THIS DOCUMENT IS IMPORTANT AND REQUIRES YOUR IMMEDIATE ATTENTION. If you are in any doubt about the contents of this document you should consult a person authorised under the Financial Services and Markets Act 2000 who specialises in advising on the acquisition of shares and other securities.

This document comprises a prospectus relating to Ferro-Alloy Resources Limited (the "**Company**") prepared in accordance with the Prospectus Rules.

This document has been filed with, and approved by, the Financial Conduct Authority (FCA) and made available to the public in accordance with Rule 3.2 of the Prospectus Rules. Applications have been made to the FCA for all of the ordinary shares in the Company (the "**Ordinary Shares**") to be admitted to the Official List of the UK Listing Authority (the "**Official List**") (by way of a standard listing under Chapter 14 of the listing rules published by the UK Listing Authority under section 73A of FSMA as amended from time to time (the "**Listing Rules**")) and to the London Stock Exchange plc (the "London Stock Exchange") for such Ordinary Shares to be admitted to trading on the London Stock Exchange's main market for listed securities (together, "**Admission**").

It is expected that Admission will become effective, and that unconditional dealings in the Ordinary Shares will commence, at 8.00am on 28 March 2019. Dealings in Ordinary Shares before Admission will be on a "when issued" basis and will be of no effect if Admission does not take place and such dealings will be at the sole risk of the parties concerned.

Investors should read this document in its entirety. In particular, your attention is drawn to Part II: "Risk Factors" for a discussion of the risks that might affect the value of your shareholding in the Company.

The Directors, whose names appear on page 46 and the Company accept responsibility for the information contained in this document. To the best of the knowledge of the Directors and the Company (who have taken all reasonable care to ensure that such is the case), the information contained in this document is in accordance with the facts and contains no omission likely to affect the import of such information.

FERRO-ALLOY
RESOURCES GROUP

FERRO-ALLOY RESOURCES LIMITED

Registered in Guernsey and operating in accordance with the provisions of Companies (Guernsey) Law, 2008 (as amended). Guernsey company registration number 63449

FUNDRAISING AND ADMISSION OF 312,978,848 ORDINARY SHARES OF NO PAR VALUE TO THE STANDARD LISTING SEGMENT OF THE OFFICIAL LIST AND TO TRADING ON THE LONDON STOCK EXCHANGE'S MAIN MARKET FOR LISTED SECURITIES

Save in respect of the Fundraising, the Company is not offering any Ordinary Shares nor any other securities in connection with Admission. This document does not constitute an offer to sell, or the solicitation of an offer to subscribe for or buy, any Ordinary Shares nor any other securities in any jurisdiction. The Ordinary Shares will not be generally made available or marketed to the public in the UK or any other jurisdiction in connection with Admission.

Shard Capital Partners LLP is authorised and regulated in the United Kingdom by the FCA and is advising the Company and no one else in connection with the Placing and Admission (whether or not a recipient of this document), and is acting exclusively for the Company. Shard Capital Partners LLP will not be responsible to any person other than the Company for providing the protections afforded to its customers, nor for providing advice in relation to Admission or the contents of this document. In particular, the information contained in this document has been prepared solely for the purposes of Admission and is not intended to inform or be relied upon by any subsequent purchasers of Ordinary Shares (whether on or off exchange) and accordingly no duty of care is accepted in relation to them. Without limiting the statutory rights of any person to whom this document is issued, no representation or warranty, express or implied, is made by Shard Capital Partners LLP as to the contents of this document. No liability whatsoever is accepted by Shard Capital Partners LLP for the accuracy of any information or opinions contained in this document, for which the Directors are solely responsible, or for the omission of any information from this document for which it is not responsible.

Application has been made for the Ordinary Shares to be admitted to a Standard Listing on the Official List. A Standard Listing will afford investors in the Company a lower level of regulatory protection than that afforded to investors in companies with a Premium

Listing which are subject to additional obligations under the Listing Rules.

It should be noted that the UK Listing Authority will not have the authority to (and will not) monitor the Company's compliance with any of the Listing Rules and/or any which the Company has indicated herein that it intends to comply with on a voluntary basis as far as is practicable or appropriate in the circumstances of the Company, nor to impose sanctions in respect of any failure by the Company to so comply.

Without prejudice to any obligation of the Company to publish a supplementary prospectus pursuant to section 87G of the FSMA or Rule 3.4 of the Prospectus Rules, the publication of this document does not create any implication that there has been no change in the affairs of the Group since, or that the information contained herein is correct at any time subsequent to, the date of this document. Notwithstanding any reference herein to the Company's website, the information on the Company's website does not form part of this document.

Overseas Investors

The distribution of this document in certain jurisdictions may be restricted. Accordingly, persons outside the United Kingdom who obtain possession of this document are required by the Company and the Directors to inform themselves about, and to observe, any restrictions as to the distribution of this document under the laws and regulations of their territory and observe any other formality prescribed in their territory. Neither the Company nor the Directors accept any responsibility for any violation of any of these restrictions by any other person.

The Placing Shares and Ordinary Shares have not been and will not be registered under the US Securities Act of 1933, as amended (the "Securities Act"), or the securities laws of any state or other jurisdiction of the United States or under applicable securities laws of Australia, Canada or Japan. Subject to certain exceptions, the Ordinary Shares may not be offered, sold, resold, transferred or distributed directly or indirectly, within, into or in the United States or to or for the account or benefit of persons in the United States, Australia, Canada, Japan or any other jurisdiction where such offer or sale would violate the relevant securities laws of such jurisdiction. This document does not constitute an offer to sell or a solicitation of an offer to purchase or subscribe for Ordinary Shares in any jurisdiction in which such offer or solicitation is unlawful or would impose any unfulfilled registration, publication or approval requirements on the Company. The Placing Shares and the Ordinary Shares may not be taken up, offered, sold, resold, transferred or distributed, directly or indirectly within, into or in the United States except pursuant to an exemption from, or in a transaction that is not subject to, the registration requirements of the Securities Act. There will be no public offer in the United States. The Company has not been and will not be registered under the US Investment Company Act pursuant to the exemption provided by Section 3(c)(1) or Section 3(c)(7) thereof, and investors will not be entitled to the benefits of that Act.

The distribution of this document in or into jurisdictions other than the United Kingdom may be restricted by law and therefore persons into whose possessions this document comes should inform themselves about and observe any such restrictions. Any failure to comply with these restrictions may constitute a violation of the securities laws of any such jurisdiction.

None of the Placing Shares and Ordinary Shares have been approved or disapproved by the United States Securities and Exchange Commission (the "SEC"), any state securities commission in the United States or any other regulatory authority in the United States, nor have any of the foregoing authorities passed comment upon or endorsed the merit of the offer of the Ordinary Shares or the accuracy or the adequacy of this Document. Any representation to the contrary is a criminal offence in the United States.

The Company is not subject to the reporting requirements of section 13 or 15(d) of the U.S. Securities Exchange Act of 1934, as amended (the "Exchange Act"). For so long as any Placing Shares and Ordinary Shares are "restricted securities" within the meaning of Rule 144(a)(3) of the Securities Act, the Company will, during any period in which it is neither subject to section 13 or 15(d) of the Exchange Act nor exempt from reporting pursuant to Rule 12g3-2(b) there under, provide, upon written request, to Shareholders and any owner of a beneficial interest in Ordinary Shares or any prospective purchaser designated by such holder or owner, the information required to be delivered pursuant to Rule 144A(d)(4) under the Securities Act.

Dated: 22 March 2019

CONTENTS

PART I
SUMMARY

Summaries are made up of disclosure requirements known as "Elements". These elements are numbered in Sections A-E (A.1-E.7).

This summary contains all the Elements required to be included in a summary for this type of securities and Issuer. Because some Elements are not required to be addressed, there may be gaps in the numbering sequence of the Elements.

Even though an Element may be required to be inserted in the summary because of the type of securities and Issuer, it is possible that no relevant information can be given regarding the Element. In this case a short description of the Element is included in the summary with the mention of "not applicable".

SECTION A – INTRODUCTION AND WARNINGS		
A.1	**Warning to investors**	This summary should be read as an introduction to this document. Any decision to invest in the Ordinary Shares should be based on consideration of this document as a whole by the investor. Where a claim relating to the information contained in this document is brought before a court the plaintiff investor might, under the national legislation of the Member States, have to bear the costs of translating this document before legal proceedings are initiated. Civil liability attaches only to those persons who have tabled this summary including any translation thereof but only if this summary is misleading, inaccurate or inconsistent when read together with the other parts of this document or it does not provide, when read together with the other parts of this document, key information in order to aid investors when considering whether to invest in such securities.
A.2	**Consent for inter-mediaries**	The Company has not given (and will not give) consent to use this document for subsequent resale or final placement of Ordinary Shares by financial intermediaries.

SECTION B – ISSUER		
B.1	**Legal and commercial name**	The legal and commercial name of the issuer is Ferro-Alloy Resources Limited.
B.2	**Domicile/ Legal form/ Legislation/ Country of incorpor-ation**	The Company was incorporated as a limited liability company with company registration number 383395 in the British Virgin Islands on 18 April 2000 and re-domiciled to Guernsey as a Guernsey non-cellular limited company with company registration number 63449 on 12 April 2017. The Company's principal place of business is Guernsey. The Company is subject to the City Code. The Existing Ordinary Shares of Ferro-Alloy Resources Limited have been listed on the Kazakhstan Stock Exchange (KASE) since 26 June 2017.
B.3	**Current operations / Principal activities**	The Company is the holding company of a mining and mineral processing business with operations located at the Balasausqandiq vanadium/polymetallic mineral deposit in Kyzylordinskaya Oblast in Southern Kazakhstan.

	and markets	Currently, the Group has two main business activities carried out by the Company's principal operating subsidiary TOO Firma Balausa (TFB): • the existing vanadium concentrate processing operation; and • the Balasausqandiq project **The Existing Concentrate Processing Operation** The existing concentrate processing operation is situated at the site of the Balasausqandiq vanadium deposit near Shieli, in Kyzylordinskaya Oblast in Southern Kazakhstan. The production facilities were originally created from a 15,000 tonnes per year pilot plant which had been constructed to test the proposed process which will be employed to treat the ore mined at Balasausqandiq. The pilot plant was then adapted to treat low-grade concentrates and is now in the process of being expanded and further adapted to treat a wider variety of raw-materials. Currently, two main types of raw material are being processed, namely vanadium-containing low-grade concentrates and spent catalysts which contain vanadium from the Demetallisation of oil in refineries. Production during the first half of 2018 was approximately 46 tonnes of vanadium pentoxide contained in ammonium metavanadate ("AMV"), a traded form of vanadium which is usually converted into vanadium pentoxide. In the third quarter of 2018 production amounted to 38 tonnes of vanadium pentoxide. AMV is generally sold at a small discount to the value of the contained vanadium pentoxide. The Group has already completed the first steps of a development plan which is expected to result in annualised production capacity increasing gradually to around 1,500 tonnes of contained vanadium pentoxide by the end of the first quarter of 2020. The development plan includes upgrades to infrastructure, an extension to the existing factory and the installation of equipment to increase the throughput and to add the facilities to convert AMV into vanadium pentoxide. **Balasausqandiq Project** The Balasausqandiq deposit is a large mineral deposit, expected to contain over 100 million tonnes of resource, containing vanadium as the principal product together with by-products, carbon, molybdenum, uranium, rare earth metals, potassium, and aluminium (the last two of which can be extracted as Potassium Alum and further processed into fertilizers). The geological resource has progressively been delineated in a number of exploration phases since its discovery in 1940 by Soviet era geo-scientists. More recently, FAR has carried out further exploration drilling, trial open-pit mining operations, and pilot plant optimisation studies using alternate metallurgical and mineral process treatment technologies. A full feasibility study in accordance with local Kazakhstan requirements has been completed and the resource estimate has been prepared on both the locally required GKZ basis and on the Western JORC basis. The resource is divided into five ore bodies, although only the first has been explored sufficiently, and sufficient records remain, to put it into the resource category under the JORC 2012 system of classification. This single ore-body is estimated to contain 24.3 million tonnes which, with normal mining dilution, is sufficient for the first eight years of operations. Ore-bodies 2 – 5 have been classified in the JORC 2012 system in the category of Exploration Targets and although further exploration is required to bring these into JORC resource categories, a total Vanadium JORC resource of over 100 million tonnes is considered to be a rational prediction by the consulting geologists in the Competent Person's Report. 100 million tonnes could contain the equivalent of around 670,000 tonnes of Vanadium Pentoxide, equal to almost five times the annual world production of 2017. A reserve on the JORC 2012 basis has been estimated only for ore-body number 1 ("OB1") which amounts to 23 million tonnes, not including the small amounts of near-surface oxidised material which is in the Inferred resource category. On the GKZ basis, the Reserves are estimated to be over 70m tonnes, sufficient for 20 years' production at the currently planned rates of production.

Development plan
The strategy of the Group is to develop both the Existing Processing Operation and the Balasausqandiq Project in parallel. Although they are located on the same site and use some of the same infrastructure, they are separate operations.

Expanding the Existing Concentrate Processing Operation will be simpler and quicker to accomplish. It is already profitable and yielding a small operating cash flow surplus. The plant is expected to reach its target annualised sustainable production of around 1,500 tonnes per year of vanadium pentoxide by the end of the first quarter of 2020. Further development after that is likely but will depend upon trading conditions at the time.

The Balasausqandiq project will take longer to develop and in spite of the size of the deposit, the Directors have decided to adopt a gradual development plan so that:

- expansions can take place in step with increases in world demand;
- technological risk will be reduced; and
- shareholder dilution will be reduced prior to the generation of substantial cash flows that can be used to fund later expansions.

It is therefore proposed that the Balasausqandiq Project will be implemented in two initial phases. The first phase (Phase 1) will be to treat 1 million tonnes of ore per year, producing some 5,600 tonnes per year of vanadium pentoxide, to be expanded shortly after (Phase 2) to a total of 4 million tonnes per year, bringing total production of vanadium pentoxide from this part of the business to 22,400 tonnes per year. This level of production is still small in comparison with the size of the deposit and further expansion after Phase 2 is likely but has not yet been planned. In view of the emerging shortage of vanadium production and higher long-term price expectations, the Directors will be considering whether the size of the Phase 1 operation should be expanded or built in an easily expandable modular form so as to bring forward the timing of the additional production.

Infrastructure
The site is already well served with road access, power and water but some further development is required to support both existing and planned operations and will be developed as a priority. These include:

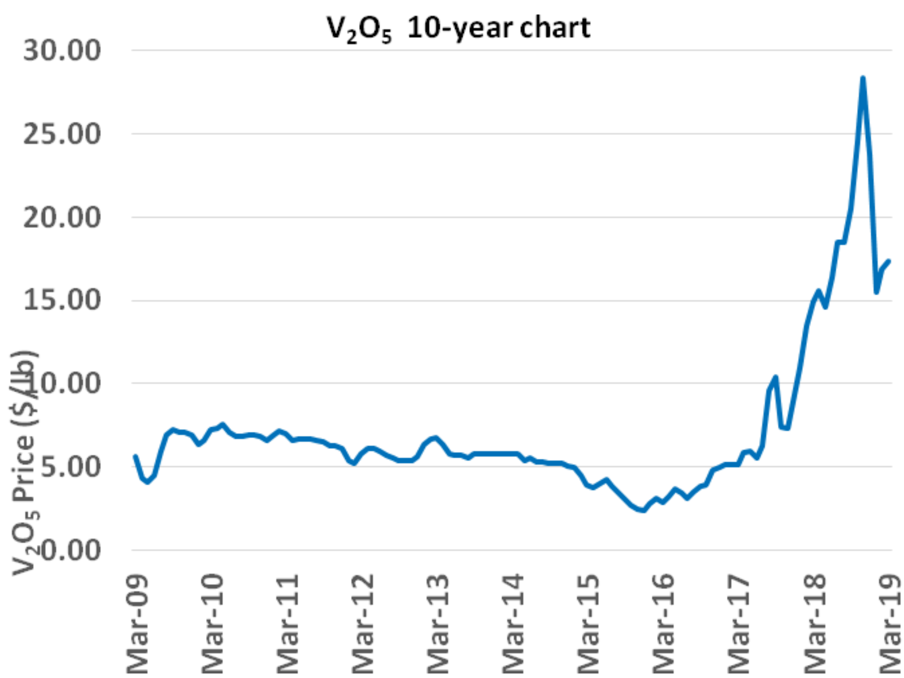
- Improved and expanded accommodation
- A railway siding and facilities to enable more efficient reception and storage of raw materials and reagents
- Connection to a nearby high voltage (110kV) electrical power supply.

Financial strategy
The phased approach allows the generation of earnings from earlier phases to partially finance the later stages so that the up-front capital to be raised and shareholder dilution are minimised.

The earliest route to increasing cash generation is to bring the capacity of the existing processing plant up to its planned maximum as soon as possible. This will be accomplished in steps and will not involve a major shutdown of operations so the anticipated capital cost of some $10m will be partly financed from earnings as the production steps up, leaving less than $5m to be financed from money raised from shareholders, subject to trading conditions.

Some of the proceeds of the IPO will be allocated to the start of detailed engineering for Phase 1 of the Balasausqandiq project and the enhanced earnings of the existing operation will be available to partially finance construction. Given the volatility of vanadium prices, it is difficult to predict the exact profile of funding but the directors believe that the residual finance required for Phase 1 will be met by an additional equity issue plus a corporate debt facility or the issue of a bond. Construction of Phase 2 is likely to be financed from the earnings of the existing processing operation plus Phase 1 of Balasausqandiq.

		Marketing The Group plans to expand the current processing plant and to start to convert its existing production of AMV into Vanadium Pentoxide. This will allow it to sell its production in a more commonly traded form and to obtain the full market price for Vanadium Pentoxide without the discount, typically about 15%, from the Vanadium Pentoxide price that applies to AMV. This will enable the Group to establish relationships with customers and provide a marketing base for the expanded production to be derived in due course from Phase 1 and Phase 2 of the production from Balasausqandiq. The directors believe that the current high price of vanadium is likely to continue in the short to medium term but that in the longer term, prices are likely to fall back to the range of US$8.00 to US$10.00 per lb of vanadium pentoxide, with US$7.50/lb being used for long term planning. In this scenario, the directors intend to capitalise on the Group's relatively low capital and operating costs to grow market share.

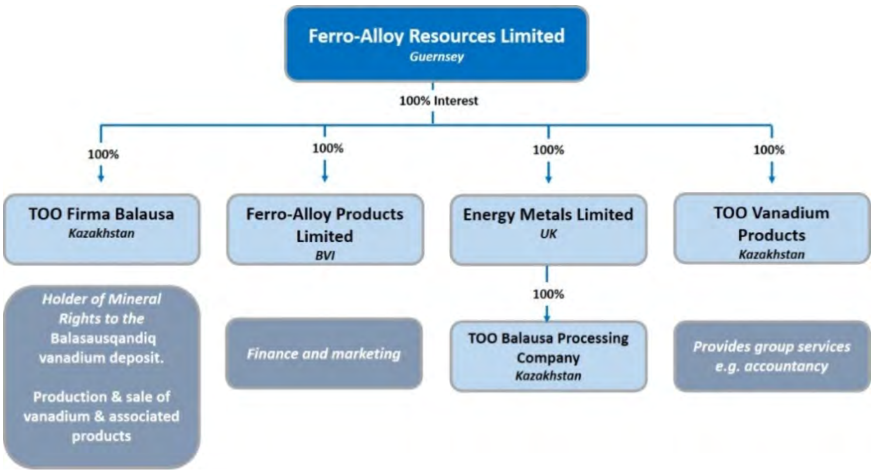
B.4	**Significant trends**	The vanadium pentoxide price recovered from the near record low of around $2.50/lb (Europe Flake 98%) at the end of 2015 to around $5.00/lb by the end of 2016. It rose to a peak of over $28 in late 2018 and on 15th March was quoted at around $16/lb.  **Vanadium Pentoxide (V2O5) Flake 98% - Europe – USD/lb** Source: FAR / SCP Analysts have suggested that there are two main factors that could be driving these rises. First, the Chinese government has revised standards for the tensile strength of construction steel products and second, at the same time, imposed a ban on vanadium slag and other vanadium-containing scrap imports. The new Chinese standard proposes eliminating 335MPa strength rebar and replacing it with 600MPa strength, further increasing the consumption of vanadium. The proposals are being implemented to improve the earthquake resistance of buildings after several devastating earthquakes in 2008. China's ban on imports of vanadium-containing scrap is one of a series of measures designed to curb the growing pollution problem in the country but which will reduce production from recycling sources.

Some 90% of global vanadium production is consumed by the global steel industry, where vanadium is used as an alloy to strengthen steel and improve high temperature performance. This is achieved by the addition of small amounts of vanadium to high carbon steel alloys, typically 0.15% to 1.5%, and high-performance tool steels which contain much higher levels of vanadium, typically 1-5%. Demand for vanadium for this purpose is growing as more countries adopt construction steel standards that require this type of steel.

A small but rapidly growing use for vanadium is as the electrolyte in Vanadium Flow Batteries which exploit the property of vanadium to occur in several oxidation states. This type of battery is particularly suited to fixed applications where large amounts of power are stored and regularly discharged, such as is required for daily storing solar and wind power and using for long periods during periods of darkness or periods of insufficient wind.

B.5 **Group structure**

Ferro-Alloy Resources Limited (FAR) is the holding company of the Group. It has five wholly owned subsidiaries.



TOO Firma Balausa (TFB) currently carries on all the Group's operations but it is planned that TFB will in future be solely concerned with mining at the Balasausqandiq deposit and will supply ore to its fellow-subsidiary, TOO Balausa Processing Company, which will carry on all the processing activities including both treating the ore from the mine at Balasausqandiq and the processing of purchased concentrates and secondary materials.

Ferro-Alloy Products Limited provides treasury services to the Group. TOO Vanadium Products Limited provides various administrative and consulting services to the group in Kazakhstan and it is planned that Energy Metals Limited will manage the processing activities of the Group.

B.6 **Major share-holders**

Each of the following persons, directly or indirectly, has a notifiable interest in the issuer's capital or voting rights based on the total number of voting rights of 312,978,848:

Name	No. of existing Ordinary Shares	Percentage of Existing Ordinary Shares	Number of Ordinary Shares on Admission	Percentage of Enlarged Share Capital
Andrey Kuznetsov	70,184,000	22.98%	70,184,000	22.42%
Nicholas Bridgen	64,738,800	21.19%	64,738,800	20.68%
Citadel Equity Fund Limited	41,913,600	13.72%	41,913,600	13.39%
AM2 (Bermuda) Limited	15,617,600	5.11%	15,617,600	4.99%

B.7	**Selected historical key financial information**	The tables below set out summary financial information of Ferro Alloy Resources Limited as derived from the audited consolidated financial information of the Company as at 31 December 2017 and as at 31 December 2016 and as at 31 December 2015. The Company's audited consolidated financial statements have been prepared in accordance with International Financial Reporting Standards (IFRS).

In the preparation of the 2017 Financial Statements the Company reconsidered the basis for impairment tests that had been performed in 2015 and 2016 in relation to property plant equipment, exploration and evaluation assets, intangible assets and inventory and made additional provision for impairment of those assets. Accordingly, the corresponding comparable figures for 2016 that appeared in the audited financial statements for the year ended 31 December 2017 were those restated figures and the adjustments to the previously audited figures for 2016 were audited. The financial statements set out below for 2016 are as restated in the 2017 financial statements. The financial statements summarised below for 2015 are the same as those originally prepared and audited at the time.

Audited Consolidated Statement of Profit or Loss and Other Comprehensive Income for the years ended 31 December 2017, 2016 and 2015.

	2017	**Restated 2016**	**2015**
	US$000	**US$000**	**US$000**
Revenue	1,132	292	127
Cost of sales	(1,084)	(645)	(105)
Gross profit (loss)	**48**	**(353)**	**22**
Other income	52	35	4
Administrative expenses	(908)	(875)	(1,138)
Distribution expenses	(64)	(14)	-
Other expenses	(124)	(47)	(554)
Loss from operating activities	**(996)**	**(1,254)**	**(1,666)**
Net finance costs	(84)	(51)	(681)
Loss before income tax	**(1,080)**	**(1,305)**	**(2,347)**
Income tax	**-**	**-**	**-**
Loss for the year	**(1,080)**	**(1,305)**	**(2,347)**
Other comprehensive income (loss)			
Items that will never be reclassified to profit or loss:			
Foreign currency translation differences	2	(11)	(2,019)
Loss and total comprehensive income for the year	**(1,078)**	**(1,316)**	**(4,366)**

Audited Consolidated Statement of Financial Position as at year ending 31 December 2017, 2016 and 2015.

	31 December 2017	Restated 31 December 2016	31 December 2015
	US$000	US$000	US$000
ASSETS			
Non-current assets			
Property, plant and equipment	79	58	2,967
Exploration and evaluation	-	-	184
Intangible assets	2	1	30
Long-term VAT receivable	91	-	-
Prepayments	52	36	37
Total non-current assets	**224**	**95**	**3,218**
Current assets			
Inventories	596	590	565
Trade and other receivables	47	102	14
Prepayments	15	10	9
Cash and cash equivalents	267	72	267
Total current assets	**925**	**774**	**855**
Total assets	**1,149**	**869**	**4,073**
EQUITY AND LIABILITIES			
Equity			
Share capital	15	15	15
Share premium	26,904	25,030	24,230
Additional paid-in capital	380		
Foreign currency translation	(2,672)	(2,674)	(2,664)
Accumulated losses	(24,238)	(23,158)	(18,698)
Total equity	**389**	**(787)**	**(2,883)**
Non-current liabilities			
Provisions	152	135	122
Total non-current liabilities	**152**	**135**	**122**
Current liabilities			
Loans and borrowings	-	392	115
Trade and other payables	608	1,129	953
Total current liabilities	**608**	**1,521**	**1,068**
Total liabilities	**760**	**1,656**	**1,190**
Total equity and liabilities	**1,149**	**869**	**4,073**

Audited Consolidated Statement of Cash Flows for the year ended 31 December 2017, 2016 and 2015.

	2017 US$000	Restated 2016 US$000	2015 US$000
Cash flows from operating activities			
Loss for the period	**(1,080)**	**(1,305)**	**(2,347)**
Adjustments for:			
Depreciation and amortisation	27	24	460
Impairment of property, plant and equipment and intangible assets	119	47	30
Impairment of exploration and evaluation	5	-	
Impairment of VAT receivables	4	25	97
Write down of inventories to net realisable value and obsolescence	39	60	-
Net finance costs (income)	84	51	681
Impairment of prepayments and trade receivables	45	9	-
Cash used in operating activities before changes in working capital	**(757)**	**(1,089)**	**(1,079)**
Change in inventories	(44)	(67)	(576)
Change in trade and other receivables, including VAT	(43)	(110)	(98)
Change in prepayments	(47)	(8)	10
Change in trade and other payables	(144)	268	660
Net cash used in operating activities	**(1,035)**	**(1,006)**	**(1,083)**
Cash flows from investing activities			
Acquisition of property, plant and equipment	(182)	(107)	(301)
Acquisition of intangible assets	(1)		
Net cash used in investing activities	**(183)**	**(107)**	**(301)**
Cash flows from financing activities			
Proceeds from issue of share capital	1,747	702	1,056
Proceeds from borrowings	20	246	543
Repayment of loans and borrowings	(368)	-	(10)
Net cash from financing activities	**1,399**	**948**	**1,589**
Net increase/(decrease) in cash and cash equivalents	**181**	**(165)**	**205**
Cash and cash equivalents at beginning of	72	267	30
Effect of movements in exchange rates on cash and cash equivalents	14	(30)	32
Cash and cash equivalents at the end of the year	**267**	**72**	**267**

Unaudited Consolidated Interim Condensed Statement of Profit or Loss and Other Comprehensive Income for the nine-month period ended 30 September 2018

	Unaudited nine-month period ended 30 September 2018 US$000	Unaudited nine-month period ended 30 September 2017 US$000
Revenue	3,259	1,032
Cost of sales	(1,172)	(696)
Gross profit (loss)	**2,087**	**336**
Administrative expenses	(950)	(776)
Distribution expenses	(87)	(40)
Other expenses	(1)	(93)
Results from operating activities	**1,049**	**(573)**
Net finance income (costs)	(3)	19
Income (loss) before income tax	**1,046**	**(554)**
Income tax	(1)	-
Income (loss) for the period	**1,045**	**(554)**
Other comprehensive income (loss)		
Items that will never be reclassified to profit or loss:		
Foreign currency translation differences	(161)	141
Total comprehensive income (loss) for the period	**884**	**(413)**

Unaudited Consolidated Interim Condensed Statement of Financial Position as at 30 September 2018

	Unaudited 30 September 2018	31 December 2017
	US$000	US$000
ASSETS		
Non-current assets		
Property, plant and equipment	347	79
Intangible assets	1	2
Long-term VAT receivable	194	91
Prepayments	13	52
Total non-current assets	**555**	**224**
Current assets		
Inventories	612	596
Trade and other receivables	981	47
Prepayments	303	15
Cash and cash equivalents	274	267
Total current assets	**2,170**	**925**
Total assets	**2,725**	**1,149**
EQUITY AND LIABILITIES		
Equity		
Share capital	27,306	15
Share premium	-	26,904
Additional paid-in capital	380	380
Foreign currency translation reserve	(2,833)	(2,672)
Accumulated losses	(23,193)	(24,238)
Total equity	**1,660**	**389**
Non-current liabilities		
Provisions	139	152
Total non-current liabilities	**130**	**152**
Current liabilities		
Trade and other payables	926	608
Total current liabilities	**926**	**608**
Total liabilities	**1,065**	**760**
Total equity and liabilities	**2,725**	**1,149**

Unaudited Consolidated Interim Condensed Statement of Cash Flows for the nine-month period ended 30 September 2018

	Unaudited nine-month period ended 30 September 2018 US$000	Unaudited nine-month period ended 30 September 2017 US$000
Cash flows from operating activities		
Income (loss) for the period	**1,046**	**(554)**
Adjustments for:		
Depreciation and amortisation	28	8
Loss on write-off of property, plant and equipment	16	-
Net finance income (costs)	(3)	19
Cash from operating activities before changes in working capital	**1,087**	**(527)**
Change in inventories	(16)	(275)
Change in trade and other receivables	(1,037)	(299)
Change in prepayments	(249)	6
Change in trade and other payables	318	115
Income tax paid	(1)	-
Net cash from operating activities	**102**	**(980)**
Cash flows from investing activities		
Acquisition of property, plant and equipment and intangible assets	(341)	(3)
Net cash used in investing activities	**(341)**	**(3)**
Cash flows from financing activities		
Proceeds from issue of share capital	387	1,498
Proceeds from borrowings	-	45
Net cash from financing activities	**387**	**1,543**
Net increase/(decrease) in cash and cash equivalents	**148**	**560**
Cash and cash equivalents at 1 January	267	72
Effect of movements in exchange rates on cash and cash equivalents	(141)	84
Cash and cash equivalents at 30 September	**274**	**716**

Background

The Ferro-Alloy Resources Group has been carrying out preparatory work towards developing the Balasausqandiq vanadium deposit and associated processing facilities. To this end, a pilot plant was constructed to test the proposed process for treating ore from Balasausqandiq and after the successful conclusion of that test programme the pilot plant was adapted to treat purchased vanadium-containing concentrates as a means of generating a cash flow for the Group while development of the Balasausqandiq project continued. This operation to treat purchased concentrates is now referred to as the Group's "current processing operation" to distinguish it from the development of the Balasausqandiq project which is separate but shares the same site and infrastructure.

Overview of trading and financial position of the Group in the three years ended 31 December 2017 and the nine months to 30 September 2018

In the first months of 2015 the company was operating a pilot plant which had been built to test the proposed process for the treatment of ore from the Group's Balasausqandiq vanadium deposit as part of the feasibility study for the development of a mine and associated processing plant. After completion of testing, the plant was closed and the decision was made to modify it to treat purchased concentrates which, being of higher grade, would enable the plant to reach a commercial level of production. The development plan was to make the minimum changes necessary to prove technical feasibility, following which the plant would be expanded to a more commercial level of output. The modifications were carried out during the remainder of 2015 and in addition, work continued on the feasibility study for the Balasausqandiq project, 15,000 tonnes of ore was mined as required by the Subsoil Use Contract, and a small revenue was obtained from the sale and delivery of associated waste as gravel for construction purposes.

No sales of vanadium products were made during 2015 but revenue of $126,722 was received from the sale of gravel and associated delivery services. The loss for the year amounted to $2.3 million, with a further loss on foreign currency translation, principally due to the depreciation of the Kazakhstan tenge, of $2.0m.

In 2016 work on the feasibility study for the Balasausqandiq project continued and the first sales of vanadium products from the modified pilot plant in the forms of ammonium metavanadate and red-cake began in mid year. Sales revenue of $237,560 from vanadium products was limited by the low level of production from the still-experimental plant and exceptionally low vanadium prices. Sales revenue from gravel and transportation services amounted to a further $54,729, giving a net loss for the year of $1.3m.

The operation of the plant demonstrated the technical feasibility of the plan and work was then undertaken to de-bottleneck and expand the operation to a more economically attractive scale. In 2017 this initial phase was accomplished and at the same time vanadium prices started to recover. The price of vanadium pentoxide started the year at around $5.00/lb and rose to nearly $10.00/lb by the end of the year. The Group then embarked on the plan to expand production to commercial levels, part of which was to test and procure suitable equipment for the treatment of a broader range of, and higher grade, concentrates. In 2017 150 tonnes of higher grade materials were procured and tested, and the first new equipment was ordered late in the year.

In July 2017 the Company's shares were listed on the Kazakhstan Stock Exchange, "KASE", and during the year the company raised $1.7m from new investors which enabled the Group to repay all borrowings and continue development of both the current processing operation and the development of the Balasausqandiq project. In 2017 the Group achieved Revenue of $1.1m and a net loss for the year of $1.1m.

During the first nine months of 2018 the price of vanadium products increased further to over US$22/lb by the end of the period. Production also increased over the course of the period, with production in the first three quarters of 2018 amounting to 19 tonnes, 27 tonnes and 38 tonnes respectively of vanadium pentoxide (contained in AMV), causing a significant increase in profitability. Revenue for the nine month period amounted to US$3.3m and net earnings amounted to US1.1m. As a result of the steep increase in vanadium prices and the good performance of the plant the Company embarked on a more significant expansion plan targeting production of 1,500 tonnes per year of vanadium pentoxide by the end of the first quarter of 2020 at a total cost, including significant infrastructure improvements that will equally serve the main Balasausqandiq project, of US$10.3m. The first steps have already been taken at a cost of some US$550,000 including infrastructure improvements and additional processing and mobile equipment.

Save for the above, there have been no other significant changes to the Group's financial condition and operating results during or subsequent to the period covered by the historical key financial information provided.

B.8	**Selected key pro forma financial information**	Not applicable.
B.9	**Profit forecast or estimate**	Not applicable. No profit forecast or estimate is being made.
B. 10	**Qualified audit report**	The audit report on the consolidated financial statements of the Company as at year ended 31 December 2017 did not contain any qualifications. The auditors' reports on the consolidated financial statements for the year ended 31 December 2016 which were issued on 17 May 2017 and for the year ended 31 December 2015 issued on 14 December 2016 were qualified for the reason that the management had not performed a formal estimate of the recoverable amount for the Group's property, plant and equipment, intangible assets, exploration and evaluation assets and inventory balances and that the recoverable amounts may have been lower than the carrying amounts. Management had considered that the basis for such an adjustment would have been speculative and the cost of carrying out the assessment and the professional review that would have been required to substantiate it was disproportionate to its value to shareholders. During the preparation of the consolidated financial statements for the year ended 31 December 2017 management reconsidered the impairment tests as at the 31 December 2017, 2016 and 2015 and under the corrected assumptions considered the value of those assets to be nil due to the fact that at the relevant time when those financial statements had been drawn up the Group had been operating in a start-up phase for several years, had a history of losses, and was still in the process of testing and changing the technologies to be used. Consequently, the financial statements for the year ended 31 December 2017 were restated, together with the comparative information for 2016, with the result that the auditors issued an unqualified audit report on those financial statements. The effect on the financial statements for the year ended 31 December 2015 was not quantified as management believed that such historic information would not be of benefit to shareholders. The principal effects of the restatement of the 2016 financial statements were to reduce the opening Total Assets at 1 January 2016 by US$3,155,000 to US$918,000 and the closing Total Assets at 31 December 2016 by US$2,937,000 to US$869,000. The loss for the year 2016 was reduced by US$218,000 to US$1,305,000 and the foreign currency translation differences were reduced by US$55,000 from a gain of US$44,000 to a loss of US$11,000.
B. 11	**Working capital explanation**	In the opinion of the Company, the Group does not have sufficient working capital for its present requirements, that is for at least 12 months following the date of this document. *Sources of funds* The Group is operating profitably and has enough working capital to meet its liabilities and to carry on in business for the foreseeable future, but will require additional finance to meet the capital expenditure plans set out in the Competent Person's Report and in this Prospectus. The expected expenditure on the development strategy, and the expected means by which it will be financed, are as follows (all figures in rounded US$m):

	Expansion of current processing	**Phase 1 (1Mtpa)**	**Phase 2 (4 Mtpa)**
Initial equity funding (after issue costs)	$5m	$1m	-
Additional equity funding		$27m	-
Debt or bond	-	$58m	-
Funded from retained earnings	$5m	$14m	$225m
Total capital requirement	**$10m**	**$100m**	**$225m**

Timing

In the above financing plan, it is envisaged that the expenditure on the expansion of current operations, which is already underway, will be completed by the end of 2019 with commissioning extending into the first quarter of 2020. However, the directors believe that from around May 2019, earnings after meeting all operational expenditure will be sufficient to finance the remaining capital expenditure on the expansion of current operations and also start to contribute to the Phase 1 capital expenditure. The initial equity funding, together with such excess cash flows from current operations, is expected to be sufficient to finance the development plan until around the third quarter of 2019 whereupon the additional equity funding and corporate borrowing or bond issue must be in place in order to keep to the schedule. Significant expenditure on Phase 2 is not expected to start until 2022 by which time earnings from the first two operations are expected to be sufficient to provide the finance.

The directors are confident that this plan is achievable, or that in the event of some part of the plan not being realised, a modified version can achieve substantially the same result. However, there is some uncertainty in each of the components of the funding.

Additional equity funding

The above financing plan assumes a contribution from initial equity funding of $6.4m (£4.8m) net of issue costs, leaving further equity to be raised of $26.6m (£20.0m). In the absence of such additional equity funding, the Company will have sufficient funds to carry out the planned expansion of the current processing plant and raise production and therefore earnings significantly, but the further amounts required to finance the Phase 1 of the Balasausqandiq project will not be available on the schedule envisaged unless financed by alternative means as discussed below.

Debt or bond issue

Because the Group is operating profitably, and the level of such profits is forecast to rise significantly as the Group steps up production during the period from now until the end of the first quarter of 2020, the directors believe that an issue of a listed corporate bond or the raising of corporate debt amounting to US$58m is likely be possible on the basis that the servicing of such bond or debt is to be made from operating earnings, obviating the need to secure project finance. The currently envisaged schedule shows the need for such borrowing to arise around the final quarter of 2019. However, the amount that it is possible to borrow in this manner is dependent on the operating earnings of the Group and is subject to market conditions at the time.

Retained earnings

The amount of retained earnings which will be available for investment and to support the servicing of debt is dependent on trading conditions. The directors have considered cash flow forecasts for the group in the light of independent forecasts of vanadium prices and have assessed the availability and pricing of raw materials and the Group's production plans. The directors believe that the amounts of earnings included in this financing plan have been conservatively assessed but there can be no certainty that the product selling prices, the cost of raw material purchases, or the production of vanadium will be as assumed throughout the relevant period of time.

Effect of a shortfall in the financing plan

The effect of any shortfall in any of the three components of the financing plan discussed above would, in the absence of any compensating changes to the plan, result in some delay in the completion of the Group's expansion plans. However, any shortfall may be met by some combination of acceleration in the timing of the raising of equity, debt or issue of a bond and an increase in the amount of such equity, borrowing or bond. In such circumstance the Company will seek to avoid any delay in the project schedule. In the event of a severe shortfall in these financing plans the directors can consider an increased equity raise if circumstances are favourable or, as a last resort, the deferral of the expenditure plans so that a greater proportion can be financed from retained earnings.

SECTION C – SECURITIES		
C.1	**Description of the type and the class of the securities being offered**	The securities subject to Admission are Ordinary Shares of no par value which are registered with ISIN number GG00BGDYDZ69 and SEDOL number: BJVNZ49.
C.2	**Currency of the securities issue**	Following Admission the price of the Ordinary Shares will be quoted on the London Stock Exchange in pounds sterling.
C.3	**Issued share capital**	The issued share capital of the Company on Admission will consist of 312,978,848 fully paid Ordinary Shares.
C.4	**Rights attached to the ordinary shares**	Each Ordinary Share ranks pari passu for voting rights, dividends and return of capital on winding up. Every Shareholder present in person, by proxy or by a duly authorised corporate representative at a general meeting of the Company shall have one vote on a show of hands and, on a poll, every Shareholder present in person, by proxy, or by a duly authorised corporate representative shall have one vote for every Ordinary Share of which he is the holder. The Company must hold an annual general meeting each year in addition to any other general meetings held in the year. The Directors can call a general meeting at any time. All members who are entitled to receive notice under the Articles must be given notice.
C.5	**Restrictions on transfer-ability**	There are no restrictions. All Ordinary Shares, including the Placing Shares are freely transferable.
C.6	**Application for admission to trading on a regulated market**	Application has been made for the Ordinary Shares to be admitted to the Official List of the UKLA by means of a Standard Listing and to trading on the Main Market of the London Stock Exchange. It is expected that Admission will become effective and that unconditional dealings will commence on the London Stock Exchange at 8.00am on 28 March 2019.
C.7	**Dividend policy**	The Company's present plan is to retain any earnings for future use within its business operations. Therefore, the Company does not expect to pay dividends in the immediate future. However, it is the Board's intention to efficiently return capital to Shareholders as and when sufficient capital reserves allow.

SECTION D – RISKS		
D.1	**Key information on the key risks that are specific to the**	***Risk of failure to obtain additional financing to complete its planned development*** The Group does not have sufficient working capital for its requirements for the next two years. *Sources of funds* The Group is operating profitably and has enough working capital to meet its liabilities and

issuer or its industry

to carry on in business for the foreseeable future, but will require additional finance to meet the capital expenditure plans set out in the Competent Person's Report and in this Prospectus.

The expected expenditure, and the expected means by which it will be financed, are as follows (all figures in US$m):

	Expansion of current processing	**Phase 1 (1Mtpa)**	**Phase 2 (4 Mtpa)**
Initial equity funding (after issue costs)	$5m	$1m	-
Additional equity funding		$27m	
Debt or bond	-	$58m	-
Funded from retained earnings	$5m	$14m	$225m
Total capital requirement	**$10m**	**$100m**	**$225m**

Timing
In the above financing plan, it is envisaged that the expenditure on the expansion of current operations, which is already underway, will be completed by the end of 2019, with commissioning extending into the first quarter of 2020. However, the directors believe that from around May 2019, earnings, after meeting all operational expenditure, will be sufficient to finance the remaining expenditure on the expansion of current operations and also start to contribute to the Phase 1 capital expenditure. The initial equity funding, together with such excess cash flows from current operations, is expected to be sufficient to finance the development plan until around the third quarter of 2019 whereupon the additional equity funding, corporate borrowing or bond issue must be in place in order to keep to the schedule. Significant expenditure on Phase 2 is not expected to start until 2022 by which time earnings from the first two operations are expected to be sufficient to provide the finance.

The directors are confident that this plan is achievable, or that in the event of some part of the plan not being realised, a modified version can achieve substantially the same result. However, there is some uncertainty in each of the components of the funding.

Additional equity funding
The above financing plan assumes a contribution from initial equity funding of $6.4m (£4.8m) net of issue costs, leaving further equity to be raised of $26.6m (£20.0m). In the absence of such additional equity funding, the Company will have sufficient funds to carry out the planned expansion of the current processing plant and raise production and therefore earnings significantly, but the further amounts required to finance the detailed engineering of Phase 1 of the Balasausqandiq project and subsequently its development will not be available on the schedule envisaged unless financed by alternative means as discussed below.

Debt or bond issue
Because the Group is operating profitably, and the level of such profits is forecast to rise significantly as the Group steps up production during the period from now until the end of the first quarter of 2020, the directors believe that an issue of a listed corporate bond or the raising of corporate debt amounting to US$58 million is likely to be possible on the basis that the servicing of such bond or debt is to be made from operating earnings, obviating the need to secure project finance. The currently envisaged schedule shows the need for such borrowing to arise around the final quarter of 2019. However, the amount that it is possible to borrow in this manner is dependent on the operating earnings of the Group and is subject to market conditions at the time.

Retained earnings
The amount of retained earnings which will be available for investment and to support the servicing of debt is dependent on trading conditions. The directors have considered cash flow forecasts for the group in the light of independent forecasts of vanadium prices and have assessed the availability and pricing of raw materials and the Group's production plans. The directors believe that the amounts of earnings included in this financing plan have been

conservatively assessed but there can be no certainty that the product selling prices, the cost of raw material purchases, or the production of vanadium will be as assumed throughout the relevant period of time.

Effect of a shortfall in the financing plan
The effect of any shortfall in any of the three components of the financing plan discussed above would, in the absence of any compensating changes to the plan, result in some delay in the completion of the Group's expansion plans. However, any shortfall may be met by some combination of acceleration in the timing of the raising of equity, debt or issue of a bond and an increase in the amount of such equity, borrowing or bond. In such circumstance the Company will seek to avoid any delay in the project schedule. In the event of a severe shortfall in these financing plans the directors can consider an increased equity raise if circumstances are favourable or, as a last resort, the deferral of the expenditure plans so that a greater proportion can be financed from retained earnings.

Permitting risks
Mining operations are subject in Kazakhstan, as well as in other jurisdictions, to significant control by authorities. Ownership of the subsoil is retained by the State and private enterprises obtain mining rights via licences and contracts, the terms of which must be complied with. The terms of these licences and contracts as well as other legislation require many permits and other approvals of mining activity, many of which require regular renewal. Kazakhstan has recently introduced a new Subsoil Code and other procedures are being changed but some of the detailed procedures implementing the new regulations have not been published and are subject to varying interpretations. Failure to adhere to the terms of subsoil contracts and licences can result in suspension and ultimately cancellation. In such event mining operations would have to cease. Failure to obtain appropriate permits in a timely manner could cause delays to the project schedule and meeting the qualifying criteria or the terms of such permits could involve unplanned expenditure.

Inaccurate estimates of reserves or resources
The Company's estimates of its resources and reserves may be inaccurate. These are subject to a number of assumptions, including the price of commodities, production costs and recovery rates. Fluctuations in the variables underlying the estimates may result in material changes to its reserve estimates which may have a materially adverse impact on the financial condition and prospects of the Company.

The Company's relationship with the Directors and conflicts of interest
The Company is dependent on the Directors to execute its corporate strategy. Each of the Directors is currently, or may in future become, affiliated with, or has financial interests in, entities engaged in business activities similar to those intended to be conducted by the Company. The Directors may become aware of business opportunities that may be appropriate for presentation to the Company but may be obliged also to present these business opportunities to other entities with which they are or may be affiliated, in addition to presenting them to the Company. Due to these existing or future affiliations, the Directors may have fiduciary obligations to present potential acquisition opportunities to more than one entity which could cause additional conflicts of interest.

The ore processing plant may not work as intended
The Company is at an early stage of development. The processes that the Company plans to use for the processing of vanadium ore mined at Balasausqandiq have only been proven in a pilot processing plant and may ultimately prove not to be as efficient or commercially viable when scaled up in the commercial processing plant.

Failure to achieve definitive supply agreements
The Company aims to sign supply agreements with companies with vanadium-bearing concentrates and other raw materials to feed its existing concentrate processing plant which is to be significantly expanded. Whilst the Company has secured sufficient supplies so far, there is no certainty that the Company will be able to sign supply agreements in future or that they will be on commercial terms acceptable to the Directors.

		Alternative technology While the Directors believe that the Company's planned processing methods will result in lower costs than other producers, it is possible that an existing or new technology will provide better results. ***Early stage of operations and reliance on management*** The Company is at an early stage of operations. Although the Company has commenced processing Vanadium concentrates and other Vanadium-bearing raw-materials procured from third party suppliers, it has not yet completed the expansion of this processing plant nor commenced commercial operations to mine and treat ore from its own mine. It is therefore difficult to predict the future performance and prospects of the Group. There can be no assurance that the Company's proposed operations will be profitable or produce a reasonable return on investment. ***Product price volatility*** The Group's main product is Vanadium (in several forms), the price of which is very volatile on world markets. There is a risk that the world prices of Vanadium may fall to levels which are uneconomic to produce. ***Reliance on management*** The Company is reliant in particular on the abilities of the executive directors Nick Bridgen and Andrey Kuznetsov to execute the Company's strategy and on their success in generating future operating revenues.
D.3	**Key information on the key risks that are specific to the securities**	External perceptions of the jurisdiction in which the Group operates with respect to political and economic instability and civil unrest may have an adverse effect on the market value of securities of issuers operating in that jurisdiction, including the Ordinary Shares. The issuance of additional Ordinary Shares in connection with future acquisitions, future capital raises, any share incentive or share option plan or otherwise may dilute all other shareholdings and their voting interest. The market price for the Ordinary Shares may be volatile and subject to wide fluctuations in response to numerous factors, many of which are beyond the Group's control. Financial markets have experienced significant price and volume fluctuations in the last several years that have particularly affected the market price of equity securities of companies. In many cases, those fluctuations have been unrelated to the operating performance, underlying asset values or prospects of such companies. To date the Company has not declared or paid any dividends on the Ordinary Shares. The Company currently intends to retain future earnings for future operations, expansion and debt repayment, if necessary. The Company's ability to pay dividends in the future could be limited by covenants contained in agreements governing any indebtedness that the Group may have at the time. On a winding-up of the Company, holders of the Ordinary Shares will be entitled to be paid a distribution out of the assets of the Company available to its members only after the claims of all creditors of the Company have been met. Application has been made for the Ordinary Shares to be admitted to the standard segment of the Official List. A standard listing affords shareholders and investors in the Company a lower level of regulatory protection than that afforded to investors in companies whose securities are admitted to the premium segment of the Official List, which are subject to additional obligations under the Listing Rules.

SECTION E – FUNDRAISING		
E.1	**Total net proceeds /estimate of expenses**	After deducting commissions and other estimated fees and expenses incurred in connection with the Fundraising of approximately £5,255,433, the Company expects to receive net proceeds of £4,787,686. A further £10,436 was received in the KASE Subscription, or £9,914 after estimated fees and expenses. The total costs (including fees and commissions, but exclusive of VAT) payable by the Company in connection with Admission are estimated to be £594,747, plus a further £522 in respect of the KASE Subscription.
E.2	**Reasons for the Offer and use of proceeds**	The net proceeds of the Fundraising will be used (a) to adapt and expand the existing processing plant to enable it to treat higher grade secondary vanadium-containing materials with a view to increasing production in stages to around 1,500 tonnes per year of vanadium pentoxide; (b) to carry out the remaining testing and design criteria for the planned development of the Balasausqandiq vanadium deposit.; (c) to make certain improvements to the infrastructure that will benefit both existing operations and the planned development of Balasausqandiq including augmentation of electricity supplies, a new accommodation block and a railway unloading spur. The Board considers the net proceeds of the Fundraising should be sufficient to cover both the expenses and any other costs associated with the proposed use of Proceeds.

Use of Proceeds

The following are estimated figures in US dollars, converted to UK£ at an exchange rate of US$1.3271:UK£1.00

	US$000	**UK£000**
Expansion of existing processing operations		
Railway siding, unloading facilities and storage	445	335
Connection to HV powerline, transformers and reticulation	2,688	2,025
Worker accommodation and office building	477	359
Evaporation ponds	343	258
Main process building expansion	1,249	941
Expansion of main process plant, leaching circuits, etc.	2,430	1,831
Ovens and other equipment to convert AMV to vanadium pentoxide	668	503
Warehouses, laboratories, security etc	474	357
Mobile equipment and vehicles	290	219
Allowance for unforeseen items	1,200	904
Total expansion of existing processing operations	**10,264**	**7,732**
Less: to be financed from operating earnings	-4,714	-3,552
Less: already completed by 31 October 2018	-550	-414
Total for expansion of current operations	**5,000**	**3,766**
Balasausqandiq Phase 1 preparations		
Final test-work and design criteria	800	603
Other preparatory work	569	429
Total for Phase 1 preparations	**1,369**	**1,032**
Overall total	**6,369**	**4,798**

Note
The above figures include delivery, installation, commissioning and contingency

E.3	**Terms and conditions of the offer**	The Fundraising will comprise the Placing and the KASE Subscription. 20% of the total will be offered in the KASE Subscription in Kazakhstan. Any Ordinary Shares subscribed for in the KASE Subscription will reduce the number of Ordinary Shares available for the Placing. The Fundraising will be made at the Placing Price and is conditional upon Admission occurring and becoming effective, as specified below. Admission is conditional on the receipt of irrevocable commitments from investors for the raising of net proceeds of US$5m (£3.8m) from the Fundraising after costs relating to the Listing. The Fundraising is only available to investors who can make certain warranties and representations as to their status as an investor. An investor applying for Placing Shares in the Fundraising may elect to receive the Ordinary Shares in dematerialised form if such investor is a system-member in relation to CREST. Where applicable, definitive certificates in respect of the Ordinary Shares are expected to be dispatched by post to the relevant holders no later than 11 April 2019. Pursuant to the Placing, Ordinary Shares will be offered only outside the United States to certain institutional investors and other investors in Guernsey, the European Economic Area and elsewhere in reliance on Regulation S. Admission is expected to become effective, and unconditional dealings in the Ordinary Shares are expected to commence on the London Stock Exchange, at 8.00 a.m. (London time) on 28 March 2019. . The earliest date for settlement of such dealings will be 28 March 2019. These dates and times may be changed without further notice. The Placing is subject to the satisfaction of certain conditions contained in the Placing Agreement between the Company, the Directors and Shard Capital Partners including Admission occurring and becoming effective by 8.00 a.m. (London time) on 28 March 2019 (or such later date as may be determined in accordance with such agreement), and to the Placing Agreement not having been terminated. None of the Ordinary Shares may be offered for subscription, sale or purchase or be delivered, or be subscribed, sold or delivered, and this Prospectus and any other offering material in relation to the Shares may not be circulated in any jurisdiction where to do so would breach any securities laws or regulations of any such jurisdiction or give rise to an obligation to obtain any consent, approval or permission, or to make any application, filing or registration other than where such consents, approvals, permissions have already been obtained in connection with Admission.
E.4	**Material interests**	Not applicable; there are no interests, known to the Company, material to Admission or which are conflicting interests.
E.5	**Lock-up arrange-ments**	Pre-listing shareholders with a Notifiable Interest at Admission, who collectively hold Ordinary Shares representing in aggregate 56.50% of the Enlarged Share Capital, have agreed to an Orderly Market Agreement (OMA). Under the OMA these parties have undertaken to the Company and Shard Capital Partners LLP that, should they wish to dispose of any interest they hold in the Ordinary Shares for a period of 12 months following Admission, such disposal will be effected only through the broker for the time being of the Company or in such orderly manner as the broker may reasonably require with a view to maintaining an orderly market in the Ordinary Shares. The restrictions on the ability of the Directors and Citadel Equity Fund Limited to transfer their Ordinary Shares are subject to certain usual and customary exceptions including (as applicable): transfers for estate planning purposes; transfers to family members; the acceptance of a takeover offer.

<table>
<tr><td>E.6</td><td>Dilution</td><td>Shareholdings immediately prior to Admission will be diluted by 2.40 per cent. as a result of New Ordinary Shares issued pursuant to the Placing.

Furthermore, as at the date of this document, the number of Warrants that the Company has issued to subscribe for Ordinary Shares is as follows: -

<table>
<tr><th></th><th>Number of warrants</th><th>Percentage of Enlarged Share Capital</th><th>Exercise price</th><th>Exercise period</th></tr>
<tr><td>Advisor Warrants</td><td>64,285</td><td>0.021%</td><td>70 pence</td><td>Until 31 March 2021</td></tr>
<tr><td>Total</td><td>64,285</td><td>0.021%</td><td></td><td></td></tr>
</table>

Should Warrant Holders choose not to exercise their Warrants then they would likely face dilution in that their percentage ownership of the Company would fall if other shareholders choose to exercise their Warrants.</td></tr>
<tr><td>E.7</td><td>Expenses charged to investors</td><td>Nil.</td></tr>
</table>

PART II
RISK FACTORS

Any investment in the Ordinary Shares is speculative and subject to a high degree of risk. Prior to investing in the Ordinary Shares, prospective investors should carefully consider the risks and uncertainties associated with any investment in the Ordinary Shares, the Group's business and the industry in which it operates, together with all other information contained in this Prospectus, including, in particular, the risk factors described below. Any of the risks described below, as well as other risks and uncertainties discussed in this Prospectus, could have a material adverse effect on the Group's business and could therefore have a negative effect on the trading price of the Ordinary Shares. Prospective investors should note that the risks relating to the Group, its industry and the Ordinary Shares summarised in Part I: "Summary" are the risks that the Company believes to be the most essential to an assessment by a prospective investor of whether to consider an investment in the Ordinary Shares. However, as the risks which the Group faces relate to events and depend on circumstances that may or may not occur in the future, prospective investors should consider not only the information on the key risks summarised in Part I: "Summary" but also, among other things, the risks and uncertainties described below.

The following factors do not purport to be a complete list or explanation of all the risk factors involved in investing in the Ordinary Shares and should be used as guidance only. Additional risks and uncertainties that are not currently known to the Group, or that it currently deems immaterial, may individually or cumulatively also have an adverse effect on the Group's business, results of operations, financial condition and prospects. If this occurs, the price of the Ordinary Shares may decline and investors could lose all or part of their investment. Prospective investors should also consider carefully whether an investment in the Ordinary Shares is suitable for them in light of the information in this Prospectus and their personal circumstances.

1. RISKS RELATING TO WORKING CAPITAL

The Group does not have sufficient working capital for its requirements for the next two years.

Sources of funds
The Group is operating profitably and has enough working capital to meet its liabilities and to carry on in business for the foreseeable future, but will require additional finance to meet the capital expenditure plans set out in the Competent Person's Report and in this Prospectus.

The expected expenditure, and the expected means by which it will be financed, are as follows (all figures in rounded US$m):

	Expansion of current processing	**Phase 1 (1Mtpa)**	**Phase 2 (4 Mtpa)**
Initial equity funding (after issue costs)	$5m	$1m	-
Additional equity funding	-	$27m	-
Debt or bond	-	$58m	-
Funded from retained earnings	$5m	$14m	$225m
Total capital requirement	**$10m**	**$100m**	**$225m**

Timing
In the above financing plan, it is envisaged that the expenditure on the expansion of current operations, which is already underway, will be completed by the end of 2019, with commissioning extending into the first quarter of 2020. However, the directors believe that from around May 2019, earnings, after meeting all operational expenditure, will be sufficient to finance the remaining expenditure on the expansion of current operations and also start to contribute to the Phase 1 capital expenditure. The initial equity funding, together with such excess cash flows from current operations, is expected to be sufficient to finance the development plan until around the third quarter of 2019 whereupon the additional equity funding and corporate borrowing or bond issue must be in place in order to keep to the schedule. Significant

expenditure on Phase 2 is not expected to start until 2022 by which time earnings from the first two operations are expected to be sufficient to provide the finance.

The directors are confident that this plan is achievable, or that in the event of some part of the plan not being realised, a modified version can achieve substantially the same result. However, there is some uncertainty in each of the components of the funding.

Additional equity funding

The above financing plan assumes a contribution from initial equity funding of \$6.4m (£4.8m) net of issue costs, leaving further equity to be raised of \$26.6m (UK£20.0m). In the absence of such additional equity funding, the Company will have sufficient funds to carry out the planned expansion of the current processing plant and raise production and therefore earnings significantly, but the further amounts required to finance the detailed engineering of Phase 1 of the Balasausqandiq project and subsequently its development will not be available on the schedule envisaged unless financed by alternative means as discussed below.

Debt or bond issue

Because the Group is operating profitably, and the level of such profits is forecast to rise significantly as the Group steps up production during the period from now until the end of the first quarter of 2020, the directors believe that an issue of a listed corporate bond or the raising of corporate debt amounting to US\$58 million is likely to be possible on the basis that the servicing of such bond or debt is to be made from operating earnings, obviating the need to secure project finance. The currently envisaged schedule shows the need for such borrowing to arise around the final quarter of 2019. However, the amount that it is possible to borrow in this manner is dependent on the operating earnings of the Group and is subject to market conditions at the time.

Retained earnings

The amount of retained earnings which will be available for investment and to support the servicing of debt is dependent on trading conditions. The directors have considered cash flow forecasts for the group in the light of independent forecasts of vanadium prices and have assessed the availability and pricing of raw materials and the Group's production plans. The directors believe that the amounts of earnings included in this financing plan have been conservatively assessed but there can be no certainty that the product selling prices, the cost of raw material purchases, or the production of vanadium will be as assumed throughout the relevant period of time.

Effect of a shortfall in the financing plan

The effect of any shortfall in any of the three components of the financing plan discussed above would, in the absence of any compensating changes to the plan, result in some delay in the completion of the Group's expansion plans. However, any shortfall may be met by some combination of acceleration in the timing of the raising of equity, debt or issue of a bond and an increase in the amount of such equity, borrowing or bond. In such circumstance the Company will seek to avoid any delay in the project schedule. In the event of a severe shortfall in these financing plans the directors can consider an increased equity raise if circumstances are favourable or, as a last resort, the deferral of the expenditure plans so that a greater proportion can be financed from retained earnings.

2. RISKS RELATING TO THE NATURAL RESOURCES SECTOR

(a) Early stage of operations and reliance on management

The Company is at an early stage of development. Although the Company has commenced processing vanadium concentrates from third party suppliers, future revenues from the expansion of current operations and the production from the Company's own vanadium mine are difficult to predict and there is no guarantee that the Company's proposed operations will be profitable or produce a reasonable return, if any, on investment.

The Company is reliant on the abilities of the executive directors, Nick Bridgen and Andrey Kuznetsov, to execute the Company's strategy and their success in generating future operating revenues.

(b) Global supply and demand changes due to a potential economic downturn may adversely

affect the business, cash flows, results of operations, and financial condition of the Company

Global supply and demand, as well as trading activities by market participants, affect commodity prices which can be subject to substantial fluctuations and cannot be accurately predicted.

Furthermore, numerous governments and central banks have made substantial funds and guarantees available to boost liquidity and confidence in their financial systems. The continuing impact or the effect of the reversal or withdrawal of such programmes is uncertain.

In the event of a substantial global economic downturn, and if that downturn depresses the economy for the medium to long term, the Company's ability to grow or sustain revenues in the future years may be adversely affected, and with respect to certain long-term price levels for a given commodity, extractive operations may no longer be economically feasible.

(c) The potential for political, legal and commercial instability which is typical of an emerging country may affect the viability of the Company's operations

Changes in Kazakhstan's political landscape by civil and social pressures could cause regime change, policy reforms or changes in legal or governmental regulations. These changes may result in expropriation or nationalisation of a company's assets. Nullification or renegotiation concerning pre-existing concessions, agreements, leases and permits, changes to economic policies, including but not limited to taxes or royalty rates, or currency restrictions are all possibilities. Regional instability due to corruption, bribery and generally underdeveloped corporate governance polices have the potential to lead to similar consequences. These risks could have a materially adverse effect on the profitability, the ability to finance, or in extreme cases, the viability of an operation.

Moreover, political pressures and fiscal constraints could lead the government to impose higher taxes on operations in the natural resources sector. These taxes or other types of expropriation of assets could be imposed on the Company. The Company's earnings growth may be constrained by delays or shutdowns as a result of political, commercial or legal instability, and may be constrained if subjected to increased taxation or other expropriation. The ability of the Company to generate long term value for Shareholders could be impacted by these risks.

(d) A material decline in the vanadium price globally may adversely affect the Group's business, prospects, financial condition and results of operations

The Company's will derive most of its revenue from the processing of purchased vanadium-bearing materials and, in time, ore from the Company's own mine. Therefore, the Group's revenues, profitability and future rate of growth will depend substantially on the prevailing vanadium price which can be volatile and subject to fluctuation.

Although the uses for vanadium are expanding rapidly, and in particular there is a growing demand for vanadium for battery use, around 90% of current world vanadium production is used in making vanadium-bearing steel and the greater part of this production is for construction purposes. Chinese steel producers account for some 50% of demand. The Group's customers are expected to be either trading companies who sell into these markets or directly to steel producers. The international vanadium price, and the price the Group can expect for its production, is therefore highly dependent on world levels of construction and Chinese construction in particular.

Changes in the vanadium price will directly affect the Group's revenues and net income.

The vanadium price is subject to fluctuations and volatility in response to a variety of factors beyond the Group's control, including, but not limited to:

- changes in the global and regional supply and demand for vanadium;

- changes in global and regional economic conditions and exchange rate fluctuations;
- political, economic and military developments in vanadium producing regions (including China, South Africa, Brazil and Russia);
- the demand for high strength steel;
- geopolitical uncertainty;
- the extent of government regulation and actions, in particular export restrictions and import tariffs and taxes;
- the development, availability, price and acceptance of vanadium redox flow batteries and the need to store energy from renewable energy sources;
- potential influence on the vanadium price due to derivative transactions on commodity exchanges, over-the-counter markets and off-market transactions.

It is impossible to accurately predict future vanadium price movements. The Company can give no assurance that the existing vanadium price or the Company's assumed long-term forecast price will be maintained in the future. Any material decline in such price could result in a reduction of its net production revenue and a decrease in the valuation of its exploration, appraisal, development and production properties. The economics of production may change as a result of lower prices, which could result in a reduction in the production volumes. The Company may elect to reduce production or not to produce at lower prices. All of these factors could potentially result in a material decrease in the Company's net production revenue and the financial resources available to it to make planned capital expenditures, resulting in a material adverse effect on its future financial condition, business, prospects and results of operations.

In addition, should the vanadium price increase significantly, governments or other counterparties may want to change their commercial terms with the Group. This may result in cancellation, termination or a unilateral change of terms (such as a change in vanadium pricing policy or the renegotiation or nullification of existing agreements) by a government or counterparty, which could have a material adverse effect on the Group's future business, prospects, financial condition and results of operations.

(e) Currency exchange rate fluctuations may negatively affect the Company

The Company's financial statements and the management costs are stated in US dollars but a significant proportion of its ongoing operational costs will be denominated and determined in Kazakhstan's tenge. However, market prices for the commodities produced are internationally determined and so the Company expects that its future revenues will be significantly determined in US dollars and other currencies. Consequently, changes in the exchange rates of these currencies and the tenge may positively or negatively affect the Company's cash flows, operating results or financial condition to a material extent.

The Company does not intend to hedge its cash resources against risks associated with disadvantageous movements in the currency exchange rates.

(f) The Company's cash flows and results of operations may be adversely affected by inflation and other cost increases

The Company will be unable to control the market prices of any commodities produced in its operations and may be unable to pass increased production costs to customers. Therefore, significant inflation or other production cost increases in Kazakhstan could increase operational costs without a corresponding increase in the sales price of the commodities the Company may produce. Moreover, if input costs fall relatively little or slowly compared with decreasing commodity prices it will have a similar negative impact on the Company's operations. Any such elevated costs or postponements in cost reductions may negatively affect the Company's profitability, cash flows and results of operations.

(g) Activities in the mining sector can be dangerous and may be subject to interruption

The Group's operations are subject to the significant hazards and risks inherent in the mining sector and countries in which it operates. These hazards and risks include:

- pit wall instability, floods and other mining interruptions;
- operational disruptions in relation to the Company's exploration;
- discrepancies between the assessed reserves and their physical orientation compared with those estimated by the Company's geologists
- disruption to processing operations;
- accidents to employees in mining or processing or ancillary operations
- natural disasters or adverse conditions including severe weather, earthquakes, cyclones, excessive rainfall, heavy snowfall, floods, bridge or road washouts, droughts or epidemic and disease;
- chemical leakage and spills from the plant or storage containers;
- equipment break-downs and other mechanical or system failures;
- improper installation or operation of equipment;
- transportation accidents or disruption of deliveries of vanadium concentrates, fuel, equipment and other supplies;
- disruption of electricity, water and other utility services;
- acts of political unrest, war or terrorism;
- regulatory orders and penalties including those in respect of ecological or health and safety matters
- labour disputes; and
- community opposition activities.

If any of these events were to occur, they could result in environmental damage, injury to persons and loss of life and a failure to produce commodities in commercial quantities. They could also result in significant delays to development programmes, a partial or total shutdown of operations, significant damage to the Group's equipment and equipment owned by third parties and personal injury or wrongful death claims being brought against the Group. These events could also put at risk some or all of the Group's licences which enable it to operate, and could result in the Group incurring significant civil liability claims, significant fines or penalties, as well as criminal sanctions potentially being enforced against the Group and/or its officers.

(h) Safety, health and environmental exposures and related regulations may expose the Company to increased litigation, compliance costs, interruptions to operations, unforeseen environmental remediation expenses and loss of reputation

The extractive and processing industry is highly regulated by health, safety and environmental laws. The Company's operations may be subject to these kinds of governmental regulations in any region in which it operates. Operations are subject to general and specific regulations and restrictions governing production, mining and processing, land tenure and use, environmental requirements (including site specific environmental licences, permits and remediation requirements), workplace health and safety, social impacts and other laws.

The Company's operations may create environmental risks including dust, noise or leakage of polluting substances from its operations. Failing to adequately manage environmental risks or to provide safe working environments could cause harm to the Company's employees or the environment surrounding the operations site. Facilities are subject to closure by governmental authorities and the Company may be subject to fines and penalties, liability to employees and third parties for injury, statutory liability for environmental remediation and other financial consequences, which may be significant. The Company may also suffer impairment of reputation, industrial action or difficulty in recruiting and retaining skilled employees. Subsequent changes in regulations, laws or community expectations that govern the Company's operations could result in increased compliance and remediation costs. Any of the foregoing developments could have a materially adverse effect on the Company's results of operations, cash flows or financial condition.

(i) The Group's insurance and indemnities may not adequately cover all risks or expenses

At present, pending commencing trading, the Group carries no insurance in respect of its business operations except for those required by law in relation to the employer's liability to employees and third parties. In future, the Group may be unable to insure against certain risks on commercially acceptable terms and may be exposed under certain circumstances to uninsurable hazards and risks which may result in financial liability, property damage, personal injury or other hazards or liability for the acts or omissions of sub-contractors, operators and joint venture partners. Although indemnities may in future be provided by sub-contractors, operators and joint venture partners, such indemnities may be difficult to enforce given the financial positions of those giving the indemnities or due to the jurisdiction in which the Group may seek to enforce the indemnities, potentially leaving the Group exposed to claims by third parties.

There is also no guarantee that the Group will be able to maintain adequate insurance in future at rates the Group considers reasonable. Accordingly, the Group could incur substantial losses if an event which is not fully covered by insurance occurs, which would have a material adverse effect on the Group's business, results of operations and financial condition.

(j) Environmental liabilities could be significantly more than provided for

Although the Group is required to set aside funds for the rehabilitation of land disturbed by subsoil use activities the amount of these and similar costs might be more than anticipated. Significant liability could be imposed on the Group for damages, clean-up costs or penalties in the event of certain discharges into the environment, environmental damage caused by previous owners of properties purchased or used by the Group, acts of sabotage by third parties or non-compliance with environmental laws or regulations by the Group. Such liabilities could have a material adverse effect on the Group. Legislation to which the Group is subject is evolving and it is expected that additional environmental protection laws will be implemented in future. It is not possible to predict what future environmental regulations will provide or how they will be enforced but they could impose additional obligations on the Group which may, for example, result in the Group incurring significant expenditures for the installation and operation of pollution control systems, as well as equipment for remedial measures and a penalty regime in the event of a breach of those laws, which could adversely affect the Group's business, financial condition and results of operations.

Furthermore, no assurance can be given that changes to environmental laws and regulations outside the Group's control will not result in a curtailment of production, a material increase in the cost of production, development or exploration activities, or increase compliance and remediation costs or otherwise adversely affect the Group's business, financial condition, results of operations or prospects.

(k) Recovery, reserve and resource estimates may prove inaccurate and reporting standards may differ from the standards of other jurisdictions

There are numerous uncertainties the Group faces that are inherent in estimating quantities of resources and reserves and cash flows to be derived therefrom, including many factors that are beyond the control of the Group. Estimation of underground resources and reserves (which cannot be measured in an exact manner) is a subjective process aimed at understanding the statistical probabilities of recovery.

The interpretation and estimates of the amounts of reserves and resources are subjective and the results of exploration and estimation of future cash flows subsequent to the date of any particular estimate may result in substantial revisions to the original interpretation and estimates. Moreover, different geologists may make different estimates of reserves, resources and cash flows based on the same available data and may make different estimates depending on which classification system is adopted. Actual production, revenues and expenditures with respect to reserves and resources will vary from estimates and the variances may be material.

The estimates assume that the Group's assumptions as to its capital expenditure and operating costs are accurate and that the development plans of the Group are successfully implemented. There can be no assurance that actual capital expenditures will not vary significantly from current estimates or that the Group will be able to implement its development strategy on the timetable currently envisaged.

If the actual reserves or resources of the Group are less than the current estimates or of lesser quality than expected, the Group may not recover its initial outlay of capital expenditures and operating costs of any such operation and there may be a material adverse effect on the business, prospects, financial condition or results of operations of the Group.

(l) The Company's inability to discover new reserves or to upgrade existing exploration potential or other resource categories into reserves could adversely affect the Company's business

Further exploration and development work is necessary for the development of the Company's business. In particular, the upgrade through further exploration of the JORC-based Exploration Potential to Indicated resources and further to proven and probable reserve categories is not guaranteed and similarly, from C2 to C1, B and A categories in the GKZ system is not guaranteed. Failure to discover new reserves or upgrade other categories of exploration potential and resources to reserves in sufficient amounts and in a timely manner could materially and adversely affect the Company's results of operations, cash flows, financial condition and prospects.

Increasingly stringent requirements relating to regulatory, environmental and social approvals can result in significant delays in construction of additional facilities and may adversely affect the Company's development plans, the expansion of existing operations and, consequently, the Company's results of operations, cash flows and financial condition, and such effects could be material.

(m) The Company may be unable to acquire or renew necessary exploration or mining rights and concessions, licences, permits and other authorisations and/or such concessions, rights, licences, permits and other authorisations may be suspended, terminated or revoked prior to their expiration

The Group holds its mining rights under a subsoil use agreement with the government of Kazakhstan and mining operations in Kazakhstan are subject to control by national agencies in respect of many aspects of the development and production cycle. Many activities require appropriate licences, permits, or contractual agreements, many of which are granted only after detailed applications and sometimes only after additional requirements have been met and which can cause delay and ultimately, if refused, the curtailment of operations. Any delay in obtaining or renewing a licence, permit or other authorisation may result in a delay in investment or development of a resource and may have a materially adverse effect on the business, results of operations, cash flows and financial condition. In addition, any existing exploration or mining rights and concessions, licences, permits and other authorisations may be suspended, terminated or revoked if the Company fails to comply with the relevant requirements.

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(n) Natural disasters may have a material impact on the productivity of the operations and may not be covered by insurance

Natural disasters, including earthquakes, drought, floods, fire, tropical storms and the physical effects of climate change, all of which are outside the Company's control, may adversely affect the Company's operations. Operating difficulties, such as unexpected geological variations that could result in significant failure, could affect the costs and feasibility of its operations for indeterminate periods. Damage to or breakdown of a physical asset, including as a result of fire, explosion or natural catastrophe, can result in a loss of assets and financial losses. Insurance (if arranged by the Group) may provide protection from some, but not all, of the costs that may arise from unforeseen events but the occurrence of a significant adverse event not fully covered by insurance could have a material adverse effect on the Company's business, results of operations, financial condition and prospects.

(o) Labour disruptions could adversely affect the Company's operations, cash flows and financial condition

Strikes and the potential for conflict with unions or employees may occur at any one of the Company's operations or in any regions in which the Company operates. Labour interruptions may be employed to advocate labour, political or social goals. Labour interruptions have the potential to increase operational costs and decrease revenues by suspending the business activities or increasing the cost of substitute labour, which may not be available. If such disruptions are material, they may adversely affect the Company's results of operations, cash flows and financial condition.

(p) The Company may be unable to access necessary infrastructure services and utilities, which may adversely affect the Company's operations

Inadequate supply of the critical infrastructure elements could result in reduced production or sales volumes which could have a negative effect on the Company's financial performance. Supply interruptions of essential utility services like electricity and communications may suspend the Company's production for the duration of the disruption and, when unexpected, may cause loss of life or damage to its mining equipment or facilities, which may in turn affect its capacity to restart operations on a timely basis.

(q) Shortages and disruptions in lead times to deliver certain key inputs may adversely affect the Company's operations

The Company's inability to acquire timely strategic consumables, raw materials and processing equipment could have an adverse impact on any results of operations and financial condition. Periods of high demand for supplies can arise when availability of supplies is limited. This can cause costs to increase above normal inflation rates. Interruption to supplies or increase in costs could adversely affect the operating results and cash flows of the Company.

(r) The Company's future growth could be adversely affected if it fails to manage relationships with local communities, government and non-government organisations

The public is increasingly concerned about the perceived negative effects of globalisation. Consequently, businesses often face increasing public scrutiny of their operations. Although there are no habitations on or near the mine and processing facilities, nearby communities may perceive the operation as disadvantageous to their environmental, economic or social circumstances. Negative community reaction to such operations could have a materially adverse impact on the cost, profitability, ability to finance or even the viability of an operation. Such events could also lead to disputes with the national or local governments or with local communities and give rise to material reputational damage. The ownership of rights with respect to land and resources can be challenged. The inherent unpredictability in these disputes may cause disruption to projects or operations. Mining operations can also have an impact on local communities, including the need, from time to time, for infrastructure works such as roads, railways and utility services as well as increased traffic. Failure to manage relationships with local communities, government and non-government organisations may adversely affect the Company's reputation, as well as its ability to commence production projects, which could in turn affect the Company's revenues, results of operations and cash flows.

3. RISKS RELATING TO THE PROCESSING PLANT

(a) The processing plants may not work as intended

The Company's business plan is based on its knowhow and technology, some of which is protected by patents, for the processing of vanadium ore and concentrates. The proposed ore treatment processes have only been proven in a pilot processing plant and may ultimately prove not to be as efficient or commercially viable when scaled up to a commercial processing plant. The currently operating concentrate processing plant is being expanded and adapted to treat a variety of raw-materials and there is a risk that such expansion and adaptation will not work as intended.

(b) Failure to achieve acceptable raw-material supply contracts

The Company aims to sign supply agreements with companies with vanadium-bearing raw-materials to feed its processing plant. Whilst the Company has been successful in securing supply agreements so far, there is no certainty that future supply agreements will materialise and, even if they do, that the terms of such agreements would be in line with the Directors' expectations.

(c) Alternative technology

While the Directors believe that the Company's proposed processing methods have been optimised for the types of material being treated, there remains potential for an existing or new technology to provide better results. If these competing technologies and processes prove successful, they would enable rival companies to lower their production costs and thereby lower the expected future market prices.

4. RISKS RELATING TO THE COMPANY'S RELATIONSHIP WITH ITS MANAGEMENT, EXTERNAL CONTRACTORS AND POTENTIAL CONFLICTS OF INTEREST

None of the Directors is currently, but may in the future become, affiliated with, or have financial interests in, entities, engaged in business activities similar to those conducted by the Company.

In addition, the Directors may become aware of business opportunities that may be appropriate for presentation to the Company. In such instances they may be obliged also to present these business opportunities to other entities with which they may become affiliated, in addition to presenting them to the Company. Due to these possible future affiliations, the Directors may have fiduciary obligations to present potential opportunities to more than one entity which could cause conflicts of interest.

(a) The Company is highly dependent on its Directors and senior management

The Company is highly dependent upon its Directors and senior management having relevant mining and processing experience. The loss of any of such executive management with its concomitant loss of institutional and operational knowledge, experience, expertise and possible effect on governmental relations, and its ability to deliver the strategy of the Company could have a disproportionate and material adverse effect on the Company.

The Company does not maintain key-man insurance as it believes that such risks will not be significantly mitigated by the receipt of the sums that might reasonably be insured. There is a risk that the unexpected loss of the services of any member of its key personnel (through serious injury, death or resignation) could have a material adverse effect on the Company.

The loss of or diminution in the services of qualified mining and processing specialists or of members of the Company's senior management team or an inability to attract and retain additional senior management and/or mining personnel could have a material adverse effect on the Company's business, financial condition and results of operations.

There is no assurance that the Company will successfully continue to retain existing specialised personnel and executive and senior management or attract additional qualified executive and senior management and/or mining personnel required to successfully execute and implement the Company's business plan. The loss of such personnel and the failure to successfully recruit replacements would have a material adverse effect on its business, prospects, financial condition and results of operations.

While the Company seeks to maintain an open relationship and dialogue with all shareholders, there can be no assurance that no future changes may be proposed by shareholders or that any changes that are brought about by shareholders would not have an adverse impact on the Company or on the holders of its debt or equity securities.

(b) *The Company may in future enter into related party transactions which may give rise to conflicts of interest between the Company and the Directors*

The Company may in future enter into other agreements with the Directors or one or more of the entities with which they are associated that are not currently under contemplation. While the Company will not enter into any related party transaction without the approval of a majority of the Directors who are independent to that particular transaction, it is possible that the entering into, or even contemplation, of such an agreement might raise conflicts of interest between the Company and the Directors.

(c) *The Company relies on the services of third parties to implement its growth and development*

The Company may rely to some extent on external contractors to carry out its activities, as well as the construction, operation and maintenance of its facilities. As a result, the Company is dependent on external contractors performing satisfactorily and fulfilling their obligations. While the Company is not aware of any specific matters, any such failure by an external contractor may lead to delays or curtailment of the production, transportation, delivery of vanadium and related products. In addition, the costs of third party operators may increase, leading to higher production and transportation expenses for the Company. Any such failure in performance or increase in costs could have an adverse effect on the Company's results of operations.

Some of the services required for the Company's operations and strategic developments are currently only available on commercially reasonable terms from a limited number of providers. These operations and developments may be interrupted or otherwise adversely affected by failure to supply, or delays in the supply of, services that meet the Company's quality requirements. While the Company currently has no plans to do so, if the Company is forced to change a provider of such services, there is no guarantee that this would not result in the Company experiencing additional costs, interruptions to supply continuity or other adverse effects on its business. There is also no guarantee that the Company will be able to find adequate replacement services on a timely basis or at all. Any failure in performance by third party service providers, external contractors or consultants, increase in costs or inability to find adequate replacement services on a timely basis, if at all, could have a material adverse effect on the Company's business prospects, financial condition and results of operations.

5. RISKS RELATING TO TAXATION

(a) *Taxation of returns from assets located outside Guernsey may reduce any net return to Investors*

The Company's operations are carried on by subsidiary companies outside Guernsey. The return the Company receives from these subsidiary companies will be reduced by irrecoverable foreign withholding or other local taxes and this may reduce any net return derived by investors from a shareholding in the Company.

(b) *Future changes in tax legislation applicable to the Company's entities may reduce net returns to Shareholders*

The tax treatment of Group entities is subject to changes in tax legislation or practices in territories in which the Group entities are resident for tax purposes. Such changes may include (but are not limited to) the taxation of operating income, investment income, dividends received or (in the specific context of withholding tax) dividends paid. Any changes to tax legislation or practices in which the Group entities are resident for tax purposes may have a material adverse effect on the financial position of the Company, reducing net returns to Shareholders. In many jurisdictions, the resources sector is subject to particular taxation regimes which sometimes impose a comparatively heavy burden on activities within the sector and the comments made above with regard to change are particularly salient in relation to such regimes.

In particular, the Kazakhstan tax environment is challenging as a result of regulations and the interpretation of such regulations continually evolving. Kazakh tax laws are not always clearly determinable and have not always been applied in a consistent manner. Tax risks in Kazakhstan are therefore substantially greater than tax risks in countries with more developed tax systems.

(c) There can be no assurance that the Company will be able to make returns to Shareholders in a tax-efficient manner

It is intended that the Company will structure the Group to maximise returns for investors in as fiscally efficient a manner as is practicable. The Company has made certain assumptions regarding taxation based on interpretations of existing laws. However, if these assumptions are not borne out in practice, taxes may be imposed with respect to any of the Company's assets, or the Company may be subject to tax on its income, profits, gains or distributions in a particular jurisdiction or jurisdictions in excess of taxes that were anticipated. This could alter the post-tax returns for Shareholders (or for Shareholders in certain jurisdictions). In addition, the Company may incur costs in taking steps to mitigate any such adverse effects on the post-tax returns for Shareholders.

(d) Any change in the Company's tax status or in taxation law could negatively affect the Company's ability to provide returns to Shareholders

Statements in this document concerning the taxation of the Group or of Shareholders are based on current tax law and practice which is subject to varying interpretation by tax authorities and to changes in law. The taxation of an investment in the Company also depends on the individual circumstances of the relevant Shareholder and shareholders may have different tax reporting obligations in the country of their tax residence or where they habitually reside. Any Shareholder who is in doubt as to its tax position should consult an appropriate adviser.

(e) Any change in the Company's Guernsey tax status or any change in Guernsey taxation law could affect the Company's ability to provide returns to Shareholders

Statements in this document concerning the taxation of Shareholders are based on current Kazakhstan and Guernsey tax law and practice which are subject to change. The taxation of an investment in the Company depends on the individual circumstances of Shareholders.

6. RISKS RELATING TO THE ORDINARY SHARES

(a) The Company's shares are quoted on the Kazakhstan Stock Exchange (KASE). The shares are not actively traded on KASE and the price of recent transactions on KASE may not reflect the actual price of the Ordinary Shares

On the London Stock Exchange Standard Listing, there is no certainty that the share price will be valued on the same basis as it was in prior trading on the Kazakhstan Stock Exchange so it is possible that the price of the Ordinary Shares may fall on that date or on later dates.

(b) The proposed Standard Listing of the Ordinary Shares will afford Shareholders a lower level of regulatory protection than a Premium Listing

Application will be made for the Ordinary Shares to be admitted to the Standard Listing segment of the Official List of the London Stock Exchange. A Standard Listing will afford investors in the Company a lower level of regulatory protection than that afforded to investors in a company with a Premium Listing, which is subject to additional obligations under the Listing Rules.

(c) The Company may be unable or unwilling to transition to a Premium Listing in the future

The Company is not currently eligible for a Premium Listing under Chapter 6 of the Listing Rules. There can be no guarantee that the Company will ever meet such eligibility criteria or that a transition to a Premium Listing will be obtained. If the Company does not obtain a Premium Listing, the Company will not be obliged to comply with the higher standards of corporate governance or other requirements which it would be subject to upon achieving a Premium Listing and, for as long as the Company continues to have a Standard Listing, it will be required to continue to comply with the lesser standards applicable to a company with a Standard Listing. In addition, an inability to obtain a Premium Listing will prohibit the Company from gaining a FTSE indexation and may have an adverse effect on the valuation of the Ordinary Shares.

Further details regarding the differences in the protections afforded by a Premium Listing as against a Standard Listing are set out in Part IV: "Consequences of a Standard Listing" of this document.

(d) Substantial future sales or additional offerings of Ordinary Shares could impact the market price of Ordinary Shares.

The Company has no current plans to issue further capital after the Initial Public Offering and the directors believe that the Company has enough finance to continue its existing operations without the need for further equity funding over at least the next twelve months. The directors plan to finance further development of the Group's projects from operating earnings and debt, but if trading conditions deteriorate or other forms of finance are not available on a timely basis the Company may decide to issue additional shares in order to finance the Group's expansion plans. The Board cannot predict what effect future sales, if any, of Ordinary Shares, or the availability of Ordinary Shares for future sale, will have on the market price of Ordinary Shares. Sales or an additional offering of substantial numbers of Ordinary Shares in the public market, or the perception or any announcement that such sales or an additional offering could occur, could adversely affect the market price of Ordinary Shares and may make it more difficult for shareholders to sell their Ordinary Shares at a time and price which they deem appropriate.

7. RISKS RELATED TO TIMING

An investment in the Company should be regarded as a long-term investment. There can be no assurance that the Company's objectives will be achieved within the timetable envisaged. Investors may be required to bear the financial risk of an investment in the Ordinary Shares for an indefinite period.

- *Liquidity risk*

  The market in Ordinary Shares may be relatively illiquid. There may be a limited number of Shareholders and this may contribute to infrequent trading in the Ordinary Shares on the London Stock Exchange and volatile Ordinary Share price movements. Investors should not expect that they will necessarily be able to realise their investment in Ordinary Shares within a period that they would regard as reasonable. Accordingly, the Ordinary Shares may not be suitable for short-term investment. The Standard Listing should not be taken as implying that there will be an active trading market for the Ordinary Shares. Even if an active trading market develops, the market price for the Ordinary Shares may fall.

- *There may be volatility in the value of an investment in Ordinary Shares and the market price for Ordinary Shares may fluctuate*

  The market price for the Ordinary Shares may be volatile and subject to wide fluctuations in response to numerous factors, many of which are beyond the Group's control, including the following: (i) actual or anticipated fluctuations in the Group's results of operations; (ii) actual or anticipated changes in vanadium prices and/or in the capital markets; (iii) recommendations by securities research analysts; (iv) changes in the economic performance or market valuations of other companies that investors deem comparable to the Company; (v) addition or departure of the Company's executive officers and other key personnel; (vi) sales or perceived sales of additional Ordinary Shares; (vii) significant acquisitions or business combinations, strategic partnerships, joint ventures or capital commitments by or involving the Group or its competitors; (viii) changes in laws, rules and regulations applicable to the Group and its operations; (ix) general economic, political and other conditions; (x) the Group's involvement in any litigation; and (xi) news reports relating to trends, concerns, technological or competitive developments, regulatory changes and other related issues in the Group's industry or target markets.

Financial markets have experienced significant price and volume fluctuations in the last several years that have particularly affected the market prices of equity securities of companies and that have, in many cases, been unrelated to the operating performance, underlying asset values or prospects of such companies. Accordingly, the market price of the Ordinary Shares may decline even if the Group's operating results, underlying asset values or prospects have not changed. Additionally, these factors, as well as other related factors, may cause decreases in asset values that are deemed to be other than temporary, which may result in impairment losses. Also, certain institutional investors may base their investment decisions on consideration of the Group's environmental, governance and social practices and performance against such institutions' respective investment guidelines and criteria, and failure to meet such criteria may result in a limited or no investment in the Ordinary Shares by those institutions, which could adversely affect the trading price of the Ordinary Shares. There can be no assurance that continuing fluctuations in the price and volume of publicly traded equity securities will not occur. If such increased levels of volatility and market turmoil continue, the Group's operations could be adversely impacted and the trading price of the Ordinary Shares may be adversely affected.

- *The Company has no immediate plan to pay dividends and its ability to pay dividends in the future may be limited*

To date the Company has not declared or paid any dividends on the Ordinary Shares. In the near-term, the Company intends to retain earnings for future operations and expansion. Any decision to declare and pay dividends in future will be made at the discretion of the Board and will depend on, among other things, the Group's results of operations, financial condition and solvency and distributable reserves tests imposed by corporate law and such other factors that the Board may consider relevant.

In addition to the foregoing, the Company's ability to institute and pay dividends now or in the future could be limited by covenants contained in the agreements governing any indebtedness that the Group may incur in the future, including the terms of any credit facilities the Group may enter into with third party lenders. It is not uncommon that credit facilities will prevent a borrower from declaring or paying any dividends (excluding stock dividends) to any of its shareholders or returning any capital (including by way of dividend) to any of its shareholders. As a result of the foregoing factors, purchasers of the Ordinary Shares may not receive any return on an investment in the Ordinary Shares unless they sell such Ordinary Shares for a price greater than that which they paid for them.

The Group conducts most of its operations through the Subsidiaries and the Company's ability to pay dividends on the Ordinary Shares is reliant on the ability of its Subsidiaries to pay dividends or make other distributions to the Company. The ability of a Subsidiary to make payments to the Company may be constrained by, among other things: (i) the level of taxation, particularly corporate profits and withholding taxes, in the jurisdiction in which it operates; (ii) the introduction of exchange controls or repatriation restrictions or the availability of hard currency to be repatriated; and (iii) local law requirements in relation to the payments of distributions.

- *If the Company is wound up, distributions to Shareholders will be subordinated to the claims of creditors*

On a winding-up of the Company, holders of the Ordinary Shares will be entitled to be paid a distribution out of the assets of the Company available to its members only after the claims of all creditors of the Company have been met.

- *Shareholders may be exposed to fluctuations in currency exchange rates*

The Ordinary Shares are priced in pounds sterling and will be quoted and traded in pounds sterling. Accordingly, a Shareholder whose functional or local currency is a currency other than pounds sterling is subject to risks arising from adverse movements in such currency against pounds sterling, which may reduce the value of the Ordinary Shares in such currency.

- *The ability of Overseas Shareholders to bring actions or enforce judgments against the Company or the*

Directors may be limited

The ability of an Overseas Shareholder to bring an action against the Company may be limited under law. The Company is a limited company incorporated in Guernsey. The rights of holders of Ordinary Shares which are set out in the Articles are governed by Guernsey law. These rights may differ from the rights of shareholders in non-Guernsey corporations. An Overseas Shareholder may not be able to enforce a judgment against some or all of the Directors and executive officers. It may not be possible for an Overseas Shareholder to effect service of process upon the Directors and executive officers within the Overseas Shareholder's country of residence or to enforce against the Directors and executive officers judgments of courts of the Overseas Shareholder's country of residence based on civil liabilities under that country's securities laws. There can be no assurance that an Overseas Shareholder will be able to enforce any judgments in civil and commercial matters or any judgments under the securities laws of countries other than Guernsey against the Directors or executive officers who are residents of Guernsey or countries other than those in which judgment is made. In addition, Guernsey or other courts may not impose civil liability on the Directors or executive officers in any original action based solely on foreign securities laws brought against the Company or the Directors in a court of competent jurisdiction in Guernsey or other countries.

- *The Company may be classified as a passive foreign investment company for United States federal income tax purposes*

Prospective investors are also notified that the Company may be classified as a passive foreign investment company for United States federal income tax purposes. If the Company is so classified, the Company may, but is not obliged to, provide to US holders of Ordinary Shares the information that would be necessary in order for such persons to make a qualified electing fund election with respect to the Ordinary Shares for any year in which the Company is a passive foreign investment company.

8. RISKS RELATING TO GUERNSEY

(a) The Company may be subject to the Guernsey Income Tax (Substance Requirements) (Implementation) Regulations 2018 ("Guernsey Substance Regulations")

In November 2018, the States of Guernsey published the draft Guernsey Substance Regulations which take effect from 1 January 2019.

Under the proposed Guernsey Substance Regulations, the Company may be classified as a '*pure equity holding company*', in which case the Company would be required to demonstrate '*adequate*' economic substance in Guernsey. To do so, the Company may be required to employ additional individuals or engage additional service providers in Guernsey, which may result in increased annual administrative costs for the Company.

(b) The Company may be subject to reporting and withholding requirements under the United States Foreign Account Tax Compliance Act, Common Reporting Standard or similar legislation

Under FATCA, certain payments made to the Company on or after 01 July 2014 may be subject to a 30 per cent. withholding tax, or "FATCA Deduction", unless the Company complies with the requirements of the intergovernmental agreement between the United States and Guernsey (which seeks to implement the requirements of FATCA) and any legislation enacted in Guernsey to implement the US-Guernsey intergovernmental agreement.

While the Company will seek to satisfy its obligations under FATCA, the US-Guernsey intergovernmental agreement and the associated implementing legislation in Guernsey to avoid the imposition of any FATCA Deductions, the ability of the Company to satisfy such obligations will depend on receiving relevant information and/or documentation about each Shareholder and the direct and indirect beneficial owners of the Ordinary Shares (if any). The Company intends to satisfy such obligations, although there can be no assurances that it will be able to do so. There is therefore a risk that the Company may be subject to one or more FATCA Deductions, any of which may have a material adverse effect on the market price of Ordinary Shares.

The Organisation for Economic Co-operation and Development has been actively engaged in working towards the exchange of information on a global scale, similar to the information to be reported under FATCA and has published a global Common Reporting Standard for multilateral exchange of information pursuant to which many governments have now signed multilateral agreements. A group of those governments, including Guernsey but excluding, in particular, the US, have committed to a common implementation timetable which has seen the first exchange of information in 2017 in respect of accounts open at and from the end of 2015, with further countries committed to implement the new global standard by 2018.

The Common Reporting Standard was implemented into Guernsey law by the Income Tax (Approved International Agreements) (Implementation) (Common Reporting Standard) Regulations, 2015 with effect from 1 December 2015 with first reporting taking place in 2017. These Regulations have the effect of requiring all reporting financial institutions in Guernsey to apply the Common Reporting Standard due diligence procedures to all financial accounts they maintain from 1 January 2016.

A number of other jurisdictions are co-operating to develop and secure inter-governmental agreements for the automatic cross-border exchange of tax information similar to the US-Guernsey intergovernmental agreement. If further agreements are entered into in the future and implemented, the Company may be required to report information to the relevant tax authorities to avoid the imposition of financial penalties or other sanctions.

The US is not adopting the Common Reporting Standard and so FATCA and the Guernsey-US intergovernmental agreement will continue.

All prospective investors should consult with their respective tax advisers regarding the possible implications.

Although the Company will seek to minimise the impact of the Risk Factors, investment in the Company should only be made by investors able to sustain a total loss of their investment. Potential investors are strongly recommended to consult an investment adviser authorised under FSMA who specialises in investments of this nature before making any decision to invest.

PART III
PRESENTATION OF FINANCIAL AND OTHER INFORMATION

No person has been authorised to give any information or to make any representations in connection with Admission other than the information and representations contained in this document and, if any other information is given or representations are made, such information or representations must not be relied upon as having been authorised by or on behalf of the Company or the Directors.

1. General

The Company does not accept any responsibility for the accuracy or completeness of any information reported by the press or other media, nor the fairness or appropriateness of any forecasts, views or opinions expressed by the press or other media regarding Admission, the Ordinary Shares, the Company or the Group. The Company makes no representation as to the appropriateness, accuracy, completeness or reliability of any such information or publication. Without prejudice to any obligation of the Company under the FSMA, the Prospectus Rules, the Listing Rules or the Disclosure Guidance and Transparency Rules, the delivery of this document shall not, under any circumstances, create any implication that there has been no change in the business or affairs of the Company or of the Group taken as a whole since the date hereof or that the information contained herein is correct as of any time subsequent to its date.

The contents of this document or any subsequent communications from the Company, the Group or any of their respective affiliates, officers, advisers, directors, employees or agents are not to be construed as advice on legal, business, taxation, accounting, regulatory, investment or any other matters. Each investor should consult his or her own lawyer, financial adviser or tax adviser for legal, financial or tax advice, as appropriate.

This document does not constitute, and may not be used for the purposes of, an offer to sell or an invitation or the solicitation of an offer or invitation to subscribe for or buy, any Ordinary Shares by any person in any jurisdiction.

The Ordinary Shares have not been and will not be registered under the Securities Act, or under any relevant securities laws of any state or other jurisdiction in the United States, or under the applicable securities laws of Australia, Canada or Japan.

Investors should read this document in its entirety.

2. Presentation of financial information

The financial information presented in this document comprises the consolidated statement of comprehensive income, the consolidated statement of financial position, the consolidated statement of changes in equity and the consolidated statement of cash flows for the periods ending 31 December 2015, 31 December 2016 and 31 December 2017 and in each case, prepared in accordance with IFRS as adopted by the European Union. Unless otherwise indicated, the financial information presented in this document has been prepared in accordance with IFRS as adopted by the European Union.

3. Currencies

In this document, references to “pounds sterling”, “£”, “pence” or “p” are to the lawful currency of the UK; and references to “US dollars”, “U.S. dollars”, “dollars”, “US$”, “cents” or “c” are to the lawful currency of the United States; and references to “KZ tenge”, “tenge” or “KZT” are to the lawful currency of the Republic of Kazakhstan.

4. Rounding

Percentages and certain amounts in this document, including financial, statistical and operating information, have been rounded to the nearest thousand whole number or single decimal place for ease of presentation. As a result, the figures shown as totals may not be the precise sum of the figures that precede them. In addition, certain percentages and amounts contained in this document reflect calculations based on the underlying information prior to rounding, and, accordingly, may not conform exactly to the percentages or amounts that would be derived if the relevant calculations were based upon the rounded numbers.

5. Third party information

The Company confirms that all third party information contained in this document has been accurately reproduced and, so far as the Company is aware and is able to ascertain from information published by that third party, no facts have been omitted that would render the reproduced information inaccurate or misleading. Where third party information has been used in this document, the source of such information has also been identified.

6. Forward-looking statements

This document includes statements that are, or may be deemed to be, “forward-looking statements”. In some cases, these forward-looking statements can be identified by the use of forward-looking terminology, including the terms “targets”, “believes”, “estimates”, “anticipates”, “expects”, “intends”, “may”, “will”, “should” or, in each case, their negative or other variations or comparable terminology. They appear in a number of places throughout the document and include statements regarding the intentions, beliefs or current expectations of the Company and the Board concerning, among other things: (i) the Company’s objective, development and financing strategies, results of operations, financial condition, capital resources, prospects, capital appreciation of the Ordinary Shares and dividends; and (ii) future deal flow and implementation of active management strategies. By their nature, forward-looking statements involve risks and uncertainties because they relate to events and depend on circumstances that may or may not occur in the future. Forward-looking statements are not guarantees of future performances. The Company’s actual performance, results of operations, financial condition, distributions to shareholders and the development of its financing strategies may differ materially from the forward-looking statements contained in this document. In addition, even if the Company’s actual performance, results of operations, financial condition, distributions to shareholders and the development of its financing strategies are consistent with the forward-looking statements contained in this document, those results or developments may not be indicative of results or developments in subsequent periods. Important factors that may cause these differences include, but are not limited to:

- the Company’s ability to ascertain the merits or risks of its operations and business;
- the availability and cost of equity or debt capital for future transactions;
- currency exchange rate fluctuations and
- legislative and/or regulatory changes, including changes in taxation regimes.

Prospective investors should carefully review the “Risk Factors” section of this document for a discussion of additional factors that could cause the Company’s actual results to differ materially, before making an investment decision. For the avoidance of doubt, nothing in this paragraph constitutes a qualification of the working capital statement contained in paragraph 7 of Part XII of this document (Additional Information).

Forward-looking statements contained in this document apply only as at the date of this document. Subject to any obligations under Listing Rules, the Disclosure Guidance and Transparency Rules and the Prospectus Rules, the Company undertakes no obligation publicly to update or review any forward-looking statement, whether as a result of new information, future developments or otherwise.

7. No incorporation of website

The contents of the Company's website, any website mentioned in this document or any website directly or indirectly linked to these websites have not been verified and do not form part of this document and investors should not rely on such information.

8. Reserves and Resources reporting – basis of preparation

GBM Minerals Engineering Consultants Limited (GBM) have provided a probable reserve and an Indicated and Inferred vanadium Mineral Resource for Ore Body #1 and for Ore Bodies #2-5 the potential tonnage and grade ranges following the reporting guidelines for an Exploration Target as stipulated in the JORC Code in compliance with the Prospectus Rules and the CESR.

An Exploration Target is a statement of the exploration potential of a mineral deposit in a defined geological setting for which there has been insufficient exploration to estimate a Mineral Resource. The reporting of such information is common in the early stages of exploration when the quantity of data available is generally not sufficient to allow any reasonable estimates of Mineral Resources, but does not come with the implication that there are reasonable prospects for eventual economic exploitation. Estimates of the Exploration Target available for mining may change significantly in the future when new information becomes available or new factors arise, and interpretations and deductions on which mineral reserves and mineral resources estimates are based may prove to be inaccurate. Consequently, whilst all forms of mineral extraction and mineral reserve and resource estimation are inherently prone to variability, investors in the Company should be aware that mining of the Balausa Ore Bodies #2-5 may carry greater risk than the mining of Ore Body #1 for which an Ore Reserve / Mineral Resource exists.

The Exploration Target provided in this Prospectus complies with the exploration target definition in the JORC Code. The relevant definitions from the 2012 edition of the JORC Code are as disclosed the Competent Persons Report dated 12 November 2018, unless otherwise stated.

For the purposes of Prospectus Rule 5.5.3R(2)(f) GBM accepts responsibility for the information contained in Part 14 of this document, '*Competent Person's Report*' and those other sections of the Prospectus which include references to information in Part 14. GBM declares that to the best of its knowledge and belief, having taken all reasonable care to ensure that such is the case, the information contained herein is in accordance with the facts and does not omit anything likely to affect the import of such information.

9. Industry overview

This Prospectus contains information on the vanadium industry obtained by the Company from a number of sources including TTP Squared, a market consulting group with recognised experience in providing industry analysis for the vanadium industry. To undertake industry analysis, the consultant compiles information from a variety of sources, including reports made available by producers, site visits, personal contacts, trade publications and other analysts' reports. Although producers may thus participate to some extent in the process through which market information is prepared, they are typically unwilling to validate analyses directly because of commercial sensitivities. Inevitably, assumptions must be made by the consultant with respect to data that such consultant is unable to obtain and judgment must be brought to bear in the case of virtually all data, however obtained.

In certain cases, market information and forecasts produced by more than one reputable industry analyst may exist with regard to a specific commodity. The methodologies employed and conclusions reached by such analysts may differ. The market information to which this Prospectus refers is the most recent market information that has been obtained by the Company from TTP Squared and other public sources.

10. Definitions and technical terms

A list of defined terms and technical terms used in this document is set out in Part XIII.

PART IV
CONSEQUENCES OF A STANDARD LISTING

Application has been made for the Ordinary Shares to be admitted to the standard segment of the Official List. A Standard Listing affords Shareholders and investors in the Company a lower level of regulatory protection than that afforded to investors in companies whose securities are admitted to the premium segment of the Official List, which are subject to additional obligations under the Listing Rules.

Chapter 14 of the Listing Rules sets out the requirements for Standard Listings and does not require the Company to comply with, *inter alia*, the provisions of Chapters 6 to 13 of the Listing Rules. The Company will comply with Listing Principles 1 and 2 set out in Chapter 7 of the Listing Rules, as required by the UK Listing Authority, and intends to comply with the Premium Listing Principles as set out in Chapter 7 of the Listing Rules notwithstanding that they only apply to companies which obtain a Premium Listing on the Official List. The Company is not, however, formally subject to such Listing Principles and will not be required to comply with them by the UK Listing Authority.

1. Listing Rules which are not applicable to a Standard Listing

Such non-applicable Listing Rules include, in particular:

- Chapter 8 of the Listing Rules regarding the appointment of a listing sponsor to guide the Company in understanding and meeting its responsibilities under the Listing Rules in connection with certain matters. In particular, the Company is not required to appoint a sponsor in relation to the publication of this document or Admission;

- Chapter 9 of the Listing Rules relating to further issues of shares, issuing shares at a discount in excess of 10 per cent. of market value, notifications and contents of financial information;

- Chapter 10 of the Listing Rules relating to significant transactions which requires Shareholder consent for certain acquisitions;

- Chapter 11 of the Listing Rules regarding related party transactions;

- Chapter 12 of the Listing Rules regarding purchases by the Company of its Ordinary Shares; and

- Chapter 13 of the Listing Rules regarding the form and content of circulars to be sent to Shareholders.

2. Listing Rules with which the Company must comply under a Standard Listing

There are, however, a number of continuing obligations set out in Chapter 14 of the Listing Rules that will be applicable to the Company. These include requirements as to:

- the forwarding of circulars and other documentation to the UKLA for publication through the document viewing facility and related notification to a regulatory information service;

- the provision of contact details of appropriate persons nominated to act as a first point of contact with the UKLA in relation to compliance with the Listing Rules and the Disclosure Guidance and Transparency Rules;

- the form and content of temporary and definitive documents of title;

- the appointment of a registrar;

- the making of regulatory information service notifications in relation to a range of debt and equity capital issues; and

- at least 25 per cent. of the Ordinary Shares being held by the public.

In addition, as a company whose securities are admitted to trading on a regulated market, the Company will be required to comply with the Disclosure Guidance and Transparency Rules.

In due course, the Directors intend to seek to transfer from a Standard Listing to a Premium Listing, based on the track record of the company, subject to fulfilling the relevant eligibility criteria at the time. If a transfer to a Premium Listing is possible (and there can be no guarantee that it will be) and the Company decides to transfer to a Premium Listing, the various Listing Rules highlighted above as rules with which the Company is not required to comply will become mandatory and the Company will comply with the continuing obligations contained within the Listing Rules (and the Disclosure Guidance and Transparency Rules) in the same manner as any other company with a Premium Listing.

It should be noted that the UK Listing Authority will not have the authority to (and will not) monitor the Company's compliance with any of the Listing Rules which the Company has indicated herein that it intends to comply with on a voluntary basis, nor to impose sanctions in respect of any failure by the Company so to comply. However the FCA would be able to impose sanctions for non-compliance where the statements regarding compliance in this document are themselves misleading, false or deceptive.

PART V
EXPECTED TIMETABLE OF PRINCIPAL EVENTS & STATISTICS

PUBLICATION OF THIS DOCUMENT	22 March 2019
ADMISSION AND COMMENCEMENT OF DEALINGS IN ORDINARY SHARES	8.00 a.m. on 28 March 2019
DISPATCH OF DEFINITIVE SHARE CERTIFICATES (WHERE APPLICABLE)	8.00 a.m. on 11 April 2019

These dates and times are indicative only, subject to change and may be brought forward as well as moved back, in which case new dates and times will be announced. All references to time in this document are to London time unless otherwise stated.

FUNDRAISING STATISTICS

PLACING PRICE	£0.70
NUMBER OF ORDINARY SHARES IN ISSUE BEFORE ADMISSION	305,471,087
NUMBER OF ORDINARY SHARES ISSUED OR SUBSCRIBED IN THE FUNDRAISING	7,507,761
SHARES ISSUED OR SUBSCRIBED IN THE FUNDRAISING AS A PERCENTAGE OF THE COMPANY'S ISSUED SHARE CAPITAL ON ADMISSION	2.40%
TOTAL NUMBER OF ORDINARY SHARES IN ISSUE ON ADMISSION	312,978,848
MARKET CAPITALISATION AT THE PLACING PRICE ON ADMISSION	£219,085,194
NUMBER OF WARRANTS OUTSTANDING AT ADMISSION	64,285
FULLY DILUTED SHARE CAPITAL (ASSUMING ALL OUTSTANDING WARRANTS ARE CONVERTED TO ORDINARY SHARES)	313,043,133
'TICKER'	FAR.L
LEI	2138003T5CF6U9W7Z780
SEDOL	BJVNZ49
ISIN NUMBER	GG00BGDYDZ69

For the purpose of this document, the exchange rates applicable are, unless otherwise disclosed, as follows:

US$1.00: £0.7535

Note: The number of ordinary shares in issue before Admission does not include 27,757,200 Nil Paid Shares which are beneficially owned by the Company and have never been subscribed for by a third party. Any remaining Nil Paid Shares not subscribed for in the KASE Subscription will be cancelled immediately upon Admission.

PART VI

DIRECTORS AND ADVISERS

DIRECTORS	Nicholas Bridgen	(Chief Executive Officer)
	Andrey Kuznetsov	(Executive Director)
	Christopher Thomas	(Non-Executive Director)
	James Turian	(Non-Executive Director)
SECRETARY	James Turian	
REGISTERED OFFICE	Noble House Les Baissieres St Peter Port Guernsey GY1 2UE	
FINANCIAL ADVISERS AND BROKERS		
UK	Shard Capital Partners LLP 20 Fenchurch Street London EC3M 3BY	
KAZAKHSTAN	Tengri Capital MB JSC 17 Al-Farabi Avenue Almaty, 050059	
AUDITOR (SEE NOTE BELOW)	BDO LLP 55 Baker Street London W1U 7EU	
BANKERS	Barclays Bank PLC Le Marchant House St Peter Port Guernsey GY1 3BE	
SOLICITORS TO THE COMPANY		
ENGLISH LAW	Smithfield Partners Limited Temple Chambers 3-7 Temple Avenue London EC4Y 0HP	
GUERNSEY LAW	Collas Crill LLP Glategny Court, Glategny Esplanade St Peter Port, Guernsey GY1 4EW	

COMPETENT PERSONS REPORT	GBM Minerals Engineering Consultants Limited Regal House 70 London Road Twickenham TW1 3QS United Kingdom
REGISTRARS	Computershare Investor Services (Guernsey) Limited The Pavilions, Bridgwater Road, Bristol BS99 6ZY United Kingdom
COMPANY CONTACT DETAILS	Tel: +44 (0) 1481 740335 Email: info@ferro-alloy.com
COMPANY WEBSITE	www.ferro-alloy.com

Note: KPMG Audit LLC will continue as auditors of the Group's operations in Kazakhstan.

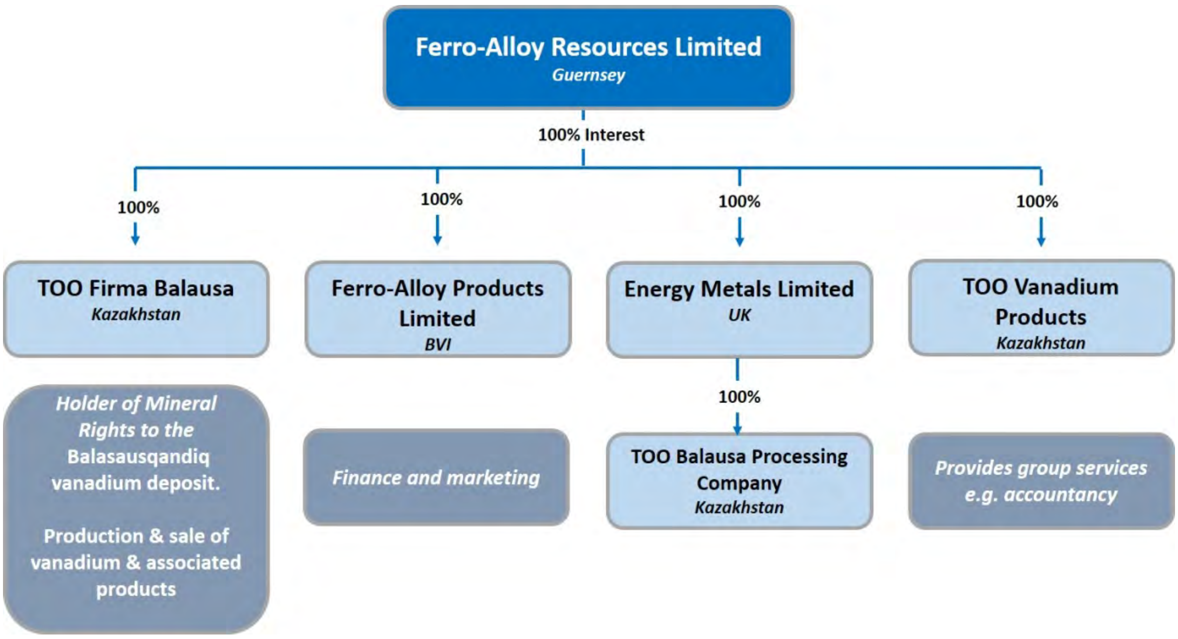
Part VII
Information Relating to the Company

Investors should read this Part VII, 'Information relating to the Company' in conjunction with the more detailed information contained in this document, including the financial and other information appearing in Part IX of this document, 'Operating and Financial Review'.

OVERVIEW

Group information

The Ferro-Alloy Resources Group is comprised of the holding company, Ferro-Alloy Resources Limited (FAR), which is a limited company domiciled in Guernsey with registration number 63449 and five subsidiary companies:



TOO Firma Balausa (TFB) currently carries on all the Group's operations but it is planned that TFB will in future be solely concerned with mining at the Balasausqandiq deposit and will supply ore to its fellow-subsidiary, TOO Balausa Processing Company, which will carry on all the processing activities including both treating the ore from the mine at Balasausqandiq and the processing of purchased concentrates and secondary materials.

Ferro-Alloy Products Limited provides treasury services to the Group. TOO Vanadium Products Limited provides various administrative and consulting services to the Group in Kazakhstan and it is planned that Energy Metals Limited will manage the processing activities of the Group.

Operations

The Group's operations are all located at the Balasausqandiq Vanadium Deposit in Kyzylordinskaya oblast in the South of Kazakhstan as indicated in the map below.

Location of FAR's Balasausqandiq vanadium project in Kazakhstan

Currently, the group has two main business activities:

(a) an existing Vanadium concentrate processing operation; and
(b) the Balasausqandiq project

The Concentrate Processing Operation

The existing concentrate processing operation is situated at the site of the Balasausqandiq vanadium deposit near Shieli, in Kyzylordinskaya Oblast in Southern Kazakhstan.

The production facilities were originally created from a 15,000 tonnes per year pilot plant which was constructed to test the proposed process which will be employed to treat the ore mined at Balasausqandiq. The pilot plant was then adapted to treat low-grade concentrates and is now in the process of being expanded and further adapted to treat a wider variety of raw-materials.

Currently, two main types of raw material are being processed, namely vanadium-containing low-grade concentrates and spent catalysts which contain vanadium from the Demetallisation of oil in refineries. Production during the first three quarters of 2018 were 19 tonnes, 27 tonnes and 38 tonnes respectively of vanadium pentoxide contained in ammonium metavanadate ("AMV"), a traded form of vanadium which is usually converted into vanadium pentoxide. AMV is generally sold at a small discount to the value of the contained vanadium pentoxide.

The Group has already completed the first steps of a development plan which is expected to result in annualised production capacity increasing gradually to around 1,500 tonnes of contained vanadium pentoxide by the end of 2019. These steps have included the expenditure of over US$550,000 on upgrading worker accommodation, offices, warehouses, additional processing equipment, evaporation ponds, a diesel generator and mobile equipment. The development plan includes upgrades to infrastructure, an extension to the existing factory and the installation of equipment to increase the throughput and to add the facilities to convert AMV into vanadium pentoxide.

Balasausqandiq Project

Balasausqandiq is a large deposit, situated in Kyzylordinskaya Oblast in Southern Kazakhstan. The ore contains vanadium as the principal product, together with by-products of carbon, molybdenum, uranium, rare earth metals, potassium, and aluminium (the last two of which can be extracted as potassium alum for sale or can be further processed into alumina and potassium fertilizers).

The geological resource has progressively been delineated by a number of exploration phases since its discovery in 1940 by Soviet era geo-scientists. More recently, FAR has carried out further exploration drilling, trial open-pit mining operations, and pilot plant optimisation studies using alternate metallurgical and mineral process treatment technologies. A full feasibility study in accordance with local Kazakhstan requirements has been completed and the reserve and resource estimates and financial appraisal have been prepared on both the locally required GKZ basis and on the Western JORC basis.

The resource is divided into five ore bodies, although only the first has been explored sufficiently, and sufficient records remain, to put it into the resource category under the JORC 2012 system of classification. This single ore-body is estimated to contain 24.3 million tonnes which, with normal mining dilution, is sufficient for the first eight years of operations. Ore-bodies 2 – 5 have been classified in the JORC 2012 system in the category of Exploration Targets and although further exploration is required to bring these into JORC resource categories, a total Vanadium JORC resource of over 100 million tonnes is considered to be a rational prediction by the consulting geologists in the Competent Person's Report. 100 million tonnes could contain the equivalent of around 670,000 tonnes of Vanadium Pentoxide, equal to almost five times the annual world production of 2017.

A reserve on the JORC 2012 basis has been estimated only for ore-body number 1 ("OB1") which amounts to 23 million tonnes, not including the small amounts of near-surface oxidised material which is in the Inferred resource category. On the GKZ basis, the GKZ Reserves are estimated to be over 70m tonnes in ore-bodies 1 to 5, sufficient for 20 years' production at the currently planned rates of production.

TOO Firma Balausa, a 100% owned subsidiary of FAR, holds the mining and exploitation rights to the deposit under the Subsoil Use Contract.

Development plan

Strategy

The strategy of the Group is to develop both the existing processing operation and the Balasausqandiq Project in parallel. Although they are located on the same site and use some of the same infrastructure, they are separate operations.

Expanding the existing concentrate processing operation will be simpler and quicker to accomplish. It is already profitable and yielding a small operating cash flow surplus. Production levels will be raised incrementally without major shutdowns and the plant is expected to reach its target annualised sustainable production of around 1,500 tonnes per year of vanadium pentoxide by the end of the first quarter of 2020. Further development of this operation is likely but will depend upon trading conditions at the time.

The Balasausqandiq project will take longer to develop and in spite of the size of the deposit, the Directors have decided to adopt a gradual development plan so that:

- expansions can take place in step with increases in world demand; and
- technological risk is reduced; and
- shareholder dilution is reduced prior to the generation of substantial cash flows that can be used to fund later expansions.

It is therefore proposed that the Balasausqandiq Project will be implemented in two initial phases. The first phase (Phase 1), for which final testing and detailed engineering is to be started immediately, will treat 1 million tonnes of ore per year, expected to produce some 5,600 tonnes per year of vanadium pentoxide. Construction is expected to begin in the first half of 2019 and is expected to be completed towards the end of 2020. After commissioning Phase 1, it is planned that an expansion (Phase 2) will treat an additional 3 million tonnes per year, bringing total production of vanadium pentoxide from this part of the business to 22,400 tonnes per year. Construction of Phase 2 is expected to start in 2022 with commissioning beginning by around the second half of 2023. This level of production is still small in comparison with the size of the deposit and further expansion after Phase 2 is likely but has not yet been planned. In view of the emerging shortage of vanadium production and higher long-term price expectations, the Directors will be considering whether the size of the Phase 1 operation should be expanded or built in an easily expandable modular form so as to bring forward the timing of the additional production.

Expansion of existing processing operations

The expansion and adaptation of existing operations has already commenced with the addition of a new pre-roaster that enables the company to treat spent catalysts which contain vanadium from the demetallisation of oil in refineries and certain other high grade secondary raw-materials. This new type of raw material is being treated in addition to the continuing treatment of purchased concentrates, giving a current production capacity of over 12 tonnes (on a vanadium pentoxide basis) per month.

Initial testing of this new raw material in April to July 2018 has led to the development of a comprehensive development plan which will aim to:

- Increase the factory space by a 1,000 square metre extension
- Install additional leach tanks and other equipment, and re-locate existing equipment
- Install furnaces to convert the current product, ammonium metavanadate ('AMV') to vanadium pentoxide

The targeted maximum potential production capacity is 178 tonnes per month of vanadium pentoxide. After allowing for maintenance, unplanned shutdowns and raw-material changes this should lead to sustainable annual production of over 1,500 tonnes per year of vanadium pentoxide.

Current production is comprised of ammonium metavanadate ("AMV") which, although often traded internationally, is a form of vanadium that is suitable for relatively few customers and typically sells at a discount from published prices for the equivalent content of vanadium pentoxide. The additional furnaces will allow the Company to convert this AMV to the more commonly traded vanadium pentoxide and is expected to open up wider markets and higher prices with shorter distribution routes.

Balasausqandiq project

TOO Firma Balausa, 100% owned by FAR, holds the mining and exploitation rights to the Balasausqandiq vanadium deposit. The Company has developed and successfully tested the technology to treat ore mined at Balasausqandiq at a 15,000 tonne per year pilot plant, and has a completed a full feasibility study for Phase 1, based on the required GKZ standards.

Phase 1 is expected to produce 5,600 tonnes of Vanadium Pentoxide (or equivalent) per year, which is a level that is lower than the expected annual increase in the market size and should be easily absorbed by the world market. After the Phase 2 expansion, Vanadium Pentoxide production is planned to increase to 22,400 tonnes per year, giving the Group an aggregate total of 23,900 tonnes per year including the output from the separate concentrate processing operation**.**

The ore at Balasausqandiq is sedimentary in origin, with little iron content, allowing direct leaching in sulphuric acid without pre-concentration and roasting as other primary producers require. This, together with the excellent infrastructure which already exists, is expected to reduce the capital and operating costs to a fraction of those at existing and other potential vanadium deposits.

FAR plan to start the final stages of planning and detailed engineering for the Balasausqandiq project immediately. Operation of the pilot plant was successful in proving the technology, reagent regimes and recoveries but left open the prospect of using simpler vertical autoclaves in place of the more expensive and complicated autoclave used in the pilot plant, and indicated that further test-work on filtration methods might yield better results. Test-work on these areas will be carried out in parallel with detailed engineering so that the impact on the build programme will be minimised. Consideration will be given to designing the plant in a modular fashion to allow for easy expansion after commissioning. Construction is likely to start in the first half of 2019 and commissioning in late 2020.

The ore bodies of the Balasausqandiq deposit are outcropping with elongated synclinal structures. The shape of the mineralisation lends itself to a conventional open pit mine design using conventional drilling, blasting, excavation and haulage of waste and mineralised rock by truck to the respective material location. The surface expression of the vanadium-bearing horizon typically shows a thickness range from 5.0 to 19m. Long term mining design, planning and operations are conventional as the open pit layout is orthodox and uncomplicated. The mine design is based on 15m bench height, 5m safety berms, with an overall slope angle of the open pit expected to be approximately 75.

The current design for OB 1 shows a 4.2:1 stripping ratio of waste and ore. As mining costs are a fraction of total costs and the forecast profit margins are high, a very much higher stripping ratio could be contemplated but this mine design already caters for 100% extraction of OB1. The mining operation extraction program will follow the orebodies along strike and to an economically defined depth which, for OB1, is the full depth of the synclinal structure.

Mining excavation commenced at Balausa in 1971 during the Soviet era. The open pit that was in operation is now called the Old Pit which is located in the middle of OB1. In 2009, FAR developed another open pit called New Pit which is located at the north western end of OB1. It is intended to mine the New Pit at an initial rate of 500ktpa with a rapid ramp up to 1Mtpa as commissioning proceeds.

As part of the extraction process, several saleable by-products are produced such as a valuable form of carbon which comprises some 18% of the tailings, potassium alum, uranium and molybdenum. In addition, up to 330 tonnes per year of a mixed rare earth concentrate will be produced but, owing to current low prices and uncertainty over the market demand for this material, no value is currently being ascribed to it.

The carbon can be separated from the remaining tailings by flotation but the company has tested various uses for the carbon-rich tailings without separation. In particular, test-work indicates that high-quality briquettes can be produced for use in the smelting of ferro-silicon where the briquettes can substitute for the carbon and silica that ferro-silicon smelters use. The uranium and molybdenum will be produced and sold as a combined concentrate. Potassium alum is precipitated as part of the process and there is currently a market for it in China where it is used for water purification. Longer term, the Company expects that this use will diminish and the Potassium Alum will be broken down into alumina and potassium and ammonium sulphate fertilizers for which there are ready markets in Kazakhstan.

Infrastructure

The site is already well served with road access, power and water but some further development is required to support both existing and planned operations and will be developed as a priority. These include:

- Improved and expanded accommodation
- A railway siding and facilities to enable more efficient reception and storage of raw materials and reagents
- Augmentation of the electrical power supply.

Financial strategy

The phased approach allows the generation of earnings from earlier phases to partially finance the later stages so that the up-front capital to be raised and shareholder dilution are minimised. Since vanadium and by-product prices are not easily predicted, an exact profile for future capital raising cannot be forecast, but the time-line and financing plan is substantially as follows.

The earliest route to increasing cash generation is to bring the capacity of the existing processing plant up to its planned maximum as soon as possible. This will be accomplished in steps and will not involve a major shutdown of operations so the anticipated capital cost of some US$10.3m, some $550,000 of which has already been spent, will be partly financed from earnings as the production steps up. Cash flows generated from operations are expected to exceed capital expenditure from the second quarter of 2019 onwards, with full production and maximum cash generation from the second quarter of 2020.

In order not to lose time in the development schedule, the proceeds of the Fundraising will also be utilised to start the final testing and completion of design criteria of Phase 1 of the Balasausqandiq Project, but the main period of expenditure on capital items will come after the expansion of the existing operation is well underway and will utilise its cash flows.

The total cost of Phase 1 is expected to be around US$100m of which approximately $1m will be met from the proceeds of the IPO and the remainder will be required over the course of 2019 and 2020. A significant proportion of this will be met from cash generated from the existing operations, as expanded, and the remainder is expected to be met from an additional equity raise and corporate debt facility or the issuance of a corporate bond. Using the assumptions of the financial analysis set out in the Competent Person's Report, the amount of additional finance required could be as low as approximately US$85m. Since group earnings at this point are likely to be substantial, the debt servicing requirement will be capable of being met from existing earnings so that the lengthy process of arranging project finance can be avoided.

After completion of Phase 1 of the Balasausqandiq project, the earnings of the two operations are likely to substantially fund the capital requirement of Phase 2 which is expected to cost approximately US$225m, spread over a two year construction period. Any shortfall will again be funded from debt or a corporate bond. By this means the Group aims to become one of the world's largest vanadium producers with only modest initial capital outlay and no further equity issues.

The exact capital funding profile will depend upon trading conditions over the relevant period and the exact profile for project expenditure but under the assumptions made in the Competent Person's Report the approximate funding plan will be as follows:

	Existing processing expansion US$	**Phase 1 (1 Mtpa) US$**	**Phase 2 (4Mtpa) US$**
Initial equity funding	5m	1m	-
Additional equity funding	-	27m	-
Debt or bond	-	58m	-
Funded from retained earnings	5m	14m	225m
Total capital requirement	**10m**	**100m**	**225m**

In the event that the additional equity funding or retained earnings are larger or smaller than the figures above, the directors intend that the amount and timing of the debt or bond will be varied accordingly, the project timing may be altered or a further equity raise may be contemplated.

In view of the current world shortage of vanadium and high prices, a priority will be to examine the case for a larger or modular Phase 1, allowing a faster ramp-up of production between phases 1 and 2. Indeed, the large size of the deposit and its low capital requirement and operating costs make it likely that a further Phase will be started soon after Phase 2 has been completed.

Marketing strategy

Currently, the main use of vanadium is in the production of high strength low alloy steel where small quantities of vanadium are added to steel to increase its strength. In future, it is expected that increasing quantities will be used as the electrolyte in vanadium flow batteries.

There are several reasons for anticipating large annual increases in the world demand for Vanadium. Firstly, there is expected to be an increase in the number of countries mandating the use of high-strength low-alloy steels for construction. China mandated the use of high strength low-alloy steels several years ago but has recently tightened the required specifications. This is expected to have the effect of forcing the industry to use more vanadium. Other countries which currently do not use such steels are expected to follow. Secondly, vanadium is already being used for batteries for electrical storage and this use is expected to grow markedly over the coming years. For these and other reasons available forecasts indicate an expectation of rising demand and continuing high prices. The current indicated price for vanadium pentoxide is over US$16.00 per lb which is significantly higher than historic levels but owing to the growth in demand the directors expect it to remain high for some time.

However, there are many potential vanadium projects awaiting finance for development and it must be expected that in the longer run, prices will fall. The directors' estimate, based on published information on other projects, that the long-run price which is required to incentivise the construction of a new primary vanadium producer, based on a typical vanadiferous titano-magnetite deposit, is in the range US$8.00 – US$10.00/lb. For this reason FAR have used a long-term price in their cash flow forecasts of $7.50/lb which the directors' believe to be conservative.

Against this more competitive longer term price scenario the Group aims to capitalise on its low capital and operating costs to grow market share by expanding production when justified by market demand. With cash operating costs per lb expected to be amongst the lowest in the world, FAR could be able to reduce prices and maintain market share when market demand is weaker.

The company plans to broaden its potential customer base by installing equipment to convert its current production of ammonium metavanadate to the more commonly marketed vanadium pentoxide. Later, the Company plans to convert its production of vanadium pentoxide to ferro-vanadium which is the form used by the steel industry to make high-strength low-alloy steels. Subject to demand, a further facility can be installed to manufacture electrolyte for use in vanadium redox flow batteries. The company considers that the market for these products is broad, transparent and growing, to the extent that the Company will have no difficulty in marketing its own production. For this reason, the Company considers that in order to be free to expand and develop new markets, it will not enter into any exclusive off-take agreement. This decision will be kept under review in case such an agreement appears to offer a higher realised price in the long run than the Company can achieve itself and will not inhibit the Company's ambitious expansion plans.

Proposed use of funds (converted to Sterling at $1.3271 = £1.00)

	US$000	**UK£000**
Expansion of existing processing operations and associated infrastructure		
Railway siding, unloading facilities and storage for raw materials	445	335
Connection to HV powerline, transformers and reticulation	2,688	2,025
Worker accommodation and office building	477	359
Evaporation ponds	343	258
Main process building expansion	1,249	941
Expansion of main process plant, leaching circuits, etc.	2,430	1,831
Ovens and other equipment to convert AMV to vanadium pentoxide	668	503
Warehouses, laboratories, security, etc.	474	357
Mobile equipment and vehicles	290	219
Allowance for unforeseen items	1,200	904
Total for the expansion of existing operations	**10,264**	**7,732**
Less: to be financed from operating earnings	-4,714	-3,552
Less: already completed by 31 October 2018	-550	-414
Total for expansion of current operations	**5,000**	**3,766**
Balasausqandiq Phase 1 preparations		
Final test-work and design criteria	800	603
Detailed engineering, other preparatory work and owner's project team	569	429
Total for Phase 1 preparations	**1,369**	**1,032**
Overall total	**6,369**	**4,798**

Note that the above amounts include delivery, installation commissioning costs and contingency

Key strengths

The directors believe that the Group has some overwhelming advantages that will set it apart from competitor projects and allow it in time to become the largest producer of vanadium in the world and also its lowest cost producer.

- Ore-type and processing

The greatest distinction of the Balasausqandiq project is that it is a different type of deposit from most of the world's other vanadium producers. Balasausqandiq is a sedimentary shale deposit and is not comprised of titano-vanadiferous magnetite. Test-work has indicated that the deposit is amenable to a fundamentally different processing approach that obtains high metallurgical recoveries and does not require pre-concentration or high temperature roasting, and hence has a fraction of both the operating and capital costs of development compared with a typical deposit.

- Pilot plant operations

The proposed treatment process has been tested at a significant scale in the 15,000 tonnes per year pilot plant. Invaluable lessons were learned in the operation of this plant and several improvements to the process resulted, substantially reducing commissioning risks.

- Capital costs

The absence of need for a concentrator and high temperature roaster means that the Phase 1 capital costs are expected to be around $100m, around one third or less of the costs of a similar project based on a vanadiferous titano-magnetite deposit.

- Cash cost of production

Cash flow projections indicate that when costs are apportioned over the range of products the cash cost of vanadium pentoxide is likely to be around $1.54/lb, about one third or less of the cash cost expected for similar producers from vanadiferous titano-magnetite.

- Not a Greenfield site

Operations started at Balasausqandiq as early as 2007 and in the years since then, through operation of first the pilot plant and now the concentrate processing plant, a great deal of experience and know-how has been built up. Many of the processes to be used in the new operations are similar to those in the existing operation and the skills of the managers and experts will be directly transferable. Existing supplier and customer relationships will be continued. This pool of experience will be invaluable in the design, building, commissioning and operating of the new facilities.

- Expertise

As noted above, the Group already has a wealth of expertise but it has also been able to draw on some outstanding scientists and engineers of the former Soviet Union and from existing vanadium operations in Russia, as well as combining with a small number of highly experienced British managers with experience of developing projects, raising finance and bringing them to a successful conclusion.

- Subsoil agreement and Kazakhstan law

The mining and exploitation rights held by TOO Firma Balausa are held under a standard subsoil use agreement under Kazakhstan law. The regulatory regime in Kazakhstan has recently been reformed to make it attractive to international mining companies with greater transparency of the award of exploration territory and a more westernised approach to regulation.

- Taxation and royalties

The group company which will be investing and developing the processing operations has negotiated a tax incentive agreement whereby the rate of tax on corporate income has been reduced to nil until 2026 and property tax to nil until 2024. It is anticipated that these incentives will reduce corporate taxes to a low level although the Company will still contribute to the local economy with employer and employee taxes, VAT, and various other local taxes. Taxes on the profits of the mining operations will continue to be payable. Royalties are at a relatively low level, being based on the primary production from subsoil use rather than the value of end products after processing which is not part of the subsoil use activity.

- Ideally situated

The Balasausqandiq project is located in an unpopulated area with no alternative land use so adequate land is available and inexpensive and there is little likelihood of social issues arising. Notwithstanding its relative geographic isolation it is served by excellent infrastructure, with a made-up road connecting the site to the town of Shieli which is on the route of the main rail and motorway links connecting Europe and the Russian Baltic through Kazakhstan and China to east coast ports.

- Employees

Employees will be housed at a site camp and will generally work day or night shifts for two week periods on site followed by two weeks of off-site rest. The village of Aksumbe is 16 km distant and provides a source of lower skilled workers whilst skilled engineers are available elsewhere in Kazakhstan or adjacent countries. Kazakhstan has universal education and literacy and a well developed mining industry, with universities teaching the necessary skills. There is therefore no need for the importation of expatriate workers or specialists.

Mining rights and permitting

Until July 2018, the primary legislative act governing mining activities in Kazakhstan was the Law on Subsoil and Subsoil Use dated 24 June 2010. On 27 December 2017 a new Code on Subsoil and Subsoil Use was passed, the key aspects of which are described in more detail below

All subsoil resources located in Kazakhstan are owned solely by the state. The government then grants Subsoil Use Contracts in the form of exploration or production contracts which are effective for a fixed period of time from the date of issuance, but may be renewed through the competent authority. Exploration contracts give the grantee (subsoil user) an exclusive right to explore a resource within a defined boundary while production contracts give grantees the exclusive right to mine or extract a resource from a defined area for the valid time, usually being 25 years from signing but may be up to 45 years for large or unique deposits. The process of applying for and negotiating a Subsoil Use Contract and obtaining the relevant licences is complex, involving government ministries and presentation of expenditure budgets and financial models.

The law of Subsoil and Subsoil Use applies only to subsoil, i.e. mining, activities and primary processing without making chemical changes. It does not, therefore, apply to the Group's processing operations.

The New Code

On 27 December 2017, Kazakhstan adopted a new code on Subsoil and Subsoil Use (the Subsoil Code). In drafting the new Code, the Ministry of Investment and Development consulted widely with stakeholder groups, and used the Western Australia Mining Act and Mining Regulations as a benchmark, incorporating some changes to meet local requirements and conditions. The Subsoil Code replaced the previous statute regulating oil and gas and mining activities, ie the Law on Subsoil and Subsoil Use of 24 June 2010. The new system is being introduced in phases starting in June 2018. Contracts executed under the old law will continue in force unless the subsoil user decides to switch to the new licensing system. The following summarises the main features that are or may be relevant to the Company if the Company chooses to adopt the new system.

The Subsoil Code will have priority over laws and introduces a number of changes. The Subsoil Code reinstates the subsoil use licence as the main title documents confirming mining rights. There will now be one competent authority which will be responsible for granting and terminating subsoil use rights with regard to all natural resources. The body will be assisted by a separate industry-specific regulator for the mining sector. The details of this body and regulator have not yet been announced. Most of the changes should not affect the operation of existing subsoil users but will affect the Company if it chooses to acquire new sub-soil rights, in which case the procedures have been made simpler and more transparent. The Subsoil Code introduces a number of new concepts that did not exist under the old law and introduces a number of substantial changes to other rules regulating subsoil users' operational activity (e.g., procurement rules, liquidation of subsoil use operations, extension of subsoil use rights, introduction of Kazakhstan Code on Reporting of Exploration Results, Mineral Resources and Ore Reserves, and public access to geological information). The purpose of the code is to simplify administrative procedures and increase attractiveness for foreign investors.

The key changes identified in the new Code are:

(a) Separate regulatory regimes for solid minerals (with exclusive regulations for uranium minerals) and hydrocarbons.

(b) Open access to geological data;

(c) Allocation of subsoil use blocks of standard size (each side of a block is equal to 1 geographical minute)

(d) A suspension of obligations under a subsoil use contract may be granted by the competent authority upon the Subsoil Licence holder's request for five years, with a possible one-time five-year extension, in the event that economic conditions make the development unfeasible.

(e) Reduced grounds for early unilateral termination of subsoil use contract by the competent body.

(f) New rules on securing performance of liquidation (abandonment) obligations will require some form of financial assurance to be provided by the licence holder to meet in full the costs of a mine closure plan. The mine closure plan will be created by the licence holder and approved by the competent authority.

In parallel with the development of the new Subsoil Code, Kazakhstan has adopted a CRIRSCO compliant mineral resource and reserves reporting standard. On 14 June 2016, Kazakhstan became a member of the Committee for Mineral Reserves International Reporting Standards via the KAZRC Association (Kazakhstan Association for Public Reporting of Exploration Results, Mineral Resources and Mineral Reserves). The CRIRSCO reporting codes are designed to maintain uniform reporting terminology to be used when listed companies disclose any mineral resource and reserves information to the stock market. Accordingly, the Code introduces the obligation of subsoil users to submit reports during exploration and production of phases in compliance with KAZRC guidelines.

Kazakhstan has yet to fully detail its adoption of CRIRSCO compliant standards. However, FAR has reported its reserves and resources under the JORC 2012 guidelines which is a CRIRSCO compliant format.

The Subsoil Use Licence

On 8 December 1997, the Government of the Republic of Kazakhstan issued TOO Firma Balausa ('the Licence-Holder') a Subsoil Use Licence MG No. 1278 F ('the Licence'), for the development and production of vanadium ore on the Balasausqandiq field. The particular spatial boundaries of the subsoil area are specified within the Mining Allotment and the information for the licensed area are based on a separate agreement with the Geology, Subsoil Use and Protection Committee drawn up within one month from the date of signature of the licence. The licence was issued for a period of 25 years from the date of grant with the possibility of extension provided that the relevant licence terms and conditions have been met. The production schedule and required extraction tonnage were specified for the first few years, with an expected annual output of 15 thousand tonnes thereafter. The planned production was to be agreed on an annual basis and a mining development plan approved.

Under the licence, information obtained in the course of works should be submitted via quarterly and annual reports to the Geology, Subsoil Use and Protection Committee without right of assignment, such details becoming the property of the Republic of Kazakhstan after expiry of the licence term.

The Licence contains certain terms and conditions in respect of training and sourcing of contractors, including that the Licence-holder will involve Kazakhstan companies in the field production through bid qualifications, announcing the tender results by mass media. In terms of training, a percentage of funds to be allocated for training national specialists will be specified in the Sub-Soil Contract.

The Licence-Holder will spend a minimum of 50% of the funds allocated for training personnel on Kazakhstan educational and business organisations, presenting the Geology, Subsoil Use and Protection Committee with a list of students in the training program along with details of their terms of study.

The Licence-Holder is obligated to obtain a subsoil use permit from the Ministry of Ecological and Natural Resources to ensure rational use and environmental protection and safety in line with the country's laws and regulations. State supervision authorities will actively monitor the user activity to ensure compliance with the terms and conditions, breach of which may cause suspension or recall of the licence.

The Subsoil Use Contract

On 30 November 1998, the Licence-Holder entered into a Subsoil Use Contract ('the **Contract**') with the State Investment Committee of the Republic of Kazakhstan ('**Competent Authority'**) based on the Licence. The Contract was entered into in accordance with the Law on Subsoil and Subsoil Use dated 27 January 1996. The Contract sets out the mutual rights and responsibilities of the parties with the aim of facilitating the Republic of Kazakhstan's effective utilisation of its mineral resources by allowing the Licence Holder to develop the Balasausqandiq vanadium ore field in accordance with its Licence. The term of the Contract is equal to the term of the Licence, expiring on the last day of the Licence but may be extended after the extension of the term of the Licence. Minor variations to the contract named Amendment No 1 and Amendment No 2 were signed in 2006 and 2011. Amendment No 3 to the Subsoil Use Contract was signed on 24 December 2018 which has the effect of extending the period of the contract until 2043 together with certain other minor amendments.

Under the Contract as amended, the Licence-Holder shall have the exclusive right to extract the vanadium ore within the geographical limits of the Licensed Area in accordance with the terms and conditions of the Contract.

The government is entitled to requisition part or all minerals belonging to the Licence-Holder in the event of war, Acts of God, and other emergency situations as stipulated by legislation. The government will guarantee compensation for minerals at global market prices. The government has preferential rights for acquisition of Vanadium ore at prices that do not exceed global market prices.

The Licence-Holder is entitled to do certain things including negotiating extensions of the term of the Contract.

The Licence-Holder is obliged to maintain a fund amounting to a minimum of 1% of the total volume of investment to be used for professional training of Kazakhstan citizens and to provide documents, information, and access to the authorities of the State.

The Licence-Holder is obliged to provide funding of 1.5% of the cost of production from subsoil activity for socio-economic development in the Kyzylorda region and the development of its infrastructure.

The Licence-Holder is required to provide funding of 1% of income from contractual activity based on the previous year for research, scientific, technical or development works to be carried out by Kazakhstan providers.

Additionally, the Licence-Holder is required to leave the area in a condition that meets the requirements of environmental rules and regulations as well as reinstate land plots which have been disturbed through its subsoil activity. For this purpose, transfers into a special deposit account of the Company amounting to 1% of extraction costs must be made to provide funds for the reinstatement.

The Licence-Holder agrees to employ at least 95% of its work force from the local community and any contract work should be at least 85% local.

Taxes will be payable according to the legislation applicable at the time of incurring of the liability.

The Licence-Holder agrees to implement the project for the construction of the hydrometallurgical complex for the autoclave processing of one million tonnes of vanadium ores by 2022 through the new group company Balausa Processing Company LLP.

The production will be done in accordance with the Operations Program approved by the Competent Body which is based on feasibility studies and field expert determinations.

The Licence-Holder is fully responsible for the funding of activities and is responsible for paying royalties based on 1% of the cost of production of vanadium ore, as well as a signature bonus and historic costs both of which have already been paid in full.

The Licence-Holder must uphold the protection of the subsoil and environmental welfare by complying with ecological requirements, including taking required measures to uphold the integrity of the soil and prevent pollution and erosion.

The Competent Body shall be entitled to suspend the Contract where there has been a breach of terms of the Contract, including violation of any applicable laws. The Contract can be terminated prematurely by giving 60 days written notice upon certain events including violations of the law and repeated suspension of the Contract.

The Contract is governed by the laws of the Republic of Kazakhstan.

In support of the application by TOO Firma Balausa for the amendment No 3 extending the mining period until 2043, a full feasibility study was submitted based on a mining rate of 1 million tonnes of ore per year up to the year 2043 and this was approved by the Central Commission for the Exploitation and Exploration of Mineral Reserves on 5 October 2017 and now forms part of the obligations of the Company.

Key terms of the revised project documents are:

- The Company agrees to annually mine the following tonnage of ore:

	2018	2019	2020-2043
	15,000	15,000	1m per annum

- The Company agrees to invest the following amounts of money in the sub-soil use activity (mining) of the Balasausqandiq deposit:

2018 – US$52,000

2019 – US$1,850,300

2020 – US$13,339,000

2021 – US$1,594,000

2026 – 2042 - US$20,624,000 (over these 17 years)

These amounts have been included in the overall capital costs for Phase 1 of the Balasausqandiq project and will be financed as part of and in the manner described under Development Plan, *Financial Strategy*, above.

Competent Person's Report (CPR)

FAR commissioned GBM Minerals Engineering Consultants Limited (GBM) to prepare the Competent Person's Report (CPR) on the Balausa vanadium operations and development projects in the Shieli district, Kyzylorda oblast, Kazakhstan. Geo Mineral Resources Limited (GMR) was engaged to produce a mineral resource report, according to accepted international standards.

The CPR was issued on 12 November 2018 and is set out in Part XIV of this document. The CPR provides an assessment of the proposed projects, including details of the current mineral resource, mining engineering, metallurgy, mineral processing, an estimation of capital and operating costs and financial analyses.

The following are summarised extracts from this report.

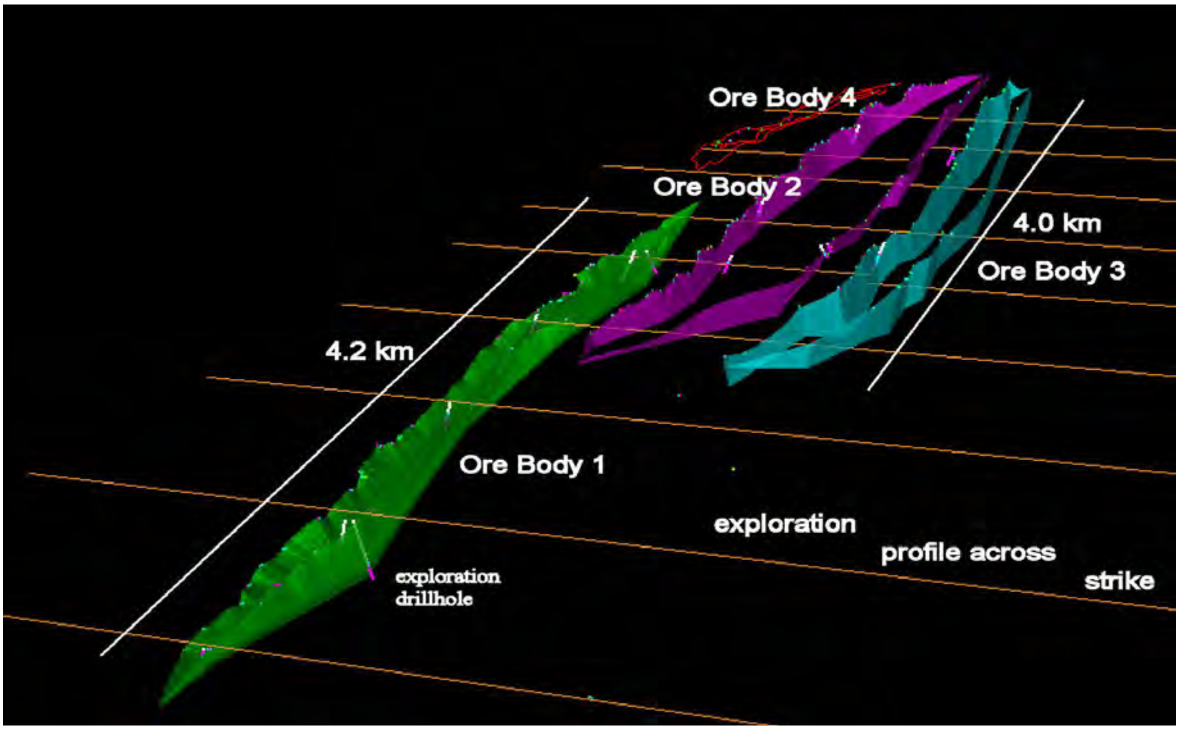
Geology

There is an extensive history of geological exploration, especially during the former Soviet-era, since the vanadium was first discovered in 1940. However, as part of this project, research into the expansive complex geological processes that affected the Balasausqandiq deposit, from 1,000 million years ago to 1.5 million years ago, especially in the field of geo-tectonics, has provided a sound basis for supporting the assessment and modelling of this deposit and has allowed a much higher confidence level in the results.

The stratiform vanadium layer is associated with five very large orebodies and their surface expression can be traced for about 40 km. These orebodies are mostly confined to deep synclinal folds, where the primary carbonaceous vanadium rocks at depth are protected from weathering and oxidation processes. From historical data and from FAR's drilling results, the global grades within these orebodies are relatively similar, and this uniformity is testament to the broad stable conditions during mineralogical deposition in a marine basin some 510 million years ago (mid-Cambrian).

Resources

Potentially, the primary resource is large, as expressed by the surface continuity of the vanadium mineralisation along strike. The reflection at depth of such observable surface mineralisation has been confirmed by FAR's drilling of Ore Body 1 (OB1) and also confirmed from the more limited drilling of Ore Body 2 (OB2) and Ore Body 3 (OB3). Currently, based on the OB1 JORC resource, plus JORC- based Exploration Targets for OB2 to OB5, a total vanadium JORC resource of over 100 million tonnes is considered to be a rational prediction.



Orebody geometry

The site boundary of the concession area where extraction of the vanadium ores will be allowed covers an area of about 54 km2.

"New Pit"

Resource History

1947. The Balausa deposit was declared as being a "geologically uncomplicated" deposit, due to its natural low complexity. This prompted a relatively early move to calculate reserves for the deposit, and in 1947

Reserves (GKZ) were defined under the Soviet System, with the OB1 reserve amounting to 2.5Mt, about 10% of the current JORC resource, with a global 1947 reserve of 73Mt.

1973. The GKZ approved further drilling in 1971-1972 to intersect the primary mineralisation, which led to a reserve update in 1973 and a lower tonnage. This was also the first time that the lower grade of the primary (vs. oxide) mineralisation was proven. The 1973 reserve amounted to 23Mt at 0.68% V2O5.

1991. On the back of the major exploration programme undertaken between 1990 and 1991 by the Tashkent Research and Development Institute, another reserve update was calculated amounting to 5.6Mt at 0.76% V2O5 at OB1 and a global resource (OB1, OB2, OB4) of 14.5Mt at 0.83% V2O5.

2011. JORC-compliant resource based on 2010-2011 drilling by FAR, resource for OB1 only. 21 successful holes were drilled at the OB1 orebody which confirmed the results from historical drilling and were used in resource estimation to generate a JORC-compliant resource. The drilling also confirmed the continuity of the synclinal structure and the vanadium grade. The total global JORC-compliant resource stands at 24.3Mt at 0.67% V2O5, for 165,670t of contained V2O5. This JORC-compliant resource is shown in the Schedule of Mineral Resources below.

2014. As required under the Kazakh system, a reserve under the GKZ (Kazakh State Reserves Committee) reporting system was calculated in 2014 amounting to 70.8mt. The JORC estimate is a separate process but the GKZ reserves are a legal requirement and form the basis of mine planning in Kazakhstan.

Schedule of Mineral Resources (JORC 2012)

JORC Vanadium Resource OB1				By-Products OB1 (primary ore only)						
				JORC Indicated		JORC inferred				
JORC Class	V2O5% Cut-off	V2O5% Mean	Tonnes (m)	C% Mean	Tonnes (m)	C% Mean	Tonnes (m)	Total C% Mean	JORC inferred MoO3% mean	JORC inferred U3O8% mean
Indicated	0.0	0.67	21.43	14.08	10.68	13.09	10.75	13.59	0.0300	0.0090
Inferred	0.0	0.67	1.56			13.43	1.56	13.43	0.0297	0.0085
Combined	0.0	0.67	22.99					13.58	0.03	0.009
Oxide Cap inferred	0.0	0.89	1.33							
TOTAL	0.0	0.68	24.32							

Schedule of mineral reserves (JORC 2012)

Category	Reserve Tonnes (m)	Mean grade V2O5 [%]
Probable	22.938	0.59

2014 GKZ Reserve Summary

Category	Reserve tonnes (m)	Mean grade V2O5 [%]
B	832	1.00
C1	15,649	0.75
C2	54,366	0.74
B+C1+C2	70,847	

Exploration target

The emphasis of FAR's previous drilling has been on the OB1 orebody. However, the surface expression of vanadium oxide mineralisation is well documented over a considerable strike length in excess of 40km.

Whereas OB1 has been extensively drill tested, OB2 and OB3 have seen limited drilling (Soviet and FAR), the remaining orebodies have been subject to trenching and sampling, but limited drilling.

As the geology of the Balausa orebodies has become understood, and because of the fairly predictable synclinal geometry, good continuity and surface expression along strike, FAR has been able to report a JORC "Exploration Target" for orebodies OB2 to OB5. JORC permits the reporting of exploration target where grades and tonnes are expressed in ranges if a detailed explanation has been provided. The calculation has also been performed for by-products.

JORC Based Exploration Target (JORC 2012 Guidelines)

		Tonnes [m]		V2O5 Grade Range [%]	
Ore Bodies 2 to 5	Strike Length (km)	From	To	From	To
Primary Zone	20.9	73	98	0.65	0.71
Oxide Zone		4.25	5.75	0.85	0.98
Combined		77.3	103.8	0.66	0.72

JORC Based Exploration Target (JORC 2012 Guidelines) – By-Products applied to OB2-OB5 (Primary Zone Only)

Target	Global Grades based on OB1	Grade Range ± 5%	
		From	To
Carbon	13.58%	12.9	14.26
MoO3	0.030%	0.029	0.032
U3O8	0.009%	0.009	0.009
REM	335 ppm	318	352
Total Tonnes (millions)		73	98

The Exploration Target compiled by FAR's competent person in the company's November 2018 CPR amounts to a range of between 77.3Mt and 103.8Mt, with a vanadium grade range from 0.66% V2O5 to 0.72% V2O5.

Using the middle of the range tonnage estimate and grades, this equates to 624,795t of contained V2O5, about four times larger than the current JORC-compliant resource. This has demonstrated to the directors that Balausa has a potential resource sufficiently large to support an operation with world-class scale.

FAR has a good degree of confidence in the estimates as grades for OB2 and OB3 were based on Soviet and/or FAR drilling, and OB4 is considered a strike extension of OB1, and likely to contain a similar grade. Similarly, OB5 is considered a strike extension of OB3.

Balasausqandiq Phase 1 & 2 project economics

GBM has audited the FAR cash flow models and using a 10% discount rate and a long-term vanadium price of $7.50/lb, the NPV (post tax) of Phases 1 and 2 of the Balasausqandiq projects is $2.0bn. As at 15 March 2019 the Vanadium Pentoxide price was around US$16.00/lb, which would give rise to a significant increase in the NPV if it were to be used as a long-term assumption.

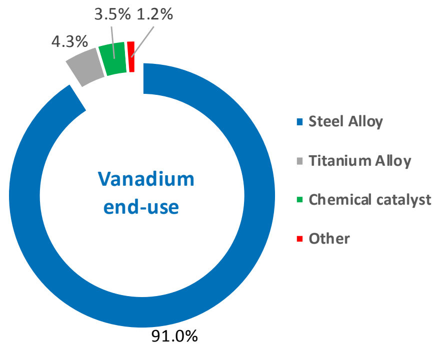
The following table is reproduced from the CPR:

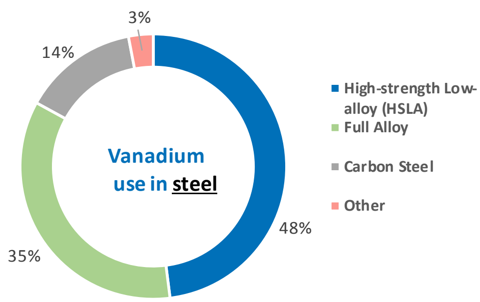
Main Aspects of Cash Flow Models (@US$7.50/lb)

Item	Value
Combined projects:	
Base case post tax asset IRR	96%
Base case post tax NPV (10 %)	US$2,048 million
(a) NPV (10%) / IRR (processing expansion only)	$73m / 242%
(b) NPV (10%) /IRR (phases 1 and 2 mining and processing)	$1,978m / 89%
Expansion of current processing operation	
Capital costs including working capital and contingency (from November 2018)	$9.7m
Annual output (V2O5 only, excluding by-products)	1,500 tonnes
Annual revenue	$23.6million
Annual costs	$11.3 million
Net operating cash flow after tax (2021 to 2026)	$9.7 million
Net operating cash flow after tax (after expiry of tax incentive agreement)	$7.8 million
Phase 1 – 1 Mtpa mining and processing	
Capital costs including working capital and contingency	$100m
Ore treated per annum	1,000,000 tonnes
Annual output V2O5 (additional to above)	5,603 tonnes
Annual revenue	$135 million
Annual costs including royalty	$32 million
Annual operating cash generation after tax	$103 million
Phase 2 – additional 3 Mtpa mining and processing	
Capital costs including working capital and contingency	$225m
Ore treated per annum (total incl. Phase 1)	4,000,000 tonnes
Annual output V2O5 (total incl. Phase 1)	22,414 tonnes
Annual revenue (total incl. Phase 1)	$541 million
Annual costs including royalty (total incl. Phase 1)	$110 million
Annual operating cash generation after tax (total incl. Phase 1)	$430 million

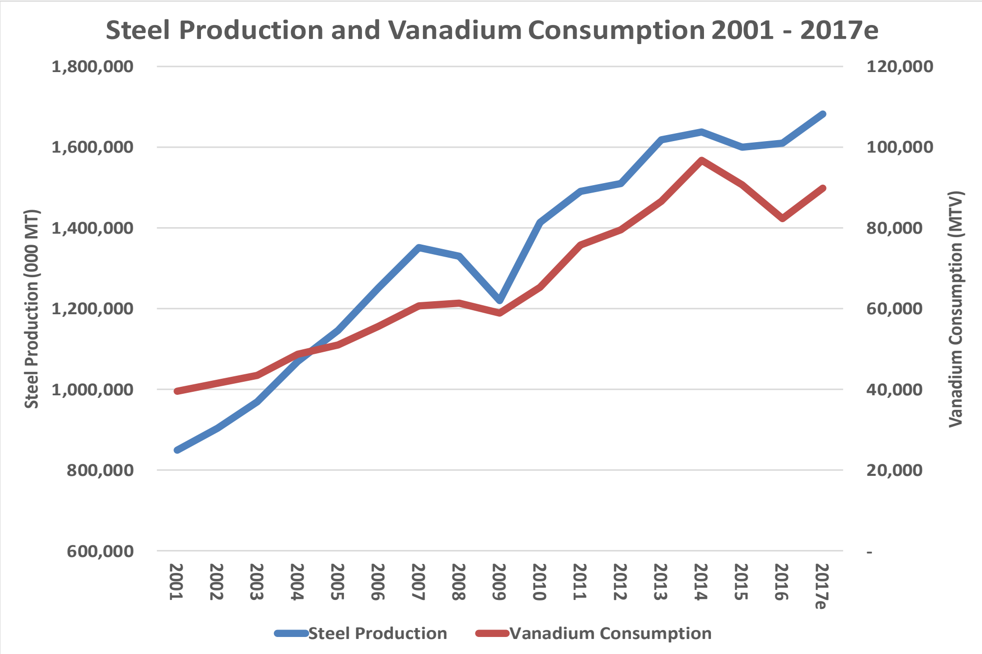
Uses of vanadium

Over 90% of global Vanadium production is consumed by the global steel industry, where vanadium is used as an alloy to strengthen steel and improve high temperature performance. This is achieved by the addition of small amounts of vanadium to high carbon steel alloys, typically 0.15% to 1.5%, and high-performance tool steels which contain much higher levels of vanadium, typically 1-5%. Vanadium also has application in specialist titanium-steels for the aerospace industry which typically use 4% vanadium.



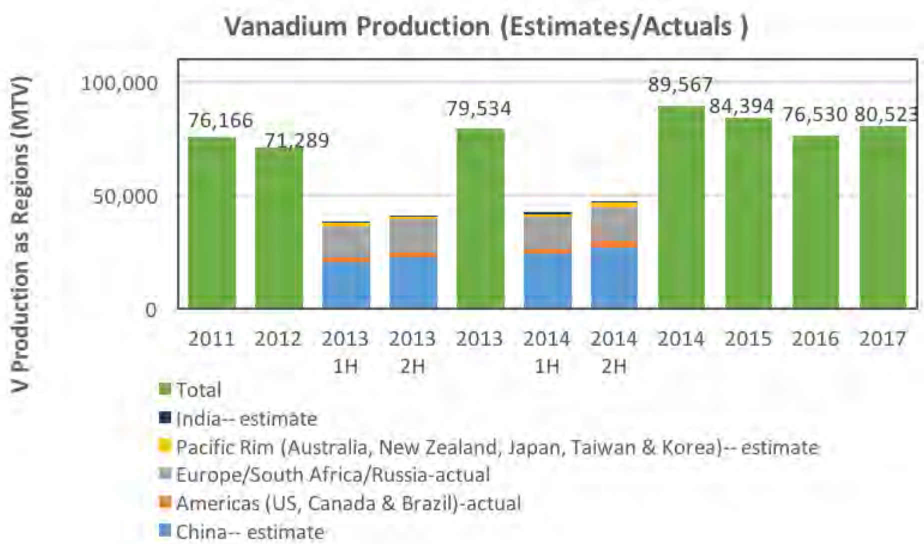


Source: Vanitec, Roskill, SCP

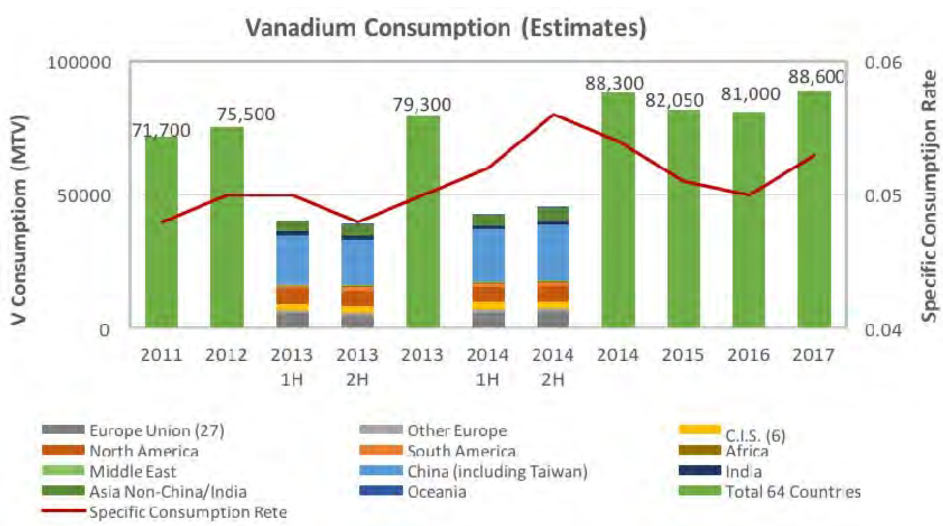


Source: TTP Squared Inc

Global vanadium production and consumption



Source: Vanitec website



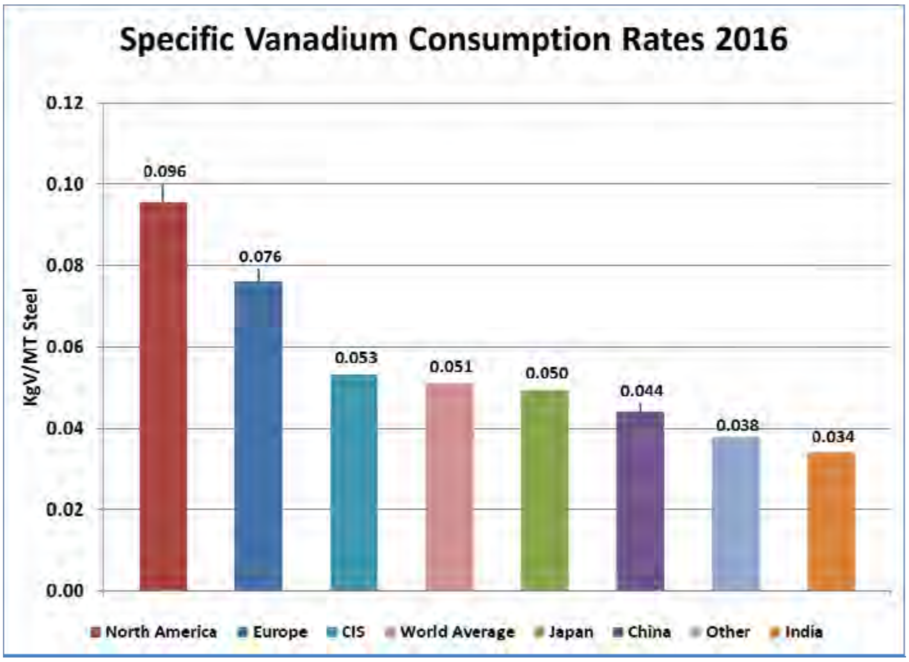
Source: Vanitec website

During 2017 and 2018 vanadium prices rose strongly particularly in China. Analysts have suggested that there are two main factors that could be driving these price rises in China. The Chinese government has revised standards for the tensile strength of rebar products and at the same time imposed a ban on vanadium slag imports.

The new standard eliminates 335MPa strength rebar and replaces it with 600MPa strength rebar further increasing the consumption of vanadium. The proposals are being implemented to improve the earthquake resistance of the steel, and consequently buildings. The changes are being put in place after several devastating earthquakes in 2008.

At the same time China has imposed a ban on all imports of vanadium-containing scrap, one of a series of measures designed to curb the growing pollution problem in the country.

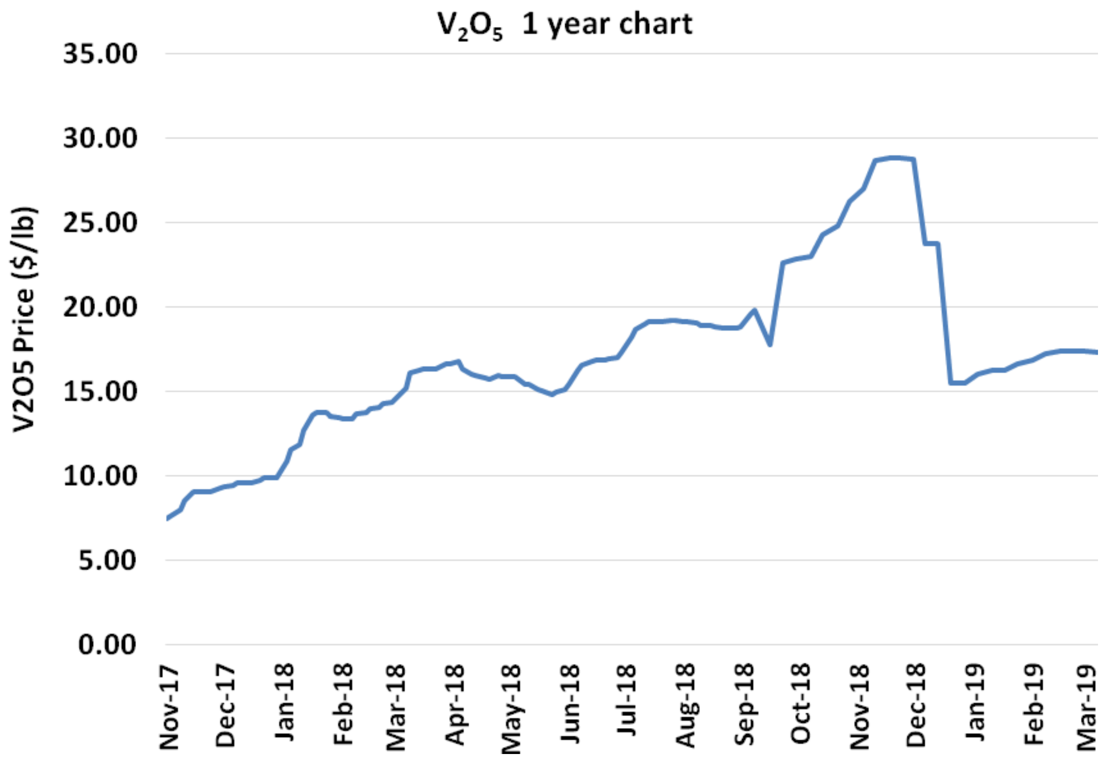
The overall consumption of vanadium in crude steel varies widely across the world, with an average of 44 grams per metric tonne (gV/MT) in China, far less than the 76gV/MT in Europe and 96gV/MT in North America, according to data compiled by TTP Squared Inc.



Source: TTP Squared

As indicated by the significant price increase during 2017, the vanadium market slipped into deficit in 2017, for the first time in almost a decade.

According to Vanitec, the vanadium sector is forecast to slip further into deficit over the next three years, with demand outstripping supply. This is based on projected 4% annual growth rate of vanadium demand for the steel industry, in combination with the new projected demand for vanadium for use in lithium-ion and vanadium flow batteries as part of the global build-out of the energy storage market. TTP Squared estimates that the global vanadium deficit in 2017 was 8,300t.



Vanadium Pentoxide (V2O5) Flake 98% - Europe – USD/lb

Source: FAR / SCP

Capital resources and capital management

Ferro-Alloy Resources Limited was incorporated on April 18, 2000 to be the holding company of a group planning to invest in mining projects. Upon formation, it issued a single share with a nominal value of USD1.00.

On 13 June 2000 a further 999 shares were issued as payment for the acquisition of 100% of the participatory capital of TOO Firma Balausa, a Kazakhstan company which holds the exploration and mining rights to exploit the Balasausqandiq vanadium bearing deposit in Kyzylorda province, Kazakhstan. 90% of the participatory interest in TOO Firma Balausa was transferred to the Company immediately and the remaining 10% was transferred on February 27, 2009.

In 2006 the authorized share capital of the Company was split from being 50,000 shares with a nominal value of USD1.00 into 5,000,000 shares of US$0.01 (one cent) each. The 1,000 shares with a nominal value of US$1.00 each that had been issued were consequently split into 100,000 shares of US$0.01 each.

From 2006 to 2012 the Company raised approximately $17m via a number of equity placings. Specifically, in 2006 the Company raised $3m from institutional investors and in 2007, 2008 and 2009, $1.9m, $1.25m and $2m respectively was raised via new equity issues. In 2010 the Company raised $7m in an equity placement in which several new institutional investors participated. In each of 2011 and 2012 the Company raised approximately $1m.

As at 31 December 2012 the Company had 231,205 ordinary shares in issue.

In each of the calendar years 2013, 2014 and 2015 the Company conducted a deep-discounted rights issue to existing shareholders raising proceeds of $2.56m, $1.45m and $1.79m respectively. In addition, new shares to the value of $195,750 were issued in lieu of fees or for cash during 2013, new shares to the value of $24,637 in 2014 and new shares to the value of $603,066 in 2015.

As at 31 December 2015, the Company had 1,496,235 ordinary shares in issue.

During 2016 7,561 new ordinary shares were issued in lieu of fees or for cash to the value of $800,000 net of expenses. As at 31 December 2016, the Company had 1,503,796 ordinary shares in issue.

On April 12 2017 Ferro-Alloy Resources Limited moved its domicile from the British Virgin Islands to Guernsey, Channel Islands. The Guernsey Registry issued the Company with a certificate of registration dated 12 April 2017 and allocated the Company the registration number 63449.

The Company's share registrar, Computershare Investor Services (Guernsey) Limited, either issued new share certificates to shareholders or transferred their shareholdings into the CREST paperless settlement system.

On 26 June 2017, Ferro-Alloy Resources Limited listed on the Kazakhstan Stock Exchange (KASE).

In preparation for the KASE listing, 150,000 Nil Paid Shares were issued and held by the Kazakhstan depository solely as a means by which shares in the Company could be offered for subscription to local Kazakhstan investors with settlement through KASE in local currency Tenge. These Nil Paid Shares are held by a nominee of the Kazakhstan depository but are beneficially owned by the Company. After subscriptions are received for the Nil Paid Shares pursuant to an offer on KASE, the subscription proceeds constitute the paid up capital and such Nil Paid Shares are treated as fully paid.

At 31 December 2017, following the KASE listing, a total of 11,201 of the Nil Paid Shares had been subscribed for (gross proceeds 358,972,000 tenge) by investors in Kazakhstan leaving 138,799 Nil Paid Shares still beneficially owned by the Company.

In addition, in the nine months to 30 September 2017 the Company had issued 5,252 new Ordinary Shares to the value of $536,684 and on 10 December 2017 the Company closed on a private placement issuing 2,727 new Ordinary Shares for gross proceeds of $300,365. During December 2017 a shareholder loan for $91,106 was converted into 756 new Ordinary Shares and all remaining shareholder loans amounting to a further $320,653 were repaid in cash.

As at 31 December 2017 the Company had 1,523,732 Ordinary Shares and 138,799 Nil Paid Shares in issue, and carried no debt. A further 13 shares Nil Paid Shares were acquired and paid up in January 2018, and a further 1,480 Ordinary Shares were issued in April 2018 bringing the total number of Ordinary Shares to 1,525,225 shares and leaving 138,786 Nil Paid Shares.

On 12 July 2018, the Company by ordinary resolution converted the Ordinary Shares of par value US $0.01 into Ordinary Shares of no par value and subdivided each existing Ordinary Share into 200 Ordinary Shares, resulting in the number of issued Ordinary Shares increasing to 305,045,000 and increasing the number of Nil Paid Shares to 27,757,200.

In July 2018, following the subdivision, 200,000 Ordinary Shares were issued for gross proceeds of US$115,000, in August 2018 173,913 Ordinary Shares were issued for gross proceeds of $100,000, and in November 2018 52,174 Ordinary Shares were issued to the non-executive directors in lieu of fees totalling US$30,000, bringing the totals in issue to 305,471,087 Ordinary Shares and 27,757,200 Nil Paid Shares at the date of this Document.

On 12 March 2019 the Company passed an ordinary resolution, subject to and with effect from Admission, to cancel all remaining Nil Paid Shares which had not been acquired and paid up as of the date of Admission or which had not been agreed to be acquired and paid up pursuant to the KASE Subscription.

Details of the Fundraising

The Placing comprises in aggregate 7,492,853 Placing Shares and will raise gross proceeds of £5.244m. The KASE Subscription will raise £10,435 by the subscription for 14,908 Subscription Shares pursuant to the KASE Subscription. The Placing Shares and the Subscription Shares will together represent approximately 2.40 per cent. of the enlarged issued ordinary share capital immediately following Admission. After the deduction of estimated expenses of £467,747 the net proceeds of the Fundraising will be £4,747,686.

The Placing is conditional upon, inter alia, the Placing Agreement not having been terminated in accordance with its terms prior to Admission and Admission becoming effective. Admission is conditional on the receipt of irrevocable commitments from investors in the Fundraising which will yield a minimum of US$5m (£3.8m) after issue costs.

Applications have been made for the Placing Shares and Subscription Shares to be admitted to a Standard Listing on the Official List and to trading on the London Stock Exchange's main market for listed securities. Any remaining Nil Paid Shares not subscribed for in the KASE Subscription will be cancelled on Admission.

The Placing Shares and Subscription Shares will, when issued and fully paid, rank pari passu in all respects with the Ordinary Shares., including the right to receive all dividends and other distributions (if any) declared, made or paid by the Company after Admission.

Directors, Senior Management and Employees

Board of directors
On Admission, the Board of the Company shall comprise two executive Directors and two non-executive Directors whose biographical details are as follows:

Nicholas Bridgen, Chief Executive
Mr. Bridgen started his career in 1975 as a Chartered Accountant at KPMG (formerly Peat Marwick Mitchell). In 1979, he moved to the Rio Tinto Group, becoming senior group accountant in 1981, before moving to Business Evaluation Department for the Group in 1985 and Group Planning Manager for the RTZ Pillar Group which held the engineering, building products and chemical companies. Nick spent 14 years in all with Rio Tinto. In the mid-1990s, he was a finance director at Bakyrchik Gold Plc. and in 1998, Mr Bridgen founded Hambledon Mining Plc which acquired the Sekisovskoye gold project, listing the company on AIM and taking the project from exploration, through construction, and into a producing mine.
Since 2006, Nicholas has been a director and more recently, CEO of Ferro-Alloy Resources Limited. He holds a Bachelor's degree with honours from Exeter University, is a Chartered Accountant and has also studied corporate finance at London Business School. He is a fluent Russian speaker.

Andrey Kuznetsov, Director of Operations
Andrey started his career in 1981 as an industrial engineer at Kirov Engineering Plant in Almaty. After three years he became Chief of the Scientific Department in Central Committee of Youth (Comsomol). In 1987, Andrey became general director of the Almaty NTTM "Kontakt" centre. In 1995-1996, he was the CEO of the Kazakhstan subsidiary of Alfa-Bank. Andrey has been the general director of TOO Firma Balausa since 2006. He holds a Specialist's degree in electrical engineering from Bauman Moscow State Technical University and a PhD in informal mathematical logic. He has also studied management at Coventry University.

Chris Thomas, Non-executive Director
Chris Thomas has nearly 35 years' experience in the communications industry. He has held various high-level management positions including CEO of Proximity London from 2003 to 2006 - one of the largest direct and digital agencies in London. In 2006, Chris was appointed Chairman & CEO of BBDO and Proximity in Asia, subsequently adding the Middle East and Africa to his responsibilities. He worked with major multinational companies across the growth markets of SE Asia, China, India and Africa. In May 2015, Chris moved to New York to take up the role of CEO of BBDO in the Americas, with responsibility for 21 agencies in the U.S., Canada and Latin America. In February 2019 he steps down from his Americas role and remains Chairman of I&S BBDO in Japan. He also served as a non-executive director on the board of Hambledon Mining from 2004 to 2011.

James Turian, Non-executive Director
James started his career in 1986 and has a background in accounting, trust and management. James has previously been involved with several mining companies in Perth, Australia, including assisting Cooper Energy in their restructuring in the early 2000's. From 2000 to 2011 James owned and operated a trust company in Guernsey which he sold to concentrate on accountancy and currently is a director of "Accounts For You Limited", a Guernsey accountancy firm. He holds several other directorships. James is a Chartered Fellow of the Securities Institute IAQ and is a Fellow of the Institute of Directors.

SENIOR MANAGEMENT

The biographical details of the directors and senior management of subsidiary companies are set out below:

Allan Davidson, Director of Energy Metals Limited
Allan has a degree in Chemical Physics from Edinburgh University and a PhD in theoretical physics from King's College, Cambridge. He is also a Fellow of the English Institute of Chartered Accountants. After qualifying as a chartered accountant in London with Price Waterhouse (now PwC), Allan held management roles in a UK investment bank and a US oil & gas multinational. He then returned to Price Waterhouse and spent over 20 years as a tax partner, in London and Almaty, advising oil & gas and mining companies.

Alexander Fofanov, Technical Director
Alexander studied chemistry at Moscow State University. From 1983 to 2004 Alexander worked at the Central Research Metallurgical Institute becoming their Chief Technologist and Managing Director. His research focused on the improvement in technology used for the extraction and processing of vanadium. From 2004 through to 2016 Alexander worked for the Evraz group becoming Deputy Director for vanadium. Recently Alexander has provided consultancy for the Pangang group in China.

Tony Thornton, Project Director
Tony Thornton graduated with honours from the Camborne School of Mines as a chartered Mining Engineer. His early experience was gained working on underground and open pit mines in Zambia, Guinea, USA, Angola, and Ghana, and more recently Tony played a leading role as Operations Manager in developing the Golden Pride Gold Mine in Tanzania for Resolute Mining of Australia. In 2008 Tony first became involved in projects in Kazakhstan as an associate Principal Mining Engineer with SRK Consulting Ltd. and in 2010 founded the SRK Consulting Ltd. practice in Almaty, Kazakhstan. In 2016 Tony joined Iluka Resources of Australia as General Director of a substantial greenfield exploration programme in Kazakhstan.

Oleg Shulepov, Deputy general director and director of the hydrometallurgical plant
Oleg obtained his degree in Mechanical Engineering at the Tula State Technical University in Russia in 1993 and has held a number of positions at director level. In particular, from 2002 to 2005 he worked in the Evraz group, latterly as Chief Engineer and a member of the board of directors of Tula Vanadium, one of the world's largest producers of vanadium. He again joined the Evraz group in 2011 as Chief Manager of the Directorate of Technical Support for Vanadium Assets and Chief Manager of the Project Development Department. Oleg speaks German and English, as well as his native Russian.

Nazygul Zhumakynbai, Chief technologist
Nazygul took her bachelors and masters degrees in Chemistry and Chemical Technology at the Kazakhstan State University followed by her doctorate in the department of inorganic substances at the Kazakh-British Technical University. She worked for six years as a researcher at the National Centre for Complex Processing of Mineral Raw Materials of the Republic of Kazakhstan before joining the Group in 2017.

Employees

The Group currently has approximately 141 employees.

Summary financial information

The audited 31 December 2017 Financial Statements are presented in Part VIII of the Prospectus.

Corporate Governance

General

As a consequence of the Ordinary Shares being admitted to the standard segment of the Official List, the UK Corporate Governance Code, published by the Financial Reporting Council (the "Corporate Governance Code"), will not apply to the Company. However, the Board recognises the importance of good corporate governance and has given due consideration to the principles and recommendations set out in the

Corporate Governance Code.

The Board of Directors of FAR is responsible for the overall corporate governance of the consolidated Group, guiding and monitoring the business and affairs of FAR on behalf of the shareholders by whom they are elected and to whom they are accountable.

Composition of the Board

The number of Directors as specified in the Articles of Incorporation of the Company is a minimum of one and up to a maximum of seven. Having regard to the Company's stage of development, the directors believe that the size of the current board comprising four directors, two of whom are executive and two are non-executive, is appropriate. The directors intend that there will always be at least as many non-executive directors as there are executive directors. Directors are encouraged to own Company shares.

Board Committees

The Company does not have any audit, remuneration or nomination committees. The Board is of the opinion that due to the nature and size of the Company, the functions performed by such committees have until now been adequately handled by the full Board. The Company intends to constitute an audit committee and a remuneration committee after admission.

Code of conduct

The goal of establishing the Company as a significant mining and processing Company is underpinned by its core values of honesty, integrity, common sense and respect for people. The Company desires to remain a good corporate citizen and appropriately balance, protect and preserve all stakeholders' interests.

Shareholder communication

The Board aims to ensure that shareholders and investors have equal access to the Company's information. The Company aims to promote effective communication with shareholders and encourage effective participation at general meetings through a policy of open disclosure to shareholders, regulatory authorities and the broader community of all material information with respect to the Company's affairs.

The Takeover Code

The UK City Code on Takeovers and Mergers (the "Takeover Code") applies to all takeover and merger transactions in relation to the Company and operates principally to ensure that Shareholders are treated fairly, are not denied an opportunity to decide on the merits of a takeover and to ensure that shareholders of the same class are afforded equivalent treatment. The Takeover Code provides an orderly framework within which takeovers are conducted and the Panel on Takeovers and Mergers is on a statutory footing.

The Takeover Code is based upon a number of general principles which are essentially statements of standards of commercial behaviour. General Principle One states that all holders of securities of an offeree company of the same class must be afforded equivalent treatment and if a person acquires control of a company, the other holders of securities must be protected. Under Rule 9 of the Takeover Code, when (i) a person acquires shares which, when taken together with shares already held by him or persons acting in concert with him, carry 30 per cent. or more of the voting rights of a company subject to the Takeover Code; or (ii) any person who, together with persons acting in concert with him, holds not less than 30 per cent. but not more than 50 per cent. of the voting rights of a company subject to the Takeover Code, and such person, or any person acting in concert with him, acquires additional shares which increases his percentage of the voting rights, then in either case that person together with the persons acting in concert with him is normally required to make a general offer in cash, at the highest price paid by him, or any person acting in concert with him, for shares in the company within the preceding 12 months, for all the remaining equity share capital of the company. "Voting rights" for these purposes means all the voting rights attributable to the share capital of a company which are currently exercisable at a general meeting,

Conflicts of Interest

There are no potential conflicts of interest between any duties owed by the Directors to the Company and their private interests or other duties.

Dividend Policy

The declaration of any payment by the Company of any future dividends in respect of the Ordinary Shares, and the amount of such, will depend on the results of its operations, financial condition, cash requirements, future prospects, profits available for distribution and other factors deemed to be relevant at the time.

Details of the Share Capital

As at the date of this document, the Company's Issued Share Capital comprises 305,471,087 Ordinary Shares. Upon Admission the Company's issued share capital will comprise 312,978,848 Ordinary Shares.

The above figures do not include 27,757,200 Nil Paid Shares which were created as a means of providing ordinary shares in the capital of the Company for issue in Kazakhstan. These ordinary shares are nil-paid and are held by a nominee of the Kazakhstan depository but are beneficially owned by the Company. They have never been beneficially owned by a third party. When such ordinary shares are subscribed for by investors in the KASE Subscription, the proceeds will be considered to be the paid in capital in respect of those ordinary shares and the total of such subscribed for Nil Paid Shares will be added to the number Ordinary Shares. On Admission, all remaining Nil Paid Shares not subscribed for under the KASE Subscription will be cancelled.

Details of the Directors' shareholdings are set out in Part XII of this document. The Company has no options in issue.

Save for the 64,285 Adviser Warrants to be issued upon Admission, the Company has no warrants in issue.

This document and the other documents that the Company is required to make available for inspection will be displayed on the Company's website (www.ferro-alloy.com).

Admission to trading on the Official List

The Directors have applied for the Ordinary Shares to be admitted to the Official List of the UKLA by way of a Standard Listing and to trading on the Main Market of the London Stock Exchange. Admission is expected to take place and unconditional dealings in the Ordinary Shares are expected to commence on the London Stock Exchange at 8.00 a.m. on 28 March 2019. Dealings on the London Stock Exchange before Admission will only be settled if Admission takes place. All dealings in Ordinary Shares prior to commencement of unconditional dealings will be at the sole risk of the parties concerned.

The expected date for electronic settlement of such dealings will be 28 March 2019. All dealings between the commencement of conditional dealings and the commencement of unconditional dealings will be on a "when issued basis".

Transferability of the Ordinary Shares

The Ordinary Shares are freely transferable and tradable and there are no restrictions on transfer.

However, the Ordinary Shares will not be registered under the Securities Act or the securities laws of any state or other jurisdiction of the US and may not be taken up, offered, sold, resold, transferred, delivered or distributed, directly or indirectly, within, into or in, the US.

CREST

The Articles permit the holding of the Ordinary Shares in uncertificated form in accordance with the Uncertificated Securities (Guernsey) Regulations 2009 (the "Regulations") and settlement of transactions in the Ordinary Shares following Admission may take place within the CREST system if any investor so wishes.

CREST is a paperless settlement procedure enabling securities to be evidenced otherwise than by a certificate and transferred otherwise than by written instrument. CREST is a voluntary system and investors who wish to receive and retain certificates for their securities will be able to do so. Subscribers may elect to receive Ordinary Shares in uncertificated form if such investor is a system-member (as defined in the Regulations) in relation to CREST.

Taxation

Information regarding taxation is set out below in Part XI of this document.

If you are in any doubt as to your tax position you should consult your own independent financial adviser immediately.

Further Information

Your attention is drawn to Part II of this document which contains risk factors relating to Ferro-Alloy Resources Limited and its operations and to Part XII which contains additional information on Ferro-Alloy Resources Limited.

PART VIII

FINANCIAL INFORMATION ON THE COMPANY

Ferro-Alloy Resources Limited

Consolidated Financial Statements
for the year ended
31 December 2017

Contents

«КПМГ Аудит» жауапкершілігі шектеулі серіктестік
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Independent Auditors' Report

To the Shareholders and the Board of Directors of Ferro-Alloy Resources Limited

Opinion

We have audited the consolidated financial statements of Ferro-Alloy Resources Limited and its subsidiaries (the "Group"), which comprise the consolidated statement of financial position as at 31 December 2017, the consolidated statements of profit or loss and other comprehensive income, changes in equity and cash flows for the year then ended, and notes, comprising significant accounting policies and other explanatory information.

In our opinion, the accompanying consolidated financial statements present fairly, in all material respects, the consolidated financial position of the Group as at 31 December 2017, and its consolidated financial performance and its consolidated cash flows for the year then ended in accordance with International Financial Reporting Standards (IFRS).

Basis for Opinion

We conducted our audit in accordance with International Standards on Auditing (ISAs). Our responsibilities under those standards are further described in the *Auditors' Responsibilities for the Audit of the Consolidated Financial Statements* section of our report. We are independent of the Group in accordance with the International Ethics Standards Board for Accountants' *Code of Ethics for Professional Accountants* (IESBA Code) together with the ethical requirements that are relevant to our audit of the consolidated financial statements in the Republic of Kazakhstan, and we have fulfilled our other ethical responsibilities in accordance with these requirements and the IESBA Code. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Emphasis of Matter

We draw attention to Note 4 to the consolidated financial statements which indicates that the comparative information presented as at and for the year ended 31 December 2016 has been restated. Our opinion is not modified in respect of this matter.

Other Matter relating to comparative information

As part of our audit of the consolidated financial statements as at and for the year ended 31 December 2017, we have audited the adjustments described in Note 4 that were applied to restate the comparative information presented as at and for the year ended 31 December 2016 and the statement of financial position as at 1 January 2016. In our opinion, the adjustments described in Note 4 are appropriate and have been properly applied.

Key Audit Matters

Key audit matters are those matters that, in our professional judgment, were of most significance in our audit of the consolidated financial statements of the current period. These matters were addressed in the context of our audit of the consolidated financial statements as a whole, and in forming our opinion thereon, and we do not provide a separate opinion on these matters.

<table>
<tr><th colspan="2">1. Impairment of property, plant and equipment, exploration and evaluation assets intangible assets and inventories</th></tr>
<tr><td colspan="2">Please refer to the Notes 13, 14, 15 and 17 in the consolidated financial statements.</td></tr>
<tr><td>The key audit matter</td><td>How the matter was addressed in our audit</td></tr>
<tr><td>In 2017 management reconsidered the basis of impairment tests that were performed for previous years in relation to property plant and equipment, exploration and evaluation assets, intangible assets and inventory. Management concluded that it was appropriate to update these tests using more appropriate assumptions. As a result, these assets have been impaired as at 31 December 2017.

Management's estimate of recoverable amounts of these assets is based on their value in use. Under the corrected assumptions, management consider that the value in use of these assets is nil, due to the fact that at the relevant time when those financial statements had been drawn up the Group had been operating in a start-up phase for several years, had a history of losses, and was still in the process of testing and changing the technologies to be used in the realisation of its business plan at previous reporting dates.

We believe that this is a key audit area, because of the amounts of impairment recognised in these consolidated financial statements, and due to the inherent uncertainties in forecasting future performance.</td><td>Our audit procedures included the following:

– Evaluating whether management's estimate of the value in use complies with the requirements of IAS 36 Impairment of assets.

– Considering the design and implementation of controls implemented by management relating to the determination of the impairment.

– Evaluating reasonableness of the key assumptions made by management in relation to the impairment in particular in relation to the planned future use of the plant and equipment.</td></tr>
</table>

<table>
<tr><th colspan="2">2. Going concern</th></tr>
<tr><td colspan="2">Please refer to the Notes 1(d) and 2(d) in the consolidated financial statements.</td></tr>
<tr><th>The key audit matter</th><th>How the matter was addressed in our audit</th></tr>
<tr><td>IFRS requires management to make an assessment of the entity's ability to continue as a going concern. When management is aware, in making its assessment, of material uncertainties related to events or conditions that may cast significant doubt upon the entity's ability to continue as a going concern, an entity is required to disclose those uncertainties in its financial statements.

In assessing whether the going concern assumption is appropriate, management took into account all available information about the financial condition of the Group, which is at least, but not limited to, twelve months from the end of the reporting period. In making this assessment, management has considered, in particular, the following:
- The group made a loss of USD 1,080 thousand in 2017, had negative operating cash flows of USD 1,035 thousand;
- The market price of vanadium increased from USD 5/lb at 31 January 2017 to USD 10/lb at 31 December 2017, and to USD 19/lb at 31 July 2018;
- During 2018, and at the approval date of the financial statements, the Group had achieved positive cash flows from its operating activities;
- In addition, management of the group indicated their willingness to provide financial support through continuing to defer payment of the Group's current liabilities which are due to them as compensation, if this should become necessary to support the Group's working capital or investment requirements.

Following this assessment, management concluded that there is no material uncertainty relating to going concern in relation to the Group's operations. This assessment is disclosed as a significant accounting judgement in Note 2 (d) to the financial statements.</td><td>We enquired of management their assessment of going concern, and performed the following procedures in relation to their assessment and documentation supporting that assessment:
- Performed audit procedures over reasonableness of operating results from 1 January to 31 July 2018 by inspecting supporting documents for revenues and comparing costs to actual incurred in 2017;
- Performed analytical audit procedures over reasonableness of cash flow forecasts prepared by management, including reasonableness of the vanadium market prices used in the forecasts, level of production and operating costs;
- Inspected bank statements showing the Group's cash balances and other documents showing overall liquidity position at the date of approval of the financial statements; and
- Inspected correspondence from management stating their intention to defer payment of the Group's current liabilities due to them, if this should become necessary to support the Group's working capital or investment requirements.

We also read the disclosures in the financial statements relating to management's assessment of going concern, and considered the adequacy of these disclosures.</td></tr>
</table>

2. Going concern, continued	
The key audit matter	***How the matter was addressed in our audit***
We believe this is a key audit area, because, if management's use of the going concern basis of accounting was to be found inappropriate, then the amounts of assets and liabilities recognised in the accompanying consolidated financial statements could have been materially misstated.	

Responsibilities of Management and Those Charged with Governance for the Consolidated Financial Statements

Management is responsible for the preparation and fair presentation of the consolidated financial statements in accordance with IFRS, and for such internal control as management determines is necessary to enable the preparation of consolidated financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the consolidated financial statements, management is responsible for assessing the Group's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless management either intends to liquidate the Group or to cease operations, or has no realistic alternative but to do so.

Those charged with governance are responsible for overseeing the Group's financial reporting process.

Auditors' Responsibilities for the Audit of the Consolidated Financial Statements

Our objectives are to obtain reasonable assurance about whether the consolidated financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditors' report that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with ISAs will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these consolidated financial statements.

As part of an audit in accordance with ISAs, we exercise professional judgment and maintain professional skepticism throughout the audit. We also:

- Identify and assess the risks of material misstatement of the consolidated financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.

- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Group's internal control.

- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by management.

- Conclude on the appropriateness of management's use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Group's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditors' report to the related disclosures in the consolidated financial statements or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditors' report. However, future events or conditions may cause the Group to cease to continue as a going concern.
- Evaluate the overall presentation, structure and content of the consolidated financial statements, including the disclosures, and whether the consolidated financial statements represent the underlying transactions and events in a manner that achieves fair presentation.
- Obtain sufficient appropriate audit evidence regarding the financial information of the entities or business activities within the Group to express an opinion on the consolidated financial statements. We are responsible for the direction, supervision and performance of the group audit. We remain solely responsible for our audit opinion.

We communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.

We also provide those charged with governance with a statement that we have complied with relevant ethical requirements regarding independence, and communicate with them all relationships and other matters that may reasonably be thought to bear on our independence, and where applicable, related safeguards.

From the matters communicated with those charged with governance, we determine those matters that were of most significance in the audit of the consolidated financial statements of the current period and are therefore the key audit matters. We describe these matters in our auditors' report unless law or regulation precludes public disclosure about the matter or when, in extremely rare circumstances, we determine that a matter should not be communicated in our report because the adverse consequences of doing so would reasonably be expected to outweigh the public interest benefits of such communication.

The engagement partner on the audit resulting in this independent auditors' report is:

Ashley Clarke
Engagement Partner

Anton Shcherbak
Certified Auditor
of the Republic of Kazakhstan,
Auditor's Qualification Certificate
No. MФ-0000183 of 2 June 2014

KPMG Audit LLC

State Licence to conduct audit # 0000021 dated 6 December 2006 issued by the Ministry of Finance of the Republic of Kazakhstan

Assel Khairova
General Director of KPMG Audit LLC
acting on the basis of the Charter

12 September 2018

	Note	2017 $000	Restated 2016 $000
Revenue	5	1,132	292
Cost of sales	6	(1,084)	(645)
Gross profit/(loss)		**48**	**(353)**
Other income	7	52	35
Administrative expenses	8	(908)	(875)
Distribution expenses		(64)	(14)
Other expenses	9	(124)	(47)
Loss from operating activities		**(996)**	**(1,254)**
Net finance costs	11	(84)	(51)
Loss before income tax		**(1,080)**	**(1,305)**
Income tax	12	-	-
Loss for the year		**(1,080)**	**(1,305)**
Other comprehensive income			
Items that will never be reclassified to profit or loss			
Foreign currency translation differences		2	(11)
Loss and total comprehensive income for the year		**(1,078)**	**(1,316)**
Loss per share of common stock attributable to the Shareholders			
Basic, USD	21	(0.71)	(0.87)
Diluted, USD	21	(0.71)	(0.87)

These consolidated financial statements were approved by Management on 11 September 2018 and were signed on its behalf by:

James Turian
Director and company secretary

The consolidated statement of profit or loss and other comprehensive income is to be read in conjunction with the notes to, and forming part of, the consolidated financial statements set out on pages 12 to 44.

	Note	31 December 2017 $000	Restated 31 December 2016 $000	Restated 1 January 2016 $000
ASSETS				
Non-current assets				
Property, plant and equipment	13	79	58	52
Intangible assets	15	2	1	1
Long-term VAT receivable	18	91	-	-
Prepayments	19	52	36	37
Total non-current assets		**224**	**95**	**90**
Current assets				
Inventories	17	596	590	538
Trade and other receivables	18	47	102	14
Prepayments	19	15	10	9
Cash and cash equivalents	20	267	72	267
Total current assets		**925**	**774**	**828**
Total assets		**1,149**	**869**	**918**
EQUITY AND LIABILITIES				
Equity				
Share capital	21	15	15	15
Share premium	21	26,904	25,030	24,230
Additional paid-in capital	24	380	-	-
Foreign currency translation reserve		(2,672)	(2,674)	(2,663)
Accumulated losses		(24,238)	(23,158)	(21,853)
Total equity		**389**	**(787)**	**(271)**
Non-current liabilities				
Provisions	23	152	135	121
Total non-current liabilities		**152**	**135**	**121**
Current liabilities				
Loans and borrowings	22	-	392	115
Trade and other payables	24	608	1,129	953
Total current liabilities		**608**	**1,521**	**1,068**
Total liabilities		**760**	**1,656**	**1,189**
Total equity and liabilities		**1,149**	**869**	**918**

The consolidated statement of financial position is to be read in conjunction with the notes to, and forming part of, the consolidated financial statements set out on pages 12 to 44.

	Share capital $000	Share premium $000	Additional paid-in capital $000	Foreign currency translation reserve $000	Accumulated losses $000	Total $000
Balance at 1 January 2016, as previously reported	**15**	**24,230**	**-**	**(2,663)**	**(18,698)**	**2,884**
Restatement (Note 4)	-	-	-	-	(3,155)	(3,155)
Balance at 1 January 2016, as restated	**15**	**24,230**	**-**	**(2,663)**	**(21,853)**	**(271)**
Loss for the year	-	-	-	-	(1,305)	(1,305)
Other comprehensive income						
Items that will never be reclassified to profit or loss						
Foreign currency translation differences	-	-	-	(11)	-	(11)
Total comprehensive income for the year	**-**	**-**	**-**	**(11)**	**(1,305)**	**(1,316)**
Transactions with owners, recorded directly in equity						
Shares issued	-	800	-	-	-	800
Balance at 31 December 2016, restated	**15**	**25,030**	**-**	**(2,674)**	**(23,158)**	**(787)**
Balance at 1 January 2017	15	25,030	-	(2,674)	(23,158)	(787)
Loss for the year	-	-	-	-	(1,080)	(1,080)
Other comprehensive income						
Items that will never be reclassified to profit or loss						
Foreign currency translation differences	-	-	-	2	-	2
Total comprehensive income for the year	**-**	**-**	**-**	**2**	**(1,080)**	**(1,078)**
Transactions with owners, recorded directly in equity						
Shares issued	-	1,874	-	-	-	1,874
Other transactions recognised directly in equity (Note 24)	-	-	380	-	-	380
Balance at 31 December 2017	**15**	**26,904**	**380**	**(2,672)**	**(24,238)**	**389**

The consolidated statement of changes in equity is to be read in conjunction with the notes to, and forming part of, the consolidated financial statements set out on pages 12 to 44.

	Note	2017 $000	Restated 2016 $000
Cash flows from operating activities			
Loss for the year		**(1,080)**	**(1,305)**
Adjustments for:			
Depreciation and amortisation	13, 15	27	24
Impairment of property, plant and equipment and intangible assets	13, 15	119	47
Impairment of exploration and evaluation assets	14	5	-
Impairment of VAT receivables	8	4	25
Write-down of inventories to net realisable value and obsolescence	6	39	60
Finance costs, net	11	84	51
Impairment of prepayments and trade receivables	8	45	9
Cash used in operating activities before changes in working capital		**(757)**	**(1,089)**
Change in inventories		(44)	(67)
Change in trade and other receivables, including VAT		(43)	(110)
Change in prepayments		(47)	(8)
Change in trade and other payables		(144)	268
Net cash used in operating activities		**(1,035)**	**(1,006)**
Cash flows from investing activities			
Acquisition of property, plant and equipment		(182)	(107)
Acquisition of intangible assets		(1)	-
Net cash used in investing activities		**(183)**	**(107)**
Cash flows from financing activities			
Proceeds from issue of share capital	22	1,747	702
Proceeds from borrowings	22	20	246
Repayment of loans and borrowings	22	(368)	-
Net cash from financing activities		**1,399**	**948**
Net increase/(decrease) in cash and cash equivalents		**181**	**(165)**
Cash and cash equivalents at the beginning of year		72	267
Effect of movements in exchange rates on cash and cash equivalents		14	(30)
Cash and cash equivalents at the end of year	20	**267**	**72**

During 2017, the Group issued new shares for the total amount of USD 1,874 thousand (2016: USD 800 thousand). Part of the expected proceeds of the new shares issued were offset against loans and borrowings and salaries in the amount of USD 91 thousand and USD 36 thousand, respectively (2016: against salaries in the amount of USD 98 thousand). The remaining amount of proceeds from shares issued was paid in cash.

The consolidated statement of cash flows is to be read in conjunction with the notes to, and forming part of, the consolidated financial statements set out on pages 12 to 44.

1 Reporting entity

(a) Organisation and operations

Ferro-Alloy Resources Limited (the "Company") was incorporated on 18 April 2000 in the British Virgin Islands. In April 2017 the Company moved its registered office from the British Virgin Islands to Guernsey and its new legal address is Noble House, Les Baissieres, St. Peter Port, Guernsey, GY1 2UE. The consolidated financial statements for the year ended 31 December 2017 comprise the Company and the following subsidiaries (together referred to as the "Group"):

Company	Location	Company's share in charter capital	Primary activities
Ferro-Alloy Products Limited	British Virgin Islands	100%	Carries out the treasury and finance activities for the Group
Energy Metals Limited	UK	100%	Manages processing activity and performs management service
Vanadium Products LLC	Kazakhstan	100%	Performs services for the Group
Firma Balausa LLC	Kazakhstan	100%	Production and sale of vanadium and associated by-products
Balausa Processing Company LLC	Kazakhstan	100%	Expected processing

The Group's principal activities are mining, processing and the sale of vanadium-containing and associated products which are sold in Kazakhstan and abroad.

(b) Kazakhstan business environment

The Group's operations are primarily located in Kazakhstan. Consequently, the Group is exposed to the economic and financial markets of Kazakhstan which display characteristics of an emerging market. The legal, tax and regulatory frameworks continue development, but are subject to varying interpretations and frequent changes which together with other legal and fiscal impediments contribute to the challenges faced by entities operating in Kazakhstan. In addition, the depreciation of the Kazakhstan tenge in 2015, and a reduction in the global price of oil, have increased the level of uncertainty in the business environment.

The consolidated financial statements reflect management's assessment of the impact of the Kazakhstan business environment on the operations and the financial position of the Group. The future business environment may differ from management's assessment.

(c) Current operations

The current production test plant is treating purchased low-grade concentrates to produce vanadium in the form of ammonium metavanadate (AMV). This plant was adapted from the former pilot plant which had been built and operated to test the proposed treatment process for ore mined at Balasausqandiq. Having served its purpose, it was converted to the treatment of purchased concentrates. The Group's plan was to prove the commercial potential of the plant whilst making minimal changes and then increase its capacity to a more substantial scale.

1 Reporting entity, continued

(c) Current operations, continued

In 2017 the first steps were taken to increase the plant's production capacity and enable it to treat a wider variety of raw materials. 150 tonnes of high-grade raw-materials of different types and origin were procured and samples were tested. A new production circuit to treat these materials was designed to operate in parallel with the existing circuits and in September 2017 this plan was initiated by the design and ordering of a new roaster. During the remainder of 2017 a new evaporation pond was constructed, the factory operations were reorganised, preparatory work was carried out to prepare for the delivery of the roaster and the associated leaching and desorption equipment was installed. The roaster was delivered in January 2018 and after installation and preliminary commissioning, operating regimes for several new materials were tested on the new equipment with favourable results. Production from the new equipment on a commercial scale is expected to start in October 2018.

Over the course of 2017 the European market price of vanadium pentoxide (an indicator of vanadium prices generally) rose from just over USD 5/lb at the start of the year to nearly USD 10/lb at the end, averaging USD 6.94/lb compared with USD 3.60/lb in 2016. The start of 2018 has also been marked by further strong growth with the price at the end of July being just under USD 19/lb.

(d) Future plans

Processing operations

The Group has already embarked on the first steps of a development plan which it expects will have the effect of increasing production capacity to a level which is expected to allow sustained production of over 125 tonnes per month of vanadium pentoxide (contained in AMV), a more than tenfold increase on previous levels. Following testing of the new roaster and associated production equipment, the plan has been modified to focus more on higher grade secondary materials.

The plan entails increasing the size of the existing plant, installing ovens to convert AMV to vanadium pentoxide in easily transportable flake or granule form together with additional leach and filtration capacity. At the same time, infrastructure improvements are being made to the power supply, railway sidings, offices and accommodation. The total capital cost is now estimated at approximately USD 10 million although the later stages will be financed by earnings from the earlier production. This represents a reduction of some USD 2 million over the previously planned amount. Much of the work will also benefit the development of the Group's own mine and associated treatment plant which will also utilise the improved power, railway sidings, accommodation and offices. The additional plant items will be built and introduced step by step so that no major shutdown will be required. Subject to finance, production is expected to rise incrementally over the course of the rest of 2018 and 2019.

Development of the Balasausqandiq mine and processing plant

In parallel with existing operations discussed above, and using the resulting cash flows, the Group plans to continue development of the Balasausqandiq vanadium deposit. A feasibility study indicates that capital costs of some USD 100 million will be required as a first stage of development to mine and treat one million tonnes per year of ore, producing some 5,600 tonnes per year of vanadium-containing products, measured on the basis of the vanadium pentoxide content. A subsequent expansion is planned which will increase this to 22,400 tonnes per year.

(e) Financing

During 2017 the Company raised USD 1.7 million from subscriptions for share capital. This was aided by the listing of the Company's shares on the Kazakhstan Stock Exchange (KASE) in July 2017. This capital has been used by the Group to continue to develop the current operations as described above, as well as to repay all group borrowings.

2 Basis of accounting

(a) Statement of compliance

These consolidated financial statements have been prepared in accordance with International Financial Reporting Standards ("IFRSs").

(b) Basis of measurement

The consolidated financial statements have been prepared on the historical cost basis.

(c) Functional and presentation currency

The national currency of Kazakhstan is the Kazakhstan tenge ("KZT) which is also the Company's functional currency and the functional currency of its subsidiaries. These consolidated financial statements are presented in United States dollars ("USD") as this is the currency familiar to the majority of the Company's shareholders. All financial information has been rounded to and is presented in thousands of USD unless stated otherwise.

(d) Going concern

The consolidated financial statements are prepared in accordance with IFRS on a going concern basis, which contemplates realisation of assets and satisfaction of liabilities in the normal course of business in the foreseeable future.

During 2017 the Group operated a production test plant and incurred a net loss of USD 1,080 thousand and had net operating cash outflows of USD 1,035 thousand.

The Group is reliant on its ability make operating profits and to raise future finance in order to implement its plans described in Note 1 (d). Its ability to generate sufficient positive cash flows may be significantly affected by unexpected fluctuations in the vanadium price or unforeseen production difficulties. In the event of such issues arising, management may consider other alternatives including adapting or rescheduling future investment plans. However, at the date of approval of these consolidated financial statements the Group is operating profitably (unaudited). In addition, management of the group indicated their willingness to provide financial support through continuing to defer payment of the Group's current liabilities which are due to them as compensation, as necessary to support the Group's working capital or investment requirements.

Based on its estimates of future operating costs and its level of liabilities management considers that the Group has sufficient funds to allow it to continue in operation and meet its obligations in the foreseeable future.

(e) Use of estimates and judgments

The preparation of consolidated financial statements in conformity with IFRSs requires management to make judgments, estimates and assumptions that affect the application of accounting policies and the reported amounts of assets, liabilities, income and expenses. Actual results may differ from those estimates.

Estimates and underlying assumptions are reviewed on an ongoing basis. Revisions to accounting estimates are recognised in the period in which the estimates are revised and in any future periods affected.

Information about critical judgments in applying accounting policies that have the most significant effect on the amounts recognised in the consolidated financial statements is included in the following note:

- Note 2(d) – Going concern assumption;
- Note 3(h) and 17 – Net realisable value of inventories;
- Note 4 – Restatement of comparative information;
- Note 16 – Unrecognised deferred tax assets;
- Note 23 – Provisions.

3 Significant accounting policies

The accounting policies set out below have been applied consistently to all periods presented in these consolidated financial statements and have been applied consistently by Group entities.

(a) Basis of consolidation

(i) Subsidiaries

Subsidiaries are entities controlled by the Group. The Group controls an entity when it is exposed to, or has rights to, variable returns from its involvement with the entity and has the ability to affect those returns through its power over the entity. The financial statements of subsidiaries are included in the consolidated financial statements from the date that control commences until the date that control ceases. The accounting policies of subsidiaries have been changed when necessary to align them with the policies adopted by the Group.

(ii) Transactions eliminated on consolidation

Intra-group balances and transactions, and any unrealised income and expenses arising from intra-group transactions, are eliminated in preparing the consolidated financial statements. Unrealised losses are eliminated in the same way as unrealised gains, but only to the extent that there is no evidence of impairment.

(b) Foreign currency

(i) Foreign currency transactions

Transactions in foreign currencies are translated to the respective functional currencies of Group entities at exchange rates at the dates of the transactions.

Monetary assets and liabilities denominated in foreign currencies at the reporting date are translated to the functional currency at the exchange rate at that date. The foreign currency gain or loss on monetary items is the difference between amortised cost in the functional currency at the beginning of the period, adjusted for effective interest and payments during the period, and the amortised cost in foreign currency translated at the exchange rate at the end of the reporting period.

Non-monetary items in a foreign currency that are measured based on historical cost are translated using the exchange rate at the date of the transaction.

Foreign currency differences arising in translation are recognised in profit or loss.

(ii) Presentation currency

The assets and liabilities of foreign operations are translated to USD at the exchange rates at the reporting date. The income and expenses of foreign operations are translated to USD at the average exchange rate for the period, which approximates the exchange rates at the dates of the transactions.

Foreign currency differences are recognised in other comprehensive income and are presented within the foreign currency translation reserve in equity.

(c) Financial instruments

(i) Non-derivative financial instruments

Non-derivative financial instruments comprise trade and other receivables, cash and cash equivalents, loans and borrowings and trade and other payables.

The Group initially recognises loans and receivables and deposits on the date that they are originated. All other financial assets are recognised initially on the trade date at which the Group becomes a party to the contractual provisions of the instrument.

The Group derecognises a financial asset when the contractual rights to the cash flows from the asset expire, or it transfers the rights to receive the contractual cash flows on the financial asset in a transaction in which substantially all the risks and rewards of ownership of the financial asset are transferred. Any interest in transferred financial assets that is created or retained by the Group is recognised as a separate asset or liability.

3 Significant accounting policies, continued

(c) Financial instruments, continued

(i) Non-derivative financial instruments, continued

Financial assets and liabilities are offset and the net amount presented in the statement of financial position when, and only when, the Group has a legal right to offset the amounts and intends either to settle on a net basis or to realise the asset and settle the liability simultaneously.

The Group has the following non-derivative financial assets: loans and receivables.

Loans and receivables

Loans and receivables are a category of financial assets with fixed or determinable payments that are not quoted in an active market. Such assets are recognised initially at fair value plus any directly attributable transaction costs. Subsequent to initial recognition loans and receivables are measured at amortised cost using the effective interest method, less any impairment losses.

Loans and receivables comprise the following classes of assets: trade and other receivables as presented in Note 18 and cash and cash equivalents as presented in Note 20.

Cash and cash equivalents

Cash and cash equivalents comprise cash balances in banks, call deposits and highly liquid investments with maturities of three months or less from the acquisition date that are subject to insignificant risk of changes in their fair value and petty cash.

(ii) Non-derivative financial liabilities

The Group initially recognises debt securities issued on the date that they are originated. All other financial liabilities are recognised initially on the trade date at which the Group becomes a party to the contractual provisions of the instrument.

The Group derecognises a financial liability when its contractual obligations are discharged or cancelled or expire.

The Group has the following non-derivative financial liabilities: loans and borrowings and trade and other payables. The Group classifies non-derivative financial liabilities into the other financial liabilities category. Such financial liabilities are recognised initially at fair value plus any directly attributable transaction costs. Subsequent to initial recognition these financial liabilities are measured at amortised cost using the effective interest method.

(iii) Share capital

Ordinary shares

Ordinary shares are classified as equity. Incremental costs directly attributable to the issue of ordinary shares are recognised as a deduction from equity, net of any tax effects.

(d) Property, plant and equipment

(i) Recognition and measurement

Items of property, plant and equipment are measured at cost less accumulated depreciation and impairment losses. Land is measured at cost.

Cost includes expenditure that is directly attributable to the acquisition of the asset. The cost of self-constructed assets includes the cost of materials and direct labour, any other costs directly attributable to bringing the asset to a working condition for their intended use, the costs of dismantling and removing the items and restoring the site on which they are located.

When parts of an item of property, plant and equipment have different useful lives, they are accounted for as separate items (major components) of property, plant and equipment.

The gain or loss on disposal of an item of property, plant and equipment is determined by comparing the proceeds from disposal with the carrying amount of property, plant and equipment, and is recognised net within other income/other expenses in profit or loss.

3 Significant accounting policies, continued

(d) Property, plant and equipment, continued

(ii) Subsequent costs

The cost of replacing part of an item of property, plant and equipment is recognised in the carrying amount of the item if it is probable that the future economic benefits embodied within the part will flow to the Group and its cost can be measured reliably. The carrying amount of the replaced part is derecognised. The costs of the day-to-day servicing of property, plant and equipment are recognised in profit or loss as incurred.

(iii) Depreciation

Depreciation is based on the cost of an asset less its residual value. Significant components of individual assets are assessed and if a component has a useful life that is different from the remainder of that asset, that component is depreciated separately.

Depreciation is recognised in profit or loss on a straight-line basis over the estimated useful lives of each part of an item of property, plant and equipment, since this most closely reflects the expected pattern of consumption of the future economic benefits embodied in the asset. Leased assets are depreciated over the shorter of the lease term and their useful lives unless it is reasonably certain that the Group will obtain ownership by the end of the lease term. Land is not depreciated.

The estimated useful lives for the current and prior periods are as follows:

- Buildings 50 years;
- Plant and equipment 4-17 years;
- Vehicles 7 years;
- Computers 3 years;
- Other 5 years.

Depreciation methods, useful lives and residual values are reviewed at each financial year end and adjusted if appropriate.

(e) Exploration and evaluation assets

Exploration and evaluation expenditure for each area of interest once the legal right to explore has been acquired, other than that acquired through a purchase transaction, is carried forward as an asset provided that one of the following conditions is met.

- Such costs are expected to be recouped through successful exploration and development of the area of interest or, alternatively, by its sale;
- Exploration and evaluation activities in the area of interest have not yet reached a stage which permits a reasonable assessment of the existence or otherwise of economically recoverable reserves, and active and significant operations in relation to the area are continuing.

Exploration and evaluation costs are capitalised as incurred. Exploration and evaluation assets are classified as tangible or intangible based on their nature. Exploration expenditure which fails to meet at least one of the conditions outlined above is written off. Administrative and general expenses relating to exploration and evaluation activities are expensed as incurred.

The exploration and evaluation assets shall no longer be classified as such when the technical feasibility and commercial viability of extracting a mineral resource are demonstrable. Exploration and evaluation assets will be reclassified either as tangible or intangible development assets and amortised on a unit-of-production method based on proved reserves.

Exploration and evaluation assets are assessed for impairment when facts and circumstances suggests that the carrying amount of exploration and evaluation assets may exceed its recoverable amount, which is the case when: the period of exploration license has expired and it is not expected to be renewed; substantial expenditures on further exploration are not planned; exploration has not led to the discovery of commercial viable reserves; indications exist that exploration and evaluation assets will not be recovered in full from successful development or by sale.

3 Significant accounting policies, continued

(f) Intangible assets

(i) Intangible assets with finite useful lives

Intangible assets that are acquired by the Group, which have finite useful lives, are measured at cost less accumulated amortisation and accumulated impairment losses.

(ii) Subsequent expenditure

Subsequent expenditure is capitalised only when it increases the future economic benefits embodied in the specific asset to which it relates. All other expenditure, including expenditure on internally generated goodwill and brands, is recognised in profit or loss as incurred.

(iii) Amortisation

Amortisation is calculated over the cost of the asset, or other amount substituted for cost, less its residual value.

Amortisation is recognised in profit or loss on a straight-line basis over the estimated useful lives of intangible assets from the date that they are available for use since this most closely reflects the expected pattern of consumption of future economic benefits embodied in the asset.

The estimated useful lives for the current and comparative periods are as follows:

- patents 10-20 years;
- mineral rights 20 years.

Amortisation methods, useful lives and residual values are reviewed at each financial year end and adjusted if appropriate.

(g) Leased assets

Leases in terms of which the Group assumes substantially all the risks and rewards of ownership are classified as finance leases. Upon initial recognition the leased asset is measured at an amount equal to the lower of its fair value and the present value of the minimum lease payments. Subsequent to initial recognition, the asset is accounted for in accordance with the accounting policy applicable to that asset.

Other leases are operating leases and the leased assets are not recognised on the Group's statement of financial position.

(h) Inventories

Inventories are measured at the lower of cost and net realisable value. The cost of inventories is based on first-in first-out method, and includes expenditure incurred in acquiring the inventories, production or conversion costs and other costs incurred in bringing them to their existing location and condition. In the case of manufactured inventories and work in progress, cost includes an appropriate share of production overheads based on normal operating capacity.

Net realisable value is the estimated selling price in the ordinary course of business, less the estimated costs of completion and selling expenses.

(i) Impairment

(i) Non-derivative financial assets

A financial asset not carried at fair value through profit or loss is assessed at each reporting date to determine whether there is any objective evidence that it is impaired. A financial asset is impaired if objective evidence indicates that a loss event has occurred after the initial recognition of the asset, and that the loss event had a negative effect on the estimated future cash flows of that asset that can be estimated reliably.

3 Significant accounting policies, continued

(i) Impairment, continued

(i) Non-derivative financial assets, continued

Objective evidence that financial assets are impaired can include default or delinquency by a debtor, restructuring of an amount due to the Group on terms that the Group would not consider otherwise, indications that a debtor or issuer will enter bankruptcy, adverse changes in the payment status of borrowers or issuers in the Group, economic conditions that correlate with defaults or the disappearance of an active market for a security. In addition, for an investment in an equity security, a significant or prolonged decline in its fair value below its cost is objective evidence of impairment.

Loans and receivables

The Group considers evidence of impairment for receivables at both a specific asset and collective level. All individually significant receivables are assessed for specific impairment. All individually significant receivables found not to be specifically impaired are then collectively assessed for any impairment that has been incurred but not yet identified. Receivables that are not individually significant are collectively assessed for impairment by grouping together receivables with similar risk characteristics.

In assessing collective impairment the Group uses historical trends of the probability of default, timing of recoveries and the amount of loss incurred, adjusted for management's judgement as to whether current economic and credit conditions are such that the actual losses are likely to be greater or less than suggested by historical trends.

An impairment loss in respect of a financial asset measured at amortised cost is calculated as the difference between its carrying amount, and the present value of the estimated future cash flows discounted at the asset's original effective interest rate. Losses are recognised in profit or loss and reflected in an allowance account against receivables. Interest on the impaired asset continues to be recognised through the unwinding of the discount. When a subsequent event causes the amount of impairment loss to decrease, the decrease in impairment loss is reversed through profit or loss.

(ii) Non-financial assets

The carrying amounts of the Group's non-financial assets, other than inventories and deferred tax assets are reviewed at each reporting date to determine whether there is any indication of impairment. If any such indication exists, then the asset's recoverable amount is estimated. An impairment loss is recognised if the carrying amount of an asset or its related cash-generating unit (CGU) exceeds its estimated recoverable amount.

The recoverable amount of an asset or CGU is the greater of its value in use and its fair value less costs to sell. In assessing value in use, the estimated future cash flows are discounted to their present value using a pre-tax discount rate that reflects current market assessments of the time value of money and the risks specific to the asset or CGU. For the purpose of impairment testing, assets that cannot be tested individually are grouped together into the smallest group of assets that generates cash inflows from continuing use that are largely independent of the cash inflows of other assets or CGU.

The recoverable amount of an asset or CGU is the greater of its value in use and its fair value less costs to sell. In assessing value in use, the estimated future cash flows are discounted to their present value using a pre-tax discount rate that reflects current market assessments of the time value of money and the risks specific to the asset or CGU. For the purpose of impairment testing, assets that cannot be tested individually are grouped together into the smallest group of assets that generates cash inflows from continuing use that are largely independent of the cash inflows of other assets or CGU.

The Group's corporate assets do not generate separate cash inflows. If there is an indication that a corporate asset may be impaired, then the recoverable amount is determined for the cash generating unit to which the corporate asset belongs.

3 Significant accounting policies, continued

(i) Impairment, continued

(ii) Non-financial assets, continued

An impairment loss is recognised if the carrying amount of an asset or its cash-generating unit exceeds its recoverable amount. Impairment losses are recognised in profit or loss.

Impairment losses recognised in prior periods are assessed at each reporting date for any indications that the loss has decreased or no longer exists. An impairment loss is reversed if there has been a change in the estimates used to determine the recoverable amount. An impairment loss is reversed only to the extent that the asset's carrying amount does not exceed the carrying amount that would have been determined, net of depreciation or amortisation, if no impairment loss had been recognised.

(j) Employee benefits

(i) Defined contribution plans

The Group does not incur any expenses in relation to provision of pensions or other post-employment benefits to its employees. In accordance with State pension social insurance regulations, the Group withholds pension contributions from employee salaries and transfers them into state pension funds. Once the contributions have been paid, the Group has no further pension obligations. Upon retirement of employees, all pension payments are administrated by the pension funds directly.

(ii) Short-term benefits

Short-term employee benefit obligations are measured on an undiscounted basis and are expensed as the related service is provided. A liability is recognised for the amount expected to be paid under short-term cash bonus or profit-sharing plans if the Group has a present legal or constructive obligation to pay this amount as a result of past service provided by the employee, and the obligation can be estimated reliably.

(iii) Share-based payments

The grant-date fair value of equity-settled share-based payment arrangements granted to employees is generally recognised as an expense, with a corresponding increase in equity, over the vesting period of the awards. The amount recognised as an expense is adjusted to reflect the number of awards for which the related service and non-market performance conditions are expected to be met, such that the amount ultimately recognised is based on the number of awards that meet the related service and non-market performance conditions at the vesting date. For share-based payment awards with non-vesting conditions, the grant-date fair value of the share-based payment is measured to reflect such conditions and there is no true-up for differences between expected and actual outcomes.

(k) Provisions

A provision is recognised if, as a result of a past event, the Group has a present legal or constructive obligation that can be estimated reliably, and it is probable that an outflow of economic benefits will be required to settle the obligation. Provisions are determined by discounting the expected future cash flows at a pre-tax rate that reflects current market assessments of the time value of money and the risks specific to the liability. The unwinding of the discount is recognised as a finance cost.

Site restoration

In accordance with the Group's environmental policy and applicable legal requirements, a provision for site restoration and the related expense is recognised when the land is disturbed as a result of pit development.

3 Significant accounting policies, continued

(l) Revenue

(i) Goods sold

Revenue from the sale of goods in the course of ordinary activities is measured at the fair value of the consideration received or receivable, net of returns, trade discounts and volume rebates. Revenue is recognised when persuasive evidence exists, usually in the form of an executed sales agreement, that the significant risks and rewards of ownership have been transferred to the buyer, recovery of the consideration is probable, the associated costs and possible return of goods can be estimated reliably, there is no continuing management involvement with the goods, and the amount of revenue can be measured reliably. If it is probable that discounts will be granted and the amount can be measured reliably, then the discount is recognised as a reduction of revenue as the sales are recognised.

The timing of the transfers of risks and rewards varies depending on the individual terms of the contract of sale. For sales of all products, transfer usually occurs when the product is delivered, depending on contractual conditions.

(ii) Services

Revenue from services rendered is recognised in profit or loss in proportion to the stage of completion of the transaction at the reporting date. The stage of completion is assessed by reference to surveys of work performed. Usually services are rendered within a short period and require no significant judgement with respect to stage of completion.

(m) Other expenses

Lease payments

Payments made under operating leases are recognised in profit or loss on a straight-line basis over the term of the lease. Lease incentives received are recognised as an integral part of the total lease expense, over the term of the lease.

Minimum lease payments made under finance leases are apportioned between the finance cost and the reduction of the outstanding liability. The finance cost is allocated to each period during the lease term so as to produce a constant periodic rate of interest on the remaining balance of the liability.

(n) Finance costs

Finance costs comprise interest expense on borrowings, unwinding of the discount on provisions for historical costs and site restoration, foreign currency losses and impairment losses recognised on financial assets. Borrowing costs that are not directly attributable to the acquisition, construction or production of a qualifying asset are recognised in profit or loss using the effective interest method.

Foreign currency gains and losses are reported on a net basis as either finance income or finance cost depending on whether foreign currency movements result in a net gain or loss.

(o) Income tax

Income tax expense comprises current and deferred tax. Current tax and deferred tax are recognised in profit or loss except to the extent that they relate to items recognised directly in equity or in other comprehensive income.

Current tax is the expected tax payable or receivable on the taxable income or loss for the year, using tax rates enacted or substantively enacted at the reporting date, and any adjustment to tax payable in respect of previous years. Deferred tax is recognised in respect of temporary differences between the carrying amounts of assets and liabilities for financial reporting purposes and the amounts used for taxation purposes. Deferred tax is not recognised for temporary differences on the initial recognition of assets or liabilities in a transaction that is not a business combination and that affects neither accounting nor taxable profit or loss. Deferred tax is measured at the tax rates that are expected to be applied to the temporary differences when they reverse, based on the laws that have been enacted or substantively enacted by the reporting date.

3 Significant accounting policies, continued

(o) Income tax, continued

Deferred tax assets and liabilities are offset if there is a legally enforceable right to offset current tax assets and liabilities, and they relate to income taxes levied by the same tax authority on the same taxable entity, or on different tax entities, but they intend to settle current tax liabilities and assets on a net basis or their tax assets and liabilities will be realised simultaneously.

A deferred tax asset is recognised for unused tax losses, tax credits and deductible temporary differences, to the extent that it is probable that future taxable profits will be available against which they can be utilised. Deferred tax assets are reviewed at each reporting date and are reduced to the extent that it is no longer probable that the related tax benefit will be realised.

(p) Earnings per share

The Group presents basic and diluted earnings per share (“EPS”) data for its ordinary shares. Basic EPS is calculated by dividing the profit or loss attributable to ordinary shareholders of the Company by the weighted average number of ordinary shares outstanding during the period, adjusted for own shares held. Diluted EPS is determined by adjusting the profit or loss attributable to ordinary shareholders and the weighted average number of ordinary shares outstanding, adjusted for own shares held, for the effects of all dilutive potential ordinary shares, which comprise convertible notes.

(q) Segment reporting

An operating segment is a component of the Group that engages in business activities from which it may earn revenues and incur expenses (including revenues and expenses related to transactions with other components of the same Group); whose operating results are regularly reviewed by the chief operating decision maker to make decisions about resources to be allocated to the segment and assess its performance, and for which discrete financial information is available.

(r) New standards and interpretations not yet adopted

A number of new Standards, amendments to Standards and Interpretations are effective for annual periods beginning after 1 January 2017 and have not been applied in preparing these consolidated financial statements. Of these pronouncements, potentially the following will have an impact on the Group’s operations. The Group plans to adopt these pronouncements when they become effective.

IFRS 9 Financial Instruments

IFRS 9 *Financial Instruments* sets out requirements for recognising and measuring financial assets, financial liabilities and some contracts to buy or sell non-financial items. This standard replaces IAS 39 *Financial Instruments: Recognition and Measurement*.

(i) Classification – Financial assets

IFRS 9 contains a new classification and measurement approach for financial assets that reflects the business model in which assets are managed and their cash flow characteristics.

IFRS 9 contains three principal classification categories for financial assets: measured at amortised cost, fair value through other comprehensive income (FVOCI) and fair value through profit or loss (FVTPL). The standard eliminates the existing IAS 39 categories of held to maturity, loans and receivables and available for sale.

Under IFRS 9, derivatives embedded in contracts where the host is a financial asset in the scope of the standard are never bifurcated. Instead, the hybrid financial instrument as a whole is assessed for classification.

Based on its assessment, the Group does not believe that the new classification requirements will have a material impact on its accounting for trade receivables.

(ii) Impairment – Financial assets and contract assets

IFRS 9 replaces the ‘incurred loss’ model in IAS 39 with a forward-looking ‘expected credit loss’ (ECL) model. This will require considerable judgement about how changes in economic factors affect ECLs, which will be determined on a probability-weighted basis.

3 Significant accounting policies, continued

(r) New standards and interpretations not yet adopted, continued

IFRS 9 Financial Instruments, continued

(ii) Impairment – Financial assets and contract assets, continued

The new impairment model will apply to financial assets measured at amortised cost or FVOCI, except for investments in equity instruments, and to contract assets.

Under IFRS 9, loss allowances will be measured on either of the following bases:

- *12-month ECLs*. These are ECLs that result from possible default events within the 12 months after the reporting date; and
- *lifetime ECLs*. These are ECLs that result from all possible default events over the expected life of a financial instrument.

Lifetime ECL measurement applies if the credit risk of a financial asset at the reporting date has increased significantly since initial recognition and 12-month ECL measurement applies if it has not. An entity may determine that a financial asset's credit risk has not increased significantly if the asset has low credit risk at the reporting date. However, lifetime ECL measurement always applies for trade receivables and contract assets without a significant financing component; the Group has chosen to apply this policy also for trade receivables and contract assets with a significant financing component.

The Group has not yet analysed the likely impact of the new Standard on its financial position or performance.

(iii) Classification – Financial liabilities

IFRS 9 largely retains the existing requirements in IAS 39 for the classification of financial liabilities.

However, under IAS 39 all fair value changes of liabilities designated as at FVTPL are recognised in profit or loss, whereas under IFRS 9 these fair value changes are generally presented as follows:

- the amount of change in the fair value that is attributable to changes in the credit risk of the liability is presented in OCI; and
- the remaining amount of change in the fair value is presented in profit or loss.

The Group has not designated any financial liabilities at FVTPL and it has no current intention to do so. The Group's assessment did not indicate any material impact regarding the classification of financial liabilities at 1 January 2018.

(iv) Disclosures

IFRS 9 will require extensive new disclosures, in particular about hedge accounting, credit risk and expected credit losses.

(v) Transition

Changes in accounting policies resulting from the adoption of IFRS 9 will generally be applied retrospectively, except as described below.

- The Group will take advantage of the exemption allowing it not to restate comparative information for prior periods with respect to classification and measurement (including impairment) changes. Differences in the carrying amounts of financial assets and financial liabilities resulting from the adoption of IFRS 9 generally will generally be recognised in retained earnings and reserves as at 1 January 2018.
- The following assessments have to be made on the basis of the facts and circumstances that exist at the date of initial application.
  - The determination of the business model within which a financial asset is held.
  - The designation and revocation of previous designations of certain financial assets and financial liabilities as measured at FVTPL.

3 Significant accounting policies, continued

(r) New standards and interpretations not yet adopted, continued

IFRS 15 Revenue from Contracts with Customers

IFRS 15 establishes a comprehensive framework for determining whether, how much and when revenue is recognised. It replaces existing revenue recognition guidance, including IAS 18 *Revenue*, IAS 11 *Construction Contracts* and IFRIC 13 *Customer Loyalty Programmes*.

(i) Sales of goods

For the sale of vanadium products, revenue is currently recognised when the goods are delivered to the point at which the customer accepts the goods and the related risks and rewards of ownership transfer. Revenue is recognised at this point provided that the revenue and costs can be measured reliably, the recovery of the consideration is probable and there is no continuing management involvement with the goods.

Under IFRS 15, revenue will be recognised when a customer obtains control of the goods. For vanadium product contracts, the customer controls the product after it is delivered to the agreed point.

The new Standard is not expected to have a significant effect on the consolidated financial statements of the Group.

Other standards

The following amended standards and interpretations are not expected to have a significant impact on the Group's consolidated financial statements.

— *IFRS 16 Leases* replaces existing leases guidance including *IAS 17 Leases*, *IFRIC 4 Determining whether an Arrangement contains a Lease, SIC-15 Operating Leases—Incentives and SIC-27 Evaluating the Substance of Transactions Involving the Legal Form of a Lease*.

— *Annual Improvements to IFRSs 2014-2016 Cycle – Amendments to IFRS 1 and IAS 28.*

— *Classification and Measurement of Share-based Payment Transactions (Amendments to IFRS 2).*

— *Transfers of Investment Property (Amendments to IAS 40).*

— *Sale or Contribution of Assets between an Investor and its Associate or Joint Venture (Amendments to IFRS 10 and IAS 28).*

— *IFRIC 22 Foreign Currency Transactions and Advance Consideration.*

— *IFRIC 23 Uncertainty over Income Tax Treatments.*

(s) Changes in accounting policies and presentation

The Company has adopted the following amendments to standards with a date of initial application of 1 January 2017. *Disclosure Initiative (Amendments to IAS 7).* IAS 7 *Statement of Cash Flows* has been amended as part of the IASB's broader disclosure initiative to improve presentation and disclosure in financial statements. The amendment requires disclosures that enable users of financial statements to evaluate changes in liabilities arising from financing activities, including both changes arising from cash flow and non-cash changes. One way to meet this new disclosure requirement is to provide a reconciliation between the opening and closing balances for liabilities arising from financing activities. However, the objective could also be achieved in other ways.

4 Restatement of comparative information

In these consolidated financial statements figures as at 1 January 2016 and as at and for the year ended 31 December 2016 were restated after making an allowance for impairment of certain assets, including assets relating to the test plant and exploration and evaluation assets. Restatement occurred because management reconsidered the basis of impairment assessments that were performed in previous years and concluded that it was appropriate to correct the carrying amounts of long-term assets and inventories as at 1 January 2016 and 31 December 2016. Cash flow projections used in previous impairment assessments were based on a number of scenarios, all of which required significant additional financing, significant recovery of vanadium prices and successful testing and implementation of new vanadium processing technologies (the test plant), which were not yet available at the dates of previous impairment assessments. Therefore management concluded that there was a reason to consider that a provision for impairment of non-current assets and some current assets was required. Consequently, the carrying values of these assets have been reduced to the values that could be proven to be recoverable in the economic conditions at the relevant year ends.

The Group is currently developing plans and forecasts for the reorganisation of current operations which are expected to show that the assets in question will be profitably utilised in future, principally due to a programme of expansion of capacity coupled with an expectation of more favourable vanadium prices. Once such plans have been formalised and put into effect and once profitable production has been demonstrated for a considerable period, the directors will consider reinstating the carrying values of impaired assets to their original cost, less accumulated depreciation.

The following tables summarise the impact of restatement on the Group's consolidated financial statements.

(a) Consolidated statement of financial position

	Impact of restatement		
1 January 2016	**As previously reported $000**	**Adjustments $000**	**As restated $000**
Property, plant and equipment	2,967	(2,915)	52
Exploration and evaluation assets	184	(184)	-
Intangible assets	30	(29)	1
Inventories	565	(27)	538
Accumulated losses	(18,698)	(3,155)	(21,853)

	Impact of restatement		
31 December 2016	**As previously reported $000**	**Adjustments $000**	**As restated $000**
Property, plant and equipment	2,687	(2,629)	58
Exploration and evaluation assets	187	(187)	-
Intangible assets	30	(29)	1
Inventories	737	(147)	590
Foreign currency translation reserve	(2,619)	(55)	(2,674)
Accumulated losses	(20,221)	(2,937)	(23,158)

4 Restatement of comparative information, continued

(b) Consolidated statement of profit or loss and other comprehensive income

	Impact of restatement		
For the year ended 31 December 2016	**As previously reported $000**	**Adjustments $000**	**As restated $000**
Cost of sales	(907)	262	(645)
Gross loss	**(615)**	**262**	**(353)**
Administrative expenses	(876)	1	(875)
Other expenses	(2)	(45)	(47)
Loss from operating activities	**(1,472)**	**218**	**(1,254)**
Loss before income tax	**(1,523)**	**218**	**(1,305)**
Loss for the year	**(1,523)**	**218**	**(1,305)**
Foreign currency translation difference	44	(55)	(11)
Loss and total comprehensive income	**(1,479)**	**163**	**(1,316)**
Loss per share (basic), USD	(1.02)	0.15	(0.87)
Loss per share (diluted), USD	(1.02)	0.15	(0.87)

There is no impact on the Group’s total operating, investing or financing cash flows for the years ended 31 December 2017 and 2016.

5 Revenue

	2017 $000	**2016 $000**
Revenue from sales of vanadium products	1,110	238
Sales of gravel and waste rock	15	49
Revenue from transportation services	3	5
Other	4	-
	1,132	**292**

6 Cost of sales

	2017 $000	**Restated 2016 $000**
Materials	571	358
Wages, salaries and related taxes	341	122
Electricity	101	62
Raw materials write-down	36	-
Depreciation	15	8
Taxes other than on income	12	21
Write-down of inventories to net realisable value	3	60
Other	5	14
	1,084	**645**

7 Other income

	2017 $000	2016 $000
Correction of property taxes	52	-
Reversal of excess depreciation	-	28
Other	-	7
	52	**35**

During 2017 the Group filed amended property tax declarations to the tax authorities and recognised income from reversal of property tax accrued for the period of 2014-2016.

8 Administrative expenses

	2017 $000	Restated 2016 $000
Wages, salaries and related taxes	471	685
Professional services	119	26
Listing and reorganisation expenses	114	-
Impairment of prepayments	42	9
Materials	39	29
Security	18	17
Business trip expenses	11	13
Bank fees	10	4
Taxes other than income tax	10	2
Utilities	9	16
Fines and penalties	9	12
Depreciation and amortization	6	16
Transportation services	6	4
Impairment of VAT receivable	4	25
Impairment of trade receivables	3	-
Communication and information services	3	2
Insurance	2	1
Rent	1	2
Staff training	1	1
Scientific and research developments	-	5
Other	30	6
	908	**875**

9 Other expenses

	Note	2017 $000	Restated 2016 $000
Impairment of property, plant and equipment	13	118	46
Impairment of exploration and evaluation assets	14	5	-
Impairment of intangible assets	15	1	1
Other		-	-
		124	**47**

10 Personnel costs

	2017 $000	2016 $000
Wages, salaries and related taxes	892	842
	892	**842**

During 2017 personnel costs of USD 341 thousand (2016: USD 122 thousand) have been charged to cost of sales, USD 471 thousand (2016: USD 685 thousand) to administrative expenses and USD 80 thousand (2016: USD 35 thousand) were charged to cost of inventories which were not yet sold as at the year-end.

11 Net finance costs

	2017 $000	2016 $000
Interest expense on financial liabilities measured at amortised cost	47	33
Unwinding of discount on site restoration provision	12	11
Net foreign exchange loss	25	7
Net finance costs	**84**	**51**

12 Income tax

The Group's applicable tax rates in 2017 are the income tax rate of 20% for Kazakhstan subsidiaries (2016: 20%) and 0% (2016: 0%) for Guernsey and BVI companies.

During the years ended 31 December 2017 and 2016 the Group incurred tax losses and therefore did not recognise any current income tax expense. Unrecognised deferred tax assets are described in Note 16.

Reconciliation of effective tax rate:

	2017		Restated 2016	
	$000	**%**	**$000**	**%**
Loss before income tax	**(1,080)**	**100**	**(1,305)**	**100**
Income tax at the applicable tax rate	(216)	20	(261)	20
Effect of unrecognised deferred tax assets	126	(12)	69	(5)
Net non-deductible expenses	90	(8)	192	(15)
	-	-	-	-

13 Property, plant and equipment

	Land and buildings $000	Plant and equipment $000	Vehicles $000	Computers $000	Other $000	Construction in progress $000	Total $000
Cost							
Balance at 1 January 2016	1,807	1,671	320	11	28	349	4,186
Additions	-	8	25	-	3	36	72
Transfers	-	279	-	-	-	(279)	-
Disposal	-	(2)	-	-	-	-	(2)
Foreign currency translation difference	37	40	6	1	1	1	86
Balance at 31 December 2016	**1,844**	**1,996**	**351**	**12**	**32**	**107**	**4,342**
Balance at 1 January 2017	1,844	1,996	351	12	32	107	4,342
Additions	3	18	37	-	11	97	166
Disposal	-	(4)	(26)	-	-	-	(30)
Foreign currency translation difference	6	5	2	1	(1)	(2)	11
Balance at 31 December 2017	**1,853**	**2,015**	**364**	**13**	**42**	**202**	**4,489**
Depreciation and impairment							
Balance at 1 January 2016, as previously reported	336	576	268	11	28	-	1,219
Restatement	1,471	1,095	-	-	-	349	2,915
Balance at 1 January 2016, as restated	**1,807**	**1,671**	**268**	**11**	**28**	**349**	**4,134**
Depreciation for the year, restated	-	-	23	1	1	-	25
Disposal, restated	-	(2)	-	-	-	-	(2)
Transfer, restated	-	292	-	-	-	(292)	-
Impairment, restated	-	8	-	-	-	38	46
Foreign currency translation difference, restated	37	27	4	-	1	12	81
Balance at 31 December 2016, restated	**1,844**	**1,996**	**295**	**12**	**30**	**107**	**4,284**
Balance at 1 January 2017	1,844	1,996	295	12	30	107	4,284
Depreciation for the year	-	-	25	-	2	-	27
Disposal	-	(4)	(26)	-	-	-	(30)
Impairment	3	18	-	-	-	97	118
Foreign currency translation difference	6	5	1	1	-	(2)	11
Balance at 31 December 2017	**1,853**	**2,015**	**295**	**13**	**32**	**202**	**4,410**
Carrying amounts							
At 1 January 2016, restated	-	-	52	-	-	-	52
At 31 December 2016, restated	**-**	**-**	**56**	**-**	**2**	**-**	**58**
At 31 December 2017	**-**	**-**	**69**	**-**	**10**	**-**	**79**

During 2017 depreciation expense of USD 15 thousand (2016: USD 8 thousand, restated) has been charged to cost of sales, USD 6 thousand (2016: USD 16 thousand, restated) – to administrative expenses, and USD 6 thousand has been charged to cost of finished goods that were not sold at the year-end (2016: USD 1 thousand, restated).

13 Property, plant and equipment, continued

Impairment

Management has considered that as at 31 December 2017, 31 December 2016 and 1 January 2016 there were indications that the recoverable amounts of the Group's property, plant and equipment ("PPE") exploration and evaluation assets ("E&E assets") and intangible assets ("IA") were lower than their carrying amounts. Management's estimate of recoverable amount of PPE, E&E assets and IA is based on their value in use, which management considered to be nil, due to uncertainties at the previous reporting dates as to the plans for the future development of the test-plant.

For the purposes of impairment tests, market prices for vanadium pentoxide were taken as fixed for the forecast period based on the price at the balance sheet date and amounted to USD 3.35/lb as at 1 January 2016, USD 5/lb as at 31 December 2016 and as of 31 December 2017 at USD 9/lb during 2018-2019 and at USD 6/lb from 2020 to the end of the forecast period. Operating expenses were projected as fixed per unit of raw materials and were based on actual operating expenses for the previous year. All cash flows were projected without taking into account inflation. The pre-tax discount rate for each impairment test equaled 10%.

The presence of full impairment based on the results of the impairment tests does not have a significant sensitivity to the assumptions above.

14 Exploration and evaluation assets

	2017 $000	Restated 2016 $000
Cost		
Balance at 1 January	187	184
Additions	5	-
Foreign currency translation difference	1	3
Balance at 31 December	**193**	**187**
Impairment		
Balance at 1 January	187	184
Accrual	5	-
Foreign currency translation difference	1	3
Balance at 31 December	**193**	**187**
Carrying amounts		
1 January, restated	-	-
31 December	**-**	**-**

15 Intangible assets

	Mineral rights $000	Patents $000	Computer software $000	Total $000
Cost				
Balance at 1 January 2016	112	34	3	149
Additions	-	1	-	1
Foreign currency translation difference	2	1	-	3
Balance at 31 December 2017	**114**	**36**	**3**	**153**
Balance at 1 January 2017	114	36	3	153
Additions	-	1	-	1
Foreign currency translation difference	1	(1)	1	1
Balance at 31 December 2017	**115**	**36**	**4**	**155**
Amortisation and impairment				
Balance at 1 January 2016, as previously reported	112	5	2	119
Restatement	-	29	-	29
Balance at 1 January 2016, as restated	**112**	**34**	**2**	**148**
Impairment, restated	-	1	-	1
Foreign currency translation difference, restated	2	1	-	3
Balance at 31 December 2016, restated	**114**	**36**	**2**	**152**
Balance at 1 January 2017	114	36	2	152
Impairment	-	1	-	1
Foreign currency translation difference	1	(1)	-	-
Balance at 31 December 2017	**115**	**36**	**2**	**153**
Carrying amounts				
At 1 January 2016, restated	-	-	1	1
At 31 December 2016, restated	**-**	**-**	**1**	**1**
At 31 December 2017	**-**	**-**	**2**	**2**

During 2017 and 2016 amortisation of intangible assets was charged to administrative expenses.

16 Deferred tax assets and liabilities

Unrecognised deferred tax assets

	31 December 2017 $000	Restated 31 December 2016 $000	Restated 1 January 2016 $000
Temporary deductible differences	537	630	691
Tax losses carried forward	1,145	926	796
	1,682	**1,556**	**1,487**

Deferred tax assets have not been recognised in respect of these items because it is not probable that future taxable profit will be available against which the Group can utilise the benefits therefrom.

Temporary deductible differences mostly relate to property, plant and equipment. Unutilised tax losses expire after 10 years from the year of origination.

16 Deferred tax assets and liabilities, continued

Unrecognised deferred tax assets, continued

Expiry dates of unrecognised deferred tax assets in respect of tax losses carried forward at 31 December 2017 are presented below:

Expiry year	$000
2018	8
2019	65
2020	94
2021	86
2022	81
2023	258
2024	132
2025	63
2026	223
2027	134
	1,145

17 Inventories

	31 December 2017 $000	Restated 31 December 2016 $000	Restated 1 January 2016 $000
Raw materials and consumables	312	266	523
Finished goods	284	39	15
Goods in-transit	-	281	-
Other	-	4	-
	596	**590**	**538**

During 2017 raw materials, consumables and changes in finished goods and work in progress recognised as cost of sales amounted to USD 574 thousand (2016: USD 418 thousand, restated) (Note 6), including USD 3 thousand (2016: USD 60 thousand, restated) written down as a result of adjustment of inventories to net realisable value.

18 Trade and other receivables

Non-current	31 December 2017 $000	31 December 2016 $000	1 January 2016 $000
VAT receivable	506	411	378
Provision for VAT receivable	(415)	(411)	(378)
	91	**-**	**-**

Current	31 December 2017 $000	31 December 2016 $000	1 January 2016 $000
Due from employees	28	80	8
Trade receivables from third parties	44	36	25
Other receivables	2	10	5
	74	**126**	**38**
Bad debt allowance	(27)	(24)	(24)
	47	**102**	**14**

During 2017 the management of the Group created a provision of USD 4 thousand for VAT receivable (2016: USD 25 thousand) due to uncertainties related to recovery of VAT by the methods allowed by legislation of the Republic of Kazakhstan. The Group's exposure to credit and currency risks and impairment losses related to trade and other receivables are disclosed in Note 25 (b).

18 Trade and other receivables, continued

Below is a movement in impairment provision on trade receivables:

	2017 $000	2016 $000
Balance at 1 January	**24**	**24**
Accrual (Note 8)	3	-
Balance at 31 December	**27**	**24**

19 Prepayments

	31 December 2017 $000	31 December 2016 $000	1 January 2016 $000
Non-current			
Prepayments for equipment	52	36	37
	52	**36**	**37**
Current			
Prepayments for goods and services	15	10	9
	15	**10**	**9**

Below is a movement in impairment provision on non-current and current prepayments:

	2017 $000	2016 $000
Balance at 1 January	**9**	**-**
Accrual	42	9
Foreign currency translation difference	2	-
Balance at 31 December	**53**	**9**
- impairment provision on short-term prepayments	15	8
- impairment provision on long-term prepayments	38	1

20 Cash and cash equivalents

	31 December 2017 $000	31 December 2016 $000	1 January 2016 $000
Bank balances and other cash deposits	267	71	248
Petty cash	-	1	19
Cash and cash equivalents	**267**	**72**	**267**

The Group's exposure to credit and foreign currency risks is disclosed in Note 25 (b).

21 Equity

(a) Share capital and share premium

	Ordinary shares	
Number of shares unless otherwise stated	**2017**	**2016**
Par value, USD	0.01	0.01
Outstanding at beginning of year	1,503,796	1,496,235
Issued	19,936	7,561
Outstanding at end of year	**1,523,732**	**1,503,796**

21 Equity, continued

(a) Share capital and share premium, continued

Ordinary shares

All shares rank equally with regard to the Group's residual assets. The holders of ordinary shares are entitled to receive dividends as declared from time to time, and are entitled to one vote per share at meetings of the Group.

During 2017 the Company issued 19,936 shares (2016: 7,651 shares) with nominal amount of USD 199 (2016: USD 76) and share premium of USD 1,874,096 (2016: USD 800,057).

(b) Dividends

No dividends were declared for the year ended 31 December 2017 (2016: nil).

(c) Loss per share (basic and diluted)

The calculation of basic and diluted loss per share has been based on the following loss attributable to ordinary shareholders and weighted-average number of ordinary shares outstanding.

(i) Loss attributable to ordinary shareholders (basic and diluted)

	2017 $000	Restated 2016 $000
Loss for the year, attributable to owners of the Company	1,180	1,305
Loss attributable to ordinary shareholders	**1,180**	**1,305**

(ii) Weighted-average number of ordinary shares (basic and diluted)

Shares	**2017**	**2016**
Issued ordinary shares at 1 January	1,503,796	1,496,235
Effect of shares issued	6,989	3,854
Weighted-average number of ordinary shares at 31 December	**1,510,785**	**1,500,089**
Loss per share of common stock attributable to the Company (basic and diluted), USD	(0.79)	(0.87)

At 31 December 2016, convertible bonds in the amount of USD 268 thousand were excluded from the diluted weighted-average number of ordinary shares calculation because their effect would have been anti-dilutive.

22 Loans and borrowings

This note provides information about the contractual terms of the Group's loans and borrowings, which are measured at amortised cost. For more information about the Group's exposure to foreign currency and liquidity risks, refer to Note 25.

	31 December 2017 $000	31 December 2016 $000	1 January 2016 $000
Current liabilities			
Loans from shareholders	-	392	115
	-	**392**	**115**

22 Loans and borrowings, continued

Terms and debt repayment schedule

Terms and conditions of outstanding loans were as follows:

				31 December 2017		31 December 2016	
USD	**Currency**	**Nominal interest rate**	**Year of maturity**	**Face value**	**Carrying amount**	**Face value**	**Carrying amount**
Loans from shareholders	USD	15%	on demand	-	-	268	268
Loans from shareholders	USD	10%	on demand	-	-	123	123
Loans from shareholders	KZT	0%	on demand	-	-	1	1
				-	**-**	**392**	**392**

During 2017 the Group received a loan tranche from shareholders in the amount of USD 20 thousand (2016: a series of loan tranches in the total amount of USD 246 thousand). During 2017 loans payable in the amount of USD 91 thousand were offset against shares issued (2016: no loans payable were offset against shares issued).

Reconciliation of movements of financial liabilities to cash flows arising from financing activities

	Loans and borrowings $000	Share premium $000	Total $000
Balance at 1 January 2017	**392**	**25,030**	**25,422**
Changes from financing cash flows			
Proceeds from issue of shares	-	1,747	1,747
Proceeds from loans and borrowings	20	-	20
Repayment of borrowings	(368)	-	(368)
Total changes from financing cash flows	**(348)**	**1,747**	**1,399**
Interest expense	47	-	47
Conversion of debt to equity	(91)	91	-
Offset with salaries payable	-	36	36
Balance at 31 December 2017	**-**	**26,904**	**26,904**

23 Provisions

	2017 $000	2016 $000
Balance at 1 January	135	121
Unwinding of discount	12	11
Change in estimate	5	-
Foreign currency translation difference	-	3
Balance at 31 December	**152**	**135**
Non-current	152	135
	152	**135**

Site restoration

A provision was recognised in respect of the Group's obligation to rectify environmental damage in the Balasausqandyq mine, Kyzylorda region.

In accordance with Kazakhstan environmental legislation, land contaminated by the Group in the Kyzylorda region must be restored before the end of 2022. The provision was estimated by considering the risks related to the amount and timing of restoration costs based on the known level of damage. Because of the long-term nature of the liability, the greatest uncertainty in estimating the provision is the costs that will be incurred. In particular, the Group has assumed that the site will be restored using technology and materials that are available currently and total estimated undiscounted cash outflow equals to KZT 81,945 thousand (31 December 2016: KZT 81,166 thousand) or USD 247 thousand at the closing 2017 KZT/USD exchange rate (31 December 2016: USD 244 thousand). The present value of restoration costs was determined by discounting the estimated restoration cost using a risk-free rate for the respective period, adjusted for the risks specific to the liability and inflation of 8.4% (31 December 2016: 8.8%). Environmental legislation in Kazakhstan continues to evolve and it is difficult to determine the exact standards required by the current legislation in restoring sites such as this. Generally the standard of restoration is determined based on discussions with the Government officials at the time that restoration commences.

24 Trade and other payables

	31 December 2017 $000	31 December 2016 $000	1 January 2016 $000
Due to employees	347	653	270
Trade payables	164	180	498
Other taxes	83	194	180
Advances received	14	102	5
	608	**1,129**	**953**

As at 31 December 2017 the Group's CEO and COO waived previously accrued salaries in the total amount of USD 380 thousand (2016: nil) due to a formal decision to reduce the amount of liabilities at the Group level. Since both CEO and COO are the Company's significant shareholders, this waiver has been recognised directly in equity as additional paid-in capital.

The Group's exposure to currency and liquidity risk related to trade and other payables is disclosed in Note 25.

25 Financial instruments and risk management

(a) Overview

The Group has exposure to the following risks from its use of financial instruments:

- credit risk;
- liquidity risk;
- market risk.

This note presents information about the Group's exposure to each of the above risks, the Group's objectives, policies and processes for measuring and managing risk, and the Group's management of capital. Further quantitative disclosures are included throughout these consolidated financial statements.

Risk management framework

The Chief Executive has overall responsibility for the establishment and oversight of the Group's risk management framework.

The Group's risk management policies are established to identify and analyse the risks faced by the Group, to set appropriate risk limits and controls, and to monitor risks and adherence to limits. Risk management policies and systems are reviewed to reflect changes in market conditions and the Group's activities. The Group aims to develop a disciplined and constructive control environment in which all employees understand their roles and obligations.

(b) Credit risk

Credit risk is the risk of financial loss to the Group if a customer or counterparty to a financial instrument fails to meet its contractual obligations, and arises principally from the Group's receivables from customers.

(i) Exposure to credit risk

The carrying amount of financial assets represents the maximum credit exposure. The maximum exposure to credit risk at the reporting date was:

	Carrying amount	
	31 December 2017 $000	**31 December 2016 $000**
Trade and other receivables, excluding due from employees and VAT receivable	19	22
Cash and cash equivalents	267	71
	286	**93**

The maximum exposure to credit risk for trade and other receivables at the reporting date by geographic region was:

	Carrying amount	
	31 December 2017 $000	**31 December 2016 $000**
Kazakhstan	19	22
	19	**22**

25 Financial instruments and risk management, continued

(b) Credit risk, continued

(i) Exposure to credit risk, continued

The maximum exposure to credit risk for trade and other receivables at the reporting date by type of customer was:

	Carrying amount	
	31 December 2017 $000	31 December 2016 $000
Trade receivables:		
Wholesale customers	17	12
Other receivables		
Other	2	10
	19	**22**

The Group's most significant customer accounts for USD 12 thousand of the trade receivables carrying amount at 31 December 2017 (31 December 2016: USD 10 thousand).

Impairment losses

The ageing of trade and other receivables at the reporting date was:

	Gross 2017 $000	Impairment 2017 $000	Net 2017 $000	Gross 2016 $000	Impairment 2016 $000	Net 2016 $000
Not past due	19	-	-	22	-	22
Past due more than 180 days	27	(27)	-	24	(24)	-
	46	**(27)**	-	**46**	**(24)**	**22**

The movement in the allowance for impairment in respect of trade and other receivables during the year was as follows:

	2017 $000	2016 $000
Balance at beginning of the year	24	24
Impairment charge	3	-
Balance at end of the year	**27**	**24**

Based on historic default rates, the Group believes that no impairment allowance is necessary in respect of trade receivables not past due or past due up to 30 days.

The allowance account in respect of trade receivables is used to record impairment losses unless the Group is satisfied that no recovery of the amount owing is possible. At that point the amount is considered irrecoverable and is written off against the financial asset directly. As at 31 December 2017 the Group did not have any collective impairment on its trade receivables (31 December 2016: nil).

25 Financial instruments and risk management, continued

(b) Credit risk, continued

(ii) Cash and cash equivalents

As at 31 December 2017 the Group held cash of USD 267 thousand (31 December 2016: USD 72 thousand), of which bank balances of USD 267 thousand (31 December 2016: USD 71 thousand) represent its maximum credit exposure on these assets. 84% (31 December 2016: 84%) is held in banks with credit ratings of A+ to AA-, 13% in banks with credit ratings of B to BB- and the remaining 3% is held with a broker, which does not have a credit rating (31 December 2016: remaining 16% is held in a bank with credit rating CCC). Credit ratings are provided by the rating agency Fitch.

(c) Liquidity risk

Liquidity risk is the risk that the Group will encounter difficulty in meeting the obligations associated with its financial liabilities that are settled by delivering cash or another financial asset. The Group's approach to managing liquidity is to ensure, as far as possible, that it will always have sufficient liquidity to meet its liabilities when due, under both normal and stressed conditions, without incurring unacceptable losses or risking damage to the Group's reputation.

Typically the Group aims to have sufficient cash on demand to meet expected operational expenses for a period of 60 days, including the servicing of financial obligations; this excludes the potential impact of extreme circumstances that cannot reasonably be predicted, such as natural disasters.

The following are the contractual maturities of financial liabilities. It is not expected that the cash flows included in the maturity analysis could occur significantly earlier, or at significantly different amounts.

2017

	Carrying amount $000	Contractual cash flows $000	On demand $000	0-6 mths $000
Non-derivative financial liabilities				
Trade and other payables, excluding due to employees, advances received and salary related taxes	164	164	-	164
	164	**164**	**-**	**164**

2016

	Carrying amount $000	Contractual cash flows $000	On demand $000	0-6 mths $000
Non-derivative financial liabilities				
Loans from shareholders	392	392	392	-
Trade and other payables, excluding due to employees, advances received and salary related taxes	180	180	-	180
	572	**572**	**392**	**180**

(d) Market risk

Market risk is the risk that changes in market prices, such as foreign exchange rates, interest rates and equity prices will affect the Group's income or the value of its holdings of financial instruments. The objective of market risk management is to manage and control market risk exposures within acceptable parameters, while optimising the return.

25 Financial instruments and risk management, continued

(d) Market risk, continued

(i) Currency risk

The Group is exposed to currency risk on sales, purchases and borrowings that are denominated in a currency other than the respective functional currency of Group entities. The currency in which these transactions are primarily denominated is USD.

In respect of monetary assets and liabilities denominated in foreign currencies, the Group ensures that its net exposure is kept to an acceptable level by buying or selling foreign currencies at spot rates when necessary to address short-term imbalances.

Exposure to currency risk

The Group's exposure to foreign currency risk was as follows based on notional amounts:

	USD-denominated 2017 $000	GBP-denominated 2017 $000	HKD-denominated 2017 $000	RUB-denominated 2017 $000
Cash and cash equivalents	164	20	21	-
Trade and other payables	(74)	(52)	-	(22)
Net exposure	**90**	**(32)**	**21**	**(22)**

	USD-denominated 2016 $000	GBP-denominated 2016 $000	HKD-denominated 2016 $000	RUB-denominated 2016 $000
Cash and cash equivalents	59	1	1	-
Trade and other payables	(665)	(90)	-	(4)
Loans and borrowings	(391)	-	-	-
Net exposure	**(997)**	**(89)**	**1**	**(4)**

The following significant exchange rates applied during the year:

in USD	**Average rate**		**Reporting date spot rate**	
	2017	**2016**	**2017**	**2016**
KZT 1	0.0031	0.0029	0.0030	0.0030
GBP 1	1.2888	1.5213	1.2642	1.0519
RUB 1	0.0171	0.0150	0.0168	0.0162
HKD 1	0.1283	0.1289	0.1259	0.1290

25 Financial instruments and risk management, continued

(d) Market risk, continued

(i) Currency risk, continued

Sensitivity analysis

A strengthening of the KZT, as indicated below, against the following currencies at 31 December would have increased/(decreased) profit or loss by the amounts shown below. This analysis is based on foreign currency exchange rate variances that the Group considered to be reasonably possible at the end of the reporting period. The analysis assumes that all other variables, in particular interest rates, remain constant.

	Profit or (loss) $000
2017	
USD (20% strengthening)	(18)
GBP (20% strengthening)	6
RUB (20% strengthening)	(4)
HKD (20% strengthening)	4
2016	
USD (20% strengthening)	200
GBP (20% strengthening)	18
RUB (20% strengthening)	1
HKD (20% strengthening)	-

A weakening of the KZT against the above currencies at 31 December would have had the equal but opposite effect to the amounts shown above, on the basis that all other variables remain constant.

(ii) Interest rate risk

Changes in interest rates do not significantly impact the Group's position as at 31 December 2017 (31 December 2016: primarily impacts loans and borrowings by changing either their fair value (fixed rate debt) or their future cash flows (variable rate debt)). Management does not have a formal policy of determining how much of the Group's exposure should be to fixed or variable rates. However, at the time of raising new loans or borrowings management uses its judgment to decide whether it believes that a fixed or variable rate would be more favourable to the Group over the expected period until maturity.

Changes in interest rates at the reporting date would not significantly affect profit or loss.

(e) Fair values versus carrying amounts

Management believes that the fair value of the Group's financial assets and liabilities approximates their carrying amounts.

The basis for determining fair values is disclosed below.

A number of the Group's accounting policies and disclosures require the determination of fair value, for both financial and non-financial assets and liabilities. Fair values have been determined for measurement and for disclosure purposes based on the following methods. When applicable, further information about the assumptions made in determining fair values is disclosed in the notes specific to that asset or liability.

Trade and other receivables

The fair value of trade and other receivables is estimated as the present value of future cash flows, discounted at the market rate of interest at the reporting date. For trade and other receivables with a short maturity fair value is not materially different from the carrying value because the effect of the time value of money is not material.

25 Financial instruments and risk management, continued

(e) Fair values versus carrying amounts, continued

Non-derivative financial liabilities

Fair value, which is determined for disclosure purposes, is calculated based on the present value of future principal and interest cash flows, discounted at the market rate of interest at the reporting date. For finance leases the market rate of interest is determined by reference to similar lease agreements.

(f) Fair value hierarchy

Financial instruments measured at fair value are presented by level within which the fair value measurement is categorized. The levels of fair value measurement are determined as following:

- Level 1: quoted prices (unadjusted) in active markets for identical assets or liabilities.
- Level 2: inputs other than quoted prices included in Level 1 that are observable for the asset or liability, either directly (i.e. as prices) or indirectly (i.e. derived from prices).
- Level 3: inputs for the asset or liability that are not based on observable market data (unobservable inputs).

As at 31 December 2017 and 31 December 2016, all financial instruments held by the Group fell within Level 3.

26 Commitments

Commitments for training of Kazakhstan employees

Under the conditions of the subsoil use contract the Group is obliged to train Kazakh employees. According to the contract, the annual training expense should equal to 1% of the Group's capital expenditures on subsoil activity. Yuzhkaznedra, the government body, responsible for regional inspection of subsoil protection and usage, approves the minimum required size of the expense to be paid annually. Total training expense in 2017 is USD 1 thousand (2016: USD 1 thousand).

27 Contingencies

(a) Insurance

The insurance industry in the Kazakhstan is in a developing state and many forms of insurance protection common in other parts of the world are not yet generally available. The Group does not have full coverage for its plant facilities or business interruption. There is a risk that the loss or destruction of certain assets could have a material adverse effect on the Group's operations and financial position.

(b) Taxation contingencies

The taxation system in Kazakhstan is relatively new and is characterised by frequent changes in legislation, official pronouncements and court decisions, which are often unclear, contradictory and subject to varying interpretation by different tax authorities, including opinions with respect to IFRS treatment of revenues, expenses and other items in the financial statements. Taxes are subject to review and investigation by various levels of authorities, which have the authority to impose severe fines and interest charges. A tax year generally remains open for review by the tax authorities for five subsequent calendar years; however, under certain circumstances a tax year may remain open longer.

These circumstances may create tax risks in Kazakhstan that are more significant than in other countries. Management believes that it has provided adequately for tax liabilities based on its interpretations of applicable tax legislation, official pronouncements and court decisions. However, the interpretations of the relevant authorities could differ and the effect on these consolidated financial statements, if the authorities were successful in enforcing their interpretations, could be significant.

28 Segment reporting

The Group's operations are highly integrated and constitute a single business segment for the purposes of IFRS 8 *Operating Segments*. The Group's assets are primarily concentrated in the Republic of Kazakhstan and the Group's revenues are derived from operations in, and connected with, the Republic of Kazakhstan. The Chief Operating Decision Maker, in the case of the Group, the Chief Executive, only receives and reviews IFRS consolidated information on the Group as a whole.

29 Related party transactions

(a) Transactions with management and close family members

Management remuneration

Key management personnel received the following remuneration during the year, which is included in personnel costs (see Note 10):

	2017 $000	**2016 $000**
Wages, salaries and related taxes	264	430

As described in Note 24 as at 31 December 2017 certain key management waived previously accrued salaries in the total amount of USD 380 thousand (2016: nil) due to a formal decision to reduce the amount of liabilities at the Group level. Since key management were also significant shareholders of the Company, this waiver has been recognised directly in equity as additional paid-in capital.

(b) Transactions with other related parties

The Group's other related party transactions are disclosed below:

Loans and receivables

	Received 2017 $000	**Paid 2017 $000**	**Outstanding balance 2017 $000**	**Received 2016 $000**	**Outstanding balance 2016 $000**
Loans received from shareholders	20	(368)	-	246	392

The information on terms and conditions of outstanding loans received from shareholders is disclosed in Note 22.

30 Share-based payments

At 31 December 2017, the Group had an arrangement, whereby the Company's non-executive directors ("NEDs") were remunerated for their services in the Company's ordinary shares. The cost of services received from NEDs was measured as a product of the number of shares issued and the fair value of those shares. The fair value of shares was determined by reference to the consideration received for share subscriptions from the Company's ordinary shareholders during 2017.

As a result, during 2017 the Group recognised an increase in share premium of USD 36 thousand (2016: USD 98 thousand) as administrative expenses in the statement of profit or loss and other comprehensive income.

31 Subsequent events

From 1 January 2018 until 11 July 2018 the Company issued 1,493 shares for a consideration of USD 165 thousand after expenses. Of the total consideration, USD 45 thousand was offset against salaries.

On 12 July 2018 the Company by shareholders' resolution subdivided each of its 1,525,225 ordinary shares of USD 0.01 each into 200 shares of no par value, resulting in 305,045,000 shares being then in issue.

Following the subdivision of the shares on 12 July 2018, a further 373,913 shares have been issued for a subscription of USD 215,000 received in cash.

Ferro-Alloy Resources Limited

Consolidated Financial Statements
for the year ended
31 December 2016

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Independent Auditors' Report

To the Shareholders of Ferro-Alloy Resources Limited

Qualified Opinion

We have audited the consolidated financial statements of Ferro-Alloy Resources Limited and its subsidiaries (the "Group"), which comprise the consolidated statement of financial position as at 31 December 2016, the consolidated statements of profit or loss and other comprehensive income, changes in equity and cash flows for the year then ended, and notes, comprising significant accounting policies and other explanatory information.

In our opinion, except for the effects of the matter described in the *Basis for Qualified Opinion* section of our report, the accompanying consolidated financial statements present fairly, in all material respects, the consolidated financial position of the Group as at 31 December 2016, and its consolidated financial performance and its consolidated cash flows for the year then ended in accordance with International Financial Reporting Standards (IFRS).

Basis for Qualified Opinion

The recoverable amount of the Group's property, plant and equipment, exploration and evaluation assets, intangible assets and inventory balances is dependent on the successful implementation of its current plan, as disclosed in Notes 1(a) and 2(d). As at 31 December 2016, the plant had not been operating on a consistent basis and the Group generated negative operating cash flows during the years ended 31 December 2016 and 31 December 2015, which indicates that the recoverable amount of the Group's property, plant and equipment, exploration and evaluation assets, intangible assets and inventory balances may be lower than their carrying amounts. Management has not performed a formal estimate of the recoverable amount of these assets as at 31 December 2016 and 31 December 2015, which is required by International Financial Reporting Standard *IAS 36 Impairment of Assets* and *IAS 2 Inventories*. The effects of this departure from International Financial Reporting Standards on the consolidated financial statements has not been determined. Our opinions on the consolidated financial statements as at and for the year ended 31 December 2015 and on the current year's figures have been modified accordingly.

We conducted our audit in accordance with International Standards on Auditing (ISAs). Our responsibilities under those standards are further described in the *Auditors' Responsibilities for the Audit of the Consolidated Financial Statements* section of our report. We are independent of the Group in accordance with the International Ethics Standards Board for Accountants' *Code of Ethics for Professional Accountants* (IESBA Code), and we have fulfilled our other ethical responsibilities in accordance with the IESBA Code. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our qualified opinion.

Material Uncertainty Related to Going Concern

We draw attention to Note 2(d) of the consolidated financial statements, which indicates that the Group incurred a net loss of USD 1,523,596 and had net operating cash outflows of USD 1,005,780 during the year ended 31 December 2016 and, as of that date, the Group's current liabilities exceeded its current assets by USD 601,443. As stated in Note 2(d) these events or conditions, along with other matters as set forth in Note 2(d), indicate that a material uncertainty exists that may cast significant doubt on the Group's ability to continue as a going concern. Our opinion is not modified in respect of this matter.

Responsibilities of Management and Those Charged with Governance for the Consolidated Financial Statements

Management is responsible for the preparation and fair presentation of the consolidated financial statements in accordance with IFRS, and for such internal control as management determines is necessary to enable the preparation of consolidated financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the consolidated financial statements, management is responsible for assessing the Group's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless management either intends to liquidate the Group or to cease operations, or has no realistic alternative but to do so.

Those charged with governance are responsible for overseeing the Group's financial reporting process.

Auditors' Responsibilities for the Audit of the Consolidated Financial Statements

Our objectives are to obtain reasonable assurance about whether the consolidated financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditors' report that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with ISAs will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these consolidated financial statements.

As part of an audit in accordance with ISAs, we exercise professional judgment and maintain professional skepticism throughout the audit. We also:

- Identify and assess the risks of material misstatement of the consolidated financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.
- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Group's internal control.

Auditors' Responsibilities for the Audit of the Consolidated Financial Statements, continued

- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by management.
- Conclude on the appropriateness of management's use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Group's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditors' report to the related disclosures in the consolidated financial statements or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditors' report. However, future events or conditions may cause the Group to cease to continue as a going concern.
- Evaluate the overall presentation, structure and content of the consolidated financial statements, including the disclosures, and whether the consolidated financial statements represent the underlying transactions and events in a manner that achieves fair presentation.
- Obtain sufficient appropriate audit evidence regarding the financial information of the entities or business activities within the Group to express an opinion on the consolidated financial statements. We are responsible for the direction, supervision and performance of the group audit. We remain solely responsible for our audit opinion.

We communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.

The engagement partner on the audit resulting in this independent auditors' report is:

Ashley Clarke
Engagement Partner

Anton Shcherbak
Certified Auditor
of the Republic of Kazakhstan,
Auditor's Qualification Certificate
No. МФ-0000183 of 2 June 2014

KPMG Audit LLC

State Licence to conduct audit # 0000021 dated 6 December 2006 issued by the Ministry of Finance of the Republic of Kazakhstan

Assel Khairova
General Director of KPMG Audit LLC
acting on the basis of the Charter

17 May 2017

USD	Note	2016	2015
Revenue	5	292,289	126,722
Cost of sales	6	(906,770)	(105,054)
Gross (loss)/profit		**(614,481)**	**21,668**
Other income		34,690	4,691
Administrative expenses	7	(876,453)	(1,138,292)
Distribution expenses		(14,331)	-
Other expenses	8	(1,700)	(553,387)
Results from operating activities		**(1,472,275)**	**(1,665,320)**
Net finance costs	10	(51,321)	(681,206)
Loss before income tax		**(1,523,596)**	**(2,346,526)**
Income tax	11	-	-
Loss for the year		**(1,523,596)**	**(2,346,526)**
Other comprehensive income			
Items that will never be reclassified to profit or loss			
Foreign currency translation differences		44,812	(2,019,312)
Loss and total comprehensive income for the year		**(1,478,784)**	**(4,365,838)**
Loss per share of common stock attributable to the Shareholders			
Basic	20	(1.02)	(2.38)
Diluted	20	(1.02)	(2.38)

These consolidated financial statements were approved by Management on 17 May 2017 and were signed on its behalf by:

FERRO-ALLOY RESOURCES LIMITED
REGISTRATION NUMBER
63449
GUERNSEY

N. J. Bridgen
Chairman

The consolidated statement of profit or loss and other comprehensive income is to be read in conjunction with the notes to, and forming part of, the consolidated financial statements set out on pages 10 to 35.

USD	Note	31 December 2016	31 December 2015
ASSETS			
Non-current assets			
Property, plant and equipment	12	2,687,325	2,966,952
Exploration and evaluation assets	13	187,304	183,603
Intangible assets	14	29,813	30,367
Prepayments	18	36,005	36,558
Total non-current assets		**2,940,447**	**3,217,480**
Current assets			
Inventories	16	736,891	565,037
Trade and other receivables	17	101,919	14,188
Prepayments	18	9,500	9,044
Cash and cash equivalents	19	71,855	266,931
Total current assets		**920,165**	**855,200**
Total assets		**3,860,612**	**4,072,680**
EQUITY AND LIABILITIES			
Equity			
Share capital	20	15,038	14,962
Share premium	20	25,030,076	24,230,019
Foreign currency translation reserve		(2,619,451)	(2,664,263)
Accumulated losses		(20,221,403)	(18,697,807)
Total equity		**2,204,260**	**2,882,911**
Non-current liabilities			
Provisions	22	134,744	121,373
Total non-current liabilities		**134,744**	**121,373**
Current liabilities			
Loans and borrowings	21	392,235	115,279
Trade and other payables	23	1,129,373	953,117
Total current liabilities		**1,521,608**	**1,068,396**
Total liabilities		**1,656,352**	**1,189,769**
Total equity and liabilities		**3,860,612**	**4,072,680**

The consolidated statement of financial position is to be read in conjunction with the notes to, and forming part of, the consolidated financial statements set out on pages 10 to 35.

USD	**Share capital**	**Share premium**	**Foreign currency translation reserve**	**Accumulated losses**	**Total equity**
Balance at 1 January 2015	7,761	21,867,863	(644,951)	(16,351,281)	4,879,392
Loss for the year	-	-	-	(2,346,526)	(2,346,526)
Other comprehensive income					
Items that will never be reclassified to profit or loss					
Foreign currency translation differences	-	-	(2,019,312)	-	(2,019,312)
Total comprehensive income for the year	**-**	**-**	**(2,019,312)**	**(2,346,526)**	**(4,365,838)**
Transactions with owners, recorded directly in equity					
Shares issued	7,201	2,362,156	-	-	2,369,357
Balance at 31 December 2015	**14,962**	**24,230,019**	**(2,664,263)**	**(18,697,807)**	**2,882,911**
Balance at 1 January 2016	14,962	24,230,019	(2,664,263)	(18,697,807)	2,882,911
Loss for the year	-	-	-	(1,523,596)	(1,523,596)
Other comprehensive income					
Items that will never be reclassified to profit or loss					
Foreign currency translation differences	-	-	44,812	-	44,812
Total comprehensive income for the year	**-**	**-**	**44,812**	**(1,523,596)**	**(1,478,784)**
Transactions with owners, recorded directly in equity					
Shares issued	76	800,057	-	-	800,133
Balance at 31 December 2016	**15,038**	**25,030,076**	**(2,619,451)**	**(20,221,403)**	**2,204,260**

The consolidated statement of changes in equity is to be read in conjunction with the notes to, and forming part of, the consolidated financial statements set out on pages 10 to 35.

USD	**Note**	**2016**	**2015**
Cash flows from operating activities			
Loss for the year		**(1,523,596)**	**(2,346,526)**
Adjustments for:			
Depreciation and amortisation	12, 14	403,532	460,127
Loss on write-off of property, plant and equipment		-	29,739
Impairment of VAT and trade receivables	7	33,992	96,570
Write down of inventories to net realisable value	6	44,195	-
Finance costs, net	10	51,321	681,206
Cash used in operating activities before changes in working capital		**(990,556)**	**(1,078,884)**
Change in inventories		(164,923)	(575,891)
Change in trade and other receivables, including VAT		(109,941)	(98,012)
Change in prepayments		(8,337)	10,033
Change in trade and other payables		267,977	659,561
Net cash used in operating activities		**(1,005,780)**	**(1,083,193)**
Cash flows from investing activities			
Acquisition of property, plant and equipment		(107,118)	(300,675)
Net cash used in investing activities		**(107,118)**	**(300,675)**
Cash flows from financing activities			
Proceeds from issue of share capital		701,923	1,055,846
Proceeds from borrowings	21	246,000	543,434
Repayment of loans received from key management		-	(10,422)
Net cash from financing activities		**947,923**	**1,588,858**
Net (decrease)/increase in cash and cash equivalents		**(164,975)**	**204,990**
Cash and cash equivalents at the beginning of year		266,931	30,305
Effect of movements in exchange rates on cash and cash equivalents		(30,101)	31,636
Cash and cash equivalents at the end of year	19	**71,855**	**266,931**

During 2016, the Group issued new shares for the total amount of USD 800,133 (2015: USD 2,369,357). Part of the expected proceeds of the new shares issued were offset against salaries in the amount of USD 98,210 (2015: against loans and salaries payable in the amount of USD 760,464 and USD 553,047, respectively). The remaining amount of proceeds from shares issued was paid in cash.

The consolidated statement of cash flows is to be read in conjunction with the notes to, and forming part of, the consolidated financial statements set out on pages 10 to 35.

1 Background

(a) Organisation and operations

Ferro-Alloy Resources Limited (the "Company") is a company established on the territory of the British Virgin Islands in accordance with the legislation of the British Virgin Islands. The Company was incorporated on 18 April 2000 and its registered office is Geneva Place, Waterfront Drive, Road Town, Tortola, British Virgin Islands. Several individuals and legal entities have ownership in the Company. No single individual or legal entity has an ultimate control over the Company.

The consolidated financial statements as at and for the year ended 31 December 2016 comprise the Company and the following subsidiaries (together referred to as the "Group"):

Company	Location	Company's share in charter capital	Primary activities
Ferro-Alloy Products Limited	The British Virgin Islands	100%	Carries out the treasury and finance activities for the Group
Vanadium Processing LLC	Kazakhstan	100%	Does not trade
Firma Balausa LLC	Kazakhstan	100%	Production and sale of vanadium and associated by-products

The Group's principal activity is mining, processing and sale of vanadium-containing ores and associated by-products extracted from the Balasausqandyq mine located in Kazakhstan, Shieli under license MG1278D dated 8 December 1997, and processing and sale of purchased iron-containing concentrate. The Group's products are sold in Kazakhstan and abroad.

The Group's operations were initially of small scale intended as a pilot plant to demonstrate the technical and financial feasibility of treating ore from the Balasausqandyq deposit. Following the conclusion of testing the Group adapted its former pilot plant to the leaching of purchased iron-containing concentrate and carried out the reconstruction of the corresponding plant equipment. Commissioning commenced in October 2015 and during 2016, the Group produced vanadium products in the form of red cake and ammonium metavanadate. A total of 117,104 kg of ammonium metavanadate and 37,120 kg of red cake was sold during 2016-March 2017. The intention of the operation was to prove feasibility on a small scale with a view to carrying out an expansion of these processing operations once the operating performance and equipment requirements were known. As a result of the small scale of operations and early experimentation with the process the Group did not generate positive cash flows during 2016. Nevertheless, the management expects a positive cash flow from operations during 2017 due to higher US dollar product prices, lower Kazakhstan tenge based costs, and a higher volume of processed concentrate planned for 2017. A significant expansion of the current factory is planned, as well as the development of the Group's own mine and associated treatment plant.

(b) Kazakhstan business environment

The Group's operations are primarily located in Kazakhstan. Consequently, the Group is exposed to the economic and financial markets of Kazakhstan which display characteristics of an emerging market. The legal, tax and regulatory frameworks continue development, but are subject to varying interpretations and frequent changes which, together with other legal and fiscal impediments, contribute to the challenges faced by entities operating in Kazakhstan.

The depreciation of the Kazakhstan tenge in 2015 caused largely by the reduction in the global price of oil, has significantly reduced local costs when expressed in US dollar terms, greatly benefiting exporters of products which are priced internationally.

The consolidated financial statements reflect management's assessment of the impact of the Kazakhstan business environment on the operations and the financial position of the Group. The future business environment may differ from management's assessment.

2 Basis of preparation

(a) Statement of compliance

These consolidated financial statements have been prepared in accordance with International Financial Reporting Standards ("IFRSs").

(b) Basis of measurement

The consolidated financial statements are prepared on the historical cost basis.

(c) Functional and presentation currency

The national currency of Kazakhstan is the Kazakhstan tenge ("KZT) which is also the Company's functional currency and the functional currency of its subsidiaries. These consolidated financial statements are presented in United States Dollars ("USD") as this is the currency familiar to the majority of the Company's shareholders. All financial information presented in USD has been rounded to the nearest USD.

(d) Going concern

The consolidated financial statements are prepared in accordance with IFRS on a going concern basis, which contemplates realisation of assets and satisfaction of liabilities in the normal course of business in the foreseeable future.

Current operations

The Group is in the investing and development stage and incurred a net loss of USD 1,523,596 (2015: USD 2,346,526) and had net operating cash outflows of USD 1,005,780 (2015: USD 1,083,193) during the year ended 31 December 2016 and, as of that date the Group's current liabilities exceeded its current assets by USD 601,443 (2015: USD 213,196).

In 2015 the pilot plant, which had been used to demonstrate and refine the processing methods to be used by the Group in developing the Balasausqandiq vanadium deposit, was modified to become a production plant to treat purchased concentrates. The objective was to use the plant to generate cash flows from small-scale operations, to be used in the development of the main project. Commissioning of the modified pilot plant started in the last quarter of 2015. No sales were made in 2015.

In the middle of 2016 production was achieved and the first shipments of vanadium pentoxide were made in July and are continuing. All production is exported.

The price quotations of vanadium pentoxide in Europe (which is used in the Group's business model for production of ammonium metavanadate) went up from USD 2.78 per lb in January 2016 to USD 6.07 per lb in May 2017. Management consider that this is still low compared with historic levels, which have averaged almost USD 7 per lb in the last ten years after adjusting for inflation. Management have considered the views of certain independent forecasters who expect a significant increase in vanadium prices but the timing of any such increase is uncertain.

Future plans

Processing operations

The management of the Group is planning a short-term project to increase throughput and production by a multiple of about ten times, which management expects will have the effect of significantly increasing profits even at current prices.

In its entirety, this project entails approximately doubling the size of the existing plant at a capital cost of approximately USD 12 million. Approximately half of this amount will be used for the development of infrastructure which will be required for the main development of Balasausqandiq, reducing the amount to be financed later. The feasibility assessment for this project has been completed and the Group plans, subject to financing, to start construction in 2017.

2 Basis of preparation, continued

(d) Going concern, continued

Future plans, continued

Processing operations, continued

The Group has tested the treatment of other secondary materials which can also provide suitable feed for the current operation. Some of these materials are highly concentrated and management considers that this will allow a significant increase in production for a much smaller capital cost than the full project described above, and will therefore allow most of the infrastructure costs to be deferred until the main project described below is constructed. In this way, management considers that a significant increase in profitability can be achieved, if necessary, without any further equity funding.

Development of the Balasausqandiq mine and processing plant

In parallel with existing operations discussed above, and using the resulting cash flows, the Group plans to continue development of the Balasausqandiq vanadium deposit. A feasibility study indicates that capital costs of some USD 100 million will be required as a first stage of development to mine and treat one million tonnes per year of ore, producing some 5,600 tonnes per year of vanadium-containing products on a vanadium pentoxide basis. A subsequent expansion is planned which will increase this fourfold.

Financing

Group's forecasts indicate that it has sufficient funds to reach the position where it will be generating cash from operations. The Group has the support of certain shareholders who have lent money to the Group from time to time and have indicated that they will not require repayment until cash flows permit.

Future plans for expansions of current processing operations and the development of the Balasausqandiq deposit are highly dependent on the Group raising additional financing. The Group plans to do this initially through listing on the Kazakhstan Stock Exchange ("KASE"). The Group has involved brokers to assist them in the KASE listing process and plan to finalise listing sometime in the summer of 2017. Later, the Group plans a dual listing on the London Stock Exchange.

The events and conditions described above suggest that there is a material uncertainty that may cast significant doubt on the Group's ability to continue as a going concern. However, as described above, management has a reasonable expectation that the Group will continue operating in the foreseeable future. If for any reason the Group is unable to continue as a going concern, then this could have an impact on the Group's ability to realise assets at their recognised values and to extinguish liabilities in the normal course of business at the amounts stated in the consolidated financial statements.

(e) Use of estimates and judgments

The preparation of consolidated financial statements in conformity with IFRSs requires management to make judgments, estimates and assumptions that affect the application of accounting policies and the reported amounts of assets, liabilities, income and expenses. Actual results may differ from those estimates.

Estimates and underlying assumptions are reviewed on an ongoing basis. Revisions to accounting estimates are recognised in the period in which the estimates are revised and in any future periods affected.

2 Basis of preparation, continued

(e) Use of estimates and judgments, continued

Information about critical judgments in applying accounting policies that have the most significant effect on the amounts recognised in the consolidated financial statements is included in the following notes:

- Note 2(d) – Going concern assumption;
- Note 3(i) – Impairment of non-financial assets;
- Note 3(d) – Useful lives of property, plant and equipment;
- Note 3(h) and 16 – Net realisable value of inventories;
- Note 15 – Unrecognised deferred tax assets;
- Note 22 – Provisions.

3 Significant accounting policies

The accounting policies set out below have been applied consistently to all periods presented in these consolidated financial statements, and have been applied consistently by Group entities.

(a) Basis of consolidation

(i) Subsidiaries

Subsidiaries are entities controlled by the Group. The Group controls an entity when it is exposed to, or has rights to, variable returns from its involvement with the entity and has the ability to affect those returns through its power over the entity. The financial statements of subsidiaries are included in the consolidated financial statements from the date that control commences until the date that control ceases. The accounting policies of subsidiaries have been changed when necessary to align them with the policies adopted by the Group.

(ii) Transactions eliminated on consolidation

Intra-group balances and transactions, and any unrealised income and expenses arising from intra-group transactions, are eliminated in preparing the consolidated financial statements. Unrealised losses are eliminated in the same way as unrealised gains, but only to the extent that there is no evidence of impairment.

(b) Foreign currency

(i) Foreign currency transactions

Transactions in foreign currencies are translated to the respective functional currencies of Group entities at exchange rates at the dates of the transactions.

Monetary assets and liabilities denominated in foreign currencies at the reporting date are translated to the functional currency at the exchange rate at that date. The foreign currency gain or loss on monetary items is the difference between amortised cost in the functional currency at the beginning of the period, adjusted for effective interest and payments during the period, and the amortised cost in foreign currency translated at the exchange rate at the end of the reporting period.

Non-monetary items in a foreign currency that are measured based on historical cost are translated using the exchange rate at the date of the transaction.

Foreign currency differences arising in translation are recognised in profit or loss.

3 Significant accounting policies, continued

(b) Foreign currency, continued

(ii) Presentation currency

The assets and liabilities of foreign operations are translated to USD at the exchange rates at the reporting date. The income and expenses of foreign operations are translated to USD at the average exchange rate for the period, which approximates the exchange rates at the dates of the transactions.

Foreign currency differences are recognised in other comprehensive income and are presented within the foreign currency translation reserve in equity.

(c) Financial instruments

(i) Non-derivative financial instruments

Non-derivative financial instruments comprise trade and other receivables, cash and cash equivalents, loans and borrowings and trade and other payables.

The Group initially recognises loans and receivables and deposits on the date that they are originated. All other financial assets are recognised initially on the trade date at which the Group becomes a party to the contractual provisions of the instrument.

The Group derecognises a financial asset when the contractual rights to the cash flows from the asset expire, or it transfers the rights to receive the contractual cash flows on the financial asset in a transaction in which substantially all the risks and rewards of ownership of the financial asset are transferred. Any interest in transferred financial assets that is created or retained by the Group is recognised as a separate asset or liability.

Financial assets and liabilities are offset and the net amount presented in the statement of financial position when, and only when, the Group has a legal right to offset the amounts and intends either to settle on a net basis or to realise the asset and settle the liability simultaneously.

The Group has the following non-derivative financial assets: loans and receivables.

Loans and receivables

Loans and receivables are a category of financial assets with fixed or determinable payments that are not quoted in an active market. Such assets are recognised initially at fair value plus any directly attributable transaction costs. Subsequent to initial recognition loans and receivables are measured at amortised cost using the effective interest method, less any impairment losses.

Loans and receivables comprise the following classes of assets: trade and other receivables as presented in Note 17 and cash and cash equivalents as presented in Note 19.

Cash and cash equivalents

Cash and cash equivalents comprise cash balances in banks and petty cash.

(ii) Non-derivative financial liabilities

The Group initially recognises debt securities issued on the date that they are originated. All other financial liabilities are recognised initially on the trade date at which the Group becomes a party to the contractual provisions of the instrument.

The Group derecognises a financial liability when its contractual obligations are discharged or cancelled or expire.

The Group has the following non-derivative financial liabilities: loans and borrowings and trade and other payables. The Group classifies non-derivative financial liabilities into the other financial liabilities category. Such financial liabilities are recognised initially at fair value plus any directly attributable transaction costs. Subsequent to initial recognition these financial liabilities are measured at amortised cost using the effective interest method.

3 Significant accounting policies, continued

(c) Financial instruments, continued

(iii) Share capital

Ordinary shares

Ordinary shares are classified as equity. Incremental costs directly attributable to issue of ordinary shares are recognised as a deduction from equity, net of any tax effects.

(iv) Recognition and measurement

Items of property, plant and equipment are measured at cost less accumulated depreciation and impairment losses. Land is measured at cost.

Cost includes expenditure that is directly attributable to the acquisition of the asset. The cost of self-constructed assets includes the cost of materials and direct labour, any other costs directly attributable to bringing the asset to a working condition for their intended use, the costs of dismantling and removing the items and restoring the site on which they are located.

When parts of an item of property, plant and equipment have different useful lives, they are accounted for as separate items (major components) of property, plant and equipment.

The gain or loss on disposal of an item of property, plant and equipment is determined by comparing the proceeds from disposal with the carrying amount of property, plant and equipment, and is recognised net within other income/other expenses in profit or loss.

(v) Subsequent costs

The cost of replacing part of an item of property, plant and equipment is recognised in the carrying amount of the item if it is probable that the future economic benefits embodied within the part will flow to the Group and its cost can be measured reliably. The carrying amount of the replaced part is derecognised. The costs of the day-to-day servicing of property, plant and equipment are recognised in profit or loss as incurred.

(d) Property, plant and equipment

Depreciation

Depreciation is based on the cost of an asset less its residual value. Significant components of individual assets are assessed and if a component has a useful life that is different from the remainder of that asset, that component is depreciated separately.

Depreciation is recognised in profit or loss on a straight-line basis over the estimated useful lives of each part of an item of property, plant and equipment, since this most closely reflects the expected pattern of consumption of the future economic benefits embodied in the asset. Leased assets are depreciated over the shorter of the lease term and their useful lives unless it is reasonably certain that the Group will obtain ownership by the end of the lease term. Land is not depreciated.

The estimated useful lives for the current and prior periods are as follows:

- Buildings 50 years;
- Plant and equipment 4-17 years;
- Vehicles 7 years;
- Computers 3 years;
- Other 5 years.

Depreciation methods, useful lives and residual values are reviewed at each financial year end and adjusted if appropriate.

3 Significant accounting policies, continued

(e) Exploration and evaluation assets

Exploration and evaluation expenditure for each area of interest once the legal right to explore has been acquired, other than that acquired through a purchase transaction, is carried forward as an asset provided that one of the following conditions is met.

- Such costs are expected to be recouped through successful exploration and development of the area of interest or, alternatively, by its sale;
- Exploration and evaluation activities in the area of interest have not yet reached a stage which permits a reasonable assessment of the existence or otherwise of economically recoverable reserves, and active and significant operations in relation to the area are continuing.

Exploration and evaluation costs are capitalised as incurred. Exploration and evaluation assets are classified as tangible or intangible based on their nature. Exploration expenditure which fails to meet at least one of the conditions outlined above is written off. Administrative and general expenses relating to exploration and evaluation activities are expensed as incurred.

The exploration and evaluation assets shall no longer be classified as such when the technical feasibility and commercial viability of extracting a mineral resource are demonstrable. Exploration and evaluation assets will be reclassified either as tangible or intangible development assets and amortised on a unit-of-production method based on proved reserves;

Exploration and evaluation assets are assessed for impairment when facts and circumstances suggests that the carrying amount of exploration and evaluation assets may exceed its recoverable amount, which is the case when: the period of exploration license has expired and it is not expected to be renewed; substantial expenditures on further exploration are not planned; exploration has not led to the discovery of commercial viable reserves; indications exist that exploration and evaluation assets will not be recovered in full from successful development or by sale.

(f) Intangible assets

(i) Intangible assets with finite useful lives

Intangible assets that are acquired by the Group, which have finite useful lives, are measured at cost less accumulated amortisation and accumulated impairment losses.

(ii) Subsequent expenditure

Subsequent expenditure is capitalised only when it increases the future economic benefits embodied in the specific asset to which it relates. All other expenditure, including expenditure on internally generated goodwill and brands, is recognised in profit or loss as incurred.

(iii) Amortisation

Amortisation is calculated over the cost of the asset, or other amount substituted for cost, less its residual value.

Amortisation is recognised in profit or loss on a straight-line basis over the estimated useful lives of intangible assets from the date that they are available for use since this most closely reflects the expected pattern of consumption of future economic benefits embodied in the asset.

The estimated useful lives for the current and comparative periods are as follows:

- patents 10-20 years;
- mineral rights 20 years.

Amortisation methods, useful lives and residual values are reviewed at each financial year end and adjusted if appropriate.

3 Significant accounting policies, continued

(g) Leased assets

Leases in terms of which the Group assumes substantially all the risks and rewards of ownership are classified as finance leases. Upon initial recognition the leased asset is measured at an amount equal to the lower of its fair value and the present value of the minimum lease payments. Subsequent to initial recognition, the asset is accounted for in accordance with the accounting policy applicable to that asset.

Other leases are operating leases and the leased assets are not recognised on the Group's statement of financial position.

(h) Inventories

Inventories are measured at the lower of cost and net realisable value. The cost of inventories is based on first-in first-out method, and includes expenditure incurred in acquiring the inventories, production or conversion costs and other costs incurred in bringing them to their existing location and condition. In the case of manufactured inventories and work in progress, cost includes an appropriate share of production overheads based on normal operating capacity.

Net realisable value is the estimated selling price in the ordinary course of business, less the estimated costs of completion and selling expenses.

(i) Impairment

(i) Non-derivative financial assets

A financial asset not carried at fair value through profit or loss is assessed at each reporting date to determine whether there is any objective evidence that it is impaired. A financial asset is impaired if objective evidence indicates that a loss event has occurred after the initial recognition of the asset, and that the loss event had a negative effect on the estimated future cash flows of that asset that can be estimated reliably.

Objective evidence that financial assets are impaired can include default or delinquency by a debtor, restructuring of an amount due to the Group on terms that the Group would not consider otherwise, indications that a debtor or issuer will enter bankruptcy, adverse changes in the payment status of borrowers or issuers in the Group, economic conditions that correlate with defaults or the disappearance of an active market for a security. In addition, for an investment in an equity security, a significant or prolonged decline in its fair value below its cost is objective evidence of impairment.

Loans and receivables

The Group considers evidence of impairment for receivables at both a specific asset and collective level. All individually significant receivables are assessed for specific impairment. All individually significant receivables found not to be specifically impaired are then collectively assessed for any impairment that has been incurred but not yet identified. Receivables that are not individually significant are collectively assessed for impairment by grouping together receivables with similar risk characteristics.

In assessing collective impairment the Group uses historical trends of the probability of default, timing of recoveries and the amount of loss incurred, adjusted for management's judgement as to whether current economic and credit conditions are such that the actual losses are likely to be greater or less than suggested by historical trends.

An impairment loss in respect of a financial asset measured at amortised cost is calculated as the difference between its carrying amount, and the present value of the estimated future cash flows discounted at the asset's original effective interest rate. Losses are recognised in profit or loss and reflected in an allowance account against receivables. Interest on the impaired asset continues to be recognised through the unwinding of the discount. When a subsequent event causes the amount of impairment loss to decrease, the decrease in impairment loss is reversed through profit or loss.

3 Significant accounting policies, continued

(i) Impairment, continued

(ii) Non-financial assets

The carrying amounts of the Group's non-financial assets, other than inventories and deferred tax assets are reviewed at each reporting date to determine whether there is any indication of impairment. If any such indication exists, then the asset's recoverable amount is estimated. An impairment loss is recognised if the carrying amount of an asset or its related cash-generating unit (CGU) exceeds its estimated recoverable amount.

The recoverable amount of an asset or CGU is the greater of its value in use and its fair value less costs to sell. In assessing value in use, the estimated future cash flows are discounted to their present value using a pre-tax discount rate that reflects current market assessments of the time value of money and the risks specific to the asset or CGU. For the purpose of impairment testing, assets that cannot be tested individually are grouped together into the smallest group of assets that generates cash inflows from continuing use that are largely independent of the cash inflows of other assets or CGU.

The Group's corporate assets do not generate separate cash inflows. If there is an indication that a corporate asset may be impaired, then the recoverable amount is determined for the cash generating unit to which the corporate asset belongs.

An impairment loss is recognised if the carrying amount of an asset or its cash-generating unit exceeds its recoverable amount. Impairment losses are recognised in profit or loss.

Impairment losses recognised in prior periods are assessed at each reporting date for any indications that the loss has decreased or no longer exists. An impairment loss is reversed if there has been a change in the estimates used to determine the recoverable amount. An impairment loss is reversed only to the extent that the asset's carrying amount does not exceed the carrying amount that would have been determined, net of depreciation or amortisation, if no impairment loss had been recognised.

(j) Employee benefits

(i) Defined contribution plans

The Group does not incur any expenses in relation to provision of pensions or other post-employment benefits to its employees. In accordance with State pension social insurance regulations, the Group withholds pension contributions from employee salaries and transfers them into state pension funds. Once the contributions have been paid, the Group has no further pension obligations. Upon retirement of employees, all pension payments are administrated by the pension funds directly.

(ii) Short-term benefits

Short-term employee benefit obligations are measured on an undiscounted basis and are expensed as the related service is provided. A liability is recognised for the amount expected to be paid under short-term cash bonus or profit-sharing plans if the Group has a present legal or constructive obligation to pay this amount as a result of past service provided by the employee, and the obligation can be estimated reliably.

(k) Provisions

A provision is recognised if, as a result of a past event, the Group has a present legal or constructive obligation that can be estimated reliably, and it is probable that an outflow of economic benefits will be required to settle the obligation. Provisions are determined by discounting the expected future cash flows at a pre-tax rate that reflects current market assessments of the time value of money and the risks specific to the liability. The unwinding of the discount is recognised as finance cost.

Site restoration

In accordance with the Group's environmental policy and applicable legal requirements, a provision for site restoration and the related expense is recognised when the land is disturbed as a result of pit development.

3 Significant accounting policies, continued

(l) Revenue

(i) Goods sold

Revenue from the sale of goods in the course of ordinary activities is measured at the fair value of the consideration received or receivable, net of returns, trade discounts and volume rebates. Revenue is recognised when persuasive evidence exists, usually in the form of an executed sales agreement, that the significant risks and rewards of ownership have been transferred to the buyer, recovery of the consideration is probable, the associated costs and possible return of goods can be estimated reliably, and there is no continuing management involvement with the goods, and the amount of revenue can be measured reliably. If it is probable that discounts will be granted and the amount can be measured reliably, then the discount is recognised as a reduction of revenue as the sales are recognised.

The timing of the transfers of risks and rewards varies depending on the individual terms of the contract of sale. For sales of all products, transfer usually occurs when the product is delivered, depending on contractual conditions.

(ii) Services

Revenue from services rendered is recognised in profit or loss in proportion to the stage of completion of the transaction at the reporting date. The stage of completion is assessed by reference to surveys of work performed. Usually services are rendered within a short period of time and require no significant judgement with respect to stage of completion.

(m) Other expenses

Lease payments

Payments made under operating leases are recognised in profit or loss on a straight-line basis over the term of the lease. Lease incentives received are recognised as an integral part of the total lease expense, over the term of the lease.

Minimum lease payments made under finance leases are apportioned between the finance expense and the reduction of the outstanding liability. The finance expense is allocated to each period during the lease term so as to produce a constant periodic rate of interest on the remaining balance of the liability.

(n) Finance costs

Finance costs comprise interest expense on borrowings, unwinding of the discount on provisions for historical costs and site restoration, foreign currency losses and impairment losses recognised on financial assets. Borrowing costs that are not directly attributable to the acquisition, construction or production of a qualifying asset are recognised in profit or loss using the effective interest method.

Foreign currency gains and losses are reported on a net basis as either finance income or finance cost depending on whether foreign currency movements are in a net gain or net loss position.

(o) Income tax

Income tax expense comprises current and deferred tax. Current tax and deferred tax are recognised in profit or loss except to the extent that they relate to items recognised directly in equity or in other comprehensive income.

3 Significant accounting policies, continued

(o) Income tax, continued

Current tax is the expected tax payable or receivable on the taxable income or loss for the year, using tax rates enacted or substantively enacted at the reporting date, and any adjustment to tax payable in respect of previous years. Deferred tax is recognised in respect of temporary differences between the carrying amounts of assets and liabilities for financial reporting purposes and the amounts used for taxation purposes. Deferred tax is not recognised for temporary differences on the initial recognition of assets or liabilities in a transaction that is not a business combination and that affects neither accounting nor taxable profit or loss. Deferred tax is measured at the tax rates that are expected to be applied to the temporary differences when they reverse, based on the laws that have been enacted or substantively enacted by the reporting date.

Deferred tax assets and liabilities are offset if there is a legally enforceable right to offset current tax assets and liabilities, and they relate to income taxes levied by the same tax authority on the same taxable entity, or on different tax entities, but they intend to settle current tax liabilities and assets on a net basis or their tax assets and liabilities will be realised simultaneously.

A deferred tax asset is recognised for unused tax losses, tax credits and deductible temporary differences, to the extent that it is probable that future taxable profits will be available against which they can be utilised. Deferred tax assets are reviewed at each reporting date and are reduced to the extent that it is no longer probable that the related tax benefit will be realised.

(p) Earnings per share

The Group presents basic and diluted earnings per share ("EPS") data for its ordinary shares. Basic EPS is calculated by dividing the profit or loss attributable to ordinary shareholders of the Company by the weighted average number of ordinary shares outstanding during the period, adjusted for own shares held. Diluted EPS is determined by adjusting the profit or loss attributable to ordinary shareholders and the weighted average number of ordinary shares outstanding, adjusted for own shares held, for the effects of all dilutive potential ordinary shares, which comprise convertible notes.

(q) Segment reporting

An operating segment is a component of the Group that engages in business activities from which it may earn revenues and incur expenses (including revenues and expenses related to transactions with other components of the same Group); whose operating results are regularly reviewed by the chief operating decision maker to make decisions about resources to be allocated to the segment and assess its performance, and for which discrete financial information is available.

(r) New standards and interpretations not yet adopted

The following new Standards, amendments to Standards and Interpretations are not yet effective as at 31 December 2016, and have not been applied in preparing these consolidated financial statements. The Group plans to adopt these pronouncements when they become effective.

The Group has not yet analysed the likely impact of the following new Standard on its financial position or performance:

- IFRS 9, published in July 2014, replaces the existing guidance in IAS 39 *Financial Instruments: Recognition and Measurement*. IFRS 9 includes revised guidance on the classification and measurement of financial instruments, including a new expected credit loss model for calculating impairment on financial assets, and new general hedge accounting requirements. It also carries forward the guidance on recognition and derecognition of financial instruments from IAS 39. IFRS 9 is effective for annual reporting periods beginning on or after 1 January 2018, with early adoption permitted;

3 Significant accounting policies, continued

(r) New standards and interpretations not yet adopted, continued

- IFRS 15 _Revenue from Contracts with Customers_ establishes a comprehensive framework for determining whether, how much and when revenue is recognised. It replaces existing revenue recognition guidance, including IAS 18 Revenue, IAS 11 Construction Contracts and IFRIC 13 Customer Loyalty Programmes. The core principle of the new standard is that an entity recognises revenue to depict the transfer of promised goods or services to customers in an amount that reflects the consideration to which the entity expects to be entitled in exchange for those goods or services. The new standard results in enhanced disclosures about revenue, provides guidance for transactions that were not previously addressed comprehensively and improves guidance for multiple-element arrangements. IFRS 15 is effective for annual reporting periods beginning on or after 1 January 2018, with early adoption permitted;
- IFRS 16 _Leases_ introduces a single, on-balance lease sheet accounting model for lessees. A lessee recognises a right-of-use asset representing its right to use the underlying asset and a lease liability representing its obligation to make lease payments. There are optional exemptions for short-term leases and leases of low value items. Lessor accounting remains similar to the current standard – i.e. lessors continue to classify leases as finance or operating leases. IFRS 16 replaces existing leases guidance including IAS 17 _Leases_, IFRIC 4 _Determining whether an Arrangement contains a Lease_, SIC-15 _Operating Leases - Incentives_ and SIC-27 _Evaluating the Substance of Transactions Involving the Legal Form of a Lease_. The standard is effective for annual periods beginning on or after 1 January 2019. Early adoption is permitted for entities that apply IFRS 15 _Revenue from Contracts with Customers_ at or before the date of initial application of IFRS 16.

4 Determination of fair values

A number of the Group's accounting policies and disclosures require the determination of fair value, for both financial and non-financial assets and liabilities. Fair values have been determined for measurement and for disclosure purposes based on the following methods. When applicable, further information about the assumptions made in determining fair values is disclosed in the notes specific to that asset or liability.

(a) Trade and other receivables

The fair value of trade and other receivables is estimated as the present value of future cash flows, discounted at the market rate of interest at the reporting date. For trade and other receivables with a short maturity fair value is not materially different from the carrying value because the effect of the time value of money is not material.

(b) Non-derivative financial liabilities

Fair value, which is determined for disclosure purposes, is calculated based on the present value of future principal and interest cash flows, discounted at the market rate of interest at the reporting date. For finance leases the market rate of interest is determined by reference to similar lease agreements.

5 Revenue

USD	2016	2015
Revenue from sales of vanadium products	237,560	-
Sales of gravel and waste rock	48,526	80,989
Revenue from transportation services	6,203	45,733
	292,289	**126,722**

6 Cost of sales

USD	2016	2015
Materials	357,510	14,499
Depreciation	286,613	55,757
Wages, salaries and related taxes	121,794	24,909
Electricity	61,728	3,180
Write down of inventory to net realisable value	44,195	-
Taxes other than on income	21,094	1,896
Other	13,836	4,813
	906,770	**105,054**

7 Administrative expenses

USD	2016	2015
Wages, salaries and related taxes	684,930	807,917
Materials	28,705	19,266
Professional services	26,027	95,350
Impairment of VAT receivable	24,664	96,570
Security	17,159	26,270
Depreciation and amortisation	16,143	23,857
Utilities	15,883	5,782
Business trip expenses	12,965	12,022
Fines and penalties	12,002	81
Expenses on bad debt allowance	9,328	-
Scientific and research developments	5,226	-
Bank fees	4,399	5,704
Transportation services	4,231	10,039
Taxes other than on income	2,218	18,259
Rent	2,092	18
Communication and information services	1,984	4,987
Insurance	1,290	759
Staff training	969	2,834
Other	6,238	8,577
	876,453	**1,138,292**

8 Other expenses

USD	2016	2015
Depreciation and amortisation of plant and equipment not used	-	380,513
Salary and related taxes	-	92,410
Property tax expenses	-	30,189
Loss on write-off of property, plant and equipment	-	29,739
Other	1,700	20,536
	1,700	**553,387**

During 2015 until September certain plant and equipment was idle and, therefore, related depreciation, production salary costs and other overhead costs are presented in other expenses.

9 Personnel costs

USD	2016	2015
Wages, salaries and related taxes	841,824	1,025,616
	841,824	**1,025,616**

During 2016 personnel costs of USD 121,794 (2015: USD 24,909) have been charged to cost of sales, USD 684,930 (2015: USD 807,917) – to administrative expenses and none (2015: USD 92,410) – to other expenses; USD 35,100 were charged to cost of inventories, which were not yet sold as at the year-end (2015: USD 100,380 were capitalised to construction in progress).

10 Finance costs

USD	2016	2015
Interest expense on financial liabilities measured at amortised cost	32,832	39,488
Unwinding of discount on site restoration provision	10,654	15,110
Net foreign exchange loss	7,835	626,608
Net finance costs	**51,321**	**681,206**

11 Income tax

The Group's applicable tax rates in 2016 are the income tax rate of 20% for Kazakhstan subsidiaries (2014: 20%) and 0% (2015: 0%) for BVI companies.

During the years ended 31 December 2016 and 2015 the Group incurred tax losses and therefore did not recognise any current income tax expense. Unrecognised deferred tax assets are described in Note 15.

Reconciliation of effective tax rate:

	2016		2015	
	USD	%	USD	%
Loss before income tax	**(1,523,596)**	**100**	**(2,346,526)**	**100**
Income tax at the applicable tax rate	(304,719)	20	(469,305)	20
Net non-deductible expenses	190,593	(13)	330,809	(14)
Effect of unrecognised deferred tax assets	114,126	(7)	138,496	(6)
	-	**-**	**-**	**-**

12 Property, plant and equipment

USD	Land and buildings	Plant and equipment	Vehicles	Computers	Other	Construction in progress	Total
Cost							
Balance at 1 January 2015	3,370,140	3,064,971	516,288	21,644	52,211	239,225	7,264,479
Additions	-	78,639	97,802	-	625	336,802	513,868
Write-offs	-	(37,808)	(32,682)	-	-	-	(70,490)
Foreign currency translation difference	(1,562,708)	(1,435,304)	(261,891)	(10,036)	(24,425)	(227,255)	(3,521,619)
Balance at 31 December 2015	**1,807,432**	**1,670,498**	**319,517**	**11,608**	**28,411**	**348,772**	**4,186,238**
Balance at 1 January 2016	1,807,432	1,670,498	319,517	11,608	28,411	348,772	4,186,238
Additions	-	69,338	24,555	474	3,090	8,652	106,109
Transfer from construction in progress	275	217,422	-	-	(275)	(217,422)	-
Transfer to inventories	-	(2,233)	(1)	-	(152)	(34,261)	(36,647)
Foreign currency translation difference	36,450	40,912	7,068	247	640	857	86,174
Balance at 31 December 2016	**1,844,157**	**1,995,937**	**351,139**	**12,329**	**31,714**	**106,598**	**4,341,874**
Depreciation							
Balance at 1 January 2015	374,772	697,979	503,504	16,573	48,240	-	1,641,068
Depreciation for the year	206,961	319,068	25,565	3,406	3,877	-	558,877
Write-offs	-	(11,340)	(29,411)	-	-	-	(40,751)
Foreign currency translation difference	(245,261)	(429,936)	(232,142)	(8,862)	(23,706)	-	(939,908)
Balance at 31 December 2015	**336,472**	**575,771**	**267,516**	**11,116**	**28,411**	**-**	**1,219,286**
Balance at 1 January 2016	336,472	575,771	267,516	11,116	28,411	-	1,219,286
Depreciation for the year	134,679	242,899	21,582	963	1,261	-	401,384
Transfer to inventories	-	(887)	-	-	-	-	(887)
Foreign currency translation difference	10,208	17,759	5,942	250	607	-	34,766
Balance at 31 December 2016	**481,359**	**835,542**	**295,040**	**12,329**	**30,279**	**-**	**1,654,549**
Carrying amounts							
At 1 January 2015	2,995,368	2,366,992	12,784	5,071	3,971	239,225	5,623,411
At 31 December 2015	**1,470,960**	**1,094,727**	**52,001**	**492**	**-**	**348,772**	**2,966,952**
At 31 December 2016	**1,362,798**	**1,160,395**	**56,099**	**-**	**1,435**	**106,598**	**2,687,325**

During 2016 depreciation expense of USD 286,613 (2015: USD 55,757) has been charged to cost of sales, USD 13,995 (2015: USD 23,210) – to administrative expenses and none (2015: USD 378,810) – to other expenses, and USD 100,776 was included in inventories, which were not yet sold as at the year-end (2015: USD 101,100 was capitalised to property, plant and equipment).

13 Exploration and evaluation assets

During the year ended 31 December 2016 the Group did not capitalise any costs to exploration and evaluation assets (2015: nil).

14 Intangible assets

USD	Mineral rights	Patents	Computer software	Total
Cost				
Balance at 1 January 2015	209,322	62,228	5,073	276,623
Additions	-	714	-	714
Foreign currency translation difference	(97,061)	(29,102)	(2,352)	(128,515)
Balance at 31 December 2015	**112,261**	**33,840**	**2,721**	**148,822**
Balance at 1 January 2016	112,261	33,840	2,721	148,822
Additions	-	1,009	-	1,009
Foreign currency translation difference	2,264	709	54	3,027
Balance at 31 December 2016	**114,525**	**35,558**	**2,775**	**152,858**
Amortisation				
Balance at 1 January 2015	(209,322)	(6,138)	(1,506)	(216,966)
Amortisation for the year	-	(2,552)	(647)	(3,199)
Foreign currency translation difference	97,061	3,728	921	101,710
Balance at 31 December 2015	**(112,261)**	**(4,962)**	**(1,232)**	**(118,455)**
Balance at 1 January 2016	(112,261)	(4,962)	(1,232)	(118,455)
Amortisation for the year	-	(1,665)	(483)	(2,148)
Foreign currency translation difference	(2,264)	(141)	(37)	(2,442)
Balance at 31 December 2016	**(114,525)**	**(6,768)**	**(1,752)**	**(123,045)**
Carrying amounts				
At 1 January 2015	-	56,090	3,567	59,657
At 31 December 2015	**-**	**28,878**	**1,489**	**30,367**
At 31 December 2016	**-**	**28,790**	**1,023**	**29,813**

Amortisation

During 2016 amortisation expense of USD 2,148 (2015: USD 647) was charged to administrative expenses, nil (2015: USD 1,703) – to other expenses and nil was capitalised to fixed assets (2015: USD 849).

15 Deferred tax assets and liabilities

Unrecognised deferred tax assets

As at 31 December 2016 the Group did not recognise deferred tax assets in the amount of USD 835,090 (2015: USD 703,874), mainly related to tax losses carried forward, because there is a doubt that the Group will be able to realise these assets in the foreseeable future. Unutilised tax losses expire after 10 years from the year of origination.

16 Inventories

USD	31 December 2016	31 December 2015
Goods in-transit	428,110	-
Raw materials and consumables	265,714	550,075
Finished goods	39,371	14,953
Work in progress	-	9
Other	3,696	-
	736,891	**565,037**

During 2016 raw materials, consumables and changes in finished goods and work in progress recognised as cost of sales amounted to USD 401,705 (2014: USD 14,499) (Note 6), including USD 44,195 (2015: nil) written down as a result of adjustment of inventories to net realisable value.

17 Trade and other receivables

Non-current **USD**	31 December 2016	31 December 2015
VAT receivable	411,187	378,271
Provision for VAT receivable	(411,187)	(378,271)
	-	**-**

Current **USD**	31 December 2016	31 December 2015
Due from employees	80,371	7,641
Trade receivables from third parties	36,013	24,623
Other receivables	9,688	5,600
	126,072	**37,864**
Bad debt allowance	(24,153)	(23,676)
	101,919	**14,188**

During 2016 the management of the Group created a provision of USD 24,664 for VAT receivable (2015: USD 96,570) due to uncertainties related to recovery of VAT by the methods allowed by legislation of the Republic of Kazakhstan. The Group's exposure to credit and currency risks and impairment losses related to trade and other receivables are disclosed in Note 24 (b).

18 Prepayments

USD	31 December 2016	31 December 2015
Non-current		
Prepayments for equipment	36,005	36,558
	36,005	**36,558**
Current		
Prepayments for goods and services	9,500	9,044
	9,500	**9,044**

19 Cash and cash equivalents

USD	31 December 2016	31 December 2015
Bank balances	71,419	247,549
Petty cash	436	19,382
Cash and cash equivalents	**71,855**	**266,931**

The Group's exposure to credit and foreign currency risks is disclosed in Note 24.

20 Equity

(a) Share capital and share premium

Number of shares unless otherwise stated	**Ordinary shares** **2016**	**2015**
Authorised shares	5,000,000	5,000,000
Par value, USD	0.01	0.01
Outstanding at beginning of year	1,496,235	776,063
Issued	7,561	720,172
Outstanding at end of year	**1,503,796**	**1,496,235**

Ordinary shares

All shares rank equally with regard to the Group's residual assets. The holders of ordinary shares are entitled to receive dividends as declared from time to time, and are entitled to one vote per share at meetings of the Group.

During 2016 the Group issued 7,561 shares (2015: 720,172 shares) with nominal amount of USD 76 (2015: USD 7,201) and share premium of USD 800,057 (2015: USD 2,362,156).

(b) Dividends

No dividends were declared for the year ended 31 December 2016 (2015: nil).

(c) Loss per share (basic and diluted)

The calculation of basic and diluted loss per share has been based on the following loss attributable to ordinary shareholders and weighted-average number of ordinary shares outstanding.

(i) Loss attributable to ordinary shareholders (basic and diluted)

USD	**2016**	**2015**
Loss for the year, attributable to owners of the Company	(1,523,596)	(2,346,526)
Loss attributable to ordinary shareholders	**(1,523,596)**	**(2,346,526)**

(ii) Weighted-average number of ordinary shares (basic and diluted)

Shares	**2016**	**2015**
Issued ordinary shares at 1 January	1,496,235	776,063
Effect of shares issued	3,854	208,727
Weighted-average number of ordinary shares at 31 December	**1,500,089**	**984,790**
Loss per share of common stock attributable to the Company (basic and diluted)	(1.02)	(2.38)

At 31 December 2016, convertible bonds in the amount of USD 267,622 (2015: nil) were excluded from the diluted weighted-average number of ordinary shares calculation because their effect would have been anti-dilutive.

21 Loans and borrowings

This note provides information about the contractual terms of the Group's loans and borrowings, which are measured at amortised cost. For more information about the Group's exposure to foreign currency and liquidity risks, refer to Note 24.

USD	31 December 2016	31 December 2015
Current liabilities		
Loans from shareholders	392,235	115,279
	392,235	**115,279**

Terms and debt repayment schedule

Terms and conditions of outstanding loans were as follows:

				31 December 2016		31 December 2015	
USD	**Currency**	**Nominal interest rate**	**Year of maturity**	**Face value**	**Carrying amount**	**Face value**	**Carrying amount**
Loans from shareholders	USD	15%	upon demand	267,622	267,622	-	-
Loans from shareholders	USD	10%	upon demand	122,973	122,973	111,765	111,765
Loans from shareholders	KZT	0%	upon demand	1,640	1,640	3,514	3,514
				392,235	**392,235**	**115,279**	**115,279**

During 2016 the Group received a series of loan tranches from shareholders in the total amount of USD 246,000 (2015: USD 543,434). During 2016 no loans payable were offset against shares issued (2015: offset with shares issued constituted USD 760,464).

22 Provisions

USD	2016	2015
Balance at 1 January	121,373	193,736
Unwinding of discount	10,654	11,578
Change in estimate	-	15,110
Foreign currency translation difference	2,717	(99,051)
Balance at 31 December	**134,744**	**121,373**
Non-current	134,744	121,373
	134,744	**121,373**

Site restoration

A provision was recognised in respect of the Group's obligation to rectify environmental damage in the Balasausqandyq mine, Kyzylorda region.

22 Provisions, continued

Site restoration, continued

In accordance with Kazakhstan environmental legislation, land contaminated by the Group in the Kyzylorda region must be restored before the end of 2022. The provision was estimated by considering the risks related to the amount and timing of restoration costs based on the known level of damage. Because of the long-term nature of the liability, the greatest uncertainty in estimating the provision is the costs that will be incurred. In particular, the Group has assumed that the site will be restored using technology and materials that are available currently and total estimated undiscounted cash outflow equals to KZT 81,166 thousand (31 December 2015: KZT 73,451 thousand) or USD 243,529 at the closing 2016 KZT/USD exchange rate (31 December 2015: USD 216,026). The present value of restoration costs was determined by discounting the estimated restoration cost using a risk-free rate for the respective period, adjusted for the risks specific to the liability and inflation of 8.8% (2015: 8.8%). Environmental legislation in the Kazakhstan continues to evolve and it is difficult to determine the exact standards required by the current legislation in restoring sites such as this. Generally the standard of restoration is determined based on discussions with Government officials at the time that restoration commences.

23 Trade and other payables

USD	31 December 2016	31 December 2015
Due to employees	653,432	269,623
Other taxes	194,453	180,259
Trade payables	179,718	497,953
Advances received	101,770	5,282
	1,129,373	**953,117**

The Group's exposure to currency and liquidity risk related to trade and other payables is disclosed in Note 24.

24 Financial instruments and risk management

(a) Overview

The Group has exposure to the following risks from its use of financial instruments:

- credit risk;
- liquidity risk;
- market risk.

This note presents information about the Group's exposure to each of the above risks, the Group's objectives, policies and processes for measuring and managing risk, and the Group's management of capital. Further quantitative disclosures are included throughout these consolidated financial statements.

Risk management framework

The Chief Executive has overall responsibility for the establishment and oversight of the Group's risk management framework.

The Group's risk management policies are established to identify and analyse the risks faced by the Group, to set appropriate risk limits and controls, and to monitor risks and adherence to limits. Risk management policies and systems are reviewed to reflect changes in market conditions and the Group's activities. The Group aims to develop a disciplined and constructive control environment in which all employees understand their roles and obligations.

24 Financial instruments and risk management, continued

(b) Credit risk

Credit risk is the risk of financial loss to the Group if a customer or counterparty to a financial instrument fails to meet its contractual obligations, and arises principally from the Group's receivables from customers.

(i) Exposure to credit risk

The carrying amount of financial assets represents the maximum credit exposure. The maximum exposure to credit risk at the reporting date was:

	Carrying amount	
USD	**31 December 2016**	**31 December 2015**
Trade and other receivables, excluding due from employees and VAT receivable	21,548	6,547
Cash and cash equivalents	71,419	247,549
	92,967	**254,096**

The maximum exposure to credit risk for trade and other receivables at the reporting date by geographic region was:

	Carrying amount	
USD	**31 December 2016**	**31 December 2015**
Kazakhstan	21,548	6,547
	21,548	**6,547**

The maximum exposure to credit risk for trade and other receivables at the reporting date by type of customer was:

	Carrying amount	
USD	**31 December 2016**	**31 December 2015**
Trade receivables:		
Wholesale customers	11,860	947
Other receivables		
Other	9,688	5,600
	21,548	**6,547**

The Group's most significant customer, a Kazakhstan wholesaler, accounts for USD 9,945 of the trade receivables carrying amount at 31 December 2016 (2015: USD 947).

Impairment losses

The ageing of trade and other receivables at the reporting date was:

USD	**Gross 2016**	**Impairment 2016**	**Net 2016**	**Gross 2015**	**Impairment 2015**	**Net 2015**
Not past due	21,548	-	21,548	6,547	-	6,547
Past due more than 180 days	24,153	(24,153)	-	23,676	(23,676)	-
	45,701	**(24,153)**	**21,548**	**30,223**	**(23,676)**	**6,547**

24 Financial instruments and risk management, continued

(b) Credit risk, continued

(i) Exposure to credit risk, continued

Impairment losses, continued

The movement in the allowance for impairment in respect of trade and other receivables during the year was as follows:

USD	2016	2015
Balance at beginning of the year	23,676	44,146
Effect on movement in exchange rates	477	(20,470)
Balance at end of the year	**24,153**	**23,676**

Based on historic default rates, the Group believes that no impairment allowance is necessary in respect of trade receivables not past due or past due up to 30 days.

The allowance account in respect of trade receivables is used to record impairment losses unless the Group is satisfied that no recovery of the amount owing is possible. At that point the amount is considered irrecoverable and is written off against the financial asset directly. As at 31 December 2016 the Group did not have any collective impairment on its trade receivables (2015: nil).

(ii) Cash and cash equivalents

As at 31 December 2016 the Group held cash of USD 71,855 (2015: USD 266,931), of which bank balances of USD 71,419 (2015: USD 247,549) represent its maximum credit exposure on these assets. 84% (2015: 89%) is held in a bank with credit rating AA- and the remaining 16% in a bank with credit rating CCC (2015: 11% is held in a in a bank with credit rating B-). Credit ratings are provided by a rating agency Fitch.

(c) Liquidity risk

Liquidity risk is the risk that the Group will encounter difficulty in meeting the obligations associated with its financial liabilities that are settled by delivering cash or another financial asset. The Group's approach to managing liquidity is to ensure, as far as possible, that it will always have sufficient liquidity to meet its liabilities when due, under both normal and stressed conditions, without incurring unacceptable losses or risking damage to the Group's reputation.

Typically the Group aims to have sufficient cash on demand to meet expected operational expenses for a period of 60 days, including the servicing of financial obligations; this excludes the potential impact of extreme circumstances that cannot reasonably be predicted, such as natural disasters.

The following are the contractual maturities of financial liabilities. It is not expected that the cash flows included in the maturity analysis could occur significantly earlier, or at significantly different amounts.

24 Financial instruments and risk management, continued

(c) Liquidity risk, continued

2016

USD	Carrying amount	Contractual cash flows	On demand	0-6 mths
Non-derivative financial liabilities				
Loans from shareholders	392,235	392,235	392,235	-
Trade and other payables, excluding due to employees, advances received and salary related taxes	179,718	179,718	-	179,718
	571,953	**571,953**	**392,235**	**179,718**

2015

USD	Carrying amount	Contractual cash flows	On demand	0-6 mths
Non-derivative financial liabilities				
Loans from shareholders	115,279	115,279	115,279	-
Trade and other payables, excluding due to employees, advances received and salary related taxes	497,953	497,953	-	497,953
	613,232	**613,232**	**115,279**	**497,953**

(d) Market risk

Market risk is the risk that changes in market prices, such as foreign exchange rates, interest rates and equity prices will affect the Group's income or the value of its holdings of financial instruments. The objective of market risk management is to manage and control market risk exposures within acceptable parameters, while optimising the return.

(i) Currency risk

The Group is exposed to currency risk on sales, purchases and borrowings that are denominated in a currency other than the respective functional currency of Group entities. The currency in which these transactions are primarily denominated is USD.

In respect of monetary assets and liabilities denominated in foreign currencies, the Group ensures that its net exposure is kept to an acceptable level by buying or selling foreign currencies at spot rates when necessary to address short-term imbalances.

24 Financial instruments and risk management, continued

(d) Market risk, continued

(i) Currency risk, continued

Exposure to currency risk

The Group's exposure to foreign currency risk was as follows based on notional amounts:

	USD-denominated 2016	GBP-denominated 2016	HKD-denominated 2016	RUB-denominated 2016
Cash and cash equivalents	58,714	1,233	704	-
Trade and other payables	(665,298)	(89,808)	-	(3,512)
Loans and borrowings	(390,595)	-	-	-
Net exposure	**(997,179)**	**(88,575)**	**704**	**(3,512)**

	USD-denominated 2015	GBP-denominated 2015	HKD-denominated 2015	RUB-denominated 2015
Cash and cash equivalents	194,514	47,955	2,115	-
Trade and other payables	(300,887)	(107,514)	-	(279,380)
Loans and borrowings	(111,765)	-	-	-
Net exposure	**(218,138)**	**(59,559)**	**2,115**	**(279,380)**

The following significant exchange rates applied during the year:

in USD	**Average rate**		**Reporting date spot rate**	
	2016	**2015**	**2016**	**2015**
KZT 1	0.0029	0.0045	0.0030	0.0029
GBP 1	1.5213	1.5285	1.0519	0.6779
RUB 1	0.0150	0.0165	0.0162	0.0137
HKD 1	0.1289	0.1290	0.1290	0.1290

Sensitivity analysis

A strengthening of the KZT, as indicated below, against the following currencies at 31 December would have increased/(decreased) profit or loss by the amounts shown below. This analysis is based on foreign currency exchange rate variances that the Group considered to be reasonably possible at the end of the reporting period. The analysis assumes that all other variables, in particular interest rates, remain constant.

USD	**Profit or (loss)**
2016	
USD (20% strengthening)	199,467
GBP (20% strengthening)	17,715
RUB (20% strengthening)	562
HKD (20% strengthening)	(141)
2015	
USD (20% strengthening)	44,615
GBP (20% strengthening)	11,912
RUB (20% strengthening)	44,701
HKD (20% strengthening)	(423)

A weakening of the KZT against the above currencies at 31 December would have had the equal but opposite effect to the amounts shown above, on the basis that all other variables remain constant.

24 Financial instruments and risk management, continued

(d) Market risk, continued

(ii) Interest rate risk

Changes in interest rates impact primarily loans and borrowings by changing either their fair value (fixed rate debt) or their future cash flows (variable rate debt). Management does not have a formal policy of determining how much of the Group's exposure should be to fixed or variable rates. However, at the time of raising new loans or borrowings management uses its judgment to decide whether it believes that a fixed or variable rate would be more favourable to the Group over the expected period until maturity.

Change in interest rates at the reporting date would not significantly affect profit or loss.

(e) Fair values versus carrying amounts

Management believes that the fair value of the Company's financial assets and liabilities approximates their carrying amounts.

The basis for determining fair values is disclosed in Note 4.

(f) Fair value hierarchy

Financial instruments measured at fair value are presented by level within which the fair value measurement is categorized. The levels of fair value measurement are determined as following:

- Level 1: quoted prices (unadjusted) in active markets for identical assets or liabilities.
- Level 2: inputs other than quoted prices included in Level 1 that are observable for the asset or liability, either directly (i.e. as prices) or indirectly (i.e. derived from prices).
- Level 3: inputs for the asset or liability that are not based on observable market data (unobservable inputs).

As at 31 December 2016 and 31 December 2015, all financial instruments held by the Group fell within Level 3.

25 Commitments

Commitments for training of Kazakhstan employees

Under the conditions of the subsoil use contract the Group is liable to train Kazakh employees. According to the contract the annual training expense should equal to 1% of the Group's capital expenditures. Regional inspection of subsoil protection and usage Yuzhkaznedra, as a government body, provides the minimum required size of the expense to be paid annually. Total training expense in 2016 is USD 969 (2015: USD 3,456).

26 Contingencies

(a) Insurance

The insurance industry in the Kazakhstan is in a developing state and many forms of insurance protection common in other parts of the world are not yet generally available. The Group does not have full coverage for its plant facilities or business interruption. There is a risk that the loss or destruction of certain assets could have a material adverse effect on the Group's operations and financial position.

26 Contingencies, continued

(b) Taxation contingencies

The taxation system in Kazakhstan is relatively new and is characterised by frequent changes in legislation, official pronouncements and court decisions, which are often unclear, contradictory and subject to varying interpretation by different tax authorities, including opinions with respect to IFRS treatment of revenues, expenses and other items in the financial statements. Taxes are subject to review and investigation by various levels of authorities, which have the authority to impose severe fines and interest charges. A tax year generally remains open for review by the tax authorities for five subsequent calendar years; however, under certain circumstances a tax year may remain open longer.

These circumstances may create tax risks in Kazakhstan that are more significant than in other countries. Management believes that it has provided adequately for tax liabilities based on its interpretations of applicable tax legislation, official pronouncements and court decisions. However, the interpretations of the relevant authorities could differ and the effect on these consolidated financial statements, if the authorities were successful in enforcing their interpretations, could be significant.

27 Segment reporting

The Group's operations are highly integrated and constitute a single business segment for the purposes of IFRS 8 *Operating Segments*. The Group's assets are primarily concentrated in the Republic of Kazakhstan, and the Group's revenues are derived from operations in, and connected with, the Republic of Kazakhstan. The Chief Operating Decision Maker, in the case of the Group, the Chairman, only receives and reviews the information on the Group as a whole.

28 Related party transactions

(a) Transactions with management and close family members

Management remuneration

The following have been provided in respect of remuneration of key management during the year, which is included in personnel costs (see Note 9):

USD	2016	2015
Wages, salaries and related taxes	430,000	551,853

(b) Transactions with other related parties

The Group's other related party transactions are disclosed below:

Loans and receivables

USD	Transaction value	Transaction value	Outstanding balance	Outstanding balance
	2016	2015	2016	2015
Loans received from shareholders	246,000	543,434	392,235	115,279

The information on terms and conditions of outstanding loans received from shareholders is disclosed in Note 21.

29 Subsequent events

In April 2017 the Company moved its registration and registered office to Noble House, Les Baissieres, St Peter Port, Guernsey, GU1 2UE.

In January-April 2017 the Company issued a total of 660 (six hundred sixty) shares for a total receipt of USD 68,670.

Ferro-Alloy Resources Limited

Consolidated Financial Statements
for the year ended
31 December 2015

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Independent Auditors' Report

To the Management of Ferro-Alloy Resources Limited

We have audited the accompanying consolidated financial statements of Ferro-Alloy Resources Limited and its subsidiaries (the "Group"), which comprise the consolidated statement of financial position as at 31 December 2015, and the consolidated statements of profit or loss and other comprehensive income, changes in equity and cash flows for the year then ended, and notes, comprising a summary of significant accounting policies and other explanatory information.

Management's Responsibility for the Consolidated Financial Statements

Management is responsible for the preparation and fair presentation of these consolidated financial statements in accordance with International Financial Reporting Standards, and for such internal control as management determines is necessary to enable the preparation of consolidated financial statements that are free from material misstatement, whether due to fraud or error.

Auditors' Responsibility

Our responsibility is to express an opinion on these consolidated financial statements based on our audit. We conducted our audit in accordance with International Standards on Auditing. Those standards require that we comply with ethical requirements and plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the consolidated financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the consolidated financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of the consolidated financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of accounting estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our qualified audit opinion.

Basis for Qualified Opinion

As disclosed in Note 1 (a) the Group ceased production of vanadium in 2011 in order to construct a new processing plant which is based on a technology not yet used in commercial production. The recoverable amount of the Group's property, plant and equipment, intangible assets, exploration and evaluation assets and inventory balances is dependent on the successful realisation of this new processing plant. At 31 December 2015, the plant had not been operating on a consistent basis and there are indicators that the recoverable amount of the Group's property, plant and equipment, intangible assets, exploration and evaluation assets and inventory balances may be lower than their carrying amounts. Management have not performed a formal estimate of the recoverable amount of these assets as at 31 December 2014 and 31 December 2015, which is required by International Financial Reporting Standard *IAS 36 Impairment of Assets* and *IAS 2 Inventories*. The effects of this departure from International Financial Reporting Standards on the consolidated financial statements has not been determined. Our opinions on the consolidated financial statements as at and for the year ended 31 December 2014 and on the current year's figures have been modified accordingly.

Qualified Opinion

In our opinion, except for the effects of the matter described in the Basis for Qualified Opinion paragraph, the consolidated financial statements present fairly, in all material respects, the financial position of the Group as at 31 December 2015, and its financial performance and its cash flows for the year then ended in accordance with International Financial Reporting Standards.

Emphasis of matter

Without further qualifying our opinion, we draw attention to the fact that the Group is in the development stage and had net operating cash outflows of USD 1,083,193 for the year ended 31 December 2015. The Group is planning to raise additional funding and its continued operations are dependent on the realisation of its business plan. These plans, together with additional matters concerning the Group's financial situation, are disclosed in Note 2(d). These conditions indicate the existence of a material uncertainty that may cast significant doubt about the Group's ability to continue as a going concern.

Anton Shcherbak
Certified Auditor
of the Republic of Kazakhstan,
Auditor's Qualification Certificate No. MФ-0000183
of 2 June 2014

KPMG Audit LLC

State Licence to conduct audit # 0000021 dated 6 December 2006 issued by the Ministry of Finance of the Republic of Kazakhstan

Assel Khairova
General Director of KPMG Audit LLC
acting on the basis of the Charter

14 December 2016

USD	Note	2015	2014
Revenue	5	126,722	176,592
Cost of sales	6	(105,054)	(265,253)
Gross profit		**21,668**	**(88,661)**
Other income		4,691	13,178
Administrative expenses	7	(1,138,292)	(2,215,041)
Other expenses	8	(553,387)	(1,006,301)
Results from operating activities		**(1,665,320)**	**(3,296,825)**
Finance costs	10	(681,206)	(43,099)
Net finance costs		**(681,206)**	**(43,099)**
Loss before income tax		(2,346,526)	**(3,339,924)**
Income tax	11	-	-
Loss for the year		**(2,346,526)**	(3,339,924)
Other comprehensive income			
Items that will never be reclassified to profit or loss			
Foreign currency translation differences		(2,019,312)	(1,347,854)
Loss and total comprehensive income for the year		**(4,365,838)**	**(4,687,778)**

These consolidated financial statements were approved by Management on 14 December 2016 and were signed on its behalf by:

N.J. Bridgen
Chairman

The consolidated statement of profit or loss and other comprehensive income is to be read in conjunction with the notes to, and forming part of, the consolidated financial statements set out on pages 9 to 33.

USD	Note	31 December 2015	31 December 2014
ASSETS			
Non-current assets			
Property, plant and equipment	12	2,966,952	5,623,411
Exploration and evaluation assets	13	183,603	342,344
Intangible assets	14	30,367	59,657
Prepayments	18	36,558	68,166
Total non-current assets		**3,217,480**	**6,093,578**
Current assets			
Inventories	16	565,037	350,642
Trade and other receivables	17	14,188	24,692
Prepayments	18	9,044	29,112
Cash and cash equivalents	19	266,931	30,305
Total current assets		**855,200**	**434,751**
Total assets		**4,072,680**	**6,528,329**
EQUITY AND LIABILITIES			
Equity	20		
Share capital		14,962	7,761
Share premium		24,230,019	21,867,863
Foreign currency translation reserve		(2,664,263)	(644,951)
Retained earnings		(18,697,807)	(16,351,281)
Total equity		**2,882,911**	**4,879,392**
Non-current liabilities			
Provisions	22	121,373	193,736
Total non-current liabilities		**121,373**	**193,736**
Current liabilities			
Loans and borrowings	21	115,279	304,728
Trade and other payables	23	953,117	1,150,473
Total current liabilities		**1,068,396**	**1,455,201**
Total liabilities		**1,189,769**	**1,648,937**
Total equity and liabilities		**4,072,680**	**6,528,329**

The consolidated statement of financial position is to be read in conjunction with the notes to, and forming part of, the consolidated financial statements set out on pages 9 to 33.

USD	**Share capital**	**Share premium**	**Foreign currency translation reserve**	**Retained earnings**	**Total**
Balance at 1 January 2014	4,147	20,401,671	702,903	(13,011,357)	8,097,364
Loss for the year	-	-	-	(3,339,924)	(3,339,924)
Other comprehensive income					
Items that will never be reclassified to profit or loss					
Foreign currency translation differences	-	-	(1,347,854)	-	(1,347,854)
Total comprehensive loss for the year	**-**	**-**	**(1,347,854)**	**(3,339,924)**	**(4,687,778)**
Transactions with owners, recorded directly in equity					
Shares issued	3,614	1,466,192	-	-	1,469,806
Balance at 31 December 2014	**7,761**	**21,867,863**	**(644,951)**	**(16,351,281)**	**4,879,392**
Balance at 1 January 2015	7,761	21,867,863	(644,951)	(16,351,281)	4,879,392
Loss for the year	-	-	-	(2,346,526)	(2,346,526)
Other comprehensive income					
Items that will never be reclassified to profit or loss					
Foreign currency translation differences	-	-	(2,019,312)	-	(2,019,312)
Total comprehensive loss for the year	**-**	**-**	**(2,019,312)**	**(2,346,526)**	**(4,365,838)**
Transactions with owners, recorded directly in equity					
Shares issued	7,201	2,362,156	-	-	2,369,357
Balance at 31 December 2015	**14,962**	**24,230,019**	**(2,664,263)**	**(18,697,807)**	**2,882,911**

The consolidated statement of changes in equity is to be read in conjunction with the notes to, and forming part of, the consolidated financial statements set out on pages 9 to 33.

USD	**Note**	**2015**	**2014**
Cash flows from operating activities			
Loss for the year		**(2,346,526)**	**(3,339,924)**
Adjustments for:			
Depreciation and amortisation	12,14	460,127	715,693
Loss on write-off of property, plant and equipment		29,739	4,165
Impairment of VAT and trade receivables	7	96,570	599,276
Finance costs	10	681,206	43,099
Cash used in operating activities before changes in working capital		**(1,078,884)**	**(1,977,691)**
Change in inventories		(575,891)	127,680
Change in trade and other receivables, including VAT		(98,012)	10,252
Change in prepayments		10,033	1,390
Change in trade and other payables		659,561	999,131
Net cash used in operating activities		**(1,083,193)**	**(839,238)**
Cash flows from investing activities			
Acquisition of property, plant and equipment		(300,675)	(41,212)
Net cash used in investing activities		**(300,675)**	**(41,212)**
Cash flows from financing activities			
Proceeds from issue of share capital		1,055,846	574,086
Proceeds from borrowings	21	543,434	295,568
Repayment of finance lease liabilities		-	(10,211)
Repayment of loans received from key management		(10,422)	-
Net cash from financing activities		**1,588,858**	**859,443**
Net increase/(decrease) in cash and cash equivalents		**204,990**	**(21,007)**
Cash and cash equivalents at 1 January		30,305	114,079
Effect of movements in exchange rates on cash and cash equivalents		31,636	(62,767)
Cash and cash equivalents at 31 December	19	**266,931**	**30,305**

During 2015, the Group issued new shares for the total amount of USD 2,369,357 (2014: USD 1,469,806). Part of the expected proceeds of the new shares issued were offset against loans and salaries and trade payable in amount of USD 760,464 (2014: USD 451,133) and USD 553,047 (2014: USD 444,587), respectively. The remaining amount of proceeds from shares issued was paid in cash.

The consolidated statement of cash flows is to be read in conjunction with the notes to, and forming part of, the consolidated financial statements set out on pages 9 to 33.

1 Background

(a) Organisation and operations

Ferro-Alloy Resources Limited (the "Company") is a company established on the territory of the British Virgin Islands in accordance with the legislation of the British Virgin Islands. The Company was incorporated on 18 April 2000 and the Company's registered office is Palm Grove House, P.O. Box 3186, Wickhams Cay 1, Road Town, Tortola, British Virgin Islands. The consolidated financial statements as at and for the year ended 31 December 2015 comprise the Company and the following subsidiaries (together referred to as the "Group"):

Company	Location	Company's share in charter capital	Primary activities
Ferro-Alloy Products Limited	The British Virgin Islands	100%	Carries out the treasuryand finance activities for the Group
Vanadium Processing LLC	Kazakhstan	100%	Does not trade
Firma Balausa LLC	Kazakhstan	100%	Production and sale of vanadium and associated by-products

The Group's principal activity is mining, processing and sale of vanadium-containing ores and associated by-products extracted from the Bala-Sauskandyk mine located in Kazakhstan, Shieli under license MG1278D dated 8 December 1997, and processing and sale of purchased iron-containing concentrate. The Group's products are sold in Kazakhstan and abroad.

The Group's operations were initially of small scale intended as a pilot plant to demonstrate the technical and financial feasibility of treating ore from the Balasauskandik deposit. In February 2011, management of the subsidiary Firma Balausa LLC decided to temporarily stop the production at its plant in order to modify the process by introducing conventional crushing milling and autoclave leaching. The improvement was intended to enable greater recovery of vanadium, reduced sulphuric acid consumption and allowed the extraction of the carbon and flux by-products, which would be available for sale. No vanadium was produced in 2011 to 2014. During 2015, the Group changed its production technology from autoclave leaching to atmospheric leaching of purchased iron-containing concentrate and carried out the reconstruction of the corresponding plant equipment. In September 2015, the Group started preparatory work for the production and in October 2015 performed a test release of hydrated vanadium pentoxide, and then continued pre-commissioning activities.

(b) Kazakhstan business environment

The Group's operations are primarily located in Kazakhstan. Consequently, the Group is exposed to the economic and financial markets of Kazakhstan which display characteristics of an emerging market. The legal, tax and regulatory frameworks continue development, but are subject to varying interpretations and frequent changes which together with other legal and fiscal impediments contribute to the challenges faced by entities operating in Kazakhstan. In addition, the recent significant depreciation of the Kazakhstan tenge, and the reduction in the global price of oil, have increased the level of uncertainty in the business environment.

The consolidated financial statements reflect management's assessment of the impact of the Kazakhstan business environment on the operations and the financial position of the Group. The future business environment may differ from management's assessment.

2 Basis of preparation

(a) Statement of compliance

These consolidated financial statements have been prepared in accordance with International Financial Reporting Standards ("IFRSs")

(b) Basis of measurement

The consolidated financial statements are prepared on the historical cost basis.

(c) Functional and presentation currency

The national currency of Kazakhstan is the Kazakhstan Tenge ("KZT) which is also the Company's functional currency and the functional currency of its subsidiaries. These consolidated financial statements are presented in United States Dollars ("USD") as this is the currency familiar to the majority of the Company's shareholders. All financial information presented in USD has been rounded to the nearest USD.

(d) Going concern

The accompanying consolidated financial statements are prepared in accordance with IFRS on a going concern basis, which contemplates realisation of assets and satisfaction of liabilities in the normal course of business in the foreseeable future.

Current operations

The Group is in the investing and development stage, and during 2015 the Group incurred losses of USD 2,341,936 (2014: USD 3,339,924), and used net cash for operating activities in the amount of USD 751,295 (2014: USD 839,238). As at 31 December 2015 its current liabilities exceeded its current assets by USD 213,196 (2014: USD 1,020,450).

In 2015 the pilot plant, which had been used to demonstrate and refine the processing methods to be used by the Group in developing the Balasausqandiq vanadium deposit, was modified to become a production plant to treat purchased concentrates. The objective was to use the plant to generate cash flows from small-scale operations, to be used in the development of the main project. Commissioning of the modified pilot plant started in the last quarter of 2015. No sales were made in 2015.

In the middle of 2016 production was achieved and the first shipments of vanadium pentoxide were made in July. Up to the date of these consolidated financial statements, three sales have been made to three customers in three countries. New equipment has recently been installed and production is expected to slowly increase as operators become more proficient at handling the increased levels of production that the plant is now capable of. The management expect a positive cash flow from operations from January 2017 onwards.

The current price of vanadium pentoxide (which is used in the Groups's business model for production of ammonium metavanadate) is quoted as USD 3.83 per lb in Europe. Management consider this is low compared with historic levels which have averaged around USD 7/lb in the last ten years after adjusting for inflation. Management have considered the views of certain independent forecasters who expect a significant increase in vanadium prices but the timing of any such recovery is uncertain. If such a recovery occurs, the profitability of operations, even at current levels of production, will rise substantially.

Future plans

Processing operations

Management of the Group is planning a project to increase throughput and production by a multiple of about five times, which management expect will have the effect of significantly increasing profits even at current prices.

2 Basis of preparation, continued

(d) Going concern, continued

Future plans, continued

Processing operations, continued

This project entails approximately doubling the size of the existing plant. Capital costs will total approximately USD 12 million. Approximately half of this amount will be used for the development of infrastructure which will be required for the main development of Balasausqandiq, reducing the amount to be financed later. The feasibility assessment for this project is nearing completion and the Group plans, subject to finance, to start construction in the beginning of 2017.

Development of the Balasausqandiq mine and processing plant

In parallel with existing operations discussed above, and using the resulting cash flows, the Group plans to continue development of the Balasausqandiq vanadium deposit. A feasibility study indicates that capital costs of some USD 100 million will be required as a first stage of development to mine and treat one million tonnes per year of ore, producing some 5,600 tonnes per year of vanadium-containing products on a vanadium pentoxide basis. A subsequent expansion will increase this fourfold.

Finance

Group's forecasts indicate that it has sufficient funds to reach the position where it will be generating cash from operations. The Group has the support of shareholders who have lent money from time to time to the Group and have indicated that they will not require repayment until cash flows permit.

Future plans for expansions of current processing operations and the development of the Balasausqandiq deposit are dependent on the Group raising additional finance. The Group is currently in discussions with its brokers concerning the raising of this finance either prior to listing on a recognised stock exchange or as part of such listing. During the year 2016, the Group issued 6,534 new shares raising USD 631,093 net of costs. The profitability of current operations without further expansion is dependent on the maintenance of vanadium prices at current levels or above and on the Group achieving its production plans.

The Group has plans to obtain additional financing to allow the execution of its business plan and negotiations with potential investors are ongoing.

(e) Use of estimates and judgments

The preparation of consolidated financial statements in conformity with IFRSs requires management to make judgments, estimates and assumptions that affect the application of accounting policies and the reported amounts of assets, liabilities, income and expenses. Actual results may differ from those estimates.

Estimates and underlying assumptions are reviewed on an ongoing basis. Revisions to accounting estimates are recognised in the period in which the estimates are revised and in any future periods affected.

Information about critical judgments in applying accounting policies that have the most significant effect on the amounts recognised in the consolidated financial statements is included in the following notes:

- Note 3(d) – Useful lives of property, plant and equipment;
- Note 3(h) and 16 – Net realisable value of inventories;
- Note 15 – Unrecognised deferred tax assets;
- Note 22 – Provisions.

3 Significant accounting policies

The accounting policies set out below have been applied consistently to all periods presented in these consolidated financial statements, and have been applied consistently by Group entities.

(a) Basis of consolidation

(i) Subsidiaries

Subsidiaries are entities controlled by the Group. The Group controls an entity when it is exposed to, or has rights to, variable returns from its involvement with the entity and has the ability to affect those returns through its power over the entity. The financial statements of subsidiaries are included in the consolidated financial statements from the date that control commences until the date that control ceases. The accounting policies of subsidiaries have been changed when necessary to align them with the policies adopted by the Group.

(ii) Transactions eliminated on consolidation

Intra-group balances and transactions, and any unrealised income and expenses arising from intra-group transactions, are eliminated in preparing the consolidated financial statements. Unrealised losses are eliminated in the same way as unrealised gains, but only to the extent that there is no evidence of impairment.

(b) Foreign currency

(i) Foreign currency transactions

Transactions in foreign currencies are translated to the respective functional currencies of Group entities at exchange rates at the dates of the transactions.

Monetary assets and liabilities denominated in foreign currencies at the reporting date are translated to the functional currency at the exchange rate at that date. The foreign currency gain or loss on monetary items is the difference between amortised cost in the functional currency at the beginning of the period, adjusted for effective interest and payments during the period, and the amortised cost in foreign currency translated at the exchange rate at the end of the reporting period.

Non-monetary items in a foreign currency that are measured based on historical cost are translated using the exchange rate at the date of the transaction.

Foreign currency differences arising in translation are recognised in profit or loss.

(ii) Presentation currency

The assets and liabilities of foreign operations are translated to USD at the exchange rates at the reporting date. The income and expenses of foreign operations are translated to USD at the average exchange rate for the period, which approximates the exchange rates at the dates of the transactions.

Foreign currency differences are recognised in other comprehensive income and are presented within the foreign currency translation reserve in equity.

3 Significant accounting policies, continued

(c) Financial instruments

(i) Non-derivative financial instruments

Non-derivative financial instruments comprise trade and other receivables, cash and cash equivalents, loans and borrowings, historical cost obligations and trade and other payables.

The Group initially recognises loans and receivables and deposits on the date that they are originated. All other financial assets are recognised initially on the trade date at which the Group becomes a party to the contractual provisions of the instrument.

The Group derecognises a financial asset when the contractual rights to the cash flows from the asset expire, or it transfers the rights to receive the contractual cash flows on the financial asset in a transaction in which substantially all the risks and rewards of ownership of the financial asset are transferred. Any interest in transferred financial assets that is created or retained by the Group is recognised as a separate asset or liability.

Financial assets and liabilities are offset and the net amount presented in the statement of financial position when, and only when, the Group has a legal right to offset the amounts and intends either to settle on a net basis or to realise the asset and settle the liability simultaneously.

The Group has the following non-derivative financial assets: loans and receivables.

Loans and receivables

Loans and receivables are a category of financial assets with fixed or determinable payments that are not quoted in an active market. Such assets are recognised initially at fair value plus any directly attributable transaction costs. Subsequent to initial recognition loans and receivables are measured at amortised cost using the effective interest method, less any impairment losses.

Loans and receivables comprise the following classes of assets: trade and other receivables as presented in Note 17 and cash and cash equivalents as presented in Note 19.

Cash and cash equivalents

Cash and cash equivalents comprise cash balances in banks and petty cash.

(ii) Non-derivative financial liabilities

The Group initially recognises debt securities issued on the date that they are originated. All other financial liabilities are recognised initially on the trade date at which the Group becomes a party to the contractual provisions of the instrument.

The Group derecognises a financial liability when its contractual obligations are discharged or cancelled or expire.

The Group has the following non-derivative financial liabilities: loans and borrowings, historical cost obligations and trade and other payables. The Group classifies non-derivative financial liabilities into the other financial liabilities category. Such financial liabilities are recognised initially at fair value plus any directly attributable transaction costs. Subsequent to initial recognition these financial liabilities are measured at amortised cost using the effective interest method.

(iii) Share capital

Ordinary shares

Ordinary shares are classified as equity. Incremental costs directly attributable to issue of ordinary shares are recognised as a deduction from equity, net of any tax effects.

3 Significant accounting policies, continued

(c) Financial instruments, continued

(iv) Recognition and measurement

Items of property, plant and equipment are measured at cost less accumulated depreciation and impairment losses. Land is measured at cost.

Cost includes expenditure that is directly attributable to the acquisition of the asset. The cost of self-constructed assets includes the cost of materials and direct labour, any other costs directly attributable to bringing the asset to a working condition for their intended use, the costs of dismantling and removing the items and restoring the site on which they are located.

When parts of an item of property, plant and equipment have different useful lives, they are accounted for as separate items (major components) of property, plant and equipment.

The gain or loss on disposal of an item of property, plant and equipment is determined by comparing the proceeds from disposal with the carrying amount of property, plant and equipment, and is recognised net within other income/other expenses in profit or loss.

(v) Subsequent costs

The cost of replacing part of an item of property, plant and equipment is recognised in the carrying amount of the item if it is probable that the future economic benefits embodied within the part will flow to the Group and its cost can be measured reliably. The carrying amount of the replaced part is derecognised. The costs of the day-to-day servicing of property, plant and equipment are recognised in profit or loss as incurred.

(d) Property, plant and equipment

Depreciation

Depreciation is based on the cost of an asset less its residual value. Significant components of individual assets are assessed and if a component has a useful life that is different from the remainder of that asset, that component is depreciated separately.

Depreciation is recognised in profit or loss on a straight-line basis over the estimated useful lives of each part of an item of property, plant and equipment, since this most closely reflects the expected pattern of consumption of the future economic benefits embodied in the asset. Leased assets are depreciated over the shorter of the lease term and their useful lives unless it is reasonably certain that the Group will obtain ownership by the end of the lease term. Land is not depreciated.

The estimated useful lives for the current and prior periods are as follows:

- Buildings 50 years;
- Plant and equipment 4-17 years;
- Vehicles 7 years;
- Computers 3 years;
- Other 5 years.

Depreciation methods, useful lives and residual values are reviewed at each financial year end and adjusted if appropriate.

(e) Exploration and evaluation assets

Exploration and evaluation expenditure for each area of interest once the legal right to explore has been acquired, other than that acquired through a purchase transaction, is carried forward as an asset provided that one of the following conditions is met:

3 Significant accounting policies, continued

(e) Exploration and evaluation assets, continued

- Such costs are expected to be recouped through successful exploration and development of the area of interest or, alternatively, by its sale;
- Exploration and evaluation activities in the area of interest have not yet reached a stage which permits a reasonable assessment of the existence or otherwise of economically recoverable reserves, and active and significant operations in relation to the area are continuing;
- Exploration and evaluation costs are capitalised as incurred. Exploration and evaluation assets are classified as tangible or intangible based on their nature. Exploration expenditure which fails to meet at least one of the conditions outlined above is written off. Administrative and general expenses relating to exploration and evaluation activities are expensed as incurred.
- The exploration and evaluation assets shall no longer be classified as such when the technical feasibility and commercial viability of extracting a mineral resource are demonstrable. Exploration and evaluation assets will be reclassified either as tangible or intangible development assets and amortised on a unit-of-production method based on proved reserves;
- Exploration and evaluation assets are assessed for impairment when facts and circumstances suggests that the carrying amount of exploration and evaluation assets may exceed its recoverable amount, which is the case when: the period of exploration license has expired and it is not expected to be renewed; substantial expenditures on further exploration are not planned; exploration has not led to the discovery of commercial viable reserves; indications exist that exploration and evaluation assets will not be recovered in full from successful development or by sale.

(f) Intangible assets

(i) Intangible assets with finite useful lives

Intangible assets that are acquired by the Group, which have finite useful lives, are measured at cost less accumulated amortisation and accumulated impairment losses.

(ii) Subsequent expenditure

Subsequent expenditure is capitalised only when it increases the future economic benefits embodied in the specific asset to which it relates. All other expenditure, including expenditure on internally generated goodwill and brands, is recognised in profit or loss as incurred.

(iii) Amortisation

Amortisation is calculated over the cost of the asset, or other amount substituted for cost, less its residual value.

Amortisation is recognised in profit or loss on a straight-line basis over the estimated useful lives of intangible assets from the date that they are available for use since this most closely reflects the expected pattern of consumption of future economic benefits embodied in the asset.

The estimated useful lives for the current and comparative periods are as follows:

- patents 10-20 years;
- mineral rights 20 years.

Amortisation methods, useful lives and residual values are reviewed at each financial year end and adjusted if appropriate.

3 Significant accounting policies, continued

(g) Leased assets

Leases in terms of which the Group assumes substantially all the risks and rewards of ownership are classified as finance leases. Upon initial recognition the leased asset is measured at an amount equal to the lower of its fair value and the present value of the minimum lease payments. Subsequent to initial recognition, the asset is accounted for in accordance with the accounting policy applicable to that asset.

Other leases are operating leases and the leased assets are not recognised on the Group's statement of financial position.

(h) Inventories

Inventories are measured at the lower of cost and net realisable value. The cost of inventories is based on first-in first-out method, and includes expenditure incurred in acquiring the inventories, production or conversion costs and other costs incurred in bringing them to their existing location and condition. In the case of manufactured inventories and work in progress, cost includes an appropriate share of production overheads based on normal operating capacity.

Net realisable value is the estimated selling price in the ordinary course of business, less the estimated costs of completion and selling expenses.

(i) Impairment

(i) Non-derivative financial assets

A financial asset not carried at fair value through profit or loss is assessed at each reporting date to determine whether there is any objective evidence that it is impaired. A financial asset is impaired if objective evidence indicates that a loss event has occurred after the initial recognition of the asset, and that the loss event had a negative effect on the estimated future cash flows of that asset that can be estimated reliably.

Objective evidence that financial assets are impaired can include default or delinquency by a debtor, restructuring of an amount due to the Group on terms that the Group would not consider otherwise, indications that a debtor or issuer will enter bankruptcy, adverse changes in the payment status of borrowers or issuers in the Group, economic conditions that correlate with defaults or the disappearance of an active market for a security. In addition, for an investment in an equity security, a significant or prolonged decline in its fair value below its cost is objective evidence of impairment.

Loans and receivables

The Group considers evidence of impairment for receivables at both a specific asset and collective level. All individually significant receivables are assessed for specific impairment. All individually significant receivables found not to be specifically impaired are then collectively assessed for any impairment that has been incurred but not yet identified. Receivables that are not individually significant are collectively assessed for impairment by grouping together receivables with similar risk characteristics.

In assessing collective impairment the Group uses historical trends of the probability of default, timing of recoveries and the amount of loss incurred, adjusted for management's judgement as to whether current economic and credit conditions are such that the actual losses are likely to be greater or less than suggested by historical trends.

An impairment loss in respect of a financial asset measured at amortised cost is calculated as the difference between its carrying amount, and the present value of the estimated future cash flows discounted at the asset's original effective interest rate. Losses are recognised in profit or loss and reflected in an allowance account against receivables. Interest on the impaired asset continues to be recognised through the unwinding of the discount. When a subsequent event causes the amount of impairment loss to decrease, the decrease in impairment loss is reversed through profit or loss.

3 Significant accounting policies, continued

(i) Impairment, continued

(ii) Non-financial assets

The carrying amounts of the Group's non-financial assets, other than inventories and deferred tax assets are reviewed at each reporting date to determine whether there is any indication of impairment. If any such indication exists, then the asset's recoverable amount is estimated. An impairment loss is recognised if the carrying amount of an asset or its related cash-generating unit (CGU) exceeds its estimated recoverable amount.

The recoverable amount of an asset or CGU is the greater of its value in use and its fair value less costs to sell. In assessing value in use, the estimated future cash flows are discounted to their present value using a pre-tax discount rate that reflects current market assessments of the time value of money and the risks specific to the asset or CGU. For the purpose of impairment testing, assets that cannot be tested individually are grouped together into the smallest group of assets that generates cash inflows from continuing use that are largely independent of the cash inflows of other assets or CGU.

The Group's corporate assets do not generate separate cash inflows. If there is an indication that a corporate asset may be impaired, then the recoverable amount is determined for the cash generating unit to which the corporate asset belongs.

An impairment loss is recognised if the carrying amount of an asset or its cash-generating unit exceeds its recoverable amount. Impairment losses are recognised in profit or loss.

Impairment losses recognised in prior periods are assessed at each reporting date for any indications that the loss has decreased or no longer exists. An impairment loss is reversed if there has been a change in the estimates used to determine the recoverable amount. An impairment loss is reversed only to the extent that the asset's carrying amount does not exceed the carrying amount that would have been determined, net of depreciation or amortisation, if no impairment loss had been recognised.

(j) Employee benefits

(i) Defined contribution plans

The Group does not incur any expenses in relation to provision of pensions or other post-employment benefits to its employees. In accordance with State pension social insurance regulations, the Group withholds pension contributions from employee salaries and transfers them into state pension funds. Once the contributions have been paid, the Group has no further pension obligations. Upon retirement of employees, all pension payments are administrated by the pension funds directly.

(ii) Short-term benefits

Short-term employee benefit obligations are measured on an undiscounted basis and are expensed as the related service is provided. A liability is recognised for the amount expected to be paid under short-term cash bonus or profit-sharing plans if the Group has a present legal or constructive obligation to pay this amount as a result of past service provided by the employee, and the obligation can be estimated reliably.

(k) Provisions

A provision is recognised if, as a result of a past event, the Group has a present legal or constructive obligation that can be estimated reliably, and it is probable that an outflow of economic benefits will be required to settle the obligation. Provisions are determined by discounting the expected future cash flows at a pre-tax rate that reflects current market assessments of the time value of money and the risks specific to the liability. The unwinding of the discount is recognised as finance cost.

Site restoration

In accordance with the Group's environmental policy and applicable legal requirements, a provision for site restoration and the related expense is recognised when the land is disturbed as a result of pit development.

3 Significant accounting policies, continued

(l) Revenue

(i) Goods sold

Revenue from the sale of goods in the course of ordinary activities is measured at the fair value of the consideration received or receivable, net of returns, trade discounts and volume rebates. Revenue is recognised when persuasive evidence exists, usually in the form of an executed sales agreement, that the significant risks and rewards of ownership have been transferred to the buyer, recovery of the consideration is probable, the associated costs and possible return of goods can be estimated reliably, and there is no continuing management involvement with the goods, and the amount of revenue can be measured reliably. If it is probable that discounts will be granted and the amount can be measured reliably, then the discount is recognised as a reduction of revenue as the sales are recognised.

The timing of the transfers of risks and rewards varies depending on the individual terms of the contract of sale. For sales of all products, transfer usually occurs when the product is delivered, depending on contractual conditions.

(ii) Services

Revenue from services rendered is recognised in profit or loss in proportion to the stage of completion of the transaction at the reporting date. The stage of completion is assessed by reference to surveys of work performed. Usually services are rendered within a short period of time and require no significant judgement with respect to stage of completion.

(m) Other expenses

Lease payments

Payments made under operating leases are recognised in profit or loss on a straight-line basis over the term of the lease. Lease incentives received are recognised as an integral part of the total lease expense, over the term of the lease.

Minimum lease payments made under finance leases are apportioned between the finance expense and the reduction of the outstanding liability. The finance expense is allocated to each period during the lease term so as to produce a constant periodic rate of interest on the remaining balance of the liability.

(n) Finance costs

Finance costs comprise interest expense on borrowings, unwinding of the discount on provisions for historical costs and site restoration, foreign currency losses and impairment losses recognised on financial assets. Borrowing costs that are not directly attributable to the acquisition, construction or production of a qualifying asset are recognised in profit or loss using the effective interest method.

Foreign currency gains and losses are reported on a net basis as either finance income or finance cost depending on whether foreign currency movements are in a net gain or net loss position.

3 Significant accounting policies, continued

(o) Income tax

Income tax expense comprises current and deferred tax. Current tax and deferred tax are recognised in profit or loss except to the extent that they relate to items recognised directly in equity or in other comprehensive income.

Current tax is the expected tax payable or receivable on the taxable income or loss for the year, using tax rates enacted or substantively enacted at the reporting date, and any adjustment to tax payable in respect of previous years. Deferred tax is recognised in respect of temporary differences between the carrying amounts of assets and liabilities for financial reporting purposes and the amounts used for taxation purposes. Deferred tax is not recognised for temporary differences on the initial recognition of assets or liabilities in a transaction that is not a business combination and that affects neither accounting nor taxable profit or loss. Deferred tax is measured at the tax rates that are expected to be applied to the temporary differences when they reverse, based on the laws that have been enacted or substantively enacted by the reporting date.

Deferred tax assets and liabilities are offset if there is a legally enforceable right to offset current tax assets and liabilities, and they relate to income taxes levied by the same tax authority on the same taxable entity, or on different tax entities, but they intend to settle current tax liabilities and assets on a net basis or their tax assets and liabilities will be realised simultaneously.

A deferred tax asset is recognised for unused tax losses, tax credits and deductible temporary differences, to the extent that it is probable that future taxable profits will be available against which they can be utilised. Deferred tax assets are reviewed at each reporting date and are reduced to the extent that it is no longer probable that the related tax benefit will be realised.

(p) New standards and interpretations not yet adopted

A number of new standards, amendments to standards and interpretations are not yet effective as at 31 December 2015, and have not applied in preparing these consolidated financial statements. Of these pronouncements, potentially the following will have an impact on the Group's consolidated financial position and performance. The Group plans to adopt these pronouncements when they become effective. The Group has not yet analysed the likely impact of these new standards on its consolidated financial statements.

- IFRS 9, published in July 2014, replaces the existing guidance in IAS 39 *Financial Instruments: Recognition and Measurement*. IFRS 9 includes revised guidance on the classification and measurement of financial instruments, including a new expected credit loss model for calculating impairment on financial assets, and new general hedge accounting requirements. It also carries forward the guidance on recognition and derecognition of financial instruments from IAS 39. IFRS 9 is effective for annual reporting periods beginning on or after 1 January 2018, with early adoption permitted;

- IFRS 15 *Revenue from Contracts with Customers* establishes a comprehensive framework for determining whether, how much and when revenue is recognised. It replaces existing revenue recognition guidance, including IAS 18 Revenue, IAS 11 Construction Contracts and IFRIC 13 Customer Loyalty Programmes. The core principle of the new standard is that an entity recognises revenue to depict the transfer of promised goods or services to customers in an amount that reflects the consideration to which the entity expects to be entitled in exchange for those goods or services. The new standard results in enhanced disclosures about revenue, provides guidance for transactions that were not previously addressed comprehensively and improves guidance for multiple-element arrangements. IFRS 15 is effective for annual reporting periods beginning on or after 1 January 2018, with early adoption permitted. The Group has not yet analysed the impact of this new standard on the consolidated financial statements.

4 Determination of fair values

A number of the Group's accounting policies and disclosures require the determination of fair value, for both financial and non-financial assets and liabilities. Fair values have been determined for measurement and for disclosure purposes based on the following methods. When applicable, further information about the assumptions made in determining fair values is disclosed in the notes specific to that asset or liability.

(a) Trade and other receivables

The fair value of trade and other receivables is estimated as the present value of future cash flows, discounted at the market rate of interest at the reporting date. For trade and other receivables and payables with a short maturity fair value is not materially different from the carrying value because the effect of the time value of money is not material.

(b) Non-derivative financial liabilities

Fair value, which is determined for disclosure purposes, is calculated based on the present value of future principal and interest cash flows, discounted at the market rate of interest at the reporting date. For finance leases the market rate of interest is determined by reference to similar lease agreements.

5 Revenue

USD	2015	2014
Sales of gravel and waste rock	80,989	175,794
Revenue from transportation services	45,733	798
	126,722	**176,592**

6 Cost of sales

USD	2015	2014
Depreciation	55,757	58,181
Wages, salaries and related taxes	24,909	70,038
Materials	14,499	51,067
Taxes other than on income	1,896	4,891
Installation and examination services	-	61,563
Other	7,993	19,513
	105,054	**265,253**

7 Administrative expenses

USD	2015	2014
Wages, salaries and related taxes	807,917	962,095
Impairment of VAT receivable	96,570	598,059
Professional services	95,350	249,927
Security	26,270	-
Depreciation and amortisation	23,857	27,429
Materials	19,266	125,790
Taxes other than on income	18,259	67,266
Business trip expenses	12,022	11,707
Transportation services	10,039	13,974
Utilities	5,782	52,888
Bank fees	5,704	6,932
Communication and information services	4,987	10,697
Staff training	2,834	2,138
Insurance	759	2,858
Fines and penalties	81	-
Rent	18	2,791
Impairment charge against trade receivables	-	1,217
Other	8,577	79,273
	1,138,292	**2,215,041**

8 Other expenses

USD	2015	2014
Depreciation and amortisation of plant and equipment not used	380,513	630,083
Salary and related taxes	92,410	332,756
Loss on write-off of property, plant and equipment	29,739	4,159
Other expenses	50,725	39,303
	553,387	**1,006,301**

The Group completed construction of certain plant and equipment and put it into use in December 2013. During 2014 and during the period from January to August 2015 this plant and equipment was idle and, therefore, related depreciation, production salary costs and other overhead costs are presented in other expenses.

9 Personnel costs

USD	2015	2014
Wages, salaries and related taxes	1,025,616	1,223,147
	1,025,616	**1,223,147**

During 2015 personnel costs of USD 24,909 (2014: USD 70,038) have been charged to cost of sales, USD 807,917 (2014: USD 962,095) - to administrative expenses and USD 92,410 to other expenses (2014: USD 332,756); USD 100,380 were capitalised to construction in progress (2014: nil). During the fourth quarter of 2015, the Group started reconstruction work of an experimental plant for the processing of ferrous concentrate. Costs of labour, materials and other costs directly related to the reconstruction of the plant were capitalised from September to December 2015.

10 Finance costs

USD	2015	2014
Interest expense on financial liabilities measured at amortised cost	39,488	24,364
Net foreign exchange loss	626,608	2,870
Unwinding of discount on site restoration provision	15,110	15,865
Finance costs recognised in profit or loss	**681,206**	**43,099**

11 Income tax

The Group's applicable tax rates in 2015 are the income tax rate of 20% for Kazakhstan subsidiaries (2014: 20%) and 0% (2014: 0%) for BVI companies.

During the years ended 31 December 2015 and 2014 the Group incurred tax losses and therefore did not recognise any current income tax expense. Unrecognised deferred tax assets are described in Note 15.

Reconciliation of effective tax rate:

	2015		2014	
	USD	%	USD	%
Loss before income tax	**(2,346,526)**	**100**	**(3,339,924)**	**100**
Income tax at the applicable tax rate in the British Virgin Islands	-	-	-	-
Income tax at the applicable tax rate in Kazakhstan	(469,305)	20	(667,985)	20
Net non-deductible expenses	330,809	(14)	121,268	(4)
Effect of unrecognised deferred tax assets	138,496	(6)	546,717	(16)
	-	**-**	**-**	**-**

12 Property, plant and equipment

USD	Land and buildings	Plant and equipment	Vehicles	Computers	Other	Construction in progress	Total
Cost							
Balance at 1 January 2014	4,000,684	3,610,924	612,428	33,149	70,061	223,957	8,551,203
Additions	-	29,191	391	-	960	51,479	82,021
Write-offs	-	(5,612)	-	(6,394)	(7,890)	-	(19,896)
Foreign currency translation difference	(630,544)	(569,532)	(96,531)	(5,111)	(10,920)	(36,211)	(1,348,849)
Balance at 31 December 2014	**3,370,140**	**3,064,971**	**516,288**	**21,644**	**52,211**	**239,225**	**7,264,479**
Balance at 1 January 2015	3,370,140	3,064,971	516,288	21,644	52,211	239,225	7,264,479
Additions	-	78,639	97,802	-	625	336,802	513,868
Write-offs	-	(37,808)	(32,682)	-	-	-	(70,490)
Foreign currency translation difference	(1,562,708)	(1,435,304)	(261,891)	(10,036)	(24,425)	(227,255)	(3,521,619)
Balance at 31 December 2015	**1,807,432**	**1,670,498**	**319,517**	**11,608**	**28,411**	**348,772**	**4,186,238**
Depreciation							
Balance at 1 January 2014	148,649	371,063	544,660	18,951	53,063	-	1,136,386
Depreciation for the year	254,057	396,292	45,495	4,960	11,059	-	711,863
Write-offs	-	(3,936)	-	(4,340)	(7,455)	-	(15,731)
Foreign currency translation difference	(27,934)	(65,440)	(86,651)	(2,998)	(8,427)	-	(191,450)
Balance at 31 December 2014	**374,772**	**697,979**	**503,504**	**16,573**	**48,240**	**-**	**1,641,068**
Balance at 1 January 2015	374,772	697,979	503,504	16,573	48,240	-	1,641,068
Depreciation for the year	206,961	319,068	25,565	3,406	3,877	-	558,877
Write-offs	-	(11,340)	(29,411)	-	-	-	(40,751)
Foreign currency translation difference	(245,261)	(429,936)	(232,142)	(8,862)	(23,706)	-	(939,908)
Balance at 31 December 2015	**336,472**	**575,771**	**267,516**	**11,116**	**28,411**	**-**	**1,219,286**
Carrying amounts							
At 1 January 2014	3,852,035	3,239,861	67,768	14,198	16,998	223,957	7,414,817
At 31 December 2014	**2,995,368**	**2,366,992**	**12,784**	**5,071**	**3,971**	**239,225**	**5,623,411**
At 31 December 2015	**1,470,960**	**1,094,727**	**52,001**	**492**	**-**	**348,772**	**2,966,952**

During 2015 depreciation expense of USD 55,757 (2014: USD 58,181) has been charged to cost of sales, USD 23,210 (2014: USD 26,703) - to administrative expenses and USD 378,810 to other expenses (2014: USD 626,979), and USD 101,100 was capitalised to property, plant and equipment (2014: nil).

13 Exploration and evaluation assets

During the year ended 31 December 2015 the Group did not capitalise the cost of drilling services to exploration and evaluation assets (2014: nil).

14 Intangible assets

USD	Mineral rights	Patents	Computer software	Total
Cost				
Balance at 1 January 2014	248,486	73,010	6,022	327,518
Additions	-	738	-	738
Foreign currency translation difference	(39,164)	(11,520)	(949)	(51,633)
Balance at 31 December 2014	**209,322**	**62,228**	**5,073**	**276,623**
Balance at 1 January 2015	209,322	62,228	5,073	276,623
Additions	-	714	-	714
Foreign currency translation difference	(97,061)	(29,102)	(2,352)	(128,515)
Balance at 31 December 2015	**112,261**	**33,840**	**2,721**	**148,822**
Amortisation				
Balance at 1 January 2014	(248,486)	(3,620)	(847)	(252,953)
Amortisation for the year	-	(3,104)	(726)	(3,830)
Foreign currency translation difference	39,164	586	67	39,817
Balance at 31 December 2014	**(209,322)**	**(6,138)**	**(1,506)**	**(216,966)**
Balance at 1 January 2015	(209,322)	(6,138)	(1,506)	(216,966)
Amortisation for the year	-	(2,552)	(647)	(3,199)
Foreign currency translation difference	97,061	3,728	921	101,710
Balance at 31 December 2015	**(112,261)**	**(4,962)**	**(1,232)**	**(118,455)**
Carrying amounts				
At 1 January 2014	-	69,390	5,175	74,565
At 31 December 2014	**-**	**56,090**	**3,567**	**59,657**
At 31 December 2015	**-**	**28,878**	**1,489**	**30,367**

Amortisation

During 2015 amortisation expense of USD 1,703 (2014: USD 3,104) was charged to other expenses, USD 647 (2014: USD 726) to administrative expenses and USD 849 was capitalised to fixed assets (2014: nil).

15 Deferred tax assets and liabilities

Unrecognised deferred tax assets

As at 31 December 2015 the Group did not recognise deferred tax assets in the amount of USD 703,874 (2014: USD 1,318,398) because there is doubt that the Company will be able to realize these assets in the foreseeable future due to the low probability of taxable profit.

16 Inventories

USD	2015	2014
Raw materials and consumables	550,075	225,763
Finished goods	14,953	84,142
Work in progress	9	40,737
	565,037	**350,642**

In 2015 raw materials, consumables and changes in finished goods and work in progress recognised as cost of sales amounted to USD 14,499 (2014: USD 51,067) (Note 6).

17 Trade and other receivables

Non-current

USD	2015	2014
VAT receivable	378,271	587,453
Provision for VAT receivable	(378,271)	(587,453)
	-	-

Current

USD	2015	2014
Trade receivables from third parties	24,623	51,868
Due from employees	7,641	9,970
Other receivables	5,600	7,000
	37,864	68,838
Bad debt allowance	(23,676)	(44,146)
	14,188	**24,692**

During 2015 and 2014, the management of the Group has created a provision for VAT receivable in the amount of USD 96,570 and USD 598,059, respectively, due to uncertainties related to recovery of VAT by the methods allowed by legislation of the Republic of Kazakhstan. The Group's exposure to credit and currency risks and impairment losses related to trade and other receivables are disclosed in Note 24 (b).

18 Prepayments

USD	2015	2014
Non-current		
Prepayments for equipment	36,558	68,166
	36,558	**68,166**
Current		
Prepayments for goods and services	9,044	29,112
	9,044	**29,112**

19 Cash and cash equivalents

USD	2015	2014
Bank balances	247,549	27,940
Petty cash	19,382	2,365
Cash and cash equivalents	**266,931**	**30,305**

The Group's exposure to credit and foreign currency risks is disclosed in Note 24.

20 Equity

(a) Share capital and share premium

Number of shares unless otherwise stated	Ordinary shares 2015	2014
Authorised shares	5,000,000	5,000,000
Par value	0.01 USD	0.01 USD
Outstanding at beginning of year	776,063	414,655
Issued	720,172	361,408
Outstanding at end of year	**1,496,235**	**776,063**

Ordinary shares

All shares rank equally with regard to the Group's residual assets. The holders of ordinary shares are entitled to receive dividends as declared from time to time, and are entitled to one vote per share at meetings of the Group.

During 2015 the Group issued 720,172 shares (2014: 361,408 shares) with nominal amount of USD 7,201 (2014: USD 3,614) and share premium of USD 2,362,156 (2014: USD 1,466,192).

(b) Dividends

No dividends were declared for the year ended 31 December 2015 (2014: nil).

21 Loans and borrowings

This note provides information about the contractual terms of the Group's loans and borrowings, which are measured at amortised cost. For more information about the Group's exposure to foreign currency and liquidity risks, refer to Note 24.

USD	**2015**	**2014**
Current liabilities		
Loans from shareholders	115,279	304,728
	115,279	**304,728**

Terms and debt repayment schedule

Terms and conditions of outstanding loans were as follows:

				31 December 2015		31 December 2014	
USD	**Currency**	**Nominal interest rate**	**Year of maturity**	**Face value**	**Carrying amount**	**Face value**	**Carrying amount**
Loans from shareholders	USD	15%	upon demand	-	-	200,910	200,910
Loans from shareholders	GBP	10%	upon demand	111,765	111,765	98,819	98,819
Loans from shareholders	KZT	0%	upon demand	3,514	3,514	4,999	4,999
				115,279	**115,279**	**304,728**	**304,728**

The Group received a series of loan tranches from shareholders during 2015 in the total amount of USD 543,434 (2014: USD 295,568). Loans payable in the amount of USD 760,464 were set off against shares issued in 2015 (2014: USD 451,133).

22 Provisions

USD	Site restoration liability
Balance at 1 January 2015	193,736
Unwinding of discount	15,110
Change in estimate	11,578
Foreign currency translation difference	(99,051)
Balance at 31 December 2015	**121,373**
Non-current	121,373
	121,373

Site restoration

A provision was recognised in respect of the Group's obligation to rectify environmental damage in the Bala-Sauskandyk mine, Kyzylorda region.

In accordance with Kazakhstan environmental legislation, land contaminated by the Group in the Kyzylorda region must be restored before the end of 2022. The provision was estimated by considering the risks related to the amount and timing of restoration costs based on the known level of damage. Because of the long-term nature of the liability, the greatest uncertainty in estimating the provision is the costs that will be incurred. In particular, the Group has assumed that the site will be restored using technology and materials that are available currently and total estimated undiscounted cash outflow equals to KZT 73,451 thousand or USD 216,026 at the closing 2015 KZT/USD exchange rate. The present value of restoration costs was determined by discounting the estimated restoration cost using a risk-free rate for the respective period of 8.8% (2014: 9.5%), adjusted for the risks specific to the liability and inflation. Environmental legislation in the Kazakhstan continues to evolve and it is difficult to determine the exact standards required by the current legislation in restoring sites such as this. Generally the standard of restoration is determined based on discussions with Government officials at the time that restoration commences.

The unwinding of discount is recognised in profit or loss. As at 1 January 2006, the full amount of the provision was capitalised in property, plant and equipment.

23 Trade and other payables

USD	2015	2014
Trade payables	497,953	356,074
Due to employees	269,623	522,130
Other taxes	180,259	44,965
Advances received	5,282	227,304
	953,117	**1,150,473**

The Group's exposure to currency and liquidity risk related to trade and other payables is disclosed in Note 24.

24 Financial instruments and risk management

(a) Overview

The Group has exposure to the following risks from its use of financial instruments:

- credit risk;
- liquidity risk;
- market risk.

This note presents information about the Group's exposure to each of the above risks, the Group's objectives, policies and processes for measuring and managing risk, and the Group's management of capital. Further quantitative disclosures are included throughout these consolidated financial statements.

Risk management framework

The Chief Executive has overall responsibility for the establishment and oversight of the Group's risk management framework.

The Group's risk management policies are established to identify and analyse the risks faced by the Group, to set appropriate risk limits and controls, and to monitor risks and adherence to limits. Risk management policies and systems are reviewed to reflect changes in market conditions and the Group's activities. The Group aims to develop a disciplined and constructive control environment in which all employees understand their roles and obligations.

(b) Credit risk

Credit risk is the risk of financial loss to the Group if a customer or counterparty to a financial instrument fails to meet its contractual obligations, and arises principally from the Group's receivables from customers.

(i) Exposure to credit risk

The carrying amount of financial assets represents the maximum credit exposure. The maximum exposure to credit risk at the reporting date was:

	Carrying amount	
USD	**2015**	**2014**
Trade and other receivables, excluding due from employees and VAT receivable	6,547	14,722
Cash and cash equivalents	247,549	27,940
	254,096	**42,662**

The maximum exposure to credit risk for trade and other receivables at the reporting date by geographic region was:

	Carrying amount	
USD	**2015**	**2014**
Kazakhstan	6,547	14,722
	6,547	**14,722**

The maximum exposure to credit risk for trade and other receivables at the reporting date by type of customer was:

	Carrying amount	
USD	**2015**	**2014**
Trade receivables:		
Wholesale customers	947	7,722
Other receivables		
Other	5,600	7,000
	6,547	**14,722**

24 Financial instruments and risk management, continued

(b) Credit risk, continued

(i) Exposure to credit risk, continued

The Group's most significant customer, a Kazakhstan wholesaler, accounts for USD 947 of the trade receivables carrying amount at 31 December 2015 (2014: USD 4,420).

Impairment losses

The aging of trade and other receivables at the reporting date was:

USD	Gross 2015	Impairment 2015	Net 2015	Gross 2014	Impairment 2014	Net 2014
Not past due	6,547	-	6,547	14,722	-	14,722
Past due more than 180 days	23,676	(23,676)	-	44,146	(44,146)	-
	30,223	**(23,676)**	**6,547**	**58,868**	**(44,146)**	**14,722**

The movement in the allowance for impairment in respect of trade and other receivables during the year was as follows:

USD	2015	2014
Balance at beginning of the year	44,146	50,986
Increase during the year	-	1,217
Effect on movement in exchange rates	(20,470)	(8,057)
Balance at end of the year	**23,676**	**44,146**

Based on historic default rates, the Group believes that no impairment allowance is necessary in respect of trade receivables not past due or past due up to 30 days.

The allowance account in respect of trade receivables is used to record impairment losses unless the Group is satisfied that no recovery of the amount owing is possible. At that point the amount is considered irrecoverable and is written off against the financial asset directly. As at 31 December 2015 the Group did not have any collective impairment on its trade receivables (2014: nil).

(ii) Cash and cash equivalents

The Group held cash of USD 266,931 at 31 December 2015 (2014: USD 30,305), of which bank balances of USD 247,549 (2014: USD 27,940) represent its maximum credit exposure on these assets. 89% (2014: 77%) is held in a bank with credit rating AA- and the remaining 11% in a bank with credit rating CCC (2014: 23% is held in a in a bank with credit rating B-). Credit ratings are provided by a rating agency Fitch.

24 Financial instruments and risk management, continued

(c) Liquidity risk

Liquidity risk is the risk that the Group will encounter difficulty in meeting the obligations associated with its financial liabilities that are settled by delivering cash or another financial asset. The Group's approach to managing liquidity is to ensure, as far as possible, that it will always have sufficient liquidity to meet its liabilities when due, under both normal and stressed conditions, without incurring unacceptable losses or risking damage to the Group's reputation.

Typically the Group aims to have sufficient cash on demand to meet expected operational expenses for a period of 60 days, including the servicing of financial obligations; this excludes the potential impact of extreme circumstances that cannot reasonably be predicted, such as natural disasters.

The following are the contractual maturities of financial liabilities. It is not expected that the cash flows included in the maturity analysis could occur significantly earlier, or at significantly different amounts.

2015

USD	Carrying amount	Contractual cash flows	On demand	0-6 mths
Non-derivative financial liabilities				
Loans from shareholders	115,279	115,279	115,279	-
Trade and other payables, excluding due to employees, advances received and salary related taxes	497,953	497,953	-	497,953
	613,232	**613,232**	**115,279**	**497,953**

2014

USD	Carrying amount	Contractual cash flows	On demand	0-6 mths
Non-derivative financial liabilities				
Loans from shareholders	304,728	304,728	304,728	-
Trade and other payables, excluding due to employees, advances received and salary related taxes	356,074	356,074	-	356,074
	660,802	**660,802**	**304,728**	**356,074**

(d) Market risk

Market risk is the risk that changes in market prices, such as foreign exchange rates, interest rates and equity prices will affect the Group's income or the value of its holdings of financial instruments. The objective of market risk management is to manage and control market risk exposures within acceptable parameters, while optimising the return.

(i) Currency risk

The Group is exposed to currency risk on sales, purchases and borrowings that are denominated in a currency other than the respective functional currency of Group entities. The currency in which these transactions are primarily denominated is USD.

In respect of monetary assets and liabilities denominated in foreign currencies, the Group ensures that its net exposure is kept to an acceptable level by buying or selling foreign currencies at spot rates when necessary to address short-term imbalances.

24 Financial instruments and risk management, continued

(d) Market risk, continued

(i) Currency risk, continued

Exposure to currency risk

The Group's exposure to foreign currency risk was as follows based on notional amounts:

	USD-denominated 2015	GBP-denominated 2015	HKD-denominated 2015	RUB-denominated 2015
Cash and cash equivalents	194,514	47,955	2,115	-
Trade and other payables	(300,887)	(107,514)	-	(279,380)
Loans and borrowings	(111,765)	-	-	-
Net exposure	**(218,138)**	**(59,559)**	**2,115**	**(279,380)**

	USD-denominated 2014	GBP-denominated 2014
Cash and cash equivalents	14,392	6,633
Trade and other payables	(503,964)	-
Loans and borrowings	(200,910)	(98,819)
Net exposure	**(690,482)**	**(92,186)**

The following significant exchange rates applied during the year:

in USD	**Average rate**		**Reporting date spot rate**	
	2015	**2014**	**2015**	**2014**
KZT 1	0.0045	0.0056	0.0029	0.0055
GBP 1	1.5285	1.6474	0.6779	1.5586
RUB 1	0.0165	-	0.0137	-
HKD 1	0.1290	-	0.1290	-

Sensitivity analysis

A strengthening of the KZT, as indicated below, against the following currencies at 31 December would have increased/(decreased) profit or loss by the amounts shown below. This analysis is based on foreign currency exchange rate variances that the Group considered to be reasonably possible at the end of the reporting period. The analysis assumes that all other variables, in particular interest rates, remain constant.

USD	**Profit or (loss)**
2015	
USD (20% strengthening)	44,615
GBP (20% strengthening)	11,912
RUB (20% strengthening)	44,701
HKD (20% strengthening)	(423)
2014	
USD (20% strengthening)	115,395
GBP (20% strengthening)	41,139
RUB (20% strengthening)	4,022

A weakening of the KZT against the above currencies at 31 December would have had the equal but opposite effect to the amounts shown above, on the basis that all other variables remain constant.

24 Financial instruments and risk management, continued

(d) Market risk, continued

(ii) Interest rate risk

Changes in interest rates impact primarily loans and borrowings by changing either their fair value (fixed rate debt) or their future cash flows (variable rate debt). Management does not have a formal policy of determining how much of the Group's exposure should be to fixed or variable rates. However, at the time of raising new loans or borrowings management uses its judgment to decide whether it believes that a fixed or variable rate would be more favourable to the Group over the expected period until maturity.

Change in interest rates at the reporting date would not significantly affect profit or loss.

(e) Fair values versus carrying amounts

Management believes that the fair value of the Company's financial assets and liabilities approximates their carrying amounts.

The basis for determining fair values is disclosed in Note 4.

(f) Fair value hierarchy

Financial instruments measured at fair value are presented by level within which the fair value measurement is categorized. The levels of fair value measurement are determined as following:

- Level 1: quoted prices (unadjusted) in active markets for identical assets or liabilities.
- Level 2: inputs other than quoted prices included in Level 1 that are observable for the asset or liability, either directly (i.e. as prices) or indirectly (i.e. derived from prices).
- Level 3: inputs for the asset or liability that are not based on observable market data (unobservable inputs).

As at 31 December 2015, all financial instruments held by the Group fell within Level 2.

25 Commitments

Commitments for training of Kazakhstan employees

Under the conditions of the subsoil use contract the Group is liable to train Kazakh employees. According to the contract the annual training expense should equal to 1% of the Group's capital expenditures. Regional inspection of subsoil protection and usage Yuzhkaznedra, as a government body, provides the minimum required size of the expense to be paid annually. Total training expense in 2015 is USD 3,456 (2014: USD 2,138).

26 Contingencies

(a) Insurance

The insurance industry in the Kazakhstan is in a developing state and many forms of insurance protection common in other parts of the world are not yet generally available. The Group does not have full coverage for its plant facilities or business interruption. There is a risk that the loss or destruction of certain assets could have a material adverse effect on the Group's operations and financial position.

26 Contingencies, continued

(b) Taxation contingencies

The taxation system in Kazakhstan is relatively new and is characterised by frequent changes in legislation, official pronouncements and court decisions, which are often unclear, contradictory and subject to varying interpretation by different tax authorities. Taxes are subject to review and investigation by various levels of authorities which have the authority to impose severe fines, penalties and interest charges. A tax year generally remains open for review by the tax authorities for five subsequent calendar years but under certain circumstances a tax year may remain open longer.

These circumstances may create tax risks in Kazakhstan that are more significant than in other countries. Management believes that it has provided adequately for tax liabilities based on its interpretations of applicable tax legislation, official pronouncements and court decisions. However, the interpretations of the relevant authorities could differ and the effect on these consolidated financial statements, if the authorities were successful in enforcing their interpretations, could be significant.

27 Related party transactions

(a) Transactions with management and close family members

Management remuneration

Key management received the following remuneration during the year, which is included in personnel costs (see Note 9):

USD	2015	2014
Wages, salaries and related taxes	551,853	553,303
	551,853	**553,303**

During 2015, USD 407,812 (2014: USD 444,587) of salaries payable to key management were offset against share issues which were made to key management.

(b) Transactions with other related parties

The Group's other related party transactions are disclosed below:

Loans and receivables

USD	Transaction value 2015	Transaction value 2014	Outstanding balance 2015	Outstanding balance 2014
Loans received from shareholders	(543,434)	(295,568)	(115,279)	(304,728)

The information on terms and conditions of outstanding loans received from shareholders is disclosed in Note 21.

28 Events subsequent to the reporting date

In 2016, the Group issued 6,541 new shares raising USD 631,093 net of costs. In addition, the Group received a 15% interest bearing loan from shareholder AM2 in the amount of USD 246,000, repayable within 30 days of a demand from the lender.

Ferro-Alloy Resources Limited

Unaudited Consolidated Interim Condensed
Financial Statements
for the nine-month period ended
30 September 2018

Contents

	Note	**Unaudited nine-month period ended 30 September 2018 $000**	**Unaudited nine-month period ended 30 September 2017 $000**
Revenue	4	3,259	1,032
Cost of sales	5	(1,172)	(696)
Gross profit		**2,087**	**336**
Administrative expenses	6	(950)	(776)
Distribution expenses		(87)	(40)
Other expenses		(1)	(93)
Results from operating activities		**1,049**	**(573)**
Net finance income/(costs)	8	(3)	19
Income (loss) before income tax		**1,046**	**(554)**
Income tax		(1)	-
Income (loss) for the period		**1,045**	**(554)**
Other comprehensive income (loss)			
Items that will never be reclassified to profit or loss			
Foreign currency translation differences		(161)	141
Total comprehensive income (loss) for the period		**884**	**(413)**
Profit/(loss) per share (basic and diluted), USD	16	0.003	(0.37)

These unaudited consolidated interim condensed financial statements were approved by management on 12 November 2018 and were signed on its behalf by:

James Turian
Director

The unaudited consolidated interim condensed statement of financial position is to be read in conjunction with the notes to, and forming part of, the unaudited consolidated interim condensed financial statements set out on pages 7 to 20.

	Note	Unaudited 30 September 2018 $000	31 December 2017 $000
ASSETS			
Non-current assets			
Property, plant and equipment	9	347	79
Intangible assets	11	1	2
Long-term VAT receivable	13	194	91
Prepayments		13	52
Total non-current assets		**555**	**224**
Current assets			
Inventories	12	612	596
Trade and other receivables	13	981	47
Prepayments	14	303	15
Cash and cash equivalents	15	274	267
Total current assets		**2,170**	**925**
Total assets		**2,725**	**1,149**
EQUITY AND LIABILITIES			
Equity	16		
Share capital		27,306	15
Share premium		-	26,904
Additional paid-in capital		380	380
Foreign currency translation reserve		(2,833)	(2,672)
Accumulated losses		(23,193)	(24,238)
Total equity		**1,660**	**389**
Non-current liabilities			
Provisions		139	152
Total non-current liabilities		**139**	**152**
Current liabilities			
Trade and other payables	17	926	608
Total current liabilities		**926**	**608**
Total liabilities		**1,065**	**760**
Total equity and liabilities		**2,725**	**1,149**
Book value of ordinary share, USD	16	0.005	0.25

The unaudited consolidated interim condensed statement of profit or loss and other comprehensive income is to be read in conjunction with the notes to, and forming part of, the unaudited consolidated interim condensed financial statements set out on pages 7 to 20.

	Share capital $000	Share premium $000	Additional paid in capital $000	Foreign currency translation reserve $000	Accumulated losses $000	Total $000
Balance at 1 January 2017	15	25,030	-	(2,674)	(23,158)	(787)
Income (loss) for the period	-	-	-	-	(554)	(554)
Other comprehensive income						
Foreign currency translation differences	-	-	-	141	-	141
Total comprehensive income (loss) for the period	**-**	**-**	**-**	**141**	**(554)**	**(413)**
Transactions with owners, recorded directly in equity						
Shares issued	-	1,498	-	-	-	1,498
Balance at 30 September 2017	**15**	**26,528**	**-**	**(2,533)**	**(23,712)**	**298**
Balance at 1 January 2018	15	26,904	380	(2,672)	(24,238)	389
Income for the period	-	-	-	-	1,045	1,045
Other comprehensive income						
Foreign currency translation differences	-	-	-	(161)	-	(161)
Total comprehensive income (loss) for the period	**-**	**-**		**(161)**	**1,045**	**884**
Transactions with owners, recorded directly in equity						
Shares issued	-	387	-	-	-	387
Other transactions recognized directly in equity	27,291	(27,291)	-	-	-	-
Balance at 30 September 2018	**27,306**	**-**	**380**	**(2,833)**	**(23,193)**	**1,660**

The unaudited consolidated interim condensed statement of changes in equity is to be read in conjunction with the notes to, and forming part of, the unaudited consolidated interim condensed financial statements set out on pages 7 to 20.

	Unaudited nine-month period ended 30 September 2018 $000	Unaudited nine-month period ended 30 September 2017 $000
Cash flows from operating activities		
Income (loss) for the period	**1,046**	**(554)**
Adjustments for:		
Depreciation and amortisation	28	8
Loss on write-off of property, plant and equipment	16	-
Net finance income (costs)	(3)	19
Cash from operating activities before changes in working capital	**1,087**	**(527)**
Change in inventories	(16)	(275)
Change in trade and other receivables	(1,037)	(299)
Change in prepayments	(249)	6
Change in trade and other payables	318	115
Income tax paid	(1)	-
Net cash from operating activities	**102**	**(980)**
Cash flows from investing activities		
Acquisition of property, plant and equipment and intangible assets	(341)	(3)
Net cash used in investing activities	**(341)**	**(3)**
Cash flows from financing activities		
Proceeds from issue of share capital	387	1,498
Proceeds from borrowings	-	45
Net cash from financing activities	**387**	**1,543**
Net increase/(decrease) in cash and cash equivalents	**148**	**560**
Cash and cash equivalents at 1 January	267	72
Effect of movements in exchange rates on cash and cash equivalents	(141)	84
Cash and cash equivalents at 30 September	**274**	**716**

The unaudited consolidated interim condensed statement of cash flows is to be read in conjunction with the notes to, and forming part of, the unaudited consolidated interim condensed financial statements set out on pages 7 to 20.

1 Background

(a) Organisation and operations

Ferro-Alloy Resources Limited (the "Company") is incorporated in Guernsey and has its registered address at Noble House, Les Baissieres, St. Peter Port, Guernsey, GY1 2UE. The unaudited consolidated interim condensed financial statements for the period ended 30 September 2018 comprise the Company and the following subsidiaries (together referred to as the "Group"):

Company	Location	Company's share in charter capital	Primary activities
Ferro-Alloy Products Limited	British Virgin Islands	100%	Carries out the treasury and finance activities for the Group
Energy Metals Limited	UK	100%	Manages processing activity and performs management service
Vanadium Products LLC	Kazakhstan	100%	Performs services for the Group
Firma Balausa LLC	Kazakhstan	100%	Production and sale of vanadium and associated by-products
Balausa Processing Company LLC	Kazakhstan	100%	Development of processing facilities

The Group's principal activities are mining, processing and the sale of vanadium-containing and associated products which are sold in Kazakhstan and abroad.

(b) Kazakhstan business environment

The Group's operations are primarily located in Kazakhstan. Consequently, the Group is exposed to the economic and financial markets of Kazakhstan which display characteristics of an emerging market. The legal, tax and regulatory frameworks continue development, but are subject to varying interpretations and frequent changes which together with other legal and fiscal impediments contribute to the challenges faced by entities operating in Kazakhstan. The financial statements reflect management's assessment of the impact of the Kazakhstan business environment on the operations and the financial position of the Group. The future business environment may differ from management's assessment.

(c) Report on operations for nine-month period to 30 September 2018

Production

By the beginning of 2018 the adaptation of the former pilot plant to treat low-grade purchased concentrates had been completed and the required operating regimes had been worked out. Operations were curtailed in January and February as a result of a shortage of raw materials caused by a regional shortage of railway wagons in the autumn of 2017 which prevented stockpiling, and difficulties loading and unloading in the short sharp winter months. Apart from this, operations have carried on without major interruption throughout the nine-months of 2018. The Company produces ammonium metavanadate (AMV) which is sold on the basis of its content of vanadium pentoxide. Production of vanadium pentoxide for the first quarter totalled approximately 19 tonnes, the second 27 tonnes and the third 38 tonnes, compared with 33 tonnes in the whole of 2017. Shipments to customers in the period totalled 91 tonnes.

Overall, the plant operated for 85% of available time in the third quarter, 77% during the nine month period. The main causes of unplanned down-time continued to be power outages and power instability. Even short outages can cause long stoppages due to the need to shut down and restart, and power instability causes damage to equipment. The Company is already carrying out the engineering design to connect to the nearby high-voltage power-line which will secure stable power at a much reduced cost.

Vanadium prices

The price of vanadium pentoxide started the year at around US$9.75 per lb and by 30 September 2018 had reached nearly US$23/lb, averaging US$16.10 in the period. The Company's only product during the nine month period was AMV, a precursor product from which vanadium pentoxide is made by heating in a dissociation oven. On the basis of the content of vanadium pentoxide, AMV sells for a small discount to standard vanadium pentoxide. The Company has ordered a dissociation oven as part of its expansion plan.

Earnings and cash flow

The Group made a net profit of US$1,045,000 in the first nine months of 2018. A further US$386,738 (before costs) was subscribed for shares issued. From these funds, US$158,000 was utilised for the reorganisation and other costs preparatory to the listing of the Company on a major stock exchange as well as for starting on the development plan described below.

Balasausqandiq

During the first nine-months of 2018 the plan to mine and process one million tonnes per year of ore up to the year 2043 was approved by the Central Commission for the Exploration and Development of Mineral Deposits of the Ministry of Natural Resources of the Republic of Kazakhstan and the Company is in the final stages of making the consequent amendments to the subsoil use agreement. The next steps are to complete testing of certain improvements which were not trialled in the pilot plant study and then to progress to detailed engineering.

Corporate

In July 2018 the Company's shareholders voted by ordinary resolution to subdivide each share into 200 new shares of no par value so that the listed shares will be of a value within the normal range for listing companies.

Future prospects

Later in the fourth quarter of the year various significant pieces of equipment which have already been ordered and are being constructed are due to be delivered. In particular, the dissociation oven to convert AMV to vanadium pentoxide and recover the ammonia, a new filter press that will reduce water content in products and enable washing to achieve higher purity, a larger capacity back-up diesel generator that will reduce down-time, and various leaching and reactor tanks to increase capacity are all due for delivery in the last quarter of the year. After installation and commissioning, this equipment is likely to start to have an impact on production early in the new year, although work on the full expansion plan will continue throughout 2019 and early 2020.

2 Basis of preparation

(a) Statement of compliance

These interim financial statements have been prepared in accordance with IAS 34 Interim Financial Reporting, and should be read in conjunction with the Group's last annual consolidated financial statements as at and for the year ended 31 December 2017 ('last annual financial statements'). They do not include all of the information required for a complete set of IFRS financial statements. However, selected explanatory notes are included to explain events and transactions that are significant to an understanding of the changes in the Group's financial position and performance since the last annual financial statements. This is the first set of the Group's financial statements where IFRS 15 and IFRS 9 have been applied. Changes to significant accounting policies are described in Note 3.

(b) Basis of measurement

The consolidated interim condensed financial statements are prepared on the historical cost basis.

(c) Functional and presentation currency

The national currency of Kazakhstan is the Kazakhstan tenge ("KZT) which is also the Company's functional currency and the functional currency of its subsidiaries. These consolidated financial statements are presented in United States Dollars ("USD") as this is the currency familiar to the majority of the Company's shareholders. All financial information presented in USD has been rounded to the nearest thousand USD.

(d) Use of estimates and judgments

Preparing the financial statements requires management to make judgements, estimates and assumptions that affect the application of accounting policies and the reported amounts of assets and liabilities, income and expenses. Actual results may differ from these estimates.

Estimates and underlying assumptions are reviewed on an ongoing basis. Revisions to accounting estimates are recognised in the period in which the estimates are revised and in any future periods affected.

3 Accounting policies

Except as described below, the accounting policies applied in these interim financial statements are the same as those applied in the Group's consolidated financial statements as at and for the year ended 31 December 2017. The changes in accounting policies are also expected to be reflected in the Group's consolidated financial statements as at and for the year ending 31 December 2018.

The Group has initially adopted IFRS 15 Revenue from Contracts with Customers and IFRS 9 Financial Instruments from 1 January 2018.

IFRS 15 *Revenue from Contracts with Customers*

IFRS 15 establishes a comprehensive framework for determining whether, how much and when revenue is recognised. It replaced IAS 18 Revenue, IAS 11 Construction Contracts and related interpretations. The Group has adopted IFRS 15 using the cumulative effect method (without practical expedients), with the effect of initially applying this standard at the date of initial application (i.e. 1 January 2018). Accordingly, the information presented for 2017 has not been restated – i.e. it is presented as previously reported under IAS 18, IAS 11 and related interpretations. The Group has determined that its accounting policies for revenue recognition applied under the previous standards do not differ significantly from those introduced by IFRS 15.

Accordingly, there was no material impact of adopting IFRS 15 on the Company's interim statement of financial position as at 30 September 2018 and its interim statements of profit or loss, other comprehensive income and cash flows for the nine month period then ended.

IFRS 9 *Financial Instruments*

IFRS 9 sets out requirements for recognising and measuring financial assets, financial liabilities and some contracts to buy or sell non-financial items. This standard replaces IAS 39 Financial Instruments: Recognition and Measurement.

i. Classification and measurement of financial assets and financial liabilities

IFRS 9 largely retains the existing requirements in IAS 39 for the classification and measurement of financial liabilities. However, it eliminates the previous IAS 39 categories for financial assets of held to maturity, loans and receivables and available for sale. The adoption of IFRS 9 has not had a significant effect on the Group's accounting policies related to financial liabilities. The impact of IFRS 9 on the classification and measurement of financial assets is set out below.

Under IFRS 9, on initial recognition, a financial asset is classified as measured at: amortised cost; fair value through other comprehensive income (FVOCI) – debt investment; fair value through other comprehensive income (FVOCI) – equity investment; or fair value through profit or loss (FVTPL). The classification of financial assets under IFRS 9 is generally based on the business model in which a financial asset is managed and its contractual cash flow characteristics.

A financial asset is measured at amortised cost if it meets both of the following conditions and is not designated as at FVTPL:

— it is held within a business model whose objective is to hold assets to collect contractual cash flows; and

— its contractual terms give rise on specified dates to cash flows that are solely payments of principal and interest on the principal amount outstanding.

A debt investment is measured at FVOCI if it meets both of the following conditions and is not designated as at FVTPL:

— it is held within a business model whose objective is achieved by both collecting contractual cash flows and selling financial assets; and

— its contractual terms give rise on specified dates to cash flows that are solely payments of principal and interest on the principal amount outstanding.

On initial recognition of an equity investment that is not held for trading, the Group may irrevocably elect to present subsequent changes in the investment's fair value in OCI. This election is made on an investment-by-investment basis.

All financial assets not classified as measured at amortised cost or FVOCI as described above are measured at FVTPL. This includes all derivative financial assets. On initial recognition, the Group may irrevocably designate a financial asset that otherwise meets the requirements to be measured at amortised cost or at FVOCI as at FVTPL if doing so eliminates or significantly reduces an accounting mismatch that would otherwise arise.

A financial asset (unless it is a trade receivable without a significant financing component that is initially measured at the transaction price) is initially measured at fair value plus, for an item not at FVTPL, transaction costs that are directly attributable to its acquisition.

The following accounting policies apply to the subsequent measurement of financial assets.

Financial assets at FVTPL	These assets are subsequently measured at fair value. Net gains and losses, including any interest or dividend income, are recognized in profit or loss.
Financial assets at amortised cost	These assets are subsequently measured at amortized cost using the effective interest method. The amortized cost is reduced by impairment losses (see (ii) below). Interest income, foreign exchange gains and losses and impairment are recognized in profit or loss. Any gain or loss on derecognition is recognized in profit or loss.
Debt investments at FVOCI	These assets are subsequently measured at fair value. Interest income calculated using the effective interest method, foreign exchange gains and losses and impairment are recognized in profit or loss. Other net gains and losses are recognized in OCI. On derecognition, gains and losses accumulated in OCI are reclassified to profit or loss.
Equity investments at FVOCI	These assets are subsequently measured at fair value. Dividends are recognized as income in profit or loss unless the dividend clearly represents a recovery of part of the cost of the investment. Other net gains and losses are recognized in OCI and are never reclassified to profit or loss.

All financial assets of the Group were classified as loans and receivables under IAS 39 and are measured at amortized cost in accordance with IFRS 9 as at 1 January 2018.

ii. Impairment of financial assets

IFRS 9 replaces the 'incurred loss' model in IAS 39 with an 'expected credit loss' (ECL) model. The new impairment model applies to financial assets measured at amortized cost, contract assets and debt investments at FVOCI, but not to investments in equity instruments. Under IFRS 9, credit losses are recognized earlier than under IAS 39.

The financial assets at amortized cost consist of guarantee deposits, trade receivables, bank deposits and cash and cash equivalents.

Under IFRS 9, loss allowances are measured on either of the following bases:

- 12-month ECLs: these are ECLs that result from possible default events within the 12 months after the reporting date; and
- lifetime ECLs: these are ECLs that result from all possible default events over the expected life of a financial instrument.

The Group measures loss allowances at an amount equal to lifetime ECLs, except for the following, which are measured as 12-month ECLs:

- bank balances for which credit risk (i.e. the risk of default occurring over the expected life of the financial instrument) has not increased significantly since initial recognition.

The Group has elected to measure loss allowances for trade receivables at an amount equal to lifetime ECLs.

When determining whether the credit risk of a financial asset has increased significantly since initial recognition and when estimating ECLs, the Group considers reasonable and supportable information that is relevant and available without undue cost or effort. This includes both quantitative and qualitative information and analysis, based on the Group's historical experience and informed credit assessment including forward-looking information.

The Group assumes that the credit risk on a financial asset has increased significantly if it is more than 30 days past due or if the external credit rating assigned to a financial asset by an international rating agency falls to CCC or lower per Standard and Poor's and Fitch.

The Group considers a financial asset to be in default when:

- the borrower is unlikely to pay its credit obligations to the Group in full, without recourse by the Group to actions such as realising security (if any is held); or
- the financial asset is more than 90 days past due.

The Group considers a debt security to have low credit risk when its credit risk rating is equivalent to the globally understood definition of 'investment grade'. The Group considers this to be BBB- or higher per Standard and Poor's or Fitch.

The maximum period considered when estimating ECLs is the maximum contractual period over which the Group is exposed to credit risk.

Measurement of ECLs

ECLs are a probability-weighted estimate of credit losses. Credit losses are measured as the present value of all cash shortfalls (i.e. the difference between the cash flows due to the entity in accordance with the contract and the cash flows that the Group expects to receive).

ECLs are discounted at the effective interest rate of the financial asset.

Impact of the new impairment model

Cash and cash equivalents

Cash and cash equivalents are held with banks and financial institutions which are rated AA- and BB- based on Fitch ratings as at 31 December 2017.

The estimated impairment on cash and cash equivalents was calculated based on the 12-month expected loss basis and reflects the short maturities of the exposures. The Group considers that its cash and cash equivalents have a low credit risk based on the external credit ratings of the counterparties.

Trade and other receivables

The estimated ECLs were calculated based on actual credit loss experience. Given the short term nature of trade receivables, actual credit loss experience was not adjusted to reflect differences between economic conditions during the period over which the historical data was collected and current conditions and the Group's view of economic conditions over the expected lives of the trade receivables.

Changes in accounting policies resulting from the adoption of IFRS 9 have been applied retrospectively, except as described below.

- The Group has taken an exemption not to restate comparative information for prior periods with respect to classification and measurement (including impairment) requirements. Differences in the carrying amounts of financial assets and financial liabilities resulting from the adoption of IFRS 9 are recognised in retained earnings as at 1 January 2018. Accordingly, the information presented for 2017 does not generally reflect the requirements of IFRS 9 but rather those of IAS 39.
- The Group has carried out the determination of the business model within which a financial asset is held on the basis of the facts and circumstances that existed at the date of initial application.
- If an investment in a debt security had low credit risk at the date of initial application of IFRS 9, then the Group has assumed that the credit risk on the asset had not increased significantly since its initial recognition.

Management consider that the impact on the financial statements of adopting IFRS 9 is not material.

4 Revenue

	Unaudited nine-month period ended 30 September 2018 $000	Unaudited nine-month period ended 30 September 2017 $000
Revenue from sales of vanadium products	3,253	1,017
Sales of gravel and waste rock	6	15
	3,259	**1,032**

5 Cost of sales

	Unaudited nine-month period ended 30 September 2018 $000	Unaudited nine-month period ended 30 September 2017 $000
Materials	689	403
Wages, salaries and related taxes	381	202
Electricity	54	56
Depreciation	12	10
Other	36	25
	1,172	**696**

6 Administrative expenses

	Unaudited nine-month period ended 30 September 2018 $000	Unaudited nine-month period ended 30 September 2017 $000
Wages, salaries and related taxes	541	467
Listing & reorganisation expenses	158	123
Audit	42	55
Professional services	35	15
Materials	31	18
Depreciation and amortization	13	13
Other	130	85
	950	**776**

7 Personnel costs

	Unaudited nine-month period ended 30 September 2018 $000	Unaudited nine-month period ended 30 September 2017 $000
Wages, salaries and related taxes	922	699
	922	**699**

8 Finance costs

	Unaudited nine-month period ended 30 September 2018 $000	Unaudited nine-month period ended 30 September 2017 $000
Interest expense on financial liabilities measured at amortised cost	-	39
Net foreign exchange costs/(income)	3	(58)
Net finance costs/(income)	**3**	**(19)**

9 Property, plant and equipment

	Land and buildings $000	Plant and equipment $000	Vehicles $000	Computers $000	Other $000	Construction in progress $000	Total $000
Cost							
Balance at 1 January 2017	1,844	1,996	351	12	32	107	4,342
Additions	3	18	37	-	11	97	166
Disposal	-	(4)	(26)	-	-	-	(30)
Foreign currency translation difference	6	5	2	1	(1)	(2)	11
Balance at 31 December 2017	**1,853**	**2,015**	**364**	**13**	**42**	**202**	**4,489**
Balance at 1 January 2018	1,853	2,015	364	13	42	202	4,489
Additions	7	72	52	11	12	186	340
Disposal	-	(1)	-	-	-	(15)	(16)
Foreign currency translation difference	(153)	(170)	(34)	(2)	(4)	(29)	(392)
Balance at 30 September 2018	**1,707**	**1,916**	**382**	**22**	**50**	**344**	**4,421**
Depreciation							
Balance at 1 January 2017	1,844	1,996	295	12	30	107	4,284
Depreciation for the period	-	-	25	-	2	-	27
Disposal	-	(4)	(26)	-	-	-	(30)
Impairment	3	18	-	-	-	97	118
Foreign currency translation difference	6	5	1	1	-	(2)	11
Balance at 31 December 2017	**1,853**	**2,015**	**295**	**13**	**32**	**202**	**4,410**
Balance at 1 January 2018	1,853	2,015	295	13	32	202	4,410
Depreciation for the period	-	1	21	2	4	-	28
Foreign currency translation difference	(152)	(165)	(26)	(1)	(3)	(17)	(364)
Balance at 30 September 2018	**1,701**	**1,851**	**290**	**14**	**33**	**185**	**4,074**
Carrying amounts							
At 1 January 2017	**-**	**-**	**56**	**-**	**2**	**-**	**58**
At 31 December 2017	**-**	**-**	**69**	**-**	**10**	**-**	**79**
At 30 September 2018	**6**	**65**	**92**	**8**	**17**	**159**	**347**

10 Exploration and evaluation assets

During the nine-month period ended 30 September 2018 the Group did not capitalise any exploration and evaluation assets (in 2017: nil).

11 Intangible assets

	Mineral rights $000	Patents $000	Computer software $000	Total $000
Cost				
Balance at 1 January 2017	114	36	3	153
Additions	-	1	-	1
Foreign currency translation difference	1	(1)	1	1
Balance at 31 December 2017	**115**	**36**	**4**	**155**
Balance at 1 January 2018	115	36	4	155
Additions	-	1	-	1
Foreign currency translation difference	(3)	(1)	(1)	(5)
Balance at 30 September 2018	**112**	**36**	**3**	**151**
Amortisation				
Balance at 1 January 2017	114	36	2	152
Amortisation for the period	-	-	-	-
Impairment loss	-	1	-	1
Foreign currency translation difference	1	(1)	-	-
Balance at 31 December 2017	**115**	**36**	**2**	**153**
Balance at 1 January 2018	115	36	2	153
Foreign currency translation difference	(3)	-	-	(3)
Balance at 30 September 2018	**112**	**36**	**2**	**(150)**
Carrying amounts				
At 1 January 2017	-	-	1	1
At 31 December 2017	**-**	**-**	**2**	**2**
At 30 September 2018	**-**	**-**	**1**	**1**

12 Inventories

	Unaudited 30 September 2018 $000	31 December 2017 $000
Raw materials and consumables	454	312
Finished goods	158	-
Goods in transit	-	284
	612	**596**

13 Trade and other receivables

Non-current	Unaudited 30 September 2018 $000	31 December 2017 $000
VAT receivable	574	506
Provision for VAT receivable	(380)	(415)
	194	**91**

Current	Unaudited 30 September 2018 $000	31 December 2017 $000
Trade receivables from third parties	943	44
Due from employees	56	28
Other receivables	4	2
	1,003	**74**
Bad debt allowance	(22)	(27)
	981	**47**

14 Prepayments

	Unaudited 30 September 2018 $000	31 December 2017 $000
Non-current		
Prepayments for equipment	13	52
	13	**52**
Current		
Prepayments for goods and services	303	15
	303	**15**

15 Cash and cash equivalents

	Unaudited 30 September 2018 $000	31 December 2017 $000
Bank balances and other cash deposits	273	267
Petty cash	1	-
Cash and cash equivalents	**274**	**267**

16 Equity

(a) Share capital and share premium

Number of shares unless otherwise stated	Ordinary shares	
	Unaudited 30 September 2018	31 December 2017
Par value	-	0.01 USD
Outstanding at beginning of period/year	1,523,732	1,503,796
Shares issued	1,493	19,936
Outstanding after splitting	305,045,000	
Shares issued after splitting	373,913	
Outstanding at end of period/year	**305,418,913**	**1,523,732**

Ordinary shares

All shares rank equally with regard to the Group's residual assets. The holders of ordinary shares are entitled to receive dividends as declared from time to time and are entitled to one vote per share at meetings of the Company.

In July the Company's shareholders voted by ordinary resolution to subdivide each share into 200 new shares of no par value so that the listed shares will be of a value within the normal range for listing companies.

(b) Book value of ordinary share calculation

In accordance with the requirements of Kazakhstan Stock Exchange the book value of ordinary share at the end of the period/year was:

	Unaudited 30 September 2018 $000	31 December 2017 $000
Total assets	2,725	1,149
Intangible assets	(1)	(2)
Total liabilities	(1,065)	(760)
Net assets	**1,659**	**387**
Outstanding ordinary shares at end of period/year	305,418,913	1,523,732
Book value of ordinary share, USD	**0.005**	**0.25**

(c) Dividends

No dividends were declared for the nine-month period ended 30 September 2018.

(d) Profit per share (basic and diluted)

The calculation of basic and diluted loss per share has been based on the following loss attributable to ordinary shareholders and weighted-average number of ordinary shares outstanding.

(i) Profit attributable to ordinary shareholders (basic and diluted)

	Unaudited nine-month period ended 30 September 2018 $000	**Unaudited nine-month period ended 30 September 2017 $000**
Profit (loss) for the year, attributable to owners of the Company	1,045	(554)
Profit (loss) attributable to ordinary shareholders	**1,045**	**(554)**

(ii) Weighted-average number of ordinary shares (basic and diluted)

Shares	**Unaudited nine-month period ended 30 September 2018**	**Unaudited nine-month period ended 30 September 2017**
Issued ordinary shares at 1 January (after subdivision)	304,746,400	1,503,796
Effect of shares issued	252,242	3,568
Weighted-average number of ordinary shares at 30 September	**304,998,642**	**1,507,364**
Income (loss) per share of common stock attributable to the Company (basic and diluted)	0.003	(0.37)

17 Trade and other payables

	Unaudited 30 September 2018 $000	**31 December 2017 $000**
Due to employees	573	347
Trade payables	247	164
Other taxes	103	83
Advances received	3	14
	926	**608**

18 Contingencies

(a) Insurance

The insurance industry in the Kazakhstan is in a developing state and many forms of insurance protection common in other parts of the world are not yet generally or economically available. The Group does not have full coverage for its plant facilities, business interruption, or third party liability in respect of property or environmental damage arising from accidents on Group property or relating to Group operations. There is a risk that the loss or destruction of certain assets could have a material adverse effect on the Group's operations and financial position.

(b) Taxation contingencies

The taxation system in Kazakhstan is relatively new and is characterised by frequent changes in legislation, official pronouncements and court decisions which are often unclear, contradictory and subject to varying interpretations by different tax authorities. Taxes are subject to review and investigation by various levels of authorities which have the authority to impose severe fines, penalties and interest charges. A tax year generally remains open for review by the tax authorities for five subsequent calendar years but under certain circumstances a tax year may remain open longer.

These circumstances may create tax risks in Kazakhstan that are more significant than in other countries. Management believes that it has provided adequately for tax liabilities based on its interpretations of applicable tax legislation, official pronouncements and court decisions. However, the interpretations of the relevant authorities could differ and the effect on these consolidated financial statements, if the authorities were successful in enforcing their interpretations, could be significant.

PART IX

OPERATING AND FINANCIAL REVIEW OF THE GROUP

The overview of financial results below provides information which the Board believes to be relevant to an assessment and understanding of the Group's financial position and results of operations. The information in this section has been derived from: the audited consolidated financial statements for the Group for the years ended 31 December 2015, 2016 and 2017 and the unaudited consolidated financial information for the Group for the nine months ended 30 September 2018.

You should read this operating and financial review and prospects in conjunction with the Annual Financial Statements, the Unaudited Interim Accounts and the working capital statement set out in Paragraph 7 of Part XII of this Document. The following operating and financial review contains statements reflecting the Board's views about the Group's future performance, constituting "forward-looking statements". These views may involve risks and uncertainties that are difficult to predict and should be considered in conjunction with the factors discussed in the "Risk Factors" section of this Document.

Background

The Ferro-Alloy Resources Group has been carrying out preparatory work towards developing the Balasausqandiq vanadium deposit and associated processing facilities. To this end, a pilot plant was constructed to test the proposed process for treating ore from Balasausqandiq and after the successful conclusion of that test programme the pilot plant was adapted to treat purchased vanadium-containing concentrates as a means of generating a cash flow for the Group while development of the Balasausqandiq project continued. This operation to treat purchased concentrates is now referred to as the Group's "current processing operation" to distinguish it from the development of the Balasausqandiq project which is separate but shares the same site and infrastructure.

Overview of trading and financial position of the Group in the three years ended 31 December 2017 and the nine months to 30 September 2018

In the first months of 2015 the company was operating a pilot plant which had been built to test the proposed process for the treatment of ore from the Group's Balasausqandiq vanadium deposit as part of the feasibility study for the development of a mine and associated processing plant. After completion of testing, the plant was closed and the decision was made to modify it to treat purchased concentrates which, being of higher grade, would enable the plant to reach a commercial level of production. The development plan was to make the minimum changes necessary to prove technical feasibility, following which the plant would be expanded to a more commercial level of output. The modifications were carried out during the remainder of 2015 and in addition, work continued on the feasibility study for the Balasausqandiq project, 15,000 tonnes of ore was mined as required by the Subsoil Use Contract, and a small revenue was obtained from the sale and delivery of associated waste as gravel for construction purposes.

No sales of vanadium products were made during 2015 but revenue of $126,722 was received from the sale of gravel and associated delivery services. The loss for the year amounted to $2.3 million, with a further loss on foreign currency translation, principally due to the depreciation of the Kazakhstan tenge, of $2.0m.

In 2016 work on the feasibility study for the Balasausqandiq project continued and the first sales of vanadium products from the modified pilot plant in the forms of ammonium metavanadate and red-cake began in mid year. Sales revenue of $237,560 from vanadium products was limited by the low level of production from the still-experimental plant and exceptionally low vanadium prices. Sales revenue from gravel and transportation services amounted to a further $54,729, giving a net loss for the year of $1.5m.

The operation of the plant demonstrated the technical feasibility of the plan and work was then undertaken to de-bottleneck and expand the operation to a more economically attractive scale. In 2017 this initial phase was accomplished and at the same time vanadium prices started to recover. The price of vanadium pentoxide started the year at around $5.00/lb and rose to nearly $10.00/lb by the end of the year. The Group then embarked on the plan to expand production to commercial levels, part of which was to test and procure suitable equipment for the treatment of a broader range of, and higher grade, concentrates. In 2017 150 tonnes of higher grade materials were procured and tested, and the first new equipment was ordered late in the year.

In July 2017 the Company's shares were listed on the Kazakhstan Stock Exchange, "KASE", and during the year the company raised $1.7m from new investors which enabled the Group to repay all borrowings and continue development of both the current processing operation and the development of the Balasausqandiq project. In 2017 the Group achieved Revenue of $1.1m and a net loss for the year of $1.1m.

During the first nine months of 2018 the price of vanadium products increased further to over US$22/lb by the end of the period. Production also increased over the course of the period, with production in the first three quarters of 2018 amounting to 19 tonnes, 27 tonnes and 38 tonnes respectively of vanadium pentoxide (contained in AMV), causing a significant increase in profitability. Revenue for the nine month period amounted to US$3.3m and net earnings amounted to US$1m. As a result of the steep increase in vanadium prices and the good performance of the plant the Company embarked on a more significant expansion plan targeting production of 1,500 tonnes per year of vanadium pentoxide by the end of the first quarter of 2020 at a total cost, including significant infrastructure improvements that will equally serve the main Balasausqandiq project, of US$10.3m. The first steps towards this plan have already been taken at a cost of some US$550,000, including infrastructure improvements and additional processing and mobile equipment.

The tables below set out summary financial information of Ferro Alloy Resources Limited as derived from the audited consolidated financial information of the Company as at 31 December 2017 and as at 31 December 2016 (restated) and as at 31 December 2015. The Company's audited consolidated financial statements have been prepared in accordance with International Financial Reporting Standards (IFRS).

The auditors' reports on the consolidated financial statements for the year ended 31 December 2016 which were issued on 17 May 2017 and for the year ended 31 December 2015 issued on 14 December 2016 were qualified for the reason that the management had not performed a formal estimate of the recoverable amount for the Group's property, plant and equipment, intangible assets, exploration and evaluation assets and inventory balances and that the recoverable amounts may have been lower than the carrying amounts. Management had considered that the basis for such an adjustment would have been speculative and the cost of carrying out the assessment and the professional review that would have been required to substantiate it was disproportionate to its value to shareholders. In the preparation of the 2017 Financial Statements the Company reconsidered the basis for impairment tests that had been performed in 2015 and 2016 in relation to property plant equipment, exploration and evaluation assets, intangible assets and inventory and made additional provision for impairment of those assets. Accordingly, the corresponding comparable figures for 2016 that appeared in the audited financial statements for the year ended 31 December 2017 were those restated figures, and the adjustments to the previously audited figures for 2016 were audited. The financial statements set out below for 2016 are as restated in the 2017 financial statements. The financial statements summarised below for 2015 are the same as those originally prepared and audited at the time as management considered that there would be no benefit to shareholders to make a historic adjustment.

The principal effects of the restatement of the 2016 financial statements were to reduce the opening Total Assets at 1 January 2016 by US$3,155,000 to US$918,000 and the closing Total Assets at 31 December 2016 by US$2,937,000 to US$869,000. The loss for the year 2016 was reduced by US$218,000 to US$1,305,000 and the foreign currency translation differences were reduced by US$55,000 from a gain of US$44,000 to a loss of US$11,000.

There have been no other significant changes to the Group's financial condition and operating results during or subsequent to the period covered by the historic key information provided.

Audited Consolidated Statement of Profit or Loss and Other Comprehensive Income for the years ended 31 December 2017, 2016 and 2015.

	2017 US$000	Restated 2016 US$000	2015 US$000
Revenue	1,132	292	127
Cost of sales	(1,084)	(645)	(105)
Gross profit (loss)	**48**	**(353)**	**22**
Other income	52	35	4
Administrative expenses	(908)	(875)	(1,138)
Distribution expenses	(64)	(14)	-
Other expenses	(124)	(47)	(554)
Loss from operating activities	**(996)**	**(1,254)**	**(1,666)**
Net finance costs	(84)	(51)	(681)
Loss before income tax	**(1,080)**	**(1,305)**	**(2,347)**
Income tax	**-**	**-**	**-**
Loss for the year	**(1,080)**	**(1,305)**	**(2,347)**
Other comprehensive income (loss)			
Items that will never be reclassified to profit or loss:			
Foreign currency translation differences	2	(11)	(2,019)
Loss and total comprehensive income for the year	**(1,078)**	**(1,316)**	**(4,366)**

Audited Consolidated Statement of Financial Position as at year ending 31 December 2017, 2016 and 2015.

	31 December 2017 US$000	Restated 31 December 2016 US$000	31 December 2015 US$000
ASSETS			
Non-current assets			
Property, plant and equipment	79	58	2,967
Exploration and evaluation			184
Intangible assets	2	1	30
Long-term VAT receivable	91	-	-
Prepayments	52	36	37
Total non-current assets	**224**	**95**	**3,218**
Current assets			
Inventories	596	590	565
Trade and other receivables	47	102	14
Prepayments	15	10	9
Cash and cash equivalents	267	72	267
Total current assets	**925**	**774**	**855**
Total assets	**1,149**	**869**	**4,073**
EQUITY AND LIABILITIES			
Equity			
Share capital	15	15	15
Share premium	26,904	25,030	24,230
Additional paid-in capital	380		
Foreign currency translation reserve	(2,672)	(2,674)	(2,664)
Accumulated losses	(24,238)	(23,158)	(18,698)
Total equity	**389**	**(787)**	**(2,883)**
Non-current liabilities			
Provisions	152	135	122
Total non-current liabilities	**152**	**135**	**122**
Current liabilities			
Loans and borrowings	-	392	115
Trade and other payables	608	1,129	953
Total current liabilities	**608**	**1,521**	**1,068**
Total liabilities	**760**	**1,656**	**1,190**
Total equity and liabilities	**1,149**	**869**	**4,073**

Audited Consolidated Statement of Cash Flows for the year ended 31 December 2017, 2016 and 2015.

	2017 US$000	Restated 2016 US$000	2015 US$000
Cash flows from operating activities			
Loss for the period	**(1,080)**	**(1,305)**	**(2,347)**
Adjustments for:			
Depreciation and amortisation	27	24	460
Impairment of property, plant and equipment and intangible assets	119	47	30
Impairment of exploration and evaluation assets	5	-	
Impairment of VAT receivables	4	25	97
Write down of inventories to net realisable value and obsolescence	39	60	-
Net finance costs (income)	84	51	681
Impairment of prepayments and trade receivables	45	9	-
Cash used in operating activities before changes in working capital	**(757)**	**(1,089)**	**(1,079)**
Change in inventories	(44)	(67)	(576)
Change in trade and other receivables, including VAT	(43)	(110)	(98)
Change in prepayments	(47)	(8)	10
Change in trade and other payables	(144)	268	660
Net cash used in operating activities	**(1,035)**	**(1,006)**	**(1,083)**
Cash flows from investing activities			
Acquisition of property, plant and equipment	(182)	(107)	(301)
Acquisition of intangible assets	(1)		
Net cash used in investing activities	**(183)**	**(107)**	**(301)**
Cash flows from financing activities			
Proceeds from issue of share capital	1,747	702	1,056
Proceeds from borrowings	20	246	543
Repayment of loans and borrowings	(368)	-	(10)
Net cash from financing activities	**1,399**	**948**	**1,589**
Net increase/(decrease) in cash and cash equivalents	**181**	**(165)**	**(205)**
Cash and cash equivalents at beginning of year	72	267	30
Effect of movements in exchange rates on cash and cash equivalents	14	(30)	32
Cash and cash equivalents at 31 December	**267**	**72**	**267**

Unaudited Consolidated Interim Condensed Statement of Profit or Loss and Other Comprehensive Income for the nine-month period ended 30 September 2018

	Unaudited nine-month period ended 30 September 2018	Unaudited nine-month period ended 30 September 2017
	US$000	US$000
Revenue	3,259	1,032
Cost of sales	(1,172)	(696)
Gross profit (loss)	**2,087**	**336**
Administrative expenses	(950)	(776)
Distribution expenses	(87)	(40)
Other expenses	(1)	(93)
Results from operating activities	**1,049**	**(573)**
Net finance income (costs)	(3)	19
Income (loss) before income tax	**1,046**	**(554)**
Income tax	**(1)**	**-**
Income (loss) for the period	**1,046**	**(554)**
Other comprehensive income (loss)		
Items that will never be reclassified to profit or loss:		
Foreign currency translation differences	(161)	141
Total comprehensive income (loss) for the period	**884**	**(413)**

Unaudited Consolidated Interim Condensed Statement of Financial Position as at 30 September 2018

	Unaudited 30 September 2018	31 December 2017
	US$000	US$000
ASSETS		
Non-current assets		
Property, plant and equipment	347	79
Intangible assets	1	2
Long-term VAT receivable	194	91
Prepayments	13	52
Total non-current assets	**555**	**224**
Current assets		
Inventories	612	596
Trade and other receivables	981	47
Prepayments	303	15
Cash and cash equivalents	274	267
Total current assets	**2,170**	**925**
Total assets	**2,725**	**1,149**
EQUITY AND LIABILITIES		
Equity		
Share capital	27,306	15
Share premium	-	26,904
Additional paid-in capital	380	380
Foreign currency translation reserve	(2,833)	(2,672)
Accumulated losses	(23,193)	(24,238)
Total equity	**1,660**	**389**
Non-current liabilities		
Provisions	139	152
Total non-current liabilities	**130**	**152**
Current liabilities		
Trade and other payables	926	608
Total current liabilities	**926**	**608**
Total liabilities	**1,065**	**760**
Total equity and liabilities	**2,725**	**1,149**

Unaudited Consolidated Interim Condensed Statement of Cash Flows for the nine-month period ended 30 September 2018

	Unaudited nine-month period ended 30 September 2018	Unaudited nine-month period ended 30 September 2017
	US$000	US$000
Cash flows from operating activities		
Income (loss) for the period	**1,046**	**(554)**
Adjustments for:		
Depreciation and amortisation	28	8
Loss on write-off of property, plant and equipment	16	-
Net finance income (costs)	(3)	19
Cash from (used in) operating activities before changes in working capital	**1,087**	**(527)**
Change in inventories	(16)	(275)
Change in trade and other receivables	(1,037)	(299)
Change in prepayments	(249)	6
Change in trade and other payables	318	115
Income tax paid	(1)	-
Net cash from operating activities	**102**	**(980)**
Cash flows from investing activities		
Acquisition of property, plant and equipment and intangible assets	(341)	(3)
Net cash used in investing activities	**(341)**	**(3)**
Cash flows from financing activities		
Proceeds from issue of share capital	387	1,498
Proceeds from borrowings	-	45
Net cash from financing activities	**387**	**1,543**
Net increase/(decrease) in cash and cash equivalents	**148**	**560**
Cash and cash equivalents at 1 January	267	72
Effect of movements in exchange rates on cash and cash equivalents	(141)	84
Cash and cash equivalents at 30 September	**274**	**716**

PART X

CAPITALISATION AND INDEBTEDNESS

The Company's capitalisation and indebtedness as at 30 September 2018 is summarised below.

	As at 30 September 2018 (unaudited) US dollars
Total non-current debt:	
Secured:	Nil
Unsecured:	Nil
Total indebtedness	**Nil**

	As at 30 September 2018 (unaudited) US$000
Capitalisation:	
Share capital	27,306
Additional paid-in capital	380
Total capitalisation	**27,686**

Notes:

i) Capitalisation does not include retained losses or foreign currency translation reserve.

ii) Since 30 September 2018 further share capital amounting to USD30,000 has been issued. With this exception there has been no material change in Ferro-Alloy Resources Limited capitalisation between 30 September 2018 and the date of this document.

The following table shows the consolidated Ferro-Alloy Resources Limited net financial liquidity and indebtedness as at 30 September 2018 (taken from the last published unaudited financial statements of the Group) and at 08 March 2019 (taken from the unaudited unpublished accounting records of the Group).

	As at 30 September 2018 (unaudited) US$000	*As at 08 March 2019 (taken from the unpublished accounting records of the Group) US$000*
Cash	274	801
Liquidity	**274**	**801**
Current financial debt	**0**	**0**
Non-current financial indebtedness	**0**	**0**
Net financial liquidity	**274**	**801**

PART XI
TAXATION

The Company is domiciled and resident in Guernsey but since many investors and intermediaries who may be involved in the listing of the company on the London Stock Exchange may be residents of the UK the following statements are provided as a general guide to current UK tax legislation and to the current practice of HMRC. They may not apply to certain Shareholders in the Company, such as dealers in securities, insurance companies and collective investment schemes, or Shareholders whose opportunity to acquire shares arose from their or another's employment. They relate (except where stated otherwise) to persons who are resident and, in the case of individuals, domiciled in the UK for UK tax purposes, who are beneficial owners of New Ordinary Shares and who hold their New Ordinary Shares as an investment. Any person who is in any doubt as to his tax position, or who is subject to taxation in any jurisdiction other than that of the UK, should consult his or her professional advisers immediately.

UK Taxation

1. Dividends

1.1. Withholding at source

The Company will not be required to withhold at source on account of UK tax when paying a dividend.

1.2. Individual Shareholders

From 6 April 2016 dividends paid by a UK company no longer carry a tax credit. An individual Shareholder who is resident in the UK (for UK tax purposes) and who receives a dividend from the Company and is liable to income tax only at the basic rate will be subject to tax on the dividend at the rate of 7.5 per cent of the dividend received. An individual Shareholder who is liable to income tax at the higher rate will be liable to tax on the dividend received at the rate of 32.5 per cent. An individual Shareholder who is liable to income tax at the additional rate will be liable to tax on the dividend received at the rate of 38.1 per cent. The dividend will be regarded as the top slice of the Shareholder's income Individuals may be entitled to an annual tax-free 'dividend allowance' of £5,000 (reduced to £2,000 from 6 April 2018).

Individual Shareholders who are not resident in the UK for tax purposes should consult their own advisers concerning their tax liabilities on dividends received

1.3. Other Shareholders

Shareholders who are within the charge to UK corporation tax will be subject to corporation tax on dividends paid by the Company, unless the dividends fall within an exempt class and certain other conditions are met. Whether an exempt class applies and whether the other conditions are met will depend on the circumstances of the particular Shareholder, although it is expected that the dividends paid by the Company would normally be exempt.

UK pension funds and charities are generally exempt from tax on dividends which they receive.

2. Chargeable Gains

For the purpose of UK tax on chargeable gains, the amounts paid by a Shareholder for New Ordinary Shares will generally constitute the base cost of his holdings in each type of security. If a Shareholder who is resident in the UK (for UK tax purposes) disposes of all or some of his New Ordinary Shares, a liability to tax on chargeable gains may arise. This will depend on the base cost which can be allocated against the proceeds, the shareholder's circumstances and any reliefs and exemptions to which they are entitled. In the case of corporate shareholders, indexation allowance may apply to any amount paid for the New Ordinary Shares.

If a Shareholder who is a UK resident individual disposes of all or some of their Ordinary Shares, a liability to tax on capital gains made from the disposal may arise. The extent of the tax liability will depend on the availability to the Shareholder of the capital gains tax (CGT) annual exemption (£11,700 for the 2018/19 tax year), to the extent this has not been used against other gains, and any other tax reliefs available such as existing capital losses.

The current rate of CGT for individuals liable to income tax at the higher or additional rate is 20 per cent. Individuals whose taxable income for the year in question is less than the upper limit of the basic rate income tax band (£34,500 for 2018/19) are subject to capital gains tax at the rate of 10 per cent, except to the extent that the aggregate of their total taxable income and chargeable gains (less allowable deductions) in that year exceeds the upper limit of the basic rate income tax band. Any such excess over the upper limit is subject to tax at the rate of 20 per cent.

Trustees of a UK resident trust will also be subject to CGT on any capital gains from disposals of Ordinary Shares. Any gain may be capable of mitigation by use of the annual exemption available to the trustees (£5,850 for the 2018/19 tax year), to the extent this has not been used against other gains, and any other tax reliefs available such as existing capital losses. For trustees and personal representatives, the rate of capital gains tax is 20 per cent.

Shareholders that are UK tax resident companies and hold Ordinary Shares as an investment will be subject to corporation tax on any capital gain arising, subject to mitigation by the indexation allowance and potentially by any losses available to the company. Corporate Shareholders are liable to tax on capital gains at the prevailing rate of corporation tax (currently up to 20 per cent). In certain circumstances a corporate Shareholder may qualify for the substantial shareholding exemption, which exempts certain gains from corporation tax on chargeable gains.

Shareholders who are not resident in the UK for tax purposes may not, depending on their personal circumstances, be liable to UK taxation on chargeable gains arising from the sale or other disposal of their New Ordinary Shares (unless they carry on a trade, profession or vocation in the UK though a branch or agency or, in case of a company, a permanent establishment with which their New Ordinary Shares are connected).

Individual Shareholders or holders who are temporarily non-UK resident may be liable to UK CGT on chargeable gains realised during their period of non-residence on their return to the UK.

3. Stamp Duty and Stamp Duty Reserve Tax ("SDRT")

As a Guernsey resident company with a register maintained in Guernsey stamp duty reserve tax does not apply to issues or transfers of shares in the Company.

The above statements are intended as a general guide to the current position. Certain categories of person are not liable to stamp duty or SDRT, and others may be liable at a higher rate or may, although not primarily liable for the tax, be required to notify and account for it under the Stamp Duty Reserve Tax Regulations 1986, as amended.

Guernsey Taxation

1. The Company

The Company, as a company incorporated in Guernsey, is subject to the company standard rate of income tax in Guernsey, currently at zero per cent..

There is an obligation on the Company, when it makes distributions to Guernsey resident "beneficial members" to withhold and pay over tax at a rate of up to 20 per cent. on behalf of the relevant Shareholder to the Director of Income Tax. The liability to account for tax from the Company's distributions arises where the ultimate beneficial member is a resident in Guernsey for Guernsey tax purposes.

Certain companies incorporated in Guernsey are subject to income tax at: i) 10 per cent. where they receive income from banking, custody services, fiduciary services, domestic insurance business, domestic insurance broking, insurance management or fund administration; or ii) 20 per cent. where they receive income from trading activities regulated by the

Guernsey Competition and Regulatory Authority, income from the ownership of land and buildings situated in Guernsey, income from retail business carried on in Guernsey generating a profit of more than £500,000 per year or income from the importation and supply of hydrocarbon oil or gas.
It is not intended that the income of the Company will derive from any of these sources.

2. Exchange of Information

The Company may be subject to the Foreign Account Tax Compliance Act ("FATCA"). In 2013, the States of Guernsey signed an inter-governmental agreement with the United States ("Guernsey – US IGA") concerning the implication of FATCA. The IGA provides details of the mechanism by which Guernsey-based entities will provide disclosure details in respect of certain investors in the Company who are residents or citizens of the US. The Guernsey – US IGA is implemented through Guernsey's domestic legislation. The Company reserves the right to request from any Shareholder or potential Shareholder such information as is deemed necessary to comply with FATCA and any obligations arising under the Guernsey – US IGA.

The Council of the European Union has repealed Directive 2003/48/EC, which had implemented the EU Savings Directive ("EUSD"). The repealing Council Directive (EU) 2015/2060 was made on 10 November 2015 and this decision impacted on the equivalent agreements that Guernsey had made with all EU Member States. For Guernsey, the EUSD ceased to apply after 2015 (the 2016 exchange, of 2015 data, being the last).

Guernsey announced that it would be an "Early Adopter" of the Common Reporting Standard ("CRS"), in replacement of the EUSD, and this has been implemented from 1 January 2016, with reporting taking place from 2017. As a result, further similar agreements with other jurisdictions have been executed, and are expected to be executed in the future, and the Company reserves the right to request from any Shareholder or potential Shareholder such information as is deemed necessary to comply not only with the existing intergovernmental agreements referred to above but any similar agreements relating to automatic exchange of information.

3. Shareholders

Shareholders who are resident in Guernsey, Alderney or Herm will incur Guernsey income tax on any dividends paid to them in respect of their Shares. The Company will be required to treat any dividend paid to such Shareholders as being declared without deduction of tax but paid net after the deduction of tax, and to pay the appropriate tax on those Shareholders' behalf to the States of Guernsey

Shareholders resident outside Guernsey will not be subject to any tax in Guernsey in respect of, or in connection with, the acquisition, holding or disposal of their Shares.

PART XII
ADDITIONAL INFORMATION

1. General

The Directors, whose names appear on Part VI of this document and the Company accept responsibility for the information contained in this document. To the best of the knowledge of the Directors and the Company (who have taken all reasonable care to ensure that such is the case), the information contained in this document is in accordance with the facts and contains no omission likely to affect its import.

2. The Company and its Share Capital

2.1 The Company was originally incorporated on 18 April 2000 in the British Virgin Islands to be the holding company of a group planning to invest in mining projects. On incorporation, a single share was issued.

2.2 On 13 June 2000, a further 999 shares were issued as payment for the acquisition of 100% of the participatory capital of TOO Firma Balausa, a Kazakhstan company which holds the exploration and mining rights to exploit the Balasausqandiq vanadium bearing deposit in Kyzylorda province, Kazakhstan. 90% of the participatory interest in TOO Firma Balausa was transferred to the Company immediately and the remaining 10% was transferred on February 27 2009.

2.3 In 2006 the authorised share capital of the company was split from being 50,000 shares with a nominal value of USD 1.00 into 5,000,000 shares of US $0.01 (one cent) each. The 1,000 shares with a nominal value of US $1.00 each that had been issued were consequently split into 100,000 shares of US $0.01 each.

2.4 From 2006 to 2012 the Company raised circa $17m via a number of equity placings.

2.5 In each of the calendar years 2013, 2014, and 2015 the Company conducted deep-discounted rights issues with shareholders raising $2.56m, $1.45m, and $1.79m respectively. In addition, new shares to the value of $823,453 were issued in lieu of fees or for cash over the same period.

2.6 During 2016, new shares to the value of $800,000 were issued in lieu of fees or for cash.

2.7 On 12 April 2017 the Company moved its domicile to Guernsey under the Companies (Guernsey) Law 2008 with limited liability and the company was issued with a new Guernsey registration number 63449 under the name Ferro-Alloy Resources Limited. The registered office is located at Noble House, Les Baissieres St Peter Port, Guernsey, GY1 2UE.

2.8 During 2017 the Company raised $1.9m from private placements and the subscription in Kazakhstan of Nil Paid Shares which enabled it to repay outstanding loans of US$411,759.

2.9 As at 31 December 2017 the Company had 1,523,732 Ordinary Shares and 138,799 Nil Paid Shares in issue and carried no debt.

2.10 In the first half of 2018 the Company issued a further 1,493 ordinary shares for gross proceeds of $171,738, taking the total shares in issue to 1,525,225.

2.11 On 12 July 2018 the Company, by way of ordinary resolution, converted its ordinary shares of par value of US $0.01 to ordinary shares of no par value and subdivided each Ordinary Share into 200 Ordinary Shares, resulting in the Company's issued share capital becoming 305,045,000 Ordinary Shares and 27,757,200 Nil Paid Shares beneficially owned by the Company.

2.12 In July 2018 200,000 Ordinary Shares were issued for gross proceeds of US$115,000, in August 2018 173,913 Ordinary Shares were issued for gross proceeds of $100,000 and in November 2018 52,174 Ordinary Shares were issued in lieu of fees to non-executive directors of $30,000, bringing the current total number of Ordinary Shares prior to the Fundraising to 305,471,087 with 27,757,200 Nil Paid Shares beneficially owned by the Company

2.13 The Company has since the date of its incorporation operated in conformity with its constitution. The registrars of the Company are Computershare who are responsible for maintaining the register of members of the Company.

2.14 The following resolutions have been passed:

By ordinary resolutions passed at the AGM of the Company held on 16 November 2018, it was resolved:

1 To receive the audited accounts and the auditors' and directors' reports for the year ended 31 December 2017.

2 To appoint KPMG Audit LLC as auditors of the Company.

3 To authorise the directors to determine the auditors' remuneration.

By special resolutions passed at the AGM of the Company held on 16 November 2018, it was resolved:

4 That the draft Articles of Incorporation of the Company, a copy of which were tabled at the 2018 annual general meeting of the Company and initialled by the chairman thereof for identification purposes ("**Admission Articles**"), were adopted as the Articles of Incorporation of the Company in substitution for, and in replacement of, the existing Articles of Incorporation of the Company subject to and with effect from Admission.

5 That, subject to and with effect from Admission, the directors be and are generally and unconditionally authorised pursuant to Article 20 of the Admission Articles to exercise all the powers of the Company to allot Relevant Securities (as defined in the Admission Articles):

(a) in respect of up to 35 million ordinary shares; and

(b) in respect of up to a further 10 million ordinary shares in connection with an offer by way of rights issue to the holders of ordinary shares on the register of members at such record date(s) as the Directors may determine, where the Relevant Securities attributable to the interests of the holders of Ordinary Shares are proportionate (as nearly as may be practicable) to the respective number of Ordinary Shares held or deemed to be held by them on any such record date(s), subject to such exclusions or other arrangements as the directors may deem necessary or expedient to deal with treasury shares, fractional entitlements or legal or practical problems arising under the laws of any overseas territory or the requirements of any regulatory body or stock exchange or by virtue of Relevant Securities being represented by depositary receipts or any other matter;

as if the rights of pre-emption set out in Article 21 of the Admission Articles did not apply, such authorities to expire on the date occurring 18 months from the date of Admission or, if earlier, on the conclusion of the Company's next annual general meeting but, in each case, so that the Company may make any offer or agreement before such expiry which would or might require Relevant Securities to be allotted or issued after such expiry. The Admission Articles also contains authority for the Board to issue up to a further 70,000,000 ordinary shares on a non-pre-emptive basis to such people at such times and on such terms as they shall determine in their absolute discretion for the purposes of or in connection with Admission, without any requirement for shareholder approval.

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2.15 By way of a written resolution of the shareholders of the Company passed on 12 March 2019, the Company passed an ordinary resolution to, subject to and with effect from Admission, cancel all remaining Nil Paid Shares which had not been acquired and paid up as of the date of Admission or which had not been agreed to be acquired and paid up pursuant to the KASE Subscription

2.16 By a resolution of the Board passed on 21 March 2019 the Company issued and allotted with effect from Admission 7,507,761 Ordinary Shares at the Placing Price.

2.17 By resolution of the Board passed on 21 March 2019, the Company authorised the transfer, pursuant to the Subscriptions and subject to receipt of the relevant subscription monies, of the legal and beneficial interest in the Subscription Shares.

2.18 The issued share capital of the Company at the date of this document is as follows: -

Issued	**Number**
Ordinary shares **(fully paid)**	312,978,848
Nil Paid Shares	27,742,292

These Nil Paid Shares which are not taken up as part of the KASE Subscription will be cancelled pursuant to the ordinary resolution set out in paragraph 2.15 above.

2.19 As at the date of this document, the number of warrants that the Company has issued to subscribe for Ordinary Shares is as follows: -

	Number of warrants	Percentage of Enlarged Share Capital	Exercise price	Exercise period Until
Adviser Warrants	64,285	0.0205%	70 pence	31 March 2021

2.20 Each Ordinary Share ranks pari passu for voting rights, dividends and return of capital on winding up.

2.21 As at the date of this document the Company does not have outstanding any indebtedness or borrowing in the nature of indebtedness.

2.22 Application will be made for the whole class of Ordinary Shares to be listed and traded on the Official List by means of a Standard Listing. A Standard Listing will afford investors in the Company a lower level of regulatory protection than that afforded to investors in companies with Premium Listings on the Official List, which are subject to additional obligations under the Listing Rules. It should be noted that the UK Listing Authority will not have authority to (and will not) monitor the Company's compliance with any of the Listing Rules and/or any provision of the Model Code which the Company has indicated herein that it intends to comply with on a voluntary basis as far as is practicable or appropriate in the circumstance of the Company, nor to impose sanctions in respect of any failure by the Company to so comply.

2.23 The number of Ordinary Shares in public hands (as defined in the Listing Rules) at the date of this document is 131,723,274 representing 42.09% of the Existing Ordinary Shares.

2.24 Except as stated in this Part XII:

(a) the Company does not have in issue any securities not representing share capital; and

(b) there are no outstanding convertible securities issued by the Company.

3. Substantial shareholders

Save for the interests of the Directors, which are set out below, the Directors are aware of the following holdings of Ordinary Shares which, following Admission, represent more than 5 per cent of the nominal value of the Company's share capital:

Name	No. of existing Ordinary Shares	Percentage of Existing Ordinary Shares	Number of Ordinary Shares on Admission	Percentage of Enlarged Share Capital
Andrey Kuznetsov	70,184,000	22.98%	70,184,000	22.42%
Nicholas Bridgen	64,738,800	21.19%	64,738,800	20.68%
Citadel Equity Fund Limited	41,913,600	13.72%	41,913,600	13.39%
AM2 (Bermuda) Limited	15,617,600	5.11%	15,617,600	4.99%

4. Directors' Interests

Name	*Number of Existing Ordinary Shares*	*Percentage of existing Ordinary Shares*	*Number of Ordinary Shares on Admission*	*Percentage of Enlarged Issued Share Capital*
Nicholas Bridgen	64,738,800	21.19%	64,738,800	20.68%
Andrey Kuznetsov	70,184,000	22.98%	70,184,000	22.42%
James Turian*	62,687	0.021%	62,687	0.020%
Christopher Thomas*	162,687	0.053%	162,687	0.052%

*James Turian's shareholding is held in his wholly owned company Panda Holdings Limited.

*Assiduous Group Ltd holds 4,193,800 Ordinary Shares (1.34%). Assiduous Group Ltd is the investment vehicle for a family trust created by Fleur Thomas for the benefit of the children of Fleur Thomas and Christopher Thomas. Christopher Thomas is the husband of Fleur Thomas and a director of Ferro-Alloy Resources Limited.

Except for the holdings of the Directors and the holdings stated above, the Directors are not aware of any persons who, directly or indirectly, jointly or severally, exercise or could exercise control over the Company.

Except for the holdings of the Directors and the holdings stated above, the Directors are not aware of any persons who, directly or indirectly, jointly or severally, exercise or could exercise control over the Company.

The City Code applies to the Company.

Under Rule 9 of the City Code, a person who acquires, whether by a series of transactions over a period of time or not, shares which (taken together with shares held or acquired or acquired by persons acting in concert with him) carry 30 per cent. or more of the voting rights of a company, is normally required by the Panel to make a general offer to the shareholders of that company to acquire the balance of the equity share capital of the company. An offer under Rule 9 must be in cash and at the highest price paid within the preceding 12 months for any shares in the Company by the person required to make the offer or any person acting in concert with him.

Rule 9 of the City Code also provides that where any person together with persons acting in concert with him is interested in shares carrying more than 30 per cent but does not hold shares carrying more than 50 per cent. of the voting rights and such person, or any person acting in concert with him, acquires any additional shares, such person is required to make a general offer to the shareholders of that company.

Accordingly each member of the Concert Party may be restricted in his or its ability to acquire further Ordinary Shares without being required to make a general offer under Rule 9 of the Code.

The attention of shareholders is drawn to the fact that if a member or the members of the Concert Party come to hold more than 50 per cent. of the issued share capital of the Company as a result of the exercise of the Warrants described in paragraph 17.3 of this Part XII, they may be entitled to increase their shareholding without triggering any obligation under Rule 9 of the Code to make a general offer to other shareholders of the Company, although individual members may not increase their interest through or between a Rule 9 threshold without Panel consent.

5. Memorandum of Incorporation

The provisions contained in the Company's Memorandum of Incorporation determining its objects state that the

Company's objects are unlimited.

6. Articles of Association

6.1 Objects

The objects of the Company are unlimited.

6.2 Dividends and other distributions

Subject to the laws of Guernsey, the Board may declare and pay dividends. If the share capital is divided into different classes, the Directors may declare and pay dividends on shares which confer deferred or non-preferred rights with regard to dividend as well as on shares which confer preferential rights with regard to dividend, but no dividend shall be paid on shares carrying deferred or non-preferred rights if, at the time of payment, any preferential dividend is in arrears. The Directors may also pay at intervals settled by them any dividend payable at a fixed rate provided it is in accordance with the laws of Guernsey. Provided the Directors act in good faith they shall not incur any liability to the holders of shares conferring preferred rights for any loss they may suffer by the lawful payment of a dividend on any shares having deferred or non-preferred rights.

Except as otherwise provided by the Articles or the rights attached to shares, all dividends shall be declared and paid according to the amounts paid up on the shares on which the dividend is paid. All dividends shall be apportioned and paid proportionately to the amounts paid up on the shares during any portion or portions of the period in respect of which the dividend is paid; but, if any share is issued on terms providing that it shall rank for dividend as from a particular date, that share shall rank for dividend accordingly.

The Board may deduct from any dividend or other moneys payable to a member by the Company on or in respect of any shares all sums of money (if any) presently payable by him to the Company on account of calls or otherwise in respect of shares of the Company.

All dividends or other sums payable on or in respect of any shares which remain unclaimed may be invested or otherwise made use of by the Board for the benefit of the Company until claimed. Any dividend which remains unclaimed on the earlier of either: i) seven years from the date when it became due for payment shall; or ii) the date the Company is wound-up, shall be forfeited and shall revert to the Company without the necessity for any declaration or other action on the part of the Company. The payment by the Board of any unclaimed dividend or other sum payable on or in respect of a share into a separate account shall not constitute the Company a trustee in respect of it.

6.3 Voting

Subject to any special rights, restrictions or prohibitions as regards voting for the time being attached to any Shares, holders of Shares shall have the right to receive notice of and to attend and vote at general meetings of the Company.

Each Shareholder being present in person or by proxy or by a duly authorised representative (if a corporation) at a meeting shall upon a show of hands have one vote and upon a poll each such holder present in person or by proxy or by a duly authorised representative (if a corporation) shall have one vote in respect of each Share held by him. In the case of a general meeting of all Shareholders, each Shareholder shall have one vote in respect of each Share held by him.

6.4 Capital

As to a winding up of the Company or other return of capital (other than by way of a repurchase or redemption of Shares in accordance with the provisions of the Articles and the Companies Law), the surplus assets of the Company attributable to the Shares remaining after payment of all creditors shall, subject to the rights of any shares that may in future be issued with special rights or privileges, be divided pari passu among the Shareholders in proportion to the number of Shares held by them.

6.5 Issue of Shares

Subject to the provisions of the Articles, the Board shall not exercise any power of the Company to allot Relevant Securities unless they are authorised to do so by the Company in general meeting. Any such authority may be given for a particular exercise of the power or for its exercise generally, and may be unconditional or subject to conditions. The authority must state the maximum amount of Relevant Securities that may be allotted under it and the date on which it will expire which must be not more than five years from the date on which the resolution is passed by virtue of which the authority is given, but such authority may be previously revoked or varied by the Company in general meeting.

The authority may be renewed or further renewed by the Company in general meeting for a period not exceeding five years, but the resolution must state (or restate) the amount of Relevant Securities which may be allotted under the authority or, as the case may be, the amount ready to be allotted under it and must specify the date on which the renewed authority will expire.

The Board may allot Relevant Securities notwithstanding that authority under the Articles has expired if they are allotted pursuant to an offer or an agreement made by the Company before the authority expired and the authority allowed it to make an offer or agreement which would or might require Relevant Securities to be allotted after the authority expired.

6.6 Pre-emption rights

There are no provisions of Guernsey law which confer rights of pre-emption in respect of the allotment of the Shares. The Articles contain pre-emption rights on the issue of shares. These rights are that the Company shall not allot any Equity Securities (as defined in the Articles, and which excludes shares to be allotted pursuant to an employees' share scheme and shares which as respect dividends and capital carry a right to participate only up to a certain amount in a distribution) for cash to a person unless it has made an offer to each person who holds Relevant Shares (as defined in the Articles) or Relevant Employee Shares (as defined in the Articles) to allot to him on the same or more favourable terms a proportion of those securities which is, as nearly as is practical, equal to the proportion of the total number of Relevant Shares and Relevant Employee shares held by him. The Company may by special resolution give the Board power to allot Equity Securities as if the above pre-emption rights do not apply or as if such rights apply with such modifications as the Board may determine. The Articles provide that the pre-emption rights shall not apply to an allotment of Equity Securities wholly or partly paid up otherwise than in cash.

The Companies Law does not include an equivalent to sections 560 to 571 of the UK Companies Act 2006 and the purpose of the above-mentioned pre-emption rights provisions of the Articles is to provide similar provisions in favour of Shareholders.

6.7 Variation of rights

Subject to the laws of Guernsey, if at any time the capital of the Company is divided into different classes of shares, the rights attached to any class may be varied:

(a) in such manner (if any) as may be provided by those rights; and

(b) in the absence of any provision, with the consent in writing of three-quarters of the issued shares of that class, or with the sanction of a resolution passed by not less than three-quarters of the votes cast at a separate meeting of the holders of that class, but not otherwise.

The necessary quorum at any separate class meeting shall be two persons present holding or representing by proxy at least one-third of the voting rights of the issued shares of that class (provided that if any such meeting is adjourned for lack of a quorum, the quorum at the reconvened meeting shall be one person present holding shares of that class or his proxy) provided always that where the class has only one member, that member shall constitute the necessary quorum and any holder of shares of the class in question may demand a poll.

6.8 Disclosure of interests in Shares

<u>Disclosure Guidance and Transparency Rules</u>

Whilst any of the Company's issued shares are admitted to trading on any stock exchange in the UK or elsewhere, the provisions of Chapter 5 of the Disclosure Guidance and Transparency Rules (“DTR5”) are deemed to be incorporated by reference into the Articles and, accordingly, the vote holder and issuer notification rules set out in DTR5 apply to the Company and each Shareholder. These rules require the Directors and other persons discharging managerial responsibilities, together with substantial Shareholders, to disclose to the Company without delay (and in any event within four trading days) certain transactions involving Shares in which they have an interest.

In addition, the Articles expressly provide that for so long as the Company is admitted to trading on the Main Market and in order for the Company to comply with its disclosure obligations under the Listing Rules and DTR5:

- any person who has a legal or beneficial interest (whether director or indirect) of 5% or more in any class of shares ("Significant Member") shall, without delay and in any event within 4 trading days from the day after the date on which the Significant Member:

    - learns of the acquisition or disposal or of the possibility of exercising voting rights, or on which, having regard to the circumstances, the Significant Member should have learned of it, regardless of the date on which the acquisition, disposal or possibility of exercising voting rights takes effect; or

    - is informed, on the basis of information disclosed by the Company, results in a 10 per cent., 15 per cent., 20 per cent., 25 per cent., 30 per cent. 50 per cent. or 75 per cent. change in the breakdown of voting rights,

notify the Company upon becoming a Significant Member and, thereafter, when a Relevant Change occurs by providing to the Company a duly completed TR1 Form and each member is also required, to the extent that he is lawfully able to do so, to notify the Company if any other person acquires or ceases to have a Notifiable Interest of which he is the registered holder, or, if unable lawfully to provide such notification, to use his reasonable endeavours to procure that such other person makes notification of his interest to the Company.

If the Company determines that a member (a "Defaulting Member") has not complied with the provisions of DTR5 with respect to some or all of such shares held by such member ("DTR Default Shares"), the Company shall have the right by delivery of notice to the Defaulting Member (a "Default Notice") to:

- suspend the right of such Defaulting Member to vote the DTR Default Shares in person or by proxy at any meeting of the Company. Such a suspension shall have effect from the date on which the Default Notice is delivered by the Company to the Defaulting Member until a date that is not more than seven (7) days after the Company has determined in its sole discretion that the Defaulting Member has cured the non-compliance with the provisions of DTR5 or Article 10; provided however, that the Company may at any time by subsequent written notice cancel or suspend the operation of a Default Notice;

- withhold, without any obligation to pay interest thereon, any dividend or other amount payable with respect to the DTR Default Shares with such amount to be payable only after the Default Notice ceases to have effect with respect to the DTR Default Shares;

- render ineffective any election to receive shares of the Company instead of cash in respect of any dividend or part thereof; and/or

- prohibit the transfer of any shares of the Company held by the Defaulting Member except with the consent of the Company or if the Defaulting Member can provide satisfactory evidence to the Company to the effect that, after due inquiry, such Defaulting Member has determined that the shares to be transferred are not DTR Default Shares.

Disclosure Notices

The Directors may serve notice on any person whom the Company knows or has reasonable cause to believe is (or was at any time in the previous 3 years) interested in the Company's shares requiring that person to disclose to the Company the identity of any person (other than that person) who has an interest in the shares held by that person and the nature of such interest. Any such notice shall require any information in response to such notice to be given within such reasonable time as the Directors may determine. Such provisions are equivalent to the powers contained in section 793 of the UK Companies Act 2006 which would apply to UK companies.

A member who holds less than 0.25 per cent. of the issued shares is obliged to disclose to the Company whether such shares are held legally and beneficially by that member without any other interest (e.g. encumbrances, third party interests, etc.), in what capacity the shares are held and the class of persons for whom they are held (if applicable). However, such member is under no obligation to disclose the actual identity of the persons concerned. A member who holds 0.25 per cent. or more of the issued shares is obliged to disclose the same information to the Company, but is also required to disclose the actual identity of all the persons for whom or on whose behalf the relevant shares are ultimately held.

If any Shareholder is in default in supplying to the Company the information required by the Company within the prescribed period (which is 14 days after service of the notice), the Directors in their absolute discretion may serve a direction notice on the Shareholder. The direction notice may direct that in respect of the shares of which the default has occurred ("Default Shares") and any other shares held by such Shareholder, such Shareholder shall not be entitled to vote in general meetings or class meetings. Where the Default Shares represent at least 0.25 per cent. of the shares for the time being in issue, the direction notice may additionally direct that dividends on such Default Shares will be retained by the Company (without interest), and that no transfer of Default Shares (other than a transfer approved under the Articles) shall be registered until the default is rectified.

6.9 Transfer of Shares

Subject to the Articles (and the restrictions on transfer contained therein), a Shareholder may transfer all or any of his Shares in any manner which is permitted by the Companies Law or in any other manner which is from time to time approved by the Board.

The instrument of transfer of a certificated share shall be executed by or on behalf of the transferor and (in the case of a partly paid share) the transferee, and the transferor shall be deemed to remain the holder of the share concerned until the name of the transferee is entered in the register in respect of it. All instruments of transfer, when registered, may be retained by the Company.

The Board may decline to register a transfer of shares in certificated form unless, subject to Articles the instrument of transfer:

- is lodged at the Office or at such other place as the Board may appoint and is accompanied by the certificate for the shares to which it relates and such other evidence as the Board may reasonably require to show the right of the transferor to make the transfer;
- is in respect of only one class of shares; and
- is in favour of not more than four transferees.

The Directors may, in the case of shares in certificated form, in their absolute discretion, refuse to register any transfer of any share which is not fully paid (provided that where any such shares are traded via a recognised clearing house or recognised investment exchange, the refusal does not prevent dealings in the shares taking place on an open and proper basis).

Transfers of shares for the time being in uncertificated form shall be registered only in accordance with the terms of the CREST Rules, but so that the Board may refuse to register a transfer which would require shares to be held jointly by more than four persons.

Compulsory Transfer of Shares

If it comes to the notice of the Board that, without the consent of the Board, a registered holder or beneficial owner of any share is a "Non-Qualified Member" (as defined below), the Board may at any time serve a notice on such non-qualified person requiring the transfer of the relevant interest in the relevant shares, and if a stock transfer form effecting the transfer and any relevant share certificate(s) have not been received at the registered office of the Company within 30 days of service of the notice, or the person to whom such notice is addressed does not within such period satisfy the Board that the requirements of the notice have been satisfied, the Company may sell the relevant shares on behalf of the holder of the shares by instructing a stockbroker to sell them in accordance with the best practice then obtaining to a person who is not a Non-Qualified Member.

To give effect to any sale of shares pursuant to the preceding paragraph the Board may authorise some person to transfer the shares in question and an instrument of transfer executed by that person will be as effective as if it had been executed by the holder of, or person entitled by transmission to, the shares. The purchaser will not be bound to see to the application of the purchase monies nor will his title to the shares be affected by any irregularity or invalidity in the proceedings relating to the sale. The net proceeds of sale will belong to the Company and, upon their receipt, the Company will become indebted to the former holder of, or person entitled by transmission to, the shares for an amount equal to the net proceeds of transfer. No trust will be created in respect of the debt, and no interest will be payable in respect of it, and the Company will not be required to account for any monies earned from the net proceeds of transfer. The Company may employ such monies earned in its business or as it thinks fit.

The Board may, at any time, require the registered holder of any shares to provide evidence that the beneficial owner of those shares is not a non-qualified person and that such shares have not been acquired for the account, or for the benefit, of any non-qualified person or with a view to offering or selling the shares to a non-qualified person or in any jurisdiction in which an offer or sale of shares would not be permitted in the manner contemplated.

For the purposes of the Articles a "Non-Qualified Member" is any person to whom a transfer of shares may:

- cause the Company's assets to be deemed "plan assets" for the purposes of the Plan Asset Regulations or the U.S. Code;
- cause the Company to be required to register as an "investment company" under the U.S. Investment Company Act (including because the holder of the shares is not a "qualified purchaser" as defined in the U.S. Investment Company Act) or to lose an exemption or status thereunder to which it might otherwise be entitled;
- cause the Company to register under the U.S. Exchange Act, the U.S. Securities Act or any similar legislation;
- cause the Company not to be considered a "foreign private issuer" as such term is defined in rule 36-4(c) under the U.S. Exchange Act;
- result in a person holding Shares in violation of the transfer restrictions put forth in any prospectus published by the Company, from time to time;
- cause the Company to be a "controlled foreign corporation" for the purposes of the U.S. Code;
- cause the Company to suffer any pecuniary disadvantage (including any excise tax, penalties or liabilities under ERISA or the U.S. Code); or
- result in any Shares being owned, directly or indirectly, by any person who is deemed to be a Non-Qualified Holder in accordance with the Articles.

6.10 General meetings

Convening general meetings

The Board shall convene and the Company shall hold general meetings as annual general meetings in accordance with the requirements of the Companies Law.

Calling of general meetings

The Board may convene general meetings and, on the requisition of members pursuant to the Companies Law, shall forthwith proceed to convene an extraordinary general meeting for a date not later than eight weeks after receipt of the requisition.

Length of notice

All annual general meetings shall be called by at least 21 clear days' notice and all extraordinary general meetings shall be called by at least 10 clear days' notice. All members of the Company entitled to attend and vote at a general meeting may in any particular case agree that a general meeting shall be deemed to have been duly called, and notice of the intention to propose any special resolution shall be deemed to have been duly given, notwithstanding that the meeting is called by less than the requisite notice.

Proceedings at general meetings

No business shall be transacted at any general meeting unless a quorum is present. Save as otherwise provided in the Articles, two members present either in person or by proxy or in the case of a corporation by a duly authorised representative shall be a quorum for a general meeting.

If such a quorum is not present within ten minutes from the time appointed for the meeting, or if during a meeting such a quorum ceases to be present, the meeting shall stand adjourned to the same date in the next week at the same time and place or to such time and place as the Board may determine. If at the adjourned meeting a quorum is not present within ten minutes after the time appointed for the holding of the meeting, the meeting shall be dissolved.

Votes of Shareholders

At any general meeting, a resolution put to the vote of the meeting shall be decided on a show of hands unless before or on the declaration of the result of the show of hands a poll is demanded. Subject to the provisions of the Companies Law, a poll may be demanded by:

- the chairman; or
- one or more Shareholders representing not less than one-tenth of the total voting rights of all the Shareholders having the right to vote on the resolution.

On a show of hands, each Shareholder present in person or by proxy, and each duly authorised representative of a Shareholder that is a corporation present in person or by proxy, has one vote. On a poll each Shareholder present in person or by proxy or (being a corporation) by a duly authorised representative or proxy has one vote for each share held by the Shareholder.

Unless the Board otherwise decides, no member shall be entitled to vote at any general meeting or at any separate meeting of the Shareholders in the Company, either in person or by proxy, in respect of any Share held by him unless all calls and other sums presently payable by him in respect of that Share have been paid.

No member of the Company shall, if the Directors so determine, be entitled in respect of any Share held by him to attend or vote (either personally or by representative or by proxy) at any general meeting of the Company or to exercise any other right conferred by membership in relation to any such meeting if he or any other person appearing to be interested in such Shares has failed to comply with a Disclosure Notice within 14 days of the expiry of the prescribed period (being, in a case where the Shares in question represent at least 0.25 per cent. of the Shares in issue at that time, or within 28 days, in any other case, from the date of such Disclosure Notice). These restrictions will continue until the information required by the notice is supplied to the Company or until the Shares in question are transferred or sold in circumstances specified for this purpose in the Articles.

6.11 Appointment, retirement and vacation of Directors

Appointment

Unless otherwise determined by ordinary resolution, the number of Directors (other than alternate Directors) shall not be less than two and there shall be no maximum number.

A Director need not be a Shareholder. A Director who is not a Shareholder shall nevertheless be entitled to attend and speak at Shareholders' meetings.

Subject to the Articles, Directors may be appointed by the Board (either to fill a vacancy or as an additional Director). No person shall be appointed as a director at any general meeting unless either:

- he is recommended by the Board; or
- not less than seven nor more than forty-two clear days before the date appointed for the general meeting there shall have been left at the Company's registered office (or, if an electronic address has been specified by the Company for such purposes, sent to the Company's electronic address) notice in writing signed by a member who is duly qualified to attend and vote at the meeting for which such notice is given of his or her

intention to propose such person for election together with notice in writing signed by that person of his or her willingness to be elected, specifying his or her tax residency status and containing a declaration that he or she is not ineligible to be a director in accordance with section 138 of the Companies Law.

6.12 Retirement

At each annual general meeting, any director:

- who has been appointed by the Board since the date of the previous annual general meeting (excluding any Directors re-appointed at such meeting);
- who held office at the time of the two preceding annual general meetings and who did not retire at either of them, or
- who has held office with the Company, other than employment or executive office, for a continuous period of nine years or more at the date of the meeting,

shall retire from office.

A director who retires at an annual general meeting may, if willing to continue to act, be elected or re-elected at that meeting. If elected or re-elected he or she is treated as continuing in office throughout. If not elected or re-elected, he or she shall remain in office until the end of the meeting or (if earlier) when a resolution is passed to appoint someone in place of such director or when a resolution to elect or re-elect the director is put to the meeting and lost.

6.13 Vacation

The office of a director shall be vacated if:

- they resign their office by one month's notice in writing sent to or deposited at the Office, unless such notice period is waived by the Board;
- they are removed from office pursuant to these Articles
- they die;
- they have absented themselves (such absence not being absence with leave or by arrangement with the Board on the affairs of the Company) from meetings of the Board for a consecutive period of 12 months and the Board resolves that their office shall be vacated;
- they become bankrupt or make any arrangements or composition with their creditors generally (including where they have their affairs declared “en desastre” or have a preliminary vesting order made against their Guernsey realty, suspend payment or compound with their creditors, or are adjudged insolvent or any analogous event occurs under the laws of any jurisdiction);
- they cease to be a director by virtue of, or become prohibited from being a director by reason of, an order made under the provisions of any law or enactment;
- they are requested to resign by written notice signed by all their co-Directors (being not less than two in number);
- they become resident in the United Kingdom for tax purposes and, as a result thereof, a majority of the Directors would be resident in the United Kingdom for tax purposes; or
- they become ineligible to be a director in accordance with the Companies Law.

If the office of a director is vacated for any reason, they shall cease to be a member of any committee or sub-committee of the Board.

6.14 Proceedings of the Board

The Board may meet for the despatch of business, and may adjourn and otherwise regulate its meetings as it thinks fit. The quorum necessary for the transaction of the business of the Board may be fixed by the Board and unless so fixed shall be two. Subject to the Articles, a meeting of the Board at which a quorum is present shall be competent to exercise all the powers and discretions exercisable by the Board.

All meetings of the Board are to take place outside the United Kingdom and any decision reached or resolution passed by the Directors at any meeting of the Board held within the United Kingdom or at which no majority of Directors resident outside the United Kingdom (and not within the United Kingdom) for UK tax purposes is present shall be invalid and of no effect.

The Board may elect one of their number as chairman. If no chairman is elected or if at any meeting the chairman is not present within five minutes after the time appointed for holding the meeting, the Directors present may choose one of their number to be chairman of the meeting. Questions arising at any meeting shall be determined by a majority of votes.

The Board may delegate any of its powers to committees consisting of one or more Directors as they think fit with a majority of such Directors being resident outside the United Kingdom for UK tax purposes. Committees shall only meet outside the United Kingdom. Any such delegation may be made subject to any conditions the Board may impose, and either collaterally with or to the exclusion of their own powers and may be revoked or altered.

6.15 Remuneration of Directors

The Directors shall be entitled to receive fees for their services, such sums not to exceed in aggregate £100,000.00 in any financial year (or such sum as the Company in general meeting shall from time to time determine by ordinary resolution). The Directors may be paid reasonable travelling, hotel and other out of pocket expenses properly incurred by them in attending board meetings or committee meetings or general meetings, and all reasonable expenses properly incurred by them seeking independent professional advice on any matter that concerns them in the furtherance of their duties as a director. If, by arrangement with the Board, any director shall perform or render any special duties or services outside his ordinary duties as a director, such director may be paid such reasonable additional remuneration as the Board may determine.

6.16 Interests of Directors

Subject to the laws of Guernsey and any rules governing companies listed on the Main Market operated by the London Stock Exchange, and provided that they have disclosed to the Board the nature and extent of any material interest of his, a Director notwithstanding his office:

- may be or become a director or other officer of, or otherwise interested in, any company promoted by the Company or in which the Company may be interested or as regards which it has any power of appointment, and shall not be liable to account to the Company or the members for any remuneration, profit or other benefit received by him as a director or officer of or from his interest in the other company. The Board may also cause any voting power conferred by the shares in any other company held or owned by the Company or any power of appointment to be exercised in such manner in all respects as it thinks fit, including the exercise of the voting power or power of appointment in favour of the appointment of the Directors or any of them as Directors or officers of the other company, or in favour of the payment of remuneration to the Directors or officers of the other company;

- may hold any other office or place of profit within the Company (except that of auditor) in conjunction with his office of director for such period (subject to the Statutes) and upon such other terms as the Board may decide, and may be paid such extra remuneration for so doing (whether by way of salary, commission, participation in profits or otherwise) as the Board or any committee authorised by the Board decide, and either in addition to or in substitution of any remuneration provided to them;

- may act by himself or his firm in a professional capacity for the Company (otherwise than as auditor) and he or his firm shall be entitled to remuneration for professional services as if he were not a Director;

- may be a party to, or otherwise interested in, any transaction or arrangement with the Company or in which the Company is otherwise interested and shall not, by reason of his office, be accountable to the Company for any benefit which he derives from any such office or employment or from any such transaction or arrangement or from any interest in any such body corporate and no such transaction or arrangement shall be liable to be avoided on the ground of any such interest or benefit,

but a director may not vote on or be counted in the quorum in relation to any resolution relating to any such matter.

A general notice given to the Board that a Director is to be regarded as having an interest of the nature and extent specified in the notice in any transaction or arrangement in which a specified person or class of persons is interested shall be deemed to be a disclosure that the Director has an interest in any such transaction of the nature and extent so specified.

An interest of which a Director has no knowledge and of which it is unreasonable to expect him to have knowledge shall not be treated as an interest of that Director.

6.18 Winding up

If the Company shall be wound up the liquidator may, with the sanction of a special resolution of the Company and any other sanction required by the Statutes: -

- divide the whole or any part of the assets of the Company among the members entitled to the same in specie and the liquidator or, where there is no liquidator, the Directors may for that purpose value any assets as he or she or they deem fair and determine how the division shall be carried out as between the members or different classes of members; and

- may vest the whole or any part of the assets in trustees upon such trusts for the benefit of the members as he or she or they may determine,

but no member shall be compelled to accept any shares or other assets upon which there is any liability.

6.19 Borrowing powers

The Directors may exercise all the powers of the Company to borrow money and to give guarantees, to mortgage, hypothecate, pledge or charge all or part of its undertaking, property (present or future) or assets or uncalled capital and to issue debentures and other securities whether outright, or as collateral security for any debt, liability or obligation of the Company or of any third party.

7. Working capital

In the opinion of the Company, the Group does not have sufficient working capital for its present requirements, that is for at least 12 months following the date of this document.

Sources of funds
The Group is operating profitably and has enough working capital to meet its liabilities and to carry on in business for the foreseeable future, but will require additional finance to meet the capital expenditure plans set out in the Competent Person's Report and in this Prospectus.

The expected expenditure, and the expected means by which it will be financed, are as follows (all figures in rounded US$m):

	Expansion of current processing	**Phase 1 (1Mtpa)**	**Phase 2 (4 Mtpa)**
Initial equity funding (after issue costs)	$5m	$1m	-
Additional equity capital	-	$27m	-
Debt or bond	-	$58m	-
Funded from retained earnings	$5m	$14m	$225m
Total capital requirement	**$10m**	**$100m**	**$225m**

Timing
In the above financing plan, it is envisaged that the expenditure on the expansion of current operations, which is already underway, will be completed by the end of 2019, with commissioning extending into the first quarter of 2020. However, the directors believe that from around May 2019, earnings, after meeting all operational expenditure, will be sufficient to finance the remaining expenditure on the expansion of current operations and also start to contribute to the Phase 1 capital expenditure. The initial equity funding, together with such excess cash flows from current operations, is expected to be sufficient to finance the development plan until around the third quarter of 2019 whereupon the additional equity and corporate borrowing or bond issue must be in place in order to keep to the schedule. Significant expenditure on Phase 2 is not expected to start until 2022 by which time earnings from the first two operations are expected to be sufficient to provide the finance.

The directors are confident that this plan is achievable, or that in the event of some part of the plan not being realised, a modified version can achieve substantially the same result. However, there is some uncertainty in each of the components of the funding.

Additional equity funding
The above financing plan assumes a contribution from initial equity funding of $6.4m (£4.8m) net of issue costs, leaving further equity to be raised of $26.6m (£20.0m). In the absence of such additional equity funding, the Company will have sufficient funds to carry out the planned expansion of the current processing plant and raise production and therefore earnings significantly, but the further amounts required to finance the detailed engineering of Phase 1 of the Balasausqandiq project and subsequently its development will not be available on the schedule envisaged unless financed by alternative means as discussed below.

Debt or bond issue
Because the Group is operating profitably, and the level of such profits is forecast to rise significantly as the Group steps up production during the period from now until the end of the first quarter of 2020, the directors believe that an issue of a listed corporate bond or the raising of corporate debt amounting to US$58 million is likely to be possible on the basis that the servicing of such bond or debt is to be made from operating earnings, obviating the need to secure project finance. The currently envisaged schedule shows the need for such borrowing to arise around the final quarter of 2019. However, the amount that it is possible to borrow in this manner is dependent on the operating earnings of the Group and is subject to market conditions at the time.

Retained earnings
The amount of retained earnings which will be available for investment and to support the servicing of debt is dependent on trading conditions. The directors have considered cash flow forecasts for the group in the light of independent forecasts of vanadium prices and have assessed the availability and pricing of raw materials and the Group's production plans. The directors believe that the amounts of earnings included in this financing plan have been conservatively assessed but there can be no certainty that the product selling prices, the cost of raw material purchases, or the production of vanadium will be as assumed throughout the relevant period of time.

Effect of a shortfall in the financing plan
The effect of any shortfall in any of the three components of the financing plan discussed above would, in the absence of any compensating changes to the plan, result in some delay in the completion of the Group's expansion plans. However, any shortfall may be met by some combination of acceleration in the timing of the raising of equity, debt or issue of a bond and an increase in the amount of such equity, borrowing or bond. In such circumstance the Company will seek to avoid any delay in the project schedule. In the event of a severe shortfall in these financing plans the directors can consider an increased equity raise if circumstances are favourable or, as a last resort, the deferral of the expenditure plans so that a greater proportion can be financed from retained earnings.

8. Directors

8.1 The Directors and senior managers, their functions within the group and brief biographies are set out in Part VII of this document, *"Directors, Senior Management and Corporate Governance*".

8.2 The Directors currently hold the following directorships (excluding directorships in the Group) and have held the following directorships within the five years prior to the publication of this document:

Nicholas Bridgen	Current Directorships and Partnerships	Previous Directorships and Partnerships
	None	Hambledon Mining plc Hambledon Mining Company Limited Satimola Limited

Andrey Kuznetsov	**Current Directorships and Partnerships**	**Previous Directorships and Partnerships**
	None	None

James Turian	**Current Directorships and Partnerships**	**Previous Directorships and Partnerships**
	Blossom Fields Care Home Limited Ompar Limited Merrywell Holdings Ltd Accounts For You Limited Noble House Ltd NH Ltd Panda Holdings Ltd JLSC Ltd Springfield Islay Ltd Local Accountants Ltd Herm Investment Ltd Guernsey Equestrian LBG CJ Props Ltd Mertons Ltd Karrah Holdings Ltd Global Residence Services Ltd G.P. (Alderney) Ltd GP CI Services Ltd GP CI Holdings Ltd Rousse Ltd Attractive Properties SL Quaine Ltd Polonaise Services Ltd OTC Services Ltd BD Limited Embankment Holdings Ltd	Acland Services Ltd Nelson Leisure Projects Ltd Caramel Company Ltd Lorenzo Company Ltd Freshwater Holdings Ltd Ludlow Company Ltd BJD Holdings Ltd Merrywell Holdings Limited Chouet Holdings Ltd Kayreel Ltd Linetide Ltd Finecast Ltd Herm Investments Ltd Pacifica Encore Ltd Reputable Properties Ltd Mineks Int'l Ltd (BVI) Nothing You Ltd FA Holdings Ltd Venchan Ventures Ltd Amarreurs Ltd Candelara Holdings Ltd Foote Ltd Translink Ltd Mineks Int'l Ltd

Christopher Thomas	**Current Directorships and Partnerships**	**Previous Directorships and Partnerships**
	I&S BBDO Inc.	Assiduous Group Limited BBDO Worldwide Inc. BBDO Asia Pacific Ltd BBDO Taiwan Advertising Limited Mint Media Integration Co. Limited BBDO (Malaysia) Sdn Bhd Proximity Marketing Services (M) Sdn Bhd BBDO Bangkok Limited BBDO China Co. Limited BBDO Singapore Pte Ltd

BBDO Hong Kong Limited
BBDO Korea Inc.
R K Swamy BBDO Private Limited
BBDO Guerro, Inc.
BBDO India Private Limited
Interone China Company Limited
Beijing Shunya International Brand Consulting Company
Beijing Shunya International Public Relations Consultancy Company
Qinhuangdao Shunya Public Relations Consultancy Company
Qinghuangdao Shunya Advertising Company Limited

Receiverships and liquidations: None

8.3 No Director:

(a) has any unspent convictions;

(b) save as set out in paragraph 8.2 above, has been a director of any company which, at that time or within 12 months after his ceasing to be a director, became bankrupt, had a receiver appointed or was liquidated (other than solvent liquidations);

(c) has had any public criticism against him by statutory or regulatory authority; or

(d) has any conflict of interest in performing his duties as director of the Company.

8.4 None of the Directors has at any time within the last five years:

(a) had any convictions in relation to fraudulent offences;

(b) been declared bankrupt or been the subject of any individual voluntary arrangement;

(c) been associated with any bankruptcy, receivership or liquidation in his or her capacity as director or senior manager;

(d) been the subject of any official public incrimination and/or sanctions by statutory or regulatory authorities (including designated professional bodies);

(e) been disqualified by a court from acting as director;

(f) been disqualified by a court from acting as a member of the administrative, management, or supervisory bodies of any company or from acting in the management or conduct of the affairs of the Company;

(g) been a partner or senior manager in a partnership which, while he was a partner or within 12 months of his ceasing to be a partner, was put into compulsory liquidation or administration or which entered into any partnership voluntary arrangement;

(h) owned any assets which have been subject to a receivership or been a partner in a partnership subject to a receivership where he was a partner at that time or within the 12 months preceding such event; or

(i) been a director or senior manager of a company which has been placed in receivership, compulsory liquidation, creditors' voluntary liquidation or administration or which entered into a company voluntary arrangement or any composition or arrangement with its creditors generally or any class of creditors, at any time during which he was a director or senior manager of that company or within 12 months of his ceasing to be a director or senior manager.

9. Directors' terms of employment

The Executive Directors will be employed for an initial fixed term of one year and thereafter employment will continue until terminated by the Company giving 12 months' prior notice or the employee giving 6 months' prior notice save in the case of breach of contract when the Executive Directors can be dismissed without notice.

Nick Bridgen will be paid a salary of $240,000 per annum.

Andrey Kuznetsov will be paid a salary of $160,000 per annum.

10. Non-Executive Directors' terms of engagement

The Non-Executive Directors will be paid $30,000 per annum commencing on the date of Admission and engaged for an initial fixed term of 1 year and thereafter employment will continue until terminated by the Company giving 3 months' prior notice or the non-executive director giving 3 months' prior notice save in the case of breach of contract when the Non-executive Directors can be dismissed without notice.

11. Pension Arrangements

There are currently no pensions or other similar arrangements in place with the Directors, though it is intended to review this position upon the Company's financial position supporting any arrangements which may be then proposed.

12. Employees

Excluding the directors, the Group currently has approximately 141 employees, the majority of which work within TOO Firma Balausa in Kazakhstan. Approximately 114 of the staff members work within the processing plant and the mine while the remaining 27 individuals work at the depot or Almaty office.

13. Subsidiaries

Ferro Alloy Resources Limited is the parent holding company which currently has five wholly owned subsidiaries.

TOO Firma Balausa (Kazakhstan) holds the exploration licence and is the primary employer of staff for the Group's purposes.

TOO Vanadium Products (Kazakhstan) provides management services to the group.

Ferro Alloy Products (BVI) primarily engages in treasury services and makes loans to group companies as needed for working capital and other purposes.

Energy Metals Limited (UK) is the owner of TOO Balausa Processing Company (Kazakhstan).

TOO Balausa Processing Company (Kazakhstan) is planned to be the group company responsible for processing operations in Kazakhstan. All future Kazakhstan processing operations will be carried out by this company and existing Kazakhstan processing assets will, over time, be transferred to it.

14. Related Party Transactions

Between the date of incorporation and the date of this document, the Company has not entered into any related party transactions.

15. Capitalisation and Indebtedness

At the date of this document, the Company:

(a) does not have any secured, unsecured or unguaranteed indebtedness, including direct and contingent indebtedness; other than its liabilities under the contracts described in paragraph 9 and 10 of this Part XII;

(b) has not granted any mortgage or charge over any of its assets; and

(c) does not have any contingent liabilities or issued any guarantees.

If Admission had taken place prior to the date of the balance sheet of the Company at Part III then the balance sheet of the Company would change as follows (on the basis that the Company had not yet invested the proceeds of the Placing):

(a) the cash held by the Company would have been lower by the amount subscribed for pursuant to the Placing (less any fees and expenses paid by the Company on Admission), being the Net Proceeds;

(b) the total assets of the Company would decrease by the amount of the Net Proceeds on Admission; and

(c) the called up share capital would decrease by the aggregate nominal amount of Ordinary Shares issued both prior to and following Admission.

If Admission had taken place prior to the date of the financial information relating to the Company set out in Part III of this document then any impact on the Company's earnings would have been to enhance earnings with the precise level being dependent on any return made on the Net Proceeds received by the Company.

16. Significant Change

Since 30 September 2018 (being the date as at which the financial information contained in Part IX has been prepared), there has been no significant change in the financial or trading position of the Group.

Since 12 November 2018 (being the date as at which the Competent Person's Report has been prepared), there has been no material change, the omission of which would make the CPR misleading.

17. Material contracts

The following are the only contracts (not being contracts entered into in the ordinary cause of business) which have been entered into by the Company since its incorporation and which are (or may be) material to the Company:

17. 1 Registrar Agreement

Pursuant to an agreement between the Registrar and the Company dated 18 April 2017, the Registrar has been engaged by the Company to provide registration services. The appointment is for a fixed term of 3 years, and terminable by either party by at least 6 months' notice. Along with itemised service transaction fees, the fee payable by the Company is a £3,500 start up fee and a £7,000 annual fixed fee. The agreement outlines certain obligations on the Company and limits Computershare's liability to the total amount of fees in any given 12 month period. The agreement is governed by the laws of Guernsey.

17.2 Orderly Market Agreement

On 21 March 2019, the Company and Shard Capital Partners LLP ("SCP") entered into agreements with each of Mr Nicholas Bridgen, Mr Andrey Kuznetsov and Citadel Equity Fund Limited by which each of these shareholders agree to certain restrictions on the disposal of their Ordinary Shares in the company for a period of twelve months from the date of admission. Under the agreement, each of these shareholders undertakes to use all reasonable endeavours to ensure no disposal is made without prior written consent of SCP. The agreement shall terminate upon the long stop date unless the parties agree to extend the date in writing. The agreement is governed by the laws of England and Wales and the parties irrevocably agree that the courts of England and Wales will have exclusive jurisdiction in the event of a dispute.

17.3 Warrants

Adviser Warrants

On 21 March 2019, the Company constituted 64,285 Warrants on the terms of an instrument under which the Company issued Warrants to Smithfield Partners Limited in consideration for the provision of legal services. The warrants are freely transferable and exercisable at the Placing Price for a period of 2 years from the date of Admission. The Warrants are equal to 0.021% of the Enlarged Share Capital.

17.4 Placing Agreement

On 21 March 2019, the Company, the Directors, and Shard Capital Partners LLP ("SCP") entered into a placing agreement pursuant to which SCP agreed, amongst other things, that Admission take place no later than 8:00am on 05 April 2019. The Company irrevocably appoints SCP as corporate adviser and agent and SCP agreed to use reasonable endeavours as on to procure subscribers and raise up to US$35m before expenses through the placing of new and existing Ordinary Shares. The Placing is not underwritten. The agreement contains customary warranties and representations given by the Company and the Directors to SCP and indemnities given by the Company to SCP. SCP may terminate the agreement in cases of material breach. In consideration for the provision of services to the Company, the Company has agreed to pay a fee as per the Letter of Engagement. The parties have agreed that the agreement shall be governed and construed in accordance with the laws of England and Wales.

18. Other Information

18.1 There are no governmental, legal or arbitration proceedings (including any such proceedings which are pending or threatened of which the Company or Group is aware) during at least the previous 12 months from the date of this document which may have or have had in the recent past significant effects on the Company and/or Group's financial position or profitability.

18.2 There are no patents or other intellectual property rights, licences or particular contracts which are of fundamental importance to the Company's business.

18.3 No exceptional factors have influenced the Company's activities.

18.4 The expenses of the Admission to Official List are estimated at £594,747, including VAT and are payable by the Company.

18.5 The minimum amount after the costs associated with the Listing, which, in the opinion of the Directors, should be raised to provide the sums required is US$5m, which sum will supplement the earnings of the Group to provide for capital expenditure and working capital.

18.6 Where information contained in this document has been sourced from a third party, the Company and the Directors confirm that such information has been accurately reproduced and, so far as they are aware and have been able to ascertain from information published by that third party, no facts have been omitted which would render the reproduced information inaccurate or misleading.

18.7 Unless otherwise stated, statements made in this document are based on the law and practice currently in force in England and Wales and subject to changes in relation to thereto.

19. Consents

SCP has given and not withdrawn its written consent to the inclusion in this document of its name in the form and context in which it is included.

GMB Minerals Engineering Consultants Limited (GMB) have given and not withdrawn their written consent to the inclusion in this document of the CPR in the form and context in which it is included and have authorised the contents of that report for the purposes of PR Annex I paragraph 23.1.

The National Bank of Kazakhstan gave and has not withdrawn its consent to the issue of shares outside Kazakhstan on 25 December 2018.

20. Data protection

The Company may delegate certain administrative functions to third parties and will require such third parties to comply with data protection and regulatory requirements of any jurisdiction in which data processing occurs. Such information will be held and processed by the Company (or any third party, functionary or agent appointed by the Company) for the following purposes:

20.1 verifying the identity of the prospective investor to comply with statutory and regulatory requirements in relation to anti-money laundering procedures;

20. 2 carrying out the business of the Company and the administering of interests in the Company;

20.3 meeting the legal, regulatory, reporting and/or financial obligations of the Company in the United Kingdom or elsewhere; and

20.4 disclosing personal data to other functionaries of, or advisers to, the Company to operate and/or administer the Company.

Where appropriate it may be necessary for the Company (or any third party, functionary or agent appointed by the Company) to:

(a) disclose personal data to third party service providers, agents or functionaries appointed by the Company to provide services to prospective investors; and

(b) transfer personal data outside of the EEA to countries or territories which do not offer the same level of protection for the rights and freedoms of prospective investors as the United Kingdom.

If the Company (or any third party, functionary or agent appointed by the Company) discloses personal data to such a third party, agent or functionary and/or makes such a transfer of personal data it will use reasonable endeavours to ensure that any third party, agent or functionary to whom the relevant personal data is disclosed or transferred is contractually bound to provide an adequate level of protection in respect of such personal data.

In providing such personal data, investors will be deemed to have agreed to the processing of such personal data in the manner described above. Prospective investors are responsible for informing any third party individual to whom the personal data relates of the disclosure and use of such data in accordance with these provisions.

21. Documents available for inspection

Copies of the following documents will be available for inspection during normal business hours on any Business Day at the offices of Smithfield Partners Limited for the period of 12 months following Admission and this document will also be available on the Company's website: www.ferro-alloy.com;

21.1 this document;

21.2 the memorandum and articles of incorporation of the Company;

21.3 the financial statements; and

21.4 the letters confirming the consents referred to in paragraph 19 "Consents" of this Part XII.

Dated: 22 March 2019

Part XIII
Definitions & Glossary

Definitions

The following definitions shall apply throughout this document unless the context requires otherwise:

"Admission"	The admission of all the Ordinary Shares to the standard segment of the Official List and to trading on the Main Market of the LSE
"Adviser Warrants"	the 64,285 Warrants granted to Smithfield Partners to subscribe for Ordinary Shares at 70 pence per share as more particularly described in Part XII of this document
"Articles"	the articles of incorporation of the Company, as amended supplemented and replaced from time to time
"Board" or "Directors"	the directors of the Company
"CESR"	Committee of European Securities Regulators, predecessor to the European Securities and Markets Authority (ESMA)
"City Code"	the City Code on Takeovers and Mergers
"Companies Law"	Companies (Guernsey) Law, 2008 (as amended)
"Company" or "Ferro Alloy Resources"	Ferro Alloy Resources Limited, a company incorporated in Guernsey with registration number 63449
"Control"	an interest, or interests, in shares carrying in aggregate 30 per cent. or more of the voting rights of a company, irrespective of whether such interest or interests give de facto control
"Corporate Governance Code"	the code of best practice including the principles of good governance known as the "UK Corporate Governance Code" (the latest edition of which was published in July 2018) published by the Financial Reporting Council as amended from time to time
"Directors' Letters of Appointment"	the letters of appointment for each of the Directors, details of which are set out in Part XII of this document
"EEA"	the European Economic Area
"Enlarged Share Capital"	the enlarged share capital of the Company assuming the exercise of all Warrants
"Executive Directors"	Nicholas Bridgen and Andrey Kuznetsov
"Existing Ordinary Shares"	The 305,471,087 Ordinary Shares and the 27,757,200 Nil Paid Shares in issue at the date if this document
"FCA"	the UK Financial Conduct Authority
"FSMA"	the Financial Services and Markets Act 2000
"Fundraising"	The Placing and KASE Subscription
"Group"	the Company and its subsidiaries from time to time

"Issued Share Capital"	the issued share capital of the Company
"KASE"	the Kazakhstan Stock Exchange
"KASE Subscription"	the subscription for some or all of the Nil Paid Shares made in relation to an offer on KASE contemporaneously with the Placing
"Listing Rules"	the Listing Rules made by the FCA under Part VI of the FSMA
"London Stock Exchange" or "LSE"	London Stock Exchange plc
"Main Market"	the main market of the London Stock Exchange for listed securities
"Member States"	member states of the European Union
"Model Code"	the model code on directors' dealings in securities set out in the Annex to Chapter 9 of the Listing Rules
"Net Proceeds"	The funds received in relation to the Placing prior to the date hereof less any expenses paid or payable in connection with Admission
"Nil Paid Shares"	The 27,757,200 nil paid ordinary shares of no par value in the capital of the Company held by a nominee in the CREST account of the Kazakhstan depository which are beneficially owned by the Company, created solely for the purpose of facilitating settlement of subscriptions for ordinary shares in the capital of the Company on KASE
"Notifiable Interest"	A person whose shareholding exceeds 5% of the total number of ordinary shares (voting rights) in issue
"Official List"	the Official List of the FCA
"Ordinary Shares"	The fully paid ordinary shares of no par value each in the capital of the Company
"Overseas Shareholder"	a Shareholder resident outside of the United Kingdom
"Placing"	the placing of the Placing Shares as described in this document
"Placing Agreement"	the conditional placing agreement entered into on 20 March 2019 between the Company and SCP, as more particularly described in Part XII of this document
"Placing Price"	70 pence per Placing Share or the equivalent in Tenge subscribed per Ordinary Share in the KASE Subscription translated from pence at the exchange rate of 499.52.
"Placing Shares"	the 7,492,853 new Ordinary Shares to be issued pursuant to the Placing
"Premium Listing"	a Premium Listing under Chapter 6 of the Listing Rules, pursuant to which a company is subject to the full requirements of the Listing Rules
"Prospectus Rules"	Directive 2010/73/EU of the European Parliament and the Council
"Regulations"	the Uncertificated Securities Regulations 2001 (SI 2001 No. 3755) as amended from time to time
"Reverse Takeover"	a transaction defined as a reverse takeover under Chapter 10 of the Listing Rules

"RNS"	one of the regulatory information services authorised by the FCA to receive, process and disseminate regulatory information in respect of the listed companies
"SCP"	Shard Capital Partners LLP
"Shareholders"	holders of Ordinary Shares
"Standard List"	the standard listing segment of the Official List of the FCA
"Standard Listing"	a listing by the FCA of equity securities of a company which is not a premium listing and is therefore not required to company with the provisions of Chapters 7, 8, 10, 11, 12 or 13 of the Listing Rules or certain provisions of Chapter 9 of the Listing Rules
"Subscription Shares"	such of the Nil Paid Shares for which valid irrevocable subscriptions have been received in relation to the KASE Subscription
"UK Listing Authority" or "UKLA"	the FCA in its capacity as the competent authority for listing in the UK pursuant to Part VI of FSMA
"US"	United States of America
"US$ or $"	United States dollars
"Voting Rights"	all the voting rights attributable to the capital of a company which are currently exercisable at a general meeting
"Warrants"	the Adviser Warrants
"Warrant Holders"	means the holders of Warrants

Glossary

The following meanings and interpretations shall apply throughout this document unless the context requires otherwise:

"Ammonium metavanadate" (AMV)	a commonly traded vanadium-containing powder with chemical formula NH4VO3. Contains 40.4% vanadium by weight

"Ammonium polyvanadate"	a commonly traded vanadium-containing powder with chemical formula (NH4)2H2V6O17. Contains 48.2% vanadium by weight
"Balausa"	TOO Firma Balausa, a wholly owned subsidiary of FAR which holds the subsoil use rights, or the Balasausqandiq vanadium deposit as the sense requires
"Carbon Black"	a form of paracrystalline carbon that has a high surface-area-to-volume ratio, used as a reinforcing filler in tyres and other rubber products and as a colour pigment
"Competent Body"	the Ministry of Investment and Development, being the body empowered by the Government of Kazakhstan to control mining subsoil activities
"Competent Person's Report (CPR)	An independent technical report on the mineral assets of a company published to provide a responsible, unbiased and independent opinion on the technical aspects of the company, with the ultimate purpose of informing and protecting investors
"CRIRSCO"	Committee for Mineral Reserves International Reporting Standards
"Demetallisation"	The removal or reduction as part of the process of refining oil of the content of undesired metal components including nickel and/or vanadium by contacting the feedstream with one or more solid absorbent materials
"DM"	Datamine TM
"DCF"	Discounted cash flow
"ESIA"	Environmental and Social Impact Assessment
"Equivalent" (Eq.)	Equivalent grade is the term used where mineralisation that is comprised of several metals of economic value is converted to a single metal. Typically the minor metals are converted by formula and added to the grade of the major metal. The formula can vary but is often only based upon price. Other factors can be included, such as recovery to concentrate and net concentrate value.
"FAR"	Ferro-Alloy Resources Limited, the Group's Guernsey domiciled holding company
"GKZ"	Kazakh State Reserves Committee
"Ferro-vanadium" (FeV)	An alloy of vanadium and iron. It is priced in US dollars per kilogramme of vanadium metal content, and typically contains between 35% and 85% vanadium. Ferro-vanadium is used primarily to harden, strengthen, and impart anti-corrosive properties to steels such as High-Strength, Low-Alloy (HSLA) steel.
"JORC"	Australian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves
"JORC 2012"	The edition of the JORC code used by Ferro-Alloy Resources
"IRR"	Internal Rate of Return
"Life of mine" (LOM)	The time in which, through the employment of the available capital, the ore reserves, or such reasonable extension of the ore reserves as conservative geological analysis may justify, will be extracted.
"NPV10"	Net Present Value using a 10% discount rate

“NSL”	Noise Sensitive Location
“OB1 – OB6”	Ore Body 1, Ore Body 2, Ore Body 3, Ore Body 4, Ore Body 5 and Ore Body 6
“OK”	Ordinary kriging
“OVOS”	Kazakh equivalent to ESIA
“Potassium Alum”	potassium aluminium sulphate, a double sulfate of potassium and aluminium, with chemical formula $KAl(SO_4)_2$
“Red cake”	a polyvanadate salt, chemical formula $Na_2H_2V_6O_{17}$. Contains 48.8% vanadium.
“SEE”	State Ecological Expertise
“SER”	State Environmental Review
“TFB”	TOO Firma Balausa
“TTP Squared”	a leading vanadium market consulting group
“Shale”	a fine grained, fissile, detrital sedimentary rock that can include relatively large amounts of organic material.
“Vanadium pentoxide”	a standard marketed vanadium-containing product, sold in powder or flake form, with chemical formula V_2O_5. Pure vanadium pentoxide contains 56.017% vanadium metal by weight and is priced in dollars per pound of V_2O_5 content
“Vanitec”	an organisation representing the interests of vanadium producers
“Vanadium Redox Flow Battery” (VFB)	a flow battery where electrical charge is held in an aqueous electrolyte containing vanadium. VFB’s are designed to store a large amount of energy, typically for grid-scale applications and micro-grids.
“VNIIKHT”	An approved design institute which carries out metallurgical test-work

PART XIV

COMPETENT PERSON'S REPORT

Balausa Vanadium Project

Competent Person's Report

Prepared For:

Ferro Alloy Resources Limited

COMPETENT PERSONS:

Timothy Daffern, B Eng (Mining), MBA, FIMMM, FAusIMM, MCIM, MSME

CONTRIBUTING CONSULTANTS:

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Geo Mineral Resources Limited

Compiled By:

GBM Project Number: 0563

Document Approval

Role	Name
Prepared by Consultant	Tim Daffern
Checked by Principal Process Engineer	Chris Stinton
Approved by Competent Person	Tim Daffern

Revision History

Date	Rev	Reason	Prepared	Checked	Approved
19/06/2018	0	Issued as final	TD	JB, CS	TD
13/07/2018	1	Updated for LSE	TD	JB, CS	TD
12/11/2018	2	Updated for LSE	TD	CS	TD

IMPORTANT NOTICE

This report was prepared for Ferro Alloy Resources Limited by GBM Minerals Engineering Consultants Limited (GBM) and Geo Mineral Resources Limited (GMR) in accordance with the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (the “JORC Code”), 2012 Edition.
This CPR is compliant with the ESMA update of the CESR recommendations – The consistent implementation of the Commission Regulation (EC) No 809/2004 implementing the Prospectus Directive.
The quality of information, conclusions and estimates contained herein is consistent with the level of effort involved in GBM and GMR’s services, based on: i) information available at the time of preparation, ii) data supplied by outside sources, and iii) the assumptions, conditions, and qualifications set forth in this report.
This report is intended for use by Ferro Alloy Resources Limited for a prospectus which needs to be approved by the United Kingdom Listing Authority (“UKLA”) in connection with a listing on the London Stock Exchange.

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NOMENCLATURE

The following abbreviations have been used in this document.

Abbreviation	Description
AMV	Ammonium Metavanadate
Balausa	The Balausa Vanadium Project that is the subject of this report
BaV_2O_4	Phengite
DCF	Discounted Cash Flow
DM	Datamine^{TM}
ESIA	Environment and Social Impact Assessment
FAR	Ferro Alloy Resources Limited
FPO	Financial Services and Markets Act 2000 (Financial Promotion) Order 2005
GBM	GBM Minerals Engineering Consultants Limited
GKZ	Kazakh State Reserves Committee
GMR	Geo Mineral Resources Limited
H_2O_2	Hydrogen peroxide
IPD	Inverse Power Distance
IRR	Internal Rate of Return
JORC	Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves
Mtpa	Million tonnes per annum
MVA	Meta-Vanadate Crystal Slurry
Na_2CO_3	Sodium Carbonate
NPV	Net Present Value
NSL	Noise Sensitive Location
OB1	Ore Body 1
OB2	Ore Body 2
OB3	Ore Body 3
OB4	Ore Body 4
OB5	Ore Body 5
OK	Ordinary kriging
OVOS	Kazakh equivalent to ESIA
SEE	State Ecological Expertise
SER	State Environmental Review
TFB	TOO Firma Balausa
TOC	Total Organic Carbon
V_2O_5	Vanadium Oxide
V_2S_4	Patronite
VNIIKHT	An approved design institute which carries out metallurgical testwork.

SECTION 1 SUMMARY

1.1 PROJECT BACKGROUND

Ferro Alloy Resources Limited (“FAR”) commissioned GBM Minerals Engineering Consultants Limited (GBM) to prepare a Competent Person’s Report on the Balausa vanadium operations and development projects in the Shieli district, Kzylorda oblast, Kazakhstan. Geo Mineral Resources Limited (GMR) was engaged to produce a mineral resource report, according to acceptable international standards.

FAR’s principal operating subsidiary, TOO Firma Balausa (“TFB”) carries on the current processing operation and holds the development and mining rights to the Balasausqandiq vanadium deposit via a subsoil-use contract. In this report the terms “Company” or “Group” refer to FAR or TFB or both as the context requires.

The licenced area forms a large part of the Balasausqandiq vanadium deposit. This deposit is based on a geological resource which has progressively been delineated by a number of exploration phases since its discovery in 1940 by Soviet era geo-scientists. More recently, FAR have carried out further exploration drilling, trial open-pit mining operations and pilot plant optimisation studies using alternate metallurgical and mineral process treatment technologies.

The Company is currently operating a processing plant based on the former pilot plant, used for testing the proposed process for treating the company’s own ore, suitably adapted to treat purchased concentrates and thereby increased output to a commercial level. Having proven the operating effectiveness, the Company has embarked on plans to increase the maximum potential output to over 1,500 tonnes per annum of vanadium pentoxide by extending the size of the factory building, purchasing suitable additional equipment and improving infrastructure at a total capital cost of some $10.3m.

Up to the end of October 2018 some US$550,000 had already been spent towards this capital programme using funds generated from operations and the production from the treatment of bought-in concentrates had reached a rate of over 12 tonnes per month of vanadium pentoxide in the form of ammonium metavanadate (AMV). In April 2018 a new pre-roaster and the basics of associated leaching and precipitation equipment were installed which enable the company to treat a wider variety of higher grade secondary raw-materials in parallel with the existing production. Commissioning and testing has now been successfully completed and some six tonnes of AMV has been produced from the new raw materials. Further equipment and infrastructure improvements are required to expand production to the targeted level which is expected to be achieved in gradual steps, without any major shutdown, over the period until the end of the first quarter of 2020.

In parallel, FAR intend to develop the Balasausqandiq mine and to build a separate processing plant using a phased approach, with a 1 Mtpa processing facility being constructed initially (“Phase 1”), followed by an expansion to 4 Mtpa (“Phase 2”), to produce a total of some 22,000 tonnes per year of vanadium pentoxide in addition to the production from the currently operating plant.

This Competent Person’s Report provides an assessment of the proposed projects, including details of the current mineral resource, mining engineering, metallurgy, mineral processing, an estimation of capital and operating costs and financial analyses.

Note that within this Competent Person’s Report, the term “ore” is used in the strict JORC definition of the term as a “mineable reserve”. FTB has, until now, operated under the procedures required by the Kazakh State Reserves Committee (GKZ) and where appropriate, information under this system of reserve classification is given for additional information. Except where otherwise stated, all information in this report is given in conformity with the JORC 2012 requirements except as to the sections concerning historical exploration in the Soviet era where the term ‘ore’ is necessarily applied to the reserve classification system employed at the time.

1.2 GEOLOGY

There is an extensive history of geological exploration, especially during the former Soviet-era, since the vanadium was first discovered in 1940. However, as part of this project, research into the expansive complex geological processes that affected the Balasausqandiq deposit, from 1,000 million years ago to 1.5 million years ago, especially in the field of geo-tectonics, has provided a sound basis for supporting the assessment and modelling of this deposit and has allowed a much higher confidence level in the results. This deposit has geological characteristics in common with vanadium deposits in South China, when in primordial times, the Karatau mountains were juxtaposed within the same supercontinent.

The stratiform vanadium layer is associated with five very large orebodies and their surface expression can be traced for about 40 km. These orebodies are mostly confined to deep synclinal folds, where the primary carbonaceous vanadium rocks at depth are protected from weathering and oxidation processes. From historical data and from FAR’s drilling results, the global grades within these orebodies are relatively similar, and this uniformity is testament to the broad stable conditions during mineralogical deposition in a marine basin some 510 million years ago (mid-Cambrian).

1.3 MINERAL RESOURCES AND RESERVES

Potentially, the primary resource is huge, as expressed by the surface continuity of the vanadium mineralisation along strike. The reflection at depth of such observable surface mineralisation has been confirmed by FAR’s drilling of Ore Body 1 (OB1) and also confirmed from the more limited drilling of Ore Body 2 (OB2) and Ore Body 3 (OB3). Currently, based on the OB1 JORC resource, plus JORC-based Exploration Targets for OB2 to OB5, a total vanadium JORC resource of over 100 million tonnes is considered to be a rational prediction.

Table 1-1 provides details of the OB1 JORC (2012) resource, for both vanadium and by-products, while the Exploration Targets are summarised in Table 1-2 and Table 1-3.

Table 1-1: Schedule of Mineral Resources (JORC 2012)

JORC Vanadium Resource OB1				By-Products OB1 (primary ore only)						
				JORC indicated		JORC inferred				
JORC Class	**V_2O_5 % Cut-off**	**V_2O_5 % Mean**	**Tonnes [m]**	**C% Mean**	**Tonnes [m]**	**C% Mean**	**Tonnes [m]**	**Total C% Mean**	**JORC inferred MoO_3 % mean**	**JORC inferred U_3O_8 % mean**
Indicated	0.0	0.67	21.43	14.08	10.68	13.09	10.75	13.59	0.0300	0.0090
Inferred	0.0	0.67	1.56			13.43	1.56	13.43	0.0297	0.0085
Combined	0.0	0.67	22.99					13.58	0.0300	0.0090
Oxide cap inferred	0.0	0.89	1.33							
Total	**0.0**	**0.68**	**24.32**							

Table 1-2: JORC Based Exploration Target (JORC 2012 Guidelines)

Orebodies 2 to 5	Strike Length (km)	Tonnes [m]		V_2O_5 Grade Range [%]	
		From	To	From	To
Primary Zone	20.9	73	98	0.65	0.71
Oxide Zone		4.25	5.75	0.85	0.98
Combined		77.3	103.8	0.66	0.72

Table 1-3: JORC Based Exploration Target (JORC 2012 Guidelines) - By-Products applied to Ore Bodies 2 to 5 (Primary Zone Only)

Target	Global Grades based on OB1	Grade Range ± 5 %	
		From	To
Carbon	13.58 %	12.9	14.26
MoO_3	0.030 %	0.029	0.032
U_3O_8	0.009 %	0.009	0.009
REM	335 ppm	318	352
Total Tonnes (millions)		73	98

Table 1-4: JORC Based Mineral Reserves (JORC 2012 Guidelines) - Ore Body 1 only

Category	Reserve Tonnes (000)	Mean grade V_2O_5 [%]
Probable	22,938	0.59

A GKZ reserve of 70 M tonnes was confirmed in 2014 as shown in Table 1-. This GKZ reserve is used as the basis for the Kazakhstan regulatory approval and control processes:

Table 1-5: 2014 GKZ Reserve Summary

Category	Reserve Tonnes (000)	Mean grade V_2O_5 [%]
B	832	1.00
C1	15,649	0.75
C2	54,366	0.74
B+C1+C2	70,847	

Table 1-6: Metal equivalents in V2O5 terms (OB1)

Product	Estimated resource grade in situ	V2O5 equivalent
V2O5	0.67%	0.670%
Carbon and organics (in silica)	14.08%	0.187%
Uranium oxide concentrate	0.009%	0.022%
Molybdenum oxide concentrate	0.03%	0.029%
Total		0.908%

This table of metal equivalents is based on the indicated and inferred resource of OB1.

The ore also contains 335 ppm of REM but no value has yet been ascribed to it.

A further by-product, potassium alum, has not been included above as it is derived partly from ore and partly from processing. If it were included, it would add an additional 0.071% on a vanadium pentoxide equivalent basis.

1.4 METALLURGY AND MINERAL PROCESSING

The metallurgical pilot plant installed at the project site shows that the vanadium mineralisation is amenable to conventional comminution and autoclave processing techniques to produce a suite of saleable products. The pilot plant testwork shows a mineral recovery of over 90 %. The mineral process plant will use conventional industrial chemistry processes, standard equipment and machinery.

Run of mine ore will be crushed, milled and classified before thickening. The thickened material is decarbonized in an acid solution and re-thickened and filtered. The solid material is leached in autoclaves to produce a carbon silica by-product, which is then washed and dewatered.

The solution from the decarbonization stage contains the main product elements. The recovery of vanadium, uranium, molybdenum and rare earths is undertaken using three separate adsorption circuits. In each stage the target element is preferentially adsorbed onto ion-exchange resin, allowing the solution to flow on to the next stage. The target elements are desorbed from the loaded resins periodically and precipitated out of solution before drying and packaging.

The proposed operational mineral process plant will produce a suite of saleable products, including vanadium, carbon, uranium, molybdenum, rare earth elements (“REE”), potassium alum and others as defined in this report.

Following completion of the test programme, the pilot plant was adapted to treat concentrates and spent catalysts. This operation does not require several sections of the former pilot plant including the crushing and milling, autoclave leaching, and the by-product recovery sections, but the production process is otherwise similar and the output of vanadium is higher.

1.5 MINING OPERATION

Small scale mining is being carried on at a rate of 15,000 tonnes per annum from open pit and the ore is currently stockpiled. Subject to demand, some of the waste from this mining is crushed and sold as gravel for road-building and construction. The future mining operations will be on a much larger scale but will use similar methods, a conventional open pit employing standard equipment for drill, blast, load and haulage of the material to the process plant from the open pit.

The equipment used will be western standard equipment augmented by regional manufacturers where appropriate. Industry standard grade control techniques will be used to ensure the grade of the material for processing is in accordance with the business plan.

1.6 INFRASTRUCTURE

The current operations and project benefit from a significant amount of regional infrastructure, including high voltage electrical lines nearby, well-made access roads, local telecommunications and a regional railway. There is also site-specific infrastructure developed for the purposes of the initial trial mining and mineral processing operations.

The site has a reliable water supply, labour force accommodation block, engineering workshops, welfare facilities, an office and telecommunication facilities, which are suitable and sufficient for the current operation and typical for the region. All facilities are in accordance with local regulatory requirements.

The proposed operations will require connection to the adjacent High Voltage 110 kV power line, enhanced electrical reticulation, a new accommodation block, new railway siding facilities in Shieli and the existing infrastructure onsite will be augmented and refurbished to a higher operational condition.

1.7 ENVIRONMENTAL

The site is situated in a plain landscape, typically desert type of raised and lowered steppe. The climate in the area is typically sharp continental, with a hot, dry and prolonged summer with temperatures commonly exceeding 40 °C. The winter is relatively short with little snow. Ground frost permeation during the winter is approximately 0.3 to 0.4 m, the coldest month being January, with an average temperature of -6.9°C, but capable of reaching as low as -25°C.

The winds in the area are strong and frequent with a prevailing north, northeast and northwest direction. Annual precipitation in the northern slopes of the Great Karatau Range total approximately 151 mm.

There is no known designated habitat area nearby. The site is in full compliance with the national OVOS scheme for environmental stewardship.

1.8 LOGISTICS

The products from the operation are of high value and relatively low in volume so transport to customers is not difficult or expensive by either truck or rail. The most usual routes will be by truck to the railway at Shieli, 70 km from the plant, where there is a railway station along the main East-West road and rail transit linking Europe and the Russian Baltic, through Kyzylorda, Shymkent and Almaty, into China and on to the East coast, or by truck to the port of Riga from where it can be shipped. There is therefore good access to Europe, Russia and China as well as the local region.

Sales have been made in the past to Russia and China, and more recently to a UK customer for onward shipment to Taiwan. In future, when the 1 Mtpa mine output is achieved, the majority of output will be sold in the form of ferro-vanadium to steel producers or in the form of vanadium electrolyte for use in vanadium flow batteries.

1.9 FINANCIAL ANALYSES

GBM has audited the FAR cash flow model. Using a 10 % discount rate over the first 23 years of operations and the following prices for vanadium pentoxide:

- Remainder of 2018 $24.00/lb
- 2019 $13.00/lb
- 2020 $10.00/lb
- 2021 onwards $7.50/lb

The combined businesses have an NPV (post tax) of USD 2.0 billion. The IRR of the combined businesses (post tax) is 96 %.

The current price of vanadium pentoxide (29 October 2018) is over $26/lb. As a sensitivity, therefore, GBM has considered the case where the price of vanadium pentoxide for 2021 onwards is assumed to be $11/lb, which gives a combined NPV of $3.0 billion.

The main aspects of the cash flow models in US dollars are detailed in Table 1-5.

Table 1-5: Main Aspects of Cash Flow Models

Item	Value
Combined projects:	

Item	Value
Base case post tax asset IRR	96%
Base case post tax NPV (10 %)	US$ 2,048 million
• NPV (10 %) / IRR (processing expansion only)	US$73 million / 242 %
• NPV (10 %) / IRR (phases 1 and 2 mining and processing)	US$1,978 million / 89 %
Expansion of current processing operation	
Capital costs including working capital and contingency (from November 2018)	US$9.7m
Annual output (V2O5 basis, excluding by-products)	1,500 tonnes
Annual revenue (from 2021)	$23.6 million
Annual costs (from 2021)	$11.3 million
Annual net operating cash flow after tax (2021 to 2026)	$9.7 million
Annual net operating cash flow after tax (after expiry of tax incentive agreement)	$7.8 million
Phase 1 – 1 Mtpa mining and processing	
Capital costs including working capital and contingency	$100m
Ore treated per annum	1,000,000 tonnes
Annual output V2O5 (additional to above)	5,603 tonnes
Annual revenue	US$135 million
Annual costs including royalty	US$32 million
Annual operating cash generation after tax	US$103 million
Phase 2 – additional 3 Mtpa mining and processing	
Capital costs including working capital and contingency	US$225m
Ore treated per annum (total incl. Phase 1)	4,000,000 tonnes
Annual output V2O5 (total incl. Phase 1)	22,414 tonnes
Annual revenue (total incl. Phase 1)	US$541 million
Annual costs including royalty (total incl. Phase 1)	US$110 million
Annual operating cash generation after tax (total incl. Phase 1)	US$430million

The NPV and IRR figures assume that the expansion of current operations will be carried out during the remainder of 2018 until the end of the first quarter of 2020 and that production will increase in steps over that period. Final testing and detailed engineering for Phase 1 will start immediately upon receipt of finance in late 2018, construction will start in 2019 with start-up at the end of 2020. Construction of Phase 2 is scheduled to start in January 2022 with start-up in second half of 2023.

Within this cash flow model it is assumed that cash generated is kept within the company and used to fund the expansions to 1Mtpa and 4Mtpa. Funding for this programme will be substantially from earnings which will depends on both raw material and end product prices so cannot be predicted with any accuracy but is expected to be approximately as follows:

Table 1-6: Summary of Capital Requirements

	Capital costs (US$)		
	Expansion of current processing	Phase 1 (1Mtpa)	Phase 2 (4 Mtpa)
Initial equity funding 2018	US$5m	US$28m	-
Debt or bond 2019		US$58m	-
Funded from retained earnings	US$5m	US$14m	US$225m
Total capital requirement	**US$10m**	**US$100m**	**US$225m**

SECTION 2 INTRODUCTION AND TERMS OF REFERENCE

2.1 COMPANY BACKGROUND

FAR is currently registered in Guernsey, The Channel Islands. FAR has five subsidiaries, as shown in Figure 2-1.

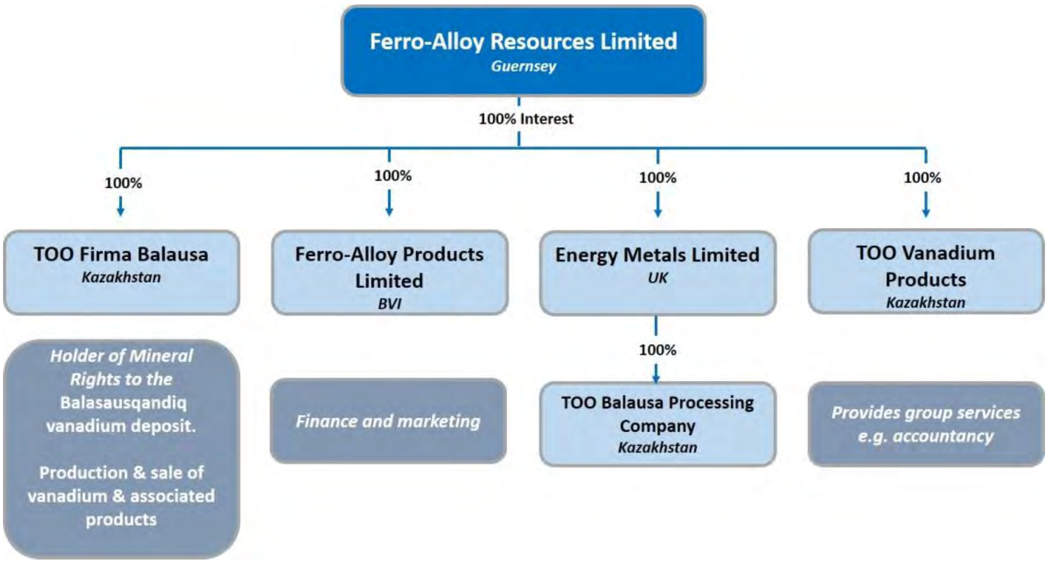

Figure 2-1: FAR Group Structure

The current directors of FAR are Nicholas Bridgen (Chief Executive), Andrey Kuznetsov (Chief Operating Officer and Director of TOO Firma Balausa Company, Almaty), Christopher Thomas (non-Executive Director) and James Turian, (non-executive director).

TFB was formed in 1996 when it was granted an exploration licence for the project. This was converted to an exploitation licence in 1998. The merger with FAR occurred in 2000 and the construction of the pilot plant at Balausa was announced in 2006.

Management of the Balausa vanadium project is supported by the technical staff based at the regional office of TFB in Shieli, approximately 70 km from the deposit.

Currently, TFB employs approximately 141 staff, working two shifts each day, with each shift remaining on site for 15 days followed by 15 off each month throughout the year. The existing management structure of TFB is shown in Figure 2-2 below.

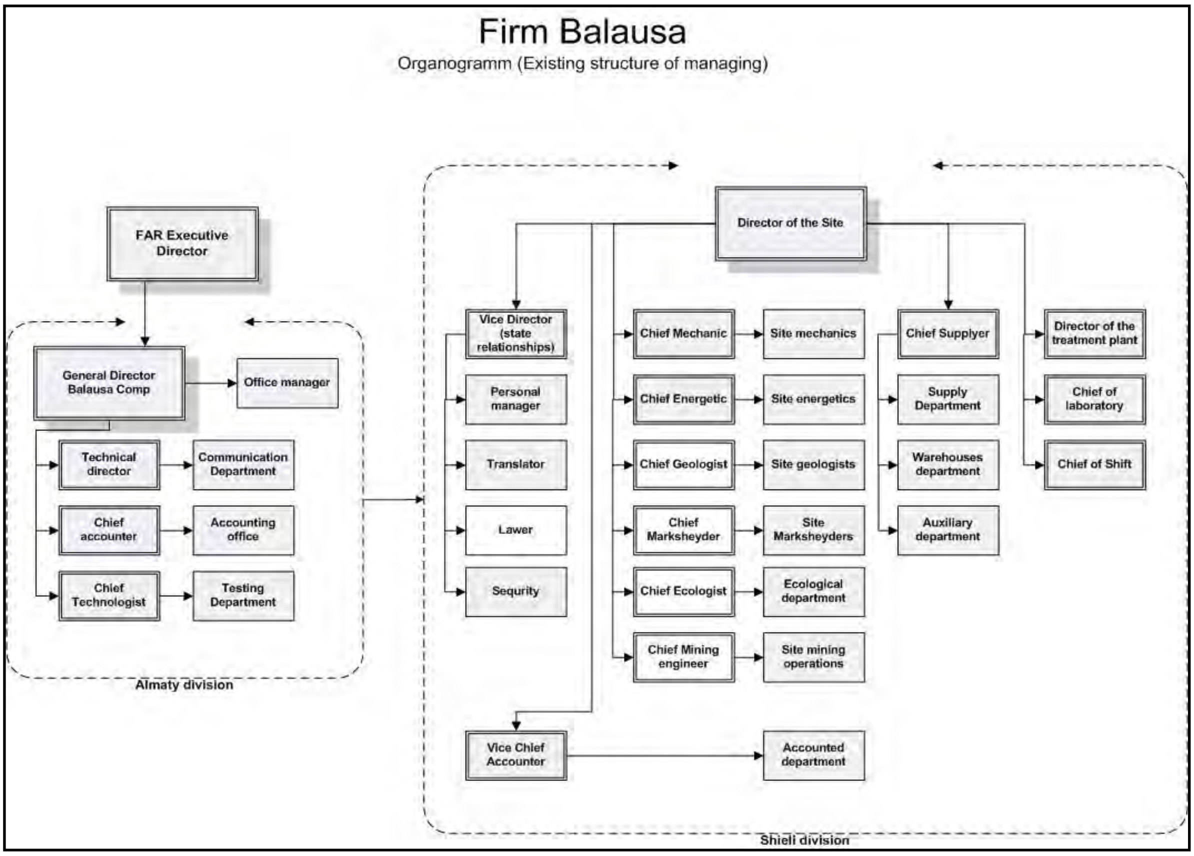

Figure 2-2: Existing Management Structure

2.2 NON-TECHNICAL SUMMARY

The Balasausqandiq deposit is large, with the centre of the estimated range for the resource being around 126 million tonnes, equivalent to over 840,000 tonnes of V_2O_5 and equal to nearly six times the annual world production of 2017. It is likely that the resource estimate will increase after further exploration. If there were no other considerations, the NPV of such a project would normally be optimised by aiming to deplete the resource over 15 – 20 years, indicating an ore treatment rate of around 8 Mtpa, producing around 44,000 tonnes per annum of vanadium pentoxide or equivalent vanadium products.

The Company's first step was to build a 15,000 tonnes per annum pilot plant to test the proposed treatment process for the Company's own mined ore. After completion of the test-programme, this plant was adapted to treat purchased concentrates, thereby increasing its output to a semi-commercial scale. The operation of first the pilot plant and subsequently the adapted plant has enabled the company to refine many of the processes that it will be using in the larger plant, to train the workforce, and to understand the cost structure of the business. These lessons will be invaluable and will substantially de-risk the expansion programme.

Although the deposit is large, there are several reasons why a more gradual development plan is being adopted. Firstly, the world market demand for vanadium (pentoxide equivalent) is currently only around 153,000 tonnes per year, so there would be a concern that if FAR produced at its optimised level the market could be oversupplied in the short term. Secondly, such a large production facility would be technologically risky. It is less risky to start up with a more manageable size and expand later when the experience of construction and operation of a smaller treatment plant can be used to make improvements to the later, larger facility. Thirdly, a smaller amount of money has to be raised to build a smaller plant and the earnings from that plant can be used to pay for, or underpin borrowing for, the next much larger plant, thus considerably reducing shareholder dilution.

The directors of FAR therefore decided on a three-step development plan. The first stage of development, which has already begun, is to extend the existing plant and adapt it to enable it to treat a wide range of much higher grade secondary vanadium-containing raw materials including catalysts from the demetallisation of oil and boiler ashes, enabling output to be increased to some 1,500 tonnes of vanadium pentoxide (equivalent) per year. This expanded plant will include equipment to convert the primary product, ammonium metavanadate, into vanadium pentoxide in powder form. Provision may also be made, subject to market demand, to make electrolyte for batteries. In parallel with the further expansion of the existing plant, detailed engineering will begin on the first of two phases, Phases 1 & 2, of the Company's own mine and processing plant which will be entirely separate from and operate independently of the expanded existing processing plant.

The throughput from Phase 1 of the Company's own mine will be 1 million tonnes per annum ("Mtpa") of ore, producing 5,600 tonnes of vanadium pentoxide (or equivalent in other forms) per year, which is a level that is much lower than the expected annual increase in the market size and should be easily absorbed by the world market. Immediately after commissioning of Phase 1, approximately two years later, work will begin on Phase 2 which is planned to increase throughput to 4Mtpa, producing a total of over 22,000 tonnes per year.

Assuming an initial capital raise of US$35m (US$33m net of expenses), the phased approach will enable the earnings of the expanded current processing operation to fund the remaining equity requirement of Phase 1 of the Balasausqandiq mine (together with approximately $58 million of debt or a bond issue), and the earnings of the two initial operations, to fund the entire requirement of Phase 2. Equity dilution after the first raise will therefore be minimised or eliminated.

The Phase 1 and 2 developments to mine and treat the Company's own ore will also produce several valuable by-products. These, in order of importance, are a valuable form of carbon – which comprises some 18 % of the tailings (together with the associated silica), potassium alum (which can be further refined into alumina and potassium and ammonium sulphate fertilizers), uranium and molybdenum. In addition, up to 330 tonnes per year of a mixed rare earth concentrate will be produced but owing to current low prices and uncertainty over the market demand for this material, no value is being ascribed to it.

The carbon-silica tailings have a number of uses, principally as a feed in the making of ferro-silicon or as filler in the making of rubber as a substitute for carbon black and silica. Both uses have been tested with successful results. The suitability of the material for making ferro-silicon gives the company the potential to build its own ferro-silicon plant which would avoid having to transport the material and has several other competitive advantages. At this stage, only a conceptual study has been carried out, based on analogous costs of another operation adjusted for local costs. The reason why this project is attractive is that all the main production costs, power, labour, carbon and silica, are extremely low cost. The silica and 50 % of the carbon would come from the briquetted tailings of the vanadium operation and power would be generated from locally procured natural gas. Labour costs in this region of Kazakhstan are also very low. Not only would the input costs be very low, but the tailings from the vanadium operation have already had their metallic impurities leached out of them, meaning that the resulting ferro-silicon would be of high purity and low in aluminium, giving a premium price. Initial indications are that such an operation could produce ferro-silicon at an exceptionally low cost, perhaps even the lowest of any in the world. The conceptual capacity is around 150,000 tonnes per year initially, which would use approximately 450,000 tonnes per year – more than half the output of carbon-silica tailings from the vanadium treatment plant. This project would be capital intensive and requires know-how of a new industry. The directors would therefore like to develop it in conjunction with an established ferro-silicon producer who knows the technology and can assist with the marketing. This ferro-silicon project is separate from the vanadium project and is not included in the financial analysis in this Competent Person’s Report or any cash flows mentioned.

There are several reasons for anticipating large annual increases in the world demand for vanadium but two are worth noting. Firstly, there is expected to be an increase in the number of countries requiring the use of vanadium-bearing steel for construction purposes – China started to implement it several years ago but further changes to regulations starting in November 2018 are expected to increase demand significantly. India and the CIS countries are expected to follow soon. Secondly, vanadium is already being used for batteries for electrical storage and this use is expected to grow markedly over the coming years. For these reasons, the directors consider that if demand for vanadium increases as some forecasters foresee, particularly if demand for vanadium for flow batteries increases, there is a strong likelihood that a further expansion after Phase 2 of up to around 8Mtpa may be considered.

It is anticipated that planning for the Phase 2 expansion of the Balasausqandiq mine will start as soon as Phase 1 is in operation. Allowing two years for design and construction (with construction to begin after six months of detail engineering), and making allowance for other potential delays, it is expected to come on stream around in the second half of 2023.

GBM concurs with this phased approach and agrees that a phased approach to project development can reduce project risks.

Table 2-1 shows the anticipated timing of the proposed expansions on the assumption that finance is available in a timely fashion.

Table 2-1: Approximate Expansion Timings

Development	Timing
Current processing operations	
Around 144 tpa of vanadium pentoxide equivalent	Already operating
Expansion to 1,500 tpa vanadium pentoxide equivalent	Increasing over the remainder of 2018 until the end of the first quarter of 2020
Phase1 – (1Mtpa)	
Detailed engineering and other preparatory work	Remainder of 2018 and early 2019
Construction	2019 – 2020
Commissioning starts	Late 2020
Phase 2 – (4Mtpa)	
Detailed engineering and other preparatory work	2021
Construction	2022 – 2023
Commissioning	Second half of 2023

2.3 COMPETENT PERSONS

The Competent Person for this report is Tim Daffern B Eng (Mining), MBA, FIMMM, FAusIMM, MCIM, MSME. Tim Daffern is responsible for the entire report. The GBM Competent Person is Tim Daffern and the GMR Competent Person is Roger Rhodes BSc, MSc, MIMMM. Tim Daffern authored Sections 1, 2, 3, 5, 6, 7, 8, 9 and 10. Roger Rhodes authored Section 4. Both contributing Competent Persons have sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity they are undertaking to qualify as Competent Persons as defined in the ”AiM Note for Mining and Oil and Gas Companies (June 2009)”.

Mr Daffern is a mining engineer of approximately 30 years international experience. This experience spans five continents in mining engineering, mine management, as a Director of numerous public and private mining companies and a corporate level technical consultant. Mr Daffern has co-authored over 65 CPR and NI 43 101 documents for IPO, M&A and Due diligence purposes.

Mr Rhodes is an economic geologist in earth resource management, with over 45+ years of mining industry experience world-wide. Since 1988, he has been an independent consultant, and has worked on numerous large-scale projects, for major mining companies, private investors and government agencies, where his expertise in resource modelling and grade estimations have been used for bankable feasibility studies and JORC-based resource evaluations. He also has extensive experience, in auditing and due diligence of mineral resources, QA/QC assessment of sampling procedures and laboratory sample preparation and analyses. Also, he has notable experience in the field of geophysics and geochemistry for mineral exploration. He has written many Competent Person reports for clients and, also, in conjunction with international consultancies.

The Competent Person Tim Daffern confirms he has taken all reasonable care to ensure that the information contained in this Competent Persons' Report is, to the best of their knowledge, in accordance with the facts and contains no omission likely to affect its import.

This report was prepared for Ferro Alloy Resources Limited by GBM Minerals Engineering Consultants Limited (GBM) and Geo Mineral Resources Limited (GMR) in accordance with the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (the "JORC Code"), 2012 Edition.

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The quality of information, conclusions and estimates contained herein is consistent with the level of effort involved in GBM and GMR's services, based on: i) information available at the time of preparation, ii) data supplied by outside sources, and iii) the assumptions, conditions, and qualifications set forth in this report.

This report is intended for use by Ferro Alloy Resources Limited for a prospectus which needs to be approved by the United Kingdom Listing Authority ("UKLA") in connection with a listing on the London Stock Exchange.

The following site visits have been carried out by Roger Rhodes to inspect the project site and verify its characteristics:

- 8 to 11 April 2007: Detailed review of operations with technical staff, including field visits with extensive geological examination of orebody related surface exposures. Collected numerous computerised historical documents and maps, plus translated technical reports. Captured and documented GPS locations of the plant and o/p operations.
- 4 to 7 June 2009: Reviewed open pit field operations, especially grade control channel sampling and results of analyses in relation to the exposed vanadium layers and geological sample maps. Visited numerous historical sample locations from the 1940s. Established analytical requirements for the FAR exploration programme.
- 8 to 11 January 2010: Reviewed progress with technical staff, about diamond drilling, logging, mapping and sampling procedures. Site visits included the new sample preparation laboratory.

- 14 to 20 August 2010: Numerous field visits to review the progress of the FAR exploration diamond drilling programme resulting in upgrading a number of procedures to facilitate quality control. Established a requirement for local co-ordinate system to be very accurately correlated with the historical grid and the UMT (WGS84) system.
- 8 to 11 December 2010: Continued to monitor the exploration programme and to check that the core sampling and sample preparation procedures are to acceptable international standards.

2.3.1 FINANCIAL INTEREST DISCLAIMER

Neither GBM, GMR, nor any of their consultants employed in the preparation of this report, have any beneficial interest in the assets of FAR.

GBM and GMR have been paid fees and will continue to be paid fees for this work in accordance with normal professional consulting practices.

2.3.2 RELIANCE ON OTHERS

The Competent Persons have relied on expert opinions and information provided by FAR pertaining to environmental considerations, taxation matters and legal matters including mineral tenure, surface rights and material contracts.

In addition, the Competent Persons have relied on property ownership data provided by FAR. This information is believed to be essentially complete and correct to the best of the Competent Persons' knowledge and no information has been intentionally withheld that would affect the conclusions made herein. The Competent Persons have not researched the property title or mineral rights for the project and express no legal opinion as to the ownership status of the property.

The Competent Persons have relied on information pertaining to product markets and prices provided by FAR. The Competent Persons have reviewed the information provided by FAR and believes this information to be correct and adequate for use in this report.

For the purposes of Section 9 (Environment) of this report the Competent Persons have relied on information provided by FAR. The Competent Persons have reviewed the information provided by FAR and believe this information to be correct and adequate for use in this report.

For the purposes of Section 10 (Financial Analysis) of this report the Competent Persons have relied on information provided by FAR pertaining to taxation. The Competent Persons have reviewed the taxation information provided and believes it to be correct and adequate for use in this report.

SECTION 3 PROJECT DETAILS

3.1 LOCATION

The Balasausqandiq deposit is located in Kazakhstan on the north-eastern slope of a ridge forming the north-western part of the Great Karatau Range. The current processing operation and associated facilities are located on a gently inclined alluvial plain to the south of the ridge.

Administratively the site is situated in the Schieliiskiy Region of the Kyzylorda Oblast of southern Kazakhstan, as shown in Figure 3-1.

Figure 3-1: Location of the Balasausqandiq Deposit in Southern Kazakhstan

The nearest centre of population is the Aksumbe village situated approximately 18 km from the proposed mine (23 km from the current operations) and within the neighbouring Oblast (see Figure 3-2).

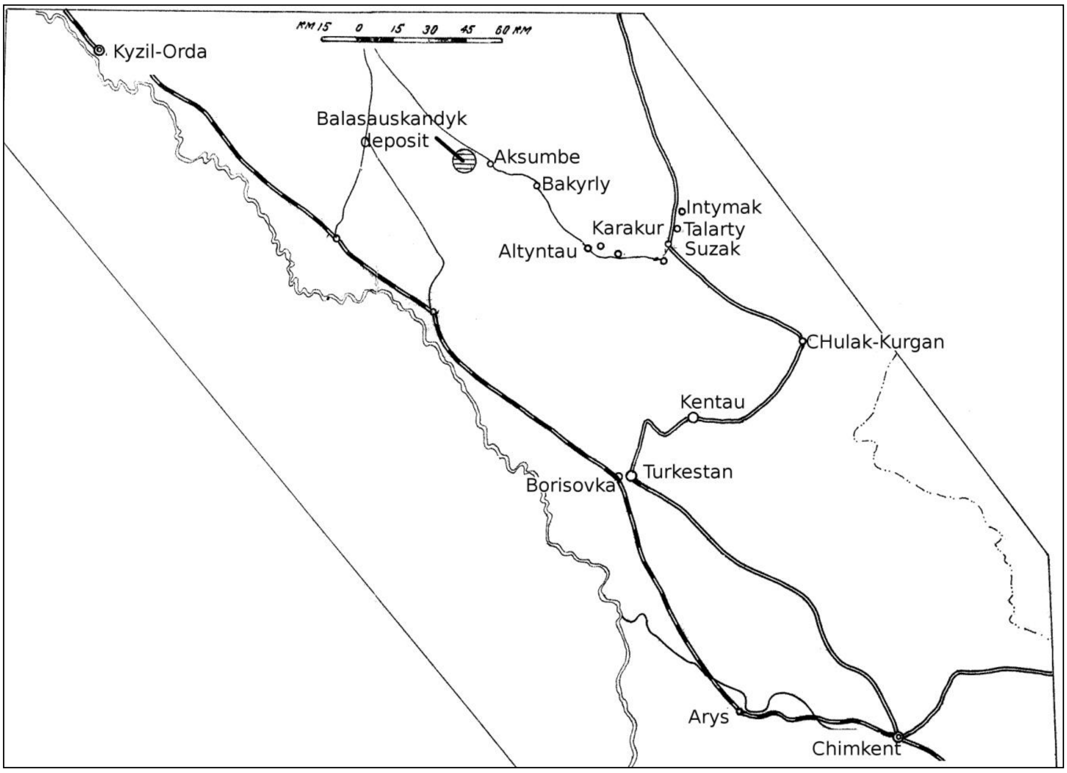


Figure 3-2: **Location of Balasausqandiq in the Schieliiskiy Region of the Kyzylorda Oblast**

3.2 ACCESS

Access to the site is via an 800-metre graded and gravelled track, from a larger surfaced road maintained by KazAtomProm to Shieli (refer to Figure 3-3) approximately 70 km from the project site. Shieli is approximately 120 km from Kyzylorda along the main Kyzylorda-Shymkent highway. Total driving time from Shieli to the deposit is around one hour, depending on weather conditions. Shieli is the nearest railway station to the site. The nearest domestic airport is located in Kyzylorda, while the main international airports are in Almaty and Astana, approximately 850 km and 1,000 km respectively from Shieli.

Figure 3-3: Access Road from Shieli

3.3 TOPOGRAPHY AND CLIMATE

The Karatau ridge extends in the north-western direction. Its general structure is apparently asymmetric with a steeper north-eastern and flatter south-western slope. Figure 3-4 shows the typical topography and scenery adjacent to the mine site.

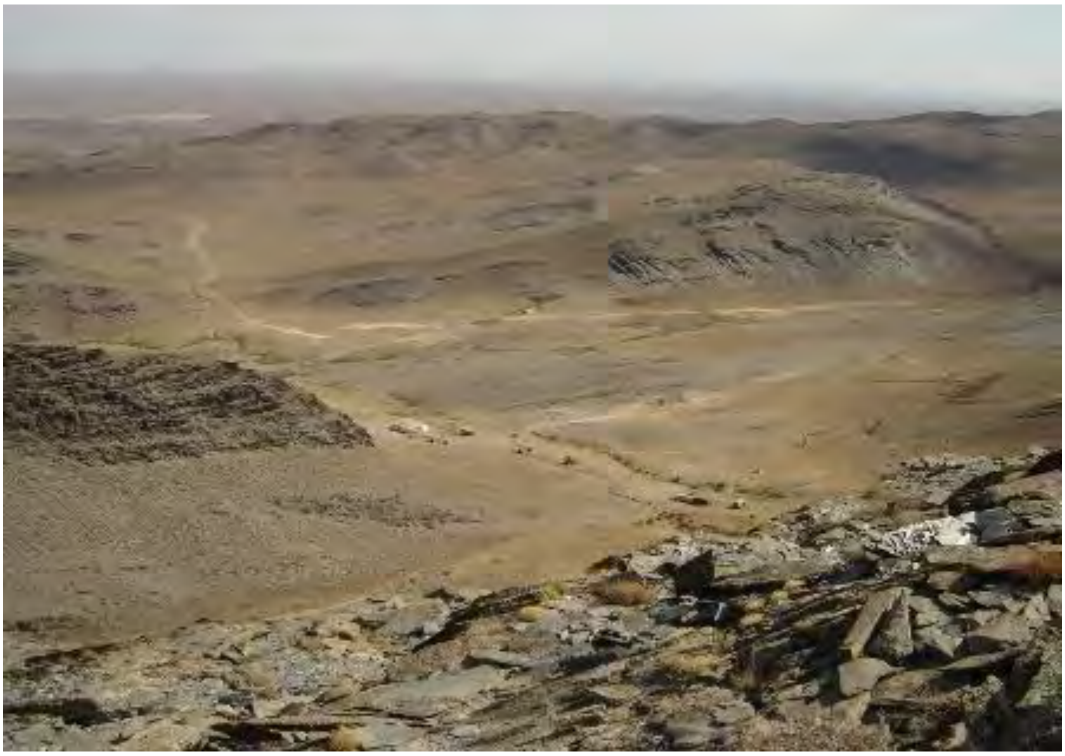


Figure 3-4: Typical Topography at the Current Operation

The Karatau mountain range, situated north of the central course of the 2,200 km Syr Darya river, is a tectonic uplift to 1,500 m that occurred 1.5-1 million years ago. The deposit, including FAR's open pit operations, is located within a ridge of hills (Karatau mountains). In this part of the mountain range, elevations vary from 400 m to 700 m and are composed of a series of SE-NW trending ridges which are interspersed by cross-cutting valleys with dominant drainage patterns to a low lying basin in the NE (Chu Sarysu Basin).

The climate in the area is typically sharp continental, with a hot, dry and prolonged summer with temperatures commonly exceeding 40 °C. The average summer temperature is approximately 36 °C. Daily temperature fluctuations of 16 – 18°C are common.

The winter is relatively short with little snow. Snow cover can be observed from late November until late March. Ground frost permeation during the winter is approximately 0.3 to 0.4 m, the coldest month being January, with an average temperature of -6.9°C, but capable of reaching as low as -25°C.

The site is accessible year round, although it is reported that on certain days when the prevailing wind blow is high, there is snow on the ground and the temperature is at the minimum, access is limited. Such days are rare, at less than 1 in 100 likelihood.

The winds in the area are strong and frequent with a prevailing north, northeast and northwest direction. According to the data provided by the Shieli weather station, the total number of days per year with no discernible wind amount to only 14.3 %. The average wind speed is 3.2 m per second, but can reach 20 – 25 m per second.

Annual precipitation in the northern slopes of the Great Karatau Range totals approximately 151 mm, according to the data provided by the Suzak weather station. The annual precipitation in the southern area of the range is around 417 mm a year, according to the Shieli weather station. Actual precipitation or evaporation rates for the site are not known.

3.4 INFRASTRUCTURE

The current mine has infrastructure sufficient for operating the existing processing plant, which comprises small-scale processing, including temporary sedimentation and water storage facilities, and the crushing of mine waste to a marketable aggregate product. Output from current small-scale mining activities is stockpiled for future mineral processing. The current infrastructure includes the administrative office, assay laboratory, security building and nearby mine camp accommodation facilities.

The infrastructure required for the proposed expansion is described in Section 8.

3.5 MINERAL RIGHTS AND PERMITTING

Mining operations are permitted under the provisions of a ‘Subsoil Usage’ Licence (MG No. 1278 D), which encompasses an allocated area of 1.176 km^2. This licence was granted by the Government of the Republic of Kazakhstan in 1998 and allowed for a mining extraction rate of 500,000tpa. It was initially valid for 25 years but changes in law followed by appropriate permitting obtained by TFB have had the effect of extending this to at least 2043 and it can be further extended when required. A new Subsoil Code came into effect in July 2018 and under the terms of this code an application for further changes has been made with a revised schedule of extraction of 1Mtpa until 2043. This has been approved by the Expert Commission set up by the Ministry of Investment & Development and a Protocol of the Working Group of the same ministry has made recommendations and comments, all of which the Company has complied with. The Company is now awaiting the final Protocol of the Working Group whereupon the Ministry of Investment & Development will sign the appropriate addendum to the subsoil use agreement,

The site boundary of the concession area where extraction of the vanadium ores will be allowed covers an area of about 54 km^2.

The coordinates of the site boundary are detailed in Table 3-1, and are depicted in yellow on the Google Earth Map in Figure 3-5. It covers most of the known vanadium mineralisation in the immediate area, but from historical mapping and sampling, the OB5 vanadium mineralisation continues beyond the boundary area to the north-west, along the geological strike. However, it is understood that for any future mining of this orebody, an extension of this exploitation licence is allowable using the well-known principle of ‘extralateral rights’.

Table 3-1: Site Boundary Coordinates

Point #	Northing	Easting
1	44º31’30”	67º20’10”
2	44º32’40”	67º22’30”
3	44º31’00”	67º26’30”
4	44º29’00”	67º29’00”
5	44º27’20”	67º25’00”

Note: This site boundary area does not include the pilot plant and ancillary infrastructures, but these are covered by individual land title certificates, including the administration offices at Shieli (65 km SW of Balausa) and were issued between 2006 and 2007.

The mining allotment covers approximately 19.2 km^2 and gives the right to mine 500,000tpa according to the approved plan for the period up to 2043 within the coordinates listed in Table 3-2 and as depicted in red on the Google Earth Map in Figure 3-5. The mining rate will be increased to 1 million tpa upon signing of the addendum described above and in 2021 FAR plans to make an application to increase the mining rate further to 4 million tpa.

Table 3-2: New Mining Allotment Coordinates

Point #	Northing	Easting
1	44°32’45”	67°19’30”
2	44°32’5”	67°21’2”
3	44°32’26”	67°21’31”
4	44°32’14”	67°21’49”
5	44°31’54”	67°22’22”
6	44°31’28”	67°23’4”
7	44°31’8”	67°23’33”
8	44°30’46”	67°24’7”
9	44°30’24”	67°24’35”
10	44°29’48”	67°25’18”
11	44°29’30”	67°25’36”
12	44°29’2”	67°24’28”
13	44°26’40”	67°25’38”
14	44°26’32”	67°25’14”
15	44°29’26”	67°23’35”

Point #	Northing	Easting
16	44°30'28"	67°22'18"
17	44°31'7"	67°21'50"
18	44°32'34"	67°19'15"

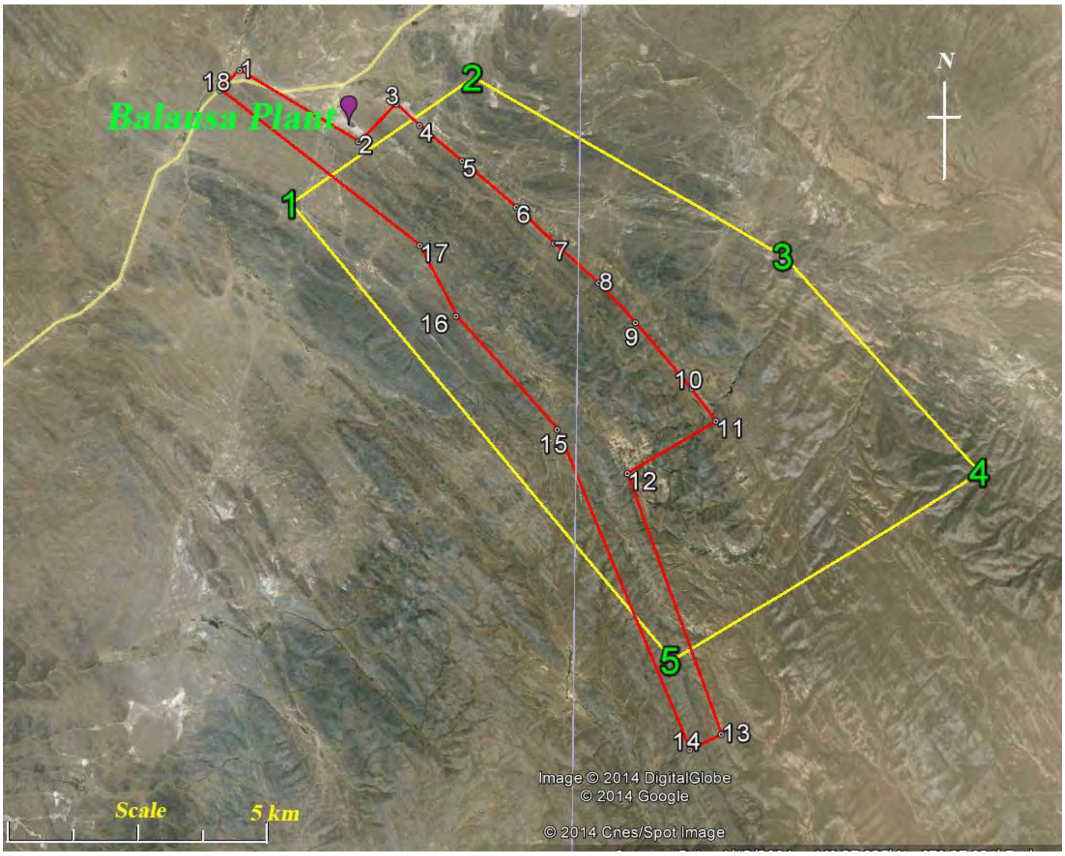


Figure 3-5: Aerial Image of the Site Boundary (yellow) and Mining Allotment

SECTION 4 MINERAL RESOURCE ESTIMATION

4.1 INTRODUCTION

GMR was commissioned by FAR in 2007 to provide on-going technical expertise in mineral resource evaluation, including geological and exploration support, to enable proper assessment of the Balasausqandiq deposit according to acceptable international standards. This diligent approach has consequently allowed the reporting of resources in accordance with the internationally recognised JORC (2012) Code guidelines. In addition, FAR is obliged to report reserves under the officially approved GKZ (Kazakhstan's State Commission on Mineral Reserves).

4.1.1 JORC MINERAL RESOURCES

FAR's drillhole exploration programme, 2010 to 2011, of the primary mineralization at depth was designed to allow JORC "Indicated" resources within ore bodies OB1 and OB2, with an additional option to evaluate OB3 and OB4 for an "Inferred" JORC resource category. However, only sufficient drilling was completed by FAR for orebody OB1 to be classified a JORC-(2012) based resource. Thus this JORC-defined resource estimation is confined only to OB1, where the total resource is smaller than the official GKZ reserves which include variably defined ore portions from ore bodies OB1 to OB5. However, under the JORC (2012) Code, it has been possible to apply JORC-based exploration resource target figures for OB2 to OB5, where additional drilling will allow upgrading to "Indicated" and "Inferred" accordingly. Note: metal equivalents were generated for OB1, as based on the contribution from the by-products of C, MoO_3, U_3O_8 within the primary resource. The method of calculation was to take the sales value derived in the financial model from each product and ascribe to it a vanadium pentoxide equivalent grade equal to the proportion that sales revenue bears to the revenue from vanadium pentoxide. All products are derived from the same process so no allowance was made for differential processing costs.

GKZ Mineral Reserves

There is an approximate relationship between JORC (2012) and the GKZ resources, where JORC "Indicated" is approximate to the GKZ "C1" category and JORC "Inferred" (± JORC exploration) is equivalent to the GKZ "C2" category.

Note that the GKZ reserve (Table 4-68) is historically based and confined to a limited depth of mineralisation with no differentiation between the surface oxide zone and the deeper primary ores. This depth limitation is the main reason for the smaller GKZ resource estimate when compared with the combined JORC "Indicated" (OB1) and JORC based exploration targets (OB2 to OB5). It is therefore a reasonable expectation that the size of the GKZ resource will increase when these ore bodies have been explored to full depth. Test-work has indicated that primary and oxide ores are amenable to the same treatment process, so the lack of a distinction on the GKZ basis does not present any difficulty in the Kazakhstan regulatory environment.

4.1.2 RESOURCE ESTIMATION TARGET

The specific target for this JORC (2012) mineral resource estimate has been confined to OB1, which is one of a number of extensive but separate synclinal-type folded vanadium orebody structures. Historically, these target zones were split and classified according to seven exploration blocks in the 1940s. The historical documentation continually refers to these exploration blocks, plus or minus the actual designated number for each orebody:

- Exploration blocks 1 and 2 refer to orebody 1 (OB1)
- Exploration block 3 refers to orebody 2 (OB2)
- Exploration block 4 refers to orebody 3 (OB3)
- Exploration block 5 refers to orebody 4 (OB4)
- Exploration block 6 refers to orebody 5 (OB5)

With reference to exploration block 7, there appears to be uncertainty as to its location, and therefore this mineralised zone could not be assessed by GMR in determining the JORC-(2012) based exploration resource target figures.

4.1.3 SUMMARY TABLES OF JORC-(2012) BASED RESOURCES, EXPLORATION TARGETS AND RESERVES

A summary of the OB1 JORC (2012) mineral resources is provided in Table 4-1, while Table 4-2 and Table 4-3 summarise the JORC-(2012) based exploration target figures for OB2 to OB5 for V_2O_5 and by-products, respectively. Table 4-4 summarises the JORC (2012) reserves.

Table 4-1: Schedule of Mineral Resources, JORC (2012)

JORC Vanadium Resource OB1				By-Products OB1 (primary ore only)						
				JORC indicated		JORC inferred				
JORC Class	V_2O_5 % Cut-off	V_2O_5 % Mean	Tonnes [m]	C% Mean	Tonnes [m]	C% Mean	Tonnes [m]	Total C% Mean	JORC inferred MoO_3 % mean	JORC inferred U_3O_8 % mean
Indicated	0.0	0.67	21.43	14.08	10.68	13.09	10.75	13.59	0.0300	0.0090
Inferred	0.0	0.67	1.56			13.43	1.56	13.43	0.0297	0.0085
Combined	0.0	0.67	22.99					13.58	0.0300	0.0090
Oxide cap inferred	0.0	0.89	1.33							
Total	**0.0**	**0.68**	**24.32**							

Table 4-2: JORC Based Exploration Target (JORC 2012 Guidelines)

Orebodies 2 to 5	Strike Length (km)	Tonnes [m]		V_2O_5 Grade Range [%]	
		From	To	From	To
Primary Zone	20.9	73	98	0.65	0.71
Oxide-Zone		4.25	5.75	0.85	0.98
Combined		77.3	103.8	0.66	0.72

Table 4-3: JORC Based Exploration Target (JORC 2012 Guidelines) - By-Products applied to all Ore Bodies 2 to 5 (Primary Zone Only)

Target	Global Grades based on OB1	Grade Range ± 5 %	
		From	To
Carbon	13.58 %	12.9	14.26
MoO_3	0.030 %	0.029	0.032
U_3O_8	0.009 %	0.009	0.009
REM	335 ppm	318	352
Total Tonnes (millions)		73	98

4.2 EXPLORATION

4.2.1 1940-1947

Since vanadium was first discovered in the north western part of the Karatau ridge in 1940, continual surface prospecting and evaluation activity in the area resulted in a preliminary exploration of the Balasausqandiq deposit in 1942 and detailed systematic exploration of the Balausa region from 1943 to 1947, with a break in 1945.

The 1943 to 1946 exploration episode covered a vast area but specifically focussed at the Balasausqandiq deposit, led by S.G. Ankinovich et al, though it was only confined to the upper horizons of the mineralisation, with sampling of the orebodies restricted to mainly a series of surface trenches (typically spaced from 50 to 100 m along the geological strike, though at 800 m along OB5), with assessment and sampling support from vertical pits, adits and short shafts with underground drives and cross-cuts. Sampling of the mineralisation in underground exposures only reached a maximum depth of 30 m below surface and was generally restricted from 10 m to 20 m. However, two unsuccessful experimental drillholes resulted in low core recoveries of only 10 % to 20 %, and so it was not possible to properly assess the characteristics of the primary mineralisation below the influence of the surface oxidation processes.

A summary of the works conducted by S.G. Ankinovich from 1941 to 1947 are given in Table 4-4.

Table 4-4: Summary of the works conducted by S.G. Ankinovich from 1941 to 1947

Description of Works	Total Volume of Works
Core drilling unsuccessful (only 15 to 20 % core recovery)	158.0 linear metres
Exploration shafts	140.0 linear metres
Adits	212.0 linear metres
Cross-cuts and drives	239.9 linear metres
Shallow pits up to 10 m	334.6 linear metres
Open pit extraction	897.0 m^3

4.2.1.1 SAMPLING OF OXIDE AND PRIMARY ZONES

This early prospecting work on the deposit had exposed and sampled oxide ores in some detail, however at depth, details of grade, thickness of ore zone and amenability to beneficiation of the primary ores, which account for 95 % of all potential resources, remained unknown. At a depth of 30 m below surface, the ore zone had been exposed by only two workings (crosscuts from shafts 2 and 4). The other six shafts and five adits with crosscuts intersected the ore horizon at a depth range of only 15 to 20 m below surface, which clearly lies in the oxide or transition zone only.

Chemical assays performed on the vanadium ore samples revealed minor uranium content with average grade values ranging from 0.006 to 0.015 %. Uranium mineralisation is unevenly distributed, and was shown to be normally associated with the upper part of the oxidation zone within the vanadium-bearing strata. This unit is thought to be enriched in uranium due to its migration from deeper horizons and subsequent adsorption by iron hydroxides.

4.2.2 1949-1969 AKINTOVITCH

Further work was conducted on the deposit from 1949 and included the following:

- E.A. Ankinovich described 148 minerals, including a few previously unknown species.
- The same year a geologic map of Karatau was issued (Scale 1:200,000), summarising many years of geological exploration.
- In 1952-1953 surveys of the vanadium-bearing strata were resumed.
- In 1961 S.G.Ankinovich published a comprehensive geological analysis of north-western Karatau.
- In 1959-1961 surveys for rare-earth metals (REE) mineralisation was conducted on the vanadium-bearing shales of Karatau. The report was issued in 1963.
- In 1961, the Balasausqandiq deposit was surveyed by three reconnaissance lines with a spacing of 2,050 to 2,650 m. The reconnaissance lines exposed the mid part and the flanks of the deposit. Additional surveys were undertaken on the north-western flank of the deposit (in Block 4) every 3,250 to 3,300 m. In total 15 trenches were cleared and deepened for

sampling including the crosscut running from Adit No. 1. A total of 198 samples were collected from the cleared workings, including 13 samples of primary ores, one sample from the siliceous overburden of the primary ores, 16 samples from the top siliceous section of oxidised ores, 13 samples from the siliceous soil of the oxidised ore and 155 samples from the base of oxidised ore.

- Field surveys were conducted during 1960 and 1962 (Scale 1:50,000 and 1:200,000) to update the geological map of the entire north-western part of the Karatau mountain ridge within the limits of the vanadium-bearing basin.
- Surveys were conducted during 1966-1968 by Kazakh Polytechnic institute, under the guidance of S.G. Ankinovich, which explored underlying rocks beneath the vanadium-bearing horizon where high grades of silicon dioxide have been defined. The results of this work were summarised in 1969 by T.M. Alzhanov.

4.2.3 1972-1973 KOMARNITSKI

4.2.3.1 DRILLING OF PRIMARY MINERALISATION

During 1972 and 1973 15 coring drillholes were concluded, totalling 1,744 linear metres, within the primary mineralised zones beneath the oxide cap, together with an additional 22 new surface trenches and re-sampling of 17 trenches from the 1940s. Table 4-5 summarises these exploration activities.

Table 4-5: Summary of Works 1972 to 1973

Operation	Unit	Scope of Work	
		Designed	Actual
Core Drilling	m	1,630.0	1,744.0
Trenches	m^3	1,370.0	1,411.5

Drillholes Nos. 1 and 7 (OB1) were later re-drilled in 1972, due to poor core recovery, but the re-drill of No. 7 was much lower than that from the initial hole. From this 1972-73 drilling programme, low core recovery was reported and it is a critical quality control issue, but the statistics do not display any obvious bias trends between core loss and vanadium grade levels, and this supports the 1973 Komarnitski report's conclusion, after exhaustive tests on artificially induced core losses. Although this drillhole No. 7 had a core recovery of only 29 %, probably due to very soft amorphous carbon content, the intersected V_2O_5 % grade is relatively high at 0.71 % - FAR's nearest drillhole (B313) is only 25 m away and the intersecting grade is also high at 0.91 % V_2O_5. It is also interesting that there is a core recovery improvement trend with successive drillholes and culminates in acceptable core recoveries at over 90 % for the later drillholes.

Particular emphasis was placed on prospecting the NE limb of OB1, with seven drillholes. Here one drillhole was positioned on each of the five prospecting gridlines (0-4). The SW limb of OB1 was intersected by two drillholes (Nos. 2 and 14) located on survey grid lines 1 and 4.

The large OB2 was intersected on the NE limb by only three drillholes (Nos. 8, 9, 12) located on exploration grid lines 4, 5 and 7, and the SW limb by only two boreholes (Nos. 4 & 10) at exploration grid line 4.

The north-eastern limb of OB3 was intersected at depth by two drillholes (Nos. 6 & 13) located on survey grid lines 4 and 6. No drillholes intersected the SW limb of this synclinal structure.

4.2.3.2 SURFACE OXIDE SAMPLING

Surface trenches were sampled by a continuous channel with a 5 x 10 cm cross-section. In rare cases, when it was necessary to sensitively test smaller intervals (0.2 to 0.30 m) the trench cross-section was increased to 10 x 20 cm.

In total, 1,808 trench and core samples were taken. Core and trench samples were prepared in a similar manner (crushing, grinding and pulverisation) and assayed at the Central Laboratory of the South Kazakhstan Geological Department for the following components: SiO_2; V_2O_5; C; Al_2O_3; P_2O_5: Fe_2O_3; TiO_2: H_2O. One part of the sample was additionally analysed and tested for CaO and Mg content. In addition, comprehensive spectral semi-quantitative analysis was done for all lab samples.

The total number of samples taken for spectral assays was dependent on the overall thickness of the tested layer; for thicker layers more than one sample was taken. Each of the thin intercalations was defined by one sample only. Chip samples for spectral analysis were taken at the intervals ranging from 10 to 20 cm (depending on the layer thickness) with subsequent compositing of them into one sample over intervals ranging from 0.5 to 5.0 m, but normally 1.5 to 2.0 m.

To test the physical properties of the ores and host rocks, samples were taken to measure the bulk volume density, true density, porosity and water absorption capacity.

4.2.4 1990-1992 TASHKENT INSTITUTE

In 2010, FAR discovered that a major exploration programme was completed during the period from 1990 to 1991, by the Tashkent Research and Development Institute, but no detailed information has been obtained. However, in a 1992 summary report, it stated that 95 diamond drillholes were completed totalling 6,400 linear metres, plus 20 surface trenches. The drilling was designed to target the primary mineralisation at depth: this included 38 drillholes for OB1 and 22 drillholes for OB2 and OB3. The depth of the drillholes ranged from 20 to 205 metres. The ore intersections targeted 10-20 m depth intervals, along the dip of the orebodies, from surface to a depth of 80 m and targeted overall depths from 80-140 m. The NE limb drilling of OB1 targeted the vanadium layer to its deepest levels, based on a grid network of 400x40x20 m. The results essentially confirmed the vanadium pentoxide grade trends for the primary zone, as reported in the 1973 feasibility report by Komarnitski.

4.2.5 2010-2011 FAR'S DIAMOND DRILLING PROGRAMME

GMR prepared a proposed drilling programme for FAR which was submitted in 2009, and included QA/QC issues (discussed in Section 4.5.2). A summary of the proposed drilling programme is shown in Table 4-6.

Table 4-6: Drilling Proposal Summary

Ore Body	Number of Holes	Total m	Average metres per hole	JORC target
1	13	1,621	125	Indicated
2	23	3,727	162	Indicated
3	9	1,209	134	Inferred
4	3	461	154	Inferred
Total	48	7,018	146	

Initially, only alternate exploration profiles were to be drilled and, based on the assessment of the vanadium grades and structural behaviour of the vanadium layer, final decisions were made as to the optimum spacing for achieving the resource objectives.

Ideally, it would have been conducive to have planned the drillhole programme for rigs having the capability of drilling up to -45 degrees, so as to maximise target objectives with the least number of holes and to allow a more orthogonal angle of penetration with the ore layers. Unfortunately, the only drill rigs available had a drilling angle of up to -60 degrees from the horizontal and these steeper angles may induce the drill string to deflect along sub-vertical bedding and therefore be more difficult to intersect the vanadium layer. Additionally, only a double-tube core barrel was available from the contractor but with a guarantee of at least 90 % core recovery within the ore horizons. The minimum core size was NQ (47.3 mm), and HQ (63.5 mm) core size drilling would be particularly used for targeting and collecting geotechnical and metallurgical core samples as part of a later but separate drilling programme.

A summary of the actual drilling programme undertaken in 2010 and 2011 is shown in Table 4-7.

Table 4-7: Summary of Drillholes Completed

Number of Drillholes Completed	Metres Drilled	Orebody #
24	1,945.4	OB1
7	931.6	OB2
3	387.2	OB3
0	0	OB4
Total	3,264.2	

Although only 13 drillholes were proposed initially for OB1, as seven acceptable historical drillholes were already available, the FAR drilling was expanded and resulted in a total of 21 successful drillholes, plus three drillholes which failed to intersect the orebody. The additional drillholes were mainly completed at intermediate drilling profiles, to confirm the continuity, structure and grade tenor of the vanadium layer. The results are shown below in Table 4-8.

Table 4-8: FAR Drilling Summary Results for OB1

Drillhole ID	OB	Profile	EOH Depth [m]	V_2O_5%	Length [m]	True Thick [m]	Comments
B110	1	0	72.8				Missed orebody
B111	1	1	64				Missed orebody
B112	1	2	92.4	0.76	20.7	12	
B112_5	1	2.5	35	0.63	12	7	
B113	1	3	48.1	0.61	6.4	3	
B113_5	1	3.5	105.5	0.66	2.9	2.9	
B114	1	4	62.5	0.73	13.6	10	
B115	1	5	71	0.5	19	?	Nose of syncline
B211	1	1	124.6	0.66	3.5	?	Complex structure
B212	1	2	102.9				Missed orebody
B212_5	1	2.5	73.6	0.67	22.2	10	
B213	1	3	126.2	0.65	25	13	
B213_5	1	3.5	74.1	0.7	13	8	
B214	1	4	76.8	0.71	8	7	
B215	1	5	50	0.68	10.3	10	
B311_bis	1	1	66.2	0.61	11.5	5.7	
B312	1	2	66	0.56	16.5	12	
B312_5	1	2.5	36	0.63	12.5	8.5	
B313	1	3	67.6	0.91	13.2	10	
B313_5	1	3.5	118.8	0.73	24.5	13	
B314	1	4	149	0.68	31.7	30	Syncline axis
B315	1	5	50.8	0.83	29.2	35	Complex syncline nose
B412	1	2	134.3	0.65	10.2	8	SW limb
B412	1	2	134.3	0.7	8.3	8	NE limb
B412_5	1	2.5	77.2	0.63	19.3	11	

For OB2, a total of 23 drillholes were proposed, though only seven holes have been completed at the date of this report, of which two drillholes missed the orebody. These results are shown below in Table 4-9.

Table 4-9: FAR Drilling Summary Results for OB2

Drillhole ID	OB	Profile	EOH Depth [m]	Comments
B124	2	4	73	Missed orebody
B125	2	5	88.4	
B224	2	4	142	Missed orebody
B225	2	5	94.3	
B324	2	4	111.2	
B325	2	5	231	
B425	2	5	191.7	

For OB3, a total of only nine drillholes was proposed, though only three holes have been completed at the date of this report. The results of this FAR drilling for OB3 suggest that structural re-interpretation of the vanadium layer is required, before continuing the exploration programme, and this will also apply for OB2. This will not affect the expected global grades and tonnages, but is necessary to optimise the drilling targets. The results are shown below in Table 4-10.

Table 4-10: FAR Drilling Summary Results for OB3

Drillhole ID	OB	Profile	EOH Depth [m]	Comments
B135	3	5	93.0	Intersected ore zones need further structural interpretation
B235	3	5	114.0	
B335	3	5	180.2	

The next phase of the FAR drilling will specifically target OB3 and OB4, with OB2 being deferred to a later phase.

4.3 HISTORICAL RESOURCES AND RESERVES

4.3.1 1947 RESERVES (GKZ DEFINITION)

After its discovery in 1941, the Kazakhstan Geological Survey undertook extensive high quality resource appraisal between 1942 and 1947. From extensive sampling along a 40 km strike length of the mineralised structure, Soviet-type reserves were estimated in 1943, 1945 and 1947, into B, C1 and C2 categories. This also included comprehensive large bulk sampling in the 1950s and they reached the following conclusions:

- Consistent chemical composition in the ore zones.
- Vanadium grades are regular in the ore horizons and this also applies to uranium and molybdenum grades.
- Carbon may vary in grade more frequently and depends on the type of ore horizon. Carbon grades average 2.69 % in the oxide layer (mean depth 8 to 10 m) and 4.40 % in the primary horizons.
- Additional bulk sampling in the 1950s show that carbon grades can reach levels of 25 % within the ore layers.
- Carbon morphologically is represented by lenses, pockets and irregular shapes, and therefore tends to be more unequally distributed than other commercial minerals.
- Higher vanadium grades tend to have higher carbon concentrations.
- In the oxide zone, carbon concentrations are directly dependent on the degree of oxidation.

The Balausa vanadium GKZ reserves based on the 1947 published former Soviet-era type resources are displayed in Table 4-11.

Table 4-11: Official 1947 Reserve (GKZ) Summary

Category	Reserve [1000 t]	Mean grade V_2O_5 [%]	Contained V_2O_5 [t]
B	5,700	1.09	62,992
C1	13,500	1.08	146,076
C2	53,800	1.04	558,715
B+C1+C2	73,000	1.05	766,783

Under the former Soviet system, the deposit was declared a Group II (geologically uncomplicated) and for this relatively low complexity, it would be required that at least 20 % of the resource must be category B and 80 % as category C1, for mineral exploitation. Under these guidelines, it was assessed by Ankinovich et al, that for the vanadium classification, cross-section profiles for sampling should be spaced at 50 m to 100 m along strike (but ≤50 m for uranium) for each synclinal limb, and for the C1 category 400 m spacing would be required. In addition, for any declared C2 resource category, it would be sufficient to have an average spacing of 800 m along strike.

An example of a 1:500 scale drawing from the 1945 estimation is shown in Figure 4-1. A number of profile blocks for the NE limb of OB1 are displayed, and the construction of the B, C1 and C2 classification blocks in relation to surface trenches and underground exposures can be seen. The format basically allowed the projection of B category reserves on each profile from surface to a depth of the underground ore exposures and, where only trench data available, this was projected to the depth of the nearest adjacent underground level. The C1 category zones were projected as contiguous extensions downdip from the B blocks to a vertical depth of 20 m below and, underneath, the C2 blocks projected to depths ranging from another 20 m to 40 m, below the C1 zones. The outlined blocks were projected half-way to adjacent profiles, for volume determinations. For the 1947 reserves, it appears that the projection of the C2 resource at depth was much greater than in 1945, ranging from 200 to 400 m.

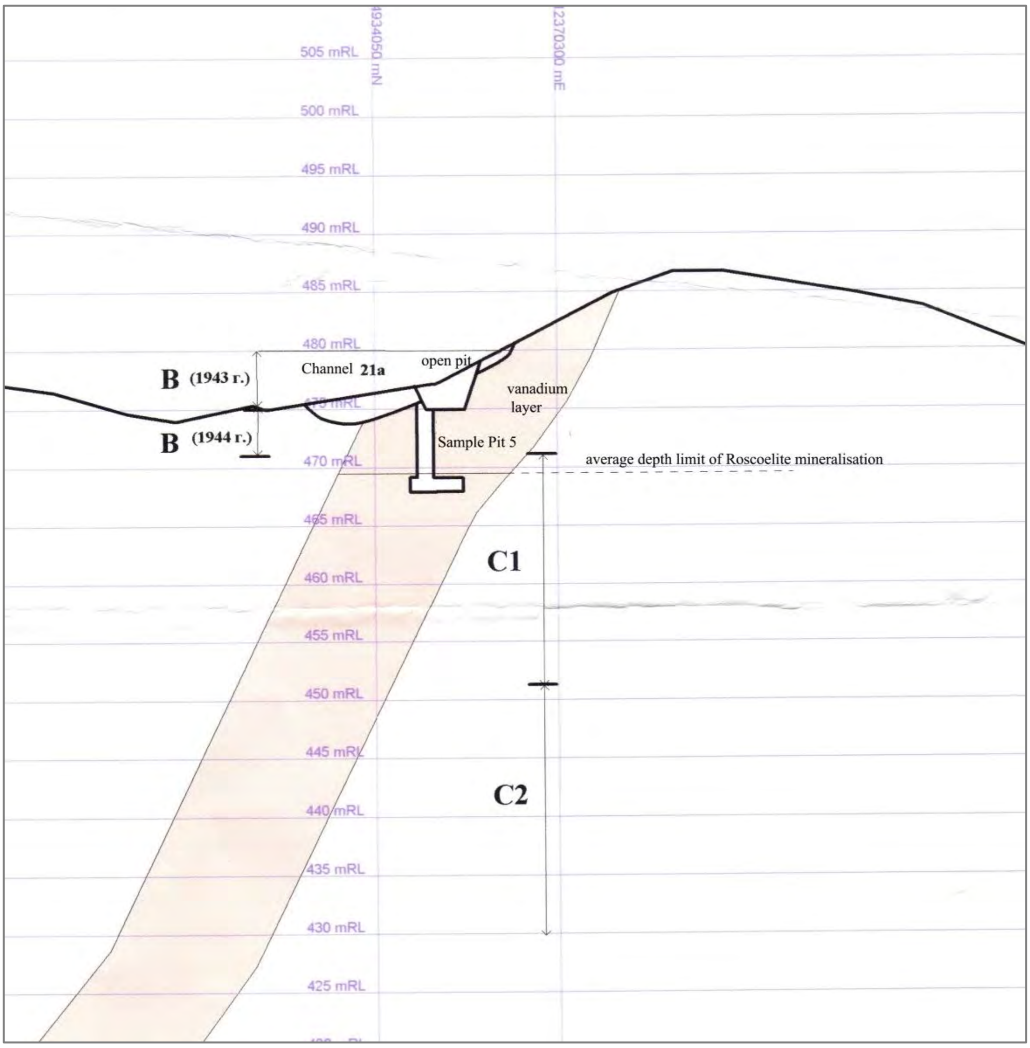


Figure 4-1: Example of a Reserve Block for NE Limb OB 1 - 1945 (Cross-Section Between Profiles 1 and 2).

Table 4-12 summarises the 1947 vanadium reserves. Although uranium reserves were also produced, the grades were low and considered as sub-economic in 1946 and have not been specifically assessed for this review. The former Soviet Union used very low uranium cut-off grades at 0.03 % U and 0.01 % for in situ leaching. It should be noted that uranium, molybdenum, rare earths and organic carbon are expected to be produced as by-products from the processing plant. The ore types are split into oxide and primary horizons and generally this appears to be based on some assumed level below the surface at which the oxide mineralisation becomes primary, as indicated by the decreasing abundance of the vanadium roscoelite mineral with depth. Ankinovich observed that roscoelite is abundant in the underground exposures, and this contrasts with the core material from two failed drillholes which contained insignificant amounts at depths at 80 m to 90 m. However, as an example, OB4 mineralisation was exposed mostly by surface trenches and only one shallow pit, and it is unclear as to how the oxide and primary zones could be confidently delineated for ore reserve estimations.

Table 4-12: 1947 Vanadium Pentoxide Ore Body Reserve Summary

	Category B		Category C1		Category C2		Category B+C1+C2	
	Tonnes	V_2O_5%	Tonnes	V_2O_5%	Tonnes	V_2O_5%	Tonnes	V_2O_5%
OB1								
Oxide	258,212	0.98	148,194.6	0.97	40,953	0.81	447,359	0.96
Primary	465,669	1.01	749,437	0.98	891,912	0.98	2,107,018	0.98
Total	723,881	1.00	897,631.6	0.97	932,865	0.97	2,554,378	0.98
OB2								
Oxide	581,100	1.10	0	0.00	0	0.00	581,100	1.10
Primary	1,655,688	1.11	5,425,901	1.10	6,504,416	1.10	13,586,005	1.10
Total	2,236,789	1.11	5,425,901	1.10	6,504,416	1.10	14,167,105	1.10
OB3								
Oxide	369,330	1.04	210,956	1.08	354,195	1.07	934,481	1.06
Primary	532,033	1.03	2,653,774	1.05	3,222,492	1.05	6,408,299	1.05
Total	901,363	1.03	2,864,730	1.05	3,576,687	1.05	7,342,780	1.05
OB4								
Oxide	324,452	1.18	0	0.00	0	0.00	324,452	1.18
Primary	705,416	1.21	2,186,809	1.13	1,203,846	1.11	4,096,072	1.14
Total	1,029,868	1.20	2,363,519	1.13	1,683,314	1.12	5,076,701	1.14
Totals								
Oxide	1,533,095	1.09	359,150.2	1.03	395,148	1.04	2,287,393	1.07
Primary	3,358,806	1.10	11,015,922	1.09	11,822,666	1.08	26,197,394	1.08
Total	4,891,901	1.10	11,375,072	1.09	12,217,814	1.08	28,484,786	1.08

Note: this OB1 reserve tonnage is only about 10 % of the JORC (2012) resource model, though the V_2O_5 % grade is higher, because of scant knowledge of grades within the primary zone.

Table 4-12 above is based on detailed historical estimations for individual blocks. Surprisingly, the reported overall global resource tonnage, as based on the extent of exploration for the whole of the Balasausqandiq deposit (see Table 4-13), as submitted to the GKZ (State Reserves Committee) in 1947, totalled 73 million tonnes at a 1.05 % V_2O_5 grade, though GMR has not seen any detailed orebody resource inventory to substantiate these figures. However, these reserves were declared as “off-balance” (i.e. not ready for exploitation but potentially economic) because of a shortfall in the understanding of the deposit, especially due to inadequate exploration within the primary zone of mineralisation at depth. This same reserve figure of 73 million tonnes, was re-confirmed by the GKZ on 1 January 1997: (see Table 4-14) but most of this reserve V_2O_5 grade was based on the oxide surface trench sampling and shallow underground exposures, and it is this vanadium grade tenor, within the oxide/transition zone, which had also been applied to the primary zone mineralisation at depth, because erroneously Ankinovich assumed that the oxide and primary zones had similar vanadium grades.

Table 4-13: Reserves as of 01.01.1947

Category	Ore Type	Ore Reserves Ktonnes	Ore grade (%)		Metal reserves		Remarks
			V_2O_5	Uranium	V_2O_5 Tonnes	Uranium tonnes	
B	OO	1,676.7	1.09	0.0012	18,335.7	193.3	OO = oxidized ore
	PO	4,010.7	1.09	0.0011	43,782.4	456.0	PO = primary ore
	Total	5,687.7	1.09	0.0011	62,118.1	649.3	Note: a conversion factor was used for the uranium grade in the ore zones
C1	OO	87.5	0.98	0.0011	853.9	9.5	
	PO	13,438.1	1.08	0.0011	144,788.1	1,416.6	
	Total	13,525.6	1.08	0.0011	145,642.0	1,426.1	
B+ C1		19,213.0	1.08	0.0011	207,760.1	2,075.4	
C2		53,814.8	1.04	0.008	557,247.7	4,557.2	
B+ C1+ C2		73,027.8	1.05	0.009	765,007.6	6,632.6	

Note: For uranium in terms of U_3O_8, the grade is 0.011 %, which is about 20 % higher than the OB1 JORC (2012) resource.

Table 4-14: GKZ Confirmation of Off-Balance Reserves 1 January 1997

Deposit name and types of minerals	Units of measurement	Reserves category (in accordance with the extent of their exploration)			
Balasausqandiq deposit		**In-balance reserves**		**Off-balance reserves**	
Vanadium-bearing shales		**C1**	**C2**	**C1**	**C2**
Ore	tonnes				73,000,000
V_2O_5*	tonnes				764,900
V_2O_5 % grade	tonnes				1.05%
Ore	tonnes				73,028,000
Molybdenum **	tonnes				15,336

Note:
** these figures confirm a weighted mean V_2O_5 grade of 1.05 %,*
*** defined within the estimation boundaries of the vanadium and uranium reserve – grade of Mo is 0.021 % (or in terms of MoO_3 = 0.032 %, which is similar to the JORC OB1 grade.*

4.3.2 1973 RESERVES

The GKZ approved further exploration drilling to produce C2 category reserves by targeting the primary vanadium at depth. Drillhole spacing along strike was nominally set at 800 m. From 1971 to 1972, 14 exploration drillholes were designed to intersect at depth the primary mineralised vanadium zone along the limbs of the synclinal folds, for OB1, OB2 and OB3. The primary focus was based on drilling five holes along the NE limb of OB1, plus two drillholes along the SW limb of the syncline. Three drillholes intersected the NE limb of OB2, but only one drillhole intersected mineralisation on the SW limb, as the other drillhole did not intersect the target zone due to structural complications. For OB3, two drillholes intersected the NE limb of the syncline but the SW limb was not drilled. Overall, the drillhole spacing along strike was based on 800 m, but because of terrain accessibility, actual profile spacing ranged from 560 m to 910 m. This spacing would allow the resource to be defined within the C2 category. Additionally, 22 new trenches were excavated for oxide ore zone channel sampling, plus 18 old trenches from the 1940s were deepened and re-sampled, but the assay results from only four of these trenches were received by GMR. The comparison between the 1947 and 1973 results for these four OB1 trenches were inconclusive, with two trenches being quite similar in grade, but the 1947 oxide grades for the other two trenches were higher than the 1973 results. A single bulk volume density figure for this resource was set at 2.5, with no adjustment for a lower density in the oxide zone, as it was considered that the influence of the oxide material was too insignificant. The depth of oxidation was set at 7 m below the surface for the vanadium layer and 4 m for the low-grade siliceous layer which is stratigraphically lower but contiguous to the vanadium layer. Table 4-15 summarises the 1973 reserves.

Table 4-15: 1973 Summary Reserves

Ore Body	Fold Limb	Tonnes	SiO_2%	V_2O_5%	C%	P_2O_5%
1	NE	4,149,007	67.94	0.72	12.41	0.48
1	SW	6,263,651	59.33	0.7	12.65	0.69
Total 1		10,412,658	62.76	0.71	12.55	0.61
2	NE	4,840,687	65	0.68	12.53	0.62
3	NE	8,111,080	68.42	0.63	11.83	0.72
Totals		23,364,425	65.19	0.68	12.30	0.65

Note: single bulk density at 2.5 and the oxide and primary grade results were combined.

It is understood that these reserves were NOT submitted to GKZ for approval.

Figure 4-2 below shows the reserve blocks projected onto a longitudinal section for the NE limb of OB1. It includes the drillholes involved in the estimation at each exploration profile line and also surface trenches used in estimating the oxide zone. The blocks are split into vanadium and siliceous layers. The calculated volumes and tonnages for each block are also shown. Because the grades within the primary zone were found to be so consistent, all blocks received the same average grade for each specific synclinal limb. This average grade approach was also applied to the oxide zone.

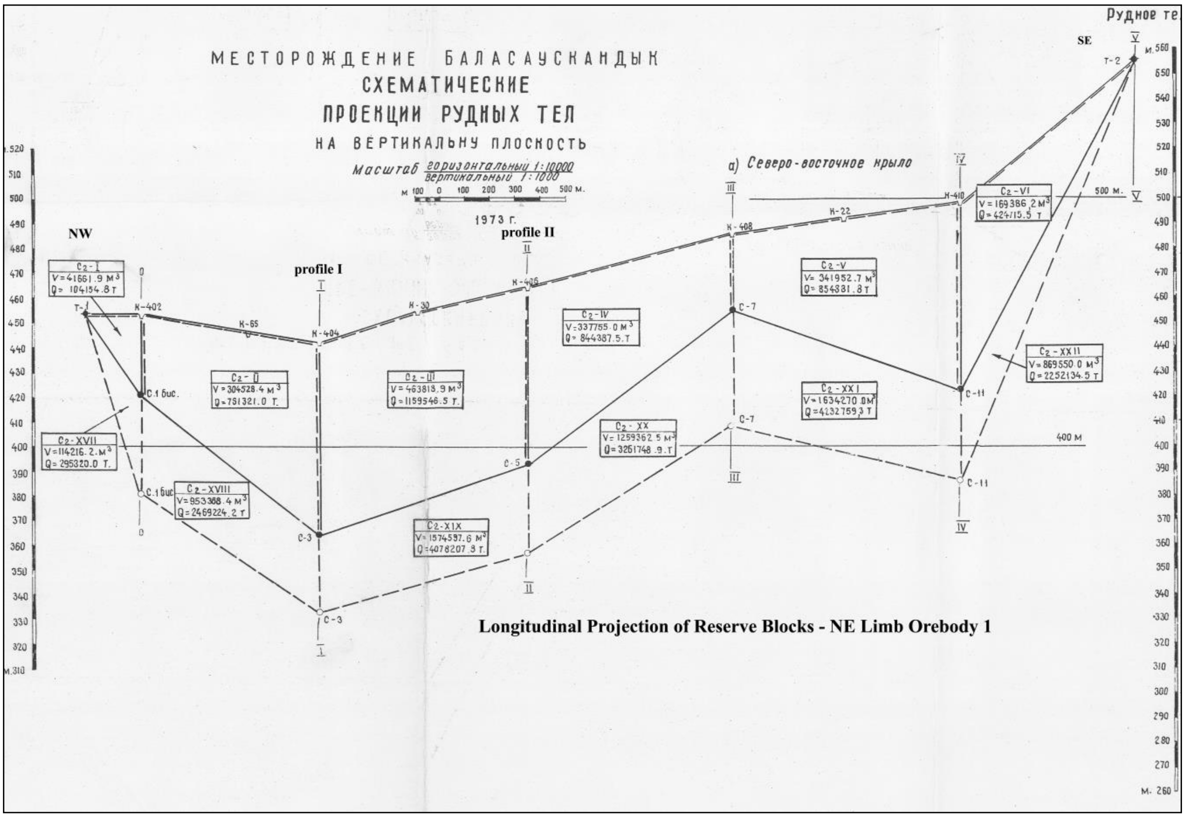


Figure 4-2: Showing Reserve Blocks for NE Limb of OB1 - 1973

4.3.3 DISCUSSION ON 1947 & 1973 RESERVES

The statistics confirmed the consistent grade distributions of the V_2O_5 levels within the vanadium layer, as reported in the historical documentation. Even though the oxide zone exhibited higher grades, there is still uniformity in the percentage level of vanadium content. This degree of homogeneity in the grade distributions allowed the recent FAR exploration drillholes to have a wider spacing than expected and experimental variogram ranges along strike also provides weight for a wider drillhole spacing pattern.

Comparison between the 1947 and 1973 reserves show a dichotomy in the reported vanadium grades. In the 1947 Ankinovich report, it was concluded that both the oxide and primary zones are similar in grade at about 1 % V_2O_5. In the 1973 Komarnitski report, the conclusion was that the vanadium grade is higher in the oxide, and their results basically confirmed the 1947 oxide vanadium grade levels. Most of the 1947 samples were from the oxides (and transition zone) from surface trenches and some shallow underground exposures <30 m: core drilling to intersect the primary mineralisation at depth was unsuccessful. Two shallow shafts reportedly exposed primary vanadium, shafts #2 and #4 in OB1, and the overall weighted grade was 0.93 % V_2O_5 (0.73 % and 1.4 % respectively). The 1973 results were mostly based on drill core sampling but the core recovery is low, so although there is no statistical grade bias, there is a need to generate reserves with good core recoveries. Fundamentally, the 1940s and 1970s reserves are based on two different types of samples, with the earlier results constrained to the upper oxide zone of the deposit, containing only an estimated 5 % of the total resource, and the latter results, based on the primary mineralised core samples at depth where core loss was high. However, there is unanimity about the average V_2O_5 grade within the oxide zone and this has been further confirmed from the results of 55 samples sent to the Intertek laboratory in Perth, Australia in 2007.

4.3.4 1990 - 1992 RESERVES

As a result of a major exploration programme in 1990 to 1991, by the Tashkent Research and Development Institute, reserves were updated (though declared as unofficial), but only a 1992 summary has been obtained by FAR. The results basically confirmed the vanadium pentoxide grade trends for the primary zone, as reported in 1973 by Komarnitski. It also reported that the B and C1 reserve categories have increased significantly, by the upgrading from lower categories.

Main points extracted from 1992 summary report:

- Classification of the reserves and their tonnages remain unchanged since the last reserve work was completed by the Geological Survey of South Kazakhstan in 1973 (Komarnitski). It also re-confirmed a general reduction in the vanadium grade from the oxide/transition surface layer to the primary mineralised vanadium layer at depth.
- In the years 1990-91 the exploration Geological Company #6 (now Kazatomprom) by the Vostokredmet State Enterprise, conducted additional geological investigation on OB1, to qualitatively define the grade of ore at depth, as the earlier work in 1947 was mainly related to the surface and subsurface part of the deposit.
- Exploration of this third phase (1990 - 1991) and, from the drilling results of the second phase (1972), resulted in the OB1 C2 category reserves being upgraded to categories B+C1 - however these reserves were not official.
- The grade of the vanadium pentoxide content from the later surface exploration phases, confirmed the oxide zone results of 1942-1947: the difference on average for OB1 was only 1 %. However, because of the grade dichotomy from oxide to the primary zone, changes in the content of vanadium pentoxide at different depths from the surface were recorded and, results presented in Table 4-17. Here the data were derived from 89 complete drillhole intersections of the vanadium ore horizon and split according to depth intervals. This showed that the 1942-47 primary ore grades were exaggerated, and re-confirmed the primary grade estimates from the 1971-1972 exploration results.

Table 4-16: Reserve Update – 1947 & 1991 Comparison

Ore Bodies, Blocks, Categories of Reserves	Categories of Reserves		Type of Ore – Oxide or Primary	1947 Reserves		1991 Reserves	
	1947	1991		Ore [Kt]	V_2O_5 [%]	Ore [Kt]	V_2O_5 [%]
OB1							
Category B	B	B	O	258.2	0.98	258.2	0.98
Blocks 1947	B	B	P	465.7	1.01	465.7	0.75
Total	B	B	O + P	723.9	1.00	723.9	0.83
Category C1	C1	C1	O	65.2	0.99	65.2	0.99
Blocks 1947	C1	B+C1	P	1,090.2	0.96	1,090.2	0.72
Total	C1	B+C1	O + P	1,155.4	0.96	1,155.4	0.74
Category C2							
Blocks 1947	C2	C2+C1	P	382.9	0.95	382.9	0.71
Blocks 1991	C2+P1	B+C1	O	406.4	0.96	406.7	0.96
Blocks 1991	P1	B+C1	P	2,942.4	0.73	2,942.4	0.73
Total	C2+P1	B+C1+C2	O+P	3,731.7	0.78	3,731.7	0.76
Total OB1		B+C1+C2	O	729.8	0.97	729.8	0.97
Total OB1		B+C1+C2	P	4,881.2	0.83	4,881.2	0.73
Total OB1		B+C1+C2	O+P	5,611	0.85	5,611	0.76
OB4							
Category B	B	B	O	324.5	1.18	324.4	1.18
Blocks 1947	B	B	P	705.4	1.2	705.4	0.9
Total	B	B	O+P	1,029.9	1.19	1,029.8	0.99
Category C1(all blocks)	C1	C1	P	2,363.5	1.13	2,363.5	0.85
Category C2							
Blocks 1947	C2	C2	P	586.8	1.12	586.8	0.83
Blocks 1991	P1	C2+P1	P	425.6	1.08	425.6	0.8
Total	C2+P1	C2+P1	P	1,012.4	1.1	1,012.4	0.82
Total OB4	B+C1+C2	B+C1+C2	O	324.5	1.18	324.5	1.18
Total OB4	B+C1+C2	B+C1+C2	P	4,081.3	1.14	4,081.3	0.85
Total OB4	B+C1+C2	B+C1+C2	O+P	4,405.8	1.14	4,405.8	0.87
OB2							
Category B	B	B	O	377.9	1.12	377.9	1.12
Category B	B	B	P	1,164.6	1.14	1,164.6	0.85
Category c1	C1	C1	P	2,934.7	1.12	2,934.7	0.85
Total OB2	B+C1	B+C1	O+P	4,477.2	1.13	4,477.2	0.87
Total OB 1,2,4				14,494	1.02	14,494	0.83

Table 4-16 shows a comparison between the official GKZ 1947 reserves and the 1991 reserves, and fundamentally this exploration work confirmed the 1947 oxide grades, but shows a basic downgrading of the primary ore grades, as based on the drillhole core sample results. There were no reserve tonnage changes.

Table 4-17: Vanadium grade at depth intervals 1990-1992 (OB1)

#	Depth intervals (m)	Distance (m)	The number of complete intersections of the ore horizon	Grade of vanadium pentoxide	
				Average (%)	Range (%)
1	10-25	15	17	0.79	0.66-0.99
2	25-40	15	13	0.73	0.67-0.86
3	40-60	20	17	0.72	0.53-0.83
4	60-80	20	11	0.73	0.60-0.83
5	80-140	60	8	0.74	0.64-0.93
			Weighted average	**0.74**	

Table 4-17 shows that, starting below the depth interval of 10-25 m, the ore is primary in nature with a related drop in V_2O_5 grades. This substantiated the 1973 Komarnitski report, where an average grade of 0.63 % V_2O_5 was recorded for 14 drillholes within the primary zone. Note however, that the 1972 former Soviet-era drillholes which were selected for the current FAR JORC resource estimate, OB1, averaged 0.67 % V_2O_5, which is similar to the global grade from the FAR drilling results.

For OB1, most of the C2 category had been upgraded to B + C1 and the reserves for these orebodies were calculated by the typical former Soviet-era method of blocks projected onto orebody slices. These historic updated results are presented in Table 4-18 below.

Company #6 conducted studies of a large number of samples for the content of Rare Earth Elements (REE). The results for OB1, 2, and 3 are listed in Table 4-34.

Table 4-18: Example of Reserve Blocks 1990–1991 OB1

Reserves of blocks explored in 1990-91 (OB1), reserve blocks 17 and 19, calculated within pit contours.

Block #	Category of reserves		Characteristics of block (m)			Amount of ore [m^3]	Unit weight	Reserves		
	1947	1991	Distance [m]	Depth	Capacity			Ore [t]	Grade [%]	V_2O_5 [t]
16	C2	B+C1	1085	135	8	1171.8	2.00	2344	0.78	18280
	Oxidized					67.7	1.73	117.2	0.98	1148
17	P1	C1	400	73	8	249.6	2.00	499.2	0.78	3894
	Oxidized					28.9	1.73	50	0.98	490
18	P1	C1	900	147	7	926.1	2.00	1852	0.79	14632
	Oxidized					42.8	1.73	74	0.95	703
19	P1	C2	1100	61.2	7	471.2	2.00	937.8	0.73	6919
	Oxidized					95.5	1.73	165.2	0.96	1578
20	P1	C2	380	70	8	212.8	2.00	425.6	1.08	4596
								Average Grade	**0.80**	

4.4 GEOLOGY AND MINERALISATION

4.4.1 GEOTECTONIC SETTING

Understanding the tectonic phases is important in helping to crystallise the somewhat complex structural features found at the deposit, and this understanding can help improve structural interpretation for realistic modelling of the vanadium ore layers. Here the Karatau mountain range has been affected by tectonic events over a lengthy geological time-frame. Regionally, the Karatau Fault System; forms a crustal-scale zone of strike-slip dominated transpressional tectonics, having undergone multiple phases and styles of deformation during a protracted history of reactivation from the Neoproterozoic to the Cenozoic.

GMR reason that the initial geological history appears to be related to the break-up of the Rodinia supercontinent at >825 Ma and the subsequent amalgamation of the supercontinent of Gondwana during the Cambrian: Neoproterozoic-Cambrian Transition. At that time, the Balausa area was centred at a primordial rift system, which developed along old suture(s) which formed when ancient continental masses collided billions of years ago; this rifting occurred within the Gondwana craton, where the ancient suture zone channelled and focussed super-plume activity from deep within the earth's mantle. The formation of the deposit, within such a supercontinent, appears to straddle the time-frame from late Precambrian to mid-Cambrian age, as supported by the occurrence of Neoproterozoic inliers within the ore field (see geological map Figure 4-9). This also appears to be similar to the situation in the Yangtze Platform of South China, where the Balasausqandiq deposit has been shown to be associated both spatially and geologically: the Balausa district would therefore have inherent deep-seated fault structures that became reactivated after continental accretion within the South Kazakhstania domain, and which eventually resulted in uplift during the Caledonian-Himalayan orogeny, forming the Karatau mountain range in the Cenozoic era (Late Pliocene epoch at about 2.5 Ma).

4.4.1.1 GLOBAL TECTONICS

Balausa is tectonically situated in the western part of the Central Asian Orogenic (Tectonic) Belt (CAOB), and centred between the East European (Baltica), Siberian and Tarim cratons (see Figure 4-3 - tectonic map of Kazakhstan showing Siberian and Tarim cratons) and has a complex tectonic history, as indicated from the early–middle Palaeozoic palaeogeography of Kazakhstan, on the basis of Ordovician and Devonian palaeomagnetic results: Mikhail L. Bazhenov et al 2012 (1). Such a geodynamic evolution of the western CAOB is often described as a tectonic mosaic generated by complex interaction of ocean basins, island arcs and microcontinents (microplates) with a Precambrian basement. The Karatau mountains have been profoundly affected by tectonic events over a protracted geological time-frame and, especially more recently, since the Oligocene (28 Ma), following collision of both the Indian and Arabian with the Eurasian continents of the Alpine-Himalayan orogeny; when dramatic reversion tectonics occurred causing uplift and formation of the Karatau mountain range.

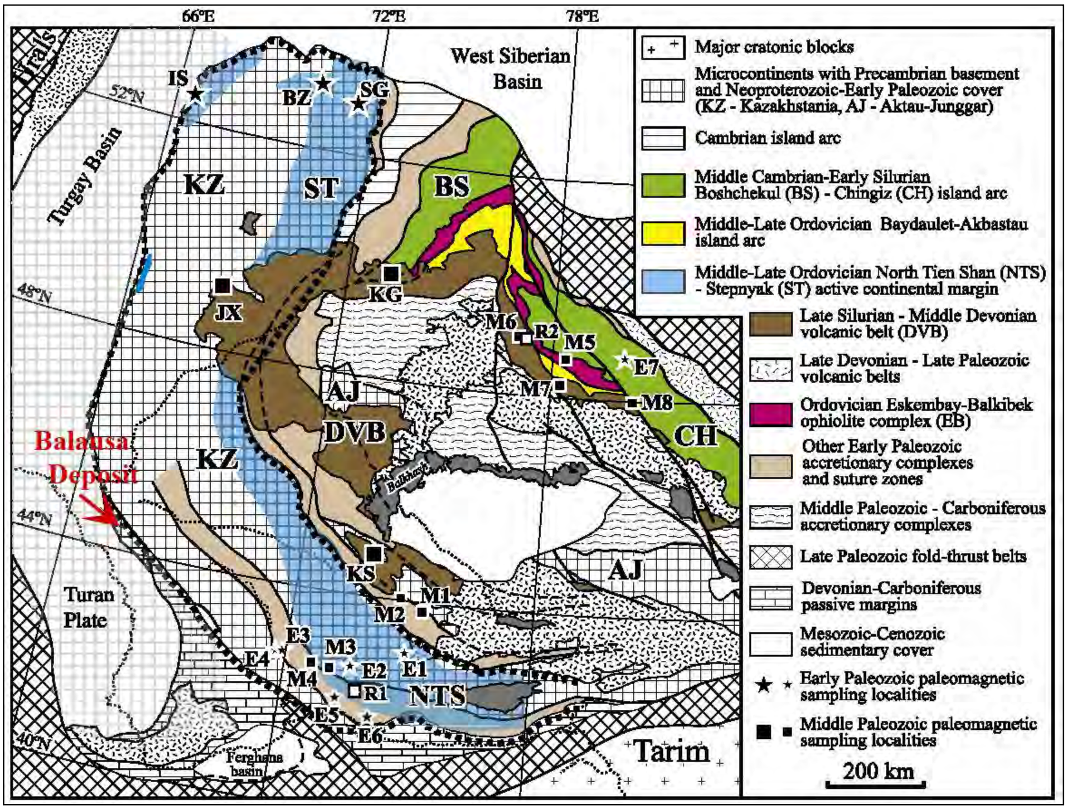


Figure 4-3: Tectonic Map of Kazakhstan

Note: Thick solid lines denote major faults (dashed where inferred). Thick dotted line denotes the exposed parts of Kazakhstania; its western extension under the Mesozoic-Cenozoic cover is in faint grey pattern.

During the Neoproterozoic-Cambrian, which saw the break-up of the supercontinent Rodinia (>825 Ma) and the subsequent amalgamation of the supercontinent Gondwana, Lawrence Och (PhD thesis - about the Neoproterozoic-Cambrian transition in China) (2) stated that the well preserved sedimentary succession from the Precambrian-Cambrian-Transition (Pc-C-T) represents a unique archive of ancient geochemical conditions on the Earth's surface, based on a significant increase of Mo, V and U enrichment in black shales across this Pc-C boundary. The evidence for predominantly anoxic-ferruginous and even intermittently euxinic conditions in the water column across the Pc-C-T boundary and, significant regional variations in geochemical parameters, unravel complex interactions between ocean chemistry, platformal configuration and palaeontology.

Based on both palaeobiogeography and palaeomagnetism, it has been possible to reassemble the spatial positions of the orogenic terranes of the Early Palaeozoic; and this is specifically related to the Kazkhstanian terranes, which forms part of the CAOB area of peri-Gondwana. Three major clusters of early Palaeozoic terranes can be recognised within the Kazakhstanian orogen, of which the southern cluster includes the Chu-Ili, North Tyan Shan and Karatau-Naryn terranes and which were amalgamated together by the late Silurian (Popov et al, 2009 (3) : see Figure 4-4 below). The Karatau-Naryn terrane appears to be unique within the Kazkhstanian terranes in showing clear distinct biogeographic affiliation with South China (Yangste Block), North China, Baltica, Avalonia and Laurentia during late Cambrian (Javier Alvaro 2012 (4)). The Karatau–Naryn terrane was indubitably a part of South China at the beginning of the Palaeozoic, and probably rifted shortly before the mid-Cambrian (Holmer et al 2001 (5)). GMR submit that this provides additional cogent evidence that explains the geological environmental similarity with the vanadium deposits in South China.

GMR conclude that such rifting with graben development, as relatively shallow marine basins, close to continental Proterozoic margins, is supported by the presence of underlying basal conglomerates (Cm2bK: see stratigraphic legend in Table 4-19) to the carbonaceous vanadium layer at the Balasausqandiq deposit and is compatible with the findings of local and regional faunal marine fossils and, in addition, supports geochemical modelling for vanadium deposition in such marine environments.

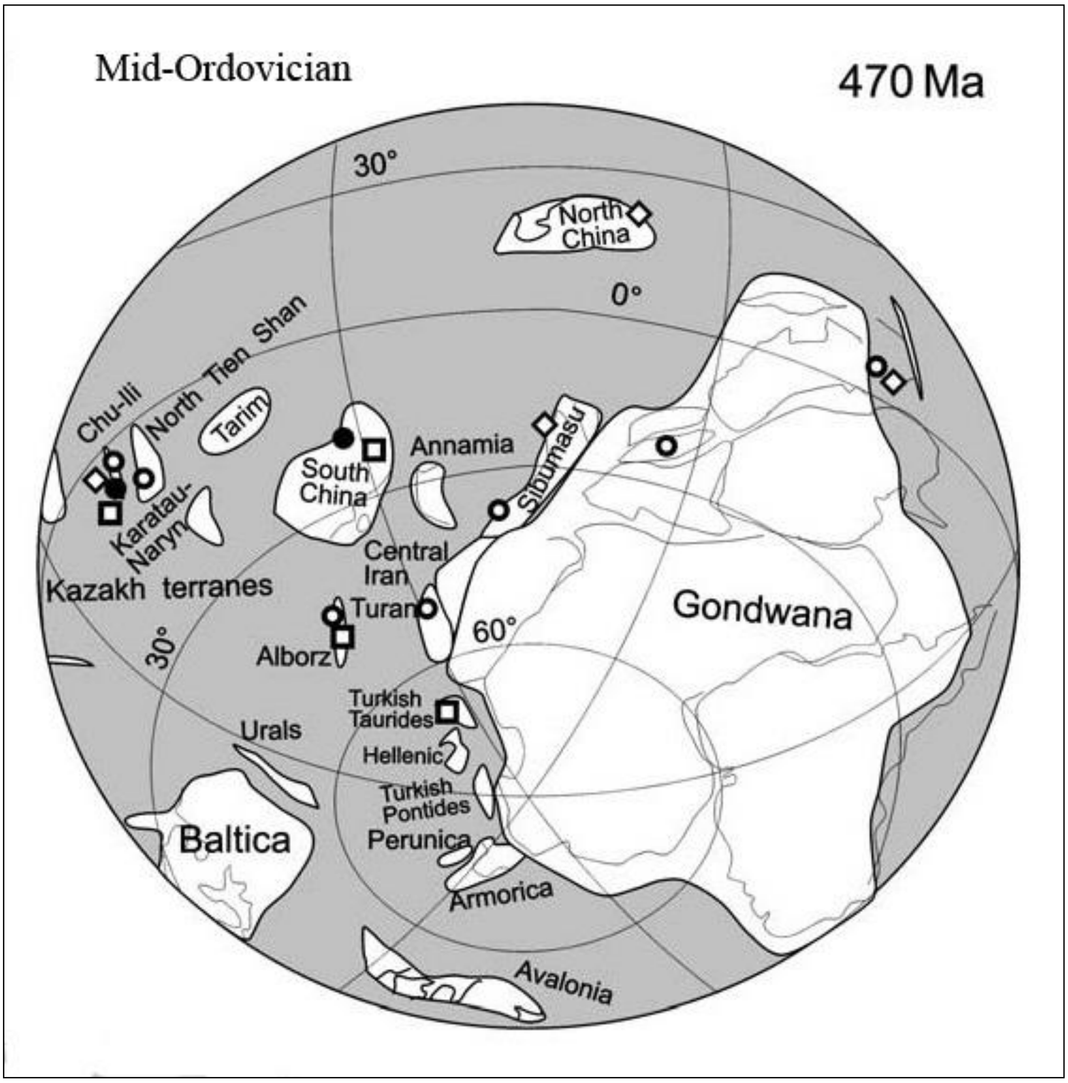


Figure 4-4: Global Reconstruction of Mid-Ordovician Continents, as Based on Distribution of some Characteristic Brachiopod Genera by Popov et al 2009 and modified by GMR 2013

Reference to Figure 4-4, three major clusters of early Palaeozoic terranes can be recognised in the Kazakhstanian orogen. The southern cluster includes three major crustal terranes (i.e. Chu-Ili, North Tien Shan and Karatau-Naryn), which were amalgamated together by the Late Silurian (Popov et al., 2009 (3)). Note especially the relatively close spatial proximity of South China with the Kazakh terranes.

According to Thorsvik and Cocks 2009 (6), the Kazakh terrane assemblage did not amalgamate with the larger Kazakhstania terrane until Late Palaeozoic. Many of those terranes have Precambrian cores (e.g. as found at Balausa) and distinctive Lower Palaeozoic successions and faunas.

The overall collective stratigraphic similarities between the Neoproterozoic-Cambrian sequences of these microcontinents were noted by Ankinovich in 1962 (7). Chumakov 2010 (8) also noted the stratigraphic and faunal similarities between many Kazakhstan and Kyrgyz microcontinents and suggests their possible close proximity in Late Neoproterozoic and Cambrian.

4.4.2 REGIONAL GEOLOGY

The Karatau mountain range, composed of the Greater Karatau (location of the Balasausqandiq deposit) and Lesser Karatau mountains, divides a large intermontane basin into the NE Chu Sarysu and SW Syrdarya sub-basins. These basins are filled with Devonian to Tertiary sediments with a thickness of up to 8,000 m, are hydrocarbon rich and also contain notable uranium deposits. Oil and gas is mainly confined to the Palaeozoic formations, but atypical gas has been discovered within highly fractured metamorphosed Proterozoic basement rocks. Figure 4-5 illustrates the location of the Balasausqandiq deposit, Figure 4-6 shows a vertical section of the Chu Sarysu basin, while Figure 4-7 illustrates a diagrammatic cross section of the relationship between the mountains the sub-basins.

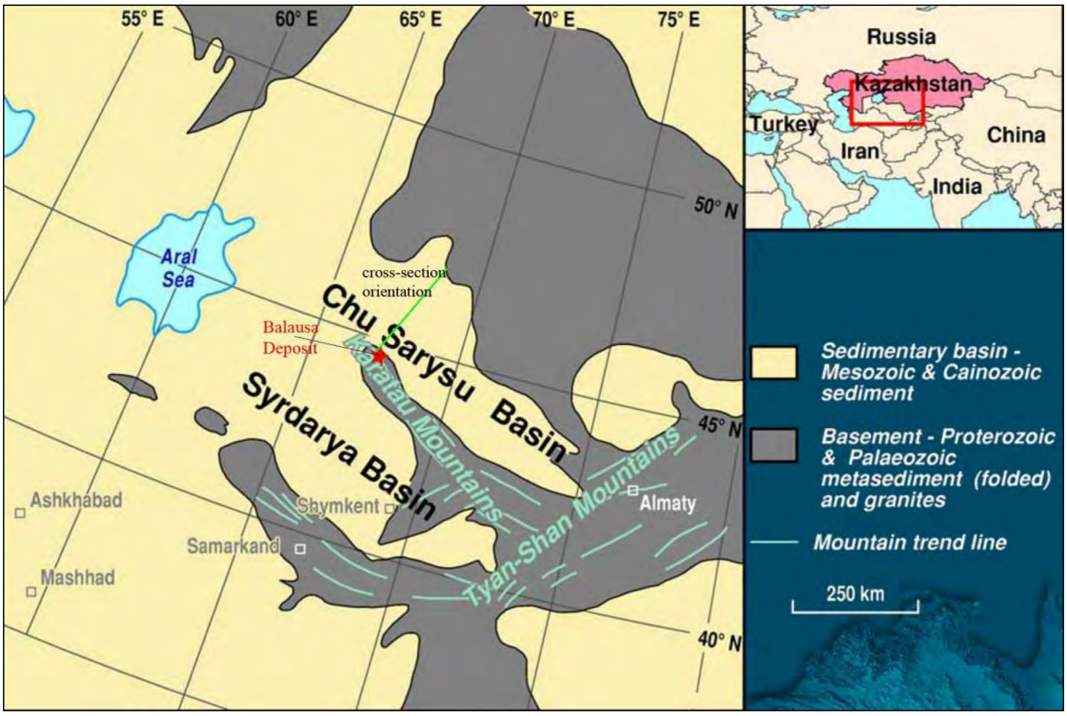


Figure 4-5: Main Structural Elements Showing the Location of the Balasausqandiq Deposit

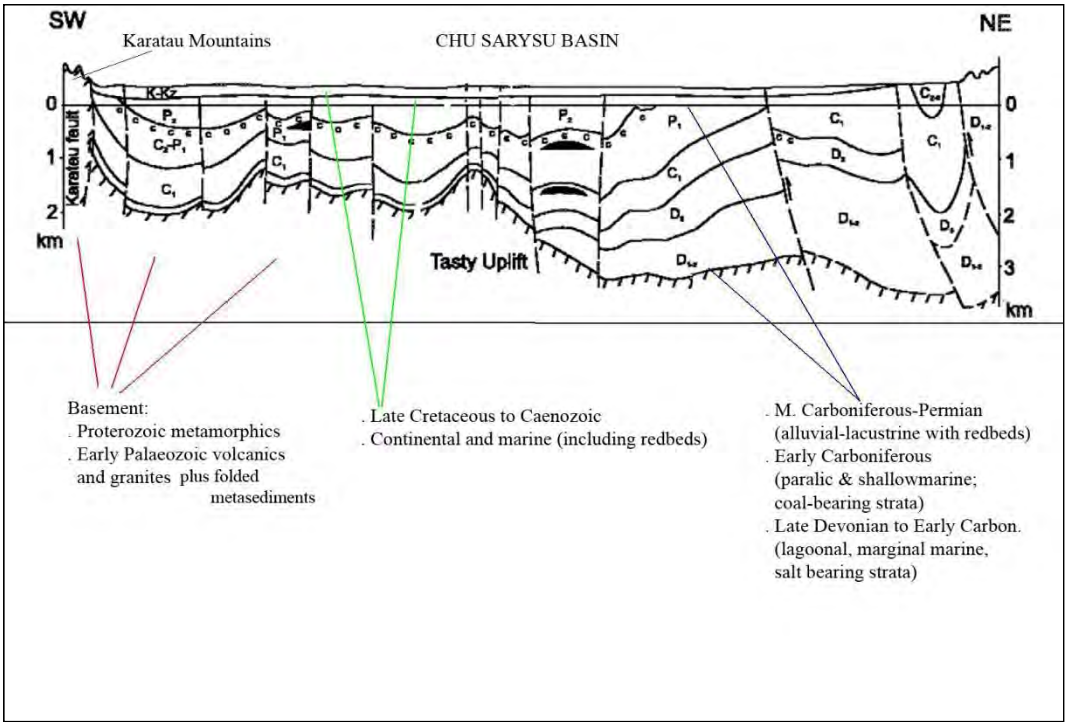


Figure 4-6: Vertical Section of the Chu Sarysu Basin (Figure 4-5 Shows Section Line) of Main Stratigraphic Units

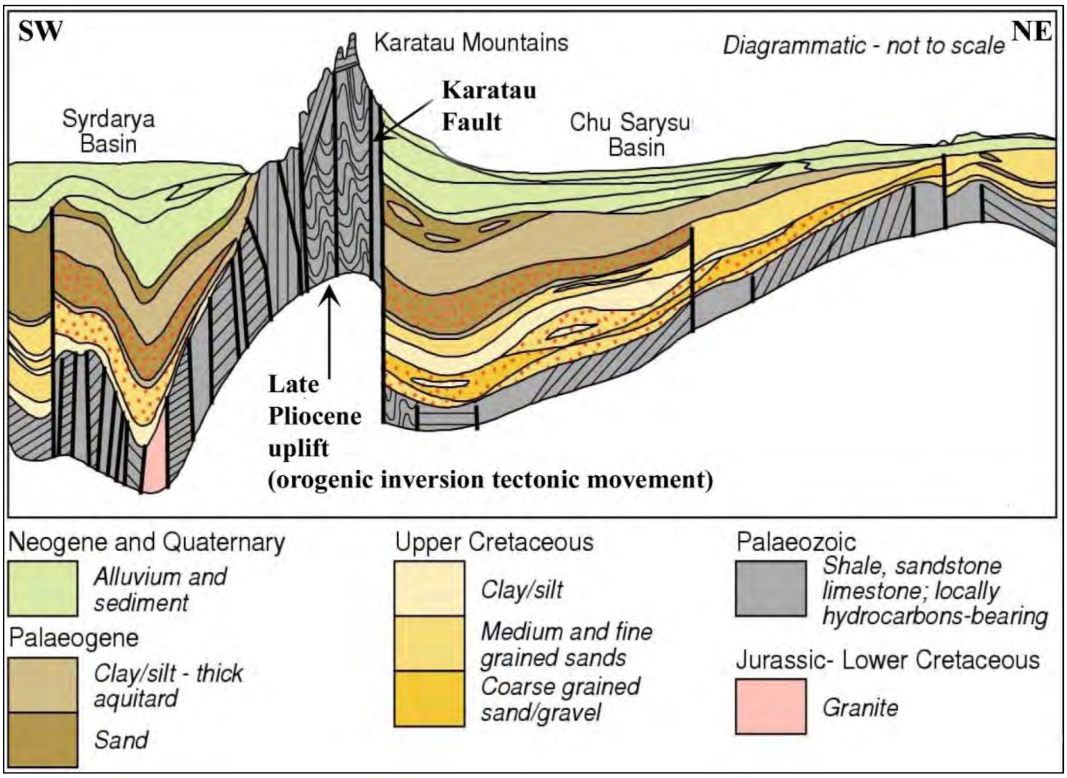


Figure 4-7: Diagrammatic Cross Section showing relationship of Karatau Mountains with adjacent intermontane basins

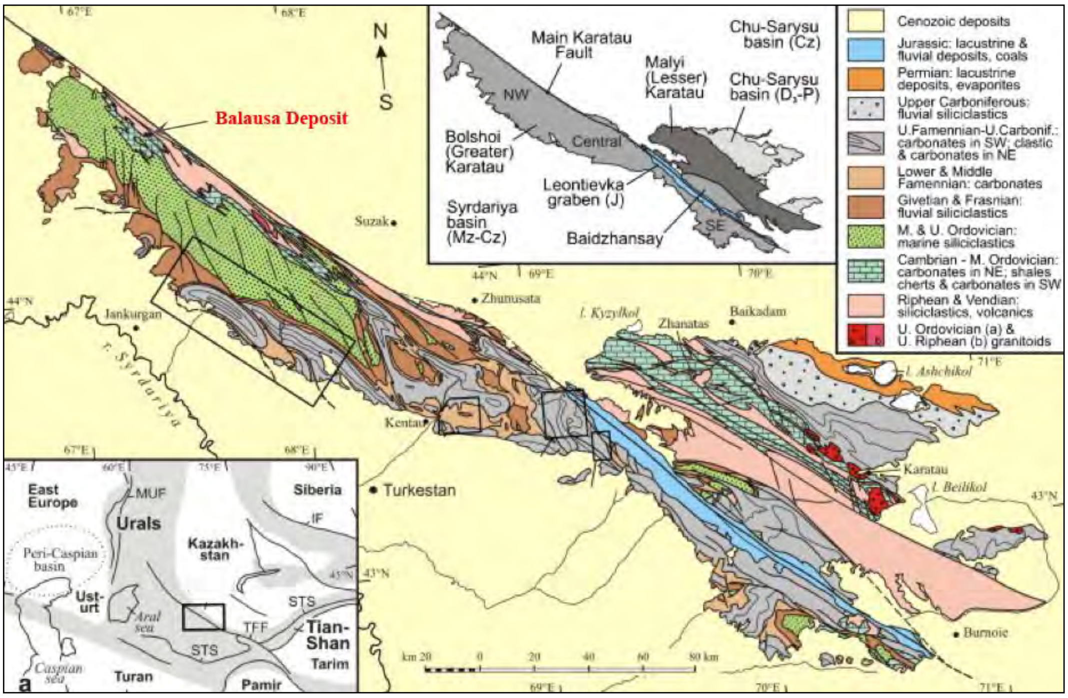


Figure 4-8: Geology of the Karatau Mountains

The geology of the Karatau mountain regions (illustrated in Figure 4-8) clearly shows the dominance of the main Karatau fault, with the juxtaposition of the contrasting Cambrian-Ordovician formations with the Cenozoic deposits to the NE of the fault. The Lesser Karatau region evolved as an isolated carbonate seamount from the Middle Cambrian times (see inset in Figure 4-8 above) and their faunas show remarkable similarity to those of South China until after the Early Ordovician period: there is a Cambrian-Ordovician facies change from carbonates in the Lesser Karatau to dominant shales in the Balausa region of the NE Greater Karatau mountains.

Karatau mountains show polyfolded stratigraphic layers, typical of orogenic belts (Karatau-Naryn) and at the Balasausqandiq deposit, the orebody layers show non-cylindrical elongated synform basin structures; as low order parasitic folds within an anticlinorium.

It is interesting to compare the similarity of the vanadium-rich Cambrian carbonaceous marine sediments of Xiushui County, Jiangxi Province, in south east China, with the Balasausqandiq deposit. Here, both primary and oxide vanadium levels match the Balausa average grades, and, with the mineralisation confined to folded synclines at the margins of regionally extensive graben structures (filled with Cretaceous sediments), also resonate with the Balausa situation. Carbon levels of the primary ores are also similar.

4.4.3 DISTRICT AND DEPOSIT GEOLOGY

The Balasausqandiq deposit is situated within the northwest distal part of the 400 km long Karatau mountain range; with a NW-SE strike. Structurally, the strong mineralogical trend is related to a northwest trending anticlinorium, with numerous subsidiary folding. Middle Cambrian (500 Ma) meta-sediments, which form 11 distinct rhythmic concordant layers, according to lithological signature characteristics, containing the vanadium mineralisation. Specifically, the economically viable vanadium mineralisation is confined to a specific stratiform layer, which typically ranges from 4 m to 14 m in total thickness. The deposit has been exposed along an overall strike length of 10 km and, the total aggregated strike-length of the individual vanadium layers within the Balausa area, is about 40 km.

Structurally the deposit comprises a number of large stratiform vanadium orebodies that have been deformed into extensive asymmetric non-cylindrical folds, with steep sub-parallel axial planes. In surface plan view they exhibit synclinal fold closures and apparent variable wavelength: the orebodies are restricted to these synclines, though an extensive atypical occurrence has been explored at the SW limb of the anticlinorium, where surface exposed vanadium mineralisation can be found as a single unfolded extensive layer and apparently isolated to the normal synclinal folding. The disharmonic fold deformation of these mineralised synclines appears related to the deep-seated Karatau Fault system, which became reactivated during the Late Pliocene (2.5 Ma) when orogenic tectonic inversion uplift generated the Karatau mountain range, with subsequent continual tectonic adjustments and rapid denudation of the mountain range (see Figure 4-9).

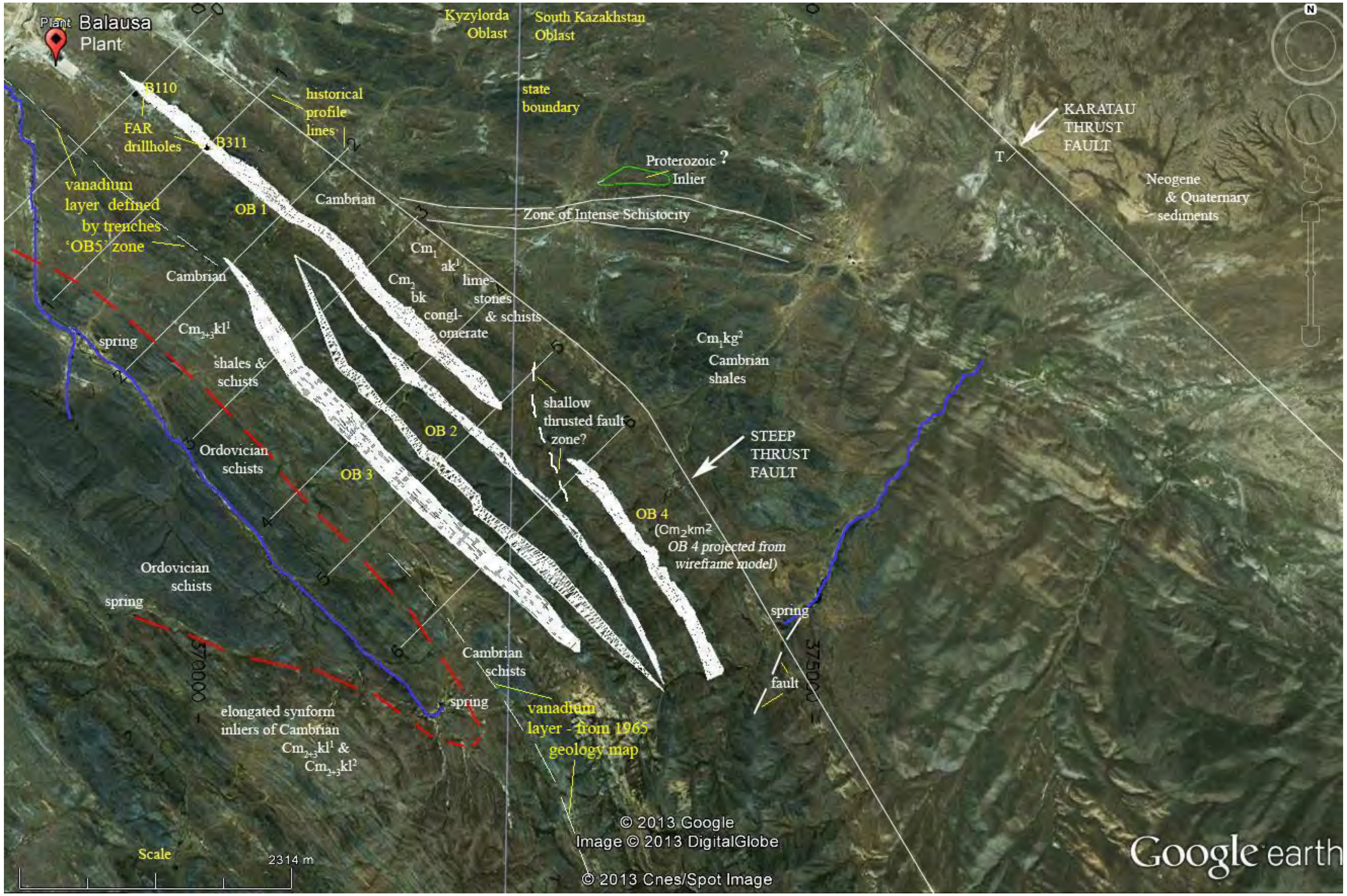


Figure 4-9: Balausa geological features overlaid on Google earth map

4.4.4 STRATIGRAPHY

The stratigraphic record indicates an extremely long geological time span, from Proterozoic to Quaternary formations (600 Ma to 0.01 Ma) and the stratigraphic legend detailed in Table 4-19 summarises the main stratigraphic formations which are associated with the mineralised zones at the Balausa project. This information is based on the evaluation work by the Kazakh Ministry of Geology (B.E. Komarnitski et al) in 1971-1972, and which also takes cognisance of the pivotal exploration work undertaken from 1942 to 1947.

The geological map shown in Figure 4-9, also utilizes the map unit symbols, as defined in the stratigraphic legend detailed in Table 4-19 below.

Table 4-19: Stratigraphic Legend Table

Period	Map Unit Symbol	Stratigraphic Unit Name and Description
Quaternary	Qm	Sediments: Alternating sand, gravel and pebble layers
Ordovician	O_3bs	Besharyk Suite: Greyish-green polymictic sandstones, siltstones, argillaceous slate,
	O_2sn	Suindik Suite: Argillaceous chloritic shales, quartz phyllitic schists,
	O,ks^2	Koskul Suite: The member within the suite is comprised of siliceous schists
	O,ks^1	Koskul Suite: Quartziferous-chloritic-sericitic schists
Mid-Cambrian	$Cm_2+_3kl^2$	Kulantauski Suite: Upper member. Thinly laminated flag-like limestones
	$Cm_2+_3kl^1$	Kulantauski Suite: Lower member. Carbonaceous and argillaceous shales, Carbonaceous-siliceous schists with concretions of phosphorite rocks
	Cm_2km^2	Kurumsak Suite: Vanadium-bearing ore horizon
	Cm_2km^1	Kurumsak Suite: Siliceous schists layer with low-grade vanadium (narrow dark grey dolomite seam at base of this layer “upper dolomites”)
	Cm_2bk	Baikonur Suite: Tillite-like conglomerate
	Cm_1ak^2	Aksumbinski Suite: Upper member. Polymictic sandstones.
	Cm_1ak^1	Aksumbinski Suite: Lower member. Sericitic-chloritic schists. Interbedding of marmorized limestones and carbonate- chloritic shales.
	Cm_1,kg^2	Karagur Suite: Upper member. Aleuritic (silty) shales
	Cm_1,kg^1	Karagur Suite. Lower member. Siltstones
	Cm_1,rn^2	Rangski Suite: Upper member. Polymictic sandstones, seams of gravelstone. Chlorite and argillaceous shales, carbonaceous-argillaceous shales
	Cm_1,rn^1	Rangski Suite: Lower member. Polymictic conglomerates. Sandstones
Proterozoic	$Ptkn^2$	Kainar Suite: Upper member. Persilicic volcanic rocks and their pyroclastic varieties (e.g. rhyolites, dacites & tuffs)

Period	Map Unit Symbol	Stratigraphic Unit Name and Description
	$Ptkn^1$	Kainar Suite: Lower member. Basic volcanic rocks and their pyroclastic varieties (e.g. basalts)

4.4.4.1 DESCRIPTION OF THE STRATIGRAPHY

4.4.4.1.1 UPPER PROTEROZOIC

Proterozoic strata within the limits of the Balasausqandiq deposit have been subdivided into two series of formations: lower Kainar Suite (Ptkn1) and upper Kainar Suite (Ptkn2). Due to apparent lack of reliable palaeontological documentation, the stratigraphic sequence still remains a matter of dispute among scientists; therefore the position of the mentioned suite is identified by their structural and tectonic features, which are variously interpreted by different experts.

Lower subsuite in the Kainar strata ($Ptkn^1$) Rocks in the subsuite include a sequence of effusive mafic formations featuring diabase porphyrite and diabase, less frequent diorite and andesite porphyry, tuffs and tuff breccias of the major or (less frequent) medium age. Sometimes the effusive rocks feature thin (less than 3-10 cm) intercalations and lenses of dark grey limestones, siltstones and siliceous shales (chert). To a different extent, the rocks are schistose and sometimes to the extent of becoming metamorphic shales. Prevailing colour is greyish-green.

The thickness of the strata which form the subsuite reaches 100 to 120 m.

Upper subsuite in the Kainar strata ($Ptkn^2$) is mainly formed by persilicic effusive rocks and, to a lesser degree by their tuffs. The effusive rocks here include albitophyres, quartz albitophyre, porphyries of light grey and yellowish-greenish-grey. Tuffs and tuff breccias persilicic are represented by crystalline and lithic variations. In certain places the rocks are intensively schistose and turned to various shales.

The thickness of these rocks ranges from 80 to 100 m.

4.4.4.1.2 LOWER PALAEOZOIC - CAMBRIAN AND ORDOVICIAN

The strata of the Lower Palaeozoic contain the exploitable mineralised target zones at Balausa. The characteristics of these strata are also similar for other, but separate, vanadium areas within this part of the Karatau mountain range.

4.4.4.1.3 MID-LOWER CAMBRIAN STRATA (CM_1)

According to structural and tectonic features, lithologic composition and, other distinctive signatures, the Mid-Lower Cambrian strata (joined into the Ulutau series) comprise three suites: Rangski (Cm1rn), Karagurski (Cm1kg) and Aksumbinski (Cm1ak).

Strata within the Rangski suites can be subdivided into two subsuites: lower subsuite of basal conglomerates and upper subsuite of coarse-grained sandstones.

Lower Rangski suite (Cm1,rn1) This horizon lies unconformably on the upper Proterozoic strata.

It is represented by basal conglomerates, with the composition of the pebbles reflecting rocks of the upper Proterozoic series. The sizes of the clasts range from a few centimetres up to 0.2 - 0.3 metres, sometimes up to 0.6 - 0.8 metres. Pebbles and boulders are well rounded. Colour of the rocks varies between greenish-grey, light grey and dark grey.

Upper Rangski suite (Cm_1,rn^2) Upwards in the stratigraphic profile, the underlying basal conglomerates develop into intercalations of siltstone shales, sandstones, limestones and dolomites, in tandem to a gradual decrease in grain sizes, and eventual merging with the overlying seams of sandstones. The upper contact of this subsuite can be identified by a bed of black dolomites.

The thickness of the subsuites of basal conglomerates is variable, from a few metres to 300-350 metres. Within the limits of Balasausqandiq deposit, the average thickness of basal conglomerates is 100 to 120 m.

Karagurian Strata

The thickness of this strata ranges from 50 to 55 metres.

Strata of the Karagurian suites can be subdivided into two subsuites: lower section is a siltstone and upper subsuite of violet and green silty shales.

Lower Karagurian (Cm_1,kg^1) strata show conformity in stratification with a gradual transition from the underlying Upper Ranskian, although the borderline between them can be clearly seen in the abrupt changes of colour. This lower subsuite is formed by siltstones with intercalations of silty shales. Rocks have greenish-grey, yellowish-grey frabic, with very infrequent violet colouration. Typically, uneven distributions of pyrite blebs are found. The thickness of the strata ranges from 60 to 100 metres.

Upper Karagurian (Cm_1,kg^2) The subsuite is distinct from other surrounding strata due to its colouration. It is predominated by crimson, lilac and violet argillaceous sericitic-hematite shales, which make this subsuite very unusual. Less frequent are the argillaceous and chloritic, siliceous-chloritic and siliceous-sericitic-chloritic shales brilliant green and emerald-green colour. A distinctive feature of the lilac shales is their thin lamination, which at times has a form of seasonal bands (banded structure), which is determined by variations in the colour of the laminations and less frequently by the grain size characteristics. The thickness of some single layers ranges from microns to one centimetre.

Shales in the top section of the profile gradually become arenaceous with thin interlayers of marmorized dolomitic limestones of cream-coloured, greenish-grey and white in colour. Upwards in the section (profile) the total number of limestone interlayers increases, which determines the gradual transition to the overlying strata.

The thickness of strata in the upper subsuites varies from 100 to 150 m.

Aksumbinski suite crowns the Mid-Lower Cambrian strata in the profile. Lithologically this suite of strata has been subdivided into two sub-suites: lower subsuite of carbonate and chloritic stratum of limestones and upper – arenaceous and shaly subsuite.

Lower Aksumbinski subsuite (Cm1ak1) shows a gradual transition to the associated underlying bedrock. Subsuite formed by evenly alternating interlayers (rhythmic stratification) of dolomitic and marmorized limestones (white and pale) and carbonate-sericitic schists (light-greenish), sometimes grey. Limestones either prevail or occur in different proportions with schists. The thicknesses of certain layers vary from microns up to 5 cm, less frequently - thicker.

Rock sub-suites frequently feature inharmonious folding or wrinkling.

The thickness of strata ranges from 100 to 170 m.

Upper Aksumbinski subsuite (Cm1ak2) conformable with the underlying subsuite, but with a distinct contact. The lower part of the suite is formed by greyish and brownish silty polymictic sandstones, in the upper section – by dark-green and dark grey to black [sic] “carbonaceous” shales with argillaceous-sericitic and argillic-chlorite-sericitic composition. A distinctive feature of the sub-suite is its impregnated pyrite, dolomite and ferrous carbonate.

Layers of yellowish-grey and light-yellow dolomites can be traced all the way through the sub-suite (total thickness of each layer up to four metres).

The thickness of single strata in the suite ranges from 10 to 60 m.

4.4.4.1.4 MID-CAMBRIAN STRATA

The designated mid-Cambrian strata can be subdivided into two suites: the lower – Baikonur suite and overlying - Kurumsakski suite (which defines the vanadium enriched horizons).

Baikonur suite (Cm_2bk) is a typical formation of the Cambrian strata. Strata of the Baikonur suite overlay and overlap with various horizons of eroded surfaces of the Aksumbinski suites with minor angular unconformity with the cross bedding structures.

Overall, the rock mass appears as a tillite-like conglomerate, but no consensus has been established.

The strata of the Baikonur suite in most cases are structureless, sometimes very schistose, greyish-green, dark grey or brownish rocks looking like sandstones or schists with some impregnations of clastic rocks of various sizes, shapes, variable spherical forms and lithologic composition, scattered chaotically in the main rock mass.

Vanadium enriched strata – Kuramsak Suite

The strata of Kurumsakski suite (Cm2km) which form the ore field comprise two constituent units: the lower Siliceous horizon (Cm2km1), which contains subeconomic vanadium grades, and the overlying vanadium horizon (Cm2km2), which is the target for this JORC resource estimation.

Siliceous Horizon (Cm2km1)

The siliceous horizon consists of dark grey rocks, which in the weathered zone are brownish-grey with a platy structure and granular texture. Normally, they are interstratified with thin layers of quartz. At the lower contact, there is a dolomite seam, the so-called “upper dolomites”, lying directly on the tillite rocks of the Baikonur suite: the thickness of this dolomite bed is not uniform, ranging from 1 to 5 m. These barren dolomites serve as a good marker for the siliceous bed and allows for clear tracing of the footwall contact. Where there are no dolomites, the lower border of the orebody can still be traced clearly by the abrupt changes of facies colour in the rock.

The dolomite horizon was intersected by only two drillholes - 11 and 12. Its absence in other boreholes can be attributed to either pinching out of the structure or poor core recovery. In surface trenches, the dolomites were revealed more frequently.

According to Alzhanov (9), the Siliceous Horizon, can be divided into five sub-layers and, from the bottom upwards, can be summarized as follows:

- Sericitic-carbonaceous-quartz schists
- Carbonaceous-siliceous schists
- Lyddites exhibiting as dense greyish-black to black rocks with a conchoidal fracture.
- Sericitic-quartz schist.
- Lyddites and quartziferous rocks.

In detail they a have variegated composition and composed of micro-quartz rocks, lyddites, carbonaceous-quartz schists with their dependant carbonaceous-sericitic and quartz schists and lentils of carbonaceous-siliceous- and argillaceous vanadium-bearing and carbonaceous-quartzitic silty schists, dolomites and radiolarian chert. At the macroscopic level the rocks are greyish-black in colour, sometimes ranging up to dark grey. Lyddites and radiolarian cherts form a massive solid rock. Various schists are clearly schistose, often crenulated. In the lower part of the layer there are intercalations of dark grey dolomites. The rocks of this layer have very minor content of carbon. Due to their massiveness, they predominate on the ridges and crest of the hills.

In general, the thickness of the siliceous horizon within the limits of the Balasausqandiq deposit range from 15 to 23.6 m.

4.4.4.1.5 VANADIUM HORIZON (CM_2KM^2)

The stratum of the vanadium horizon forms a conformable and natural continuation of the underlying siliceous strata.

Within the weathered surface zone of the vanadium-bearing horizon, 14 lithological interlayers have been defined. However, at depth within the primary rocks, it is not possible to distinguish such layering in the drillcore.

1. Rn-ore lower bench – coarsely laminated siliceous schists alternating with carbonaceous and combined argillaceous-carbonaceous shales with the former prevailing. Average thickness 40 cm.
2. Rs-ore schistose bench – alternation of carbonaceous-argillaceous, argillaceous-sericitic and silty schists with intercalation of argillaceous-siliceous, carbonaceous and siliceous schists with characteristic quartzitic interlayers with siliceous and roscoelite ore. Average thickness is 1.0 m.
3. Rpf-ore sub-phosphate bench – regular [parallel] intercalation of black siliceous schists with ore-containing carbonaceous-argillaceous interlayers. The thickness of the siliceous schist interlayers ranges from 3 to 20 cm, argillaceous-carbonaceous shales – from 8 cm to 0.64 cm.
4. Sf-schistose phosphate seam – argillaceous, siliceous-argillaceous silty schists black in colour with abundant phosphate and siliceous-phosphatic concentrations. The thickness of the seam is variable and it ranges from 5 cm to 25 cm.
5. Rf-ore phosphate bench – consists of ore-bearing argillaceous and carbonaceous shales with siliceous schists. Abundance of phosphate concentrations (0.65 m).
6. Gn-argillaceous seam, lower – thin seam of argillaceous, argillaceous-carbonate schists with pyrite and pyrite pseudomorphing marcasite. Average thickness from 6 to 20 cm.
7. Rpd – ore sub-dolomite bench: in its lower part it shows intercalation of siliceous and argillaceous-carbonate shales, and in upper part – intercalation of argillaceous and argillaceous-sericitic shales. Average thickness is 92 cm.
8. D – seam of dolomites – dark-grey medium-grained dolomites. Average thickness is 40 cm.
9. S – shaley seam above dolomites – lower part mainly consists of argillaceous-siliceous, sericitic-siliceous and siliceous schists, with thin laminations.

   Upper part of the bench is formed by argillaceous, chlorite-argillaceous and siliceous-argillaceous schists.
10. Rnd – ore seam above dolomites – thin alternation of argillaceous-carbonaceous and siliceous schists with thicknesses of their interlayers not exceeding 5-7 cm. In the central part of the seam there are obvious thin intercalations of argillaceous schists. Average thickness is 1.98 m.

11. Gs – mid argillaceous seam – the same argillaceous schists as in the seam Gn. Average thickness is 10 cm.
12. Rp – continuous ore-containing layer – regular rhythmical alternation of siliceous and argillaceous-carbonaceous shales, equally distributed, with some minor phosphate and siliceous- phosphate concentrations. Average thickness is 1.3 m.
13. Gv– upper argillaceous seam – the same argillaceous schists as in the interlayers Gn and Gs. Average thickness is 10 cm.
14. Rv – ore upper bench – argillaceous-carbonaceous vanadium-bearing schists, in which some lenses of siliceous schists are unevenly distributed. Average thickness is 82 cm.

The total thickness of these strata in the vanadium-bearing horizon range from 4.4 m to 12.0 m.

Kulantauski Suite – lower member ($Cm_2+_3kl^1$)

The strata of the lower suite of the Kulantauski formation occur directly above the vanadium horizon. According to their composition, chemistry and rock fabric, they are identical to the Siliceous formation which directly underlies the vanadium horizon, and signifies that their depositional environment must also be similar.

4.4.5 STRUCTURAL GEOLOGY OF THE ORE BODIES

The Balasausqandiq deposit comprises a number of large stratiform ore bodies that have been deformed into extensive asymmetric non-cylindrical folds, with steep sub-parallel axial planes. In surface plan view they exhibit synclinal fold closures and apparent variable wavelength: the ore bodies are restricted only to these synclines. This apparent disharmonic fold deformation appears related to the deep-seated Karatau Fault, which became reactivated during the Late Pliocene orogenic uplift (2.5 Ma) with continual tectonic adjustments. In plan, OB2 appears anomalously large in outline, and GMR believe that such an apparent disharmonic fold, located spatially between OB1 and OB3, could be the result of thrust displacements along strike orientated faults, whereby two normal synclines have been “joined” by displacement of the vanadium layer: such evidence can be seen from historical surface mapping and trenching results of the vanadium mineralisation, at the NW synclinal closure area, where there is a confusing split distribution of the ore layers at surface, plus a recent FAR drillhole intersection, where unexpectedly ore was encountered within the central area of this syncline. Note: the continuation of the FAR exploration drilling programme will help resolve this apparent structural anomaly: see Figure 4-16.

The Balasausqandiq deposit was initially split and classified by S.G.Ankinovich into seven exploration blocks. However, exploration blocks 1 and 2 constitute a single (consolidated) closed synclinal structure, cut by a cross-fault approximately in the middle part of the fold. Thus, the previously classified seven exploration blocks have been reclassified into six ore bodies.

Although most of the notable vanadium mineralisation is represented by large folded structures showing synclinal closures and steeply inclined limbs, OB5 appears to be anomalous, being composed of a single limb-type structure but with an extensive strike length of about 8 km.

4.4.5.1 ORE BODY 1

OB1 corresponds to exploratory blocks 1 and 2 described by S.G.Ankinovich. The ore body constitutes a spatially separate asymmetric synclinal fold situated on the north-eastern flank of the ore field. Strike length 4.5 km.

The rocks forming the north-eastern limb dip towards the south-west at approximately 75-78°. The core of the fold is made up of siliceous-carbonaceous rocks of lower-Kulantau subsuite, whilst the limbs are of tillites of the Baikonur suite. The thickness of the vanadium-bearing horizon on the north-eastern limb varies from 5.4 to 8.7 m and up to 11.8 m on the south-western limb. The thickness of the siliceous horizon ranges from 16 to 24 m on the north-eastern limb and from 16 to 18 m on the south-western limb.

4.4.5.2 ORE BODY 2

OB2 corresponds to exploration block 3 described by S.G.Ankinovich. This is the largest in the ore field and occupies its central part. The strike of the syncline fold, which forms OB2 is north-west (azimuth 310º to 315°). The rocks of the north-eastern limb dip to the south-west at 80-85°. The thickness of the ore body varies for the vanadium-bearing horizon from 5 to 12 m, and for the siliceous horizon from 16.5 to 23 m. Strike length 5.5 km.

The south-western limb of OB2 has mainly been explored at outcrop. Only one borehole was drilled to the depth. The south-western limb is flatter, dipping at 55 to 75° to the north-east.

Thus, the fold, which forms two ore bodies, has an asymmetric structure. The south-western flank is broken up by faults, sometimes with complete removal of the vanadium-bearing horizon, the thickness of which is up to 12.1 m. Minimal thickness of siliceous strata reaches 35 m while the minimal thickness of siliceous rocks is unknown.

4.4.5.3 ORE BODY 3

OB3 (exploration block 4 of S.G.Ankinovich) forms a narrow synclinal fold oriented parallel to OB2. Strike length 4.8 km.

The synclinal fold that forms OB3 is comprised of siliceous and carbonaceous rocks of the lower Kulantauski subsuites, and along the fold limbs it includes tillites of the Baikonur suite and (less frequently) by formations of the siliceous horizon.

The north-eastern limb of the fold dips at angles of 80 to 85° to the south-west. However, some areas demonstrate overturned bedding, and the beds in this case dip towards the north-east at the same angle. The rocks of the south-western flank also steeply dip towards the north-east.

The thickness of the vanadium-bearing strata varies from 3.2 to 12.0 m on the north-eastern limb and from 3.0 to 7.8 m on the south-western limb. The strata of the siliceous horizon have a thickness between 14 and 26.6 m on the north-eastern limb. While on the south-western limb the thickness of the siliceous rocks has not been explored.

4.4.5.4 ORE BODY 4

OB4, exploration Block 5 according to S. G Ankinovich, was not explored in great detail during 1971-72. Previous prospecting works only surveyed the oxidised ores by a series of trenches spaced every 100 m and, as yet, no drilling of the primary horizon has been undertaken. Strike length 2.6 km.

Primary ores were surveyed only through one sampling pit (No. 4). OB4 is a natural strike continuation of OB1, separated by tectonic thrusting.

According to S.G.Ankinovich, both the north-eastern and the south-western limbs of this fold are steeply dipping, and its cross-strike profile is close to symmetrical. Both limbs dip from 50 to 75°. The thickness of the vanadium-bearing horizon on the north-eastern limb ranges from 6.45 to 17.1 m, and on the south-western limb from 5.5 to 16.7 m. The rocks of the siliceous horizon were not surveyed.

4.4.5.5 ORE BODY 5

Block 6 (OB5) identified by S.G.Ankinovich was not surveyed during 1971-72. Exploration consisted of using a low-density grid of trenches within the oxidized ores. This ore body lies on the south-western limb of the Balasausqandiq anticline. The thickness of the vanadium-bearing horizon varies from 5.56 to 7.94 m. The dip of the strata is typically steep, towards the south-west, at angles ranging from 60 to 80° striking 310-325°. The siliceous horizon here was not explored. Strike length 8 km.

Figure 4-10: Lower Contact of OB1 (NE Limb OB1) – Tape Extended 1m

Figure 4-10 illustrates an exposure that was seen in a historical trench and clearly shows the brown oxidation of the vanadium layer and the distinct contact with the lower conformable graphitic looking siliceous layer, which contain low grade mineralisation. The upper contact within the same trench is seen in Figure 4-11. This contact is less distinct with the overlying schists to the right.

Figure 4-11: Upper Contact OB1 (NE Limb) Looking SE

4.4.6 ORE GENESIS

The geological history of this deposit in relation to plate tectonics and lithology/geochemistry characteristics, strongly imply that the primary ore layers and, other juxtaposed sediment layers, were deposited in graben structures that were in a marine environment of relatively shallow depth: at Balausa there are indications of conglomerates, deep seated faulting and rifting in common with the South China vanadium deposits, within the Gondwana craton. Such grabens were spatially centred at a reactivated suture zone which had pre-existed in the Precambrian supercontinent of Rodinia, and this developed into an open but relatively shallow marine basin within the supercontinent of Gondwana from Late Proterozoic.

Historically, there were a number of hypotheses on the genesis of the vanadium mineralisation:

- Vanadium is believed to have penetrated into the basin of sedimentation, together with other volcanic products (tephra). This viewpoint is based on the paragenetic relation between carbonaceous-siliceous schists, volcanic formations and higher content of vanadium pentoxide in the effusive rocks of Precambrian and Cambrian strata. However, it was noted that this direct relationship between vanadium concentrations and the sub-synchronous volcanism was not well correlated, as the extent of volcanism was very restricted, yet the vanadium was widely spread in the vanadium-bearing Cambrian strata of Kazakhstan, Tien-Shan and other areas.
- S.G. Ankinovich, E.A. Ankinovich and M. Adyshev attribute the penetration of vanadium into mid-Cambrian ponds, to deep chemical erosion of their adjacent land areas, where the effusive rocks of Precambrian age feature higher vanadium content. As a result of this, primary vanadium accumulations took place in the weathering crust, and thereafter as a result of erosion, moved to the accumulation basin in solution (as dissolved substance) with their subsequent precipitation.
- B.T. Tyurin assumed it possible that chemical sedimentation occurred from regular (molecular) solutions, however, S.G. Ankinovich believes that vanadium precipitation occurred as a result of biochemical processes through digestion by plankton. On death of the plankton, vanadium accumulation built up within sea floor sediments.

Fundamentally however, a primary sedimentary origin has now been accepted for the vanadium mineralisation at the Balasausqandiq deposit, and this has been established for other vanadium deposits occurring in similar mid-Cambrian strata of Kazakhstan. The ore horizon being clearly stratified and can be traced over vast distances.

From a genesis perspective, there are two valid, but probably overlapping scenarios: a biogenic and an abiogenic geochemical process, which were involved in the concentration of the vanadium mineralisation.

4.4.6.1 BIOGENIC CONTRIBUTION

Marine filter feeders are known to concentrate vanadium several (10^6) million times seawater levels. A positive trend between V (IV) and large size phytoplankton biomass suggests that levels of reduced V oxidation states may be influenced by biological activity.

Vanadium is an essential element for many marine phytoplankton species and other organisms. Many enzymes contain V and it may be involved in many metabolic processes such as chlorophyll synthesis, cell division, phosphate uptake kinetics, sulfoxidation in cell motility and photosynthesis. While V (V) is the thermodynamically stable form in oxygenated seawater, V (IV) commonly exists in intra-cellular media V (IV) ions, such as VO_2+, and is generally internalized into the cytoplasm through passive diffusion. Once inside the cell, V (IV) is actively involved in phytoplankton metabolism. Vanadium is relatively abundant in open ocean waters (34–45 nano-metres in oxygenated seawater) with a relatively conservative distribution. Thermodynamically, V (V) is stable in oxidized marine environments, while V (IV) is stable in moderately reducing environments. In general, the solubility of V decreases with decreasing valence, and therefore V (IV) increases proportionally with decreasing total dissolved V pool as the environment becomes progressively more reducing (e.g., Sadiq, 1988 (10)). For example, compared to the Atlantic Ocean, dissolved V concentrations are depleted (by ~60 %) in reducing deep waters of the Black Sea and the Cariaco Basin suggesting that reducing sediments may serve as a major sink for this element (e.g. Emerson and Huested, 1991; Nameroff et al., 2002 (11)).

However, the role of molybdenum as a trace-nutrient is crucial for organisms performing nitrogen fixation, the capability of reducing N_2 to biologically useful ammonia is limited to some bacteria and archea - this observation can be confirmed at OB1, where Mo has a higher correlation with carbon than vanadium with carbon at Balausa.

As for the underlying formation layer of siliceous rocks, which contain low grade vanadium, the precipitation of silicon dioxide apparently took place through chemical processes and partly through a biogenic process, which is testified by numerous remnants of siliceous sponge skeletons in the area of the Lesser Karatau mountains.

4.4.6.2 ABIOGENIC CONTRIBUTION

High concentrations of vanadium (>0.1 % V_2O_5) in carbonaceous shales can be explained by abiogenic geochemical changes that occur during the time of deposition and this environment exhibits distinct signatures:

- High correlation between vanadium and organic carbon
- Close source of rocks enriched in phosphate
- High content of organically based sulphur
- Relatively slow rate of deposition in a marine basin.

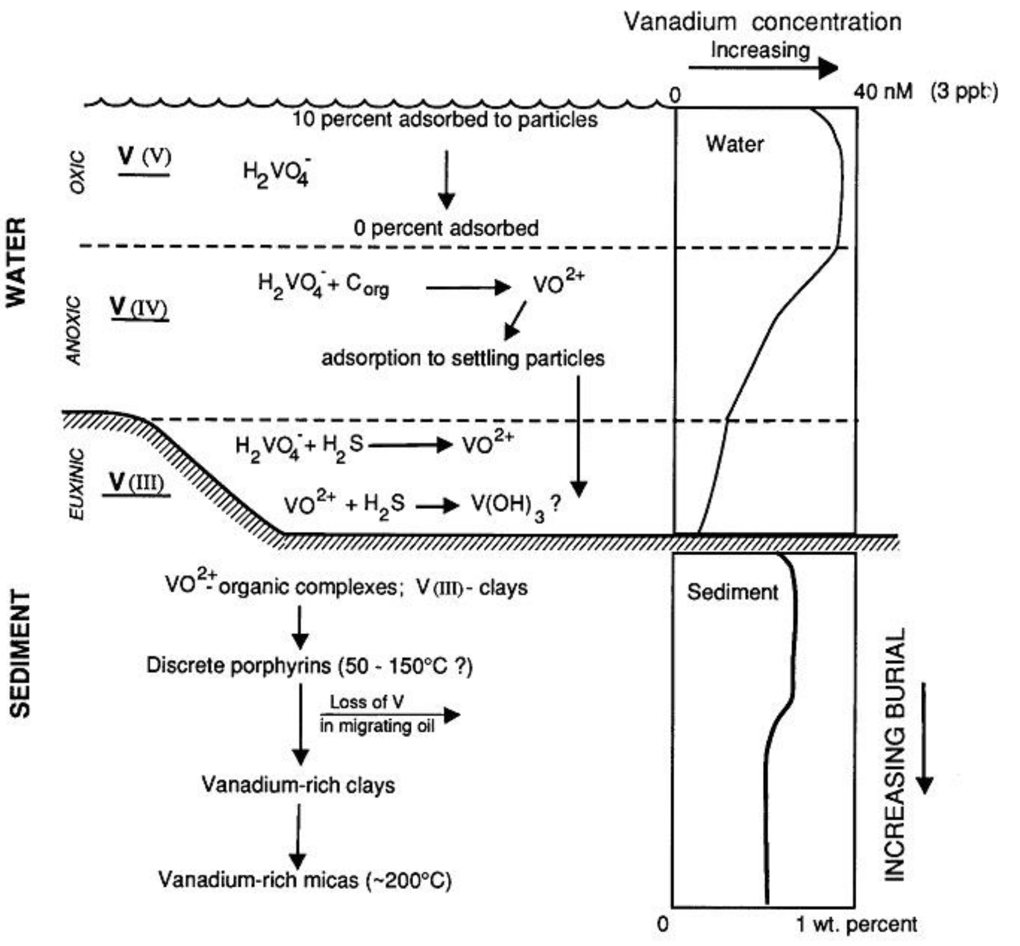
Reduction/oxidation, adsorption and complexation control the mobility and accumulation of vanadium. Vanadate mineral species V (V) dominates the surface aerated surface waters, adsorbs strongly to some mineral surfaces, especially ferric oxides, and limits the concentration of dissolved vanadium at moderate pH levels. Adsorption to biogenic particles promotes depletion in shallow-marine waters but contributes V to the sediments, though in oxic waters these particles will tend to redissolve during re-mineralisation of these particles. In deeper oxic or anoxic waters detrital organic matter and associated vanadium is likely to be preserved. Adsorbed vanadium is likely to increase in anoxic waters because of reduction of vanadate V (V) to vanadyl V (IV) - having a greater tendency to adsorb: see Figure 4-12. Formation of stable organic complexes by the vanadyl ion, relative to many transition metals, explains why vanadium and organic carbon is highly correlated in the primary layer.

The common occurrence of vanadyl-organic species in petroleum attests to the stability of such complexes.

Vanadium-rich carbonaceous rocks are commonly interbedded with transitional rocks enriched in phosphate. The separation of vanadium-rich carbonaceous and phosphatic rocks into distinct sub-units, is due to the contrasting composition of the depositional waters. Phosphate accumulations form when organic matter is partly destroyed under suboxic conditions, whereas carbonaceous matter and associated vanadium are mostly retained by sediments that are in contact with anoxic or euxinic waters. The occurrence of such sub-units can be seen in surface exposures at Balausa.

The presence of organically bound sulphur in vanadium-rich carbonaceous rocks suggests that H_2S was abundant during early diagenesis. H_2S not consumed in pyrite formation reacted with organic matter or diffused upwards, resulting in possible euxinic bottom waters. Under natural conditions, only H_2S is known to reduce V (IV) to V (III), an oxidation state which favours incorporation of vanadium into clay minerals and such enrichment appears to be a characteristic of this deposit. Vanadium enrichment of clays, will tend to be retained during metamorphism, to produce vanadium-rich graphitic schist, though graphite at Balausa has been reported to be <1 % of the total carbon, so the level of metamorphism must be relatively lower than that required to form a general conversion to graphitic schists.

Stratified marine basin sediments require open circulation, in order to provide sufficient vanadium for carbonaceous sediments to have high concentrations of vanadium greater than 0.1 % of V_2O_5.



Geochemical processes that affect the abundance and speciation of dissolved vanadium and the distribution of vanadium in sediments during diagenesis. Vanadium concentration profiles are estimated based on the geochemical processes. Concentrations in water are nanomolar; concentrations in sediment are weight percent on a dry-weight basis.

Figure 4-12: Vanadium Geochemical Enrichment Processes in Marine Basin of Deposition

As an addition to ore genesis, observations and interpretations on a Queensland vanadium deposit provide interesting additional information, which support some of the findings at Balausa (12):

Although V and Mo were concentrated by marine organisms and deposited with organic matter which is a significant component of the Toolebuc Formation, these elements were firstly mobilised into new phases by diagenesis and then again by oxidation during weathering. Diagenesis caused the majority of V (~80 %) to be adsorbed onto clay minerals, although the specific hosts are unresolved. Mo was incorporated into the sulphide component of the fresh rock. Oxidation due to weathering removed TOC as a rock component, with residual enrichment of V and Mo. The majority of the V (~60 %) and Mo (~85 %) contents in fresh rock are remobilised during oxidation/weathering and redeposited in oxide/oxyhydroxide phases.

4.4.7 MINERALISATION

Extensive mineralogical investigation of the vanadium enriched strata was conducted under Ankinovitch in 1943 to 1947. However, most of this research was confined to the depth-limited exposures found at surface, including shallow underground exposures, within the oxide and transition zones. Here, such weathering of the primary ores had changed the chemical and mineralogical character of the vanadium and its associated by-products, so only relatively scant observation of the true nature of the underlying primary zone was achievable; but it was acknowledged that these primary ores comprised an estimated 95 % of the total resource potential and this is confirmed by GMR from the OB1 resource modelling. It was not until the 1970s (Komarnitski) that core was successfully recovered from the primary ores at depth, and then a better understanding of the mineralogy was possible.

The primary ore stratum (Cm_2km^2) normally starts at a depth of 10 m from the topographic surface, but may outcrop when the carboniferous schists/shales are highly silicified or can be deeply oxidized to a depth of 25 m+ where the carbonaceous shales are more argillaceous and only slightly siliceous.

The stratiform vanadium layer is the economic target for exploitation, though historically, the underlying and thicker conformable siliceous horizon (Cm_2km^1 stratum), has also been the target for evaluation, but the grade levels in this formation are sub-economic.

4.4.7.1 SURFACE OXIDATION OF PRIMARY VANADIUM HORIZON

Oxidised vanadium ores, which account for only 5 % of the total ore tonnage exhibit significant changes in chemical characteristics. The content of silicon dioxide is typically 10 % higher than in primary ore, whilst the carbon content is 80 % lower but the vanadium pentoxide content is about 55 % higher.

Low levels of uranium have been identified with the deposit strata. Uranium mineralisation is unevenly distributed and normally associated with the upper part of the oxidation zone in the vanadium-bearing strata due to its migration from the deeper parts and subsequent adsorption by iron hydroxides. The uranium content is considered too low for commercial mining, but will be extracted as a by-product. It is understood that a small quantity of vanadium (10 %) is associated with uranium bearing minerals.

Other typical minerals in the oxide zone include halloysite, metahalloysite, allophone-alumophosphates, ferroalumophosphates, alunite, gypsum, jarosite hydrohematite and limonite.

In general terms, loss of organic matter by oxidative weathering takes place across a reaction "front" where organic carbon content decreases sharply toward the land surface along with organic nitrogen and sulphur, but not for organic phosphorus which remains relatively constant over the same depth range. Accompanying the decrease in organic matter is an increase in porosity. The oxygen content of the organic matter increases sharply toward the land surface across a similar carbon oxidation front.

Pyrite in the primary zone decreases toward the surface more extensively than organic matter and at intermediate depths it is essentially absent in the presence of high levels of organic matter.

Weathering of organic carbon in shales is caused by its reaction with gaseous O_2 and O_2 dissolved in groundwater. Once a weathering profile is developed the downward migrating of O_2 reacts first with modern soil organic matter and subsequently with low concentrations of remaining pyrite and ancient organic matter before reaching the "front". Pyrite reacts faster with O_2 than does organic matter (for a given local concentration of oxygen) as evidenced by reduced pyrite concentrations accompanying high organic matter concentrations at the front. Upon further downward migration, lower levels of O_2 react with higher concentrations of pyrite and organic matter.

Table 4-20: Chemical Composition of the Oxide Ore Horizon Ore Body 1

Element Assayed	Oxide Ore		
	Max (%)	Min (%)	Average (%)
Ignition Losses	8.3	2.88	5.57
SiO_2	82.38	62.6	72.8
Al_2O_3	7.09	2.1	5.07
CaO	6	2.13	3.38
MgO	0.65	0.43	0.57
BaO	*	*	*
Fe_2O_3	6.71	4.57	5.51
C	7.3	0.48	2.69
P	0.38	0.23	0.31
Fe	4.7	3.2	3.85
Mn	0.29	0.16	0.19
P_2O_5	0.89	0.53	0.72
MnO	0.67	0.21	0.31
V_2O_5	1.27	0.76	1.1

Based on analysis of 239 core samples from 13 drill intersections, the primary vanadium ores possesses high organic carbon content (see Table 4-20 and Table 4-21) which has a positive impact on using these ores in metallurgical applications along with a relatively high content of silicon dioxide and low content of phosphorous pentoxide and aluminium oxide. The titanium oxide content is also very low with higher titanium values directly correlated to the amount of pyritisation present, which itself is associated with increased content of aluminium oxide.

Overall this will contribute to the level of iron in the ferro-alloys. The level in the vanadium ore being directly correlated with the amount of argillaceous material present as intercalations within the bed.

Table 4-21: Typical Composition of Vanadium Ore

Component	Range [%]	
SiO_2	59.2	74.8
V_2O_5	0.53	0.83
C	9.96	13.61
P_2O_5	0.41	0.75
Al_2O_3	3.01	6.07
Fe_2O_3	2.56	5.01
CaO	0.60	4.11
MgO-	0.34	1.93

4.4.7.2 MINERALISATION OF VANADIUM HORIZON

In explaining the occurrence of different vanadium minerals, within both the primary ore and the relatively minor secondary oxide ore zone, it would be informative to see this in the context of the geochemical changes that are associated with the type of carbonaceous black shales found at Balausa. Such changes can be explained by abiogenic geochemical changes that occur during the time of deposition and this environment exhibits distinct signatures: refer to Section 4.4.6.2.

Figure 4-13: Drillhole Core from B213 at 121m

Figure 4-13 shows characteristic primary ore formation rock, containing 0.84 % V_2O_5 and 14.73 % carbon: schisty carbonaceous siliceous vanadium shale showing a mesh of quartziferous veinlets.

4.4.7.2.1 VANADIUM

At Balausa, vanadium has been found in 117 minerals, but the bulk of the vanadium is confined to a few dominate minerals, and, as vanadium is found in a number of oxidation states (II, III, IV, V) the vanadium within the various minerals are characterised by specific oxidation states. As a general trend, vanadium in sulphides show low oxidation states (II and III), as found in the primary carbonaceous zone, intermediate oxidation states (III and IV) are seen in micas within the zones of weathering and primary, and the highest oxidation state (V) are seen in vanadate compounds (V_2O_5) within the oxide surface zones. This scenario also mirrors the geochemical changes that occur during enrichment processes within a marine basin (Figure 4-12 above) and also reflects the degree of difficulty at which vanadium can be extracted from the ore-bearing minerals during ore processing: it is more intricate to recover vanadium from the sulphides, easier from micas and easiest from vanadates.

4.4.7.2.2 MAIN VANADIUM MINERALS IN THE PRIMARY ZONE:

- **Patronite**: is an impure vanadium sulphide, and the V_2S_3 form is the most stable – it is the main vanadium contributor at an estimated 50 % of the ore resource.
- **Sulvanite**: is a primary ore sulphide of copper and vanadium, CU_3VS_4, and contributes 5 % of the vanadium resource.
- **Phengite**: it is micaceous vanadium mineral that is similar to muscovite, high in silica, either as a primary mineral or as a detrital mineral which can survive low grade metamorphism. It has been spilt into two types, according to the vanadium oxidation state:
- **Phengite**: where the oxidation state is V (III), containing BaV_2O_4 and contributes a massive 35 % of the vanadium resource. The higher amount of vanadium in this phengite type is because vanadium as V (III) is much more easily incorporated into clay minerals (from which phengite is derived), during deposition and diagenesis, than V (IV).
- **Phengite**: where the oxidation state is V (IV), but its vanadium contribution is relatively minor.

4.4.7.2.3 VANADIUM SECONDARY MINERALS FORMED BY OXIDATION PROCESSES

These remaining minerals contribute about only 10 % of the total vanadium resource. The list is limited, but contains the most important vanadium containing minerals within the oxide zone:

- **Roscoelite**: a vanadium bearing mica found where there is intense weathering of the primary vanadium ores and more typical and dominant in this type of arid climate.

- **Carnotite**: is a uranium-vanadium oxide mineral, $K_2(UO_2)_2(V_2O_8)\cdot H_2O$, typically formed through the action of meteoric waters on primary uranium and vanadium minerals. It is also similar to tyuyamunite, $Ca_2(UO_2)_2(V_2O_8)\cdot H_2O$, and these two minerals are found together within the zone of oxidation.
- **Nolanite**: is a vandiferous iron oxide formed under oxidizing conditions, and contains both V (IV) and V (V) oxidation states.
- **Chernikovite**: is a vanadium bearing mica and may have variable composition.
- **Muscovite**: although a widely spread rock-forming mineral, this mica can contain vanadium and survive within the zone of oxidation.
- **Montrozeite**: VO(OH) – note that when the water decreases it can alter to VO_2. It is normally found in the more relatively unoxidized parts of the weathered zone and considered to be a primary mineral, though GMR believe that its existence within the oxide zone at Balausa could be related to the presence of reported weathered anthraxolite bitumen (occurring in veins or disseminated), as with similar vanadium deposits in China, where anthraxolite has been reported to contain the mineral montrozeite. This explains why this primary mineral remains stable, when complexed with bitumen, in the zone of oxidation.
- **Wakefieldite**: is an uncommon rare earth metal vanadate mineral, tending to have lighter REMs. It is derived by the natural leaching of primary vanadium-yttrium minerals, such as hollandite.

V- porphrins: ($C_{32}H_{38}N_4V$) these are vandiferous organic compounds, probably derived from primitive plant forms at the time of deposition. In the oxide zone these are most likely associated with bitumens. Their contribution to the vanadium resource is estimated at 1 %.

4.4.7.2.4 CARBON

Carbon, as a by-product, is a major economic contributor to the resource. The carbonaceous primary shales and schists, are rich in carbon, containing an estimated average 14 %, and it is relatively straightforward to extract, with very high recoveries from the ore processing. The form of the elemental carbon can range from graphite, to partial graphite and amorphous carbon. It has been reported that the graphitic form of the carbon is very minor at <1 %, and this is indicative of a relatively low level of metamorphism to which the vanadium layer has been subjected, vis-à-vis graphitic schists where metamorphism is much more pronounced. Note: the open pit area exposed the nose of the OB1 syncline, and because here the vanadium horizon has been atypically highly compressed, contorted and silicified, the carbon is more likely to be converted to graphite, vis-à-vis limbs of the fold. Although the carbon can be considered to be in an elemental form, it has obviously been derived from the organic carbon that existed during the time of deposition. In the zone of oxidation, it is easily leached from the rock strata, whereby the rock fabric is converted to a light brown colour.

Note: at the time of writing this report, there is very little information on the molybdenum and uranium containing minerals.

4.5 DRILLING, SAMPLING AND ASSAYING

4.5.1 FORMER SOVIET-ERA

4.5.1.1 SAMPLING OF THE OXIDE ZONE 1942 – 1947

Although extensive sampling campaigns were undertaken in the 1940s (Ankinovich) this was broadly restricted to the oxidized surface layers, by mostly cross-strike trenching and minor underground exposures, via shafts and galleries to a maximum depth of 30 m. Underground sampling intersected both oxides and transition ores but only very minor primary unoxidized layers were mined. Based on the analytical results from the 1940s exploration sampling, it was erroneously concluded that the V_2O_5 grades were similar for both the oxidized and deeper primary zones, due to scant knowledge on the vanadium grade distributions at depth, beyond the influence of surface oxidation processes. This sampling bias was confirmed from the core drilling campaign, by Komarnitski (1970 to 1971), which sampled primary unoxidized ores at depth: results clearly showed that grades were lower in the primary ores vis-à-vis oxide zone. However, the total reported organic carbon values, by Komarnitski, appeared far too low for the primary ore zone, due to the analytical method employed: note that FAR’s total carbon analyses from the primary zone averaged 14 %, as based on Australian laboratory results in 2011.

The extensive historical sampling of the oxide layer, via trenches, pits, shafts, crosscuts and adits, proved extremely valuable in determining the surface continuity and geometry of the ore bodies, and this defined surface expression of the vanadium layers was used in helping to generate 3D models using Datamine.

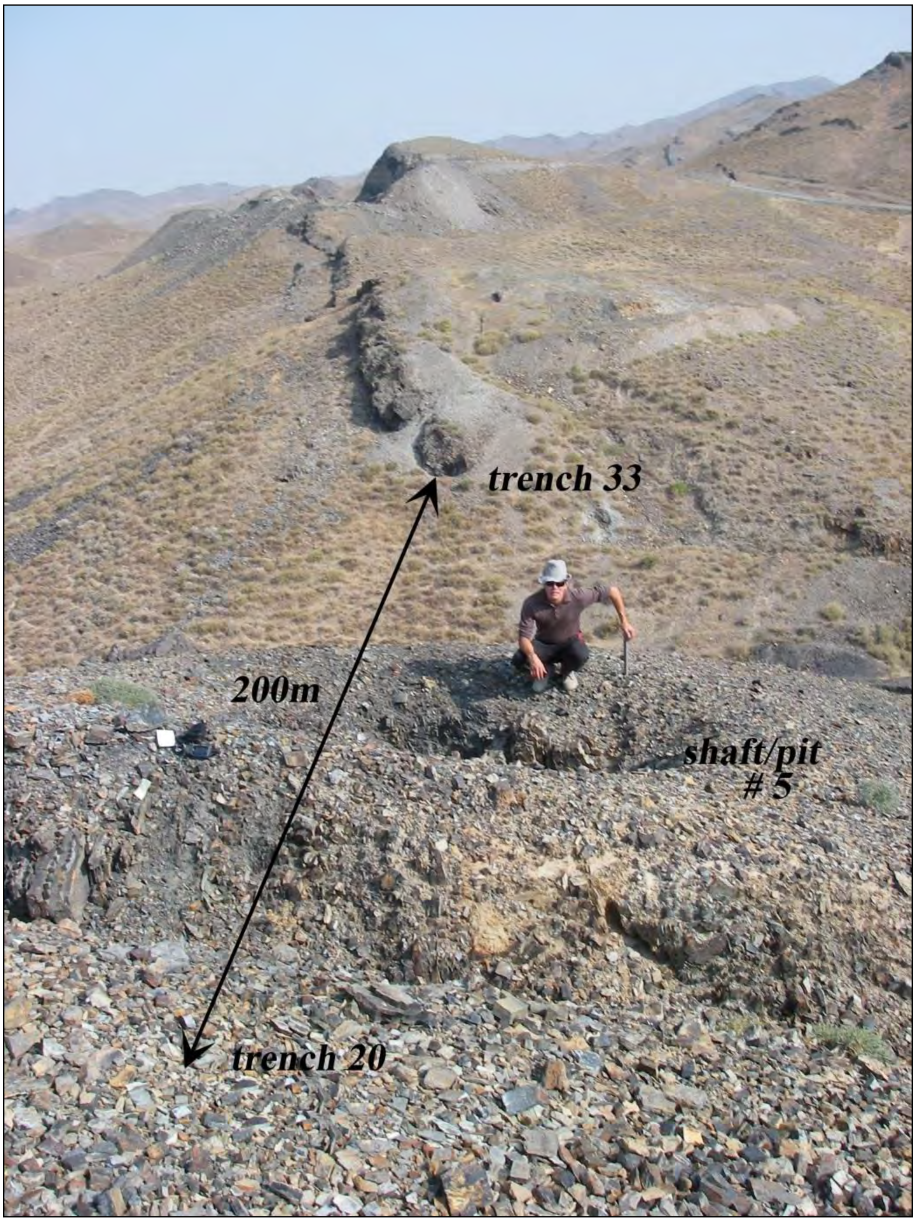


Figure 4-14: Photo at profile 1 looking SE along NE limb of Orebody 1

shows the NE limb as a conspicuous and contiguous surface expression, where the stratigraphically and conformable underlying sub-vertical siliceous horizon to the vanadium stratum, is more highly silicified than that of the lower elevated SW limb to the right. It also clearly demonstrates the continuity of the ore horizon along strike and emphasised by the historical sampling sites at trenches and pits. shows the same view from the 3D Datamine model.

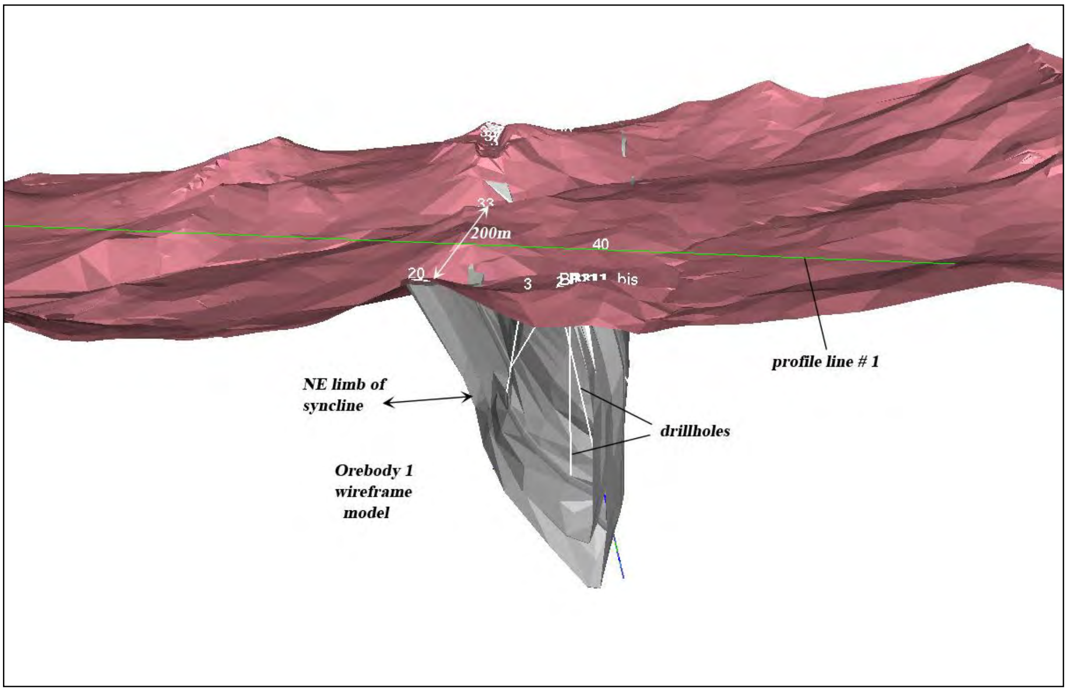


Figure 4-15: 3D DM Model – Same View as with Trench 20 and 33 at Surface

The comprehensive trench sampling results, from this period, were used to estimate the global resource for the surface oxide zone at OB1 (Inferred JORC). However, very little reliable information was available for the primary mineralisation at depth, from this period, and no suitable assay results were accessible for resource estimations.

4.5.1.2 1943-1944 FIRST CORE DRILLING ATTEMPTS

The first recorded core drilling was conducted during 1943 and 1944. Two boreholes were drilled for a total length of 158 m (true vertical depth). Core recovery in the ore zone was very low, being in the order of 15 to 20 %, which clearly is unrepresentative of the ore horizon. No more core drilling was attempted until the 1970s.

4.5.1.3 PHASE 2 EXPLORATION DRILLING (KOMARNITSKI 1972-1973)

During this period 15 coring boreholes were drilled totalling 1,744.0 m, together with an additional 22 new trenches and clearance, deepening (by 0.2-0.5 m) and re-sampling of 17 old trenches (total volume 1411.5 m3), from which 1,808 samples were taken (see Table 4-22).

Table 4-22: Summary of Works 1972 to 1973

Operation	Unit	Scope of Work	
		Designed	Actual
Core Drilling	m	1,630	1,744.0
Trenches	m^3	1,370	1,411.5

Borehole Nos. 2 to 8, No. 9 - down to 74.7 m and borehole No. 10 - down to 31.8 m were drilled with a double ejector pellet borer (borehole size 110 mm), known as “Shot drilling”.

Borehole Nos. 1, 11, 12, 13, 14 and 1-bis, together with extension to borehole Nos. 9 and 10 were drilled with a single-barrel core drilling machine with diamond drill bits (bore size 76 mm). Diamond drilling however was not “successful” because low levels of core recovery were recorded. However, the 1990-1991 drilling campaign (see Section 4.5.1.4 below) confirmed the soundness of the V_2O_5 grades and the FAR drilling results also supported the credibility of the sample analyses.

Borehole Nos. 1 and 7 drilled and sampled in 1971 were later (in 1972) re-drilled due to poor core recovery. Borehole No.1 was also twin drilled and named “1-bis”. This borehole produced better core recovery than borehole No. 1. Although borehole No. 7 was re-drilled, it produced no positive results as the core recovery was much lower than that from the initial hole.

Particular emphasis was placed on prospecting the north eastern limb of OB1 (seven boreholes). Here one borehole was positioned on each of the five prospecting gridlines (0-IV). The south-western limb of OB1 was intersected by two boreholes (Nos. 2 and 14) located on survey grid lines I and IV.

The north-eastern limb of OB2 was intersected by three boreholes (Nos. 8, 9, 12) located on survey grid lines IV, V and VII only. OB2 was not surveyed at depth on survey grid lines II, III, VI and VIII. The south-western limb of OB2 was intersected at depth by only two boreholes (Nos. 4 and 10) both being located on survey line IV.

The north-eastern limb of OB3 was intersected at depth by two boreholes (Nos. 6 and 13) located on survey grid lines IV and VI. The south-western limb of this structure was not explored at depth.

During the same period, gamma-logging was also conducted on all boreholes and gamma measurements were taken in old workings and trenches (see summary Table 4-23 below). All of the trenches were covered by gamma-logs. In boreholes, some of the holes were only partially surveyed. Calliper log measurements and neutron-activity logging to reveal vanadium-52 and aluminium-28 isotopes was also undertaken alongside gamma logging. In the course of logging operations, it was discovered that the presence of radium and aluminium interfered with the vanadium identification.

Table 4-23: Summary of Gamma Logging 1972 to 1973

Planned Coverage	Operation	Unit	Scope of work		%
			Designed	Actual	
95 %	Gamma Logging	m	1,548.5	1,474.4	88
100 %	Gamma Measurement	Points	1,370	1,555	110

Samples were taken from all of the vanadium-bearing and siliceous horizons. In addition, two to three samples were taken from the hangingwall rocks (strata of the lower Kulan subsuite) in view of their possible use as siliceous ores. The footwall rocks were typically tested by two to four samples, and less frequently by more than four samples.

For the siliceous horizon the minimum length sample interval was 1.0 m, and typically up to 3.0 m.

Sampling of the vanadium-bearing horizon, which has greater lithological variation and frequent interlayers, was completed over core intervals not in excess of 1.5 m. The minimum sample interval was 0.4 m, whilst the average length was 0.5-0.8 m.

4.5.1.4 DRILLING FEASIBILITY CAMPAGN 1990-1991

In 2010, FAR discovered that a major drilling programme, comprising of 95 drillholes, was completed during the period from 1990 to 1991 by the Tashkent Research and Development Institute. Unfortunately, details of this 1992 drilling programme, plus specific core sample analyses and the generated feasibility report, are not available. However, a summary report of this work, dated 1992, is available and states that there were 95 diamond drillholes totalling 6,400 linear metres, plus 20 surface trenches. The drilling was designed to target the primary mineralisation at depth: this included 38 drillholes for OB1, 22 drillholes for OB3 and 13 drillholes for OB4. The results basically confirmed the vanadium pentoxide grade trends for the primary zone, as reported by Komarnitski in 1973. It also reported that the B and C1 reserve categories have increased significantly.

The 1992 results also cover analyses of rare earths (lanthanides): see Table 4-34.

4.5.2 FAR'S EXPLORATION DRILLING 2010 TO 2011

4.5.2.1 EXPLORATION DRILLING PROPOSAL 2009

An exploration drilling programme was proposed with the cardinal objective to obtain sufficiently detailed information to allow JORC "Indicated" resources within OB1 and OB2, with an additional option to evaluate OB3 and OB4 for an "Inferred" JORC resource category. To help define the exploration programme, appropriate historical archived materials were computerised and Datamine software used for evaluating the data, generating wireframe models of the vanadium layer and designing drillhole layouts for the project.

In order to achieve JORC (2012) classification for the resource, the drilling should establish continuity of the geological synclinal structures and grade continuity. The historical exploration profiles ranged from 650 m to 900 m along strike and GMR's experimental variogram suggested that this nominal historical 800 m spacing along the strike would be sufficient to provide an acceptable confidence level in estimating the primary vanadium resource: this spacing is also supported from the 1973 core drilling results. It was therefore on this principle that the diamond drilling programme was planned, but of course, complexity due to folding and faulting can add problems to the structural interpretation of the deposit, but it is not likely to fundamentally undermine the confidence in the grades and tonnages, especially on a global context. To confirm that the expected grade and structural continuity can be projected between historical profiles, some intermediate profiles would also be drilled for OB1. Table 4-24 summarises the planned drilling programme for a total 7,000 linear metres. For downdip drillhole intersections of the orebody, a target spacing of about 60 m was planned for the JORC "Indicated" category, with a maximum predicted depth of ore intersection at about 200 m from surface.

Table 4-24: FAR's Drilling Programme Summary

Ore Body	Number of Holes	Total m	Ave. metres per hole	JORC target
1	13	1,621	125	Indicated
2	23	3,727	162	Indicated
3	9	1,209	134	Inferred
4	3	461	154	Inferred
Total	48	7,018	146	

Initially, only alternate exploration profiles would be drilled and, based on the assessment of the vanadium grades and structural behaviour of the vanadium layer, final decisions would be made as to the optimum spacing for achieving the resource objectives.

Altyn-Ken (contractors) provided Longyear wireline core drilling, but the refurbished Soviet-era mounting platforms were restricted to angles between 60° to 90° (vertical), though optimally, shallower angles would have provided a greater flexibility for drilling the orebodies orthogonally. Contracted core size was NQ (47.6 mm) through the vanadium layer and reported core recovery was high at 90 %+. HQ (63.5 mm) was the larger core size.

4.5.2.2 LISTS OF PROPOSED DRILLHOLES

The three number drillhole ID (BHID) has a built-in code to allow easy identification of the target and location. The leading digit is the sequential number of the hole for the specific profile number (trailing digit) and the middle digit is the ore body number. Table 4-25 provides details of the proposed drillholes for OB1, Table 4-26 for OB2 and Table 4-27 for OB3 and OB4.

Table 4-25: Proposed Exploration Holes for OB1

ORE BODY	PROFILE	BHID	LENGTH	AZIMUTH	DIP	EASTING	NORTHING	RL
1	0	B110	80	45	60	12369513	4934650	451
1	1	B111	178	45	70	12370055	4934152	394
1	1	B211	206	225	60	12370073	4934169	386
1	2	B112	150	45	60	12370718	4933645	441
1	2	B212	115	225	60	12370724	4933652	444
1	2	B312	76	45	60	12370747	4933675	459
1	3	B113	78	225	60	12371319	4933092	490
1	3	B213	146	225	65	12371341	4933114	462
1	3	B313	104	45	65	12371369	4933142	482
1	4	B114	104	225	60	12371921	4932457	480
1	4	B214	126	45	70	12371975	4932511	468
1	4	B314	159	45	87	12371954	4932490	446
1	5	B115	99	225	60	12372432	4932034	541

Table 4-26: Proposed Exploration Holes for OB2

ORE BODY	PROFILE	BHID	LENGTH	AZIMUTH	DIP	EASTING	NORTHING	RL
2	2	B122	175	45	60	12370545	4933473	464
2	2	B222	198	45	70	12370503	4933429	459
2	2	B322	250	225	65	12370321	4933247	479
2	2	B422	207	45	60	12370303	4933230	526
2	3	B123	100	45	61	12371153	4932927	549
2	3	B223	170	45	70	12371126	4932900	500
2	3	B323	191	225	65	12370840	4932614	547
2	3	B423	106	225	60	12370820	4932593	594
2	4	B124	105	45	60	12371767	4932303	519
2	4	B224	170	45	60	12371727	4932262	499
2	4	B324	74	225	60	12371481	4932018	568
2	4	B424	121	225	60	12371503	4932041	544
2	5	B125	134	45	60	12372266	4931867	545

ORE BODY	PROFILE	BHID	LENGTH	AZIMUTH	DIP	EASTING	NORTHING	RL
2	5	B225	185	45	70	12372226	4931830	520
2	5	B325	225	225	65	12371912	4931515	526
2	5	B425	158	225	60	12371885	4931488	571
2	6	B126	131	45	60	12372851	4931254	603
2	6	B226	200	45	60	12372794	4931199	580
2	6	B326	171	225	60	12372478	4930884	612
2	6	B426	169	45	60	12372436	4930842	626
2	7	B127	101	44	60	12373189	4930876	627
2	7	B227	140	44	80	12373153	4930839	616
2	7	B327	246	224	60	12373037	4930248	697

Table 4-27: Proposed Exploration Holes for OB3 & OB4

ORE BODY	PROFILE	BHID	LENGTH	AZIMUTH	DIP	EASTING	NORTHING	RL
3	2	B132	209	225	60	12370213	4933140	525
3	3	B133	117	45	60	12370757	4932530	592
3	3	B233	109	225	60	12370618	4932391	590
3	4	B134	126	45	60	12371269	4931965	603
3	4	B234	148	225	60	12371109	4931804	606
3	5	B135	136	45	65	12371766	4931371	609
3	5	B235	97	225	60	12371674	4931277	618
3	6	B136	141	225	60	12372179	4930587	666
3	7	B137	126	224	60	12372902	4930106	775
4	6	B146	105	45	60	12373122	4931527	600
4	7	B147	172	224	60	12373454	4931152	553
4	7	B247	184	44	60	12373425	4931122	556

4.5.2.3 CURRENT STATUS OF FAR'S EXPLORATION DRILLING RESULTS

Table 4-28 below shows the current status of the drilling as at the date of this report and, for OB1, the basic primary objective has been achieved with the generation of an acceptable JORC (2012) resource. Intermediate profiles were also drilled at 2.5 and 3.5 metres, and this confirmed that the grade, geometry and continuity of the fold structure could be reasonably well predicted from the basic profile drilling positions. However, nearer the bottom of the syncline (hinge line) where the maximum curvature of folding occurs, the vanadium layers appear much thicker than expected.

OB2 appears to be the largest and possibly the deepest fold structure, but a drillhole located at the apparent centre of the syncline (see Figure 4-16) unexpectedly encountered vanadium at a depth of only 100 m. Thus OB2 appears to be affected by strike thrusting, where the vanadium layer has been displaced to a higher elevation. Only seven out of the planned 23 drillholes have been completed, but two holes missed the orebody.

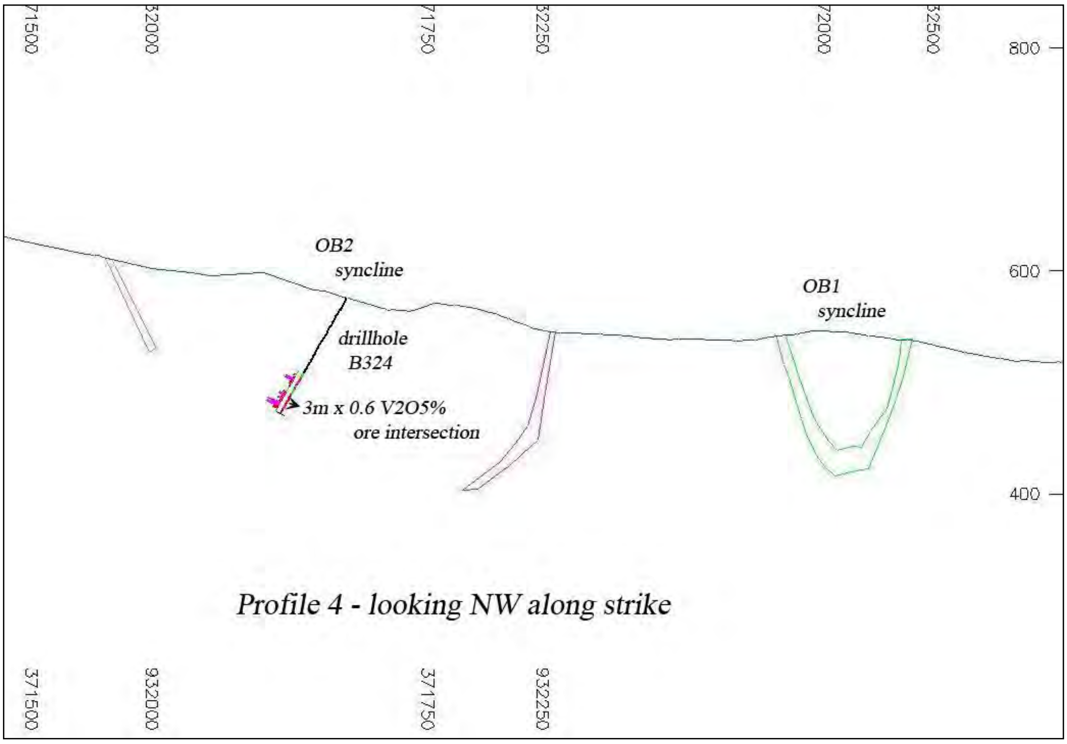


Figure 4-16: Unexpected Vanadium Intersected at 100m Depth - Centre of OB2 Syncline

OB3 fold style appears similar to OB1, though only one third of the drillholes have been completed, but evidence of strike thrusting in the axis of the fold has been seen.

For OB4, three drillholes were proposed, but no drilling has occurred to date.

Table 4-28: FAR Drilling Results – 2010 to 2011

BHID	OB	Profile	EOH Depth in metres	Laboratory V_2O_5 Analysis
B110	1	0	72.8	missed orebody
B111	1	1	64.0	Australia
B112	1	2	92.4	Australia
B112_5	1	2.5	35.0	XRF-FAR
B113	1	3	48.1	Australia
B113_5	1	3.5	105.5	Karaganda
B114	1	4	62.5	Australia

BHID	OB	Profile	EOH Depth in metres	Laboratory V_2O_5 Analysis
B115	1	5	71.0	Australia
B211	1	1	124.6	Australia
B212	1	2	102.9	missed orebody
B212_5	1	2.5	73.6	Australia
B213	1	3	126.2	Australia
B213_5	1	3.5	74.1	Karaganda
B214	1	4	76.8	Australia
B215	1	5	50.0	Australia
B311_bis	1	1	66.2	Australia
B312	1	2	66.0	Australia
B312_5	1	2.5	36.0	Australia
B313	1	3	67.6	XRF-FAR
B313_5	1	3.5	118.8	XRF-FAR
B314	1	4	149.0	Australia
B315	1	5	50.8	XRF-FAR
B412	1	2	134.3	Australia
B412_5	1	2.5	77.2	Australia
B124	2	4	73.0	no assay stopped 1m in OB
B125	2	5	88.4	Karaganda
B224	2	4	142.0	XRF-FAR
B225	2	5	94.3	XRF-FAR
B324	2	4	111.2	XRF-FAR
B325	2	5	231.0	XRF-FAR
B425	2	5	191.7	XRF-FAR
B135	3	5	93.0	Karaganda
B235	3	5	114.0	Karaganda
B335	3	5	180.2	Australia
	Total		3264.2	OB1 1945.4m, OB2 931.6m, OB3 387.2m

4.5.2.4 FAR'S SAMPLING & SAMPLE PREPARATION

High quality sampling and sample preparation are critical for acceptable QA/QC standards, and in 2010 FAR constructed a modern sample preparation laboratory for treating the core samples for their exploration programme. Half-core is cut at the core shed, using a diamond saw, under the supervision of the geologists to ensure that the core cutting produce unbiased samples: see Figure 4-17. At the nearby sample preparation laboratory, the half-core samples are crushed to 2 mm (crushers 1, 2 and

3 are shown in Figure 4-18), mixed and split using a Jones splitter and a 400 g fraction is extracted for pulverization. The rest of the sample is stored as a coarse reject for future additional analyses. The 400 g sample is ground to -200 mesh (74 µm) and 2 x 200 g samples are sent to external accredited laboratories, such as to Intertek and Ultra Trace in Perth, Australia, for analyses. Figure 4-19 illustrates this sample preparation flow diagram. The Perth laboratories endorsed FAR's prepared pulped samples as being suitable for their analyses.

Figure 4-17: Cutting Core

Figure 4-18: Sample Preparation – Crushing Equipment

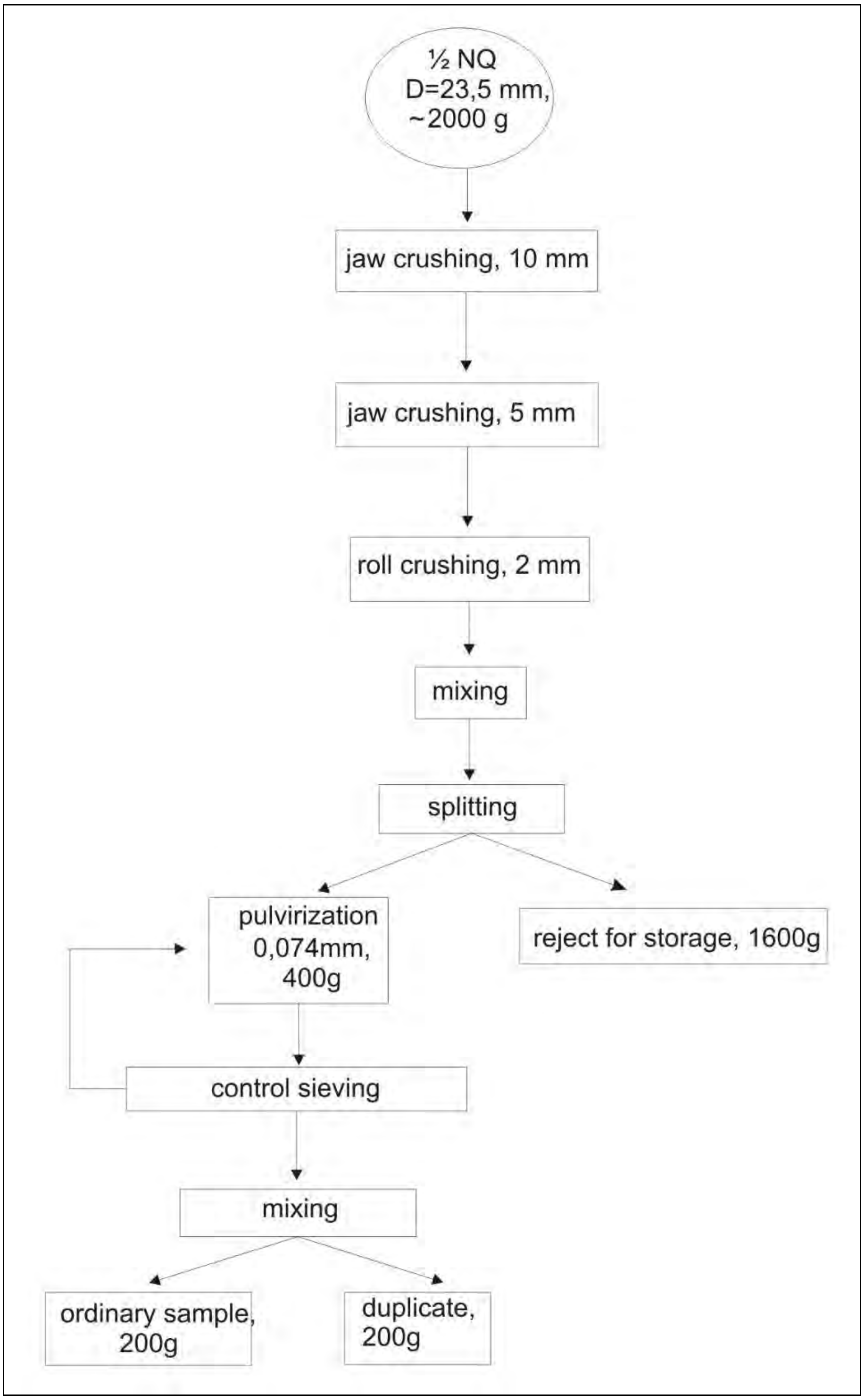


Figure 4-19: Sample Preparation Flow Diagram

4.6 QUALITY ASSURANCE AND QUALITY CONTROL

4.6.1 GEOGRAPHIC SURVEY

Typically, the former Soviet-era maps and plans do not display coordinate data and FAR undertook an extensive topographical re-survey of the Balausa area, which included locations of drillhole collars, sample trenches, adits, shafts and sample pits, and infrastructure. The survey data were compiled in MapInfo, from UMT (WGS84) survey measurements, and from which AutoCAD drawings were generated with a 'local' coordinate system that was parallel with the old historic grid (based on the Soviet Gauss Kruger (Pulkovo 42)). These AutoCAD plans were directly imported into DM and used for generating topographic wireframe surfaces (digital terrain models), plus imported AutoCAD drawings of historic maps and plans. There were a number of problems in locating the correct historical drillhole standpipe collars for the 1973 exploration holes during field surveys, because of indecipherable or absent identification numbers and, especially, where there was confusion from unknown drillhole collars related to the extensive 1990s drilling campaign: but after diligent examination of the 1973 archived plans and maps, together with the new DM topographic model, it was possible to locate with reasonable certainty, the actual drillhole locations. Based on GMR's independent GPS audit measurements of a number of FAR's surveyed drillhole locations, these were accurate and correlated with the historical plans. However, for a very few drillholes, it was not possible to exactly reconcile the field survey with the historical plans and the topographic surface, and this discrepancy was less than a maximum horizontal displacement of 25 m, which is considered to be within acceptable limits for this resource project.

4.6.2 OPEN PIT SAMPLE ANALYSES

The first QA/QC analytical exercise was to establish if the laboratory at the Balausa mine site can produce acceptably accurate and reproducible V_2O_5 results, when compared with internationally accredited laboratories. However, it must be emphasised that analytical results from the Balausa laboratory have never been used for resource estimations.

In October 2007, shallow rotary drillhole and surface trench samples, totalling 55, were taken within the oxide (+ or – transition) zone of the operating pit and submitted to the internationally accredited Alex Stewart laboratory in Kara Balta, Kyrgyzstan. The samples were re-numbered by a GMR geologist based in Almaty, prior to despatch to Kara Balta, to allow independent QA/QC checks to be made. Samples were pulverised to 85 % passing minus 75 µm (-200 mesh) screen and vanadium determined by Inductively Coupled Plasma Optical Emission Spectrometry. The Balausa methodology for analysis of the vanadium content was by either redox titration or gravimetric analysis. The assay results were compared with the Balausa's laboratory sample-splits from the same batch of samples sent to Alex Stewart. It is also understood that Alex Stewart pulped the samples and produced splits, prior to despatch to an Australia laboratory, as a second validation check, but GMR do not know if these samples were sent to Australia.

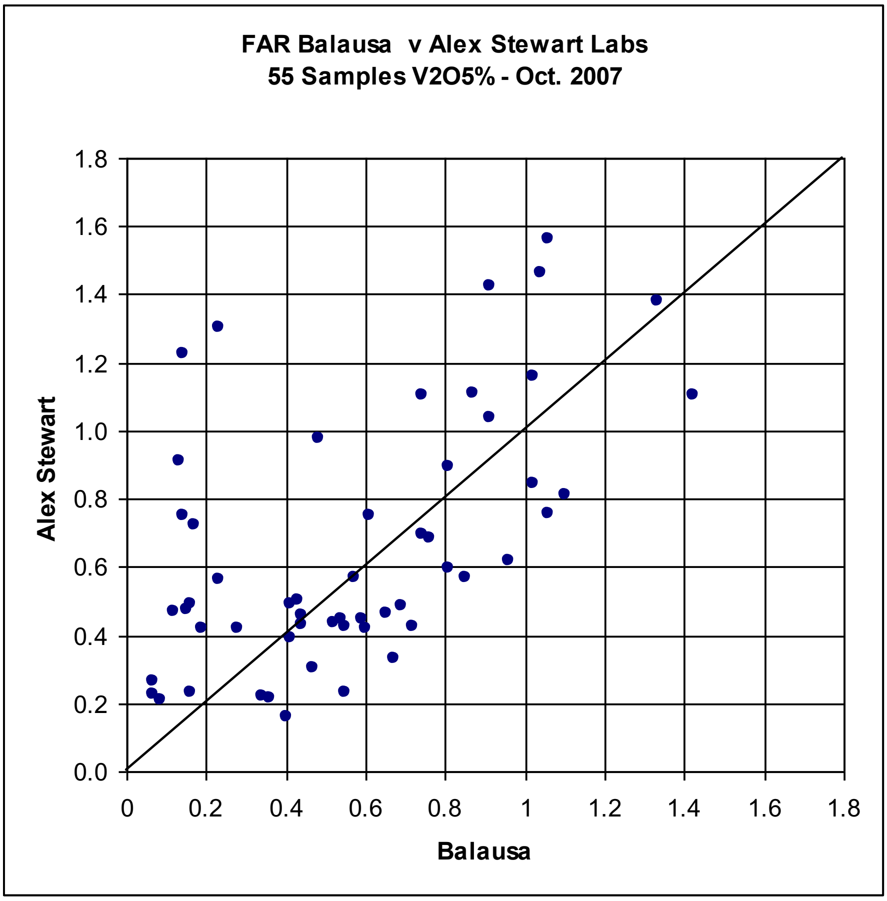


Figure 4-20: FAR v Alex Stewart laboratory V_2O_5 % – oxide open pit samples

The results in Figure 4-20 show a poor correlation between the laboratories. The reasons are unknown, but problems could include poor sample preparation, digestion and analysis, plus mislabelling. Average results were 0.56 % and 0.66 % of V_2O_5 %, between the Balausa and Alex Stewart laboratories. Note that these samples exhibited lower grades than expected for the oxide zone, as a number of samples were taken from adjacent contact waste zones – these samples were derived from 29x rotary holes and 26x channel samples.

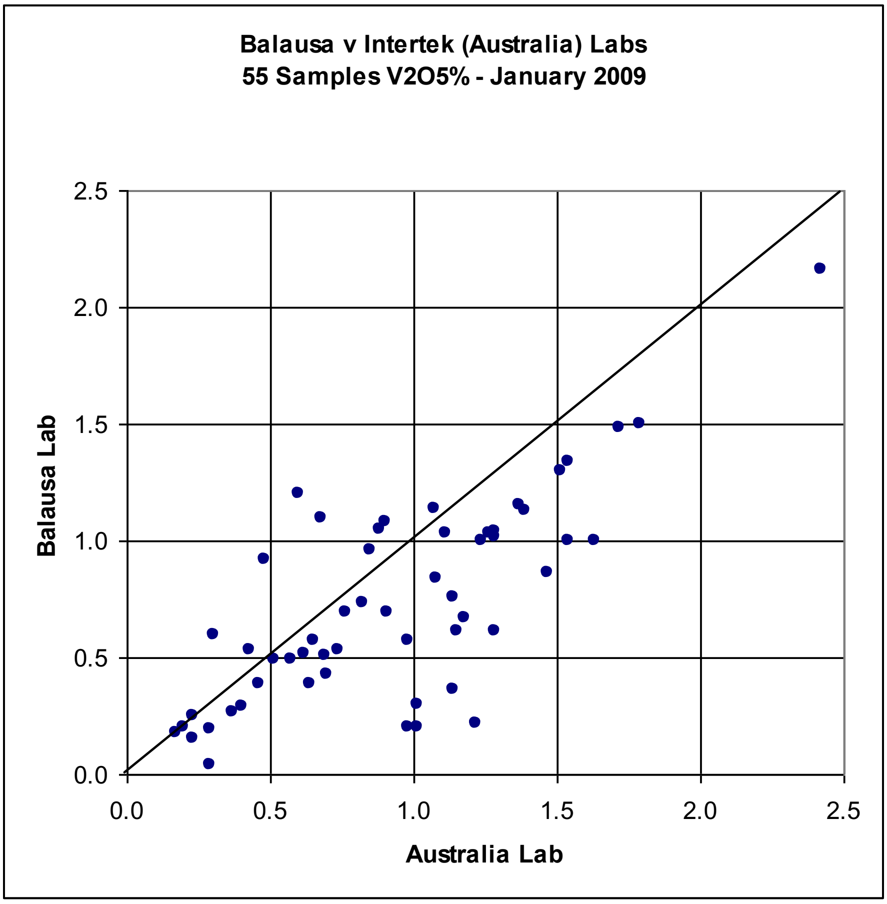


Figure 4-21: Balausa mean V_2O_5 % 0.73 % and Australia mean 0.93 % (oxide)

A second batch of samples was based on channel samples taken from the active open pit bench, located at the nose of the synclinal structure in OB1 in June 2008. These channels were dug by a bulldozer's ripper (10 to 30 cm deep x 1 m length and each sample weighed about 8 to 9 kg) and sample-splits were taken from these samples after homogenising. The results, illustrated in Figure 4-21, are much better than the 2007 results, with a much improved correlation trend between the both laboratories, but the accuracy of the Balausa lab results are not acceptable, as it has a distinct propensity to understate the actual contained vanadium – this lower V_2O_5 grade was also apparent for the 2007 results.

The preliminary comparison of results between the FAR Balausa laboratory for V_2O_5 % and the internationally accredited Australian laboratory (Intertek), showed that it was critical to send the samples for the FAR exploration drilling programme to an internationally accredited laboratory. The Intertek laboratory in Perth, Australia, was selected for this project. Average results (shown in Table 4-29) confirm the reported historical V_2O_5, C, Mo and U grade levels and are typical for the oxide zone, as indicated from the low carbon content and signature vanadium levels vis-à-vis primary zone.

Table 4-29: Quality Control Results Intertek Laboratory

C %	Mo ppm	U ppm	V ppm	V_2O_5%
0.83	149.02	45.45	5,213.02	0.93

Sample preparation and analytical methods at internationally accredited laboratories were undertaken to ensure appropriate analytical techniques. Note however, when FAR's new sample preparation laboratory was completed in 2010, the quality of the pulps was endorsed by the Australian laboratory as being acceptable for their analytical work.

4.6.2.1 ANALYTICAL METHOD - INTERTEK LABORATORY, AUSTRALIA

The analytical methods for the 55 samples sent to Intertek (14/01/2009) were as follows:

- V - Oxidative alkaline fusion using sodium peroxide flux, after roasting (ashing) to remove graphitic and other organic material (some analytes may be lost during roasting). Analysed by Inductively Coupled plasma optical (atomic) emission spectrometry. (50 ppm detection limit) – lab code RD/OES
- C - Digestion by hot acids and infrared analyses using induction furnace. (0.01 % detection limit) – lab code Ind/IR
- Mo - Oxidative alkaline fusion using sodium peroxide flux, after roasting (ashing) to remove graphitic and other organic material (some analytes may be lost during roasting.). Analysed by Inductively Coupled plasma mass spectrometry (1 ppm detection limit) – lab code RD/MS
- U - Oxidative alkaline fusion using sodium peroxide flux, after roasting (ashing) to remove graphitic and other organic material (some analytes may be lost during roasting.). Analysed by Inductively Coupled plasma mass spectrometry (0.1 ppm detection limit) – lab code - RD/MS

4.6.3 FAR'S EXPLORATION CORE SAMPLE ANALYSES

The first batch of core samples from FAR's exploration programme, totalling 110 samples, was sent to Intertek in March 2011, after sample preparation on site, these pulped samples weighed about 200 g each. FAR requested that Intertek test the validity of using a multi-acid digestion, vis-à-vis the more expensive sodium peroxide fusion approach, as used in 2009 (Section 4.6.2.1 above). A comparison of results on 20 test samples confirmed that both methods were similarly accurate in determining the actual contained V, Mo, and U elements, and the four-acid approach was therefore adopted for all FAR's exploration sample analyses. A further two batches of samples were sent to Intertek: giving a total of 370 samples. To confirm the Intertek laboratory results, for external QA/QC assessment, a number of random sample pulp duplicates were re-analysed by the internationally accredited laboratory Ultra Trace, also in Perth, amounting to 14 % (51 samples) of the Intertek samples (see Figure 4-22). Results show excellent precision and accuracy: the analytical technique is identical for both laboratories. Also, see the Intertek assay certificates for the first batch of samples in APPENDIX A.

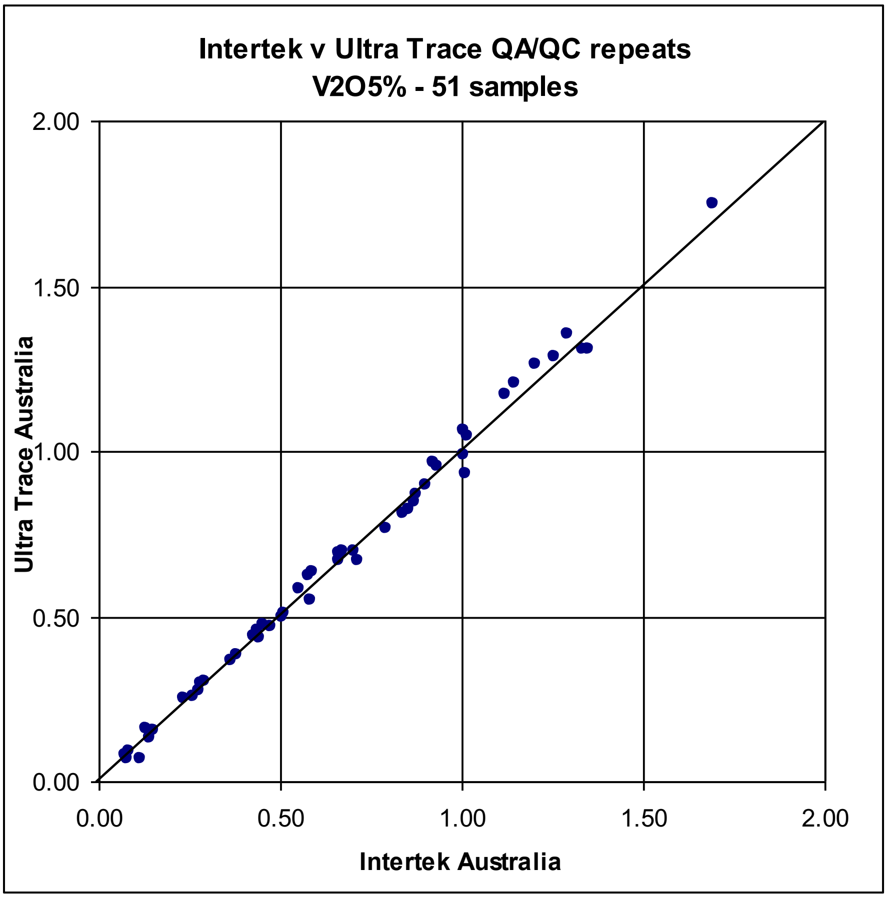


Figure 4-22: V_2O_5 – Ultra Trace (0.67 %) + QA/QC repeats at Intertek (0.67 %)

4.6.4 ANALYSES UNDERTAKEN BY OTHER LABORATORIES – KAZAKHSTAN

After the three main batches of samples were analysed in Australia, FAR decided to send core samples from the exploration programme to the TOO CentreGeoAnalysis Laboratories, in Karaganda, which is approved by the National Centre of Accreditation Kazakhstan. FAR also decided to upgrade its own laboratory by installing a modern XRF facility in Balausa. In addition, there were a number of trial sample splits analysed at the Kozlov laboratory (KazMex) which appears to be a former Soviet-era style laboratory.

4.6.4.1 ANALYSES AT THE KARAGANDA LABORATORY – V_2O_5

GMR assessed the quality of the Karaganda laboratory, by comparing sample splits which were also analysed in Australia. The results are illustrated in Figure 4-23, and it shows a good correlation and good accuracy. On this basis, GMR accepted the use of this laboratory for the resource estimate. Although GMR does not have the details of the analytical method used by Karaganda, FAR stated that it was similar to the method used in Australia. It should be noted that only V_2O_5 was analysed at the Karaganda laboratory, and this limited the final number of samples containing C, U and Mo results for the by-product resource estimations.

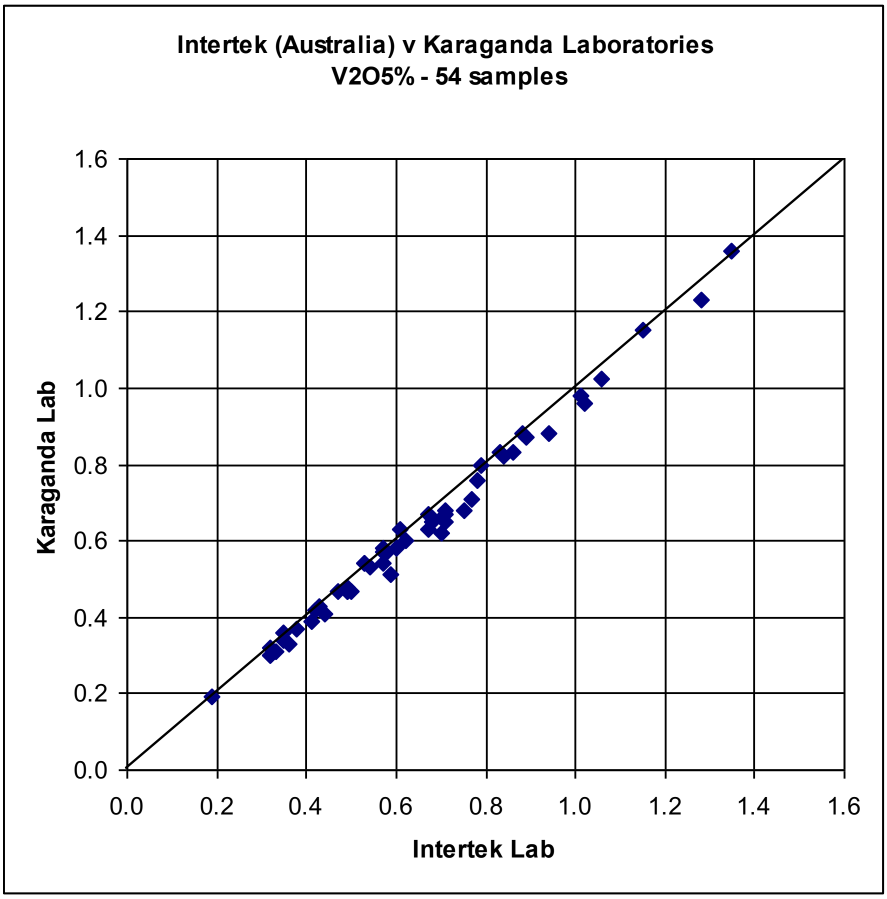


Figure 4-23: Scatterplot V_2O_5 Intertek (0.65 %) v Karaganda lab (0.63 %)

4.6.4.2 BALAUSA XRF LABORATORY ANALYSES OF V_2O_5

FAR had installed modern XRF equipment to specifically analyse elements on site. The XRF system is very accurate in quantifying the contained metals and is the preferred technique for the determination of the major element oxides, as well as some trace elements. However, it needs careful preparation of the samples, plus calibration of standards and matrix corrections and adjustments for drift etc., to avoid false readings. At Balausa, the press powder technique, vis-à-vis fusion technique, is used but is subject to particle size and matrix effects which increase analytical uncertainty.

A comparison between the analytical results from the Karaganda laboratory and the Balausa XRF results were used to determine the acceptability of the XRF method for the resource estimations. The scatterplot in Figure 4-24 shows the results of 117 samples.

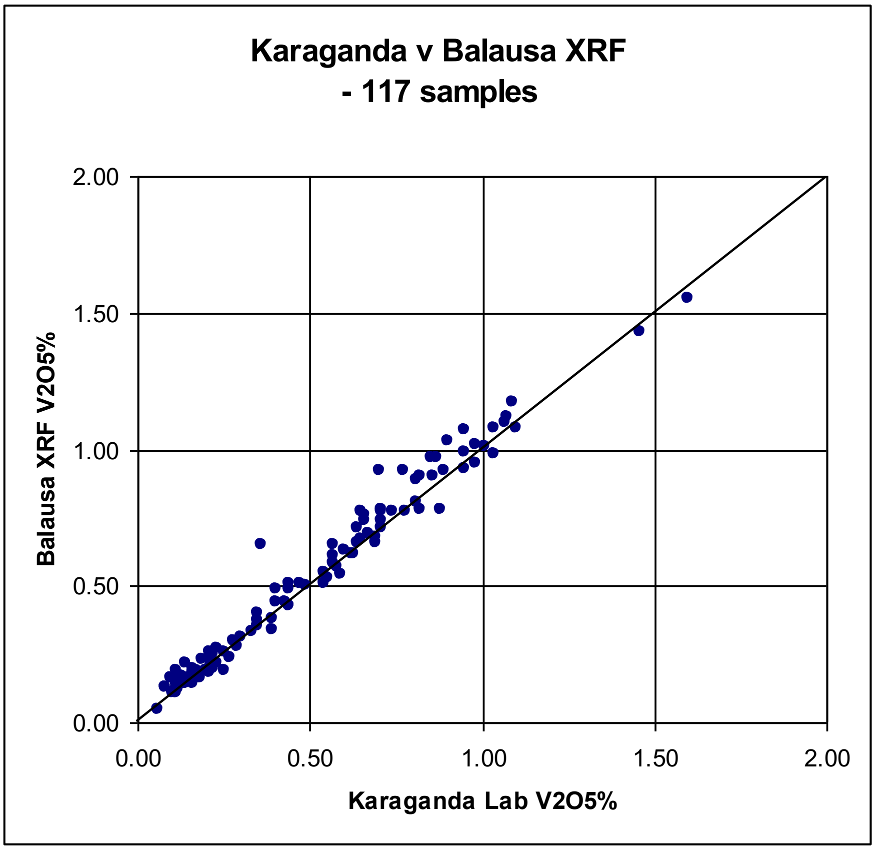


Figure 4-24: Scatterplot Karaganda v Balausa XRF V_2O_5

The average V_2O_5 is 0.48 % at Karaganda and 0.51 % Balausa XRF lab. Overall, the correlation is good but the accuracy slightly lower than expected, with Balausa having 6 % higher grade than Karaganda, which is reasonable and considered to be within acceptable limits and not a fundamental flaw. The data comparison was mostly from OB2 and OB3 samples, and included ore and adjacent low grade zones - however, with the16 samples from OB1 the XRF result was 7.4 % higher than the Karaganda results, though this is still considered by GMR to be within acceptable limits.

Note: when the above problems were recognised, sample homogenization improvements by finer sample grinding, for the press powder technique, has improved the XRF accuracy of the results, according to FAR.

4.6.4.3 ANALYSES AT THE KOZLOV LABORATORY – V_2O_5 & C

The results of the Kozlov laboratory in Kazakhstan were compared with the Balausa XRF and with the Intertek results. Figure 4-25 shows the comparison with the Balausa XRF results for 41 samples and highlights a fundamental flaw with the accuracy of the Kozlov analytical procedure, as the results are far too high, and totally unacceptable for JORC-based resource estimations. Comparisons with other laboratories also show anomalous high-grade trend problems with the Kozlov analyses: see Intertek laboratory results in Figure 4-26.

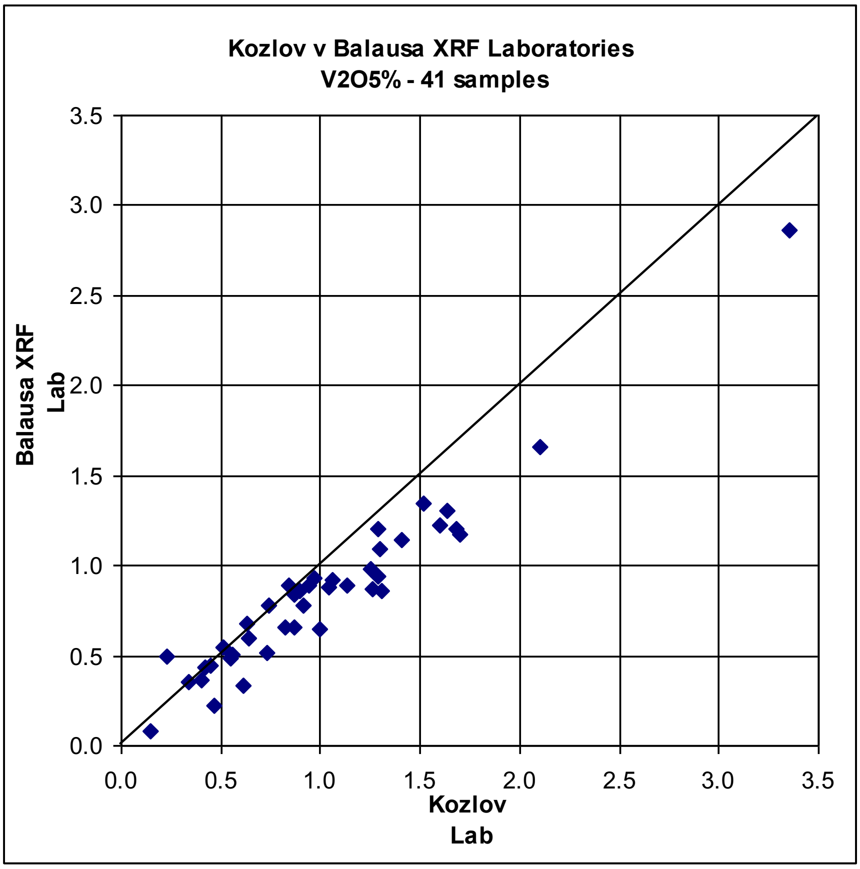


Figure 4-25: Scatterplot V_2O_5 Balausa XRF (0.84 %) v Kozlov (1.01 %)

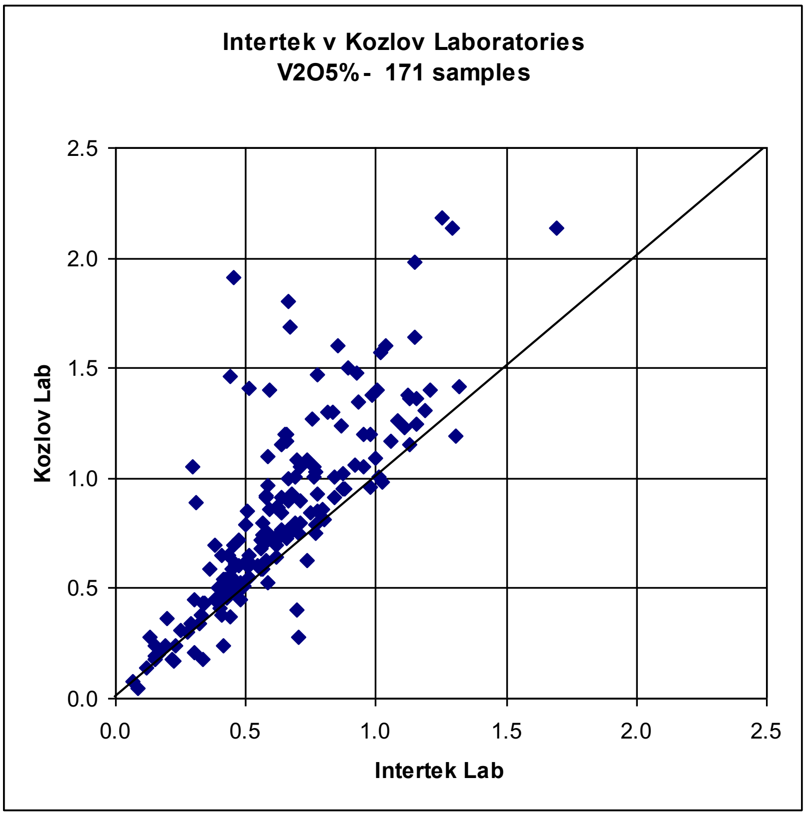


Figure 4-26: Scatterplot V_2O_5 - Intertek (0.64 %) v Kozlov lab (0.85 %)

Similar to the previous example, the 171 Kozlov results show big discrepancies with the Intertek results and, again, are highly exaggerated, especially above 0.5 % V_2O_5.

In addition to the V_2O_5 analyses, it has been possible to assess the Kozlov carbon analyses with the Intertek results for OB1. These results show quite a poor correlation and the average carbon grades are, Kozlov 14.4 % versus Intertek mean of 11.7 % - this again confirms that the Kozlov results do have a high grade bias. See Figure 4-27.

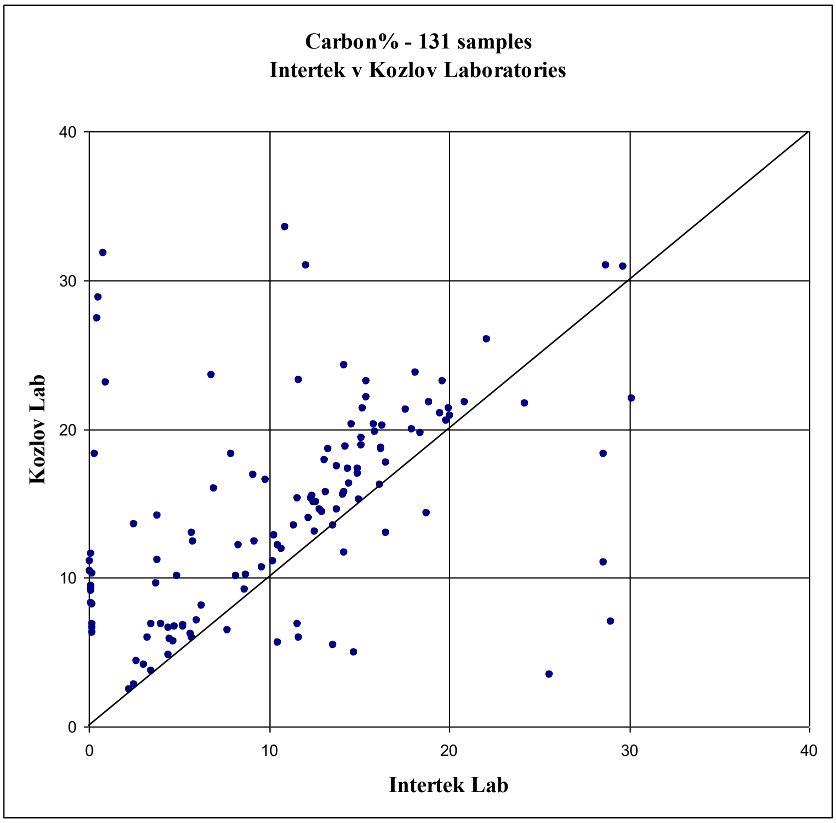


Figure 4-27: Scatterplot Carbon - Intertek (11.73 %) v Kozlov lab (14.36 %)

4.6.4.4 ANALYTICAL V_2O_5 RESULTS FOR BALAUSA LABORATORY (PRE-XRF)

Similar to the findings for the open pit oxide analyses at Balausa in 2007 and 2009, see Section 4.6.2 above, the Balausa laboratory (pre-XRF) results for the FAR exploration samples continue to show the same analytical accuracy problems, especially when compared with the Intertek results, where there is also a low correlation or repeatability. See Figure 4-28 and Figure 4-29.

The pre-XRF Balausa laboratory analyses are therefore not reliable enough to be used for the JORC-based estimations, and neither are the Kozlov analyses.

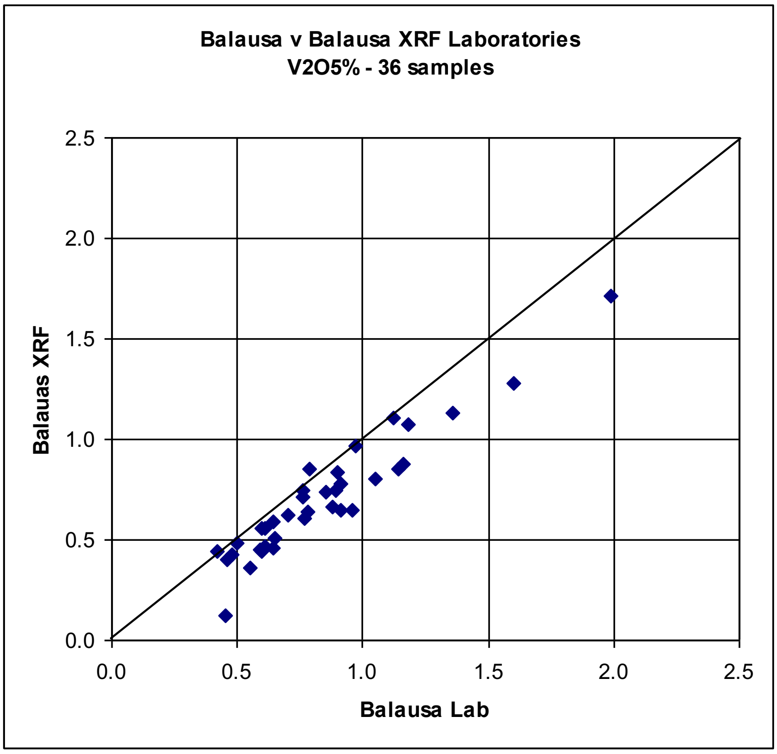


Figure 4-28: Scatterplot V_2O_5 Balausa lab (0.84 %) v Balausa XRF (0.70 %)

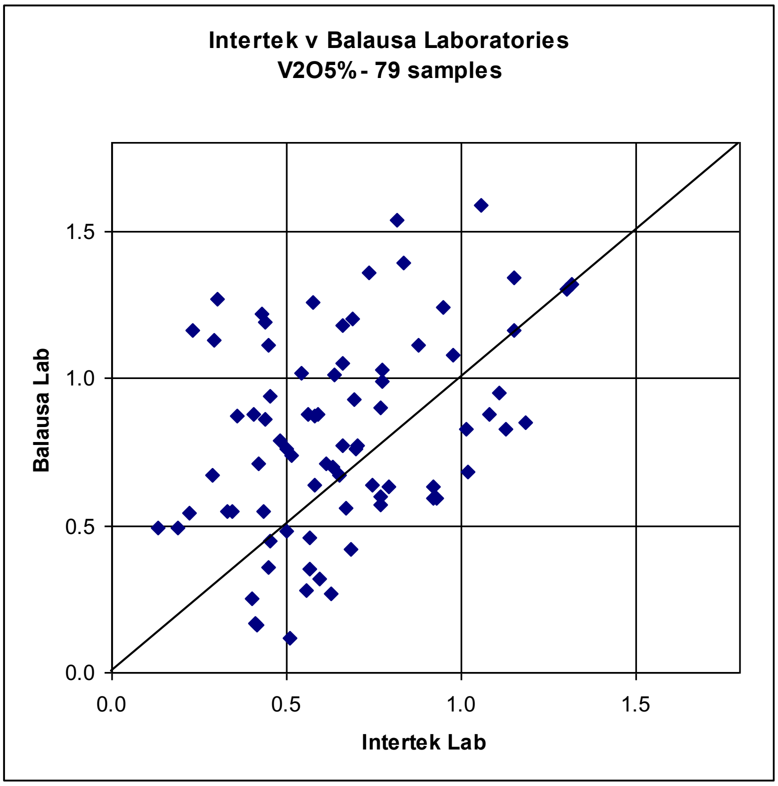


Figure 4-29: Scatterplot V_2O_5 Intertek (0.65 %) v Balausa lab (0.81 %)

4.6.5 QA/QC ANALYTICAL ASSESSMENT

Many FAR core samples had analytical results from more than one laboratory, and GMR generated an algorithm using the DM macro facility, to prioritise the use of V_2O_5 results, according to confidence levels, as ascertained from the QC assessment studies. The confidence levels in the laboratory results, from highest to lowest are as follows:

Australian labs > Karaganda > Balausa XRF

Note that Kozlov and the pre-XRF Balausa laboratories were too unreliable to be used for the grade estimations.

When comparing the recent FAR drilling results to the 1973 Komarnitski Soviet-era drillhole results at similar orebody intersection locations, expected levels of vanadium content were found and therefore these historical former Soviet-era drillhole results were accepted for the purpose of this mineral resource estimate.

4.6.6 REE ANALYSES

4.6.6.1 REE ANALYSES - AUSTRALIA

Rare earth elements can be an important economic contributor to the resource and to make a preliminary quantitative assessment of a selected range of these elements, within the vanadium layer for OB1, a number of FAR's sample pulps at the Ultra Trace Laboratory in Perth were composited into four compound samples, representing specific exploration section lines (1, 2, 3, & 4). Aliquots of these samples were selected from drillholes representing intersections through the primary vanadium layer and composited accordingly. See Table 4-30.

Table 4-30: Sample composites for REE analysis

Profile Line	Drillholes	Sample #'s	Total No. of Pulp Samples	Composite #	V_2O_5%
1	B211 & B311	B211-2 to B211-6 B311-2 to B311-9	13	Comp 1	0.68
2	B412	B412-2 to B412-8 B412-10 to B412-13	11	Comp 2	0.71
3	B113 & B213	B113-4 to B113-10 B213-2 to B213-24	30	Comp 3	0.65
4	B314	B314-2 to B314-17 B314-20 to B314-27	24	Comp 4	0.73

Note: in addition to rare earth elements, gold, platinum and palladium were also analysed. See Table 4-31 for a summary of the Ultra Trace results.

Table 4-31: REE Results Ultra Trace laboratory

Sample	Au1	Pt	Pd	La	Ce	Pr	Nd	Sm	Gd	Ho	Er	Yb	Lu	Y	Sc
	ppb	ppb	Ppb	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Comp 1	15	40	60	39	46	10	43	11	14	3.6	11	10	1.4	127	<
Comp 2	34	40	60	47	58	13	59	15	18	4.0	12	11	1.4	140	<
Comp 3	30	40	60	36	40	8	35	8	8	2.4	7	6	0.8	95	<
Comp 4	36	40	40	45	54	11	47	10	12	3.0	10	8	1	123	<
Mean	**29**	**40**	**55**	**41**	**49**	**10**	**46**	**11**	**13**	**3**	**10**	**9**	**1.2**	**121**	**<**

Repeat checks of these analyses were completed by Intertek and these results are summarised in Table 4-32.

Table 4-32: REE Results Intertek laboratory

Sample	Au1	Pt*	Pd*	La	Ce	Pr	Nd	Sm	Gd	Ho	Er	Yb	Lu	Y	Sc
	ppb	ppb	Ppb	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Comp 1	15	21	42	38	46	10	44	10	13	3.3	11	10	1.4	127	<
Comp 2	25	20	59	44	58	12	56	13	17	3.7	12	11	1.4	134	<
Comp 3	25	20	49	51	75	11	49	10	11	2.5	8	7	1.1	105	<
Comp 4	18	17	40	43	52	11	47	10	13	2.9	10	9	1.3	125	<
Mean	**21**	**19**	**47**	**44**	**58**	**11**	**49**	**11**	**13**	**3**	**10**	**9**	**1.3**	**123**	**<**

** mean of 2 repeats*

The results from both laboratories show acceptable repeatability and accuracy, however, for sample Comp 3 the La and Ce results show a noticeable dichotomy and also a problem with all Pt results. GMR therefore asked Intertek to check their Pt assays, and the Intertek re-analyses confirmed that the Ultra Trace Pt results were “too high” at 40 ppb - Intertek communiqué dated April 2012.

The overall composite REE results show a mean grade of 335 ppm for the four composites and, individually, the average composite REE grades are similar. This suggests a regular grade level distribution throughout OB1.

An initial analysis check by Intertek, using a multi-acid approach, showed REE levels at only about half the level compared to the fusion method, as certain minerals such as cassiterite, rutile, ilmenite, zircon, tantalite-columbite, wolframite, garnets, and xenotime incorporate lots of REE in their structures and these may be the dominant REE carriers in the Balausa vanadium bearing sediments for some of these elements. These minerals will therefore not dissolve completely in four acid digests, hence the acid digestion approach show lower levels than the fusion. This is less noticeable in rocks with higher REE contents, as the REE carriers tend to be more soluble in acids, such as bastnäsite and monazite minerals, although REE locked up in xenotime will not be released fully in most cases. See Intertek REE check result assay certificate in APPENDIX A.

AU, PT, AND PD

The samples have been analysed by fire assay using a 40 g or 25 g (Intertek) portion of the composite sample. This is a classical fire assay process and will give total separation of gold, platinum and palladium in the sample. Analysed by Inductively Coupled Plasma Optical Emission Spectrometry.

LA, CE, PR, ND, SM, GD, HO, ER, YB, LU AND Y

The samples have been fused with sodium peroxide and subsequently the melt has been dissolved in dilute hydrochloric acid for analysis. Due to the high furnace temperatures volatile elements are lost. This procedure is particularly efficient for determination of major element composition (including silica) in the samples or for the determination of refractory mineral species. Analysed by Inductively Coupled Plasma Mass Spectrometry.

SC

Sc has been determined by Inductively Coupled Plasma Optical Emission Spectrometry.

AG (ONLY INTERTEK ANALYSED THIS ELEMENT)

Multi-acid digest including Hydrofluoric, Nitric, Perchloric and Hydrochloric acids in Teflon Tubes. Analysed by Inductively Coupled Plasma Mass Spectrometry.

The final REE analytical methods have now been optimised, in accordance to the Ultra Trace and Intertek laboratory methodology, and this approach provides excellent results for total determinations of contained rare earth metals at Balausa.

4.6.6.2 REE ANALYSES – KARAGANDA LABORATORY

The Karaganda Laboratory analysed 477 drillhole pulp splits for vanadium, from the FAR exploration programme, for mostly OB1, with minor samples from OB2 and OB3. These pulps were split into three class limits, based on V_2O_5% values, into 0.25 to 0.5 %, 0.5 to 1.0 % and 1.0 to 1.5 %. Pulps within each class limit were composited, using about 15 samples per composite. The final 31 composites were assayed for REE, and results are listed in Table 4-33. The V_2O_5% value was based on the average grade of the pulps within each composite.

GMR has no direct confirmation of Karaganda's REE analytical methods, in support of this QA/QC assessment. However, the Karaganda average REE results show a good correspondence with the Australian laboratory results, even though the samples are of different composites. The only exceptions are where the Karaganda's detection limits are not sensitive enough; e.g. for the Ho, Er, and Lu elements.

Table 4-33: Karaganda REE Analyses – Based on Vanadium Pulp Sample Composites

	Lu	Eu	Dy	Tm	Yb	Y	Er	Nd	La	Gd	Ho	Pr	V_2O_5%
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	
Limit	5	?	5	2			10		20	10	5	10	
		1			14	69		23	24				0.37
		2			14	100		37	37				0.42
		1			11	57		29	27				0.4
		1			14	88		38	36				0.38
		1			15	91		33	29				0.37
		2			18	127		36	34				0.39
		1			16	83		32	26				0.37
		2			18	116		39	38				0.38
					11	53		19					0.35
		1			15	92		31	29				0.37
		2	6		29	162		48	41				0.72
		2	5		29	159		44	41				0.77
		3	7		25	203		68	38	11		11	0.75
		3	6		29	175		63	41	10		11	0.69
		2			27	149		46	38				0.69
		2			25	136		40	36				0.68
		2	5		27	235		48	46				0.74
		3	6		30	189		61	37			11	0.77
		2	6		30	234		51					0.69
		2	5		28	164		50	42				0.73
		3	6		30	178		59	44				0.68
		2	6		30	198		45					0.74
		2			24	143		47	46			10	0.72
		2			20	109		39	33				0.65
		2			23	205		50	43			10	0.73
		2	6		27	150		44	43				0.69
		3	5		42	217		75	58	11		15	1.2

	Lu	Eu	Dy	Tm	Yb	Y	Er	Nd	La	Gd	Ho	Pr	V_2O_5%
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	
		2	6		35	157		52		10			1.4
		3	7		36	200		67	53	13		12	1.15
		4	10		50	239		87	37	18		14	1.5
		3	6		40	198		75	57	12		15	1.26
Mean		2	6		25	151		48	39	12		12	0.67

Yttrium is widely distributed in this deposit and to illustrate its distribution in relation to vanadium levels, Figure 4-30 shows a distinct broad propensity for the higher yttrium levels to be associated with raised levels of V_2O_5, though the lowest class group at <0.5 V_2O_5%, and the higher class groups above >0.5 %, do not exhibit notable sensitivity trends in relation to changes in the yttrium levels within their respective groups.

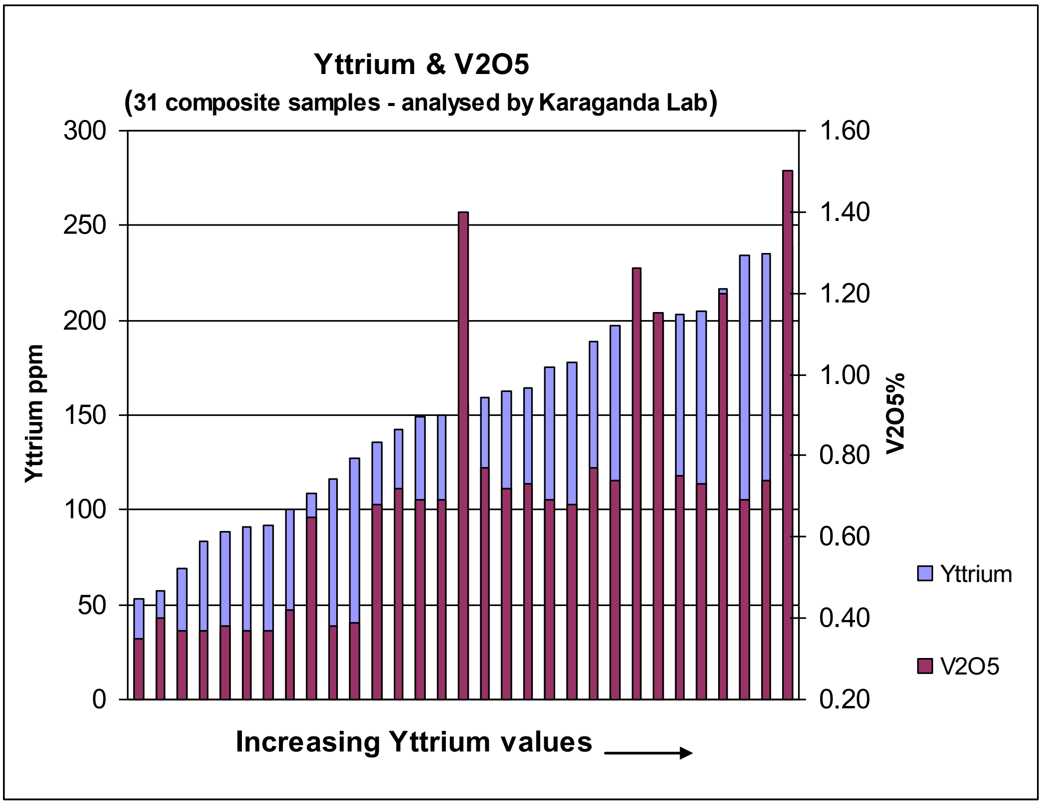


Figure 4-30: Yttrium and V_2O_5% levels

GMR recommend that a comprehensive study on the contained REE mineralogy is undertaken as soon as possible, in order to identify the specific REE containing minerals which are peculiar to Balausa, in order to improve the selection of the most appropriate elements for analysis and to optimise the economic contribution potential of the deposit’s rare earths.

4.6.6.3 REE ANALYSES: TASHKENT RESEARCH INSTITUTE 1993

In the 1992 summary report, a table on REE analyses was submitted and these results are displayed in Table 4-34. GMR has no additional information, but the yttrium levels are broadly similar to those reported above.

Table 4-34: Rare Earth Element Grades 1993

REE	Grade in ore (g/t) ppm	Amount REE in (t)	Tonnes of Ore (millions)
Yttrium	142	10,366	73
Lanthanum	48	3,504	73
Cerium	60	4,380	73
Samarium	14	1,022	73
Praseodymium	30	2,190	73
Neodymium	30	2,190	73
Europium	4	292	73
Gadolinium	7	511	73
Terbium	3	219	73
Dysprosium	16	1,168	73
Holmium	7	511	73
Erbium	17	1,241	73
Thulium	3	219	73
Ytterbium	12	876	73
Lutetium	2	146	73
Total Lanthnium group	193	14,089	73
Total		**24,455**	

Note: this is the same ore tonnage as reported in the 1997 GKZ confirmation of off-balance reserves as shown in Table 4-14.

4.6.7 FAR'S BULK DENSITY DETERMINATIONS

4.6.7.1 INTRODUCTION

Historically, numerous rock density determinations have been reported, but most of this work was related to the oxidised or transition vanadium rocks at surface or at immediate sub-surface locations. For the primary vanadium rocks at depth, Komarnitski reported in 1973 that bulk density determinations of primary vanadium drillcore pieces averaged 2.42 and ranged from 2.24 to 2.62 for 48 samples – however, a density of 2.50 was used for official ore reserves.

For the reporting of historical ore reserves, the densities listed in Table 4-35 have been used.

Table 4-35: Historical Rock Bulk Densities Used for Ore Reserves

Year	Oxide	Primary
1947	1.60	2.25
1973		2.50
1992	1.73	2.00
2013	1.70	2.10

This variability in the historical bulk densities for the reserves necessitated a reappraisal of especially the primary vanadium rocks (estimated 95 % of total resource), and FAR undertook to measure the bulk density (mass per unit of volume) using drillcore from FAR's drilling exploration programme of OB1. An independent laboratory, TOO GeoAnalytica, based in Almaty performed the analyses and, for external QA/QC purposes, the Kazmekhanobr laboratory in Almaty re-analysed a random selection of these core samples.

Bulk density implies the density of extractable volumes of rock inclusive of voids, or "volume density". The in-situ density includes the void and grain boundary water present in the rock in its natural state. Whilst the latter is important for estimation of the tonnage of material to be moved during mining, for resource estimations a dry bulk density is required (Lipton, 2000 (13)) and this was used for these density determinations. Prior to this bulk density assessment, a similar number of true density (defined as density of particles that make up a solid) determinations had been undertaken by FAR, but although it can be a useful indicator, it is not reliable for resource tonnage estimations.

4.6.7.2 METHOD IN DETERMINING BULK DENSITY

From the OB1 drilling, 49 core samples were selected which provided a representative suite of samples that defined the distinct primary vanadium rock characteristics found at Balausa. It also included a few samples from the hangingwall and footwall margins of the vanadium layer. Note that most of the core samples had already been split and sampled for metal analyses, and so only half-core remained, plus some whole core samples taken from beyond the vanadium layer.

The following method was used to determine the bulk density at the GeoAnalytical laboratory in Almaty:

- The core pieces were first dried in an oven at a temperature of 105 degrees Celsius.
- Samples weighed in air.
- Each sample coated with a thin layer of wax and weighed again.
- Wax coated sample was immersed in deionised water and weighed.

Determination of the bulk density was as follows:

$$Bulk\ Density\ \frac{A * p\ (\text{liq})}{B - C - ([B - A]\ /\ p(\text{wax}))}$$

Where:

A - weight of the sample in the air

B - weight of the coated sample in the air

C - weight of coated sample immersed in the water

p (wax) – specific gravity of the wax

p (liq) – specific gravity of the water

Note:

Specific gravity of the wax = *0.862 g/cm^3.*

Specific gravity of deionised *water = 1.0 g/cm^3.*

Table 4-36 provides details of the results of the bulk density determination.

Table 4-36: Bulk Density Results

Sample #	Depth down hole			weight in air. g	weight with wax in air. g	weight with wax in water. g	Bulk Density	Ore Samples
	Drillhole	From (m)	To (m)					
DSG-1	B213.5	60.6	60.7	336.57	343.69	193.26	2.37	2.37
DSG-2	B412	39.8	39.9	139.56	144.58	81.26	2.43	
DSG-3	B213.5	59.2	59.3	204.44	209.46	118.75	2.41	2.41
DSG-4	B313.5	106.5	106.6	288.97	299.83	160.87	2.29	2.29
DSG-5	B412	43.5	43.6	122.79	126.43	67.32	2.24	2.24
DSG-6	B412	125.3	125.4	154.64	161.29	91.14	2.48	2.48
DSG-7	B313.5	90.2	90.3	332.89	341.09	194.28	2.42	2.42
DSG-8	B313	50.3	50.4	190.68	198.43	101.48	2.17	2.17
DSG-9	B211	117.3	117.4	123.54	129	64.56	2.13	2.13
DSG-10	B412	121.1	121.2	459.7	469.52	284.11	2.64	
DSG-11	B313	63.5	63.6	103.58	110.66	60.77	2.49	
DSG-12	B313.5	104.6	104.7	156.66	160.69	96.72	2.64	2.64
DSG-13	B412	94.4	94.5	260.46	265.4	157.56	2.55	
DSG-14	B313	56.4	56.5	305.14	313.93	173.97	2.35	2.35
DSG-15	B113	44.7	44.8	348	357.27	205.17	2.46	2.46
DSG-16	B211	119.3	119.5	172.87	177.83	99.08	2.37	2.37

Sample #	Depth down hole			weight in air. g	weight with wax in air. g	weight with wax in water. g	Bulk Density	Ore Samples
	Drillhole	From (m)	To (m)					
DSG-17	B313.5	98.2	98.3	322.69	329.34	186.77	2.39	2.39
DSG-18	B313.5	85.4	85.5	265.75	276.83	147.6	2.28	2.28
DSG-19	B213.5	63.0	63.1	271.54	278.76	164.57	2.57	
DSG-20	B313.5	100.8	100.9	180.98	187.4	102.28	2.33	2.33
DSG-21	B213	117.1	117.2	363.56	372.42	220.79	2.57	2.57
DSG-22	B213	118.3	118.4	271.69	281.04	158.41	2.43	2.43
DSG-23	B213	122.5	122.6	187.6	192	107.53	2.36	2.36
DSG-24	B114	47.4	47.5	207.42	213.63	121.27	2.43	2.43
DSG-25	B114	46.8	46.9	158.16	162.51	91.15	2.38	2.38
DSG-26	B114	44.8	44.9	179.47	183.59	102.33	2.35	2.35
DSG-27	B112	77.2	77.3	161.1	164.9	102.49	2.78	2.78
DSG-28	B112	79.5	79.6	134.9	138.62	83.05	2.63	2.63
DSG-29	B112	82.3	82.4	136.66	141.95	79.94	2.44	2.44
DSG-30	B314	94.9	95.0	222.94	231.39	134.24	2.55	2.55
DSG-31	B314	92.8	92.9	161.74	166.1	98.04	2.57	
DSG-32	B314	95.5	95.6	120.91	124.47	71.36	2.47	2.47
DSG-33	B215	25.6	25.7	185.29	189.81	117.73	2.77	2.77
DSG-34	B215	26.9	27.0	138.74	142.97	81.3	2.44	2.44
DSG-35	B215	28.0	28.1	177.24	182.73	101.65	2.37	2.37
DSG-36	B115	23.2	23.3	109.42	115.06	52	1.94	1.94
DSG-37	B115-4	26.3	26.4	145.85	152.3	80.43	2.26	2.26
DSG-38	B115-5	22.3	22.4	164.78	169.75	99.08	2.54	2.54
DSG-39	B212.5	52.2	52.3	132.53	138.12	80.65	2.6	2.6
DSG-40	B215.5	52.9	53.0	257.16	264.78	143.62	2.29	2.29
DSG-41	B212.5	54.9	55.0	347.88	355.82	203.96	2.44	2.44
DSG-42	B212.5	57.5	57.6	252.16	259.83	151.06	2.52	2.52
DSG-43	B212.5	58.4	58.5	189.01	194.36	106.39	2.31	2.31
DSG-44	B312.5	22.5	22.6	231.99	237.58	125.67	2.2	2.2
DSG-45	B312.5	25.0	25.1	215.1	220.76	112.99	2.12	2.12
DSG-46	B312.5	26.7	26.8	187.16	191.93	98.93	2.14	2.14
DSG-47	B412.5	58.6	58.7	270	276.82	155.81	2.39	2.39
DSG-48	B412.5	61.4	61.5	313.51	320.16	185.77	2.47	2.47
DSG-49	B412.5	63.0	63.1	387.5	398.06	234.05	2.55	2.55
Average		**68 m**		**219 g**			**2.42**	**2.4**

Figure 4-31: Bulk density 2.13 (true density 2.25) V_2O_5% 0.5 and carbon 22.7 % DSG9

Figure 4-31 shows a core sample that has a relatively low density, as a result of having a high content of amorphous carbon at nearly 23 % of the total.

Figure 4-32: Bulk density 2.46, V_2O_5% 0.75 and carbon 23.0 % (no true density) DSG15

Figure 4-32 shows a core sample with a sharp contact of highly friable black carbonaceous rock with more normal siliceous vanadium ore.

Figure 4-33: Bulk density 2.57 (true density 2.57) V_2O_5% 0.2 and no carbon analysis (in FW waste zone) DSG19

The core sample in Figure 4-33 shows an equal result for both the bulk and true density. The rock is extremely solid with little porosity and this is a typical rock sample from the siliceous layer which lies stratigraphically below the vanadium stratum.

Scatterplots were prepared to see if statistically the carbon levels have an influence on rock density. With the bulk density (Figure 4-34) there is a slight propensity for higher carbon content to have a lower density, but with true density (Figure 4-35) there is a sharper correlation between high carbon and lower density, which suggests that the rock porosity has quite an important influence on the density rather than the carbon content. To put this into another context, V_2O_5 levels were compared with the carbon content, and here there is a distinct propensity for high grade V_2O_5 to be positively correlated with high carbon content (see Figure 4-36 and Figure 4-37).

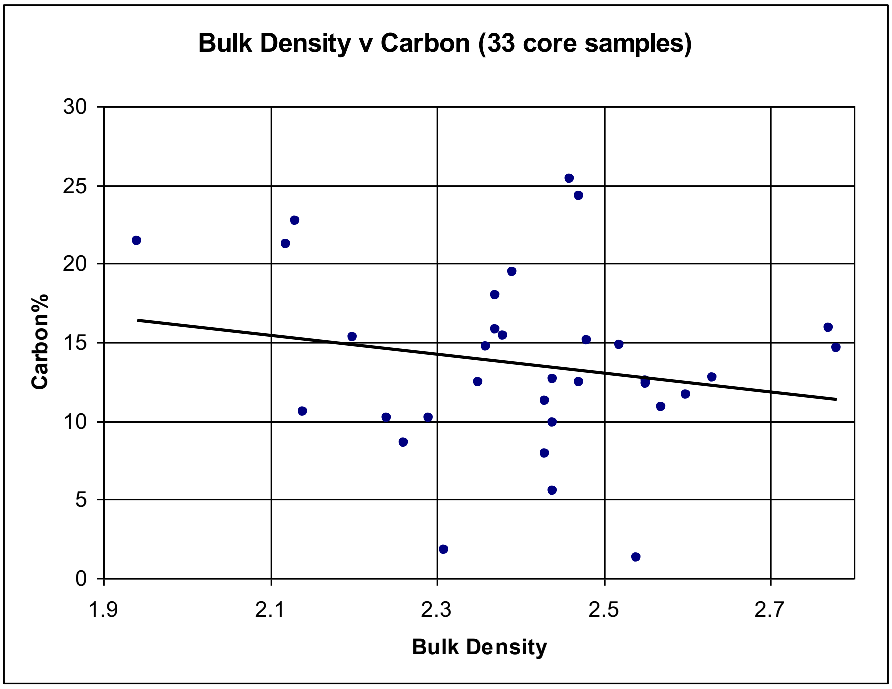


Figure 4-34: Bulk Density versus Carbon Content - Scatterplot

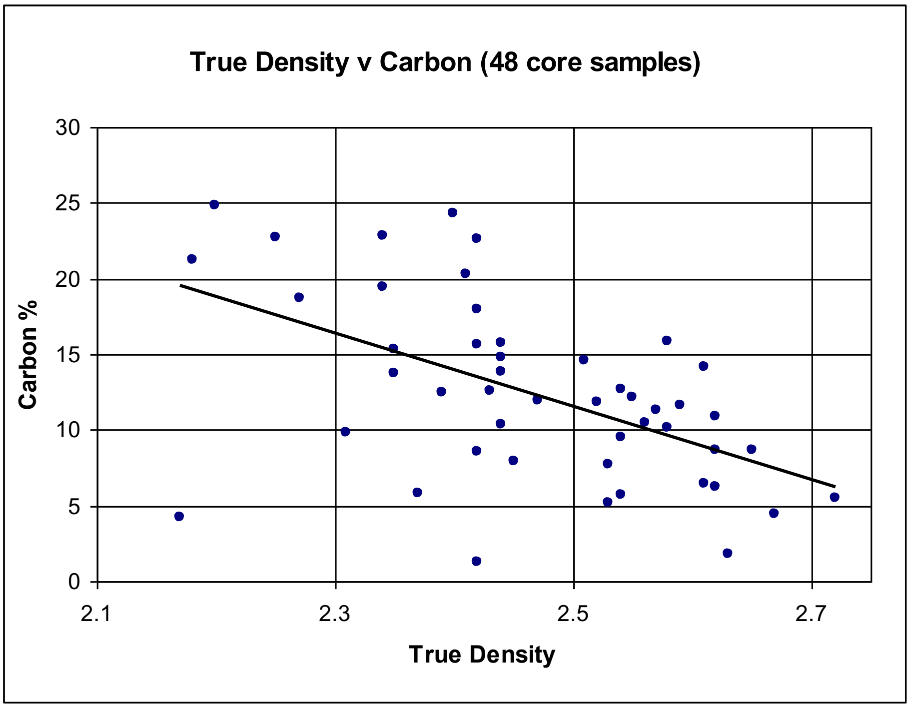


Figure 4-35: True Density Mean versus Carbon Content

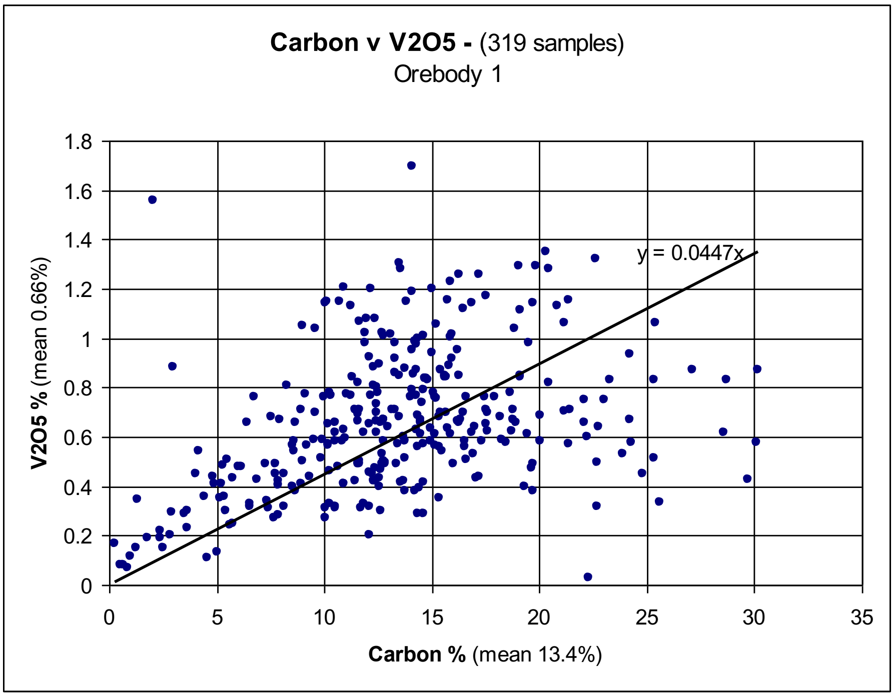


Figure 4-36: Carbon Content versus V_2O_5 – Correlation Coefficient 0.38

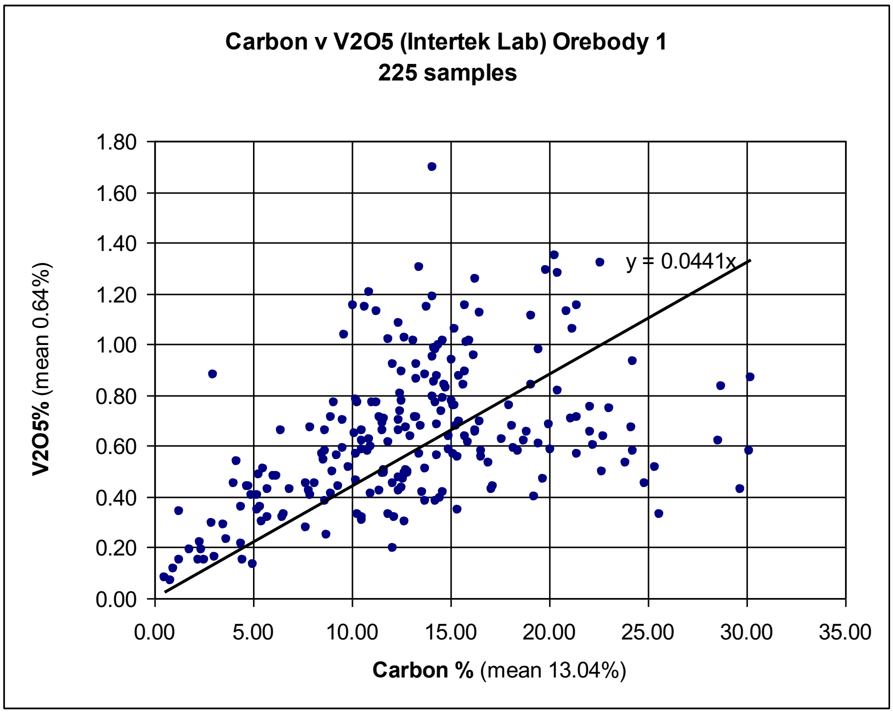


Figure 4-37: Carbon content versus V_2O_5 with only Intertek lab results

4.6.8 DRILLHOLE INCLINOMETRY

The drilling contractor for the 2010-2011 FAR exploration programme was responsible for surveying down-the-hole to determine the azimuth and angle from the vertical (zenith). A Russian built MIG-24 (gyro inclinometer) was used, but it is understood this measurement was undertaken as a separate exercise after the drillhole was completed. The result sheets only show the zenith measurements, at intervals of about 30 m. There appears to be very little deviation of the drillholes. The drillhole azimuth is only recorded on the geological drillhole logs, which is probably the azimuth direction from FAR's surveyor. During a site visit, the author was assured that these measurements were accurate and, from their experience, these drillholes will stay straight with the type of drilling equipment being used. Note: most of the deeper holes were drilled vertically, to target the bottom of the fold at depth, and their zenith angles were mostly zero.

4.6.9 DRILLHOLE GEOLOGICAL LOGS

The historical drillhole logs (passports) from the 1970s are extremely comprehensive, and include gamma log results and V_2O_5 sample grades through the orebody. GMR used these to confirm that the sample grades in the database are correct.

FAR's drillhole logs, include code abbreviations to record the geological features of the core, and also record each sample number with depth interval. A graphical log is also produced, showing rock-type symbols. These logs are stored in a spreadsheet format.

4.7 SAMPLE DATABASE

4.7.1 REVIEW OF HISTORICAL DATA

Two major episodes of mineral exploration, 1942-1947 (oxide surface layer only) and 1971-1972 (targeting primary mineralisation at depth), resulted in milestone reserve estimations and the data generated from these exploration periods was extracted from archived documentation with the objective of assessing the validity of the mineral resource. In support of this objective, exploratory data analysis processes on a range of data types, allow observations, with realistic conclusions about the historical results, with special emphasis on the use of statistical tools to evaluate the character of the vanadium grade distributions.

4.7.2 DATA PROVENANCE

FAR retrieved historical data records from archived sources in Kazakhstan on a range of information dating from the 1940s and 1970s. The documentation included copies of maps, exploration mine plans and various reports on sampling results, drillhole logs and feasibility studies with its associated graphical materials. According to priorities, documents were transcribed to computer storage and selected reports translated into English, especially the major feasibility reports for 1947 and 1973. This also included some digital scanning and the generation of CAD drawings of the associated graphical materials.

The final database comprised of a reasonably large percentage of the aggregated historical sample records, from surface trench channels, pits, underground exploration and diamond drilling, and these were imported into DM for evaluation. This review work included 3D terrain modelling from digital topographic point data, the 3D generation of ore body contact limits at the topographic surface from scanned historical geological maps, plus calculating the spatial coordinates of the individual samples from both the trench and drillhole records.

4.7.3 DATA AUDIT

Computerised records of various attributes from resource tables to drillhole geology logs and assays, were compared with a random selection of scans from the historical documents and the level of transcription errors were assessed to be low. Confidence in the correct replication of the data in the computerised format, used to evaluate the deposit, is therefore acceptable and, where anomalies were highlighted in the database records, as determined from statistical and interactive graphic interrogation, corrections were made accordingly. Apparent problems in some of the spatial positions of historical trenches and drillhole collars were resolved to a reasonable level of accuracy, but some unresolved anomalies remain with an estimated maximum of ± 25 m from the true location: these problems appear to be related to the identification of the correct historical drillhole collar locations during FAR's topographic survey of the property: see Section 4.6.1.

4.7.4 TRENCH SAMPLE DATA 1947

The trench sample summary in provided in Table 4-37 for the main orebodies OB1 to OB4, expresses an intensive exploration evaluation of the oxide mineralisation during the 1940s and the OB1 results are consistent with vanadium grades from FAR's pilot plant open pit mining operation. The U_3O_8 results show relatively higher correlation coefficient values than the vanadium and this erratic uranium distribution is a common feature at this deposit, and was also a feature within the primary layer. Note that during the former Soviet-era, only down-the-hole gamma logging was employed to measure the radiation levels within the primary ores.

Table 4-37: Summary Statistics for Surface Trench Data – 1947 (Mean Length 0.5 m)

Ore Body	Grade	Mean	Min	Max	Variance	SD	CV	# SAMPS
1	V_2O_5%	0.89	0	3.02	0.23	0.48	0.54	830
1	U_3O_8%	0.01	0	0.44	0.0005	0.022	1.69	830
2	V_2O_5%	1.1	0	4.4	0.32	0.57	0.52	1,088
2	U_3O_8%	0.02	0	0.38	0.0003	0.017	1.13	1,090
3	V_2O_5%	1.02	0	4.25	0.27	0.52	0.51	828
3	U_3O_8%	0.02	0	0.1	0.0002	0.013	0.81	829
4	V_2O_5%	1.07	0.07	3.16	0.29	0.54	0.51	349
4	U_3O_8%	0.01	0	0.39	0.0003	0.016	1.14	351
All	V_2O_5%	1.02	0	4.4	0.29	0.53	0.52	3,218
All	U_3O_8%	0.01	0	0.44	0.0003	0.018	1.29	3,223

4.7.5 DRILL SAMPLE DATA 1972-1973

In contrast to the trench channel samples in Section 4.7.4 above, the 1972-1973 drill core sample data are specifically related to intersections through the vanadium horizon within the primary mineralised zone, situated below the zone of oxidation. The top of the primary zone is not necessarily at a constant depth-level from the surface, but will reflect local geological characteristics of the formations. From the historical documentation, there appears to be no definitive consensus on the definition of oxide and primary ores, and no doubt there will be areas where there are well-developed intermediate transition zones between oxide and primary mineralisation. The core drilling was restricted to evaluating the vanadium and siliceous horizons in the synclinal limbs of OB1, OB2 and OB3, totalling seven, four and two drillholes respectively. The mean vanadium results for OB1 and

OB2 is 0.66 % V_2O_5 with OB3 slightly lower at 0.61 %, though this has been adjusted by GMR (see Table 4-44 and associated footnote comment). These primary grade results contrast with the higher trench grades found at surface. However, the core recovery is low with a weighted average recovery at only 52 %, so there could be doubt as to the quality of these samples to properly reflect the contained vanadium grades. This is therefore a critical problem in understanding the validity of the reported vanadium levels within the primary mineralised layer. Correlation coefficients for drillhole number and core recovery revealed a surprising but definite correlation trend, where there is a propensity for the higher drillhole numbers (i.e. later holes) to have higher core recoveries (see Figure 4-38). There is no such correlation between drillhole number and V_2O_5% grade or between V_2O_5% grade and core recovery. The validity of these relationships was also checked, using scatterplots, for distribution patterns that can give misleading coefficient results. It shows therefore, with better drilling techniques and experience, core recoveries gradually improved to 90 %+ for a number of later drillhole sample intersections during the 1971-72 drilling programme. Table 4-38 summaries the average weighted core recovery and V_2O_5 values in these drillholes.

According to the Komarnitski report in 1973, an in-depth study of the core loss was undertaken to understand its effect on the validity of the sample results. This included artificial core loss experiments from drilled core where the recovery was in excess of 90 %. The conclusion was that from laboratory tests, *the core recovery does not make any considerable difference to the measured contents of the principal components. However, further studies need to be continued.* The above statistical review of the data does indeed indicate that there is no obvious bias in the results, but the quality of the historical sampling, sample preparation and analyses needs to be supported by due diligence sample testing of the primary mineralisation. On a more qualitative note, the lowest mean core recovery occurs for Drillhole ID 7 at only 29 %, and yet the measured V_2O_5% grade is one of the highest at 0.71 %, and this high grade has been corroborated by a nearby FAR drillhole (profile 3), at a distance of only 25 m.

Table 4-38: Drillholes with % Core Recoveries and V_2O_5 Grades - 1973

Drillhole ID	Core recovery %	Mean V_2O_5%	OB #	Comment
1	42	0.65	1	
2	32	0.66	1	
3	43	0.61	1	
4	67	0.66	2	
5	47	0.61	1	
6	72	0.52	?	between 2 & 3
7	29	0.71	1	
8	57	0.51	2	
9	56	0.69	2	
11	55	0.74	1	

Drillhole ID	Core recovery %	Mean V_2O_5%	OB #	Comment
12	89	0.70	2	
13	68	0.66	3	
14	87	0.71	1	

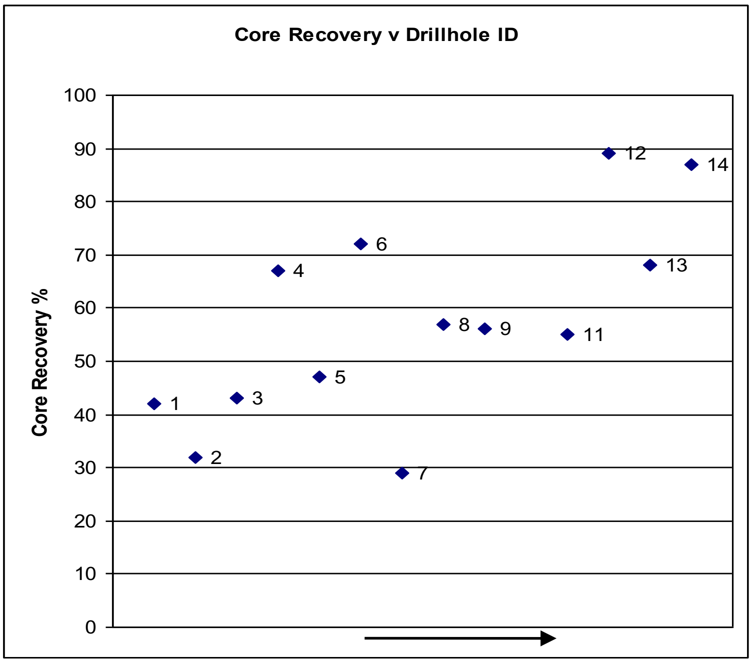


Figure 4-38: Scatterplot - core recovery trends with drillhole ID

The carbon statistics appear to be on total carbon which would include total organic carbon (TOC) including some inorganic graphite, and for all orebodies this is about 14 %, as based on the 1973 core data for the primary zone. In the oxide environment, TOC will tend to be depleted, but can be preserved locally where silicified. The concentration of TOC can therefore be an indicator on the degree of oxidation and reaches average maximum levels in the primary zone. In the 1947 Ankinovich report there was no indication of analysing for organic carbon but the reported total carbon values show an average grade of 2.69 % in the oxide and only 4.4 % in the primary ore. During the main leaching phase for the sample analytical process, high temperatures appeared to have caused combustion of the organic carbon, yet these values are not consistent with expected TOC levels for the oxide and primary zones. However, sometime after the 1947 reserves were published, Ankinovich re-investigated the TOC in old exploration samples and discovered that the TOC can reach levels of 25 %, and he confirmed that the early work was not correct.

Table 4-39 shows consistent V_2O_5 grade levels between the different ore bodies and supports the common acknowledgement from the various episodes of exploration that the grades are uniform within the vanadium layer and this is also supported as a common feature with other such vanadium deposits worldwide. In stark contrast with the trench sample results, the average organic carbon values are high at 14 %, vis-à-vis <1 % in the oxide zone, and this level of contained carbon is indicative of the primary mineralisation zone. The high coefficient of variation values of MGO and, sometimes for the P_2O_5, are caused by high erratic values and this has been reported as being due to the irregular distribution in the form of cluster concentrations within sub-layers.

4.7.6 SAMPLE DATABASE – FAR

A summary of the core drilling sample database is presented in Table 4-39. A number of different laboratories were used for analyses, and many individual samples, using pulp or coarse reject sample splits, were assayed by more than one laboratory, and this was extremely useful for QA/QC assessment. The different laboratories have been identified by a suffix in the in the database as follows:

- AU = Australia
- KA = Karaganda
- BAX = Balausa XRF
- BA = Balausa (this was the old FAR laboratory and now superseded by the Balausa XRF laboratory).
- KO = Kozlov

Note: as the BA and KO laboratory results were unacceptable, these were not included in the summary statistics, and for the OB1 JORC-based grade interpolations, only the analytical results from the AU, KA and BAX laboratories were utilized.

Table 4-39: FAR Drilling Sample Analysis Summary Stats – OB1 to OB3

OB	Grade% _ Laboratory	Mean	MIN	Max	Variance	SD	CV	# Samps
1	V_2O_5_AU	0.52	0.02	1.70	0.11	0.33	0.62	306
1	V_2O_5_KA	0.48	0.06	1.36	0.09	0.30	0.63	109
1	V_2O_5_BAX	0.66	0.05	2.86	0.18	0.42	0.64	97
1	C_AU	10.51	0.08	30.19	45.03	6.71	0.64	306
1	U_AU	0.0078	0.0008	0.5476	0.0012	0.0342	4.37	306
1	MO_AU	0.0165	0.0002	0.0747	0.0001	0.0104	0.63	306
1	Total Records 1,267							
2	V_2O_5_AU							0
2	V_2O_5_KA	0.45	0.06	1.04	0.09	0.30	0.68	21
2	V_2O_5_BAX	0.38	0.08	1.86	0.10	0.32	0.83	150
2	C_AU							0
2	U_AU							0
2	MO_AU							0
2	Total Records 476							
3	V_2O_5_AU	0.41	0.06	1.33	0.08	0.29	0.70	57
3	V_2O_5_KA	0.48	0.06	1.60	0.11	0.33	0.69	115
3	V_2O_5_BAX	0.12	0.12	0.12				1
3	C_AU	7.15	2.98	15.61	12.08	3.48	0.49	57
3	U_AU	0.0049	0.0011	0.0191	0.0000	0.0034	0.70	57
3	MO_AU	0.0101	0.0012	0.0370	0.0001	0.0075	0.75	57
3	Total Records 224							
All	V_2O_5_AU	0.51	0.02	1.70	0.10	0.32	0.64	363
All	V_2O_5_KA	0.47	0.06	1.60	0.10	0.31	0.66	245
All	V_2O_5_BAX	0.49	0.05	2.86	0.15	0.39	0.78	248
All	C_AU	10.01	0.08	30.19	41.56	6.45	0.64	363
All	U_AU	0.0074	0.0008	0.5476	0.0010	0.0316	4.27	363
All	MO_AU	0.0155	0.0002	0.0747	0.0001	0.0103	0.66	363
All	Total Records 1,967							

4.8 GEOLOGICAL INTERPRETATION AND MODELLING

4.8.1 OVERVIEW

The target mineralisation for modelling was characterised by the vanadium enriched layer, forming conformal contacts with both the hangingwall and footwall formations. Beyond these lithological contacts, the V_2O_5 levels dropped sharply to <0.2 % V_2O_5, and so it has been relatively straightforward to define the orebody contacts for the 3D modelling. All fundamental interpretations from these contacts were undertaken at pre-defined cross-strike profile sections (locations for the exploration drilling) and, on these profiles, contact strings were defined interactively. These profile strings were used as templates for interpreting the contacts at intermediate distances along strike and here the vanadium layer geometry is modified according to structural trends: see Figure 4-39. Both the exploration sections and the intermediate pseudo-sections, formed the basis for constructing a solid 3D vanadium model of the primary mineralisation.

4.8.2 DETAILS

Fundamentally, the exploration drillholes are located approximately at the Soviet-era defined exploration profiles: profiles 0 to 5, at a strike spacing of 670 m between 4 and 5 to 900 m between profiles 3 and 4, plus an additional two intermediate profiles, defined by FAR at profiles 2.5 and 3.5. Surface expression of the mineralisation was defined by trench exposures taken at intervals of 25 m to 200 m along both limbs of the syncline - in effect, the trenches proved the continuity of the mineralisation along the whole strike of the orebody.

The geological interpretation of the primary zone was based on drillcore sample analyses of the vanadium content and aided by lithological features; from both the historical (1973) and FAR's drillhole exploration programme. Typically, the orebody's hangingwall and footwall were seen to form conformable contacts with adjacent formational layers, and their precise intersection location is based on assay values from core samples plus support from apparent visible mineralogical changes along the core. See Figure 4-39 below.

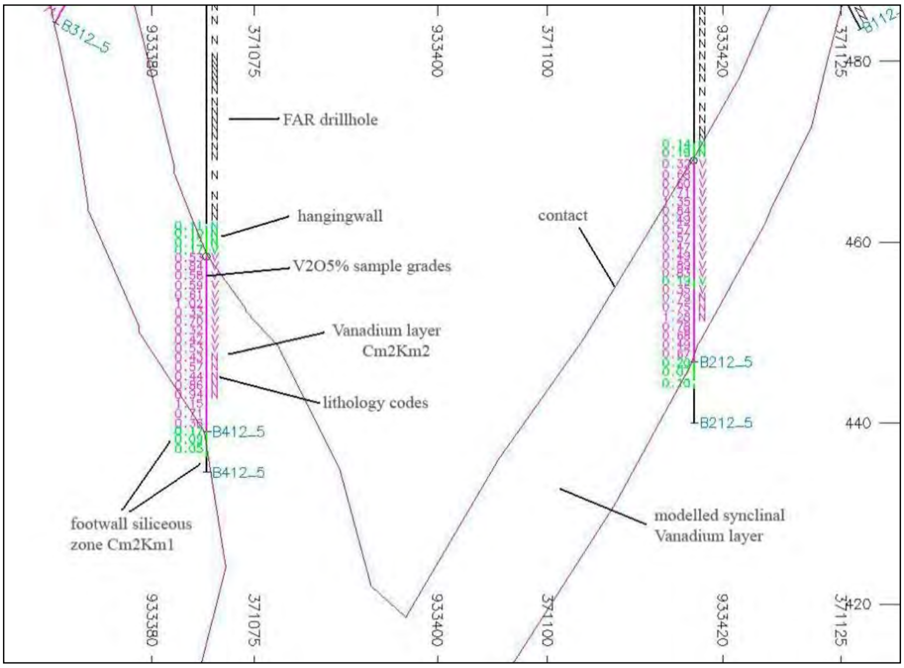


Figure 4-39: Profile 2.5 Showing Interpretation & Modelling Details of Orebody Syncline -OB1

The projection of the intersecting drillhole contacts, between adjacent drillholes on each of their respective exploration profiles, was aided by intersecting angles of the sedimentary micro-layering to the core axis, plus downward projections from surface trench orebody intersections. The interpretation of these contacts between adjacent drillholes on each profile was undertaken by 3D interactive digitising of the contacts, forming linking strings between drillholes.

Because of the relatively wide distances between exploration profiles, it was necessary to define orebody geometric trends along strike, through the construction of pseudo intermediate sections at 50 m intervals, to mid-way between adjacent exploration sections. This was achieved by first projecting the interpreted exploration section strings 50 m along strike, interactively modifying the geometry according to strike trend changes at that point, and then projecting this modified pseudo-section 50 m, editing these strings at this new pseudo-section and repeating the process accordingly. Note: in order to properly express geometric strike trend changes, such as fold amplitude and orebody thickness etc., cognisance was taken of topographic changes, surface expression of the orebody (defined by trenches) and longitudinal fold axial plunge angle trends between exploration profiles. These final OB1 section strings were tagged (red strings) to their respective adjacent profile strings for controlling wireframe modelling: wireframe model – see Figure 4-40.

The basic modelling approach was undertaken in DM, in which the geological contacts are interpreted interactively by digitising contact strings on cross-strike section profiles, at regular strike intervals. See Figure 4-40 and Figure 4-41. Interpretation control was based on actual spatial contacts, as defined by drillhole core contacts, mostly from FAR's exploration drilling and minor Soviet-era drilling and, orebody surface expression of the mineralisation, as defined from historical sampling of the mineralisation via trenches. Fundamentally, the drillholes are located at the Soviet-era defined exploration profiles: profiles 0 to 5, at a strike spacing of 670 m between 4 and 5 to 900 m between profiles 3 and 4, plus an additional two intermediate profiles, defined by FAR at profiles 2.5 and 3.5. Surface expression of the mineralisation were defined by trench exposures taken at intervals of 25 m to 200 m along both limbs of the syncline - in effect, the trenches proved the continuity of the mineralisation along the whole strike of the orebody.

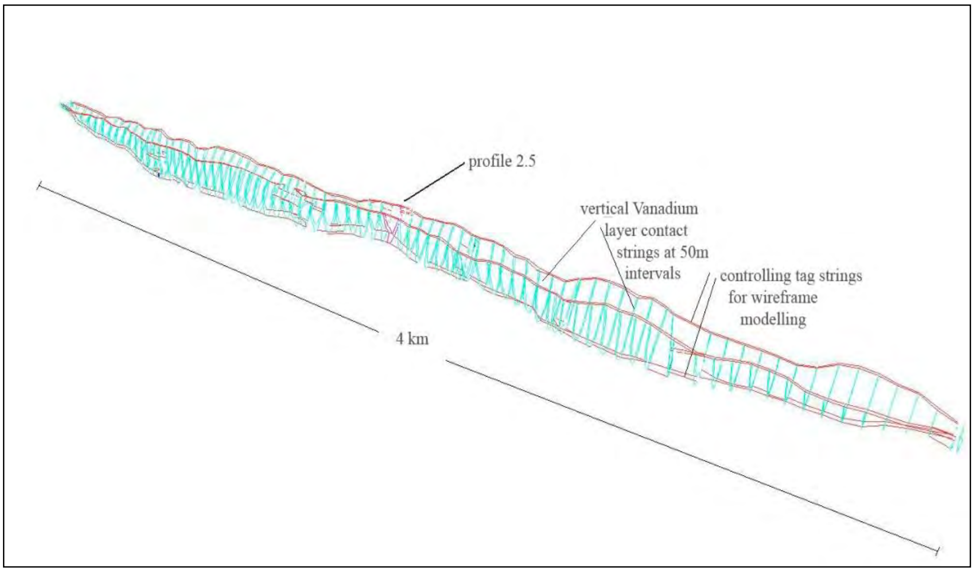


Figure 4-40: Perspective view looking north – showing string elements

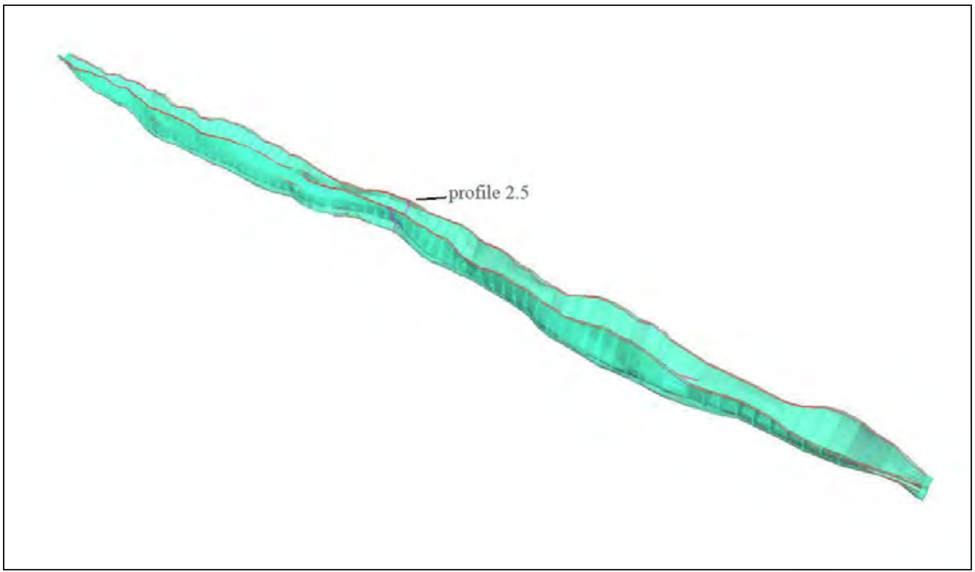


Figure 4-41: Perspective view showing completed solid wireframe model – OB1

Note: the intermediate profiles drilled by FAR, confirmed both the expected geometry of the folded vanadium layer and the level of V_2O_5 grades.

4.9 EXPLORATORY DATA ANALYSIS

In statistics, exploratory data analysis is a numerical and graphical examination of data sets to summarise their main characteristics. Here, the exploratory data analysis focuses on the sample data, with special emphasis on OB1 data used for grade interpolation.

Table 4-40: Summary Analysis Stats - Surface Trench Samples – 1947

Ore-Body	Grade	Mean	Min	Max	Variance	SD	CV	# SAMPS	# Trenches
1	V_2O_5%	0.89	0.00	3.02	0.23	0.48	0.54	830	39
	U_3O_8%	0.01	0.00	0.44	0.0005	0.022	1.69	830	
2	V_2O_5%	1.1	0.00	4.4	0.32	0.57	0.52	1088	79
	U_3O_8%	0.02	0.00	0.38	0.0003	0.017	1.13	1090	
3	V_2O_5%	1.02	0.00	4.25	0.27	0.52	0.51	828	47
	U_3O_8%	0.02	0.00	0.1	0.0002	0.013	0.81	829	
4	V_2O_5%	1.07	0.07	3.16	0.29	0.54	0.51	349	20
	U_3O_8%	0.01	0.00	0.39	0.0003	0.016	1.14	351	
5	V_2O_5%	1.03	0.00	2.86	0.29	0.54	0.52	123	9
	U_3O_8%	0.01	0.00	0.32	0.0003	0.017	1.31	123	
All	V_2O_5%	1.02	0.00	4.4	0.29	0.53	0.52	3218	194
	U_3O_8%	0.01	0.00	0.44	0.0003	0.018	1.29	3223	

Average sample length 0.5 m

Summary statistics for the 1940s data were restricted to the oxide surface trench samples with only individual grade results for vanadium and uranium available: see Table 4-40 above. Uranium grades (U_3O_8%) are very low and therefore not economic to mine, but would be produced as a by-product from the vanadium processing. A useful statistic is the coefficient of variation and for U_3O_8 this can reach values greater than one which indicates that erratic highs are present in the sample database. These high values could have a significant impact on the estimation of the resource and it would be necessary to curtail the influence of these values. In contrast, the vanadium (V_2O_5) coefficient of variation does not indicate problems with erratic high values and all ore bodies show a consistent statistic. V_2O_5 mean values for OB2, OB3 and OB4 are about 1 %, with OB1 samples showing a 10 % lower grade at 0.89 %.

4.9.1 PRIMARY ORE DATA 1973 AND CORE LOSS

In contrast to the trench channel samples above, the 1972-1973 sample data are derived from drill core samples which intersected the vanadium layer within the primary mineralised zone, situated below the zone of oxidation: OB1, OB2 and OB3 only. The top of the primary zone is not necessarily at a constant depth-horizon from the surface, but will reflect local geological characteristics of the formations. From the historical documentation, there appears to be no definitive consensus on the definition of oxide and primary ores, and no doubt there will be areas where there are well-developed intermediate transition zones between oxide and primary mineralisation. The core drilling was restricted to evaluating the vanadium and siliceous layers in the synclinal limbs of OB1, OB2 and OB3, totalling seven, four and two drillholes respectively.

The mean vanadium results for OB1 and OB2 is 0.66 % V_2O_5 with OB3 slightly lower at 0.61 % and these results contrast with the higher trench grades at surface. However, the core recovery is low with a weighted average recovery at only 52 %, so there could be doubt as to the quality of these samples to properly reflect the contained vanadium grades. This is therefore a critical problem in understanding the validity of the reported vanadium levels within the primary mineralised layer during the 1970s.

Correlation coefficients for drillhole number and core recovery revealed a surprising but definite correlation trend, where there is a propensity for the higher drillhole numbers (i.e. later holes) to have higher core recoveries. There is no such correlation between drillhole number and V_2O_5% grade or between V_2O_5% grade and core recovery. The validity of these relationships was also checked, using scatterplots, for distribution patterns that can give misleading coefficient results. It shows therefore, with better drilling techniques and experience, core recoveries gradually improved to 90 %+ for a number of later drillhole sample intersections during the 1971-72 drilling programme. Table 4-41 summarises the average weighted core recovery and V_2O_5 values in these drillholes.

According to the Komarnitski report in 1973, an in-depth study of the core loss was undertaken to understand its effect on the validity of the sample results. This included artificial core loss experiments from drilled core where the recovery was in excess of 90 %. The conclusion was that from laboratory tests, *the core recovery does not make any considerable difference to the measured contents of the principal components. However, further studies need to be continued.* The above statistical review of the data does indeed indicate that there is no obvious bias in the results, but the quality of the historical sampling, sample preparation and analyses needs to be supported by due diligence sample testing of the primary mineralisation. On a more qualitative note, the lowest mean core recovery occurs for Drillhole ID 7 at only 29 %, and yet the measured V_2O_5% grade is one of the highest at 0.71 %.

Table 4-41, Table 4-42, Table 4-43, Table 4-44 and Table 4-45 summarise the 1973 drill sample results.

Table 4-41: Drillholes 1973 V_2O_5 grades and OBs

Drillhole ID	Core Recovery %	Mean V_2O_5%	Orebody #
1	42	0.65	1
2	32	0.66	1
3	43	0.61	1
5	47	0.61	1
7	29	0.71	1
11	55	0.74	1
14	87	0.71	1
4	67	0.66	2
8	57	0.51	2
9	56	0.69	2
10	?	0.31	2
12	89	0.70	2
6	72	0.52	3
13	68	0.66	3

Table 4-42: Summary statistics 1973 drillholes OB1 - 106 samples

	Mean	Min	Max	Variance	SD	CV
V_2O_5%	0.66	0.03	1.56	0.08	0.29	0.44
C%	13.88	0.28	27.15	25.59	5.06	0.36
P_2O_5%	0.54	0.11	4.50	0.20	0.45	0.83
TIO_2%	0.18	0.04	0.53	0.01	0.09	0.50
MGO%	1.16	0.16	13.23	5.89	2.43	2.09
FE_2O_3%	4.09	1.25	11.56	3.92	1.98	0.48
SIO_2%	63.41	22.48	89.25	157.70	12.56	0.20
AL_2O_3%	4.39	0.90	11.63	3.64	1.91	0.44

Note: average length of core sample is 1.0 m

Table 4-43: Summary statistics 1973 drillholes OB2 - 83 samples

	Mean	Min	Max	Variance	SD	CV
V_2O_5%	0.66	0.09	1.96	0.12	0.34	0.52
C%	14.02	0.36	31.95	42.46	6.52	0.47
P_2O_5%	0.57	0.09	4.10	0.31	0.55	0.96
TIO_2%	0.17	0.05	0.54	0.01	0.08	0.48
MGO%	1.61	0.17	12.97	6.36	2.52	1.57
FE_2O_3%	3.46	0.24	11.68	4.68	2.16	0.62
SIO_2%	64.24	14.90	91.00	186.60	13.66	0.21
AL_2O_3%	3.80	0.65	14.35	3.61	1.90	0.50

Note: average length of core sample is 1.0 m

Table 4-44: Summary statistics 1973 drillholes OB3 - 52 samples

	Mean	Min	Max	Variance	SD	CV
V_2O_5%	*0.61	0.05	1.46	0.11	0.36	0.59
C%	13.42	0.42	26.05	41.19	6.42	0.48
P_2O_5%	0.66	0.14	6.87	0.61	0.78	1.18
TIO_2%	0.22	0.05	1.00	0.03	0.19	0.86
MGO%	0.20	0.00	0.67	0.04	0.20	1.00
FE_2O_3%	3.73	1.16	8.45	1.99	1.41	0.38
SIO_2%	67.42	30.80	90.13	116.60	10.80	0.16
AL_2O_3%	4.87	1.10	10.52	4.31	2.08	0.43

Note: average length of core sample is 1.0 m

*Note: GMR considers that drillhole #6 does not belong to OB3, as it appears to have intersected a thrusted ore slice, which lies between OB2 and OB3 – so this depressed the *V_2O_5% grade. Taking the other drillhole #13, as a truer representation for OB3, then 0.66 % should be the mean value and this also supports the grade indications from FAR's drilling results.*

Table 4-45: Summary statistics all 1973 drillholes - 241 samples

	Mean	Min	Max	Variance	SD	CV
V_2O_5%	0.65	0.03	1.96	0.10	0.31	0.48
C%	13.82	0.28	31.95	34.03	5.83	0.42
P_2O_5%	0.57	0.09	6.87	0.32	0.57	1.00
TIO_2%	0.19	0.04	1.00	0.01	0.12	0.63
MGO%	1.04	0.00	13.23	4.62	2.15	2.07
FE_2O_3%	3.82	0.24	11.68	3.80	1.95	0.51
SIO_2%	64.53	14.90	91.00	159.80	12.64	0.20
AL_2O_3%	4.32	0.65	14.35	3.92	1.98	0.46

Note: average length of core sample is 1.0 m

4.9.2 FORMER SOVIET ERA (1947 AND 1973)

The frequency histograms for V_2O_5 (see Figure 4-42) for both oxide and primary mineralisation show typical log normal distributions with a positive skew, and the oxide grades have a greater range spread than the primary V_2O_5. The cumulative log probability plots show similar gradient curves and exhibit bimodality with the curve inflexion at about 0.5 % to 0.6 % V_2O_5, which marks the overlapping point of the two sub-populations. These sub-populations may represent synsedimentary or post-depositional diagenetic changes within the vanadium stratum, and especially related to organic and inorganic forms of the vanadium in the anoxic marine environment. Oxides show obvious enrichment relative to the primary ore, because of “acid leaching” and re-deposition of vanadium to more stable mineral forms.

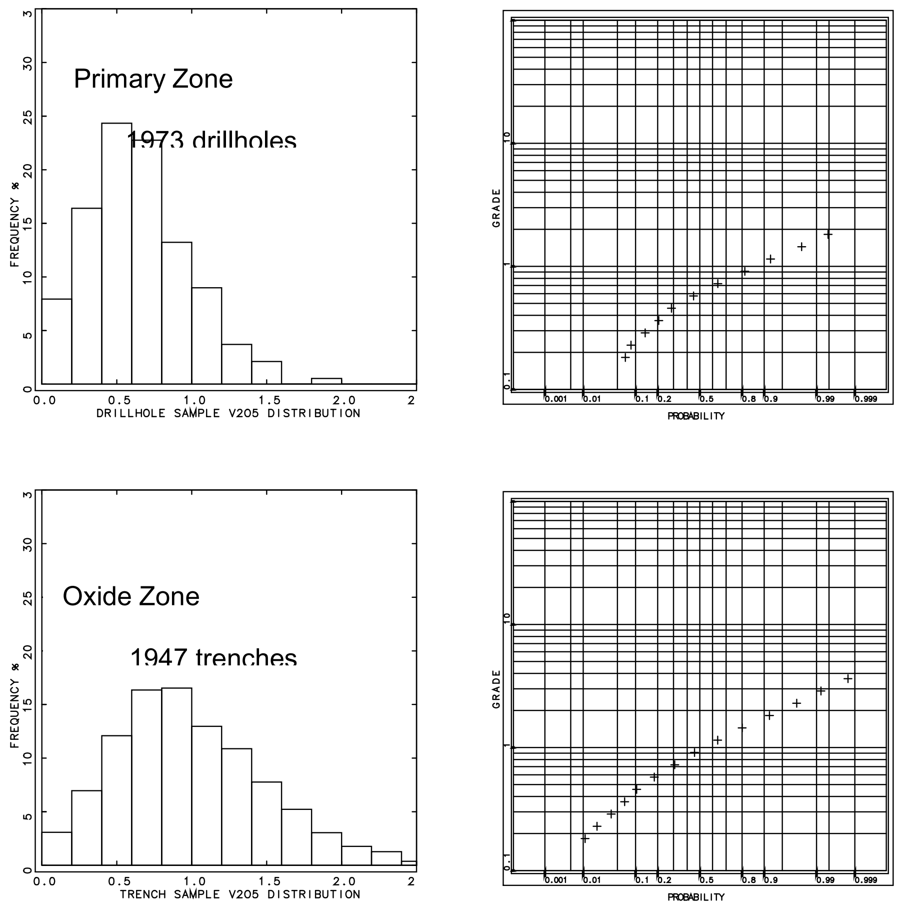


Figure 4-42: V_2O_5 Trench & Drillhole Histograms and Log Probability Plots Soviet-Era

Oxidation due to weathering removed TOC as a rock component, with residual enrichment of V and Mo. The majority of the V (~60 %) and Mo (~85 %) contents in fresh rock are remobilised during oxidation/weathering and redeposited in oxide/oxyhydroxide phases.

A combined cumulative probability plot, Figure 4-43 below, shows that both the oxide and primary V_2O_5 values have almost exactly the same paralleling curve form, with the trench data having consistently higher grades throughout the curve. This curve is therefore a type of distinct fingerprint for the deposit and shows that the vanadium distributions still retain the same grade relationship within both the oxide and primary zone.

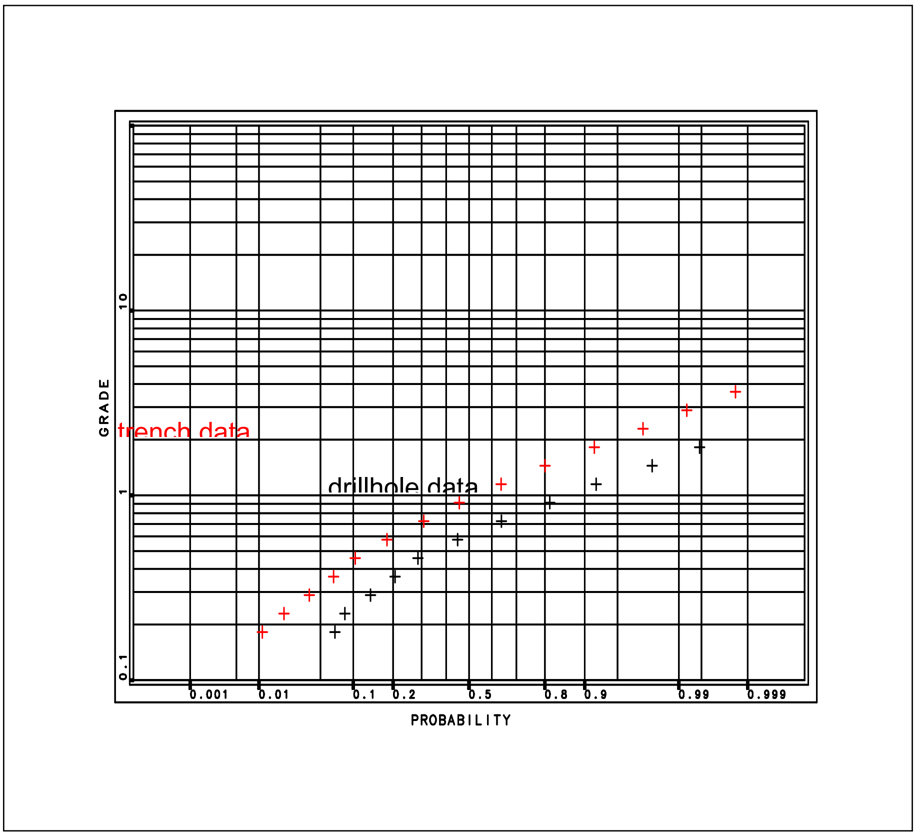


Figure 4-43: Combined probability plot – trench & drillhole V_2O_5% data

To see how the V_2O_5 mineralisation may be variable within the defined 14 sub-units of the vanadium layer, the trench oxide grade logs also included geology and, this was coded, and where possible mean grade statistics were derived for the sub-layers. Table 4-46 lists the sub-units in stratigraphic order from lowest to highest. Although there is variability of V_2O_5 within the sub-layers, this is within a fairly narrow grade band ranging from 0.77 % in the dolomite to 1.25 % within the argillaceous ore. It was not possible to determine the statistics for a number of the sub-units, as the geology description was sometimes ambiguous or sometimes the grade was related to a combination of more than one layer, resulting in an insignificant number of samples for statistical evaluation.

Table 4-46: 1947 V_2O_5 Oxide Trench Results Split on Sub-Units within Vanadium Layer

Interlayer Number	Name	Mean V_2O_5%	Number of Samples
1	Lower Ore	0.81	154
2	Shaly Ore	0.94	193
3	Under Phosphoritic Ore	1.10	240
4	Phosphoritic Shale	Unclear from log description	
5	Phosphoritic Ore		
6	Lower Agillaceous Interlayer		
7	Under Dolomite Ore	1.17	258
8	Dolomite	0.77	135
9	Above Dolomite Shale	1.06	210
10	Above Dolomite Ore	0.85	673
11	Middle Agillaceous Interlayer	Unclear from log description	
12	Argillaceous Ore	1.25	378
13	Upper Agillaceous Interlayer	Unclear from log description	
14	Shaly Ore Member	0.98	673

Quantile analysis is a useful tool to see if too small a number of high grade samples contain a disproportionately large percentage of the contained metals within the sample database. Comparing the decile intervals between the 1973 and 1947 sample data, the percentage V_2O_5 metal levels are very similar within each decile, though the mean weighted V_2O_5 grades are consistently higher within the oxide samples (see Table 4-47 and Table 4-48). The results show that the metal content for each decile and, the top decile percentile splits, are at acceptable levels and there is no need to top-cut the higher grade samples for resource grade estimations. The percentage metal variations also give support to the consistent nature of the grade distributions, within both the oxide and primary zones.

Table 4-47: Quantile Table of 1973 Drillhole Data from the Primary Vanadium Layer OB1

Q%_from	Q%_to	Nsamples	Mean	Min	Max	Metal	Metal%
0	10	14	0.16	0.03	0.28	1.82	2.29
10	20	13	0.34	0.29	0.41	4.38	5.52
20	30	10	0.48	0.42	0.51	5.34	6.73
30	40	8	0.57	0.53	0.60	5.67	7.13
40	50	6	0.61	0.61	0.63	8.91	11.22
50	60	9	0.66	0.64	0.67	8.42	10.59
60	70	11	0.73	0.67	0.76	7.92	9.97
70	80	13	0.82	0.77	0.85	10.99	13.84
80	90	8	0.94	0.87	1.05	10.65	13.40

Q%_from	Q%_to	Nsamples	Mean	Min	Max	Metal	Metal%
90	100	14	1.19	1.06	1.56	15.35	19.32
91	92	2	1.06	1.06	1.07	2.50	3.15
92	93	1	1.08	1.08	1.08	1.19	1.50
93	94	2	1.14	1.14	1.14	1.48	1.87
94	95	1	1.14	1.14	1.14	0.97	1.22
95	96	1	1.17	1.17	1.17	1.05	1.33
96	97	1	1.20	1.20	1.20	1.74	2.19
97	98	2	1.21	1.20	1.23	2.54	3.19
98	99	2	1.27	1.26	1.28	1.65	2.08
99	100	2	1.44	1.29	1.56	2.23	2.81
0	100	106	0.66	0.03	1.56	79.46	100.00

Table 4-48: Quantile Table of 1947 Surface Trench Data from the Oxide Vanadium Layer

Q%_from	Q%_to	Nsamples	Mean	Min	Max	Metal	Metal%
0	10	342	0.26	0.00	0.43	43.21	2.54
10	20	324	0.52	0.44	0.60	86.77	5.10
20	30	298	0.65	0.60	0.70	108.26	6.36
30	40	309	0.76	0.70	0.82	127.80	7.50
40	50	311	0.88	0.82	0.94	147.29	8.65
50	60	302	1.00	0.94	1.06	166.94	9.80
60	70	319	1.14	1.06	1.22	190.60	11.19
70	80	331	1.32	1.22	1.40	219.57	12.89
80	90	331	1.54	1.40	1.68	258.44	15.18
90	100	351	2.12	1.68	4.40	354.02	20.79
90	91	35	1.71	1.68	1.74	27.60	1.62
91	92	34	1.77	1.74	1.80	30.01	1.76
92	93	37	1.81	1.80	1.85	30.41	1.79
93	94	33	1.88	1.86	1.92	30.49	1.79
94	95	35	1.94	1.92	1.96	33.26	1.95
95	96	32	2.02	1.96	2.08	34.15	2.01
96	97	36	2.14	2.08	2.20	35.91	2.11
97	98	37	2.27	2.20	2.36	38.16	2.24
98	99	36	2.51	2.36	2.74	41.62	2.44
99	100	36	3.11	2.77	4.40	52.40	3.08
0	100	3218	1.02	0.00	4.40	1702.90	100.00

4.9.3 DATA USED FOR GRADE ESTIMATION – OB1

Table 4-49 and Table 4-50 detail the data used for grade estimation in OB1.

Table 4-49: OB1 Composite Data Statistics Split on Laboratory Prior to Compositing

Laboratory	Field %	Number of Samples	Mean	From	To	Variance	SD	CV	% of Samples
AU	V_2O_5	217	0.66	0.07	1.70	0.08	0.28	0.43	52.80
KA	V_2O_5	15	0.71	0.40	1.07	0.04	0.20	0.28	3.65
BAX	V_2O_5	77	0.78	0.08	2.86	0.16	0.39	0.51	18.73
SO	V_2O_5	102	0.67	0.03	1.56	0.08	0.28	0.41	24.82
ALL	V_2O_5	411	0.68	0.03	2.86	0.09	0.30	0.44	100.00

Update 17 December 2013

Table 4-50: FAR Composite Data Stats Split on Laboratory – 2m Lengths

Laboratory	Field %	Number of Samples	Mean	From	To	Variance	SD	CV	% of Samples
AU	V_2O_5	118	0.66	0.08	1.29	0.05	0.22	0.34	53.15
KA	V_2O_5	7	0.71	0.60	1.03	0.02	0.14	0.20	3.15
BAX	V_2O_5	39	0.78	0.28	1.36	0.07	0.27	0.35	17.57
SO	V_2O_5	58	0.67	0.23	1.03	0.03	0.17	0.25	26.13
ALL	V_2O_5	222	0.68	0.08	1.36	0.05	0.22	0.32	100.00

NOTE: there are 16 samples with both KA and BAX analyses, the KA mean is 0.68 % and the BAX average is 0.73 %, which is higher by 7.4 %, which is considered to be within acceptable limits, though it does exemplify the higher grade tendency for the BAX results. For the other BAX results, there is only the unreliable KO or BA analytical results for comparison.

4.9.4 ADDITION OF BY-PRODUCTS OB1

By-products C, MoO_3 and U_3O_8 and REE are important revenue contributors to the project. The ore also contains 335 ppm of REE and although no value is currently being ascribed, FAR expects to produce this by-product in future. For REE, there is a need to first determine which REE minerals are in the vanadium layer and then make comprehensive analyses of these REEs accordingly, before global estimates can be produced. Table 4-51 shows summary data for V_2O_5, C, MoO_3 and U_3O_8.

Table 4-51: Summary Data

Field %	Number of Samples	Mean	From	To	Variance	SD	CV
V_2O_5	411	0.68	0.03	2.86	0.09	0.30	0.44
MoO_3*	217	0.028	0.000	0.062	0.000	0.013	0.46
U_3O_8*	217	0.012	0.001	0.646	0.002	0.047	4.12
C	319	13.49	0.28	30.19	31.09	5.58	0.41

**Assays from Australia only*

Table 4-52: Summary Statistics after Top-Cutting U_3O_8 (Prior to Compositing)

Field %	Number of Samples	Mean	From	To	Variance	SD	CV
V_2O_5	411	0.68	0.03	2.86	0.091884	0.303124	0.44
MoO_3*	217	0.028	0.0003	0.062	0.000	0.013	0.46
U_3O_8*	217	0.008	0.001	0.1	0.000	0.009	1.13
C	319	13.49	0.28	30.19	31.08909	5.575759	0.41

**Assays from Australia only (Update 17 December 2013) Note: U_3O_8 top-cut to 0.1*

Quantile analysis was used to assess the U_3O_8, as the coefficient of variation was very high and this statistic indicated that there were some anomalously high grade samples which caused this high ratio. Results of the quantile analysis suggested that top-cutting to 0.1 % was appropriate and Table 4-52 shows an acceptable coefficient of variation ratio. It also resulted in a change in the correlation coefficient from random to a weak correlation trend with V_2O_5.

For geostatistical applications, samples are composited to equal lengths and the summary statistics of these composited samples are shown in Table 4-53. Note for details on compositing the samples refer to Section 4.9.5.

Table 4-53: Summary data after compositing

Field %	Number of Samples	Mean	From	To	Variance	SD	CV
V_2O_5	222	0.68	0.08	1.36	0.05	0.22	0.32
MoO_3*	118	0.028	0.000	0.049	0.000	0.010	0.37
U_3O_8*	118	0.008	0.002	0.052	0.000	0.006	0.79
C	176	13.48	0.81	26.80	20.36	4.51	0.33

**Assays from Australia only (Update 17 December 2013)*

4.9.5 COMPOSITING

Within the vanadium layer, the target core size was NQ (43 mm) and for geostatistical interpolation, equal support is required, and this is normally achieved by compositing the samples into equal lengths. The mean sample length for all input samples is 1.09 m with a wide range from 0.25 m to 5.3 m in length (see Table 4-54) and for compositing a target length of 2 m was considered to be suitable.

Table 4-54: Length Statistics for Uncomposited and Composited Samples

Orebody	N Samples	Mean	From	To	Range
1 (uncomps)	434	1.09	0.25	5.3	5.05m
1 (comps)	222	2.01	1.15	2.9	1.15m

Statistically, the composited samples at ±10 % of the 2.01 m mean, range from 1.81 to 2.21 m and this comprises >99 % of the total samples and therefore is acceptable for grade interpolation. Note: for the uncomposited samples, only 56 % of the samples are within ±10 % of the 1.09 m mean, and would not have been acceptable for geostatistical estimations. See Figure 4-44 and Figure 4-45 for an illustration of the sample length distribution uncomposited and composited samples respectively. Figure 4-46 and Figure 4-47 show histograms and log probability plots for the uncomposited and composited samples respectively.

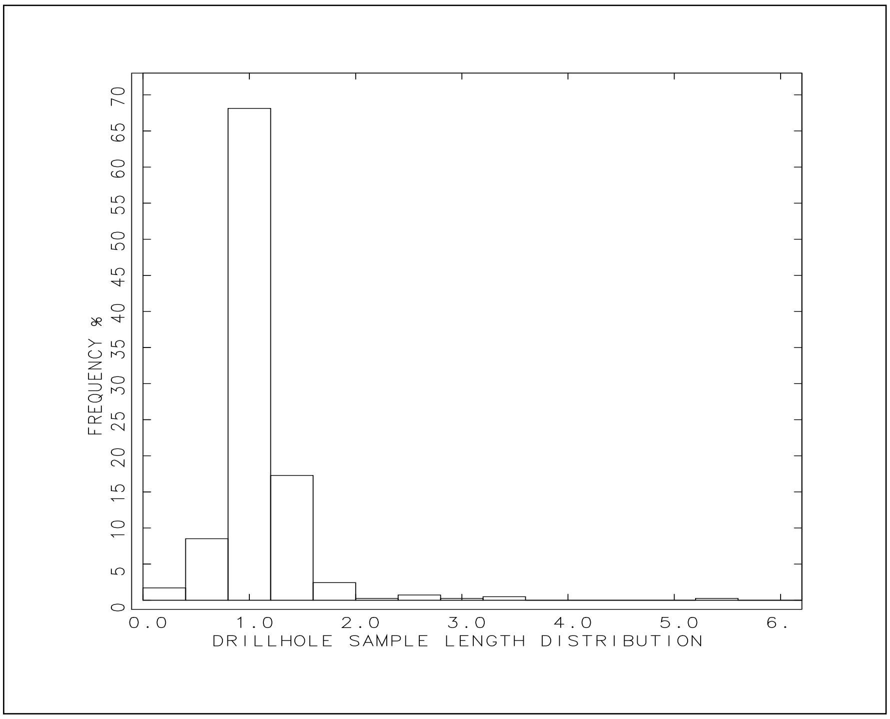


Figure 4-44: OB1 Uncomposited Sample Lengths

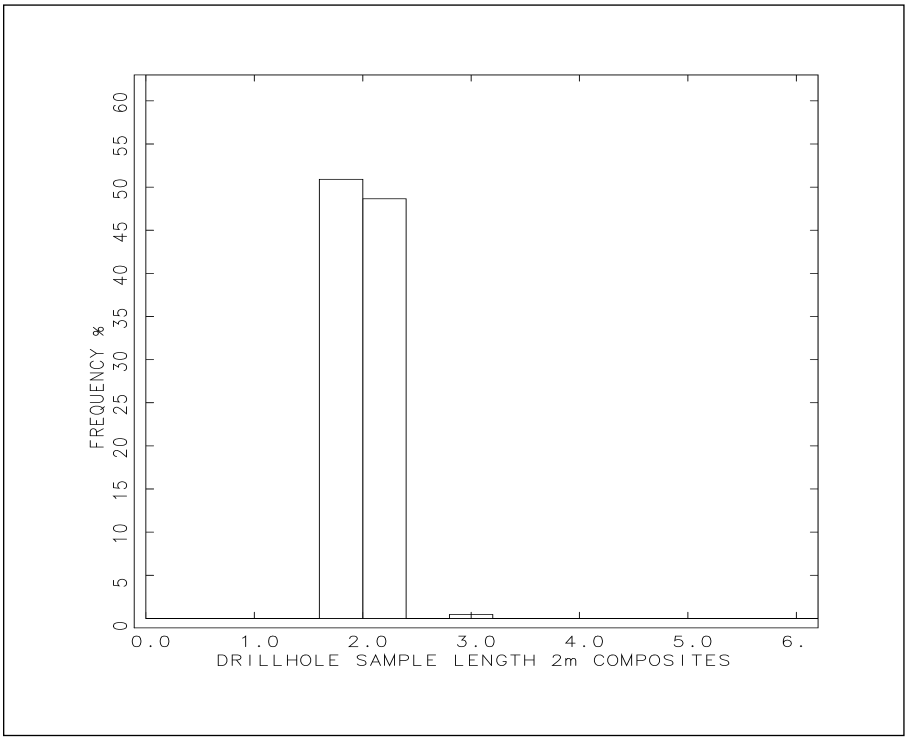


Figure 4-45: OB1 Composited Sample Lengths

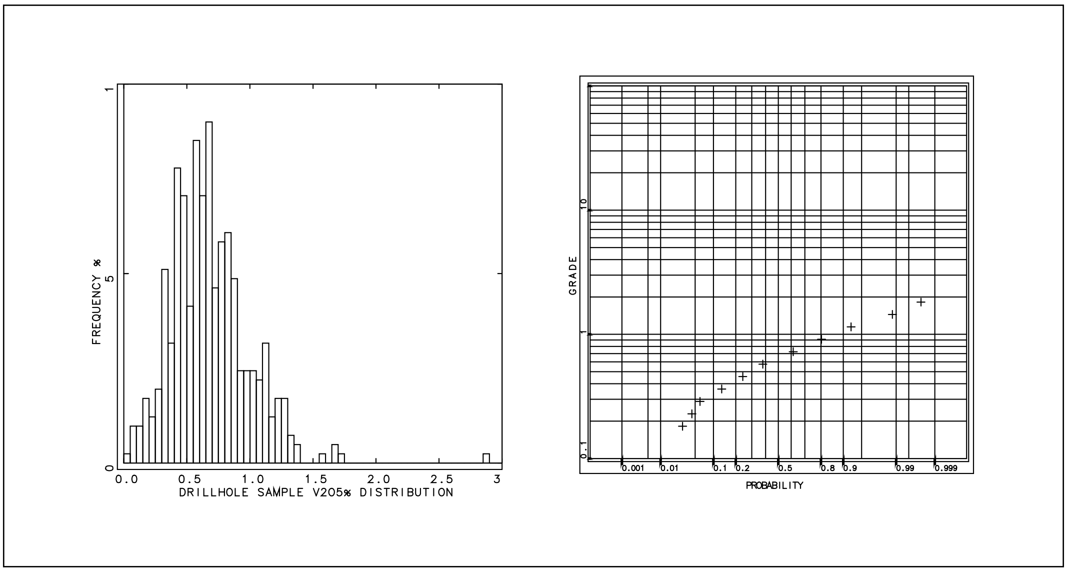


Figure 4-46: OB1 V_2O_5 Histogram & Log Probability Plots Uncomposited Samples

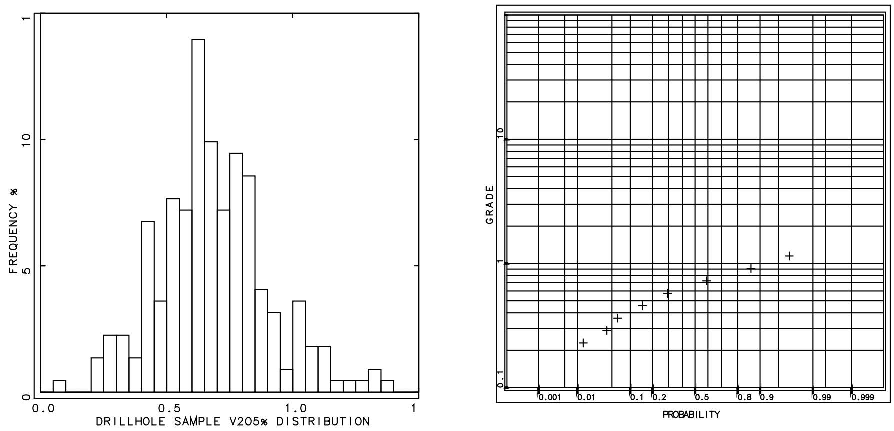


Figure 4-47: OB1 V_2O_5 Histogram & Log Probability Plots 2m Composites

4.9.6 BY-PRODUCTS (UNCOMPOSITED)

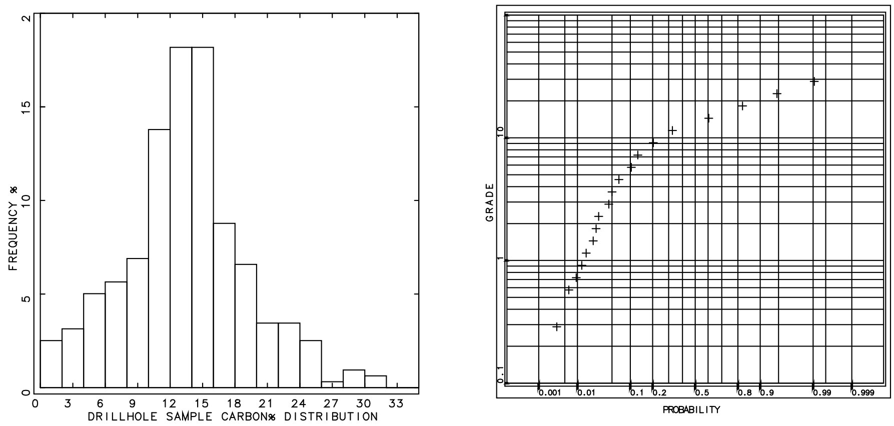


Figure 4-48: Carbon Histogram and Log Probability Plots OB1

Figure 4-48 contains a carbon probability plot showing a distinct bimodal distribution. The lower population (about 10 % of samples) probably represents migration and loss of carbon during diagenesis and low grade metamorphism. Figure 4-49 shows MoO_3 and Figure 4-50 shows U_3O_8 probability plot data.

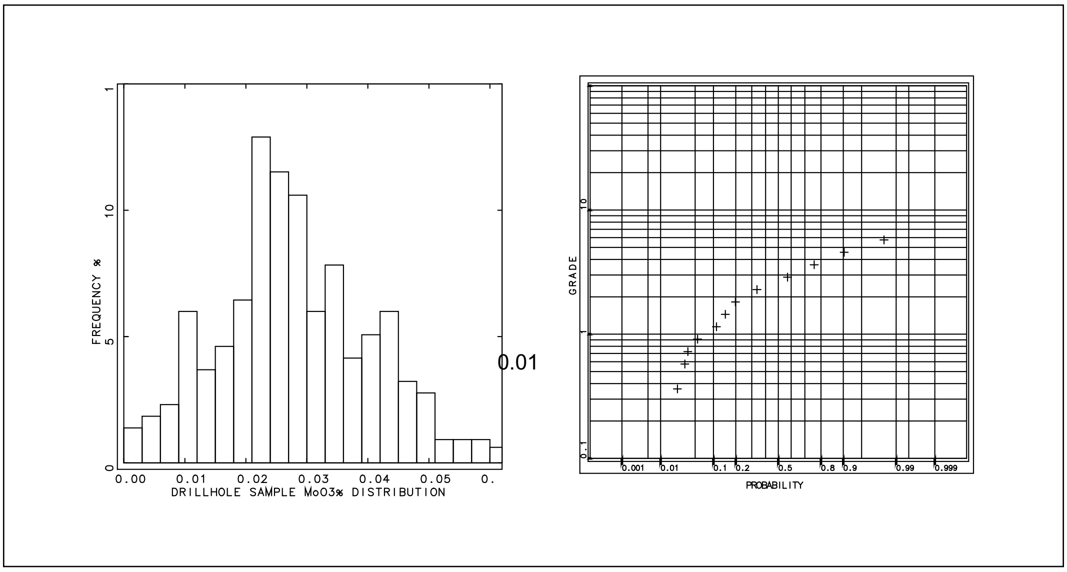


Figure 4-49: MoO_3 Histogram & Log Probability Plots OB1

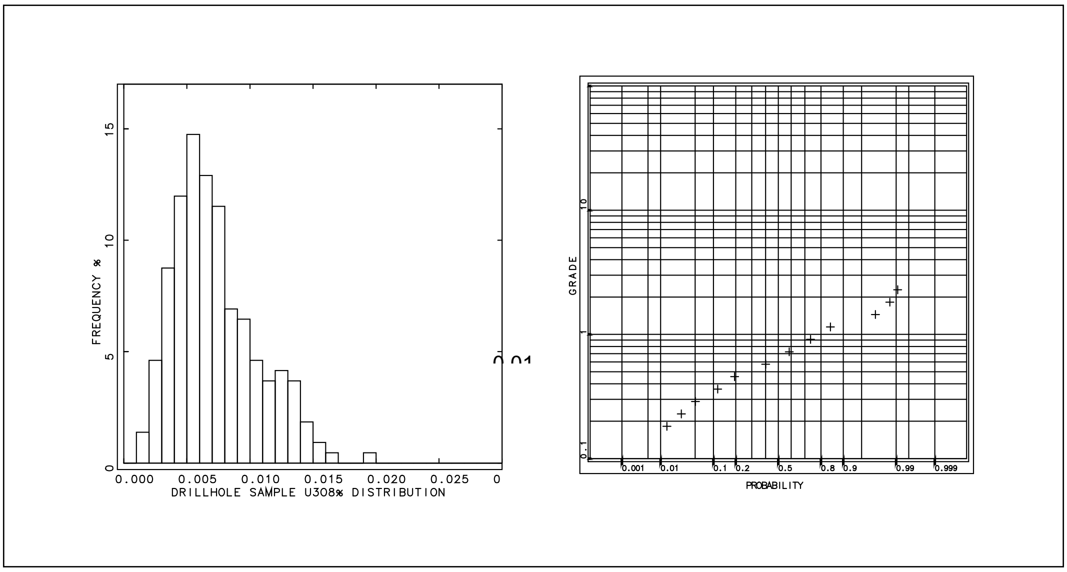


Figure 4-50: U_3O_8 Histogram & Log Probability Plots (top-cut <0.1) n=217

4.10 VARIOGRAPHY

4.10.1 VARIOGRAPHY OXIDE

In understanding the grade variability along strike, experimental variograms were generated from the oxide sample trench-grade results, as an aid to help plan the drillhole spacing for the exploration programme. The 1946 oxide surface trench samples averaged 0.5 m in length and to ensure uniform support (length) the samples were composited to 1 m lengths. It was found from the limited data available, that the OB1 trench samples provided sufficient density coverage to generate acceptable experimental variograms along strike.

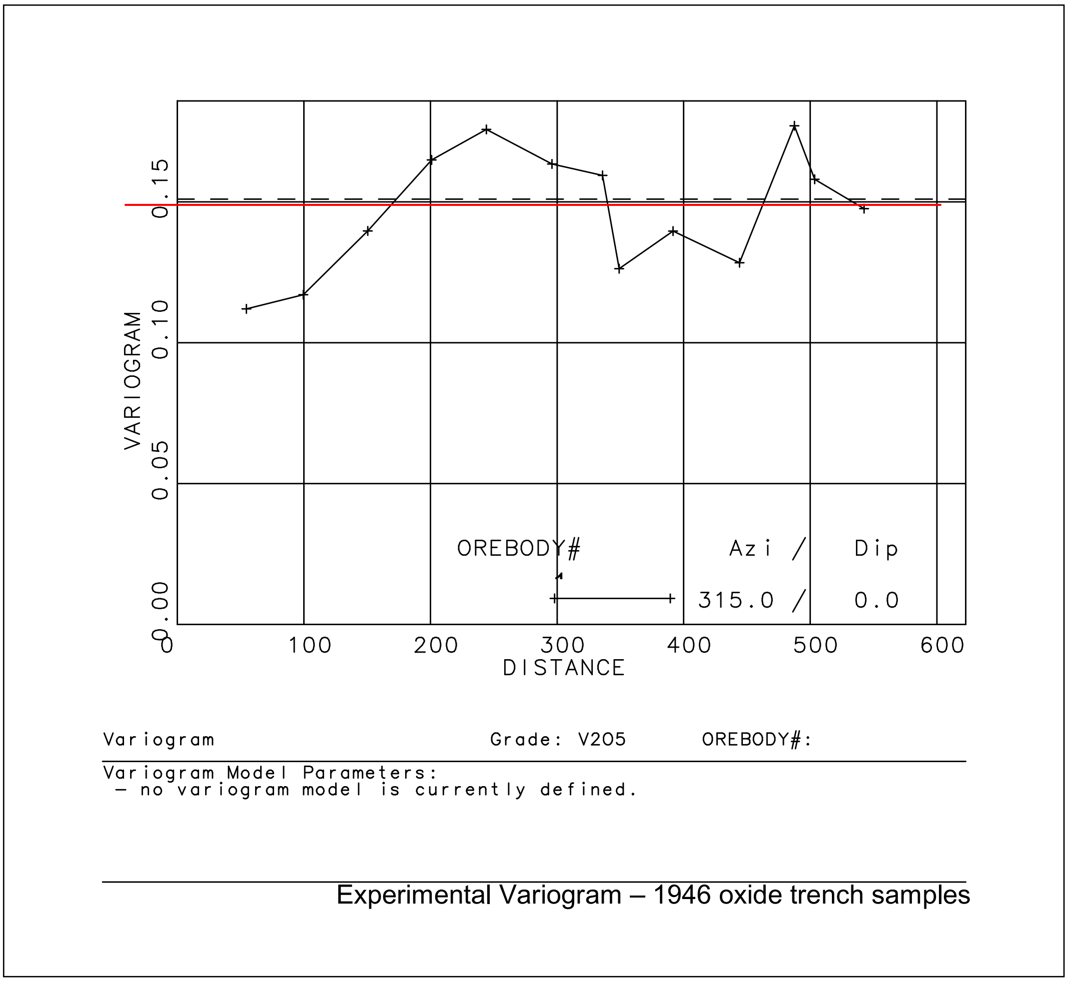


Figure 4-51: Experimental variogram for oxide trench data – OB1

Figure 4-51 shows the experimental variogram for the oxide zone, using 1 m composites (average input sample length 0.5 m), totalling 419 samples with a mean of 0.88 % V_2O_5. It was constructed from a basic lag of 60 m and the resulting range of influence is about 200 m along the strike at 315°.

The nugget effect appears quite high relative to the sill, and may account for up to half of the variability range, but this would need to be confirmed from variogram modelling. It does however indicate that the historical 50 m trench spacing along strike was probably overzealous.

4.10.2 VARIOGRAPHY FOR OB1 RESOURCE ESTIMATION

Because OB1 is a tight synclinal fold structure, it was necessary to split the drillhole sample data into their respective fold limbs, designated as the SW and NE limbs, prior to generating experimental variograms. Numerous 3D experimental variograms, along variable strike directions and dip, showed that a very strong anisotropy was apparent, with the strike range direction, parallel with the fold axis, being several times greater than the downdip range direction. It was discovered that by removing the drillhole sample grades at the noses of the syncline, a clearer downdip range structure was apparent, as the localised “nose” mineralisation could not appropriately represent the general grade distribution down dip.

Although along the strike of the fold, there are numerous localised complexities in the fold geometry, affecting both strike and dip directions, only typified variogram structures were modelled and these formed the basis for V_2O_5 grade estimations for each limb structure. Additionally, it was also possible to model a separate variogram for the carbon grades within the NE limb, and the range structure closely mirrored the vanadium model. However, for the SW limb there were insufficient carbon grade analyses from the drillcore samples to generate useable experimental variograms. This also applies to both U_3O_8 and MoO_3, where unfortunately it has not been possible to produce acceptable variograms for either the SW or NE limb.

The results of the variogram modelling (see Table 4-55, Table 4-56, Table 4-57, Figure 4-52, Figure 4-53, and Figure 4-54) reflect the geological environment of deposition, within a relatively shallow marine basin (graben), in which strong mineralogical distribution trends follow the “shoreline” strike and where the graben slope directions showing much more rapid mineralogical changes. It is notable that the SW limb demonstrates longer variogram range structures, especially downdip, and it is suggested that this is an artefact which has been induced by the Karatau thrust fault (40 Ma), so that the relatively nearer NE limb shows greater and abrupt geometric complexity. Both limbs however do exhibit variable changes in strike and dip and the final variogram models presented here were used as templates for generating local variogram models during grade estimation procedures.

Table 4-55: V_2O_5 NE limb variogram parameters

Limb	Single Anisotropic Spherical Structure	Nugget Variance C_0	Spatial Variance C_1	Range SW-NE Dip 300 Azimuth 41^0 (Z)	Down-dip Azimuth 221^0 (X)		Strike direction Dip = 0^0 (Y)	
					Dip	Range	Range	Azimuth
NE	1	0.0055	0.0491	15 m	600	75 m	550 m	3110

The nugget effect is typically only 10 % of the variogram sill, which reflects the high level of consistency of the samples.

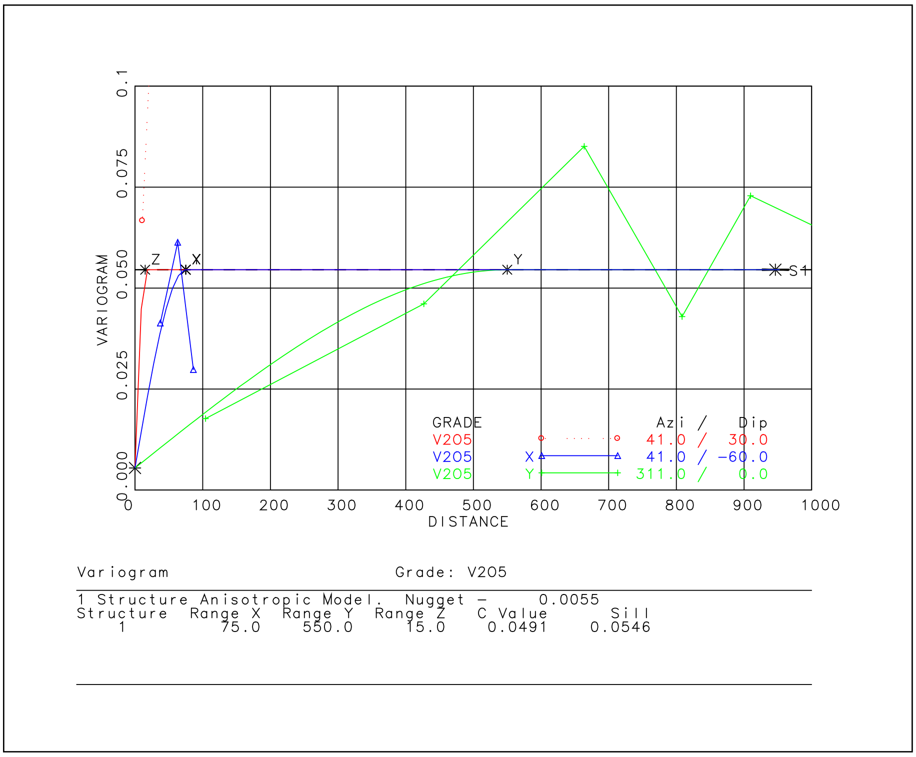


Figure 4-52: NE limb variograms – basic models

Table 4-56: V_2O_5 SW limb variogram parameters

Limb	Single Anisotropic Spherical Structure	Nugget Variance C_0	Spatial Variance C_1	Range SW-NE Dip 300 Azimuth 41^0 (Z)	Down-dip Azimuth 221^0 (X)		Strike direction Dip = 0^0 (Y)	
					Dip	Range	Range	Azimuth
SW	1	0.0059	0.0531	15 m	700	130 m	650 m	3110

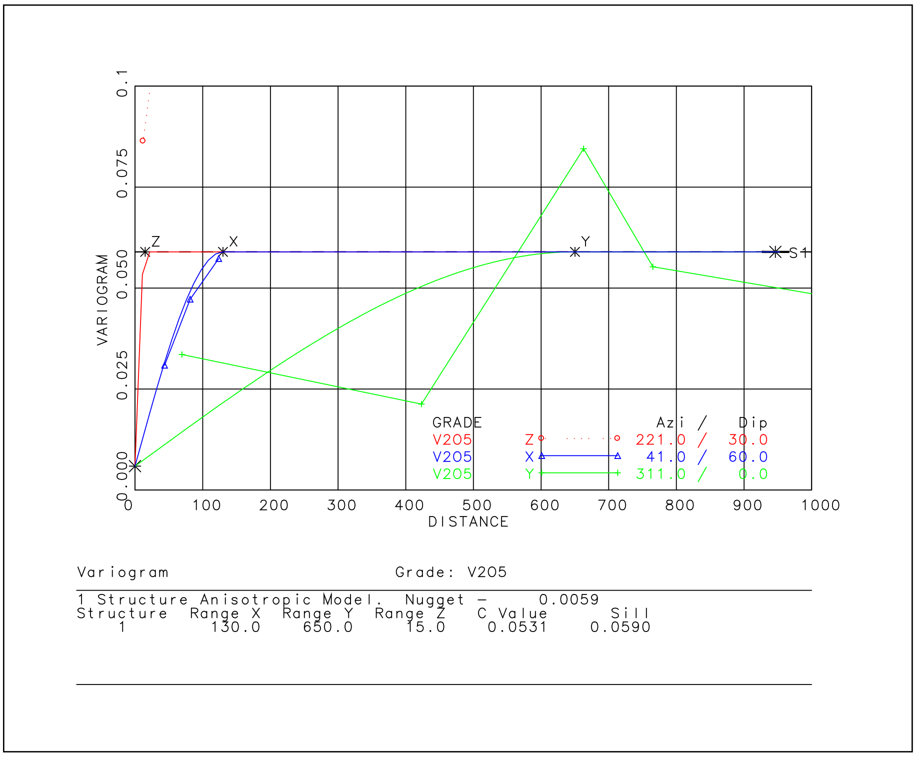


Figure 4-53: SW limb variograms for V_2O_5

Note: this basic model's (Figure 4-53) ranges were used as the search ellipsoid for IPD[2] carbon interpolations (SW limb only), and also for MoO_3 and U_3O_8 grade interpolations.

Table 4-57: Carbon NE limb variogram parameters

Limb	Single Anisotropic Spherical Structure	Nugget Variance C_0	Spatial Variance C_1	Range SW-NE Dip 300 Azimuth 41⁰ (Z)	Down-dip Azimuth 221⁰ (X)		Strike direction Dip = 0⁰ (Y)	
					Dip	Range	Range	Azimuth
NE	1	8.0	14.0	15 m	600	56 m	550 m	3110

Carbon nugget is 36 % of the sill, indicating a much more erratic distribution than V_2O_5 grades, even though there is a notable correlation between the two elements.

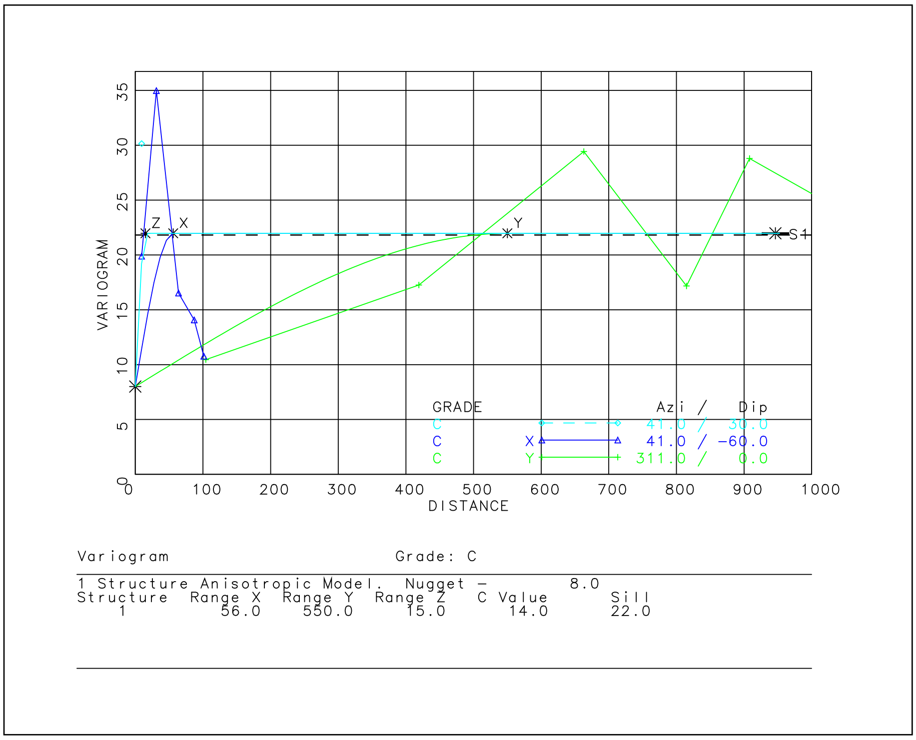


Figure 4-54: Carbon variograms – NE limb only

Note: this basic model's ranges (Figure 4-54) were used as the search ellipsoid for MoO_3 and U_3O_8 grade interpolations using IPD^{2}.

4.11 GEOLOGICAL BLOCK MODELLING

Testing of the most appropriate block size for allowing sufficient sensitivity, yet keeping the number of blocks to a low optimal level resulted in a fundamental block size of 40 m x 20 m x 20 m (X, Y & Z directions) and these parent blocks were split at the contacts of the orezone wireframe model, according to splitting criteria, resulting in a block dimension of 5 m along the X (easting) direction, 2.5 m along Y (northing) direction and along the Z (elevation) direction the blocks were split exactly at the wireframe contact, resulting in a minimal block dimension of 0.1 m to a maximum dimension of 20 m (mean length of 10.33 m). No subzone identifiers were required for this block model, though later surface oxide blocks would be removed to form a final primary orebody model. Due to the somewhat uniform grade distributions of the commercial products, these variable block sizes are not expected to induce grade biases. Details of the OB1 block model are provided in Table 4-58, Table 4-59 and Table 4-60.

Table 4-58: Spatial definition of OB1 block model (m) (oxide and primary)

Axes	X	Y	Z
Model Origin	369450	931960	290
Max. No. of Basic Blocks	77	139	18
Basic Block Size	40	20	20
Dimension	3080	2780	360
Max. Co-ordinates	372530	934740	650

Table 4-59: Actual dimensions of OB1 block model (m) – oxide

Direction	Coordinate		Range [m]
	Min	Max	
X (east)	369502.5	372467.5	2965
Y (north)	932003.75	934688.75	2685
Z (elevation)	449.4	598.35	148.95
Total # blocks = 6578			

NE limb split into 50,383 blocks and SW limb 32,079

Table 4-60: Actual dimensions of OB1 block model (m) – primary

Direction	Coordinate		Range [m]
	Min	Max	
X (east)	369497.50	372472.50	2975
Y (north)	932006.25	934686.25	2680
Z (elevation)	328.20	586.55	258.35
Total # blocks = 71598			

NE limb split into 50,383 blocks and SW limb 32,079 blocks

4.11.1 SPLITTING OB1 BLOCKS INTO SEPARATE SW AND NW LIMB MODELS

To better control the estimation of grades into the block model, it was necessary to split the fundamental block model into its SW and NE limb components and, to control this splitting, a subvertical wireframe surface was generated and used to extract the blocks to their respective structural limb components (see Figure 4-55). After grade interpolations these blocks were recombined into the basic model again.

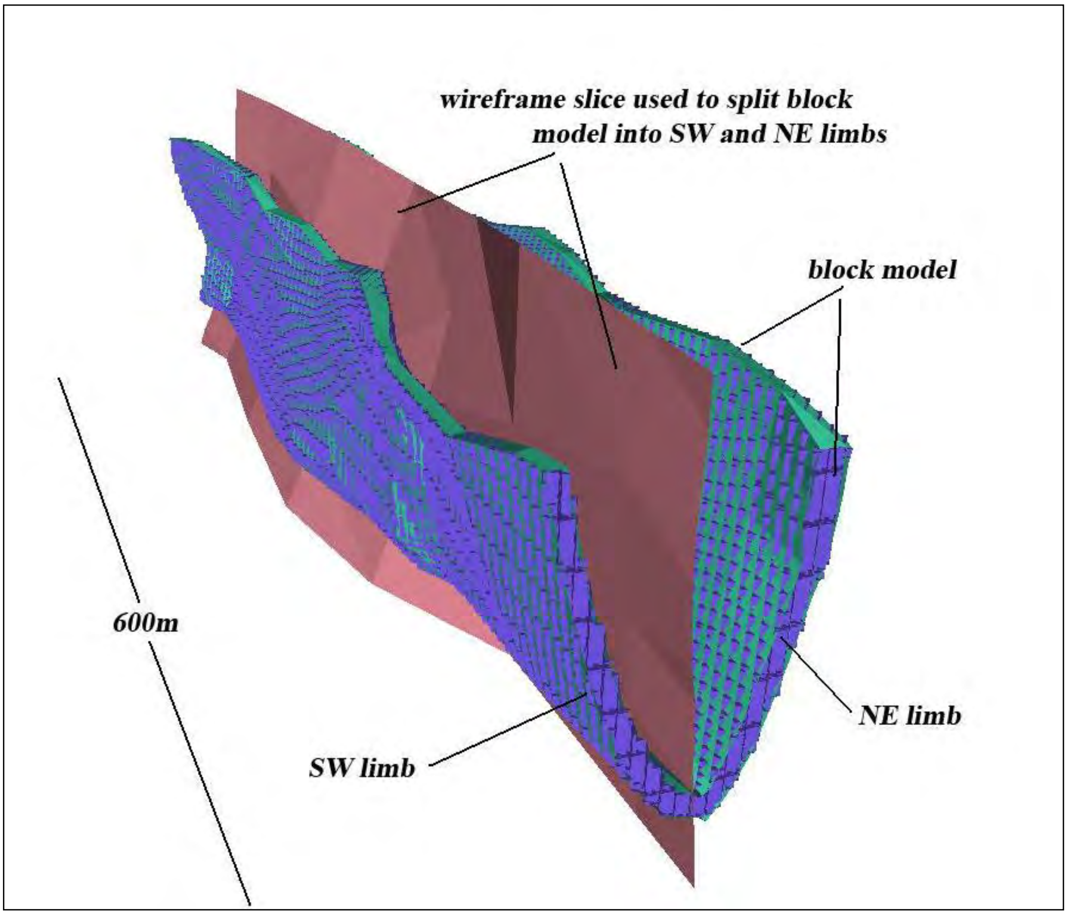


Figure 4-55: Perspective view along part of OB1 showing wireframe slice used for splitting block model into separate limbs for grade estimation

4.11.2 EXTRACTING THE PRIMARY AND OXIDE ORE BLOCKS

As the fundamental basic block model also includes the surface oxide layers, these oxide blocks need to be removed from the model in generating the primary blocks. The depth of oxidation from surface is about 10 m, though locally this can be erratic, and this notional 10 m layer is removed from the block model as follows:

The topographic wireframe surface is dropped 10 m vertically and this new oxide/primary interface surface is used to control the extraction of primary mineralised blocks below this interface and the extraction of oxide blocks are controlled by the topographic surface and the oxide/primary interface, whereby the intervening blocks are removed to form the oxide sub-model.

4.12 GRADE ESTIMATION PRIMARY ZONE OB1

Ordinary kriging (OK) was selected as the most appropriate geostatistical approach for estimating the grades into the block model (split into the SW and NE limb submodels) using the modelled variogram parameters as presented in Section 4.10 (see Table 4-55 and Table 4-56). Both V_2O_5 and C were estimated using OK, but for MoO_3 and U_3O_8 only IPD grade interpolations were realistic and IPD for C was required for the SW limb submodel because valid experimental variograms could not be generated due to limited sample assays.

4.12.1 GEOMETRIC COMPLEXITY AND ESTIMATING GRADES

Although basic variogram models were generated, because of the folding complexity due to variable strike and dip directions, it is difficult to represent the continuity of mineralisation using specific 3D search ellipsoids, according to length and orientation of the three axes. Therefore, when estimating the grade values for each cell within the block model, it is very important to get the orientation of the search volume and estimation parameters correctly aligned. To overcome this problem, DM Studio 3 has developed an application called Geodynamic Anisotropy and this was tested by GMR, as it appeared ideal for this folded tabular orebody. The application allows the anisotropy rotation angles, for defining the search volume and variogram models, to be defined for each cell within the model.

Dip and dip directions were generated from the structural wireframe model using the Datamine ANISOANG process, which generates a point file containing the dips and dip directions within the model: dips and dip directions are developed from direction and orientation of the wireframe triangles. The point file is used to define the true dip and dip direction within the block model of the vanadium layer, using IPD with a circular search distance of 25 metres where a maximum of 10 points are used for dip and direction interpolations in each model cell: IMETHOD=8.

The most appropriate representative 3D variogram models were selected for OK and, controlled by local changes in orientation of the model, according to the defined dip and direction of each block, the V_2O_5 grades were interpolated using the dynamic anisotropy process. Figure 4-56 illustrates the orientation of the geological modelling and geostatistical nomenclature.

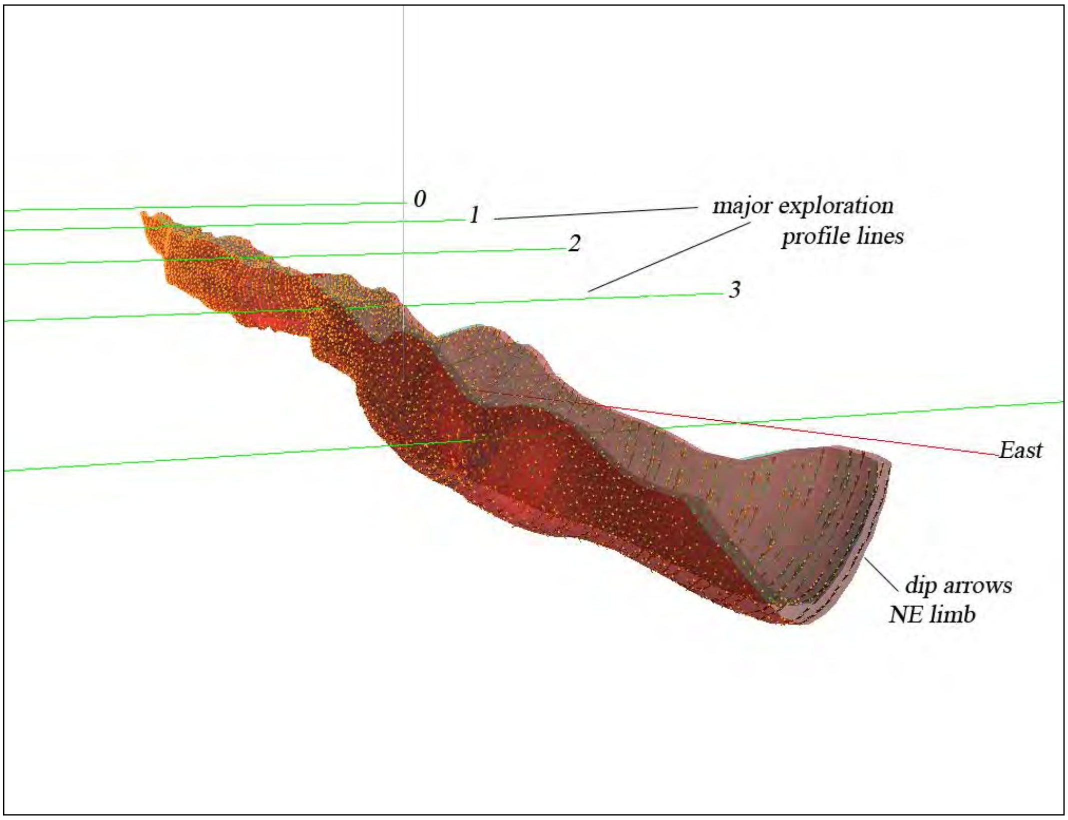


Figure 4-56: 3D perspective looking northerly and showing OB1 model with true dip directions

However, because of the extreme local geometric complexity, it appeared impractical to generate non-conflicting trends into the model, for interpreting the true local changes in the ellipsoid. Therefore, GMR took an alternative approach to the Geodynamic Anisotropy application, and this involved generating geometric sub-domains, according to local changes in dip and strike, along the strike length for each limb. Specifically, limbs SW and NE were treated differently; based on variable dip/strike directions and based on a consistent dip but variable strike, respectively.

4.12.2 SW LIMB ESTIMATION

The SW limb appears more complex than the NE limb, due to variability of both dip and strike changes. This resulted in defining seven sub-zone geometric domains according to their distinct dip and strike directions; dip directions range from of 75˚ westerly to 80˚ easterly, and strike range directions from 307˚ to 320˚. A fundamental 3D variogram model was generated and used to represent the search ellipsoid for selecting samples, but corrected for sub-domain geometric changes in dip and strike. Sub-model blocks were extracted accordingly and sub-region search ellipsoids defined in accordance to their respective sub-domains. Note that for both limbs the experimental and modelled variograms are comparatively similar, and have a strong consistency within the defined dip and strike ranges.

4.12.3 NE LIMB ESTIMATION

The grade estimation approach was slightly different for the NE limb. The dip was more or less constant at 60° west but strike changes were quite variable and abrupt along the length of the syncline and it was not realistic to identify distinct sub-domains. However, it was possible overall, to represent the variable strike change directions, according to three direction angles: 311°, 313° and 315° – to form three strike models. Sample selection search ellipsoids were based on the 3D variogram models, and blocks that were estimated within the variogram ranges (JORC (2012) “indicated”) were given precedence over block grade estimations generated from ellipsoid ranges beyond the variogram ranges, when combining the three strike grade models together. This successfully allowed the correct selection of model blocks that were estimated according to the “indicated” category for the NE limb.

4.12.4 GRADE BLOCK MODEL

There were a number of drillholes which intersected the axial zone of the fold and their samples were common to both the SW and NE limb sample sets for the grade interpolation. A rectangular anisotropic search ellipsoid, for the selection of the 2 m composite samples, was based on the variogram models. A general rule for the selection of the 2 m composite samples, within the basic ellipsoid ranges require at least three samples to a maximum of ten samples to be selected before a block grade can be estimated (classed at a JORC “indicated” level). For the second search distance, the basic variogram or ellipsoid ranges are expanded by 1.5x and a minimum of two to a maximum ten composite samples are required for estimation (classed at a JORC “inferred” level). For the very minor number of blocks still unestimated, a factor of 3x the ellipsoid, with a minimum of one to a maximum of ten samples selected and also classed at the lowest JORC level of “inferred”.

The final two grade limb models were added together to form the completed grade block model for the primary zone. The output model included the following attributes:

- OK estimates
- Kriging variance
- IPD estimates
- NN (nearest neighbour) estimates
- Mean of sample values involved for each estimate
- Number of samples involved for each estimate
- JORC classification code 1= “indicated”, 2= “inferred”

4.13 GRADE ESTIMATION FOR THE OXIDE ZONE

Detailed historical grade information and information from FAR's pilot plant open pit operations, demonstrate that the oxide zone's V_2O_5 grade is consistently higher than the primary zone at depth. Additionally, the oxide layer on average can be defined to a depth of 10 m from surface, but vertical thickness locally can be quite variable. However, the oxide represents only about 5 % of the total resource for OB1.

To define the model oxide blocks, the wireframe digital terrain model was dropped 10 m and this oxide contact surface was used to flag the oxide blocks in the model. No grade interpolation of the oxide blocks was undertaken, because overall the historical (1947) trench sample data were too sparse to properly represent this surface layer: 31 trenches intersected the NE limb and only nine trenches for the SW limb. However, the average weighted trench sample grades were used to assign a global grade for these oxide blocks, and GMR considered that an "inferred" JORC classification was acceptable for this zone at 0.89 % V_2O_5. Note: the overall sparse density of the trench data, precluded a grade interpolation for the orebody oxide model blocks, and this was confirmed by indications from experimental variogram ranges. Additionally, appropriate due diligence sampling would be necessary to confirm the historical trench results before upgrading this JORC resource, in addition for the need to increase the number of samples along the strike length of the oxide cap.

4.14 VALIDATION OF GRADE ESTIMATES

The results of the block-grade estimations in the resource model need to be endorsed, which includes extensive visual checking of the blocks in relation to actual drillhole sample assays and comparing the results of different grade interpolations with a de facto geostatistical approach. For the block-grade interpolation comparison, nearest neighbour (NN – value of the nearest sample to the estimated block) and inverse power distance squared (IPD^2), were used to compare with the ordinary kriging (OK) geostatistical results. This interpolation comparison is based on a statistical summary of "swaths" or regular slices, along three orthogonal axial directions of X, Y and Z through the grade model. These results are graphically represented by swath plots and for both the X (rows) and Y (columns) directions the width of the swath was set at 200 m and for the Z (level) direction a width of 20 m was selected. Figure 4-57 illustrates the rows, columns and levels used in the swath plots.

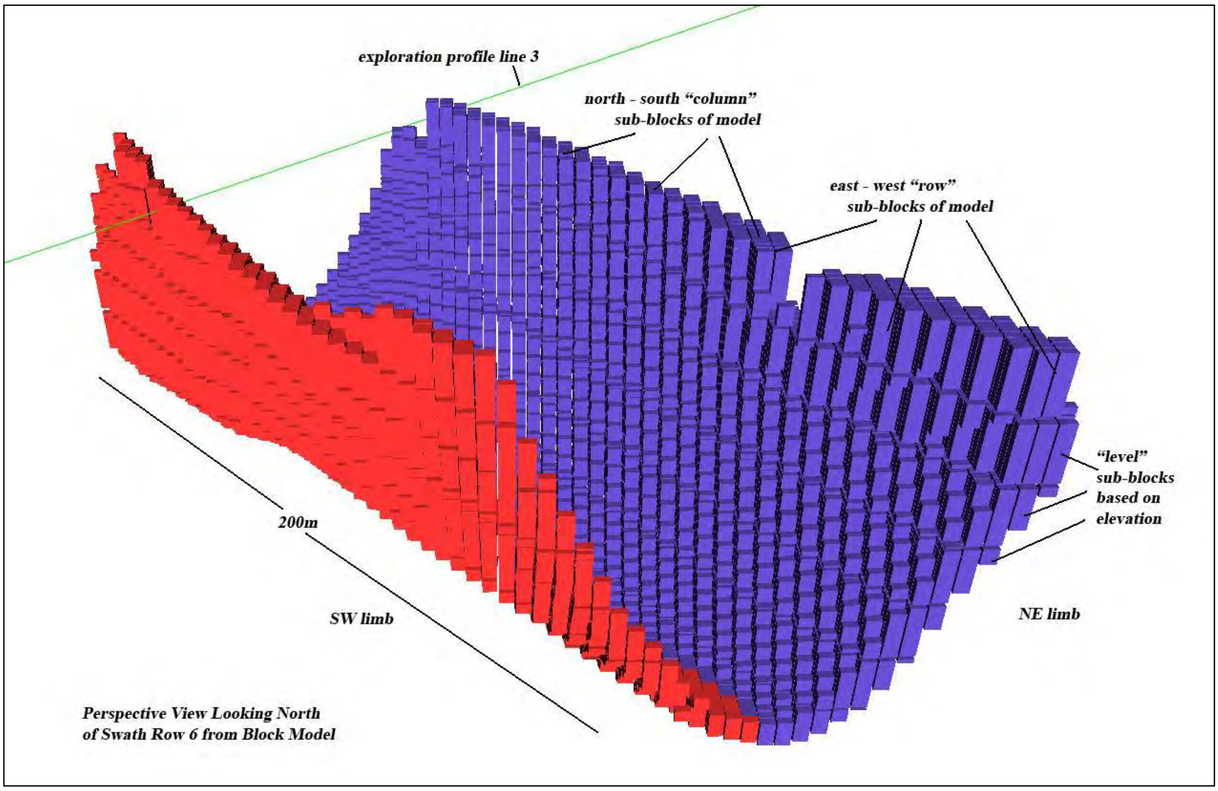


Figure 4-57: Illustration of "column", "row" and "level" used for the swath graphs – 3D block model

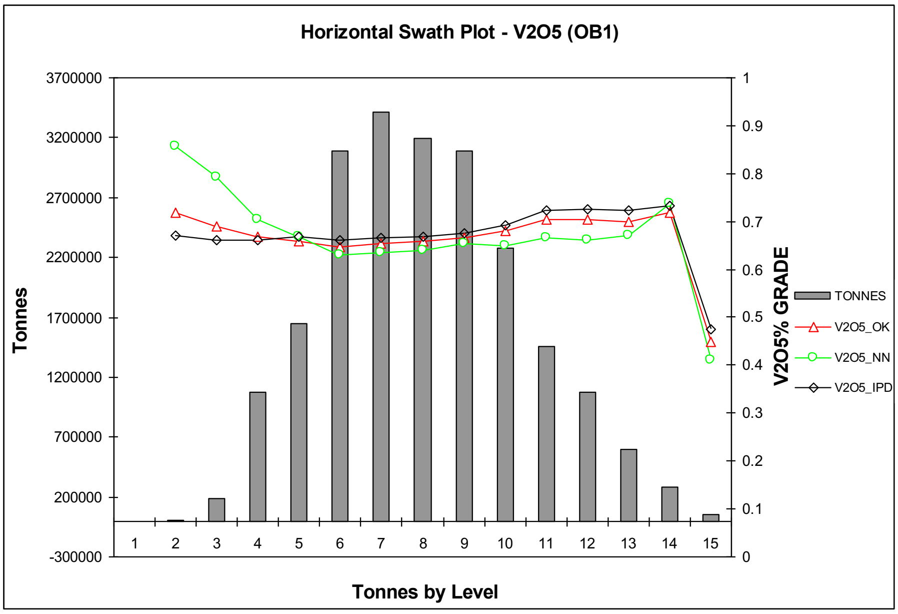


Figure 4-58: Horizontal swath plot - 310mRL to 590mRL in 20m increments (x14 levels 2 to 15)

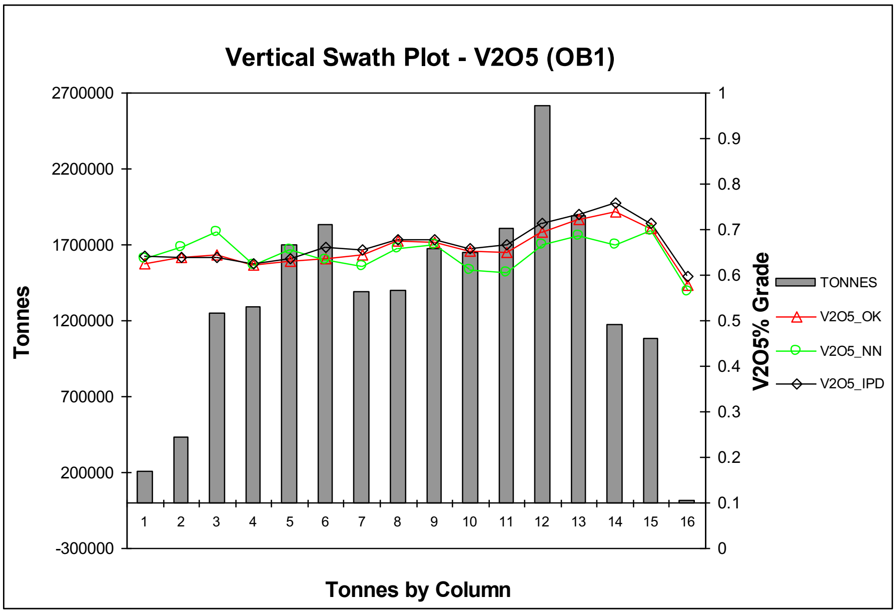


Figure 4-59: Vertical column swath plot 9450E to 372650E in 200m increments (x16)

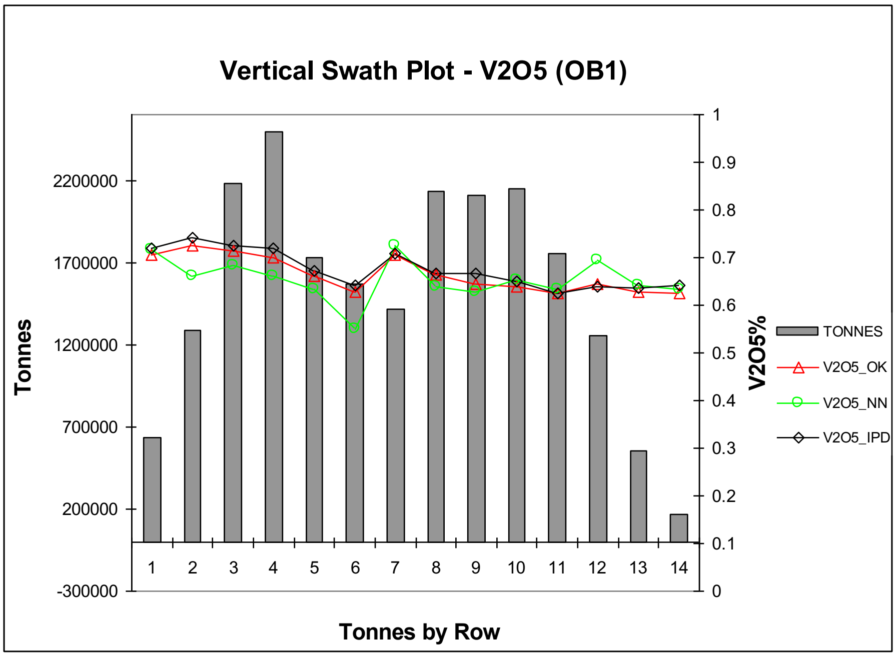


Figure 4-60: Vertical row swath plot (931960N to 934760N) in 200m increments x14

The V_2O_5 swath graphs presented in Figure 4-58, Figure 4-59, and Figure 4-60 show reasonably good correlations between the various estimation methods. OK and IPD exhibit very similar grades, though the IPD does show a slightly higher trend, which is more pronounced at higher grade levels, and this is a typical grade interpolation observation between these two popular methods of estimation. For the NN results, a more random-type of observation might be expected, in relation to the other two methods, but there is an unexpected observable lower grade trend bias for each model swath direction (ignoring low tonnage areas). A careful interrogation of this anomaly showed that this bias is due to the generally low angle of drillhole intersection through the steep tabular synclinal limbs and coupled with a tendency of lower V_2O_5 grades at the footwall and hangingwall margins. This will result in blocks which are physically higher than the hangingwall contacts or lower than the footwall contacts to have a greater spatial affinity with the lower assay grades at these contact zones. This does not affect the validity of the estimations and this nearest neighbour bias trend would not be seen if the same drillholes had intersected more orthogonally through the ore layer. The overall global averages presented in Table 4-61, show very good correlations between the various methods used to estimate the block model vanadium grades.

Table 4-61: Showing overall mean grades for OB1 JORC (2012) "indicated"

Model Estimates	OK %	NN %	IPD %	Samples* %	Tonnes (millions)
V_2O_5	0.67	0.65	0.68	0.68	21.4
Carbon	14.08	13.87	13.97	13.93	10.7

** Overall arithmetic mean grade of the samples used for each block estimation*

Carbon, although a by-product, is a major revenue generator, and the validation results for the estimation of the block grades are presented in swath plots in Figure 4-61, Figure 4-62 and Figure 4-63.

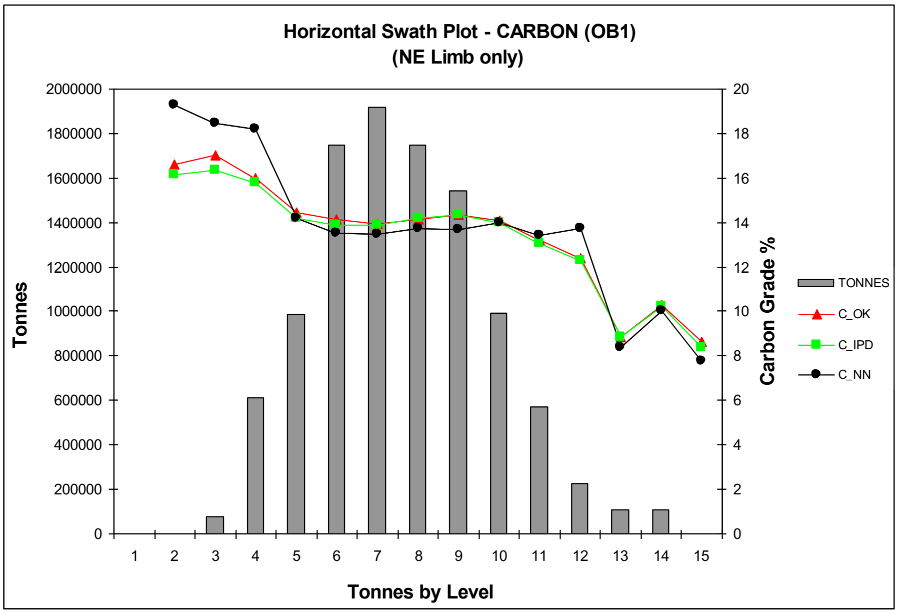


Figure 4-61: Horizontal swath plot Carbon 330mRL to 570mRL in 20m increments (x12 levels - 3 to 14)

Figure 4-61, Figure 4-62, Figure 4-63 and Figure 4-64 illustrate a trend of higher grades at the hinge of the syncline, where the carbonaceous sediments are more silicified in areas where there are intense compressional forces, as seen in the open pit where complex buckle folding occurs at the nose of the syncline.

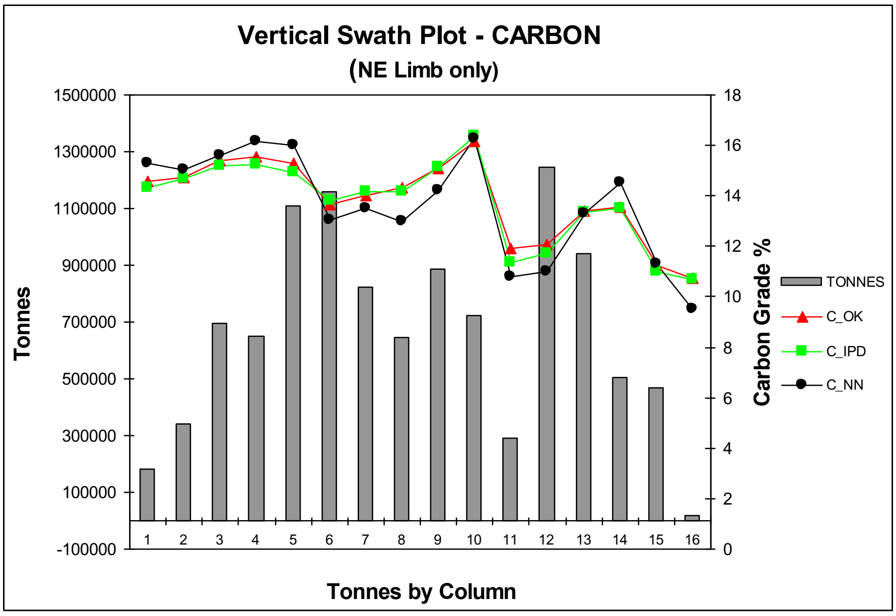


Figure 4-62: Vertical column swath plot Carbon (369450E to 372650E in 200m increments) (x16)

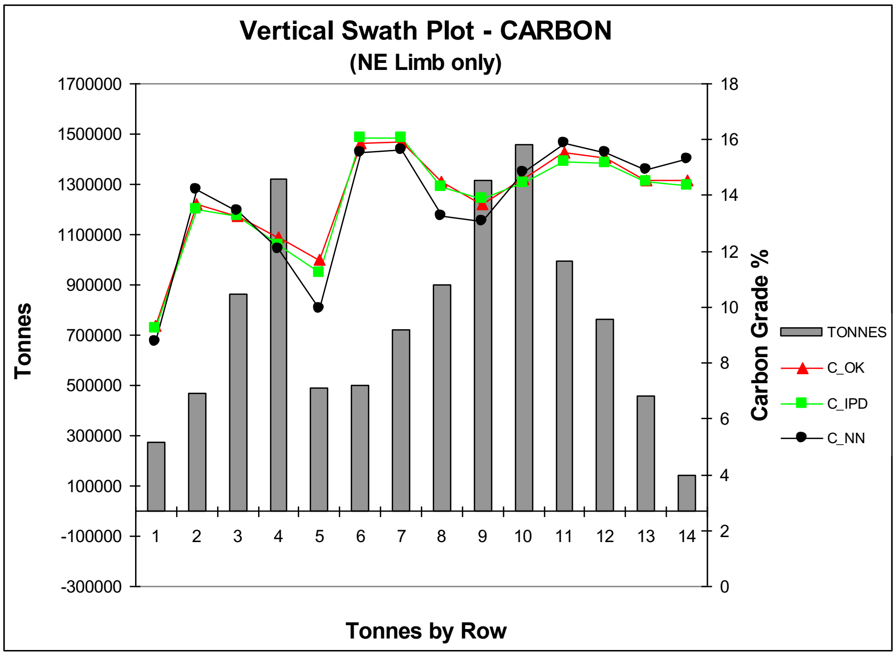


Figure 4-63: Vertical row swath plot Carbon (931960N to 934760N in 200m increments x14)

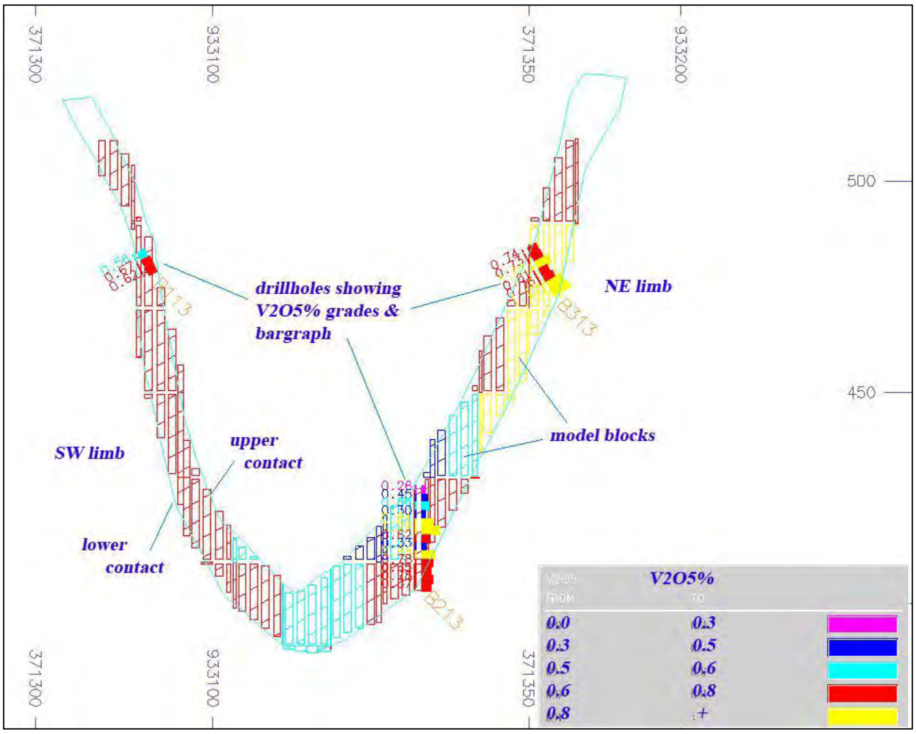


Figure 4-64: SW-NE section of model (Profile 3) showing drillhole grades and estimated block grades

4.15 RESOURCE CLASSIFICATION

The author has used the guidelines endorsed by the established Australasian Code for the Reporting of Mineral Resources and Ore Reserves (JORC, 2012). The system is split into Mineral Resources and Ore Reserves. A Mineral Resource is an in situ concentration of material of intrinsic economic interest in or on the Earth’s crust in such form and quantity that there are reasonable prospects for eventual economic extraction. Depending on levels of confidence, the Mineral Resource is split into Measured, Indicated, and Inferred. JORC (2012) states that an Ore Reserve is the economically mineable part of a Measured and/or Indicated Mineral Resource, allowing for dilution and losses that may occur during mine extraction.

The three main categories of Measured, Indicated and Inferred Resources have been defined as follows:

- Measured Mineral Resource is that part of a Mineral Resource for which tonnage, densities, shape, physical characteristics, grade and mineral content can be estimated with a high level of confidence. It is based on detailed and reliable exploration, sampling and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes. The locations are spaced closely enough to confirm geological and/or grade continuity.

Guidelines in the code show that for a Resource to be classified as Measured, the confidence in the estimate is such that additional technical information would not significantly affect technical or economic decisions made on the basis of the estimate.

- Indicated Mineral Resource is that part of a Mineral Resource for which tonnage, densities, shape, physical characteristics, grade and mineral content can be estimated with a reasonable level of confidence. It is based on exploration, sampling and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes. The locations are too widely or inappropriately spaced to confirm geological and/or grade continuity but are spaced closely enough for continuity to be assumed.

  The Indicated Resource has a lower level of confidence than the Measured Resource, but a higher confidence level than the Inferred Resource category. Confidence in the estimate would be such as to allow the application of technical and financial parameters and to enable an evaluation of economic viability. As an example, if infill drilling could significantly affect the shape and/or distribution of the mineralised zones but not substantially affect the tonnage/grade estimate, then an Indicated classification could be justified.
- Inferred Mineral Resource is that that part of a Mineral Resource for which tonnage, grade and mineral content can be estimated with a low level of confidence. It is inferred from geological evidence and assumed but not verified geological and/or grade continuity. It is based on information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes that may be limited or of uncertain quality and reliability. Confidence in this estimate would be too low to allow the appropriate application of technical and economic parameters for Ore Reserve assessment.

4.16 RESOURCE STATEMENT

4.16.1 SCHEDULE OF MINERAL RESOURCES

Table 4-62 summarises the schedule of JORC (2012) mineral resources for both the primary resource and the oxide resource, which are discussed in the following sections. The JORC (2012) mineral resources are broadly analogous to the state GKZ mineral resources using similar geological systems to define the resource category and should be read as complimentary.

Table 4-62: Schedule of JORC (2012) Mineral Resources

JORC Vanadium Resource OB1				By-Products OB1 (primary ore only)						
				JORC indicated		JORC inferred				
JORC Class	V_2O_5 % Cut-off	V_2O_5 % Mean	Tonnes [m]	C% Mean	Tonnes [m]	C% Mean	Tonnes [m]	Total C% Mean	JORC inferred MoO_3 % mean	JORC inferred U_3O_8 % mean
Indicated	0.0	0.67	21.43	14.08	10.68	13.09	10.75	13.59	0.0300	0.0090
Inferred	0.0	0.67	1.56			13.43	1.56	13.43	0.0297	0.0085
Combined	0.0	0.67	22.99					13.58	0.0300	0.0090
Oxide cap inferred	0.0	0.89	1.33							
Total	**0.0**	**0.68**	**24.32**							

4.16.2 PRIMARY RESOURCE

The primary mineralisation is the major contributor of the resource at about 95 % of the total and the remainder of the vanadium resource is confined to the oxide cap. Table 4-63 provides details of the OB1 primary mineralisation resource, while Figure 4-65, Figure 4-66 and Figure 4-67 illustrate grade tonnage curves for JORC (2012) Indicated, Inferred and combined resources, respectively, for the primary mineralisation.

Table 4-63: OB1 Resource (Primary Mineralisation)

JORC Class	V_2O_5% Cut-Off	V_2O_5% Mean	Tonnes Millions	By-Products						
				JORC Indicated		JORC Inferred		Total C% Mean	JORC Inferred MoO_3% Mean	JORC Inferred U_3O_8% Mean
				C% Mean	Tonnes Millions	C% Mean	Tonnes Millions			
Indicated	0.0	0.67	21.43	14.08	10.68	13.09	10.75	13.59	0.0300	0.0090
	0.1	0.67	21.43	14.08	10.68	13.09	10.75	13.59	0.0300	0.0090
	0.2	0.67	21.43	14.08	10.68	13.09	10.75	13.59	0.0300	0.0090
	0.3	0.67	21.34	14.13	10.62	13.11	10.72	13.62	0.0301	0.0091
	0.4	0.67	21.25	14.16	10.55	13.11	10.70	13.63	0.0301	0.0091
	0.5	0.67	21.06	14.16	10.43	13.10	10.63	13.62	0.0302	0.0091
	0.6	0.69	18.43	14.13	8.87	13.08	9.56	13.58	0.0302	0.0093
	0.7	0.77	5.67	13.66	3.10	13.34	2.57	13.51	0.0303	0.0109
	0.8	0.87	1.38	14.75	0.63	13.59	0.74	14.12	0.0309	0.0098
	0.9	0.98	0.35	16.47	0.10	13.60	0.25	14.43	0.0290	0.0086
	1.0	1.04	0.11	17.57	0.02	13.77	0.09	14.56	0.0302	0.0090
Inferred	0.0	0.67	1.56			13.43	1.56	13.43	0.0297	0.0085
	0.1	0.67	1.56			13.43	1.56	13.43	0.0297	0.0085
	0.2	0.67	1.56			13.43	1.56	13.43	0.0297	0.0085
	0.3	0.67	1.56			13.43	1.56	13.43	0.0297	0.0085
	0.4	0.67	1.56			13.43	1.56	13.43	0.0297	0.0085
	0.5	0.67	1.56			13.43	1.56	13.43	0.0297	0.0085
	0.6	0.67	1.49			13.41	1.49	13.41	0.0298	0.0085
	0.7	0.72	0.52			13.23	0.52	13.23	0.0297	0.0094
	0.8	0.82	0.03			14.00	0.03	14.00	0.0286	0.0112
Combined	0.0	0.67	22.99					13.58	0.0300	0.0090
	0.1	0.67	22.99					13.58	0.0300	0.0090
	0.2	0.67	22.99					13.58	0.0300	0.0090
	0.3	0.67	22.90					13.61	0.0301	0.0090
	0.4	0.67	22.81					13.62	0.0301	0.0090
	0.5	0.67	22.62					13.61	0.0301	0.0090
	0.6	0.69	19.92					13.57	0.0302	0.0092
	0.7	0.77	6.19					13.49	0.0302	0.0108
	0.8	0.87	1.41					14.12	0.0309	0.0098
	0.9	0.98	0.35					14.43	0.0290	0.0086
	1.0	1.04	0.11					14.56	0.0302	0.0090

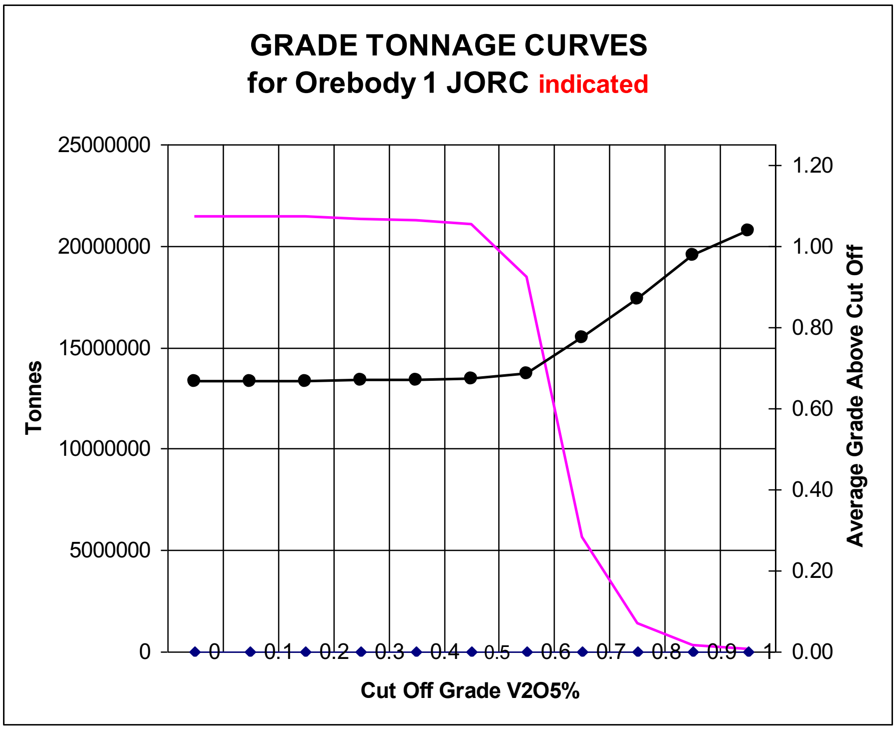


Figure 4-65: Grade tonnage JORC Indicated

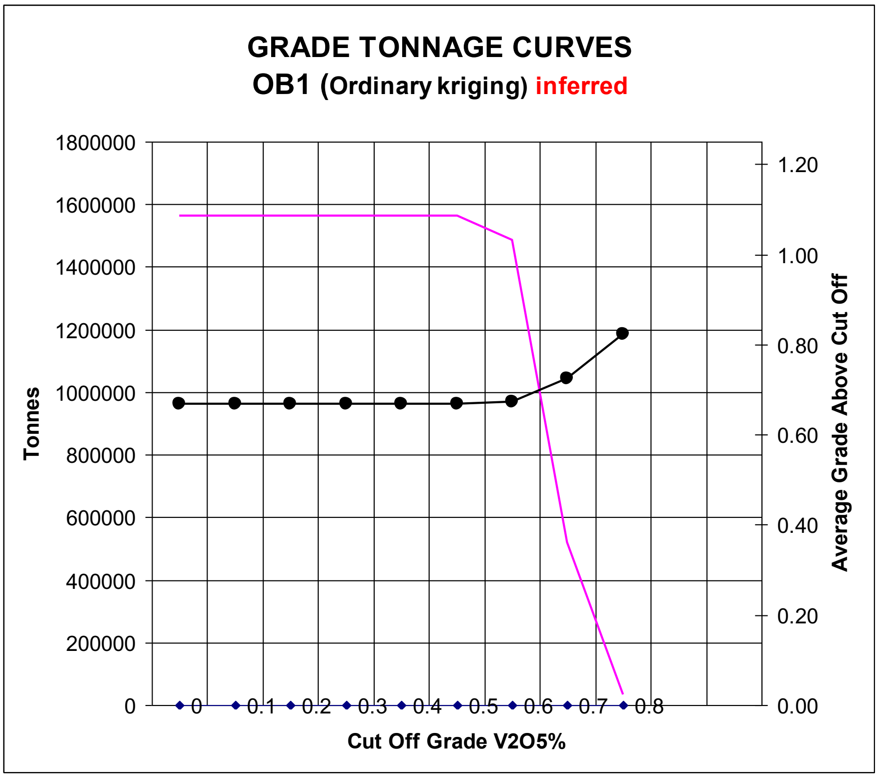


Figure 4-66: Grade tonnage JORC Inferred

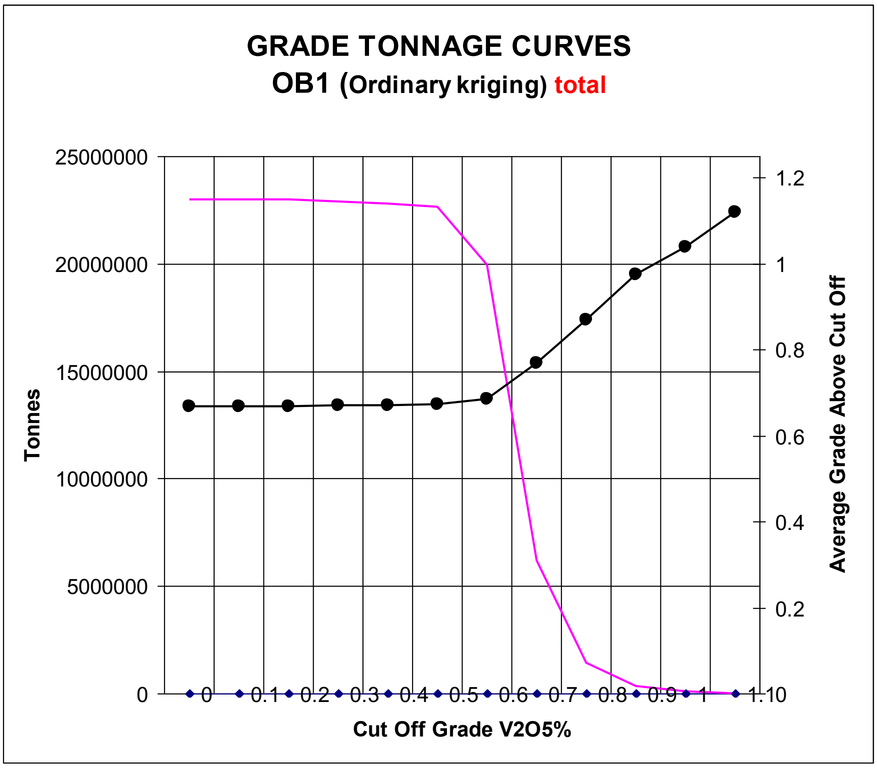


Figure 4-67: Grade tonnage JORC Combined

4.16.3 OXIDE RESOURCE

Although an oxide block model has been generated, it has only been possible to estimate a global vanadium grade from the historical surface trench data. Table 4-64 summarises the JORC (2012) Inferred Mineral Resource for the oxide mineralisation.

Table 4-64: OB1 Resource (Oxide Mineralisation)

JORC (2012) Vanadium Resource OB1 – Oxide Cap			
JORC Class	V_2O_5% Cut-off	V_2O_5% mean	Tonnes millions
Inferred	0.0	0.89	1.33

4.17 JORC EXPLORATION TARGETS (OB2, OB3, OB4 AND OB5)

JORC (2012) permits the reporting of exploration target size and type with strict conditions, whereby grades and tonnes are expressed in ranges and a detailed explanation for the basis for such a statement is submitted.

Historically, the surface vanadium oxide zone has been well documented from trench sampling plus some subsurface exploration drives and shows distinct continuity, but at depth where the primary ore constitutes about 95 % of the resource, only a limited amount of drilling has been completed for OB2 and OB3. However, based on the distinct surface expression of these orebodies (as illustrated in Figure 4-68) and, by analogy with the OB1 resource, it has been possible to derive approximate ranges of expected tonnages for OB2 to OB5. The exploration targets for the primary resource are summarised in Table 4-65 and Table 4-66, while the exploration targets for the oxide resource are summarised in Table 4-67.

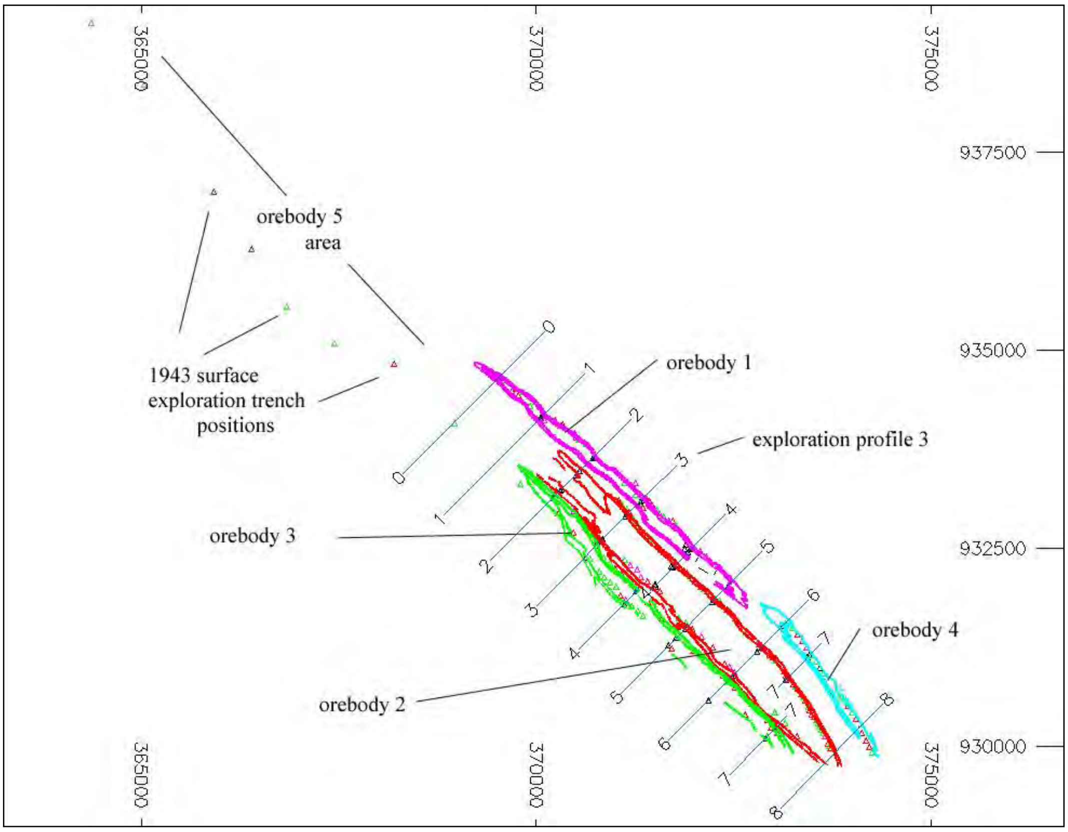


Figure 4-68: Historical surface outline of orebodies – based on 1947 map

4.17.1 PRIMARY EXPLORATION RESOURCE

4.17.1.1 DETAILED EXPLANATION

The following parameters were used to define the tonnages and V_2O_5 grades for assessing JORC exploration targets in the primary mineralisation, refer to Table 4-66:

1. Tonnages based on the OB1 JORC resource, where there are 23 million tonnes of resource with a strike length of 4.5 km and this equates to 5.11 million tonnes per km. The factor 5.11 is multiplied to the strike length for each orebody to obtain the expected median tonnage and the tonnage range has been calculated as ±15 % to the median tonnage. For OB5, which only has a single limb structure, the tonnage has been halved.
   Total tonnes = strike length in km*5.11 million.
   - OB2 global tonnage = 28.1 million (strike length =5.5 km)
   - OB3 global tonnage = 24.5 million (strike length 4.8 km)
   - OB4 global tonnage = 13.3 million (strike length 2.6 km)
   - OB5 global tonnage = 40.9/2 = 20.4 million (strike length 8.0 km)
2. V_2O_5 Grade: The expected global mean grade for each orebody was derived from the relatively scant historical and/or FAR drilling mean grade results and the grade range applied at ±5 % of the mean grade.
   - OB2 mean grade = 0.66 % - based on former Soviet-era drilling
   - OB3 mean grade = 0.69 % - based on Soviet-era drilling and FAR drilling
   - OB4 mean grade = 0.67 % - considered as a strike extension of OB1 and likely to contain a similar global grade.
   - OB5 mean grade = 0.69 % - it appears to be a strike extension to OB3 and so the same global grade has been applied.

Table 4-65: JORC-based Exploration Target (JORC 2012 guidelines)

Orebody	Strike Length (km)	TONNES (million)*		V_2O_5% GRADE RANGE	
		From	To	From	To
2	5.5	24	32	0.63	0.69
3**	4.8	21	28	0.66	0.73
4	2.6	11	15	0.64	0.71
5**	8.0	17	23	0.66	0.73
Total	20.9	73	98	0.65	0.71

** based on bulk density of 2.4 ** OB5 is a strike continuation of OB3, as a single limb layer only*

Table 4-66: JORC-based Exploration Target (JORC 2012 guidelines) - By-products applied to all Ore Bodies 2 to 5

Target	Global Grades based on OB1	GRADE RANGE ± 5%	
		From	To
Carbon	13.58%	12.9	14.26
MoO_3	0.030%	0.029	0.032
U_3O_8	0.009%	0.009	0.009
REM	335 ppm	318	352
Total Tonnes (millions)		73	98

4.18 OXIDE EXPLORATION RESOURCE

4.18.1 DETAILED EXPLANATION

The following parameters were used to define the tonnages and V_2O_5 grades for assessing JORC exploration targets in the oxide mineralisation:

1. Tonnages based on the OB1 JORC resource, where there are 1.33 million tonnes of resource with a strike length of 4.5 km and this equates to 0.296 million tonnes per km. The factor 0.296 is multiplied to the strike length for each orebody to obtain the expected median tonnage and the tonnage range has been calculated as ±15 % to the median tonnage. For OB5, which only has a single limb structure, the tonnage has been halved.
   Total tonnes = strike length in km*0.296 million.
   - OB2 global tonnage = 1.63 million (strike length 5.5 km)
   - OB3 global tonnage = 1.42 million (strike length 4.8 km)
   - OB4 global tonnage = 0.77 million (strike length 2.6 km)
   - OB5 global tonnage = 2.37/2 = 1.18 million (strike length 8.0 km)
2. V_2O_5 Grade: Only the expected global mean grade of 0.89 % for the oxide cap of OB1 has been applied to these orebodies and the grade range applied at ±5 % of this global grade.

Table 4-67: JORC-based Exploration Target (JORC 2012 guidelines) Oxide Cap

Orebody	Strike Length (km)	TONNES (million)*		V_2O_5% GRADE RANGE	
		From	To	From	To
2	5.5	1.39	1.87	0.85	0.98
3**	4.8	1.21	1.63	0.85	0.98
4	2.6	0.65	0.89	0.85	0.98
5**	8.0	1.00	1.36	0.85	0.98
Total	20.9	4.25	5.75	0.85	0.98

** based on bulk density of 1.7 ** OB5 is a strike continuation of OB3, as a single limb layer only*

4.19 RESERVES

Detailed mine planning for OB1 has been undertaken using open pit optimisation software ("Datamine"). The open pit was designed to take into account the Indicated resource which also includes the Inferred resource representing the oxide cap together with inferred by-product values. Since only the Indicated part of the resource can be used to form a Reserve under the JORC (2012) system of classification the inferred resources were taken as waste for Reserve reporting purposes in the following table:

JORC Based Mineral Reserves (JORC 2012 Guidelines) - Ore Body 1 only

Category	Reserve Tonnes (000)	Mean grade V_2O_5 [%]
Probable	22,938	0.59

GKZ RESERVES

A mineral resource in Kazakhstan is registered with the state committee GKZ. This is a legal requirement and the mine will operate under the GKZ jurisdiction and in accordance with the state rules for subsoil use. The JORC resource estimate is a separate exercise and is used to provide an additional and complimentary resource estimate for the reader who may not be familiar with the GKZ resource classification system. In May 2014 the GKZ reserve detailed in Table 4-68 was confirmed and placed onto the national register. This GKZ reserve totals 71 M tonnes and is the basis for regulatory control.

Table 4-68: 2014 GKZ Reserve Summary

Category	Reserve [1000 t]	Mean grade V_2O_5 [%]
B	832	1.00
C1	15,649	0.75
C2	54,366	0.74
B+C1+C2	70,847	

4.20 CONCLUSIONS AND RECOMMENDATIONS

Potentially, the primary resource is huge, as expressed by the surface continuity of the vanadium mineralisation along strike. The reflection at depth of such observable surface mineralisation has been confirmed by FAR's drilling of OB1 and also confirmed from the more limited drilling of OB2 and OB3. Currently, based on the OB1 JORC resource, plus JORC-based Exploration Targets for OB2 to OB5, a total vanadium GKZ or JORC resource of over 100 million tonnes is considered to be a rational prediction. Note: additional anomalous surface vanadium mineralisation has also been defined from historical exploration and which has not been included in this estimate –see Figure 4-9 geological map.

GMR has advised that for an optimum assessment of the rare earths potential, there is a need to identify the specific REM associated minerals within the primary ore, to allow a better understanding as to which rare earth elements should be analysed. It is understood that FAR has made arrangements for this work, but results have not been seen.

SECTION 5 MINING

5.1 INTRODUCTION

The ore bodies of the Balasausqandiq deposit are outcropping. The commercial vanadium mineralisation geometry forms elongated synclinal structures. The shape of the mineralisation lends itself to a conventional open pit mine design.

The dipping of the ore body at the flanks of the synclinal structures generally ranges from 65 to 90°. The surface expression of the vanadium-bearing horizon typically shows a thickness range from 5.0 to 19 m.

Within the limits of the outcropping ore bodies, the siliceous intercalations form clear-cut, saddleback hills and hilltop surfaces with gaps in between them; thus the terrain of the deposit area is inverse, i.e. the trough cores of the synclinal structures repeat the positive shape of the surface terrain. Outcrops of the ore bodies are associated with the upper part of the slopes. Striking of the ridges matches the striking of the structures. The top parts of the ridges are quite flat.

Mining excavation commenced at Balausa in 1971 during the Soviet era. The open pit that was in operation is now called the Old Pit which is located in the middle of OB1. Whilst in production a total of 12 kt of ore was extracted for pilot plant mineral processing analysis.

In 2009, FAR developed another open pit called New Pit which is located at the north western end of OB1. The current status of New Pit is shown in Figure 5-1.

5.2 MINING PLANNING

It is intended to mine the New Pit at a rate of 500ktpa with a rapid ramp up to 1Mtpa as commissioning proceeds. Long term mining design, planning and operations are conventional as the open pit layout is orthodox and uncomplicated. The mining operation extraction program will follow the orebodies along strike and to an economically defined depth which, for OB1, is the full depth of the synclinal structure.

Figure 5-1: Current Status of New Pit

5.2.1 MINING CUT-OFF GRADE

According to normal mining convention, cut-off grade is defined as the level of mineralisation that yields a nil operating revenue, with operating revenue being the net mine site realisation from sales, less all mine site direct operating costs for mining, milling, and general and administration.

This process was used to create mining excavation boundaries, defining what is waste and thus is not economically viable to process and sell.

The cut-off grade used to outline the mine excavation plan was determined using the following formula:

*Cut-off Grade = Operating Costs / Metal price * Metallurgical Recovery*

The following values were used:

Operating Cost	35 USD/t of ore (excluding transport and smelter charges)
Metallurgical Recovery	90 %
Revenue Price	135 USD/t
Cut-off Grade	0.1 % Vanadium (V_2O_5)

A cut-off grade of 0.1 % V_2O_5 was therefore used to determine the mine plan and ore volumes. In practice, there is a sharp boundary between ore and the waste, which contains little vanadium, so the cut-off can be taken as the limit of the vanadium-containing strata.

5.2.2 OPEN PIT DESIGN

The mine design has been undertaken using industry standard computerised design software. Figure 5-2 shows the current pit design and Figure 5-3 shows the cross-sectional view through the middle of the pit, looking towards the northwest. The mine design is based on 15 m bench height, 5 m safety berms, with an overall slope angle of the open pit expected to be approximately 75 °.

5.3 GEOTECHNICAL PARAMETERS

Historic geotechnical investigations were completed based on the geological and geo-mechanical programme carried out in the Soviet era. Subsequently a mine design geotechnical report was written in 2001 by CJSC “KazGIIZ”. This report was part of investigations to ensure that the area designated for the mineral process pilot plant was suitable, did not sterilise mineral resource, allowed the development of the open pit and also determined the location of the final operational mineral process plant.

It is noted that the rock quality designation is good and stable open pit mine walls are envisaged. It is worth noting that since the original excavations in 1943, no caving or sloughing was noticed in the trench walls or in the roof of the underground adits.

5.4 HYDROLOGICAL PARAMETERS

The ground water of the region that hosts the mineral resource is confined to the outcropping zone of middle Cambrian age; the lithological nature comprises carbonaceous-clayey, siliceous, and sericite-chloritic schists. The rocks are highly schistose and broken by tectonic fissures into separate blocks. The depth or thickness of this rock type is approximately 100 m in average. The depth of ground water in the area of the open pits varies from surface to 14.5 m below surface.

The permeability or filtration properties of the rocks are low. The filtration ratio varies from 0.047 to 0.262 m/day. Test well flow rates vary from 0.5 to 4.2 l/s, specific flow rates vary from 0.03 to 0.196 l/s. The water is fresh, dissolved salt mineralization is 0.8-1.0 g/l and the chemical composition is mixed, hydrocarbonate-sulfate, calcium-sodium. Underground water mainly migrates to the south-west with surface expression in the topographic relief depressions in the form of springs. Water inflow to the open pit mining area will be minor, of nuisance value, from the underground water body, which is classified as a low producing water body. There will be some ingress of water due to rain and melting snow but the majority of this precipitation will be directed away from the open pit by the establishment of a surface draining system designed as part of the surface road network.

Any water ingress will be diverted from the open pit by judicious mine design; the north western area of the open pit intersects low lying topography and it will be possible to excavate a drain allowing the water from the open pit to drain naturally by a graded pit floor. This allows water to drain naturally from the south east to the north west and out of the pit.

5.4.1 SURFACE WATER FROM OPERATIONS

The mine water emanating from the open pit will be directed via surface drains to a series of dams, which will allow water to be collected for road dust suppression and general operational use. Excess ground water will be discharged according to the discharge permits as set out in the OVOS.

5.5 MINING METHOD

The mining operation is based on conventional open pit mining using conventional drilling, blasting, excavation and haulage of waste and mineralised rock by truck to the respective material location. The equipment used will be modern industry standard, and sized according to the excavation volumes.

The mine design studies have been based on an optimisation process which uses standard industry calculations to maximise the value of the waste to ore extraction ratio. The current design shows a 4.2:1 stripping ratio of waste and ore. As mining costs are a fraction of total costs and the forecast profit margins are high, a very much higher stripping ratio could be contemplated but this mine design already caters for 100 % extraction of OB1. The general inter bench slope angle is 75°.

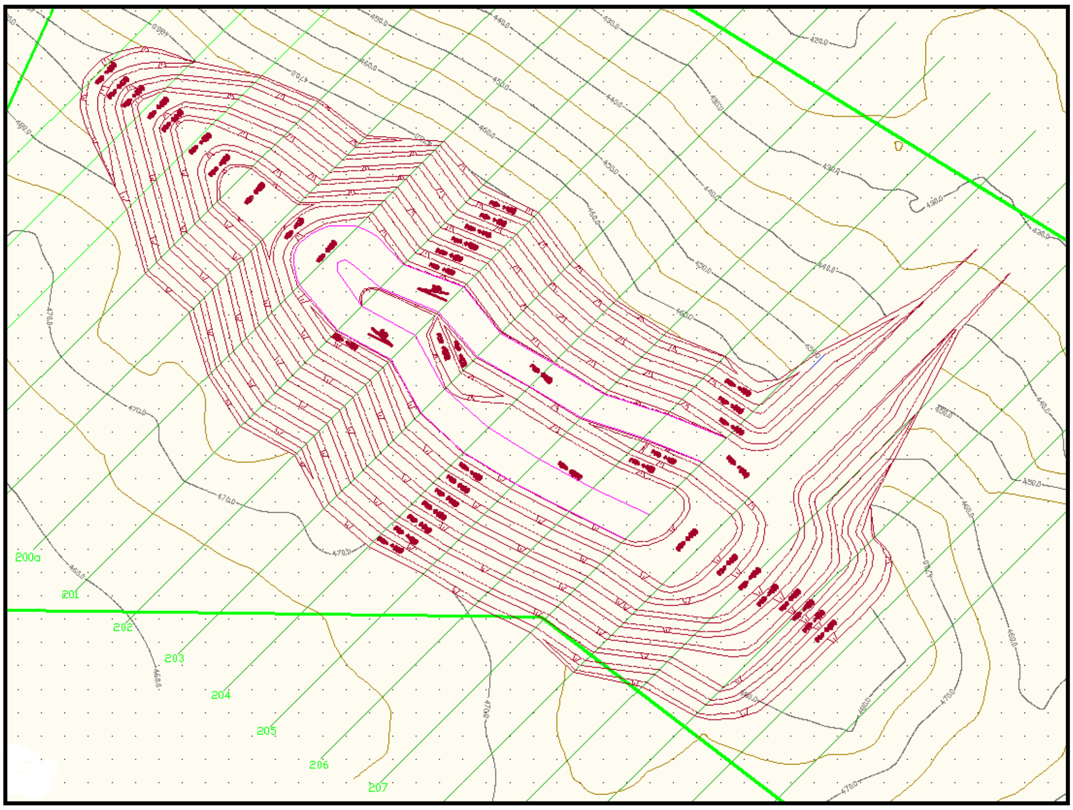


Figure 5-2: Current Design for New Pit Ore Body 1

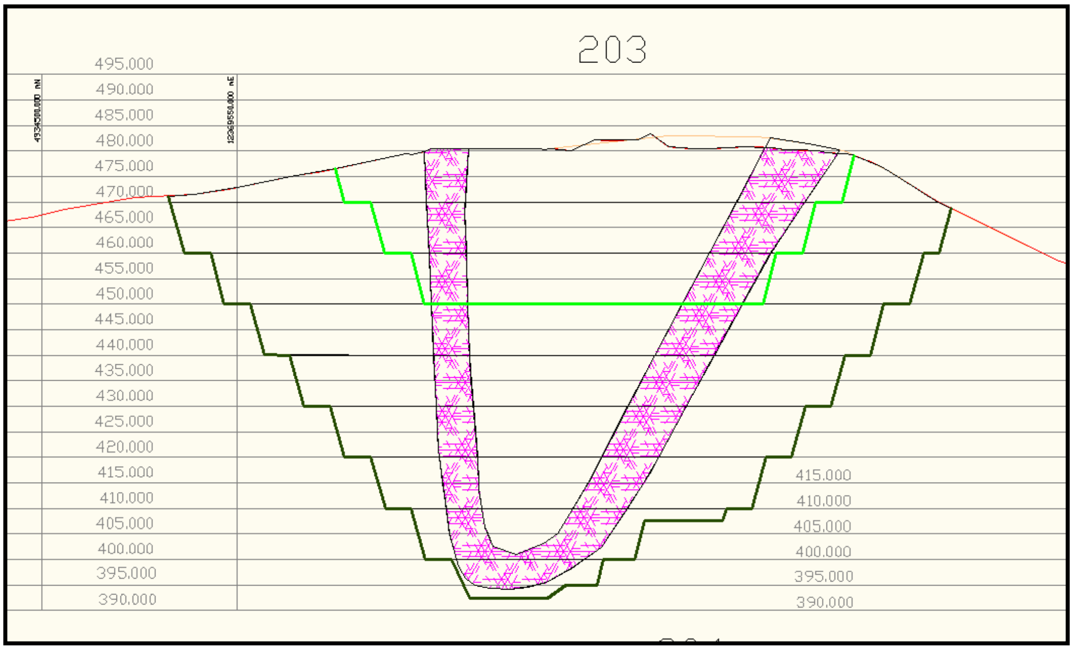


Figure 5-3: Cross-section 203 of New Pit Design Ore Body 1

5.6 DRILLING AND BLASTING

The pilot operation drilling and blasting tasks to date have been performed by a contractor. FAR intends initially to continue using a contractor for drilling and blasting, with a commercial structure based on the larger volume of rock. It will remain an option to bring the operation in-house if suitable contractual terms cannot be negotiated.

The use of a contractor minimises the need for explosives storage, handling facilities and specialist skills.

5.7 OPERATIONAL ORE GRADE CONTROL / WASTE DETERMINATION

The rocks-strata classified as ore and those classified as waste are clearly visible at footwall contact within primary ore. To ensure the quality of the mined ore is consistent and constant, a program of grade control sampling will be undertaken. This will involve the sampling of drill cuttings from the blast hole drilling process, tested in the onsite laboratory and excavation plans used daily to ensure that that the ore extracted will be at the required grade.

5.8 OVERBURDEN / WASTE REMOVAL

A waste emplacement location has been developed to the northern side of the New Pit. This material will be stored until mine closure and used for restoration purposes. During the life of the mine, the waste rock will be used for site roads, water drainage bunds and safety barriers around the site. There is also a market for aggregates for construction and local road building. Since 2010 a large quantity of rock has been sold for regional road construction.

5.9 MINING FLEET

Current and future mining fleet Table 5-1 sets out the fleet of equipment proposed for Balausa.

Table 5-1: Proposed New Capital Plant and Equipment for Mining

Name of Equipment	Number	Cost 000 USD
Main mining equipment		
Excavator Hitachi ZX850 – 5G (4.3m)	2	1,474
Loader ZL50	2	100
Bulldozer Shantui SD2	3	616
BelAZ – 7547 45 tonne	12	2,900
Grader DZ 98	2	144
Vibrating roller Dynapac CA 3500	1	136
Excavator with hydraulic hammer Hitachi ZX280-5G/Furukawa F35XP	1	245
Blasting rig Furukawa HCR 1500 – EDII	1	398
Compressor KB-12/12P CHKZ	2	73
Sprinkler truck Ural 420	2	140
Charging machine BB-MZU-16 KAMAZ-6520	1	85
Mobile workshop AROK with IM-50	1	60
Fuel Truck GAZ 36135-11	1	35
Mobile lighting system	4	57
Total		**6,464**

5.9.1 MINING OPERATIONAL INFRASTRUCTURE

The mine site already has a suitable machinery refuelling depot and diesel generator for the workshops and administration facilities. A coal-fired boiler will provide the heating requirements, later supplemented by waste heat from the sulphur burner.

5.10 LABOUR REQUIREMENTS

It is anticipated that approximately 271 personnel will be required for the mining department for Phase 1 which will consist of 158 operators and 73 management and support staff. The intended work roster from March till November will be based around two x 12 hour shifts (day and night), 10 hours work time with two one hour breaks. During the short harsh winter period a single 12 hour shift operation will take place. Workers will be on site for 15 days, sleeping in on-site accommodation, followed by 15 days off, throughout the year.

5.11 MINING SERVICES

5.11.1 MINE SERVICES, COMMUNICATION

Communications around the mine are via hand held two-way radios and mobile phones.

A system consisting of a series of base station(s), located in the control office, workshop and supervisory vehicles will be established to communicate with each piece of mobile plant.

Multiple channel systems are available which can be used to provide separate communications for different departments (e.g. mine, maintenance and surface staff), yet still enable all personnel to communicate when necessary.

5.11.2 MINE SERVICES, MAINTENANCE FACILITIES

Given the proposed size of the Balausa mine a site workshop will be constructed. This will include crane and vehicle pit facilities, storeroom, welding bays, tyre changing facilities, engine and transmission removal and other conventional tasks associated with machinery maintenance.

This will enable all vehicles to be repaired and serviced. The fuelling and lubrication facility will comprise a secure, bunded fuel tank with an electrically operated pump; commonly used greases and lubricants with either electric or pneumatic pumps; environmental and spill protection equipment; a pressure washer; and a range of tools for carrying out basic repairs and servicing.

5.11.3 MINE OFFICE AND CHANGE ROOM

The mine office and changing room facilities are established in the site building and will be suitable for the expanded operations. The office facility has sufficient room for technical and supervisory staff as well as contractors. This includes an open plan area for survey plans and geological drawings to be laid out for planning meetings. The laboratory facilities located nearby are for grade control works.

Changing facilities are equipped with a clean and dirty section where personnel can shower and change into or out of their work clothes. In addition, a heated area is provided so that industrial work clothing (i.e. overalls) can be dried ready for the next shift. A system of lockers and employee space is established to ensure security and a high regard to personal welfare.

5.11.4 HEALTH, SAFETY AND WELFARE

The company will continue to develop a culture in which each individual will be trained in a safe system of working, and thereby adhere to the health, safety and welfare management plans and system that enable the company to aim for zero harm to employees; the motto, ‘everyone-home, every shift’ exemplifies this culture.

The company's activities will focus on risk assessment, hazard identification and appropriate and reasonable control measures. Management will ensure a programme of continual monitoring and review of health, safety and welfare to provide a work environment that is safe from harm. By nature humans err, therefore a comprehensive program of safe systems of working will be implemented to define safe work procedures for higher risk tasks, this will be linked to the personal risk management ethos adopted and will be used as an educational tool to increase health, safety and welfare awareness.

Effective annual health screening will be undertaken to test cardiovascular, physiological, lung function, hearing, sight and fitness to ensure that all employees are capable of undertaking the tasks prescribed to the job functions they undertake. This will be reinforced with training in personal health and hygiene. There will be specific training in the control of chemicals hazardous to health.

The company will abide by and exceed the requirements of the Health and Safety Authority of Kazakhstan and where appropriate will utilise the suite of guidance and approved codes of practise from the international mining industry.

SECTION 6 METALLURGICAL TESTWORK

6.1 INTRODUCTION

The optimised processing regime has been derived from experience of operating the existing pilot plant which was itself designed after testwork carried out from 2008 onwards. In October 2008, a series of testwork programmes were commissioned to investigate alternative methods of leaching the ore using atmospheric and autoclave leach technologies.

Between November 2008 and January 2010 the National Centre for Complex Processing of Raw Materials, Republic of Kazakhstan, undertook a programme of testwork with the following objectives:

- Undertaking a mineralogical examination of the ore,
- Establishing crushability and grindability of the ore,
- Identifying a selective oxidiser suitable for the recovery of vanadium,
- Minimising acid consumption during autoclave leaching,
- Establishing a flowsheet for the selective adsorption of uranium and molybdenum, vanadium and rare earths,
- Establishing a flowsheet for the recovery of "carbon black" using flotation technology, and
- Reducing levels of aluminium inside barren solution by production of potassium alum.

Both atmospheric and autoclave leaching were investigated as part of the study. A summary of the testwork undertaken is now provided in the following sections.

6.1.1 ATMOSPHERIC LEACHING

High activation energy is required in order to achieve sufficient dissolution of vanadium from patronite and phengite using sulphuric acid. The leach process was therefore carried out at elevated temperatures. The following conditions were used:

- Material ground to -0.1 mm,
- Temperature of sulphidisation of 350 °C,
- Temperature of leach 80 °C,
- Solid-liquid ratio of 1:2, and
- Leach durations of three and six hours.

The sample tested had a high content of acid consuming minerals such as carbonates and chlorites which led to high acid consumption rates. It was noted that during the decomposition of chlorite minerals, silicon hydroxide was formed which caused a sharp increase in the viscosity of the pulp which in turn negatively affected the dissolution of vanadium.

The testwork established that with the low temperature atmospheric leach process it was possible to obtain relatively high vanadium extraction rates. Recoveries in excess of 95 % were achieved with sulphuric acid consumptions of up to 500 kg/t of ore.

However, due to the high consumption of sulphuric acid it was concluded that autoclave leaching would be superior.

6.1.1.1 AUTOCLAVE LEACHING

The decomposition of patronite and phengite were found to be more effective with the application of pressure leach technology. This resulted in improved vanadium dissolution rates in comparison to atmospheric leaching.

The results of the pressure leach tests also demonstrated that sulphuric acid consumption could be reduced by three to four times compared with atmospheric leaching. Nitric acid is added as a catalyst and its consumption depends on the quantity of sulphides within the ore.

Another advantage of the process was that the dissolution of chlorites was significantly reduced. At an operating temperature of 150 °C, with between 15 g/l and 20 g/l of sulphuric acid, it was found that only 5-10 % of the chlorite minerals dissolved. A further benefit of operating the leach at elevated pressure is that aluminium and iron are precipitated as jarosite and alunite resulting in the recovery of some of the acid.

The tests were undertaken on a two-tonne composite sample consisting of a blend of primary and oxide ore types. The blend consisted of 95 % primary ore, 3 % oxide ore and 2 % transitional ore.

The semi-pilot plant tests were undertaken using a 1 m^3 autoclave unit. Tests were undertaken using material ground to 100 µm, with the autoclave operating at a temperature and pressure of 150 °C and 13 atm respectively. A nitric acid strength of 1 % was used and leaching was undertaken for five hours. Using these conditions, the following variables were investigated:

- Sulphuric acid (concentration 10 % to 16 %),
- Temperature (100 °C to 170 °C),
- Leach time (2 to 7 hours),
- Nitric acid (concentration 0 to 2 %), and
- Pulp density (solids-liquid ratios of between 1:0.5 to 1:3).

The optimum conditions found were as follows:

- Grind size of -0.1 mm,
- Solids/liquid ratio of 1:1.7,
- Pressure of 13 atm,
- Temperature of 150 °C,
- Leach time of two hours,

- Sulphuric acid concentration of 12 %, and
- Nitric acid concentration of 1 %.

Using these conditions, a vanadium leach extraction of 95 % was predicted. The filtration of the leach pulp was considered to be favourable due to the coarse grind size of 100µm.

6.1.1.2 SORPTION AND DESORPTION TESTWORK

After the autoclave process, the filtered solutions contain uranium and molybdenum, vanadium and rare-earth metals which can be selectively recovered by sorption technology and subsequently processed to give separate saleable concentrates. A summary of the testwork undertaken on the various metals is now provided.

Solution generated from the autoclave testwork was used for adsorption testwork. The solution assayed 3 g/l V, 0.11 g/l U, 0.17 g/l Mo and 0.1 g/l RE. The solution had a pH of 1.7 and a redox potential of 450 mV. The solution contained 2 g/l NO_3.

Testwork showed that the anion exchange resin Ambersep IRA 920 (supplied by Rohm and Haas) was suitable for the sorption of uranium, molybdenum and vanadium. The maximum capacity of the uranium was found to be 106 kg/t after 48 hours. At pH 2.5 the maximum resin capacity for vanadium was found to be 450 kg/t after two hours.

Prior to adsorption of uranium and molybdenum the solution Eh (redox potential) was modified to 350 mV. Following adsorption of the uranium and molybdenum, the vanadium was then oxidised using H_2O_2 at a redox potential of 1000 mV. Further tests were undertaken using a weakly basic resin (Purolite A-100), but this was found not to be as effective as the Ambersep resin. The Ambersep resin has been commercially used in the uranium industry for a number of years in Kazakhstan.

The desorption of uranium was achieved with the use of ammonia nitrate (100 g/l) and sulphuric acid (10 g/l) while the desorption of vanadium was effective with ammonia nitrate (150 g/l) and ammonia hydroxide (10 g/l).

It was recommended that the uranium be precipitated as polyuranate of ammonia (yellow cake).

6.1.1.3 RECOVERY OF POTASSIUM ALUM

Alum was produced as part of the operation of the pilot plant from the potash and aluminium sulphate contained within the ore. The alum was precipitated in evaporation ponds in order to remove the pulp from the solutions before sorption. This product was analysed and reportedly conformed to GOCT 4329-77.

In the proposed autoclave leach flowsheet, alum will be produced in stoichiometric proportion to potash leached into solution from the ore, with the other products also in stoichiometric proportion. Although any remaining aluminium oxide is sedimented upon neutralisation, the recovery into alum can be increased by the introduction of additional potassium, either recycled from production or purchased. Testwork was undertaken on barren solution containing 9g/l $Al_2(SO_4)_3$ at pH 2.5 and 60 °C and the resulting alum conformed to the GOST standard for standard potassium alum as sold for use in the purification of water and other industries.

Alum is commonly used in China and acceptable terms have been offered by Chinese intermediaries. However, FAR considers that in the long term, the use of alum for water purification is likely to be phased out as easier-to-handle liquids are introduced. FAR therefore plan to refine the potassium alum into alumina and ammonium and potassium sulphates which are commonly sold as fertilizers. The alumina will be sold to Kazakhstan smelters and the fertilizers to local and regional users.

6.1.1.4 PHYSICAL TESTING

A bond ball mill work index test indicates that the ore is moderately hard at 14.8 kwh/t.

6.1.1.5 OPTIMUM CONDITIONS – AUTOCLAVE ROUTE

The results of the tests undertaken at the Kazakhstan National Centre for the Integrated Processing of Raw Materials are summarised as follows:

- Milling size: 0.1 mm (100 %),
- Liquids-to-solids ratio: 1:1.7,
- Pressure: 13 atm,
- Temperature: 150 °C,
- Leaching time: 2 hours,
- H_2SO_4 consumption: 12 %, and
- Nitric acid consumption: 0.5 %.

The dissolution rates of the metals and key operating parameters were found to be:

- Vanadium dissolution: 91 %,
- Uranium and molybdenum dissolution: 100 % and 80 % respectively,
- Rare earth elements dissolution: 75 %,
- H_2SO_4 consumption: 100 kg/t,
- Loss of weight in the slurry: 27 %,
- In the sorption process the efficiencies were 99 % V, 99 % U-Mo and 95 % rare earths,
- In the desorption process the efficiencies were 98 % V, 97 % U-Mo and 94 % rare earths, and
- In the alum crystallisation and precipitation: 60 %.

Based on this data the total predicted recoveries were 89.4 % V, 98.3 % U, 78.6 % Mo, 72.2 % rare earths and 64.7 % alum.

6.2 PRE 2008 METALLURGICAL TESTWORK

The vanadium within the Balausa mineralisation is chemically bound to the host mineralogy and is not liberated by grinding to a fine particle size. The separation of the vanadium requires pressure oxidation.

Due to the fact that the economic ore mineralisation is locked in a sulphide lattice and associated with deleterious minerals such as arsenopyrite and carbon (commonly referred to as double refractory), the first and foremost task was to determine an effective treatment scheme for these ores and thus being able to register the deposit's reserves on the state balance of the Republic of Kazakhstan which requires the definition of optimally effective processing conditions.

During 1998 to 2006, a series of engineering works and heavy industrial testing was undertaken to determine the optimal processing technology. FAR also conducted research and development to determine optimal industrial chemistry and mineral processing characteristics associated with the pilot plant. Lists of the testwork undertaken are contained in APPENDIX B.

6.2.1.1 LIST OF METALLURGICAL PATENTS

The FAR research and development provided much intellectual property. Table 6-1 lists details of the metallurgical patents that FAR has obtained.

Table 6-1: Metallurgical Patents

#	Name	Number
1	Patent RK 19294 Method of sorption treatment of vanadium ore	2006/0725.1 27.06.2006
2	Патент RF №2374344 Method of sorption treatment of vanadium ore	2007119178 24.05.2007
3	Patent RK 19176 Method of sorption treatment of vanadium ore	2006/0726.1 27.06.2006
4	Patent RF №2374345 Method of sorption treatment of vanadium ore	2007119179 24.05.2007
5	Method of treatment of black shales	№2011/0890.1 12.08.2011
6	Method of treatment of black shales	2011147849 24.11.2011
7	Method of autoclave treatment of black shales	№2011/0891.1 от 12.08.2011
8	Method of autoclave treatment of black shales	2011147850 от 24.11.2011
9	Method of treatment of black shales	№2011/0892.1 от 12.08.2011
10	Method of treatment of black shales	2011147852 от 24.11.2011
11	Method of treatment of dominic formations	№2012/0301.1 от 12.03.2012
12	Method to produce alum	№2012/0302.1 от 12.03.2012
13	Ore preparation for ore treatment	№2012/0303.1 от 12.03.2012

Two additional patents relating to the briquetting and use of the carbon-silica tailings for making ferro-silicon are being applied for.

SECTION 7 METALLURGY AND MINERAL PROCESSING

7.1 INTRODUCTION

Much of the world's vanadium production is sourced from vanadium-bearing magnetite found in ultramafic gabbro geological bodies, either as primary production, where the main product is vanadium, or as co-production with steel. Vanadium is mined mostly in South Africa, north-western China, Russia and Brazil. In 2016 these four countries mined more than 90 % of the world's production. Balasausqandiq is a different type of deposit, comprising shale and containing little iron.

Vanadium's current primary use is as a steel hardening agent. When used in the steelmaking process vanadium increases the strength and corrosion resistance of steel. The demand for vanadium, therefore, is strongly dependent on steel production rates. Historically the price of vanadium has shown periodic spikes, followed by longer periods of lower prices.

Vanadium producers can be categorised into primary, co-product, and secondary.

The dominant source of vanadium is co-product production. Vanadium is recovered as a co-product from steelmaking during the 'two-step' steel-making process where the feed is vanadium-bearing magnetite. In 2016, vanadium from co-product sources accounts for about 71% of global production.

Primary sources of vanadium are operations that mine rock specifically for the purpose of extracting vanadium. Primary sources accounted in 2016 for 17 % of the global production. Secondary, recycled sources of vanadium account for 12 % of world vanadium production.

7.2 MINERALOGY

The Balasausqandiq deposit is confined to a metamorphosed schisty stratum layer ranging from a primary black carbonaceous siliceous rock to oxidized quartzite-roscoelite schists.

Two main mineralised metal bearing rock types are present:

- Oxidised rock (nominally called 'oxide ore') consisting of quartz and roscoelite. This is found in the weathered surface layer of the deposit to a depth of between 25 m and 30 m; and
- Primary mineralised metal bearing rock (nominally called 'primary ore') consisting of un-weathered black quartz carbonaceous schists found directly below the oxidised layer.

Vanadium is found mainly in the minerals of patronite (V_2S_4) and phengite (BaV_2O_4) which account for 55 % and 35 % of the total vanadium in the ore respectively. A smaller quantity (10 %) is associated with micas and uranium-bearing oxide minerals.

The ore also contains organic substances such as anthraxolite which has high carbon content (96-98 %). Anthraxolite is the name given to anthracite-like materials that occur in veins and as disseminated masses in sedimentary rocks in which commonly the primary vanadium mineral montrozeite may be preserved, as it is within the oxide zone at Balausa.

The ore body also contains aluminium, uranium and molybdenum, rare earth elements and potassium which are all considered to be of economic value.

The chemical composition of the primary vanadium ore type is shown in Table 7-1.

Table 7-1: Chemical Composition of Primary Ore

Compound	Composition %
SiO_2	72.0
C	14.0
Fe_2O_3	5.5
Al_2O_3	4.7
CaO	3.5
V_2O_5	0.67
BaO	0.9
P_2O_5	0.7
MgO	0.6
MnO	0.3
Others	0.7

As detailed in Section 4 Mineral Resource estimations indicate that the deposit contains approximately 5 % of oxide ore and 95 % of primary ore. Both types of ore are amenable to the same processing method.

7.3 MINERAL PROCESS PLANT

In 2012, a flow sheet for the processing by pressure oxidation of vanadium ore from Balausa was completed by the Kazakh National Center for Complex Processing of Mineral Raw Materials, adapted from work by the research institute VNIIKHT (a subsidiary of Rosatom, of the Russian Federation). From this work, design data for the operation of an experimental pilot plant with a processing capacity of 15,000tpa was developed. Detail engineering of the plant and autoclave was carried out by LLC Interfos (Moscow).

FAR completed the construction of the pilot plant and in 2013 began operations to prove the technology and optimize the design for the planned 1Mtpa expansion and, in particular, to:

- Improve the machinery and equipment layout to reduce the capital costs of the proposed 1Mtpa plant
- Achieve operational stability to provide steady state operations of the future enterprise

- Optimize the technological parameters (pressure, temperature, acid consumption, etc.) of the autoclave processing of vanadium ore to reduce operating costs

After a programme of testing and optimisation, and the implementation of several amendments to simplify and improve the operation, the final plant configuration, operating parameters and performance were finalised as further described in this section. In section 7.4 the adaptations made to the pilot plant to treat purchased concentrates will be described.

The pilot plant was designed with a capacity of 15,000 tonnes of ore per annum which was not sufficient scale at the time and the prevailing prices to be considered a commercial operation. FAR therefore adapted the plant to treat higher grade purchased concentrates. As proof of feasibility, the plant was adapted with a minimum of changes so that it can now produce around 144 tonnes of vanadium pentoxide equivalent per year. FAR now proposes to increase output tenfold to around 1,500 tonnes per annum. In parallel, FAR proposes to build a separate new plant to treat 1Mtpa of mined ore using the processing scheme optimised in the pilot plant.

The current processing plant produces only vanadium in the form of ammonium metavanadate, with no by-products. Once this is expanded, it will be capable of converting the production to vanadium pentoxide or to electrolyte if there is demand for vanadium flow batteries. Future operations treating mined ore will produce vanadium in its various forms as well as a uranium-molybdenum bulk concentrate, a rare earth concentrate, potassium alum and a carbon-rich silica product for use as a smelting flux or a “carbon black” concentrate which can be sold to rubber manufacturers. The Phase 1 operation will additionally have the capability to convert vanadium pentoxide into ferro-vanadium which is the form that the steel industry generally requires. Equipment for the conversion of AMV into vanadium pentoxide (by heating and capture of off-gas) and ferro-vanadium (by *aluminothermy*) has been procured and was tested on FAR produced AMV at the manufacturer’s site.

By early June 2014 the process testing at the pilot plant had been completed, the process parameters optimised and required modifications had been completed. A post-implementation inspection and report was organised by the developers of the process VNIIKHT who reported on the success of the plant and of the significant improvements that had been made by FAR to the initial technology. Minor changes planned by FAR that might be made in the scale-up to 1Mtpa to improve efficiency were confirmed.

The process is covered by 13 patents but also involves considerable know-how and for the purposes of confidentiality, the following process description is abbreviated.

The following process description refers to the pilot plant, which is practically identical to the planned full-scale process plant. Some mechanical engineering improvements will be included at full-scale and in particular, it was discovered that the highly sophisticated test autoclave is not necessary and a much simpler vertical autoclave without mixing or oxygen will suffice. Some additional testwork of such an autoclave will be carried out as part of the final design process. Other changes will be to the filtration process and dry milling will be considered instead of wet milling to reduce water demand.

7.3.1 PROCESS DESCRIPTION

The optimised final process plant flowsheet for the pilot plant is set out in Figure 7-1.

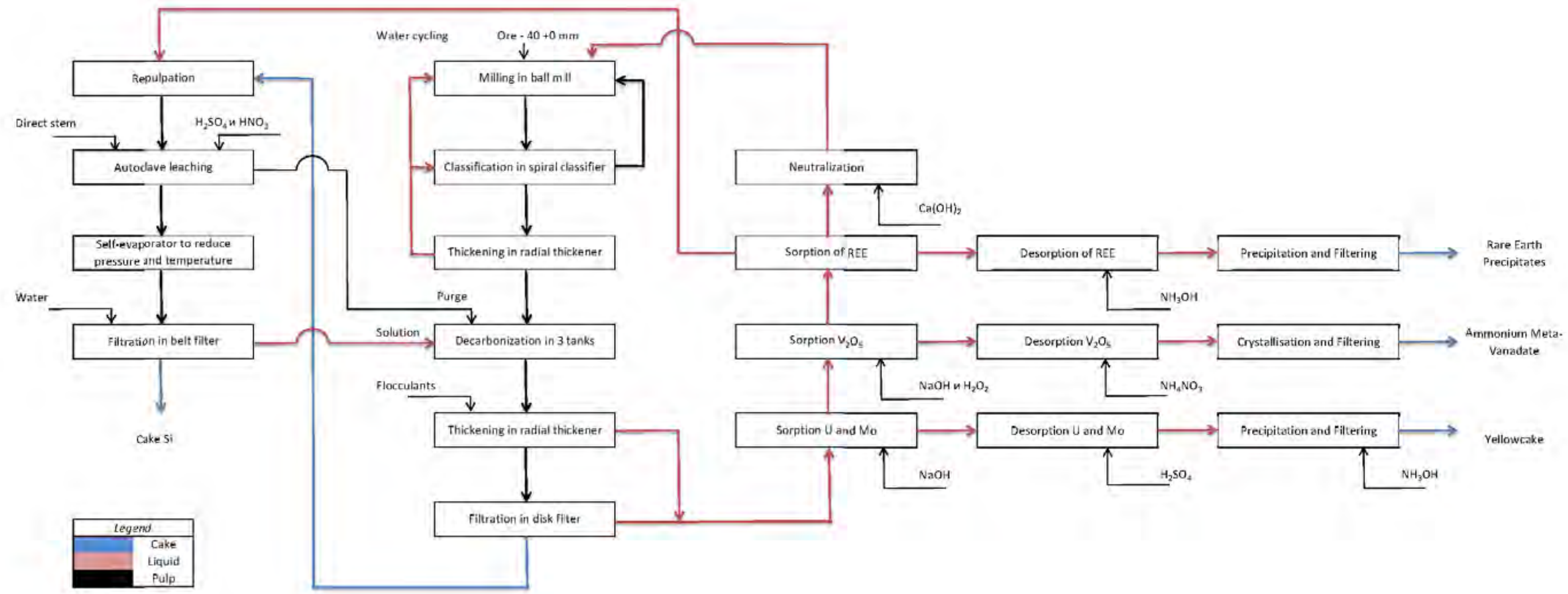


Figure 7-1: Process Block Diagram

7.3.2 CRUSHING AND GRINDING

Run-of-mine (ROM) ore will be crushed from 350 mm to 20 mm using a standard crushing flowsheet. is

Figure 7-2: Mill and Gravity Classifier

Output from the mill is directed to a spiral classifier (circulating load 100 %), milled ore -0.2 mm (100 %) from the spiral classifier is sent to a thickener of 6 m diameter which provides acceptable thickening without the use of flocculants. The mill and classifier are illustrated in Figure 7-2.

7.3.3 DE-CARBONISATION

After settling by radial thickener, the dense slurry is transfered to the decarbonising process using a diaphragm pump. Decarbonisation is carried out in three tanks (i.e. acid wash reactors) with two bladed stirrer mechanisims with rotational stiring speed of 240 revolutions/minute.

Acid solution from the belt filter is recirculated (70 g/l) to the first reactor with the addition of sulfuric acid and a temperature of 60 - 70 °C.

The reactor tanks for decarbonisation are brick lined and steam heated, with the injection point being the first reactor.

The optimum regimes of decarbonisation are shown in Table 7-2.

Table 7-2: Optimum Regimes of Decarbonization

Time in process [h]	Density of slurry [kg/m^3]	Screening less	Recovery V_2O_5 [%]	Recovery U [%]
1.9	1,211.2	0.2 mm	25.9	89

During the neutralisation stage, acid consuming minerals are reacted with sulphuric acid in order to prevent them consuming acid during the autoclave process. The acid used during the neutralisation stage is sourced from the autoclave circuit. Acid generated during the autoclave process, which would otherwise require further treatment prior to disposal, is consumed during the neutralisation stage. During the process carbon dioxide is produced.

7.3.4 THICKENING AND FILTRATION

After decarbonisation, the pulp is sent to a second radial thickener with an area of 4.9 m^2.

After settling, the pulp goes to a disc filter (porous ceramic) with a filtration area of 12 m^2. The cake from the disc filter is removed to the autoclave by conveyor (moisture 7-10 %). The liquid goes to desorption.

The thickener and disc filter are illustrated in Figure 7-3 and Figure 7-4 respectively.

Figure 7-3: Thickener

Figure 7-4: Disc Filter

7.3.5 AUTOCLAVE LEACHING CIRCUIT

The autoclave circuit consists of a single autoclave operating with a self-evaporator to allow for the reduction in pressure without boiling of the fluids. Cake from the disc filter is first repulped before being pumped into the autoclave with high-pressure peristaltic pumps. Acid mixture is also pumped into the autoclave.

The autoclave was designed to work in different modes with variable pressure and temperature in order to test and optimise the regimes. Currently, a pressure of 0.8 Mpa is maintained. Autoclave heating is by steam at 270 to 320 °C, maintaining the temperature in the autoclave at between 125 to 150 °C. Pulp density is 1,500 kg/m^3.

After the autoclave, pulp density is maintained at 1,500 kg/m^3 and the output temperature of the slurry is 85-90 °C. After the self-evaporator, the pulp is cooled by a pipe-in-pipe heat exchanger before passing to the belt filter. Because the density of the pulp is enough for filtration, there is no need for further thickening.

Pulp from the autoclave is passed to the belt filter with a temperature of 70-80 °C. The filtration area is 16 m^2. The cake is passed out of the plant by conveyor as the product - carbon-silica flux. The solutions pass to the decarbonization process for neutralization and then sorption processes.Table 7-3 outlines the optimum regime of autoclave leaching. The autoclave unit is shown in Figure 7-5

Table 7-3: Optimum Regimes of Autoclave Leaching

Time in autoclave (h)	Pressure [kg/cm^2]	T, ^{0}C	Density (kg/m3)	Recovery V (%)	Screening less
1.6	5.0	130.0	1,430	91	0.2 mm

Figure 7-5: Autoclave

7.3.6 ADSORPTION CIRCUIT

The recovery of vanadium, uranium, molybdenum and rare earths is undertaken using three separate adsorption circuits. Solution from the autoclave circuit is initially fed to the uranium-molybdenum adsorption circuit with the exit solution being fed to the vanadium circuit. The solution exiting the vanadium circuit is fed to the rare earth adsorption circuit while the solution exiting this stage is sent to the “alum sedimentation” stage. Figure 7-6 shows the current adsorption circuit arrangement.

Figure 7-6: Adsorption Circuit

After the adsorption process there is, for each of the three process streams, subsequent desorption processes, the process steps for each mineral assemblage are described separately.

7.3.6.1 URANIUM AND MOLYBDENUM ADSORPTION

Pregnant solution is fed through two columns, operated in parallel, containing the resin “Ambersep 920”. The solution is fed until the resin loading is completed at which point the feed solution will be diverted to the second column. Uranium and molybdenum is stripped from the resin using a solution containing 1 % H_2SO_4.

7.3.6.2 VANADIUM ADSORPTION

The pregnant liquor from the uranium column is fed into three resin columns operated in series. The columns are operated in a counter current arrangement with fresh resin being loaded into the last column and transported from column to column until it exits the first column. The solution flows in the opposite direction to that of the resin.

In order to separate vanadium from iron (Fe^{3+}) step-by-step pH adjustment is undertaken between each of the adsorption columns. Hydrogen peroxide (H_2O_2) is also added to the process in order to convert the vanadium from oxidation state V (IV) to V (V) so that it is amenable to adsorption onto the resin.

In the first column the pH is maintained at pH 1.8 with H_2O_2 being added. The exit solutions from each column flow into holding tanks where the pH is adjusted accordingly using sodium carbonate (Na_2CO_3).

The overall contact time of the solution with the resin is less than one hour in order to prevent the reduction of V (V) to V (IV). The loaded resin contains between 400 and 450 kg of V_2O_5 per tonne of resin.

7.3.6.3 RARE EARTHS ADSORPTION

The solution leaving the vanadium adsorption circuit is transferred to the rare earth adsorption circuit. The loaded resin contains approximately 38.2 kg of rare earths per tonne. Prior to stripping the rare earth from the resin, the solution flow is diverted to an alternative column.

7.3.6.4 SEDIMENTATION OF ALUM

Potassium and aluminium in the ore are precipitated as potassium alum and separated from the solution using a thickener. The thickener overflow reports to the autoclave circuit. Additional aluminium oxide is precipitated after the neutralisation circuit. It is envisaged that higher recovery of alum can be obtained by adding further (purchased or recycled) potassium to the circuit.

7.3.6.5 CARBON - SILICA

The filter cake generated from the autoclave circuit is fed to a washing circuit for the removal of residual sulphuric acid and filtered. The resulting carbon-silica is currently removed to tailings as it has been derived from the upper oxidised ore where the carbon level is low. In the 1Mtpa circuit treating high carbon ore, the carbon-silica will be further treated to make saleable products according to demand. Market studies and test-work have been carried out to determine the market and suitability of the product for briquetting and use for smelting ferro-silicon. The market and product study found that briquetting could be carried out using pressure alone, resulting in high quality briquettes which could withstand transport shocks and smelting heat tests. The carbon and silica were found to be of an ideal form to substitute for 100% of the silica and approximately 50% of the carbon requirement in smelting arrangements. Further market studies will underpin the optimal product specifications. See also under 7.6.5.

7.3.6.6 URANIUM DESORPTION AND PROCESSING

Loaded resin containing uranium and molybdenum (up to 40 kg/t resin) is washed with an ammonium nitrate and sulphuric acid solution (NH_4NO_3 100g/l + H_2SO_4 10g/l). Desorption processing takes five hours.

The uranium and molybdenum within the washed solution is then precipitated with ammonia, aqua ammonia, caustic soda or ammonium carbonate solutions to produce 'yellow cake'.

7.3.6.7 VANADIUM DESORPTION AND PROCESSING

The loaded resin contains up to 400-500 kg/t of V_2O. Vanadium desorption is undertaken with a solution of ammonia nitrate (150-200 g/l) at a pH of between 7.5 and 8.5 and at a temperature of between 50 to 60 °C. The material produced from the desorption unit is directed to the resin reloading unit and four volumes of the column effluent are recirculated until the ammonium meta-vanadate (MVA) is fully recovered.

The resin and the washed solution are mechanically screened in order to separate the MVA crystal slurry from the resin. The resin is then reloaded into the column and the MVA slurry is sent for filtration. At the filtration stage, ammonium meta-vanadate is separated from the solution and directed to the recrystallisation processing stage. The barren solution is used for making desorption solution.

Recrystallisation of the MVA is undertaken in water at 80-90 °C and with a V_2O_5 concentration of 20 to 25 g/l at pH 7.0-7.5. The barren solution is re-circulated and the MVA crystals are directed to the thermal breakdown circuit.

Thermal breakdown is done in a rotary furnace at a temperature of 550 °C. The vanadium oxide powder is then bagged ready for shipment.

7.3.6.8 DESORPTION OF RARE EARTH METAL.

The loaded resin is washed with ammonia solution at pH 7.5-8.5. The resin and the washed solution are separated from one another using a screen. The washed solution is filtered in order to remove rare earth precipitates. The precipitated residue contains 91 % rare earth metal oxides.

7.3.6.9 NEUTRALISATION

The process liquor is recycled and used again in the hydrometallurgical process. The recycling circuit involves neutralisation and clarification of the liquors and is attained by mixing with quick lime (Size - 1 mm, flow rate - 12 kg/t of ore). The neutralisation of the acidic solution is conducted in a tank with mechanical stirring whilst simultaneously feeding lime milk. The process results in a liquor with pH 7.5-8.0. The batch processing time is 2-3 hours.

The pulp from the clarification process is pumped to a 'mud' settling impoundement and held for 3-5 days. During this period the precipitate (slurry) settles with gypsum $CaSO_4 \cdot 1.5H_2O$, calcium phosphate $Ca_3(PO_4)_2$, iron and aluminum hydrates being the main solid products. The clarified solution (with concentration: Fe 0.01 g/l; Al 0.0027 g/l, NO_3 4.94 g/l, K 1.37 g/l and salinity 10.91 g/l) is then decanted and is used in the milling and classification stages.

7.4 METALLURGICAL RECOVERY DURING OPERATIONS

Recovery of vanadium occurs principally in two stages of the process, in decarbonisation and in the autoclave leaching circuit.

Overall recovery into solution is 93.3 %. The vanadium grade is 0.78 % V_2O_5. The average grade in the tailings is 0.052 % V_2O_5. Average grade after decarbonisation (before autoclave leaching) is 0.58 % V_2O_5.

7.4.1 RECOVERY DURING SORPTION-DESORPTION

Further small losses currently take place as vanadium not recovered from solutions in the first pass across the resin can be lost when surplus water is neutralized and returned to the process water storage dam. However, it is proposed that the expansion to 1Mtpa will use dry milling, thus reducing the water brought into the process and obviating the need to return surplus water. This will result in 100 % of the solutions remaining in cycle so what is not recovered in the first pass across the resin will be captured on subsequent passes. Losses will be small as they will be limited to losses through spillage etc.

The overall recovery of vanadium is therefore predicted to be over 93 % from the 1Mtpa plant.

7.5 ENGINEERING DESIGN FOR 1MTPA EXPANSION

An engineering design has been undertaken by FAR for the treatment of 1Mtpa of mined ore. The main processing sections will be the same as in the current experimental plant, consisting of:

- Crushing and grinding circuit
- Hydrometallurgical facility consisting of:
    - Autoclave circuit
    - Adsorption circuit
    - Desorption circuit
    - Crystallisation and precipitation circuits
- Product handling facilities

- Waste impoundment and management facility

It is proposed that a sulphuric acid plant will be built to make sulphuric acid for the processing facility from sulphur procured from desulphurisation plants for oil production in western Kazakhstan. This sulphur is currently being stored by the producers and is attracting environmental penalties. Waste heat from the acid plant will be used for the generation of steam for the purpose of heating the autoclave unit and the generation of power. However, current prices of sulphuric acid are low and if they remain at this level, the directors of FAR propose to defer the construction of sulphur burner until Phase 2 construction starts.

The process plant will be similar to the existing pilot plant but two significant improvements will be made. Firstly, the use of dry milling will eliminate the requirement for the neutralisation stage and waste water recycle, thus reducing reagent costs and vanadium losses. Secondly, the current filtration systems have proven to be inefficient and the final belt filter will be replaced by disc filters.

7.6 PRODUCT SPECIFICATION

7.6.1 GENERAL

Sales of vanadium have taken place to customers in China, Russia and Taiwan. FAR has acquired commercially available studies on the world vanadium market and has investigated the potential users of the various by-products, their markets and product specification requirements.

The Kazakhstan National Centre for the Integrated Processing of Raw Materials stated that the products conformed to the following specifications:

- Ammonia metavanadate – compliant with standard 38088316–01–2007 (content of V_2O_5 75-77 %);
- Potassium alumen – compliant with standard GOST 4329-77 (content of the basic substance K_2SO_4*Al_2 $(SO_4)_3$*$12H_2O$ at least 98 %);
- Concentrate of rare-earth metals compliant with GOST 25702.0-83* (content of the total rare-earth elements 92 %);
- Uranium concentrate (yellow cake): quality requirements for such products are determined by the agreements of the supplier and the consumer (content of the basic substance 45 % U); and
- Carbon (C) industrial composite mix – compliant with GOST ACTM H-330 (content of 30 % C).

7.6.2 VANADIUM PENTOXIDE

The product specification for the ammonia metavanadate (Standard # ST TOO 38088316-01-2007, UDK MKS 71.060.50) is:

- Grade 65-75 %;
- Moisture 12-15 %;
- P not more than 0.05-0.08 %;
- Fe not more than 0.10-0.15 %;
- S not more than 0.05-0.10 %; and
- U-238 not more than 0.005 % to hold exposition radioactivity in norm.

The grade of metavanadate and impurities produced from the pilot plant operations are as shown in Table 7-4, together with the grade of vanadium pentoxide produced from it. The grade of the product is therefore of good quality. Further upgrade in quality can be achieved by re-crystallisation using purified water if required.

Table 7-4: Grade of Metavanadate and Impurities Produced from Operations

	Metavanadate [%]	V_2O_5 derived [%]
$V_2O_{5/4}$	75.9	98.8
V_2O_4	-	1.24
TiO_2	<0.010	<0.010
Mn	<0.005	<0.005
CaO	0.092	0.097
Fe	0.01	0.025
Si	0.1	0.1
P	0.017	0.024
MgO	0.23	0.24
Cr	<0.005	<0.005
Ni	<0.001	<0.001
Mo	<0.005	<0.005
Na	0.023	0.027
K	0.017	0.017
Pb	<0.005	<0.005
S	<0.005	0.014

7.6.3 URANIUM AND MOLYBDENUM

FAR intends to sell its products to KazAtomProm which has suitable processing facilities and has a statutory first right to purchase uranium products in Kazakhstan.

7.6.4 RARE EARTHS

The rare earth product from Balausa conforms to a Kazakhstan standard. Sales are likely to be made to the Ulba processing plant in Kazakhstan but currently FAR ascribes no value in the cash flow to this by-product as a result of uncertainty over market demand and low prices. In practice, some value is likely to be derived.

7.6.5 "CARBON BLACK" AND FLUX

The ore processing at Balausa involves crushing and milling to <0.2 mm followed by removal of the carbonates and then autoclave sulphuric acid leaching of the metallic content.

After these processes, the remaining material is comprised of around 76.4 % silica, 18.7 % organic material and 4.9 % other (non-deleterious) components. The organic material is composed of 88.7 % carbon, 1.1 % hydrogen, 8.5 % nitrogen and 1.6 % sulphur.

The organic material has unusual characteristics that make it suitable for a number of high-value uses. Physically and chemically, it is similar to carbon black, having a high surface area of 224 m^2/g and calorific value from 7,000 to 9,000 kcal/kg. The silica can also be used for some specialised purposes as a result of being milled and free from deleterious constituents, particularly aluminium.

The organic material cannot easily be separated from the silica by physical means as the two are physically bound together. However, using flotation technology the organic material can be upgraded to around 30 % with a recovery into concentrate of around 45 %, leaving the depleted-carbon tailings for other uses that do not require high-carbon. Fluoric acid or sodium hydroxide leaching can be used to remove the silica, but no detailed analysis of this has yet been undertaken.

FAR has focused on finding uses for the mix of organic material and silica ("carbon-silica tailings"), either at the unconcentrated grade of around 18 % organic or the concentrate grade of 30 % organic, as well as for the remaining low-carbon silica after concentration or pyrolysis of the carbon to make gas or diesel.

Uses for the concentrated tailings include use as a filler in the production of rubber (a carbon black substitute), use as a flux in the production of ferro-silicon (particularly low-aluminium or high-purity ferro-silicon), pyrolysis to produce gas or diesel and the desalination of land. Uses for the un-concentrated or depleted-carbon tailings include pyrolysis, the making of acid-proof or sulphur concrete, and as an additive to make high strength concretes.

The annual production of the silica-carbon tailings will be some 820,000 tonnes per annum from the first stage development of 1Mtpa expansion and around 3.3Mtpa after the planned expansion to 4Mtpa of ore treated.

FAR's base case plan is to sell the leach residue as a smelting flux to ferro-silicon producers. Alternatively, the leach residue can be concentrated and sold as a "carbon black" substitute.

FAR advise that in April 2010 the Combustion Institute tested the tailings from the autoclave testwork for suitability for use in ferro-alloy production. Their conclusion was that the carbon exceeded the properties of coke in terms of calorific value and porosity, and the impurity levels in the silicon were low. They concluded that it was highly suitable after pelletisation or briquetting as a charge for the production of ferro-alloys, with pricing likely to be based on the equivalent price paid by producers for coke and silica.

The Karaganda Chemical-Metallurgical Institute also evaluated a sample of the material to determine its suitability for other applications and has reported that the form of silica is amorphous and the quality of carbon high in calorific content and porosity. They also concluded that it is therefore ideal for use in the manufacture of silica-containing ferro-alloys and ferro-silica.

Studies undertaken by the National Center for Complex Processing of the Republic of Kazakhstan Minerals have shown that FAR's "carbon black" product can be used as a substitute for carbon black and is recognised as a GOST standard (as tested in 2008 by the Central Laboratory for Certification Testwork of Construction Materials, Almaty).

Carbon black is man-made product (made by combustion of hydrocarbon products under controlled conditions). Therefore, the term carbon black is not completely correct with reference to the current project, but it can be sold as a substitute.

Carbon black is used as a pigment and reinforcer in rubber and plastic products. Various grades of concentrate between 30 % and 90 % (generated from flotation testing) have been tested by the Central Laboratory for the certification of construction materials. The 90 % concentrate meets the requirements of the carbon-black standard GOST 7885-86, ASTM D1765 (equivalent to the western N330) and ISO 1867-86 showing that the carbon content is comparable to carbon black.

Flotation tests were undertaken on leach tailings having a carbon content of about 14 % at a particle size of 80 % passing 74 µm. It was recommended that the flotation process utilises a roughing and scavenger stage at reagent dosages of 400 g/t kerosene, 300 g/t amine and 250 g/t T-80 frother. An amine collector was found necessary for the recovery of carbon that was associated with quartz.

Carbon black is usually mixed with silica when used in the manufacture of rubber and, since the silica in the tailings is of high purity and small particle size, it was shown to be suited for this application.

FAR has tested a concentrate assaying 30 % C in the manufacture of rubber products at the Issyk Technical Rubber Factory. The rubber products were tested for stretch and return, tear resistance, wear and strength and were found to have good properties.

7.6.6 POTASSIUM ALUM

Potassium alum is used in the purification of water, glue spreading, papermaking, painting, dyeing, leather producing, fibre board processing, rubber production and the fermentation of foodstuffs.

The product specification for alum (to GOST 4329-77) is shown in Table 7-5.

Whilst there is currently a good market for potassium alum in China, FAR believes this market may diminish in future as more easily handled alternatives are introduced for water purification as they have in Europe. FAR therefore plans to further refine the alum into alumina and potassium and ammonium sulphate fertilizers.

Table 7-5: Physico-Chemical Indices According to GOST 4329-77

Indices	Standard	
	Pure for analysis	Pure
Mass fraction of potassium alum $AlK(SO_4)_2 * 12 H_2O$, %, not more than	98.0-100.0	Not less than 96.0 %
Mass fraction of insoluble substances, %, not more than	0.005	0.010
Mass fraction of NH_4, %, not more than	0.005	0.010
Mass fraction of chlorides (CL), %, not more than	0.0008	0.0040
Mass fraction of Fe, %, not more than	0.0010	0.0020
Mass fraction of heavy metals (Pb), %, not more than	0.0010	0.0020
Mass fraction of As, %, not more than	0.00005	0.00010
Mass fraction of Na, %, not more than	0.02	Not standardized
pH of preparation solution with 5 % mass fraction	3.0	3.0

7.6.7 EXISTING PROCESSING OPERATION

The pilot plant as described above was modified in 2015/16 to treat purchased concentrates which contain around 4 % vanadium, of which around 1.5 % is extractable in soluble form. The material comes in milled form so the crushing and milling parts of the operation are not required, and the leaching is carried out at atmospheric pressure so the autoclave is also not used. As there is no by-product content, the sorption and adsorption systems formerly used to recover uranium, molybdenum and rare earth metals have been adapted to recover the greater quantities of vanadium that are now produced. The first steps have been taken to convert this plant to treat a wide variety of secondary sources of vanadium including spent catalysts and vanadium-containing ashes.

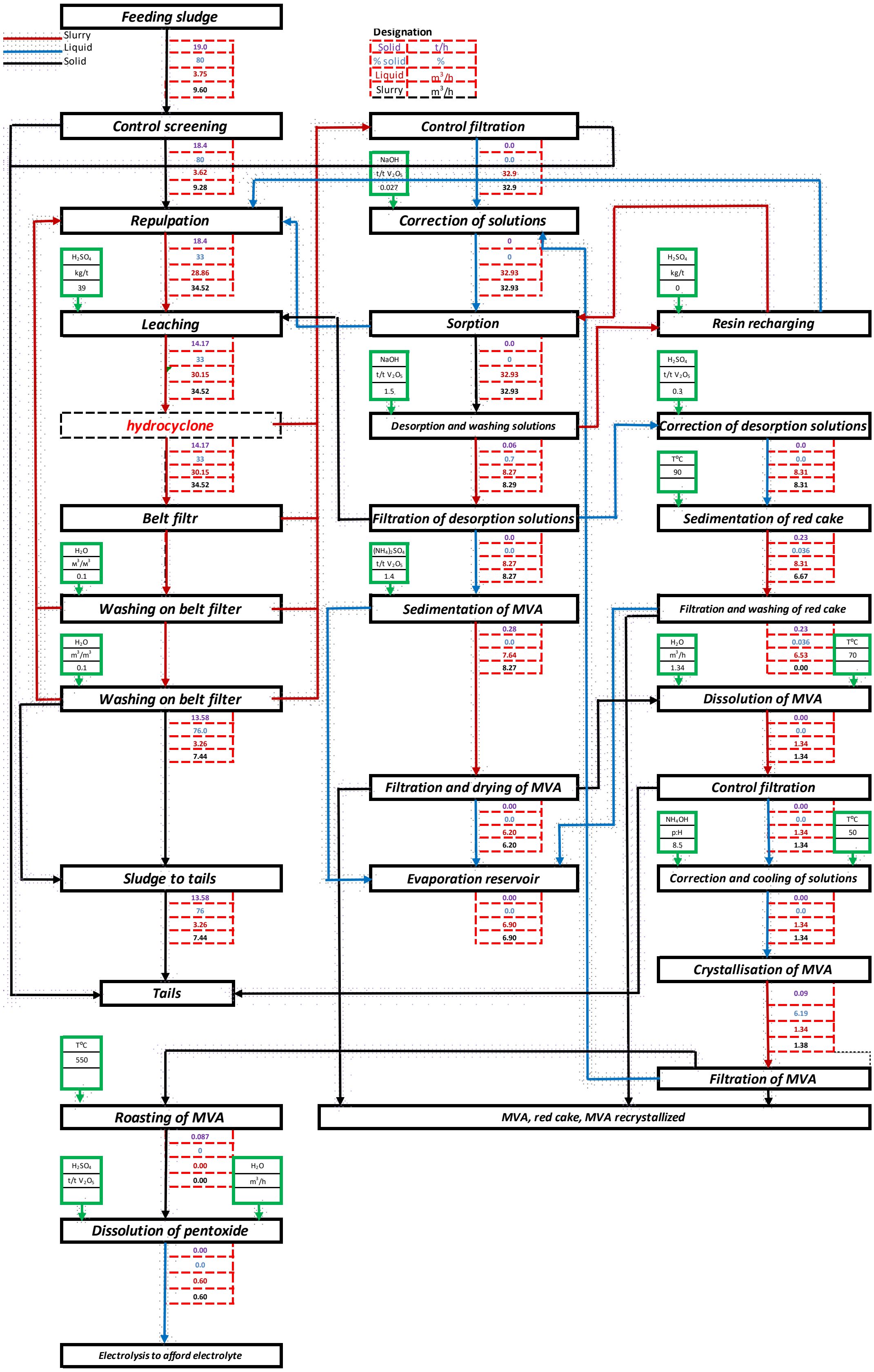


Figure 7-7: Process block flow diagram

SECTION 8 INFRASTRUCTURE

8.1 INTRODUCTION

The infrastructure at the current mine is sufficient for the existing operation which comprises the existing processing operation and small-scale mining. There are plant, engineering, administration and workshop buildings, waste storage facilities and impoundments, a water storage dam, and rock crushing and screening machinery for the sale of aggregates. Within the building suite there is also a chemical assay laboratory, security building and administration building and welfare facilities.

The industrial complex is heated by a central boiler using regionally sourced coal. There are good road and railway links to the region and roadway to the site. The operation produces its own construction aggregates; cement and lime materials are sourced locally.

8.2 RAILWAY SIDING

At Shieli, 70 km from the plant, there is a railway station along the main East-West road and rail transit linking the Russian Baltic, through Kyzylorda, Shymkent and Almaty, into China and on to the East coast. The business plan does not require an extension to the railway to the mine site for the 1Mtpa expansion as input and product volumes are relatively low. There is a possibility to connect the mine to the railway from the other direction when the ferro-silicon operation (which is not part of the expansion proposed in this report) is started.

FAR is currently examining several options to acquire railway sidings in Shieli, together with associated storage buildings and handling equipment. These sidings will be used for the transfer of reagents, materials and capital items from rail to road for onward transfer to site and for the transfer of products from truck to rail.

8.3 OFFICES / BUILDINGS / LABORATORY

These facilities are adequate for the current operations and will be partially upgraded as part of the expansion plans. The upgrade will include high voltage electrical reticulation, the fabric of the buildings and general refurbishment. The company has its main office in the town of Shieli. Figure 8-1 shows the current office building at the factory site.

Figure 8-1: Process Building with Office Block in Foreground

8.4 WORKSHOP AND STORES

The site has modest workshop and operating stores facility which will be upgraded as part of the 1Mtpa expansion. The upgrade will include extra storage racking and the purchase of additional tools.

8.5 DIESEL SUPPLY

There is a well-established diesel storage facility at the Balausa mine (as shown in Figure 8-2). This is adequate for current and future requirements of the business.

Figure 8-2: Diesel Storage

8.6 ELECTRICITY SUPPLY

FAR has built a 22 km overhead power-line from Aksumbe to site which connects with the supply to Aksumbe from Karatau. This line is rated at 35 kV but is currently supplying only 10 kV which is sufficient for the current processing plant operations. The line from Akusmbe to Karatau is owned by the local electricity supply company and is in very poor condition, having wooden poles and is subject to repeated failures, especially after strong winter winds. A separate 110 kV line is immediately adjacent to the Balausa site and FAR plans to connect to a suitable connection point some 2 km distant. This line can provide sufficient reliable and much cheaper power with enough capacity for the expansion of current processing facilities. The line to Aksumbe will continue to be available as back up. Some further upgrade of the 110 kV line will be required to provide power for the Phase 1 development.

When it is constructed, waste heat from the sulphur burner will produce additional power as well as useful heat for steam.

The 10 kV currently used in the pilot plant is reduced to 380 V by on-site transformers for use in the offices and laboratory.

There is a 100 kW diesel generator on site to provide back up to the mains power.

8.7 WATER SUPPLY

8.7.1 CAMP WATER

There is a natural spring near to the accommodation supplying piped water for washing, showers etc. Although of high quality, it is not approved for drinking so bottled water is used for drinking purposes.

8.7.2 PROCESS WATER

Water consumption in the pilot plant is kept to a minimum through recycling, but for top-up purposes there are two sources:

- A bore-hole supplying up to 6 m^3/h (down to about 2 m^3/h in summer),
- A water collection reservoir that fills with the snow melt in spring and other precipitation.

Underground and surface water is plentiful and FAR plans to drill for more underground water to meet the needs of the expanded plant.

8.8 CAMP

The camp consists of two houses to accommodate personnel and an outside lavatory. It is capable of accommodating up to 77 people during the summer which will be busiest time of the year. This is adequate for the current operation. For the expansion a new accommodation block is to be built, the foundations of which are already in existence. This will be further developed at the time of the Phase 1 development.

Electricity is provided to the camp via a 10 kV overhead line that has been run out from the mine distribution transformer and then broken down to 380 V. Water is usually supplied daily as bottled water which is brought to site from Shieli.

8.9 ROAD

All materials and equipment will be transported to site by road. The road between Shieli and the mine is maintained by KazAtomprom and is currently in good condition, having been resurfaced in 2013 and is well-maintained.

SECTION 9 ENVIRONMENTAL STUDIES AND SOCIAL & COMMUNITY IMPACT

9.1 ENVIRONMENTAL LEGISLATIVE FRAMEWORK

9.1.1 INTRODUCTION

The development of any industrial enterprise requires a series of permissions from various regulatory organisations in the state of Kazakhstan. The common theme throughout is a satisfactory consideration of the environment and that the industrial design of the proposed business will allow the function of the business to be sustainable and not be disruptive in its integration with the local environment.

9.1.2 BACKGROUND TO THE LEGISLATIVE OBLIGATIONS

Details of the requirements of Kazakh legislation are provided in this section.

The Republic of Kazakhstan achieved independence on the 16 December 1991 following the breakup of the Soviet Union. The country is a democratic presidential republic which adopted a Constitution in 1995 stipulating the fundamental principles of the governance of the Republic and the rights of its citizens. The Constitution has evolved through a number of reviews and amendments but the political and economic system has demonstrated its stability and development. The Republic's other laws and regulations are derived through the Constitution.

In 2007, the Ecology Code came into force in Kazakhstan and it combined all of the main regulations related to ecology issues into one document, including duties and responsibilities of the authorized state bodies and of nature users as well as requirements for the protection of natural resources.

The Ecology Code requires that development activities and projects, which have direct or indirect impact on the environment and socio-economic issues, are subject to the Environment and Social Impact Assessment (ESIA) process. The ESIA process includes the evaluation of environmental and social impacts over the life of the project and requires that studies should establish a baseline prior to commencement of works with regular updates and reviews throughout the project's life.

Monitoring of environmental and social impacts is required and is regulated by the terms of the licence and by periodic regulatory inspection by the authorities to ensure compliance. Emissions and other limits are set for a number of parameters such as water quality, air quality, soil quality, dust, noise and vibration. The regulatory authorities expect and require full compliance with the achievement and fulfilment of all environmental limiting indices and licence requirements and any non-compliance or violations may lead to severe consequences, including cessation of operations and judicial penalty.

9.1.3 ENGAGEMENT REQUIREMENTS

The government of Kazakhstan has ratified the UNECE Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters, also known as the Aarhus Convention. The Aarhus Convention requires the government to grant the public rights regarding access to information on the environment, including information on the environmental impact of corporate activities, access to which is available only to the relevant environmental authority.

According to legal regulations, information disclosure and dissemination, as well as public consultation, are a part of the development process, especially if the project impacts the environment.

The following legislative acts relate to public participation in decision making within Kazakhstan:

- Environmental Code of RK No. 212-III of 9 January 2007 (as amended on 17 July 2009);
- Instruction of Environmental Impact Assessment, Conduct of Proposed Economical or Other Activities during Development of Pre-planning, Planning, Pre-design and Design Documentation, approved by Order of the Minister of Environmental Protection of RK No.204-p of 28 June 2007;
- Rules on the conduct of Public Hearings, approved by Order of Minister of Environmental, Protection of RK No.135-p of 07 May 2007;
- Rules on Access to Environmental Information Relevant to Environmental Impact Assessment (EIA) Procedure and Decision-Making Process on Proposed Economical and Other Activities, approved by Order of the Minister of Environmental Protection of RK No.233-p of 25 July 2007;
- Rules on the Conduct of Public Hearings while Considering Application for Approval or Change of Tariffs (Prices, Rates) of Entities which are Natural Monopolies. Approved by Decree of RK Government No. 376 of 21 April 2003;

The current legislative system provides guidelines for public consultation and participation in decision-making, although the scale of such activities is dependent on the type and scale of the proposed project and the degree of public interest.

9.1.4 THE OVOS

Prior to 1991, the laws in Kazakhstan provided for State Ecological Expertise (SEE), based on Soviet era laws. This system was also known as the State Environmental Review (SER), and was in the Soviet era controlled under law by the Law of Environmental Protection. The SER processes are mandatory for all projects and are subject to an OVOS, an Assessment of Environmental Impacts; a procedure which is still regulated by the Soviet era OVOS guidelines of 1990 and amended in 1992.

The OVOS process has evolved continuously within the Kazakh legislative system, although its original structure remains; the precepts of an EIA persist and are comparable to and as comprehensive as that of an EIA carried out in the EU. A project in predevelopment or pilot plant phase will carry out a pred OVOS, pre EIA, a detailed screening assessment, which is common place in the EU Environmental Assessment and Protection system.

9.2 LAND OWNERSHIP

FAR leases from the State the land beneath the existing pilot plant and associated facilities, mine buildings and utilities including the route of the overhead power line, plus a buffer zone of 30 m width surrounding the power line and pylons. The land will be returned at the end of the mine life.

9.3 EIS STUDY

9.3.1 INTRODUCTION

The operation is governed by the Kazakhstan system of environmental compliance and as such a Pred OVOS and full OVOS are completed by registered design institutes and company staff. The OVOS (EIS) is similar to that of an EU based EIS. FAR have completed the full OVOS for a proposed 500,000tpa mining operation and this has been approved in full by the relevant authorities.

The business, when at 1Mtpa, will normally operate at full load on a continuous 24 hour basis, all year, with the exception of the peak winter months of January and February. The business will employ approximately 760 full time staff, though a smaller number, of approximately 100, will be working at any one time as a result of the 15 day on-site rotation.

It is anticipated that the OVOS will be updated to incorporate the requirements for a 1Mtpa mining operation and this will be submitted to the relevant authorities for approval during the project development phase.

9.3.2 USE OF RESOURCES

It is estimated that the site currently uses and the 1Mtpa expansion will use the following resources:

- Electricity – currently 250 kW per annum, rising to 5 MW for a 1Mtpa operation.
- Water – 5 m^3 per day, rising to 18 m^3 per day for a 1Mtpa operation. Water is fully recycled but losses arise mainly from evaporation. Any discharges via a planned and constructed passive treatment system are set out in the OVOS and are approved by the regulator.

9.3.3 PROPOSED DISCHARGE DETERMINATION

The main emissions to air arise as fugitive emissions from diesel powered machinery, the chemical processes within the mineral process plant and dust from open pit mining activities.

Other emissions are noise from the machinery and equipment in use, light used to provide safe road and walk ways around the site and road traffic for the import of materials and export of saleable goods.

The ambient concentrations are not affected due to the small scale of the sources and this is expected to continue with expansion to a 1Mtpa process plant.

9.3.4 EMISSIONS TO WATERS

The basis of the operation is that no waste, solid or liquid, is discharged to water from the project site.

Appropriate containment measures (e.g. bunding etc.) are and will be used to prevent contamination of surface water due to leaks or spillages around the workshop/garage in the main building and from the process plant which is contained within this same building.

Groundwater is sampled from three boreholes located to the south of the current tailings pond facility servicing the pilot plant. Samples are taken bi-annually and analysed internally for potassium, chlorine, hydrocarbons, nitrate, sulphate, ammonia, vanadium, and pH. The results for 2008 showed that the pH of the groundwater was neutral.

9.3.5 EMISSIONS TO GROUND

The main emissions to the ground will the stacking of the open pit waste on ground adjacent to the open pit. The mineral process waste will be minimal and will be stacked in a designed impoundment.

The waste rock has been analysed for carbon and oxides of silica, vanadium, aluminium, iron, potassium, titanium, magnesium and calcium. Silica content is high (>80 % by volume) as expected and is inert and benign.

The mine waste material is, where possible, crushed to a range of gravel products and sold as aggregate and collected by the purchaser or delivered by the mine fleet. This minimises the site waste generation.

Domestic sewage will drain to a septic tank for solids settlement, with the supernatant draining to a sump.

9.3.6 WASTE

Small quantities of hazardous wastes such as waste oil and grease, oil filters, cleaning fluids, engine coolant, lab chemicals and lighting tubes/lamps will be generated. Other wastes consist of septic tank sludge, domestic and packaging waste, scrap metal and spent air and water filters. All waste will be collected and sent off-site for disposal by approved and appropriately licensed/permitted recovery/disposal contractors.

9.3.7 NOISE

The proposed project will be designed with various noise control measures so that the noise from the operations does not exceed 55 dBA by day and 45 dBA by night, during normal operation, at the nearest noise sensitive location (NSL). Since there is an absence of non-industrial locations, this is deemed to be the employee accommodation block.

9.3.8 HABITATS

From information studied there are no designated conservation sites within 5 km of the site.

The proposed development is therefore not expected to have any significant adverse effect on any habitat, nor significantly impinge adversely on the environment.

9.4 FUEL HANDLING AND STORAGE

Fuel is stored in above ground tanks and drums at the site. The tanks appear in reasonable condition and are within a bund, as shown in Figure 9-1. The tanks and drums are situated on a concrete base. The fuel pump for refuelling vehicles is situated a considerable distance from the tanks and it is not known whether any containment measures are located beneath the pump or pipeline.

Figure 9-1: Fuel Drums (Foreground) and Tanks (Background) within Mine Waste Bund

Hazardous chemicals are used at the site. Most of these are stored in the containers that they are supplied in. Sulphuric acid and ammonia water are currently stored in large tanks above the plant and HLP, and gravity fed via suspended pipelines to the plant.

The tanks are situated on a concrete base and are well maintained.

9.5 FIRE SAFETY AND FIRST AID

Fire extinguishers and required equipment along with diagrams for contingency situations are located at various points across the mine and plant site. The 'Mine Rescue' (independent contractors) has been engaged for emergency situations and has carried out practice drills.

9.6 MINE CLOSURE AND REHABILITATION

The OVOS requires an assessed mine closure plan. Statutory obligations are in place for accumulation of funds to meet the approved business closure plan. Oversight by the regulator is in place.

9.7 HUMAN RESOURCES

The nearest village to the mine site is Aksumbe, 18 km away. The administrative office of the mine is located at Shieli, approximately 70 km from the mine site, being the closest town to the site and location of the nearest railway station. The mine accommodation block is sized for around 70 persons. This will be upgraded as part of the expansion project.

Unemployment in Shieli region is reported to be around 60 %, with below national average monthly salaries. The workforce for the business will be sourced from Aksumbe, Shieli and surrounding areas. Specialists will be sourced from other parts of Kazakhstan.

9.8 INDUSTRIAL DESIGN IMPLICATION

After initial assessment of the site and the likely project parameters, GBM is considers it unlikely that there will be any significant environmental or social issues nor any significant impacts that cannot be mitigated by normal project design, protection and management measures.

SECTION 10 FINANCIAL ANALYSIS

10.1 BACKGROUND

GBM has audited, with the directors of FAR and senior staff from TFB, a cash flow forecast economic model which separately projects the financial results of (1) the expansion of current processing operations and (2) the combined Phase 1 and Phase 2 developments of the Balasausqandiq deposit and processing plant, to produce a combined cash flow.

The expansion of current processing operations is already underway but for the purposes of the financial model account is taken of expenditure scheduled from November 2018 to the end of 2019. It is assumed that operations continue and production steadily rises over this period, reaching full capacity at the end of the first quarter of 2020 and continuing thereafter for the life of the Balasausqandiq operation. For the financial model of Phases 1 and 2, the cash flow forecast model assumes an initial Phase 1 development of the mine and plant production to 1Mtpa, for which commissioning is scheduled for the last quarter of 2020, followed by an increase to 4Mtpa, starting up in the second half of 2023 and continuing through the economic projection to 2043.

In order to construct the model, calculations were made to determine appropriate capital and operating cost estimates. This information has been audited by GBM and found to be reasonable. The estimated accuracy of the cost estimate is ±15 % for phase 1. Phase 2 costs are estimated by industry standard factoring of the phase 1 costs, therefore there is greater variability in the phase 2 estimated costs.

The cash flow models for Balausa include a post-tax Discounted Cash Flow (DCF) analysis and a resultant Net Present Value (NPV). The business post tax IRR is also derived.

Given that a semi-commercial pilot plant has already been constructed and that mining and treatment operations are already taking place, many of the capital and operating costs have been or are already being incurred and this information has been used in the assessment of costs in the cash flow. The Phase 1 expansion will be little different from a scaled-up version of the pilot plant.

Capital and operating cost estimates were prepared in mixed currencies and reported in United States dollars (USD). The exchange rates used are shown in Table 10-1.

Table 10-1: Currency Exchange Rate

Currency	Code	US$ per unit
Euro	EUR	0.8789
Chinese Yuan Renminbi	CNY	6.96
Russian Rouble	RUB	65.56
Kazakhstan Tenge	KZT	366.8

10.2 CAPITAL COSTS

The capital expenditure required for the development of the business has been derived from experience of building and adapting the pilot plant, quotations from vendors, cross referenced against submissions from capable contractors and constructors. The directors of FAR have substantial experience of mineral asset development in Kazakhstan and the capital costs estimates are considered to be realistic.

Table 10-2 shows the estimated initial capital costs for the expansion of the current processing operations, and table 10-3 shows the capital costs for Phase 1.

Table 10-2: Capital costs for expansion of current processing operations

Cost Centre	TOTAL 000 USD	%
Total Capital		
Railway siding, unloading facilities and storage for raw materials	445	4.3
Connection to HV powerline, transformers and reticulation	2,688	26.2
Worker accommodation and office building	477	4.6
Evaporation ponds	343	3.3
Main process building expansion	1,249	12.2
Expansion of main process plant, leaching circuits etc	2,430	23.8
Ovens and other equipment to convert AMV to vanadium pentoxide	668	6.5
Warehouses, laboratories, security etc	474	4.6
Mobile equipment and vehicles	290	2.8
Allowance for unforeseen items	1,200	11.7
TOTAL	**10,264**	**100.0%**

Note that the above individual items include allowance for contingency, construction, installation and commissioning, whilst allowance for unforeseen items is provided separately. At the time of writing this report, over $550,000 had already been spent towards this capital expenditure using funds generated from operations, leaving net remaining capital expenditure of US$9.7million

Table 10-3: Capital and other initial costs for Phase 1 (1Mtpa) mine and processing

Cost Centre	TOTAL [USD000]	%
Total Capital		
Detailed engineering, other preparatory work and owners' project team	9,728	9.7
Additional exploration	1,494	1.5
Buildings and facilities	6,460	6.5
Mining equipment	7,110	7.1
Additional transport equipment	2,629	2.6
Treatment plant equipment	37,261	37.2
Auxiliary treatment plant equipment	5,884	5.9
Geological exploration equipment	1,024	1.0
Tailings impoundment and mining capital works	2,357	2.4
Other infrastructure	3,948	3.9
Corporate overheads	3,071	3.1
First fill	2,399	2.4
Initial spare parts inventory	1,639	1.6
Commissioning support	1,415	1.4
Contingency and allowance for over-run (18% of pre-contingency capital costs)	13,728	13.7
Total	**100,148**	**100.0**

10.2.1 INDIRECT CAPITAL COSTS - BALASAUSQANDIQ

10.2.1.1 OWNERS COSTS

In addition to the corporate overhead costs of USD 3.1 million during the construction phase shown above, $1.1m has been included for the owners' project management team in "Detailed engineering, other preparatory work".

10.2.1.2 EXPLORATION COSTS

GBM also notes that FAR has allowed USD 1 million for the acquisition of geological drill rig and associated equipment and a further USD 1.5 million in its capital cost estimate for the completion of the upgrade of the resource of OB2, OB3, OB4 and OB5 to JORC 2012 indicated standards. Following the completion of such work, there is likely to be considerable upside potential from the further expansion of operations.

10.2.1.3 FIRST FILL

An allowance based on the cost of reagents for 3 months at 1Mtpa have been used as the basis to estimate first fill costs.

10.2.1.4 CONTINGENCY

Contingency is a cost element of the estimate used to cover the uncertainty and variability associated with unforeseeable elements not defined in the project scope. Based on the level of project definition a contingency of 18 % of the initial capital cost has been included as part of the capital cost estimate.

10.2.2 WORKING CAPITAL

Approximately USD 2.8 million has been allowed for working capital costs in addition to the corporate overheads and owners' team project management costs. Full salaries have been assumed during commissioning and the ramp up of production.

10.2.3 PHASED COSTS DISCUSSION

It has been assumed that the bulk of the detailed engineering and other project preparations is carried out in the first six months and that the main capital expenditure will take place during the following 18 months.

It has been assumed that commissioning will start at the end of the second year and that production that year will be 25% of a full year, 80% the second and 100% for the third year of production onwards.

Sustaining capital costs include annual building maintenance, upgrade to a 4Mtpa plant operation and replacement of mobile equipment based on estimated vehicle service life. Similarly, the service life of the mining fleet has been estimated and sustaining capital allows for purchase of new mobile equipment as required. Overhaul and maintenance costs of the process plant and auxiliary equipment are included within the operating costs rather than as sustaining capital.

10.3 OPERATING COSTS - BALASAUSQANDIQ

The main operating cost components in the Balausa project are:

- Mining costs,
- Processing costs (including reagents and transportation), and
- General and administrative costs.

The operating costs for the business have been built up from actual operating experience onsite, procurement prices, and benchmarked against other similar operations. GBM is satisfied that such costs are a reasonable estimate of likely future costs in current terms. A summary of the operating costs is shown in Table 10-3.

Table 10-3: LOM Operating Costs

Description	Life of Mine (LOM) Cost [USD million]	Percentage of LOM OPEX	LOM average cost per ore [USD/t]
GENERAL & ADMINISTRATION	**105**	**4.98%**	**1.37**
General business operations	82	3.89%	1.07
Local employees training	6	0.28%	0.08
Liquidation fund	6	0.28%	0.08
Insurances	1	0.05%	0.01
Development and maintenance of social sphere	10	0.47%	0.13
MINING	**649**	**30.77%**	**8.48**
PROCESS	**1,355**	**64.25%**	**17.70**
Material	38	1.8%	0.50
Reagents	796	37.74%	10.40
Electroenergy	74	3.51%	0.97
Heating	159	7.54%	2.08
Water Supply	1	0.05%	0.01
Repairing of Equipment	151	7.16%	1.97
Lab Chemicals	4	0.19%	0.05
Labour	120	5.69%	1.57
Mobile equipment operation (including fuel, lubricants, labour and maintenance)	12	0.57%	0.16
TOTAL	**2,109**	**100.00%**	**27.55**

The predicted level of costs will make FAR a very low-cost producer. There are several ways of measuring costs per unit of production in a multi-product operation. Offsetting by-product revenues from overall costs would lead to negative costs of vanadium production. Perhaps more appropriately, costs can be arrived at by apportionment of costs pro rata to revenue. The unit costs of production and operating margins are both favourable as detailed in Table 10-4.

Table 10-4: Operating Margins

Description	Processing expansion	1Mtpa ore	4Mtp ore
Operating cost/lb V_2O_5 (where costs are attributed pro-rata to products)	2.76	USD 1.82	USD 1.54
Operating cost/lb V_2O_5 (where by-product revenues are deducted from costs)	2.76	USD (0.80)	USD (1.20)
Operating cost as % of revenue	39.3%	24.2%	20.6 %

Note that operating costs include royalties in the above figures

10.4 FINANCIAL ANALYSIS CRITERIA

A preliminary financial analysis of the Balausa projects has been carried out to estimate the potential economic outcome and its robustness, considering all the possible expenditure which may have an impact on operating and capital costs.

The technical practicality of the project has been investigated and the economic sensitivities tested by the development of a cash flow model with conservative assumptions. The post-tax cash flow forecast model has been prepared based on a mine schedule that is considered attainable.

The main assumptions underlying the base line cash flow model are detailed in Table 10-5.

Table 10-5: Cash Flow Assumptions (current processing expansion)

Assumption	Detail
Currency and inflation	Real terms in 2018 US dollars
Vanadium pentoxide price (Europe)	2018: USD18/lb 2019: USD 13/lb 2020 onwards: $7.50/lb
Metallurgical recovery of V_2O_5	Low grade concentrate 40%; High grade secondary materials 85%
Annual production (V_2O_5)	1,500 tonnes
Kazakhstan corporate tax rate	20 %
Discount rate	10 %

Table 10-6: Cash Flow Assumptions (1 & 4Mtpa project)

Assumption	Detail
Currency and inflation	Real terms in 2018 US dollars
Vanadium pentoxide price (Europe)	7.50 USD/lb of V_2O_5
Carbon-silica flux price	35 USD/t

Assumption	Detail
Annual treatment (tonnes of ore) Year 2 from start of construction (second half) Year 3 Year 4 Year 5 Years 6 – 23	 250,000 800,000 1,000,000 2,500,000 4,000,000
Flux recovery from ore treated	73.8 %
Metallurgical recovery of V_2O_5	91.1 %
Annual production (V_2O_5 only) Year 2 Year 3 Year 4 Year 5 Years 6 – 23	 1,401 tonnes 4,483 5,604 14,009 22,414
Total revenue from each tonne treated	USD 135.25
Kazakhstan corporate tax rate	20 %
Discount rate	10 %

10.5 ASSUMPTIONS AND EXCLUSIONS

All the cost estimates and product sales prices used in the model were taken without inflation and are considered real, not nominal.

For the project to expand the current processing plant, the costs of building the existing operating plant up to its current state have been ignored. It has also been assumed that the bulk of the expansion can be carried out without interrupting operations by building and largely equipping the extension of the factory building alongside the existing, so that only a short shutdown is required to move and install various plant items in the original building.

For the 1Mtpa mine and processing plant, the cost estimate has been prepared beginning from the point of the start of detailed engineering. Therefore, project development costs which have already been incurred are excluded from this cost estimate. Major project development components which have already been incurred and are therefore not included are:

- Pilot Plant capital or operating costs;
- Expansion costs already undertaken
- Metallurgical testwork;
- EIA;
- PFS / BFS engineering and studies;
- Exploration drilling to date;

- Project development social and environmental programs;
- Land acquisition and right of way costs; and
- Permits, licences, bonds or legal and administrative costs associated with government mining and environmental regulations. This includes reporting requirements during operation and related administrative costs.

Additionally, no allowance has been made for:

- Cost escalation;
- Currency fluctuations;
- Currency hedging;

It has been assumed that the mine will produce a total of 76,550 tonnes of ore in the years up to 2043, the currently approved exploitation period. The current JORC (2012) reserves for OB1 amount to some 23m tonnes and an additional 3 million tonnes are expected from the near-surface oxide cap and other inferred resources. The remaining 50.6 million tonnes is a conservative estimate of what might reasonably be expected to be derived from the other four ore-bodies for which the JORC (2012) exploration potential has been assessed as being in the range from 77.3 million tonnes to 103.8 million tonnes. These ore-bodies are outcropping and their known features are sufficient to have a good degree of confidence that after further resource definition, will prove to minable with costs similar to those of OB1. The costs of this further exploration have been allowed for in the financial analysis.

FAR have prepared a feasibility study which includes the additional 50.6 million tonnes which was prepared for locally required approval purposes under the GKZ system of resource estimation. Whilst under the JORC system of resource evaluation these reserves have been classified as Exploration Potential, GBM considers that this feasibility study can be taken as evidence that there are good reasons to consider such Exploration Potential to be Production Target and to be included in the financial evaluation.

GBM has considered whether the additional cash inflows derived from such Production Target should be subject to further discount to reflect the greater uncertainty relating to such material and have concluded that since the total of such Production Target material is some 35% less than the lowest point in the Exploration Potential range, and having regard to the disposition of such material in the geological models examined, the estimates derived are already conservatively estimated and no further discount should be applied.

10.6 FINANCIAL MODEL RESULTS

The main aspects of the cash flow model are presented in Table 10-7.

Table 10-6: Main Aspects of Cash Flow Model (processing expansion)

Item	Value [USD]
Capital costs remaining	9.7 million
Funding requirement net of operating cash inflows	5.0 million
Annual operating costs	11.3 million
Annual revenue	23.6 million
Annual operating cash generation	9.7 million
Annual operating cash generation after tax incentive agreement expires in 2027	7.8 million
Base case post tax NPV (10 %)	**73 million**
Base case post tax asset IRR	**242 %**

Table 10-7: Main Aspects of Cash Flow Model (Phases 1 & 2 only)

Item	Throughput	Value [USD]
Phase 1, 1Mtpa, start-up 2020		
Total funding required	Phase 1	100 million
Funding required net of operating inflows	Phase 1	86 million
Annual operating costs & royalty	1Mtpa	32 million
Annual revenue	1Mtpa	135 million
Annual operating cash generation	1Mtpa	103 million
Phase 2, 4Mtpa, start-up 2023		
Total funding for stage	Phase 2	225 million
Funding required net of operating inflows	Phase 2	nil
Annual op. costs & royalty	4Mtpa	110 million
Annual revenue	4Mtpa	541 million
Annual operating cash generation	4Mtpa	430 million
Combined phases 1 & 2 (but excluding expanded processing)		
Base case post tax NPV (10 %)		**1,978 million**
Base case post tax asset IRR		**89 %**

10.7 SENSITIVITIES AND SCENARIOS

A sensitivity analysis was performed on the base case for key cost variables as discussed in Section 10.7.1.

Additionally, upside potential for the project was examined by considering the benefits of revenue gained from smelting of the autoclave tails to produce ferro-silicon. The results of this scenario are presented in Section 10.7.2.

10.7.1 BASE CASE SENSITIVITY

Sensitivities to changes in product revenues and the main operating cost components are provided in Table 10-8 and Table 10-9.

Table 10-8: Sensitivities (Expansion of current processing)

Sensitivity	Base Case	Change %	Sensitivity Value	NPV USD million
Base Case				73
Vanadium pentoxide price/lb	$24/$13/$10/$7.50	-10 %	$21.6/$11.7/$9/$6.75	61
Vanadium pentoxide price/lb (2020 on)	$10.00/$7.50/lb	+47% (2021 on)	$11.00	132
Reduced raw material feed	30,564 t/a	-10 %	27,508 t/a (2021 on)	70
Concentrate price increase	various	+10%	various	62
Operating price increase (excl. Concentrate)	USD 1.8 million	+10 %	USD 2.0 million	68
Capital cost increase	USD 9.7 million	+10 %	USD 10.7 million	72
Discount Rate	10 %	+20 %	12 %	61

Table 10-9: Sensitivities (Balasausqandiq Phases 1 & 2 only)

Sensitivity	Base Case	Change %	Sensitivity Value	NPV USD million
Base Case				1,962
Vanadium pentoxide price reduction	USD 7.50/lb	-10 %	USD 6.75/lb	1,784
Vanadium pentoxide price	$7.50/lb	+47%	$11.00	2,875
Carbon-silica flux price reduction	USD 35.00/tonne	-10 %	USD 31.50/tonne	1,924
Vanadium pentoxide recovery	91%	-10 %	82%	1,797
Carbon-silica flux recovery	74%	-10 %	66%	1,924
Mining operating cost increase	USD $8.48/t	+10 %	USD 9.33/t	1,959
Treatment operating price increase	USD 16.55/t	+10 %	USD 18.21t	1,943
Capital cost increase (phases 1&2)	USD 326 million	+10 %	USD 359 million	1,951

Sensitivity	Base Case	Change %	Sensitivity Value	NPV USD million
Discount Rate	10 %	+20 %	12 %	1,610

GBM notes the low sensitivity to operating cost increases which are expected as mining and treatment costs amount to only around 8 % and 18 % of revenue respectively. Similarly, the project is relatively insensitive to capital costs which amount to only a small proportion of NPV. Not surprisingly, the biggest sensitivities are to the vanadium pentoxide price and recovery where vanadium accounts for 69 % of revenue.

10.7.2 FERRO-SILICON SCENARIO

FAR has considered many uses for the carbon-silica tailings from the autoclave treatment. The base case financial analysis provides for this material to be briquetted and sold to smelters but FAR has considered a further scenario where ferro-silicon itself is made. The reasons for the attractiveness of this project are:

- Very low cost gas is available locally which can lead to power generation by a company owned gas turbine generator at under USD 0.02 per kWh. Since power is the main determiner of cost, this will give FAR a significant cost advantage.
- The carbon and silica are ideal materials for the feed, providing 100% of the silica and approximately 50% of the carbon requirement. Labour costs are also low in Kazakhstan.
- Since the aluminium has been removed from the tailings by the vanadium treatment process, the resulting ferro-silicon will be low-aluminium. This type of ferro-silicon has a niche market and typically sells for a premium over ordinary ferro-silicon.

These three factors indicate that such a project would be highly attractive and preliminary projections show that a 150,000tpa operation would add approximately USD 0.4 billion to the project NPV over and above the benefits of selling the carbon-silica flux to smelters.

10.8 MARKET BASED EVALUATION

GBM have considered whether there are other listed companies with sufficient similarity to FAR to allow some inference as to the valuation of FAR by comparison. Since there are few pure-play listed vanadium producing or vanadium project companies, and such companies are based on deposits with very different types of ore to that which FAR group is planning to mine, such comparisons are difficult. With few exceptions, the operations or projects held by such listed companies are concerned with the mining and treatment of titano-vanadiferous magnetite (TVM) which requires a much more complicated processing route including pre-concentration and high temperature roasting, neither of which is required to treat ore from Balasausqandiq. This difference gives Balasausqandiq significant capital and operating cost advantages which will become more significant as the vanadium price returns to more usual levels.

The process for treating Balasausqandiq ore produces a range of by-products which add significant value to the project and which have no parallel for TVM deposits where the iron ore by-product has little or no value. Furthermore, the lack of a pre-concentration stage in the processing route gives a much higher metallurgical recovery of over 90% for Balasausqandiq compared with around 75% typical for TVM. When by-product values and the higher recovery are taken into account, Balasausqandiq's recovered value per tonne treated is much higher than would be expected by comparison on the basis of in situ grade. TVM deposits are often compared by reference not only to in situ grade but also to concentrate grades but these are not applicable to Balasausqandiq.

For these reasons, GBM does not believe that a detailed comparison with any existing quoted primary pure-play vanadium producers can have any useful value in determining the valuation of Ferro-Alloy Resources Limited and we recommend that greater reliance should be put on the analysis of future cash flows and the resulting NPV estimation.

10.9 DISCUSSION

The results of the financial analysis show the benefit of the ore at Balausqandiq compared with other magnetite-based projects. The ore is treated in a single step with a hydrometallurgical process which does not require the capital and operating costs of pre-concentration and high temperature roasting as in the standard processing route for magnetite ores.

The financial return potentially benefits from the availability of low cost sulphur for the production of sulphuric acid. The burning of sulphur to generate acid is an accepted method of producing low cost acid (and heat energy). Kazakhstan is a large producer of oil which mostly requires desulphurisation. The resulting sulphur is accumulating as an environmental hazard and is available for a nominal cost. Transport to site will be at low cost by rail, resulting in a cost price of sulphuric acid of under USD 50 per tonne and significant energy can be recovered from the process to produce power or steam. This will substantially reduce the life-of-mine acid costs but owing to the current low costs and easy availability of acid FAR is proposing to defer the building of the acid plant until Phase 2 is commenced or acid prices rise, whichever is the sooner.

The operation of the autoclave indicates that leach recoveries are over 93 % for vanadium. The adsorption of vanadium onto resin and its subsequent recovery has been demonstrated. The base case financial model has used a more conservative estimate of recovery of 91.1 %.

SECTION 11 FAR DEVELOPMENT STRATEGY

Although not yet fully explored it is considered likely that the Balasausqandiq deposit is large enough to support an operation of up to 10Mtpa of ore, producing about 55,000 tonnes of vanadium pentoxide over the life of mine. This would be some 36 % of the world market and create oversupply, as well as producing vast quantities of carbon-silica flux for which it might take time to develop a sufficient market.

If such a plant were built, there would be a danger of a sharp reduction in the market price of vanadium and although FAR would most likely be profitable because of its low production cost, it would be a high-risk strategy with consequences that are difficult to forecast.

There would also be engineering risk in building such a plant and starting to mine at a rate of around 55Mtpa (ore and waste).

FAR has therefore sought to develop more slowly, in steps that are more in tune with the natural expansion of the vanadium market that is expected to grow strongly even in the absence of any significant demand for vanadium for flow batteries. If such demand materialises, then FAR will be able to increase its rate of expansion.

Although the marketing position argues for caution, there are economies of scale that mean that larger plants are more attractive provided the vanadium price is not significantly affected. FAR decided that a two-step solution, starting at 1Mtpa, would capture most of the economies of scale and would then allow a subsequent expansion, currently envisaged to be to 4Mtpa, to be paid for out of earnings and debt. Vanadium production from 1Mtpa will be about 5,600 tonnes per annum of pentoxide, less than half the predicted annual growth of the market, and 4Mtpa would produce an additional 16,800 tonnes – figures which are less than the currently estimated deficit and expected growth.

The 1Mtpa expansion followed by a 4Mtpa expansion is an integrated plan aimed at limiting engineering and market risk, whilst still benefiting from the economies of scale of the large deposit size. GBM considers this two-step development to be soundly based and a sensible, low risk development plan.

Either Phase 1 or Phase 2 could be scaled up if the vanadium market warrants it and capital is available. For example, if vanadium redox battery technology takes off as some forecasters believe it will, the effect on the size of the market could be dramatic and could justify a larger expansion at this stage of the project.

SECTION 12 BIBLIOGRAPHY

1. **Mikhail L. Bazhenov, Natalia M. Levashova, Kirill E. Degtyarev, Rob Van der Voo, Alexandra V. Abrajevitch, Phil J.A. McCausland.** *Unraveling the early–middle Paleozoic paleogeography of Kazakhstan on the basis of Ordovician and Devonian paleomagnetic results. International Association for Gondwana Research 22 .* s.l. : Elsevier B.V., 2012. 974-991.

2. **Och, Lawrence Michael.** *Biogeochemical cycling through the Neoproterozoic-Cambrian transition in China: an integrated study of redox-sensitive elements (Ph.D. thesis).* London : University College London (UCL), Department of Earth Sciences, 2011.

3. **Leonid E. Popov, Michael G. Bassett, Vyacheslav G. Zhemchuzhnikov, Lars E. Holmer & Inna A. Klishevich.** *Gondwanan faunal signatures from Early Palaeozoic terranes of Kazakhstan and Central Asia: evidence and tectonic implications. From:Bassett, M. G. (ed.) Early Palaeozoic Peri-Gondwana Terranes: New Insights from Tectonics and Biogeography.* Special Publications, 325. London : Geological Society, 2009. pp. 23-64.

4. **Alvaro, J. Javier.** *Cambrian trilobite-based biogeographic patterns of Central Asia.1st international workshop on geodynamic evolution of the Central Asian Orogenic Belt.* St Petersburg : Institute of Precambrian Geology and Geochronology, Russian Academy of Sciences, 2012.

5. **Holmer, L. E., Popov, L. E., Koneva,S. P. & Bassett, M. G.** *Cambrian–early Ordovician brachiopods from Malyi Karatau, the western Balkhash Region,.* s.l. : Special Papers in Palaeontology, 2001. p. 65.

6. **Trond H. Torsvik, L. Robin M. Cocks.** *The Lower Palaeozoic palaeogeographical evolution of the northeastern and eastern peri-Gondwanan margin from Turkey to New Zealand.* Special Publications v. 325. London : Geological Society, 2009. pp. 3-21.

7. **Ankinovich, S.G.** *The Lower Paleozoic of the vanadium-rich Central Tien-Shan Basin and of the Central Kazakhstan west margin.* s.l. : Alma-Alta, 1962. p. 185.

8. **Chumakov, N.M.** *Precambrian glaciations and associated biospheric events. Stratigraphy and Global Correlation 18.* pp. 467-479.

9. **T.M., Alzhanov.** *On the prospect evaluation surveys of the Balasausqandik (Balausa) deposit of siliceous and vanadium-bearing shales conducted in 1971-1972. Based on internal summary report translated from Russian for FAR.* [ed.] B.E. Komarnitski (Ed) 1973. s.l. : Kazakh Ministry of Geology Almaty and South Kazakhstan Regional Geological Department. p. 100.

10. **Sadiq, M.** *Thermodynamic solubility relationships of inorganic vanadium in the marine environment.* s.l. : Mar. Chem., 1988. pp. 23, 87–96.

11. **Emerson S.R., Huested S.S.** *Ocean anoxia and the concentrations of molybdenum and vanadium in seawater.* 1991. pp. 177-196.

12. **Stephen Edward Lewis, Robert A. Henderson, Gerald R. Dickens,Graham A. Shields, Simon Coxhell.** *The geochemistry of primary and weathered oil shale and coquina across the Julia Creek vanadium deposit (Queensland, Australia).* Mineralium Deposita, August 2010, Volume 45, Issue 6. 2010. pp. 559-620.

13. **Lipton, I. T.** *Measuring of bulk density for resource estimation.* Monograph 23, Chapter 2. s.l. : AusIMM, 2001. pp. 57-66.

14. **T.M., Alzhanov.** *On the prospect evaluation surveys of the Balasausqandik (Balausa) deposit of siliceous and vanadium-bearing shales conducted in 1971-1972.* [ed.] B.E. Komarnitski. 1973. s.l. : Kazakh Ministry of Geology Almaty and South Kazakhstan Regional Geological Department., 1969. p. 100. Translated from Russian for FAR.

15. **Nameroff, T.J., Balistrieri, L.S., Murray, J.W.** *Suboxic trace metal geochemistry in the eastern tropical North Pacific.* Geochem. Cosmochim. Acta 66. 2002. pp. 1139-1158.

APPENDIX A. ASSAY CERTIFICATES

In this first batch of results from Intertek it was found that the multi-acid digestion approach was similar to the sodium peroxide fusion method for vanadium, molybdenum and uranium, see first page of analytical report “Assay certificates – 1st batch from Intertek”

A.1 ASSAY CERTIFICATES – 1ST BATCH FROM INTERTEK

Page 1 of 8

ANALYTICAL REPORT

A KUSNETSOV
TOO Fiem Balausa
86/6 Masarchi Street
ALMATY, RK
KAZAKHSTAN

JOB INFORMATION

JOB CODE	:	6.3/1103120
No. of SAMPLES	:	120
No. of ELEMENTS	:	4
CLIENT O/N	:	Roger Rhodes (Job 1 of 1)
SAMPLE SUBMISSION No.	:	Roger Rhodes
PROJECT	:	TOO Fiem Balausa
STATE	:	Drill core
DATE RECEIVED	:	14/03/2011
DATE COMPLETED	:	21/04/2011
DATE PRINTED	:	21/04/2011
PRIMARY LABORATORY	:	Genalysis Main Laboratory

LEGEND

X	= Less than Detection Limit
N/R	= Sample Not Received
*	= Result Checked
( )	= Result still to come
I/S	= Insufficient Sample for Analysis
E6	= Result X 1,000,000
UA	= Unable to Assay
>	= Value beyond Limit of Method
OV	= Value over-range for Package

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GENALYSIS LABORATORY SERVICES PTY LTD
ABN 32 008 787 237

.3/1103120 (21/04/2011) CLIENT O/N: Roger Rhodes

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Part 1/1

ANALYSIS

ELEMENTS	TOC+C	Mo	Mo	U	U	V	V
UNITS	%	ppm	ppm	ppm	ppm	ppm	ppm
DETECTION LIMIT	0.01	1	2	0.1	0.01	20	1
DIGEST	C71/	RFP1/	R4AB/	RFP1/	R4AB/	RFP1/	R4AB/
ANALYTICAL FINISH	CSA	MS	OE	MS	MS	OE	OE
SAMPLE NUMBERS							
0001 B211-1	1.33	47	46	28.4	27.93	620	588
0002 B211-2	24.84	331	335	118.1	119.40	2574	2528
0003 B211-3	22.72	297	298	79.0	83.23	2885	2794
0004 B211-4	22.79	318	308	71.6	74.34	3596	3572
0005 B211-5	15.76	339	330	95.7	97.93	6406	6466
0006 B211-6	6.45	147	143	132.8	137.33	3785	3755
0007 B412-1	2.03	135	139	31.9	31.28	1649	1650
0008 B412-2	5.78	134	141	44.1	33.49	2252	2392
0009 B412-3	8.69	161	163	44.1	44.44	3759	3674
0010 B412-4	14.11	202	199	53.3	52.94	5258	5304
0011 B412-5	10.51	154	148	54.6	48.77	3881	3724
0012 B412-6	9.54	147	146	46.7	44.81	3419	3296
0013 B412-7	10.16	156	144	48.5	45.49	3857	3667
0014 B412-8	10.31	191	187	41.3	39.73	4493	4332
0015 B412-9	6.18	115	110	25.6	25.74	2708	2682
0016 B412-19	6.13	185	183	35.0	34.18	1137	1134
0017 B412-10	8.63	204	192	40.0	38.33	3413	3250
0018 B412-11	15.08	283	269	70.1	64.69	4630	4351
0019 B412-12	20.47	291	270	108.4	108.04	4977	4575
0020 B412-13	14.28	236	244	60.4	63.28	5444	5469
0021 B412-14	11.87		220		64.19		3443
0022 B412-15	12.50		210		49.09		4348
0023 B412-16	10.99		171		54.94		3326
0024 B412-17	7.72		221		47.20		2517
0025 B412-18	4.41		211		76.06		1230
0026 B214-1	9.61		175		75.14		1315
0027 B214-2	6.79		86		34.72		898
0028 B214-3	4.86		77		29.56		1295
0029 B214-4	5.65		151		49.62		1302
0030 B214-5	16.49		292		106.19		3895
0031 B214-6	15.77		245		114.04		3551
0032 B214-7	12.40		239		114.90		6057
0033 B214-8	11.58		190		100.70		3874
0034 B214-9	10.20		202		98.45		3177
0035 B214-10	14.34		171		74.25		3831
0036 B214-11	13.76		184		54.76		4914
0037 B214-12	4.05		108		36.83		2523
0038 B214-13	2.97		67		36.67		1429
0039 B114-1	5.89		182		39.34		1728
0040 B114-2	17.18		240		104.73		2464

GENALYSIS LABORATORY SERVICES PTY LTD
ABN 32 008 787 237

.3/1103120 (21/04/2011) CLIENT O/N: Roger Rhodes

ANALYSIS

ELEMENTS	TOC+C	Mo	Mo	U	U	V	V
UNITS	%	ppm	ppm	ppm	ppm	ppm	ppm
DETECTION LIMIT	0.01	1	2	0.1	0.01	20	1
DIGEST	C71/	RFP1/	R4AB/	RFP1/	R4AB/	RFP1/	R4AB/
ANALYTICAL FINISH	CSA	MS	OE	MS	MS	OE	OE
SAMPLE NUMBERS							
0041 B114-3	15.36		228		101.79		3123
0042 B114-4	11.26		210		64.52		6322
0043 B114-5	12.47		201		93.17		4120
0044 B114-6	12.76		139		58.32		2818
0045 B114-7	14.36		165		83.78		3142
0046 B114-8	15.21		215		80.36		5929
0047 B114-9	6.43		91		60.81		3695
0048 B114-10	1.27		23		30.44		851
0049 B114-11	11.26		150		48.51		4303
0050 B114-12	14.09		212		44.00		6654
0051 B114-13	12.08		179		46.24		5167
0052 B114-14	9.35		194		54.51		2465
0053 B114-15	1.07		48		19.55		564
0054 B113-1	3.27		31		18.68		1438
0055 B113-2	6.72		365		33.21		2831
0056 B113-3	3.91		163		50.31		1311
0057 B113-4	12.10		176		52.03		2542
0058 B113-5	8.51		74		33.73		3175
0059 B113-6	7.94		79		30.44		3754
0060 B113-7	23.04		285		69.68		4187
0061 B113-8	25.37		328		98.88		2874
0062 B113-9	30.13		343		140.82		3237
0063 B113-10	9.57		227		75.40		3918
0064 B113-11	3.28		59		29.88		431
0065 B112-1	6.11		139		23.65		1298
0066 B112-2	14.68		315		59.98		4694
0067 B112-3	19.29		241		102.98		2246
0068 B112-4	21.14		263		72.85		3944
0069 B112-5	19.14		317		88.78		6225
0070 B112-6	14.07		216		111.21		4435
0071 B112-7	12.55		172		57.76		2428
0072 B112-8	10.85		212		103.97		3256
0073 B112-9	8.93		120		115.32		2293
0074 B112-10	14.60		126		69.92		2321
0075 B112-11	12.72		159		84.22		5728
0076 B112-12	5.49		75		94.07		2849
0077 B112-13	13.32		155		50.80		5154
0078 B112-14	15.97		190		60.59		5685
0079 B112-15	24.22		226		61.02		5226
0080 B112-16	13.47		294		66.59		7311

GENALYSIS LABORATORY SERVICES PTY LTD
ABN 32 008 787 237

.3/1103120 (21/04/2011) CLIENT O/N: Roger Rhodes

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Part 1/1

ANALYSIS

ELEMENTS	TOC+C	Mo	Mo	U	U	V	V
UNITS	%	ppm	ppm	ppm	ppm	ppm	ppm
DETECTION LIMIT	0.01	1	2	0.1	0.01	20	1
DIGEST	C71/	RFP1/	R4AB/	RFP1/	R4AB/	RFP1/	R4AB/
ANALYTICAL FINISH	CSA	MS	OE	MS	MS	OE	OE
SAMPLE NUMBERS							
0081 B112-17	11.04		157		49.25		4319
0082 B112-18	10.90		277		63.53		3510
0083 B112-19	3.27		83		22.70		1204
0084 B115-1	7.86		224		28.56		2357
0085 B115-2	21.40		298		75.72		6458
0086 B115-3	22.60		396		78.30		7397
0087 B115-4	8.59		187		75.16		3038
0088 B115-5	1.30		57		63.84		1924
0089 B115-6	4.89		352		118.11		2284
0090 B115-7	3.50		43		29.51		1606
0091 B115-8	4.40		64		29.63		2019
0092 B115-9	2.35		57		19.69		1232
0093 B115-10	2.88		76		24.63		1647
0094 B115-11	2.37		49		17.16		1057
0095 B115-12	3.64		76		27.77		1292
0096 B115-13	5.42		102		33.24		1685
0097 B115-14	6.57		145		41.88		1857
0098 B115-15	5.02		62		15.32		735
0099 B115-16	3.57		54		11.96		644
0100 B115-17	3.46		46		11.32		642
0101 B115-18	2.60		48		14.28		704
0102 B115-19	2.76		53		15.33		669
0103 B115-20	4.59		39		10.79		639
0104 B115-21	2.74		50		11.28		870
0105 B115-22	3.16		51		13.03		795
0106 B115-23	2.20		123		28.15		1567
0107 B115-24	0.54		84		33.52		784
0108 B115-25	6.58		692		45.71		3728
0109 B115-26	8.83		747		48.86		3091
0110 B115-27	4.74		503		33.08		2037
0111 0-1-1	61.41		5		0.75		32
0112 0-1-2	61.61		5		0.79		32
0113 0-1-3	61.94		5		0.75		30
0114 0-1-4	60.42		5		0.80		29
0115 0-1-5	60.79		5		0.85		32
0116 1-2-1	58.78		7		13.32		5099
0117 1-2-2	60.77		7		14.52		4823
0118 1-2-3	60.90		7		11.96		4793
0119 1-2-4	63.40		7		13.24		5178
0120 1-2-5	59.99		6		13.27		5216

GENALYSIS LABORATORY SERVICES PTY LTD
ABN 32 008 787 237

6.3/1103120 (21/04/2011) CLIENT O/N: Roger Rhodes

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Part 1/1

ANALYSIS

ELEMENTS	TOC+C	Mo	Mo	U	U	V	V
UNITS	%	ppm	ppm	ppm	ppm	ppm	ppm
DETECTION LIMIT	0.01	1	2	0.1	0.01	20	1
DIGEST	C71/	RFP1/	R4AB/	RFP1/	R4AB/	RFP1/	R4AB/
ANALYTICAL FINISH	CSA	MS	OE	MS	MS	OE	OE
CHECKS							
0001 B211-1	1.39		45		28.66		599
0002 B412-14	11.53		218		58.94		3551
0003 B114-3	15.21		227		103.81		3253
0004 B113-8	23.80		328		94.42		2831
0005 B112-17	11.30		158		50.36		4321
0006 B115-18	2.67		49		14.31		720
0007 1-2-1	60.42		7		14.50		5367
STANDARDS							
0001 AMIS0085			4		258.18		32
0002 TOC-1	1.79						
0003 AMIS0096			81		136.65		45
0004 TOC-1	1.48						
0005 AMIS0098			556		861.02		99
0006 TOC-1	1.41						
0007 OREAS 100a			21		139.05		34
0008 TOC-1	1.61						
0009 AMIS0098		581		838.2		102	
0010 BL-2a			7		4201.35		657
0011 TOC-1	1.42						
0012 AMIS0085			11		265.48		30
0013 BL-2a		13		4116.0		677	
0014 AMIS0096			81		136.88		37
0015 AMIS0098			555		840.39		94
0016 OREAS 100a			23		137.61		32
BLANKS							
0001 Control Blank	X	X	X	X	0.03	X	X
0002 Control Blank			X		0.02		X
0003 Control Blank		X		0.2		X	
0004 Acid Blank			X		0.01		X
0005 Acid Blank		X		X		X	

MISSING SAMPLES: Kh-5 Kh-4 Kh-3 Kh-2 Kh-1

GENALYSIS LABORATORY SERVICES PTY LTD ABN 32 008 787 237

METHOD CODE DESCRIPTION

C71/CSA Genalysis Main Laboratory

Digestion by hot acid(s) and Induction Furnace Analysed by Infrared Spectrometry

R4AB/MS Genalysis Main Laboratory

Pre-roast Multi-acid digest including Hydrofluoric, Nitric, Perchloric and Hydrochloric acids in Teflon Beakers. Analysed by Inductively Coupled Plasma Mass Spectrometry.

R4AB/OE Genalysis Main Laboratory

Pre-roast Multi-acid digest including Hydrofluoric, Nitric, Perchloric and Hydrochloric acids in Teflon Beakers. Analysed by Inductively Coupled Plasma Optical (Atomic) Emission Spectrometry.

RFP1/MS Genalysis Main Laboratory

Pre-roast Sodium peroxide fusion (Nickel crucibles) and Hydrochloric acid to dissolve the melt. Analysed by Inductively Coupled Plasma Mass Spectrometry.

RFP1/OE Genalysis Main Laboratory

Pre-roast Sodium peroxide fusion (Nickel crucibles) and Hydrochloric acid to dissolve the melt. Analysed by Inductively Coupled Pl

A.2 REE TEST CERTIFICATE RESULTS FROM INTERTEK

Showing 4-acid digestion v peroxide fusion results

Intertek

Page 1 of 8

GENALYSIS LABORATORY SERVICES

ANALYTICAL REPORT

A KUZNETSOV
FERRO ALLOY RESOURCES LTD
86/6 Masanchi Street
ALMATY 050022
KAZAKHSTAN

COMMENTS

1. Amended Report - This report replaces the previously issued results

JOB INFORMATION

JOB CODE	: 6.3/1204023
No. of SAMPLES	: 4
No. of ELEMENTS	: 16
CLIENT O/N	: Roger Rhodes (Job 1 of 1)
SAMPLE SUBMISSION No.	:
PROJECT	: Balausa Exploration 2010 -2
STATE	: Composites
DATE RECEIVED	: 12/03/2012
DATE COMPLETED	: 01/05/2012
DATE PRINTED	: 01/05/2012
PRIMARY LABORATORY	: Genalysis Main Laboratory

LEGEND

X	= Less than Detection Limit
N/R	= Sample Not Received
*	= Result Checked
( )	= Result still to come
I/S	= Insufficient Sample for Analysis
E6	= Result X 1,000,000
UA	= Unable to Assay
>	= Value beyond Limit of Method
OV	= Value over-range for Package

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6.3/1204023 (01/05/2012) CLIENT O/N: Roger Rhodes

ANALYSIS

ELEMENTS	Au	Au-Rp1	Au-Rp2	Ag	Ce	Ce-Rp2	Er	Er-Rp2	Gd	Gd-Rp2
UNITS	ppb	ppb	ppb	ppm	ppm	ppm	ppm	ppm	ppm	ppm
DETECTION LIMIT	1	1	1	0.05	0.01	0.5	0.01	0.1	0.01	0.1
DIGEST	FA25/	FA25/	FA25/	4A/	4A/	FP6/	4A/	FP6/	4A/	FP6/
ANALYTICAL FINISH	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS
SAMPLE NUMBERS										
0001 Comp 1	15		22	3.82*	33.39	45.6	4.51	10.8	7.62	13.3
0002 Comp 2	25	25	30	4.61*	44.46	57.8	4.53	11.8	10.06	16.7
0003 Comp 3	25		31	3.04*	25.50	74.9	2.62	8.4	4.58	11.0
0004 Comp 4	18		23	6.06*	36.41	51.7	3.54	10.0	7.02	12.8
STANDARDS										
0001 AMIS0124	160									
0002 WGB-1				0.07	15.27		1.45		2.68	
0003 Acid Blank						1.1		X		0.2
0004 BCS381						23.8		0.6		1.1
0005 TRM-2						2.94%		74.3		392.9
0006 MPL-5						540.1		2.8		21.0
0007 SY-4						191.8		15.7		16.0
0008 OREAS 45P						59.6		2.2		4.5
0009 AMIS0167						45.1		3.1		5.0
0010 AMIS0124			175							
0011 AMIS0074			44							
BLANKS										
0001 Control Blank	X			X	0.01		X		X	
0002 Control Blank				X	0.01		X		X	
0003 Acid Blank				X	X		X		X	
0004 Control Blank						5.2		X		X
0005 Control Blank						1.7		X		X
0006 Control Blank			X							

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Part 2/4

ANALYSIS

ELEMENTS	Ho	Ho-Rp2	La	La-Rp2	Lu	Lu-Rp2	Nd	Nd-Rp2	Pd	Pd-Rp1
UNITS	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppb	ppb
DETECTION LIMIT	0.01	0.1	0.01	0.2	0.005	0.05	0.01	0.1	1	1
DIGEST	4A/	FP6/	4A/	FP6/	4A/	FP6/	4A/	FP6/	FA25/	FA25/
ANALYTICAL FINISH	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS
SAMPLE NUMBERS										
0001 Comp 1	1.56	3.3	30.09	38.4	0.581	1.43	35.01	44.2	40	
0002 Comp 2	1.69	3.7	32.19	44.2	0.673	1.43	48.38	56.0	58	57
0003 Comp 3	0.85	2.5	20.80	51.4	0.435	1.10	23.90	48.9	47	
0004 Comp 4	1.15	2.9	27.26	43.0	0.593	1.27	36.27	47.1	38	
STANDARDS										
0001 AMIS0124									872	
0002 WGB-1	0.54		6.67		0.193		9.51			
0003 Acid Blank		X		1.9		X		1.3		
0004 BCS381		0.2		12.3		0.10		8.1		
0005 TRM-2		29.1		1.72%		6.24		8355.7		
0006 MPL-5		1.2		280.6		0.33		219.8		
0007 SY-4		4.7		95.2		2.37		78.9		
0008 OREAS 45P		0.8		27.6		0.32		24.2		
0009 AMIS0167		1.1		23.6		0.32		19.5		
0010 AMIS0124										
0011 AMIS0074										
BLANKS										
0001 Control Blank	X		X		X		X		X	
0002 Control Blank	X		X		X		X			
0003 Acid Blank	X		X		X		X			
0004 Control Blank		X		2.4		X		1.6		
0005 Control Blank		X		1.9		X		1.4		
0006 Control Blank										

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ANALYSIS

ELEMENTS	Pd-Rp2	Pr	Pr-Rp1	Pt	Pt-Rp1	Pt-Rp2	Sc	Sc-Rp2	Sm	Sm-Rp2
UNITS	ppb	ppm	ppm	ppb	ppb	ppb	ppm	ppm	ppm	ppm
DETECTION LIMIT	1	0.005	0.05	1	1	1	0.1	20	0.01	0.1
DIGEST	FA25/	4A/	FP6/	FA25/	FA25/	FA25/	4A/	FP6/	4A/	FP6/
ANALYTICAL FINISH	MS	MS	MS	MS	MS	MS	MS	OE	MS	MS
SAMPLE NUMBERS										
0001 Comp 1	43	8.116	9.68	20		22	3.7*	X	7.89	10.1
0002 Comp 2	60	10.275	11.97	19	17	20	4.0*	X	10.75	12.9
0003 Comp 3	51	5.544	11.17	19		21	3.4*	X	4.63	10.0
0004 Comp 4	41	8.087	10.64	16		17	4.1*	X	7.21	9.6
STANDARDS										
0001 AMIS0124				837						
0002 WGB-1		2.108					39.9		2.41	
0003 Acid Blank			0.38					X		0.1
0004 BCS381			2.30					X		1.4
0005 TRM-2			2830.77					X		863.2
0006 MPL-5			57.89					47		35.1
0007 SY-4			21.12					X		14.7
0008 OREAS 45P			6.09					65		4.7
0009 AMIS0167			5.18					X		4.6
0010 AMIS0124	929					902				
0011 AMIS0074	617					962				
BLANKS										
0001 Control Blank		X		X			X		X	
0002 Control Blank		X					X		X	
0003 Acid Blank		X					X		X	
0004 Control Blank			0.38					X		0.2
0005 Control Blank			0.39					X		X
0006 Control Blank	X					X				

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Part 4/4

ANALYSIS

ELEMENTS	Y	Y-Rp3	Yb	Yb-Rp2
UNITS	ppm	ppm	ppm	ppm
DETECTION LIMIT	0.05	0.5	0.01	0.1
DIGEST	4A/	FP6/	4A/	FP6/
ANALYTICAL FINISH	MS	MS	MS	MS
SAMPLE NUMBERS				
0001 Comp 1	47.40	127.2	4.28	9.8
0002 Comp 2	55.34	133.5	4.32	10.6
0003 Comp 3	35.61	105.2	2.67	7.2
0004 Comp 4	46.38	125.2	3.40	9.1
STANDARDS				
0001 AMIS0124				
0002 WGB-1	14.00		1.31	
0003 Acid Blank		0.6		X
0004 BCS381		8.2		0.6
0005 TRM-2		1044.3		52.8
0006 MPL-5		32.4		2.2
0007 SY-4		127.6		16.1
0008 OREAS 45P		19.7		2.6
0009 AMIS0167		24.1		2.2
0010 AMIS0124				
0011 AMIS0074				
BLANKS				
0001 Control Blank	X		X	
0002 Control Blank	X		X	
0003 Acid Blank	X		X	
0004 Control Blank		X		X
0005 Control Blank		X		X
0006 Control Blank				

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Part 4/4

ANALYSIS

ELEMENTS	Y	Y-Rp3	Yb	Yb-Rp2
UNITS	ppm	ppm	ppm	ppm
DETECTION LIMIT	0.05	0.5	0.01	0.1
DIGEST	4A/	FP6/	4A/	FP6/
ANALYTICAL FINISH	MS	MS	MS	MS
SAMPLE NUMBERS				
0001 Comp 1	47.40	127.2	4.28	9.8
0002 Comp 2	55.34	133.5	4.32	10.6
0003 Comp 3	35.61	105.2	2.67	7.2
0004 Comp 4	46.38	125.2	3.40	9.1
STANDARDS				
0001 AMIS0124				
0002 WGB-1	14.00		1.31	
0003 Acid Blank		0.6		X
0004 BCS381		8.2		0.6
0005 TRM-2		1044.3		52.8
0006 MPL-5		32.4		2.2
0007 SY-4		127.6		16.1
0008 OREAS 45P		19.7		2.6
0009 AMIS0167		24.1		2.2
0010 AMIS0124				
0011 AMIS0074				
BLANKS				
0001 Control Blank	X		X	
0002 Control Blank	X		X	
0003 Acid Blank	X		X	
0004 Control Blank		X		X
0005 Control Blank		X		X
0006 Control Blank				

A.3 KARAGANDA ASSAY CERTIFICATE (TRANSLATION)

KZ.И.10.0109

Testing Centre TOO Tsentrolanaleet

100008, Karaganda, Boulvar Mira, 12; tel/fax: 8(7212) 42-60-39

Laboratory of analytic studies

100008, Karaganda, Boulvar Mira, 12; tel/fax: 8(7212) 42-60-38

Order No 902-129-11

Ordered by TOO Firma Balausa

120700 Kyzylorda obl., Sieli region, Shieli GRP-2

Deposit Balasausqandiq

Method of process: photometric

Date of test: 10.11.2011

Total pages 3

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TEST REPORT

№ p/p	№ Lab	№ test	V_2O_5, %
1	1	B335-1	0.060
2	2	B335-2	0.105

3	3	B335-3	0.100
4	4	B335-4	0.140
5	5	B335-5	0.210
6	6	B335-6	0.210
7	7	B335-7	0.200
8	8	B335-8	0.106
9	9	B335-9	0.340
10	10	B335-10	0.410
11	11	B335-11	0.540
12	12	B335-12	0.150
13	13	B335-13	0.240
14	14	B335-14	0.210
15	15	B335-15	0.310
16	16	B335-16	0.610
17	17	B335-17	0.590
18	18	B335-18	0.670
19	19	B335-19	0.510
20	20	B335-20	0.400
21	21	B335-21	0.830
22	22	B335-22	0.710
23	23	B335-23	0.560
24	24	B335-24	1.240

25	25	B335-25	1.100
26	26	B335-26	0.770
27	27	B335-27	0.900
28	28	B335-28	0.310
29	29	B335-29	0.620
30	30	B335-30	0.330
31	31	B335-31	1.160
32	32	B335-32	0.490
33	33	B335-33	0.520
34	34	B335-34	0.440
35	35	B335-35	0.180
36	36	B335-36	0.380
37	37	B335-37	0.226
38	38	B335-38	0.380
39	39	B335-39	0.390
40	40	B335-40	0.370
41	41	B335-41	0.330
42	42	B335-42	0.240
43	43	B335-43	0.440
44	44	B335-44	0.190
45	45	B335-45	0.226
46	46	B335-46	0.240

47	47	B335-47	0.180
48	48	B335-48	0.200
49	49	B335-49	0.210
50	50	B335-50	0.290
51	51	B335-51	0.180
52	52	B335-52	0.110
53	53	B335-53	0.180
54	54	B335-54	0.150
55	55	B335-55	0.130
56	56	B335-56	0.140
57	57	B335-57	0.140
58	58	B212,5-1	0.130
59	59	B212,5-2	0.190
60	60	B212,5-3	0.300
61	61	B212,5-4	0.650
62	62	B212,5-5	0.580
63	63	B212,5-6	0.670
64	64	B212,5-7	1.360
65	65	B212,5-8	0.820
66	66	B212,5-9	0.470
67	67	B212,5-10	0.570
68	68	B212,5-11	0.580

69	69	B212,5-12	0.470
70	70	B212,5-13	0.470
71	71	B212,5-14	0.870
72	72	B212,5-15	0.830
73	73	B212,5-16	0.190
74	74	B212,5-17	0.340
75	75	B212,5-18	0.800
76	76	B212,5-19	0.680
77	77	B212,5-20	1.230
78	78	B212,5-21	0.760
79	79	B212,5-22	0.660
80	80	B212,5-23	0.480
81	81	B212,5-24	0.670
82	82	B212,5-25	0.180
83	83	B212,5-26	0.080
84	84	B212,5-27	0.102
85	85	B312,5-1	0.250
86	86	B312,5-2	0.086
87	87	B312,5-3	0.320
88	88	B312,5-4	0.470
89	89	B312,5-5	0.390
90	90	B312,5-6	0.360

91	91	B312,5-7	0.370
92	92	B312,5-8	1.022
93	93	B312,5-9	0.530
94	94	B312,5-10	0.600
95	95	B312,5-11	0.880
96	96	B312,5-12	0.630
97	97	B312,5-13	0.980
98	98	B312,5-14	0.710
99	99	B312,5-15	0.650
100	100	B312,5-16	0.190
101	101	B312,5-17	0.220
102	102	B312,5-18	0.170
103	103	B312,5-19	0.410
104	104	B412,5-1	0.110
105	105	B412,5-2	0.090
106	106	B412,5-3	0.135
107	107	B412,5-4	0.170
108	108	B412,5-5	0.540
109	109	B412,5-6	0.820
110	110	B412,5-7	0.570
111	111	B412,5-8	0.510
112	112	B412,5-9	0.630

113	113	B412,5-10	0.960
114	114	B412,5-11	0.310
115	115	B412,5-12	0.620
116	116	B412,5-13	0.300
117	117	B412,5-14	0.420
118	118	B412,5-15	0.540
119	119	B412,5-16	0.43
120	120	B412,5-17	0.540
121	121	B412,5-18	0.410
122	122	B412,5-19	0.830
123	123	B412,5-20	0.880
124	124	B412,5-21	1.150
125	125	B412,5-22	0.680
126	126	B412,5-23	0.330
127	127	B412,5-24	0.150
128	128	B412,5-25	0.102
129	129	B412,5-26	0.062

This protocol applies only to the samples tested

Chief of laboratory

analytic studies K.R. Tyo

APPENDIX B. PRE 2008 METALLURGICAL TESTWORK LISTING

During 1998 to 2006, a series of engineering works and heavy industrial testing was undertaken to determine the optimal processing technology and these are detailed in Table 12-1.

Table 12-1: Industrial Testing 1998 to 2006

#	Name	Year
1	Laboratory testing technology of vanadium pentoxide direct pyrometallurgical method for Achpolimetall plant (Kazakhstan);	1999-2000
2	Large-scale technological tests pirometallurgical process for the preparation of vanadium pentoxide on Achpolimetall plant (Kazakhstan);	2000-2001
3	Technological tests produce vanadium pentoxide in parallel with chrome salts on Chilisai plant (Kazakhstan);	2002
4	Technological tests produce vanadium pentoxide in parallel with the rare earths at Ulba Metallurgical Plant (Kazakhstan);	2003
5	Technological tests produce ferrosilicon vanadium- technology electro Chelyabinsk plant and Novokuznetsk ferroalloy plant (Russia);	2003
6	Technological tests use vanadium quartzite as a flux Novodzhambyl phosphorus plant (Kazakhstan);	2012
7	Pilot testing of vanadium quartzite at JSC "Izhora Plants" (St. Petersburg, Russia) direct reduction of vanadium ore solution in cryolite ;	2012
8	Large- development of the technology obtaining standard vanadium ferroalloys FS -45 and FS -65 with parallel dephosphorization pilot production Karaganda Chemical and Metallurgical Institute;	2005
9	Large- test vanadium ore as vanadium flux at the Nizhny Tagil Metallurgical Combine (Russia).	2005
10	Semi- industrial tests and heap leaching quartzites Kara- Tau -based Institute Kazmekhanobr and "Vostokredmet " (Tajikistan) .	2006

12.1.1.1 RESEARCH AND DEVELOPMENT BALAUSA, AUTOCLAVE LEACHING TECHNOLOGY

Table 12-2 sets out in chronological sequence the research and development carried out by FAR to determine optimal industrial chemistry and mineral processing characteristics associated with the pilot plant.

Table 12-2: Research and Development Balausa

#	Name	Contractor	Place	Year
1	Development of technology for the processing of ammonium metavanadate in ferrovanadium FV -80	TOO “Floga”	Almaty Kazakhstan	2007
2	Specifications for ammonium metavanadate produced LLP " The Company " Balausa "	№ 38088316-01-2007, Kometee of standardization of Kazakhstan	Astana Kazakhstan	2007

#	Name	Contractor	Place	Year
3	Research report carbonaceous samples carbon-silicon composite physicochemical methods	Institute of electrochemistry	Almaty Kazakhstan	2008
4	Sanitary-epidemiological conclusion on the safety of radioactive ore Bala Sauskandyk	Kyzil-Orda sanitary inspection	Kyzylorda Kazakhstan	2008
5	Conclusion on carbon black derived from black shales deposit Bala Sauskandyk	Central certification lab of construction materials	Almaty Kazakhstan	2008
6	Pressure leaching vanadium ore Bala Sauskandyk	Stepnogorsk chemical-metallurgical plant	Stepnogorsk Kazakhstan	2009
7	Development sorption technology of complex processing of black shale ores components Big Kara -Tau on large- sample (overall analysis of the results of work performed for the processing of black shale ores Big Kara- Tau deposit Bala Sausqandyk)	National center of mineral resources< lab of vanadium and titanium	Almaty, Kazakhstan	2009
8	Conducting the initial phase of the integrated test enrichment ore Bala Sauskandyk for vacuum aeration installation	National center of mineral resources< lab of vanadium and titanium	Almaty, Kazakhstan	2009
9	Hours of carbon-containing products from tailings leach ore Bala Sausqandyk	Institute Kazmechanobr	Almaty, Kazakhstan	2009
10	Study and development of the technology of carbon from shale Kara- Tau	National center of mineral resources< lab of vanadium and titanium	Almaty Kazakhstan	2009
11	Study and development of technology for integrated extraction of uranium , molybdenum, rare earth elements (REE) , carbon -silicon composite of black shales Kara- Tau with concurrent utilization of flux and potash alum (initial data for designing the plant for processing 500,000 tonnes of black shale ore Bala Sausqandyk)	National center of mineral resources< lab of vanadium and titanium	Almaty Kazakhstan	2010
12	Development of technology for the production of ammonium metavanadate of black shale deposits Bala Sauskandyk	Doctor level of Ayimbetova I. (chief of Balausa lab)	Almaty Kazakhstan	2010
13	Act pilot tests autoclave processing and sulfuric acid sorption from solutions of black shale vanadium vanadium ore.	National center of mineral resources< lab of vanadium and titanium	Almaty Kazakhstan	2010
14	Technological scheme of pilot tests on a representative sample of the deposit Bala Sausqandyk in volume 5000 kg	Central institute of chemical technology	Moskow, Russia, Rosatom	2010
15	Preliminary results of tests node decarbonization, autoclaving and washing and sulfated oxidized black shale ores Bala Sausqanyk	Central institute of chemical technology	Moskow, Russia, Rosatom	2010
16	Initial datas for detail engineering for "The Company " Balausa "	Central institute of chemical technology	Moskow, Russia, Rosatom	2010

#	Name	Contractor	Place	Year
17	Test carbon nanomaterials from ultrafine black shales Kara- Tau (Bala Sausqandyk)	National center of mineral resources< lab of vanadium and titanium	Almaty, Kazakhstan	2010
18	Engineering calculations for tailings ore Bala Sauskandyk	TOO “Bekka”	Semsk, Kazakhstan	2010
19	Development of technology for the production of briquettes from sludge deposits Bala Sauskandyk for ferroalloys	National center of mineral resources< lab of vanadium and titanium	Almaty Kazakhstan	2010
20	Development of autoclave technology of complex processing of black shale ores Kazakhstan (d. Bala Sausqandyk)	National center of mineral resources< lab of vanadium and titanium	Almaty Kazakhstan	2011
21	Conduct pilot testing technology of complex processing black shale deposits Bala Sauskandyk	National center of mineral resources< lab of vanadium and titanium	Almaty Kazakhstan	2011
22	Bond index definition of working procedure of ore deposits Bala Sausqandyk	NII"Kazmekanobre"	Almaty Kazakhstan	2011
23	Laboratory testing of carbon- silicon composite "The Company " Balausa "	RGP "Institute of firing"	Almaty Kazakhstan	2011
24	Autogenous pressure leaching vanadium from black shale deposits Bala Sausqandyk	Central institute of chemical technology	Moskow, Russia, Rosatom	2011
25	Initial data for the installation Designing POX processing of black shales (capacity 15,000 tonnes of ore per annum)	Central institute of chemical technology	Moskow, Russia, Rosatom	2011
26	Research and conduct pilot tests to obtain ferroalloys from black shale deposits of sludge Bala Sausqandyk	Chemical-metallurgical institute	Karaganda, Kazakhstan	2011
27	Development of an integrated processing technology black shale deposits Bala Sausqandyk	National center of mineral resources< lab of vanadium and titanium	Almaty, Kazakhstan	2012
28	Production schedules industrial development ores Bala Sausqandyk	National center of mineral resources< lab of vanadium and titanium	Almaty, Kazakhstan	2012
29	Production of ferro-vanadium , enterprise standard for LLP " The Company " Balausa "	TOO “Floga”	Almaty, Kazakhstan	2013
30	Production schedules for the production of ferro-vanadium FV - 50 of ammonium metavanadate for LLP " The Company " Balausa "	TOO “Floga”	Almaty, Kazakhstan	2013
31	Work organization project area receiving ferrovanadium FV -50 " The Company " Balausa "	TOO “Floga”	Almaty, Kazakhstan	2013
32	Investigation and determination of optimal conditions agglomeration black shale deposits of sludge Bala Sausqandyk by briquetting	Chemical-metallurgical institute	Karaganda, Kazakhstan	2013

APPENDIX C. JORC 2012 – TABLE 1

SECTION 1 SAMPLING TECHNIQUES AND DATA

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

Criteria	JORC Code explanation	Commentary
Sampling techniques	• *Nature and quality of sampling (eg cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheld XRF instruments, etc). These examples should not be taken as limiting the broad meaning of sampling.* • *Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.* • *Aspects of the determination of mineralisation that are Material to the Public Report.* • *In cases where 'industry standard' work has been done this would be relatively simple (eg 'reverse circulation drilling was used to obtain 1 m samples from which 3 kg was pulverised to produce a 30 g charge for fire assay'). In other cases more explanation may be required, such as where there is coarse gold that has inherent sampling problems. Unusual commodities or mineralisation types (eg submarine nodules) may warrant disclosure of detailed information.*	• FAR's main sampling technique was by surface core drilling and the quality was acceptable for appropriate assessment of the resource. • Former Soviet-era sampling from the 1940s to 1960s of the surface exposures included continuous cross-strike channel samples and channel sampling from shallow u/g excavations: quality unknown but it showed a vast resource with a strike length of several kilometers (sample results not used for resource estimates). • In the 1970s,Soviet-era shot-drilling and single-barrel diamond drilling had poor core recovery but provided information on the primary zone (95%+ of the total resource) beneath the oxide cap. All holes gamma logged. • In a 1990-91 drilling campaign however, (section 4.5.1.4 of report) the reported soundness of the 1970s V_2O_5 grades were confirmed and FAR's twin drilling also supported the credibility of the historical results.
Drilling techniques	• *Drill type (eg core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc) and details (eg core diameter, triple or standard tube, depth of diamond tails, face-sampling bit or other type, whether core is oriented and if so, by what method, etc).*	• Diamond drilling using double tube core barrels with a minimum core diameter of 47.3mm (NQ) to 63.5mm (HQ) within the target mineralised zone. Gyro inclinometry was used to trace the drillhole after completion, though drill holes were basically straight.

Criteria	JORC Code explanation	Commentary
Drill sample recovery	• *Method of recording and assessing core and chip sample recoveries and results assessed.* • *Measures taken to maximise sample recovery and ensure representative nature of the samples.* • *Whether a relationship exists between sample recovery and grade and whether sample bias may have occurred due to preferential loss/gain of fine/coarse material.*	• The contractor provided a 90%+ core recovery within the mineralised horizon: core from each run was re-assembled and measured to determine the recovery against the actual run length. This was supervised by FAR's geologist. • The drill site geologist was able determine when the drillhole was near the target depth and the driller was able to reduce the bit pressure when needed and take shorter runs to help maximize recovery in softer zones. • No discernible relationship was found between core recovery and grade and, any detrimental bias considered to be negligible.
Logging	• *Whether core and chip samples have been geologically and geotechnically logged to a level of detail to support appropriate Mineral Resource estimation, mining studies and metallurgical studies.* • *Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc) photography.* • *The total length and percentage of the relevant intersections logged.*	• Core has been geologically logged and is appropriate for resource estimations. A separate core drilling programme for geotechnical and metallurgical samples has yet to be implemented. • The historical drillhole logs (passports) from the 1970s are extremely comprehensive, and include gamma log results and V_2O_5 sample grades through the orebody. GMR used these to confirm that the sample grades in the database are correct. FAR's drillhole logs, include code abbreviations to record the geological features of the core, and also record each sample number with depth interval. A graphical log is also produced, showing rock-type symbols. These logs are stored in a spreadsheet format. Core photography was also undertaken. • 100% of the mineralized zones were logged, but generally, only logged about 2m orthogonally from the contact into the surrounding country rocks, as there is a sharp grade cut-off.

Criteria	JORC Code explanation	Commentary
Sub-sampling Techniques and sample preparation	• *If core, whether cut or sawn and whether quarter, half or all core taken.* • *If non-core, whether riffled, tube sampled, rotary split, etc and whether sampled wet or dry.* • *For all sample types, the nature, quality and appropriateness of the sample preparation technique.* • *Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.* • *Measures taken to ensure that the sampling is representative of the in situ material collected, including for instance results for field duplicate/second-half sampling.* • *Whether sample sizes are appropriate to the grain size of the material being sampled.*	• FAR's half core samples were cut by a saw, under the supervision of the geologist to ensure unbiased sampling. See section 4.5.2.4 in report. • Non-core appeared to be extremely rare, as based on site visits by the CP and from photographic evidence. • Descriptions of the historic drillhole sampling are not available, but standard Soviet-era practice involves production of half core samples using a saw, for this type of deposit. • FAR's core was oriented and marked, prior to cutting, to produce identical halves. Half core samples were crushed to 2 mm (crushers 1, 2 and 3 are shown in Figure 4-18), mixed and split using a Jones splitter and a 400 g fraction is extracted for pulverization. The rest of the sample was stored as a coarse reject for future additional analyses. The 400 g samples were ground to -200 mesh (74 μm) and 2 x 200 g samples sent to external accredited laboratories in Australia for analyses. • Sample sizes are appropriate to the primary zones' mineralised grain size.
Quality of assay data and laboratory tests	• *The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.*	• The first batch of pulped core samples, weighing 200g, from FAR's exploration programme, totalling 110 samples, was sent to Intertek in March 2011. The CP requested that Intertek test the validity of using a cheaper multi-acid digestion, vis-à-vis the more expensive sodium peroxide fusion approach, as used in 2009 (see section 4.6.2.1 in report). A comparison of results on 20 test samples confirmed that both methods were similarly accurate in determining the total contained V, Mo, and U elements, and the four-acid digestion approach was therefore adopted for all FAR's exploration sample analyses. A further two batches of samples were sent to Intertek: giving a total of 370 samples. To confirm the

Criteria	JORC Code explanation	Commentary
	• *For geophysical tools, spectrometers, handheld XRF instruments, etc, the parameters used in determining the analysis including instrument make and model, reading times, calibrations factors applied and their derivation, etc.* • *Nature of quality control procedures adopted (eg standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (ie lack of bias) and precision have been established.*	Intertek laboratory results, for external QA/QC assessment, a number of random sample pulp duplicates were re-analysed by the internationally accredited laboratory Ultra Trace, also in Perth, amounting to 14 % (51 samples) of the Intertek samples (see Figure 4-22). Results show excellent precision and accuracy. • FAR installed modern XRF equipment to specifically analyse elements on site. The XRF system is very accurate in quantifying the contained metals and is the preferred technique for the determination of the major oxide elements, as well as some trace elements. However, it needs careful preparation of the samples, plus calibration of standards and matrix corrections and adjustments for drift etc., to avoid false readings. At Balasausqandiq, a press powder technique, vis-à-vis fusion technique, is used but is subject to particle size and matrix effects which increase analytical uncertainty, resulting in lower grade results. However, when the above problems were recognised, sample homogenization improvements by finer sample grinding, for the press powder technique, has improved the XRF accuracy of the results, according to FAR. • Although the CP had made no site visits to the accredited Australian laboratories, extensive telephone discussions with the laboratory managers, showed that their procedures on QA/QC were of a high standard.
Verification of sampling and assaying	• *The verification of significant intersections by either independent or alternative company personnel.* • *The use of twinned holes.*	• Routine inspection of assay grades with drill logs and remaining half-core, by FAR's chief geologist and checks by the CP, confirmed that the weighted intersection grades of the primary zone Orebody 1 (OB1) beneath the oxide cap, are relatively uniform, see Table 4-8, and no significant intersections were found. • FAR drilled a twinned hole, to test the validity of grades in an historic drillhole, from the early 1970s, where there was low core recovery: and the assay results corroborated the historic vanadium results -See

Criteria	JORC Code explanation	Commentary
	• *Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.* • *Discuss any adjustment to assay data.*	section 4.7.5 of report. • FAR retrieved historical data, which included sampling results and drillhole logs, and transcribed for computer storage - this primary data of surface trench sampling, u/g exploration results and diamond drilling were imported into Datamine for downstream computerisation processes. Also, all FAR's generated primary data also computerised and imported into Datamine. This also allowed verification of the data, coupled with routine electronic backups and onto disk drive storage. • No adjustments were made to the assay results.
Location of data points	• *Accuracy and quality of surveys used to locate drill holes (collar and down-hole surveys), trenches, mine workings and other locations used in Mineral Resource estimation.*	• The former Soviet-era maps and plans do not display coordinate data and FAR undertook an extensive topographical re-survey of the Balausa area, which included locations of drillhole collars, sample trenches, adits, shafts and sample pits, and infrastructure. The survey data were compiled in MapInfo, from UMT (WGS84) survey measurements, and from which AutoCAD drawings were generated. These AutoCAD plans were directly imported into Datamine and used for generating topographic wireframe surfaces (digital terrain models). FAR's down-the-hole surveys had an acceptable accuracy. • There were a number of problems in locating the correct historical drillhole standpipe collars for the 1973 exploration holes during field surveys, because of indecipherable or absent identification numbers and, especially, where there was confusion from unknown drillhole collars related to the extensive 1990s drilling campaign: but after diligent examination of the 1973 archived plans and maps, together with the new DM topographic model, it was possible to locate with reasonable certainty, the actual drillhole locations. Based on GMR's independent GPS audit measurements of a number of FAR's surveyed drillhole locations, these were accurate and correlated with the historical plans. However, for a very few drillholes, it was not

Criteria	JORC Code explanation	Commentary
	• *Specification of the grid system used.* • *Quality and adequacy of topographic control.*	possible to exactly reconcile the field survey with the historical plans and topographic surface, and this discrepancy was less than a maximum horizontal displacement of 25 m, which was considered to be within acceptable limits for this resource project. . • FAR's local grid system was made parallel to the old historic grid, as based on the Soviet Gauss Kruger (Pulkovo 42). • The final topographic models proved to be of a high standard.
Data spacing and distribution	• *Data spacing for reporting of Exploration Results.* • *Whether the data spacing and distribution is sufficient to establish the degree of geological and grade continuity appropriate for the Mineral Resource and Ore Reserve estimation procedure(s) and classifications applied.* • *Whether sample compositing has been applied.*	• Experimental variograms of historical surface trench-grade results in the oxide cap, were generated to help plan the drillhole spacing for the exploration programme. These 1946 oxide surface trench samples provided sufficient density coverage to generate acceptable experimental variograms along strike. Although, as expected for the oxide zone, the nugget effect appears quite high relative to the sill, it does indicate that the historical 50m trench spacing along strike was conservative. See section 4.10 in the report. Extensive variogram modelling of the primary zone drillhole sample grades for V2O5%, show that the nugget effect is typically only 10% of the variogram sill, reflecting a high level of grade consistency. These model parameters were used to help form the search ellipsoids for grade interpolations. See section 4.10.2 in the report for details. • The data spacing was sufficient to establish geological and grade continuity of the primary zone for mineral resource estimation and classification accordingly. • All samples were composited to 2m lengths from an average sample length of 1m.

Criteria	JORC Code explanation	Commentary
Orientation of data in relation to geological structure	• *Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.* • *If the relationship between the drilling orientation and the orientation of key mineralised structures is considered to have introduced a sampling bias, this should be assessed and reported if material.*	• Although some minor drillhole orientations can be inconsistent in relation to the mineralised structure, this did not affect the unbiased nature of the sampling, because FAR overcame the complex geometry of the folded structure by generating geometric sub-domains (SW Limb), each with a consistent strike and dip, for the block model, prior to grade estimations. See Figure 4-55 and section 4.12.1 of the report. • The sampling bias was nullified – see the above comments.
Sample security	• *The measures taken to ensure sample security.*	• Soviet-era sample security, although not documented, would have been a high priority and FAR's assessment of analytical results suggest no security issues. FAR's sample security was supervised by the chief geologist, and sample preparation was on site in a secure laboratory. Shipment of pulverized samples to recipient analytical laboratories in Australia and Central Asia were also secure including changing sample numbers and no discrepancies were observed.
Audits or reviews	• *The results of any audits or reviews of sampling techniques and data.*	• Internal audits were conducted by FAR of historical data – see section 4.7.3 of report. Results showed some drillhole discrepancies of up to 25m from the true location and related to the identification of the correct historical drillhole location.

SECTION 2 REPORTING OF EXPLORATION RESULTS

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

Criteria	JORC Code explanation	Commentary
Mineral tenement and land tenure status	• *Type, reference name/number, location and ownership including agreements or material issues with third parties such as joint ventures, partnerships, overriding royalties, native title interests, historical sites, wilderness or national park and environmental settings.* • *The security of the tenure held at the time of reporting along with any known impediments to obtaining a licence to operate in the area.*	• The mineral tenement is 100% held by FAR through its wholly owned subsidiaries. • There are no land restrictions to the site, other than state observance of subsoil extraction regulations. There is no known security or threat of loss issues with the tenement.
Exploration done by other parties	• *Acknowledgment and appraisal of exploration by other parties.*	• Refer to section 4.2 of the report for a detailed summary of the historic exploration programmes of the Soviet era to the present.
Geology	• *Deposit type, geological setting and style of mineralisation.*	• This deposit has geological characteristics in common with vanadium deposits in South China, when in primordial times the Karatau mountains were juxtaposed within the same supercontinent. The stratiform vanadium layer is associated with five very large orebodies and their surface expression can be traced for about 40 km. These orebodies are mostly confined to deep synclinal folds, where the primary carbonaceous vanadium rocks at depth are protected from weathering and oxidation processes. From historical data and from FAR's drilling results, the global grades within these orebodies are relatively similar, and this uniformity is testament to the broad stable conditions during mineralogical deposition in a marine basin some

Criteria	JORC Code explanation	Commentary
		510 million years ago (mid-Cambrian).

Drill hole Information	• *A summary of all information material to the understanding of the exploration results including a tabulation of the following information for all Material drill holes:*
	  ○ *easting and northing of the drill hole collar*
	  ○ *elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar*
	  ○ *dip and azimuth of the hole*
	  ○ *down hole length and interception depth*
	  ○ *hole length.*
	• *If the exclusion of this information is justified on the basis that the information is not Material and this exclusion does not detract from the understanding of the report, the Competent Person should clearly explain why this is the case.*
		• Graphical statistical information on the drillhole samples (Figures 4-44 to 4-50), Figure 4-5 showing a 3D Datamine model profile and a cross section profile of drillholes (Figure 4-39), in the report, all provide critical information on the understanding of the exploration results.
		• Referring to the above comments, tabulations of the drillholes are considered to be unnecessary, but if required these can be obtained from FAR.

Data Aggregation methods	• *In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (eg cutting of high grades) and cut-off grades are usually Material and should be stated.* • *Where aggregate intercepts incorporate short lengths of high grade results and longer lengths of low grade results, the procedure used for such aggregation should be stated and some typical examples of such aggregations should be shown in detail.* • *The assumptions used for any reporting of metal equivalent values should be clearly stated.*	• No data aggregation was undertaken, with all 2m composited sample results used individually to represent the mineralisation characteristics. Quantile analysis was used to assess the U_3O_8, as the coefficient of variation was very high and this statistic indicated that there were some anomalously high grade samples which caused this high ratio. Results of the quantile analysis suggested that top-cutting to 0.1 % was appropriate and Table 4-52 in the report shows an acceptable coefficient of variation ratio. It also resulted in a change in the correlation coefficient from random to a weak correlation trend with V_2O_5. • Metal equivalents are based on indicated and inferred resources of OB1. These by-products are based on their economic sales value in terms of the equivalent V_2O_5%. See Table 1-6.

Criteria	JORC Code explanation	Commentary
Relationship Between mineralisation widths and intercept lengths	• *These relationships are particularly important in the reporting of Exploration Results.* • *If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported.* • *If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (eg 'down hole length, true width not known').*	• The main mineralised zone OB1, is basically a narrow synclinal fold structure and approximate true widths of the sub-vertical side walls can be projected from the surface exposures to depth: and this has been confirmed from the drilling. Additionally, vertical drillholes which intercepted the keel area of the syncline showed the mineralised zone to be abnormally thicker, vis-à-vis the flanks. This thickening is also seen at the nose of the syncline. See Figure 4-56 showing 3D perspective of OB1. Although only some of the drill intercepts on the flanks were orthogonal to the mineralised structure, interactive computer modelling has produced an accurate geometric interpretation of OB1.
Diagrams	• *Appropriate maps and sections (with scales) and tabulations of intercepts should be included for any significant discovery being reported These should include, but not be limited to a plan view of drill hole collar locations and appropriate sectional views.*	• There are a number of diagrams and photos to illustrate the mineralised structures, plus a plan view showing the geology on a Google Earth map (Figure 4-9). Also, refer to Figure 4-10, Figure 4-11, Figure 4-14 and Figure 4-16 showing an unexpected vanadium intersection at 100m depth for OB2.
Balanced reporting	• *Where comprehensive reporting of all Exploration Results is not practicable, representative reporting of both low and high grades and/or widths should be practiced to avoid misleading reporting of Exploration Results.*	• Although all exploration results have not been described, the report does show a balanced perspective and should not lead to any misconceptions.
Other Substantive Exploration data	• *Other exploration data, if meaningful and material, should be reported including (but not limited to): geological observations; geophysical survey results; geochemical survey results; bulk samples – size and method of treatment; metallurgical test results; bulk density, groundwater, geotechnical and rock characteristics; potential deleterious or contaminating substances.*	• All relevant data have been described and included in the report.

Criteria	JORC Code explanation	Commentary
Further work	• *The nature and scale of planned further work (eg tests for lateral extensions or depth extensions or large-scale step-out drilling).* • *Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.*	• Future work recommendations have been described in section 4.20.

SECTION 3 ESTIMATION AND REPORTING OF MINERAL RESOURCES

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

Criteria	JORC Code explanation	Commentary
Database integrity	• *Measures taken to ensure that data has not been corrupted by, for example, transcription or keying errors, between its initial collection and its use for Mineral Resource estimation purposes.* • *Data validation procedures used.*	• Computerised records of various attributes from resource tables to drillhole geology logs and assays, were compared with a random selection of scans from the historical documents and the level of transcription errors were assessed to be low. Confidence in the correct replication of the data in the computerised format, used to evaluate the deposit, is therefore acceptable. • In Datamine, continual checks of the data, during various stages of computer processing, were compared with primary clean databases.
Site visits	• *Comment on any site visits undertaken by the Competent Person and the outcome of those visits.* • *If no site visits have been undertaken indicate why this is the case.*	• 8 to 11 April 2007: Detailed review of operations with technical staff, including field visits with extensive geological examination of orebody related surface exposures. Collected numerous computerised historical documents and maps, plus translated technical reports. Captured and documented GPS locations of the plant and o/p operations. • 4 to 7 June 2009: Reviewed open pit field operations, especially grade control channel sampling and results of analyses in relation to

Criteria	JORC Code explanation	Commentary
		the exposed vanadium layers and geological sample maps. Visited numerous historical sample locations from the 1940s. Established analytical requirements for the FAR exploration programme. • 8 to 11 January 2010: Reviewed progress with technical staff, about diamond drilling, logging, mapping and sampling procedures. Site visits included the new sample preparation laboratory. • 14 to 20 August 2010: Numerous field visits to review the progress of the FAR exploration diamond drilling programme resulting in upgrading a number of procedures to facilitate quality control. Established a requirement for local co-ordinate system to be very accurately correlated with the historical grid and the UMT (WGS84) system. • 8 to 11 December 2010: Continued to monitor the exploration programme and to check that the core sampling and sample preparation procedures are to acceptable international standards.
Geological interpretation	• *Confidence in (or conversely, the uncertainty of) the geological interpretation of the mineral deposit.* • *Nature of the data used and of any assumptions made.* • *The effect, if any, of alternative interpretations on Mineral Resource estimation.* • *The use of geology in guiding and controlling Mineral Resource estimation.* • *The factors affecting continuity both of grade and geology.*	• The data used for geological interpretation have been extensive, from both historic and FAR's drilling campaigns and there is a high confidence level in the interpretation for OB1. • The range of the data employed has been extensive, as clearly shown in the report and assumptions were unnecessary. • Because of the consistency in the V_2O_5 grades and the established continuity of the mineralised primary zone, no alternative interpretation has been necessary. • Local changes in dip and strike of the primary zone were overcome by using sub-domains with similar dips and strike, as detailed in the report. • No obvious factors affecting continuity.

Criteria	JORC Code explanation	Commentary
Dimensions	• *The extent and variability of the Mineral Resource expressed as length (along strike or otherwise), plan width, and depth below surface to the upper and lower limits of the Mineral Resource.*	• OB1 has a strike length of 4.5km and a maximum depth of 200m to the upper contact. Flank thicknesses ranges from 5m to 9m approx. with variable thickening of the mineralised zone at the bottom of the anticline. Note: OB2 to OB5 (see map of these zones Figure 4-9) have been explored during the Soviet era and these have a combined strike length of 21km.
Estimation and modelling techniques	• *The nature and appropriateness of the estimation technique(s) applied and key assumptions, including treatment of extreme grade values, domaining, interpolation parameters and maximum distance of extrapolation from data points. If a computer assisted estimation method was chosen include a description of computer software and parameters used.*	• Ordinary Kriging (OK) was selected as the most appropriate geostatistical approach for estimating the grades into the block model (split into the SW and NE limb submodels) using the modelled variogram parameters as presented in Section 4.10 (see Table 4-55 and Table 4-56). Both V_2O_5 and C were estimated using OK, but for MoO_3 and U_3O_8 only IPD grade interpolations were realistic and IPD for C was required for the SW limb submodel because valid experimental variograms could not be generated due to limited sample assays. Variography results for V_2O_5 exhibited good ranges along strike. For the SW limb, strike 650m, downdip 130m and 15m across the mineralised zone. For the SE limb, strike 550m, downdip 75m and 15m across the mineralised zone. For estimation processing, Datamine software was used.
	• *The availability of check estimates, previous estimates and/or mine production records and whether the Mineral Resource estimate takes appropriate account of such data.* • *The assumptions made regarding recovery of by-products.* • *Estimation of deleterious elements or other non-grade variables of economic significance (eg sulphur for acid mine drainage characterisation).*	• Check estimates using IPD grade interpolations were used to compare with the OK estimations for V_2O_5 and results were very similar: but IPD results were not used for the final resource model. • All products have been estimated as detailed above. • No deleterious elements of economic significance.

Criteria	JORC Code explanation	Commentary
	• *In the case of block model interpolation, the block size in relation to the average sample spacing and the search employed.*	• Testing of the most appropriate block size for allowing sufficient sensitivity, yet keeping the number of blocks to a low optimal level resulted in a fundamental block size of 40 m x 20 m x 20 m (X, Y & Z directions) and these parent blocks were split at the contacts of the orezone wireframe model, according to splitting criteria, resulting in a block dimension of 5 m along the X (easting) direction, 2.5 m along Y (northing) direction and along the Z (elevation) direction the blocks were split exactly at the wireframe contact, resulting in a minimal block dimension of 0.1 m to a maximum dimension of 20 m (mean length of 10.33 m). No subzone identifiers were required for this block model, though later surface oxide blocks would be removed to form a final primary orebody model. Due to the somewhat uniform grade distributions of the commercial products, these variable block sizes are not expected to induce grade biases.
	• *Any assumptions behind modelling of selective mining units.*	• None
	• *Any assumptions about correlation between variables.*	• Good correlations are found between V_2O_5 and Carbon and a weak correlation between U_3O_8 and V_2O_5 within the primary zone.
	• *Description of how the geological interpretation was used to control the resource estimates.*	• See the Geological interpretation above.
	• *Discussion of basis for using or not using grade cutting or capping.*	• Grade cutting or capping of V_2O_5 is not necessary, as grade levels are consistently similar for OB1 within the primary zone, with a sharp grade drop into the waste rocks of the hanging wall and footwall: see grade/ tonnage curve for total V_2O_5 (Figure 4.67). Note: there was cutting of U_3O_8 grades as previously discussed.

Criteria	JORC Code explanation	Commentary
	• *The process of validation, the checking process used, the comparison of model data to drill hole data, and use of reconciliation data if available.*	• Statistical checks on the grade estimates, visual checks with drillhole data and a detailed investigation of the swath plots (Figure 4-56 to Figure 4-63) were used to validate the model.
Moisture	• *Whether the tonnages are estimated on a dry basis or with natural moisture, and the method of determination of the moisture content.*	• The tonnages are determined on a dry basis.
Cut-off parameters	• *The basis of the adopted cut-off grade(s) or quality parameters applied.*	• All material above zero was reported.
	• *Assumptions made regarding possible mining methods, minimum mining dimensions and internal (or, if applicable, external) mining dilution. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential mining methods, but the assumptions made regarding mining methods and parameters when estimating Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the mining assumptions made.*	• The mineralisation is amenable to extraction by conventional open pit mining. The mineral resource does not include any mining dilution.
Metallurgical factors or assumptions	• *The basis for assumptions or predictions regarding metallurgical amenability. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential metallurgical methods, but the assumptions regarding metallurgical treatment processes and parameters made when reporting Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the metallurgical assumptions made.*	• The mineral resource estimate has been based on extensive metallurgical test work, as described in Section 6 of the report. This has been corroborated by the actual process plant performance from the onsite plant.

Criteria	JORC Code explanation	Commentary
Environmental factors or assumptions	• *Assumptions made regarding possible waste and process residue disposal options. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider the potential environmental impacts of the mining and processing operation. While at this stage the determination of potential environmental impacts, particularly for a greenfields project, may not always be well advanced, the status of early consideration of these potential environmental impacts should be reported. Where these aspects have not been considered this should be reported with an explanation of the environmental assumptions made.*	• The mineral property has been assessed by preliminary EIA in accordance with the State of Kazakhstan requirements.
Bulk density	• *Whether assumed or determined. If assumed, the basis for the assumptions. If determined, the method used, whether wet or dry, the frequency of the measurements, the nature, size and representativeness of the samples.* • *The bulk density for bulk material must have been measured by methods that adequately account for void spaces (vugs, porosity, etc), moisture and differences between rock and alteration zones within the deposit.* • *Discuss assumptions for bulk density estimates used in the evaluation process of the different materials.*	• The bulk density of 2.4 was used in the resource estimation: see section 4.6.7 of the report for details.
Classification	• *The basis for the classification of the Mineral Resources into varying confidence categories.* • *Whether appropriate account has been taken of all relevant factors (ie relative confidence in tonnage/grade estimations, reliability of input data, confidence in continuity of geology and metal values,*	• The JORC classification of the model was based upon search ellipsoids which were used to define JORC ‘Indicated’ and ‘Inferred’ resources. The processes were quite involved and details are presented in section 4.12.2 (SW Limb estimation), section 4.12.3 (NE Limb Estimation) and section 4.12.4 (Grade Block Model) of the report. • All these factors were addressed.

Criteria	JORC Code explanation	Commentary
	quality, quantity and distribution of the data). • *Whether the result appropriately reflects the Competent Person's view of the deposit.*	• The results do reflect the Competent Person's view of the deposit.
Audits or reviews	• *The results of any audits or reviews of Mineral Resource estimates.*	• Internal reviews of the resource have been undertaken.
Discussion of Relative accuracy/ confidence	• *Where appropriate a statement of the relative accuracy and confidence level in the Mineral Resource estimate using an approach or procedure deemed appropriate by the Competent Person. For example, the application of statistical or geostatistical procedures to quantify the relative accuracy of the resource within stated confidence limits, or, if such an approach is not deemed appropriate, a qualitative discussion of the factors that could affect the relative accuracy and confidence of the estimate.* • *The statement should specify whether it relates to global or local estimates, and, if local, state the relevant tonnages, which should be relevant to technical and economic evaluation. Documentation should include assumptions made and the procedures used.* • *These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.*	• The CP is confident in the accuracy of the Mineral resource, as supported by graphical and various statistical investigations. Additionally, strong mineralization continuity and consistent grade distributions support this confidence in the global resource for the primary zone of the OB1 model.

SECTION 4 ESTIMATION AND REPORTING OF ORE RESERVES

(Criteria listed in section 1, and where relevant in sections 2 and 3, also apply to this section.)

Criteria	JORC Code explanation	Commentary

Not Applicable

SECTION 5 ESTIMATION AND REPORTING OF DIAMONDS AND OTHER GEMSTONES

(Criteria listed in other relevant sections also apply to this section. Additional guidelines are available in the 'Guidelines for the Reporting of Diamond Exploration Results' issued by the Diamond Exploration Best Practices Committee established by the Canadian Institute of Mining, Metallurgy and Petroleum.)

Criteria	JORC Code explanation	Commentary

Not Applicable