21 March 2025

Tivan achieves high-purity vanadium electrolyte specification for Speewah

- **Tivan has completed a vanadium electrolyte ("VE") testwork program using vanadiferous titanomagnetite ("VTM") ore sourced from Speewah, successfully achieving the high-purity VE specification of Japanese battery manufacturer Sumitomo Electric Industries.**
- **Tivan's vanadium salt roasting testwork program is now complete, with the program demonstrating that Speewah VTM ore has very high amenability to the salt roasting processing technology.**
- **Vanadium pentoxide ("V_2O_5") produced from Speewah ore using salt roast processing exhibited nearly identical electrochemical performance to a commercial V_2O_5 sample.**
- **Speewah V_2O_5 has been confirmed as suitable for the production of VE and supports Tivan's long-term strategy of Speewah becoming Australia's pre-eminent supplier of high-purity VE for local and global markets.**

The Board of Tivan Limited (ASX: TVN) ("Tivan" or the "Company") is pleased to advise that the vanadium electrolyte ("VE") testwork program for the Speewah Vanadium Project has achieved outstanding results. Tivan has successfully met the high-purity VE specifications provided by Sumitomo Electric Industries ("SEI"), a Japanese manufacturer of large-scale, long-life vanadium flow batteries. The VE produced from Speewah vanadiferous titanomagnetite ("VTM") ore is considered to have excellent properties for use in vanadium flow battery storage technology.

Ahead of the VE testwork program, Tivan announced excellent salt roast testwork outcomes, including the production of a high-purity vanadium pentoxide (99.86% V_2O_5) without the use of solvent extraction (see ASX announcement of 21 January 2025). The V_2O_5 produced was used for the VE preparation and testing program undertaken at the University of New South Wales ("UNSW") that specifically targeted achievement of the SEI VE specifications.

With the completion of the VE testwork program, all stages of the salt roast testwork program for Speewah have now been completed, as detailed below in *Table 1*:

Testwork Scope	Key Aims
Salt roasting	Investigate salt roast parameters to establish preferred conditions
Downstream purification & vanadium precipitation	Investigate desilication parameters and purification flowsheet options
Bulk V_2O_5 preparation	Bulk processing of Speewah VTM concentrate through to the preparation of a V_2O_5 sample for VE testwork
VE works	Prepare vanadium electrolyte to SEI specification

Table 1: 2024/25 testwork program for vanadium electrolyte production

Salt roasting technology is the traditional industry process for the production of vanadium oxide products. Across multiple testwork phases Tivan has demonstrated that Speewah VTM ore is highly amenable to this standard industry processing technology.

The key highlights across the previously announced testwork include:

- Salt roasting vanadium extractions of up to 98.3% from Speewah VTM ore with industrially relevant process conditions (see ASX announcement 19 June 2024).
- Development of a simple purification process without solvent extraction to recover high-purity V_2O_5 from salt roast liquors.
- High purity 99.86% V_2O_5 sample prepared for VE testwork.

Vanadium Electrolyte Testwork Program Results

UNSW was engaged to prepare a VE sample from the Speewah high-purity (99.86% V_2O_5) vanadium pentoxide sample. UNSW has a prestigious history with the development of vanadium battery technology through the involvement of Professor Maria Skyllas-Kazacos, the pioneer of the vanadium redox flow battery. Professor Skyllas-Kazacos, who is a member of Tivan's Technical Advisory Group, supported management of the VE testwork program and interpretation of the results.

The primary aim for this scope was to demonstrate the preparation of a high-purity VE that meets the specifications provided to Tivan by SEI. Two VE samples were prepared, with both meeting the SEI specification for all 24 analysed impurities. The assays for key elements are presented as a percentage of their target specification in *Table 2* (<100% is within specification) - the lower the number, the better the result. The summary highlights that all elements were well within the target specification.

Analyte	Sample 1 (%)	Sample 2 (%)
Al	46.2	48.6
Ca	3.6	4.2
Cr	4.7	4.8
Cu	24.0	33.0
Fe	3.4	2.0
K	2.9	1.5
Mg	0.8	1.2
Mn	0.2	0.1
Mo	0.4	0.1
Na	2.0	2.2

Ni	17.8	19.4
Si	43.4	66.6
Sb	Within Specification	Within Specification
Pb	10.2	10.4
Zn	1.4	1.5

Table 2: Comparison of select VE assays as a percentage of the SEI target

Within specification: assay data reported to be <0.00 ppm
Four species from the SEI specification were not analysed due to laboratory limitations for this program; these species are more likely introduced by the flowsheet and not the ore itself.

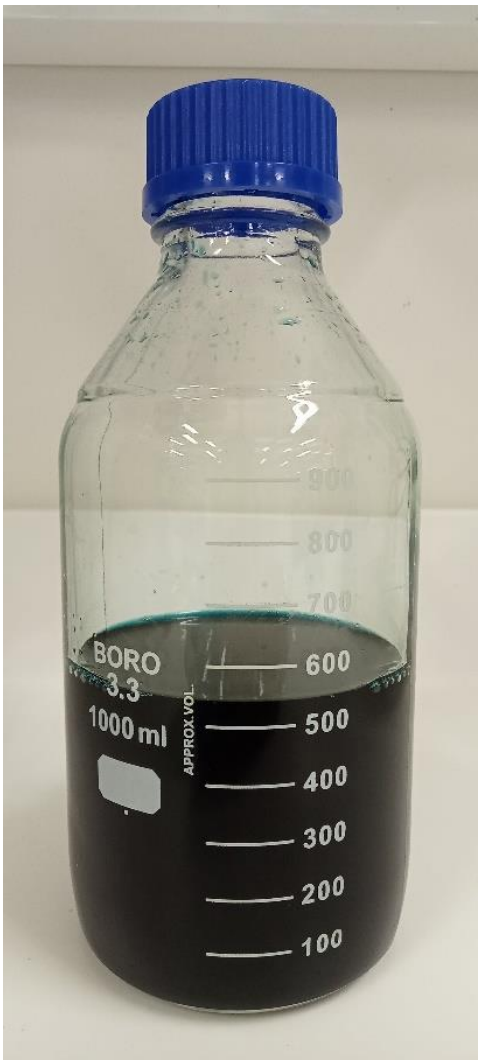

Figure 1: VE sample prepared by UNSW using Speewah VTM ore

Vanadium Battery Testing

A commercial high-purity V_2O_5 sample utilised for electrolyte production was also converted to electrolyte with the same procedure as the Tivan V_2O_5 sample. To test the electrochemical performance of the Tivan sample, both the Tivan sample and the commercial sample were then run through a cyclic voltammetry test, a linear sweep voltammetry test and a laboratory scale cell cycling test. The overall electrochemical performance of the two electrolytes in all tests were nearly identical, an excellent result which strongly indicates that the Tivan Speewah V_2O_5 will be suitable for the production of VE.

Next Steps

The results achieved through this program will be utilised by Tivan to conclude its assessment of the two vanadium processing technology pathways under consideration for the Speewah Vanadium Project: TIVAN+ in strategic partnership with CSIRO and a conventional salt roast processing flowsheet.

The results will also facilitate an enhanced dialogue with SEI and Sumitomo Corporation regarding project development pathways at Speewah and commercialisation of VFB in Australia. Executive Chairman, Mr Grant Wilson, is scheduled to lead the next round of these discussions in Tokyo and Osaka in Q2.

Tivan Executive Chairman Mr Grant Wilson commented:

"Tivan has completed two major testwork programs this week that confirm Speewah's status as Australia's premier dual-resource critical minerals project. With neither Fluorite or Vanadium in domestic production, the opportunity Tivan has to advance a staged-development project is unique and strongly aligned with the Australian Government's Critical Minerals Strategy and National Battery Strategy.

Our Vanadium testwork program has confirmed the exceptional amenability of Speewah ore to traditional salt roast technology and the resulting vanadium electrolyte has now met the demanding specification provided by Sumitomo Electric Industries. Speewah has been confirmed as a unique sovereign endowment, ideally placed as a secure source of supply for Australia's long-duration energy storage requirements.

This news will be well received in Japan, where the technical and commercialisation challenges for Vanadium Flow Batteries are well understood. We extend sincere thanks and congratulations to Professor Maria and her team at UNSW in achieving this important milestone."

This announcement has been approved by the Board of the Company.

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Competent Person's Statement

Tivan's exploration activities for the Speewah Vanadium Project are being overseen by Mr Stephen Walsh (BSc). The information that relates to historic results in this announcement is based on and fairly represents information and supporting documentation prepared and compiled by Mr Walsh, a Competent Person, who is the Chief Geologist and an employee of Tivan, and a member of the Australasian Institute of Mining and Metallurgy (AusIMM). Mr Walsh has sufficient experience of relevance to the styles of mineralisation and the types of deposits under consideration, and to the activities undertaken, to qualify as a Competent Person as defined in the 2012 Edition of the Joint Ore Reserves Committee (JORC) Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves. Mr Walsh consents to the inclusion in this announcement of the matters based on information compiled by him in the form and context which it appears.

Speewah Vanadium Exploration Results

The information in this announcement that relates to exploration results for the Speewah Vanadium Project has been extracted from the Company's previous ASX announcements entitled "Update on Vanadium Electrolyte Testwork Program" dated 19 June 2024 and "Tivan achieves high-purity vanadium specification at Speewah" dated 21 January 2025. Copies of these announcements are available at www.asx.com.au or www.tivan.com.au/investors/asx-announcements/. The Company confirms that it is not aware of any new information or data that materially affects the information included in those announcements. Tivan confirms that the form and context in which the Competent Person's findings are presented have not been materially modified from those announcements.

Forward looking statement

This announcement contains certain "forward-looking statements" and comments about future matters. Forward-looking statements can generally be identified by the use of forward-looking words such as, "expect", "anticipate", "likely", "intend", "should", "estimate", "target", "outlook", and other similar expressions and include, but are not limited to, the timing, outcome and effects of the future studies, plans, programs, budgets, project development and other work. Indications of, and guidance or outlook on, future exploration and development, earnings, financial position, performance of the Company or global markets for relevant commodities are also forward-looking statements. You are cautioned not to place undue reliance on forward-looking statements. Any such statements, opinions and estimates in this announcement speak only as of the date hereof, are preliminary views and are based on assumptions and contingencies subject to change without notice. Forward-looking statements are provided as a general guide only. There can be no assurance that actual outcomes will not differ materially from these forward-looking statements. Any such forward looking statement also inherently involves known and unknown risks, uncertainties and other factors and may involve significant elements of subjective judgement and assumptions that may cause actual results, performance and achievements to differ. Except as required by law the Company undertakes no obligation to finalise, check, supplement, revise or update forward-looking statements in the future, regardless of whether new information, future events or results or other factors affect the information contained in this announcement.

JORC Code, 2012 Edition - Table 1 Report

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.*	• The metallurgical testwork program was completed on a titanomagnetite concentrate sample received in the Speewah Project acquisition from King River Resources Limited ("KRR"). • The sample used is a p80 45 micron high grade concentrate that assayed 2.44% V_2O_5 produced from a RC chips sample by magnetic separation methods in 2011.
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).*	• No new drilling was completed in preparation for the testwork reported in this announcement. • The testwork described in this announcement was completed on titanomagnetite concentrate derived from RC drilling with a face-sampling bit.
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.*	• RC chip samples from every 1 metre drilled interval were sampled and composited. The host gabbro is fresh from near surface and sample recovery into RC bags was high. • No relationship between grade and recovery has been identified.
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.*	• RC drill 1 metre intervals logged 100% from surface to end-of-hole.
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 maximize 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.*	• RC bags were re-sampled to collect a 6 tonne composite sample for testwork. • The average grade of the 6 tonne sample compares with the drill assayed intervals for the HG zone. • Subsampling was performed during the preparation stage according to the metallurgical laboratories' internal protocol. • RC chips from every 1 metre interval were sampled and composited. The final composited grade compares favourably with the average V, Ti and

	• *Whether sample sizes are appropriate to the grain size of the material being sampled.*	Fe grades from the drill assays for the HG zones of the vanadium deposit. • Sample sizes were considered appropriate to the grain size of the material being sampled.
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 established.*	For the testwork program reported in this announcement: • ICP-MS was used to measure trace impurities at UNSW
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.*	• Significant drill intersections have been verified by alternative company personnel. • Data is incorporated into a digital database, assays from laboratories received in a digital format. • No adjustments or calibrations made to primary assay data collected for the purpose of reporting assay grades and mineralized intervals.
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.*	• Almost 90% of the collars used in the resource estimate were surveyed using a differential global positioning system instrument, with the remaining surveyed using a hand-held GPS. Downhole deviations were measured by downhole survey instruments on 3 holes only using a Globaltech Pathfinder digital downhole camera. All but four holes are vertical. All metallurgical holes are vertical. The vertical and shallow nature of the drilling means that the absence of downhole surveys is not considered a material risk. • The adopted grid system is GDA 94 Zone 52.
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.*	• RC drill spacing is mostly 250 m by 250 m in the deposit, closing down to 100 m by 100 m in the Western Area. • 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. • The RC composite represents the HG zone within the magnetite gabbro within the resource envelope. This was considered appropriate given the metallurgical testwork was designed to test the HG zones of mineralisation and it provided for a bulk sample suitable for testwork.

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.* • *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.*	• All RC holes are vertical. This allowed the holes to intersect the mineralisation at a high angle as the magnetite gabbro has a very shallow dip to the East. • The relationship between the drilling orientation and the orientation of key mineralised structures is not considered to have introduced sampling bias.
Sample security	• *The measures taken to ensure sample security.*	• The titanomagnetite concentrate stored at Nagrom under job number T687; was transported to a secure site followed by delivery to the metallurgical laboratory by the Company.
Audits or reviews	• *The results of any audits or reviews of sampling techniques and data.*	• No external audits have been completed.
SECTION 2 REPORTING OF EXPLORATION RESULTS		
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.*	• The Speewah Project comprises two Exploration Licences (E80/2863, E80/3657), three Mining Leases (M80/267, M80/268, M80/269) and two Miscellaneous Licences (L80/43, L80/47). The tenements are 100% owned by Speewah Mining Pty Ltd (a wholly owned subsidiary of Tivan Limited), and are located over the Speewah Dome, 100 km SW of Kununurra in the East Kimberley. The testwork described in this announcement was on samples collected entirely within E80/2863. The tenements are in good standing and no known impediments exist.
Exploration done by other parties	• *Acknowledgment and appraisal of exploration by other parties.*	Historical exploration: • All exploration and testwork relevant to the preparation of the titanomagnetite concentrate utilised for the testwork described in this announcement was managed by KRR.
Geology	• *Deposit type, geological setting, and style of mineralisation.*	• The deposits represent part of a large layered intrusion (the Hart Dolerite), which was intruded c1790 Ma into the Palaeo-Proterozoic sediments and minor volcanics of the 1814 Ma Speewah Group in the East Kimberley Region of Western Australia. The deposits occur within the Speewah Dome, which is an elongated antiform trending N-S. The dome is about 30 km long and attains a maximum width of about 15 km. The Hart Dolerite sill forms the core of the dome. Two distinct types of felsic granophyres (K felsic granophyre and Mafic granophyre) and three mafic gabbros (pegmatoidal gabbro, magnetite gabbro and felsic gabbro) have been identified in the Hart Dolerite.

		The vanadium-titanium mineralisation is hosted within a magnetite bearing gabbro unit which is up to 80 m thick. Given the mode of formation, mineralisation displays excellent geological and grade continuity. Exposure is limited and fresh rock either outcrops or is at a shallow depth of a few metres. Ti-V-Fe mineralisation occurs as disseminations of vanadiferous titanomagnetite and ilmenite. The Speewah Project comprises three deposits (Central, Buckman and Red Hill). The reported Mineral Resource lies entirely within fresh magnetite gabbro of the Hart Dolerite sill within the Speewah Dome. The magnetite gabbro unit can be subdivided into an upper low grade zone and a basal high grade zone, based on increasing vanadium tenor (grade) in the magnetite grains towards the base of the unit.

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.*
		• No new drilling is reported in this release.
		• The hole data is not presented in this announcement. This information is not considered material as the concentrate was prepared from many holes across the deposit. Therefore, the testwork results for the concentrate can only show the generalised response of the orebody, and not variability due to location throughout the orebody.

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.* • *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.* • *The assumptions used for any reporting of metal equivalent values should be clearly stated.*	• RC chip samples from every 1 metre drilled interval were sampled and composited. The final composited grade compares favourably with the average V, Ti and Fe grades from the drill assays average grades for the HG zones of the vanadium deposit. • Metal equivalent values have not been used for reporting.
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').*	• Due to the very shallow dip of the mineralisation, the vertical holes represent almost the true width of the mineralisation.
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*	• No new drilling is reported in this release.

	plan view of drill hole collar locations and appropriate sectional views.	
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 relevant results have been reported
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.*	• All relevant data is included in the body of the announcement.
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.*	• See body of announcement.