east of Mt Isa
- The project is a Joint Venture between Horizon Minerals Ltd and unlisted Richmond Vanadium Technology Pty Ltd ("RVT") with RVT earning up to 75% by spending $6 million to March 2021 inclusive of a Feasibility Study [1]
- Lilyvale mineralisation sits within a shallow band of oxide marine sediments from surface to 15m depth enabling cost effective low impact mining, significant upgrade potential at the site followed by conventional concentrate treatment to produce electrolyte or flake
- A total of 333 AC holes for 7,817m of resource drilling were completed in 2019
- Typical significant intercepts received included [2]:
  - 9m @ 0.69% V_2O_5 from 2m (L234)
  - 10m @ 0.60% V_2O_5 from 3m (L186)
  - 9m @ 0.64% V_2O_5 from 4m (L150)
- Results demonstrated excellent grade continuity across the entire strike length
- Updated independent Mineral Resource estimate now compiled for Lilyvale and stands at:
  - **560Mt grading 0.48% V_2O_5 for 2.6Mt V_2O_5 at a 0.30% V_2O_5 lower grade cut-off [3]**
- Over 76% now in the Indicated Resource category [2]
- Updated global Mineral Resource estimate for Richmond - Julia Creek stands at:
  - **1.8Bt grading 0.36% V_2O_5 for 6.7Mt V_2O_5 at a 0.30% V_2O_5 lower grade cut-off [3]**
- Commercial scale metallurgical testwork on 1.5 - 2% Lilyvale concentrate well advanced
- Pre-Feasibility Study centred on commercial evaluation and ore reserve generation from the updated mineral resource will be completed in June for review and expected release in the September Quarter 2020

Commenting on the Richmond – Julia Creek project, Horizon Managing Director Mr Jon Price said:

"Infill drilling at Lilyvale has demonstrated the improved scale and quality of the resource that can be readily upgraded on site for conventional downstream processing. Lilyvale alone can provide globally significant electrolyte and flake product to meet the increasing demand for both the steel and emerging energy storage markets. We look forward to the completion of the commercial evaluation as part of the Feasibility Study"

[1] As announced to the ASX on 13 December 2016. [2] See Table 1 and Competent Persons Statement on page 6 and JORC Tables on Page 16. [3] See Tables and Competent Persons Statement on Page 7 and JORC Tables on Page 16. [4] See Forward Looking and Cautionary Statements on Page 15

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Overview

Horizon Minerals Limited (ASX: HRZ) ("Horizon" or the "Company") is pleased to announce drilling results and an updated Mineral Resource estimate for the Richmond - Julia Creek ("Richmond") vanadium project located in Central North Queensland (Figure 1).

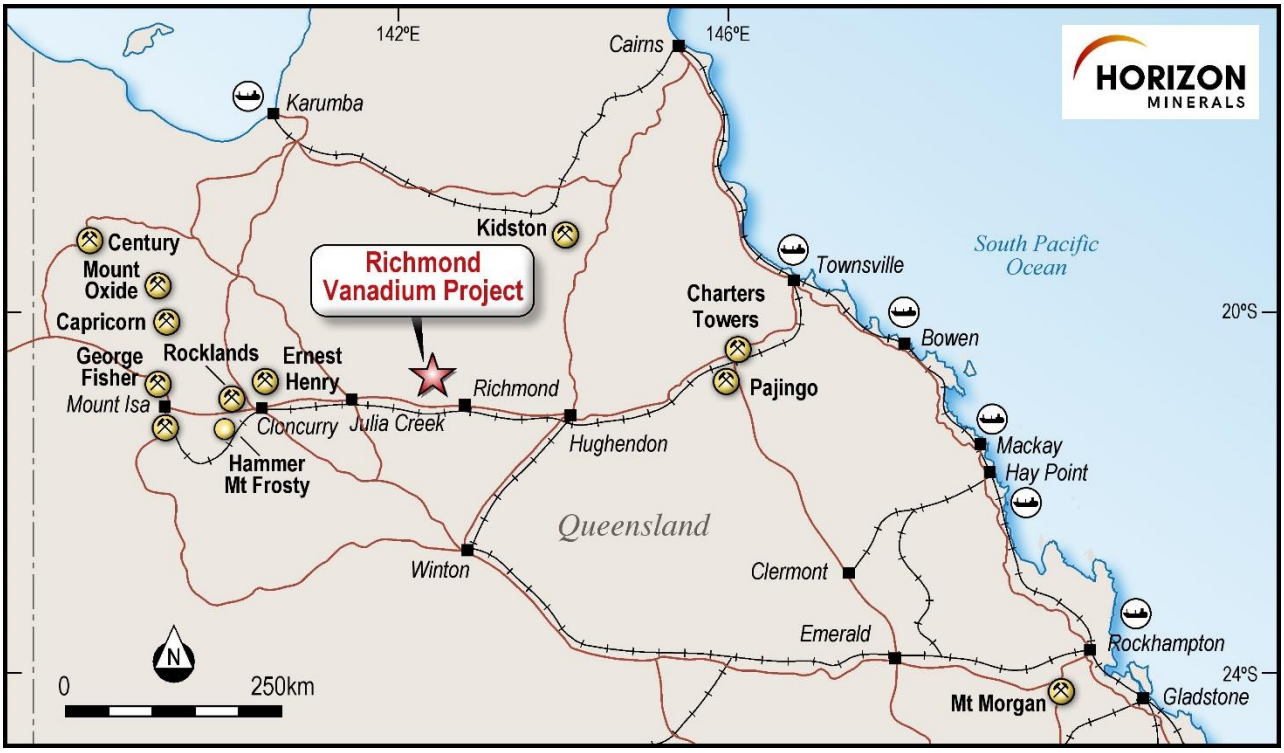

Figure 1: Richmond vanadium Project location and surrounding infrastructure

In March 2017, the Company entered a strategic development Joint Venture ("JV") with Richmond Vanadium Technology Pty Ltd ("RVT"). The JV covered Horizon's 100% interest in the Richmond vanadium project comprising 1,550km^2 of Cretaceous Toolebuc Formation (Figure 2) [1].

RVT completed the initial earn in period (A$1 million to earn 25% interest) in March 2018 and have commenced the second stage expenditure commitment of A$5 million over 3 years inclusive of a Feasibility Study to earn a further 50% interest in the project.

Since commencement of the JV, RVT have conducted extensive metallurgical test work initially focussed on upgrading the run of mine ore prior to downstream processing of the concentrate. Results from the concentration tests using simple screening, gravity and flotation mineral dressing techniques produced excellent results with the concentrate comprising 21% of the original mass at an improved grade of 1.6% V_2O_5 and a 73% recovery [2]. The concentrate produced also had a greatly reduced calcium content enabling a number of downstream processing options to be pursued.

Downstream pilot plant testing utilising conventional proven roasting and acid leaching techniques produced commercial grade vanadium pentoxide with acceptable recoveries.

[1] As announced to the ASX on 13 December 2016. [2] As announced to the ASX on 8 May 2018 and 26 November 2018

With the success of the pre-concentration and downstream test work, work has now advanced to simulated production tests. These tests are to be conducted with semi-industrial scale samples through the entire process flowsheet from samples to final product. An additional 3-4t of new samples have been dispatched to the metallurgical laboratory to ensure the most representative samples. Results from these advanced tests are expected in the September Quarter 2020.

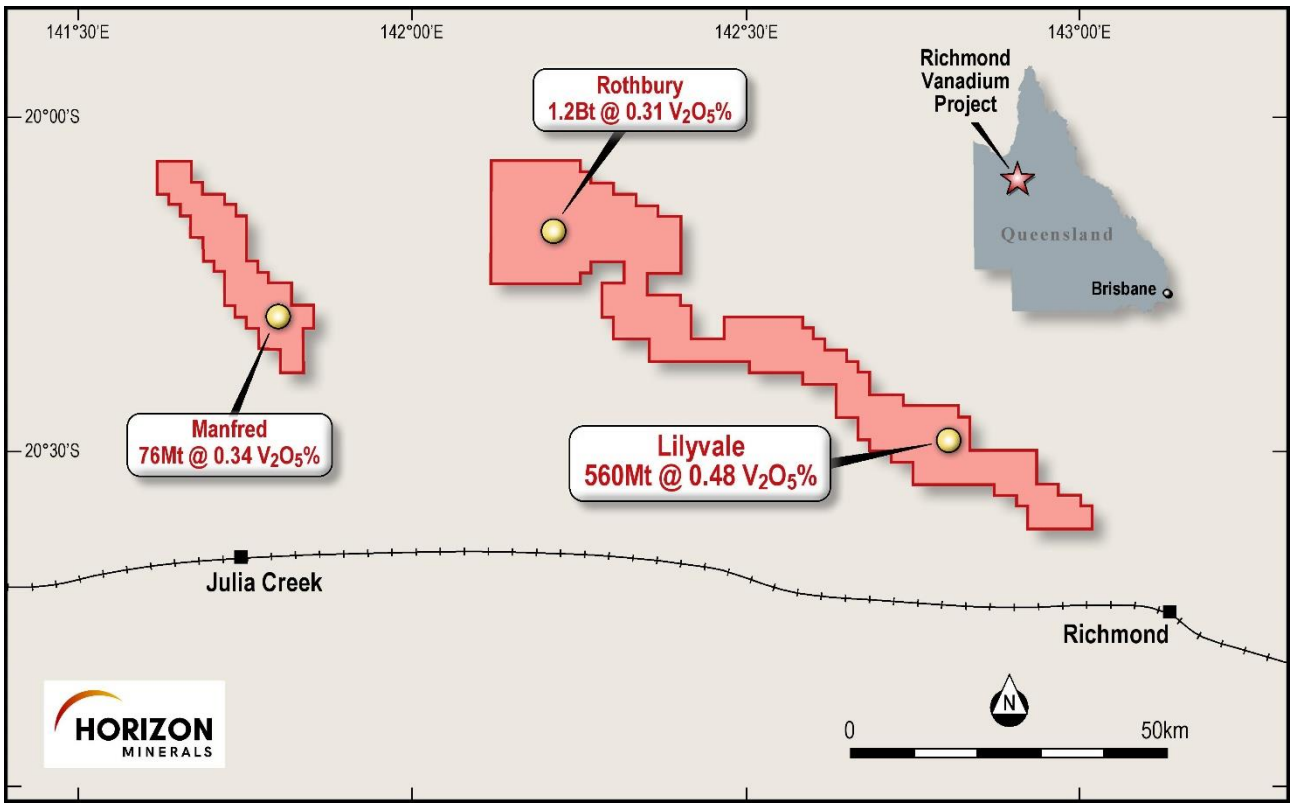

Figure 2: Lilyvale Vanadium project location and Richmond Lease areas

Project Geology

The Richmond-Julia Creek project is located within marine sediments of the Early Cretaceous Toolebuc Formation which is a stratigraphic unit that occurs throughout the Eromanga Basin central-northern Queensland. The Toolebuc sediments consist predominantly of black carbonaceous and bituminous shale and minor siltstone, with limestone lenses and coquinites (mixed limestone and clays). It is composed of two distinct units representing two different facies; an upper coarse limestone-rich-clay-oil shale unit (coquina) and a lower fine grained carbonate-clay-oil shale unit.

The Lilyvale deposit is located 45km northwest of the Richmond Township and in close proximity to the Flinders Highway and Great Northern Railway line (Figure 2). The deposit is 5-10m thick, up to 4km wide, over 5km long and is open along strike.

The mineralisation commences 2m from the surface and, as with all the prospects, occurs in two different facies:

1. Oxidised coarse limestone rich clay unit from surface to 15m depth where the oil has been leached out and enrichment of vanadium and other metals has occurred (Figure 4). Previous test work has shown that over 90% of the contained metal lies in the -38µm size fraction
2. Fresh fine grained carbonate – clay – oil shale unit containing vanadium, molybdenum, nickel, copper and significant oil content of 65-75 litres of oil per tonne of shale

Lilyvale drilling program

In 2019, RVT completed an infill drilling program on the Lilyvale deposit comprising 333 aircore holes for 7,817m on north-south lines spaced 400m apart, with collars spaced 200m along the lines (Figures 3-5 and 10). The aim of the drilling was to infill previous drilling to enable an updated Mineral Resource estimate at an improved JORC Category from Inferred to Indicated. In addition, the drilling provided a large metallurgical sample representative of the orebody for concentration and downstream processing testwork.

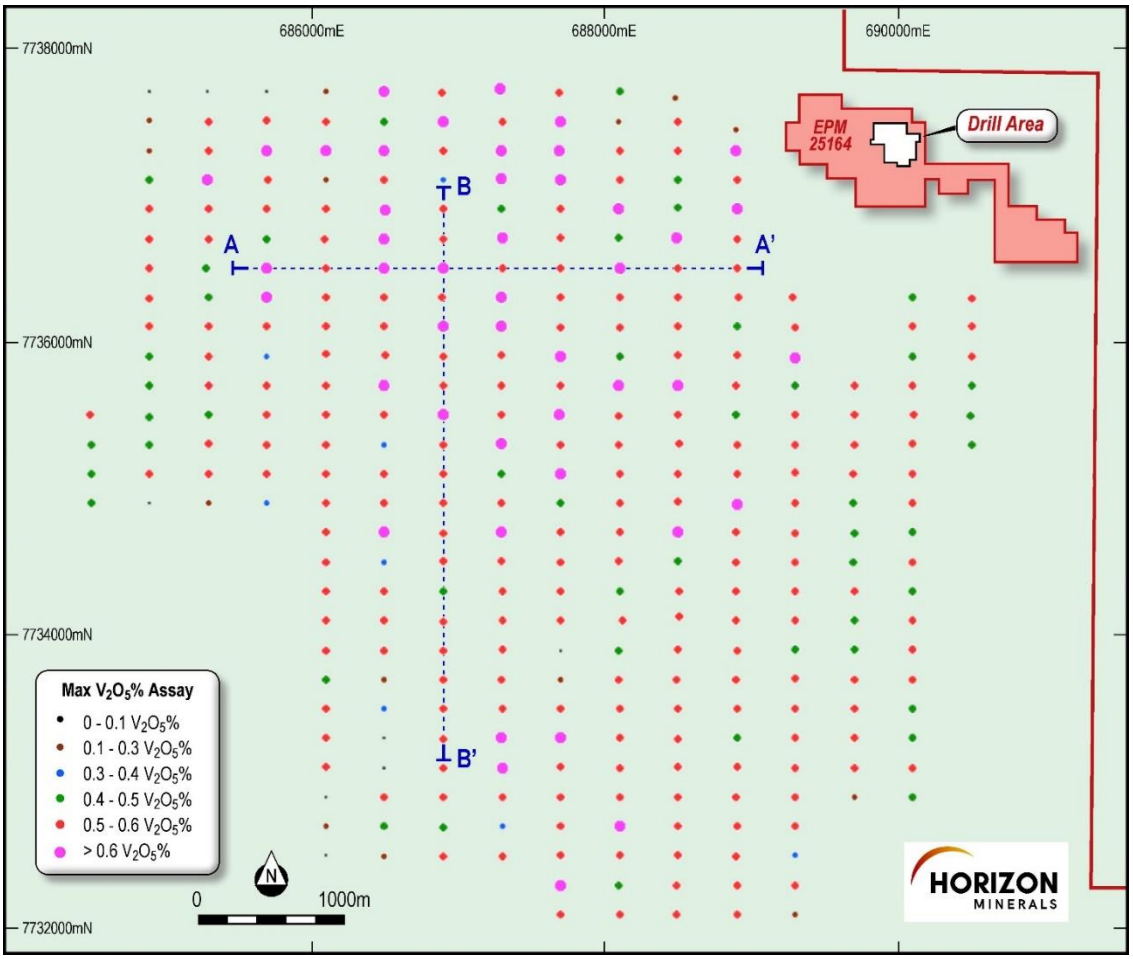

Figure 3: Lilyvale drill hole plan showing maximum V_2O_5% grades

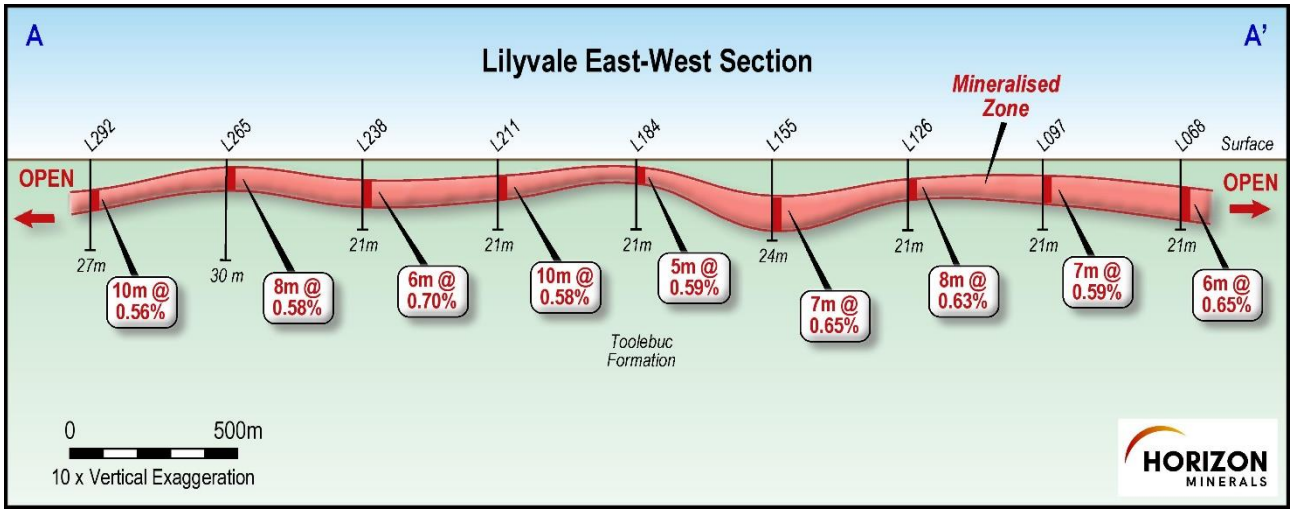

Figure 4: Lilyvale cross section AA' showing V_2O_5% thickness and grade

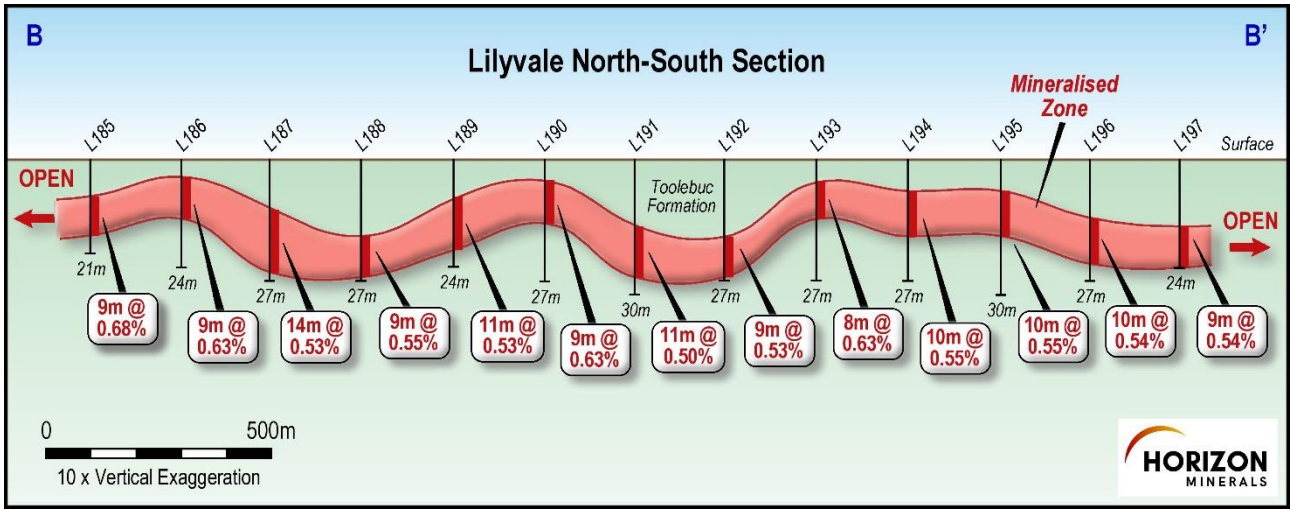

Figure 5: Lilyvale cross section BB' showing V_2O_5% thickness and grade
(Note: The vertical exaggeration has accentuated the undulation of the ore zone)

The drilling was highly successful in intercepting remarkably consistent oxide mineralisation along section. The grade has improved, relative to the historic resource, by this infill drilling. Examples of the significant intercepts are given in Table 1 below.

Table 1: Significant Intercepts from the Lilyvale Vanadium project *

Northing (m)	Easting (m)	Elevation (m)	Hole ID	From (m)	To (m)	Interval (m)	V2O5 (%)
7737301	686501	128.5	L234	2.0	11.0	9.0	0.69
7737301	685700	126.0	L288	5.0	13.0	8.0	0.65
7737495	686904	125.5	L206	5.0	14.0	9.0	0.65
7737498	687701	126.5	L150	4.0	13.0	9.0	0.64
7736500	688101	127.0	L126	4.0	12.0	8.0	0.62
7737106	687300	130.0	L181	2.0	8.0	6.0	0.62
7736702	687303	130.0	L183	2.0	8.0	6.0	0.61
7732298	687699	127.0	L176	4.0	12.0	8.0	0.61
7736100	687295	127.0	L186	3.0	13.0	10.0	0.60
7735903	686503	124.5	L241	6.0	15.0	9.0	0.60
7735500	687692	127.0	L160	3.0	13.0	10.0	0.59
7735702	688099	125.5	L130	4.0	15.0	11.0	0.59
7736707	688495	128.5	L096	2.0	11.0	9.0	0.59
7737724	687289	129.0	L178	2.0	10.0	8.0	0.58
7734100	688898	128.0	L080	3.0	11.0	8.0	0.58
7736300	685699	130.0	L293	2.0	8.0	6.0	0.58
7735701	686101	119.5	L269	11.0	20.0	9.0	0.58
7735102	687700	130.0	L162	2.0	8.0	6.0	0.58
7732903	687702	128.0	L173	4.0	10.0	6.0	0.58
7734702	687301	126.0	L193	4.0	14.0	10.0	0.57
7735893	689300	128.5	L042	2.0	11.0	9.0	0.57
7735499	686897	128.0	L216	3.0	11.0	8.0	0.57
7735102	686100	126.5	L272	6.0	11.0	5.0	0.57
7734699	686501	127.0	L247	3.0	13.0	10.0	0.57
7736498	686500	125.0	L238	5.0	15.0	10.0	0.57
7737700	686500	124.0	L232	6.0	16.0	10.0	0.57
7734133	688513	124.0	L109	6.0	16.0	10.0	0.57
7732700	688101	124.5	L145	6.0	15.0	9.0	0.57
7734701	688500	125.5	L106	4.0	15.0	11.0	0.57
7733298	686901	119.0	L227	11.0	21.0	10.0	0.57
7736897	686508	128.5	L236	2.0	11.0	9.0	0.56

Collar coordinates are in GDA94, Zone 54.
Elevation is for mid-point of the corresponding Interval.

* The Information in this report that relates to Exploration Results is based on and fairly represents information and supporting documentation prepared by Mr Warwick Nordin, who is a Competent Person and a member of the Australasian Institute of Geoscientists (AIG). Mr Nordin is a full-time employee of Richmond Vanadium Technology Pty Ltd. Mr Nordin has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration and to the activities being undertaken to qualify as a Competent Person as defined in the 2012 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'. Mr Nordin consents to the inclusion in the report of the matters based on his information in the form and context in which it appears. See also JORC Tables on Page 16.

Lilyvale Resource Update

The 2019 drilling was compiled to generate an updated independent Mineral Resource estimate compliant with the 2012 JORC Code as shown in the table below *:

JORC Classification	Cut-off grade %	Tonnage (Mt)	Grade			Metal content (Mt)		
			% V_2O_5	ppm Mo	ppm Ni	V_2O_5	Mo	Ni
Indicated	0.30	430	0.50	240	291	2.10	0.10	0.13
Inferred	0.30	130	0.41	213	231	0.50	0.03	0.03
TOTAL		**560**	**0.48**	**234**	**277**	**2.60**	**0.13**	**0.16**

Importantly, over 76% of the resource has been upgraded to the Indicated Category enabling detailed economic evaluation to be completed for reserve generation as part of the Pre-Feasibility Study due for release in the September Quarter 2020.

The global Mineral Resource estimate for the Richmond project area is shown in the Table below*:

Project (Res Cat)	Cut-off grade %	Tonnage (Mt)	Grade			Metal content (Mt)		
			% V_2O_5	ppm Mo	ppm Ni	V_2O_5	Mo	Ni
Rothbury (Inferred	0.30	1202	0.312	259	151	3.75	0.31	0.18
Lilyvale (Indicated)	0.30	430	0.50	240	291	2.15	0.10	0.1
Lilyvale (Inferred)	0.30	130	0.41	213	231	0.53	0.03	0.03
Manfred (Inferred)	0.30	76	0.345	369	249	0.26	0.03	0.02
TOTAL		**1,838**	**0.364**	**256**	**193**	**6.65**	**0.46**	**0.36**

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Next Steps

Mine optimisation studies and commercial evaluation will now be completed on the updated Lilyvale resource model and, in conjunction with further metallurgical testwork, form the basis of the Feasibility Study.

Given the scale of Lilyvale deposit and the potential to produce globally significant quantities of both 98% flake and electrolyte from this resource alone, the key focus of the Study will be to determine the optimal concentration and downstream processing flowsheets and associated capital and operating costs. Further discussions will then be held with potential offtake partners within the steel and energy storage market providers.

Listing Rule 5.8.1 Disclosures

Geology and Geological Interpretation

The Richmond-Julia Creek project mineralisation is located within marine sediments of the Early Cretaceous Toolebuc Formation, a stratigraphic unit that occurs throughout the Eromanga Basin in central- northern Queensland.

The Eromanga Basin (Figure 6) is a sub-basin of the Great Artesian Basin and consists of a number of thick sequences of non-marine and marine sedimentary units. The Toolebuc is part of the Rolling Downs Group of the Eromanga Basin that covers a wide but relatively shallow structural depression in eastern Australia, covering 1.5 million km^2. The basin was developed as a major downward warpon a basement of Proterozoic to Palaeozoic metamorphic and igneous rocks during the Jurassic to Cretaceous Periods.

The Toolebuc Formation is a flat lying early Cretaceous (Albian ~ 100My) sediment that consists predominantly of black carbonaceous and bituminous shale and minor siltstone, with limestone lenses and coquinites (mixed limestone and clays). It is composed of two distinct units representing two different facies: an upper coarse limestone-rich-clay-oil shale unit (coquina) and a lower fine-grained carbonate-clay-oil shale unit.

The Toolebuc Formation outcrops only at the margins of the Eromanga and Carpentaria basins, except at Julia Creek where it is draped over an interpreted original basement high and has been structurally brought to the surface. Where the unit outcrops it forms low, rubbly, subtle topographic highs which have been the source of road building materials in many areas.

The limestone within the Toolebuc Formation has an abundant fossil assemblage which has been extensively studied. Two main faunal assemblages have been recognised, corresponding to the upper coquina facies (shelly limestone and clay) and a lower fine-grained carbonate shale facies. The organic matter in the fresh shale is predominantly lamellar and referred to by Hutton et al (1980) as ‘lamosite’ (lamellar oil shale). The organic compounds are described as Alginite B in order to distinguish them from the more generally recognised Alginite A, in which clear evidence of algal morphology can be observed. Alginite B comprises elongate anastomosing films derived from benthonic algae that are attributable to the Cyanophyceae genera of blue-green algae (Ozimic, 1986).

High magnification scanning electron microscopy reveals the oil shale contains abundant micro fossils, dominated by small planktonic foraminifera and coccoliths (algal plates) believed to be derived from Cyanophta / blue- green algae. Average grain size of the lower oil shale calcareous nanofossils and clays are less than 5-7 microns. The blue-green algae are interpreted to have formed extensive algal mats on the sea floor. The preservation of dead algal matter can be related to an oxidising-reducing boundary probably situated immediately below the base of the living algal mat layer and keeping pace with its upward growth. The clays and kerogen are derived from planktonic algae and blue- green benthonic algae with the calcite representing the inorganic component of the organisms.

The episode of clear water calcareous sedimentation represented by the Toolebuc Formation ended when muddy conditions returned, preventing further growth of the benthonic fauna and leading to widespread deposition of the argillaceous sediments of the Allaru Mudstone (Ramsden, 1983).

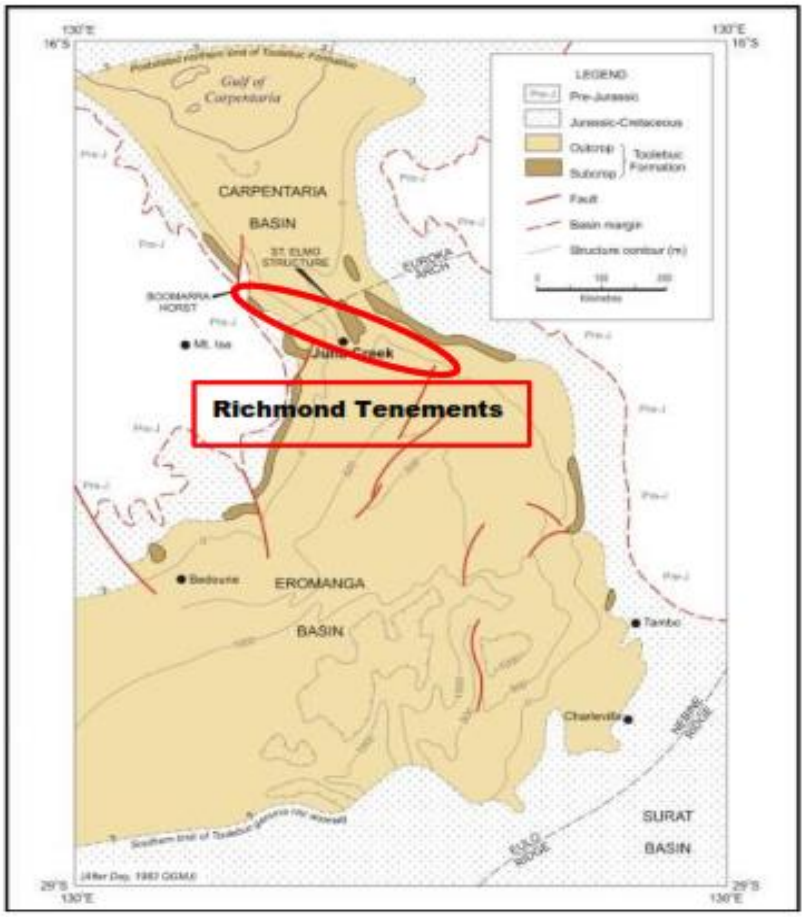

Figure 6: Richmond project area regional geology and location

Sampling and Sub-sampling

Sample was collected in large green plastic bags (via cyclone) and delivered to a laydown area in Richmond. Approximately 1kg of material was speared from each bag into a pre-numbered calico bag and sent to ALS Global Pty Ltd laboratory in Townsville.

Sample Analysis Method

The 2019 aircore samples were assayed by ALS Global Pty Ltd in Townsville, Brisbane and Perth using the MS85 (Li borate fusion) method (V only). Every 20th hole was also assayed by ICP61 (Ca, Cu, Fe, Mo, Ni, S and V). A small subset was also submitted for XRF analysis for comparison. There was good agreement between these methods. The stoichiometric factor used to convert V to V_2O_5 was 1.7852 (divided by 10000 to derive a percent figure).

Drilling Techniques

The 2019 Lilyvale deposit drilling was performed by a 150MEX rig with dump mast using a 350psi compressor. The aircore bit had an OD of 84mm. One duplicate in each of the Lilyvale holes drilled in 2019 was submitted for vanadium assay – the agreement between results was acceptable.

None of the drill holes have been twinned for the purposes of QAQC sampling though the quantity of holes duplicated over time, due to differences of methodologies, show a continuity of grade, interpretation continuity and geological consistency.

The variances show that time and methodology do not alter the consistency in the orebody definition.

Estimation Methodology

Each area, Manfred, Rothbury and Lilyvale was interpreted separately and had models created separately due to sizes and lode orientations.

Histograms on the Lilyvale data before and after the 2019 drilling are presented in Figure 7 and Figure 8. The bimodal character of the distribution is pronounced when the 2019 data is included, and there is also a slight increase in the grade tenor. A cumulative probability plot on this latest Lilyvale data supports a grade population break near 0.3% V2O5 (Figure 9).

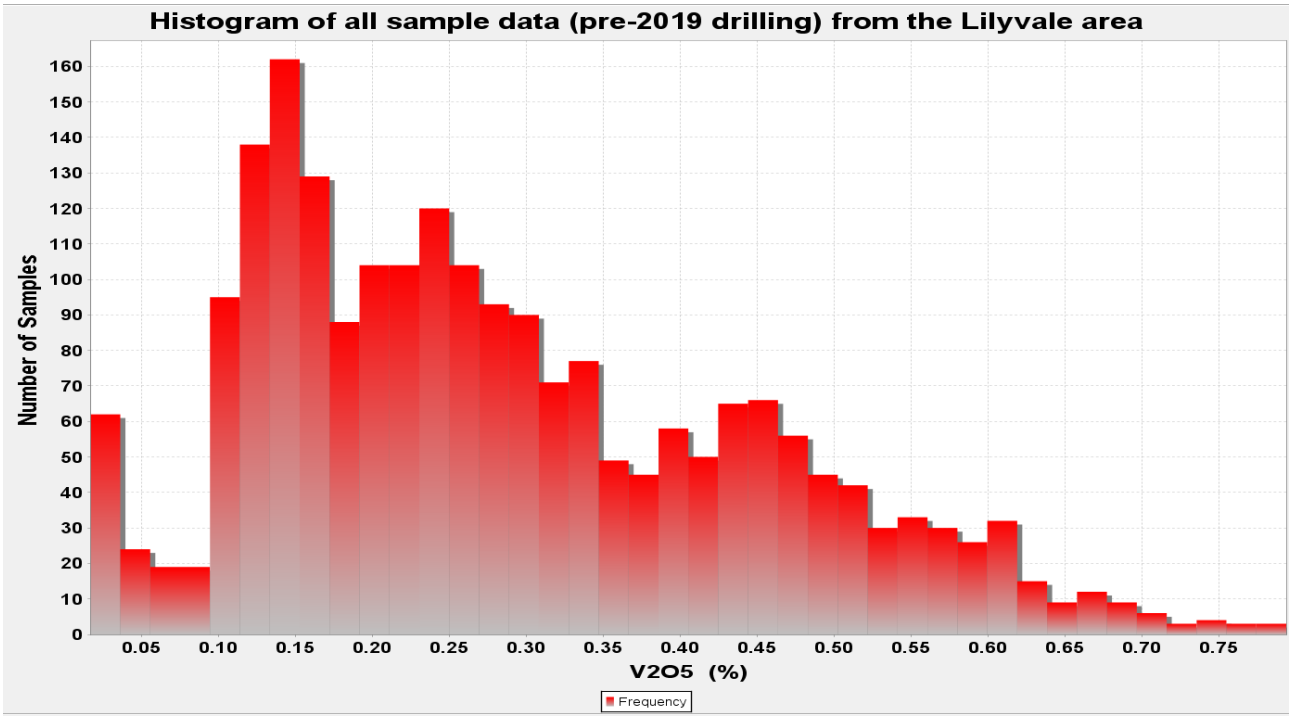

Figure 7: Histogram of all sample data (pre-2019) from the Lilyvale area showing a distinct grade variation at the 0.1%V_2O_5.

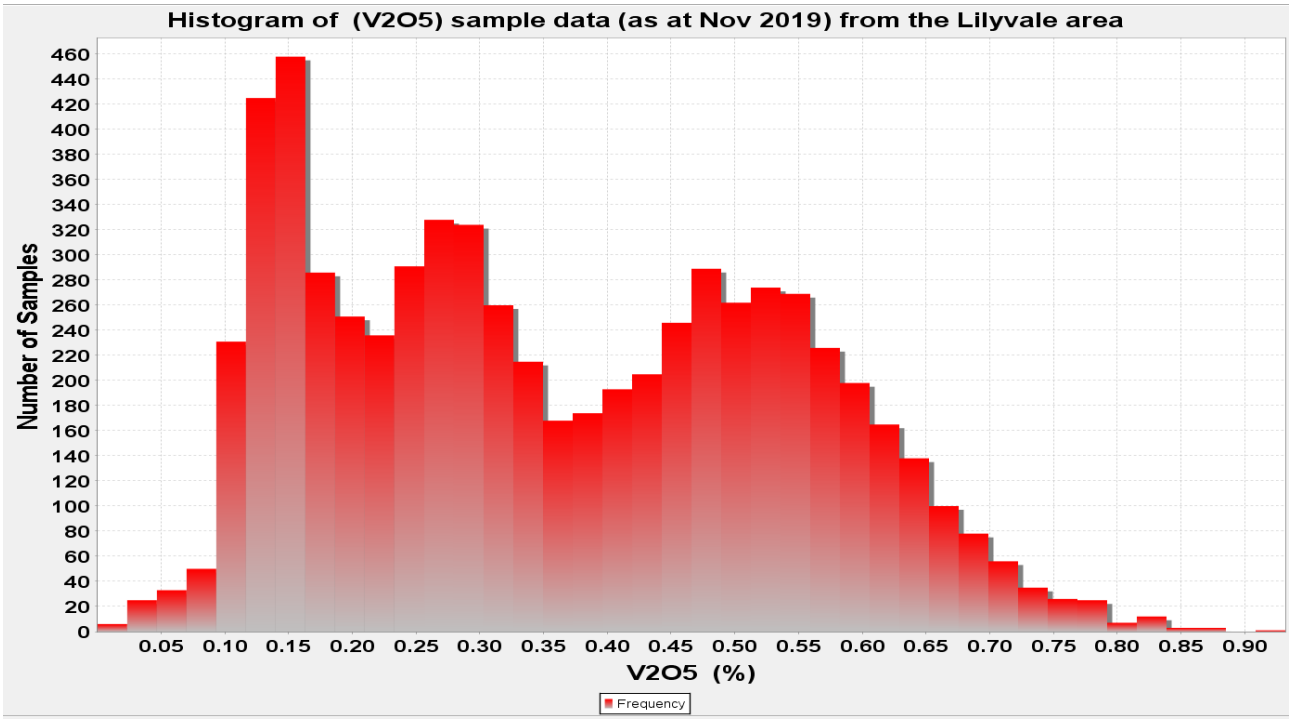

Figure 8: Histogram of all sample data post 2019 drilling showing bimodal distribution attributable to the Indicated portion of the deposit

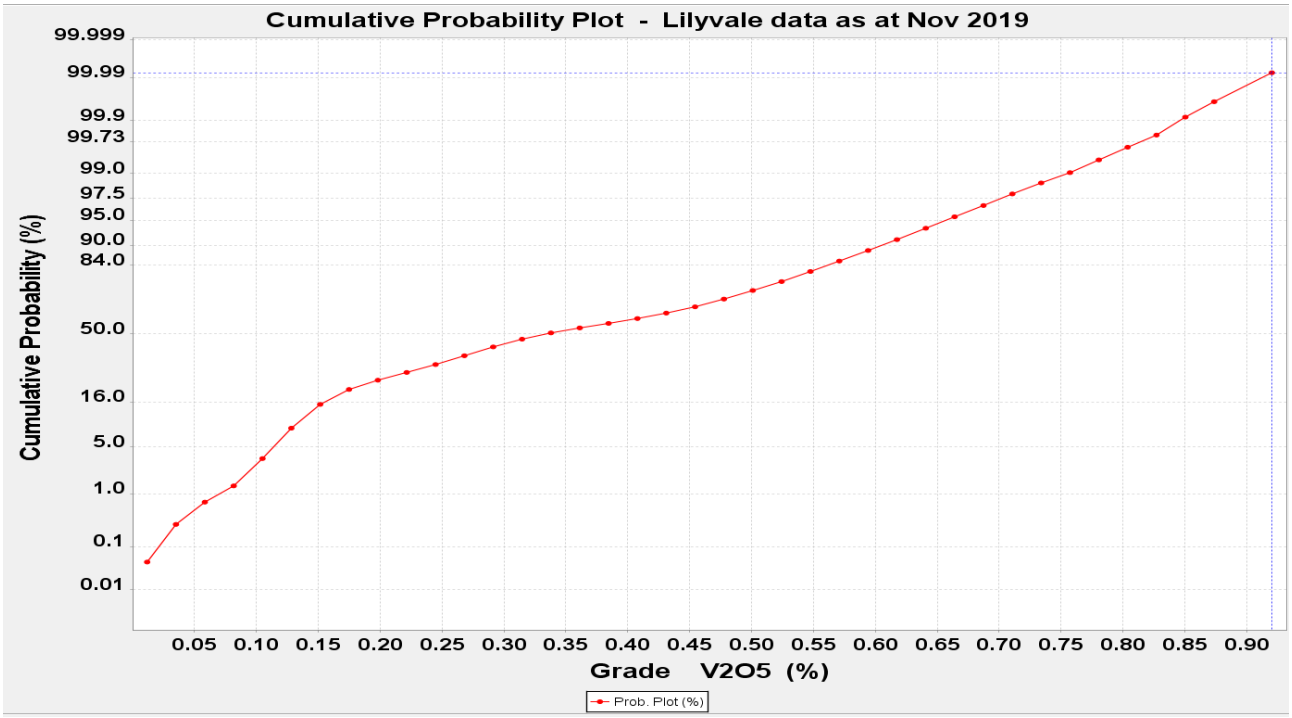

Figure 9: Cumulative probability plot for Lilyvale data indicating population breaks near 0.15%, 0.3% and 0.5% V_2O_5

Criteria used in the interpretations were:

- Interpretations were based on V_2O_5values only.
- A nominal 0.3% V_2O_5 lower cut-off grade with flexibility for geological continuity.
- Sections extended 100m beyond the last interpreted section.
- Geology mostly comprises the following:

Kloc	COQUINA
Klol	LIMESTONE
Kloy	KAOLINIZED WEATHERED OIL SHALE +V-Mo-Cu
Klos	OIL SHALE

Interpretations were created in cross-sections to correlate with the drilling sections.

The Indicated portion of the Lilyvale deposit shows good continuity of geology and grade between drill holes.

The interpreted sections were wire framed to create solids used in extracting composite data and coding the block models.

Although section spacing is extremely wide the continuity of assay data, interpretation widths and geological recognition identifies the lodes with relative accuracy.

Block Model

The 2020 Lilyvale model was created in Surpac (version 6.9 x64):

- "lilyvale_model_nov2019.mdl".

The interpolation process used Inverse Distance Squared (ID2) as the preferred algorithm. The dynamic anisotropy module (using a trend surface on the lower bound of the >0.3% ore zone) was used when performing the ID2 interpolation of the 2019 Lilyvale model.

Block Model parameters for Lilyvale are shown below:

Type	Northing	Easting	Elevation
Minimum Coordinates	7731050	680350	90
Maximum Coordinates	7739250	697050	150
User Block Size	100	100	1
Min. Block Size	25	25	0.25
Rotation	0	0	0
Total Blocks	3,127,405		

Resource Classification

The resource model uses a classification scheme based upon both block estimation parameters and other relevant modifying factors as determined by the Competent Person. The block estimation parameters initially used for classification guidance included average distance of points, closest points, number of points and standard deviation.

Following the 2019 drilling a large part of the Lilyvale resource (inside the 200m x 400m drill grid) is now upgraded to Indicated.

The Manfred and Rothbury Mineral Resources are classified as Inferred.

Cut-off Grade

The cut-off grade of 0.3% for the stated Lilyvale Mineral Resource Estimate is determined from economic and statistical parameters and reflects the current and anticipated mining practices. The 0.3% cut applies to the geological model wireframe envelopes. The model is considered valid for reporting and potential open pit mine planning.

Mining and Metallurgical Methods and Parameters and other modifying factors considered to date

Subject to satisfactory concentration and extraction techniques being developed, Intermin suggest that the vanadium mineralisation could be mined by open cut methods. The mineralisation is often less than 10m from the surface, tabular and thick. Significant volumes of testwork have been conducted on the Julia Creek and Richmond oil shales. Richmond hosts both vanadium-molybdenum and oil shale but the oil shale values at Julia Creek (Burwood, MDL522) are significantly higher than those at Richmond. The Richmond-Julia Creek project is primarily a vanadium-molybdenum project and provides the focus for the ongoing development work.

Beneficiation and extraction of vanadium and molybdenum from the Richmond-Julia Creek project varied with the composition of the ore. Testwork to evaluate the vanadium/molybdenum (V/Mo) deportment conducted on representative samples from the deposit included:

- Beneficiation by screening
- Beneficiation by flotation
- Acid leaching and solvent extraction
- SO_2 pre-leaching
- High temperature chlorination

RVT is confident of an economic processing route for the project based on metallurgical testwork completed to date.

Approved for release by the Board of Directors of Horizon and RVT.

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Figure 10: Infill drilling at the Lilyvale Vanadium project

Forward Looking and Cautionary Statements

Some statements in this report regarding estimates or future events are forward looking statements. They include indications of, and guidance on, future earnings, cash flow, costs and financial performance. Forward looking statements include, but are not limited to, statements preceded by words such as “planned”, “expected”, “projected”, “estimated”, “may”, “scheduled”, “intends”, “anticipates”, “believes”, “potential”, “could”, “nominal”, “conceptual” and similar expressions. Forward looking statements, opinions and estimates included in this announcement are based on assumptions and contingencies which are subject to change without notice, as are statements about market and industry trends, which are based on interpretations of current market conditions. Forward looking statements are provided as a general guide only and should not be relied on as a guarantee of future performance. Forward looking statements may be affected by a range of variables that could cause actual results to differ from estimated results, and may cause the Company’s actual performance and financial results in future periods to materially differ from any projections of future performance or results expressed or implied by such forward looking statements. These risks and uncertainties include but are not limited to liabilities inherent in mine development and production, geological, mining and processing technical problems, the inability to obtain any additional mine licenses, permits and other regulatory approvals required in connection with mining and third party processing operations, competition for among other things, capital, acquisition of reserves, undeveloped lands and skilled personnel, incorrect assessments of the value of acquisitions, changes in commodity prices and exchange rate, currency and interest fluctuations, various events which could disrupt operations and/or the transportation of mineral products, including labour stoppages and severe weather conditions, the demand for and availability of transportation services, the ability to secure adequate financing and management’s ability to anticipate and manage the foregoing factors and risks. There can be no assurance that forward looking statements will prove to be correct.

Statements regarding plans with respect to the Company’s mineral properties may contain forward looking statements in relation to future matters that can only be made where the Company has a reasonable basis for making those statements.

This announcement has been prepared in compliance with the JORC Code (2012) and the current ASX Listing Rules.

The Company believes that it has a reasonable basis for making the forward looking statements in the announcement, including with respect to any production targets and financial estimates, based on the information contained in this and previous ASX announcements.

Appendix 1 – Lilyvale Vanadium project

JORC Code (2012) Table 1, Section 1, 2 and 3

Mr Warwick Nordin, a full time employee of Richmond Vanadium Technology compiled the information in Section 1, Section 2 and Section 3 of the following JORC Table 1 and is the Competent Person for those sections.

The following Table and Sections are provided to ensure compliance with the JORC Code (2012 edition) requirements for the reporting of Mineral Resources.

Section 1 Sampling Techniques and Data

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.* • *Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.* • *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.*	Aircore drill sample was collected in large green plastic bags (via cyclone) and delivered to a laydown area in Richmond. Approximately 1kg of material was speared from each bag into a pre-numbered calico bag and sent to ALS Global Pty Ltd laboratory in Townsville. The samples presented for assaying can therefore be considered as being representative and uncontaminated. RVT retain digital photos on file that detail the drilling and field sampling procedures. One duplicate sample per hole was inserted into the assay stream. Good correlation is observed between these samples. Time based deviation on internal assay lab QAQC samples showed less than two standard deviations between parent and daughter samples.
Drilling techniques	• *Drill type (eg core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc) and details (eg 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).*	Aircore: 333 Holes for 7,178m An experienced RVT, or contract geologist was present during the drilling – the cyclone was periodically checked (and cleaned). No sample recovery issues were encountered.

Criteria	JORC Code explanation	Commentary
Drill sample recovery	• *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.*	All the holes within the resource model are vertical air core drilled to a nominal 30m depth. RAB holes exist in the database but are not present within the resource area. Sample interval is 1 metre.
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.* • *Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc) photography.* • *The total length and percentage of the relevant intersections logged.*	Lithology, sample colour and degree of weathering were recorded on paper logs. An estimate of clay content was noted in a number of holes.
Sub-sampling techniques and sample preparation	• *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.*	See section on assaying for details of sample preparation.
Quality of assay data and laboratory tests	• *The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.* • *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.* • *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*	All of the samples used to construct the resource model were assayed at ALS Laboratories. Vanadium was analysed by the MS85 method (lithium borate fusion, dissolution with ICP finish). Samples in every 20th hole were also subjected to 4 acid digest followed by ICP-AES and analysed for Ca, Cu, Fe, Mo, Ni, S and V. The V results from this method were consistently (~8%) lower when compared to MS85 or XRF, which substantiated the laboratory claim that the MS85 method liberated V more efficiently.

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	established.	XRF analyses were performed at the beginning of the program to confirm the validity of the MS85 method - there was a very good correlation between MS85 and XRF which supported the decision to use the MS85 method for all samples. At the time of drilling 1 duplicate sample was inserted per hole.
Verification of sampling and assaying	• *The verification of significant intersections by either independent or alternative company personnel.* • *The use of twinned holes.* • *Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.* • *Discuss any adjustment to assay data.*	Hawker Geological Services Pty Ltd, trading as HGS Australia, conducted an assessment of the database assessing the collars, surveys, geology and assay data in 2017/18. The recent 333 aircore holes were carefully checked and added to this database. A few of the recent (2019) holes were drilled in close proximity to historical holes; a visual comparison confirms grade thickness and tenor. V (ppm) was converted to V_2O_5 (%) using a factor of 1.7852 divided by 10000.
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.* • *Specification of the grid system used.* • *Quality and adequacy of topographic control.*	Collar coordinates were collected using a hand-held GPS in the GDA94 (Zone 54) coordinate system by the field personnel during drilling. As the holes are shallow and vertical there is no down hole survey data collected for any of the drill holes presented. The depth of the holes in relation to the depth of the ore body will not deviate the orientation of the hole.
Data spacing and distribution	• *Data spacing for reporting of Exploration Results.* • *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.* • *Whether sample compositing has been applied.*	Holes defining the Lilyvale orebody are constrained between 7730000N and 7739000N; and from 680500E to 696700E. NS lines spaced at 1000m from 680500E to 684900E, with collars about 400m apart – mostly the western Indicated part of the resource. NS lines spaced at 400m from 684900E to 690500E, with collars about 200m apart – this largely delineated the Inferred part of the resource. NS lines spaced at 1000m from 690500E to 696700E, with collars about 400m apart – the eastern Inferred part of the resource. The 1m samples were not composited.
Orientation of data in relation to	• *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*	All drilling was vertical, as the orebody is sub-horizontal.

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geological structure	*sampling bias, this should be assessed and reported if material.*	
Sample security	• *The measures taken to ensure sample security.*	Data was presented in Excel format which was imported into a Microsoft Access database referenced by Surpac V6.9.
Audits or reviews	• *The results of any audits or reviews of sampling techniques and data.*	In 2017 HGS Australia carried out a full review of the data and created an Access database. This database was updated electronically in November 2019 - the data integrity and consistency show sufficient quality to support resource estimation.

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 security of the tenure held at the time of reporting along with any known impediments to obtaining a licence to operate in the area.*	Richmond Vanadium Technology Pty Ltd. (RVT; previously AXF Vanadium Pty Ltd) and Horizon Minerals Limited (HRZ; previously Intermin Resources Ltd) own 100% in five Mineral Exploration Permits (EPM25163, EPM25164, EPM25258, EPM26425 and EPM26426) covering 1550km2 near Richmond and 100% metal rights to Global Oil Shale Plc's Julia Creek MDL 522. Project Status was given for the Richmond-Julia Creek Vanadium Project, on 28 August 2017 by the Department of Natural Resources, Mines & Energy (DNRME.)
Exploration done by other parties	• *Acknowledgment and appraisal of exploration by other parties.*	Previous workers in the area include Aquitane (1969), CSR (1983), CSIRO (1973), CRA (1991), Fimiston (1998).
Geology	• *Deposit type, geological setting and style of mineralisation.*	Cretacious, sedimentary Toolebuc formation

Criteria	JORC Code explanation	Commentary

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.*
	• *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 however Intermin drilling results have all been released and reported to the ASX.
		• No information is excluded.

Data aggregation methods	• *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.* • *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.*	• No weighting or averaging calculations were made, assays reported and compiled on the “first assay received” basis. • Cut off grades were routinely applied and reported accordingly and used in the construction of all resource calculations. • No metal equivalent calculations were applied.

Criteria	JORC Code explanation	Commentary
	• *The assumptions used for any reporting of metal equivalent values should be clearly stated.*	
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 (e.g. 'down hole length, true width not known').*	• Oxide mineralisation is predominantly flat lying (blanket like) while fresher mineralisation at depth is interpreted to be gently dipping to the south. The V_2O_5 mineralisation is of a kilometric scale. • Drill intercepts and true width appear to be very close to each other, or within reason allowing for the minimum intercept width of 1m. Intermin estimates that the true width is variable but probably close to 90-100% of the intercepted width. • Given the nature of AC/RC drilling, the minimum width and assay is 1m. Diamond core is best used to determine cm scale mineralisation widths. True intercepts are not known however the downhole intercepts appear to represent very close to true width given the orientation of the vertical drilling and the flat stratigraphy.
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.*	• Summary maps and figures have been included in this release to describe the locations and orientations of the Mineral Resource Estimates.
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.*	• For compilation of resource estimates all data is evaluated from the database to form the basis of mineralisation outlines which have been determined nominally >0.3 % V_2O_5.
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;*	• See details from previous ASX releases from Intermin Resources Limited (ASX IRC). These can be accessed via the internet.

Criteria	JORC Code explanation	Commentary
	potential deleterious or contaminating substances.	
Further work	• *The nature and scale of planned further work (e.g. 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.*	• Scoping or engineering studies have not yet been undertaken. Additional drilling, surveying and metallurgy is planned. • Commercially sensitive.

Section 3 Estimation and Reporting of Mineral Resources

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 was updated with the (validated) drill data from the 333 aircore holes drilled in 2019 for the purpose of conducting a resource evaluation. The resource evaluation was conducted by Richmond Vanadium Technology Pty Ltd (RVT).
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.*	Frequent site visits were undertaken by W.Nordin of RVT.

Criteria	JORC Code explanation	Commentary
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 resource area has been sufficiently interpreted by geological consultants and the geology matches grade and geological interpretations as anticipated. Criteria used in the interpretations were: • Interpretations were based on V_2O_5 values only. • A nominal 0.3% V_2O_5 lower cut-off grade with flexibility for geological continuity. • Sections extended 100m beyond the last interpreted section. • Geology mostly comprises the following: - Kloc COQUINA - Kloy KAOLINIZED WEATHERED OIL SHALE + (V, Mo, Ni) - Klos OIL SHALE
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.*	Lilyvale is largely a sub-horizontal deposit between 7730000N and 7739000N; and from 680500E to 696700E. It has a roughly WNW-ESE strike. The Indicated resource is roughly 6km x 6km in areal extent. Deposit thickness is defined by V_2O_5 cut-off; at a 0.30% cutoff Lilyvale averages about 10m in thickness. Overburden thickness varies between 2m and 15m.
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*	The models were created using Surpac software Version 6.9.

Criteria	JORC Code explanation	Commentary
	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 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.*	Interpolation method used is Inverse Distance Squared using dynamic anisotropy following the (0.30% V_2O_5 cutoff) mineralisation trend. The estimation was carried out in two passes: • Search1 = 500m with min/max samples = 10/30 respectively • Search2 = 1800m with min/max samples = 5/30 respectively Model size and parameters are: **Lilyvale** / **Northing** / **Easting** / **Elevation** Minimum Coordinates: 7731050 / 680350 / 90 Maximum Coordinates: 7739250 / 697050 / 150 User Block Size: 100 / 100 / 1 Min. Block Size: 25 / 25 / 0.25 Rotation: 0 / 0 / 0 Total Blocks: 2384222 Swathe plots comparing block and drill composite grades in vertical (NS) slices (with 100m WE width) showed good agreement.
Moisture	• *Whether the tonnages are estimated on a dry basis or with natural moisture, and the method of determination of the moisture content.*	The tonnages are estimated on a dry basis. Value used is 1.8t/bcm.

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Cut-off parameters	• *The basis of the adopted cut-off grade(s) or quality parameters applied.*	Univariate statistics were conducted; an upper cut-off grade was not required. A cumulative probability plot indicated population breaks near 0.15%, 0.3% and 0.5% V_2O_5.
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.*	Resource economics identifies the probable lower cut-off to be 0.3% V_2O_5 based on the following parameters: • V_2O_5 + MoO_3 prices of approximately $23000/tonne • Cash operating costs of $100/tonne
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.*	Significant volumes of testwork have been conducted on the Richmond - Julia Creek Project by various permit holders over many years. Early work focused on the search for oil and process test work of the unoxidised kerogen-rich oil shale. RVT's focus is on the metal content only. Initial testwork completed by RVT in 2018 focused on ore preconcentration of the run of mine ore by physical means, followed by both hydrometallurgical and pyrometallurgical testwork on the concentrate to produce a final 98% V_2O_5 flake for use in both the steel and energy storage markets. Testwork included: • Beneficiation by screening • Beneficiation by flotation • Acid leaching and solvent extraction • SO_2 pre-leaching • High temperature chlorination Based on the mineralogy study of the ore and mineral processing research, three optimal mineral processes were selected for the concentration of vanadium ore. These three options will form the technical basis for a Preliminary Feasibility Study.

Criteria	JORC Code explanation	Commentary
		RVT is confident of an economic processing route for the project based on metallurgical testwork completed to date.
Environmen-tal 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 this should be reported with an explanation of the environmental assumptions made.*	No assessments have been made yet. A pre-feasibility study is about to be completed; this will include environmental aspects.
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.*	The tonnages are estimated on a dry basis. Value used is 1.8t/bcm.
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 200m x 400m drill density in the central section of the Lilyvale deposit renders that portion Indicated; the balance (to the west and east) is considered Inferred. The Competent Person believes the mineralised domains have sufficient geological and grade continuity to support the classification applied to the Mineral Resources given the current drill pattern.

Criteria	JORC Code explanation	Commentary
Audits or reviews	• *The results of any audits or reviews of Mineral Resource estimates.*	
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 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.*	The competent person has confidence in the interpretation with regards to accuracy for the classification announced. The variability in the assay statistics are similar for all three (3) resource areas as well as the interpretation shape.