Financial model assessment of the TTR Taranaki VTM Ironsand Project

Sanofex report in collaboration with Whanganui District Council

30 September 2025

About Sanofex

Developing the offshore mineral estate in an environmentally conscionable way. Our mission is the long-term sustainable development of the offshore mineral estate of New Zealand for the benefit of all Kiwi's. Our vision is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. SANOFEX is a world leader in finding, mining and processing the Earth's offshore mineral resources.

Dr Neil Loftus is an offshore mineral exploration executive and the Chairman of the Sanofex Group. He has held the role of Chairman and for Sanofex subsidiaries as CEO from 2008 and was instrumental in the early stages of development of the offshore mineral estate of New Zealand.

He is not a geologist, metallurgist or engineer and where such subjects are discussed he is expressing the views of other experts as referenced.

With over seventeen years in the industry at senior executive and board level, he is adept at designing and assessing mathematical models for the purpose of mineral exploration and offshore mine development. Such models have an implied accuracy of +/- 30% at the pre-feasibility stage and where possible sensitivity and uncertainty analyses are provided.

Dr Loftus is the author of sixteen NZP&M mineral reports in the New Zealand offshore mineral exploration space.

Authorship

This report was prepared at Sanofex by Dr Neil Loftus in alignment and agreement with the Code of Conduct for Expert Witnesses in the Environment Court Practice Note 2023.

The assistance of Tamsin Eggleton, Advisor - Research and Policy and Councillor Charlotte Melser of Whanganui District Council is gratefully acknowledged.

How to cite this document: Sanofex. 2025. Financial model assessment of the TTR Taranaki VTM Ironsand Project. A report in collaboration with Whanganui District Council.

Registered office: 7A Rosedale Office Park, 331 Rosedale Rd, Auckland 0632
SANOFEX Limited
Tel +64 9 216 1455 | **Report.TTR@Sanofex.com** | **Sanofex.com**

What we do

Sanofex is an independent provider of commercial financial reports and models for the offshore mineral mining industry.

The absence of an independent review of the Trans-Tasman Resources Limited [TTR] financial model contained in their Substantive Application to the Fast-track Panel, prompted Sanofex to review the model and author an early edition of this report which we brought to the attention of Whanganui District Council on 4 July 2025.

Having further collaborated with Whanganui District Council over the last several months, the latest edition of the report analysis is now presented with additional data and updated inputs on 30 Sept 2025.

Whanganui District Council has not contracted Sanofex to provide this Report. The role of Sanofex is limited to making the Report available, with context, to assist Whanganui District Council in their submission to the Fast-track Expert Panel.

The Report is provided to Whanganui District Council on a non-exclusive, limited license basis. The license provided restricts Whanganui District Council's use of the Report to submitting the Report as provided to the Fast-track Expert Panel for its consideration.

Readers should note the author of this report is Sanofex, which through its subsidiaries previously held Ironsand permits in the New Zealand offshore mineral space from 2009 until 2022. The Group no longer holds any offshore mineral permits and is not a competitor to TTR but wishes to express its concerns to interested parties regarding the TTR Project and their claims of financial and economic benefit to the Government, Treasury and the public of New Zealand.

Summary of Main Findings

Siecap is not a valid independent assessor for the purposes of presenting an arms-length report and in assuming TTRs inputs to the TTR cash flow model are valid has caused NZIER to further assume these inputs are valid for NZIER's assessment of revenue related outcomes such as GDP, royalties and taxation.

The TTR product has not been normalised to fair market pricing for an iron fines product with its contained impurities and specification. The realised price of iron ore sales from the Project will be materially different to TTRs claimed figures by a large margin to the downside due to the chemical content of the product.

The Project costs do not include any operational or capital requirements associated with the extraction of Vanadia from the base Ironsand product. When the operational expenditure and capex requirements are added to the model considerable losses are evident.

An independent Vanadium Marketing Plan is required to establish potential concentrate markets, off-take agreements and concentrate pricing formulas. The metallurgical process flow to recover the Vanadium is at a very early first pass stage for the generation of Vanadia sales revenue, which cannot be assumed to be a valid revenue source.

Vanadia extraction from the ore is considered implausible offshore and non-commercial from the perspective of becoming a primary Vanadium producer and an Ironsand exporter.

Revenue from Vanadia contained in VTM ore processed to steel making slags is not recoverable where the cash cost to recover from processing slags is more expensive than market sales. Direct credits may be recoverable from slag processing if market prices for Vanadia improve.

Direct credits for Vanadia contained in the VTM ore processed to hot metal may be recovered from steelmakers producing Rebar to meet 2024 Chinese standards. However, the quantum of these credits will be much less than suggested by TTR. Overall, 3-12% in total of quoted values.

The evidence for Vanadia being a valid revenue stream falls short of that required for the provision of a Vanadium mining permit by NZP&M, which should be at the PFS level of confidence if TTRs MEP54068 (in Appraisal) is to be upgraded to a subsequent Mining Permit.

Our analysis of market driven cash flows suggests TTR may not be able to meet its debt capital repayments if market conditions decline to below US$85/dmt 62% Fe fines CFR China, showing high sensitivity to the iron ore pricing structure, in-situ grade of the ore and Vanadia market prices.

Further infill drilling work is required to upgrade the resource to provide a higher level of confidence in the continuity of the resource (grade-control) across the proposed mining area.

The correction of Ironsand revenue to meet fair market pricing and the removal of Vanadia revenue creates a ***sufficiently significantly 'adverse impact' out of proportion to regional or national benefits***. Overall, GDP changes, royalties and tax revenues are much lower than suggested.

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Abstract

This report concentrates on the financial proposals of Trans-Tasman Resources Limited (TTR) contained in their Fast-track Approvals Act 2024 (Act) application (Application). We focus on the claimed revenue that TTR have submitted to the Fast-track Expert Panel for consideration under the Act.

The wider economic implications for New Zealand are contained in a report authored by NZIER attached to the TTR Substantive Application as the NZIER economic impact assessment (EIA).

NZIER's EIA report and Siecap (NZ) Limited, accept the long-term average prices for Iron Ore and Vanadia contained in the Siecap NZ's pre-feasibility study (PFS) for the Taranaki VTM Project and assume they are applicable to TTR's stated revenue stream contained in the TTR discounted cash flow financial model of the same report (Section 15-Financial Evaluation-PFS).

The total capital required to setup the project is around NZ$ 1 billion with NZ$ 55 million (~5%) spent in New Zealand. On commencing production, operational expenses are expected to be about NZ$ 238 million per year assuming TTR achieves stated production levels. Planned employment and expenditure inputs to the model are supplied by TTR and NZIER apply a cost multiplier methodology to assess the direct, indirect and flow through economic effects of the Project in terms of the local economy, the regional economy and the New Zealand economy.

The EIA goes on to say, gross domestic product (GDP), Project export earnings, contributions to royalties and taxation paid to the New Zealand Government are estimated bases on Iron Ore and Vanadium price inputs provided by TTR.

NZIER are an independent economic consultancy, but the results of the EIA are only justifiable if the key metrics supplied by TTR can be independently validated.

This report evaluates the inputs to the TTR discounted cash flow financial model to assess the soundness of the revenue stream claimed by TTR in the Application. The TTR DCF Model has been reconstructed in excel and corrected where appropriate to *fair market* pricing to assess legitimacy.

Three model scenarios are considered, the TTR 20-year DCF Model (PFS model), the normalised Market 20-year DCF Model and the Canberra predicted Market 20-year DCF Model. The first 10 years of the cash flows in the Models are then assessed further to focus on the financial viability of the Project, whilst debt capital payments are being paid down.

The Market 20-year DCF Model is further evaluated with the addition of a primary Vanadia production facility, where revenue from long term average pricing is accounted for together with operational expenditure and debt capital servicing.

Siecap (NZ) Limited

It is important for the validity of a feasibility study that the person or team performing the study be independent of the project owner and free of any conflict of interest e.g. they should not be employees of TTR or shareholders in the Project.

There are three common reasons for carrying out pre-feasibility studies (PFS). Including, to justify proceeding to a bankable feasibility study, as the basis of committing to further development, or to attract a buyer for the project. Studies are completed with increasing levels of accuracy from scoping to pre-feasibility and bankable feasibility. Regardless of the level of accuracy, each study generally encompasses the same topics conducted by independent assessors e.g. mineral resources by Golder Associates.

The subjects covered are generally: geology, mineral resources and reserves, mining systems equipment selection and mine plan, processing systems, flow sheets, plant capital and operating costs, infrastructure requirements and costs, human resource requirements, risk analysis, mine capital and operating costs, environmental consents and approvals, marketing and pricing for the products produced and financial analysis. These independently performed studies are then collated into the PFS and independently assessed in the final report.

The TTR PFS Report by Siecap (NZ) Limited seeks to present the data with a balance between environmental effects and economic performance and strongly favours the economic outcome. The environmental consequences of the Project activities are well covered, except for the environmental risk profile of integrated mining vessel (IMV) and suggested to be localised with almost minimal adverse effects. Whereas the economic effects are deemed to be largely dependent on local capital and operational expenditure flowing into an economic multiplier model with results presented by NZIER.

Siecap (NZ) Limited have assessed the current iron ore market, its historical pricing and provided index references but have not discussed *normalisation* of the TTR iron fines product price for low Fe weight and impurities. They discuss the potential to receive credits for the co-products of Vanadia and Titania but provide no evidence or examples of actual sales by this mechanism in the market.

The components of the TTR revenue stream include prospective Vanadia sales of US$113 million pa based on a laboratory study at a level less than initial scoping but included in the PFS as though it was validated at the PFS level of optimism. The evidence for Vanadia being a justifiable revenue stream falls short of that required for the provision of a Vanadium mining permit by NZP&M, which should be at the PFS level of confidence and reflect established markets.

There is no independent Vanadia Marketing Plan to establish potential concentrate markets, off-take agreements, or concentrate pricing formulas, and the metallurgical process flow to recover the Vanadium and Titanium metals is at a very early first pass stage with *no capital or operational expenditure included in the DCF Model for the generation of Vanadia sales revenue*.

For the TTR DCF model results to be authenticated, the marketing and pricing for the products produced and the resulting financial analysis must be independently validated and Siecap (NZ) Limited have not provided evidence of this having occurred for the quoted Vanadia revenue.

Siecap (NZ) Limited has accepted the validity of the TTR DCF Model revenue stream without independent assessment of the Vanadia revenue and NZIER appear to have accepted Siecap (NZ) Limited as having independently assessed the TTR DCF Model.

Are Siecap (NZ) Limited independent of TTR

Siecap (NZ) Limited is a subsidiary of Siecap Pty Ltd based in QLD, Australia. Several of the key personnel working on the TTR PFS Report authored by Siecap (NZ) Limited have close connections with TTR and their independence is questionable.

Tim Crossley is a Partner in Siecap Pty Ltd (2016 onwards) and held positions with TTR firstly as CEO from Oct 2012 until Oct 2013, then as Executive Chairman until Jan 2015. On leaving TTR he is quoted in an email to BusinessDesk as remaining available to TTR on a 'consultancy basis'. In 2012, he received 4,000 shares held by the TTR Trustee for his benefit in the TTR Employee Share Scheme. Following TTR's sale to Manuka Resources Limited in 2022 he may have received shares in Manuka in exchange for these shares.

Shawn Thompson is the Managing Director of Siecap (NZ) Limited and previously held the role of Project Director at TTR from Apr 2013 to Oct 2017. He received shares in TTR in Feb 2017 and may have received shares as part of the MKR takeover of TTR in Nov 2022.

Matthew Brown is the General Manager of Siecap (NZ) Limited and previously held the role of General Manager Exploration at TTR from Oct 2011 to Jun 2019. He previously held and sold shares in TTR (2017).

This calls into question the independence and validity of the Siecap (NZ) Limited PFS report and the soundness of the NZIER EIA report.

Does the Project comply with the Purpose of the FTA Act

The information provided by TTR regarding the Vanadia revenue is ***uncertain and inadequate*** and ***does not provide*** the Panel with the ***best available information*** required under section 61(1)(b) and (c) and (2) to (5) of the EEZ Act 2012 [EEZ].

This in turn invokes EEZ section 62(2) because there is ***inadequate information*** (independent evidence) to determine the economic validity of the Project; and on removing the Vanadia revenue stream as a valid source of revenue from the TTR DCF Financial Model, the economic benefits (which are now reduced to ***minimal royalties, tax losses and potential job losses***) do not outweigh the adverse environmental effects of the Project or possible other environmental effects caused by foul weather or force majeure events on the IMV.

Corrections to the Ironsand market revenue and the removal of the Vanadia revenue creates a ***sufficiently significantly 'adverse impact' out of proportion to regional or national benefits*** under FTA section 85(3) to (5), which in complying with section 81(2) and after considering section 81(4), the Panel may form the view which weighs against granting the approval because the Project no longer meets the threshold for the Purpose of the Fast-track Approvals Act.

Report

We have reviewed the financial proposals of Trans-Tasman Resources Limited (TTR), a wholly owned subsidiary of Manuka Resources Limited (MKR) a company listed on the Australian Stock Exchange.

Manuka Resources Limited has limited operational capital and high debt exposure, with over $A40 million in debt financing facilities (page 14, June 2025, ASX Quarterly Activities Report). The debt facility comprises loans on varying terms due on or before April 2026, shortly after the Expert Panel is expected to deliver its decision on TTRs Fast-track Application (18 Mar 2026).

On the 26 Sep 2025, MKR announced approval for a secondary listing on the NZX main market (commenced trading on 29 Sep 2025) and the assignment of its $A20 million debt facility (due 1 Sep 2025) and security package to a '*Unit Trust*' structure comprising existing Manuka shareholders. Two further loans, together about $A6 million are due 30 Sept 2025 and one of about $A17 million expires April 2026.

MKR describe the new debt facility as a '*binding offer*'. However, a footnote states '*the offer remains subject to further negotiation and there is no certainty that a binding agreement will be executed*'. Concurrently, the maturity date has been extended by six months to March 2026. Failing which, MKR may not be able to continue as a going concern if the debt facilitator enforces it's security over the Company's assets.

TTR will require further significant debt and equity capital to be raised to proceed with its mine development plans. We believe this will be in the order of $200 million US equity and $400 million US debt (plus an additional estimated US350 million of capital will be required for primary Vanadium production), which will be highly dependent on the outcome of the Application and the subsequent bankable feasibility study (BFS).

The TTR pre-feasibility study (PFS), which forms the basis of the Application does not correctly reference Market pricing for its products and is unlikely to achieve the predicted revenue.

The Application PFS is ***optimistic*** of TTR's ability to develop the Project to a BFS level, which will satisfactorily provide all the technical, engineering, economic, environmental and auditing necessary to determine that the Project risks are acceptable on a stand-alone project financing basis by providing a level of ***certainty*** for investors.

Consequently, ***no decision to mine*** is able to be made at this stage of the Projects development. This is largely because certain areas of the Project require more detailed work to be conducted to provide the assurance of ***near certainty*** or ***certainty*** for bankers or investors to proceed to finance the build of the mine infrastructure.

To date, the technical design, potential risks and environmental impacts of the Project have been studied to ***evaluate the Project viability***. There is a considerable volume of work covering these aspects of the Project. Although, most of the presented data appears to date from 2013-2015 and will need to be updated. This includes environmental impact studies and technical designs (Substantive Application).

The JORC (an industry standard) resource statements provided by TTR show the Project resource definition to be at the minimum level required for the Project to be developed to a bankable asset (indicated level of assurance and continuity) and will require ***further infill drilling*** to provide more certainty over the continuity of the resource prior to financing.

The ***Project costs*** are well studied from the perspective of the operational expenditure and capital required to realise sales of *Ironsand* (Vanadium Titano-Magnetite or VTM) but ***do not include any operational or capital requirements associated with the extraction of Vanadia*** (Vanadium Pentoxide or Vanadium Flake) or Titania (Titanium Dioxide) from the base Ironsand product. Concerningly, ***the TTR product has not been normalised to expected market pricing for an iron fines product with its contained impurities and specification***. This omission materially affects revenue (overvalues).

It is ***not possible to evaluate the Project profitability*** with any degree of optimism without a full evaluation of these costs, the market demand for the basket of products for sale and the revenue expected from these studies.

TTR's Application relies upon an NZIER Economic impact assessment of TTRs Taranaki VTM Project dated March 2025, which in turn relies upon data supplied by TTR. NZIERs summary of the analysis states:

To the extent that our approach to estimating the economic impacts reflects the expenditure to carry out the activities for the Project, fluctuations in the exchange rate, prices of the commodities produced from the Project's Ironsand mining and the price of Intermediate Fuel Oil (IFO) used for bunkering will not materially affect our economic impact estimates. We recognise the impacts through revenue and, in turn, tax paid to the Crown.

It is important to note that our economic impact analysis captures the benefits from the level of operational and economic activities by overlaying the current structure of the local, regional and national economies rather than the price of iron ore, price of Intermediate Fuel Oil (IFO) or exchange rate. Given that the Project's operation is a relatively fixed process, the level of the Project's operational and economic activities will unlikely change over time.

With a captioned note stating:

We applied the assumed long-term average prices for iron ore and V_2O_5 in the Siecap NZ's pre-feasibility study for the Taranaki VTM Project. These are US$90 per metric ton of iron ore concentrate and US$5.45 per pound of V_2O_5.

It is our opinion that the financial benefits to New Zealand are directly linked to the realised sale price of the commodities produced by TTR and we believe the revenue stream from the TTR resource basket will be much lower than claimed.

Whilst we accept the operational costs for the extraction of iron fines to be reasonable at $27.20 US$/t, ***the realised price of Ironsand ore from the Project will be materially different to TTRs claimed figures by a large margin to the downside due to the undesirable chemical content of the product.*** This is supported historically by the low prices achieved for the same Ironsand product previously exported by BlueScope from Taharoa.

TTRs dredge mine operations produce a product with approximately 10% moisture. Revenue should be based on the tonnes of dry product sold (US$/dmt) after adjustment for moisture content. Purchasers do not pay for moisture, only for product. TTR state an output of 4.9 million dmt of Ironsand concentrate pa in Section 5.15-PFS, which is used in their revenue model.

Section 2.4-Key Findings-PFS states: *It is reasonable to expect that if implemented, the proposed mining method has the capability of mining 39Mtpa of sediment (dry basis) (50Mtpa wet basis)* and *It is reasonable to assume that if expected yields are achieved, the proposed processing facility is expected to produce 4.9Mtpa of iron ore VTM concentrate, taking into account mining losses and dilutions.*

Section 3.1-Project Description-PFS states: regarding ***Ore Beneficiation:*** *The extracted ore grading 10.17% Fe_2O_3 … will undergo a mineral beneficiation process to increase the iron content, producing a VTM concentrate with an iron grade of 56-57% Fe.*

Table 1 below shows the expected maximum weight of VTM concentrate produced in dry metric tonnes (dmt) per annum from the TTR Project, provided there are no losses in the Run of Mine (ROM) production process.

Sediment mined in dry metric tonnes pa	39,000,000
Grade of Fe2O3 in the sediment	10.17%
Conversion factor to Fe	0.6994
Fe mined in dry metric tonnes pa	2,774,030
Grade Fe in VTM concentrate	56-57%
Average VTM concentrate produced in dmt pa	4,910,173

Table 1: Average VTM concentrate production without any process losses

However, losses from the process must be considered e.g. from the seabed crawler recovery of sediment process, which in Section 5.14-SBC Assumptions-PFS are stated to have a *Typical Process Recovery = 92%* and which TTR have requested to be set to *100%* for *Mining recovery of in situ and feed tonnages.*

After the sediment is uplifted from the seabed it enters the ROM process on the IMV, and Section 7.5.7-LIMS 3-PFS states, *the weight recovery to concentrate … is expected to be 90% with the concentrate having a Fe grade of more than 56% Fe.*

It is reasonable to assume the process to mine and produce a VTM concentrate of between 56-57% Fe would incur **losses of at least 10%** (more likely 8% + 10% =>18%), which we have applied to our Market model with an estimated VTM annual production rate of 4.9 x 90% => 4.41 million dmt pa of 56-57% Fe ore concentrate, i.e. **revenue is based on 4.41 m dry tpa.**

ROM operational costs should be based on dry metric tonnes (US$/dmt) for a mine product but in TTRs case, adjusted up because they produce a final product with a targeted 10% moisture content (section 7.5.1-Process Overview-PFS). Likewise, freight costs should be based on wet tonnes because that is what is produced and transported to the buyer, i.e. **costs are based on 4.9m wet tpa.**

Quoted prices for Iron Ore are indexed and referenced by standard Incoterms, such as CFR and FOB. Using CFR pricing "The seller delivers at the port of loading but pays freight to the port of

destination where the buyer is obligated to receive the goods from the vessel." This is TTRs quoted spot price declination. FOB excludes freight costs from the loading port onwards.

TTR has referenced the 62% Fe fines Index spot price CFR, which is quoted in dry metric tonnes, as their starting point for calculating revenue and suggested a linear relationship exists between low grade 58% Fe fines and the higher grade 62% Fe product. The relationship is ***not linear*** and often the low grade 58% Fe price is cheaper than such a linear relationship would assume; say, 12%-20% less.

TTRs 13.7% reduction from a 62% Fe to a 56-57% Fe product overestimates the revenue achievable, which may be as low as 20% less than a similar 62% Fe fines product.

The spot price achieved is also affected by several other factors including, Fe content weight, Aluminium, Titania, Silica and Phosphorous levels, which will be discussed further below.

Overall, we believe TTRs 56-57% Fe fines product will be 27-30% lower than the 62% Fe fines reference price after normalisation to the market, which is lower than the 13.7% TTR have used.

The ***characteristics of the Integrated Mining Vessel*** (IMV), [see Attachment 9] prevent access to local ports. When swells are 4+m a 'cease mining state' is enforced and the IMV will 'weathervane' on a single anchor. At the times that South Taranaki is experiencing 4+m swell, Port Taranaki is closed to commercial traffic due to associated long period wave. Because of these hazards, it is unlikely that Port Taranaki would qualify as a 'place of refuge'. What happens in 'foul weather' and an IMV ***disaster management plan*** for running aground, HFO spillage, Crawler collision, breech of hull, sinking, fire etc. needs expansion.

In addition, IHC-Merwede in their design of the IMV and Crawler (mining tool) have stated a ***minimum safe operational water depth of 30m for mining activities*** (Page 331-PFS). ***The resource that can be safely mined should have a condition that mining would not occur in waters shallower than 30m*** to avoid collision between the Crawler and the IMV during operations, should the final design reflect the current design. ***Although, a 30m restriction would reduce the available minable area by about 50%*** (Attachment 10).

Iron content of the VTM ore

TTRs Application states the Fe content in the Vanadium Titanomagnetite concentrate (VTM) is 56-57% Fe (Section 2.4-Key Findings-PFS). The average reduction in price for a 58% Fe fines ore compared to a 62% Fe fines ore has been calculated at 13.7% by TTR but may be as high as 20%. We consider 13.7% a reasonable discount for a 58% Fe fines ore. However, a further weight penalty is attracted in low grade Fe ores (58% Fe ore) at ~3% of the 58% Fe ore price per 1% reduction in the contained Fe weight below 58% i.e. 3-6% for a 56-57% Fe fines product.

With regards to TTRs VTM ore, after the stated 13.7% penalty has been applied to the 62% Fe fines price, a further 3 - 6% penalty must be applied to the calculated 58% Fe ore price to correctly normalise the TTR 56-57% Fe fines price for the reduced Fe weight.

In our Market model we have used a 3% penalty based on a 57% Fe ore product.

Vanadium extraction and revenue

On reviewing TTRs Application Attachment-4: Siecap-recovery of Vanadium which shows bench scale (laboratory) experiments that reveal 77% Vanadia extraction from a well-dressed, highly milled TTR ore; we note, there is no comment on the loss of ore due to this preparatory process. ***Commercial scale operations may have lower recovery rates.***

In the same report TTR suggest (without any detailed evaluation of costs) the potential to build a pilot-plant in New Zealand, to provide metallurgical and chemical evidence to the market of TTRs ability to commercially extract Vanadia from their VTM ore. ***The capital expenditure to build a large scale hydrometallurgical (chemical) plant for the extraction of Vanadium from low grade Vanadia ores*** is circa ***US$350 million*** (primary plant equipment only) and importantly, ***cannot be conducted offshore***.

There are several primary Vanadium producers (Table 2). Their operational expenditure and capital costs vary according to production method, ore grade and production volume but in general **a plant to extract Vanadia from TTRs VTM ore would increase TTR's stated debt obligations by around US$250 million for their Project size, providing a further US$100 million capital contribution could be raised by TTR from equity sales on the ASX.**

	Largo Inc[1]	Vanadium[2] Resources	Bushveld[3] Minerals	Richmond[4] Vanadium	Trans-Tasman Resources
Plant Feed millions tpa	1.5 - 5.0	1.6 - 3.5	1.0	4.1	4.9
Resource Grade V_2O_5 %	0.6	0.7	0.5	0.5	0.5
Production V_2O_5 >98% ktpa	12.0	21.0	9.5	12.7	17.3
Capex - US$ millions	241	400	298	177	350*
Cash Cost - US$/lb V_2O_5	5.25	3.24	3.28	6.32	4.91*

**Estimate Only - based on Table 1 averages*

Table 2: Primary Vanadium Flake producers compared to TTR

[1] Largo Inc NI43-101 16 December 2021, Largo Inc MD&A Q3 2022 & 2023 Guidance per Website
[2] Vanadium Resources – Steelpoortdrift DFS – 4 October 2022, Vanadium Resources - Steelpoortdrift DFS Financial Model
[3] Bushveld Minerals – Mokopane PFS 4 February 2016
[4] Richmond Vanadium – Prospectus 9 December 2022

For the moment, ***Vanadia is reflected on the TTR financial model balance sheet as a basket product attracting considerable revenue (US113.3m pa) with no additional operating expenditure or Capex requirements***. The typical cash cost (US$/lb V_2O_5) is US$3-7 with a current market price of about US$5. ***The average cash cost/lb from Table 2 is US$4.91/lb V_2O_5.*** In other words, there is currently ***no margin in Vanadia sales from primary production***.

This is illustrated below in Table 3. In this example, TTR would raise a further US$111 million from equity sales on the ASX. After costs to the issue, US$100 million in equity would be contributed to overall capital expenditure to build a primary Vanadium production facility for a total of US$350 million. Debt capital would need to be secured for the balance of US$250 million at market rates. Interest (about 7.6% pa) and principal debt capital payments would need to be met, together with operational expenditure. To minimise logistical outlay, we assume the VTM concentrate produced by TTRs IMV would be shipped to a Vanadium production facility adjacent to a steelmaking facility in mainland China. TTR would secure an offtake agreement with the Steelmaker for the TTM concentrate after the Vanadia was removed by TTRs process from the primary VTM concentrate (77% recovery of Vanadia).

Table 3 illustrates, after operational and debt capital disbursements; ***substantial losses could be expected*** unless TTR can reduce operational expenditure to below the average cash cost of US$4.91/lb V_2O_5. ***Breakeven is at an operational expenditure of US$4.35/lb V_2O_5.***

Vanadia flake 98% price per pound - based on long term average price stated by TTR - (A)	5.45	US$/lb
Operating expenditure Vanadia cash cost US$/lb (98%) - based on Table 1 average cash cost - (B)	4.91	US$/lb
Sands mined per year in wet metric tonnes	50,000,000	wet metric tonnes pa
ROM wet tonnes VTM concentrate produced per year - including 10% moisture	4,900,000	wet metric tonnes pa
ROM dry tonnes VTM concentrate produced per year - (C)	4,410,000	dry metric tonnes pa
Vanadia % grade in VTM	0.5%	%
Vanadia contained in VTM concentrate	22,050	dry metric tonnes pa
Vanadia Flake 98% recovered from concentrate at 77% recovery - (D)	17,325	dry metric tonnes pa
Revenue from Vanadia 98% Flake sales per year (based on A & D) - (E)	211,503,600	US$ pa
Revenue from Vanadia 98% Flake sales per ROM tonne VTM concentrate (E/C)	47.96	US$/dmt
Operating expenditure for Vanadia 98% Flake sales per year (based on B & C) - (F)	190,547,280	US$ pa
Operating expenditure for Vanadia 98% Flake sales per ROM tonne VTM concentrate (F/C)	43.21	US$/dmt
EBITDA (F-E)	20,956,320	US$ pa
Capital expenditure - Primary Plant Equiptment Only	350,000,000	US$
Debt Principle	250,000,000	US$
Equity Raised on ASX - after costs to the issue	100,000,000	US$
Interest and Principle payment yearly on US$250m debt capital, at 7.6% interest pa	42,845,576	US$ pa

Cost of Logistics is not included (Port => Vanadia plant => Steel mill)

Table 3: Balance sheet including Vanadia primary production capital and operational expenditure

The proposed ***Vanadium extraction process is not compatible with TTRs proposed design and capital structure*** set out in their application to extract and sell Ironsand offshore. The Vanadium extraction methodology requires an ***energy source for a roasting facility***, like a Steel Mill requires and this cannot be conducted offshore.

This implies TTR will not be extracting Vanadium from their ore offshore Taranaki, and the downstream purchasers of their ore will be unlikely to add the proposed high-cost hydrometallurgical plant to their existing process. Consequently, ***no Critical Minerals will be extracted in New Zealand via this project.***

Glenbrook Steel Mill operates a specialist rotatory hearth furnace for its steel making process. They use New Zealand Ironsand like the TTR VTM product as their feedstock material. Vanadia typically partitions about 65% in the hot metal bound to the iron and about 35% into the slags[5]. ***Extracting Vanadia from the slags is not always profitable, even with 100% VTM feed at*** current market prices (25 Sep 2025) using electric arc processing of slags and a vanadium recovery unit.

In China, legislation was passed in 2018 and updated in 2024 (improving construction and earthquake resilience) to include small amounts of Vanadia in rebar produced at Chinese steel mills. A 100% VTM feed to a traditional Chinese steel mill is unattractive for reasons contained below (Titania content) but smaller percentage blends varying from 8% to 24% VTM, mixed with Australian and Brazilian feedstock would appear *superficially* to meet the Vanadia content requirement on a percentage basis. However, because of the VTM component melting points (Iron 1538, Titanium 1668, Vanadium 1910 – degrees Celsius) it is not possible to liberate the Vanadia to blend throughout the additional iron feed without causing harm to the furnace hearth refractory from liberated Titanium compounds; and again, recovery of Vanadia from low grade slags would be cost prohibitive.

[5] Treatment of NZ Titanomagnetites – Page 14 - 13 June 2014, Metallurgical Solutions, Tom Owen MIMMM C.Eng.

Consequently, steel makers in China will need to add Vanadium Flake (98% V_2O_5) or Vanadium alloy to produce higher strength rebar and China's rebar standard GB1499.2-2024 changes in 2024, make this mandatory. The [required] amount of Vanadium to be added is 0.04% for HRB400 (400ppm) and 0.05% for HRB500 officials at the China Iron & Steel Research Institute (CISRI) have commented.

TTR are proposing to remove the Vanadia from their VTM to create Vanadium Flake (98% V_2O_5) prior to iron production but unfortunately there is no profit in the current market. If the sale price of Vanadium Flake improves to create a profitable market, TTRs Vanadia is in the lower grade range compared to primary competitors and they may not be able to compete on a cash basis.

If TTR wishes to add the Vanadium Flake revenue stream to its financial model, then TTR also needs to add the operational expenditure, capital and debt servicing costs for the process as would any primary producer (Table 4 illustrates):

Project Discounted Cash Flow

STB Vanadium Titanomagnetite Iron Sands Project
20 Year Life of Mine
High Level DCF — x US$1,000,000 — OPEX/US$t 27.2

					Ramp Up Schedule								
					Yr1	Yr2	Yr3						
					92%	100%	100%						
					Ramp Up to Full Production								
	US$M	Yr	1	2	3	4	5	6	7	8	9	10
NOTE: TTR Uses Spot CFR rates/dmt	Conc m/t avg sales				4.1	4.4	4.4	4.4	4.4	4.4	4.4	4.4
90.00 US$/dmt China CFR	***Revenue(FeX Earnings)***				266.9	290.1	290.1	290.1	290.1	290.1	290.1	290.1
26.90% Total discount	***Discounted for Weight, Titania, Alumina - May need to add Phosphate***											
5.45 US$/Lb V2O5	V2O5 Revenue/ROMt	$ 47.96			194.6	211.5	211.5	211.5	211.5	211.5	211.5	211.5
113.75 *Revenue/tonne US$/t*	***Total Revenue***				**461.5**	**501.6**	**501.6**	**501.6**	**501.6**	**501.6**	**501.6**	**501.6**
43.21 US$/t	V2O5 Operational Expenditure/ROMt	$ 43.21			175.3	190.5	190.5	190.5	190.5	190.5	190.5	190.5
27.20 Fixed	Direct & GA costs avg	***(IFO $500/t US$75/bbl)***			122.6	133.3	133.3	133.3	133.3	133.3	133.3	133.3
16.00 US$/dmt	Freight	*Added 10% netback to wt =>*			71.4	77.6	77.6	77.6	77.6	77.6	77.6	77.6
91.03 *Cost/tonne US$/t*	***Total Costs***				**369.3**	**401.4**	**401.4**	**401.4**	**401.4**	**401.4**	**401.4**	**401.4**
22.72 *EBITDA/tonne US$/t*	**EBITDA**				**92.2**	**100.2**	**100.2**	**100.2**	**100.2**	**100.2**	**100.2**	**100.2**
~3% *<=Unrealistic Finance Cost %*	Interest	*<= Market Interest Rate % =>*	7.60%		51.0	46.2	40.9	35.3	29.2	22.7	15.7	
952.2	Depn / Amort (DA)	EOL 7yrs. SL Depn			136.0	136.0	136.0	136.0	136.0	136.0	136.0	
10.0% *APR % Royalty*	Fe, V2O5 & TiO2 Royalties	10% APR	*<= whichever is higher=>*		(9.5)	(8.2)	(7.7)	(7.1)	(6.5)	(5.9)	(5.2)	10.0
2.0% *AVR % Royalty*	Fe, V2O5 & TiO2 Royalties	2% AVR			7.8	8.5	8.5	8.5	8.5	8.5	8.5	8.5
	NPBT				**(102.7)**	**(90.5)**	**(85.3)**	**(79.6)**	**(73.6)**	**(67.0)**	**(60.0)**	**90.2**
28% *CTR%*	Tax	Corporate tax rate. Loss not C/fwd			0.0	(25.3)	(23.9)	(22.3)	(20.6)	(18.8)	(16.8)	25.2
	NPAT				**(102.7)**	**(65.2)**	**(61.4)**	**(57.3)**	**(53.0)**	**(48.3)**	**(43.2)**	**64.9**
	Cash Flows											
	NIAT-DA				33.3	70.9	74.6	78.7	83.1	87.8	92.8	64.9
952.2 Capex (602.2 + 350)	Asset		225.0	727.2								
280.7 Equity ASX	Financing Principal repayments			671.5	(64.0)	(68.9)	(74.2)	(79.8)	(85.9)	(92.4)	(99.4)	(115.1)
	CF - Free Cash Flow	-374.2	(225.0)	(55.7)	(30.7)	2.0	0.5	(1.1)	(2.8)	(4.6)	(6.6)	(50.2)
6.96% Discount factor - WACC	NPV of CFs	-316.7	(210.4)	(48.7)	(25.1)	1.5	0.3	(0.7)	(1.7)	(2.7)	(3.6)	(25.6)
7.60% Cost of Debt Aus/NZ	**IRR**	-8.8%	(225.0)	(727.2)	33.3	70.9	74.6	78.7	83.1	87.8	92.8	64.9
	Royalties - LOM	68.7										
	Royalties - pa average	8.6										
	Tax - LOM	-102.4										
	Tax - pa average	-12.8										

<= Not Accounted

Table 4: Meeting the Market and adding primary Vanadium production expenditure

Using a revenue of 5.45US$/lb, an operation expense of 4.91US$/lb, Capex of 350m US$ (250m US$ debt@7.6%pa), it can be seen from the resulting balance sheet that ***adding a Vanadium primary production facility would not be financially viable for TTR***. Over the first ten years of operations TTR would make an operating loss of US$93.5 million, with tax losses of US$102.4 million. The 10-year and 20-year Market US$90/dmt models with Vanadium primary production outputs added can be compared in Attachment 7 and Attachment 8.

The government (on paper) would receive royalties of US$8.6 million pa provided operations were not shuttered in the first years of production.
On the other hand, if a credit for Vanadia sales is sought by TTR from a specialist steelmaker then credits could be expected for Vanadia recovered from steel slags and for Vanadia meeting the minimum rebar standard in the hot metal.

With respect to Vanadia slag recovery, the steelmakers operational expenditure needs to be removed from the revenue and the net profit divided according to the risk taken by each party e.g. using the long term sale average price of US$5.45/lb V_2O_5 98% flake with an average cash cost of US$4.91/lb (table 1) a **credit of US$0.16/ROMt of concentrate** sold (**total of US$726,742 pa**) could be expected by TTR (table 5).

4,900,000	<= ROM tpa ore	77%	<= % Vanadia recovery	66,691,548	<= Opex for Vanadia production
4,410,000	<= ROM tpa concentrate	5,942	<= Vanadia tpa for sale	7,334,712	<= Net Profit
0.5%	<= % Grade Vanadia	13,582,800	<= lbs Vanadia pa for sale (98%)	90%	<= % Risk reward - Producer
22,050	<= Vanadia tpa In concentrate	5.45	<= Vanadia US$/lb (98%) LTA	10%	<= % Risk reward - Supplier
35%	<= % Vanadia partitions to slag	74,026,260	<= Vanadia 98% revenue pa	726,742	<= Risk reward - Supplier US$
7,718	<= Vanadia tpa in slag	4.91	<= Vanadia cash cost US$/lb (98%)	0.16	<= Credit Vanadia/ROMt

Table 5: Vanadia sales credits for Vanadia slag recovery by specialist steelmakers after costs

A larger credit could be expected for meeting the minimum rebar requirement of HRB400 in China. This being the cost the steelmaker would otherwise have to pay to meet the standard by purchasing the equivalent amount of Vanadia. The maximum credit expected pa is illustrated in (table 6) and is the total expected if the steelmaker buys all TTR's VTM concentrate production, which is a narrowly focused, limited market opportunity.

Most steelmakers do not produce only one product and rebar accounts for about 200 million metric tonnes pa of Chinese steel mill output (~20%) compared to a total crude steel output of 1,005 million metric tonnes pa by Chinese steel mills in 2024 (worldsteel.org).

4,410,000	<= ROM tpa concentrate 57% Fe	
2,618,438	<= Hot Metal 96% Fe	
0.04%	<= % Vanadia Standard Rebar	<= 400 ppm Vanadia
1,047	<= Vanadia to be credited in tpa	
5.45	<= Vanadia US$/lb (98%) LTA	
2,557,271	<= Min (20%) Hot Metal Vanadia credit US$ pa	<= Min Credit for HRB400 Rebar Standard in Hot Metal
0.58	<= Min (20%) Hot Metal Vanadia credit US$/ROMt	
12,786,354	<= Max (100%) Hot Metal Vanadia credit US$ pa	<= Max Credit for HRB400 Rebar Standard in Hot Metal
2.90	<= Vanadia credit US$/ROMt	
3,429,361	<= Min (20%) Total Vanadia credit US$ pa	<= Min Total Credit from Hot Metal Vanadia and Slag Vanadia
0.78	<= Min (20%) Total Vanadia credit US$/ROMt	
13,513,096	<= Max (100%) Total Vanadia credit US$ pa	<= Max Total Credit from Hot Metal Vanadia and Slag Vanadia
3.06	<= Max (100%) Total Vanadia credit US$/ROMt	

Table 6: Credit for meeting HRB400 rebar standard in China

It is likely the steelmaker will produce between 20% - 100% rebar in a continuous production facility. Therefore, Vanadia credits from hot metal and slag recovery will vary between **US$3,429,361 pa** and **US$13,513,096** or **US$0.78 – 3.00/ROMt of VTM concentrate sold**, which is a long way from the **US$113.3 million pa** claimed by TTR in their financial model.

Importantly, adding sales of Vanadia to TTRs revenue stream should not be considered viable, unless TTR can show an offtake agreement for the Vanadia at their claimed revenue point.

Titanium extraction and VTM ore price penalties

TiO_2 (Titania) has always proved difficult to handle in Blast Furnaces in concentrations above 10 kg/thm (tonne of hot metal), due to a dramatic increase of slag fluidity because of formation of TiC and TiN in the blast furnace hearth. TiO_2 also acts aggressively in steelmaking slags to increase refractory wear. This has resulted in numerous processes that seek to economically process VTMs but to date the presence of Titania continues to attract penalties from purchasers of VTM ore.

With Titania concentrations above 4% as in TTR-VTM ore, the price of the ore is reduced by 10-15%/t of ore. We have added a 10% penalty for the 8% Titania in the VTM ore.

Iron ore price

Industry analysts and market researchers including Macquarie and Australia's Office of the Chief Economist (OCE) are expecting long-term iron ore price forecasts ranging from US$70-$100/t, with most expecting medium term rates to be in the ***US$70-80/t*** range up to 2030.

The iron ore price is a lead indicator of economic activity in the Chinese real estate market. Around six months prior to a real estate market downturn, the Iron ore price begins to decline from its peak. This happened in 2021 and with the downturn in China continuing, ***we expect the iron ore price to decline further below US$90/t.***

Iron ore prices peak roughly every 9-10 years, with lows achieved around 5 years after the peak. We expect the iron ore price to decline further into 2026 to a low around 70 US$/t before recovering to 70-80 US$/t into 2030.

Canberra is expecting iron ore prices to decline to $74/dmt (FOB) in 2027 (price 4 Aug 2025, US$88/dmt FOB).

TTRs price of 90 US$/dmt for 62% Fe fines CFR is consistent with Canberra's view for the short to medium term market. ***We have used 90 US$/dmt CFR in our analysis for consistency.***

However, if the 62% Fe fines CFR price drops ***below 85 US$/dmt*** as predicted by Canberra into 2027 (US$74/t FOB) then ***TTR may be unable to repay its debt finance obligations*** over the first ten years of the Project. ***Unless a revenue stream for Vanadia was achieved.***

The success of the Project is highly sensitive to the iron ore market price, the grade of the resource in-situ and the claimed Vanadia revenue stream.

To produce the revenue stream, taxes and royalties suggested in the TTR Application excluding the claimed Vanadia revenue, the 62% Fe fines CFR price portside N. China would need to be at market highs over 150 US$/dmt.

Other impurities requiring price normalisation

Fe	MnO	TiO2	CaO	K2O	P2O5	SiO2	Al2O3	MgO	Na2O	V2O5
56.70	0.68	8.40	0.94	0.12	0.34	3.40	3.70	3.14	0.15	0.50

Table 7: TTR VTM typical specification

Alumina, phosphorous and ***silica*** also attract penalties with Al_2O_3 concentrations of 2.25%-4% in low grade Fe ores as seen in the TTR-VTM ore, receiving Al_2O_3 penalties of about US2/t and Silica penalties of about US$3/t. TTRs ore phosphorous level is also elevated, with some but not all purchasers discounting about US$1/t: recent (normalisation, rates and penalties) are shown in tables 8 and 9.

Low Fe Grade Al 2.25-4% price historical Data

Table 8: Al_2O_3 penalties

1% Silica differential (low grade) price historical Data

Table 9: Silica penalties

WACC

TTRs discounted cash flow (DCF) Model has used a 10% rate for the weight adjusted cost of capital (WACC). This is a typical rate for pre-production development projects.

At today's rates, with a 40:60 (equity:debt) ratio as stated by TTR in Section 3.13-Financial Analysis-PFS we have calculated the ***WACC to be 6.96% with a cost of debt capital of 7.6-10.6%. The cost of debt provided by TTR in their model has been calculated at around 3.2%, which reduces interest payments and improves profits in TTRs cash flow analysis.***

A further 3% spread on the cost of debt (7.6% => 10.6%) will be added by lenders who see volatility in the TTR (MKR:ASX) share price, with mining stock on the ASX currently exhibiting a standard deviation of between 80-90%. This spread may rise further in early entry companies with greater volatility. MKR exhibits these characteristics and may attract spread penalties of up to 7.3% => a ***15% minimum interest rate pa***.

The current minimum cost of debt capital is 7.6%, with the New Zealand 10 Yr bond rate (risk free rate) at circa 4.6% pa. ***We have used a rate of 7.6% in our Market assessment.*** Manuka Resources has ***AUS$40 million plus in outstanding debt facilities at rates varying between 15% -26% pa*** (June 2025, ASX Quarterly Activities Report).

These rates are consistent with MKR's ASX market profile.

Cash flows and Project model length

TTR present their discounted cash flow model over 22 years with a 20 year life of mine. However, TTRs Project cash flow will be analysed by project financiers over the first ten years of the Project's life, from the time project finance is successfully raised. This is to ensure the Project can repay the principal debt capital borrowed and pay interest on the balance of the debt according to market conditions.

If the Project cannot survive the first ten years then it will not be financed.

From the perspective of Treasury and the New Zealand public, forecasted cash flows beyond ten years artificially inflate taxation and royalty recoveries by extending cash flows into years that have no existing debt residuals, which is unlikely to be the case with plant development, maintenance and refits e.g. replacement parts and critical spares could add US$10 million pa to maintain operational plant infrastructure.

Ramp up of commercial operations

The ***TTR model shows no ramp up of commercial operations***, which typically start at 75% in Yr 1, 85%in Yr 2 and 95% to full production in year 3. This ***ramp up*** period is important for analysis of cash flow and the ability to meet repayments over the ramp up period ***must be factored in***. We suggest production rates of 75% Yr 1, 85% Yr 2 and 95% Yr 3 of full capacity.

A typical mine takes an average of 10 quarters to reach full design capacity (data based on 108 ramp-ups) (table 10).

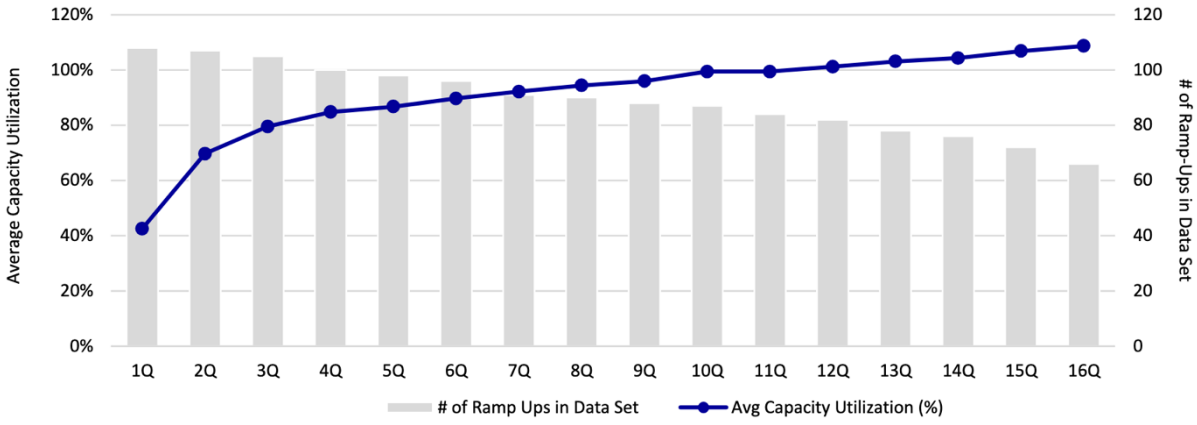

Table 10: Typical ramp-up schedule (source: Company Reports, RBC Capital Markets)

However we note, ***Golder Associates*** estimate of a **three month phased build up from 92% to 100%** in their 30 May 2014 report (Page 416-PFS), which we have incorporated in our Models. ***We believe this is overly generous, but we have used this as the minimum ramp up schedule***, applied across year 1 of operations (not just the first 3 months).

Suggesting full production is achievable at the commencement of the Project is unrealistic and represents a material risk to cash flows.

Freight prices

TTR state an expected average freight price to be 10 US$/t from Taranaki to N. China.

The distance from Port Hedland in the Pilbara, N. Australia to Qingdao port N. China is 3,386 nautical miles. The distance from TTRs Project site south of Port Taranaki to Qingdao is over 5,400 nautical miles. ***The extra distance factors a cost multiple of 1.6x the Port Hedland freight price.***

At current market rates the cape size vessel freight cost is ~10 US$/t from Port Hedland, implying the ***freight cost from Taranaki to be 16 US$/wt***.

We expect TTR freight costs to vary between 15-20 US$/wt portside N. China and readers should note that ***wet metric tonnes (wt) are to be used to calculate freight costs (including the 10% moisture in TTRs VTM).***

TTR has used dry metric tonnes (dmt) to calculate freight costs and this needs to be adjusted.

Inputs to the Application PFS Model

The inputs to the financial model suggested by TTR have presented the financial potential of the Company in a way that suggests a greater tax and royalty benefit to New Zealand than is reasonably achievable.

In particular, ***no revenue from primary production of Vanadia can be expected.***

In our analysis we have considered the iron ore price suggested by TTRs PFS (***90 US$/dmt CFR***) and also the expected FOB price (Canberra is expecting iron ore prices to decline to $74/dmt (FOB) in 2027), which is equivalent to ***84 US$/dmt CFR*** after netting forward US$10/t freight from N. Australia to N. China.

We then ***normalised the Market price*** of the ore by ***applying penalties for low Fe weight, Alumina, Titania and correcting the freight price*** for transit from Taranaki to ASWP (any safe world port) China***. No penalties were applied for Silica or Phosphorus.***

The primary Vanadia sales basket revenue has been removed because it is not achievable and no direct credits from Steelmakers have been added because no offtake agreements are in place to quantify Vanadia credits (if any).

We have correctly calculated the WACC and applied the minimum current market cost of debt capital (7.6% calculated vs ~3% in the TTR Model). The WACC is lower in our model compared to TTRs model input (6.96% vs 10%), which should improve TTRs position.

Current Market inputs are presented compared to TTRs Application Model inputs in Table 11:

Inputs	TTR $90	Market $90	Market $84	
Mining - Millions of tonnes of sediment mined/Yr	50.0	50.0	50.0	<= Dry tonnes sediment mined per yr
Production - Millions of tonnes of ore produced/Yr	4.9	**4.4**	**4.4**	<= dmt after 10% weight loss to concentrate
Spot price Fe fines 62% - North China CFR (includes freight paid by the seller)	$ 90.00	$ 90.00	$ **84.00**	<= US$/dmt 62% Fe fines CFR Spot Price
Spot price Fe fines 58% - North China CFR - penalty TTR quote is 13.7%	$ 77.67	$ 77.67	$ **72.49**	13.70% <= TTR discount
Penalty per 1% reduction Fe in Low Grade Fe product (under 58%) => 57% Fe pr	$ -	$ **2.33**	$ **2.17**	**3.00%** <= TTR product is 57% Fe
Penalty for low grade Fe product with Al2O3 2.25%-4%/t	$ -	$ **1.79**	$ **1.67**	**2.30%** <= Alumina penalty
Titania penalty for 8.6% TiO2 is 10-15%/t	$ -	$ **7.77**	$ **7.25**	**10.00%** <= Titania penalty
Realised price per tonne of ore sold US$/t	$ 77.67	$ **65.79**	$ **61.40**	**26.90%** <= Actual discount
Freight penalty for Port Taranaki compared to Port Hedland	$ 10.00	$ **16.00**	$ **16.00**	**1.60** <= Actual freight
Vanadia (V2O5) $US/lb	$ 5.45	$ **-**	$ **-**	<= Unsellable Vanadia content
Titanium (TiO2) $US/t	$ 2,080.00	$ **-**	$ **-**	<= Unsellable Titanium content
TTR OPEX US$/t	$ 27.20	$ 27.20	$ 27.20	<= TTR Opex
Capex US$ Millions	$ 602.2	$ 602.20	$ 602.20	<= TTR Capex
Equity raised on ASX Yr1 US$ Millions	$ 200.0	$ **180.70**	$ **180.7**	<= Balance for Yr 1 & 2 Capex payments
Cost of Equity Capital % interest	5.00%	**9.18%**	**9.18%**	<= Actual cost of equity
Cost of Debt Capital % interest	3.20%	**7.60%**	**7.60%**	<= Actual cost of debt
Cost of Capital (WACC) => DCF % pa	10.00%	**6.96%**	**6.96%**	<= Actual cost of capital
Ramp up of production - % of full output Yr 1	100.00%	**92.00%**	**92.00%**	<= Add Ramp-Up to Production
Ramp up of production - % of full output Yr 2	100.00%	100.00%	100.00%	<= Add Ramp-Up to Production
Ramp up of production - % of full output Yr 3	100.00%	100.00%	100.00%	<= Add Ramp-Up to Production
Royalty APR rate %	10.00%	10.00%	10.00%	<= NZP&M Rate
Royalty AVR rate %	2.00%	2.00%	2.00%	<= NZP&M Rate
Corporate tax rate %	28.00%	28.00%	28.00%	<= IRDNZ Rate

Table 11: Inputs to the DCF model

Input deviations compared to the TTR model are shown in red.

Outputs of the Model

The outputs of the TTR US$90 Model are compared to the Market US$90 Model and the Canberra expected Market US$84 Model in Table 3. The first group of *Output* metrics in Table 12 are not dependent on project length.

Outputs	TTR $90	Market $90	Market $84
Cash Cost => Operating Costs + Royalties US$/t ore mined	3.22	2.53	2.50
ROM => Operating Costs + Royalties (A) US$/t produced (exclusive of freight)	32.88	28.69	28.37
ROM => Operating Costs + Royalties (A) US$/t produced (inclusive of freight)	42.88	44.69	44.37
Revenue (B) US$/t produced	100.79	65.79	61.40
Cash Margin (B-A) US$/t produced (EBITDA/t)	57.91	21.10	17.03
Revenue : Cost of Sales Ratio (B/A) Ratio : 1	2.35	1.47	1.38
Debt Capital Interest $US Millions	62.92	156.40	156.40
Break Even Yr	5	12	17
Project Metrics Varying with LOM - 22 Yr Project with 20 Yr LOM	**TTR $90**	**Market $90**	**Market $84**
Free Cash Flow US$ millions	3,660.2	468.9	206.7
NPV of Cash Flows US$ M	1,169.3	70.0	(54.9)
IRR %	37%	6.3%	3.1%
Royalties - total US$ M	556.9	131.3	103.5
Royalties - pa average US$ M	27.8	6.6	5.2
Tax - total US$ M	1,349.9	203.7	108.5
Tax - pa average US$ M	67.5	10.2	5.4
Project Metrics Varying with LOM - 10 Yr Project with 8 Yr LOM	**TTR $90**	**Market $90**	**Market $84**
Free Cash Flow US$ millions	1,237.2	(141.0)	(252.9)
NPV of Cash Flows US$ M	638.9	(136.6)	(210.5)
IRR %	33%	-5.0%	-9.6%
Royalties - total US$ M	183.0	37.1	32.5
Royalties - pa average US$ M	22.9	1.9	1.6
Tax - total US$ M	407.6	(33.5)	(70.2)
Tax - pa average US$ M	51.0	(4.2)	(8.8)

Table 12: Comparison of TTR to Market achievable sales

TTRs revenue is overestimated (100.79 US$/t) ***compared to the Market*** (61.40 - 65.79 US$/t) and ***cash margins are reduced*** from 57.91 US$/t to 17.03 - 21.10 US$/t.

The break-even year for the Project at the Market is calculated to be outside of the lending criteria for project financiers (beyond 10 yrs). Consideration of other Project output metrics that vary with the length of the Project further outline the cash flow problems of the company during its early stages. This is most evident over the first ten years of the Project when TTR is paying down principal and interest payments on its debt capital borrowings.

Free cash flows show substantial losses without the revenue stream for Vanadia expressed in the TTR Model.

The Net Present Value (NPV) of the Project over the first ten years reflects the high borrowings required to finance a Project with limited revenue returns (highly negative) and the Internal Rate of Return (IRR %) of the Project at Market is less than 0% (-5% to -10%) (about 15% required), which will not attract financing.

TTR has claimed the following expected royalties and corporate taxes to be delivered from its PFS Project base case using the reference value of US$90/dmt 62% Fe fines CFR China. TTRs Application states on page 17 of its Attachment-2-NZIER-Economic-Impact-Statement:

'... annual royalty payment to be between NZ$36 million and NZ$39 million in the Project's first seven years of operation, increasing to about NZ$54 million per annum thereafter...annual corporate tax paid...to range from NZ$91 million to NZ$136 million (in 2024 New Zealand dollars). Note that the lower bound of the royalties and corporate tax estimates reflect the higher financing costs in the start-up phase of the Project.'

NZIER base their estimates on an NZD:USD foreign exchange rate of $0.58, which we have used to calculate comparisons (Table 13) between TTRs base case modelled by NZIER, our recalculated TTR US$90/t CFR base case, Market rates at US$90/t CFR and Market rates at Canberra's expected US$74/t FOB (US$84/t CFR) forward rate for 2027 (when the Project is due to commence operations).

Project Metrics Varying with LOM - 20 Yr Project - US$	NZIER	TTR $90	Market $90	Market $84
Royalties - total US$ M	565.5	556.9	131.3	103.5
Royalties - pa average US$ M	28.3	27.8	6.6	5.2
Tax - total US$ M	1,394.9	1,349.9	203.7	108.5
Tax - pa average US$ M	69.7	67.5	10.2	5.4

Table 13: Comparison of Project outputs over 20 years

During the time TTR is required to pay down principal and interest on its debt capital borrowings, the royalty stream is best derived from the ***ad valorem rate*** (AVR) set at 2% of net revenue (gross revenue from sales, less shipping freight costs between the point of valuation and the point of sale). In this case, minerals sold on a CFR basis generate gross revenue that is subject to a freight netback before the 2% AVR is applied i.e. based on FOB (across the beam at the port of origin) rates.

After TTR has paid off its mine build debt capital, royalties are best derived from ***accounting profits*** at the 10% APR rate.

We calculate Market royalties are about 5.2 to 6.6 million US$/pa (~NZ$ 10 million pa) and tax revenues about 5.4 to 10.2 million US$/pa (~NZ$ 9 to 17 million pa) when averaged over 20 years. Whereas ***TTRs Application suggests much higher returns*** with royalties about 28 million US$/pa (~NZ$ 49 million pa) and tax revenues about 70 million US$/pa (~NZ$ 120 million pa) when averaged over the same 20 years.

The figures stated for royalties and taxes are only realised if the Project is financed and can repay its liabilities over the first 10 years.

To illustrate more clearly, the same Project metrics averaged ***over the first ten years of the Project***, whilst the Company is paying down debt capital are presented in Table 14 (US$).

Project Metrics Varying with LOM - 10 Yr Project - US$	NZIER	TTR $90	Market $90	Market $84
Royalties - total US$ M	252.3	183.0	37.1	32.5
Royalties - pa average US$ M	25.2	22.9	4.6	4.1
Tax - total US$ M	606.1	407.6	(33.5)	(70.2)
Tax - pa average US$ M	60.6	51.0	(4.2)	(8.8)

Table 14: Comparison of Project outputs over 10 years

We calculate Market royalties are about 4.1 to 4.6 million US$/pa (NZ$ 7 to 8 million pa) and ***tax revenues are tax losses*** of about 4.2 to 8.8 million US$/pa (NZ$ 7 to 15 million pa) when averaged over the first 10 years of the Project, which may be ***carried forward***.

TTRs Application suggests much higher returns with royalties about 25.2 million US$/pa (NZ$ 43.5 million pa) and tax revenues about 60.6 million US$/pa (NZ$ 104.5 million pa) when averaged over the same 10-year period.

Concluding Comments

Whether considering 10 or 20 years of Project life the ***excess revenue claimed by TTR*** is mainly based on:

- not meeting Market pricing (overvalued products)
- selling wet product at dry prices
- not realistically ramping-up commercial operations
- not accounting for ROM losses when producing concentrates
- underestimating freight charges
- underestimating debt interest repayments
- overestimating Vanadia revenue
- not assessing operational and capital expenditure for primary Vanadia production
- overvaluing potential Vanadia credits from steelmakers

A full analysis is available in excel model format on request and snapshots of the TTR US$90 Model, the Market US$90 Model, the Market US$84 Model and the Market US$90 Model with Vanadium Primary Production added, are shown in the appendices over both 20-year and 10-year time horizons.

Questions may be directed by email to: Report.TTR@sanofex.com.

Report End

Attachment 1: TTR US$90 Model over 20 Years

Project Discounted Cash Flow

STB Vanadium Titanomagnetite Iron Sands Project
20 Year Life of Mine
High Level DCF | x US$1,000,000 | OPEX/US$t | 27.2

					Ramp Up Schedule																				
					Yr1	Yr2	Yr3																		
					100%	100%	100%																		
					Ramp Up to Full Production																				
	US$M	Yr	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
NOTE: TTR Uses Spot CFR rates/dmt	Conc m/t avg sales				4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9
90.00 US$/dmt China CFR	***Revenue(FeX Earnings)***				380.6	380.6	380.6	380.6	380.6	380.6	380.6	380.6	380.6	380.6	380.6	380.6	380.6	380.6	380.6	380.6	380.6	380.6	380.6	380.6
13.70% Total discount	Weight discount for 57% Fe	13.70%																						
5.45 US$/Lb V2O5 less 50% costs	0.50%	0.77	50%		113.3	113.3	113.3	113.3	113.3	113.3	113.3	113.3	113.3	113.3	113.3	113.3	113.3	113.3	113.3	113.3	113.3	113.3	113.3	113.3
2080.00 US$/TiO2	8.50%	0.77	0%		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
100.79 *Revenue/tonne US$/t*	***Total Revenue***				**493.9**	**493.9**	**493.9**	**493.9**	**493.9**	**493.9**	**493.9**	**493.9**	**493.9**	**493.9**	**493.9**	**493.9**	**493.9**	**493.9**	**493.9**	**493.9**	**493.9**	**493.9**	**493.9**	**493.9**
0.00 US$/t	V2O5 & TiO2 Roast 50% revenue (cost 50% revenue row 11)				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
27.20 Fixed	Direct & GA costs avg	***(IFO $500/t US$75/bbl)***			133.3	133.3	133.3	133.3	133.3	133.3	133.3	133.3	133.3	133.3	133.3	133.3	133.3	133.3	133.3	133.3	133.3	133.3	133.3	133.3
10.00 US$/dmt	Freight	*Needs 10% netback to wt =>*			49.0	49.0	49.0	49.0	49.0	49.0	49.0	49.0	49.0	49.0	49.0	49.0	49.0	49.0	49.0	49.0	49.0	49.0	49.0	49.0
37.20 *Cost/tonne US$/t*	***Total Costs***				**182.3**	**182.3**	**182.3**	**182.3**	**182.3**	**182.3**	**182.3**	**182.3**	**182.3**	**182.3**	**182.3**	**182.3**	**182.3**	**182.3**	**182.3**	**182.3**	**182.3**	**182.3**	**182.3**	**182.3**
63.59 *EBITDA/tonne US$/t*	**EBITDA**				**311.6**	**311.6**	**311.6**	**311.6**	**311.6**	**311.6**	**311.6**	**311.6**	**311.6**	**311.6**	**311.6**	**311.6**	**311.6**	**311.6**	**311.6**	**311.6**	**311.6**	**311.6**	**311.6**	**311.6**
	Interest				13.5	12.0	10.4	8.8	7.2	5.5	3.7													
602.2	Depn / Amort (DA)	EOL 7yrs. SL Depn			86.0	86.0	86.0	86.0	86.0	86.0	86.0													
10.0% *APR %*	Fe, V2O5 & TiO2 Royalties	*<= whichever is higher=>*			21.2	21.4	21.5	21.7	21.8	22.0	22.2	31.2	31.2	31.2	31.2	31.2	31.2	31.2	31.2	31.2	31.2	31.2	31.2	31.2
2.0% *AVR %*	Fe, V2O5 & TiO2 Royalties				8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9
	NPBT				**190.9**	**192.2**	**193.6**	**195.1**	**196.6**	**198.1**	**199.7**	**280.4**	**280.4**	**280.4**	**280.4**	**280.4**	**280.4**	**280.4**	**280.4**	**280.4**	**280.4**	**280.4**	**280.4**	**280.4**
28% *CTR%*	Tax	Corporate tax rate. Loss not C/fwd			0.0	53.8	54.2	54.6	55.0	55.5	55.9	78.5	78.5	78.5	78.5	78.5	78.5	78.5	78.5	78.5	78.5	78.5	78.5	78.5
	NPAT				**190.9**	**138.4**	**139.4**	**140.5**	**141.5**	**142.6**	**143.8**	**201.9**	**201.9**	**201.9**	**201.9**	**201.9**	**201.9**	**201.9**	**201.9**	**201.9**	**201.9**	**201.9**	**201.9**	**201.9**
	Cash Flows																							
	NIAT-DA				276.9	224.4	225.4	226.5	227.6	228.7	229.8	201.9	201.9	201.9	201.9	201.9	201.9	201.9	201.9	201.9	201.9	201.9	201.9	201.9
602.2 Capex	Asset		125.0	477.2																				
180.7 Equity ASX =125 & 55.7 Yr1&2	Financing Principal repayments			421.5	(47.1)	(48.6)	(50.1)	(51.7)	(53.4)	(55.1)	(56.9)	(60.6)												
	CF - Free Cash Flow	3660.2	(125.0)	(55.7)	229.8	175.9	175.3	174.8	174.2	173.6	172.9	141.4	201.9	201.9	201.9	201.9	201.9	201.9	201.9	201.9	201.9	201.9	201.9	201.9
10.00% Discount factor TTR - 10%	NPV of CFs	1169.3	(113.6)	(46.0)	172.7	120.1	108.9	98.6	89.4	81.0	73.3	54.5	70.8	64.3	58.5	53.2	48.3	43.9	39.9	36.3	33.0	30.0	27.3	24.8
3.20% Cost of Interest TTR %	**IRR**	36.5%	(125.0)	(477.2)	276.9	224.4	225.4	226.5	227.6	228.7	229.8	201.9	201.9	201.9	201.9	201.9	201.9	201.9	201.9	201.9	201.9	201.9	201.9	201.9
	Royalties - LOM	556.9																						
	Royalties - pa average	27.8																						
	Tax - LOM	1349.9																						
	Tax - pa average	67.5																						

<= Not Accounted

Attachment 2: Market US$90 Model over 20 Years

Project Discounted Cash Flow

STB Vanadium Titanomagnetite Iron Sands Project
20 Year Life of Mine
High Level DCF x US$1,000,000 OPEX/US$t 27.2

					Ramp Up Schedule																				
					Yr1	Yr2	Yr3																		
					92%	100%	100%																		
					Ramp Up to Full Production																				
	US$M	Yr	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
NOTE: TTR Uses Spot CFR rates/dmt	Conc m/t avg sales				4.1	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4
90.00 US$/dmt China CFR	***Revenue(FeX Earnings)***				266.9	290.1	290.1	290.1	290.1	290.1	290.1	290.1	290.1	290.1	290.1	290.1	290.1	290.1	290.1	290.1	290.1	290.1	290.1	290.1	290.1
26.90% Total discount	***Discounted for Weight, Titania, Alumina - May need to add Phosphate***																								
0.00 US$/Lb V2O5 less 50% costs	***Unrealisable recovery of Vanadia at sale of ore***				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.00 US$/TiO2	***Unrealisable recovery of Titania at sale of ore***				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
65.79 *Revenue/tonne US$/t*	***Total Revenue***				**266.9**	**290.1**	**290.1**	**290.1**	**290.1**	**290.1**	**290.1**	**290.1**	**290.1**	**290.1**	**290.1**	**290.1**	**290.1**	**290.1**	**290.1**	**290.1**	**290.1**	**290.1**	**290.1**	**290.1**	**290.1**
0.00 US$/t	V2O5 & TiO2 Roast 50% revenue (cost 50% revenue row 11)				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
27.20 Fixed	Direct & GA costs avg	***(IFO $500/t US$75/bbl)***			122.6	133.3	133.3	133.3	133.3	133.3	133.3	133.3	133.3	133.3	133.3	133.3	133.3	133.3	133.3	133.3	133.3	133.3	133.3	133.3	133.3
16.00 US$/dmt	Freight	*Added 10% netback to wt =>*			72.1	78.4	78.4	78.4	78.4	78.4	78.4	78.4	78.4	78.4	78.4	78.4	78.4	78.4	78.4	78.4	78.4	78.4	78.4	78.4	78.4
48.00 *Cost/tonne US$/t*	***Total Costs***				**194.7**	**211.7**	**211.7**	**211.7**	**211.7**	**211.7**	**211.7**	**211.7**	**211.7**	**211.7**	**211.7**	**211.7**	**211.7**	**211.7**	**211.7**	**211.7**	**211.7**	**211.7**	**211.7**	**211.7**	**211.7**
17.79 *EBITDA/tonne US$/t*	**EBITDA**				**72.2**	**78.4**	**78.4**	**78.4**	**78.4**	**78.4**	**78.4**	**78.4**	**78.4**	**78.4**	**78.4**	**78.4**	**78.4**	**78.4**	**78.4**	**78.4**	**78.4**	**78.4**	**78.4**	**78.4**	**78.4**
~3% *<=Unrealistic Finance Cost %*	Interest	*Adjust interest to market% =>*	7.60%		32.0	29.0	25.7	22.2	18.3	14.3	9.8														
602.2	Depn / Amort (DA)	EOL 7yrs. SL Depn			86.0	86.0	86.0	86.0	86.0	86.0	86.0														
10.0% *APR %*	Fe, V2O5 & TiO2 Royalties	10% APR	*<= whichever is higher=>*		(4.6)	(3.7)	(3.3)	(3.0)	(2.6)	(2.2)	(1.7)	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8
2.0% *AVR %*	Fe, V2O5 & TiO2 Royalties	2% AVR			3.9	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2
	NPBT				**(49.8)**	**(40.8)**	**(37.5)**	**(34.0)**	**(30.2)**	**(26.1)**	**(21.7)**	**70.6**	**70.6**	**70.6**	**70.6**	**70.6**	**70.6**	**70.6**	**70.6**	**70.6**	**70.6**	**70.6**	**70.6**	**70.6**	**70.6**
28% *CTR%*	Tax	Corporate tax rate. Loss not C/fwd			0.0	(11.4)	(10.5)	(9.5)	(8.4)	(7.3)	(6.1)	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8
	NPAT				**(49.8)**	**(29.4)**	**(27.0)**	**(24.5)**	**(21.7)**	**(18.8)**	**(15.6)**	**50.8**	**50.8**	**50.8**	**50.8**	**50.8**	**50.8**	**50.8**	**50.8**	**50.8**	**50.8**	**50.8**	**50.8**	**50.8**	**50.8**
	Cash Flows																								
	NIAT-DA				36.2	56.6	59.0	61.6	64.3	67.3	70.4	50.8	50.8	50.8	50.8	50.8	50.8	50.8	50.8	50.8	50.8	50.8	50.8	50.8	50.8
602.2 Capex	Asset			125.0	477.2																				
180.7 Equity ASX =125 & 55.7 Yr1&2	Financing Principal repayments				421.5	(40.2)	(43.3)	(46.5)	(50.1)	(53.9)	(58.0)	(62.4)	(72.2)												
	CF - Free Cash Flow	468.9		(125.0)	(55.7)	(4.0)	13.4	12.5	11.5	10.4	9.3	8.0	(21.4)	50.8	50.8	50.8	50.8	50.8	50.8	50.8	50.8	50.8	50.8	50.8	50.8
6.96% Discount factor - WACC	NPV of CFs	70.0		(116.9)	(48.7)	(3.2)	10.2	8.9	7.7	6.5	5.4	4.4	(10.9)	24.3	22.7	21.2	19.8	18.5	17.3	16.2	15.2	14.2	13.2	12.4	11.6
7.60% Cost of Debt Aus/NZ	**IRR**	6.3%		(125.0)	(477.2)	36.2	56.6	59.0	61.6	64.3	67.3	70.4	50.8	50.8	50.8	50.8	50.8	50.8	50.8	50.8	50.8	50.8	50.8	50.8	50.8
	Royalties - LOM	131.3																							
	Royalties - pa average	6.6																							
	Tax - LOM	203.7																							
	Tax - pa average	10.2																							

<= Not Accounted

Attachment 3: Market US$84 Model over 20 Years

Project Discounted Cash Flow

STB Vanadium Titanomagnetite Iron Sands Project
20 Year Life of Mine
High Level DCF | x US$1,000,000 | OPEX/US$t 27.2

					Ramp Up Schedule																				
					Yr1	Yr2	Yr3																		
					92%	100%	100%																		
					Ramp Up to Full Production																				
	US$M	Yr	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
NOTE: TTR Uses Spot CFR rates/dmt	Conc m/t avg sales				4.1	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4
84.00 US$/dmt China CFR	***Revenue(FeX Earnings)***				249.1	270.8	270.8	270.8	270.8	270.8	270.8	270.8	270.8	270.8	270.8	270.8	270.8	270.8	270.8	270.8	270.8	270.8	270.8	270.8	270.8
26.90% Total discount	***Discounted for Weight, Titania, Alumina - May need to add Phosphate***																								
0.00 US$/Lb V2O5 less 50% costs	***Unrealisable recovery of Vanadia at sale of ore***				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.00 US$/TiO2	***Unrealisable recovery of Titania at sale of ore***				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
61.40 ***Revenue/tonne US$/t***	***Total Revenue***				**249.1**	**270.8**	**270.8**	**270.8**	**270.8**	**270.8**	**270.8**	**270.8**	**270.8**	**270.8**	**270.8**	**270.8**	**270.8**	**270.8**	**270.8**	**270.8**	**270.8**	**270.8**	**270.8**	**270.8**	**270.8**
0.00 US$/t	V2O5 & TiO2 Roast 50% revenue (cost 50% revenue row 11)				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
27.20 Fixed	Direct & GA costs avg ***(IFO $500/t US$75/bbl)***				122.6	133.3	133.3	133.3	133.3	133.3	133.3	133.3	133.3	133.3	133.3	133.3	133.3	133.3	133.3	133.3	133.3	133.3	133.3	133.3	133.3
16.00 US$/dmt	Freight *Added 10% netback to wt =>*				72.1	78.4	78.4	78.4	78.4	78.4	78.4	78.4	78.4	78.4	78.4	78.4	78.4	78.4	78.4	78.4	78.4	78.4	78.4	78.4	78.4
48.00 ***Cost/tonne US$/t***	***Total Costs***				**194.7**	**211.7**	**211.7**	**211.7**	**211.7**	**211.7**	**211.7**	**211.7**	**211.7**	**211.7**	**211.7**	**211.7**	**211.7**	**211.7**	**211.7**	**211.7**	**211.7**	**211.7**	**211.7**	**211.7**	**211.7**
13.40 ***EBITDA/tonne US$/t***	**EBITDA**				**54.4**	**59.1**	**59.1**	**59.1**	**59.1**	**59.1**	**59.1**	**59.1**	**59.1**	**59.1**	**59.1**	**59.1**	**59.1**	**59.1**	**59.1**	**59.1**	**59.1**	**59.1**	**59.1**	**59.1**	**59.1**
~3% *<=Unrealistic Finance Cost %*	Interest *Adjust interest to market% =>* **7.60%**				32.0	29.0	25.7	22.2	18.3	14.3	9.8														
602.2	Depn / Amort (DA) EOL 7yrs. SL Depn				86.0	86.0	86.0	86.0	86.0	86.0	86.0														
10.0% ***APR %***	Fe, V2O5 & TiO2 Royalties 10% APR *<= whichever is higher=>*				(6.4)	(5.6)	(5.3)	(4.9)	(4.5)	(4.1)	(3.7)	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9
2.0% ***AVR %***	Fe, V2O5 & TiO2 Royalties 2% AVR				3.5	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8
	NPBT				**(67.2)**	**(59.8)**	**(56.5)**	**(52.9)**	**(49.1)**	**(45.0)**	**(40.6)**	**53.2**	**53.2**	**53.2**	**53.2**	**53.2**	**53.2**	**53.2**	**53.2**	**53.2**	**53.2**	**53.2**	**53.2**	**53.2**	**53.2**
28% ***CTR%***	Tax Corporate tax rate. Loss not C/fwd				0.0	(16.7)	(15.8)	(14.8)	(13.8)	(12.6)	(11.4)	14.9	14.9	14.9	14.9	14.9	14.9	14.9	14.9	14.9	14.9	14.9	14.9	14.9	14.9
	NPAT				**(67.2)**	**(43.0)**	**(40.7)**	**(38.1)**	**(35.4)**	**(32.4)**	**(29.2)**	**38.3**	**38.3**	**38.3**	**38.3**	**38.3**	**38.3**	**38.3**	**38.3**	**38.3**	**38.3**	**38.3**	**38.3**	**38.3**	**38.3**
	Cash Flows																								
	NIAT-DA				18.8	43.0	45.4	47.9	50.7	53.6	56.8	38.3	38.3	38.3	38.3	38.3	38.3	38.3	38.3	38.3	38.3	38.3	38.3	38.3	38.3
602.2 Capex	Asset		125.0	477.2																					
180.7 Equity ASX =125 & 55.7 Yr1&2	Financing Principal repayments			421.5	(40.2)	(43.3)	(46.5)	(50.1)	(53.9)	(58.0)	(62.4)	(72.2)													
	CF - Free Cash Flow	206.7	(125.0)	(55.7)	(21.4)	(0.3)	(1.2)	(2.2)	(3.2)	(4.4)	(5.6)	(33.9)	38.3	38.3	38.3	38.3	38.3	38.3	38.3	38.3	38.3	38.3	38.3	38.3	38.3
6.96% Discount factor - WACC	NPV of CFs	-54.9	(116.9)	(48.7)	(17.5)	(0.2)	(0.8)	(1.4)	(2.0)	(2.6)	(3.1)	(17.3)	18.3	17.1	16.0	14.9	14.0	13.1	12.2	11.4	10.7	10.0	9.3	8.7
7.60% Cost of Debt Aus/NZ	**IRR**	3.1%	(125.0)	(477.2)	18.8	43.0	45.4	47.9	50.7	53.6	56.8	38.3	38.3	38.3	38.3	38.3	38.3	38.3	38.3	38.3	38.3	38.3	38.3	38.3	38.3
	Royalties - LOM	103.5																							
	Royalties - pa average	5.2																							
	Tax - LOM	108.5																							
	Tax - pa average	5.4																							

<= Not Accounted

Attachment 4: TTR US$90 Model over 10 Years

Project Discounted Cash Flow

STB Vanadium Titanomagnetite Iron Sands Project
20 Year Life of Mine
High Level DCF x US$1,000,000 OPEX/US$t 27.2

					Ramp Up Schedule							
					Yr1	Yr2	Yr3					
					100%	100%	100%					
					Ramp Up to Full Production							
US$M	Yr	1	2	3	4	5	6	7	8	9	10
Conc m/t avg sales				4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9
Revenue(FeX Earnings)				380.6	380.6	380.6	380.6	380.6	380.6	380.6	380.6
Weight discount for 57% Fe	13.70%										
0.50%	0.77	50%		113.3	113.3	113.3	113.3	113.3	113.3	113.3	113.3
8.50%	0.77	0%		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Revenue				**493.9**	**493.9**	**493.9**	**493.9**	**493.9**	**493.9**	**493.9**	**493.9**
V2O5 & TiO2 Roast 50% revenue (cost 50% revenue row 11)				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Direct & GA costs avg	***(IFO $500/t US$75/bbl)***			133.3	133.3	133.3	133.3	133.3	133.3	133.3	133.3
Freight	*Needs 10% netback to wt =>*			49.0	49.0	49.0	49.0	49.0	49.0	49.0	49.0
Total Costs				**182.3**	**182.3**	**182.3**	**182.3**	**182.3**	**182.3**	**182.3**	**182.3**
EBITDA				**311.6**	**311.6**	**311.6**	**311.6**	**311.6**	**311.6**	**311.6**	**311.6**
Interest				13.5	12.0	10.4	8.8	7.2	5.5	3.7	
Depn / Amort (DA)	EOL 7yrs. SL Depn			86.0	86.0	86.0	86.0	86.0	86.0	86.0	
Fe, V2O5 & TiO2 Royalties	*<= whichever is higher=>*			21.2	21.4	21.5	21.7	21.8	22.0	22.2	31.2
Fe, V2O5 & TiO2 Royalties				8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9
NPBT				**190.9**	**192.2**	**193.6**	**195.1**	**196.6**	**198.1**	**199.7**	**280.4**
Tax	Corporate tax rate. Loss not C/fwd			-	53.8	54.2	54.6	55.0	55.5	55.9	78.5
NPAT				**190.9**	**138.4**	**139.4**	**140.5**	**141.5**	**142.6**	**143.8**	**201.9**
Cash Flows											
NIAT-DA				276.9	224.4	225.4	226.5	227.6	228.7	229.8	201.9
Asset		125.0	477.2								
Financing Principal repayments			421.5	(47.1)	(48.6)	(50.1)	(51.7)	(53.4)	(55.1)	(56.9)	(60.6)
CF - Free Cash Flow	1237.2	(125.0)	(55.7)	229.8	175.9	175.3	174.8	174.2	173.6	172.9	141.4
NPV of CFs	638.9	(113.6)	(46.0)	172.7	120.1	108.9	98.6	89.4	81.0	73.3	54.5
IRR	33.5%	(125.0)	(477.2)	276.9	224.4	225.4	226.5	227.6	228.7	229.8	201.9
Royalties - LOM	183.0										
Royalties - pa average	22.9										
Tax - LOM	407.6										
Tax - pa average	51.0										

NOTE: TTR Uses Spot CFR rates/dmt		
90.00	US$/dmt China CFR	
13.70%	Total discount	
5.45	US$/Lb V2O5 less 50% costs	
2080.00	US$/TiO2	
100.79	***Revenue/tonne US$/t***	
0.00	US$/t	
27.20	Fixed	
10.00	US$/dmt	
37.20	***Cost/tonne US$/t***	
63.59	***EBITDA/tonne US$/t***	
602.2		
10.0%	***APR %***	
2.0%	***AVR %***	
28%	***CTR%***	
602.2	Capex	
180.7	Equity ASX =125 & 55.7 Yr1&2	
10.00%	Discount factor TTR - 10%	
3.20%	Cost of Interest TTR %	

<= Not Accounted

Attachment 5: Market US$90 Model over 10 Years

Project Discounted Cash Flow

STB Vanadium Titanomagnetite Iron Sands Project
20 Year Life of Mine
High Level DCF

x US$1,000,000 | OPEX/US$t | 27.2

	Ramp Up Schedule		
	Yr1	Yr2	Yr3
	92%	100%	100%

					Ramp Up to Full Production							
	US$M	Yr	1	2	3	4	5	6	7	8	9	10
NOTE: TTR Uses Spot CFR rates/dmt	Conc m/t avg sales				4.1	4.4	4.4	4.4	4.4	4.4	4.4	4.4
90.00 US$/dmt China CFR	***Revenue(FeX Earnings)***				266.9	290.1	290.1	290.1	290.1	290.1	290.1	290.1
26.90% Total discount	***Discounted for Weight, Titania, Alumina - May need to add Phosphate***											
0.00 US$/Lb V2O5 less 50% costs	***Unrealisable recovery of Vanadia at sale of ore***				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.00 US$/TiO2	***Unrealisable recovery of Titania at sale of ore***				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
65.79 ***Revenue/tonne US$/t***	***Total Revenue***				**266.9**	**290.1**	**290.1**	**290.1**	**290.1**	**290.1**	**290.1**	**290.1**
0.00 US$/t	V2O5 & TiO2 Roast 50% revenue (cost 50% revenue row 11)				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
27.20 Fixed	Direct & GA costs avg	***(IFO $500/t US$75/bbl)***			122.6	133.3	133.3	133.3	133.3	133.3	133.3	133.3
16.00 US$/dmt	Freight	*Added 10% netback to wt =>*			72.1	78.4	78.4	78.4	78.4	78.4	78.4	78.4
48.00 ***Cost/tonne US$/t***	***Total Costs***				**194.7**	**211.7**	**211.7**	**211.7**	**211.7**	**211.7**	**211.7**	**211.7**
17.79 ***EBITDA/tonne US$/t***	**EBITDA**				**72.2**	**78.4**	**78.4**	**78.4**	**78.4**	**78.4**	**78.4**	**78.4**
~3% *<=Unrealistic Finance Cost %*	Interest	*<= Market Interest Rate % =>* 7.60%			32.0	29.0	25.7	22.2	18.3	14.3	9.8	
602.2	Depn / Amort (DA)	EOL 7yrs. SL Depn			86.0	86.0	86.0	86.0	86.0	86.0	86.0	
10.0% ***APR % Royalty***	Fe, V2O5 & TiO2 Royalties	10% APR *<= whichever is higher=>*			(4.6)	(3.7)	(3.3)	(3.0)	(2.6)	(2.2)	(1.7)	7.8
2.0% ***AVR % Royalty***	Fe, V2O5 & TiO2 Royalties	2% AVR			3.9	4.2	4.2	4.2	4.2	4.2	4.2	4.2
	NPBT				**(49.8)**	**(40.8)**	**(37.5)**	**(34.0)**	**(30.2)**	**(26.1)**	**(21.7)**	**70.6**
28% ***CTR%***	Tax	Corporate tax rate. Loss not C/fwd			0.0	(11.4)	(10.5)	(9.5)	(8.4)	(7.3)	(6.1)	19.8
	NPAT				**(49.8)**	**(29.4)**	**(27.0)**	**(24.5)**	**(21.7)**	**(18.8)**	**(15.6)**	**50.8**
	Cash Flows											
	NIAT-DA				36.2	56.7	59.0	61.6	64.3	67.3	70.4	50.8
602.2 Capex	Asset			125.0	477.2							
180.7 Equity ASX =125 & 55.7 Yr1&2	Financing Principal repayments				421.5	(40.2)	(43.3)	(46.5)	(50.1)	(53.9)	(58.0)	(62.4)	(72.2)
	CF - Free Cash Flow	-141.0		(125.0)	(55.7)	(4.0)	13.4	12.5	11.5	10.4	9.3	8.0	(21.4)
6.96% Discount factor - WACC	NPV of CFs	-136.6		(116.9)	(48.7)	(3.2)	10.2	8.9	7.7	6.5	5.4	4.4	(10.9)
7.60% Cost of Debt Aus/NZ	**IRR**	-5.0%		(125.0)	(477.2)	36.2	56.7	59.0	61.6	64.3	67.3	70.4	50.8
	Royalties - LOM	37.1										
	Royalties - pa average	4.6										
	Tax - LOM	-33.5										
	Tax - pa average	-4.2										

<= Not Accounted

Attachment 6: Market US$84 Model over 10 Years

Project Discounted Cash Flow

STB Vanadium Titanomagnetite Iron Sands Project
20 Year Life of Mine
High Level DCF

x US$1,000,000 | OPEX/US$t | 27.2

				Ramp Up Schedule								
				Yr1	Yr2	Yr3						
				92%	100%	100%						
				Ramp Up to Full Production								
	US$M	Yr	1	2	3	4	5	6	7	8	9	10
NOTE: TTR Uses Spot CFR rates/dmt	Conc m/t avg sales				4.1	4.4	4.4	4.4	4.4	4.4	4.4	4.4
84.00	US$/dmt China CFR	***Revenue(FeX Earnings)***			249.1	270.8	270.8	270.8	270.8	270.8	270.8	270.8
26.90%	Total discount	***Discounted for Weight, Titania, Alumina - May need to add Phosphate***										
0.00	US$/Lb V2O5 less 50% costs	***Unrealisable recovery of Vanadia at sale of ore***			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.00	US$/TiO2	***Unrealisable recovery of Titania at sale of ore***			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
61.40	***Revenue/tonne US$/t***	***Total Revenue***			**249.1**	**270.8**	**270.8**	**270.8**	**270.8**	**270.8**	**270.8**	**270.8**
0.00	US$/t	V2O5 & TiO2 Roast 50% revenue (cost 50% revenue row 11)			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
27.20	Fixed	Direct & GA costs avg	***(IFO $500/t US$75/bbl)***		122.6	133.3	133.3	133.3	133.3	133.3	133.3	133.3
16.00	US$/dmt	Freight	*Added 10% netback to wt =>*		72.1	78.4	78.4	78.4	78.4	78.4	78.4	78.4
48.00	***Cost/tonne US$/t***	***Total Costs***			**194.7**	**211.7**	**211.7**	**211.7**	**211.7**	**211.7**	**211.7**	**211.7**
13.40	***EBITDA/tonne US$/t***	**EBITDA**			**54.4**	**59.1**	**59.1**	**59.1**	**59.1**	**59.1**	**59.1**	**59.1**
~3%	*<=Unrealistic Finance Cost %*	Interest	*<= Market Interest Rate % =>*	7.60%	32.0	29.0	25.7	22.2	18.3	14.3	9.8	
602.2		Depn / Amort (DA)	EOL 7yrs. SL Depn		86.0	86.0	86.0	86.0	86.0	86.0	86.0	
10.0%	***APR % Royalty***	Fe, V2O5 & TiO2 Royalties	10% APR	*<= whichever is higher=>*	(6.4)	(5.6)	(5.3)	(4.9)	(4.5)	(4.1)	(3.7)	5.9
2.0%	***AVR % Royalty***	Fe, V2O5 & TiO2 Royalties	2% AVR		3.5	3.8	3.8	3.8	3.8	3.8	3.8	3.8
		NPBT			**(67.2)**	**(59.8)**	**(56.5)**	**(52.9)**	**(49.1)**	**(45.0)**	**(40.6)**	**53.2**
28%	***CTR%***	Tax	Corporate tax rate. Loss not C/fwd		0.0	(16.7)	(15.8)	(14.8)	(13.8)	(12.6)	(11.4)	14.9
		NPAT			**(67.2)**	**(43.0)**	**(40.7)**	**(38.1)**	**(35.4)**	**(32.4)**	**(29.2)**	**38.3**
		Cash Flows										
		NIAT-DA			18.8	43.0	45.4	47.9	50.7	53.6	56.8	38.3
602.2	Capex	Asset		125.0	477.2							
180.7	Equity ASX =125 & 55.7 Yr1&2	Financing Principal repayments			421.5	(40.2)	(43.3)	(46.5)	(50.1)	(53.9)	(58.0)	(62.4)	(72.2)
		CF - Free Cash Flow	-252.9	(125.0)	(55.7)	(21.4)	(0.3)	(1.2)	(2.2)	(3.2)	(4.4)	(5.6)	(33.9)
6.96%	Discount factor - WACC	NPV of CFs	-210.5	(116.9)	(48.7)	(17.5)	(0.2)	(0.8)	(1.4)	(2.0)	(2.6)	(3.1)	(17.3)
7.60%	Cost of Debt Aus/NZ	**IRR**	-9.6%	(125.0)	(477.2)	18.8	43.0	45.4	47.9	50.7	53.6	56.8	38.3
		Royalties - LOM	32.5									
		Royalties - pa average	4.1									
		Tax - LOM	-70.2									
		Tax - pa average	-8.8									

<= Not Accounted

Attachment 7: Market US$90 Model over 20 Years with Vanadium Primary Production added

Project Discounted Cash Flow

STB Vanadium Titanomagnetite Iron Sands Project
20 Year Life of Mine
High Level DCF | x US$1,000,000 | OPEX/US$t 27.2

					Ramp Up Schedule																					
					Yr1	Yr2	Yr3																			
					92%	100%	100%																			
					Ramp Up to Full Production																					
	US$M	Yr	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
NOTE: TTR Uses Spot CFR rates/dmt	Conc m/t avg sales				4.1	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4
90.00 US$/dmt China CFR	***Revenue(FeX Earnings)***				266.9	290.1	290.1	290.1	290.1	290.1	290.1	290.1	290.1	290.1	290.1	290.1	290.1	290.1	290.1	290.1	290.1	290.1	290.1	290.1
26.90% Total discount	***Discounted for Weight, Titania, Alumina - May need to add Phosphate***																							
5.45 US$/Lb V2O5	V2O5 Revenue/ROMt	$ 47.96			194.6	211.5	211.5	211.5	211.5	211.5	211.5	211.5	211.5	211.5	211.5	211.5	211.5	211.5	211.5	211.5	211.5	211.5	211.5	211.5
					0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
113.75 ***Revenue/tonne US$/t***	***Total Revenue***				**461.5**	**501.6**	**501.6**	**501.6**	**501.6**	**501.6**	**501.6**	**501.6**	**501.6**	**501.6**	**501.6**	**501.6**	**501.6**	**501.6**	**501.6**	**501.6**	**501.6**	**501.6**	**501.6**	**501.6**
43.21 US$/t	V2O5 Operational Expenditure/ROMt	$ 43.21			175.3	190.5	190.5	190.5	190.5	190.5	190.5	190.5	190.5	190.5	190.5	190.5	190.5	190.5	190.5	190.5	190.5	190.5	190.5	190.5
27.20 Fixed	Direct & GA costs avg	***(IFO $500/t US$75/bbl)***			122.6	133.3	133.3	133.3	133.3	133.3	133.3	133.3	133.3	133.3	133.3	133.3	133.3	133.3	133.3	133.3	133.3	133.3	133.3	133.3
16.00 US$/dmt	Freight	*Added 10% netback to wt =>*			71.4	77.6	77.6	77.6	77.6	77.6	77.6	77.6	77.6	77.6	77.6	77.6	77.6	77.6	77.6	77.6	77.6	77.6	77.6	77.6
91.03 ***Cost/tonne US$/t***	***Total Costs***				**369.3**	**401.4**	**401.4**	**401.4**	**401.4**	**401.4**	**401.4**	**401.4**	**401.4**	**401.4**	**401.4**	**401.4**	**401.4**	**401.4**	**401.4**	**401.4**	**401.4**	**401.4**	**401.4**	**401.4**
22.72 ***EBITDA/tonne US$/t***	**EBITDA**				**92.2**	**100.2**	**100.2**	**100.2**	**100.2**	**100.2**	**100.2**	**100.2**	**100.2**	**100.2**	**100.2**	**100.2**	**100.2**	**100.2**	**100.2**	**100.2**	**100.2**	**100.2**	**100.2**	**100.2**
~3% *<=Unrealistic Finance Cost %*	Interest	*Adjust interest to market% =>*	7.60%		51.0	46.2	40.9	35.3	29.2	22.7	15.7													
952.2	Depn / Amort (DA)	EOL 7yrs. SL Depn			136.0	136.0	136.0	136.0	136.0	136.0	136.0													
10.0% ***APR %***	Fe, V2O5 & TiO2 Royalties	10% APR	*<= whichever is higher=>*		(9.5)	(8.2)	(7.7)	(7.1)	(6.5)	(5.9)	(5.2)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
2.0% ***AVR %***	Fe, V2O5 & TiO2 Royalties	2% AVR			7.8	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5
	NPBT				**(102.7)**	**(90.5)**	**(85.3)**	**(79.6)**	**(73.6)**	**(67.0)**	**(60.0)**	**90.2**	**90.2**	**90.2**	**90.2**	**90.2**	**90.2**	**90.2**	**90.2**	**90.2**	**90.2**	**90.2**	**90.2**	**90.2**
28% ***CTR%***	Tax	Corporate tax rate. Loss not C/fwd			0.0	(25.3)	(23.9)	(22.3)	(20.6)	(18.8)	(16.8)	25.2	25.2	25.2	25.2	25.2	25.2	25.2	25.2	25.2	25.2	25.2	25.2	25.2
	NPAT				**(102.7)**	**(65.2)**	**(61.4)**	**(57.3)**	**(53.0)**	**(48.3)**	**(43.2)**	**64.9**	**64.9**	**64.9**	**64.9**	**64.9**	**64.9**	**64.9**	**64.9**	**64.9**	**64.9**	**64.9**	**64.9**	**64.9**
	Cash Flows																							
	NIAT-DA				33.3	70.9	74.6	78.7	83.1	87.8	92.8	64.9	64.9	64.9	64.9	64.9	64.9	64.9	64.9	64.9	64.9	64.9	64.9	64.9
952.2 Capex (602.2 + 350)	Asset			225.0	727.2																			
280.7 Equity ASX	Financing Principal repayments				671.5	(64.0)	(68.9)	(74.2)	(79.8)	(85.9)	(92.4)	(99.4)	(115.1)												
	CF - Free Cash Flow	404.8	(225.0)	(55.7)	(30.7)	2.0	0.5	(1.1)	(2.8)	(4.6)	(6.6)	(50.2)	64.9	64.9	64.9	64.9	64.9	64.9	64.9	64.9	64.9	64.9	64.9	64.9
6.96% Discount factor - WACC	NPV of CFs	-52.8	(210.4)	(48.7)	(25.1)	1.5	0.3	(0.7)	(1.7)	(2.7)	(3.6)	(25.6)	31.0	29.0	27.1	25.3	23.7	22.1	20.7	19.4	18.1	16.9	15.8	14.8
7.60% Cost of Debt Aus/NZ	**IRR**	3.7%	(225.0)	(727.2)	33.3	70.9	74.6	78.7	83.1	87.8	92.8	64.9	64.9	64.9	64.9	64.9	64.9	64.9	64.9	64.9	64.9	64.9	64.9	64.9
	Royalties - LOM	188.9																						
	Royalties - pa average	9.4																						
	Tax - LOM	200.5																						
	Tax - pa average	10.0																						

<= Not Accounted

Attachment 8: Market US$90 Model over 10 Years with Vanadium Primary Production added

Project Discounted Cash Flow

STB Vanadium Titanomagnetite Iron Sands Project
20 Year Life of Mine
High Level DCF

x US$1,000,000 | OPEX/US$t | 27.2

					Ramp Up Schedule								
					Yr1	Yr2	Yr3						
					92%	100%	100%						
					Ramp Up to Full Production								
	US$M	Yr	1	2	3	4	5	6	7	8	9	10
NOTE: TTR Uses Spot CFR rates/dmt	Conc m/t avg sales				4.1	4.4	4.4	4.4	4.4	4.4	4.4	4.4
90.00 US$/dmt China CFR	***Revenue(FeX Earnings)***				266.9	290.1	290.1	290.1	290.1	290.1	290.1	290.1
26.90% Total discount	***Discounted for Weight, Titania, Alumina - May need to add Phosphate***											
5.45 US$/Lb V2O5	V2O5 Revenue/ROMt	$ 47.96			194.6	211.5	211.5	211.5	211.5	211.5	211.5	211.5
113.75 ***Revenue/tonne US$/t***	***Total Revenue***				**461.5**	**501.6**	**501.6**	**501.6**	**501.6**	**501.6**	**501.6**	**501.6**
43.21 US$/t	V2O5 Operational Expenditure/ROMt	$ 43.21			175.3	190.5	190.5	190.5	190.5	190.5	190.5	190.5
27.20 Fixed	Direct & GA costs avg	***(IFO $500/t US$75/bbl)***			122.6	133.3	133.3	133.3	133.3	133.3	133.3	133.3
16.00 US$/dmt	Freight	*Added 10% netback to wt =>*			71.4	77.6	77.6	77.6	77.6	77.6	77.6	77.6
91.03 ***Cost/tonne US$/t***	***Total Costs***				**369.3**	**401.4**	**401.4**	**401.4**	**401.4**	**401.4**	**401.4**	**401.4**
22.72 ***EBITDA/tonne US$/t***	**EBITDA**				**92.2**	**100.2**	**100.2**	**100.2**	**100.2**	**100.2**	**100.2**	**100.2**
~3% *<=Unrealistic Finance Cost %*	Interest	*<= Market Interest Rate % =>*	7.60%		51.0	46.2	40.9	35.3	29.2	22.7	15.7	
952.2	Depn / Amort (DA)	EOL 7yrs. SL Depn			136.0	136.0	136.0	136.0	136.0	136.0	136.0	
10.0% ***APR % Royalty***	Fe, V2O5 & TiO2 Royalties	10% APR	*<= whichever is higher=>*		(9.5)	(8.2)	(7.7)	(7.1)	(6.5)	(5.9)	(5.2)	10.0
2.0% ***AVR % Royalty***	Fe, V2O5 & TiO2 Royalties	2% AVR			7.8	8.5	8.5	8.5	8.5	8.5	8.5	8.5
	NPBT				**(102.7)**	**(90.5)**	**(85.3)**	**(79.6)**	**(73.6)**	**(67.0)**	**(60.0)**	**90.2**
28% ***CTR%***	Tax	Corporate tax rate. Loss not C/fwd			0.0	(25.3)	(23.9)	(22.3)	(20.6)	(18.8)	(16.8)	25.2
	NPAT				**(102.7)**	**(65.2)**	**(61.4)**	**(57.3)**	**(53.0)**	**(48.3)**	**(43.2)**	**64.9**
	Cash Flows											
	NIAT-DA				33.3	70.9	74.6	78.7	83.1	87.8	92.8	64.9
952.2 Capex (602.2 + 350)	Asset		225.0	727.2								
280.7 Equity ASX	Financing Principal repayments			671.5	(64.0)	(68.9)	(74.2)	(79.8)	(85.9)	(92.4)	(99.4)	(115.1)
	CF - Free Cash Flow	-374.2	(225.0)	(55.7)	(30.7)	2.0	0.5	(1.1)	(2.8)	(4.6)	(6.6)	(50.2)
6.96% Discount factor - WACC	NPV of CFs	-316.7	(210.4)	(48.7)	(25.1)	1.5	0.3	(0.7)	(1.7)	(2.7)	(3.6)	(25.6)
7.60% Cost of Debt Aus/NZ	**IRR**	-8.8%	(225.0)	(727.2)	33.3	70.9	74.6	78.7	83.1	87.8	92.8	64.9
	Royalties - LOM	68.7										
	Royalties - pa average	8.6										
	Tax - LOM	-102.4										
	Tax - pa average	-12.8										

<= Not Accounted

The characteristics of the IMV are:
Overall length: 345 m;
Length between perpendiculars: 330 m;
Design draught: 12 m;
Scantling-Draught: 15 m;
Breadth moulded: 60 m;
Depth: 26.25 m;
Highest point above the water line: 58 m; and
Tonnage: 100,000 t.

Our understanding from the 'Port Taranaki - Port Guide' and from communications with the Marine Manager is Port Taranaki is unlikely to provide a pilotage, towage, mooring & wharfage service to the IMV, namely because is exceeds the berthing dimensions for the berths and the berth pockets. The approach to the harbour could also be an issue if the IMV was loaded to capacity (scantling-draught 15m or more). TTR intends to conduct 24 hour, 365 days-a-year operations with all supplies, maintenance, refits, repairs and potential hull cleaning conducted 'on site' and not 'in harbour' or 'dry dock'. Such 'on site' maintenance and repair programmes for the IMV would seem inconsistent with EEZ Act section 59(2)(i) best practice in relation to an industry or activity.

Other concerns focus on poor and foul weather operational plans for the IMV. In the conditions TTR proposes for the Marine Consent, poor weather with wave heights 4+m would enforce a ‘cease mining state’, where the IMV would be moored offshore as a 'weathervane' on a 'single anchor' and if foul weather conditions arose the IMV would seek 'safe harbour' or other shelter. At the times that South Taranaki is experiencing 4+m swell, Port Taranaki is usually closed to commercial traffic due to associated long period wave. Because of these hazards, it is unlikely that Port Taranaki would qualify as a ‘place of refuge’.

TTRs application through the FTA requires the Panel's oversight of the EEZ Act, where 'navigational safety and vessel movements' are not a regulated activity but under EEZ section 59(2)(m) allows the Panel to consider 'any other matter considered relevant and reasonably necessary to determine the application'.

Has Taranaki Regional Council considered the size of the IMV and the risks to the local and regional environment if the IMV were to run aground or be breached in foul weather because we cannot see any 'safe harbour' available from the Ports of Nelson, Whanganui, Wellington or Taranaki where approaches or harbours are too shallow? In perilous circumstances perhaps the processed ore would have to be dumped to achieve safe passage? Are there plans above insurance requirements to lodge a sufficient bond for environmental reparations because TTRs insurance covers its assets and may not payout or cover environmental disasters?

An IMV Disaster Plan needs to be developed to cover all eventualities: sinking, hull breach, fire, fuel spillage, hijack, run-aground etc.

Attachment 10: Bathymetry in the Mine Area

The light blue area seaward boundary is the 30m isobath.

The red polygon outlines the proposed mining area.

The white area within the red polygon is the safe (more than 30m) operating zone.