Technical Report

Title:	**OKANJANDE GRAPHITE PROJECT** **Preliminary Economic Assessment Study Report**
ISSUED to:	**Northern Graphite**
Location:	**Namibia, Otjozondupa Region**
DATE:	**01/07/2022**
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LEAD CONSULTANT

Name	Project Role	Company	Date	Signature
Etienne Roux	Lead Consultant	CREO Engineering Solutions	01/07/2022	

PROJECT OWNER

Name	Project Role	Company	Date	Signature
Dave Marsh	Client	Northern Graphite Corporation	01/07/2022	
Greg Bowes	Project Sponsor	Northern Graphite Corporation	01/07/2022	

QUALIFIED PERSONS SIGNATURES

This report entitled "OKANJANDE GRAPHITE PROJECT - Preliminary Economic Assessment Study Report", of February 25, 2022 and dated June 08, 2022 was prepared and signed by the following authors:

Competent Person	Company		Date	Signature
Etienne Roux	CES		01/07/2022	
Veronique Daigle	KP		01/07/2022	
Robert Barnett	MSA		01/07/2022	
Ipelo Gasela	MSA		01/07/2022	
Mark Mohring	MSA		01/07/2022	

CERTIFICATE OF QUALIFIED PERSON

Etienne Roux

I, Etienne Roux, Director at Creo Engineering Solutions and SME Registered Member, of Windhoek, Namibia, as an author of the technical report entitled "OKANJANDE GRAPHITE PROJECT: Preliminary Economic Assessment Study Report, Otjozondupa Region, Namibia" (the "PEA Report") with an effective date of 31 May 2022 and a report date of 1 July, 2022 prepared for Northern Graphite Corporation (the "Issuer"), do hereby certify:

1) I am currently employed as a Director at Creo Engineering Solutions Pty Ltd, 1551 Sam Nujoma Drive, Tsumeb, Namibia.
2) This certificate applies to the PEA report titled "OKANJANDE GRAPHITE PROJECT Preliminary Economic Assessment Study Report", NI 43-101 PEA Report, that has an effective date of 25 February 2022 and a report date of 8 June 2022 (the PEA Report).
3) I graduated with a Bachelor of Science degree in Chemical Engineering in 1999 from the University of Stellenbosch, South Africa.
4) I am a Registered Member (#04155055) of the Society of Mining, Metallurgy and Exploration (SME).
5) I have been employed an engineer continuously for over 19 years. My experience includes mineral processing and extractive metallurgy, process operations and management, process and infrastructure design and project management at various Zinc, Copper, Gold and other operations and research facilities in Africa, South America, Europe and North America. I have worked continuously as a consultant to mining operations since 2017.
6) I have read the definition of "Qualified Person" set out in National Instrument 43-101 – *Standards for Disclosure for Mineral Projects* ("NI 43-101") and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfil the requirements to be a "Qualified Person" for the purposes of NI 43-101.
7) I made personal inspections of the Okanjande Project site during December 2021, January and February 2022.
8) I am responsible for Sections 1, 2, 3, 13, 17, 18, 19, 21, 22, 24, 25, 26, 27 and 28 and co-responsible for Sections 5 of the PEA Report.
9) I am independent of the Issuer as independence is described in Section 1.5 of NI 43-101.
10) Prior to being retained by the Issuer, I have not had prior involvement with the property that is the subject of the PEA Report.
11) I have read NI 43-101 and Form 43-101F1, and the portions of the PEA Report for which I am responsible have been prepared in compliance with NI 43-101.
12) As of the effective date of the PEA Report, to the best of my knowledge, information and belief, the portions of the PEA Report for which I am responsible contain all scientific and technical information that is required to be disclosed to make the portions of the PEA Report for which I am responsible not misleading.

Dated: July 1, 2022

(signed/sealed)

Etienne Roux, SME-RM

CERTIFICATE OF QUALIFIED PERSON

Robert Barnett

I, Robert Nicholas Barnett, Pr. Sci. Nat. do hereby certify that:

1) I am an Associate Consulting Geologist of: The MSA Group (Pty) Ltd Henley House Greenacres Office Park, Victory Rd, Victory Park, Randburg, 2195
2) This certificate applies to the technical report titled "Northern Graphite Corporation, Okanjande Mineral Resource Estimate, Namibia, NI 43-101 Technical Report, that has an effective date of 29 November 2021 and a report date of 15 December 2021 (the Technical Report).
3) I graduated with a degree in BSc Eng Mining Geology from the University of the Witwatersrand in 1972. In addition, I have obtained an MSc Industrial Mineralogy in 1979 at Hull University.
4) I am a Fellow of the Geological Society of South Africa, a Professional Natural Scientist (Pr. Sci. Nat) registered with the South African Council for Natural Scientific Professions (SACNASP), and a member of the Zimbabwe Geological Society.
5) I have worked as a geologist for a total of 49 years, during which time I have worked in a wide range of roles ranging from base metal prospecting, industrial mineral prospecting and mining, manager of an industrial mineral laboratory, industrial mineral product research and industrial mineral market studies. I have had extensive experience in the mineral fields of graphite, limestone, clays, vermiculite, silica, talc and abrasive minerals.
6) I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfil the requirements to be a "qualified person" for the purposes of NI 43-101.
7) I visited the Okanjande Graphite Mine property on 29 September 2021 for one day. I again visited the Property from 19 to 21 October 2021.
8) I am responsible for Section 2, 3, 4, 5, 7, 8, 9, 10 and 19; and co-responsible for, the preparation of sections 1, 11, 12, 23, 24, 25, 26 and 27 of the Technical report.
9) I have not had prior involvement with the property that is the subject of the Technical Report.
10) I am not aware of any material fact or material change with respect to the subject matter of the Technical Report that is not reflected in the Technical Report, the omission to disclose which makes the Technical Report misleading.
11) I am independent of the issuer according to the definition of independence described in section 1.5 of National Instrument 43-101.
12) I have read National Instrument 43-101 and Form 43-101F1 and, as of the date of this certificate, to the best of my knowledge, information and belief, those portions of the Technical Report for which I am responsible have been prepared in compliance with that instrument and form.
13) I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication by them for regulatory purposes, including electronic publication in the public company files on their websites accessible by the public, of the Technical Report.

Dated: July 1, 2022

(signed/sealed) ______________________________

Robert Barnett, M (Eng); NHDip; BSc Geology (Hons), Pr Sci Nat, FGSSA

CERTIFICATE OF QUALIFIED PERSON

<u>Ipelo Gasela</u>

I, Ipelo Golang Rebecca Gasela, Pr. Sci. Nat. do hereby certify that:

1. I am a Senior Mineral Resource Consultant of: The MSA Group (Pty) Ltd Henley House Greenacres Office Park, Victory Rd, Victory Park, Randburg, 2195
2. This certificate applies to the technical report titled “Northern Graphite Corporation, Okanjande Mineral Resource Estimate, Namibia”, NI 43-101 Technical Report, that has an effective date 29 November 2021 and a report date of 15 December 2021 (the Technical Report).
3. I graduated with a B.Sc. (Hons) degree in Geology from the University of the Witwatersrand in 2004. I also obtained a M.Sc. (Eng) from the University of the Witwatersrand in 2018.
4. I am a Professional Natural Scientist (Pr. Sci. Nat) registered with the South African Council for Natural Scientific Professions (SACNASP) and a Member of the Geological Society of South Africa (GSSA).
5. I have worked as a Geologist for a total of 17 years, during which time I have worked in a number of roles; as an Evaluation Management trainee and a Senior Evaluator at a mine and corporate office for a mining company and a Mineral Resource consultant for mining consultancies, where I have undertaken Mineral Resource estimates, due diligence reviews and audits for a variety of commodities including graphite.
6. I have read the definition of “qualified person” set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfil the requirements to be a “qualified person” for the purposes of NI 43-101.
7. I have not visited the Okanjande Graphite Mine property.
8. I am responsible for Section 14 and co-responsible for sections 11, 12, 23, 24, 25 ,26 and 27 of the Technical Report.
9. I have not had prior involvement with the property that is the subject of the Technical Report.
10. I am not aware of any material fact or material change with respect to the subject matter of the Technical Report that is not reflected in the Technical Report, the omission to disclose which makes the Technical Report misleading.
11. I am independent of the issuer according to the definition of independence described in section 1.5 of National Instrument 43-101.
12. I have read National Instrument 43-101 and Form 43-101F1 and, as of the date of this certificate, to the best of my knowledge, information and belief, those portions of the Technical Report for which I am responsible have been prepared in compliance with that instrument and form.
13. I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication by them for regulatory purposes, including electronic publication in the public company files on their websites accessible by the public, of the Technical Report.

Dated: July 1, 2022

<u>*(signed/sealed)*</u>

Ipelo Golang Rebecca Gasela, Pr. Sci. Nat, MGSSA

CERTIFICATE OF QUALIFIED PERSON

Mark Richard Mohring

I, Mark Richard Mohring, Consulting Associate Mining Engineer with MSA Group (Pty) Ltd, and Registered Professional Engineer, as a co-author of the technical report entitled "OKANJANDE GRAPHITE PROJECT: Preliminary Economic Assessment Study Report, Otjozondupa Region, Namibia" (the "PEA Report") with an effective date of 31 May 2022 and a report date of 1 July, 2022 prepared for Northern Graphite Corporation (the "Issuer"), do hereby certify:

1) I am currently employed as a Consulting Associate Mining Engineer with MSA Group (Pty) Ltd, Henley House, Greenacres Office Park, Johannesburg
2) This certificate applies to the PEA report titled "OKANJANDE GRAPHITE PROJECT Preliminary Economic Assessment Study Report", NI 43-101 PEA Report, that has an effective date of 25 February 2022 and a report date of 8 June 2022 (the PEA Report).
3) I graduated with a Bachelor of Science Mining Engineering in 1995 from the University of the Witwatersrand, South Africa.
4) I am a Registered Engineer (#20060170) in terms of the Engineering Profession Act,200 (ActNo.46 of 2000) with the Engineering Council of South Africa (ECSA).
5) I am a registered member of Southern African Institute of Mining and Metallurgy (SAIMM)
6) I have been employed an engineer continuously for over 25 years. My experience includes mine management, design and planning at various coal and gold and other operations in Southern Africa. I have been a mining consultant to various mining operations in Africa, providing mine design and planning services, mining reserve determination and sign off, mine and project valuation, financial and operational analysis of operating mines and Greenfields projects
7) I have worked continuously as a consultant to mining operations since 2008.
8) I have read the definition of "Qualified Person" set out in National Instrument 43-101 – *Standards for Disclosure for Mineral Projects* ("NI 43-101") and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfil the requirements to be a "Qualified Person" for the purposes of NI 43-101.
9) I made personal inspections of the Okanjande Project site during May 2021.
10) I am responsible for Section 15 and 16 of the PEA Report.
11) I am an independent of the Issuer as independence is described in Section 1.5 of NI 43-101.
12) I have read NI 43-101 and Form 43-101F1, and the portions of the PEA Report for which I am responsible have been prepared in compliance with NI 43-101.
13) As of the effective date of the PEA Report, to the best of my knowledge, information and belief, the portions of the PEA Report for which I am responsible contain all scientific and technical information that is required to be disclosed to make the portions of the PEA Report for which I am responsible not misleading.

Dated: July 1, 2022

(signed/sealed)
Mark Mohring

CERTIFICATE OF QUALIFIED PERSON

Veronique Daigle

I, Veronique Daigle, am a Lead Professional Engineer and Director at Knight Piésold Consulting (Pty) Ltd. (Registration 2008:0657), Windhoek, Namibia, and an author of the report entitled "OKANJANDE GRAPHITE PROJECT: Preliminary Economic Assessment Report, Otjozondupa Region, Namibia" with an effective date of May 31, 2022 and a report date of 1 July 2022 (the "PEA Report") prepared for Northern Graphite Corporation (the "Issuer"). I do hereby certify:

1. I am employed as Lead Engineer and Director at Knight Piésold Consulting (Pty) Ltd (registration 2008:0657), at 11 Nelson Mandela, Klein Windhoek, Windhoek, Namibia,
2. This certificate applies to the PEA Report titled "N.I. 43-101 Preliminary Economic Assessment Report for the Okanjande Project, Otjozondupa Region, Namibia", with an Effective Date of February 25, 2022 (the "PEA Report").
3. I graduated with a Civil Engineering Degree (Cooperative Program) in 2006 from the Université de Sherbrooke, in the Province of Québec, Canada.
4. I am a member in good standing with the Engineering Council of Namibia, and Registered as Professional Engineer (license number PE2017-19) since 2017.
5. My Relevant Experience includes 15 years of continuous experience in tailings, geotechnical engineering and water management employed at Knight Piésold. In that time, I have been involved in preliminary and feasibility studies design, construction, operational review, risk analysis, and dam safety inspection of mining dams through North America including the Arctic, Western and Southern Africa, the Middle East and Europe. I am a member in good standing with the South African Committee on Large Dams, the Canadian Dam Association, and the Ordre des Ingenieurs du Quebec, Canada.
6. I have read the definition of "Qualified Person" set out in Canadian National Instrument 43-101 – Standards for Disclosure for Mineral Projects ("NI 43-101") and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfil the requirements to be a "Qualified Person" for the purposes of NI 43-101.
7. I visited the Okanjande Mine site as well as the Okorusu Processing and waste disposal site facilities ("the Project").
8. I am co-author of the PEA Report and am responsible for Section 20 and for inputs in Sections 16, 21, 25 and 26 of the PEA Report.
9. I am independent of Northern Graphite Corporation, the Issuer, as independence is described in Section 1.5 of NI 43-101.
10. Prior to being retained by the Issuer, I have been involved in the design, construction and inspection of the existing Graphite Tailings Storage Facility eastern extension at the Okorusu processing site.
11. I have read NI 43-101 and Form 43-101F1, and the Relevant Sections of the PEA Report for which I am responsible have been prepared in compliance with NI 43-101.
12. As of the effective date of the PEA Report, to the best of my knowledge, information and belief, the Relevant Sections of the PEA Report for which I am responsible contain all scientific and technical information that is required to be disclosed to make the portions of the PEA Report for which I am responsible not misleading.

Dated: July 1, 2022

(signed/sealed)

Veronique Daigle, Director at Knight Piésold Consulting (Pty) Ltd

1 EXECUTIVE SUMMARY

(Prepared by CREO Engineering Solutions (Pty) Ltd.)

1.1 INTRODUCTION

1.1.1 Issuer

Northern Graphite Corporation ("Northern" or the "Company"), a Canadian company listed on the TSX Venture Exchange ("TSX-V"), recently acquired 100 per cent ownership of Imerys Gecko Holdings (Pty) Ltd ("Holdings") which in turn owns a 100 per cent interest in Imerys Gecko Graphite (Namibia) (Pty) Ltd ("IGG") and a 100 per cent interest in Imerys Gecko Okanjande Mining (Pty) Ltd ("IGOM"). Collectively, Holdings, IGG and IGOM are referred to as the "JV" or "Imerys-Gecko" as they operate as one under joint management and control.

IGOM holds Mining Licence ("ML") 196 (the "Property") which covers the Okanjande graphite deposit and is located approximately 23 kilometers ("km") by road to the southwest of the town of Otjiwarongo, 230km north of Windhoek, the capital city of the Republic of Namibia ("Namibia"), and 388km east from the port of Walvis Bay. The previously producing Okanjande graphite Mine, active from 2017 to 2018, is located on the Property. The Okanjande graphite Mine is currently under care and maintenance, with no mining taking place. IGOM also holds Exclusive Prospecting Licence ("EPL") 4717 which surrounds the mining licence.

IGG owns all the equipment necessary to process graphite-bearing material and produce a saleable concentrate. The equipment is located on land and in buildings leased from Okorusu Fluorspar (Pty) Ltd at the idle Okorusu Fluorspar mine site ("Okorusu"). Okorusu is 60 km, by road, northeast of Otjiwarongo and is located on Mining Licence ML 90, held by Okorusu Fluorspar (Pty) Ltd.

Historically, mining started at the Okanjande graphite Mine in August 2017, with the run of mine ("RoM") graphite-bearing material trucked to Okorusu for processing, and continued until October 2018 when operations at the Okanjande graphite Mine ceased and the Okanjande graphite Mine was placed on care and maintenance.

Imerys SA ("Imerys") spent more than USD 50 million to retrofit the Okorusu plant to produce graphite concentrate and earned a 51 percent interest in Holdings. The process plant experienced a number of start-up issues and failed to meet design specifications in terms of throughput, recoveries and flake size distribution. The operation was placed on care and maintenance in October 2018 and effective April 29, 2022 Northern acquired 100 per cent ownership of Holdings from Imerys and its joint venture partner.

This Preliminary Economic Assessment Report (PEA) was prepared and compiled by Creo Engineering Solutions (Pty) Ltd, with contributions from various competent persons, on behalf of the Company for the Okanjande Graphite Project which includes the Okanjande Graphite Mining Operation (Okanjande) and the Okorusu Processing Operation (Okorusu) (together the "Project"). The Okorusu processing facilities are located 86 km by road north of the Okanjande Mine and approximately 60km from the town of Otjiwarongo in the Otjozondjupa region of Namibia. Okanjande and Okorusu assets have both been included as part of Northern's acquisition of the JV. The project has been under care and maintenance since 2018 and is planned to be restarted by the client after executing several brown fields projects to modify and refurbish the plant to improve its efficiency and expand production.

1.1.2 Terms of Reference

The Okanjande Graphite Project is located in the Otjozondjupa Region of Namibia near the town of Otjiwarongo.

Northern Graphite commissioned a team of consultants in mid-2021 to conduct a Preliminary Economic Assessment study on the Project which includes bringing the in-situ (weathered and fresh material) resource into production. A production rate of 31,877t/a graphite concentrate of greater than 96% TGC is projected.

The purpose of this PEA Report is to evaluate the business feasibility of the project. This report was compiled in accordance with the requirements of National Instrument 43-101, *Standards of Disclosure for Mineral Projects* ("NI 43-101").

1.1.3 Sources of Information

Information contained in this report includes abstracts of professional sources for the different fields of expertise. The following table provides a list of the key sources of information incorporated into this document. See Table 1-1.

Table 1-1: Key sources of information

Source	Title
MSA Group	Northern Graphite Corporation Okanjande Mineral Resource Estimate Namibia, November 2021
MSA Group	Okanjande Project – Mining Report, December 2021
Knight Piésold Consulting	High-Level Tailings Storage Facility Capacity Assessment, Geotechnical and Environmental Scoping Study and Gap Analysis, January 2022
METPRO	Process Review and Optimization for the Okorusu Plant, October 2021

1.1.4 Competent Person Site Inspection Report

E. Roux – Consulting Process Engineer, CREO Engineering Solutions

Mr Etienne Roux, Director at CREO Engineering Solutions Pty. Ltd., is the Competent Person for the Mineral Processing and Metallurgical testing, Recovery Methods, Capital and Operating Costs and Economic Analysis. I have visited the site on 4 occasions during 19 July 2021, 13 December 2021, 18 January 2022 and 18 February 2022 with relevance pertaining to inspection of existing processing equipment, infrastructure, tailings storage facility, previous mining operations and general lay of land. I have read the instrument, and the parts of the report that I am responsible for have been prepared in compliance with the instrument.

V. Diagle – Pr. Eng., Lead Engineer and Director at Knight Piésold Consulting

Mrs Veronique Daigle, Pr. Eng. at Knight Piésold Consulting (Pty) Ltd., is the Competent Person for the Tailings Storage Facility, Waste Rock Dump and associated the Capital Costs Estimates, as well as Operating Costs for the Tailings Storage Facility. I visited the Project site prior to the initiation of the Preliminary Economic Assessment in September 2020, as part of a due diligence review of the existing graphite Tailings Storage Facility for the development of a care and maintenance project; and am familiar with the general lay of land. Information provided from the prior inspection was used as a basis of current conditions assessment and for capital cost estimation. With relevance pertaining to inspection of existing tailings storage facility and general lay of land. I have read the instrument, and the parts of the report that I am responsible for have been prepared in compliance with the instrument.

R.N. Barnett – Consulting Associate Industrial Minerals Geologist, MSA Group (Pty) Ltd

Mr Robert Nicholas Barnett, Associate Consulting Geologist with MSA Group (Pty) Ltd, is the Competent Person responsible for the Geological Setting and Mineralization, Deposit Types, Exploration and Drilling, and co-responsible for Sample Preparation, Analyses and Security, and Data Verification. I have visited the site on two occasions from 28 September to 1 October and 18 to 22 October 2021 with relevance to geology, drill core and graphite ore exposed in the mine pit. I have read the instrument and the parts of the report that I am responsible for and have been prepared in compliance with the instrument.

M Mohring – Consulting Associate Mining Engineer, MSA Group (Pty) Ltd

Mr Mark Richard Mohring, Associate Consulting Mining Engineer with MSA Group (Pty) Ltd, is the Competent Person responsible for the Mining Report. I have visited the site from 11 May 2021 to 14 May 2021, where I inspected the pit and associated infrastructure of the mining and processing operation. I have read the instrument and the parts of the report that I am responsible for have been prepared in compliance with the instrument.

1.2 RELIANCE ON OTHER EXPERTS

1.2.1 CREO Disclaimer

This report was prepared for Northern Graphite Corporation (the Client), by Creo Engineering Solutions (the Consultant), as an independent Consultant, and is based in part upon information and historical study work furnished by the Client and third-party consultants.

Information on the graphite market (section 19 Market Studies and Contracts) was compiled from a report commissioned from Benchmark Mineral Intelligence ("BMI"), as well as other industry sources, by Gregory Bowes P.Geo. who is the Chief Executive Officer of Northern and not an Independent Person.

While it is believed that the information, conclusions, and recommendations will be reliable under the conditions and subject to the limitations set forth herein, the Consultant cannot guarantee their accuracy. The opinions expressed in this report subject to the project responsibilities fulfilled by Creo Engineering Solutions, are Creo Engineering Solutions' best estimate taken from the data available, combined with experience and knowledge of the work. The Client and any other Third Parties that might review or use the information in this report are responsible for their independent analysis based on the information herein and must acknowledge the risks associated with such an operation. The Consultant will not be liable for any damages or loss suffered or occasioned, whether directly or indirectly, from any party relying on any of the information contained in this document.

1.2.2 MSA Disclaimer

Neither MSA nor the authors of this Technical Report, are qualified to verify the legal status of ML 196 and EPL 4717. MSA has relied on a legal opinion by Ellis Shilengudwa Incorporated ("ESI"), dated 09 December 2021, that IGOM is the legal holder of 100% of the interest in ML 196 and EPL 4717, which are valid as of the date of the opinion. ESI is a corporate and commercial law firm based in Windhoek, is regulated by the Law Society of Namibia, and is a member of DLA Piper Africa, a Swiss Verein whose members are comprised of independent law firms in Africa working with DLA Piper. Furthermore, ESI have verified the Existing Lease Agreement in place and the form of the New Lease Agreement in which the agreement(s) provide Imerys-Gecko with the necessary rights, title and interest in and to the Leased Premises to allow for the conducting of agreed processing activities.

The present status of tenements listed in this report (section 2 Introduction, section 4.2 Mineral Tenure, Permitting, Rights and Agreements and section 4.3 Environmental Liabilities) is based on information and copies of documents provided by Northern and ESI, and this Independent Technical Report has been prepared on the assumption that the tenements will prove lawfully accessible for evaluation. Comment on these legal agreements is for introduction only and should not be relied on by the reader. ESI has not provided comment on the status of ML90 which is not the focus of this Technical Report.

Similarly, neither MSA nor the authors of this report are qualified to provide comment on environmental issues associated with the Property.

No warranty or guarantee, be it express or implied, is made by MSA with respect to the completeness or accuracy of the legal aspects of this document. MSA does not undertake or accept any responsibility or liability in any way whatsoever to any person or entity in respect of these parts of this document, or any errors in or omissions from it, whether arising from negligence or any other basis in law whatsoever.

1.3 PROPERTY DESCRIPTION AND LOCATION

Northern has acquired 100 per cent ownership of IGOM. IGOM holds ML 196 which covers the Okanjande graphite deposit ("Okanjande"). Mining started at Okanjande in 2017 and the ROM product was transported to the idle Okorusu Fluorspar mine site ("Okorusu") for processing over an 18-month period, before the Okanjande Mine was placed on care and maintenance in October 2018. Okorusu is 60 km by road northeast of Otjiwarongo.

1.3.1 Location

The Property is located approximately 23km southwest of the town of Otjiwarongo, 230km north of Windhoek, the capital city of Namibia, and 388km from the port of Walvis Bay. The Okorusu plant is 83km northeast of the Property.

1.3.2 Mineral Tenure, Permitting, Rights and Agreements

The Okanjande Mine is located within ML 196. ML 196 is valid until February 9, 2042 and covers an area of 903.4ha.

IGOM also holds an Exclusive Prospecting License EPL 4717 which surrounds the mining license, covers 46,670 ha, and is valid until November, 2022.

An Environmental Compliance Certificate ("ECC") covering mining and exploration activities for Okanjande was applied for, and received from the national authorities on November 11, 2021, valid for three years until November 11, 2024.

An amended Environmental Impact Assessment ("EIA") and Environmental Management Plan ("EMP") was filed and approved in March, 2016 and authorizes the transport of ore from the Okanjande deposit to the Okorusu plant for processing. The associated ECC with transport of ore was granted on September 27, 2019 and expires September 27, 2022.

1.3.3 Environmental Liabilities

IGOM carried out contract mining operations on the Okanjande deposit (Okanjande mine) during parts of 2017 and 2018 and mined approximately 300,000 tonnes of weathered mineralisation, most of which was transported to the Okorusu processing plant, and 400,000 tonnes of weathered waste rock. The waste rock and a stockpile of approximately 35,000 tonnes of mineralized material remains on the Okanjande site. Testing by Imerys has indicated that the weathered material is non-acid generating. The waste rock has been deposited on a calc-silicate unit which has low permeability and provides natural buffering were any acidic seepage to occur.

1.4 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY

Namibia is located in the south-western part of Africa. It is bound by the Atlantic Ocean to the west, and between South Africa and Angola to the south and north respectively. With an estimated population of 2.1 million and an area of 824,292km², Namibia is one of the most sparsely populated countries in the world. The capital city is Windhoek, with approximately 350,000 inhabitants.

1.4.1 Access and Infrastructure

1.4.1.1 Regional – Otjiwarongo / Otjozondupa

Otjiwarongo has a well-developed road network. It is situated at the junction of national road B1 that passes north–south through all of Namibia, the C38 to Outjo and further into the Kunene Region in Namibia's northwest, and the C33 to Karibib, which connects the coastal town of Swakopmund and the port city of Walvis Bay.

Otjiwarongo is connected by road and rail to the port at Walvis Bay, a natural deep-water harbour. Walvis Bay is the largest port on the country's coast and is an important logistical port for the southern African region, providing import and export facilities for Namibia, Zambia, the Democratic Republic of Congo, and Botswana. The port has the capacity to move 1 one million containers a year.

1.4.1.1.1 Local Resources

Local resources required for labour, supplies and equipment will be insufficient from the nearby community to support the project. Some local resources can be utilised, but skilled mining contractors, consultants and suppliers will be available throughout Namibia to support the project and its operations.

During operations, Okorusu will have to source its key personnel outside of the immediate area, Otjiwarongo, the greater Namibia and possibly from the neighbouring country – South Africa.

Otjiwarongo's population sustains a diverse economy including cement manufacture, many service industries and institutions. The economics of the town mainly revolve around agriculture as the majority of businesses are related to this sector. Some 55,000 people are employed in the Otjozondjupa region, of whom about 31,000 are male. The employment participation rate is approximately 70%; this is above the national average of 55%. The largest occupational group is labourers and other unskilled trades, which constitute 40% of all those employed.

1.4.2 Climate, Operating Season

Most of Namibia has a subtropical desert climate characterized by hot summers and mild winters, great differences in day- and night-time temperatures, low rainfall and low humidity. Sunshine days are reported to average 300 days per year. Namibia experiences winter and summer at opposite times from Europe and North America. The winter (June to August) is generally dry. Although arid, the rainy season in the inland north-central areas and in the northeast is from November to March.

Rainfall in the Otjiwarongo area is fairly constant at 400 – 500mm per year; rain showers occur mainly during November to April, with the highest rainfall rates recorded in January and February. Rain are often of short duration and high intensity.

Yearly average mean temperatures are 21°C, with average monthly highs and lows of 29°C and 13°C respectively. However, much higher and lower daily temperatures often occur. The highest temperatures (in degrees Celsius) are experienced in January (an average of 22.7°C with highs of 37.2°C and lows of 12.1°C) and the lowest in June (an average of 15.2°C with highs of 28.5°C and lows of -1.9°C).

The Okanjande and Okorusu Mining Licences can be operated and/or are accessible all year.

1.4.3 Physiography

The Otjozondjupa region is characterized by a relatively flat plain with inselbergs and low ridges standing out above the general land surface. The general elevation is between 1,300m and 1,600m above mean sea level ("mamsl"). The Okanjande graphite deposit is situated on the lower west-facing slopes of one of the ridges. The proximity of other low ridges to the site means that the Okanjande deposit is effectively screened from public view.

The Project area forms part of the thornbush savanna with fairly thin soil and occasional patches of bedrock exposed at the surface. This habitat is widespread and homogeneous throughout central Namibia and contains no unique or singular features of high ecological importance. None of the species found on site are rare, threatened or endangered. The current land use in the area consists primarily of livestock farming and, to a lesser degree, hunting tourism operations. Because of the thin soils and low rainfall, the land has a very low agricultural capability rating. Grazing is only suitable on the lower slopes and valley areas as the soils on the upper parts of the ridges are too thin to support any specific land use.

1.5 HISTORY

In 1990, Rössing Uranium Limited ("RUL"), a subsidiary of Rio Tinto, noted the occurrence of flake graphite on a group of farms immediately south of Otjiwarongo. Subsequent reconnaissance geological programmes revealed substantial amounts of flake graphite particularly on the farms Okanjande and Highlands. Between 1991 and 1993, RUL undertook a number of detailed studies pertaining to the Project including geological, drilling, metallurgical and environmental studies and a feasibility study was completed. Extensive exploration drilling and trial mining operations were carried out. A pilot plant was constructed, and metallurgical test work completed.

Gecko Namibia (Pty) Ltd ("Gecko") subsequently acquired the rights to Okanjande. In 2016 Gecko entered into a Joint Venture ("JV") with Imerys S.A. "(Imerys") to form Imerys Gecko Holdings (Pty) Ltd ("Holdings"). The development scenario pursued by the JV consisted of mining weathered mineralisation at the Okanjande deposit and transporting it to the Okorusu fluorspar plant for processing. This plant was refurbished and modified to suit the requirements of graphite processing. The Okanjande/Okorusu operation started up in April 2017, however the processing plant encountered a number of difficulties with throughput, flake size and purity all being lower than expected. The operation was put on care and maintenance in November 2018.

1.6 GEOLOGICAL SETTING AND MINERALIZATION

1.6.1 Regional Geology

The Okanjande deposit is located in a metamorphic complex in the north-central ("nCZ") part of the Neoproterozoic Damara Orogen. The Damara Orogen comprises three highly oblique mobile belts; namely the north-northwest trending Kaoko Belt in the northwest, the Gariep Belt in the southwest and the north-eastern trending Damara (inland) Belt.

The Project is located in the nCZ and is underlain by Nosib Group sediments and upper Swakop Group shelf carbonates that are intruded by a number of syn- and late-tectonic granites and pegmatites (Steven, 1993).

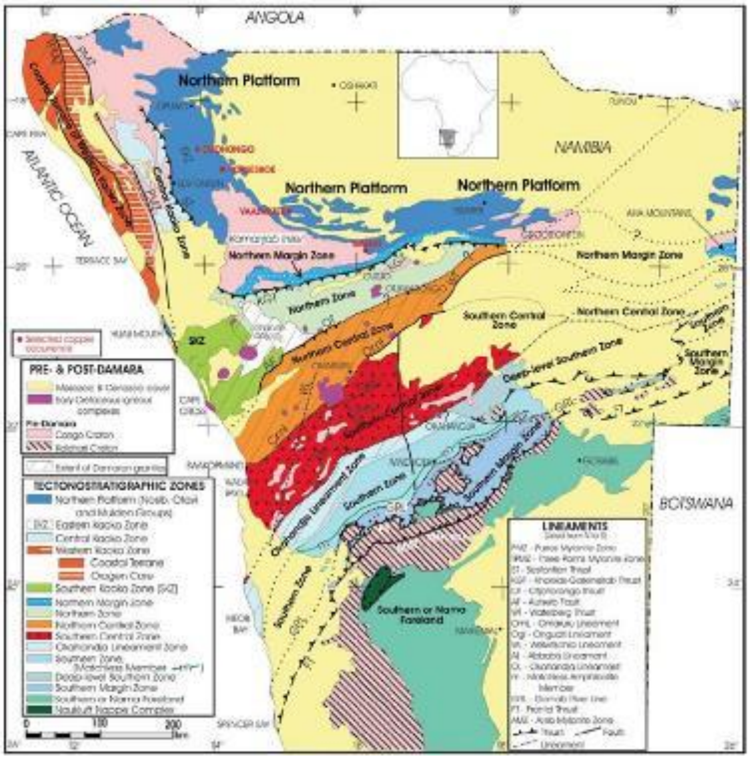


Figure 1-1: Regional Geology of the Damara Belt (Miller, 2013)

1.6.2 Local Geology

The Nosib and Swakop Groups in the Project area have been intruded by syn- and post-tectonic pegmatites and granites, with the latter typically comprising two types of leucogranites. These pegmatites and granites occur as irregular and semi-disconcordant narrow bodies, which cross-cut the metasedimentary layering in places. Quartz veining also occurs in the area. The sedimentary rocks have been subjected to high grade regional metamorphism (RUL, 1993; RUL, 1994).

The Nosib Group comprises arkoses, feldspathic quartzites and ortho-quartzites that have been metamorphosed to feldspathic-quarzitic gneisses and graphitic quartzite, which host the graphite as an accessory mineral. The graphite mineralization is hosted locally in discrete units. Sulphide mineralization is prevalent in the Nosib Group.

The Swakop Group conformably overlies the Nosib Group, with its basal contact marked by a thin biotite schist. Cover rocks comprise Quaternary sediments, including alluvium, sand and gravel, which tend to accumulate in the valleys.

The area has been subjected to multiple phases of deformation, which have resulted in dome-and-basin structures with a WSW-ENE fold axis.

Major north-south and northeast-southwest orientated faults cut across the region, which are typical of the Damara region.

1.6.3 Property Geology

In the Project area, the Nosib and Swakop Groups are tightly folded along a west-southwest fold axis, resulting in quartz-rich ellipsoidal domes of the Nosib Group, while the valleys comprise Swakop Group. Graphite occurs locally as disseminated flakes in stratabound units.

The Okanjande deposit reaches its highest grade and is thickest in the centre, with graphitic carbon grades and mineralization thickness decreasing towards the peripheries. The contacts of the graphite units are difficult to define as they tend to be transitional.

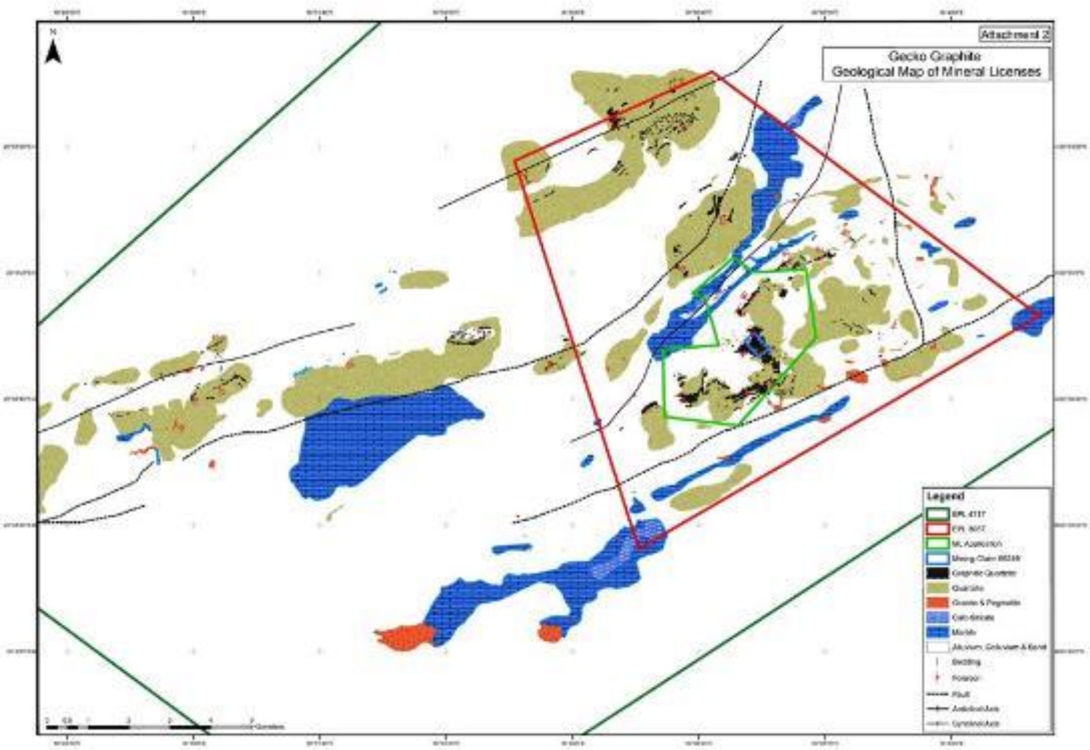


Figure 1-2: Okanjande Property Geology Map

The Okanjande deposit is a massive deposit with shallow dipping layering to the south-east. It extends on surface approximately 900m northeast to southwest and up to 820m from northwest to southeast. The mineralization extends from surface and has been defined by drilling up to a depth of 90m below surface. The mineralization is open at depth. The deposit is extensively weathered to depths of generally between 10m and 20m.

1.6.4 Mineralization

RUL completed mineralogical studies on selected Okanjande deposit core samples at an independent laboratory, Mintek, Johannesburg. The mineralogical studies were completed on weathered and fresh mineralized samples from 12 drillhole cores using transmitted and reflected light microscopy and point counting methods, scanning electron microscopy ("SEM") and X-ray diffraction ("XRD").

The mineralogical investigations revealed that the graphitic samples generally contain similar minerals, although they vary significantly in both proportion and texture. The minerals identified are shown in Table 1-2.

Table 1-2: Okanjande Mineralogy

Major Constituents (>10%)	Minor Constituents (between 10% and 1%)	Trace Constituents (<1%)
Quartz	Muscovite	Rutile
K-Feldspar	Plagioclase	Zircon
Jarosite (K-Fe-sulphate)	Graphite	Apatite
	**Phlogopite	Chlorite
	**Biotite	+Chalcopyrite
	Sillimanite	Ce-Phosphate
	+Pyrrhotite	Monazite
	+Pyrite	Ba-K Feldspar
	*Fe-Hydroxides (Goethite)	Baryte
	*Haematite	+Molybdenite
		Wolframite
		Cassiterite
		+Ni-Sulphide
		Cr-spinel
		Xenotime

Source: ***RUL, 1993***

Note: **** in weathered mineralized samples***

+ in fresh mineralized samples

***** present in some rocks only***

1.7 DEPOSIT TYPES

Graphite mineralization occurs in three types of deposits worldwide; microcrystalline, vein graphite and crystalline flake graphite. The Okanjande deposit fits the description of a crystalline flake graphite deposit in a paragneiss. The original rocks at the Okanjande deposit were arkoses, feldspathic quartzites and ortho-quartzites that have been subjected to high grade metamorphism to become feldspathic-quarzitic gneisses and graphitic quartzites.

1.8 EXPLORATION

Exploration had been carried out by various companies since 1990. In addition to drilling work and analyses of the drillhole samples (documented in Items 10 and 11), the following exploration was undertaken:

- 1990 – 1993: RUL carried out topographic and aerial surveys;
- 2003 – 2010: Solvay – no work undertaken;
- 2010 – 2016: Gecko completed mapping, soil sampling, pitting, geophysical surveys and topographic surveys; and
- 2016 – to date: Imerys-Gecko completed a review of the exploration data and a topographic survey

1.9 DRILLING

Drilling at the Okanjande deposit was completed by RUL (early 1990s), Gecko (2014 to 2016) and Imerys-Gecko (2018).

1.9.1 Rossing Uranium Drilling

In 1990, RUL drilled 66 percussion drillholes and 25 diamond drillholes, with 11 of the diamond drillholes twinning the percussion drillholes at the Okanjande deposit (also known as Target 2).

The drillholes were either drilled at an approximate azimuth of 320° and a dip of 60° or vertical. The drillholes were completed along southeast to northwest lines at an average line spacing of 50m, with the southwestern part of the deposit drilled at 100m line spacing. The holes were drilled 50m apart on each line. Most of the drillholes reached a depth of 60m, with the minimum and maximum depths being 40m and 90m, respectively.

According to RUL reports (RUL, 1993; RUL, 1994), RUL originally identified four drilling targets. Target 2 is the Okanjande deposit discussed in the preceding paragraphs.

RUL also completed three percussion drillholes 600m to the northwest of the main Okanjande deposit for sterilization purposes for a tailings area site. The drillholes intersected mineralization, and the area became known as the Tailings Area Ore Zone and is now referred to as the Northern Ore Band.

1.9.2 Gecko Drilling

From 2014 to 2015, Gecko drilled 91 diamond drillholes, which include infill drilling, twin drilling of the RUL drilling and exploration drilling in the fringes and outside the main Okanjande deposit. Eleven RUL percussion drillholes and two RUL diamond drillholes were twin drilled. The infill drilling resulted in approximately 25 m spacing between section lines towards the centre of the deposit. Exploration drilling was in the peripheries and in the Northern and Southern Extension of the main Okanjande deposit, the Northern Ore Band, and approximately 2km northeast of the main Okanjande deposit.

All Gecko holes were from diamond drilling. Holes were drilled at an azimuth of 320° and dip of 60°, or vertical in the central parts of the Okanjande deposit, while the rest of the holes were drilled at various orientations including vertically.

In 2014 a topographic survey was completed on the Namibian Bessel (Schwarzeck) system LO22/17 and was later converted to UTM WGS84 33S.

1.9.3 Imerys-Gecko Drilling

From June to September 2018, Imerys-Gecko completed a total of 44 diamond drillholes within the Okanjande deposit and surrounding prospects. Twelve of these were infill holes drilled in the southwestern portion of the deposit, to reduce the drill line spacing from 100m to 50m. These holes were drilled at an approximate azimuth of 320° and a dip of 60° and at 50m spacing within the drill lines. These holes are within the current Mineral Resource area.

Imerys-Gecko identified additional drilling targets from the airborne survey and mapping previously completed by Gecko. Imerys-Gecko considered three of the targets to be of a higher priority for further drilling; the Northern Ore Band (farm Okanjande), SW Target (farm Highlands) and Old Mine (farm Welgelegen).

1.10 SAMPLE PREPARATION, ANALYSIS AND SECURITY

1.10.1 Rossing Uranium Campaign

Percussion drilling chips were collected at 1 m intervals. The sample material was collected directly from the cyclone underflow and was homogenised by passing it through the riffle splitter three times prior to collecting the sample. A sample of 2kg to 3kg was collected from the riffle splitter and bagged for assay. Diamond drillhole cores were cut longitudinally into half, then cut longitudinally in half again. The quarter core samples were collected at 2 m intervals continuously through the entire length of the drillhole core. RUL submitted samples to Scientific Services in Windhoek for sample preparation, entailing crushing, pulverising and homogenising. Sub-samples of pulverised material were dispatched to Scientific Services in Cape Town, an independent commercial laboratory, for graphitic carbon, sulphur and titanium oxide analyses. It was reported that a total of 94 field duplicate samples were collected as well as 25 field duplicates for umpire assays at a second laboratory. No further QAQC samples were mentioned in the RUL reports.

1.10.2 Gecko Campaign

The cores were logged and marked up for sampling by geologists. Sample positions were marked on the core using a permanent marker at 1 m intervals, while adhering to the geological contacts identified during logging. The cores were split longitudinally in half using a diamond saw and again into quarter core for sampling purposes. The cores were broken along sample markings, individual samples were placed into bags with uniquely numbered sample tickets and sample numbers were written on the outside of the bags. Visibly un-mineralized intervals were not sampled. All remaining cores were stored in galvanised core trays on site in a core shed. In 2018, a secure core storage facility was built next to the Okanjande mine offices and all the cores are currently stored there.

Samples were dispatched by Gecko to Bureau Veritas (BV) in Swakopmund, a SANAS accredited independent commercial laboratory, for sample preparation. Upon receipt of the pulverised material from BV at Gecko's premises in Nonidas, outside of Swakopmund, Gecko homogenised the material and split it using a riffle splitter to prepare between 30 g and 50 g sub-samples for assaying. The samples were submitted to BV Swakopmund for dispatch to BV Rustenburg for assaying.

The samples were assayed for sulphur and total graphitic carbon ("TGC") at BV in Rustenburg, which was a SANAS accredited independent commercial laboratory at the time (the laboratory is now closed). Gecko used five graphitic CRMs, a titanium oxide CRM and pulp duplicates for its QA/QC samples submitted to BV in Swakopmund. The CRMs showed acceptable accuracy for the TGC assays.

It is the QP's opinion that the Gecko TGC and S assays have been demonstrated by QA/QC processes to be of acceptable accuracy and precision to use in Mineral Resource estimation.

1.10.3 Gecko-Imerys Campaign

The samples from the Imerys-Gecko cores were taken at 1 m intervals continuously through the entire core length while adjusting for geologically logged boundaries. The samples were recorded on a sampling sheet. The cores were cut longitudinally in half using a diamond saw and one half was cut again longitudinally in half to generate quarter core. The cores were broken at sample beginning and end markings, and individual samples were placed in plastic bags together with manila sample tags labelled with the unique sample number. The bags were sealed with twine and another sample label was tied to the twine. Visibly un-mineralized intervals were not sampled. The remaining cores are stored in galvanised steel core trays in a secure core storage facility near the Okanjande mine office.

The Imerys-Gecko samples were transported by courier to BV Swakopmund. Upon receipt of samples, the laboratory signed a form to maintain chain of custody. Sample preparation was completed at BV Swakopmund, where the samples were crushed, split and pulverised. The pulverised sub-samples were dispatched to BV Centurion (South Africa), where the samples were analysed for S and TGC using method codes ACT-TPM-013 and ACT-TPM-028, respectively.

Imerys-Gecko inserted duplicates as quarter core samples at a rate of 5%, for a total of 58. The Imerys-Gecko field duplicates show good precision for TGC and S, where 90% of the data have a HARD value of less than 15% for TGC and less than 13% for S. The precision of the Imerys-Gecko assays is good. Accuracy was not assessed, as CRMs were not inserted and umpire analyses were not performed.

The precision of the Imerys-Gecko assays is good. Accuracy was not assessed, as CRMs were not inserted and umpire analyses were not performed. The degree of contamination is not known, as blank samples were not used. The QP is therefore partly reliant on indirect QA/QC for the Imerys-Gecko data, i.e., by examining global bias between different exploration campaigns that had more acceptable QA/QC protocols.

1.11 DATA VERIFICATION

1.11.1 Qualified Person

The Geology QP, Mr Rob Barnett, established an audit trail of the electronic drilling data that is captured in several spreadsheets that were provided to MSA.

Mr Barnett also completed two site visits, one between 28th September and 1st October and the second between October 18-22, 2021.

The Mineral Resource QP, Ms Ipelo Gasela, completed the statistical analyses on the data to determine their appropriateness to use in a Mineral Resource estimation. Ms Gasela did not visit site.

1.11.2 Rossing Uranium Twin Drilling

MSA completed a quantile-quantile ("QQ") plot comparing the grades of the samples obtained by RUL percussion drilling to the twin diamond drillholes completed by RUL. The QQ plot indicates that there is no bias between the sample assays of TGC from the two drilling methods. The QQ plot shows a significant positive bias of 16% towards the three percussion holes that were assayed for sulphur. The bias is higher at depth where grades are higher. The results of the statistical tests from the twin drilling reveal that samples from the RUL percussion and diamond drilling have TGC grades that are not significantly biased with respect to one another.

It is therefore the QP's opinion that the two datasets can be used together in Mineral Resource estimation. The S grades show a high bias towards the percussion samples at greater depths. There are only two percussion holes at depths exceeding 24m, therefore the inclusion of percussion data in the estimation has limited risk on the S estimates at depth.

1.11.3 Gecko Verification Work

1.11.3.1 Gecko Check Sampling of RUL Drillhole Samples

Gecko completed a check sampling programme on a selection of the remaining core intersections drilled by RUL. Gecko completed the check sampling by collecting 1 m samples of quarter core from the remaining RUL core, and a total of 129 check samples were assayed. The samples were assayed for TGC and S at Bureau Veritas in Rustenburg (South Africa), which was an independent and accredited commercial laboratory at the time. The remaining cores were photographed. The Gecko check samples were not accompanied by QA/QC samples.

The TGC assays show a strong positive relationship between the original and check sample assays, though with some scatter, resulting in a correlation co-efficient of approximately 0.94. The two datasets show almost no bias to one another.

The check sample S assays show a strong positive relationship with the original assays, with some scatter, resulting in a correlation co-efficient of 0.95. The check sample assays show a positive bias against the original assays of approximately 20%.

It is the QP's opinion that the TGC assays of the RUL samples compare within acceptable limits to the Gecko check samples. However, there is a significant bias between the RUL and Gecko check sample sulphur assays.

1.11.3.2 Gecko Twin Drilling of RUL Drillholes

Gecko completed twin drilling of 11 RUL percussion holes and two diamond drillholes. The Gecko twin drillhole samples included samples of three CRM's. All but one of the CRM samples returned assays within the acceptance limit of three-standard deviations of the certified value.

The CRM sulphur assays showed poor results, with 42% of the GGC-09 CRM and 33% of the GGC-10 CRM sample assays outside the acceptance limit of three-standard deviations of the certified value. Most of the failures are by a small margin.

The QQ plot of the paired hole TGC assays demonstrate that there is minor overall bias between TGC sample assays of the RUL and Gecko drilling. The QQ plot shows insignificant bias in the sulphur grades of the two datasets as well.

It is the QP's opinion that the two datasets are considered acceptable to use in a Mineral Resource estimation.

1.11.4 Imerys-Gecko Verification Work

1.11.4.1 Imerys-Gecko Check Sampling of Gecko Drillholes

In 2018, Imerys-Gecko completed check sampling of OKD039, a Gecko diamond drillhole. A good linear correlation was observed between the original Gecko sample assays and the Imerys-Gecko check sample assays for TGC and S, with correlation coefficients of 0.99 and 0.98, respectively. However, the original Gecko TGC assays are on average approximately 6% higher than the Imerys-Gecko check sample assays, with a tendency to be lower in the low-grade ranges and higher in the high-grade ranges. The sulphur assays are on average 8% higher than the Imerys-Gecko check sample assays with a tendency to be higher for assays greater than 2%.

In the QP's opinion, biases between the Gecko and Imerys-Gecko assays are not material.

1.11.4.2 Bias Test Between Imerys-Gecko and RUL Drilling

The QP completed a bias test between the TGC assays from the Imerys-Gecko drillhole samples and the RUL drillhole samples in the southwestern part of the deposit. The data were composited to 2 m intervals and a threshold of 2% TGC applied for both sets of data to account for un-mineralized intervals that were not sampled in the Imerys-Gecko drilling campaign.

The TGC QQ plot shows that the two datasets have similar TGC grade distributions, with the Imerys-Gecko average TGC grade being 2.5% higher. The QQ plot between the RUL and Imerys-Gecko sample sulphur grades show slight conditional bias and the Imerys-Gecko average sulphur grade is 4% lower.

It is the QP's opinion that the two datasets verify each other, and this allows for the two datasets to be used together in the Mineral Resource estimation process.

1.12 MINERAL PROCESSING AND METALLURGICAL TESTING

1.12.1 Early Process Test Work - MINTEK

Early investigations were carried out by Rossing Uranium Limited and Mintek in South Africa in the period 1989-1992.

1.12.1.1 Preliminary investigation into the upgrading of Graphite Ore, 1989

Batch floatation tests produced high grade graphite concentrate of 93% Carbon.

The recommended flowsheet from test campaign: Rod Milling, Rougher Flotation, three Pebble Mill re-grinding stages, three stages of flotation and magnetic separation.

1.12.1.2 Preliminary tests to recover flake graphite from the Okanjande deposit, 1990

A flow sheet was tested consisting of Rod Milling, Rougher Flotation, Pebble Mill regrind and 3 stages for cleaner flotation. Concentrates in the region of 93% C were produced from both areas.

A Flash Flotation stage was added, which increased the yield of >300um flakes, but did not affect the yield of >106um flakes.

1.12.1.3 Preliminary tests on drill core samples from the Okanjande deposit to recover flake graphite, 1991

Milling and flotation tests completed on 32 drill core samples with an average head grade of 6% fixed carbon as graphite and produced concentrate grades ranging from 83% to 96% at recoveries in excess of 80%. Optimal flow sheet developed from the test program was Rod Milling, Rougher Flotation, Pebble Mill regrinding of rougher concentrate and 3 stages of cleaner flotation.

1.12.1.4 Metallurgical Commissioning of the Okanjande Graphite Beneficiation Pilot Plant, 1991

Rossing Uranium ran a pilot campaign on the Okanjande deposit to recover flake graphite in 1991. Mintek assisted in the metallurgical commissioning of the pilot plant. The observations from the campaign were:

- Closed circuit rod milling with 2mm classification screen applied without sanding in rougher cells. High recovery obtained from rougher cells.
- Cleaning flotation noted free gangue, but investigation indicated graphite attachments leading to floating of gangue.
- Free and visible gangue was a constant problem in the final concentrate. Remaining gangue was mainly mica.

1.12.1.5 Autogenous Milling and Flotation of Okanjande ore, 1992

Weathered and Fresh ore samples proved to be amenable to autogenous milling during laboratory testing. Closed circuit milling with 2mm screen classification was used and resulting in 40% circulating loads and a screen undersize P80 of 425um.

Autogenous milled samples produced similar flotation performance than rod milled samples, but fresh ore autogenous milled samples produced coarser graphite flake sizes than Rod milling.

Fresh material milling indices for AG and SAG milling were found to be: 2.5kWh/t and 3.1kWh/t respectively.

Weathered drop tests indicate high friability, but with enough competent rocks in between to allow for autogenous milling.

1.12.1.6 The Purification of Okanjande Graphite Concentrate: Exploratory Work, 1992

Exploratory test work was conducted in the pursuit of producing 99.5 and up to 99.9% concentrate purity.

Roasting of graphite concentrate with either sodium hydroxide or sodium carbonate, followed by successive leaching with water, sulfuric acid and hydrofluoric acid produced greater than 99.9% purity.

Roasting of graphite concentrate with sodium hydroxide followed by successive leaching with water and sulphuric acid produced graphite concentrate with greater than 99.5% purity.

1.12.1.7 Pneumatic Flotation of Graphite at Okanjande, 1992

Column and Jameson float cells were testing in the pilot plant at various functional locations. In general, it was found that the column cells produced slightly better recoveries at similar concentrate grades to that obtained from the Jameson cells but required additional frother addition.

1.12.2 Early Mineralogical Characterization – MINTEK

Mineralogical investigations were carried out by MINTEK over the period of 1991 to 1992.

1.12.2.1 A Mineralogical Examination of the Okanjande Graphite Ores, March 1991

Seventeen borehole core intersections were tested. The predominant minerals were Quartz, K-Feldspar, Graphite, Mica, Pyrite, Pyrrhotite and Sillimanite. Mean graphite flakes sizes were found to be in the region of 0.5-0.7mm while maximum flake size ranging from 1.0 to 2.0mm were observed.

Two distinct ore textures were described:

1. Altered Ore with distorted graphite flakes which contained closely intergrown gangue minerals. Deformation appeared to be the resulted of shearing and deformation of the ore. Full liberation of graphite expected to be difficult to achieve.
2. Un-Altered ore containing undistorted and largely inclusion-free graphite.

The most common phase interlaminated with graphite flakes was Muscovite and Sericite. Sulphide minerals were also frequently found to be interlaminated with graphite.

1.12.2.2 A Mineralogical Investigation of the Sulphide minerals present in graphite concentrates from Okanjande, July 1991

Graphite concentrates prepared from Okanjande ore were exanimated for the occurrence and nature of sulphide minerals.

The sulphide phases present were Pyrite, Pyrrhotite, Chalcopyrite and Molybdenite. The sulphide phases were present as free grains as well as occlusions within the graphite flakes. The fraction of occluded sulphides was the highest for the coarse graphite (>300um) fraction and the lowest in the fine graphite (38um).

Chalcopyrite and Molybdenum were found to preferentially occur in the fine fractions of graphite, perhaps due to their milling characteristics.

1.12.2.3 A Mineralogical Investigation of the Sulphate Minerals present in graphite ore samples from Okanjande, July 1991

Fifteen samples of Okanjande graphite ores were examined. The main sulphate phases present were Jarosite, Barite, Gypsum, Siderotil and Melanterite. Siderotil and Melanterite are water soluble and mainly found in shear and fractures as well the altered ore zones at depth.

The iron sulphate minerals are mainly present in the weathered ore, but do occasionally occur in fresh ore along fractures and joints.

The presence of iron sulphates are the result of weathering.

1.12.3 Recent Process Test Work

1.12.3.1 Gecko MINTEK test program 2015

The test work program comprised comminution characterisation, mineralogy and flotation test work to develop a base case flowsheet. The flowsheet development test work was conducted on weathered material and the final flowsheet was tested on the fresh material.

1.12.3.1.1 Flotation Testing

The optimal processing flowsheet selected (Figure 1-3) consisted of rougher and cleaner flotation cells with scavengers on both tailings to maximise recoveries. The cleaner concentrate was milled in a pebble mill to liberate graphite flakes attached to gangue with minimum flake breakage. A double stage pebble mill was required for maximum graphitic carbon recovery. The base case flowsheet utilised DOW 200 as frother without the addition of a collector.

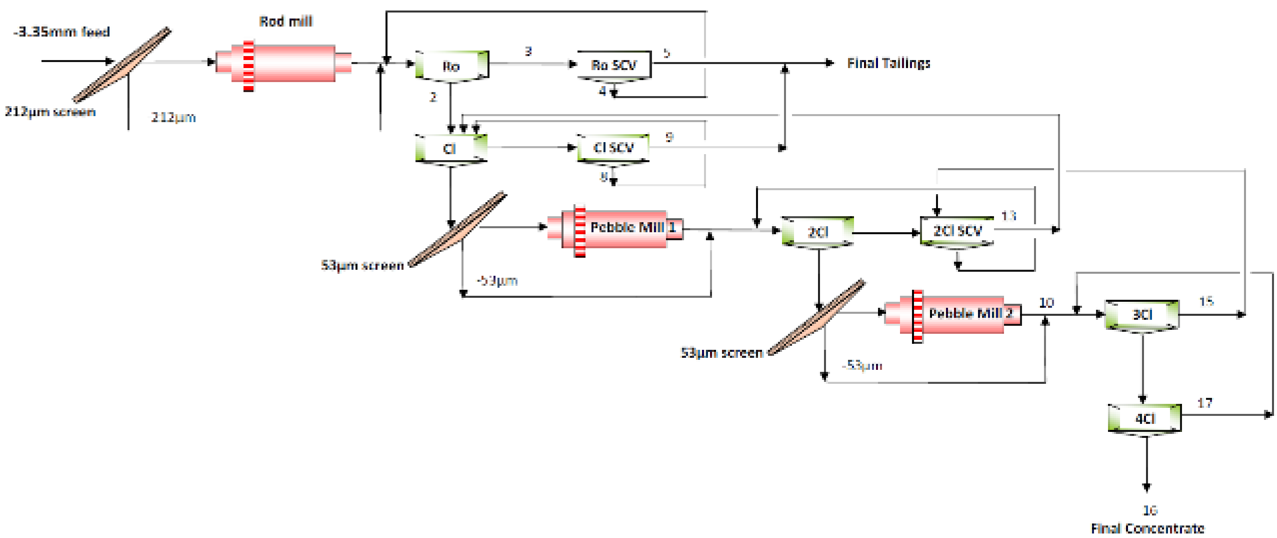


Figure 1-3: MINTEK Optimum Graphite Floatation Flowsheet

Test work on the Weathered material showed that it was possible to obtain 95% Graphitic C at 85% recovery. The inclusion of the -53mm size fraction into the final product was critical to obtain the overall recovery targeted.

Table 1-3: Optimum Flowsheet Graphite Concentrate Size-by-size analysis (Weathered)

Size Fraction (mm)	% Mass	% Passing	%C as graphite	% S
>212	6.7	93.3	97.9	0.06
150 – 212	17.1	76.2	97.8	0.06
106 – 150	21.8	54.5	97.9	0.05
75 – 106	21.8	32.8	97.3	0.09
<75	32.8		94.8	0.16
Combined			**96.7**	**0.10**

1.12.3.1.2 Comminution Characterization

Samples of Weathered and Fresh material were used for various hardness tests conducted by JK Tech and MINTEK The following tests were conducted for the hardness characterization and subsequent use in comminution circuit design criteria:

- JK Teck Dropweight tests
- SAG Milling Comminution tests (SMC)
- Uniaxial Compressive Strength tests (UCS)
- Bond Crushability tests (CWi)
- Bond Abrasion Index tests (Ai)
- Bond Rod Mill Work Index tests (BRWi)
- Bond Ball Mill Work Index tests (BBWi)

The results of the hardness test conducted in 2015 forms the basis of the process design criteria for the comminution circuit design and is presented in Table 1-4.

Table 1-4: Summarized Hardness Indices

Hardness Test	Samples	Result
JK Tech Dropweight	Weathered	Axb = 85.5 (Soft)
SAG Milling Comminution Tests (SMC)	Weathered and Fresh	Weathered Axb = 57.6 (Moderate) Fresh Axb = 57.2 (Moderate
Uni-Axial Compressive Strength (UCS)	Weathered	UCS = 65.5MPa (Soft)
Bond Crushabillity Index (CWi)	Weathered	CWi = 12.0kWh/t (Soft)
Bond Abrasion Index (Ai)	Weathered and Fresh	Weathered Ai = 0.23 (Slightly Abrasive) Fresh Ai = 0.28 (Slightly Abrsive)
Bond Rod Mill Work Index (BRWi)	Weathered and Fresh	Weathered BRWi = 11.60kWh/t (Medium Hard) Fresh BRWi = 9.48kWh/t (Soft-Medium Hard)
Bond Ball Mill Work Index (BBWi)	Weathered and Fresh	Weathered BBWi = 12.06kWh/t (Medium Hard) Fresh BBWi = 10.51kWh/t (Soft-Medium Hard)

1.12.3.1.3 Mineralogy

A representative pulverized sub-sample was analysed using qualitative X-Ray diffraction (XRD) to obtain the bulk mineralogical assemblage. Polished sections of each size were prepared for examination by optical microscope with the aim of establishing textures and liberation characteristics of the graphite flakes and their association with gangue minerals.

Test work products were analysed using the following methods: Total C organic C, proximate analysis (high grade concentrates) and inductively coupled plasma optical emission spectrometry (ICP-OES) on feed samples.

The bulk mineralogical composition of the crushed weathered feed sample indicated major gangue minerals to be quartz, mica and feldspar in varying amounts and sulphur is contributed as a result of the presence of various sulphides including chalcopyrite, pyrite and pyrrhotite. In addition, sulphur is contributed by jarosite, which is an oxidation product of these sulphides. Rutile occurs in amounts less than the detection limit for XRD, but the presence of rutile was confirmed using scanning electron microscope (SEM) analysis as less than 1% by mass.

1.12.3.1.4 Liberation

Liberation characterization of the crushed samples indicated that graphite flake liberation is inversely related to flake size with ~50% liberation in the 500-850µm size and greater than 90% liberation in the minus 200µm flake size. Rod milling tests indicated that graphite flake liberation increases with milling time.

Gangue minerals observed in the concentrate include clay (kaolinite), quartz, plagioclase, K-feldspar, pyrite and goethite. Scanning electron microscopy shows that gangue occurs interlayered between the graphite flakes and delamination may not separate all the gangue minerals from graphite. Separation of this type of gangue might be possible by chemical leaching.

Table 1-5: Liberation Characteristics of Graphite Flakes in 1st Cleaner Concentrate (MINTEK Base Case Flowsheet)

Size Fraction (µm)	% Fully Liberated	% Liberated + Inclusions	% Attached	% Locked
>500	77.2	17.7	3.0	2.0
425 – 500	76.7	20.1	2.0	1.2
300 -425	75.8	21.9	1.4	0.9
212 – 300	80.8	17.8	1.2	0.2
150 – 212	81.2	18.1	0.7	0.0
106 – 150	77.2	22.2	0.3	0.2
53 – 106	84.3	15.7	0.0	0.0
45 – 53	80.2	19.3	0.6	0.0
38 – 45	86.4	13.0	0.6	0.0
25 – 38	89.9	10.1	0.0	0.0
<25	93.7	6.3	0.0	0.0

1.12.3.1.5 Conclusions and Recommendations of the Test program

- 200µm was selected as the optimum liberation size based on the mineralogy alone. However, to preserve coarse graphite flakes, 80%-425mm grind was selected as the optimum graphitic carbon liberation grind.
- A large proportion of graphite reported to the -53mm size fraction (down to -25mm), pointing out that it will not be possible to produce a discardable barren fines fraction.
- Sulphur grades in the weathered material was shown to not be of concern, since grades repeatedly reported well below the targeted 0.1% S.
- It is possible to produce a final concentrate product at 95% Graphitic Carbon content and with a recovery of 85% when processing (floating) the -53mm fraction.
- All flotation tests were performed using frother only (Dow200).
- Reagent optimisation test work, pH control test work and Mineralogy on the rougher tails of the fresh ore is recommended to determine if recoveries could be improved.

1.12.3.2 Flowsheet Confirmation Test Work, METPRO/SGS 2021

Data reviewed by METPRO suggested that a more conventional graphite flotation flowsheet similar to the Bissett Creek process would be more suitable for the Okorusu mineralization. It was postulated that two polishing stages may be beneficial to maximize the +180µm yield. The suitability of the proposed revised flowsheet was evaluated in a series of seven cleaner flotation tests that were carried out at SGS Lakefield using one weathered and one fresh sample, which were shipped from site. The weathered sample was a composite of four random samples taken from the ore stockpile at the Okorusu plant. The fresh sample was a composite taken from six drill holes at depths between 55 and 71m.

Process variables that were investigated in the flotation program included:

- Elimination of ball mill and scavenger flotation
- Single and double polishing mill
- Classification of intermediate concentrate and SMM grinding
- Cleaning circuit without classification of intermediate concentrate

The flowsheet was simplified by eliminating the ball mill and scavenger flotation stages which produced a very high graphite concentrate and good flake size distribution but resulted in elevated graphite losses. Recoveries declined from 92.5% to 85.1%. The graphite losses may be reduced with more aggressive froth removal and/or longer rougher flotation retention time.

The first test, NA-1 investigated the degree of liberation of the +300 microns graphite flakes after the primary grind and a very short polishing grind. The +300 micron concentrate yield was high at 18.4% but this mass is inflated by a lot of gangue material as it graded a low 54.8% C(t). The -300 microns concentrate was subjected to a second polishing stage, cleaned, and then classified at 180 microns. Even after two stages of polishing, the -180 microns concentrate failed the minimum grade requirements. These results confirm the assumption that the graphite flakes are poorly liberated after the primary grind and would be rejected to the spiral tailings and then redirected to the ball mill.

Tests N2 to N4 evaluated different grind times in the polishing and SMM grinding applications with classification of the intermediate concentrate prior to SMM grinding. These three tests produced consistent results.

The purpose of Test N5 was to determine if the flowsheet could be simplified by eliminating the classification of the intermediate concentrate and treated the entire intermediate concentrate in one SMM. However, this resulted in noticeably higher +48 mesh and -48/+80 mesh flake degradation.

The flowsheet was then simplified by eliminating the ball mill and scavenger flotation stages in N6 which produced a very high graphite concentrate and good flake size distribution but resulted in elevated graphite losses. Recoveries declined from 92.5% to 85.1%. The graphite losses may be reduced with more aggressive froth removal and/or longer rougher flotation retention time. Further, graphite units in intermediate streams are considered losses during open circuit testing and a large percentage of these graphite units are recovered into the concentrate during closed circuit operation.

The next set of tests (NA-2 to NA-4) evaluated different grind times in the polishing and SMM grinding applications with classification of the intermediate concentrate prior to SMM grinding. These three tests produced consistent results.

The purpose of test NA-5 was to determine if the flowsheet could be simplified by eliminating the classification of the intermediate concentrate and treated the entire intermediate concentrate in one SMM. However, this resulted in noticeably higher +48 mesh and -48/+80 mesh flake degradation.

The flowsheet was then simplified by eliminating the ball mill and scavenger flotation stages in test NA-6 which produced a very high graphite concentrate and good flake size distribution but resulted in elevated graphite losses. Recoveries declined from 92.5% to 85.1%. The graphite losses may be reduced with more aggressive froth removal and/or longer rougher flotation retention time. Further, graphite units in intermediate streams are considered losses during open circuit testing and a large percentage of these graphite units are recovered into the concentrate during closed circuit operation.

All tests employed a simplified reagent regime of diesel and MIBC without the use of a gangue dispersant. An aliphatic alcohol frother such as MIBC has the benefit of a less persistent froth, which reduces the risk of elevated gangue entrainment.

Table 1-6: Summary of SGS Flotation Tests (METPRO/SGS, 2021)

Test	Sample	Combined Conc Grade %C(t)	Recovery %C(t)	% Mass >300µm	% Mass -300µm/ +180µm
NA-1	Weathered	84.6	86.4	18.4	40.8
NA-2	Weathered	95.6	88.1	11.4	42.8
NA-3	Weathered	94.9	92.7	11.6	40.7
NA-4	Weathered	96.3	91.6	9.9	37.8
NA-5	Weathered	95.5	92.5	8.6	34.3
NA-6	Weathered	96.9	85.1	10.0	41.3
NA-7	Fresh	95.6	92.4	21.2	46.3

The SGS program matched and exceeded the results of the original Mintek work and confirmed that the current plant flowsheet is not suitable for treating the Okorusu mineralization.

Table 1-7: A Comparison of Graphite Flake Distribution between Plant and Lab (METPRO, 2021)

Flake Size (µm)	Okorusu Plant 2017-2018 (%)	MINTEK Lab tests (%)	MINTEK Pilot Plant (%)	SGS Weathered tests (%)	SGS Fresh Test (%)
>300	2	5	13	10	21
>180	16	35	35	41	46
>106	37	26	23	30	20
<106	45	34	29	19	13

1.12.4 Sample Representativity

The Weathered samples were collected as grab samples from crushed ore (-13mm) stockpiles in May 2021. The Fresh samples were collected in July 2021 and were prepared from a blend of 6 different drillholes that intersected the fresh ore zone.

1.12.5 Mineral and Metallurgical Test Work Conclusions & Recommendations

The mineral processing test work program completed at SGS in 2021 indicated that the new flow sheet could improve on the existing flow sheet and corresponded well with early test work and pilot campaigns conducted in the 1990's.

Based on the latest test work conducted improved recovery and flake distribution was achieved when compared to the test work conducted by MINTEK in the 1990's and 2015.

Based on the completed SGS test work program the design criteria for the flotation plant modifications were developed.

Table 1-8: Expected Concentrate Grade and Flake Size Distribution from new process flow sheet

Product	Average		Range	
	%C(t)	% Distribution	%C(t)	% Distribution
Composite				
Composite	96.0	92.0	95.0 – 96.5	91.0 – 93.0
Concentrate Composition				
>300µm	96.0	9	95.0 – 97.0	7 – 11
300 – 180µm	96.0	40	95.0 – 97.0	38 – 42
180 – 106µm	96.0	30	95.0 – 97.0	28 – 32
<106µm	96.0	21	94.0 – 96.0	19 – 23

While the mineral processing test work leading up to this PEA Report supported the expectation for much better performance in terms of graphite flake purity and flake size distribution, it is recommended to conduct further test work to investigate:

- **Concentrate upgrading with gravity separation**. This could be beneficial with regards to possible difficulties with graphite / mica separation with flotation as the only separation method. If required, the newly redundant Okorusu gravity spirals can be brought back into operation with relative ease and low cost.
- **Concentrate upgrading by chemical means.** As per the early test work discussion a measure of success was achieved with various schemes of roasting followed by acidic leaching. This could potentially be a method to upgrade marginal concentrates or concentrates failing to achieve grade.
- **Alternative concentrate polishing/liberation methods.** Early MINTEK test work mentioned testing of a delaminator unit for improved liberation of graphite flakes. Literature reviews also indicate the potential of ultrasound in flotation stages to improve liberation and hydrophobicity of graphite flakes.

1.13 MINERAL RESOURCE ESTIMATES

1.13.1 Mineral Resource Data

MSA received all the drillhole data from Imerys-Gecko in Excel spreadsheets including data pertaining to:

- Collars;
- Sample assays;
- Hole inclination and direction (based on set up orientation);
- Geology logging; and
- Density.

The drilling data are from percussion and diamond drillholes completed at the Okanjande graphite deposit and the surrounding, satellite deposits (Table 1-9).

Table 1-9: Summary of the drillhole data (MSA, 2021)

Deposit	Drillhole Series	Campaign	Type	Number of drillholes
Okanjande Main	OAD03 – OAD13; OAD15 – OAD27; OAP10 – OAP75; OAP81; OAW01 - OAW14	RUL	Percussion and Diamond	105
Northern Ore Band	OAP76 – OAP78	RUL	Percussion	4
Okanjande Main (including North Ore Extension and Southern Ore Extension)	OAD19DT - OAD75D; OKD005 - OKD050; OPH001 - OPH009; SZH002 - SZH004; SZH006	Gecko	Diamond	72
Northern Ore Band	OKD051 – OKD063	Gecko	Diamond	13
North-east of Okanjande Main	OKD001 – OKD004	Gecko	Diamond	4
Okanjande Main (including North Ore Extension and Southern Ore Extension)	OKJ1 – OKJ12; OkaPBH_020 – OkaPBH_026	Imerys-Gecko	Diamond	19
Northern Ore Band	OkaPBH_027 – OkaPBH_034	Imerys-Gecko	Diamond	6
SW Target	OkaPBH_013 – OkaPBH_019	Imerys-Gecko	Diamond	7
Highlands Target	OkaPBH_009 – OkaPBH_012	Imerys-Gecko	Diamond	4
Old Mine	OkaPBH_007 – OkaPBH_008	Imerys-Gecko	Diamond	2
Leopardskloof Target	OkaPBH_001, OkaPBH_002, OkaPBH_005	Imerys-Gecko	Diamond	3
Rooibult Target	OkaPBH_035 – OkaPBH_037	Imerys-Gecko	Diamond	3

1.13.2 Exploratory Data Analysis

The data for the Okanjande Main deposit includes drilling data collected by RUL, Gecko and Imerys-Gecko. Generally, the drillholes are spaced 50 m apart with drill lines at the central area of the deposit being 25 m apart. The data comprises 81 percussion holes and 115 diamond holes. The TGC grade distribution is mixed due to the interbedded mineralised and non-mineralised layers in the graphitic gneiss/quartzite (Figure 1-4).

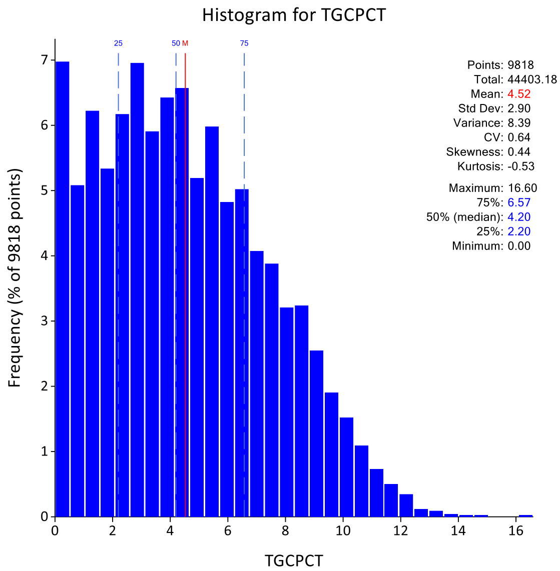


Figure 1-4: Histogram of un-composited lengths for TGC

1.13.3 <u>Bivariate Analysis</u>

The bivariate plot between TGC and S assays shows two groups of weakly positive correlations; one for weathered and the other for fresh rock (Figure 1-5).

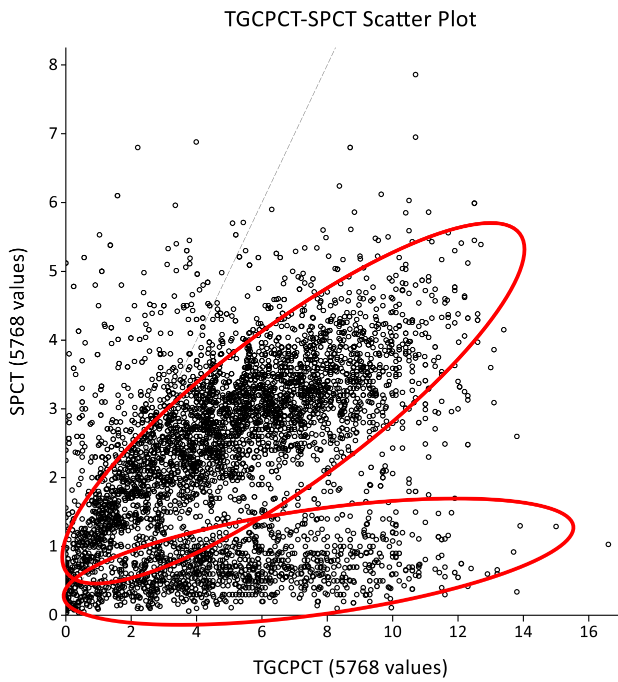


Figure 1-5: Bivariate plot between TGC and S (MSA, 2021)

1.13.4 Geological Modelling

The graphite at Okanjande Main is mainly contained within graphitic gneisses and quartzite while the un-mineralised rocks are pegmatite veins or interbedded un-mineralized quartzite. The deposit was modelled as a simple volume with the lateral extent constrained by un-mineralised drillholes. The lateral extent was modelled halfway between mineralised and un-mineralised drillholes or extrapolated up to a 100m from a mineralised, sampled and assayed drillhole (Figure 1-6).

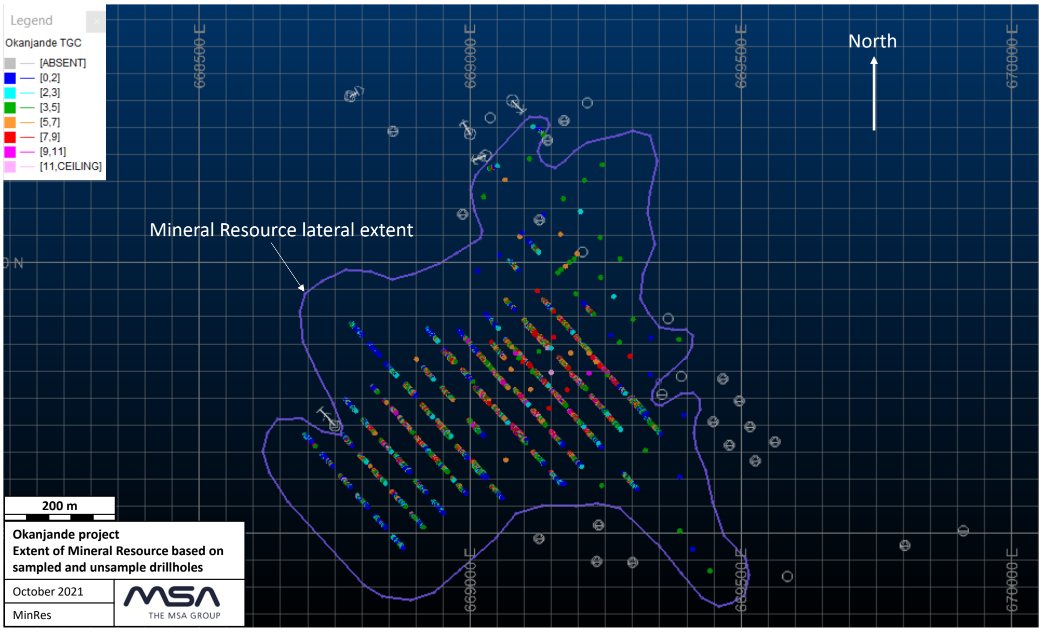


Figure 1-6: Plan view of Mineral Resource extent (MSA, 2021)

1.13.5 Estimation Domains

Weathering domains form the basis for sulphur grade estimation; therefore, three estimation domains were used for the sulphur grade estimation (Table 1-10). The TGC grades have a similar grade distribution for both the weathered and transitional domains. The higher average grade in the fresh domain is because of a high-grade zone at depth.

Table 1-10: Sulphur estimation domains (MSA, 2021)

Weathering Domain	Explanation
1	Weathered
2	Transitional
3	Fresh

1.13.6 Composite Data

The drillhole samples were composited to 1m because this is the most occurring sample length accounting for the majority of the data. The TGC sample grade population shows a mixed distribution, with a high frequency of composite samples with a grade of 0% TGC due to the zero values applied where samples were not taken (Figure

1-7: Composite TGC grade histogram (MSA, 2021)). The mixed distribution is due to the deposit being made up of alternating mineralised and un-mineralised layers, which could not be modelled as separate domains. The deposit also has a high-grade core, which transitions into lower grades towards the peripheries.

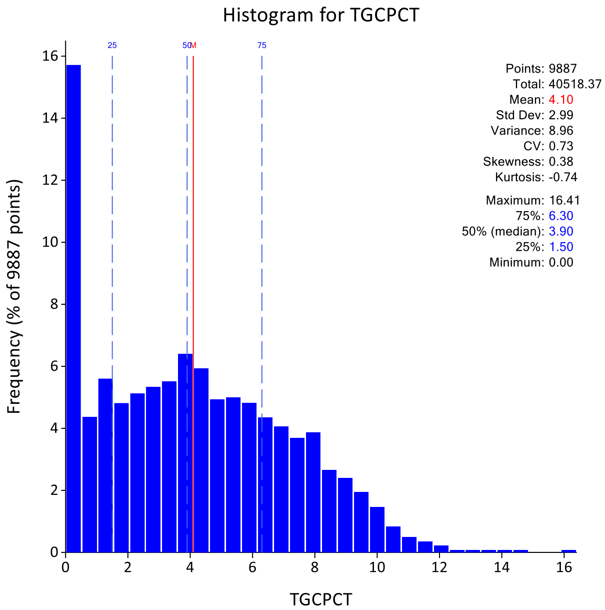


Figure 1-7: Composite TGC grade histogram (MSA, 2021)

1.13.7 Geostatistical Analysis

A single variogram was modelled for TGC and two variograms were modelled for S grade; one for weathered and the other for the fresh domain. A variogram for the transitional domain could not be modelled reliably and the variogram for the fresh domain was used in estimating the transitional domain.

The variograms demonstrate strong continuity in excess of the drillhole spacing.

Table 1-11: TGC and S variogram parameters (MSA, 2021)

Variable	Domain	*Rotation angles			Nugget Effect	Sill 1	Range 1 (m)			Sill 2	Range 2 (m)		
		X	Y	Z			X	Y	Z		X	Y	Z
TGC	-	140	20	180	0.11	0.56	40	40	5	0.33	230	195	25
Sulphur	Weathered	0	0	0	0.13	0.63	80	100	6	0.24	525	220	13
	Fresh	140	20	180	0.10	0.63	50	30	7	0.27	440	195	60

Note: **Rotation angles were applied to XZX.*
Ranges are rounded off to the nearest 5 m.

1.13.8 Block Modelling

A kriging neighbourhood analysis was completed using the TGC variogram to optimise the block size as well as other kriging parameters.

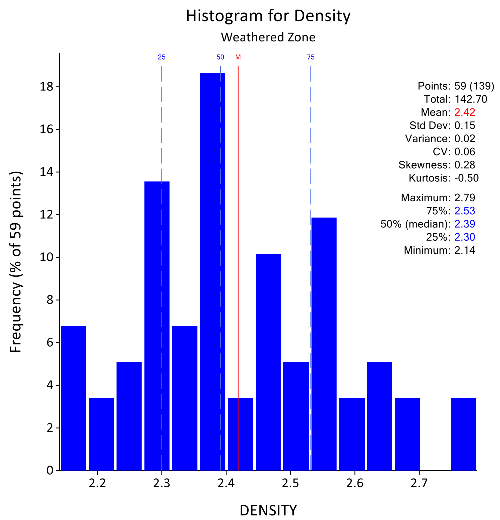
A block model was created with a block size of 20mX by 20mY by 5mZ, which is two fifths of the average drillhole spacing. The block model was sub-celled to the minimum dimensions of 5mX by 5mY by 2.5mZ. The block model was coded by weathering.

1.13.9 Estimation

The TGC and S grades were estimated into the block model using ordinary kriging into parent cells. TGC grades were estimated using a search ellipse of 100m by 80m by 20m. The transitional and fresh S grades were estimated using the same search ellipse and the weathered S grades were estimated using a search ellipse of 100 m by 50 m by 5 m in line with the variogram range proportions. The grades were estimated with a minimum number of 12 composites and a maximum number of 18 composites.

1.13.10 Density

A total of 144 density measurements were completed in October 2021 at the Okanjande deposit using the remaining core from previous drilling. The data were collected from 11 holes located in the central and southern parts of the deposit. Average density values were applied to the block model according to weathering.



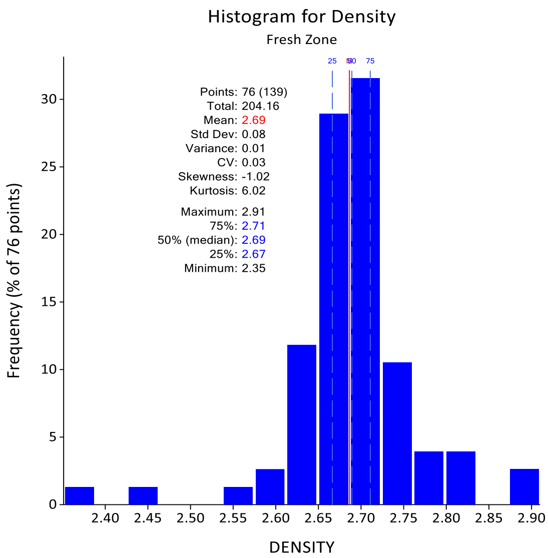


Figure 1-8: Density histograms per weathering domain (MSA, 2021)

1.13.11 <u>Validation of the Estimates</u>

The grade estimates were validated by:

- Visual inspection;
- Global mean comparison; and
- Swath plots.

Visual inspection of the block model shows that the estimated grades are representative of the input composite grades.

The global declustered mean grades of the TGC and sulphur composites were compared to the block model estimated average grades. The relative differences are less than 10% for all domains except sulphur estimates in the transitional zone.

Swath plots demonstrate that the TGC and S estimates follow the trend of the input data, with some level of smoothing that is expected through estimation.

1.13.12 <u>Classification</u>

The estimates were classified into Measured, Indicated and Inferred Mineral Resource categories as defined by the CIM Definition Standards for Mineral Resources and Mineral Reserves (2014). The Mineral Resource is classified on the basis of TGC estimates as the main variable of economic interest.

- Modelled mineralisation covered by a 50m by 50m grid, that also includes the highest confidence Gecko drilling, was classified as Measured Mineral Resources. The Measured Mineral Resource was extrapolated by 25m laterally and by 5m from the base of drillholes at depth:
- Areas drilled at a grid of 50m to 100m spacing were classified as Indicated Mineral Resources. The Indicated Mineral Resource was extrapolated by 50m laterally and by 10m from the base of drillholes at depth; and

- Areas covered by drilling at wider than 100m spacing, or in the north-west where the area appears to be more geologically complex, were classified as Inferred Mineral Resources. Inferred Mineral Resources were extrapolated to the lateral extent of the Mineral Resource model and by 25m vertically from the base of drillholes at depth.

A plan of the classified Mineral Resource is shown in Figure 1-9.

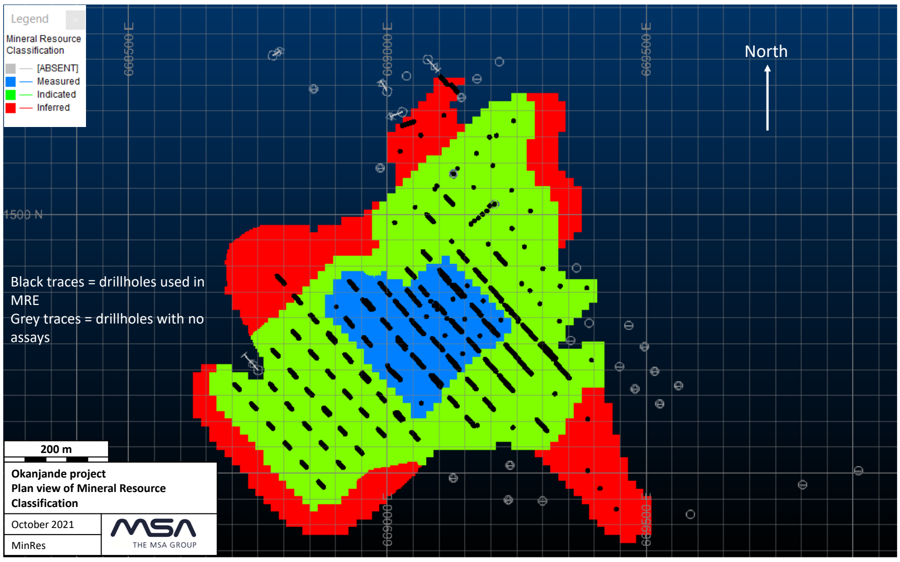


Figure 1-9: Mineral Resource Classification (MSA, 2021)

1.13.13 <u>Reconciliation</u>

Mining at Okanjande took place from early 2017 to October 2018. As part of grade control during mining, blast holes were drilled vertically at a spacing of 3m. MSA completed a reconciliation against the Mineral Resource model in the same areas that the blast holes were drilled (Figure 1-10). On average, the blast holes and Mineral Resource model TGC grades compare well, with a relative difference of -4%.

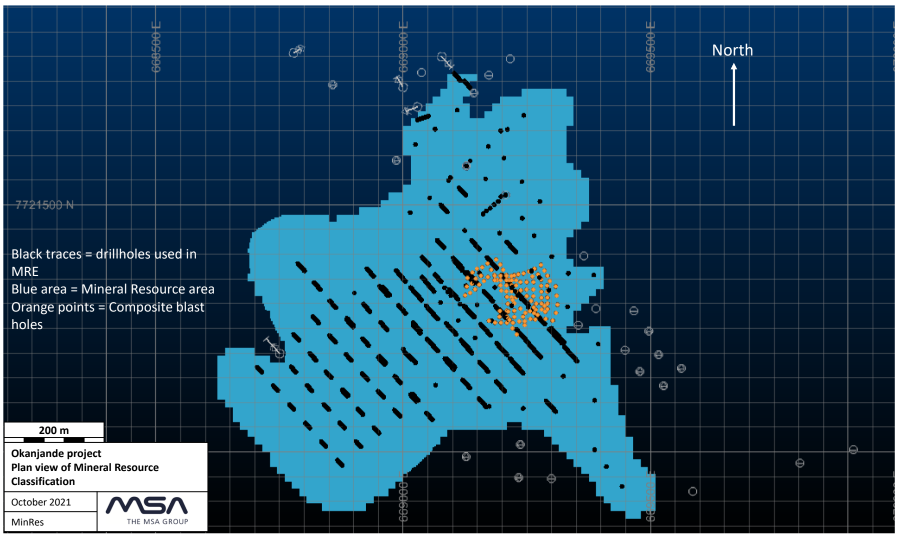


Figure 1-10: Plan view of the Mineral Resource reconciliation (MSA, 2021)

1.13.14 Reasonable Prospects for Eventual Economic Extraction (RPEEE)

MSA carried out a high-level economic analysis to determine "Reasonable Prospects for Eventual Economic Extraction" ("RPEEE") as required by CIM Definition Standards for Mineral Resources and Mineral Reserves (2014).

1.13.15 Mineral Resource Statement

The Weathered Mineral Resource, as at November 29, 2021, is reported in accordance with the CIM Definition Standards for Mineral Resources and Mineral Reserves (2014), as reported in Table 1-12.

Table 1-12: Weathered Mineral Resource at a cut-off grade of 2.6% TGC as at 29 November 2021 (MSA, 2021)

Material	Classification Category	Tonnes (Mt)	TGC (%)	Graphite content (kilo tonnes)
Weathered	Measured	1.7	4.66	80
	Indicated	4.2	4.03	168
	Subtotal	**5.9**	**4.21**	**248**
	Inferred	0.5	3.45	17
Transitional	Measured	0.2	5.42	13
	Indicated	1.0	4.08	40
	Subtotal	**1.2**	**4.35**	**53**
	Inferred	0.1	3.20	2

Notes:

1. All tabulated data have been rounded and as a result minor computational errors may occur.
2. Mineral Resources which are not Ore Reserves have no demonstrated economic viability.
3, Inferred Mineral Resources are reported separately from other categories.
4. The Mineral Resources reported are the total Mineral Resources for the Project, regardless of ownership.
5. The Mineral Resource is reported for mineralization contained within pit shells above a cut-off grade of 2.6% TGC, which is based on a product price of USD 1,250/t TGC, mining costs of USD 3.75/t RoM, transport cost to plant of USD 6.5/t RoM, processing and treatment costs of 14.9 USD/t (RoM), G&A USD 0.8/t (RoM), transport cost to the market USD 175/t product, 2% royalty, concentrate recovery 92%.
6. MSA is not aware of any known environmental, permitting, legal, title-related, taxation, socio-political, marketing, or other relevant issue that could materially affect the Mineral Resource Estimate.
7. The Inferred Mineral Resource has a lower level of confidence than that applying to an Indicated Mineral Resource and must not be converted to a Mineral Reserve. It is reasonably expected that the majority of Inferred Mineral Resources could be upgraded to Indicated Mineral Resources with continued exploration.

The Fresh Mineral Resource, as at 29 November 2021, is reported in accordance with the CIM Definition Standards for Mineral Resources and Mineral Reserves (2014), as reported in Table 1-13.

Table 1-13: Fresh Mineral Resource at a cut-off grade of 3.1% TGC as at 29 November 2021 (MSA, 2021)

Classification Category	Tonnes (Mt)	TGC (%)	Graphite content (kilo tonnes)
Measured	7.1	5.86	419
Indicated	17.0	5.10	868
Subtotal	**24.2**	**5.33**	**1,287**
Inferred	7.2	5.02	359

Notes:

1. *All tabulated data have been rounded and as a result minor computational errors may occur.*
2. *Mineral Resources which are not Ore Reserves have no demonstrated economic viability.*
3, *Inferred Mineral Resources are reported separately from other categories.*
4. *The Mineral Resources reported are the total Mineral Resources for the Project, regardless of ownership.*
5. *The Mineral Resource is reported for mineralization contained within a Whittle pit shell above a cut-off grade of 3.1% TGC, which is based on a product price of USD 1,250/t TGC, mining costs of USD 5.11/t RoM, transport cost to plant of USD 6.5/t RoM, processing and treatment costs of 17.88 USD/t (RoM), G&A USD 0.96/t (RoM), transport cost to the market USD 175/t product, 2% royalty, concentrate recovery 92%.*
6. *MSA is not aware of any known environmental, permitting, legal, title-related, taxation, socio-political, marketing, or other relevant issue that could materially affect the Mineral Resource Estimate.*
7. *The Inferred Mineral Resource has a lower level of confidence than that applying to an Indicated Mineral Resource and must not be converted to a Mineral Reserve. It is reasonably expected that the majority of Inferred Mineral Resources could be upgraded to Indicated Mineral Resources with continued exploration.*

1.14 MINERAL RESERVE ESTIMATES

No mineral reserve estimate was determined or is available at the time of writing.

1.15 MINING METHODS

1.15.1 Background

The Okanjande graphite deposit lends itself to being mined by opencast mining methods. The intention is to mine at a rate of 631,450 tonnes of mineralised material per month which will be transported to the Okorusu plant for treatment.

This report considers a 10-year mining plan, commencing with the mining of the weathered graphite-bearing material and ending with a short period of mining the transitional and fresh graphite-bearing material underlying the weathered material.

The intention is to mine the Okanjande deposit by making use of contractors who will supply their own mining equipment and to deliver the graphite-bearing material to a product stockpile and the balance to a waste rock dump. The mining contractors will also be responsible for the loading of the graphite-bearing material into side tippers to be transported to the plant at Okorusu.

1.15.2 Mine Scheduling

A pit shell was defined incorporating only the weathered graphite-bearing material and using geotechnical parameters as defined in the previous mine design contemplated by Imerys-Gecko. The pit shell was then reconfigured and expanded to include some of the transitional and fresh graphite-bearing material in order to achieve a 10-year life of mine at a production rate of approximately 631,450tpa graphite-bearing material to achieve approximately 31,877 tonnes of product per annum.

1.15.2.1 Pit Design Parameters

The open pit design parameters considered are summarised below:

- Bench heights: 5m
- Bench widths: 10m to 70m
- Slope angles: 45° to 55°
- Cut-off Grade: 3% TGC
- Dilution to RoM tonnes: 2%
- Recovery: 92%.

1.15.2.2 Schedules

1.15.2.2.1 Base Case 4% TGC Cut-off

Using the above design parameters, a mining schedule was developed to mine at a rate of approximately 630,000tpa at an average Stripping Ratio ("S/R") of 0.66 (tonnes of waste to one tonne of graphite-bearing material) over the 10-year period (Table 1-13).

Table 1-14: 10-year mining schedule @3% TGC cut-off (MSA, 2021)

	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	TOTAL
Total Mining (t)	1 419 921	1 154 011	1 715 632	1 401 837	878 519	685 038	738 987	707 697	764 570	675 780	**10 141 990**
Waste (t)	1 009 479	522 561	1 082 452	770 387	247 069	53 588	105 807	76 247	133 120	44 330	**4 045 040**
ROM (t)	410 443	631 450	633 180	631 450	631 450	631 450	633 180	631 450	631 450	631 450	**6 096 950**
TGC %	5.58	4.95	4.81	5.05	4.90	5.06	5.46	5.65	5.47	5.86	**5.27**
S %	0.79	0.71	0.79	0.95	1.94	2.48	2.54	2.65	2.69	2.90	**4.85**
S/R	2.46	0.83	1.71	1.22	0.39	0.08	0.17	0.12	0.21	0.07	**0.66**
Product TGC (t)	21 070	28 756	28 019	29 337	28 453	29 395	31 806	32 823	31 777	34 043	**295 480**

1.15.2.2.2 Increasing and Decreasing TGC Cut-off

An exercise was carried out to look at the effect of increasing the cut-off grade to see the effect on the Graphite production, depletion of weathered material and total tonnes moved. Table 1-15 below shows the results for 3, 3.5, 4, 4.5 and 5% TGC cut-offs. The base case of 4%TGC is highlighted.

Table 1-15: 10-year Mining Schedule @ 3, 3.5, 4, 4.5 and 5% TGC cut-off (MSA, 2021)

	3.0%	3.5%	4.0%	4.5%	5.0%
Total Tonnes	8 464 034	9 193 913	**10 141 990**	11 086 863	11 938 342
Waste Tonnes	2 347 081	3 096 960	**4 045 040**	4 989 909	5 849 142
ROM Tonnes	6 096 953	6 096 953	**6 096 950**	6 096 953	6 089 199
%TGC	4.75	5.00	**5.27**	5.41	5.50
%S	1.40	1.61	**1.88**	2.11	2.48
S/R	0.38	0.51	**0.66**	0.82	0.96
Product Tonnes	266 338	280 259	**295 480**	303 441	308 119

1.15.3 Mining Recovery

Given the nature of the Okanjande deposit, 92% recovery with 2% dilution is anticipated, the dilution is based on barren rock within the Okanjande deposit which is randomly dispersed and differs in thickness and orientation throughout. The Strip ratio of the Okanjande deposit is extremely low for the selected 4% TGC cut-off and the relatively small amount of waste rock is stockpiled on a dedicated rock dump.

1.15.4 Mining Equipment

The following mining equipment is proposed to undertake the mining of the graphite-bearing material and waste at the Okanjande deposit, as well as for loading of the road trucks (Table 1-16).

Table 1-16: Mining Equipment

Quantity	Description	Size / Capacity
2	Excavator 60 t	60 t
5	Articulated Dump Trucks (“ADTs”)	30 t
1	Drill Rig	Top Hammer 102mm diameter
1	Track Dozer	40 t
1	Motor Grader	CAT140/Bell 770
1	Water Bowser	15,000 *l*
1	Lubrication Service Truck	
2	Front End Loader (“FEL”)	3 -5 m^3
1	Diesel Bowser	15,000 *l*

1.15.4.1 Drilling and Blasting

To achieve this powder factor with 102mm holes and 5m high benches, each bench is drilled on a 3m by 3m pattern and charged with an emulsion explosive agent.

1.15.4.2 Mining Cost

Mining costs for the operation were obtained from three budget quotations provided by mining contractors in Namibia. A review of the costs by URE Consulting Inc concludes that costs provided by one of the contractors be used in the economic assessment of the Okanjande deposit and that closer to the start of mining, two of the three contractors be asked for full and final quotes.

Table 1-17: Mining and Transport Costs (Namibian Dollar)

Operating Costs	Units	Cost
Establishment and De-establishment	N$, Once-off	3,064,250
P&Gs	N$/a	12,862,591
Load, haul and dump topsoil	N$/m³	51.45
Drill & blast waste and ore	N$/m³	43.84
Load, haul and dump waste	N$/m³	51.45
Load haul and stockpile ore	N$/t	56.47
Hauling Ore to Okorusu	N$/t	96.83

1.15.5 Waste Rock Dump Design

Knight Piésold selected the location and modelled the WRD on the one end of the approved footprint area, taking into consideration for potential expansion beyond the 10-year life. The WRD was designed at an overall slope of 1V:3H, assuming that the facility would be benched which allows for the control of rainfall runoff and assists in closure of the facility. Furthermore, utilising a flatter slope is a conservative approach for this level of study. The WRD is shown in Figure 1-11 below, it has a footprint area of 12.7ha, with a total of 3.12Mt stored waste rock material and a final height of 23m.

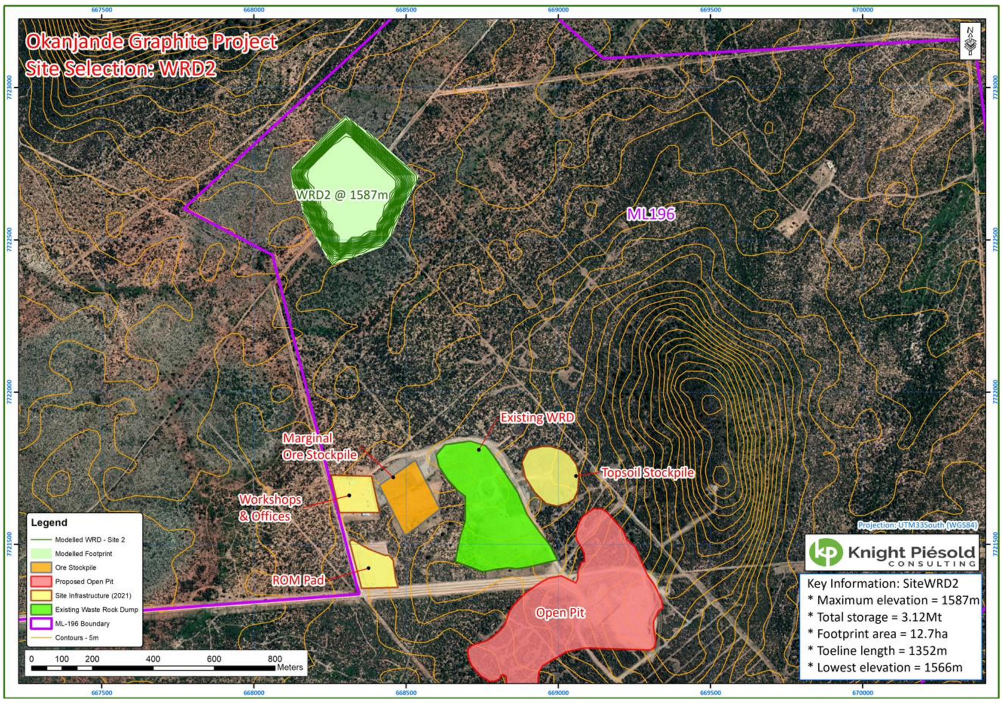


Figure 1-11: Okanjande WRD conceptual footprint

1.15.6 Conclusions

This 10-year mining plan (4%TGC cut-off) considers the mining of weathered as well as fresh graphite bearing material. The weathered material can be treated at the modified Okorusu Fluorspar plant, and this can be done for the first 5 years of the mine plan at a 4%TGC cut-off grade. Once the fresh material is accessed Northern will be required to design the waste rock dump (WRD) at Okanjande and the tailings storage facility (TSF) at Okorusu to handle acid generating material. All testing to date indicates that the same processing flowsheet can be used for both fresh and hard rock.

If the cut-off grade is increased, the above adjustments to process the fresh graphite bearing material will be required sooner.

1.16 RECOVERY METHODS

1.16.1 Previous Imerys-Gecko Process

The existing graphite processing plant at Okorusu, which was used to process Okanjande graphite ore during 2017-2018 is based somewhat on the Imerys Lac de Iles graphite operation in Quebec, Canada. This process relied heavily on the use of gravity spirals early on in the process. While spirals can be a suitable technology to separate gangue from graphite, it is paramount that the graphite is well liberated to produce an acceptable concentrate. This was not the case for the Okanjande graphite, and the plant struggled operationally to achieve nameplate production rates and concentrate grades.

1.16.2 Current Northern Graphite Process Design

1.16.2.1 Design Basis

The addition of a new comminution circuit and the process flow changes of the existing flotation circuit flow out from the outcomes both early and recent test work programs and are designed to improve flake preservation and improve purity of graphite flake concentrate through following changes:

- A split milling circuit that will prevent excessive recirculation and reduce the potential for flake degradation.
- The split milling circuit will make provision for potentially implementing a flash flotation stage after the Autogenous Mill (AG mill) to further improve large flake recovery.
- Generation of a flotation feed stream of the optimal solids content – 30%.
- A Flotation Feed Buffer Tank to reduce fluctuations in feed rate and solids content and improve steady operation of the flotation circuit.
- The removal of gravity spirals early in the process flow where incomplete liberation may be expected.
- The removal of excessive recirculating streams which hamper effective capacity of process equipment and complicates process control and plant water balance.
- The correct flotation solids content will remove the need for dispersants.

- The addition of more suitable frother in the form of MIBC
- Allowance for reagent addition at all flotation banks.

1.16.2.2 Process Description

The Comminution circuit will consist of a single crushing stage followed by an open circuit AG mill and closed-circuit Rod Mill with stack sizer classification. Crushing will take place at the mine site and crushed ore will be transported to the Okorusu processing site via side-tipping haul trucks following the transport route.

The Flotation circuit consists of existing flotation banks from the original Solvey fluorspar processing plant which was converted to a graphite flotation plant by Imerys-Gecko and will be reconfigured for the amended Northern Graphite process flow (Figure 1-12). The flotation circuit will consist of a roughing stage followed by two stages of polishing milling and cleaners. The concentrate is then classified into a coarse and fine fraction (+ and – 180 microns), before undergoing a further stage of polishing and cleaning flotation

The combined concentrate is the passed through the existing Imerys circuit for dewatering through a thickener, belt filter and rotary drier. The dry concentrate is classified through screens into 4 products (+300µm, +180µm, +106µm and -106µm) and bagged.

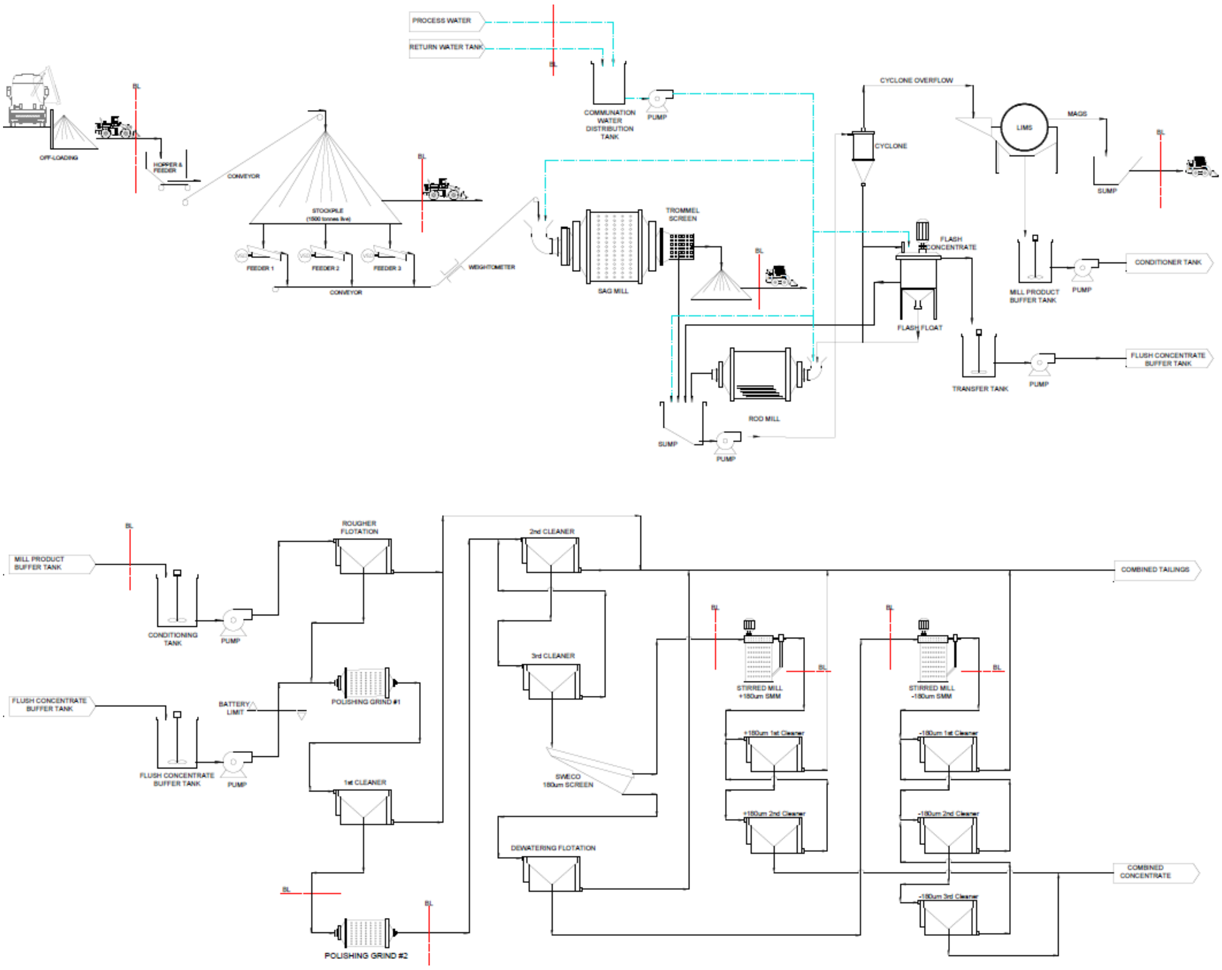


Figure 1-12: Planned Okorusu Process Block flow Diagram

1.16.2.3 Mass Balance

Table 1-18: High Level Mass Balance

PROJECT KEY PERFROMANCE INDICATORS	UOM	Value
Throughput	t/h	87.1
Mean Head Grade	% TGC	4.75%
Total Graphite Concentrate produced	t/h	4.0
Concentrate Grade	%	96%
Total Contained Graphite in Concentrate	t/h	3.8
Total Tailings (dry) deposited	t/h	83.1
Recovery	%	92%

Table 1-19: Graphite Mass Balance (5% Head grade)

Product	Mass	Grade	Distribution
	%	% C(g)	% C(g)
+80 mesh 2nd Clnr Conc	2.22	95.1	42.2
+80 mesh 1st Clnr Tails	0.15	20.0	0.6
-80 mesh 3rd Clnr Conc	2.60	95.1	49.5
-80 mesh 1st Clnr Tails	0.25	30.0	1.5
4th Clnr Tails	0.10	20.0	0.4
3rd Clnr Tails	0.40	8.00	0.6
2nd Clnr Tails	0.75	3.00	0.4
1st Clnr Tails	7.53	0.86	1.3
Rougher Tails	86.0	0.20	3.4
Feed	100.00	5.00	100.0
Combined Products	**Mass**	**Grade**	**Distribution**
	%	**% C(g)**	**% C(g)**
Combined Concentrate	4.82	95.1	91.7
+80 mesh 2nd Clnr Conc	2.22	95.1	42.2
-80 mesh 3rd Clnr Conc	2.60	95.1	49.5
4th Clnr Conc	5.22	89.8	93.8
3rd Clnr Conc	5.32	88.5	94.2
2nd Clnr Conc	5.72	82.9	94.8
1st Clnr Conc	6.47	73.6	95.3
Rougher Conc	14.0	34.5	96.6
Feed	100	5.00	100
Combined Products	**Mass**	**Grade**	**Distribution**
	%	**% C(g)**	**% C(g)**
Combined Concentrate	4.82	95.1	91.7
+80 mesh 1st Clnr Tails	0.15	20.0	0.6
-80 mesh 1st Clnr Tails	0.25	30.0	1.5
2nd Clnr Tails	1.25	5.95	1.5
1st Clnr Tails	7.53	0.86	1.3
Rougher Tails	86.0	0.20	3.4
Feed	100.00	5.00	100

1.16.3 Production Plan

Run-of-Mine mineralized material will be transported to Okorusu with minimal stockpiling of material at the plant. The main stockpiling will be kept at the Okanjande mine site and blending will be done through mine stockpile extraction and transport to Okorusu.

Production from the Okanjande mine will ramp up rapidly due to being a brown fields operation with all initial required overburden stripping completed during the previous operational period 2017-2018.

Plant commissioning and ramp-up can be fast tracked during construction through the availability of existing graphite ore stockpiles at the Okorusu site. Plant production rates match mining production rates and stockpile inventory is kept to a minimum.

The run of mine head grade increases with depth with the average grade exceeding 5% from year 7. A flat concentrate graphite grade was assigned to the production plan. However, the increased grade in the last 3 years of operation could likely lead to improved achieved concentrate grade and/or overall graphite recovery.

Table 1-20: Process Production Plan

	Units	Totals	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Mining														
Ore Mined	t/a	**6,096,950**	-	410,442	631,450	633,179	631,450	631,449	631,450	633,180	631,450	631,450	631,450	
Grade Mined	%	**5.27%**	0.00%	5.58%	4.95%	4.81%	5.05%	4.90%	5.06%	5.46%	5.65%	5.47%	5.86%	
Graphite Mined	t/a	**321,174**	-	22,903	31,257	30,456	31,888	30,927	31,951	34,572	35,677	34,540	37,003	
Waste Mined	t/a	**4,045,040**	-	1,009,479	522,561	1,082,452	770,387	247,069	53,588	105,807	76,247	133,120	44,330	
Strip Ratio		**0.66**		2.5	0.8	1.7	1.2	0.4	0.1	0.2	0.1	0.2	0.1	
Mineralized Waste Mined	t/a	**0.00**	-	-	-	-	-	-	-	-	-	-	-	
Total Mined	t/a	**10,141,990**	-	1,419,921	1,154,011	1,715,631	1,401,837	878,518	685,038	738,987	707,697	764,570	675,780	
Ore Stockpiles			**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**
Opening														
Ore Tons	t		-	-	-	-	1,729	1,729	1,728	1,728	3,458	3,458	3,458	3,458
Ore Grade	%		0.0%	0.0%	0.0%	0.0%	4.8%	5.0%	4.9%	5.1%	5.5%	5.6%	5.5%	5.9%
Graphite Tons	t		-	-	-	-	83	87	85	87	189	195	189	203
Incoming														
Ore Tons	t	**6,096,950**	-	410,442	631,450	633,179	631,450	631,449	631,450	633,180	631,450	631,450	631,450	-
Ore Grade	%	**5.3%**	0.0%	5.6%	5.0%	4.8%	5.1%	4.9%	5.1%	5.5%	5.7%	5.5%	5.9%	0.0%
Graphite Tons	t	**321,173.61**	-	22,903	31,257	30,456	31,888	30,927	31,951	34,572	35,677	34,540	37,003	-
Outgoing														
Ore Tons	t	**6,096,950**	-	410,442	631,450	631,450	631,450	631,450	631,450	631,450	631,450	631,450	631,450	3,458
Ore Grade	%	**5.3%**	0.0%	5.6%	5.0%	4.8%	5.0%	4.9%	5.1%	5.5%	5.6%	5.5%	5.9%	5.9%
Graphite Tons	t	**321,174**	-	22,903	31,257	30,373	31,884	30,929	31,949	34,470	35,670	34,546	36,990	203
Closing														
Ore Tons	t		-	-	-	1,729	1,729	1,728	1,728	3,458	3,458	3,458	3,458	-
Ore Grade	%		0.0%	0.0%	0.0%	4.8%	5.0%	4.9%	5.1%	5.5%	5.6%	5.5%	5.9%	0.0%
Graphite Tons	t		-	-	-	83	87	85	87	189	195	189	203	-
Processing			**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**
Ore Processed	t	**6,096,950**	-	410,442	631,450	631,450	631,450	631,450	631,450	631,450	631,450	631,450	631,450	3,458
Grade Processed	%	**5.3%**	0.0%	5.6%	5.0%	4.8%	5.0%	4.9%	5.1%	5.5%	5.6%	5.5%	5.9%	5.9%
Graphite Processed	t	**321,174**	-	22,903	31,257	30,373	31,884	30,929	31,949	34,470	35,670	34,546	36,990	203
Graphite Recovered to Concentrate	t	**295,480**	-	21,070	28,756	27,943	29,333	28,455	29,393	31,713	32,817	31,783	34,030	186
Concentrate Produced	t	**307,792**	-	21,948	29,954	29,107	30,556	29,641	30,617	33,034	34,184	33,107	35,448	194
Upgrade Achieved	%	**18.22**	-	17.2	19.4	20.0	19.0	19.6	19.0	17.6	17.0	17.5	16.4	16.4
Tailings			**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**
Tailings Produced (dry)	t	**5,789,159**	-	388,494	601,496	602,343	600,894	601,809	600,833	598,416	597,266	598,343	596,002	3,264
TSF Site 3A	t	**3,200,000**	0	388,494	601,496	602,343	600,894	601,809	404,964	-	-	-	-	-
TSF Site 3B	t	**2,589,159**		-	-	-	-	-	195,868	598,416	597,266	598,343	596,002	3,264

1.16.4 Major Equipment List

The major processing plant equipment is listed in Table 1-21.

Table 1-21: Okorusu Process Plant Major Equipment List

Equipment	Description	Dimensions	Installed Power	Condition
Comminution				
Jaw Crusher	C130 equivalent	1.3x1.0m	160	New
AG Mill		5.0x2.5m	500	New
Rod Mill		3.0x4.5m	600	New
Stack-Sizer	Derrick Screen	5 Deck	75	Refurbished
Buffer Tank		50m3	20	New
Flotation				
Rougher	Rougher #1&2	12x2.8m3	266	Refurbished
Polishing Scrubber #1	Scrubber	2.6x7.5m	110	New
1st Cleaner	Cleaner #1	6x1.4m3	45.5	Refurbished
Polishing Scrubber #2	Mill	1.9x2.7m	228	Refurbished
2nd Cleaner	Cleaner #6	6x1.4m3	45.5	Refurbished
3rd Cleaner	Cleaner #2	4x1.4m3	30.5	Refurbished
180mm Classification Screen	SWECO 31, 32, 33		2.4	Refurbished
Dewatering Flotation	Scavenger #3	3x1.4m3	22.5	Refurbished
Coarse Polishing Mill	Stirred Media Mill		55	New
1st Coarse Cleaner	Cleaner #3	2x1.4m3	15	Refurbished
2nd Coarse Cleaner	Cleaner #4	2x1.4m3	15	Refurbished
Fine polishing Mill	Stirred Media Mill		55	New
1st Fine Cleaner	Cleaner #7	4x1.4m3	30.5	Refurbished
2nd Fine Cleaner	Cleaner #5	2x1.4m3	15	Refurbished
3rd Fine Cleaner	Cleaner #8	2x1.4m3	15	Refurbished
Dewatering, Classification and Bagging				
Thickener			2.2	Existing
Belt Filter	Vacuum		7.5	Existing
Dryer	Direct Fired		70	Existing
Vacuum Transfer			18.5	Existing
Filter Extraction Fan			75	Existing
Sizing Screens			11	Existing
Product Silos	4 classifications			Existing
Screens Extraction Fan			37	Existing
Bulk Bagging Stations	4 classifications		48	Existing

1.16.5 Site Layout

The only changes to the existing Okorusu Site layout will be due to the construction of the Milling circuit at the current concentrate storage area. The Milling area will be located directly south of the existing Engineering Workshop (Figure 1-13). The site access route will be extended and rerouted to allow for the crushed ore side tipping offloading ramp.

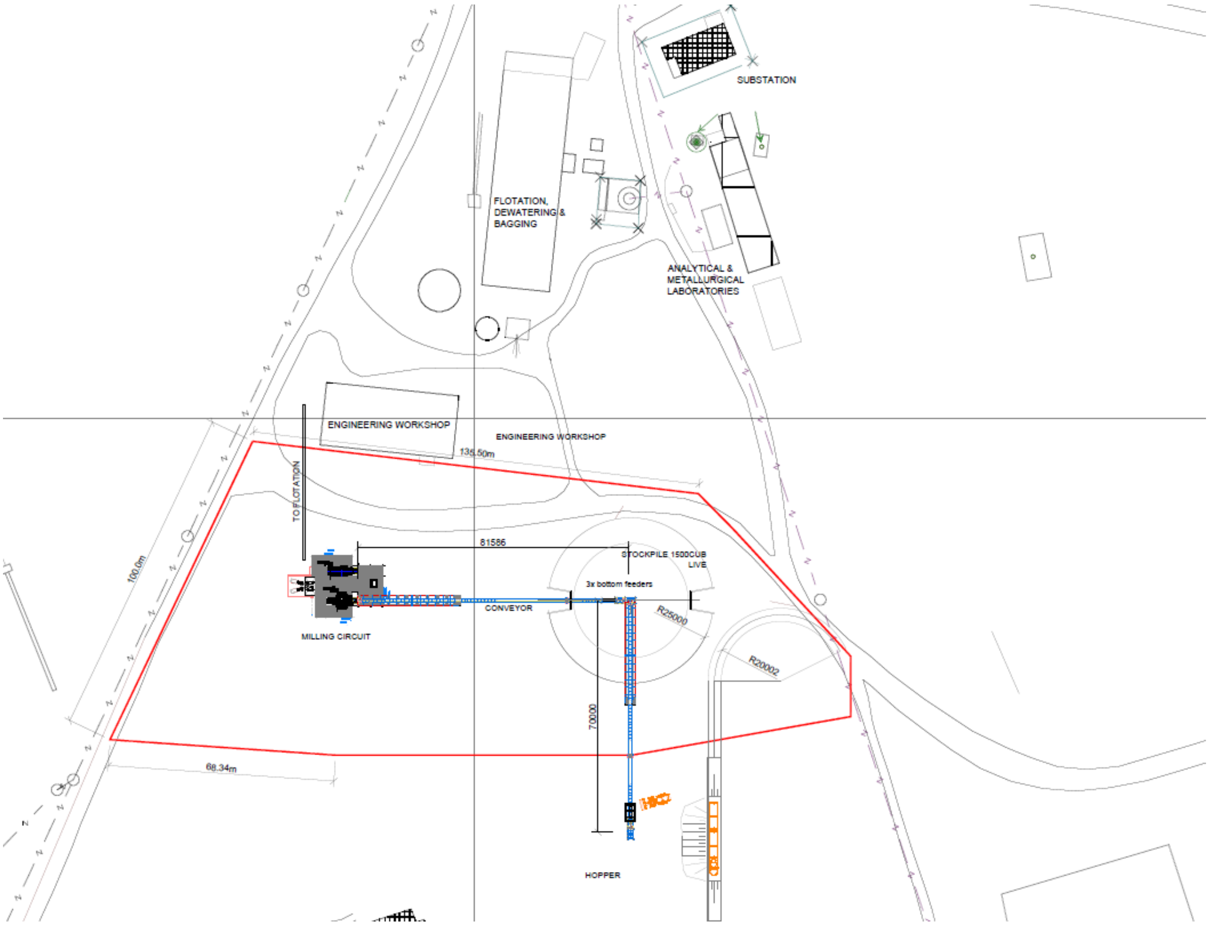


Figure 1-13: Okorusu Site Layout

1.17 PROJECT INFRASTRUCTURE

1.17.1 Access Roads and Haul Roads

1.17.1.1 Okanjande

The Okanjande deposit is accessed from the B1, 8km south from Otjiwarongo, unto the D2512 (a well-maintained gravel road) for some 24km to the entrance of the property.

1.17.1.2 Okorusu

The Okorusu processing facility is easily accessible from the B1, a national standard tarmac road, unto the D2463 (a well-maintained gravel road) some 40km north of the town, Otjiwarongo. The property is accessed some 20km along the D2463.

1.17.2 Local Resources

Local resources required for labour, supplies and equipment will be insufficient from the nearby community to support the project. Some local resources can be utilised, but skilled mining contractors, consultants and suppliers will be available throughout Namibia to support the project and its operations.

1.17.3 Buildings

1.17.3.1 Okanjande

The mining operations infrastructure located at the Okanjande deposit has adequate and well-maintained operating facilities required for supporting operational restart.

1.17.3.2 Okorusu

The Okorusu processing facility building infrastructure has adequate and well-maintained operating facilities required for supporting operational restart.

1.17.4 Surface Water and Drainage Collection

The site, located on the foot of the Okorusu mountain, is such that it drains naturally to the southeast. The Okorusu mountain, which collects most of the rainwater, naturally diverts the bulk of the rainwater into a side canal which routes the run-off to a run-off collection pond. The existing collection pond will be cleaned and fitted with a pump barge to recover run-off water through the process water clarifiers to the process water storage tanks.

1.17.5 Sewerage Disposal – Okanjande

1.17.5.1 Okanjande

All site produced sewerage is diverted to a septic tank. The septic tank capacity is adequate for the planned site operations.

1.17.5.2 Okorusu

All site produced sewerage is diverted to two separate septic tanks. The septic tanks capacity is adequate for the planned site operations.

1.17.6 Security

1.17.6.1 Okanjande

The Okanjande property is adequately fenced off. Existing access control points with security guard houses are part of the existing infrastructure in place. No additional security infrastructure is required.

1.17.6.2 Okorusu

The entire Okorusu processing facility is adequately fenced off. Existing access control points with security guard houses are part of the existing infrastructure in place. No additional security infrastructure is required.

1.17.7 Water Supply

1.17.7.1 Okanjande

Water is supplied from a borehole on the mining license for drinking and ablution purposes.

An existing water abstraction permit was renewed for two addition boreholes, located some 19km away in a straight line, on Farm Doornlaagte (Figure 28-2). There is no existing pumping, storage or pipeline infrastructure to utilize this water.

1.17.7.2 Okorusu

Raw water is supplied from three boreholes located on an adjacent farm some 5km away. Water is pumped to site from the operational boreholes with two buried pipelines to the steel water reservoirs situated on site. All three boreholes are in operational condition with two being in active production supplying raw water to the care and maintenance crew currently maintaining the assets. The water infrastructure will require maintenance in order to sustain a fully operational site again.

For supplementary purposes a metered connection exists to Namibian Water Corporation (NamWater) at km40. This water is available at cost and with a maximum use of $20m^3/h$ and was historically only used during emergency water shortages or breakdowns.

The water distribution network is in good condition as it is being utilised currently by the team on site.

1.17.8 Communications

1.17.8.1 Okanjande

The Okanjande site has adequate mobile telecommunication coverage that is used for internet connectivity as well.

1.17.8.2 Okorusu

Site communication infrastructure exists through a fibre connection from the B1 main road to site enabling internet and landline communications. Cell phone coverage is also available on site. An existing telecommunication service provider is rendering site communication services.

1.17.9 Power Supply

1.17.9.1 Okanjande

No utility power is currently available at the Okanjande property. Electricity is supplied from a diesel driven generator adequately supplying power to site operations. The closest utility power connection available is in Otjiwarongo at 66kV some 20km away. This facility may require some up-grade to accommodate the crushing equipment planned at the mine.

1.17.9.2 Okorusu

Electrical power is currently available at the site and in good condition. Power is distributed via a 22kV overhead line to site, and its various take-off points, from a utility owned substation some 6km away.

1.17.10 Fuel

1.17.10.1 Okanjande

Limited diesel storage is available for the site generator powering the administration buildings and workshop only. Mining fleet fuel infrastructure will be provided by the Mining Contractor.

1.17.10.2 Okorusu

Local infrastructure available at the Okorusu facility is adequate to supply diesel fuel to the diesel fired dryer during operations. On site fuel storage and distribution infrastructure was operated by a local fuel distributer through 4 x 23kL storage tanks and associated pumps. The restart operations can make use of the existing distributer infrastructure through renewed supply and distribution agreements.

1.17.11 Camp and Canteen

No room or board facilities will be built for this project and no site located facilities are available to be utilised for operational personnel or construction crew. It is recommended to accommodate staff in Otjiwarongo and set up transport to and from site for the Okanjande mining site as well as the Okorusu processing plant site.

1.17.12 Fire Protection

Fire water is supplied from the process water ring main. Fire hose reels and extinguishers are located throughout the process building. The fire hose reels will be replaced upon restart, the extinguishers were routinely replaced in February 2022. There is currently no dedicated fire water supply system in place.

1.18 MARKET STUDIES AND CONTRACTS

Because of supply concerns relating to China being the world's dominant producer, and to potential demand growth from new applications such as lithium-ion batteries ("LiBs"), the European Union considers graphite to be one of 14 "critical mineral raw materials" with high supply risk.

1.18.1 Graphite Supply

Benchmark Mineral Intelligence ("BMI") estimates that worldwide production of natural flake graphite in 2021 will be marginally over 1.0 Mt of which China will produce approximately 75%. Brazil (8%) and Mozambique (6%) make up most of the balance, with the rest largely scattered among Madagascar, Tanzania and Europe.

Chinese production of the larger flake sizes is declining. Heilongjiang has substantial small flake resources and excess production capacity, most of which is targeting the LiB market. Current sources indicate that Chinese production may be under-estimated by leading analysts.

A large new graphite mine was built in Mozambique in 2018 and it substantially increased world natural flake graphite supply. Most of its production has been sold into the Chinese steel market as the Chinese do not find its production suitable for the battery market.

Because of potential demand from the rapidly growing electric vehicle ("EV")/ LiB markets, there are over 20 advanced stage graphite projects outside of China that have completed feasibility studies. These projects are expected to take up to two years to bring into production after they obtain financing. Not all these projects have battery grade material and/or carry substantial country risk.

1.18.2 Graphite Demand

Graphite is the anode material in lithium-ion batteries and is their largest single component. There are no substitutes in this application although the anode material can be either synthetic or natural graphite. Natural graphite is less expensive and has a higher capacity whereas synthetic graphite charges faster and has a longer cycle life. In a relatively short period of time, LiB's have grown from a small market to the second largest market by volume for flake graphite.

Hybrid vehicles, EVs and grid storage are potentially large markets for continued growth in LiB production and indirectly flake graphite. BMI estimates that flake graphite production may need to more than double by 2025 to meet this demand.

There is very little recycling of, or substitution for graphite.

1.18.3 Graphite Price

There is no posted spot price or futures market for graphite. Sales are negotiated between producers and consumers. Prices increase with flake size and carbon content. The premiums are relatively small going from +150 mesh (small) flake to +100 mesh (medium) and +80 mesh large flake. Prices are much higher for +50 mesh (XL) and +32 mesh (XXL) flake sizes as they are rarer and more valuable. Purity is also a factor, but not considered important when concentrate grade is above 94% carbon. Most mine concentrates, produced by flotation alone, range between 94 and 98% carbon.

Graphite prices peaked in the $1,300/t range for the premium grade (large flake +80 mesh, 94-97%C) in the late 1980s and then declined sharply as Chinese producers entered the market. This caused western mines to close and development projects to be shelved. Prices did not begin to recover until 2005 and peaked in a range of US$2,500 to $3,000/t in 2012 when some shortages were reported. This was due to the growth in China and the commodity super cycle and the resultant demand from the steel market. The subsequent slowdown in the Chinese economy combined with a lack of growth in the US/Japan/Europe caused prices to fall back approximately 50% from 2012 levels. In the second half of 2017 prices rebounded 30 to 40% due to a recovering steel industry, continued strong growth in LiB demand and environmentally related capacity shutdowns in China. Current CIF Europe prices are approximately US$1,775/t for 94-95%C +50 mesh flake, US$1,500/t for 94%C +80 mesh flake, US$1,415/t for 94%C +100 mesh medium flake and US$1,135/t for -100 mesh small flake. These prices consist of Benchmark's FOB China prices with approximately US$300/t added for freight and handling. Due to the current state of container markets, these prices are likely understated.

Based on pilot plant work completed by a subsidiary of Rio Tinto in the 1990s and recent testing at SGS Lakefield, resources at the Okanjande deposit can be processed into a concentrate containing approximately 11% +50 mesh XL flake, 48% +80 mesh large flake, 24% +100 mesh medium flake and 17% +150 mesh small flake. Based on Fastmarkets and Benchmark's published prices, such a concentrate would realize a weighted average price in excess of US$1,447.80 per tonne. Northern's experience with the producing Lac des Iles mine in Quebec demonstrates that high quality concentrates from a secure, politically stable, non-Chinese source of supply can achieve substantial premiums over published prices. Accordingly, a weighted average price of US$1,500/t has been used for the purposes of this PEA.

1.18.4 Potential Products and Markets

Graphite is sold based on 80 per cent meeting the required size specification. A large flake concentrate for example is only 80 per cent large flake with the balance being smaller sizes. Accordingly, the size fractions produced by metallurgical testing have been grossed up by 20 percent. The expected product split figures provided by Northern are 11% +50 mesh XL flake; 48% +80 mesh large flake; 24% +100 mesh medium flake; and 17% -100 mesh small flake.

1.18.5 Graphite Market Outlook

In the near- to medium-term, graphite prices are expected to increase as LiB demand is growing rapidly, supply from China is getting tighter, and political, environmental and social governance ("ESG") concerns are increasing with respect to all operations.

1.18.6 Material Contracts

The Company has not entered into any material contracts.

1.19 ENVIRONMENTAL STUDIES, PERMITTING AND SOCIAL OR COMMUNITY IMPACT

1.19.1 Project Environmental Permitting Requirements

A review of available documentation was undertaken to determine the authorisation status at both the Okorusu and Okanjande sites. The status of environmental permitting is listed in Table 1-22 and Table 1-23.

Table 1-22: Environmental Authorization Status Okorusu

Year	Consultant	Type of application	Activities
1998	Unknown	EMP	• Original application
2003	Unknown	EIA Amendment	• Various changes at the mine • Specialist studies
2008	Unknown	EIA Amendment	• Further amendments
2012	Unknown	Application in terms of new Act	• 2008 EMP submitted
2013	Unknown	EIA	• Expansion of mining operations (ML-90 and ML-179)
2016	SLR	EIA Amendment	• Transport of graphite from Otjiwarongo to the Okorusu Mine • the construction of a new access road on the Okorusu Mine site • the processing of graphite at the existing processing plant • the development of a new TSF cell within the approved Okorusu TSF footprint in order to dispose of graphite ore processing tailings • mining of magnetite within the ML-90 and ML-179 mining licence areas; and • reworking of the Okorusu mine tailings for the production of metspar at the existing Okorusu processing facility.
2017	Namib Hydrosearch	Environmental Issues Report	• Mine water use • Water quality • Management of wastewater • Disturbances and environmental concerns • Groundwater exploration for resources
2020	Phillip Hooks	EIA Amendment	Request stand-alone ECC for the following: • Whole processing of graphite ore at the Okorusu mine site • The storage and use of diesel and heavy fuel oil to be included under the transferred certificate • The new Tailings Storage Facility • The haulage of graphite ore from Okanjande mine site to Okorusu mine site by truck

Table 1-23: Environmental Authorisation Status Okanjande

Year	Consultant	Type of application	Status	Comments
2014	Enviro Dynamics	EIA		
2020	Imerys	Renewal application (with EAR)	EAR Submitted, ECC renewed and Valid until 2024-11-11	
2021	Geokey	Environmental Audit Report	Bi-Annual reporting up to date. EMP up to date	Requirement for Bi-annual internal audit and report

The Okanjande ECC for graphite mining activities was first issued on 23 April 2015. The Okorusu ECC for mine expansion was first issued on 26 September 2016.

1.19.2 Regulatory Requirements

1.19.2.1 Environmental clearance certificate (ECC)

1.19.2.2 Water Abstraction Permits

1.19.2.2.1 Okanjande

The water abstraction permit nr 11163 for the remaining portion of Farm Okanjande was issued 5 July 2021 for the abstraction of 25,000m^3/a for the use in mining purposes. The water abstraction permit nr 10946 from the Farm Doornlaagte was issued 13 July 2021 for the abstraction of 90,000m^3/a for the use in mining purposes.

1.19.2.2.2 Okorusu

The water abstraction permit nr 11472 for Farm Okorusu was issued on 17 October 2019 for the abstraction of 640,000m3 of water per year from borehole nr WW205415 for the use in mining purposes. The permit expired on 16 October 2021. Application for renewal of the water permit was submitted to the Department of Water Affairs on 6 October 2021.

1.19.3 Social/Community Requirements

1.19.3.1 Public Participation

A public participation plan should be compiled at the initiation of the project to identify the role players and detail the public participation activities. This will ensure that stakeholders are not overlooked and that that effective methods for communication are used. Public participation is requirement of an EIA process.

1.19.3.2 Analysis of Social Issues

No social issues of concern have been identified at the time of writing of this report.

1.19.4 Mine Closure

Mine closure plans need to be developed for the Okanjande Graphite project for the closure of Open Pits, Waste Dumps, Tailings Storage Facility, Process Plant Buildings and Infrastructure; as well as general surface rehabilitation.

The open pit mining at Okanjande lends itself to a number of risks which need to be considered during the development of closure plans. These risks were identified in 2014 Environmental Impact Assessment conducted by Namib Hydrosearch.

1.20 CAPITAL AND OPERATING COST ESTIMATES

The Okanjande overall capital and operating cost estimate was developed by Creo Engineering Solutions Pty Ltd, MSA Group and Knight Piésold Consulting Pty Ltd, with input from Northern Graphite Corporation.

The cost estimates have been prepared in accordance with the recommended practices of the American Association of Cost Engineers (AACE) and are considered to have an accuracy of +40 -30% overall and are discussed in greater detail in the following sections.

The currency for the cost estimate is expressed in 2nd Quarter 2022 US dollars. No provision is included for potential future cost escalation. The exchange rate applied is NAD 15.60 : USD 1.00

The scope of facilities addressed in the cost estimate includes the following major elements:

- Mining (OPEX Only)
- Comminution (CAPEX and OPEX)
- Flotation (CAPEX and OPEX)
- Dewatering and Bagging (CAPEX and OPEX)
- Tailings Storage (CAPEX and OPEX)

1.20.1 Capital Cost Estimate

The initial project process plant capital expenditure is given in Table 1-24. The majority portions of the initial capital are required for the construction of the new Grinding circuit and infrastructure. Table 1-25 presents the initial capital related to the construction of the first portion (3A) of a new tailings storage facility.

The Okanjande mine infrastructure has been established and no further capital is required. Contract mining will be applied and as such no capital is required from Northern Graphite for a mining fleet. In the current study no allowance has been made for mining capital cost.

Table 1-24: Okanjande Initial Process Plant CAPEX Summary

DIRECT FIELD COSTS		%IDFC	%TCC
Mechanical	2,173,642	29%	21%
Civil & Earthworks	811,540	11%	8%
Structural	1,426,055	19%	14%
Piping & Valves	267,155	4%	3%
Platework	199,951	3%	2%
Electrical & Instrumentation	1,391,084	19%	14%
SUBTOTAL: DIRECT FIELD COSTS	**6,269,427**	**84%**	**61%**
Cost of Services During Construction	1,211,561	16%	12%
TOTAL: INSTALLED DIRECT FIELD COSTS	**7,480,988**	**100%**	**73%**
INDIRECT FIELD COSTS			
Transport	512,497	7%	5%
EPCM Allowance	793,513	10.6%	8%
Owner Teams Cost	500,000	7%	5%
SUBTOTAL INSTALLED COST	**9,286,997**	**124%**	**90%**
Contingency Allowance	1,000,000	13%	10%
TOTAL CAPITAL COST	**10,286,997**	**138%**	**100%**

Table 1-25: Okanjande Initial TSF 3A CAPEX Summary

DIRECT FIELD COSTS		%IDFC	%TCC
Mechanical	225,000	6%	5%
Civil & Earthworks	1,825,612	46%	38%
Structural	52,500	1%	1%
Piping & Valves	808,567	20%	17%
Platework	10,000	0%	0%
Electrical & Instrumentation	250,537	6%	5%
SUBTOTAL: DIRECT FIELD COSTS	**3,172,216**	**80%**	**66%**
Cost of Services During Construction	772,057	20%	16%
TOTAL: INSTALLED DIRECT FIELD COSTS	**3,944,273**	**100%**	**82%**
INDIRECT FIELD COSTS			
Transport	39,443	1%	1%
EPCM Allowance	243,590	6%	5%
Owner Teams Cost	0	0%	0%
TOTAL INSTALLED COST	**4,227,305**	**107%**	**88%**
Contingency Allowance	591,641	15%	12%
TOTAL CAPITAL COST	**4,818,946**	**122%**	**100%**

1.20.1.1 Basis of Capital Cost Estimate

The estimate is developed based on a mix of material take-offs and factored quantities and costs, semi-detailed unit costs and work packages for major equipment supply.

The structure of the estimate is a build-up of the direct and indirect cost of the current quantities; this includes the installation/modification/rectification/construction costs, contractor construction distributable costs, bulk and miscellaneous material and equipment costs, any subcontractor costs and freight.

The pricing and delivery information for quoted equipment, material and services was provided by suppliers based on the market conditions and expectations applicable at the time of developing the estimate. The estimate in this report is based on information provided by suppliers and assumes there are no problems associated with the supply and availability of equipment and services during the execution phase.

1.20.1.1.1 Direct Field Costs

The direct costs were estimated by CREO. The direct field costs were developed based on a mix of material take-offs on the major cost items, factored quantities and costs, semi-detailed unit costs and work packages for major equipment supply. Major equipment costs were estimated through a budgetary enquiry process and factorised associated construction related costs. All equipment and material requirements are based on the design information available for the 2022 PEA.

An estimated cost was prepared for the following:

- Civils and Earthworks - Factored from mechanical equipment costs
- Structural Steel - Estimated from layouts and preliminary material take-offs coupled with factorisation on minor items.
- Platework - Factored from mechanical equipment costs
- Piping & Valves - Factored from mechanical equipment costs
- Electrical and Instrumentation - Estimated from preliminary layouts, load lists and MCC schedules together with factorisation on minor items.

1.20.1.1.2 Indirect Field Costs

The following Indirect Field Costs were considered:

- **Transport**: Estimated as 7% of the project direct costs.
- **EPCM Allowance**: Estimated as 10.6% of the project direct costs. The EPCM allowance is lower than standard, as the bulk of these costs will only be applicable to the new comminution circuit expansion activities.
- **Owner's Team Costs**: Estimated as 7% of the project direct costs.
- **Contingency**: Applied at 13% of the direct field costs

1.20.1.2 Mining Capital Cost Estimate

The Okanjande mine infrastructure has been established and no further capital is required. Contract mining will be applied and as such no capital is required from Northern Graphite for a mining fleet. In the current study no allowance has been made for mining capital cost.

1.20.1.3 Process Plant Capital Cost Estimate

The following Indirect Field Costs were considered:

- **Site Wide Services and Infrastructure**: The Okorusu site wide services and infrastructure was inspected and found to be in an acceptable condition for the restart of operations. No capital cost allowance was made for site wide services and utilities in this study.
- **Crushing and screening**: Primary crushing at Okanjande will be contracted together with mining and a such no capital cost allowance was made for crushing in this study.
- **Milling**: Multiple budgetary quotes were obtained for the mechanical equipment, with the exception of the circulation pumps where existing equipment will be repurposed. For the purpose of this study quotes from Chinese equipment suppliers was used as the basis for this estimate.
- **Flotation**: Initial mechanical costs for the Flotation circuit was derived from estimates for the maintenance and refurbishment of existing flotation equipment. The largest contributor to flotation circuit mechanical costs are due to a new polishing scrubber and 2 new polishing vertical stirred media mills.
- **Concentrate Dewatering**: Solely due to estimates for the maintenance and refurbishment of existing equipment.
- **Screening and Bagging**: Solely due to estimates for the maintenance and refurbishment of existing equipment.
- **Tailings Disposal:** TSF Site 3 from the KP TSF study was selected for construction of the new tailings storage facilities. The TSF will be constructed in 2 stages.
- **Reagent Handling:** Solely due to estimates for the maintenance and refurbishment of existing equipment.
- **Utilities:** Solely due to estimates for the maintenance and refurbishment of existing equipment.
- **General Facilities and Buildings:** The Okorusu general facilities and buildings were inspected and found to be in an acceptable condition for the restart of operations. No capital cost allowance was made for and general facilities and buildings in this study.

A summary of the process plant capital estimate is given in Table 1-26.

Table 1-26: Initial CAPEX Summary (Process Plant & TSF Site 3A)

Area	Installed Direct Field Costs	Total Capital Costs
Site Wide Services & Infrastructure	0	0
Mining and Stockpiles	0	0
Crushing	0	0
Milling	6,057,805	8,455,507
Flotation	1,216,068	1,562,395
Concentrate Dewatering	39,985	54,562
Screening & Bagging	12,032	15,192
Tailings Disposal	4,227,305	4,818,946
Reagent Handling	11,623	14,939
Utilities	143,474	184,402
General Facilities & Buildings	0	0
Total Direct Field Costs	**11,708,293**	**15,105,943**

1.20.1.4 Life of Mine Process Capital Costs

The life of mine capital costs are given in Table 1-27. The Initial Capital costs cover both the initial Process Plant and TSF Site 3A capital costs.

The TSF Site 3B expansion will be required for the deposition of fresh material and is scheduled for construction in year 5.

A sustaining capital provision of 1% of Initial Direct Field cost was made annually (Table 1-27). Closedown costs for the TSF reclamation for determined by KP. A working capital provision was made based on 4 months of anticipated annual operational cost.

Table 1-27: Okanjande Life of Mine Capital costs

Capital Class	Description	Cost
Initial Capital	Process Plant and TSF 3A	15,105,943
Expansion Capital	TSF 3B	9,116,308
Sustaining Capital	1% of Initial Direct Field Costs Annually	631,880
Close-down costs	TSF 3A & 3B Reclamation, KP 2021	3,920,116
Working Capital	1 Third of Year 1 OPEX	5,483,062
Total LOM Capital		**34,257,308**

1.20.2 Operating Cost Estimate

Total operating cost estimates for the Okanjande Project are presented in Table 1-28. The unit operating costs are based on total mined material of 10.1Mt, of which 6.1Mt is mineralized material and 4.0Mt is waste. The estimated mine life is ten years plus one year of pre-mining/construction. Processing will continue into Year 11. G&A costs, as per Table 1-28, include the following elements: Security Services, Surface Rights Charges, External Services, standard site related General and Administration costs, Royalties and Concentrate Sales Costs.

Table 1-28: Summarized Operating Costs

Operating Costs (C1)	(US$ 10^6)	$/t Ore Processed	$/t Concentrate Produced
Mining	47.28	7.75	153.61
Ore Haulage	37.84	6.21	122.96
Processing	90.08	14.77	292.65
G&A	63.41	10.40	206.00
Total	**238.61**	**39.14**	**775.22**

1.20.2.1 Exclusions

The following cost contributors were not accounted for in the OPEX estimate:

- Scope changes
- Escalation beyond the second quarter of 2022
- Financial cost
- Schedule delays

- Operating permits
- Currency fluctuations
- Reagent and Fuel Pricing fluctuations

1.20.2.2 Basis of Operating Costs

Mining costs are based on contractor mining. The mining costs were derived from budgetary proposals for contract mining received in 2021.

Ore hauling costs are based on local logistics service providers estimates and factorized for standard 34t side tipping haul trucks.

Processing labour costs were developed from the anticipated manpower staffing plan. Power was estimated based on the current local utility rate of US$0.11/kWh and the power consumption estimates from the electrical load list. Variable costs for reagents and consumables were applied based on historical and test work consumption rates and current local pricing for reagents. Fixed cost elements were derived from factoring and from previous operating budgets for the process.

1.21 ECONOMIC ANALYSIS

This PEA is preliminary in nature. The current basis of Project information is not sufficient to convert the in-situ Mineral Resources to Mineral Reserves, and Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability. The PEA results provide an initial assessment of the Project economics based on preliminary information. This PEA is based on technical and economic assumptions which will be evaluated in more advanced studies.

1.21.1 Principle Assumptions

1.21.1.1 Resource

Table 1-29: 10-Year Mine plan for 4.0% TGC cut-off

Mineral Resource Assumptions	Value	UOM	Comments
Weathered			
Measured and Indicated Tonnes	2,540,623	Mt	MSA, Mining Report
Measured and Indicated Graphite Grade	5.03%	% TGC	MSA, Mining Report
Contained Graphite	127,881	t	MSA, Mining Report
Fresh			
Measured and Indicated Tonnes	3,556,327	Mt	MSA, Mining Report
Measured and Indicated Graphite Grade	5.44%	% TGC	MSA, Mining Report
Contained Graphite	193,293	Kt	MSA, Mining Report
Total			
Measured and Indicated Tonnes	6,096,950	Mt	MSA, Mining Report
Measured and Indicated Graphite Grade	5.27%	% TGC	MSA, Mining Report
Contained Graphite	321,174	Kt	MSA, Mining Report

1.21.1.2 Mining

Table 1-30: Mining Assumptions for Economic Evaluation

Mining Production	Value	UOM	Comments
Ore Mining Rate- Mean	609,695	t/a	CES, MSA Mine Plan
Ore Mining Rate - Steady State	631,450	t/a	CES, MSA Mine Plan
Waste Mining - Mean	404,504	t/a	CES, MSA Mine Plan
Strip Ratio	0.7	ratio	CES, MSA Mine Plan
Life-of-Mine	10	years	MSA, Mining Report

1.21.1.3 Processing

Table 1-31: Processing Assumptions for economic evaluation

Process Production	Value	UOM	Comments
Crushing			
Annual Throughput	631,450	t/a	MSA, 2021
Standard Operating Days	261	d/a	Northern Graphite, 2021
Standard Operating Hours	12	h/d	Northern Graphite, 2021
Availability	92.0%	%	Northern Graphite, 2021
Utilization	90.0%	%	Northern Graphite, 2021
Effective Utilization	82.8%	%	CES, calculated
Mean Crush Rate - Instantaneous	244	t/h	CES, calculated
Milling			
Annual Throughput (80tph)	631,450	t/a	Northern Graphite, 2021
Standard Operating Days	365	d/a	Northern Graphite, 2021
Standard Operating Hours	24	h/d	Northern Graphite, 2021
Availability	92.0%	%	Northern Graphite, 2021
Utilization	90.0%	%	Northern Graphite, 2021
Effective Utilization	82.8%	%	CES, calculated
Mean Grinding Rate (dry)	87	t/h	CES, calculated
Flotation			
Throughput (dry)	87	t/h	Northern Graphite, 2021
Grade	5.3%	%	METPRO
Recovery	92.0%	%	METPRO
Concentrate Grade	96.0%	%	METPRO
Mass pull	5.0%	%	CES, Calculated
Concentrate Production (dry)	31,877	t/a	CES, Calculated
Tailings			
Tailings deposition feed moisture	% H2O m/m	70%	CES assumption
TSF Site 3A	Mt (dry)	3.2	KP, 2021
TSF Site 3B	Mt (dry)	2.6	KP, 2021

1.21.1.4 Financial, Taxes, Royalties and Levies

Table 1-32: Financial assumptions

Financial Assumptions	Value	UOM	Comments
Discount Rate	8%	%	CES
Exchange Rate	15.60	NAD:USD	www.Exchangerates.org.uk, 31 May 2022
Royalties	2.0%	%	KPMG, 2021
Graphite Flake Price	1,500.00	USD/t TCG	NG, 2022
Corporate Income Tax, Namibia	37.5%	%	PWC, Dec 2021
Depreciation Period	3	a	NG, EY 2022

1.21.2 Key Performance Indicators

Table 1-33: Project Overall KPI's

Project KPIs	UOM	
Measured and Indicated Resource - Weathered	Mt, %TGC	5.9Mt @ 4.21% TGC
Measured and Indicated Resource - Fresh	Mt, %TGC	1.2Mt @ 4.35% TGC
Post Tax NPV @8% CoC	US$	65,058,495
Post Tax IRR	%	62%
Post Tax and Royalty Undiscounted Cashflow	US$	120,732,276
Post Tax Payback Period	a	2
Pre Tax NPV @8% CoC	US$	107,261,317
Pre Tax IRR	%	82%
Pre Tax and Royalty Undiscounted Cashflow	US$	194,306,354
Pre Tax Payback Period	years	2

Table 1-34: Key Project Cost Indices

Cost Indicators	UOM	Cost Index (US$)
Mining & Haul OPEX/t Concentrate	$/t con	276.57
Mining OPEX/t Total Mined	$/t total mined	4.66
Mining OPEX/t Ore Mined	$/t Ore mined	7.75
Process OPEX/t Concentrate	$/t con	325.25
Process OPEX/t Graphite Concentrate produced	$/t concentrate	16.42
Total OPEX/t Concentrate	$/t con	601.82
Total C1 Cost/t Concentrate	$/t con	775.22
Total CAPEX/t Concentrate	$/t con	93.49
Total Expenses/t Concentrate	$/t con	868.71

1.21.3 Cash Flow

Table 1-35: Okanjande Project Cash Flow

Year		Ore Mining	Ore TCC	Ore Hauled and Processed	Concentrate Produced and Shipped (dry)	Revenue from Graphite Con Sales	Total OPEX	Total Off-the-top Costs[1]	Total CAPEX	Total Taxable Income[2]	Income Tax	Net Profit After Tax	Cumulative Net Profit After Tax
		t/a	%TGC	t/a	t/a	US$/a	US$/a	US$/a	US$/a	US$/a	US$/a	US$/a	US$
0	2022	-	-	-	-	-	(1,714,608)	-	(15,105,943)	-	-	(16,820,551)	(16,820,551)
1	2023	410,442	22,903	410,442	21,948	32,922,579	(16,449,185)	(3,805,850)	(5,483,062)	882,307	(330,865)	6,853,617	(9,966,934)
2	2024	631,450	31,257	631,450	29,954	44,931,614	(19,166,853)	(5,194,095)	-	15,535,352	(5,825,757)	14,744,909	4,777,975
3	2025	633,179	30,456	631,450	29,107	43,660,821	(21,205,621)	(5,047,191)	(78,985)	17,381,680	(6,518,130)	10,810,894	15,588,869
4	2026	631,450	31,888	631,450	30,556	45,833,375	(20,127,531)	(5,298,338)	(78,985)	20,354,849	(7,633,068)	12,695,452	28,284,321
5	2027	631,449	30,927	631,450	29,641	44,461,145	(18,121,179)	(5,139,708)	(9,195,293)	18,082,504	(6,780,939)	5,224,026	33,508,347
6	2028	631,450	31,951	631,450	30,617	45,926,085	(17,461,901)	(5,309,055)	(2,245,858)	19,315,083	(7,243,156)	13,666,115	47,174,462
7	2029	633,180	34,572	631,450	33,034	49,551,039	(17,814,799)	(5,728,100)	(78,985)	22,168,095	(8,313,036)	17,616,120	64,790,581
8	2030	631,450	35,677	631,450	34,184	51,276,133	(17,770,094)	(5,927,521)	(78,985)	26,777,242	(10,041,466)	17,458,067	82,248,649
9	2031	631,450	34,540	631,450	33,107	49,660,550	(17,710,471)	(5,740,760)	(78,985)	26,130,335	(9,798,876)	16,331,459	98,580,108
10	2032	631,450	37,003	631,450	35,448	53,172,537	(17,376,713)	(6,146,745)	(78,985)	29,570,093	(11,088,785)	18,481,308	117,061,416
11	2033	-	-	3,458	194	291,188	(316,485)	(33,661)	3,729,819	(696,030)	-	3,670,860	120,732,276
12	2034	-	-	-	-	-	-	-	-	(610,743)	-	-	120,732,276
13	2035	-	-	-	-	-	-	-	-	(584,414)	-	-	120,732,276
Total		**6,096,950**	**321,174**	**6,096,950**	**307,791**	**461,687,066**	**(185,235,440)**	**(53,371,025)**	**(28,774,247)**	**194,306,354**	**(73,574,078)**	**120,732,276**	

1 After Depreciation

2 After Depreciation and carried forward losses

1.21.4 Sensitivity Analysis

The sensitivity of the PEA in terms of project NPV was evaluated in terms of the main revenue drivers – Graphite Price and Graphite recovery, as well as the main cost drivers – Power, Ore Mining Cost, Ore Hauling Cost and NAD : USD exchange rate. As per Figure 1-14 below, the project NPV is highly sensitive towards both Graphite Pricing followed Graphite Recovery (based on slope).

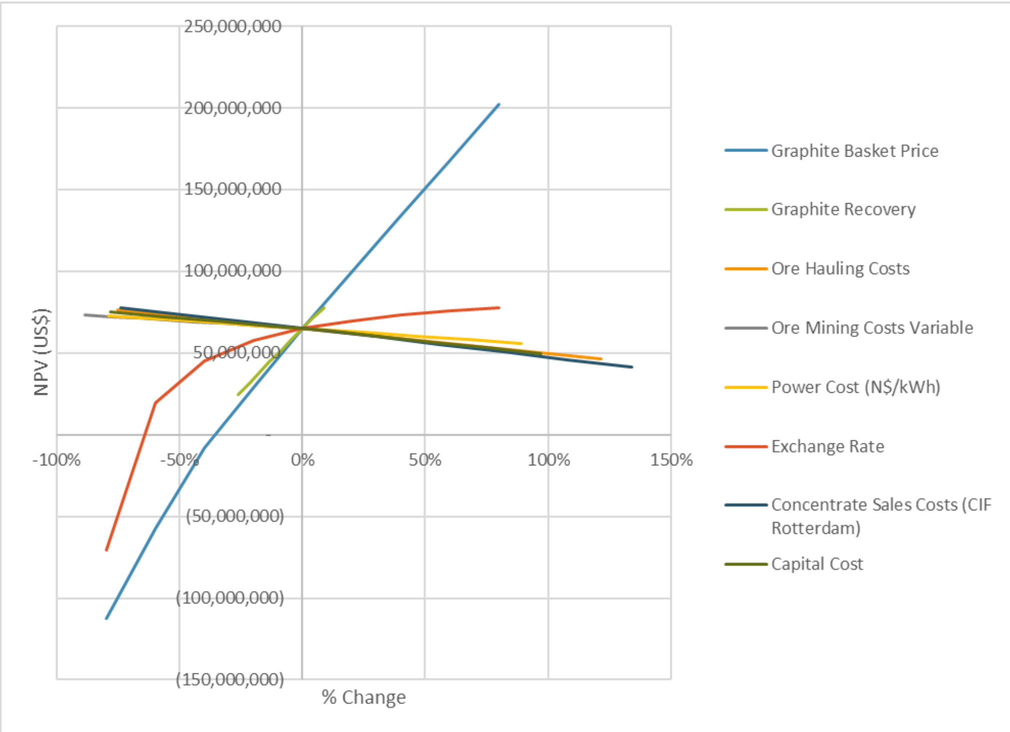


Figure 1-14: Project NPV Sensitivity wrt to main Revenue and Cost Drivers (after Tax)

1.21.5 Taxes, Royalties and Other Interests

- **Namibian Corporate Income Tax** for non-Diamond Mining Companies = 37.5%,
- **Value Added Tax** (VAT): Any legal entity with an annual taxable turnover of greater the N$500,000 is required to register for Value Added Tax (VAT). Value-added tax is payable on the taxable value of all goods sold or imported. The standard rate is 15%. The effect of VAT rebates was not considered in this economic analysis.
- **Export Processing Zone** (EPZ): New enterprises that export produce to countries outside the Southern African Customs Union (SACU) can qualify for EPZ status. The benefits of an EPZ enterprise are: relief from income tax import duties and VAT, exchange control-free FOREX accounts.
- **Withholding Tax Payable and Double Taxation Agreements**: Namibia has Withholding Tax and Double Taxation Agreements with certain countries. However, Canada does not fall in the list of treaty countries and as such this was not considered in this economic evaluation.

- **Depreciation**: The estimated cost recovery for calculation of Namibia income tax consisted of a 3 years 100% declining balance calculation, based on initial and expansion capital. The JV has tax losses of approximately US$50 million which have not been applied to pre-tax income as the Company's tax advisors have not yet determined if they are available for use.
- **Royalties**: Royalties are levied in terms of the Namibian Prospecting and Mining Act as a percentage of the market value of the minerals extracted by licence holders in the course of finding or mining any mineral or group of minerals. Graphite concentrate will fall into the group of minerals "Semi-precious stones/Industrial metals/Non-Nuclear fuel minerals" for which the Royalty rate is 2%. Royalties were considered on this basis in the economic evaluation.

1.22 ADJACENT PROPERTIES

The Okanjande Mining Licence (ML196) is surrounded by an EPL 4717, which is also held by Imerys-Gecko (35,050 ha). Adjacent to this licence, to the northwest, is an EPL (7123) held by Cobe Investment CC (valid until 08/10/2023) for a range of minerals including industrial minerals (20,966 ha). To the north is an EPL (5847) held by Kunene Resources (Pty) Ltd for precious stones and industrial minerals (6,869 ha). This EPL is valid to 15/07/2022.

To the southeast is an EPL held by Josua Neshuku, EPL 7113 which expired in August 2021. To the east is an EPL 6734 held by Osino Gold Exploration and Mining (Pty) Ltd which expires on 09/06/2023. All adjacent properties are EPLs granted for precious minerals, dimension stone and industrial minerals.

1.23 OTHER RELEVANT DATA AND INFORMATION

None of the contributors are aware of any additional relevant data that might materially impact the interpretation and conclusion of this PEA Report

1.24 INTERPRETATIONS AND CONCLUSIONS

This report was prepared by a group of independent consultants, all qualified persons as defined by NI 43-101, to demonstrate the potential economic viability of open pit mining and processing, based upon the estimated Mineral Resources at the Okanjande Project (MLP). This report provides a summary of the results and findings to the level that would be expected for a Preliminary Economic Assessment. Standard industry practices and assumptions have been applied in this PEA.

Under the base case assumptions for the Project, the PEA indicates an undiscounted pre-tax cash flow of US$164.3M, and a post-tax NPV at 8% discount rate of US$65.1M. The resulting post-tax IRR is 62% for an initial capital investment of US$15.1M (processing plant and tailings storage 3A).

The results of sensitivity analyses of post-tax cash flow and post-tax IRR show that the project is most sensitive to graphite price and recovery. Breakeven graphite price is US$926.43/t and post-Tax NPV doubles at US$2,068.20/t.

The Okanjande graphite deposit has demonstrated its potential for a large tonnage variable grade graphite deposit. The continuity of the deposit is well-defined. The Mineral Resource Estimate demonstrates the potential of the Okanjande Project.

The mineral processing test work program completed at SGS in 2021 indicated that the modifications made to the flow sheet could improve on the process flow sheet implemented by Imerys-Gecko and corresponded well with early test work and pilot campaigns conducted in the 1990's.

The 10-year mining plan (4%TGC cut-off) considers the mining of weathered as well as fresh graphite bearing material. The weathered material can be treated at the modified Okorusu Fluorspar plant, and this can be done for the first 5 years of the mine plan at a 4%TGC cut-off grade.

The modifications to the Okorusu graphite flotation circuit will correct the processing difficulties experienced by Imerys-Gecko and the flow sheet was tested and verified through a test work program completed at SGS in 2021. Tests indicated that the new modified process flow is expected to exceed performance in terms of recovery and concentrate grade, compared to the Imerys-Gecko flow sheet as well as that of the MINTEK flow sheet developed in the 1990's.

Both the Okorusu and Okanjande sites currently have ECCs in terms of the Environmental Management Act. It is necessary to amend both these ECC to incorporate the proposed changes of the project.

The cost estimates were developed to support a nominal mining rate of 631,450t/a. The process facility cost estimate is based on a nominal throughput capacity of 631,450t/a and producing 31,877t/a of upgraded and bagged graphite flakes per year. The cost estimates have been prepared in accordance with the recommended practices of the American Association of Cost Engineers (AACE) and are considered to have an accuracy of +40 -30%.

The Okanjande Project will process 6,096,950t of graphite mineralized material at an average of 5.27%TGC to produce a total of 307,791t of Graphite concentrate at a grade of 96%TGC. With mining costs projected at US$7.75/t mineralized material mined and processing costs at US$325.25/t concentrate produced an overall C1 cost of US$775.22/t concentrate is achieved. Life of mine capital expenses come in at US$93.49/t concentrate produced.

The resulting NPV after tax and royalties is US65,1M at a discount rate of 8%. The life of mine cashflow after taxes and royalties is US120.7M, for an initial capital outlay of US$15.1M. The project Payback period is 2 years after initial capital outlay.

Based on the Key Performance Indicators above, the Okanjande Project Makes a strong economic case for success.

1.25 RECOMMENDATIONS

This PEA study is preliminary in nature and is based on technical and economic assumptions which need to be evaluated in more advanced studies. The detail developed is sufficient for a PEA level study. However, additional work would be required to meet a pre-feasibility level.

- **Resources –** In order to fully evaluate the resource potential of the Okanjande deposit and immediate area, un-assayed drill intersections should be assayed, and a drill program carried out to extend and delineate the margins of the current resources and to evaluate nearby exploration targets
- **Mining** –Optimize the Mine design and schedule based on current resources.
- **Mineral Processing** – Extend process test work to included locked-cycle testing, variability testing and piloting if possible.
- **Environmental** – Complete Mine Closure planning, Optimize siting and design of Tailings Storage, Waste Rock and Overburden piles.

- **Capital and Operating Costs** – Complete a number of Trade-Off studies including: Shipping studies and alternative packaging methods.
- **Future Development** – The Okanjande deposit currently has fresh rock resources of 1,287k tonnes of contained graphite in the measured and indicated category and 359k tonnes in the inferred category. Combined with potential additions from the re-assaying/drilling program, the deposit could potentially support production of 100,000-150,000tpy to meet forecast demand from the EV market. A Preliminary Economic Assessment should be carried out with respect to building a large new processing plant on site to meet this demand and eliminate trucking costs to Okorusu.

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2 INTRODUCTION

(Prepared by CREO Engineering Solutions (Pty) Ltd.)

2.1 ISSUER

Northern Graphite Corporation ("Northern" or the "Company"), a Canadian company listed on the Toronto Venture Exchange ("TSX-V"), has acquired 100 per cent ownership of Imerys Gecko Holdings (Pty) Ltd ("Holdings"). Holdings in turn owns a 100 per cent interest in Imerys Gecko Graphite (Namibia) (Pty) Ltd ("IGG") and a 100 percent interest in Imerys Gecko Okanjande Mining (Pty) Ltd ("IGOM"). Collectively, Holdings, IGG and IGOM are referred to as the "JV" or "Imerys-Gecko" as they operate as one under joint management and control.

IGOM holds Mining Licence ("ML") 196 (the "Property") which covers the Okanjande graphite deposit and is located approximately 23 kilometres ("km") by road to the southwest of the town of Otjiwarongo, 230 km north of Windhoek, the capital city of the Republic of Namibia ("Namibia"), and 388 km east from the port of Walvis Bay. The previously producing Okanjande graphite Mine, active from 2017 to 2018, is located on the Property. The Okanjande graphite Mine is currently under care and maintenance, with no mining taking place. IGOM also holds Exclusive Prospecting Licence ("EPL") 4717 which surrounds the mining licence

IGG owns all the equipment necessary to process graphite-bearing material and produce a saleable concentrate. The equipment is located on land and in buildings leased from Okorusu Fluorspar (Pty) Ltd at the idle Okorusu Fluorspar mine site ("Okorusu"). Okorusu is 60 km, by road, northeast of Otjiwarongo and is located on Mining Licence ML 90, held by Okorusu Fluorspar (Pty) Ltd.

Historically, mining started at the Okanjande graphite Mine in August 2017, with the run of mine ("RoM") graphite-bearing material trucked to Okorusu for processing and continued until October 2018 when operations at the Okanjande graphite Mine ceased and the Okanjande graphite Mine was place on care and maintenance.

Imerys SA ("Imerys") spent more than USD 50 million to retrofit the Okorusu plant to produce graphite concentrate. The process plant experienced a number of start-up issues and failed to meet design specifications in terms of throughput, recoveries and flake size distribution. The operation was placed on care and maintenance in October 2018.

This Preliminary Economic Assessment Report (PEA) was prepared Creo Engineering Solutions (Pty) Ltd on behalf of the Company for the Okanjande Graphite Project (the Project) which includes the Okanjande Graphite Mining Operation (Okanjande) and the Okorusu Processing Operation (Okorusu). The Okorusu processing facilities are located 86 km by road north of the Okanjande Mine and approximately 60 km from the town of Otjiwarongo in the Otjozondjupa region of Namibia. Okanjande and Okorusu assets have both been included as part of the acquired JV. The project has been under care and maintenance since 2018 and is planned to be restarted by the client after executing several brown fields expansion projects, modifications and refurbishment activities.

2.2 TERMS OF REFERENCE

The Okanjande Graphite Project is located in the Otjozondjupa Region of Namibia near the town of Otjiwarongo.

Norther Graphite commissioned a team of consultants in mid-2021 to conduct a Preliminary Economic Assessment study on the Okanjande Graphite Project. The Project intends to bring the in-situ (weathered and fresh mineralized material) resource into production. A production rate of 31,877kt/a graphite concentrate of greater than 96% TGC is projected.

The purpose of this PEA Report is to provide an economic analysis of the potential viability of the Okanjande mineral resource. This report was compiled in accordance with the requirements and specifications of the CIM NI 43-101 standard.

This preliminary economic assessment is preliminary in nature, and no mineral reserves have been declared. Mineral resources that are not mineral reserves do not have demonstrated economic viability and thus there is no certainty that the preliminary economic assessment will be realized.

2.3 SOURCES OF INFORMATION

Information contained in this report includes abstracts of professional sources for the different fields of expertise. The following table provides a list of the key sources of information incorporated into this document. See Table 2-1.

Table 2-1: Key sources of information

Source	Title
MSA Group	Technical Report: Northern Graphite Corporation Okanjande Mineral Resource Estimate Namibia, November 2021
MSA Group	Okanjande Project – Mining Report, December 2021
Knight Piésold Consulting	High-Level Tailings Storage Facility Capacity Assessment, Geotechnical and Environmental Scoping Study and Gap Analysis, January 2022
METPRO	Process Review and Optimization for the Okorusu Plant, October 2021

2.4 QP SITE INSPECTION REPORT

E. Roux – Consulting Process Engineer, CREO Engineering Solutions

Mr Etienne Roux, Director at CREO Engineering Solutions Pty. Ltd., is the Competent Person for the Mineral Processing and Metallurgical testing, Recovery Methods, Capital and Operating Costs and Economic Analysis. I have visited the site on 3 occasions during 19 July 2021, 13 December 2021, 18 January 2022 and 18 February 2022 with relevance pertaining to inspection of existing processing equipment, infrastructure, tailings storage facility, previous mining operations and general lay of land. I have read the instrument, and the parts of the report that I am responsible for have been prepared in compliance with the instrument.

V. Daigle – Pr. Eng., Lead Engineer and Director at Knight Piésold Consulting

Mrs Veronique Daigle, Pr. Eng. at Knight Piésold Consulting (Pty) Ltd., is the Qualified Person for the Tailings Storage Facility, Waste Rock Dump and associated the Capital Costs Estimates, as well as Operating Costs for the Tailings Storage Facility. I visited the Project site prior to the initiation of the Preliminary Economic Assessment in September 2020, as part of a due diligence review of the existing graphite Tailings Storage Facility for the development of a care and maintenance project; and am familiar with the general lay of land. Information provided from the prior inspection was used as a basis of current conditions assessment and for cost capital estimation. With relevance pertaining to inspection of existing tailings storage facility and general lay of land. I have read the instrument, and the parts of the report that I am responsible for have been prepared in compliance with the instrument.

R.N. Barnett – Consulting Associate Industrial Minerals Geologist, MSA Group (Pty) Ltd

Mr Robert Nicholas Barnett, Associate Consulting Geologist with MSA Group (Pty) Ltd, is the Competent Person responsible for the Geological Setting and Mineralization, Deposit Types, Exploration and Drilling, and co-responsible for Sample Preparation, Analyses and Security, and Data Verification. I have visited the site on two occasions from 28 September to 1 October and 18 to 22 October 2021 with relevance to geology, drill core and graphite ore exposed in the mine pit. I have read the instrument and the parts of the report that I am responsible for and have been prepared in compliance with the instrument.

M Mohring – Consulting Associate Mining Engineer, MSA Group (Pty) Ltd

Mr Mark Richard Mohring, Associate Consulting Mining Engineer with MSA Group (Pty) Ltd, is the Competent Person responsible for the Mining Report. I have visited the site from 11 May 2021 to 14 May 2021, where I inspected the pit and associated infrastructure of the mining and processing operation. I have read the instrument and the parts of the report that I am responsible for have been prepared in compliance with the instrument.

3 RELIANCE ON OTHER EXPERTS AND QUALIFICATION FOR DISCLAIMERS

(Prepared by CREO Engineering Solutions Pty. Ltd.)

This Preliminary Economic Assessment Study (PEA) Report has been prepared by CES on behalf of Northern Graphite Corporation, with inputs from third party. This PEA Report is a compilation of information received from the qualified persons representing each of the stakeholders/consultants. Each qualified person approved and validated their scope of work. Table 3-1 provides a list of stakeholders and consultants who contributed to the study.

Table 3-1: List of stakeholders and assignments

ASSIGNMENT	STAKEHOLDER/CONSULTANT
• Mineral Processing and Metallurgical Testing • Recovery Methods • Project Infrastructure • Market Studies and Contracts • Capital and Operating Costs – Process and Site Infrastructure • Economic Analysis • Compilation of Report	Creo Engineering Solutions, Etienne Roux & Derick Louw
• Environmental Studies, Permitting and Social or Community Impact • Project Infrastructure – Tailings Storage • Capital and Operating Costs – Tailings Storage Facility	Knight Piésold, Veronique Daigle
• Property Description and Location • Accessibility, Climate, Local Resources, Infrastructure and Physiography • History • Sample Preparation, Analyses and Security • Data Verification • Geological Setting and Mineralization • Deposit Types • Drilling • Adjacent Properties	MSA, Robert Barnett
• Sample Preparation, Analyses and Security • Data Verification • Mineral Resource Estimates • Adjacent Properties	MSA, Ipelo Gasela
• Mining Methods • Mineral Reserve Estimate	MSA, Mark Mohring

3.1 CREO RELAINCE ON OTHER EXPERTS - DISCLAIMER

This report was prepared for Northern Graphite Corporation (the Client), by Creo Engineering Solutions (the Consultant), as an independent Consultant, and is based in part upon information and historical study work furnished by the Client and third-party consultants (see Table 2-1).

Information on the graphite market (section 19 Market Studies and Contracts) was compiled from a report commissioned from Benchmark Mineral Intelligence ("BMI"), as well as other industry sources, by Gregory Bowes P.Geo. who is the Chief Executive Officer of Northern and not an Independent Person

While it is believed that the information, conclusions, and recommendations will be reliable under the conditions and subject to the limitations set forth herein, the Consultant cannot guarantee their accuracy. The opinions expressed in this report subject to the project responsibilities fulfilled by Creo Engineering Solutions, are Creo Engineering Solutions' best estimate taken from the data available, combined with experience and knowledge of the work. The Client and any other Third Parties that might review or use the information in this report are responsible for their independent analysis based on the information herein and must acknowledge the risks associated with such an operation. The Consultant will not be liable for any damages or loss suffered or occasioned, whether directly or indirectly, from any party relying on any of the information contained in this document. Further, this report is for the exclusive and "Confidential" use of only those Parties subject to the same Confidentiality Agreement(s) between the Client and its Consultants and as such may not be copied or distributed to any third party without the prior written consent of the Consultant being obtained.

3.2 MSA RELIANCE ON OTHER EXPERTS - DISCLAIMER

Neither MSA nor the authors of this Technical Report, are qualified to verify the legal status of ML 196 and EPL 4717. MSA has relied on a legal opinion by Ellis Shilengudwa Incorporated ("ESI"), dated 09 December 2021, that IGOM is the legal holder of 100% of the interest in ML 196 and EPL 4717, which are valid as of the date of the opinion. ESI is a corporate and commercial law firm based in Windhoek, is regulated by the Law Society of Namibia, and is a member of DLA Piper Africa, a Swiss Verein whose members are comprised of independent law firms in Africa working with DLA Piper. Furthermore, ESI have verified the Existing Lease Agreement in place and the form of the New Lease Agreement in which the agreement(s) provide Imerys-Gecko with the necessary rights, title and interest in and to the Leased Premises to allow for the conducting of agreed processing activities.

The present status of tenements listed in this report (Item 2 – Introduction preface, Item 4.2 – Mineral Tenure, Permitting, Rights and Agreements, and Item 4.3 – Environmental Liabilities) is based on information and copies of documents provided by Northern and ESI, and this Independent Technical Report has been prepared on the assumption that the tenements will prove lawfully accessible for evaluation. Comment on these legal agreements is for introduction only and should not be relied on by the reader. ESI has not provided comment on the status of ML90 which is not the focus of this Technical Report.

Similarly, neither MSA nor the authors of this report are qualified to provide comment on environmental issues associated with the Property.

No warranty or guarantee, be it express or implied, is made by MSA with respect to the completeness or accuracy of the legal aspects of this document. MSA does not undertake or accept any responsibility or liability in any way whatsoever to any person or entity in respect of these parts of this document, or any errors in or omissions from it, whether arising from negligence or any other basis in law whatsoever.

4 PROPERTY DESCRIPTION AND LOCATION

(Taken from the MSA Group Report Technical Report titled "Northern Graphite Corporation, Okanjande Mineral Resource Estimate, Namibia" with effective date 29 November 2021)

Northern has acquired 100 per cent ownership of Holdings, which in turn owns 100 per cent interest in IGOM. IGOM holds ML 196 which covers the Okanjande graphite deposit.

Historically, mining started at the Okanjande graphite Mine, located on the Property, in August 2017. The run of mine ("RoM") graphite-bearing material was trucked to Okorusu for processing, and this continued until October 2018 when operations at the Okanjande graphite Mine ceased and the mine was placed on care and maintenance.

4.1 LOCATION

The Property is located approximately 23 road km southwest of the town of Otjiwarongo, 230 km north of Windhoek, the capital city of Namibia, and 388 km from the port of Walvis Bay. The Okorusu plant is 83 km northeast of the Property. The location of ML 196 is indicated in Figure 4-1 and the license area corner co-ordinates are listed in Table 4-1.

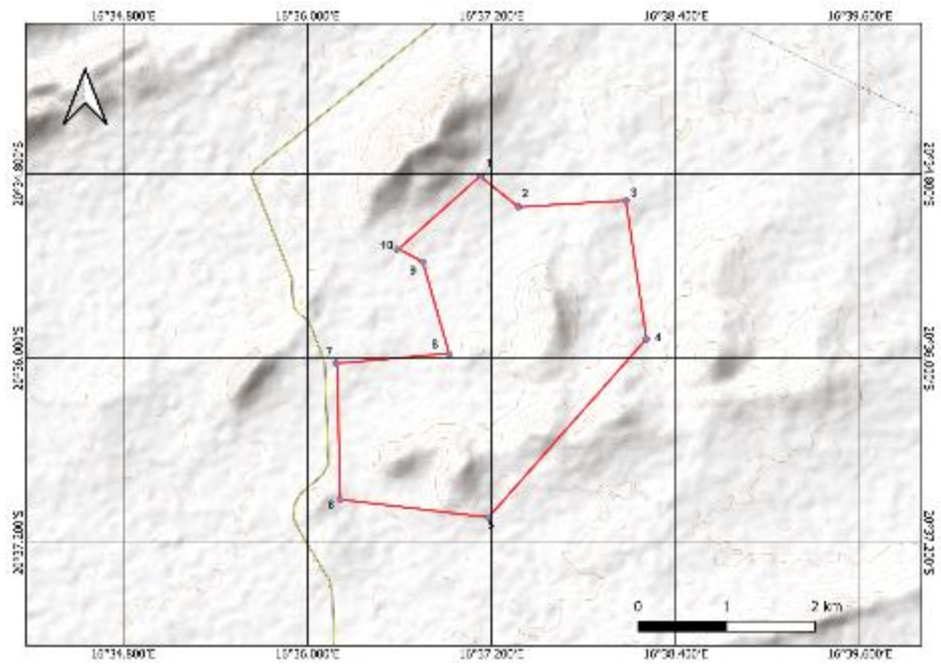


Figure 4-1: Locality map of licence area

Table 4-1 ML 196 corner co-ordinates (MSA, 2021):

Order	Lat Deg	Lat Min	Lat Sec		Long Deg	Long Min	Long Sec	
1	-20	34	48.8	S	16	37	7.6	E
2	-20	35	0.93	S	16	37	22.51	E
3	-20	34	58.41	S	16	38	4.56	E
4	-20	35	52.48	S	16	38	12.43	E
5	-20	37	2.17	S	16	37	10.77	E
6	-20	36	55.08	S	16	36	12.69	E
7	-20	36	1.94	S	16	36	11.32	E
8	-20	35	58.42	S	16	36	55.39	E
9	-20	35	22.27	S	16	36	45.16	E
10	-20	35	17.41	S	16	36	35.09	E

4.2 MINERAL TENURE, PERMITTING, RIGHTS AND AGREEMENTS

The Okanjande Mine is located within ML 196. ML 196 is valid until February 9, 2042 and covers an area of 903.4 ha.

IGOM also holds and Exclusive Prospecting License EPL 4717 which surrounds the mining license, covers 46,670 ha, and is valid until November, 2022.

An Environmental Compliance Certificate ("ECC") covering mining and exploration activities for Okanjande was applied for, and received from the national authorities on November 11, 2021, valid for three years until November 11, 2024.

An amended Environmental Impact Assessment ("EIA") and Environmental Management Plan ("EMP") was filed and approved in March, 2016 and authorizes the transport of ore from the Okanjande deposit to the Okorusu plant for processing. The associated ECC with transport of ore was granted on September 27, 2019 and expires September 27, 2022.

4.3 ENVIRONMENTAL LIABILITIES

Historically, IGOM carried out contract mining operations at the Okanjande graphite Mine during parts of 2017 and 2018 and mined approximately 300,000 tonnes of weathered mineralisation (most of which was transported to the Okorusu processing plant) and 400,000 tonnes of weathered waste rock. The waste rock and a stockpile of approximately 35,000 tonnes of graphite-bearing material remains on the Okanjande Property. Testing by Imerys-Gecko has indicated that the weathered material is non-acid generating. The waste rock has been deposited on a calc-silicate unit which has low permeability and provides natural buffering from any acidic seepage to occur.

5 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY

(This section was compiled by The MSA Group Pty. Ltd. with inputs from CREO Engineering Solutions)

Namibia is located in the south-western part of Africa. It is bound by the Atlantic Ocean to the west, and between South Africa and Angola to the south and north respectively. With an estimated population of 2.1 million and an area of 824,292 km², Namibia is one of the most sparsely populated countries in the world. The capital city is Windhoek, with approximately 350,000 inhabitants.

Figure 5-1: Namibia Location Map (Maps of the World, 2020)

Namibia is an independent country and a presidential republic with a constitution that follows democratic principles including freedom of speech, press and religion. The country's main industries are agriculture and mining (diamonds, uranium, copper, lead, zinc and marble). The fastest growing sector is the tourism industry due to the country's safety, ecological diversity and climate. The currency of Namibia is the Namibian Dollar (N$ or NAD) which is pegged to the South African Rand and converts into USD at approximately N$15.60 : US$1.00 (31 May 2022).

Namibia's Ease of Doing Business ranking was updated by the World Bank in 2019 to 104, with a ranking of 1 being the most business-friendly regulations and total ranked nations being 190.

5.1 ACCESS AND INFRASTRUCTURE

5.1.1 Regional – Otjiwarongo / Otjozondupa

Otjiwarongo has a well-developed road network. It is situated at the junction of national road B1 that passes north–south through all of Namibia, the C38 to Outjo and further into the Kunene Region in Namibia's northwest, and the C33 to Karibib, which connects the coastal town of Swakopmund and the port city of Walvis Bay. The national road B1 is a major road link between central and northern Namibia and is a corridor for all traffic travelling from South Africa and Botswana, through Namibia, to Angola. Otjiwarongo is also connected to the national railway grid, run by TransNamib.

Otjiwarongo is connected by road and rail to the port at Walvis Bay, a natural deep-water harbour. Walvis Bay is the largest port on the country's coast and is an important logistical port for the southern African region, providing import and export facilities for Namibia, Zambia, the Democratic Republic of Congo, and Botswana. The port has the capacity to move 1 one million containers a year. Bureaucratic and logistical problems at the city's competitor port at in Durban, South Africa, has resulted in the diversion of traffic to Walvis Bay.

5.1.1.1 Local Resources

Local resources required for labour, supplies and equipment will be insufficient from the nearby community to support the project. Some local resources can be utilised, but skilled mining contractors, consultants and suppliers will be available throughout Namibia to support the project and its operations.

During operations, Okorusu will have to source its key personnel outside of the immediate area, Otjiwarongo, the greater Namibia and possibly from the neighbouring country – South Africa.

The Otjozondjupa region has in the order of 150,000 inhabitants, approximately 30,000 of which live in the main city and capital of Otjiwarongo. Otjiwarongo has a large German-speaking population and Germanic influence is evident in many of the buildings. About 90% of the town's residents speak and understand Afrikaans, about 75% speak English and 35% German. The population density is low, even for Namibia, due to a large portion of the region being communal farming land.

Otjiwarongo's population sustains a diverse economy including cement manufacture, many service industries and institutions. The economics of the town mainly revolve around agriculture as the majority of businesses are related to this sector. Its industries are not large but other key economic activities include the manufacture of polystyrene, tyre re-tread, taxidermy, Fabupharm (manufacturing a wide range of cosmetic and toiletry preparations as well as registered pharmaceutical products for the private sector and the Government Tender Market), brick makers, auction houses, Namaqua Meat (producing meat for the European export market), and charcoal production which is based on a number of nearby farms. It has several government and private primary and secondary schools and good medical services including doctors, dentists, pharmacists and a government and private hospital.

Some 55,000 people are employed in the Otjozondjupa region, of whom about 31,000 are male. The employment participation rate is approximately 70%; this is above the national average of 55%. The largest occupational group is labourers and other unskilled trades, which constitute 40% of all those employed.

5.2 CLIMATE, OPERATING SEASON

Most of Namibia has a subtropical desert climate characterized by hot summers and mild winters, great differences in day- and night-time temperatures, low rainfall and low humidity. Sunshine days are reported to average 300 days per year. Namibia experiences winter and summer at opposite times from Europe and North America. The winter (June to August) is generally dry. Although arid, the rainy season in the inland north-central areas and in the northeast is from November to March.

Rainfall in the Otjiwarongo area is fairly constant at 400 – 500 mm per year; rain showers occur mainly during November to April, with the highest rainfall rates recorded in January and February. Yearly average mean temperatures are 21°C, with average monthly highs and lows of 29 °C and 13 °C respectively. However, much higher and lower daily temperatures often occur. The highest temperatures (in degrees Celsius) are experienced in January (an average of 22.7 °C with highs of 37.2 °C and lows of 12.1 °C) and the lowest in June (an average of 15.2 °C with highs of 28.5 °C and lows of -1.9 °C).

The Okanjande and Okorusu Mining Licences can be operated and/or are accessible all year.

5.2.1 Precipitation

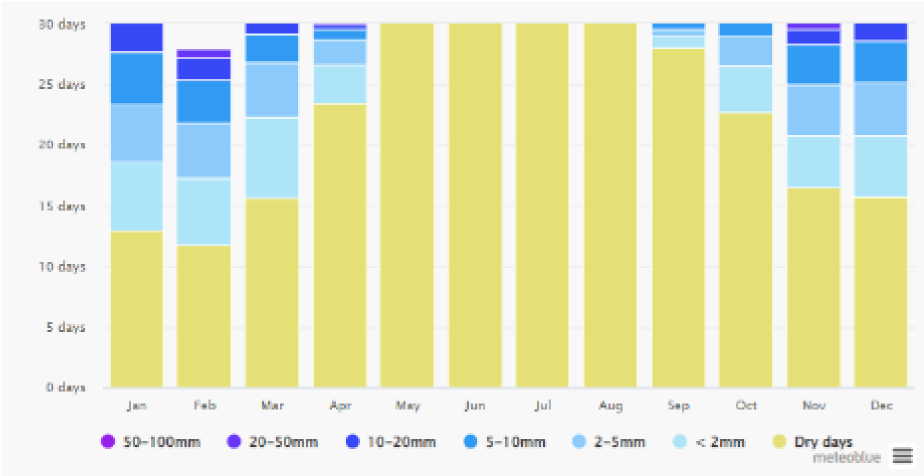


Figure 5-2: Average Rainfall - Otjiwarongo (Meteoblue, 2021)

5.2.2 Temperature

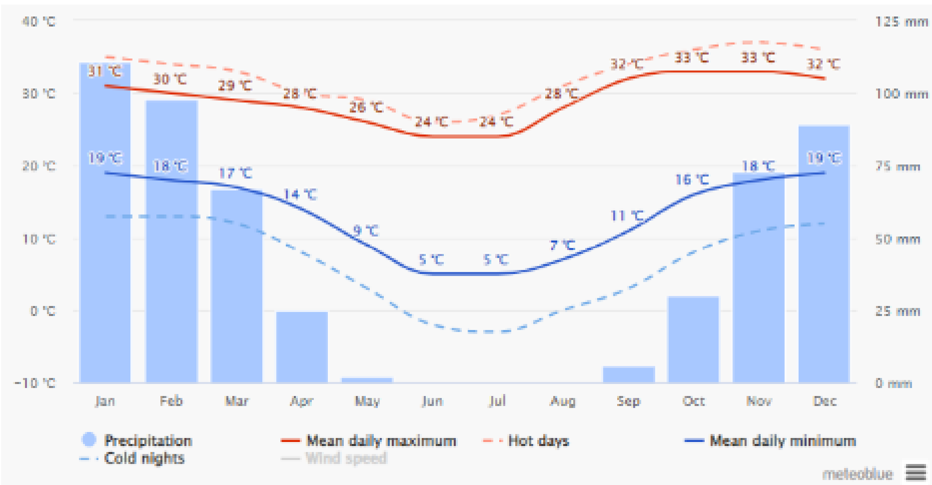


Figure 5-3: Mean Minimum and Maximum Temperatures and Precipitation Occurrence - Otjiwarongo (Meteoblue, 2021)

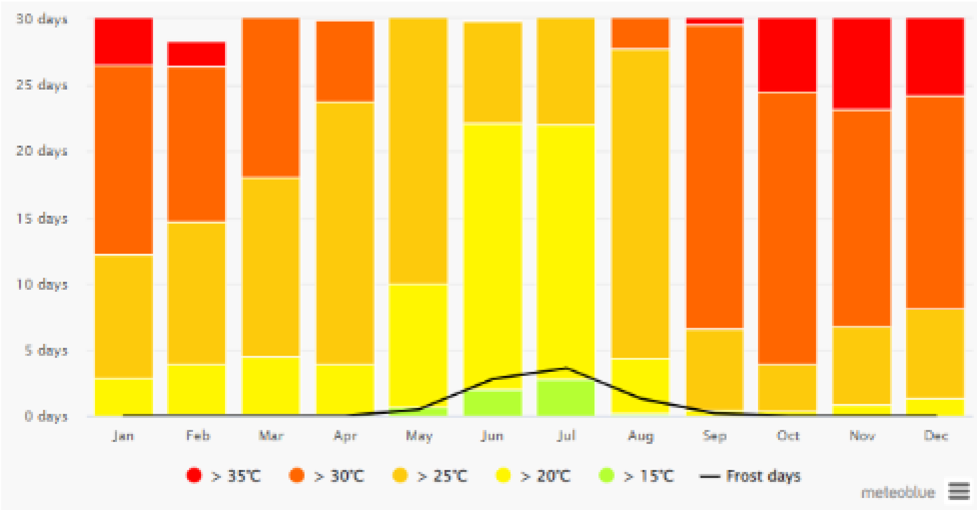


Figure 5-4: Monthly Temperature Distribution and Frost occurrence - Otjiwarongo (Meteoblue, 2021)

5.2.3 <u>Wind</u>

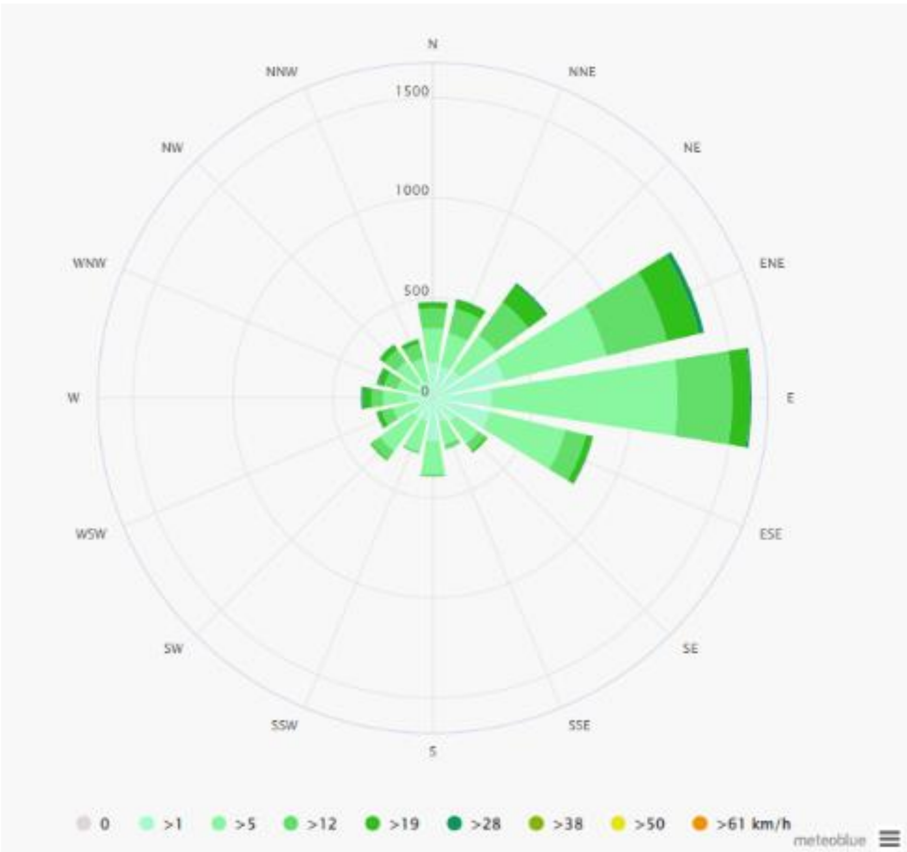


Figure 5-5: Windrose - Otjiwarongo (Meteoblue, 2021)

5.3 PHYSIOGRAPHY

The Otjozondjupa region is characterized by a relatively flat plain with inselbergs and low ridges standing out above the general land surface. The general elevation is between 1,300 m and 1,600 m above mean sea level ("mamsl"). The Okanjande graphite deposit is situated on the lower west-facing slopes of one of the ridges. The proximity of other low ridges to the site means that the Okanjande deposit is effectively screened from public view.

The Project area forms part of the thornbush savanna with fairly thin soil and occasional patches of bedrock exposed at the surface. This habitat is widespread and homogeneous throughout central Namibia and contains no unique or singular features of high ecological importance. None of the species found on site are rare, threatened or endangered. The current land use in the area consists primarily of livestock farming and, to a lesser degree, hunting tourism operations. Because of the thin soils and low rainfall, the land has a very low agricultural capability rating. Grazing is only suitable on the lower slopes and valley areas as the soils on the upper parts of the ridges are too thin to support any specific land use.

6 HISTORY

(Taken from the MSA Group Report Technical Report titled "Northern Graphite Corporation, Okanjande Mineral Resource Estimate, Namibia" with effective date 29 November 2021)

In 1990, Rössing Uranium Limited ("RUL"), a subsidiary of Rio Tinto, noted the occurrence of flake graphite on a group of farms immediately south of Otjiwarongo. Subsequent reconnaissance geological programs revealed substantial amounts of flake graphite particularly on the farms Okanjande and Highlands. Between 1991 and 1993, RUL undertook a number of detailed studies pertaining to the Project including geological, drilling, metallurgical and environmental studies and a feasibility study was completed. The historical exploration by RUL and the related activities are discussed in detail in this report from Items 9 to 11. As part of the RUL Feasibility study, RUL estimated 34 Mt of "Demonstrated Geological Reserves" at an average of 5.14% total graphitic carbon (TGC), plus 4.4 Mt at an average grade of 6.28% TGC of "Inferred Geological Reserves" for a total of 38.4 Mt at an average grade of 5.27% TGC (RUL, 1993; RUL, 1994). Part of the Demonstrated Geological Reserve that was shown to be amenable to mining by open pit methods was reported as a Mineable Reserve with 25 Mt at an average grade of 5.65% TGC. Extensive exploration drilling and trial mining operations were carried out. A pilot plant was constructed, and metallurgical test work completed. Due to a decline in graphite prices, development was never pursued.

Gecko Namibia (Pty) Ltd ("Gecko") subsequently acquired the rights to Okanjande. Its original development plan for the Okanjande deposit included building a processing plant, tailings storage facility ("TSF"), waste dumps and other infrastructure adjacent to the deposit. An EMP was compiled by Enviro Dynamics, approved in 2014 ("the 2014 EMP") and remains valid. This development scenario was not pursued.

From 2014 to 2015, Gecko completed exploration activities including geophysical surveys and drilling. The detail of this work is described from Items 9 to 11. In 2015, Gecko contracted Kai Batla to complete an "NI 43 101 compliant" Mineral Resource of the Okanjande deposit. The Mineral Resource was completed using the historical RUL and the then current Gecko drillhole data. A total of 112 Mt was estimated for the entire Mineral Resource, at an average of 4.32% TGC. In MSA's understanding, this report was eventually used for internal purposes only.

In 2016 Gecko entered into a Joint Venture ("JV") with Imerys S.A. "(Imerys") to form Imerys Gecko Holdings (Pty) Ltd ("Holdings"). Pursuant to the terms of the JV, Imerys earned a 51% interest by financing the development of the Okanjande deposit and retrofitting the Okorusu fluorspar plant to process graphite-bearing material. Gecko retained a 49% interest in the JV.

The development scenario pursued by the JV consisted of mining weathered mineralisation at the Okanjande deposit and transporting it to the Okorusu fluorspar plant for processing. This plant was refurbished and modified to suit the requirements of graphite processing for a substantially lower cost than a green fields development, and it already had an approved TSF as well as access to grid power and water. A Mining Licence (ML196) was awarded for the Project in 2017 pursuant to the 2014 EMP and is valid until 2042. An ECC covering mining, processing and exploration activities for the Okanjande deposit was issued on 18 April 2018, valid for three years. A renewed ECC certificate was received from the national authorities on 11 November 2021, valid for a further three years.

The Okanjande graphite Mine/Okorusu processing operation started up in August 2017, however the processing plant encountered a number of difficulties with throughput, flake size and purity all being lower than expected. The operation was put on care and maintenance in October 2018. The Okorusu plant, as reconfigured by Imerys-Gecko, was based on the Imerys plant at Lac Des Iles in Quebec, Canada, and was unsuitable for the Okanjande deposit mineralization and did not reflect the successful flowsheet developed previously by RUL, through test work and pilot plant programs.

It is likely that there was poor liberation of the larger flakes at the coarse primary grind size of P80 ~425 microns and as a result, a large amount of the large graphite flakes were redirected to a regrind mill. This reduced throughput and resulted in flake size degradation.

One of the polishing mills was also being over-fed, creating a bottleneck and resulting in a reduced plant feed rate.

The Okorusu plant also employed spirals as a means of recovering the larger flakes and these were inefficient.

In 2018, the JV completed a review of the historical data, topographic survey and drilling at Okanjande and surrounding prospects within the Exclusive Prospecting Licence area. The activities related to exploration and drilling are discussed in detail from Items 9 to 11. Further in 2018, on behalf of the JV, Imerys completed an internal Mineral Resource estimate of the Okanjande deposit using historical drilling data collected by RUL and Gecko. None of the Imerys-Gecko drillhole data was used. A total of 60.2 Mt of Weathered and Fresh material was estimated at an average grade of 4.86% TGC (non-Code compliant).

7 GEOLOGICAL SETTING AND MINERALIZATION

(Taken from the MSA Group Report Technical Report titled "Northern Graphite Corporation, Okanjande Mineral Resource Estimate, Namibia" with effective date 29 November 2021)

7.1 REGIONAL GEOLOGY

The Okanjande deposit is located in a metamorphic complex in the north-central ("nCZ") part of the Neoproterozoic Damara Orogen. The Damara Orogen comprises three highly oblique mobile belts; namely the north-northwest trending Kaoko Belt in the northwest, the Gariep Belt in the southwest and the north-eastern trending Damara (inland) Belt. These three mobile belts mark the convergence of three cratonic blocks, namely the Rio de la Plata, Congo, and Kalahari cratons, during the creation of the Gondwana Supercontinent (Lehmann et al., 2016).

The Damara belt is sub-divided into seven north-east trending tectonostratigraphic zones, named from north to south (Nascimento et al., 2017) (Regional Geology of the Damara Belt (Miller, 2013)):

- Northern Platform of the Congo Craton ("NP");
- Northern Margin Zone ("NMZ");
- Northern Zone ("NZ");
- Central Zone ("CZ"), subdivided into Northern and Southern parts ("nCZ" and "sCZ", respectively);
- Southern Zone ("SZ") - also referred to as the Khomas Trough, includes the Okahandja Lineament Zone ("OLZ") and the Deep-level Southern Zone ("DLSZ");
- Southern Margin Zone ("SMZ"); and
- Southern Foreland of the Kalahari Craton ("SF").

The CZ of the Damara Orogen consists of the Damaran metasediments that have undergone greenschist-amphibolite facies metamorphism, through multiple phases of deformation, and are intruded by several syn-/late-tectonic felsic igneous intrusions. The CZ is sub-divided by the northeast-trending Omaruru Lineament-Waterberg Fault into a northern zone, referred to as the nCZ, and a southern zone, known as the sCZ. The Omaruru Lineament distinguishes between the magnetically quiet domain of the nCZ and the disturbed part in the sCZ (Steven, 1993). The nCZ is bound by the Otjihorongo Thrust to the north (Lehmann *et al.*, 2016).

The Project is located in the nCZ and is underlain by Nosib Group sediments and upper Swakop Group shelf carbonates that are intruded by a number of syn- and late-tectonic granites and pegmatites (Steven, 1993).

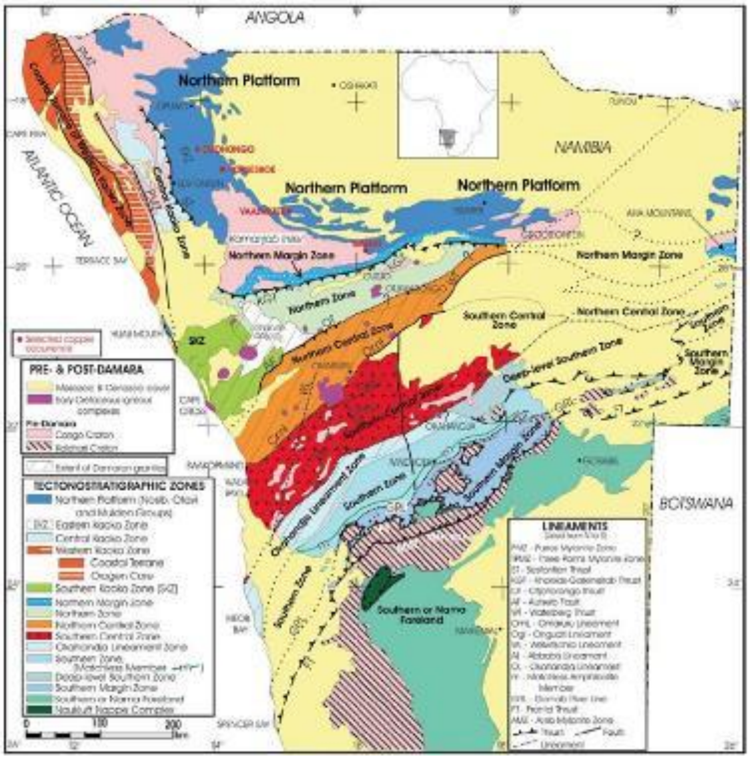


Figure 7-1: Regional Geology of the Damara Belt (Miller, 2013)

7.2 LOCAL GEOLOGY

The Nosib and Swakop Groups in the Project area have been intruded by syn- and post-tectonic pegmatites and granites, with the latter typically comprising two types of leucogranites. These pegmatites and granites occur as irregular and semi-disconcordant narrow bodies, which cross-cut the metasedimentary layering in places. Quartz veining also occurs in the area. The sedimentary rocks have been subjected to high grade regional metamorphism (RUL, 1993; RUL, 1994).

The Nosib Group comprises arkoses, feldspathic quartzites and ortho-quartzites that have been metamorphosed to feldspathic-quarzitic gneisses and graphitic quartzite, which host the graphite as an accessory mineral. The graphite mineralization is hosted locally in discrete units. Sulphide mineralization is prevalent in the Nosib Group. The Nosib Group is relatively resistant to weathering and forms a range of low hills that are observed in the area (RUL, 1993; RUL, 1994). It is not clear whether the host rock is a gneiss or quartzite; this requires further investigation.

The Swakop Group conformably overlies the Nosib Group, with its basal contact marked by a thin biotite schist. The lithologies of the Swakop Group include marble, locally intercalated with calcsilicates, overlain by a thin layer of graphite-rich feldspathic quartzite, followed by a thick sequence of quartz-biotite schists and gneisses with thin calc-silicate intercalations intruded by granites (RUL, 1993; RUL, 1994).

Cover rocks comprise Quaternary sediments, including alluvium, sand and gravel, which tend to accumulate in the valleys. Calcrete is developed locally, overlying the marbles and calc-silicates of the Swakop Group (RUL, 1993; RUL, 1994).

The area has been subjected to multiple phases of deformation, which have resulted in dome-and-basin structures with a WSW-ENE fold axis. The synformal structures are associated with steep and near-vertical foliations, while the antiforms are associated with gentler foliations (RUL, 1993; RUL, 1994).

Major north-south and northeast-southwest orientated faults cut across the region, which are typical of the Darama region (RUL, 1993; RUL, 1994).

7.3 PROPERTY GEOLOGY

In the Project area, the Nosib and Swakop Groups are tightly folded along a west-southwest fold axis, resulting in quartz-rich ellipsoidal domes of the Nosib Group, while the valleys comprise Swakop Group. The graphite mineralized gneisses occur on the flanks of the antiformal dome structures along valley margins (Figure 7 2) (RUL, 1993; RUL, 1994).

Graphite occurs locally as disseminated flakes in stratabound units. Graphite mineralization is ubiquitous in the Property (Figure 7-2), and several targets have been identified and investigated by the different owners over time, with the most successful target being the Okanjande deposit (RUL, 1993; RUL, 1994). Several other targets are currently defined that require further investigation.

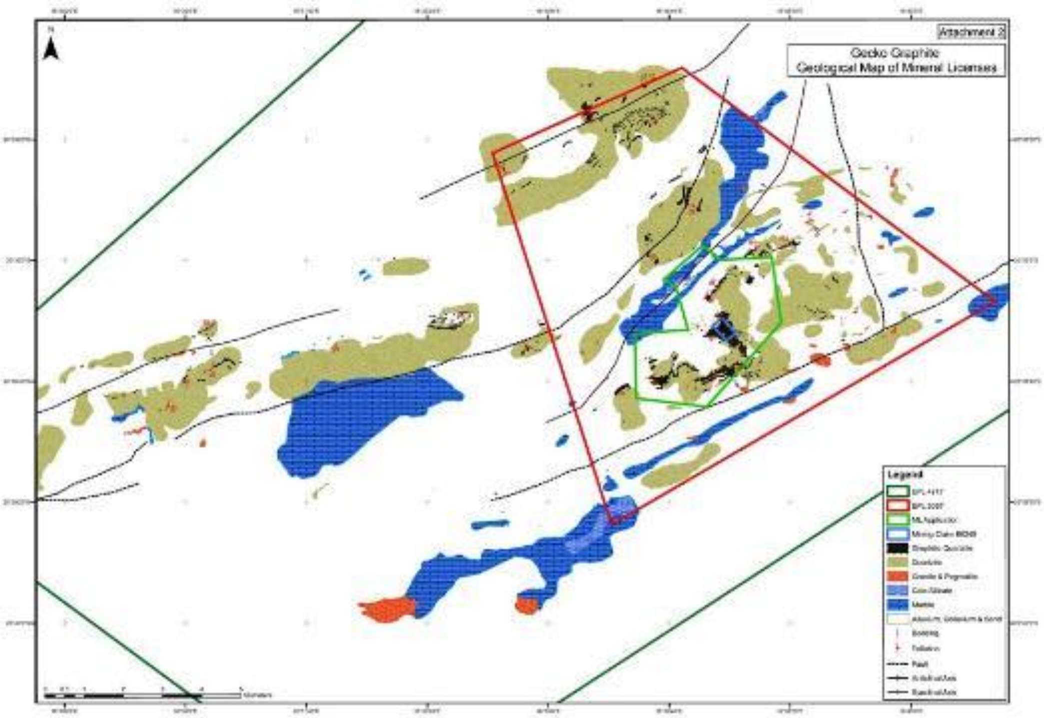


Figure 7-2: Property Geology Map (Gecko, 20xx)

The Okanjande deposit reaches its highest grade and is thickest in the centre, with graphitic carbon grades and mineralization thickness decreasing towards the peripheries. The contacts of the graphite units are difficult to define as they tend to be transitional. The graphite mineralization is typically defined over zones of significant total graphitic carbon grade rather than discrete lithologies, since the mineralized and non-mineralized rocks can be petrographically and stratigraphically the same. Unmineralized / waste zones are typically graphitic poor gneisses/quartzite, interbedded within the graphitic gneiss/quartzite or irregular intrusive pegmatites and granites. Two other waste rocks identified at the Okanjande deposit include a pinkish coloured, phlogopite-rich quartzite, which is typically 2 cm to 3 cm thick; and a friable mica schist, which rarely exceeds 1 m in thickness. The mica schist may result in pit wall instability if exposed on bench faces (RUL, 1993; RUL, 1994).

The Okanjande deposit is a massive deposit with shallow dipping layering to the south-east. It extends on surface approximately 900 m northeast to southwest and up to 820 m from northwest to southeast. The mineralization extends from surface and has been defined by drilling up to a depth of 90 m below surface. The mineralization is open at depth. The deposit is extensively weathered to depths of generally between 10 m and 20 m. The thickness of the weathered zone increases in the southwest and northeast of the deposit. A transitional zone of partial weathering of 1 m to 5 m thickness overlies the fresh rocks. The thickness of the transitional zone increases to the northeast of the deposit. An altered zone was identified at depth in the western part of the deposit from core logging and petrographic studies. The altered zone is confined to shear zones in this area (RUL, 1993; RUL, 1994).

Towards the deposit edges, the geology appears to be more variable with lower grades, as observed in the northern and southern extensions of the deposit. More work is required in these areas to better understand these complexities.

The structure of the Okanjande deposit is tenuous. The present interpretation of the deposit structure is an isoclinal to recumbent fold structure that was refolded on a NW-SE axis. This is suggested by the small-scale structures identified in the rocks. Steeply dipping E-W and NE-SW trending faults have been observed to cut across the deposit (RUL, 1993; RUL, 1994).

The mineralized gneisses/quartzites have banded, porphyroblastic or magmatic textures. These gneissic textures relate to varying degrees of mineralization (Imerys-Gecko, 2018):

- The “banded ore” has bands of high-grade graphitic quartzite interbedded with barren bands of quartzite;
- The “porphyroblast ore” consists of massive high-grade graphitic quartzite with medium to large sillimanite porphyroblasts. This mineralization style can be of relatively high grade. Graphite flakes in this mineralization style have preferential orientations which result in a schistose fabric; and
- “Migmatitic ore” is related to higher metamorphic grade and has magmatic folds that indicate early melts due to an increase in temperature during metamorphism. Generally, this mineralization style has the highest grades.

7.4 MINERALIZATION

RUL completed mineralogical studies on selected Okanjande deposit core samples at an independent laboratory, Mintek, Johannesburg. The mineralogical studies were completed on weathered and fresh mineralized samples from 12 drillhole cores using transmitted and reflected light microscopy and point counting methods, scanning electron microscopy (“SEM”) and X-ray diffraction (“XRD”).

The mineralogical investigations revealed that the graphitic samples generally contain similar minerals, although they vary significantly in both proportion and texture. The minerals identified are shown in Table 7-1.

Table 7-1: Okanjande Mineralogy

Major Constituents (>10%)	Minor Constituents (between 10% and 1%)	Trace Constituents (<1%)
Quartz	Muscovite	Rutile
K-Feldspar	Plagioclase	Zircon
Jarosite (K-Fe-sulphate)	Graphite	Apatite
	**Phlogopite	Chlorite
	**Biotite	+Chalcopyrite
	Sillimanite	Ce-Phosphate
	+Pyrrhotite	Monazite
	+Pyrite	Ba-K Feldspar
	*Fe-Hydroxides (Goethite)	Baryte
	*Haematite	+Molybdenite
		Wolframite
		Cassiterite
		+Ni-Sulphide
		Cr-spinel
		Xenotime

Source: ***RUL, 1993***

Note: **** in weathered mineralized samples***

+ in fresh mineralized samples

***** present in some rocks only***

The major silicate minerals of the graphitic gneiss at Okanjande are quartz and K-feldspar. The most common mica is muscovite, comprising between 2% and 8% of the rock.

Sulphide mineral content in the samples varies between 2% and 7%. Pyrite and pyrrhotite are the most commonly occurring sulphide minerals, with approximately equal proportions. Other sulphide minerals were identified in trace amounts, including chalcopyrite, molybdenite and covellite (only observed in weathered rock). Sulphides occur in irregular patches or clusters of up to 20 mm across, or in veins associated with quartz, and a small proportion of the sulphide is associated with graphite flakes.

Five sulphate minerals (barite, gypsum, jarosite, sidorotil and melanterite) were identified. Barite occurs in small quantities and is the only primary sulphate mineral, while the other minerals are as a result of weathering and oxidation of sulphide minerals. Jarosite can make up more than 10% of the weathered rock and some of the jarosite particles are closely associated with graphite flakes. Sidorotil and melanterite are soluble iron sulphate minerals which occur in minor amounts in the weathered rock, commonly along joints and fractures. Sulphate minerals may occur at depth in fresh mineralisation due to oxidation along joints, faults and shears.

Rutile content in the Okanjande deposit samples is between 0.2% and 1.3% with an average of 0.8%. Rutile particle size is between 0.05 mm and 0.40 mm, with an average of 0.20 mm. Rutile grains are commonly enclosed in gangue minerals and most have no association with graphite. A small proportion of rutile has inclusions of graphite, zircon and sulphides. SEM analysis indicates that some rutile grains are high in vanadium occurring in solid solution within the rutile structure.

The graphite content of the analysed samples ranges between 3% and 18% TGC. The average flake size ranges between 500 µm and 800 µm. More than 85% of the graphite flakes occur as straight undeformed, well-crystallised, euhedral flakes, and free of interlaminated gangue minerals in unaltered ore. Only 3% to 12% of the graphite flakes are interlaminated with gangue minerals. Most of the flakes that are interlaminated with gangue minerals are very large flakes that occur in the form of books. A small proportion of the flakes (<5%) occur as tiny flakes or grains enclosed in the feldspar or muscovite grains.

In the western part of the deposit, approximately 15% of the graphite flakes in weathered rocks at depths below the observed levels of oxidation have altered textures. The altered graphite flakes are associated with localised shear stresses at depth along a zone trending northeast to southwest. Altered graphite flakes are curved, bent or broken, reducing flakes to smaller sizes. Graphite flakes with this texture are interlaminated with gangue minerals and are commonly rimmed with muscovite.

8 DEPOSIT TYPES

(Taken from the MSA Group Report Technical Report titled "Northern Graphite Corporation, Okanjande Mineral Resource Estimate, Namibia" with effective date 29 November 2021)

Graphite mineralization occurs in three types of deposits worldwide; microcrystalline, vein graphite and crystalline flake graphite (Simandl et al., 2015):

- Microcrystalline graphite or amorphous graphite deposits have partially ordered graphite flakes. The deposits are found in low regional metamorphic or along contact metamorphic environments of coal seams (Simandl et al., 2015).
- Graphite vein deposits are made up of graphite veins typically found in metasedimentary belts that are metamorphosed to upper amphibolite and granulite facies. In these belts, vein graphite deposits are found in in pegmatite like bodies (quartz, graphite and pyrite precipitated in layers) in anticline fold hinge zones. Graphite veins are currently only mined in Sri Lanka. Vein graphite product is commonly made up of graphite-rich fragments that are typically 0.5 cm to 0.8 cm in diameter (Simandl et al., 2015).
- Crystalline flake graphite deposits are commonly hosted by marbles and paragneiss that have been subjected to upper amphibolite to granulite facies metamorphism. These deposits can also occur in iron formation, quartzite, pegmatite, syenite and, less commonly in serpentinized ultramafic rocks. Graphite mineralization in paragneiss occurs in thick sequences, and mineralization tends to be evenly distributed with total graphitic carbon grades in the order of 2% to 3% or less (Simandl et al., 2015).

The Okanjande deposit fits the description of a crystalline flake graphite deposit in a paragneiss. The original rocks at the Okanjande deposit were arkoses, feldspathic quartzites and ortho-quartzites that have been subjected to high grade metamorphism to become feldspathic-quarzitic gneisses and graphitic quartzites.

The Okanjande deposit is a massive deposit with shallow dipping layering to the southeast. Its surface extent is approximately 900 m northeast to southwest and up to 820 m from northwest to southeast. The mineralization extends from surface and has been defined by drilling up to a depth of 90 m below surface. The mineralization is open at depth.

9 EXPLORATION

(Taken from the MSA Group Report Technical Report titled "Northern Graphite Corporation, Okanjande Mineral Resource Estimate, Namibia" with effective date 29 November 2021)

Exploration had been carried out by various companies since 1990. In addition to drilling work and analyses of the drillhole samples (documented in Items 10 and 11), the following exploration was undertaken:

- 1990 – 1993: RUL carried out topographic and aerial surveys;
- 2003 – 2010: Solvay – no work undertaken;
- 2010 – 2016: Gecko completed mapping, soil sampling, pitting, geophysical surveys and topographic surveys; and
- 2016 – to date: Imerys-Gecko completed a review of the exploration data and a topographic survey.

9.1 RÖSSING URANIUM LIMITED (RUL) EXPLORATION

According to the RUL reports (RUL, 1993; RUL,1994), topographic surveys and aerial black and white photography were completed at Okanjande deposit subsequent to drilling.

The RUL work was coordinated on a local grid.

9.2 GECKO EXPLORATION

In 2014 and 2015, Gecko completed geological mapping, soil sampling, pitting and geophysical surveys. Soil sampling and pitting were completed as part of the environmental investigations on an area identified for the establishment of a plant. Gecko completed extensive geological mapping of exposed outcrops, and geological maps of the Project area were produced as a result of the mapping programme (Figure 9-1).

Gecko contracted Fugro Airborne Surveys ("Fugro") to fly a fixed wing TEMPEST electromagnetic and magnetic survey at 200 m line spacing over the Project area. After second level processing, a set of conductivity depth images were produced by the contractor, together with the imagery on the terrain and magnetics of the area. Later, Imerys-Gecko planned holes based on these surveys (Figure 1-9).

In 2014, at the time of drilling, Gecko contracted Mr Zaan Wichtman of African Land Survey to complete a topographic survey, as well as collar surveys of the historical drillholes and the drillholes drilled by Gecko.

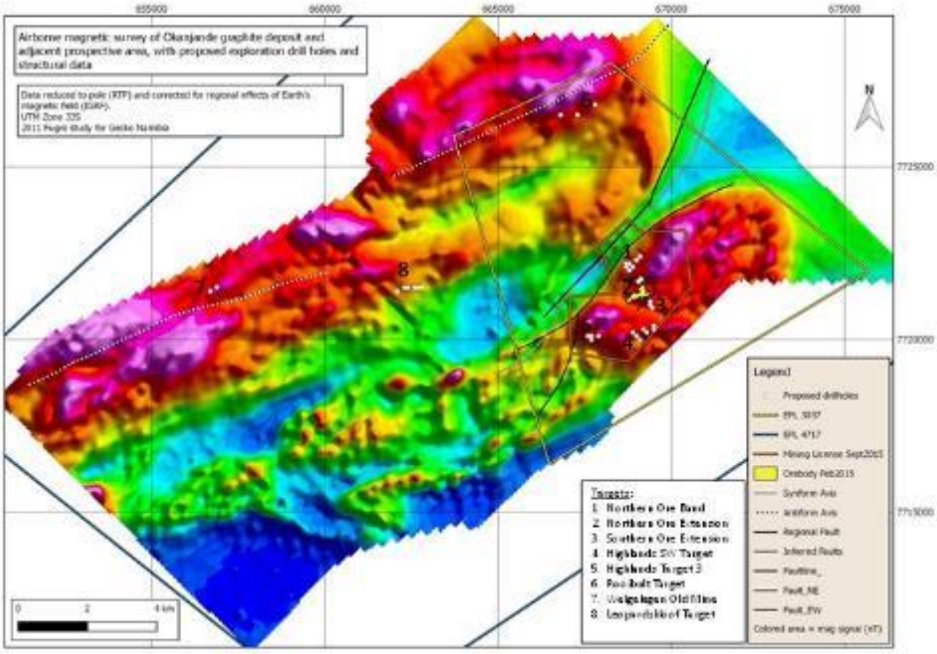


Figure 9-1: Gecko airborne magnetic survey with planned Imerys-Gecko collars

9.3 IMERYS-GECKO EXPLORATION

In September 2018, Imerys-Gecko contracted Mr H. L. Strydom of Strydom & Associates to complete a topographic survey of the Project area, which included a pit and several stockpiles. The survey was completed using unmanned aerial vehicle ("UAV"), commonly known as a drone, with a Leica SR530 GPS system. The survey used a number of pre-marked, surveyed ground control points and was based on the local UTM33 projection. The method is expected to have an error of less than 0.025 m in the X, Y and Z co-ordinates. This topography was used to limit the vertical extent and deplete the mined-out areas from the Mineral Resource model.

9.4 NORTHERN GRAPHITE EXPLORATION

No exploration work has been conducted by or on behalf of, Northern Graphite Corporation.

10 DRILLING

(Taken from the MSA Group Report Technical Report titled "Northern Graphite Corporation, Okanjande Mineral Resource Estimate, Namibia" with effective date 29 November 2021)

Drilling at the Okanjande deposit was completed by RUL (early 1990s), Gecko (2014 to 2016) and Imerys-Gecko (2018).

10.1 RUL DRILLING

The descriptions of the RUL drilling were derived from the RUL reports (RUL, 1993; RUL, 1994). The work described in this section was completed prior to the QP's involvement in the Project, therefore the QP did not observe any of the processes described during their implementation.

In 1990, RUL drilled 66 percussion drillholes and 25 diamond drillholes, with 11 of the diamond drillholes twinning the percussion drillholes at the Okanjande deposit (also known as Target 2). Percussion drilling was used to rapidly delineate the Mineral Resource, while being cost-effective. Diamond drilling was used to provide detailed geological information, to obtain samples for metallurgical test work and to drill where the sites were not accessible for the percussion drilling equipment. Poor recoveries, slow drilling rates and mud losses were encountered during the diamond drilling, especially in weathered areas, which limited its effectiveness as the primary drilling method.

The drillholes were either drilled at an approximate azimuth of 320° and a dip of 60° or vertical. The drillholes were completed along southeast to northwest lines at an average line spacing of 50 m, with the southwestern part of the deposit drilled at 100 m line spacing. The holes were drilled 50 m apart on each line (Figure 10-1). Most of the drillholes reached a depth of 60 m, with the minimum and maximum depths being 40 m and 90 m, respectively.

In the area where the bulk sample was taken, RUL drilled 11 short percussion holes of up to 25 m in depth.

Assay information is available for a total of 5,978 m of RUL drilling at the Okanjande deposit, which is made up of 4,376 m drilled by percussion and 1,602 m drilled by diamond drilling. Logging information is only available for 296.69 m of diamond drillhole core.

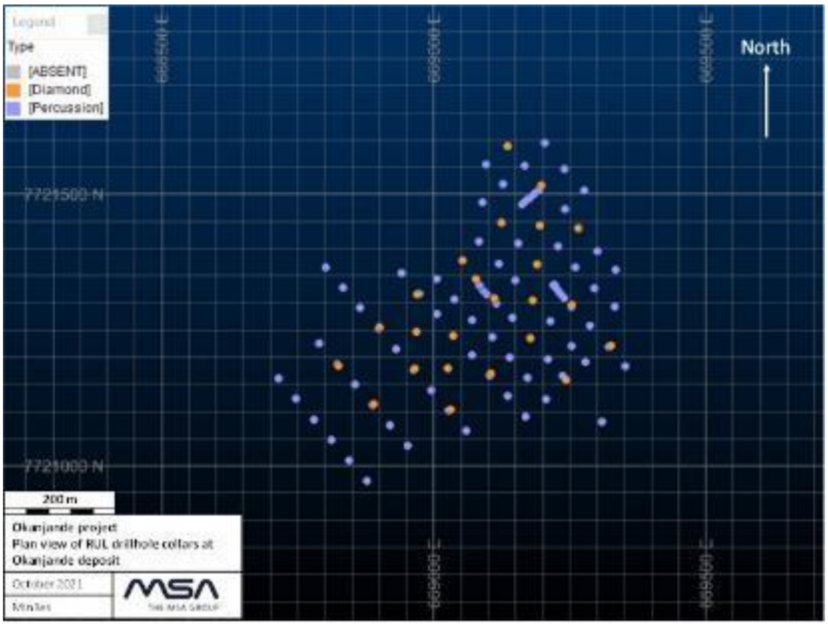


Figure 10-1: Collar positions of RUL drillholes at Okanjande deposit, colour-coded by type (MSA, 2021)

According to RUL reports (RUL, 1993; RUL, 1994), RUL originally identified four drilling targets. Target 2 is the Okanjande deposit discussed in the preceding paragraphs.

- Target 1 is adjacent to the district gravel road of D2515 and had one hole drilled, which did not intersect mineralization;
- At Target 3, to the southwest of the main Okanjande deposit, RUL completed nine percussion drillholes. RUL reported that two drillholes intersected mineralization but the results for the rest of the drillholes are not discussed in the RUL reports, thus MSA assumed that they did not intersect significant mineralization. RUL completed follow up diamond drilling of two holes, however these did not intersect mineralization and the cores were not sampled; and
- Target 4 forms part of a domal structure on the southwestern portion of the Good Hope Farm and no holes were drilled by RUL.

Data are not available for the targeting drilling described above and therefore the results cannot be verified. The QP is not relying on the information from the RUL targeting drilling for its interpretation of the deposit.

Three holes (OAP80, OAP81, OAP82) were drilled by RUL to the north of the main Okanjande deposit for sterilization purposes for a primary crusher site. These holes intersected mineralization in an area now referred to as the Northern Extension, and thus the position of the crusher plant was moved further away from the Okanjande deposit. The QP is not relying on the information from the RUL sterilization drilling as it is incomplete and is instead relying on verifiable data from later Gecko drilling in the Northern Extension for its interpretation and modelling of the Mineral Resource.

RUL also completed three percussion drillholes 600m to the northwest of the main Okanjande deposit for sterilization purposes for a tailings area site. The drillholes intersected mineralization, and the area became known as the Tailings Area Ore Zone and is now referred to as the Northern Ore Band. Assay data are not available for the sterilization holes and therefore the results cannot be verified.

Percussion drilling was collared with 150mm diameter drilling, subsequent to which 115mm diameter drilling was used for the rest of the holes. RUL used HQ drilling for the diamond holes.

The drillhole collars were surveyed in a local grid system by the Rössing Mine Survey department.

10.1.1 Density Measurements

According to the RUL reports (RUL, 1993 and RUL, 1994), density measurements were completed on selected core samples at Mintek, which resulted in an average density value of 2.61t/m^3 for the weathered mineralisation and 2.73t/m^3 for the fresh mineralised material. The original data for these density measurements are not available. This density data was not used in the current Mineral Resource estimate, because it could not be verified.

10.2 GECKO DRILLING

The descriptions of the Gecko drilling were derived from an internal Imerys-Gecko Mineral Resource report (Imerys, 2018), e-mail communications with Gecko (2021) and from observation made on the data provided. The work described in this section was completed prior to the QP’s involvement in the Project, therefore the QP did not observe any of the processes described during their implementation.

From 2014 to 2015, Gecko drilled 91 diamond drillholes, which include infill drilling, twin drilling of the RUL drilling and exploration drilling in the fringes and outside the main Okanjande deposit. Eleven RUL percussion drillholes and two RUL diamond drillholes were twin drilled. The infill drilling resulted in approximately 25 m spacing between section lines towards the centre of the deposit. Exploration drilling was in the peripheries and in the Northern and

Southern Extension of the main Okanjande deposit, the Northern Ore Band, and approximately 2 km northeast of the main Okanjande deposit (Figure 10-2).

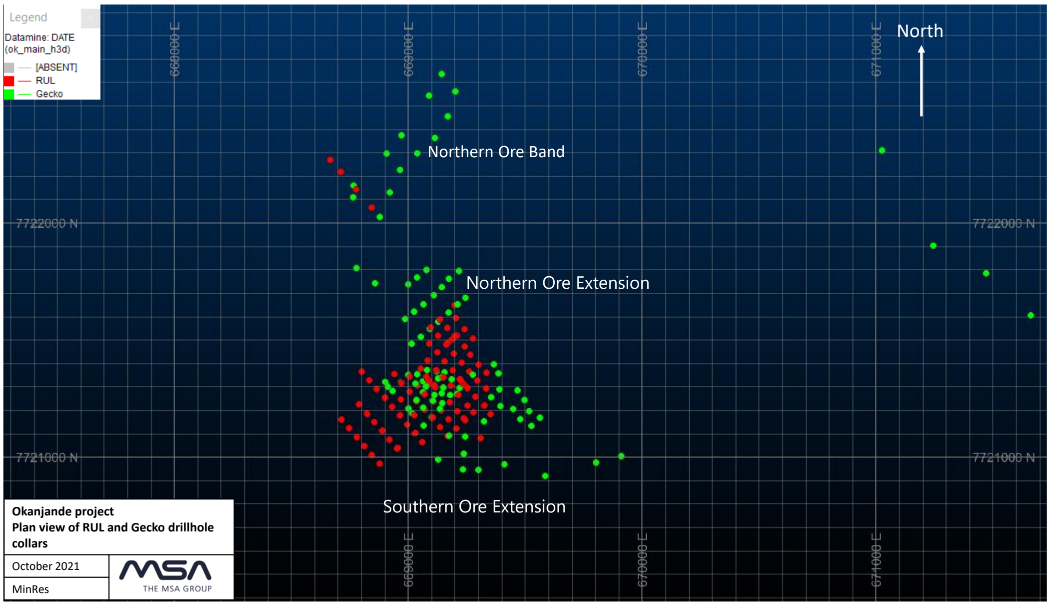


Figure 10-2: Location of Gecko drillhole collars (MSA, 2021)

All Gecko holes were from diamond drilling. Holes were drilled at an azimuth of 320° and dip of 60°, or vertical in the central parts of the Okanjande deposit, while the rest of the holes were drilled at various orientations including vertically.

According to Gecko, the drillholes were planned by the geologist on site, with advice from Kai Batla, Holdings (Pty) Ltd ("Kai Batla") who was the advising consulting company to Gecko at the time. The drillhole collars were positioned by surveyors in the field. During drilling, cores were removed by the drilling contractor from the core barrels and placed in core boxes. The start and end of each core run was marked by the drilling contractor using plastic "stick ups".

Core logging was completed by two geologists, Mr. Eugene van der Heever and Mr. Konrad Amunime. The geologists were trained by the consulting geologists, Mr. Pieter van Wyk and Mr. Oliver Krappmann. Mr. Pieter van Wyk supervised the team, checked their logging, marking and cutting of the core to ensure that they abided to the logging and sampling protocols. Upon completion, the core logging was first checked by Gecko's senior geologist, Mr Gideon Kalumbu, and Mr Pieter van Wyk conducted the final checks for inconsistencies and/or errors. Core recovery was not routinely recorded, and remarks were made by exception for areas of interest.

The entire cores were photographed prior to sampling, and the full core photograph database is available in digital format, with the exception of OKD008, OKD012 and OKD013, which are missing

In 2014, Gecko contracted Mr Zaan Wichtman of African Land Survey to complete a topographic survey and to conduct collar surveys of the historical drillholes and its own holes. The survey instrument used was Trimble R8 GPS System with a TSC3 controller, and the survey was completed on the Namibian Bessel (Schwarzeck) system LO22/17 and was later converted to UTM WGS84 33S. A total of 58 Gecko holes and 40 RUL collars were surveyed by Mr Zaan Wichtman. The rest of the RUL collars were geo-referenced from historical plans. Figure 10-3 shows the drillhole collar positions as surveyed or georeferenced from plans.

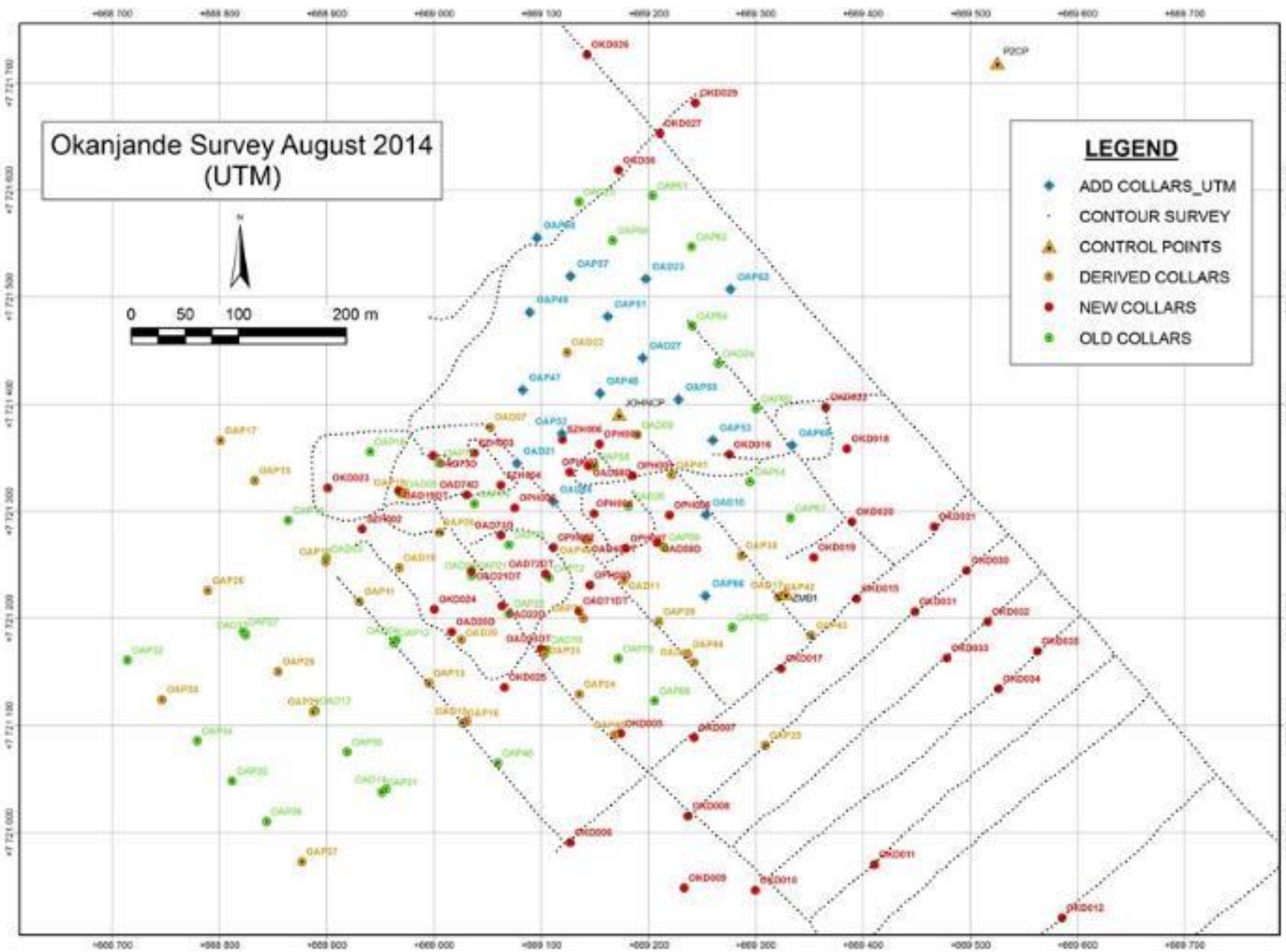


Figure 10-3: 2014 Survey plan of drillhole collars (African Land Survey, 2014)

In December 2014, Gecko contracted Mr Herman Strydom of Strydom & Associated Land Surveyors to survey an additional 27 collar positions located in the Northern Extension and in areas outside the Okanjande deposit. The collar surveys were completed using a Leica GPS900 series instrument on the Namibia Bessel System in the LO22/17 projection, which was later converted to UTM WGS84 33S.

10.2.1 Density Measurements

Density was not measured on a systematic basis during the Gecko drilling programme. A selection of twenty-three core samples were selected, of which two were fresh graphitic core, nineteen were weathered graphitic core and two were fresh waste core.

The two fresh mineralized rock density measurements are 2.74g/cm³and 2.70g/cm³, while the two fresh waste rock density measurements are 2.58g/cm³ and 2.60g/cm³. The weathered graphitic rock density values range between 2.18g/cm³ and 2.62g/cm³ with an average of 2.40g/cm³.

There is no report on the method of density measurement and the results could not be verified. Therefore, the results were not used in the Mineral Resource estimate.

10.3 IMERYS-GECKO

The Imerys-Gecko work described in this section was completed prior to the QP's involvement in the Project, therefore the QP did not observe any of the processes described during their implementation. The Imerys-Gecko processes described in the following sections were based on the Imerys-Gecko standard operating procedures (SOPs) and email communications with Imerys-Gecko (Machoko, 2021).

From June to September 2018, Imerys-Gecko completed a total of 44 diamond drillholes within the Okanjande deposit and surrounding prospects. Twelve of these were infill holes drilled in the southwestern portion of the deposit, to reduce the drill line spacing from 100 m to 50 m (Figure 10-4). These holes were drilled at an approximate azimuth of 320° and a dip of 60° and at 50 m spacing within the drill lines. These holes are within the current Mineral Resource area.

Imerys-Gecko identified additional drilling targets from the airborne survey and mapping previously completed by Gecko:

- Imerys-Gecko completed four drillholes at the Northern Ore Extension (Figure 10-4). Two of the drillholes intersected significant mineralization (greater than 2% TGC), while the other two holes drilled 30 m away did not intersect mineralization. Imerys-Gecko recommended that follow up mapping be completed at the Northern Ore Extension to improve understanding of the local geology;
- Three shallow drillholes were completed at the Southern Ore Extension (Figure 10-4). Two of the drillholes intersected significant grade mineralization, but narrower than previously intersected by Gecko in the area. These holes may not have been drilled deep enough to intersect the full mineralized package;
- Out of the six drillholes completed at the Northern Ore Band, four drillholes intersected significant mineralization that is approximately 13 m thick on average (Table 10-1), which is narrower than mineralization intersected by Gecko drillholes in the south-west part of the deposit, that was 40 m thick on average (Figure 10-4);
- Seven drillholes were completed at the SW Target that were drilled on three north-west to south-east lines spaced approximately 320 m apart, with a drill spacing of approximately 150 m within the drillhole lines (Figure 10-4). Six holes intersected mineralization (Table 10-1). The hole that did not intersect mineralization plots in the south-east area of the target and was not sampled;

- Out of four drillholes completed by Imerys-Gecko at the Highlands Target 3 (Figure 10-4), two drillholes intersected mineralization (Table 10-1). The other two drillholes did not intersect significant mineralization; one of the drillholes was sampled and the other one was not sampled. The holes that did not intersect significant mineralization are located between the holes that intersected significant mineralization. This suggests that the mineralization is discontinuous in this area;
- Imerys-Gecko completed three drillholes approximately 5 km north of the Okajande deposit at Rooibult (Figure 10-4), with only one drillhole intersecting shallow, thin significant grade mineralization (Table 10-1). The other drillholes were not sampled;
- The two drillholes completed at the Welgelegen Old Mine (Figure 10-4), approximately 12 km west of the Okajande deposit, intersected mineralization over thicknesses of 21 m and 35 m (Table 10-1); and
- Three drillholes approximately 250 m apart along an east-west line were completed approximately 6 km to the west of the Okajande deposit at the Leopardkloof Target (Figure 10-4). One drillhole intersected significant mineralization and the others were not sampled. (Table 10-1).

Imerys-Gecko considered three of the targets to be of a higher priority for further drilling; the Northern Ore Band (farm Okanjande), SW Target (farm Highlands) and Old Mine (farm Welgelegen).

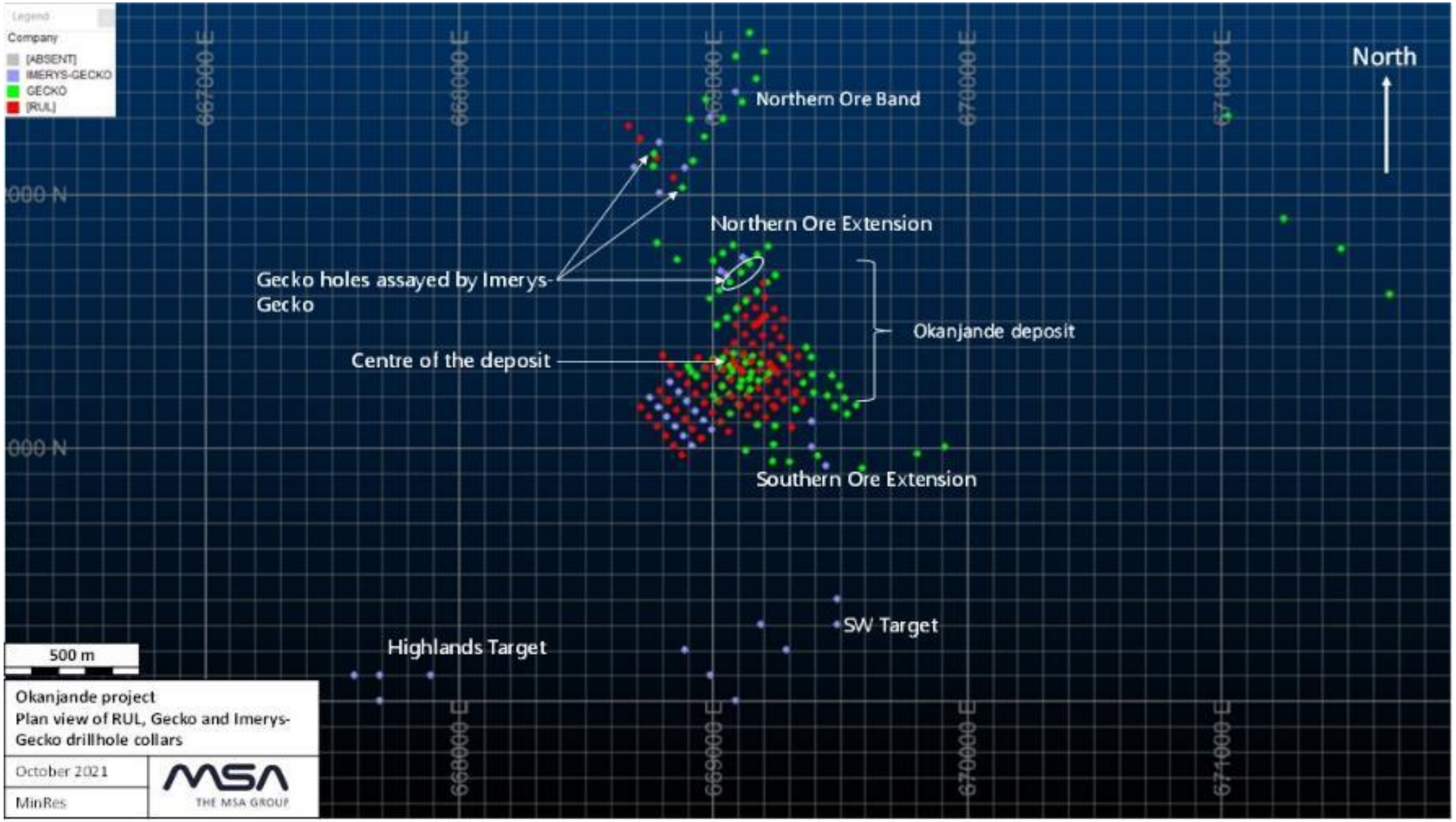


Figure 10-4: Drillhole collars of the different drilling campaigns at and around the Okanjande deposit (MSA, 2021)

Table 10-1: Imerys-Gecko significant intersections outside of the Okanjande deposit (MSA, 2021)

Prospect	Drillhole Identity	Depth From (m)	Depth To (m)	Length (m)	TGC average (%)
Northern Ore Band	OkaPBH_027	2.00	25.00	23.00	3.12
	OkaPBH_030	14.00	27.00	13.00	3.27
	OkaPBH_033	0.50	10.00	9.50	4.47
		29.00	34.40	5.40	2.47
	OkaPBH_034	10.00	28.00	18.00	5.01
SW Target	OkaPBH_013	0.36	6.00	5.64	5.82
	OkaPBH_014	7.00	47.20	40.20	3.70
	OkaPBH_015	26.00	29.15	3.15	7.69
	OkaPBH_017	2.00	16.00	14.00	7.29
	OkaPBH_018	5.00	27.00	22.00	3.75
	OkaPBH_019	2.00	12.00	10.00	4.58
		24.00	26.03	2.03	5.02
Highlands Target 3	OkaPBH_009	0.20	31.00	30.80	4.31
	OkaPBH_012	3.00	30.00	27.00	2.12
Rooibult	OkaPBH_037	0.16	0.16	4.00	2.15
Welegelegen Old Mine	OkaPBH_007	3.00	24.00	21.00	5.75
	OkaPBH_008	4.00	39.00	35.00	3.48
Leopardkloof	OkaPBH_002	3.00	25.00	22.00	4.13

The drillholes were collared using HQ drilling size and the rest of the holes were drilled using NQ drilling. After a drilling run was completed, the drilling contractor collected core from the core barrel and placed it in a core box, where the beginning of each run was marked on a plastic core block. The core was transported from the drill site to the logging and processing area, where a geologist checked and verified the plastic core blocks. Broken core was gathered together, and core length measured. Core logging was completed by a geologist on standard log sheets. The logging included descriptions of lithology, core recovery, rock quality designation, colour, weathering, texture and mineralization. The logged information was never captured electronically.

A handheld GPS was used for the initial positioning of the drillhole collars, thereafter the surveyor picked up the collar positions prior to drilling. Imerys-Gecko contracted Brighton Zhou of Top Range Survey & Mapping cc to complete general survey work at Okanjande mine site, including the collar survey of the Imerys-Gecko exploration holes.

The drillhole data were provided by Imerys-Gecko in numerous Excel spreadsheets.

10.3.1 Density Measurements

Core density was not measured during the drilling campaign.

10.4 DENSITY MEASUREMENTS COMPLETED POST THE DRILLING CAMPAIGN

Due to the lack of sufficient verifiable density data from the three drilling programmes, the QP requested for density to be measured on a selection of drillhole cores under his supervision. A total of 144 samples were selected from eleven drillholes in the main Okanjande deposit. Densities were measured on-site and measurements for nine of the drillholes were completed under the QP's supervision. Weathered core was coated with lacquer to prevent water being absorbed into core samples. Sections of the core that had undergone secondary (i.e., post-drilling) weathering, mainly those exhibiting degradation of sulphides, were not used for density measurements.

Samples were weighed both wet and dry suspended under a digital scale (Figure 10-5). The QP is satisfied that the density data collected from the samples in this manner is acceptable for Mineral Resource estimation.

Figure 10-5: Density measurement scale and apparatus with lacquer coated core (MSA, 2021)

10.5 NORTHERN GRAPHITE DRILLING

No drilling has been conducted by or on behalf of, Northern Graphite Corporation.

11 SAMPLE PREPARATION, ANALYSES AND SECURITY

(Taken from the MSA Group Report Technical Report titled "Northern Graphite Corporation, Okanjande Mineral Resource Estimate, Namibia" with effective date 29 November 2021)

11.1 RUL CAMPAIGN

The following description is sourced from the RUL Feasibility Study and geological reports (RUL, 1993; RUL, 1994) , and from observations made on the data provided. The work was completed historically, and the QP did not observe the processes.

Percussion drilling chips were collected at 1m intervals. The sample material was collected directly from the cyclone underflow and was homogenised by passing it through the riffle splitter three times prior to collecting the sample. A sample of 2kg to 3kg was collected from the riffle splitter and bagged for assay. The percussion chips were originally kept but are no longer available for inspection.

Diamond drillhole cores were cut longitudinally into half, then cut longitudinally in half again. The quarter core samples were collected at 2m intervals continuously through the entire length of the drillhole core. Where the core was broken and could not be cut, typically at the beginning of the hole, the broken material was homogenised and then half was taken as a sample for assay.

RUL submitted samples to Scientific Services in Windhoek for sample preparation, entailing crushing, pulverising and homogenising. Sub-samples of pulverised material were dispatched to Scientific Services in Cape Town, an independent commercial laboratory, for graphitic carbon, sulphur and titanium oxide analyses. The QP is not aware whether the two Scientific Services laboratories were accredited at the time. According to the RUL reports (RUL, 1993 and RUL, 1994), sulphur and total carbon were analysed using LECO, carbon grade in carbonate was analysed using wet chemistry (no further details provided) and titanium oxide was analysed using X-Ray Fluorescence ("XRF"). Total graphitic carbon was calculated as the difference between the total carbon and carbon in carbonate assays. A limited number of percussion holes were assayed for sulphur. Though all diamond drillholes were assayed for sulphur, there are unexplainable gaps in the sulphur assay data.

A total of 94 field duplicate samples were collected as well as 25 field duplicates for umpire assays at a second laboratory (RUL, 1993 and RUL, 1994). It is not clear which laboratory was used for the umpire assays, and the results of neither the duplicates nor the umpire samples are available. No further quality assurance and quality control (QA/QC) samples are mentioned in the RUL reports (RUL, 1993 and RUL, 1994).

There are no further details provided on sample security.

Given the lack of QA/QC applied or available, the QP is reliant on indirect QA/QC for the RUL data, i.e., by examining global bias between different exploration campaigns that had more acceptable QA/QC protocols and twin drilling (refer to section 12.2 RUL Twin Drilling).

11.2 GECKO CAMPAIGN

The following description is sourced from a report by Gecko (2014) on the sample preparation of the drillhole samples, the Bureau Veritas (BV) assay certificates, BV quotations, from e-mail communications with Gecko (Krappmann, 2021), and from observations made on the data provided. The work was completed historically, and the QP did not observe any of the processes.

The cores were logged and marked up for sampling by geologists. Sample positions were marked on the core using a permanent marker at 1 m intervals, while adhering to the geological contacts identified during logging. The cores were split longitudinally in half using a diamond saw and again into quarter core for sampling purposes. The cores were broken along sample markings, individual samples were placed into bags with uniquely numbered sample tickets and sample numbers were written on the outside of the bags. Visibly un-mineralized intervals were not sampled. All remaining cores were stored in galvanised core trays on site in a core shed. In 2018, a secure core storage facility was built next to the Okanjande mine offices and all the cores are currently stored there.

Samples were dispatched by Gecko to Bureau Veritas (BV) in Swakopmund, a SANAS accredited independent commercial laboratory, for sample preparation. The samples were accompanied by a sample submission form completed and signed by Gecko. The sample preparation at BV Swakopmund included crushing and pulverising (no further details provided).

Upon receipt of the pulverised material from BV at Gecko's premises in Nonidas, outside of Swakopmund, Gecko homogenised the material and split it using a riffle splitter to prepare between 30 g and 50 g sub-samples for assaying. The pulverized sub-samples were incorporated into a new sample stream, which included certified reference material ("CRM") and pulp duplicates at an insertion rate of 4% for both. Blanks were inserted initially and were later discontinued. The assay results for the blanks are not available. The samples were submitted to BV Swakopmund for dispatch to BV Rustenburg.

The samples were assayed for sulphur and total graphitic carbon ("TGC") at BV in Rustenburg, which was a SANAS accredited independent commercial laboratory at the time (the laboratory is now closed). Sulphur was analysed using a LECO combustion analyser. For TGC assays, the samples were acidified and roasted to remove carbonate and organic carbon respectively. The residual carbon was determined using a LECO combustion analyser. The TGC method used is a SANAS accredited method, with the code I-9421-QA-022. The titanium oxide assays were completed at BV Swakopmund using the schedule code of PF101 which involves a sodium peroxide fusion with an Inductively Coupled Plasma - Optical Emission Spectrometry ("ICP-OES") finish. Drillhole samples from holes drilled at the periphery of the Okanjande deposit were randomly selected for sulphur assays.

Gecko used five graphitic CRMs, a titanium oxide CRM and pulp duplicates for its QA/QC samples submitted to BV in Swakopmund. The results of the TGC and S assays of the CRMs are shown in Table 11-1.

Table 11-1: CRM results for Gecko sampling (MSA, 2021)

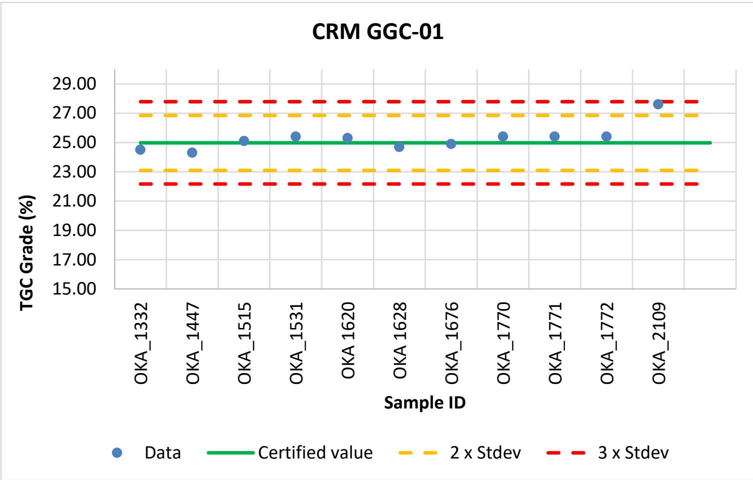
CRM name	Element	Certified value (%)	Standard Deviation	Number of samples	Bias	Number of samples outside *limits
GGC-09	TGC	2.41	0.27	37	2%	0
	S	4.59	0.13	37	**0%	7
GGC-10	TGC	4.79	0.29	10	**7%	1
	S	4.40	0.19	10	**10%	3
GGC-01	TGC	24.97	0.94	11	1%	0
	S	0.05	0.02	11	-23%	0
GGC-04	TGC	13.53	0.64	24	3%	0
	S	0.05	0.02	24	**2%	1
GGC-03	TGC	16.29	1.01	12	-7%	0
	S	0.04	0.01	12	24%	0

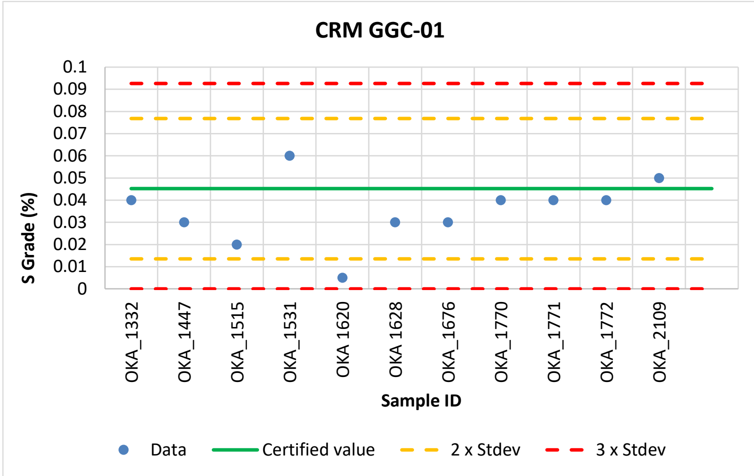
Note: **limit is three times standard deviation of the certified value*
***bias is calculated after removing failing samples*

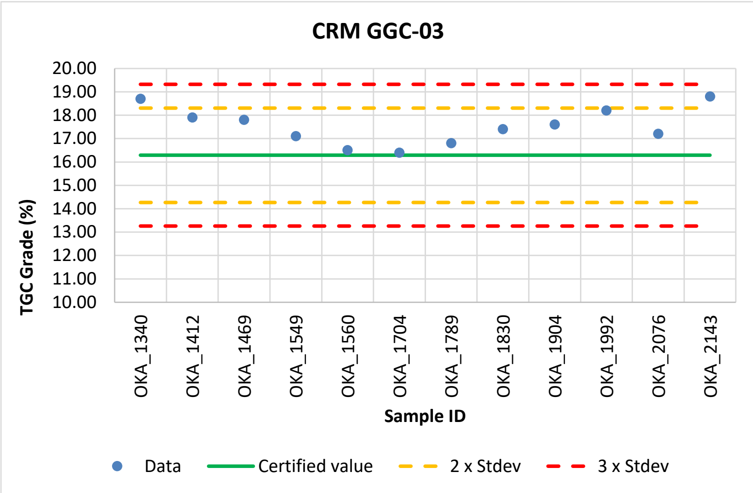
The graphitic CRMs have TGC grades ranging from 2.41% to 24.97% (Table 11-1 and Figure 11-1). Four of these cover the grade ranges of the deposit, but the TGC grade of CRM GGC-01 is outside the range of the Okanjande mineralization.

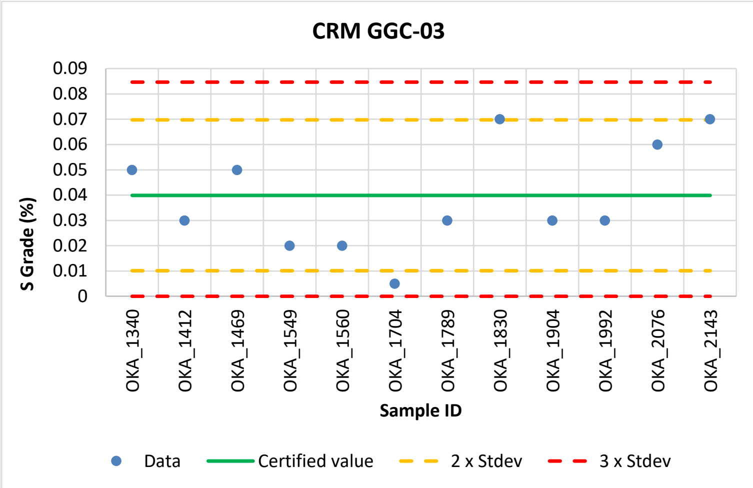
The CRMs show acceptable accuracy for the TGC assays, with all the samples, except one GGC-10 sample, returning values within control limits of three times the standard deviation of the certified value. Four out of the five CRMs show a positive bias for the TGC assays of between 2% and 7%. The fifth CRM shows a negative bias of 7% (Table 11-1 and Figure 11-1).

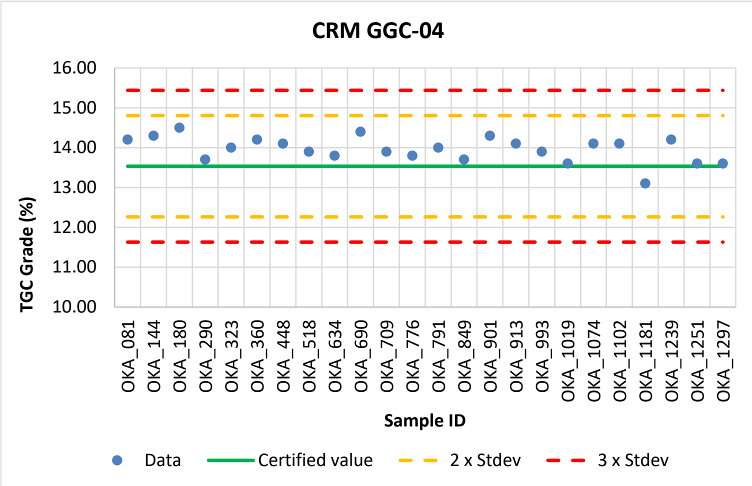
The certified CRM sulphur grades are either low grade (0.04% / 0.05%) or relatively high grade (4.40% / 4.56%). The CRM analyses with the largest relative biases are the low grades ones, although the absolute differences are negligible (Table 11-1 and Figure 11-1). One of the higher sulphur grade CRMs has a failure rate of 19% and the other 30%, although the most frequently used one had minimal average bias. The QP is of the opinion that the sulphur results are acceptable because almost half of the assays that plot outside the three standard deviation limits fail by a small margin, and the biases are within a significant level of 10%. It is also worth noting that sulphur does not form part of the Mineral Resource but was rather estimated to allow assessment of any impact sulphur may have on the Project and the environment.

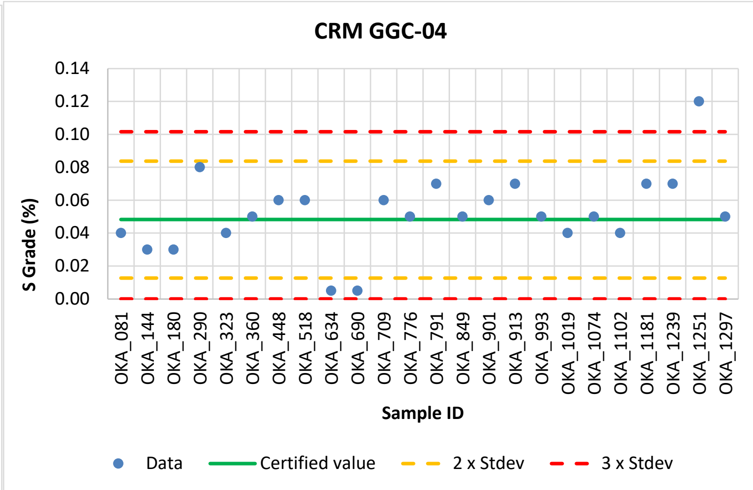

CRM GGC-01
TGC Grade (%)
29.00
27.00
25.00
23.00
21.00
19.00
17.00
15.00
OKA_1332
OKA_1447
OKA_1515
OKA_1531
OKA 1620
OKA 1628
OKA_1676
OKA_1770
OKA_1771
OKA_1772
OKA_2109
Sample ID
Data
Certified value
2 x Stdev
3 x Stdev

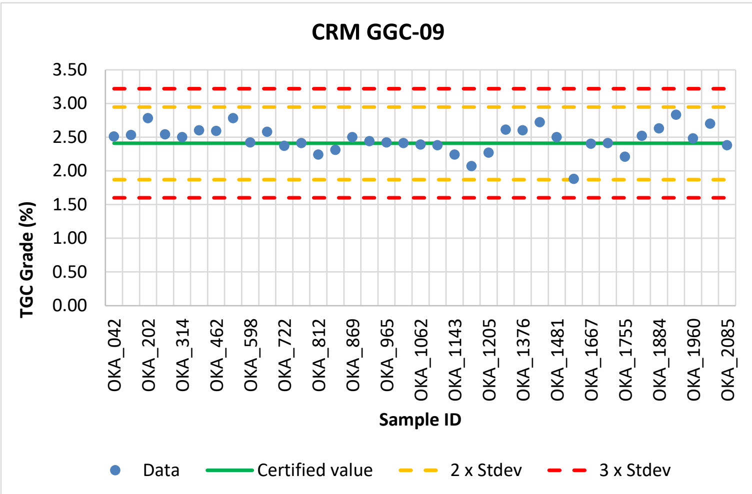

CRM GGC-01
S Grade (%)
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
OKA_1332
OKA_1447
OKA_1515
OKA_1531
OKA 1620
OKA 1628
OKA_1676
OKA_1770
OKA_1771
OKA_1772
OKA_2109
Sample ID
Data
Certified value
2 x Stdev
3 x Stdev

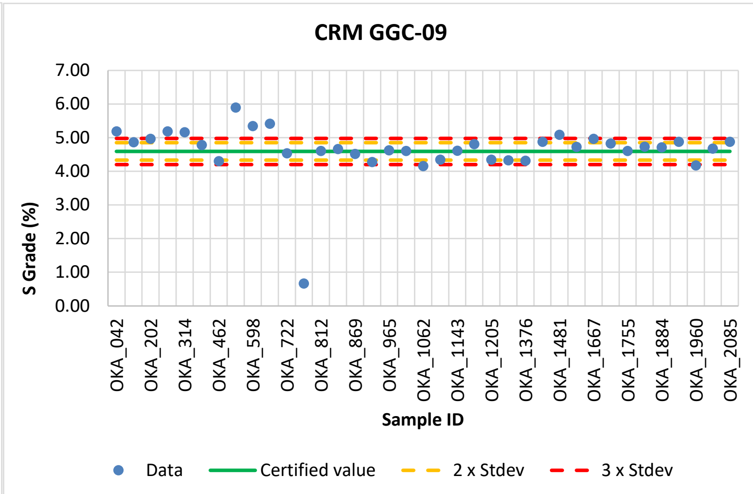

CRM GGC-03
TGC Grade (%)
20.00
19.00
18.00
17.00
16.00
15.00
14.00
13.00
12.00
11.00
10.00
OKA_1340
OKA_1412
OKA_1469
OKA_1549
OKA_1560
OKA_1704
OKA_1789
OKA_1830
OKA_1904
OKA_1992
OKA_2076
OKA_2143
Sample ID
Data
Certified value
2 x Stdev
3 x Stdev


CRM GGC-03
S Grade (%)
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
OKA_1340
OKA_1412
OKA_1469
OKA_1549
OKA_1560
OKA_1704
OKA_1789
OKA_1830
OKA_1904
OKA_1992
OKA_2076
OKA_2143
Sample ID
Data
Certified value
2 x Stdev
3 x Stdev


CRM GGC-04
16.00
15.00
14.00
13.00
12.00
11.00
10.00
TGC Grade (%)
OKA_081
OKA_144
OKA_180
OKA_290
OKA_323
OKA_360
OKA_448
OKA_518
OKA_634
OKA_690
OKA_709
OKA_776
OKA_791
OKA_849
OKA_901
OKA_913
OKA_993
OKA_1019
OKA_1074
OKA_1102
OKA_1181
OKA_1239
OKA_1251
OKA_1297
Sample ID
Data
Certified value
2 x Stdev
3 x Stdev


CRM GGC-04
0.14
0.12
0.10
0.08
0.06
0.04
0.02
0.00
S Grade (%)
OKA_081
OKA_144
OKA_180
OKA_290
OKA_323
OKA_360
OKA_448
OKA_518
OKA_634
OKA_690
OKA_709
OKA_776
OKA_791
OKA_849
OKA_901
OKA_913
OKA_993
OKA_1019
OKA_1074
OKA_1102
OKA_1181
OKA_1239
OKA_1251
OKA_1297
Sample ID
Data
Certified value
2 x Stdev
3 x Stdev


CRM GGC-09
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
TGC Grade (%)
OKA_042
OKA_202
OKA_314
OKA_462
OKA_598
OKA_722
OKA_812
OKA_869
OKA_965
OKA_1062
OKA_1143
OKA_1205
OKA_1376
OKA_1481
OKA_1667
OKA_1755
OKA_1884
OKA_1960
OKA_2085
Sample ID
Data
Certified value
2 x Stdev
3 x Stdev


CRM GGC-09
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
S Grade (%)
OKA_042
OKA_202
OKA_314
OKA_462
OKA_598
OKA_722
OKA_812
OKA_869
OKA_965
OKA_1062
OKA_1143
OKA_1205
OKA_1376
OKA_1481
OKA_1667
OKA_1755
OKA_1884
OKA_1960
OKA_2085
Sample ID
Data
Certified value
2 x Stdev
3 x Stdev

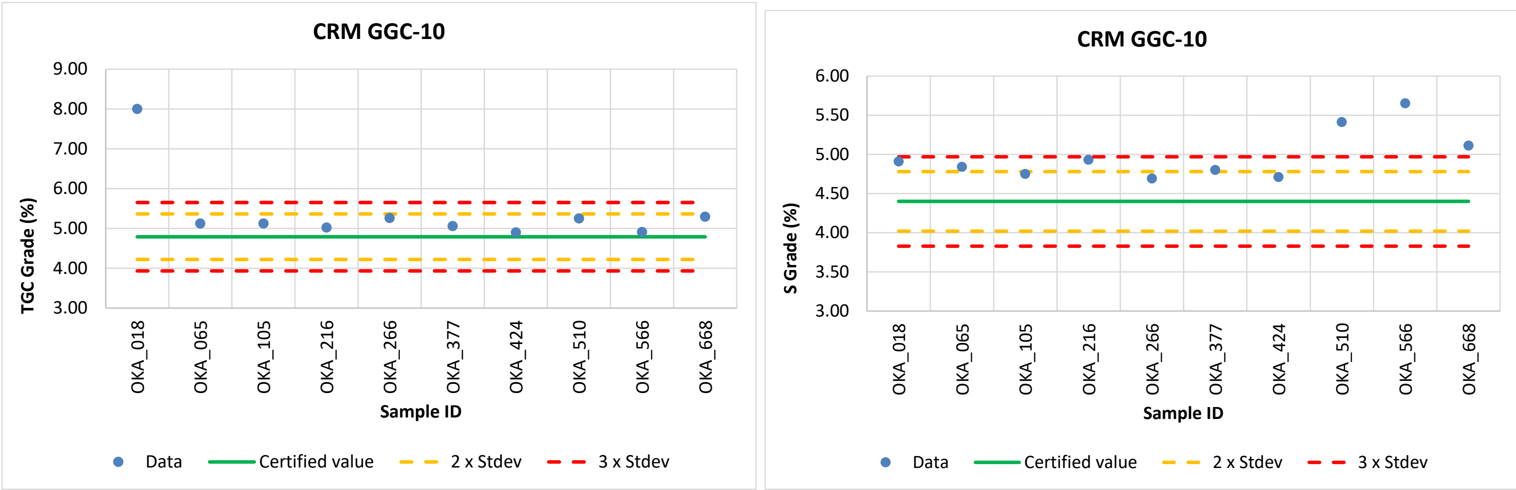
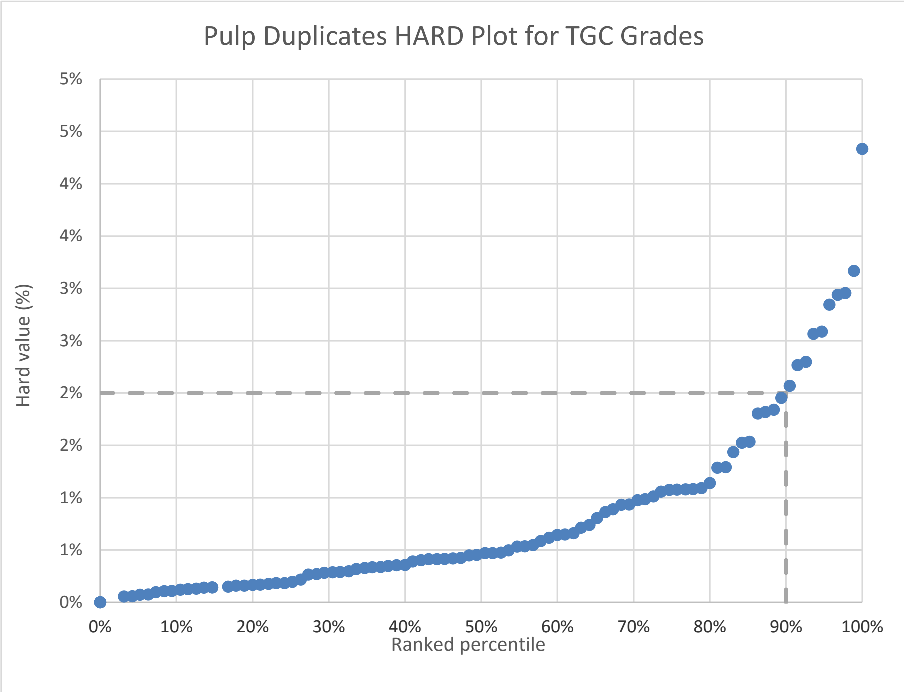


Figure 11-1: Control charts for the Gecko CRM's (MSA, 2021)

A total of 96 pulp duplicates were submitted to the laboratory for analyses with the rest of the samples. The results show good precision, where 90% of the TGC assays have a half absolute relative difference ("HARD") of less than or equal to 2%, and 90% of the S assays have a HARD value of less than or equal to 4% (Figure 11-2). This shows better precision than the industry benchmark where 90% of pulp duplicates are expected to have a HARD value of 5% or less.



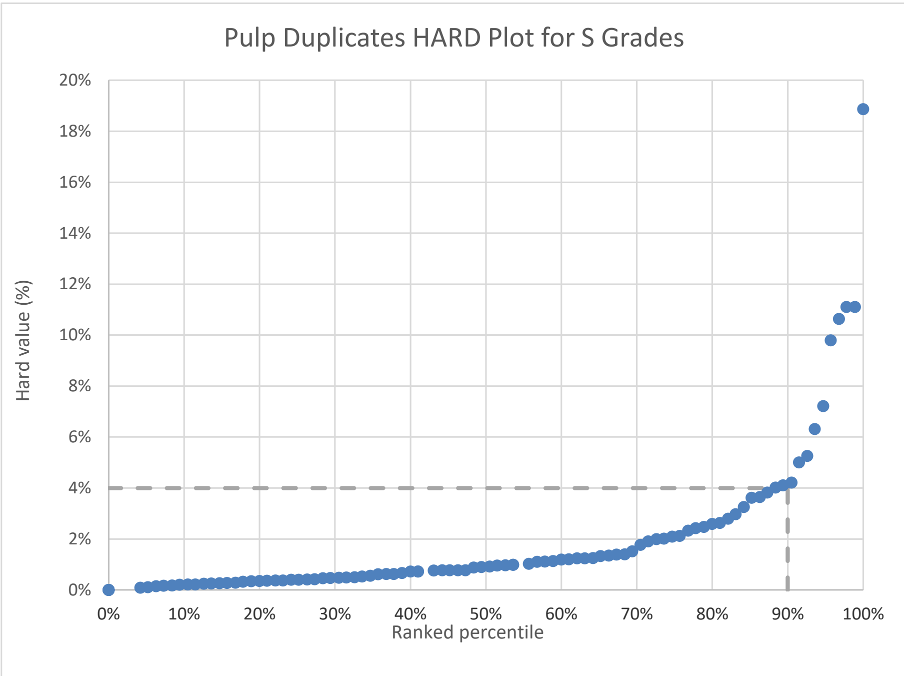


Figure 11-2: HARD plots for the Gecko pulp duplicates (MSA, 2021)

It is the QP's opinion that the Gecko TGC and S assays have been demonstrated by QA/QC processes to be of acceptable accuracy and precision to use in Mineral Resource estimation.

11.3 IMERYS-GECKO CAMPAIGN

The descriptions of the processes in this section were sourced from the Imerys-Gecko standard operating procedures ("SOP"), BV assay certificates and from observations and interpretations made on the data provided. The work was completed historically and the QP did not observe any of the processes.

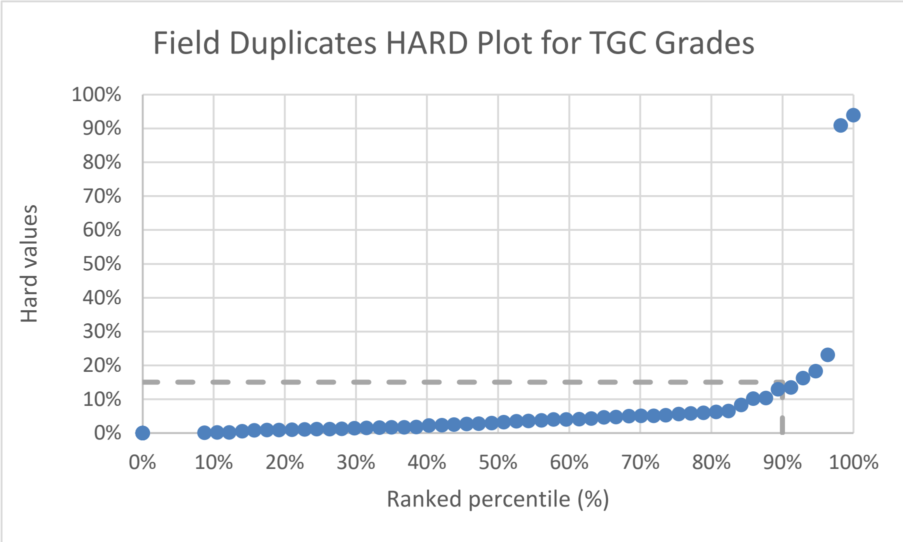
The samples from the Imerys-Gecko cores were taken at 1 m intervals continuously through the entire core length while adjusting for geologically logged boundaries. The samples were recorded on a sampling sheet. The cores were cut longitudinally in half using a diamond saw and one half was cut again longitudinally in half to generate quarter core. The cores were broken at sample beginning and end markings, and individual samples were placed in plastic bags together with manila sample tags labelled with the unique sample number. The bags were sealed with twine and another sample label was tied to the twine. Visibly un-mineralized intervals were not sampled. The remaining cores are stored in galvanised steel core trays in a secure core storage facility near the Okanjande mine office.

Imerys-Gecko completed a review of the previous exploration data at the Project and identified that several holes drilled by Gecko were not sampled, although they were logged to have intersected graphite mineralization. These holes were drilled towards the edges of the deposit, but the reason for the holes not being sampled was not clear. Imerys-Gecko selected five of these holes for sampling (OKD027, OKD029, OKD036, OKD038, and OKD040) and another hole (OKD039) was re-sampled.

The Imerys-Gecko samples were transported by courier to BV Swakopmund, a SANAS accredited, independent commercial laboratory. Upon receipt of samples, the laboratory signed a form to maintain chain of custody. Sample preparation was completed at BV Swakopmund, where the samples were crushed, split and pulverised. The pulverised sub-samples were dispatched to BV Centurion (South Africa), a SANAS accredited, independent commercial laboratory, where the samples were analysed for S and TGC using method codes ACT-TPM-013 and ACT-TPM-028, respectively. The samples were analysed for S using LECO through a C-S/S Analyser. For TGC analyses, the samples were reacted with hydrochloric acid to remove the carbonate, followed by roasting of the sample at 425°C to remove the organic carbon, and the residue was then analysed using LECO through the Total Combustion by C-S Analyser. BV Centurion is SANAS accredited for both analytical methods.

Imerys-Gecko inserted duplicates as quarter core samples at a rate of 5%, for a total of 58. Provision was also made in the sampling sequence for reporting of laboratory duplicates every 12 samples. The laboratory duplicates were inserted at the laboratory. Since these duplicates are normally used for the laboratory's internal QA/QC, these samples were not assessed in this report.

The Imerys-Gecko field duplicates show good precision for TGC and S, where 90% of the data have a HARD value of less than 15% for TGC and less than 13% for S (Figure 11-3). This is better than the industry benchmark where 90% of the data is expected to have a HARD value of 20% or less for field duplicates and demonstrates that the quarter core sample is an adequate sub-sample for this style of mineralization.



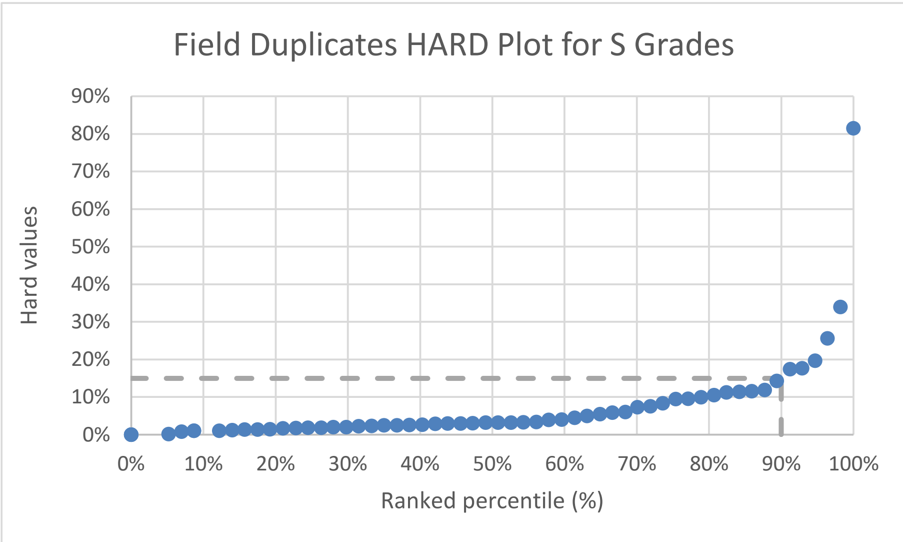


Figure 11-3: HARD plots for the Imerys-Gecko field duplicates (MSA, 2021)

The precision of the Imerys-Gecko assays is good. Accuracy was not assessed, as CRMs were not inserted and umpire analyses were not performed. The degree of contamination is not known, as blank samples were not used. The QP is therefore partly reliant on indirect QA/QC for the Imerys-Gecko data, i.e., by examining global bias between different exploration campaigns that had more acceptable QA/QC protocols (refer to Item 12 - Data Verification).

11.4 NORTHERN GRAPHITE

No sampling has been conducted by or on behalf of, Northern Graphite Corporation.

12 DATA VERIFICATION

(Taken from the MSA Group Report Technical Report titled "Northern Graphite Corporation, Okanjande Mineral Resource Estimate, Namibia" with effective date 29 November 2021)

12.1 QUALIFIED PERSON

The Geology QP, Mr Rob Barnett, established an audit trail of the electronic drilling data that is captured in several spreadsheets that were provided to MSA.

Mr Barnett also completed two site visits, one between 28th September and 1st October and the second between October 18-22, 2021.

The Mineral Resource QP, Ms Ipelo Gasela, completed the statistical analyses on the data to determine their appropriateness to use in a Mineral Resource estimation. Ms Gasela did not visit the site.

12.1.1 Electronic Data Review

A selection of original assay certificates was compared to data recorded in the spreadsheets for several drillholes (OKD016, OKJ2, OKJ5 and OPH001) and no discrepancies were found.

Weathering depths, as recorded in drillhole logs, were compared to sulphur analyses in order to verify the depth of weathering. Unexpected S values for the stated weathering state were observed in the data for seven drillholes. Mr Barnett compared these drillhole logs with core box photographs and found that in three drillholes the logs were accurate regarding depth of weathering, while in the other four drillholes the sulphur analyses were a more accurate measure of weathered depth.

12.1.2 Site Visits

On the first site visit, Mr Barnett inspected the graphite mineralization exposed in the Okanjande mine pit and inspected cores stored in the mine core yard. Drillhole cores of holes OKD017, OKD019 and OKD020 were compared to the drillhole logs and good correlation was found. The visual mineralogy of the graphite gneiss/quartzite was observed to be comparable to that of graphite gneiss he has observed at other graphite projects in Mozambique, Tanzania and Malawi. The graphitic quartzite at the Okanjande deposit was not observed at the other projects Mr Barnett is familiar with; however, the flake size in this lithology is similar to that occurring in other graphite gneiss.

Mr Barnett also investigated the drillhole cores of three drillholes which had graphitic mineralization logged but do not have sample records (OKD006, OKD026, OKD037 and OKJ12). He found that only OKJ12 had no mineralization worth sampling and that OKD006, OKD026 and OKD037 should be sampled as they are mineralized.

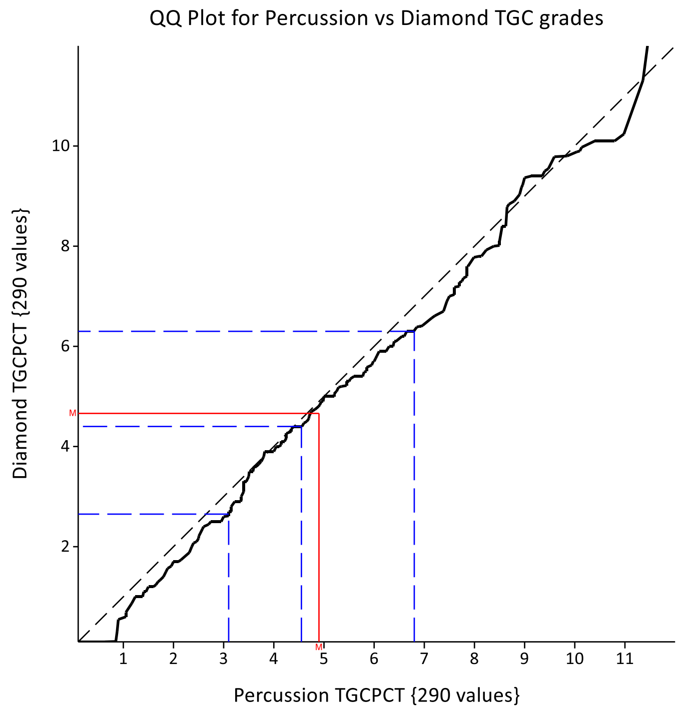
The drillhole core boxes are stored in a fenced off shed at the mine office site. The shed is roofed and has open sides. Drillhole core boxes are stacked separately for each drillhole and their locations are shown on a control plan for ease of retrieval. Core box markings are fading and it was recommended that the boxes be re-marked. Some core has undergone secondary weathering due to sulphide weathering, with the weathered core having a yellow and brown staining. In the most extreme cases the core has been altered to a clay-like texture with froth on the surfaces.

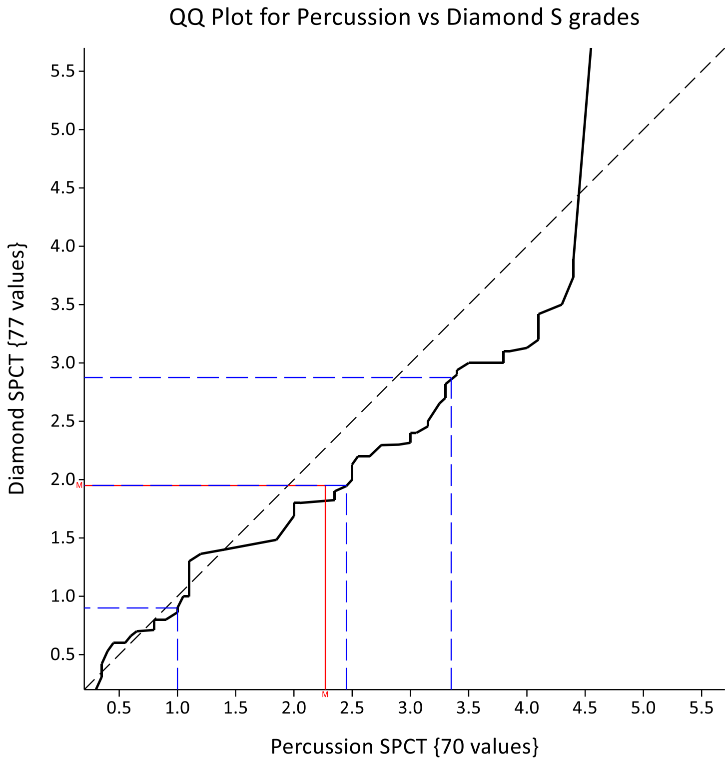
It was proposed that core density measurements should be undertaken while avoiding cores affected by secondary weathering. Density measurements became the primary purpose of the second site visit.

Mr Barnett visited the processing plant, which is "mothballed", at Okorusu mine where he inspected flake graphite product still in stock that was sourced from Okanjande. The flake product has the typical shape and form of flake graphite products observed at other similar projects.

12.2 RUL TWIN DRILLING

MSA completed a quantile-quantile ("QQ") plot comparing the grades of the samples obtained by RUL percussion drilling to the twin diamond drillholes completed by RUL. The QQ plot indicates that there is no bias between the sample assays of TGC from the two drilling methods (Figure 12-1). Most of the percussion holes were not assayed for sulphur, therefore only three of the twinned percussion holes that were assayed for sulphur were used in the bias test. The QQ plot shows a significant positive bias of 16% towards the percussion holes for sulphur grade. The bias is higher at depth where grades are higher and thus at the shallow depth, where most percussion drilling was undertaken, the bias is minimal overall (Figure 12-1).





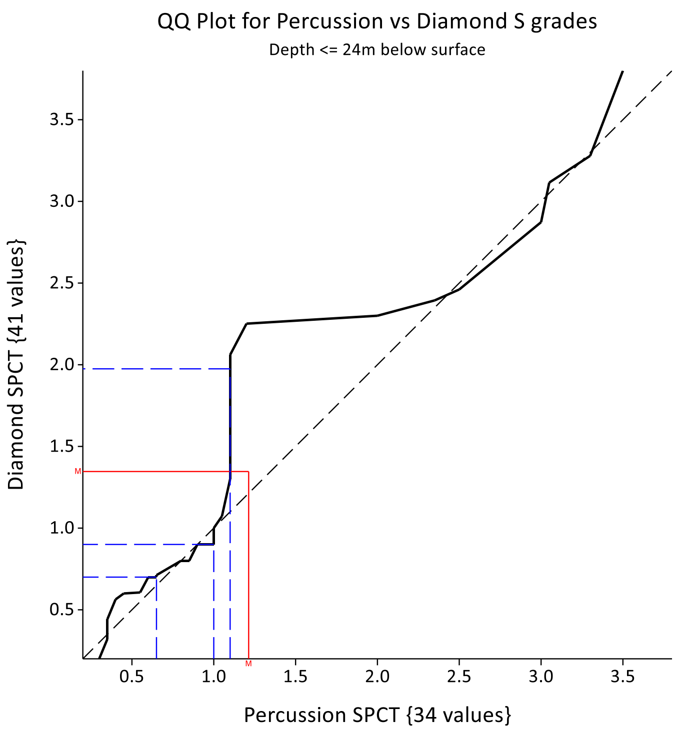


Figure 12-1: QQ plot between RUL percussion drillhole sample assays and the RUL twinned diamond drillhole sample assays – TGC (top), all S (middle), S up to 24 m depth (bottom) (MSA, 2021)

The QPs did not observe any of the RUL drilling. The results of the statistical tests from the twin drilling reveal that samples from the RUL percussion and diamond drilling have TGC grades that are not significantly biased with respect to one another. It is therefore the QP's opinion that the two datasets can be used together in Mineral Resource estimation.

The S grades show a high bias towards the percussion samples, which appears to be more significant at greater depths where S grades are higher. There are only two percussion holes at depths exceeding 24 m, therefore the inclusion of percussion data in the estimation has limited risk on the S estimates at depth.

12.3 GECKO VERIFICATION WORK

12.3.1 Gecko Check Sampling of RUL Drillhole Samples

Gecko completed a check sampling programme on a selection of the remaining core intersections drilled by RUL. Gecko completed the check sampling by collecting 1 m samples of quarter core from the remaining RUL core, and a total of 129 check samples were assayed. The samples were assayed for TGC and S at Bureau Veritas in Rustenburg (South Africa), which was an independent and accredited commercial laboratory at the time. The remaining cores were photographed. The Gecko check samples were not accompanied by QA/QC samples.

For statistical comparison with the RUL data, the Gecko check sample assays were composited to 2 m composites. The same intervals corresponding to the RUL 2 m samples were not always sampled by Gecko therefore not all intervals in the selected holes were compared.

The TGC assays show a strong positive relationship between the original and check sample assays, though with some scatter, resulting in a correlation co-efficient of approximately 0.94. A scatter is expected as the check sampling was carried out on quarter cores and some differences between two sides of a core can be expected. The two datasets show almost no bias to one another, evidenced by a best fit line of y = 0.9888x (Figure 12-2).

The check sample S assays show a strong positive relationship with the original assays, with some scatter, resulting in a correlation co-efficient of 0.95. The check sample assays show a positive bias against the original assays of approximately 20%, which results in a best fit linear equation of y = 1.19x. This indicates that the sulphur grade is potentially under-estimated in the RUL data, or over-estimated in the Gecko check assays.

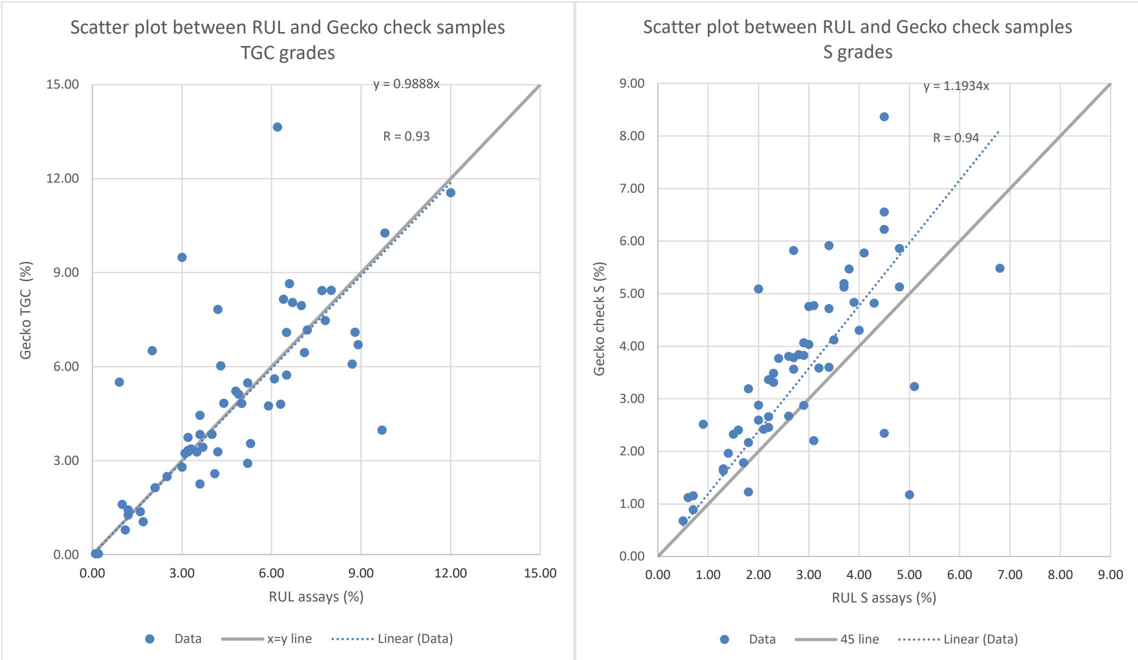


Figure 12-2: Scatter plot of the assays of the Gecko check samples versus RUL samples - TGC (left) and S (right) (MSA, 2021)

The QPs did not take the verification samples and only completed a statistical check of the check sample assays against the original samples. It is the QP's opinion that the TGC assays of the RUL samples compare within acceptable limits to the Gecko check samples. However, there is a significant bias between the RUL and Gecko check sample sulphur assays.

12.3.2 Gecko Twin Drilling of RUL Drillholes

Gecko completed twin drilling of 11 RUL percussion holes and two diamond drillholes. The Gecko twin drillhole samples included samples of three CRMs; namely CRM GGC-09, CRM GGC-10 and CRM GGC-04. All but one of the CRM samples returned assays within the acceptance limit of three-standard deviations of the certified value but with minor biases (from 3% to 7%) to the certified values. The QP is of the opinion that the CRMs demonstrated good accuracy of the TGC assays.

The CRM sulphur assays show poor results, with 42% of the GGC-09 CRM and 33% of the GGC-10 CRM sample assays outside the acceptance limit of three-standard deviations of the certified value (Table 12-1 and Figure 12-3). Most of the failures are by a small margin (Table 12-1 and Figure 12-3). The average biases of the assays of the two high grade sulphur CRMs are less than 10% of the certified values, after the removal of the failures. It is therefore the QP's opinion that the CRMs show adequate accuracy for S assays. Sulphur is not part of the Mineral Resource, but the grades were estimated to be able to assess any impact sulphur may have on the Project.

Table 12-1: CRM results for Gecko sampling for the twin drilling (MSA, 2021)

CRM name	Element	Certified value (%)	Standard Deviation	Number of samples	Bias	Number of samples outside *limits
GGC-09	TGC	2.41	0.27	12	3%	0
	S	4.59	0.13	12	**0%	5
GGC-10	TGC	4.79	0.29	9	**7%	1
	S	4.40	0.19	9	**9%	3
GGC-04	TGC	13.53	0.64	9	4%	0
	S	0.05	0.02	9	-17%	0

Note: **limit is three times standard deviation of the certified value*
***bias is calculated after removing failing samples*

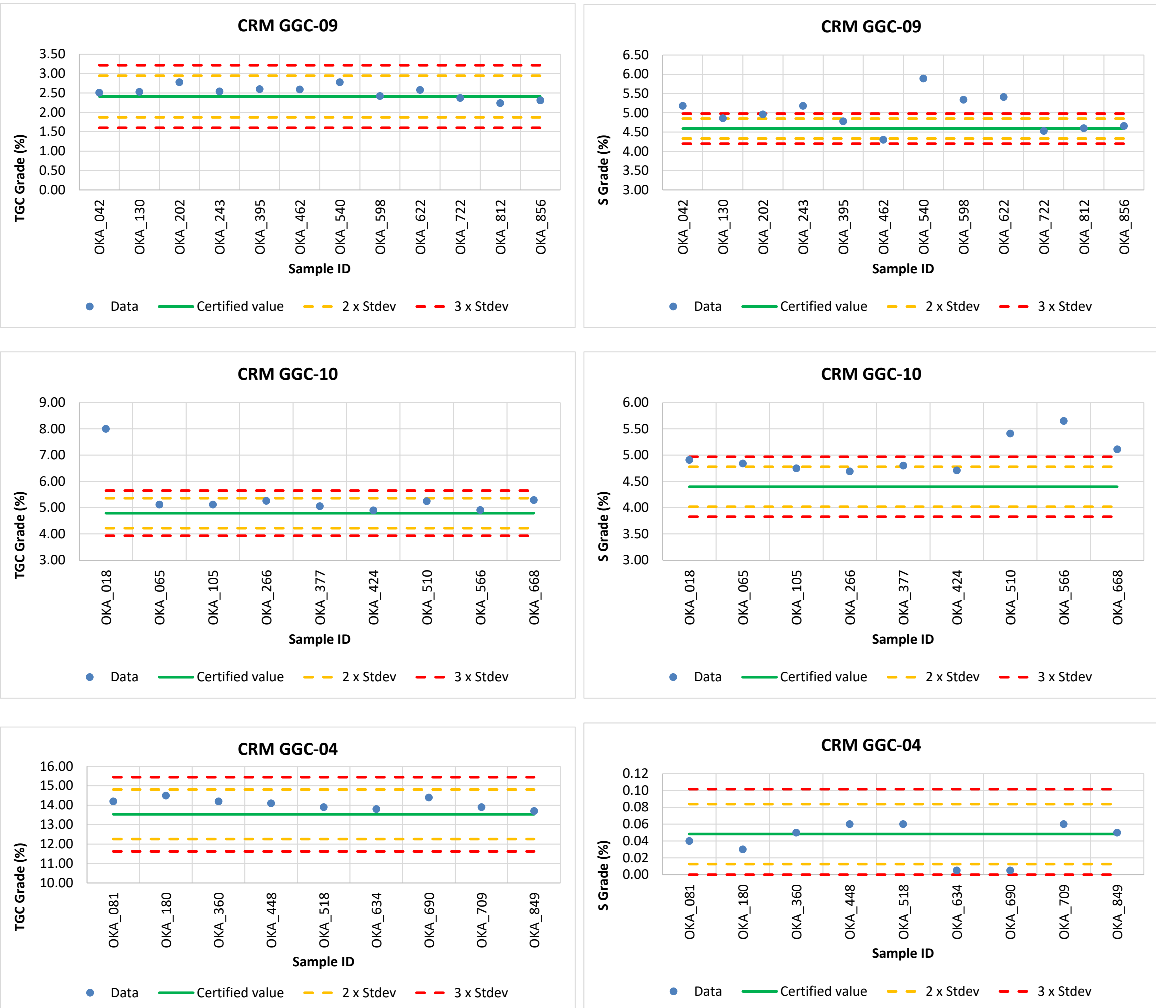


Figure 12-3: Control charts for the CRMs used for Gecko twin drillhole sample assay QA/QC (MSA, 2021)

For statistical test purposes, the data were composited to 2 m intervals and a threshold of 2% TGC was applied to both sets of data to account for un-mineralized intervals that were not sampled in the Gecko drilling campaign.

The QQ plot of the paired hole TGC assays demonstrate that there is minor overall bias between TGC sample assays of the RUL and Gecko drilling (Figure 12-4). Due to the limited number of sulphur assays on RUL drillhole samples, only the two twinned RUL diamond drillholes had sulphur assays which could be used in the QQ plot. The QQ plot shows insignificant bias in the sulphur grades of the two datasets (Figure 12-4).

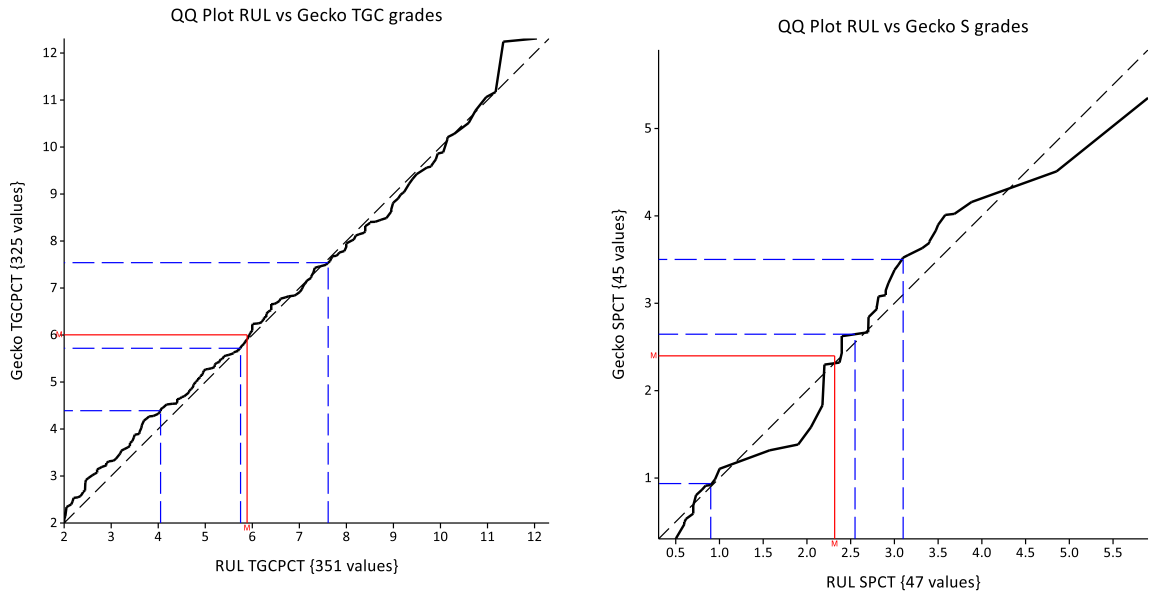


Figure 12-4: Quantile-quantile (QQ) plot between the RUL and Gecko twin drilling sample assays– TGC (left) and S (right) (MSA, 2021)

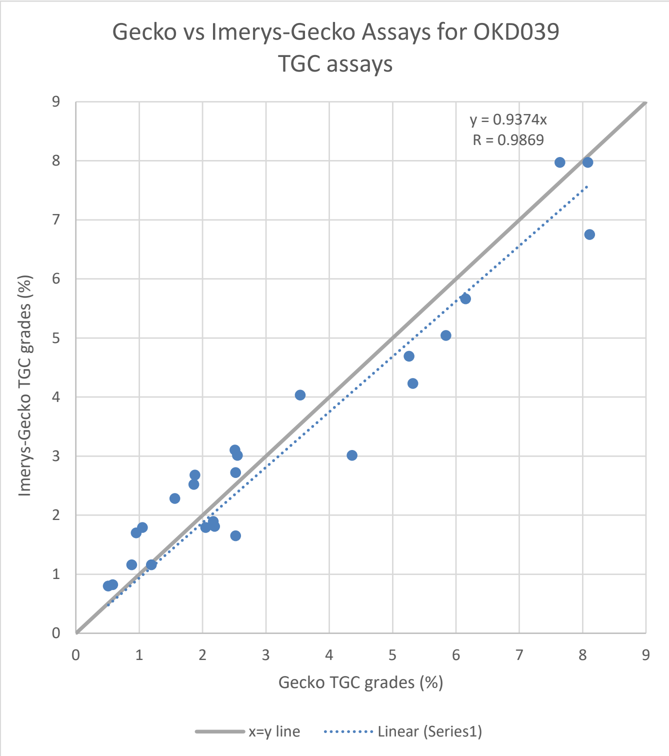
The QPs did not observe or supervise the twin drilling programme and only completed the statistical tests, which indicate that there is no significant bias between the RUL and Gecko sample TGC assays. Therefore, it is the QP's opinion that the two TGC datasets verify each other and are suitable to use in a Mineral Resource estimation. The RUL diamond drillhole and the Gecko twin drillhole sulphur grades also do not show significant bias with respect to one another. Therefore, it is the QP's opinion that the two datasets are considered acceptable to use in a Mineral Resource estimation.

12.4 IMERYS-GECKO VERIFICATION

12.4.1 Imerys-Gecko Check Sampling of Gecko Drillholes

In 2018, Imerys-Gecko completed check sampling of OKD039, a Gecko diamond drillhole. A good linear correlation was observed between the original Gecko sample assays and the Imerys-Gecko check sample assays for TGC and S, with correlation coefficients of 0.99 and 0.98, respectively. However, the original Gecko TGC assays are on average approximately 6% higher than the Imerys-Gecko check sample assays, with a tendency to be lower in the low-grade ranges and higher in the high-grade ranges. The sulphur assays are on average 8% higher than the Imerys-Gecko check sample assays with a tendency to be higher for assays greater than 2% (Figure 12-5).

The QP did not observe or carry out the check sampling and only completed the statistical analyses. In the QP's opinion, biases between the Gecko and Imerys-Gecko assays are not material.



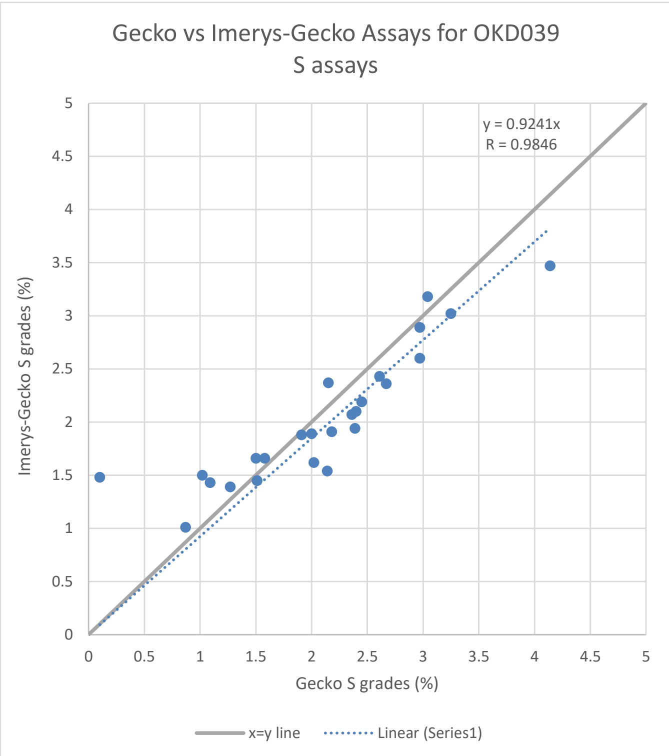


Figure 12-5: Scatter plot for OKD039 check sample assays - TGC (top) and S (bottom) (MSA, 2021)

12.4.2 Bias Test Between Imerys-Gecko and RUL Drilling

The QP completed a bias test between the TGC assays from the Imerys-Gecko drillhole samples and the RUL drillhole samples in the southwestern part of the deposit. The data were composited to 2m intervals and a threshold of 2% TGC applied for both sets of data to account for un-mineralized intervals that were not sampled in the Imerys-Gecko drilling campaign.

The TGC QQ plot shows that the two datasets have similar TGC grade distributions, with the Imerys-Gecko average TGC grade being 2.5% higher. The QQ plot between the RUL and Imerys-Gecko sample sulphur grades show slight conditional bias (Figure 12-6) and the Imerys-Gecko average sulphur grade is 4% lower.

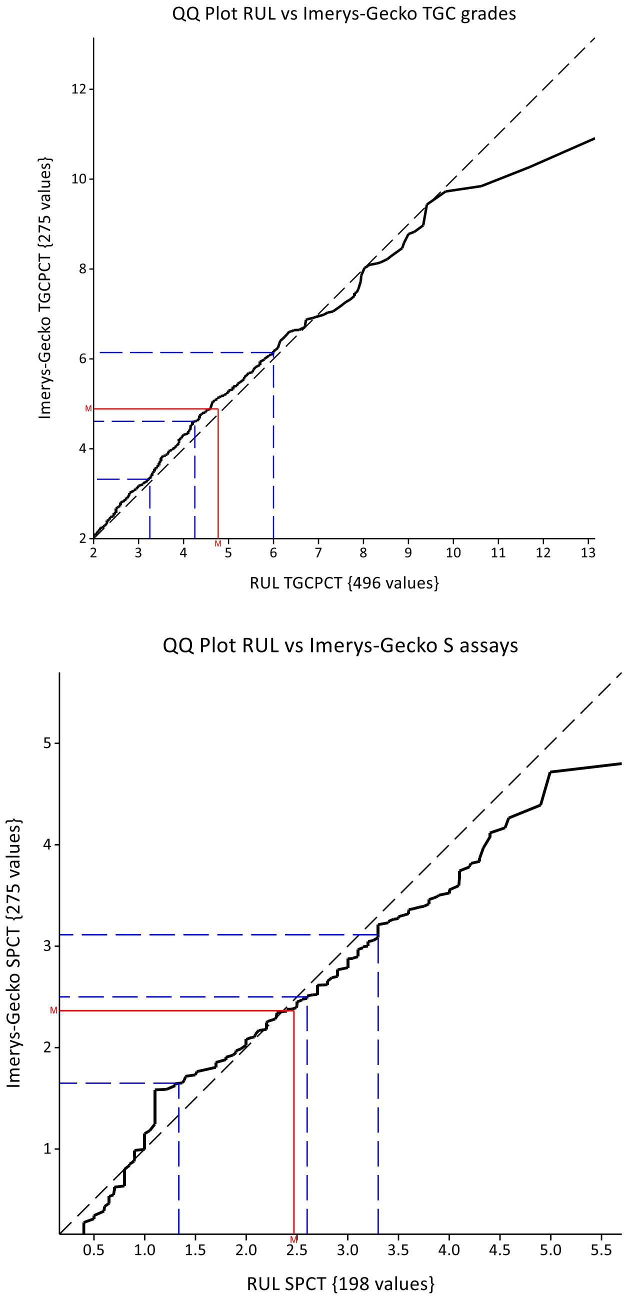


Figure 12-6: QQ plot between Imerys-Gecko and RUL drillhole sample assays in the southwest part of the Okanjande deposit – TGC (top) and S (bottom) (MSA, 2021)

The QPs did not observe or supervise any of the drilling programmes and only completed the statistical tests.

There is no significant bias between the Imerys-Gecko and the RUL TGC and S drillhole sample assays, therefore it is the QP's opinion that the two datasets verify each other, and this allows for the two datasets to be used together in the Mineral Resource estimation process.

13 MINERAL PROCESSING AND METALLURGICAL TESTING

(Prepared by CREO Engineering Solutions (Pty) Ltd.)

13.1 EARLY PROCESS TEST WORK – MINTEK

Early investigations were carried out by Rossing Uranium Limited and Mintek in South Africa in the period 1989-1992. Salient outcomes of the early test work programs are given below:

13.1.1 Preliminary investigation into the upgrading of Graphite Ore, 1989

Batch tests produced high grade graphite concentrate – 93% Carbon

Recommended flowsheet from test campaign: Rod Milling, Rougher Flotation, three Pebble Mill re-grinding stages, three stages of flotation and magnetic separation

Middling fractions (cleaner tails, WHIMS magnetics): 55% recovery at 88.7% carbon content. Best performance Magnetics middling's: to be recycled to second pebble mill. Cleaner Tails: showed benefit of recycling middling's.

13.1.2 Preliminary tests to recover flake graphite from the Okanjande deposit, 1990

A flow sheet was tested consisting of Rod Milling, Rougher Flotation, Pebble Mill regrind and 3 stages for cleaner flotation.

Samples from 2 distinct areas were test ranging in head grades from 9.5 to 10.5%fixed carbon as graphite.

Concentrates in the region of 93% C were produced from both areas.

A Flash Flotation stage was added, which increased the yield of >300um flakes, but did not affect the yield of >106um flakes

Single stage versus 2 stage pebble regrind was investigated and determined that 2 stages of regrinding does not improve graphite concentrate.

Pebble mill versus Delaminator was tested as regrind stage and it was determined that the Delaminator produced higher grade graphite in all fractions than the Pebble mill, but reduced the fraction of >106 flake by 12%. Details regarding the Delaminator are not available.

13.1.3 Preliminary tests on drill core samples from the Okanjande deposit to recover flake graphite, 1991

Milling and flotation tests completed on 32 drill core samples with an average head grade of 6% fixed carbon as graphite and produced concentrate grades ranging from 83% to 96% at recoveries in excess of 80%.

Optimal flow sheet developed from the test program was Rod Milling, Rougher Flotation, Pebble Mill regrinding of rougher concentrate and 3 stages of cleaner flotation.

Low pH in the Rougher Float circuit for altered ore samples resulted in poor selectivity, but this was improved to produce a rougher concentrate of 81% carbon at a recovery of 93,4% through pH adjustment to 10 utilizing sodium hydroxide.

High intensity magnetic separation failed to increase concentrate grade of large flakes containing sulfur/sufides.

13.1.4 Metallurgical Commissioning of the Okanjande Graphite Beneficiation Pilot Plant, 1991

Rossing Uranium ran a pilot campaign on the Okanjande deposit to recover flake graphite in 1991. Mintek assisted in the metallurgical commissioning of the pilot plant. General observations and conclusions from the pilot campaign:

- Crushing of the Okanjande ore led to much dust generation and loss of graphite product on windy days. Dust control required at crushing, transfer points and stockpiles.
- Closed circuit rod milling with 2mm classification screen applied without sanding in rougher cells. High recovery obtained from rougher cells.
- Pebble milling applied for polishing.
- Cleaning flotation noted free gangue, but investigation indicated graphite attachments leading to floating of gangue. More vigorous cleaning flotation conditions recommended (higher impeller speeds, shorter residence times).
- TEB was used as flotation reagent.
- Free and visible gangue was a constant problem in the final concentrate. Further polishing milling and gravity separation stages were recommended to improve the quality of the final concentrate. Gravity separation was shown to be more effective for larger flake sizes. Remaining gangue was mainly mica.
- Best process flow sheet tested was judged to be: Rod Milling with 2mm classification followed by 2 stages of Rougher flotation and one stage of Scavenger flotation. Rougher concentrated was polished in a Pebble Mill followed by 6 stages of Cleaner flotation with internal recirculation.

13.1.5 Autogenous Milling and Flotation of Okanjande ore, 1992

Weathered and Fresh ore samples proved to be amenable to autogenous milling during laboratory testing in 1992. Closed circuit milling with 2mm screen classification was used and resulting in 40% circulating loads and a screen undersize P80 of 425um.

Autogenous milled samples produced similar flotation performance than rod milled samples, but fresh ore autogenous milled samples produced coarser graphite flake sizes than Rod milling. Weathered ore produced coarser graphite flakes in a crushing and rod milling circuit, indicating rod milling damaged flakes while grinding of fresh ore due to hard quartz grits.

Fresh Ore milling indices for AG and SAG milling were found to be: 2.5kWh/t and 3.1kWh/t respectively.

Weathered ore drop tests indicate high friability, but with enough competent rocks in between to allow for autogenous milling.

Two distinct pebble types were distinguished: relatively pure milky white quartz and high graphitic content (10% TGC) black pebbles. The high graphite pebbles were shown to wear significantly faster than the white quartz pebbles, indicating that the AG mill will result in a load of mainly milky quartz pebbles which could be ideal grinding media in a pebble mill.

Semi-Autogenous milling produced significant graphite flake damage

13.1.6 The Purification of Okanjande Graphite Concentrate: Exploratory Work, 1992

Exploratory test work was conducted in the pursuit of producing 99.5 and up to 99.9% concentrate purity.

Roasting of graphite concentrate with either sodium hydroxide or sodium carbonate, followed by successive leaching with water, sulfuric acid and hydrofluoric acid produced greater than 99.9% purity.

Roasting of graphite concentrate with sodium hydroxide followed by successive leaching with water and sulphuric acid produced graphite concentrate with greater than 99.5% purity.

13.1.7 Pneumatic Flotation of Graphite at Okanjande, 1992

Column and Jameson float cells were testing in the pilot plant at various functional locations. In general, it was found that the column cells produced slightly better recoveries at similar concentrate grades to that obtained from the Jameson cells, but required additional frother addition.

Oxidation of sulphides in the tailings facilities resulted in low pH return water, which necessitated pH adjustment to prevent poor flotation response.

Sulphide recovery to concentrate from fresh ore remained a problem throughout and indicated floatability of sulphide minerals present in the fresh ore. Oxide ore in the column cell could not produce higher than 91% grade.

Increasing froth washing in the column cell could not increase concentrate grade, indicating incomplete liberation of graphite flakes.

13.2 EARLY MINERALOGICAL CHARACTERIZATION - MINTEK

Mineralogical investigations were carried out by MINTEK over the period of 1991 to 1992.

13.2.1 A Mineralogical Examination of the Okanjande Graphite Ores, March 1991

Seventeen borehole core intersections were tested. The predominant minerals were Quartz, K-Feldspar, Graphite, Mica, Pyrite, Pyrrhotite and Sillimanite. Mean graphite flakes sizes were found to be in the region of 0.5-0.7mm while maximum flake size ranging from 1.0 to 2.0mm were observed.

Oxidized samples were found to contain notable amounts of jarosite and other iron oxides and hydroxides.

Two distinct ore textures were described:

3. Altered Ore with distorted graphite flakes which contained closely intergrown gangue minerals. Deformation appeared to be the result of shearing and deformation of the ore. Full liberation of graphite expected to be difficult to achieve.
4. Un-Altered ore containing undistorted and largely inclusion-free graphite.

The most common phase interlaminated with graphite flakes was Muscovite and Sericite. Sulphide minerals were also frequently found to be interlaminated with graphite.

It is recommended to identified shear zone in the ore body which would contain the altered ore with poor beneficiation characteristics.

13.2.2 A Mineralogical Investigation of the Sulphide minerals present in graphite concentrates from Okanjande, July 1991

Graphite concentrates prepared from Okanjande ore were exanimated for the occurrence and nature of sulphide minerals.

The sulphide phases present were Pyrite, Pyrrhotite, Chalcopyrite and Molybdenite. The sulphide phases were present as free grains as well as occlusions within the graphite flakes. The fraction of occluded sulphides was the highest for the coarse graphite (>300um) fraction and the lowest in the fine graphite (38um).

Chalcopyrite and Molybdenum were found to preferentially occur in the fine fractions of graphite, perhaps due to their milling characteristics.

13.2.3 A Mineralogical Investigation of the Sulphate Minerals present in graphite ore samples from Okanjande, July 1991

Fifteen samples of Okanjande graphite ores were examined. The main sulphate phases present were Jarosite, Barite, Gypsum, Siderotil and Melanterite. Siderotil and Melanterite are water soluble and mainly found in shear and fractures as well the altered ore zones at depth.

The iron sulphate minerals are mainly present in the weathered ore, but do occasionally occur in fresh ore along fractures and joints.

The presence of iron sulphates are the result of weathering.

13.3 RECENT TEST WORK

13.3.1 Gecko MINTEK test program 2015

The test work program comprised comminution characterisation, mineralogy and flotation test work to develop a base case flowsheet. The flowsheet development test work was conducted on weathered material and the final flowsheet was tested on the fresh material.

13.3.1.1 Flotation Testing

The optimal processing flowsheet selected (Figure 13-1) consisted of rougher and cleaner flotation cells with scavengers on both tailings to maximise recoveries. The cleaner concentrate was milled in a pebble mill to liberate graphite flakes attached to gangue with minimum flake breakage. A double stage pebble mill was required for maximum graphitic carbon recovery. The base case flowsheet utilised DOW 200 as frother without the addition of a collector.

Test work on the Weathered material showed that it was possible to obtain 95% Graphitic C at 85% recovery. The inclusion of the -53mm size fraction into the final product is critical to obtain the overall recovery required. This fraction should form part of the cleaning flotation stages after the first pebble mill. Graphitic carbon recoveries obtained on the fresh material were low at 67% at the reagent dosages tested, but this could possibly be optimized.

Weathered material was used for flotation and flowsheet development work to produce well characterised graphite concentrate of more than 95%Cg with a high proportion of coarse flake recovery.

Table 13-1: Optimum Flowsheet Graphite Concentrate Size-by-size analysis (Weathered)

Size Fraction (mm)	% Mass	% Passing	%C as graphite	% S
>212	6.7	93.3	97.9	0.06
150 – 212	17.1	76.2	97.8	0.06
106 – 150	21.8	54.5	97.9	0.05
75 – 106	21.8	32.8	97.3	0.09
<75	32.8		94.8	0.16
Combined			**96.7**	**0.10**

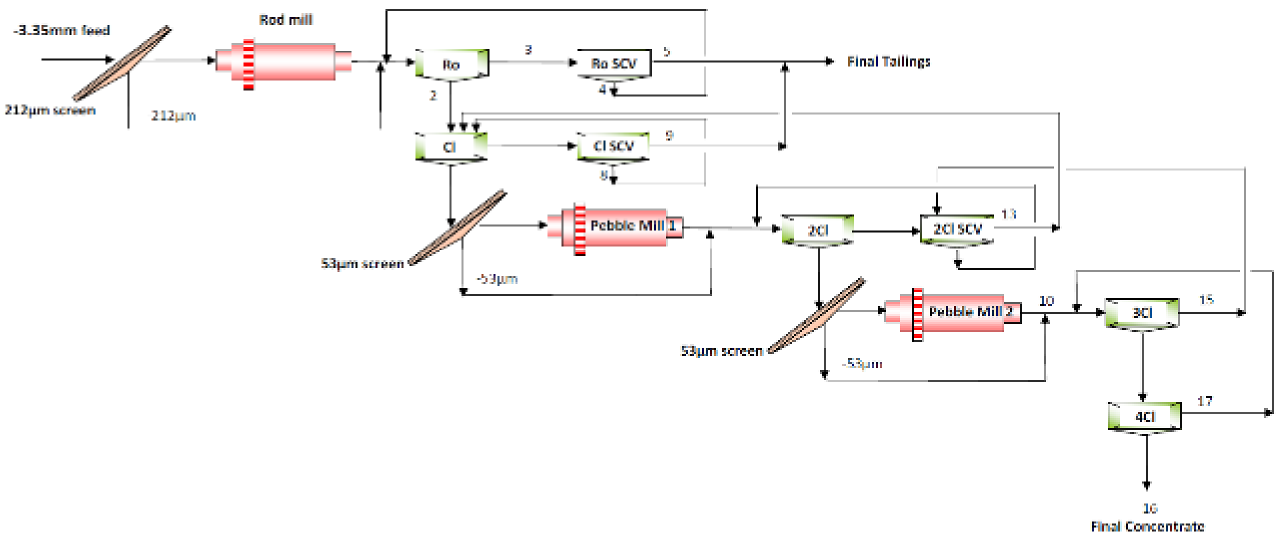


Figure 13-1: MINTEK Optimum Graphite Flotation Flowsheet

13.3.1.2 Comminution Characterization

Comminution characterization test work was completed and weathered and fresh samples. Fresh material was delivered in the form of quartered cores. The size of the cores was not suitable for Uniaxial compressive strength test work (UCS), Bond Crushability Work Index (CWI) test work and JKTech drop weight test work. As a result, these tests were only conducted on the weathered material. SAG mill comminution test work was conducted on the weathered and fresh material.

13.3.1.2.1 JKTech Dropweight Tests

JKTeck Dropweight tests were only completed on Weathered samples. The JKTech method characterises ore breakage at different energy levels using two complimentary techniques:

a) A drop weight tester was used to characterise breakage at moderate to high energy levels.
b) A tumbling (abrasion) test was used to characterise breakage at low energy levels

The JKTech drop weight and abrasion tests provide the ore specific parameters for use in the JKSimMet Mineral Processing Simulator software. In JKSimMet, these parameters are combined with pilot data, equipment details and operating conditions to analyse and/or predict milling and crusher performance.

The results are given in Table 13-2. The classifications are relative to all the other samples in the JKTech data base. The value for Axb gives the resistance of the sample to impact breakage. Guidance for the interpretation of Axb values are given in Table 13-3. The smaller this value is, the greater the resistance to impact breakage. The weathered graphite sample depicted an A*b value of 85.50 indicating that the sample was soft.

Resistance to abrasion is indicated by the Ta parameter in the Table above. Smaller value of Ta indicates more resistance to abrasion breakage. The Ta value of the weathered graphite sample was 0.79 indicating that the sample was soft.

Table 13-2: JKTech Dropweight Results - Weathered

Sample	SG	Ta	A	b	Axb
Weathered	2.38	0.79	67.3	1.27	85.5
Classification:	**67 to 127 (70-90 Percentile) = SOFT**				

Table 13-3: JKTech Hardness Classification

JKTech DB Percentile	JKTech Hardness Classification
Hardest 10% (A*b range ~ 0 – 30)	Very Hard
10% to 30% (A*b range ~ 30 to 39)	Hard
30% to 40% (A*b range ~ 39 to 43)	Moderately Hard
40% to 60% (A*b range ~ 43 to 56)	Medium
60% to 70% (A*b range ~ 56 to 67)	Moderately Soft
70% to 90% (A*b range ~ 67 to 127)	Soft
90% to 100% (A*b range ~ 127 to 956)	Very Soft

13.3.1.2.2 SAG Milling Comminution (SMC) Tests

JKTeck Dropweight tests were completed on Weathered and Fresh samples. The SMC test uses the same device as the JKTeck drop weight tester. The SMC test generates a Drop weight index (DWi), which is a measure of the rock strength when broken under impact. The parameters obtained from the testing are again used in the JK SAG mill models to predict throughput, power draw and product size distribution with the aid of their database of information on the performance of continuously fed pilot and production scale mills. The results are given in Table 13-4.

The value for Axb gives the resistance of the sample to impact breakage. The smaller this value is, the greater the resistance to impact breakage. Guidance for the interpretation of Axb values are given in Table 13-3. The weathered and fresh samples depicted Axb values of 57.6 and 57.2 respectively indicating that the sample were moderately soft.

Table 13-4:SMC Test Results - Weathered and Fresh

Sample	SG	DWi	MIa	A	b	Axb	Classification
Weathered	2.42	4.19	14.90	68.60	0.84	57.60	Moderately Soft
Fresh	2.7	4.70	14.70	65.00	0.88	57.20	Moderately Soft

13.3.1.2.3 Uniaxial compressive strength (UCS) tests

The UCS tests were only completed on Weathered samples. The Uni-axial compressive strength (UCS) test investigates the competency of a rock sample by assessing how a particular material breaks in a mill under an applied load. The Uni-axial compressive strength is a function of the maximum force recorded at the point of ductile/brittle transition of a sample under slow compression. The results are given in Table 13-5.

The UCS test results indicated that the sample was soft with an average uniaxial compressive strength value of 46.7Mpa. From the UCS guidance for interpretation of results the weathered samples can be classified as Soft. See Table 13-6.

Table 13-5: UCS Test Results - Weathered

Sample	UCS Minimum (MPa)	UCS Average (MPa)	UCS Maximum (MPa)
Weathered	25.4	46.7	65.0
Classification:		**SOFT**	

Table 13-6: UCS Test Classification Guide

UCS (MPa)	50-100	100-150	150-250	>250
Classification	Soft	Medium	Hard	Very Hard

13.3.1.2.4 Bond Crushability Work Index (CWI) test

The Bond crushability tests were only conducted on Weathered samples. This test is conducted in order to obtain a measure of the materials crushability (CWi), which is expressed as the energy required to accomplish a given crushing operation. Individual rocks are placed on a holder within striking distance of two opposing swinging hammers. By adjusting the height of the hammers or impact angle, it is possible to measure the breakage or crushing strength of the rock and calculate the impact work index. The test was conducted on the weathered material at a feed size range of -76 mm to + 50 mm. The results are given in Table 13-7. The average CWi index of 12kWh/t corresponds to a soft crushing material following the guidance in Table 13-8.

Table 13-7: CWI test results - Weathered

Sample	**CWi Minimum kWh/t**	**CWi Average kWh/t**	**CWi Maximum kWh/t**
Weathered	10.5	12.0	13.3

Table 13-8: BWi Classification Guide

CWi (kWh/t)	<10	10-14	14-18	18-22	>22
Classification	Very Soft	Soft	Average	Difficult	Very Difficult

13.3.1.2.5 Bond Abrasion Index (AI) tests

Abrasion index tests were conducted on both weathered and fresh samples. The test is used to obtain an indication of the relative abrasiveness of an ore compared to a standard metal sample. The sample is placed in an apparatus with a rotating paddle which impacts the sample. The measure of mass loss of the paddle over a determined time is used to calculate an abrasion index.

The abrasion test results are given in Table 13-9. Based on their average Ai values of 0.23 and 0.28 respectively, both the Fresh and Weathered are Slightly Abrasive.

Table 13-9: AI Test Results - Weathered and Fresh

Sample	Paddle Mass Before (g)	Paddles Mass After Test (g)	Abrasion Index Ai	Life Factor LF
Weathered	93.75	93.52	0.23	1.93
Fresh	90.72	90.44	0.28	1.67

Table 13-10: Ai Classification Guide

Ai	<0.1	0.1-0.4	0.4-0.6	0.6-0.8	>0.8
Classification	Non-Abrasive	Slightly Abrasive	Medium Abrasive	Very Abrasive	Extremely Abrasive

13.3.1.2.6 Bond Rod Work Index (BRWI) tests

Bond Rod Work Index tests were conducted on both weathered and fresh samples. The Bond rod work index test was performed to provide information that will quantify the energy requirements and performance for open circuit rod milling. A special tilting Bond rod mill was used for this test. The test results are presented in Table 13-11.

The Weathered sample Bond Rod Work Indices were 10.78kWh/t and 12.06kWh/t for the limiting screen sizes of 1180µm and 600µm respectively, indicating that it is Medium Hard with respect to Rod Milling.

The Fresh sample Bond Rod Work Indices were 10.32kWh/t and 10.51kWh/t for the limiting screen sizes of 1180µm and 600µm respectively, indicating that it is Medium Hard with respect to Rod Milling.

Table 13-11: BRWi Test Results: Weathered and Fresh

Sample	Limiting Screen (µm)	F80 (µm)	P80 (µm)	Nett Production (g/rev)	BRWi (kWh/t)
Weathered	1180	10,501	840	13.3	10.78
Weathered	600	9,848	454	7.5	12.06
Fresh	1180	8,588	800	14.4	10.32
Fresh	600	9,515	456	9.5	10.51

Table 13-12: BRWi and BBWi Classification Guide

BRWi (kWh/t)	7 - 9	10 - 14	15 - 20	>20
Classification	Soft	Medium	Hard	Very Hard

13.3.1.2.7 Bond Ball Work Index (BBWI)

Bond Ball Mill Index tests were conducted on weathered and fresh samples. This test is aimed at providing useful information for the design of grinding circuits, and, in particular, to estimate the energy requirements for closed circuit ball milling. It is also used to predict and continually evaluate the performance of commercial ball mills. The test results are presented in Table 13-13.

The Weathered sample produced a Bond Ball Mill index of 11.60 kWh/t, indicating that it is Medium hard in terms of ball milling. The Fresh sample produced a Bond Ball Mill Index of 9.48kWh/t, indicating it is Soft to Medium hard in terms of ball milling.

Table 13-13: BBWi Test Results: Weathered and Fresh

Sample	Limiting Screen (µm)	F80 (µm)	P80 (µm)	Nett Production (g/rev)	BBWi (kWh/t)
Weathered	600	2,557	446	4.64	11.60
Fresh	600	2,453	459	6.25	9.48

13.3.1.2.8 Summary of Hardness Testing Results

The results of the hardness test conducted in 2015 forms basis for the process design criteria for the comminution circuit design and is presented in Table 13-14.

Table 13-14: Summarized Hardness Indices

Hardness Test	Samples	Result
JK Tech Dropweight	Weathered	Axb = 85.5 (Soft)
SAG Milling Comminution Tests (SMC)	Weathered and Fresh	Weathered Axb = 57.6 (Moderate) Fresh Axb = 57.2 (Moderate
Uni-Axial Compressive Strength (UCS)	Weathered	UCS = 65.5MPa (Soft)
Bond Crushabillity Index (CWi)	Weathered	CWi = 12.0kWh/t (Soft)
Bond Abrasion Index (Ai)	Weathered and Fresh	Weathered Ai = 0.23 (Slightly Abrasive) Fresh Ai = 0.28 (Slightly Abrsive)
Bond Rod Mill Work Index (BRWi)	Weathered and Fresh	Weathered BRWi = 11.60kWh/t (Medium Hard) Fresh BRWi = 9.48kWh/t (Soft-Medium Hard)
Bond Ball Mill Work Index (BBWi)	Weathered and Fresh	Weathered BBWi = 12.06kWh/t (Medium Hard) Fresh BBWi = 10.51kWh/t (Soft-Medium Hard)

13.3.1.3 Mineralogy

The aim of the mineralogical investigations was to determine the liberation characteristics and to determine the resulting processing equipment. A representative pulverized sub-sample was analysed using qualitative X-Ray diffraction (XRD) to obtain the bulk mineralogical assemblage. Polished sections of each size were prepared for examination by optical microscope with the aim of establishing textures and liberation characteristics of the graphite flakes and their association with gangue minerals.

Test work products were analysed using the following methods: Total C organic C, proximate analysis (high grade concentrates) and inductively coupled plasma optical emission spectrometry (ICP-OES) on feed samples.

The bulk mineralogical composition of the crushed weathered feed sample indicated major gangue minerals to be quartz, mica and feldspar in varying amounts and sulphur is contributed as a result of the presence of various sulphides including chalcopyrite, pyrite and pyrrhotite. In addition, sulphur is contributed by jarosite, which is an oxidation product of these sulphides. Rutile occurs in amounts less than the detection limit for XRD, but the presence of rutile was confirmed using scanning electron microscope (SEM) analysis as less than 1% by mass.

Table 13-15: Bulk Mineral Analysis with SEM observations

Mineral	Formula	Relative Abundance
Quartz	SiO_2	xxx
K-Feldspar	$KAlSi_3O_8$	xx
Plagioclase	$(Ca,Na)(Si,Al)_4O_8$	xx
Mica	$KAl_2(Si,Al)_4O_3(OH)_2$	xx
Clinochlore	$Mg_5Al(Si,Al)_4O_{10}(OH)_8$	x
Graphite	C	xx
Amphibole	$Ca_2[Mg_4(Al,Al,Fe)]Si_7AlO_{22}(OH)_2$	x
Chalcopyrite	$CuFeS_2$	x
Pyrite	FeS_2	y
Pyrrhotite	FeS	y
Sphalerite	(Zn,Fe)S	y
Fe-oxide/hydroxide	$FeOOH/Fe_2O_3$	y
Rutile	TiO_2	y
Zircon	$ZrSiO_4$	y
Kaolinite	$KFe_3(OH)_6(SO_4)_2$	y
Barite	BaSO4	y
Monazite	$(Ce,La,Nd,Th)PO_4$	y
Ba K-Feldspar	$(Ba,K)AlSiO_8$	y
Sillimanite	Al_2SiO_5	y

xxx = 20-50% mass;
xx = 5-20% mass;
x = <5% mass,
y = below detection but observed by SEM

13.3.1.4 Liberation

Liberation characterization of the crushed samples indicated that graphite flake liberation is inversely related to flake size with ~50% liberation in the 500-850µm size and greater than 90% liberation in the minus 200µm flake size. See Table 13-16.

Table 13-16: Liberation Characteristics of Graphite flakes in Jaw Crusher Product

Size Fraction (µm)	% Locked / Attached	% Liberated
1700 – 3350	99	1
850 – 1700	93	7
500 – 850	51	49
425 – 500	32	68
212 – 425	31	69
106 – 212	6	94
<106	<2	>98

Rod milling tests indicated that graphite flake liberation increases with milling time, with the liberation results of the 15-minute milling test, shown in Table 13-17.

Table 13-17: Liberation Characteristics Graphite Flakes on Rod Milled Product (15min milling time)

Size Fraction (µm)	% Liberated	% Attached	% Locked
>600	98.77	0.96	0.27
500 – 600	98.40	1.60	0.00
425 – 500	96.81	3.19	0.00
300 – 425	94.20	3.99	1.81
38 – 300	100.00	0.00	0.00

The first cleaner concentrate of the base case flow sheet was analysed. Flake size fraction above 425µm contained between 19-24% gangue by volume. Size fractions below 425µm contained 10-15% gangue by volume.

Gangue minerals observed in the concentrate include clay (kaolinite), quartz, plagioclase, K-feldspar, pyrite and goethite. Scanning electron microscopy shows that gangue occurs interlayered between the graphite flakes and delamination may not separate all the gangue minerals from graphite. Separation of this type of gangue might be possible by chemical leaching.

Table 13-18: Liberation Characteristics of Graphite Flakes in 1st Cleaner Concentrate (MINTEK Base Case Flowsheet)

Size Fraction (µm)	% Fully Liberated	% Liberated + Inclusions	% Attached	% Locked
>500	77.2	17.7	3.0	2.0
425 – 500	76.7	20.1	2.0	1.2
300 -425	75.8	21.9	1.4	0.9
212 – 300	80.8	17.8	1.2	0.2
150 – 212	81.2	18.1	0.7	0.0
106 – 150	77.2	22.2	0.3	0.2
53 – 106	84.3	15.7	0.0	0.0
45 – 53	80.2	19.3	0.6	0.0
38 – 45	86.4	13.0	0.6	0.0
25 – 38	89.9	10.1	0.0	0.0
<25	93.7	6.3	0.0	0.0

The test program concluded that the optimum liberation size for graphite flakes is 200µm. And primary grind size of 80% passing 425µm was recommended as feed to the flotation plant.

13.3.1.5 Conclusions and Recommendations of the Test program

- 200µm was selected as the optimum liberation size based on the mineralogy alone. However, to preserve coarse graphite flakes, 80%-425 µm grind was selected as the optimum graphitic carbon liberation grind.
- A large proportion of graphite reported to the -53 µm size fraction (down to -25 µm), pointing out that it will not be possible to produce a discardable barren fines fraction.
- Sulphur grades in the weathered material was shown to not be of concern, since grades repeatedly reported well below the targeted 0.1% S.
- It is possible to produce a final concentrate product at 95% Graphitic Carbon content and with a recovery of 85% when processing (floating) the -53 µm fraction.
- All flotation tests were performed using frother only (Dow200).
- Reagent optimisation test work, pH control test work and Mineralogy on the rougher tails of the fresh ore is recommended to determine if recoveries could be improved.

13.3.2 Flowsheet Confirmation Test Work, METPRO/SGS 2021

Data reviewed by METPRO suggested that a more conventional graphite flotation flowsheet similar to the Bisset Creek process would be more suitable for the Okorusu mineralization. It was postulated that two polishing stages may be beneficial to maximize the +180µm yield. The suitability of the proposed revised flowsheet was evaluated in a series of seven cleaner flotation tests that were carried out at SGS Lakefield using one weathered and one fresh sample, which were shipped from site. The weathered sample was a composite of four random samples taken from the ore stockpile at the Okorusu plant. The fresh sample was a composite taken from six drill holes at depths between 55 and 71m.

The first six cleaner flotation tests were carried out on the weathered sample and focused primarily on the cleaning circuit. The objective of the tests was to achieve a combined graphite concentrate grade of at least 95% C(t) while minimizing flake degradation. A secondary objective was to design the flowsheet to maximize the use of the existing equipment.

Process variables that were investigated in the flotation program included:

- Elimination of ball mill and scavenger flotation
- Single and double polishing mill
- Classification of intermediate concentrate and SMM grinding
- Cleaning circuit without classification of intermediate concentrate

The first test (NA-1) investigated the degree of liberation of the +300µm graphite flakes after the primary grind and a very short polishing grind. The +300µm concentrate yield was high at 18.4% but this mass is inflated by a lot of gangue as it graded a low 54.8% C. The -300µm concentrate was subjected to a second polishing stage, cleaned, and then classified at 180µm. Even after two stages of polishing, the -180µm concentrate failed the minimum grade requirements. These results confirm the assumption that the graphite flakes are poorly liberated after the primary grind.

The next set of tests (NA-2 to NA-4) evaluated different grind times in the polishing and SMM grinding applications with classification of the intermediate concentrate prior to SMM grinding. These three tests produced consistent results.

The purpose of test NA-5 was to determine if the flowsheet could be simplified by eliminating the classification of the intermediate concentrate and treated the entire intermediate concentrate in one SMM. However, this resulted in noticeably higher +48 mesh and -48/+80 mesh flake degradation.

The flowsheet was then simplified by eliminating the ball mill and scavenger flotation stages in test NA-6 which produced a very high graphite concentrate and good flake size distribution but resulted in elevated graphite losses. Recoveries declined from 92.5% to 85.1%. The graphite losses may be reduced with more aggressive froth removal and/or longer rougher flotation retention time. Further, graphite units in intermediate streams are considered losses during open circuit testing and a large percentage of these graphite units are recovered into the concentrate during closed circuit operation.

All tests employed a simplified reagent regime of diesel and MIBC without the use of a gangue dispersant. An aliphatic alcohol frother such as MIBC has the benefit of a less persistent froth, which reduces the risk of elevated gangue entrainment.

Table 13-19: Summary of SGS Flotation Tests (METPRO/SGS, 2021)

Test	Sample	Combined Conc Grade %C(t)	Recovery %C(t)	% Mass >300µm	% Mass -300µm/ +180µm
NA-1	Weathered	84.6	86.4	18.4	40.8
NA-2	Weathered	95.6	88.1	11.4	42.8
NA-3	Weathered	94.9	92.7	11.6	40.7
NA-4	Weathered	96.3	91.6	9.9	37.8
NA-5	Weathered	95.5	92.5	8.6	34.3
NA-6	Weathered	96.9	85.1	10.0	41.3
NA-7	Fresh	95.6	92.4	21.2	46.3

The combined concentrates of the seven cleaner tests were submitted for a size fraction analysis (SFA) to better illustrate the impact of circuit modifications on the flake size distribution and grades. The mass recovery into the various size fractions and the associated total carbon grades of the SFAs are presented in Figure 13-2 and Figure 13-3, respectively. The charts illustrate the overall robust and consistent response of the weathered material to changes in the grinding conditions between tests NA-2 and NA-6. The much coarser flake size distribution of the fresh material is evident in Figure 13-2.

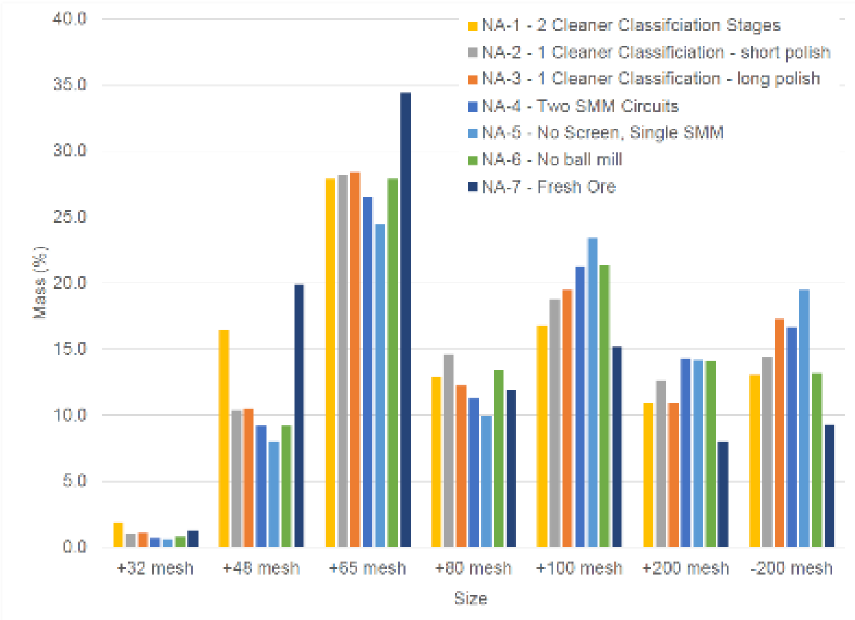


Figure 13-2: SGS Tests Concentrate Mass Distribution (METPRO/SGS, 2021)

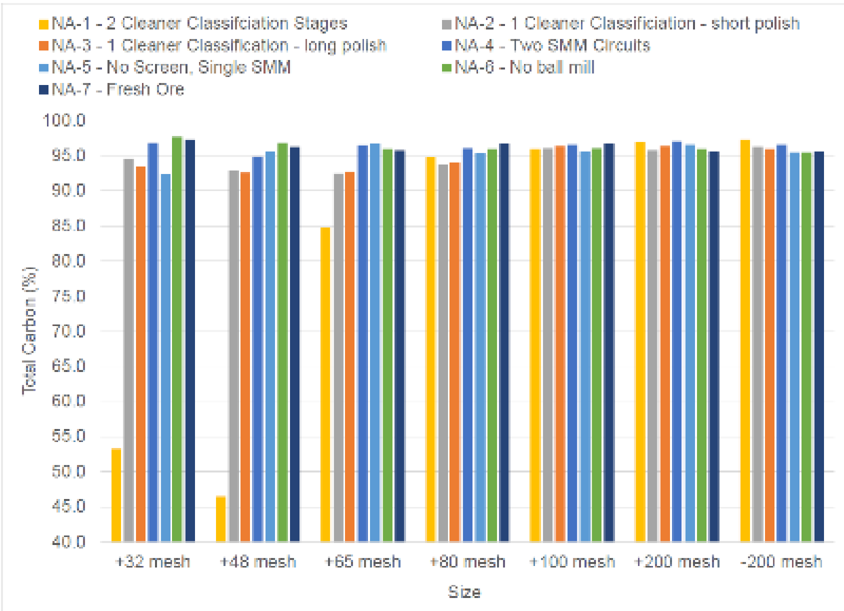


Figure 13-3: SGS tests Concentrate Carbon Mass Distribution (METPRO/SGS, 2021)

A comparison of the flake size distribution of the combined concentrate of the operating plant, Mintek laboratory and pilot testing, and the flotation testing performed at SGS is presented in Table 13-20. The SGS program matched and exceeded the results of the original Mintek work and confirmed that the current plant flowsheet is not suitable for treating the Okorusu mineralization.

Table 13-20: A Comparison of Graphite Flake Distribution between Plant and Lab (METPRO, 2021)

Flake Size (µm)	Okorusu Plant 2017-2018 (%)	MINTEK Lab tests (%)	MINTEK Pilot Plant (%)	SGS Weathered tests (%)	SGS Fresh Test (%)
>300	2	5	13	10	21
>180	16	35	35	41	46
>106	37	26	23	30	20
<106	45	34	29	19	13

13.4 SAMPLE REPRESENTATIVITY

Sampling for the test work program was completed by representatives of MSA, Worley, Halyard as well as Imerys.

The Weathered samples were collected as grab samples from crushed ore (-13mm) stockpiles in May 2021. The Fresh samples were collected in July 2021, and was prepared from a blend of 6 different drillholes that intersected the fresh ore zone. (Table 13-21).

Table 13-21: Fresh Core Samples for SGS Flowsheet Confirmation Test program

BHID	SAMPLE ID	FROM (m)	TO (m)	LENGTH (m)	S %	C %
OKJ2	OKJ2-25	55.00	56.00	1.00	2.36	4.20
OKJ3	OKJ2-26	56.00	57.00	1.00	4.57	7.80
OKJ4	OKJ4-33	41.00	42.00	1.00	2.52	3.34
OKJ4	OKJ4-62	69.00	70.00	1.00	3.01	5.53
OKJ4	OKJ4-75	81.00	82.00	1.00	3.02	6.60
OKJ6	OKJ6-25	26.00	27.00	1.00	3.80	3.77
OKJ8	OKJ8-65	69.00	70.00	1.00	2.64	8.08
OKJ9	OKJ9-58	73.00	74.00	1.00	2.37	4.31

13.5 MINERAL AND METALLURGICAL TEST WORK CONCLUSIONS & RECCOMENDATIONS

The mineral processing test work program completed at SGS in 2021 indicated that the new flow sheet could improve on the existing flow sheet and corresponded well with early test work and pilot campaigns conducted in the 1990's.

Based on the latest test work conducted improved recovery and flake distribution was achieved when compared to the test work conducted by MINTEK in the 1990's and 2015.

Based on the completed SGS test work program the design criteria for the flotation plant modifications were developed.

Table 13-22: Expected Concentrate Grade and Flake Size Distribution from new process flow sheet

Product	Average		Range	
	%C(t)	% Distribution	%C(t)	% Distribution
Composite				
Composite	96.0	92.0	95.0 – 96.5	91.0 – 93.0
Concentrate Composition				
>300μm	96.0	9	95.0 – 97.0	7 – 11
300 – 180μm	96.0	40	95.0 – 97.0	38 – 42
180 – 106μm	96.0	30	95.0 – 97.0	28 – 32
<106μm	96.0	21	94.0 – 96.0	19 – 23

While the mineral processing test work leading up to this Technical Report supported the expectation for much better performance in terms of graphite flake purity and flake size distribution, it is recommended to conduct further test work to investigate:

- **Concentrate upgrading with gravity separation**. This would be beneficial to possible difficulties with graphite / mica separation by flotation as the only separation method. If required the newly redundant Okorusu gravity spirals can be brought back into operation with relative ease and low cost.
- **Concentrate upgrading by chemical means.** As per the early test work discussion a measure of success was achieved with various schemes of roasting followed by acidic leaching. This could potentially be a method to upgrade marginal concentrates or concentrates failing to achieve grade.
- **Alternative concentrate polishing/liberation methods.** Early MINTEK test work mentioned testing of a delaminator unit for improved liberation of graphite flakes. Literature reviews also indicate the potential of ultra sound in flotation stages to improve liberation and hydrophobicity of graphite flakes.

14 MINERAL RESOURCE ESTIMATES

(Taken from the MSA Group Report Technical Report titled "Northern Graphite Corporation, Okanjande Mineral Resource Estimate, Namibia" with effective date 29 November 2021)

The Mineral Resource estimate was completed by Ms Ipelo Gasela, Senior Mineral Resource Consultant, who is also the QP for the Mineral Resource. The Mineral Resource estimation was completed using Datamine Studio RM software, augmented by Datamine Supervisor software for statistical and geostatistical analysis. The data used for the Mineral Resource include drilling data collected by RUL, Gecko and Imerys-Gecko. TGC and S grades were estimated in the block model. The S grades were estimated to inform assessments of the impact sulphur may have on the Project.

14.1 MINERAL RESOURCE DATA

MSA received all the drillhole data from Imerys-Gecko in Excel spreadsheets including data pertaining to:

- Collars;
- Sample assays;
- Hole inclination and direction (based on set up orientation);
- Geology logging; and
- Density.

The drilling data are from percussion and diamond drillholes completed at the Okanjande graphite deposit and the surrounding, satellite deposits (Table 14-1). The only data used for Mineral Resource estimation is for the Okanjande Main deposit that includes the North Ore Extension and South Ore Extension.

A high-level validation was completed that includes the following processes:

- Examining the sample assay, collar survey, downhole survey and geology data to ensure that the data were complete for all of the drillholes;
- Examining the de-surveyed data in three dimensions to check for spatial errors;
- Examination of the assay data in order to ascertain whether they are within expected ranges;
- Checks for "FROM-TO" errors, to ensure that the sample data did not overlap one another or that there were no unexplained gaps between samples;
- Checks for excessive mineralised sample lengths; and
- Checks for unsampled drillholes.

Table 14-1: Summary of the drillhole data (MSA, 2021)

Deposit	Drillhole Series	Campaign	Type	Number of drillholes
Okanjande Main	OAD03 – OAD13; OAD15 – OAD27; OAP10 – OAP75; OAP81; OAW01 - OAW14	RUL	Percussion and Diamond	105
Northern Ore Band	OAP76 – OAP78	RUL	Percussion	4
Okanjande Main (including North Ore Extension and Southern Ore Extension)	OAD19DT - OAD75D; OKD005 - OKD050; OPH001 - OPH009; SZH002 - SZH004; SZH006	Gecko	Diamond	72
Northern Ore Band	OKD051 – OKD063	Gecko	Diamond	13
North-east of Okanjande Main	OKD001 – OKD004	Gecko	Diamond	4
Okanjande Main (including North Ore Extension and Southern Ore Extension)	OKJ1 – OKJ12; OkaPBH_020 – OkaPBH_026	Imerys-Gecko	Diamond	19
Northern Ore Band	OkaPBH_027 – OkaPBH_034	Imerys-Gecko	Diamond	6
SW Target	OkaPBH_013 – OkaPBH_019	Imerys-Gecko	Diamond	7
Highlands Target	OkaPBH_009 – OkaPBH_012	Imerys-Gecko	Diamond	4
Old Mine	OkaPBH_007 – OkaPBH_008	Imerys-Gecko	Diamond	2
Leopardskloof Target	OkaPBH_001, OkaPBH_002, OkaPBH_005	Imerys-Gecko	Diamond	3
Rooibult Target	OkaPBH_035 – OkaPBH_037	Imerys-Gecko	Diamond	3

The results of the validation and corrections made to the data are as follows:

- Geology logging for the Imerys-Gecko holes was not captured electronically. MSA captured weathering logging where necessary to facilitate modelling;
- Most of the collar positions plot between -2m and +1.5m relative to the topography. Only two collars are located below -2m, to -2.8m, and another two collars above +1.5m, to +3.6m, relative to the topography. In addition, numerous collars in the pit area are in excess of 2m above the topography. The collars were accepted for the Mineral Resource estimation;
- 28 drillholes located on the peripheries of the deposit were not sampled and assayed. Though these were identified to be mineralized, the thickness and magnitude of the mineralization in these drillholes is not known, therefore the areas in which they are drilled were excluded from the Mineral Resource;
- A total of 78 gaps were observed in the Gecko and Imerys-Gecko data due to un-mineralised intervals that were not sampled. The gaps are between 0.07m and 28.5m in length;
- Sample lengths are from 0.15m to 4m, with only six samples that are longer than 2m;
- The TGC assays are from 0% to16.6%, and S assays are from 0.01% to 16.38%. These assay ranges are expected for the deposit and no adjustments were made to the data;

- A total of 144 density measurements are available, which are between 2.14 t/m^3 and 2.91 t/m^3, which is considered an acceptable range for the deposit;
- No downhole surveys were completed. Drillholes are up to 98m long at Okanjande and no major deviations from the collared orientation are expected; and
- A total of 12 overlaps were observed in the lithology file. These are not considered to be material and the overlapping intervals were removed from the Mineral Resource estimation database.

The final dataset used to estimate the Mineral Resource comprises 196 drillholes.

14.2 EXPLORATORY DATA ANALYSIS

The data for the Okanjande Main deposit includes drilling data collected by RUL, Gecko and Imerys-Gecko. The drillholes were drilled on northwest oriented sections. Generally, the drillholes are spaced 50m apart with drill lines at the central area of the deposit being 25m apart. Drillhole spacing widens towards the edges up to approximately 100m (Figure 14-1). The data comprises 81 percussion holes and 115 diamond holes. 23 of the diamond drillholes are from twin drilling, 21 of them twinning percussion holes and two are twin diamond drillholes. Holes were drilled either vertically or inclined, with most of the inclined holes dipping at 60° at an azimuth of 320° to intersect the south-east dipping mineralization at a near to perpendicular angle. The maximum drilling depth is to 90m below surface.

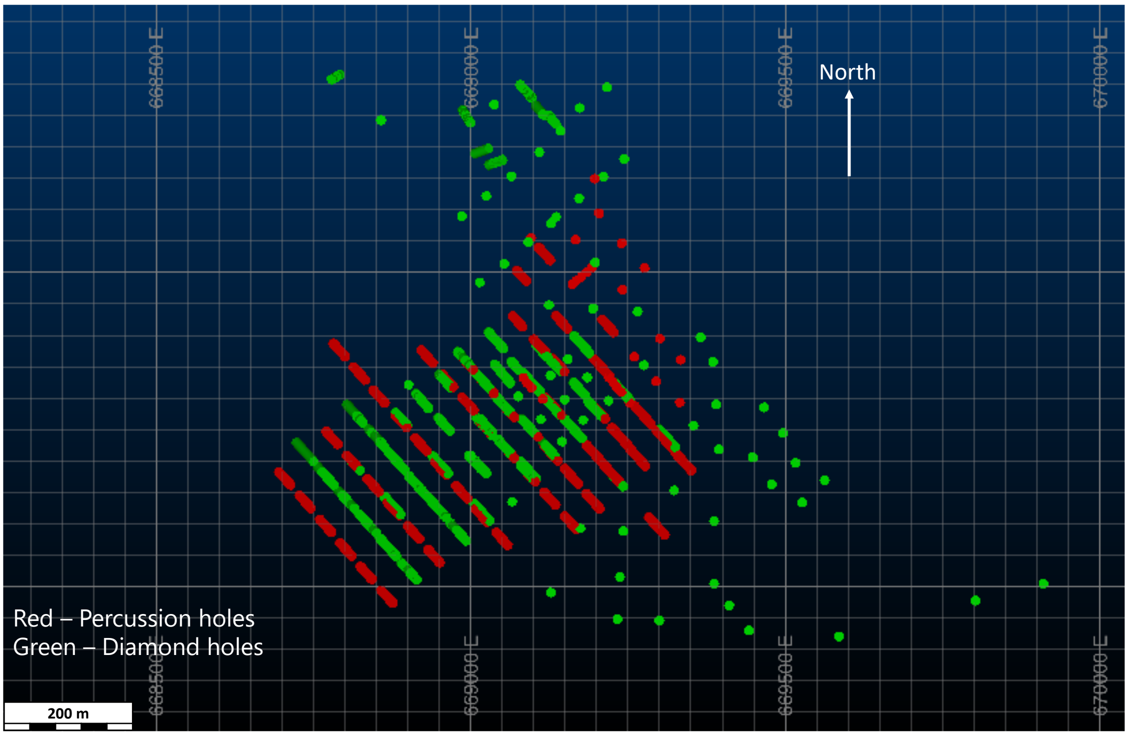
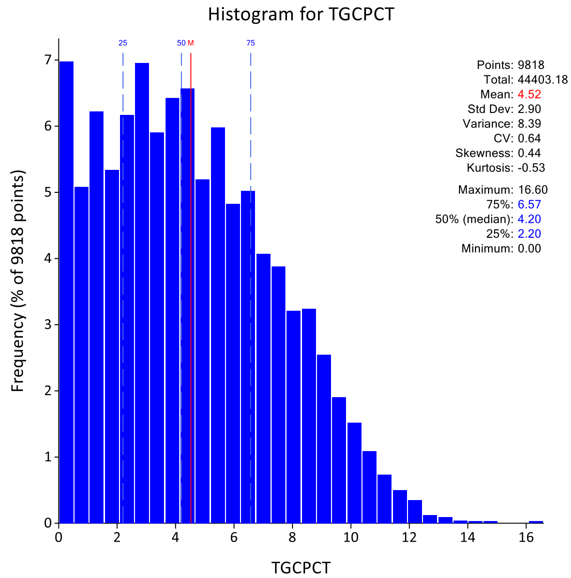


Figure 14-1: Plan view of drillhole traces, coloured by drilling type (MSA, 2021)

The TGC grade distribution is mixed due to the interbedded mineralised and non-mineralised layers in the graphitic gneiss/quartzite (Figure 14-2). The sulphur grade histogram shows a bimodal distribution (Figure 14-2). This is related to weathering, where the lower sulphur grades represent the weathered material and the higher sulphur grades are within the fresh rock.



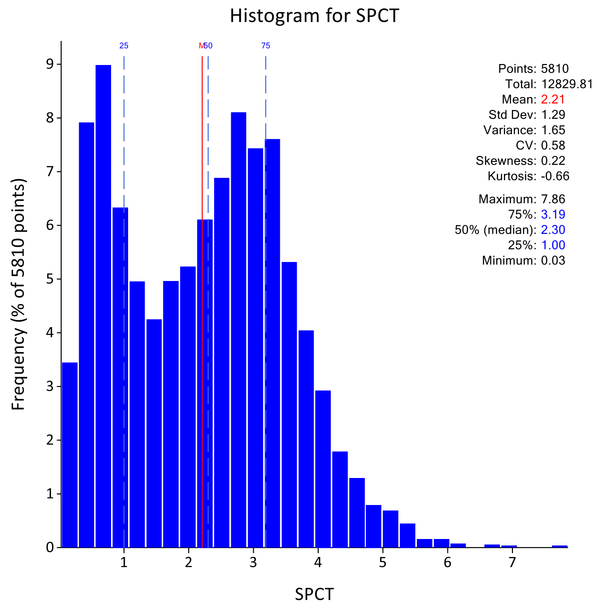


Figure 14-2: Histogram of un-composited lengths for TGC (top) and S (bottom)

14.3 BIVARIATE ANALYSIS

The bivariate plot between TGC and S assays shows two groups of weakly positive correlations; one for weathered and the other for fresh rock (Figure 14-3).

Intersections with no assays were assumed to be un-mineralized and therefore a default value of 0% was applied to the TGC grades for unsampled core. Intervals with TGC grade but missing S grade were left absent for S grade. Based on the correlation between the two variables in the fresh rock, a default S grade of 0.5% was applied to core that was not sampled.

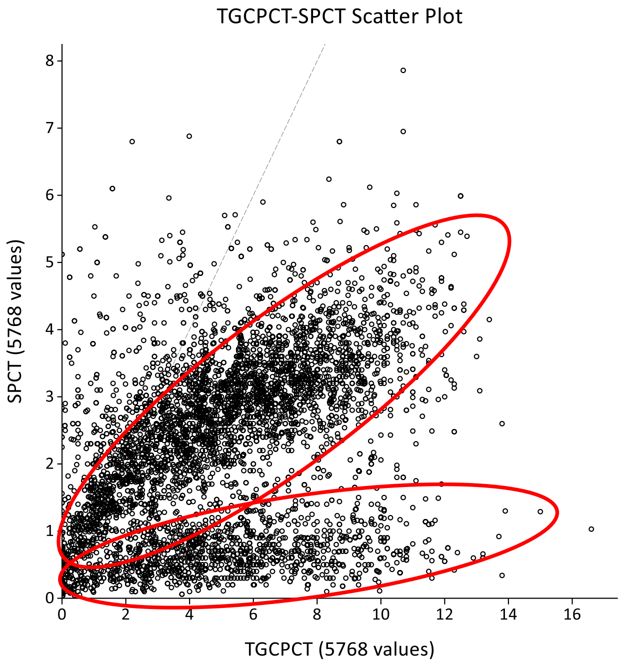


Figure 14-3: Bivariate plot between TGC and S (MSA, 2021)

14.4 GEOLOGICAL MODELLING

A topographic surface, completed in September 2018, included the profiles of the stockpiles and pits. The stockpiles are located outside the Mineral Resource area. The topographic surface was used to limit the vertical extent of the block model and depleted the mined-out areas.

The graphite at Okanjande Main is mainly contained within graphitic gneisses and quartzite while the un-mineralised rocks are pegmatite veins or interbedded un-mineralized quartzite. The logging indicates small scale local geological complexity that could not be modelled at a deposit scale. The deposit was modelled as a simple volume with the lateral extent constrained by un-mineralised drillholes. The lateral extent was modelled halfway between mineralised and un-mineralised drillholes or extrapolated up to a 100m from a mineralised, sampled and assayed drillhole (Figure 14-4).

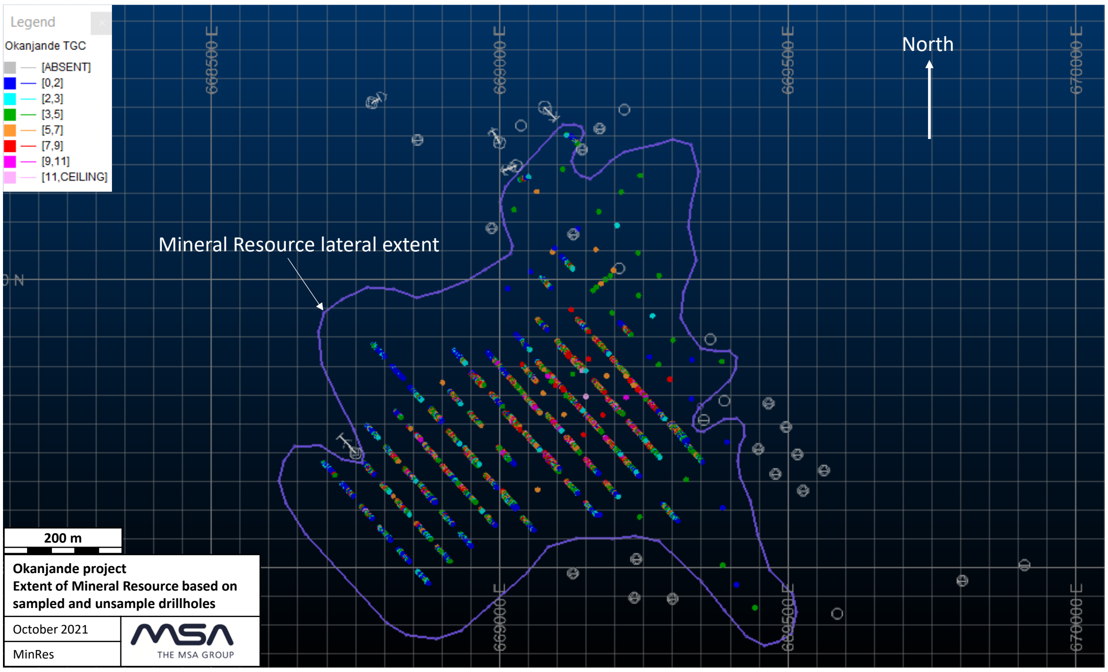


Figure 14-4: Plan view of Mineral Resource extent (MSA, 2021)

The sulphur distribution shows inflection points on the log probability plot at approximately 1% and 2%, which correspond with the base of the weathered and transitional zones respectively (Figure 14-5). However, numerous intersections with sulphur grades less than the 2% S threshold were logged as fresh rock, especially towards the west. The weathered and transitional surfaces were modelled using weathering logging, rather than using S assays. The weathered zone comprises zones of logged weathering intensity of 2 or more and the base of the transitional zone correspond to an interface between a weathering intensity of 1 and 0.

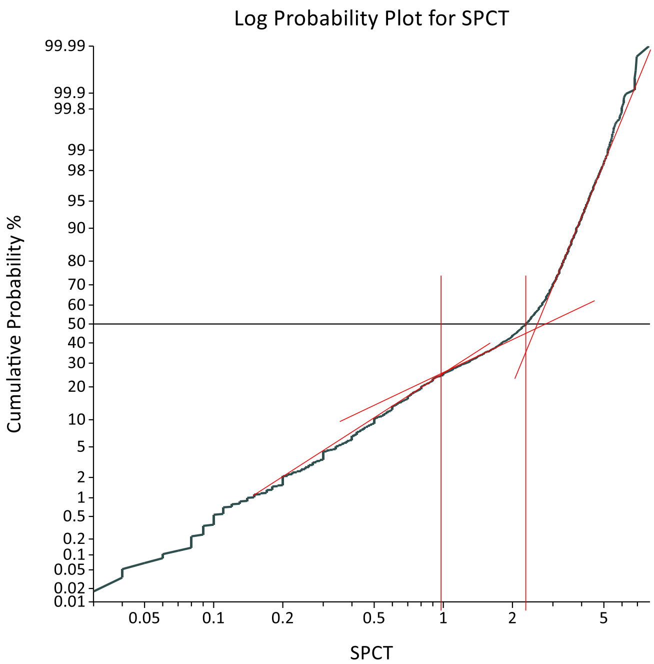


Figure 14-5: Log probability plot for sulphur grade (MSA, 2021)

Generally, the weathered zone is between 15m and 25m below surface. The transitional zone is between 1m and 5m thick, although it can reach thicknesses of 15m locally in the east.

14.5 ESTIMATION DOMAINS

Weathering domains form the basis for sulphur grade estimation; therefore, three estimation domains were used for the sulphur grade estimation (Table 14-2).

Table 14-2: Sulphur estimation domains (MSA, 2021)

Weathering Domain	Explanation
1	Weathered
2	Transitional
3	Fresh

The TGC grades have a similar grade distribution for both the weathered and transitional domains. The TGC grades in the fresh domain are higher than in the weathered zones (Figure 14-6). The higher average grade in the fresh domain is because of a high-grade zone at depth. Visual assessment of grades in the contact zone revealed that there are no grade changes attributed to the change of weathering state and that TGC can appropriately be estimated as one domain.

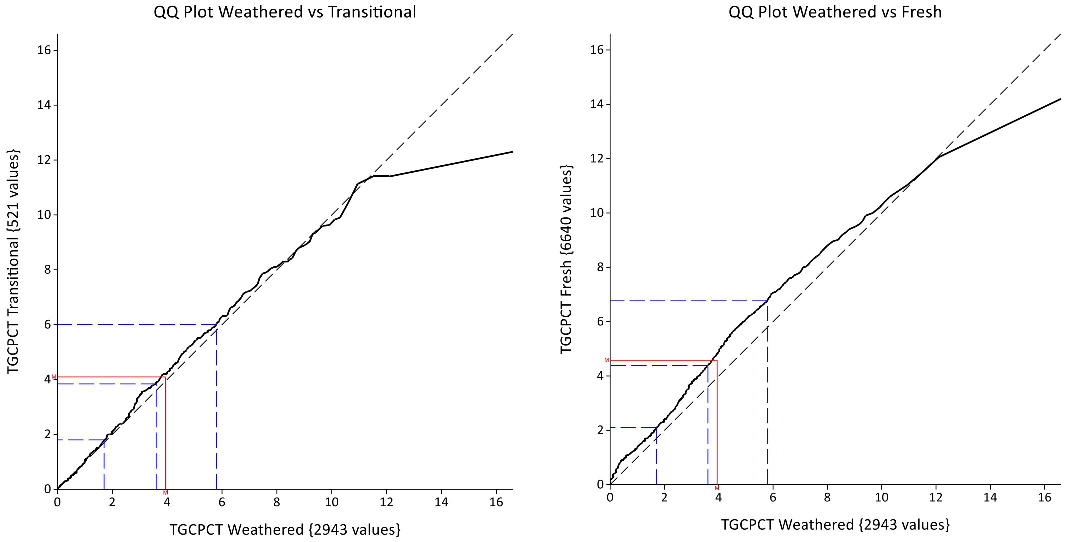


Figure 14-6: QQ plot comparing TGC grades in different weathering domains (MSA, 2021)

14.6 COMPOSITE DATA

The drillhole samples were composited to 1m because this is the most occurring sample length accounting for the majority of the data (Figure 14-7). The compositing method allowed for slight adjustments in the composite length in order to avoid discarding any sample where the sampled portion of the drillhole is not an exact multiple of the composite length.

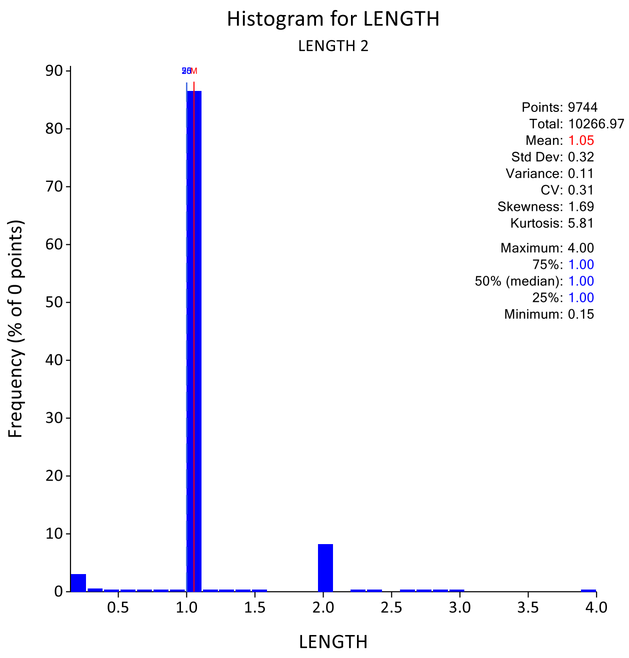


Figure 14-7: Un-composited sample length histogram (MSA, 2021)

The TGC sample grade population shows a mixed distribution, with a high frequency of composite samples with a grade of 0% TGC due to the zero values applied where samples were not taken (Figure 14-8). The mixed distribution is due to the deposit being made up of alternating mineralised and un-mineralised layers, which could not be modelled as separate domains. The deposit also has a high-grade core, which transitions into lower grades towards the peripheries.

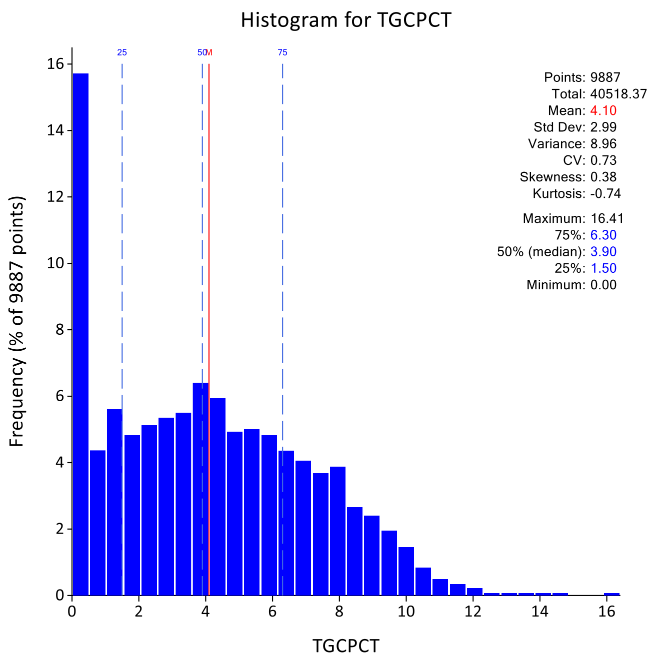
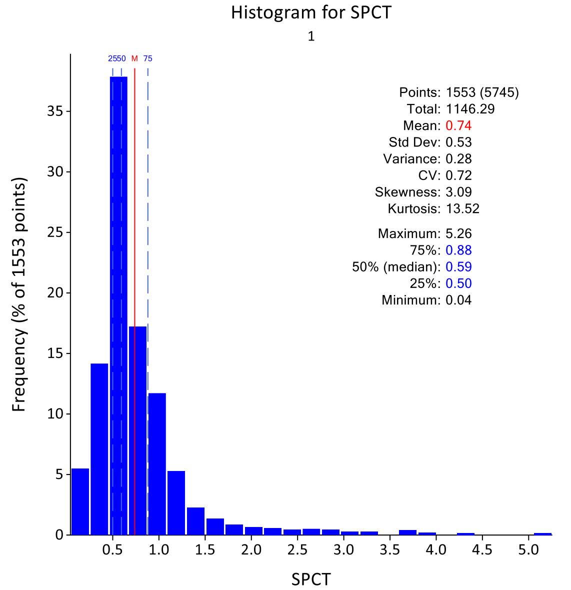
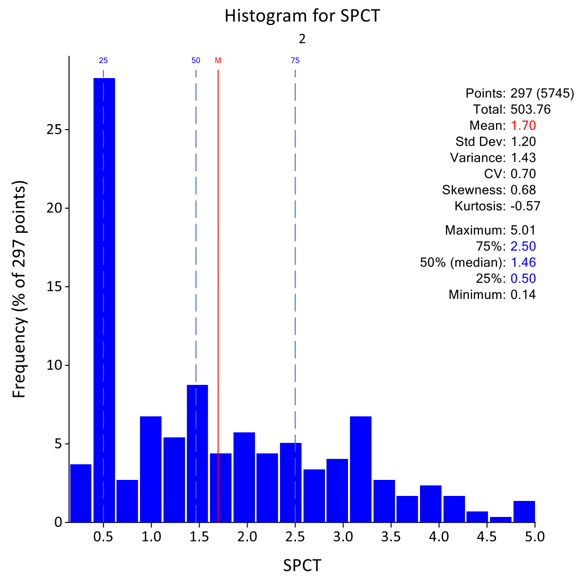


Figure 14-8: Composite TGC grade histogram (MSA, 2021)

The sulphur data were assigned domains based on weathering. The sulphur grades show a progressive increase from weathered through transitional to fresh. The weathered domain has a positively skewed distribution, the transitional has a mixed distribution and the fresh domain distribution tends towards a normal distribution. All the domains have a high frequency of 0.5% S values (Figure 14-9), which was the default value applied where there were no samples collected.





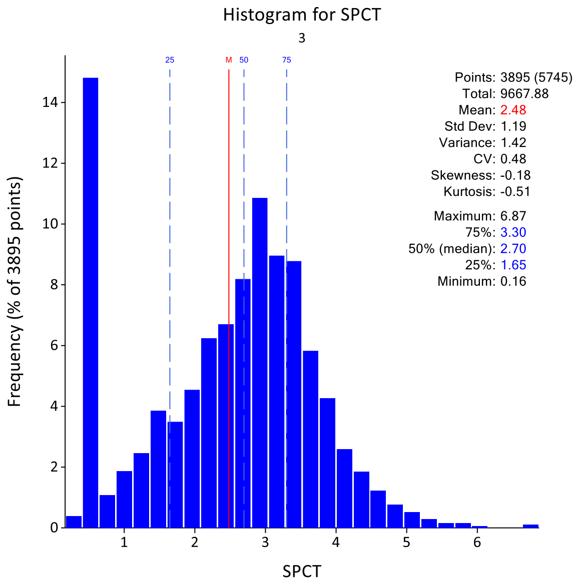


Figure 14-9: Composite sulphur grade histograms per weathering domains (MSA,2021)

14.7 GEOSTATISTICAL ANALYSIS

A single variogram was modelled for TGC and two variograms were modelled for S grade; one for weathered and the other for the fresh domain. A variogram for the transitional domain could not be modelled reliably and the variogram for the fresh domain was used in estimating the transitional domain.

The experimental variograms for sulphur were calculated from composite data without default values since the high frequency of the default values artificially changes the spatial variance.

The variograms were modelled at a lag distance of 50m, which is the general drillhole spacing. The nugget effect of the variograms was established using the downhole variograms. The variograms were modelled with two spherical structures and the sill variance was scaled to 1.

The TGC variogram and S variogram for the fresh domain were orientated in line with the interlayering observed in the granitic gneiss at an azimuth of 50° and a dip of 20° to the southeast. The S variogram model for the weathered domain was orientated horizontally with the east-west major direction being based on the variogram fan. The S data were transformed to normal scores for the weathered domain because the grade distribution is positively skewed. The final parameters for the variograms were back-transformed (Table 14-3).

The variograms demonstrate strong continuity in excess of the drillhole spacing.

Table 14-3: TGC and S variogram parameters (MSA, 2021)

Variable	Domain	*Rotation angles			Nugget Effect	Sill 1	Range 1 (m)			Sill 2	Range 2 (m)		
		X	Y	Z			X	Y	Z		X	Y	Z
TGC	-	140	20	180	0.11	0.56	40	40	5	0.33	230	195	25
Sulphur	Weathered	0	0	0	0.13	0.63	80	100	6	0.24	525	220	13
	Fresh	140	20	180	0.10	0.63	50	30	7	0.27	440	195	60

Note: **Rotation angles were applied to XZX.*
Ranges are rounded off to the nearest 5 m.

14.8 BLOCK MODELLING

A kriging neighbourhood analysis was completed using the TGC variogram to optimise the block size as well as other kriging parameters.

A block model was created with a block size of 20 mX by 20 mY by 5 mZ, which is two fifths of the average drillhole spacing. The block model was sub-celled to the minimum dimensions of 5 mX by 5 mY by 2.5 mZ. The block model was coded by weathering.

14.9 ESTIMATION

The TGC and S grades were estimated into the block model using ordinary kriging into parent cells. The TGC grades and the sulphur grades in the transitional and fresh domains were estimated in line with the interlayering of the granitic gneiss at an azimuth of 050° and dip of 20° to the southeast. Sulphur grade in the weathered zone was estimated using dynamic anisotropy that aligns the estimates to the weathering surfaces, which are sub-horizontal.

TGC grades were estimated using a search ellipse of 100 m by 80 m by 20 m. The transitional and fresh S grades were estimated using the same search ellipse and the weathered S grades were estimated using a search ellipse of 100 m by 50 m by 5 m in line with the variogram range proportions. The estimates were completed using a three-search strategy. The second search distances were set at one and a half times the first search distances and the third search distances were ten times the first search distances. This is to ensure that all block model cells were filled with estimates. The grades were estimated with a minimum number of 12 composites and a maximum number of 18 composites.

14.10 DENSITY

A total of 144 density measurements were completed in October 2021 at the Okanjande deposit using the remaining core from previous drilling. The data were collected from 11 holes located in the central and southern parts of the deposit (Figure 14-10).

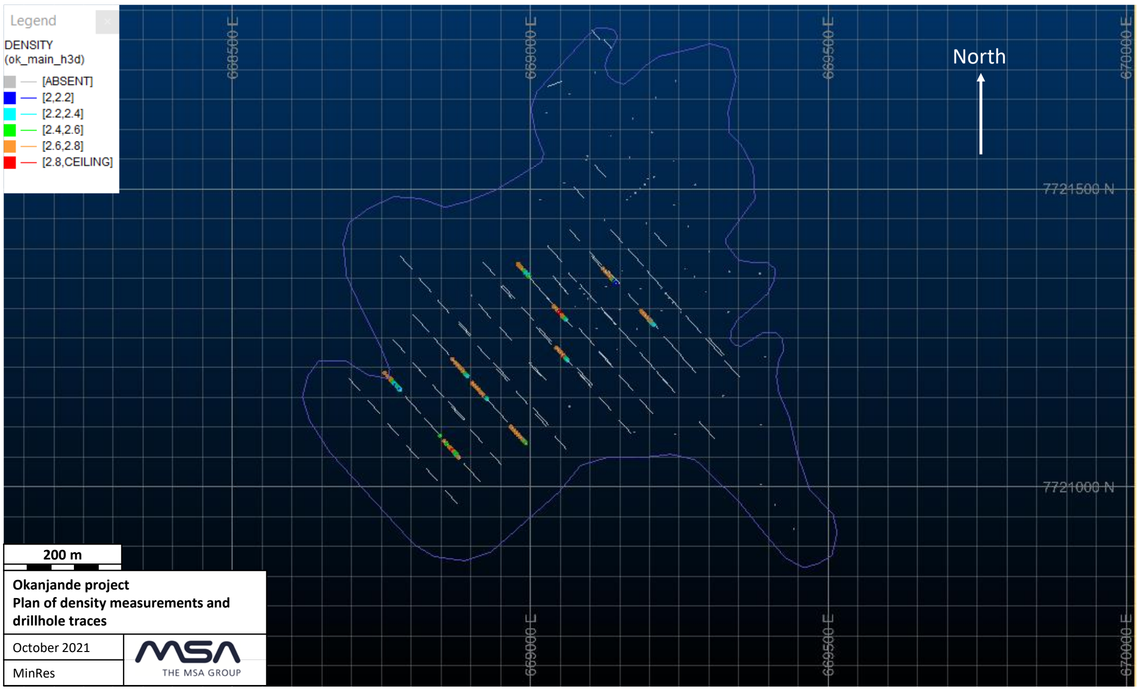
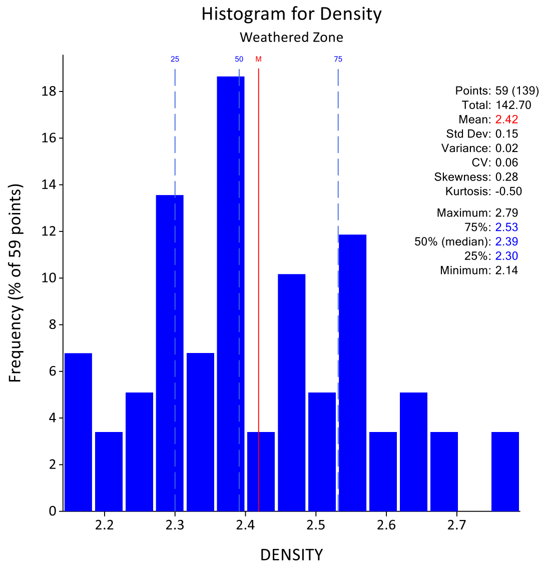
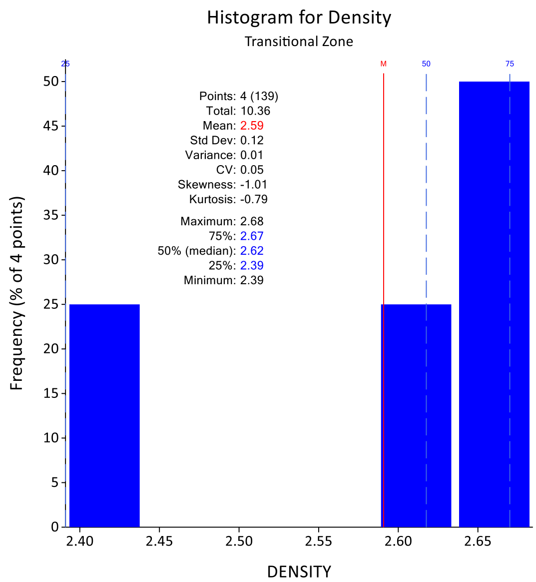


Figure 14-10: Location of drillholes selected for density measurements (MSA, 2021)

The density distributions for the weathered and fresh domains tend towards a normal distribution. Only four measurements were taken in the transitional domain due to the thin nature of this zone and difficulty in finding suitable samples.

Average density values were applied to the block model according to weathering. The amount of density measurements and their low variability were sufficient to derive a reliable average density value for the weathered and fresh domains (Figure 14-11). The mean of the transitional zone density measurements was considered acceptable as it falls between the average densities of the weathered and fresh domains.





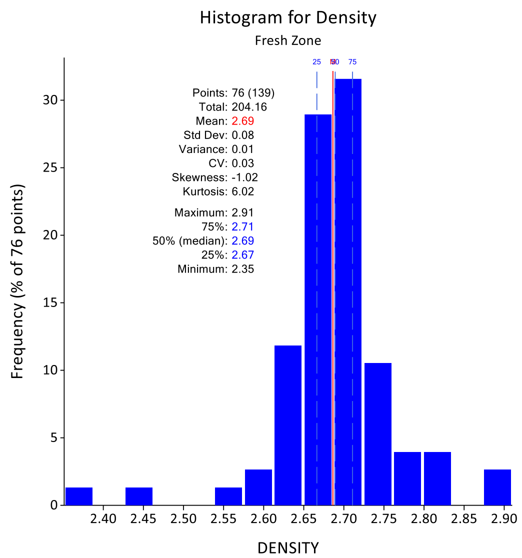


Figure 14-11: Density histograms per weathering domain (MSA, 2021)

14.11 VALIDATION OF THE ESTIMATES

The grade estimates were validated by:

- Visual inspection;
- Global mean comparison; and
- Swath plots.

Visual inspection of the block model shows that the estimated grades are representative of the input composite grades. The TGC and S grade trends in the transitional and the fresh domains follow the orientation of the graphitic gneiss interlayering, while the sulphur grade trend in the weathered domain is sub-horizontal following the orientation of the weathering surface (Figure 14-12 to Figure 14-15 (TGC) and Figure 14-16 and Figure 14-19 (S)).

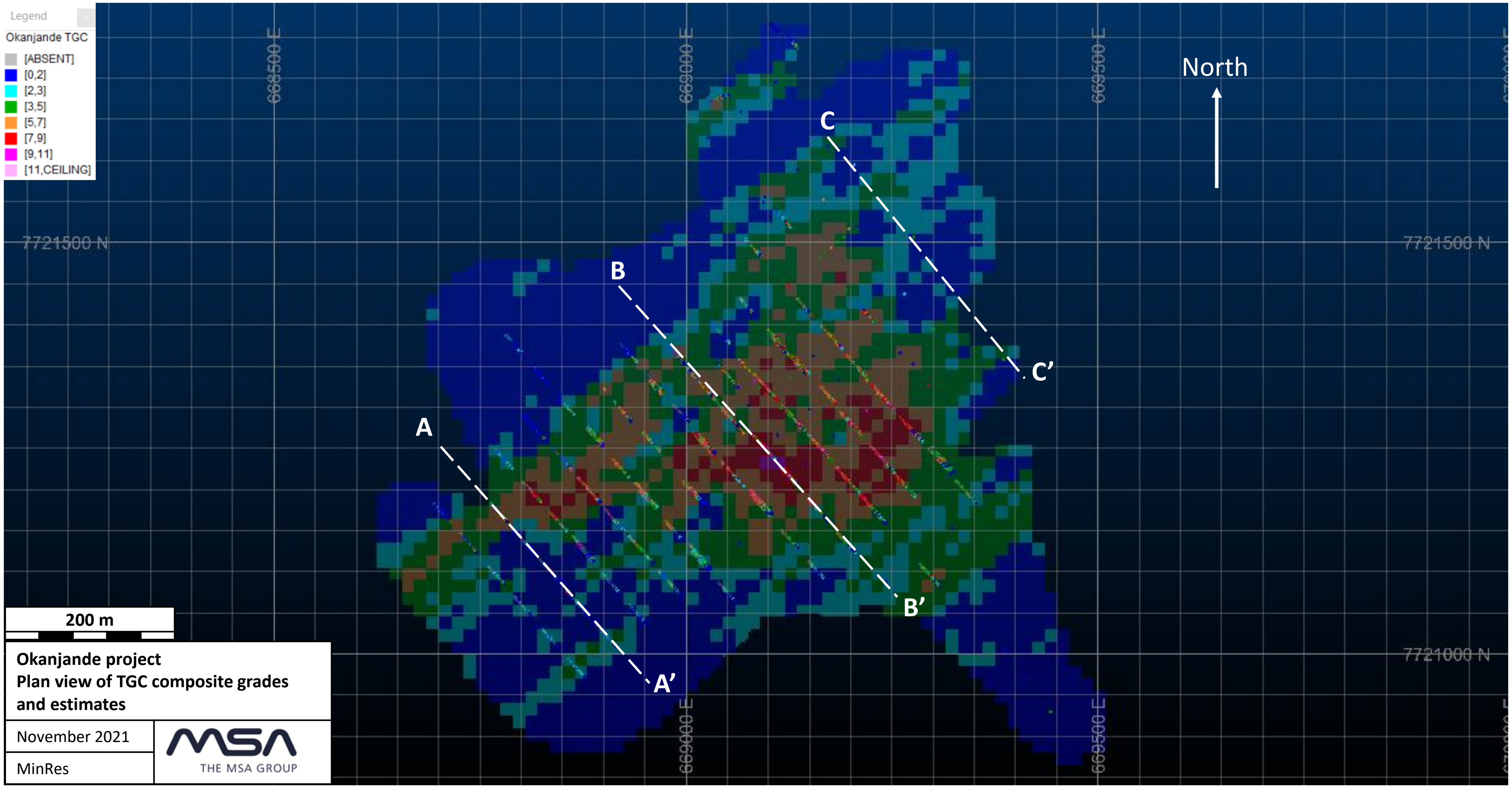


Figure 14-12: Plan view showing block model grades and composite drillhole sample grades for TGC, and section lines for the sections (MSA, 2021)

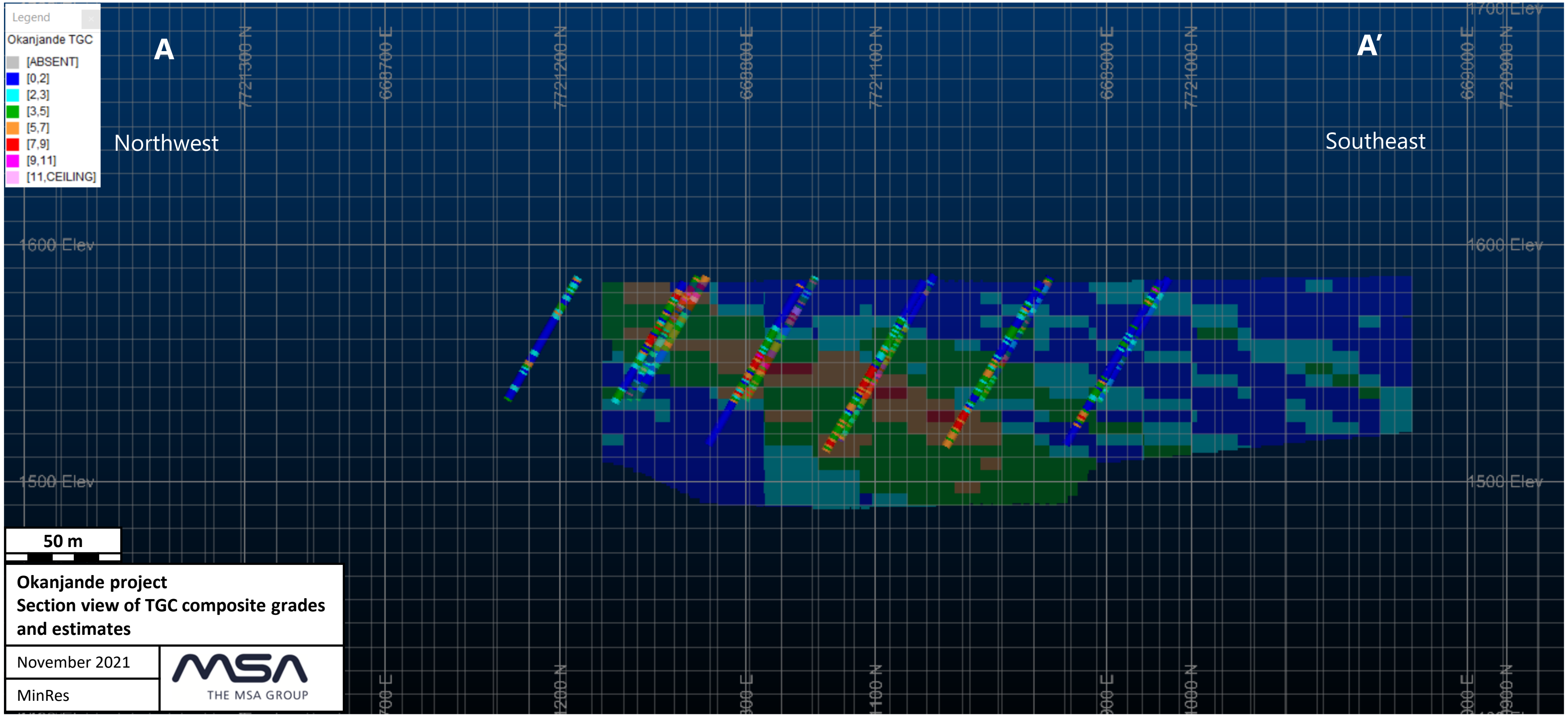


Figure 14-13: Section showing block model grades and composite drillhole sample grades for TGC for section line A – A′ (MSA, 2021)

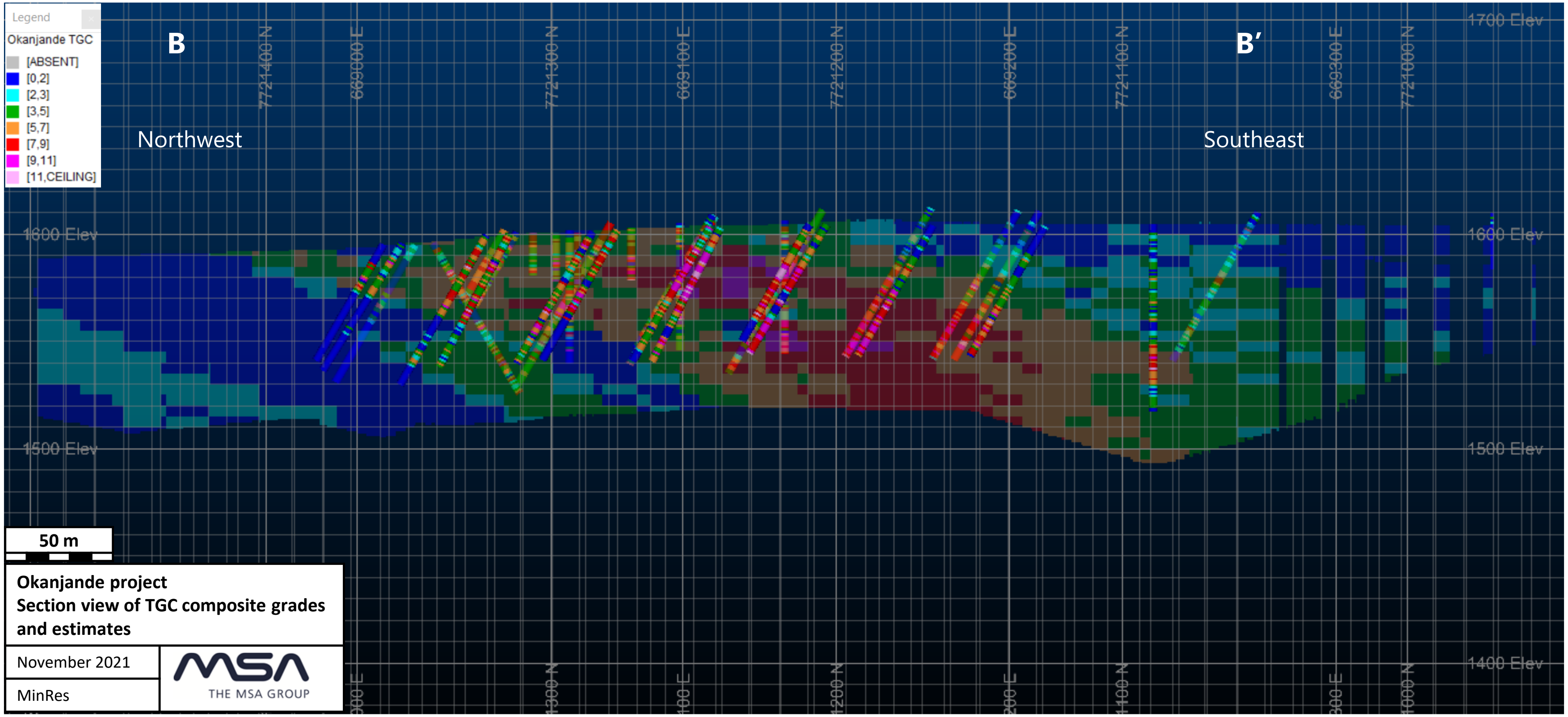


Figure 14-14: Section showing block model grades and composite drillhole sample grades for TGC for section line B – B′ (MSA, 2021)

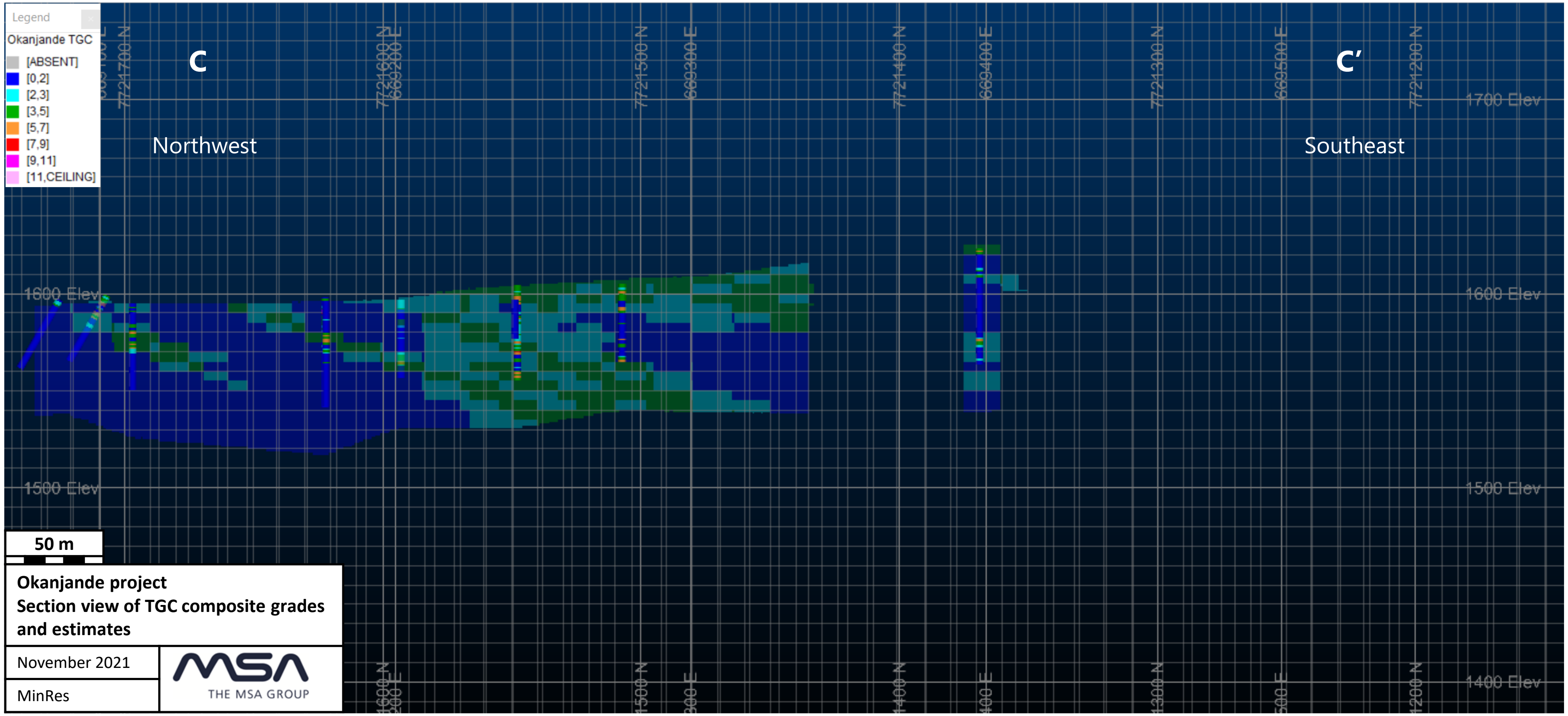


Figure 14-15: Section showing block model grades and composite drillhole sample grades for TGC for section line C- C' (MSA, 2021)

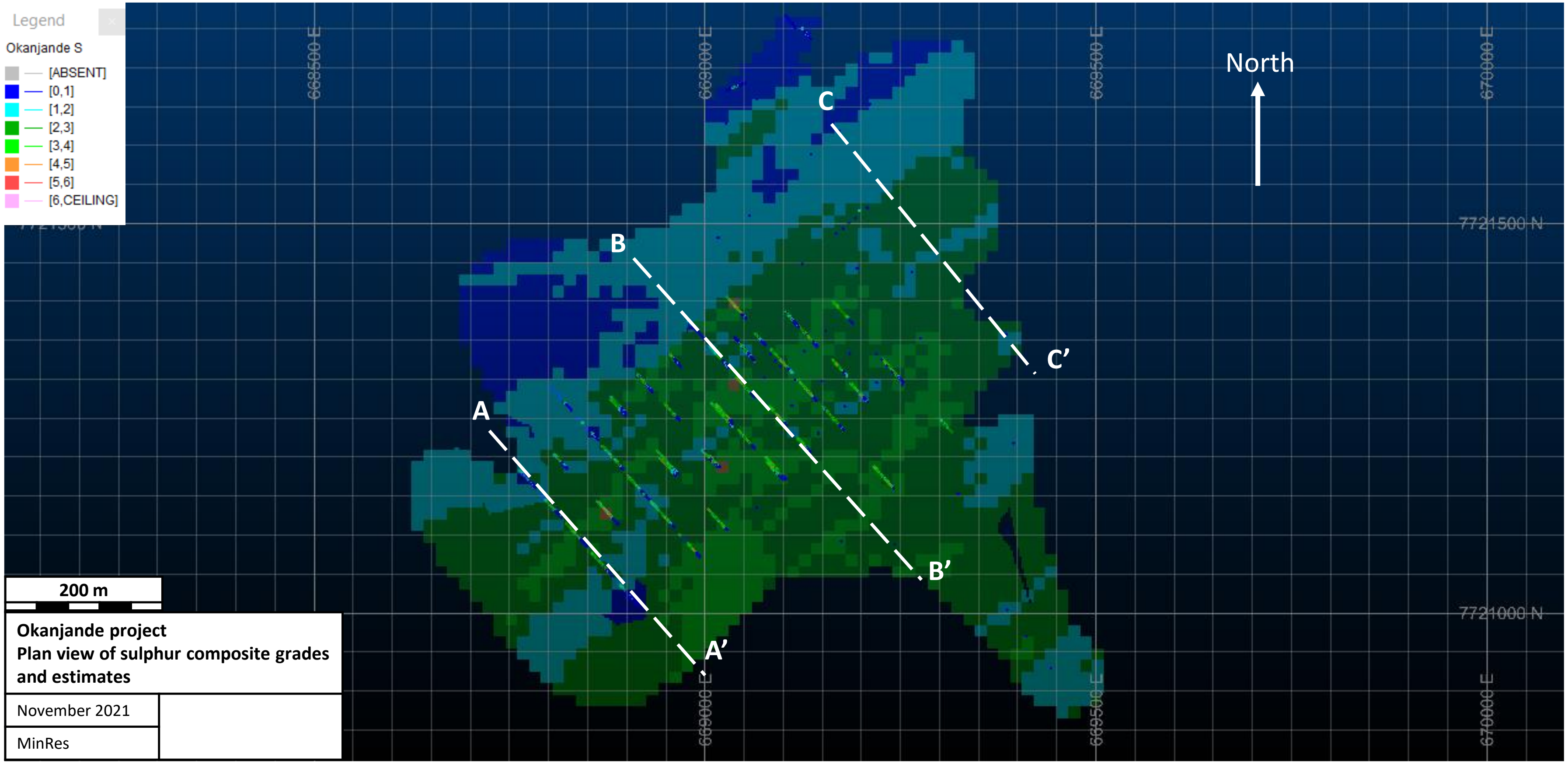


Figure 14-16: Plan view showing block model grades and composite drillhole sample grades for S (MSA, 2021)

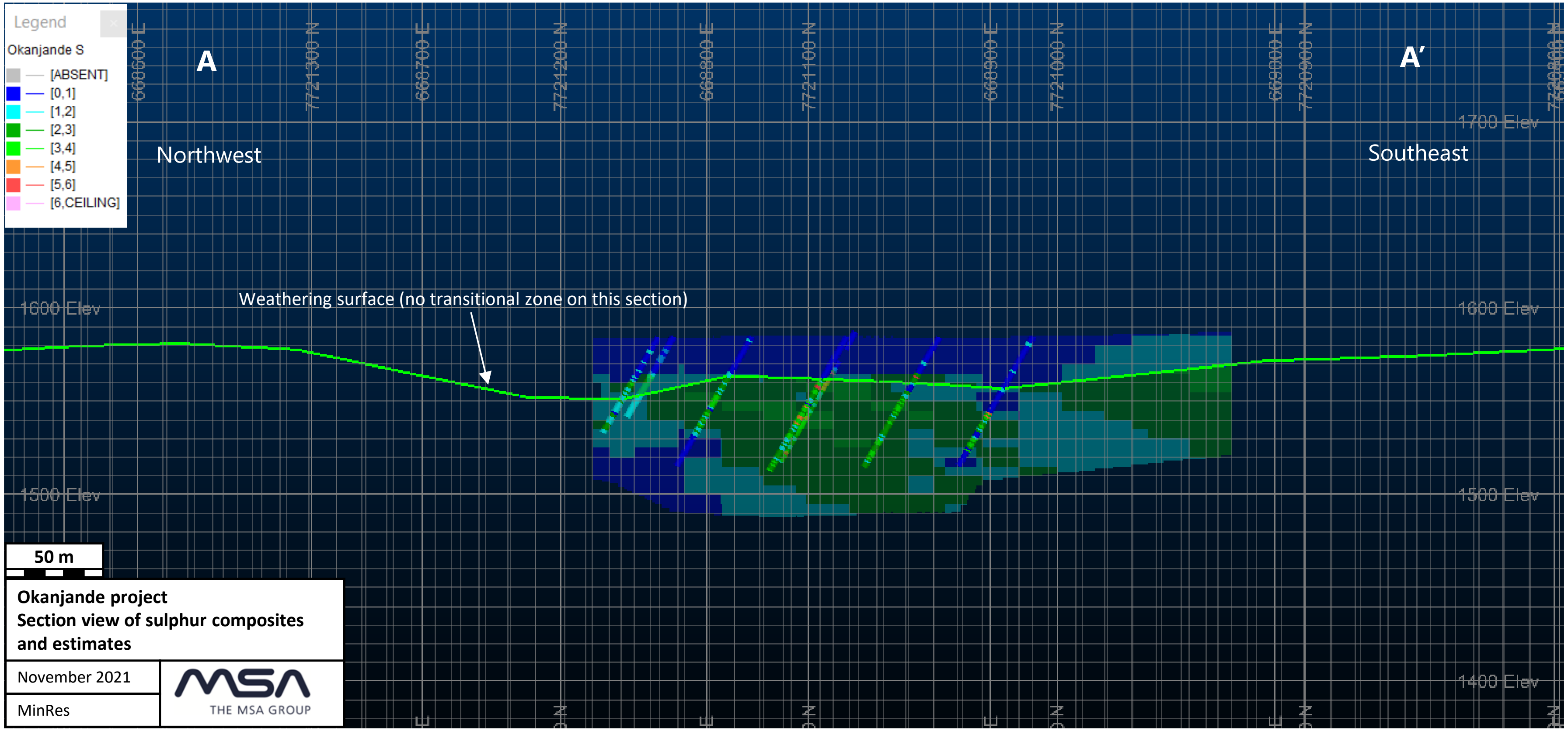


Figure 14-17: Section showing block model grades and composite drillhole sample grades for S for section line A – A′ (MSA, 2021)

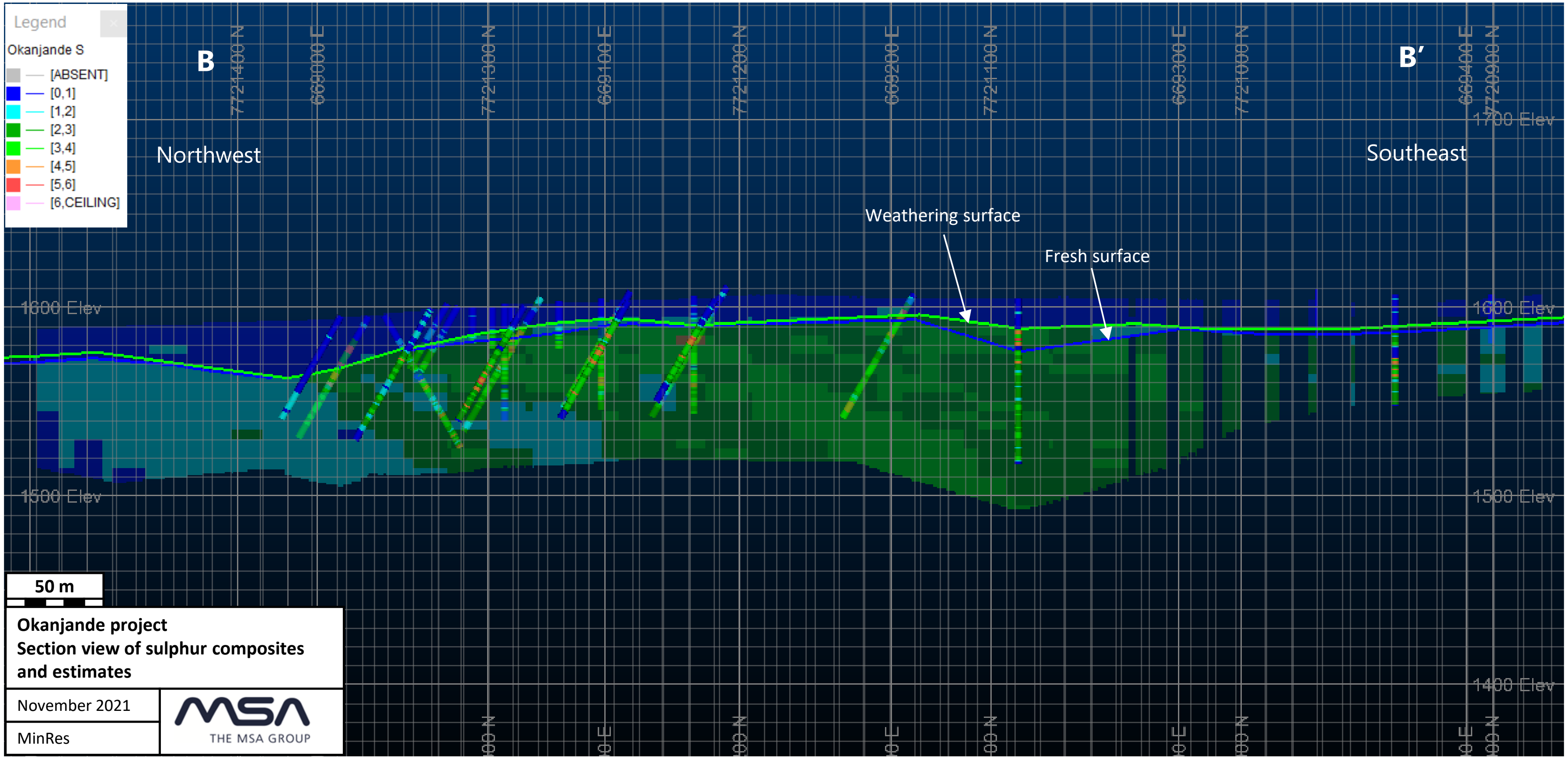


Figure 14-18: Section showing block model grades and composite drillhole sample grades for S for section line B – B′ (MSA, 2021)

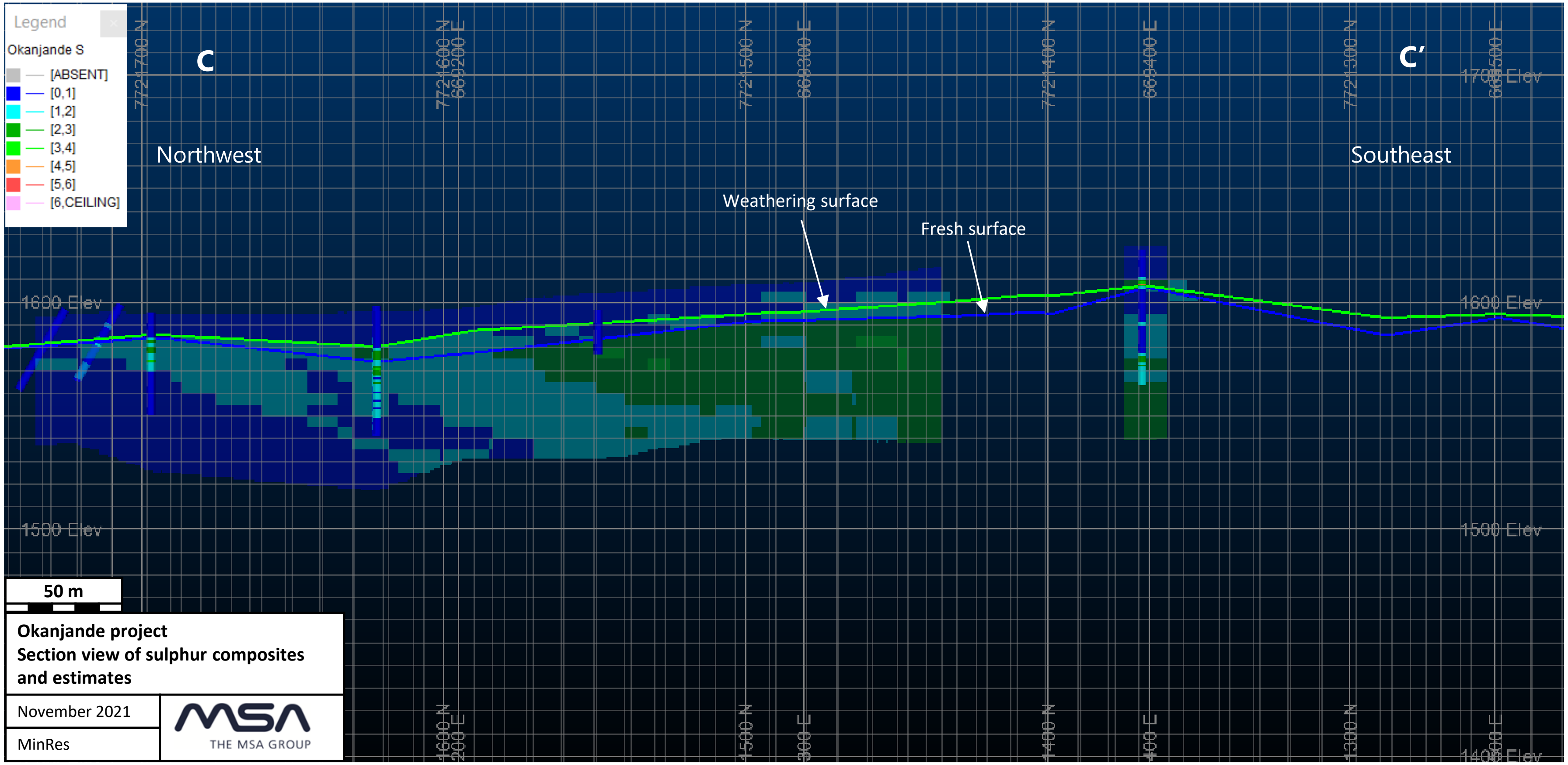


Figure 14-19: Section showing block model grades and composite drillhole sample grades for S for section line C – C' (MSA, 2021)

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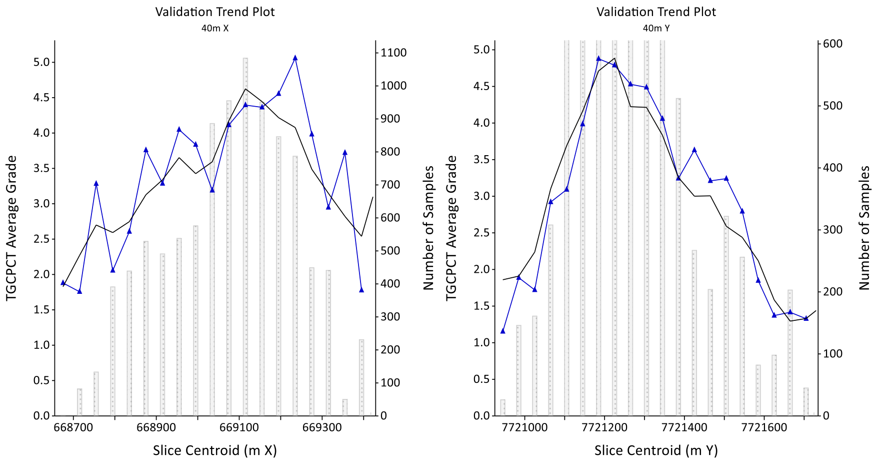
The composite grades were declustered to 50 mX by 50 mY by 5 mZ and the global mean declustered grades of the TGC and sulphur composites were compared to the block model estimated average grades. The relative differences are less than 10% for all domains except sulphur estimates in the transitional zone (Table 14-4). The validation demonstrated that the estimated grades are globally representative of the composite data and the discrepancy in the transitional zone sulphur can be explained by wide data spacing in localised higher grade areas.

Table 14-4: Global mean grade comparisons

Variable	Weathering domain	Declustered mean (%)	Block model mean (%)	Percentage difference
TGC	N/A	3.65	3.61	-1%
S	Weathered	0.71	0.77	8%
	Transitional	1.59	1.87	18%
	Fresh	2.31	2.35	2%

Swath plots demonstrate that the TGC and S estimates follow the trend of the input data, with some level of smoothing that is expected through estimation. This shows that the estimated grades are locally representative of the input composite grades (Figure 14-20).



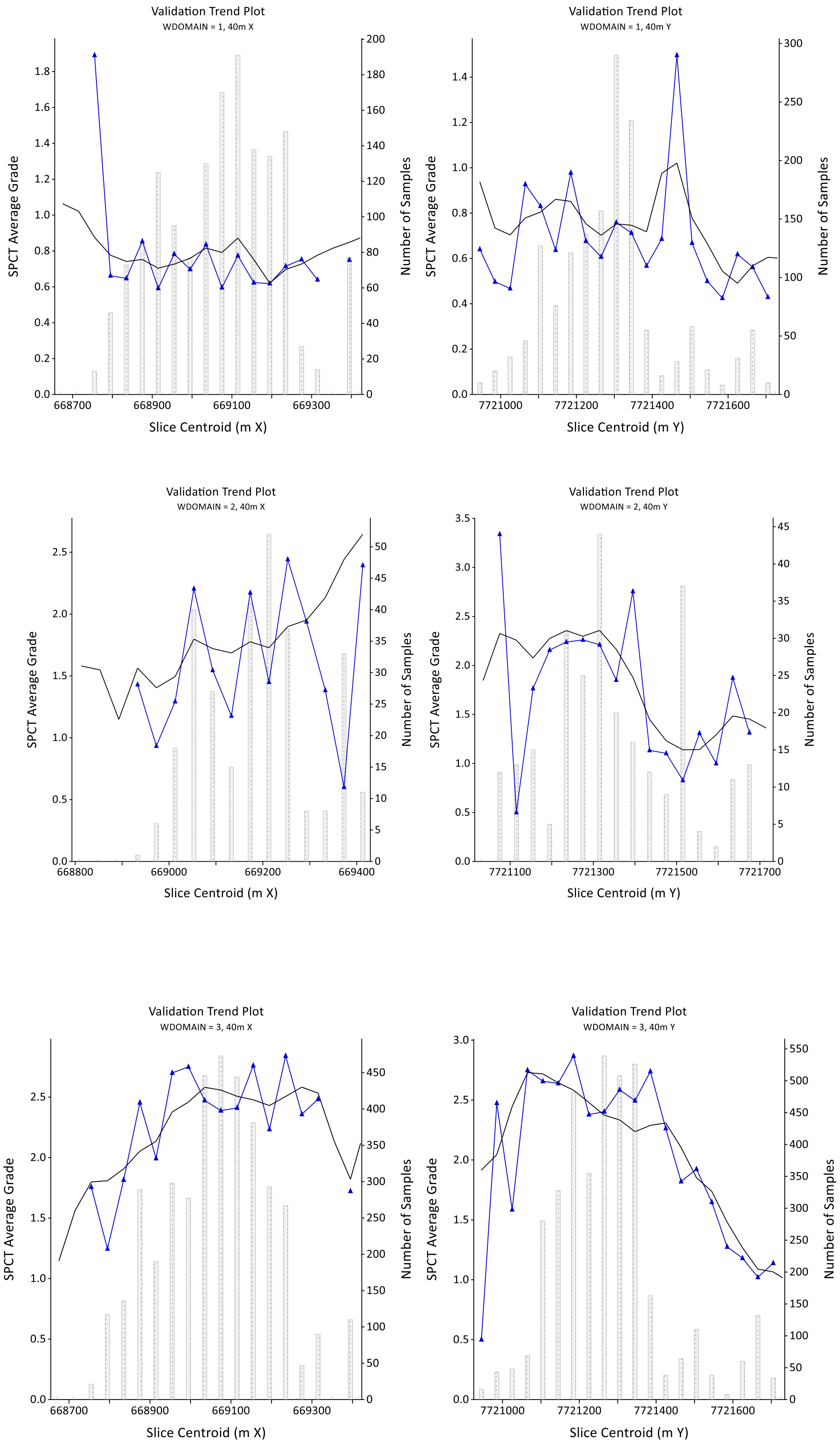


Figure 14-20: Swath Plots for TGC and S estimates (MSA, 2021)

Note: *blue line = declustered data; black line = estimates*

14.12 CLASSIFICATION

The estimates were classified into Measured, Indicated and Inferred Mineral Resource categories as defined by the CIM Definition Standards for Mineral Resources and Mineral Reserves (2014). The following factors were considered during the Mineral Resource classification:

- the reliability of the drilling data;
- confidence of the geological model, geological and structural interpretation; and
- grade continuity.

The historical database has been verified through examination of drillhole logs and assay certificates. Cores were randomly selected on site and verified against drillhole logs. QA/QC analyses of the data show adequate accuracy and precision in the Gecko data, while the Imerys-Gecko assay data were assessed with field duplicates only. None of the RUL duplicate data are available for assessment. Bias testing between the different drilling campaigns shows similar TGC grade distributions.

The collar positions could not be verified by the Geology QP because the areas were inaccessible or covered with thick vegetation. The QP is satisfied that the signed off reports by the surveyors who completed the collar surveys provide for a reasonable audit trail.

The depth limit of the mineralization is not clear and appears to be open at depth. Un-sampled drillholes have defined the lateral extents over much of the area in the north. The extents were limited to 100 m extrapolation from the nearest sampled and assayed mineralised drillhole intersection for the rest of the Mineral Resource.

The Mineral Resource is classified on the basis of TGC estimates as the main variable of economic interest.

- Modelled mineralisation covered by a 50 m by 50 m grid, that includes the highest confidence Gecko drilling, was classified as Measured Mineral Resources. The Measured Mineral Resource was extrapolated by 25 m laterally and by 5 m from the base of drillholes at depth:
- Areas drilled at a grid of 50 m to 100 m spacing were classified as Indicated Mineral Resources. The Indicated Mineral Resource was extrapolated by 50 m laterally and by 10 m from the base of drillholes at depth; and
- Areas covered by drilling at wider than 100 m spacing, or in the north-west where the area appears to be more geologically complex, were classified as Inferred Mineral Resources. Inferred Mineral Resources were extrapolated to the lateral extent of the Mineral Resource model and by 25 m vertically from the base of drillholes at depth.

A plan of the classified Mineral Resource is shown in Figure 14-21.

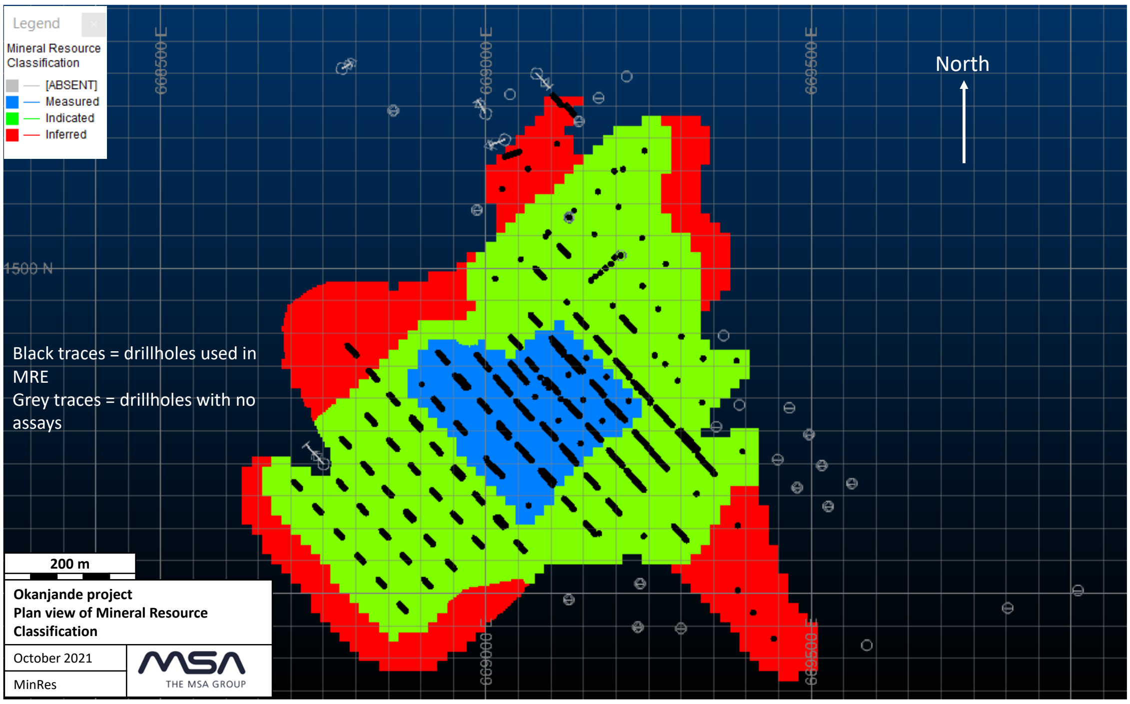


Figure 14-21: Mineral Resource Classification (MSA, 2021)

14.13 RECONCILIATION

Mining at Okanjande took place from early 2017 to October 2018. As part of grade control during mining, blast holes were drilled vertically at a spacing of 3 m. The blast holes were composited according to pre-determined blocks of approximately 15 m by 15 m prior to assaying. The blast holes are 5 m long on average. MSA completed a reconciliation against the Mineral Resource model in the same areas that the blast holes were drilled (Figure 14-22).

On average, the blast holes and Mineral Resource model TGC grades compare well, with a relative difference of -4%. The trend of the blast hole TGC grades conform to the trend of the Mineral Resource TGC estimates (Figure 14-22).

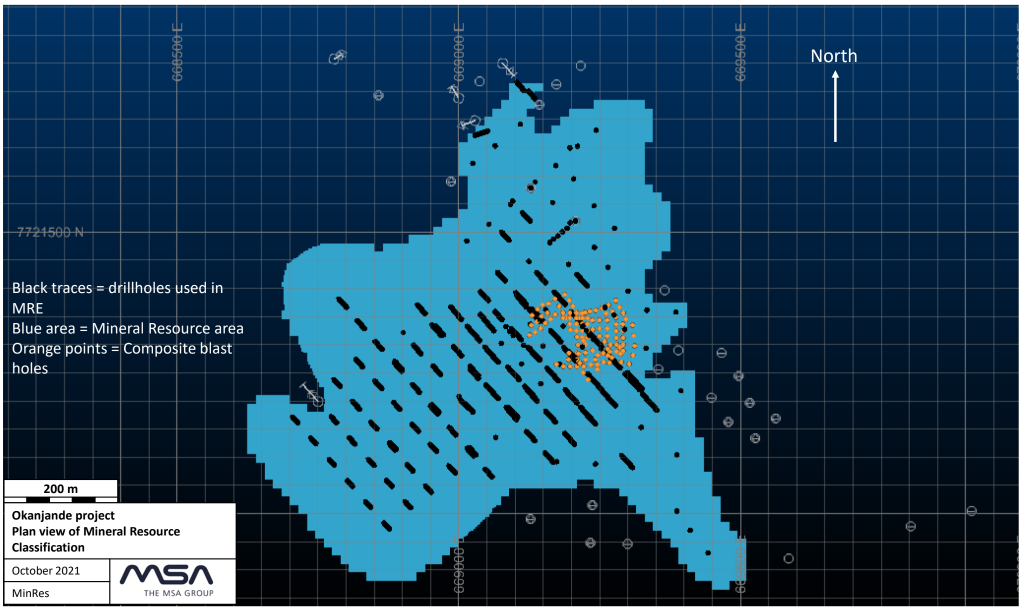


Figure 14-22: Plan view of the Mineral Resource reconciliation (MSA, 2021)

It is the QP's opinion that the reconciliation validates the estimated TGC grades, albeit over a limited area.

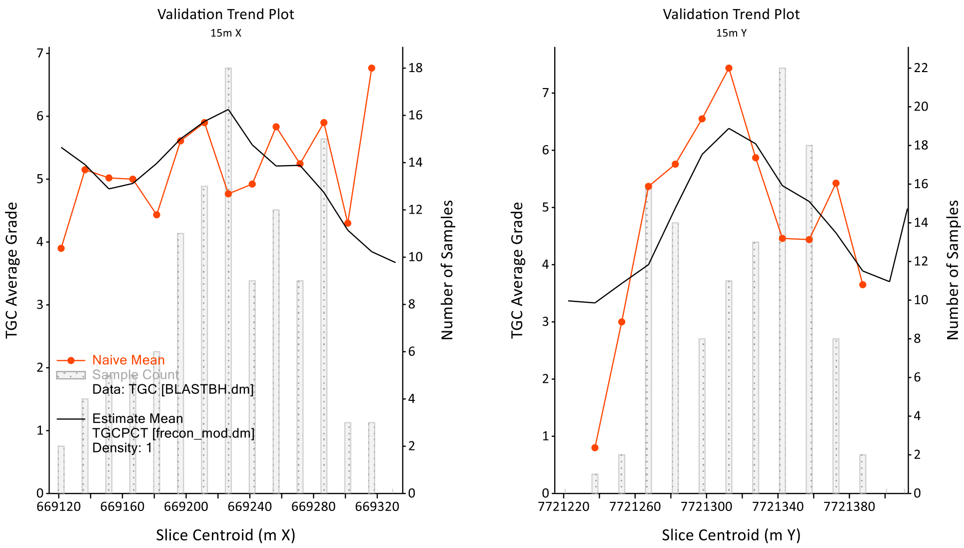


Figure 14-23: Reconciliation between Mineral Resource estimates and blast holes (MSA, 2021)

14.14 REASONABLE PROSPECTS FOR EVENTUAL ECONOMIC EXTRACTION (RPEEE)

MSA carried out a high-level economic analysis to determine "Reasonable Prospects for Eventual Economic Extraction" ("RPEEE") as required by CIM Definition Standards for Mineral Resources and Mineral Reserves (2014).

A conceptual pit shape was manually created with a pit slope angle of 50° for the fresh rock, and a Whittle pitshell was created with pit slope angle of 45° for the weathered rock in order to determine the stripping ratio (Figure 14-24). The maximum depth of the conceptual pit is 110 m, which is the depth of the model considered for Mineral Resources using the extrapolation distances described in Section 14.12. The fresh pit is at least 350 m to the mining license boundary. The cost and revenue assumptions are stated in Table 14-5.

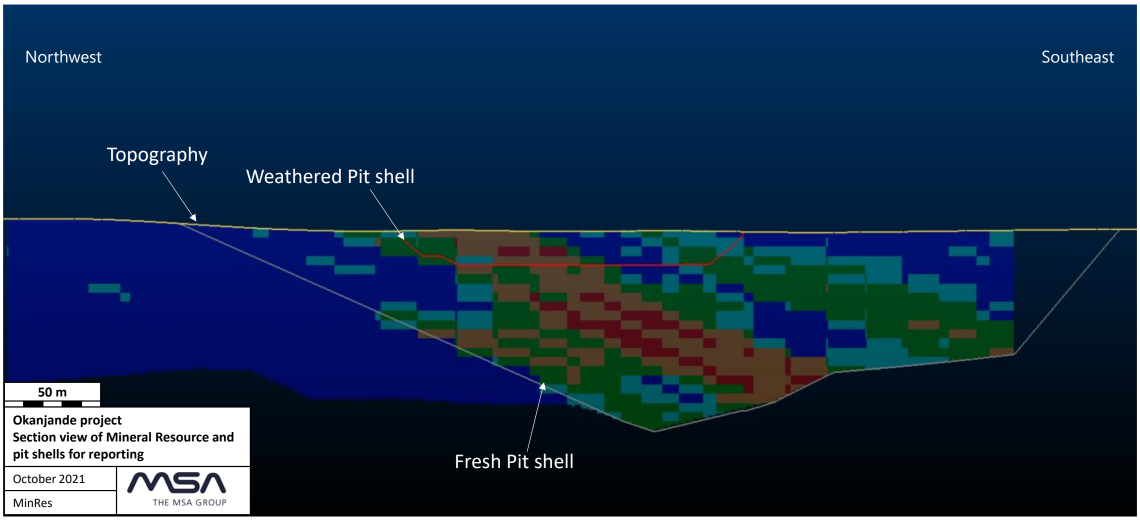


Figure 14-24: Section view of the block model and the pit shells used to report the Mineral Resource (MSA, 2021)

Table 14-5: Cost and Revenue assumptions for RPEEE (MSA, 2021)

Material type	Parameters	Value
Weathered and Transitional	Graphite Product Price	USD 1,250/tonne
	All in Mining Cost / Ore t (Stripping ratio 0.54)	USD 3.75/tonne
	Processing Cost	USD 14.9/tonne RoM
	G+A Cost	USD 0.8/tonne RoM
	Transport Cost (Okurusu Plant)	USD 6.5/tonne RoM
	Transport Cost (Market)	USD 175/tonne product
	Royalty	2%
	Recovery	92%
Fresh	Graphite Product Price	USD 1,250/tonne
	All in Mining Cost / Ore t (Stripping ratio 0.75)	USD 5.11/tonne
	Processing Cost	USD 17.9/tonne RoM
	G+A Cost	USD 0.96/tonne RoM
	Transport Cost (Okurusu Plant)	USD 6.5/tonne RoM
	Transport Cost (Market)	USD 175/tonne product
	Royalty	2%
	Recovery	92%

Costs and revenue inputs assume the following:

- Mineralisation will be either be processed at a modified plant at Okurusu that is 80 km from the Okanjande Mine or a new plant to be constructed at the Okanjande site. The plant may be further modified if/ when fresh rock is processed;
- The recovery is based on historical pilot plant performance and test work in progress (refer to section 6 History and section 13.3.2 Flowsheet Confirmation Test Work, METPRO/SGS 2021);
- Mining costs are based on approximate contractor quotations provided for the operation;
- Processing costs are based on study work done by URE Consulting Inc – by D Marsh, now of Northern Graphite;
- Transport costs are based on quotes received from Manitoulin Global Forwarding;
- Product price is based on market study summarised in Section 19 of the of the Mineral Resource report dated 15 December 2021.
- Fresh mineralisation, mining and processing costs were adjusted for the increased stripping ratio and higher cost of mining and milling harder rock.

The assessment to satisfy the criteria of Reasonable Prospects for Eventual Economic Extraction (RPEEE) is not an attempt to estimate Ore Reserves and does in no way whatsoever imply that the Project has been demonstrated to be economical.

14.15 MINERAL RESOURCE STATEMENT

The Weathered Mineral Resource, as at November 29, 2021, is reported in accordance with the CIM Definition Standards for Mineral Resources and Mineral Reserves (2014), as reported in Table 14-6.

Table 14-6: Weathered Mineral Resource at a cut-off grade of 2.6% TGC as at 29 November 2021 (MSA, 2021)

Material	Classification Category	Tonnes (Mt)	TGC (%)	Graphite content (kilo tonnes)
Weathered	Measured	1.7	4.66	80
	Indicated	4.2	4.03	168
	Subtotal	**5.9**	**4.21**	**248**
	Inferred	0.5	3.45	17
Transitional	Measured	0.2	5.42	13
	Indicated	1.0	4.08	40
	Subtotal	**1.2**	**4.35**	**53**
	Inferred	0.1	3.20	2

Notes:

1. All tabulated data have been rounded and as a result minor computational errors may occur.
2. Mineral Resources which are not Ore Reserves have no demonstrated economic viability.
3, Inferred Mineral Resources are reported separately from other categories.
4. The Mineral Resources reported are the total Mineral Resources for the Project, regardless of ownership.
5. The Mineral Resource is reported for mineralization contained within pit shells above a cut-off grade of 2.6% TGC, which is based on a product price of USD 1,250/t TGC, mining costs of USD 3.75/t RoM, transport cost to plant of USD 6.5/t RoM, processing and treatment costs of 14.9 USD/t (RoM), G&A USD 0.8/t (RoM), transport cost to the market USD 175/t product, 2% royalty, concentrate recovery 92%.

6. *MSA is not aware of any known environmental, permitting, legal, title-related, taxation, socio-political, marketing, or other relevant issue that could materially affect the Mineral Resource Estimate.*
7. *The Inferred Mineral Resource has a lower level of confidence than that applying to an Indicated Mineral Resource and must not be converted to a Mineral Reserve. It is reasonably expected that the majority of Inferred Mineral Resources could be upgraded to Indicated Mineral Resources with continued exploration.*

Table 14-8, and Figure 14-25 and Figure 14-26 represent grade tonnage tables and plots for the Weathered Mineral Resource reported within the pitshells. The tables and plots are prepared for Measured and Indicated Mineral Resources and separately for Inferred Mineral Resources.

Table 14-7: Grade Tonnage table for Measured and Indicated Weathered Mineral Resource within the pitshells as at 29 November 2021 (MSA, 2021)

TGC Cut-off grade (%)	Tonnes above cut-off grade	Average grade above cut-off grade (%)
2.0	9.1	3.82
2.5	7.4	4.17
2.6	7.1	4.24
3.0	5.9	4.54
3.5	4.5	4.92
4.0	3.5	5.28
4.5	2.5	5.70
5.0	1.8	6.07

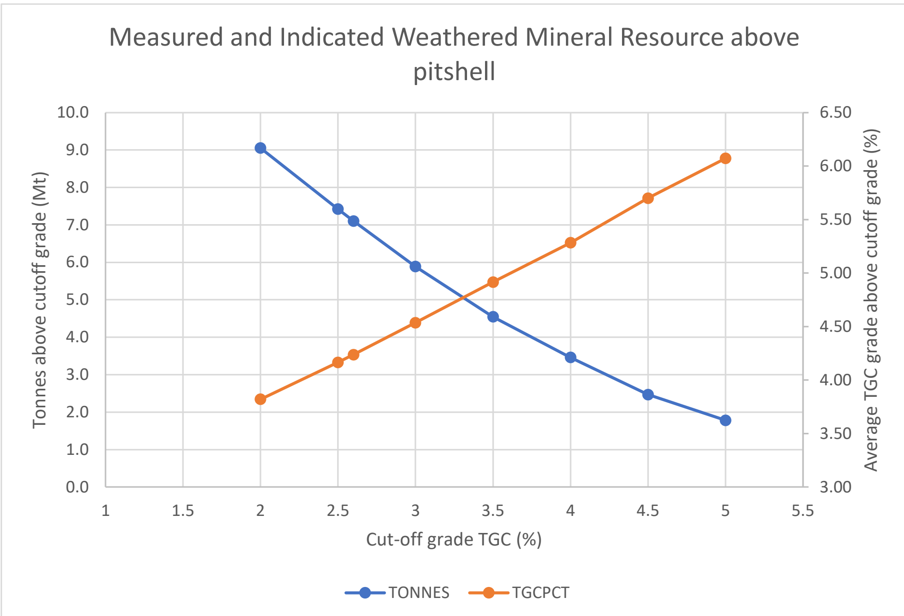


Figure 14-25: Weathered Mineral Resource Grade Tonnage plot within the pitshells as at 29 November 2021 (MSA, 2021)

Table 14-8: Grade Tonnage table for Inferred Weathered Mineral Resource within the pitshells as at 29 November 2021

TGC Cut-off grade (%)	Tonnes above cut-off grade	Average grade above cut-off grade (%)
2.0	0.8	3.04
2.5	0.6	3.36
2.6	0.6	3.42
3.0	0.4	3.69
3.5	0.2	4.18
4.0	0.1	5.09
4.5	0.0	5.51
5.0	0.0	5.87

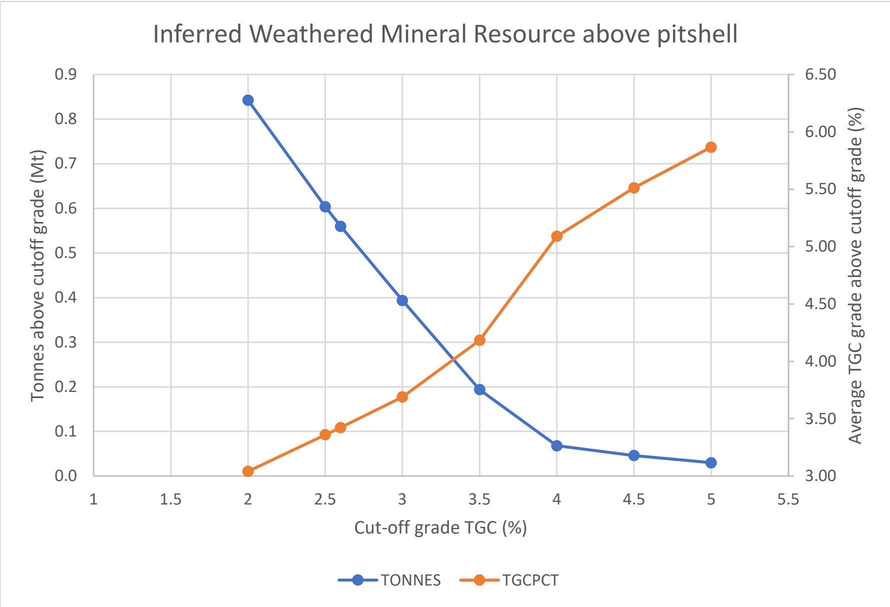


Figure 14-26: Grade Tonnage plot for Inferred Weathered Mineral Resource within the pitshells as at 29 November 2021

The Fresh Mineral Resource, as at 29 November 2021, is reported in accordance with the CIM Definition Standards for Mineral Resources and Mineral Reserves (2014), as reported in Table 14-9.

Table 14-9: Fresh Mineral Resource at a cut-off grade of 3.1% TGC as at 29 November 2021 (MSA, 2021)

Classification Category	Tonnes (Mt)	TGC (%)	Graphite content (kilo tonnes)
Measured	7.1	5.86	419
Indicated	17.0	5.10	868
Subtotal	**24.2**	**5.33**	**1,287**
Inferred	7.2	5.02	359

Notes:

1. *All tabulated data have been rounded and as a result minor computational errors may occur.*
2. *Mineral Resources which are not Ore Reserves have no demonstrated economic viability.*
3, *Inferred Mineral Resources are reported separately from other categories.*
4. *The Mineral Resources reported are the total Mineral Resources for the Project, regardless of ownership.*
5. *The Mineral Resource is reported for mineralization contained within a Whittle pit shell above a cut-off grade of 3.1% TGC, which is based on a product price of USD 1,250/t TGC, mining costs of USD 5.11/t RoM, transport cost to plant of USD 6.5/t RoM, processing and treatment costs of 17.88 USD/t (RoM), G&A USD 0.96/t (RoM), transport cost to the market USD 175/t product, 2% royalty, concentrate recovery 92%.*
6. *MSA is not aware of any known environmental, permitting, legal, title-related, taxation, socio-political, marketing, or other relevant issue that could materially affect the Mineral Resource Estimate.*
7. *The Inferred Mineral Resource has a lower level of confidence than that applying to an Indicated Mineral Resource and must not be converted to a Mineral Reserve. It is reasonably expected that the majority of Inferred Mineral Resources could be upgraded to Indicated Mineral Resources with continued exploration.*

Table 14-10 and Table 14-11, and Figure 14-27 and Figure 14-28 represent grade tonnage tables and plots for the Fresh Mineral Resource reported within the pitshell. The tables and plots are prepared for Measured and Indicated Mineral Resources and separately for Inferred Mineral Resources.

Table 14-10: Grade tonnage table for Measured and Indicated Fresh Mineral Resource within the pitshell as at 29 November 2021 (MSA, 2021)

TGC Cut-off grade (%)	Tonnes above cut-off grade	Average grade above cut-off grade (%)
3.0	24.8	5.27
3.1	24.2	5.33
3.5	21.7	5.55
4.0	18.8	5.83
4.5	16.0	6.11
5.0	13.0	6.43
5.5	10.4	6.73
6.0	7.9	7.04

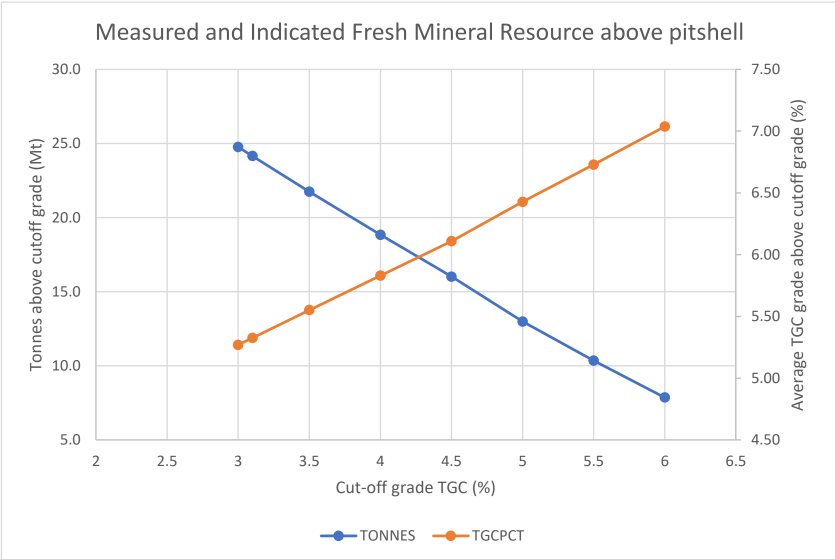


Figure 14-27: Grade Tonnage plot for Measured and Indicated Fresh Mineral Resource within the pitshell as at 29 November 2021 (MSA, 2021)

Table 14-11: Grade Tonnage table for Inferred Fresh Mineral Resource within the pitshell as at 29 November 2021 (MSA, 2021)

TGC Cut-off grade (%)	Tonnes above cut-off grade	Average grade above cut-off grade (%)
3.0	7.6	4.91
3.1	7.2	5.02
3.5	6.0	5.35
4.0	4.8	5.74
4.5	3.9	6.09
5.0	3.0	6.48
5.5	2.4	6.80
6.0	1.9	7.10

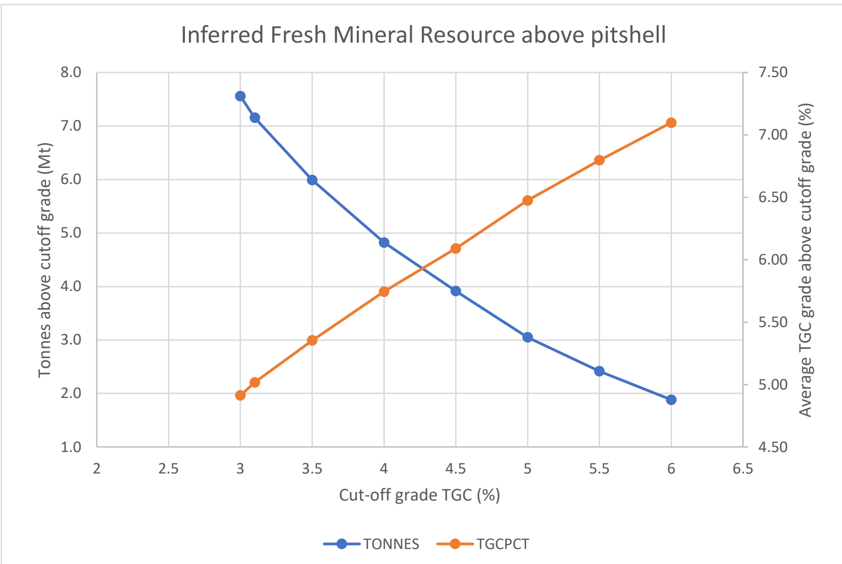


Figure 14-28: Grade Tonnage plot for Inferred Fresh Mineral Resource within the pitshell as at 29 November 2021 (MSA, 2021)

15 MINERAL RESERVE ESTIMATES

No mineral reserve estimate available at the time of writing.

16 MINING METHODS

(This section was compiled by The MSA Group Pty. Ltd., with section 16.5 by Knight Piésold Consulting (Pty) Ltd.)

16.1 BACKGROUND

The Okanjande graphite deposit lends itself to being mined by opencast mining methods. The intention is to mine at an average rate of 631,450 tonnes of mineralised material per year which will be transported to the Okorusu plant for treatment.

This report considers a 10-year mining plan, commencing with the mining of the weathered graphite-bearing material and ending with a short period of mining the transitional and fresh graphite-bearing material underlying the weathered material. The Okanjande Deposit was mined from August 2017 until October 2018, when mining ceased and the Okanjande Mine was placed on care and maintenance. The run of mine ("RoM") graphite-bearing material was trucked to Okorusu for processing.

The intention is to mine the Okanjande deposit by making use of contractors who will supply their own mining equipment to deliver the graphite-bearing material to a product stockpile and the balance to a waste rock dump. Overburden will be stockpiled on a separate overburden stockpile. It is not envisaged that any waste material will be backfilled into the pit at this stage as there is further fresh graphite-bearing material at depth; this fresh graphite-bearing material will be the subject of a future economic assessment.

The mining contractors will also be responsible for crushing the ore (single stage jaw crusher) and loading into side tippers to be transported to the plant at Okorusu.

16.2 MINE SCHEDULING

The Minex geological model, which was reviewed by the MSA Mineral Resources team, was uploaded into Deswik mine design software. A pit shell was defined incorporating only the weathered graphite-bearing material and using geotechnical parameters as defined in the previous mine design contemplated by Imerys-Gecko. This pit shell did not yield the required tonnage for a 10-year mine plan at a planned production of 630,000 tonnes per annum ("tpa"). The pit shell was then reconfigured and expanded to include some of the transitional and fresh graphite-bearing material in order to achieve a 10-year life of mine at a production rate of approximately 630,000 tpa graphite-bearing material to achieve approximately 30,000 tonnes of product per annum (Figure 16-1). A recovery of 92% was used to determine the final saleable product.

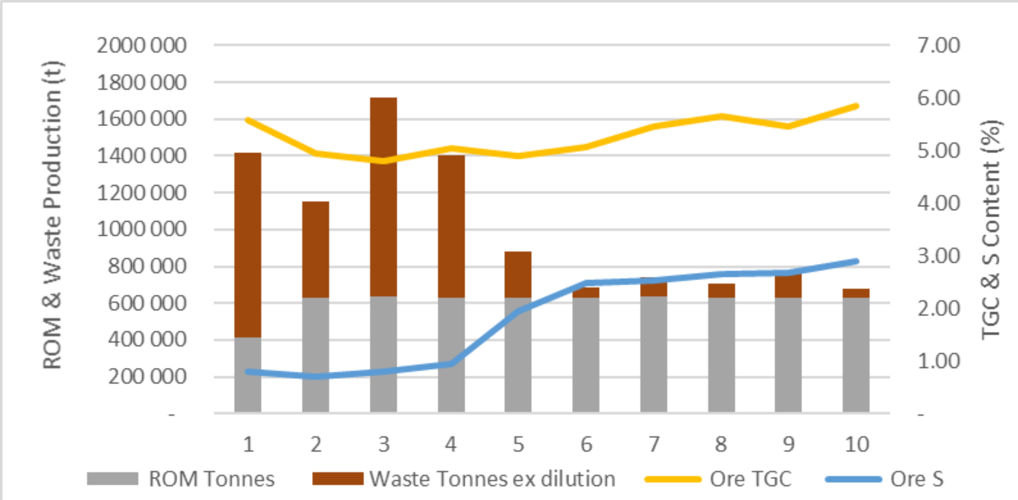


Figure 16-1: Production Profile (MSA, 2021)

16.2.1 Pit Design Parameters

The open pit design parameters considered are summarised below:

- Bench heights: 5m
- Bench widths: 10 m to 70m
- Slope angles: 45° to 55°
- Cut-off Grade: 3% TGC
- Dilution to RoM tonnes: 2%
- Recovery: 92%.

16.2.2 Schedules

16.2.2.1 Base Case 4% TGC Cut-off

Using the above design parameters, a mining schedule was developed to mine at a rate of approximately 630,000 tpa at an average Stripping Ratio (“S/R”) of 0.66 (tonnes of waste to one tonne of graphite-bearing material) over the 10-year period (Table 16-1). The first four years consider only mining the weathered graphite-bearing material. In the second quarter of Year 5 the mining of Fresh graphite-bearing material begins and continues until the end of the 10-year period. The ramp up to full production is rapid, with the first year’s mining opening up the pit utilizing the current established faces (in the historic Okanjande open pit) to create pit room to sustain the maximum tonnage required.

The total Graphite production at a 4% TGC cut-off over the 10-year LOM is 295 425 tonnes at an average rate of 29 543 tonnes per annum (tpa).

Table 16-1: 10-year mining schedule @4% TGC cut-off (MSA, 2021)

	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	TOTAL
Total Mining (t)	1 419 921	1 154 011	1 715 632	1 401 837	878 519	685 038	738 987	707 697	764 570	675 780	**10 141 990**
Waste (t)	1 009 479	522 561	1 082 452	770 387	247 069	53 588	105 807	76 247	133 120	44 330	**4 045 040**
ROM (t)	410 443	631 450	633 180	631 450	631 450	631 450	633 180	631 450	631 450	631 450	**6 096 950**
TGC %	5.58	4.95	4.81	5.05	4.90	5.06	5.46	5.65	5.47	5.86	**5.27**
S %	0.79	0.71	0.79	0.95	1.94	2.48	2.54	2.65	2.69	2.90	**4.85**
S/R	2.46	0.83	1.71	1.22	0.39	0.08	0.17	0.12	0.21	0.07	**0.66**
Product TGC (t)	21 070	28 756	28 019	29 337	28 453	29 395	31 806	32 823	31 777	34 043	**295 480**

Mining is performed by two excavator teams operating at a rate of 3,000 tonnes per day (“tpd”) on both the waste and ore (Table 16-2). 2 teams will be required for the first 5 years, reducing to 1 team for the last 5 years.

Table 16-2: Production Capacity

Quantity		Production Rate 3000 tpd	
	Days per Month	22	
2	Excavator	132,000	tpm
12	Months	1,584,000	tpa

Notes: ***Additional Waste stripping will be required to be stripped in year 2 to reduce the stripping requirement in year 3 where the required capacity is higher that the equipment capacity.***

The progress plots in (Figure 16-2) and schedules (Table 16-3 and Table 16-4) show the mining advance over the 10-year plan. In the progress plots, the pink represents the weathered material while the blue represents the fresh material to be mined (the orange around the edges shows the final pit shell). In Year 1, mining starts in the southwest portion of the pit and opens in all directions to create pit room. The volume of waste is high in the first year due to the expansion of the pit; this contributes to the high strip ratio in the first year of 2.46 tonnes of waste per one tonne of graphite-bearing material. The total tonnage to be mined decreases as the waste decreases, so equipment requirements will decrease after the first 5 years.

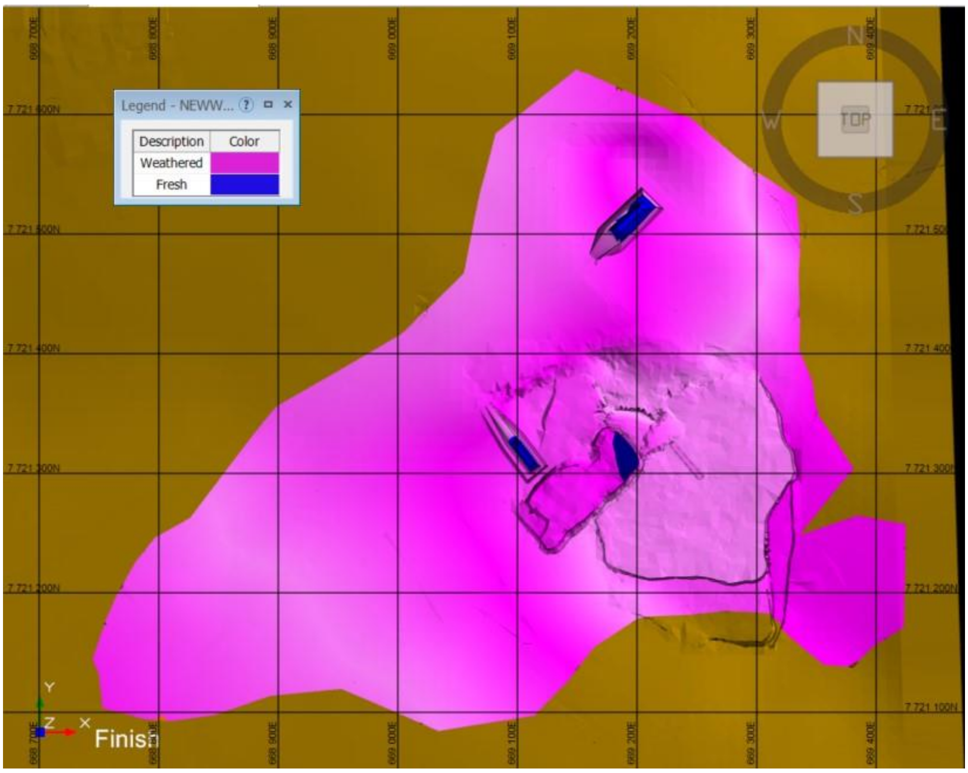
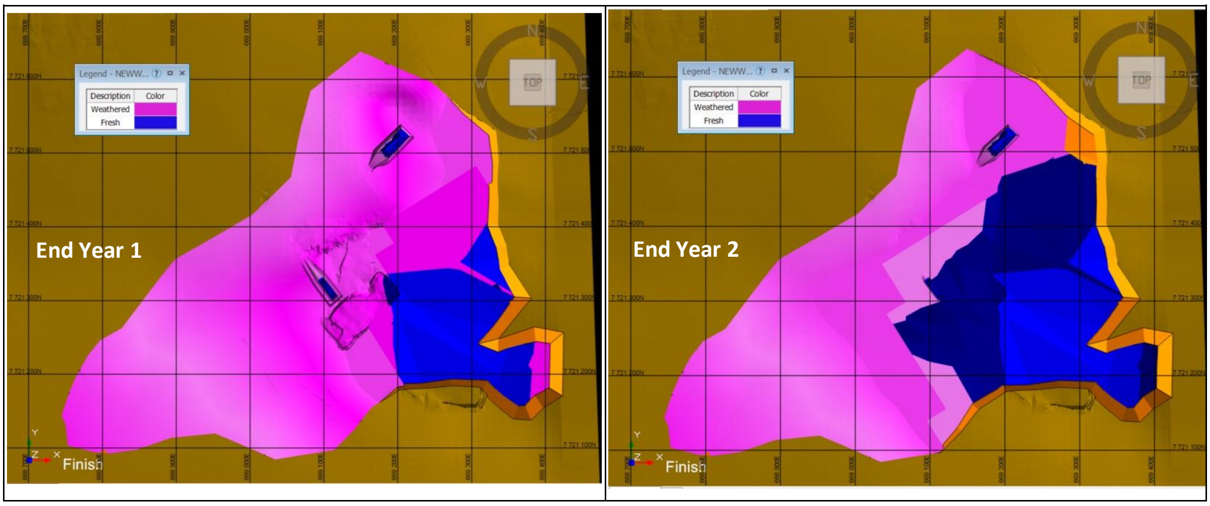
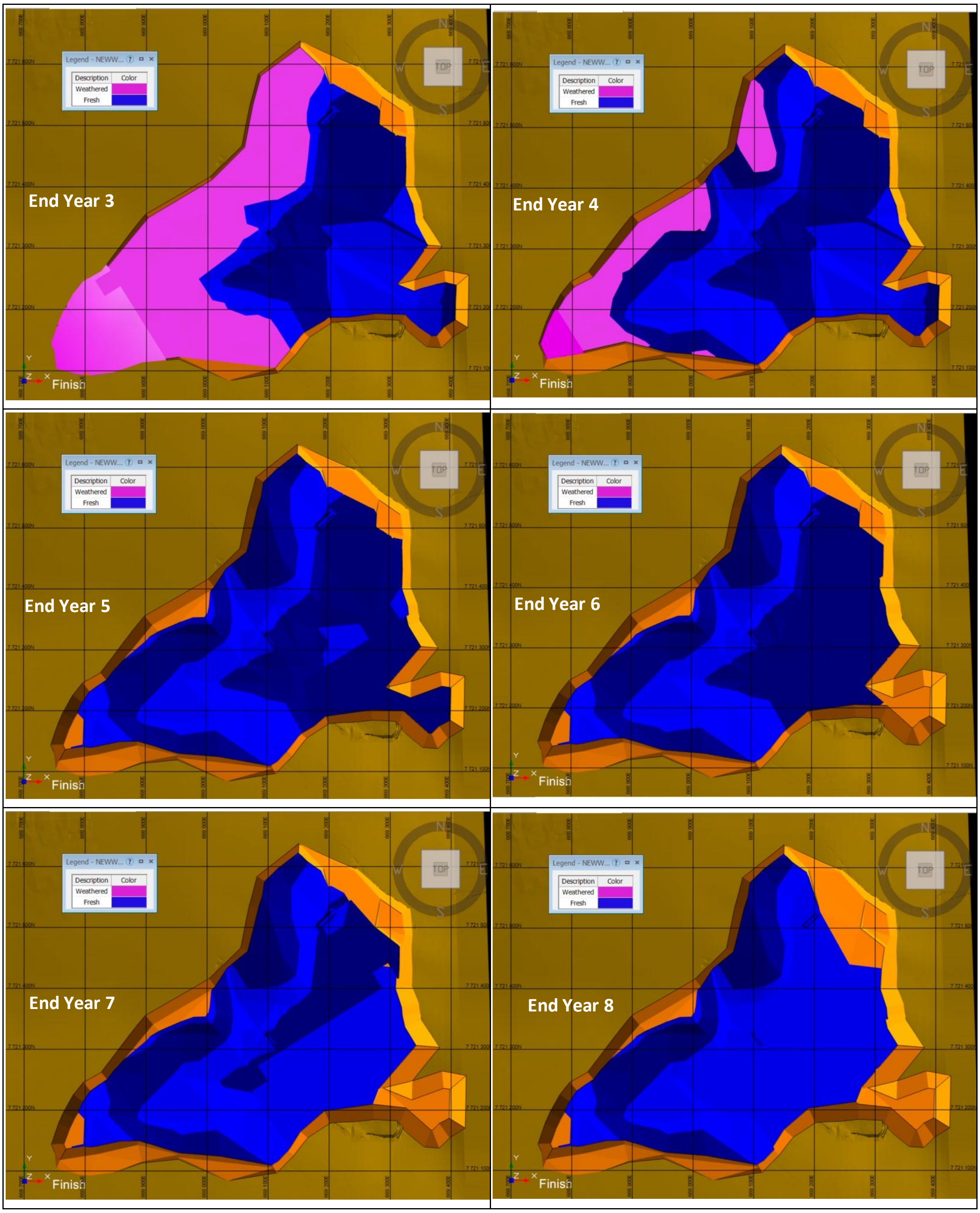


Figure 16-2: Okanjande Pit at start of Mining (MSA, 2021)

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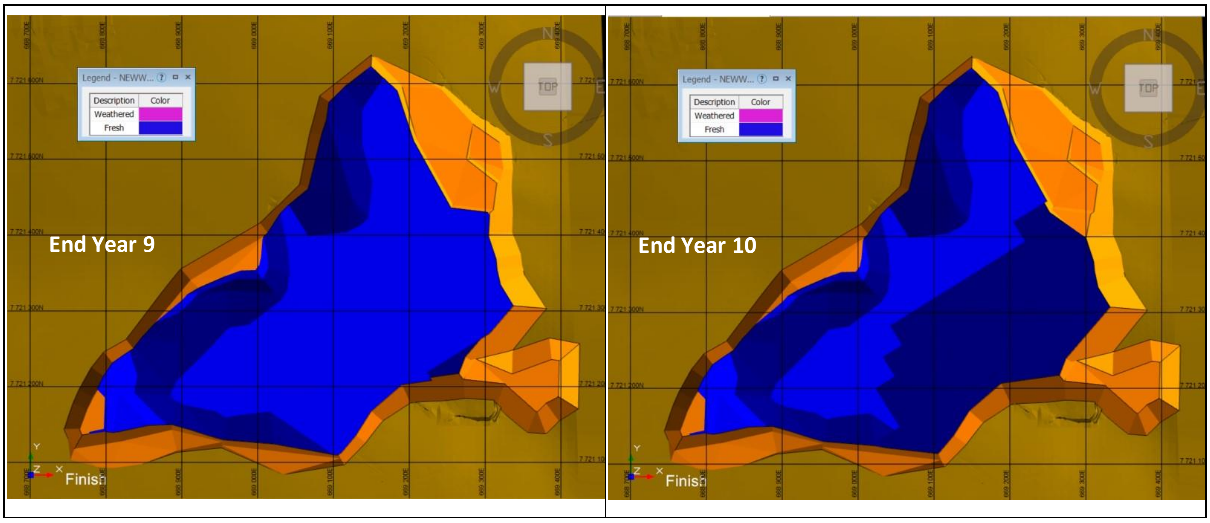

Figure 16-3: Okanjande 10-year Pit Progress Plots (MSA, 2021)

Table 16-3: Mining Schedule – Weathered graphite-bearing material (MSA, 2021)

	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	TOTAL
ROM (t)	410 442	631 450	633 179	631 450	234 102	-	-	-	-	-	2,540,623
TGC %	5.58	4.95	4.81	5.05	4.86	-	-	-	-	-	5.03
S %	0.79	0.71	0.79	0.95	1.03	-	-	-	-	-	0.83
Product TGC (t)	21 068	28 775	27 996	29 330	10 458	-	-	-	-	-	117,650

Table 16-4: Mining Schedule – Fresh graphite-bearing material (MSA, 2021)

	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	TOTAL
ROM (t)	-	-	-	-	397 347	631 450	633 180	631 450	631 450	631 450	3,556,327
TGC %	-	-	-	-	4.92	5.06	5.46	5.65	5.47	5.86	5.44
S %	-	-	-	-	2.48	2.48	2.54	2.65	2.69	2.90	2.63
Product TGC (t)	-	-	-	-	17 992	29 381	31 800	32 828	31 761	34 035	177,829

16.2.2.2 Increasing and Decreasing TGC Cut-off

An exercise was carried out to look at the effect of increasing and decreasing the cut-off grade to see the effect on the Graphite production, depletion of weathered material and total tonnes moved. Table 16-5 below shows the results for 3, 3.5, 4, 4.5 and 5% TGC cut-offs. The base case of 4%TGC is highlighted.

Table 16-5: 10-year Mining Schedule @ 3, 3.5, 4, 4.5 and 5% TGC cut-off (MSA, 2021)

	3.0%	3.5%	4.0%	4.5%	5.0%
Total Tonnes	8 464 034	9 193 913	**10 141 990**	11 086 863	11 938 342
Waste Tonnes	2 347 081	3 096 960	**4 045 040**	4 989 909	5 849 142
ROM Tonnes	6 096 953	6 096 953	**6 096 950**	6 096 953	6 089 199
TGC	4.75	5.00	**5.27**	5.41	5.50
S	1.40	1.61	**1.88**	2.11	2.48
S/R	0.38	0.51	**0.66**	0.82	0.96
Product Tonnes	266 338	280 259	**295 480**	303 441	308 119

The total Graphite production increases as the cut-off percentage increases with increased waste produced and the weathered material is mined more quickly.

The mining of fresh graphite material starts one year earlier for each half percent increase in cut-off grade. Starting at year 7 at the 3% cut-off it reduces to year 3 at 5% cut off.

The tables below show the mining schedules for the 3.5% and 4.5% cut-off grades, at 3.5% cut-off the weathered material is depleted in year 6 of mining and at 4.5% it is depleted in year 4.

Table 16-6: Mining Schedule @3.5% TGC cut-off

	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	TOTAL
Waste (t)	712,209	301,899	551,091	555,711	420,592	171,711	110,700	107,731	68,914	96,400	**3,096,960**
Weathered											
ROM (t)	410,443	631,450	633,180	631,450	631,450	457,784	-	-	-	-	**3,395,756**
Grade (% TGC)	4.75	4,95	4.64	4.57	4.60	4.76	-	-	-	-	**4.71**
Grade (% S°)	0.76	0.76	0.76	0.83	0.97	0.93	-	-	-	-	**0.84**
Concentrate (t)	17,931	28,779	27,055	26,542	26,742	20,065	-	-	-	-	**147,114**
Fresh											
ROM (t)	-	-	-	-	-	173,666	633,180	631,450	631,450	631,450	**2,701,196**
Grade (% TGC)	-	-	-	-	-	4.50	5.11	5.30	5.51	5.75	**5.36**
Grade (% S°)	-	-	-	-	-	2.35	2.51	2.42	2.65	2.86	**2.59**
Concentrate (t)	-	-	-	-	-	7,194	29,773	30,763	32,027	33,387	**133,144**
Total Mining (t)	**1,122,652**	**933,349**	**1,184,271**	**1,187,161**	**1,052,042**	**803,161**	**743,880**	**739,181**	**700,364**	**727,850**	**9,193,912**
Total Concentrate	**17,931**	**28,779**	**27,055**	**26,542**	**26,742**	**27,259**	**29,773**	**30,763**	**32,027**	**33,387**	**280,258**

Table 16-7: Mining Schedule @4.0% TGC cut-off

	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	TOTAL
Waste (t)	1,347,566	1,278,819	1,552,292	242,060	100,981	50,447	99,233	110,168	44,330	164,012	**4,989,909**
Weathered											
ROM (t)	410,442	631,450	633,180	87,682	-	-	-	-	-	-	**2,540,626**
Grade (% TGC)	5.80	5.21	5.29	5.27	-	-	-	-	-	-	**5.38**
Grade (% S°)	0.78	0.77	0.90	1.11	-	-	-	-	-	-	**0.84**
Concentrate (t)	21,885	30,271	30,791	4,255	-	-	-	-	-	-	**87,203**
Fresh											
ROM (t)	-	-	-	534,769	631,450	631,450	631,450	631,450	631,450	631,450	**3,556,328**
Grade (% TGC)	-	-	-	4.97	5.06	5.60	5.64	5.60	5.74	5.28	**5.39**
Grade (% S°)	-	-	-	2.40	2.43	2.73	2.69	2.65	2.93	2.56	**2.69**
Concentrate (t)	-	-	-	24,857	29,386	32,538	32,852	32,549	33,359	30,696	**216,237**
Total Mining (t)	**1,758,009**	**1,910,269**	**2,185,472**	**873,510**	**732,431**	**681,897**	**732,413**	**741,618**	**675,780**	**795,462**	**11,086,863**
Total Concentrate	**21,885**	**30,271**	**30,791**	**29,112**	**29,386**	**32,538**	**32,851**	**32,549**	**33,359**	**30,696**	**303,441**

16.3 MINING RECOVERY

Given the nature of the Okanjande deposit, 92% recovery with 2% dilution is anticipated, the dilution is based on barren rock within the Okanjande deposit which is randomly dispersed and differs in thickness and orientation throughout. The Strip ratio of the Okanjande deposit is low for the 4% TGC cut-off and the relatively small amount of waste rock is stockpiled on a dedicated rock dump.

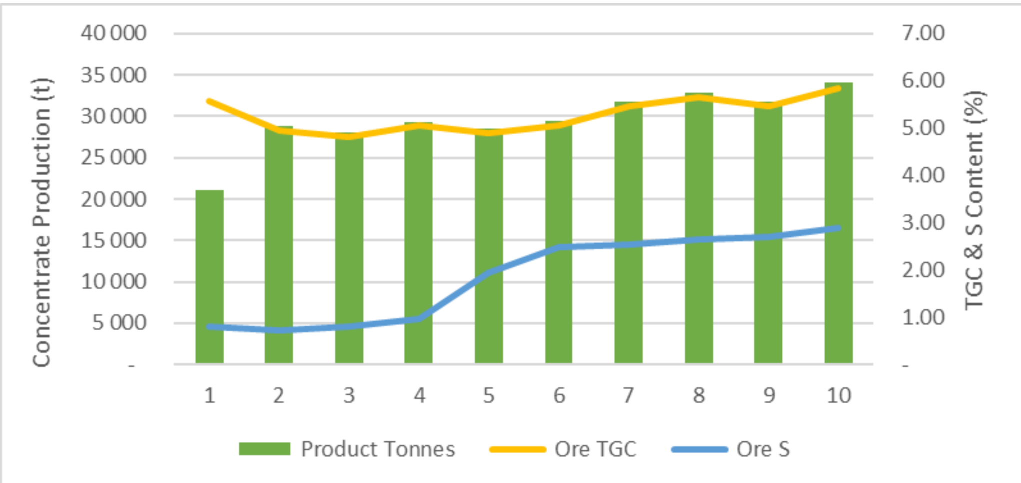

Figure 16-4: Okanjande Graphite Concentrate Product per year @ 4% TGC cut-off (MSA, 2021)

16.4 MINING EQUIPMENT

The following mining equipment is proposed to undertake the mining of the graphite-bearing material and waste at the Okanjande deposit, as well as for loading of the road trucks (Table 16-8).

Table 16-8: Mining Equipment

Quantity	Description	Size / Capacity
2	Excavator 60 t	60 t
5	Articulated Dump Trucks ("ADTs")	30 t
1	Drill Rig	Top Hammer 102mm diameter
1	Track Dozer	40 t
1	Motor Grader	CAT140/Bell 770
1	Water Bowser	15,000 *l*
1	Lubrication Service Truck	
2	Front End Loader ("FEL")	3 -5 m^3
1	Diesel Bowser	15,000 *l*

In addition to the mining equipment specified above (Table 16-8), Light Delivery Vehicles (LDVs) for supervisors and support staff are also required.

If crushing of the ROM ore at the Okanjande deposit is required an additional FEL and excavator to feed the crusher will be required on the site.

16.4.1 Drilling and Blasting

It is proposed that holes of 102 mm diameter are drilled into mineralised material and waste to get a final powder factor of 0.7 kg/m^3.

To achieve this powder factor with 102 mm holes and 5 m high benches, each bench is drilled on a 3 m by 3 m pattern and charged with an emulsion explosive agent. If one considers a charge length of 3 m and an emulsion density of 1.3, the mass of explosives per hole will be approximately 32 kg. The powder factor can be increased by reducing the burden and spacing if the fragmentation needs to be increased.

Drilling and blasting is planned to be done by the mining contractor or by their sub-contractor. Blocks corresponding to a week's loading are to be drilled and blasted on a weekly basis. On blasting day, the explosive supplier does a bench delivery of emulsion and accessories for that blast and the mining contractor oversees the blast.

16.4.2 Mining Cost

Mining costs for the operation were obtained from three budget quotations provided by mining contractors in Namibia. A review of the costs by URE Consulting Inc concludes that costs provided by two contractors were very similar and recommended the figures in Table 16-9 be used in the economic assessment of the Okanjande deposit and that closer to the start of mining, two of the three contractors will be asked for full and final quotes.

The mining cost considered is a combination of Preliminary and General, Load and Haul and Drill and Blast costs and is summarised in Table 16-9. Also included is the loading of the road trucks (PBS trucking system) and transportation of the graphite-beating material to the Okorusu plant. These costs are wet rates and include the cost of diesel which will either be supplied by the owner or the contractor, subject to final negotiations.

Table 16-9: Mining and Transport Costs (Namibian Dollar)

Operating Costs	Units	Cost
Establishment and De-establishment	N$, Once-off	3,064,250
P&Gs	N$/a	12,862,591
Load, haul and dump top soil	N$/m³	51.45
Drill & blast waste and ore	N$/m³	43.84
Load, haul and dump waste	N$/m³	51.45
Load haul and stockpile ore	N$/t	56.47
Hauling Ore to Okorusu	N$/t	96.83

Drilling and blasting costs are estimated using a powder factor of 0.6 kg/m^3 and will be higher if the recommended powder factor of 0.7 kg/m^3 is used.

There are additional *ad-hoc* costs which have also been quoted for standing time, off-mine road maintenance and bush clearing.

The access road to the mine and the access road to the plant at Okorusu need to be maintained and the estimated cost for this from the quotes received is in the order of N$ 3.2 million per annum or N$ 5.07 per tonne of graphite-bearing material.

16.5 WASTE ROCK DUMP DESIGN (WRD)

(This section was compiled by Knight Piésold Consulting (Pty) Ltd.)

16.5.1 WRD Design Criteria

Table 16-10 summarises the design criteria and the assumed values of material properties for the design of the WRD. The life of mine waste rock production was provided by URE Consulting, which showed an initial 10 years of operation of the graphite pit from 2022 to 2031, yielding 3.12 Mt waste rock to be stored.

Table 16-10: Okanjande waste rock dump design criteria

Item no.	Item	Sub-Item	Value	Source
1	Mining Throughput	Design Life of Facility	10 years	URE Consulting
		Total Waste Rock Tonnes	3 119 121 tonnes	URE Consulting
		Total Waste Rock Volume	1 559 561m3	KP Calculated
		Waste Rock Annual Production	311 912 tpa	KP Calculated
2	Material Properties	Waste Rock SG	2.70	Imerys
		Waste Rock Void Ratio	35%	KP Assumed
		Waste Rock In-place Density	2.0 t/m3	KP Calculated
3	Embankment Section	Overall Slope	1V:3H	KP Assumed
		Bench Slope (if required)	1V:1.5H (Angle of repose)	KP Assumed
		Maximum Height Restrictions	None	KP Assumed

16.5.2 High Level WRD Design

The original Okanjande site plan as provided by IGG was to construct the WRD in the proposed TSF location as per Figure 16-5. KP considered a similar location and modelled the WRD on the one end of the approved footprint area, taking into consideration for potential expansion beyond the 10-year life. The WRD has been designed at an overall slope of 1V:3H, assuming that the facility would be benched which allows for the control of rainfall runoff and assists in closure of the facility. Furthermore, utilising a flatter slope is a conservative approach for this level of study. The WRD is shown in Figure 16-5 below, it has a footprint area of 12.7 ha, with a total of 3.12 Mt stored waste rock material and a final height of 23 m.

A high-level slope stability was not completed for the WRD. However, due to the WRD's low height and overall proposed slope of 1V:3H the slope stability is not envisioned to pose a design risk. It is recommended that a detailed slope stability assessment be completed during future studies. This analysis would require a geotechnical investigation to be completed to determine the foundation material parameters and the waste rock properties to be verified.

It is recommended that should WRD progress into detailed studies where the volume requirements are confirmed and the footprint optimised. Storm water management and drainage shall be designed during this phase of the study.

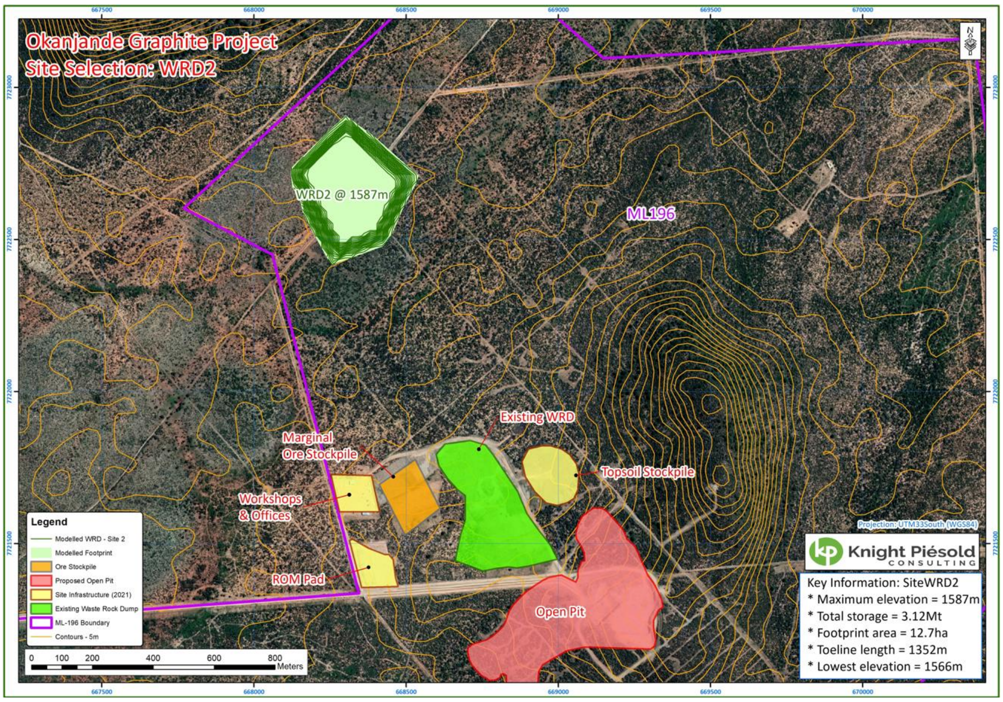

Figure 16-5: Okanjande WRD conceptual footprint

16.6 CONCLUSION

This 10-year mining plan (4%TGC cut-off) considers the mining of weathered as well as fresh graphite bearing material. The weathered material can be treated at the modified Okorusu Fluorspar plant and this can be done for the first 5 years of the mine plan at a 4%TGC cut-off grade. Once all the fresh material is accessed, Northern will be required to design the waste rock dump (WRD) at Okanjande and the tailings storage facility (TSF) at Okorusu to handle acid generating material. All testing to date indicates that the same processing flowsheet can be used for both fresh and hard rock.

If the cut-off grade is increased, the above adjustments to process the fresh graphite bearing material will be required sooner.

17 RECOVERY METHODS

(Prepared by CREO Engineering Solutions (Pty) Ltd.)

17.1 PREVIOUS IMERYS-GECKO PROCESS

The existing graphite processing plant at Okorusu, which was used to process Okanjande graphite ore during 2017-2018 is based on the Imerys Lac de Iles graphite operation in Quebec, Canada (Figure 17-1). This process relied heavily on the use of gravity spirals to up-grade flotation concentrates. While spirals can be a suitable technology to separate gangue from graphite, it is paramount that the graphite is well liberated to produce an acceptable concentrate. However, this degree of liberation is rarely observed after a primary grind and polishing and/or stirred media mills are required in the cleaning circuit to liberate the graphite flakes.

The plant struggled operationally to achieve nameplate production rates and concentrate grades. A number of design and operational issues were identified (METPRO, 2021):

- The rod mill had a high reduction ratio target of 22:1 based on a crush size of P80 = 10 mm and a mill discharge size of P80 = 425 microns. While reduction ratios of 2-20 are observed for rod mills, a more typical reduction ratio is approximately 8. Depending on the circulating loads, this large reduction ratio could translate into increased flake degradation.
- Graphite projects typically do not require the use of dispersants. The rougher circuit was fed from the grinding circuit at over 46% solids, which would likely have created high viscosities and gangue entrainment issues, which may have triggered the use of the dispersant Betamin. Rougher circuits are typically operated between 25% solids (clayish material) and 35% solids (fresh rock).
- Dowfroth 200 is a very strong poly glycol ether frother that produces a strong and persistent froth. This frother also tends to create entrainment issues in graphite flotation. It appears that the plant may have been switched over to Aerofroth 76A prior to shut down. Aerofroth 76A is a suitable frother based on comparative reagent tests performed on other graphite deposits. Alternatively, MIBC is a standard frother in graphite applications.
- It appears that collector and frother were only added to the 2^{nd} cleaner stage, which could have led to elevated graphite losses.

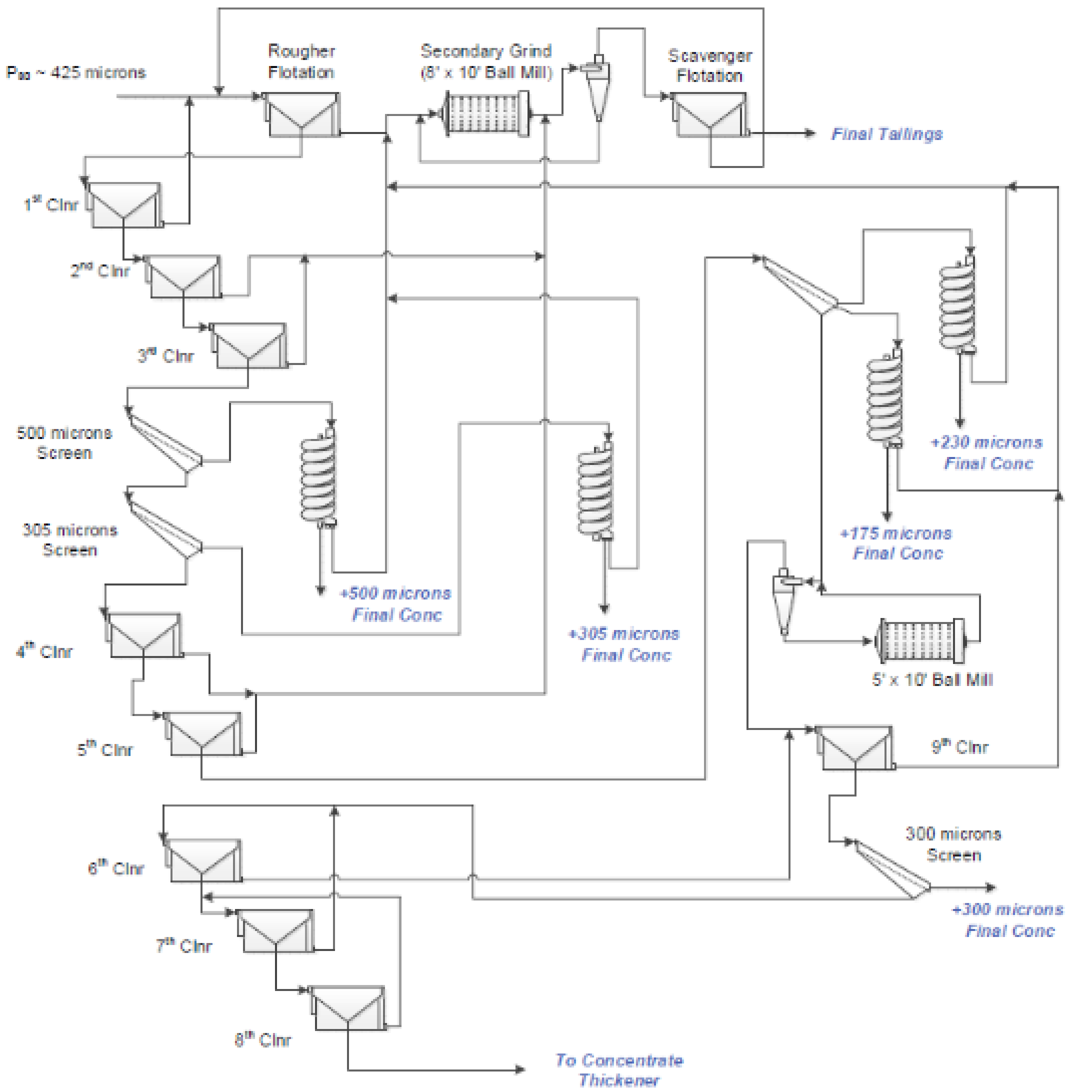

Figure 17-1: Geck/Imerys Era Okorusu Process (2017-2018)

Due to the processing problems experienced during the Gecko/Imerys era of operation, as well as the results of early MINTEK test work (13.1 Early Process Test Work – MINTEK) and the subsequent SGS metallurgical test work program (13.3.2 Flowsheet Confirmation Test Work, METPRO/SGS 2021), a new process flow sheet was developed which is more suitable to the Okanjande mineralization (Figure 17-3).

17.2 CURRENT NORTHERN GRAPHITE PROCESS DESIGN

17.2.1 Design Basis

The addition of a new comminution circuit and the process flow changes of the existing flotation circuit flow out from the outcomes of both early and recent test work programs and are designed to improve flake preservation and improve purity of graphite flake concentrate through following changes:

- A split milling circuit that will prevent excessive recirculation and reduce the potential for flake degradation.
- The split milling circuit will make provision for potentially implementing a flash flotation stage after the Autogenous Mill (AG mill) to further improve large flake recovery.
- Generation of a flotation feed stream of the optimal solids content – 30%.
- A Flotation Feed Buffer Tank to reduce fluctuations in feed rate and solids content and improve steady operation of the flotation circuit.
- The removal of gravity spirals early in the process flow where incomplete liberation would be expected.
- The removal of excessive recirculating streams which hamper effective capacity of process equipment and complicates process control and plant water balance.
- The reduced flotation solids content will remove the need for dispersants.
- The addition of more suitable frother in the form of MIBC
- Allowance for reagent addition at all flotation banks.

The process design/development for the upcoming Northern Graphite processing plant may be separated into 4 distinct areas, each with its own level of engineering changes required:

1. Front-End Comminution: Due to the relative unsuitability of existing comminution equipment, restrictions in terms of accessibility and the cost of relocating this equipment, a completely new front-end comminution circuit is required. This allows for fit-for-purpose process equipment selection to optimize liberation and graphite flake preservation.
2. Flotation: The majority of the existing flotation processing equipment is suitable in terms of throughput capacity, type and condition; and suitable for repurposing in the new graphite process. The only new processing equipment to be included in the flotation circuit will be a polishing scrubber and 2 polishing stirred medial mills. The remainder of processing equipment will be refurbished and piping re-routed to match the updated flow sheet.
3. Concentrate de-Watering, Classification and Bagging: This circuit was designed and constructed by Imerys-Gecko to be fit-for-purpose for graphite concentrate de-watering, drying, classification and bagging. No changes or modifications are required for the upcoming operation and minor maintenance and refurbishment is required.
4. Tailings Storage Facility (TSF): The existing TSF is not suitable for the deposition of tailings material due to insufficient overall capacity, rise rate as well as concerns due to potential stability issues in the case where the Fluorspar tailings facility against which it abuts, is reclaimed. A new TSF site was identified

(Site 3) with sufficient capacity and rise rate to the southeast of the existing processing plant. The tailings storage facility will be split into 2 separate dams for the containment of weathered ore tailings and fresh (sulphide containing) ore tailings.

Table 17-1: Process Design Criteria

Project Fundamentals		
Design Throughput Factor	%	15%
Mean Annual Throughput	t/a	631,450
Operating Schedule Crushing and Screening		
Hours per Shift	h	12
Shifts per day	s/d	1
Days per Week	d/w	7
Operating Days per Year	d/a	365
Availability	%	92%
Utilization	%	90%
Effective Utilization	%	82.8%
Operating Hours per Year	h/a	3627
Nominal Feed Rate	t/h	174.1
Design Feed Rate	**t/h**	**200**

Operating Schedule: Mill and Concentrator		
Hours per Shift	h	8
Shifts per day	s/d	3
Days per Week	d/w	7
Operating Days per Year	d/a	365
Availability	%	92%
Utilization	%	90%
Effective Utilization	%	83%
Operating Hours per Year	h/a	7,253
Nominal Feed Rate	t/h	87.1
Design Feed Rate	**t/h**	**100**

ROM Physical Characterization		
Moisture		
Min	%	2%
Ave	%	5%
Max	%	7%
Material Handling		
Rock SG	t/m3	2.7
Bulk Density	t/m3	1.6
Angle of Repose	deg	35
Hardness		
JK Tech Dropweight Index	a x b	85.5
Uni-Axial Compressive Strength	Mpa	46.7
Abrasion Index	Ai	0.2
BCWi		12
BBMi	kWh/t	11.6
BRMi	kWh/t	12.1
Particle Size		
ROM Top size	mm	600
ROM F80	mm	300-400
Head Grade		
ROM Head Grade	%TGC	5%
Primary Crushing		
Primary Crusher P100 – Max	mm	180
Primary Crusher P100 – Nominal	mm	150
Primary Crusher P80 – Nominal	mm	120
AG Mill		
Nr of Mills	#	1
Drive		Variable Speed
Fresh Mill Feed – Nominal	t/h	87.1
Fresh Mill Feed – Design	t/h	100.1
Design Mill Feed Top size	mm	180
Design Mill feed F80	mm	120
Design Mill Product P80 (estimate)	µm	3000
Mill Discharge Solids Concentration (estimate)	% m/m	65%

Rod Mill		
Nr of Mills	#	1
Drive		Variable Speed
Fresh Mill Feed – Nominal	t/h	87.1
Fresh Mill Feed – Design	t/h	100.1
Design Mill Feed Top size	µm	4000
Design Mill feed F80 (estimate)	µm	3000
Design Mill Product P80 (estimate)	µm	325
Mill Discharge Solids Concentration (estimate)	% m/m	65%
Mill Circulation Load (estimate)	%	250%
Flotation		
Mean Combined Recovery of TGC	%	92%
Mean Combined Concentrate Grade	% C	96%
Mean Combined Concentrate Production Rate (dry)	t/a	30,257
Flake Distribution		
+300µm	% m/m	9%
+180µm	% m/m	40%
+106µm	% m/m	30%
-106µm	% m/m	21%

17.2.2 Process Description

17.2.2.1 Front-End Comminution

The Comminution circuit will consist of a single crushing stage followed by an open circuit AG mill and closed-circuit Rod Mill with stack sizer classification.

The primary crushing stage will be fulfilled by contractor crushing at the Okanjande mine site, and will consist of a modular Jaw crusher with a hopper feeder and feed conveyor, Jaw crusher and slewing product conveyor fitted with a tramp magnet.

Crushed ore will be transported to the Okorusu processing site via side-tipping haul trucks following the transport route as per Figure 18-1. The crushed ore will be side-tipped from a ramp to a loading bunker, from which it will be fed to a hopper feeder with front-end loaders. Crushed ore will be conveyed to a crushed ore stockpile of 5000t live capacity. Crushed ore will be fed onto the mill feed conveyor via 3 drawdown feeders. The mill feed conveyor will be fitted with a tramp magnet and belt scale.

The AG mill will be of the grate discharge type and be fitted with a trommel screen to discharge mill scats and oversize. The trommel screen oversize will be discharged into a bunker for removal by skid-steer/front-end loader. The trommel screen undersize will feed into a common mill sump which will feed the hydro-cyclone classifier.

A portion of underflow from the hydro-cyclone will feed a flash flotation stage. Hydro-cyclone underflow bypassing the flash flotation stage will feed directly into the Rod Mill. Concentrate recovered from the flash flotation stage will be fed to a concentrate transfer batching tank. Tailings from the flash flotation unit will be fed to the Rod mill. The Rod mill will discharge into the common mill sump.

The hydro-cyclone overflow will feed the Low Intensity Magnetic Drum Separator (LIMS). Magnetics from the LIMS will be discharged into a sump for removal by skid-steer. Non-magnetics from the LIMS will feed the Flotation Feed buffer tank.

17.2.2.2 Flotation

The Flotation circuit consists of existing flotation banks housed in the processing facility from the original Solvey fluorspar processing plant which was converted to a graphite flotation plant by Imery-Gecko (Figure 17-2). As previously discussed in Section 17.1 Previous Imerys-Gecko Process, the process was not suitable for Okanjande graphite processing. The process will be converted as per Figure 17-3.

Ground ROM ore at 30% solids will be fed to conditioning tanks where Diesel (collector) and MIBC (frothing agent) will be dosed. Conditioning will be followed by a Rougher stage with rougher tails discharged to final tails with no scavenging. All tails from downstream cleaner stages will be combined with rougher tailings for deposition in the TSF.

Rougher concentrate will be polished through a newly installed 2.6'x7.5' wet scrubber (Polishing #1) with smooth rubber liners and ceramic grinding media. Rougher concentrate polishing will be followed by a single cleaning stage which will be followed by a polishing in repurposed 6.5'x9.0' ball mill (Polishing #2) fitted with smooth rubber liners and ceramic grinding media. Polished concentrate will be cleaned again through another two stages of cleaners with internal recycle.

Cleaned concentrate will be classified into a coarse (>180μm) and fine (<180μm) fraction of two stages of SWECO screens. Both Fractions will be polished through vertical stirred media mills followed by two and three further cleaning stages with internal recycles for the coarse and fine concentrate fractions respectively.

Polished and cleaned coarse and fine concentrate streams will be combined and pumped forward to the Concentrate Thickener.

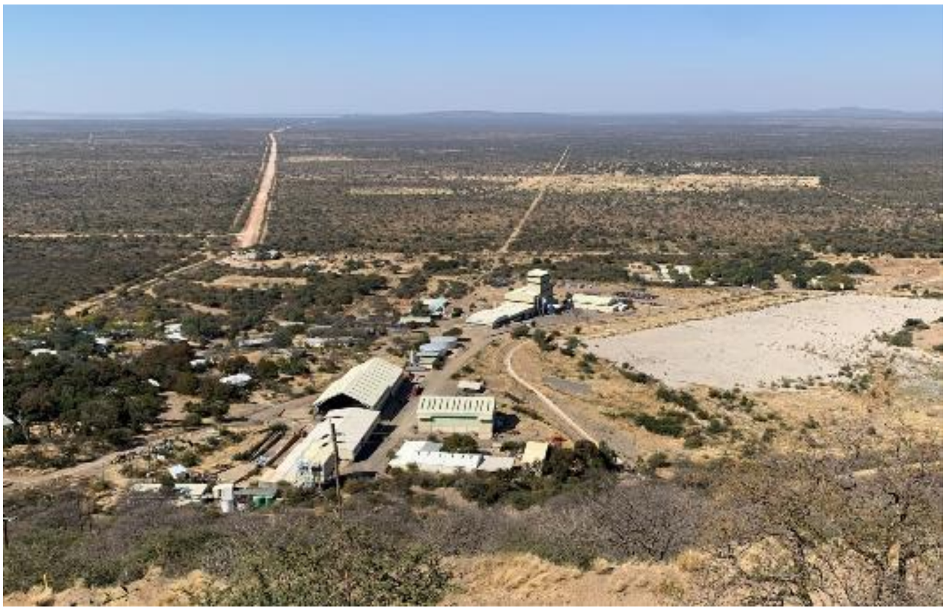

Figure 17-2: Vista of the Okorusu Processing Facilities

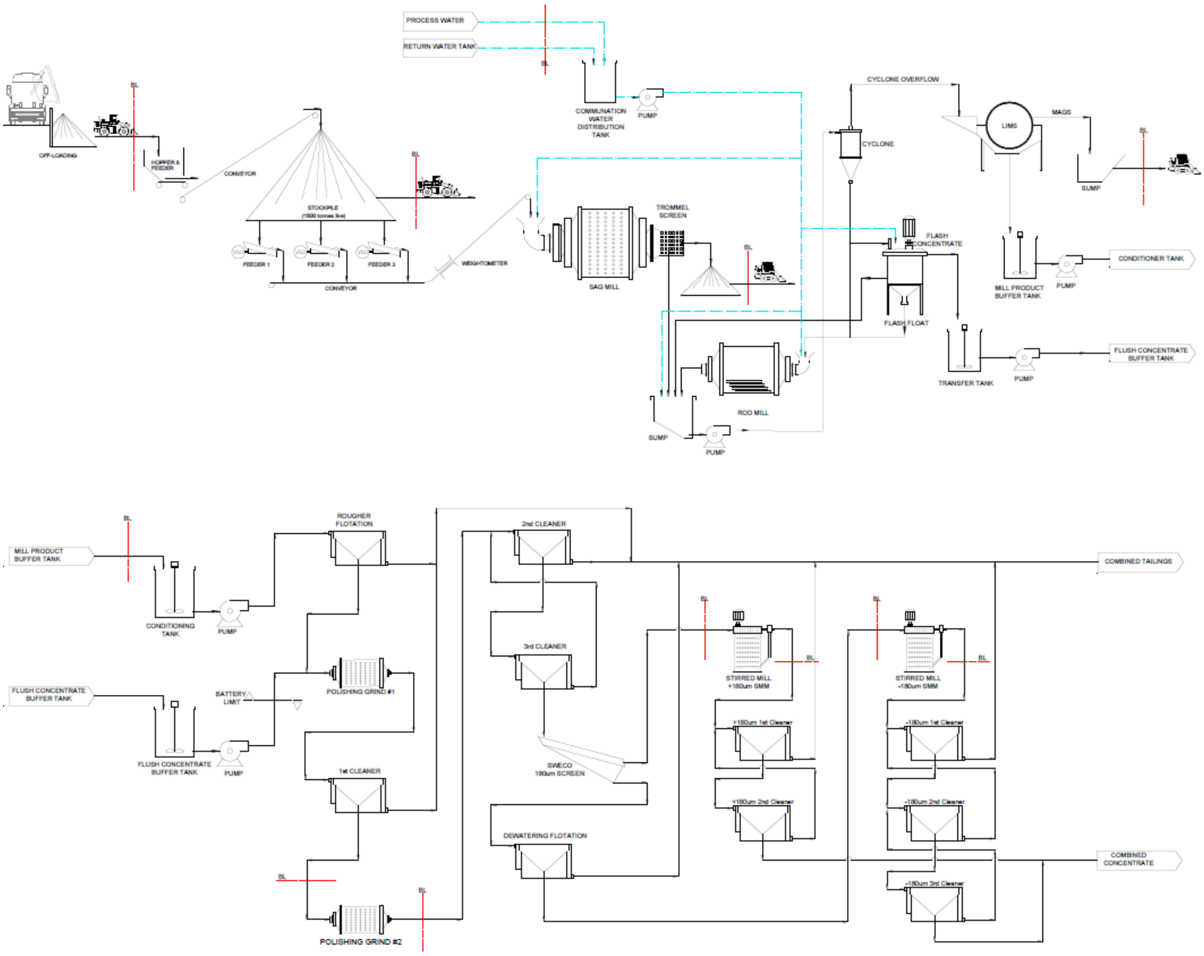

Figure 17-3: Okorusu Process Block flow Diagram

17.2.2.3 Concentrate Dewatering, Classification and Bagging

The Concentrate Dewatering, Classification and Bagging section of the Okorusu plant was constructed by Imerys-Gecko and is fit-for-purpose for the described duties. No modifications are planned for this section of the plant and only minor maintenance will be required since it was only constructed in 2016/17.

Combined concentrate size fractions will be received from the flotation circuit into the concentrate thickener, where the concentrate will be thickened before being pumped to the vacuum belt filter for further dewatering. The vacuum belter filter is fitted with dust extraction to recover any graphite dust generated.

Graphite filter cake is discharged into a rotary drum dryer which is diesel fired. The rotary drum dryer is fitted with dust extraction to recover any generated graphite dust.

Dried graphite concentrate is discharged from the drum drier and pneumatically transported to storage bins from where it is passed over classifying screens for separation into the following fractions:

- +300µm (ultra-coarse)
- -300 to +180µm (coarse)
- -180 to +106µm (middling's)
- -106µm (fines)

The different size fractions are stored in product bins each with dedicated bagging stations for bagging the various concentrate size fractions into 1t bulk bags for shipment.

17.2.2.4 Tailings Storage Facility

New tailings storage facilities will be constructed to the southeast of the existing Okorusu processing plant.

The first tailings storage facility will be un-lined and will cater for the deposition of tailings resulting from the treatment of weathered ore from the Okanjande Mine (Figure 17-4). The TSF siting and basic design was completed by Knight Piésold. The TSF will accommodate the 3.2Mt of the estimated 5.8Mt total tailings to be deposited.

A second tailings storage facility (TSF Site 3B) will be constructed in year 5 of operations to cater for the deposition of tailings resulting from the processing of mixed weathered and fresh sulphide bearing ores, as well as pure fresh ore. TSF Site 3B will be constructed at a location adjacent to TSF Site 3A, and will be lined to make provision for the potential of the fresh sulphide ore tailings to generate acid from sulphide oxidation.

Both facilities will feed decant' water into a raw water dam that will also collect any storm water run-off.

Figure 17-4: Okorusu TSF Site 3A (TSF Site 3B not indicated)

17.2.3 Mass Balance

17.2.3.1 Ore, Graphite, Concentrate, Tails

The high-level mass balance over the graphite flotation process is given in Table 17-2. A comprehensive mass is provided in the Appendices.

Table 17-2: High Level Mass Balance

PROJECT KEY PERFROMANCE INDICATORS	UOM	Value
Throughput	t/h	87.1
Mean Head Grade	% TGC	5.3%
Total Graphite Concentrate produced	t/h	4.4
Concentrate Grade	%	96.0%
Total Contained Graphite in Concentrate	t/h	4.2
Total Tailings (dry) deposited	t/h	82.7
Recovery	%	92.0%

Table 17-3: Graphite Mass Balance (5.3% Head grade)

Product	Mass	Grade	Distribution
	%	% C(g)	% C(g)
+80 mesh 2nd Clnr Conc	3.19	95.1	57.1
+80 mesh 1st Clnr Tails	0.15	15.0	0.4
-80 mesh 3rd Clnr Conc	2.00	95.1	35.8
-80 mesh 1st Clnr Tails	0.25	30.0	1.4
4th Clnr Tails	0.06	12.5	0.1
3rd Clnr Tails	0.15	10.0	0.3
2nd Clnr Tails	0.40	5.59	0.4
1st Clnr Tails	3.50	2.10	1.4
Rougher Tails	90.3	0.18	3.1
Feed	100.0	5.3	100.0
Combined Products	**Mass**	**Grade**	**Distribution**
	%	% C(g)	% C(g)
Combined Concentrate	5.19	95.1	92.9
+80 mesh 2nd Clnr Conc	3.19	95.1	57.1
-80 mesh 3rd Clnr Conc	2.00	95.1	35.8
4th Clnr Conc	5.59	90.0	94.7
3rd Clnr Conc	5.65	89.2	94.9
2nd Clnr Conc	5.80	87.2	95.1
1st Clnr Conc	6.20	81.9	95.6
Rougher Conc	9.7	53.1	96.9
Feed	100.0	5.3	100

Combined Products	Mass	Grade	Distribution
	%	% C(g)	% C(g)
Combined Concentrate	5.19	95.1	92.9
+80 mesh 1st Clnr Tails	0.15	15.0	0.4
-80 mesh 1st Clnr Tails	0.25	30.0	1.4
2nd Clnr Tails	0.61	7.35	0.8
1st Clnr Tails	3.50	2.10	1.4
Rougher Tails	90.30	0.18	3.1
Feed	100.0	5.3	100

17.2.3.2 Water

Water will be abstracted from nearby boreholes and recycled from TSF decantation. Water consumption rates were obtained from historical process data from graphite processing at the Okorusu plant. Average anticipated annual water consumption is 134,639m^3/a.

17.2.3.3 Reagents

Estimate process annual reagent consumption rates are given in Table 17-4. Dosage rates are based on values obtained from historical graphite processing at the Okorusu plant and the recent SGS testwork program.

Table 17-4: Process Reagent Consumption

Reagent	Average Consumption
	kg/y
Diesel – Flotation	57,462
Flocculent- Concentrate	1,453
Water Treatment	3,157
MIBC	31,573
Diesel – Drying	324,625

17.3 PRODUCTION PLAN

Run-of-Mine ore will be transported to the plant site and fed onto a 5,000t stockpile. A larger stockpile will be kept at the Okanjande mine site and blending will be done through mine stockpile extraction and transport to Okorusu.

Production from the Okanjande mine will ramp up rapidly due to being a brown fields operation with all initial required overburden stripping completed during the previous operational period 2017-2018.

Plant commissioning and ramp-up can be fast tracked during construction through the availability of existing graphite ore stockpiles at the Okorusu site.

The run of mine ore head grade increase with depth with the average grade exceeding 5% from year 7. A flat concentrate graphite grade was assigned to the production plan. However, the increased grade in the last 3 years of operation could likely lead to improved achieved concentrate grade and/or overall graphite recovery.

Table 17-5: Process Production Plan

	Units	Totals	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Mining														
Ore Mined	t/a	**6,096,950**	-	410,442	631,450	633,179	631,450	631,449	631,450	633,180	631,450	631,450	631,450	
Grade Mined	%	**5.27%**	0.00%	5.58%	4.95%	4.81%	5.05%	4.90%	5.06%	5.46%	5.65%	5.47%	5.86%	
Graphite Mined	t/a	**321,174**	-	22,903	31,257	30,456	31,888	30,927	31,951	34,572	35,677	34,540	37,003	
Waste Mined	t/a	**4,045,040**	-	1,009,479	522,561	1,082,452	770,387	247,069	53,588	105,807	76,247	133,120	44,330	
Strip Ratio		**0.66**		2.5	0.8	1.7	1.2	0.4	0.1	0.2	0.1	0.2	0.1	
Mineralized Waste Mined	t/a	**0.00**	-	-	-	-	-	-	-	-	-	-	-	
Total Mined	t/a	**10,141,990**	-	1,419,921	1,154,011	1,715,631	1,401,837	878,518	685,038	738,987	707,697	764,570	675,780	
Ore Stockpiles			**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**
Opening														
Ore Tons	t		-	-	-	-	1,729	1,729	1,728	1,728	3,458	3,458	3,458	3,458
Ore Grade	%		0.0%	0.0%	0.0%	0.0%	4.8%	5.0%	4.9%	5.1%	5.5%	5.6%	5.5%	5.9%
Graphite Tons	t		-	-	-	-	83	87	85	87	189	195	189	203
Incoming														
Ore Tons	t	**6,096,950**	-	410,442	631,450	633,179	631,450	631,449	631,450	633,180	631,450	631,450	631,450	-
Ore Grade	%	**5.3%**	0.0%	5.6%	5.0%	4.8%	5.1%	4.9%	5.1%	5.5%	5.7%	5.5%	5.9%	0.0%
Graphite Tons	t	**321,174**	-	22,903	31,257	30,456	31,888	30,927	31,951	34,572	35,677	34,540	37,003	-
Outgoing														
Ore Tons	t	**6,096,950**	-	410,442	631,450	631,450	631,450	631,450	631,450	631,450	631,450	631,450	631,450	3,458
Ore Grade	%	**5.3%**	0.0%	5.6%	5.0%	4.8%	5.0%	4.9%	5.1%	5.5%	5.6%	5.5%	5.9%	5.9%
Graphite Tons	t	**321,174**	-	22,903	31,257	30,373	31,884	30,929	31,949	34,470	35,670	34,546	36,990	203
Closing														
Ore Tons	t		-	-	-	1,729	1,729	1,728	1,728	3,458	3,458	3,458	3,458	-
Ore Grade	%		0.0%	0.0%	0.0%	4.8%	5.0%	4.9%	5.1%	5.5%	5.6%	5.5%	5.9%	0.0%
Graphite Tons	t		-	-	-	83	87	85	87	189	195	189	203	-
Processing			**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**
Ore Processed	t	**6,096,950**	-	410,442	631,450	631,450	631,450	631,450	631,450	631,450	631,450	631,450	631,450	3,458
Grade Processed	%	**5.3%**	0.0%	5.6%	5.0%	4.8%	5.0%	4.9%	5.1%	5.5%	5.6%	5.5%	5.9%	5.9%
Graphite Processed	t	**321,174**	-	22,903	31,257	30,373	31,884	30,929	31,949	34,470	35,670	34,546	36,990	203
Graphite Recovered to Concentrate	t	**295,480**	-	21,070	28,756	27,943	29,333	28,455	29,393	31,713	32,817	31,783	34,030	186
Concentrate Produced	t	**307,791**	-	21,948	29,954	29,107	30,556	29,641	30,617	33,034	34,184	33,107	35,448	194
Upgrade Achieved	%	**18.22**	-	17.2	19.4	20.0	19.0	19.6	19.0	17.6	17.0	17.5	16.4	16.4
Tailings			**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**
Tailings Produced (dry)	t	**5,789,159**	-	388,494	601,496	602,343	600,894	601,809	600,833	598,416	597,266	598,343	596,002	3,264
TSF Site 3A	t	**3,200,000**	0	388,494	601,496	602,343	600,894	601,809	404,964	-	-	-	-	-
TSF Site 3B	t	**2,589,159**		-	-	-	-	-	195,868	598,416	597,266	598,343	596,002	3,264

17.4 MAJOR EQUIPMENT LIST

Table 17-6: Okorusu Process Plant Major Equipment List

Equipment	Description	Dimensions	Installed Power	Condition
Comminution				
Jaw Crusher	C130 equivalent	1.3x1.0m	160	New
AG Mill		5.0x2.5m	500	New
Rod Mill		3.0x4.5m	600	New
Hydro-Cyclone		TBD	NA	New
LIMS		900x900		New
Flash Float Cell		TBD	TBD	New
Buffer Tank		50m3	20	New
Flotation				
Rougher	Rougher #1&2	12x2.8m3	266	Refurbished
Polishing Scrubber #1	Scrubber	2.6x7.5m	110	New
1st Cleaner	Cleaner #1	6x1.4m3	45.5	Refurbished
Polishing Scrubber #2	Mill	1.9x2.7m	228	Refurbished
2nd Cleaner	Cleaner #6	6x1.4m3	45.5	Refurbished
3rd Cleaner	Cleaner #2	4x1.4m3	30.5	Refurbished
180mm Classification Screen	SWECO 31, 32, 33		2.4	Refurbished
Dewatering Flotation	Scavenger #3	3x1.4m3	22.5	Refurbished
Coarse Polishing Mill	Stirred Media Mill		55	New
1st Coarse Cleaner	Cleaner #3	2x1.4m3	15	Refurbished
2nd Coarse Cleaner	Cleaner #4	2x1.4m3	15	Refurbished
Fine polishing Mill	Stirred Media Mill		55	New
1st Fine Cleaner	Cleaner #7	4x1.4m3	30.5	Refurbished
2nd Fine Cleaner	Cleaner #5	2x1.4m3	15	Refurbished
3rd Fine Cleaner	Cleaner #8	2x1.4m3	15	Refurbished
Dewatering, Classification and Bagging				
Thickener			2.2	Existing
Belt Filter	Vacuum		7.5	Existing
Dryer	Direct Fired		70	Existing
Vacuum Transfer			18.5	Existing
Filter Extraction Fan			75	Existing
Sizing Screens			11	Existing
Product Silos	4 classifications			Existing
Screens Extraction Fan			37	Existing
Bulk Bagging Stations	4 classifications		48	Existing

17.5 SITE LAYOUT

The only changes to the existing Okorusu Site layout will be due to the construction of the Milling circuit at the current concentrate storage area. The Milling area will be located directly south of the existing Engineering Workshop (Figure 17-5). The site access route will be extended and rerouted to allow for the crushed ore side tipping offloading ramp.

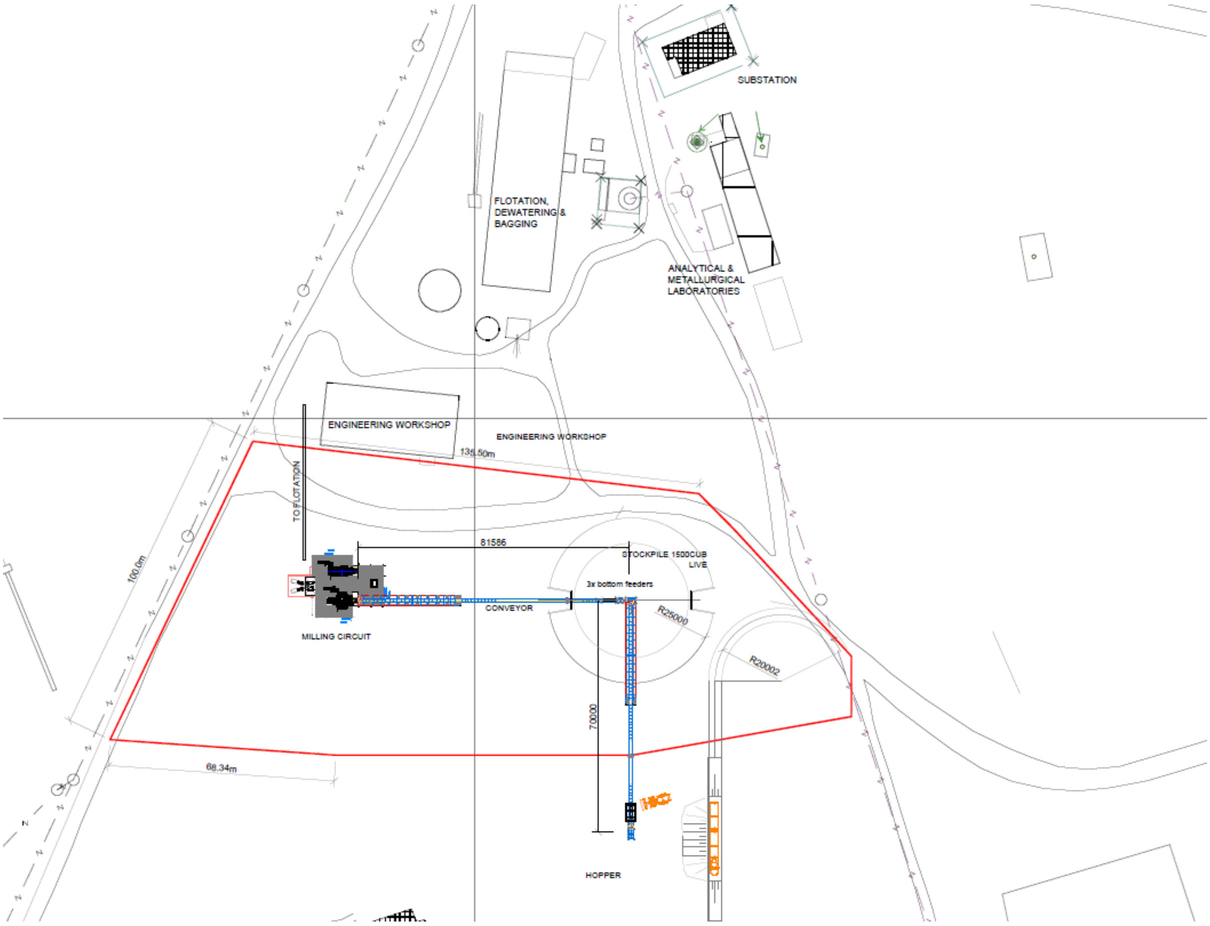

Figure 17-5: Okorusu Site Layout

18 PROJECT INFRASTRUCTURE

(Prepared by CREO Engineering Solutions (Pty) Ltd.)

The project will require certain infrastructure modifications and limited additions in order to support the processing facility. Existing infrastructures are listed in this section. Existing roads will require maintaining. The existing buildings can be used for operational support while temporary construction facilities are available.

18.1 ACCESS ROADS AND HAUL ROADS

18.1.1 Okanjande

The Okanjande deposit is accessed from the B1, 8km south of Otjiwarongo, onto the D2512 (a well-maintained gravel road) for some 24 km to the entrance of the property. Access for operational and logistical purposes is possible with ease along this route as long as road maintenance is executed during operations. Previous mining activities at the Okanjande deposit is evident and the established haul roads can be utilised as soon as operations continue. Okorusu

The Okorusu processing facility is easily accessible from the B1, a national standard tarmac road, onto the D2463 (a well-maintained gravel road) some 40km north of the town, Otjiwarongo. The property is accessed some 20km along the D2463. Access via this route can easily accommodate any logistical and operational requirements for the project. Increased traffic on the D2463 gravel road will necessitate regular road maintenance and dust suppression as the road is used by the local community as a district road.

Figure 18-1 illustrates the two properties and its access from the B1 main road.

Figure 18-1: Ore Transport Route

18.2 LOCAL RESOURCES

Local resources required for labour, supplies and equipment will be insufficient from the nearby community to meet all the project requirements. Some local resources can be utilised, but skilled mining contractors, consultants and suppliers will be available throughout Namibia to support the project and its operations.

During operations, Okorusu will have to source some of its key personnel from outside of the immediate area, Otjiwarongo and possibly from the neighbouring country – South Africa.

18.3 BUILDINGS

18.3.1 Okanjande

The mining operations infrastructure located at the Okanjande deposit has adequate and well-maintained operating facilities sufficient for supporting operational restart. Existing infrastructure at the Okorusu Processing Facility include

- Administration offices
- Operational office
- Site ablution fcailities
- Mobile equipment workshop at the Okanjande property.

18.3.2 Okorusu

The Okorusu processing facility building infrastructure has adequate and well-maintained operating facilities required for supporting operational restart. Existing infrastructure at the Okorusu Processing Facility include:

- Process Control and Engineering Block
- Administration Block
- On-Site clinic
- Site ablutions facilities
- Adequate access control through a manned vehicle entry control point and pedestrian control points.
- Engineering workshop at the Okorusu Processing Facility and
- Shared facilities for Analytical and Metallurgical Laboratories.

18.4 SURFACE WATER DRAINAGE AND COLLECTION

The site, located on the foot of the Okorusu mountain, drains naturally to the south-east. The Okorusu mountain collects significant volumes of rainwater which is diverted into a side canal that runs down to a collection pond. The existing collection pond will be cleaned and fitted with a pump barge to recover as much run-off as possible and recycle it into the plant water systems via the process water clarifiers and the process water storage tanks.

18.5 SEWERAGE DISPOSAL – OKANJANDE

18.5.1 Okanjande

All site produced sewerage is diverted to a septic tank. The septic tank capacity is adequate for the planned site operations. Minor maintenance may be required in order to ensure sewerage system effectiveness and operation in accordance to standard procedures.

18.5.2 Okorusu

All site produced sewerage is diverted to two separate septic tanks. The septic tanks capacity is adequate for the planned site operations. Minor maintenance will be required in order to ensure sewerage system effectiveness and operation in accordance to standard procedures.

18.6 SECURITY

18.6.1 Okanjande

The Okanjande property is adequately fenced off. Existing access control points with security guard houses are part of the existing infrastructure in place. Some additional site security measures are planned.

18.6.2 Okorusu

The entire Okorusu processing facility is adequately fenced off. Existing access control points with security guard houses are part of the existing infrastructure in place. Some additional site security measures are planned.

18.7 WATER SUPPLY

18.7.1 Okanjande

Water is supplied from a borehole on the mining license for drinking and ablution purposes.

An existing water abstraction permit was renewed for two addition boreholes, located some 19km away in a straight line, on Farm Doornlaagte (Figure 28-2). There is no existing pumping, storage or pipeline infrastructure to utilize this water.

18.7.2 Okorusu

Raw water is supplied from three boreholes located on an adjacent farm some 5km away. Water is pumped to site from the operational boreholes with two buried pipelines to the steel water reservoirs situated on site. All three boreholes are in operational condition with two being in active production supplying raw water to the care and maintenance crew currently on site. The water infrastructure will require maintenance in order to sustain a fully operational site again.

For supplementary purposes a metered connection exists to Namibian Water Corporation (NawWater) at km40. This water is available at cost but with a maximum use of 20m^3/h, and was historically only used during emergency water shortages or breakdowns.

The water distribution network is in good condition as it is being utilised currently by the team on site.

18.8 COMMUNICATIONS

18.8.1 Okanjande

The Okanjande site has adequate mobile telecommunication coverage that is used for internet connectivity as well.

18.8.2 Okorusu

Site communication infrastructure exists through a fibre connection from the B1 main road to site enabling internet and landline communications. Cell phone coverage is also available on site. An existing telecommunication service provider is rendering site communication services.

18.9 POWER SUPPLY

18.9.1 Okanjande

No utility power is currently available at the Okanjande property. Electricity is supplied from a diesel driven generator adequately supplying power to site operations. The closest utility power connection available is located in Otjiwarongo at 66kV some 20km away.

18.9.2 Okorusu

Electrical power is currently available at the site and in good condition. Power is distributed via a 22kV overhead line to site and its various take-off points, from a utility owned substation some 6km away. The installed capacity of the utility substation is adequate for the current connected loads, but any future major expansions will require additional infrastructure and expansions.

New distribution take-off points will be required for the envisaged Milling and Front-End sections planned closer to the processing facility.

18.10 FUEL

18.10.1 Okanjande

There is limited fuel storage facilities available on the Okanjande mine site. Diesel storage is available for the site generator powering the administration buildings and workshop only.

Mining fleet fuel infrastructure will be provided by the Mining Contractor.

18.10.2 Okorusu

Local infrastructure available at the Okorusu facility is adequate to supply diesel fuel to the diesel fired dryer during operations. On site fuel storage and distribution infrastructure was operated by a local fuel distributer through 4 x 23kL storage tanks and associated pumps. The restart operations can make use of the existing distributer infrastructure through renewed supply and distribution agreements.

18.11 CAMP & CANTEEN

No room or board facilities will be built for this project and no site located facilities are available to be utilised for operational personnel or construction crew. It is recommended to accommodate staff in Otjiwarongo and set up transport to and from site for the Okanjande mining site as well as the Okorusu processing plant site.

A clean "tea room" will be provided at Okorusu for operators to eat in.

18.12 FIRE PROTECTION

Fire water is supplied from the process water ring-main with fire hose reels located throughout the process building. The fire hose reels will be replaced upon restart. There is currently no dedicated fire water supply system in place.

There are also multiple fire extinguishers located throughout the site. These were all checked and replaced in February 2022

19 MARKET STUDIES AND CONTRACTS

(Prepared by CREO Engineering Solutions (Pty) Ltd, based on information provided by Northern Graphite Corporation)

Graphite is one of only two naturally occurring forms of pure carbon, the other being diamonds. Diamonds have a three-dimensional crystal structure whereas graphite consists of a "two dimensional", planar molecular structure. For this reason, graphite generally occurs as flakes, which are multiple layers of "graphene" held together by weak bonds. Graphene is a single, one atom thick layer of carbon atoms arranged in a "honeycomb" or "chicken wire" pattern. It has been estimated that there are three million layers of graphene in a one-millimetre thickness of graphite. The delamination or exfoliation of graphite flakes is therefore one method of producing graphene.

Graphite is formed by the metamorphism of carbon rich materials which leads to the formation of either crystalline flake graphite, fine grained amorphous graphite, or crystalline vein or lump graphite. Graphite is a non-metal but has many properties of metals and is desirable as a strong, light weight, heat and corrosion resistant reinforcement material with a high aspect ratio. It also has high thermal and electrical conductivity, chemical inertness, and a natural lubricity.

Because of supply concerns relating to the fact that China is the world's dominant producer, and to potential demand growth from new applications such as lithium-ion batteries ("LiBs"), the European Union considers graphite to be one of 14 "critical mineral raw materials" with high supply risk. The United States has also included graphite on a list of mineral resources whose loss could critically impact the public health, economic security and/or national and homeland security of the United States.

There is very little recycling of, or substitution for, graphite.

19.1 GRAPHITE SUPPLY

Benchmark Mineral Intelligence ("Benchmark") estimates that worldwide production of natural flake graphite in 2021 will be just over 1,000,000t of which China will produce approximately 75%. Brazil (8%) and Mozambique (6%) make up most of the balance with the rest largely scattered among Madagascar, Tanzania and Europe.

Historically, most Chinese flake graphite production came from Shandong province. However, production has declined as mines get older and deeper, costs rise, resources are depleted, and environmental regulations have become increasingly strict. The majority of Chinese production now comes from Heilongjiang province where deposits are generally higher grade but smaller flake and lower quality. As a result, Chinese production of the larger flake sizes is declining. Heilongjiang has substantial small flake resources and excess production capacity, most of which is targeting the LiB market.

At the 14th ICCSINO Anode Material and Feedstock Market Conference held in Qingdoa China in May, 2021 it was reported that production from the two main areas in China was 731,000t in 2020. Including output from other provinces that would put Chinese flake graphite production at 850,000t which indicates that it is being under-estimated by western commentators including Benchmark, Roskill and Fastmarkets who put it at about 750,000tpa.

Surplus Chinese supply had largely related to a large mine in Loubei which is owned by Minmetals, a state-owned company that is one of the largest metals and minerals trading companies in the world. The mine had only been operating about four months per year and producing about 300,000tpa of flake graphite. Based on the ICCSINO figures it is likely the Loubei mine is now near full production. Minmetals, which is the largest Chinese natural graphite producer, had forecast a supply deficit in 2020, which did not happen due to Covid, and a very large supply deficit by 2025.

A large new graphite mine was built in Mozambique in 2018 and it substantially increased world natural flake graphite supply. The mine was significantly over budget, has only operated at about 50 per cent of nameplate capacity and has been cash flow negative since start up. Its future is uncertain as western buyers do not want to switch to a supplier that may not be able to continue operations. Most of its production has been sold into the Chinese steel market as the Chinese do not find its production suitable for the battery market.

Because of potential demand from the rapidly growing EV/LiB markets, there are over 20 advanced stage graphite projects outside of China that have completed feasibility studies. Almost all are looking for financing and almost none are under construction. Most are in Tanzania, Mozambique, Australia and Canada. They represent a significant source of future supply, but each will take up to two years to bring into production after they obtain financing. Also, not all are battery grade and many come with substantial political risk.

19.2 GRAPHITE DEMAND

Benchmark estimates that worldwide demand for natural flake graphite in 2022 will be 1,123,000t. Historically the single biggest use of graphite has been for the manufacture of refractories for the steel industry which accounts for over 40% of demand or 400,000t. These are essentially fire bricks which line and protect blast furnaces. They contain 10-25% graphite which acts as a lightweight reinforcement that is resistant to heat and corrosion. Accordingly, graphite is a consumable in the steel making process, not an alloy, although graphite is sometimes added to steel to increase the carbon content.

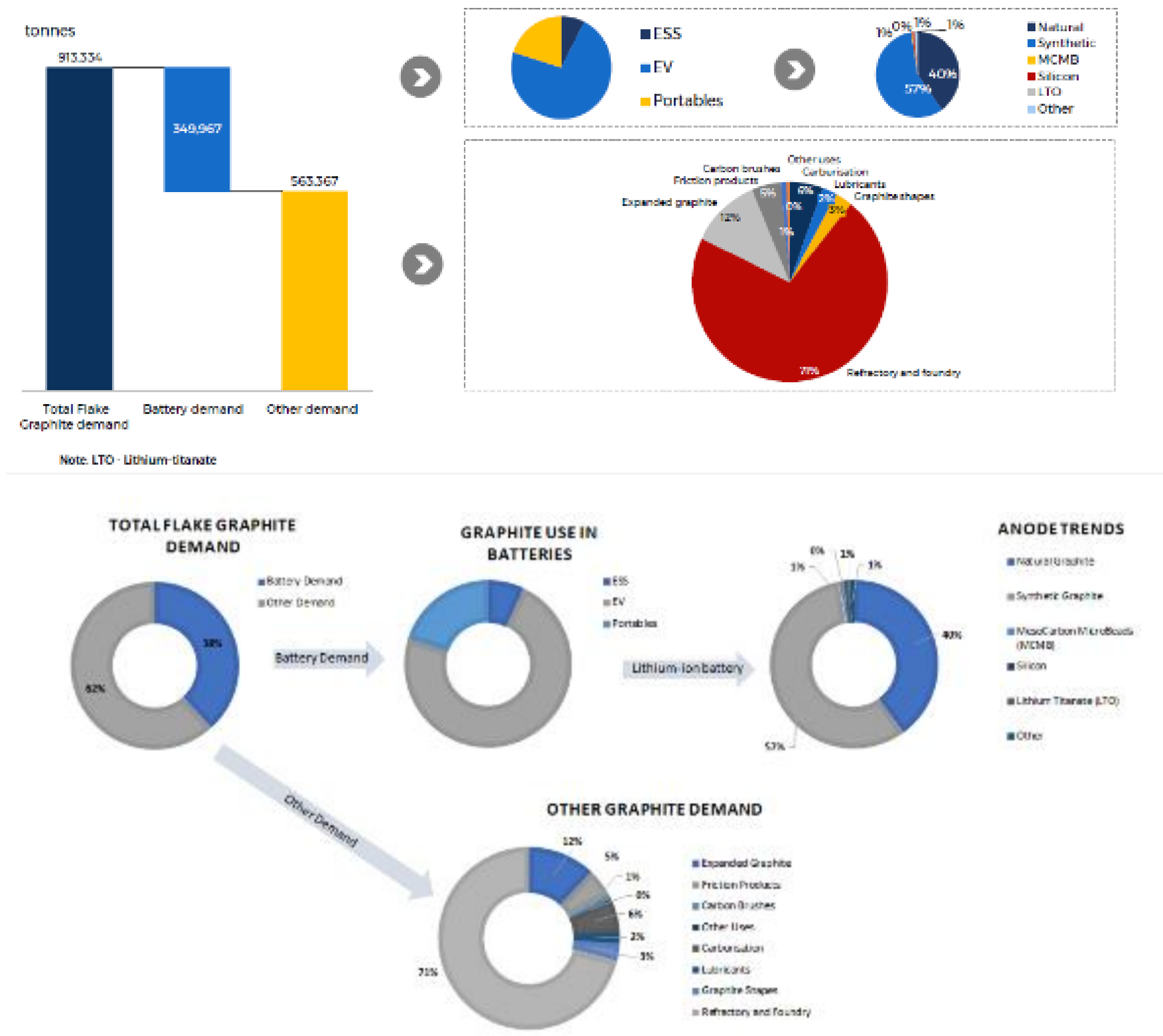

Figure 19-1:Flake Graphite Demand Breakdown, by end-use 2021 (BMI, 2021)

Graphite is the anode material in lithium-ion batteries and is their largest single component. There are no substitutes in this application although the anode material can be either synthetic or natural graphite. Natural graphite is less expensive and has a higher capacity whereas synthetic graphite charges faster and has a longer cycle life. Natural graphite-based anode material is called spherical graphite ("SPG") and is manufactured from graphite mine concentrate through a process that involves micronization, rounding, purification, high temperature heat treatment and coating. Micronizing and rounding flake graphite concentrate provides an SPG yield of 35 to 40%. The rejects have little value.

In order to be used in the manufacture of SPG, mine concentrates should have a purity of 94 per cent or higher, have a high bulk density, high crystallinity and have the ability to be rounded and purified. Not all mine concentrates, or even all concentrates from any one mine, will be "battery grade".

Benchmark estimates that demand for flake graphite from the anode material market will be approximately 535,000t in 2022. In a relatively short period of time, LiBs have gone from a very small market to the largest. The initial growth was largely due to small devices such as cell phones, cameras, laptops, power tools, etc. Hybrid and electric vehicles and grid storage are potentially huge markets that are still in their infancy and provide ample opportunity for continued strong growth in LiB production and therefore the demand for raw materials, including flake graphite. Continued annual growth of 20% means a big new 100,000tpa mine is required every year and none are currently under construction. Benchmark estimates that flake graphite production needs to more than double by 2025 to meet demand.

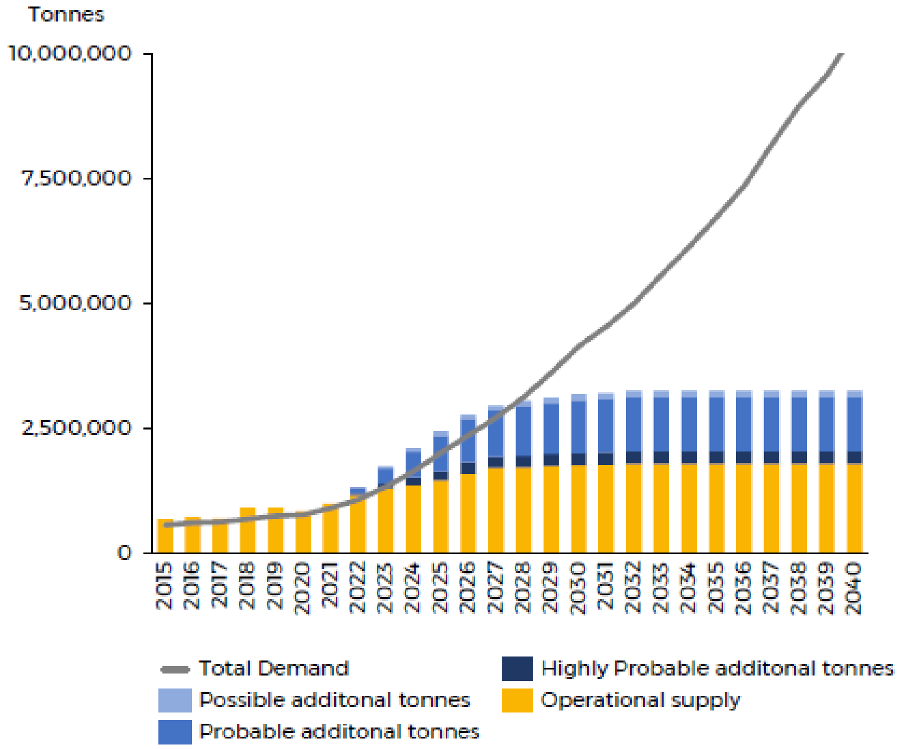

Figure 19-2: Graphite Demand, 2015 to F2040 (BMI, 2021)

Graphite also has a myriad of other uses including in the automobile industry (gaskets, brake linings and clutch parts), thermal management in consumer electronics, insulation products, electric motors (carbon brushes), heat and corrosion resistant gaskets, fuel cells, fire retardants, lubricants, pencils and many others. The "graphite" commonly used in golf clubs, hockey sticks, tennis rackets and composite materials is actually carbon fiber, a synthetic form of graphite made from petroleum coke.

These other uses make up about 160,000t of demand of which 100,000t are expandable graphite products. Expandable graphite is made by treating graphite concentrate, predominantly +50 mesh extra-large flake, with a dilute acid solution which intercalates between the many layers in each flake. When heated, the solution expands forcing the layers apart and increasing their volume by hundreds of times. The expanded graphite is then pressed into self-binding sheets and foils which are used in many of the products listed above. Expandable graphite is one of the fastest growing graphite markets along with LiBs expandable graphite is also the only market segment that has reported price increases over the last few years.

19.3 GRAPHITE PRICES

There is no posted spot price or futures market for graphite. Sales are negotiated between producers and consumers of which there are many. Some have long standing relationships and negotiate prices and volumes annually but there are no long-term contracts or offtake agreements. A number of industry sources (including Industrial Minerals magazine and Benchmark) publish prices for the most popular grades and they provide a conservative indication of pricing for large, high-volume buyers. Generally, concentrates have to be above 150 mesh in size (which is considered small flake), have a carbon content higher than 94 per cent, and not have any undesirable impurities in order to consistently attract buyers and achieve the best price.

Prices increase with flake size and carbon content. The premiums are relatively small going from +150 mesh (small) flake to +100 mesh (medium) and +80 mesh large flake. Prices are much higher for +50 mesh (XL) and +32 mesh (XXL) flake sizes as they are rarer and more valuable. Purity is also a factor but not a big one if the concentrates are above 94% carbon. Most mine concentrates, produced by flotation alone, range between 94 and 98% carbon. The difference in pricing is currently about 2.8% per 1% increase in the absolute level of purity. Other more technical factors can affect pricing including bulk density, expansion ratio, ash composition, crystallinity, volatile content and oxidation resistance.

Most mines also produce a substantial amount of -150 mesh material, which is micro flake and fines, and it usually has a carbon content less than 94%. This material presents a marketing challenge as it is not suitable for many of the major markets.

Graphite prices peaked in the $1,300/t range for the premium grade (large flake +80 mesh, 94-97%C) in the late 1980s and then declined sharply as Chinese producers entered the market. This caused western mines to close and development projects to be shelved. Prices did not begin to recover until 2005 and peaked in a range of US$2,500 to $3,000/t in 2012 when some shortages were reported. This was due to the growth in China and the commodity super cycle and the resultant demand from the steel market. The subsequent slowdown in the Chinese economy combined with a lack of growth in the US/Japan/Europe caused prices to fall back approximately 50% from 2012 levels. In the second half of 2017 prices rebounded 30 to 40% due to a recovering steel industry, continued strong growth in LiB demand and environmentally related capacity shutdowns in China. Current CIF Europe prices are approximately US$1,775/t for 94-95%C +50 mesh flake, US$1,500/t for 94%C +80 mesh flake, US$1,415/t for 94%C +100 mesh medium flake and US$1,135/t for -100 mesh small flake. These prices consist of Benchmark's FOB China prices with approximately US$300/t added for freight and handling. Due to the current state of container markets, these prices are likely understated.

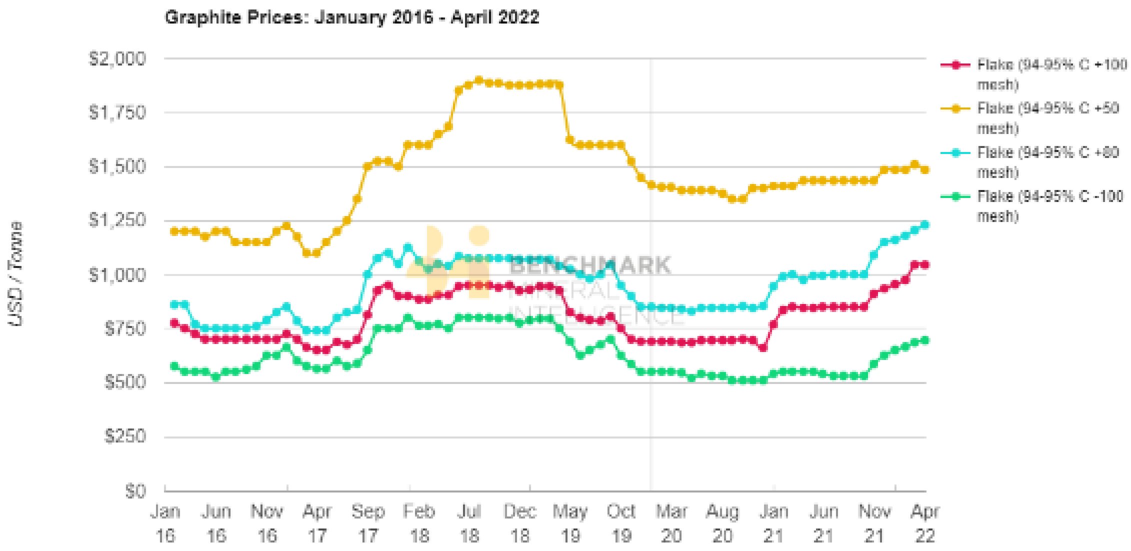

Figure 19-3: Recent Graphite Pricing Trends (BMI, 2022)

Based on pilot plant work completed by a subsidiary of Rio Tinto in the 1990s and recent testing at SGS Lakefield, resources at the Okanjande deposit can be processed into a concentrate containing approximately 11% +50 mesh XL flake, 48% +80 mesh large flake, 24% +100 mesh medium flake and 17% +150 mesh small flake. Based on Fastmarkets and Benchmark's published prices, such a concentrate would realize a weighted average price in of US$1,447.80/t. Northern's experience with the producing Lac des Iles mine in Quebec demonstrates that high quality concentrates from a secure, politically stable, non-Chinese source of supply can achieve substantial premiums over published prices. Accordingly, a weighted average price of US$1,500/t has been used for the purposes of this PEA.

In the near to medium term graphite prices are expected to increase as lithium-ion battery demand is growing rapidly, supply from China is getting tighter, political and ESG concerns relating to China are increasing and freight markets are getting expensive and uncertain. Recent disruptions have been caused by the Suez Canal blockage, Covid related issues and a shortage of containers, container ships and unloading capacity at western ports. Local supply chains are very much desired.

19.4 POTENTIAL PRODUCTS AND MARKETS

As indicated in section 13 Mineral Processing and Metallurgical Testing, Northern estimates that in practice it is possible to achieve a 20% increase in the coarser flake size due to market requirements of only 80% of the product being at spec, the balance being smaller flake. The expected product split figures provided by Northern are 11% +50 mesh XL flake; 48% +80 mesh large flake; 24% +100 mesh medium flake; and 17% -100 mesh small flake.

Northern expects the Okanjande deposit concentrates may be able to attract a premium by selling smaller volumes to multiple customers rather than selling larger volumes to a small number of traders and/or distributors. It may also realise a premium based on its high-quality ex-mine product, providing a secure, stable, non-Chinese source of supply and inventory management.

19.5 GRAPHITE MARKET OUTLOOK

In the near- to medium-term, graphite prices are expected to increase as LiB demand is growing rapidly, supply from China is getting tighter, and political, environmental and social governance ("ESG") concerns are increasing. The importance of a local and/or shorter supply chain has been highlighted by recent disruptions including the Suez Canal blockage, COVID-related shortages of labour resulting in long delivery times at ports, and a shortage of containers and container ships. All have combined to substantially increase transportation costs and make projects such as the Okanjande Project more attractive.

19.6 MATERIAL CONTRACTS

The Company has not entered into any material contracts

19.7 QUALIFIED PERSON STATEMENT

CREO has reviewed the market studies and analyses and confirms that the results support the assumptions in this PEA Report.

20 ENVIRONMENTAL STUDIES, PERMITTING AND SOCIAL OR COMMUNITY IMPACT

(Prepared by Knight Piésold Consulting (Pty) Ltd.)

20.1 PROJECT ENVIRONMENTAL PERMITTING REQUIREMENTS

20.1.1 Authorisation Status

A review of available documentation was undertaken to determine the authorisation status at both the Okorusu and Okanjande sites. Table 20-1 and Table 20-2 provide the authorisation history of the two sites respectively. Both sites currently have Environmental Clearance Certificates (ECC) in terms of the Environmental Management Act (No. 7 of 2007) (EMA). The Okanjande Mine ECC allows for the construction, infrastructure development and operation of the graphite mine and the graphite processing plant comprising of crushing, milling, heavy mineral separation, flotation, filtration, drying, screening, bagging and tailings disposal

Table 20-1: Environmental Authorization Status Okorusu

Year	Consultant	Type of application	Comments
1998	Unknown	EMP	• Original application
2003	Unknown	EIA Amendment	• Various changes at the mine • Specialist studies
2008	Unknown	EIA Amendment	• Further amendments
2012	Unknown	Application in terms of new Act	• 2008 EMP submitted
2013	Unknown	EIA	• Expansion of mining operations (ML-90 and ML-179)
2016	SLR	EIA Amendment	• Transport of graphite from Otjiwarongo to the Okorusu Mine • the construction of a new access road on the Okorusu Mine site • the processing of graphite at the existing processing plant • the development of a new TSF cell within the approved Okorusu TSF footprint in order to dispose of graphite ore processing tailings • mining of magnetite within the ML-90 and ML-179 mining licence areas; and • reworking of the Okorusu mine tailings for the production of metspar at the existing Okorusu processing facility.
2017	Namib Hydrosearch	Environmental Issues Report	• Mine water use • Water quality • Management of wastewater • Disturbances and environmental concerns • Groundwater exploration for resources
2020	Phillip Hooks	EIA Amendment	Request stand-alone ECC for the following: • Whole processing of graphite ore at the Okorusu mine site • The storage and use of diesel and heavy fuel oil to be included under the transferred certificate • The new Tailings Storage Facility • The haulage of graphite ore from Okanjande mine site to Okorusu mine site by truck

Table 20-2: Environmental Authorisation Status Okanjande

Year	Consultant	Type of application	Status	Comments
2014	Enviro Dynamics	EIA		
2020	Imerys	Renewal application (with EAR)	EAR Submitted, ECC renewed and Valid until 2024-11-11	
2021	Geokey	Environmental Audit Report	Bi-Annual reporting up to date. EMP up to date	Requirement for Bi-annual internal audit and report

The Okanjande ECC for graphite mining activities was first issued on 23 April 2015. The Okorusu ECC for mine expansion was first issued on 26 September 2016.

20.2 REGULATORY REQUIREMENTS

This section details the regulatory requirements, proposed public participation processes as well as recommended specialist studies for the project.

20.2.1 Environmental clearance certificate (ECC)

Although both Okorusu and Okanjande currently have ECCs, it is recommended that any potential changes to the process be reconciled with the current ECC's of the two sites to determine whether amendments to them are required. This will first and foremost entail engagement with the Ministry of Environment, Forestry and Tourism (MEFT) as the regulating agency. The process to follow will entail two separate Scoping Studies with impact assessments of the new activities, and an updated EMP.

Table 20-3: Environmental Clearance Status

Project	License /Project	ECC expiry	ECC/MET online #
Okanjande	EPL4717 / OKA	20-Feb-25	ECC – 001996
Okorusu	EPL5046 / OKU	22-Jun-24	ECC – 01433
Okanjande	ML196 / OKA	11-Nov-24	ECC – 01730
Okorusu	ML90 / OKU	27-Sep-22	ECC – 00148

20.2.2 Water Abstraction Permits

20.2.2.1 Okanjande Mine Site

The water abstraction permit nr 11163 on the remaining portion of Farm Okanjande was issued 5 July 2021 to abstract 25,000m^3/a for the use in mining purposes. The permit is applicable to borehole nr. WW203557 and is valid for a period of 2 years.

Figure 20-1: Permitted Farm Okanjande Borehole siting

The water abstraction permit nr 10946 from the Farm Doornlaagte was issued 13 July 2021 to abstract 90,000m^3/a for the use in mining purposes. The permit is applicable to borehole nr. WW203557 and is valid for a period of 2 years.

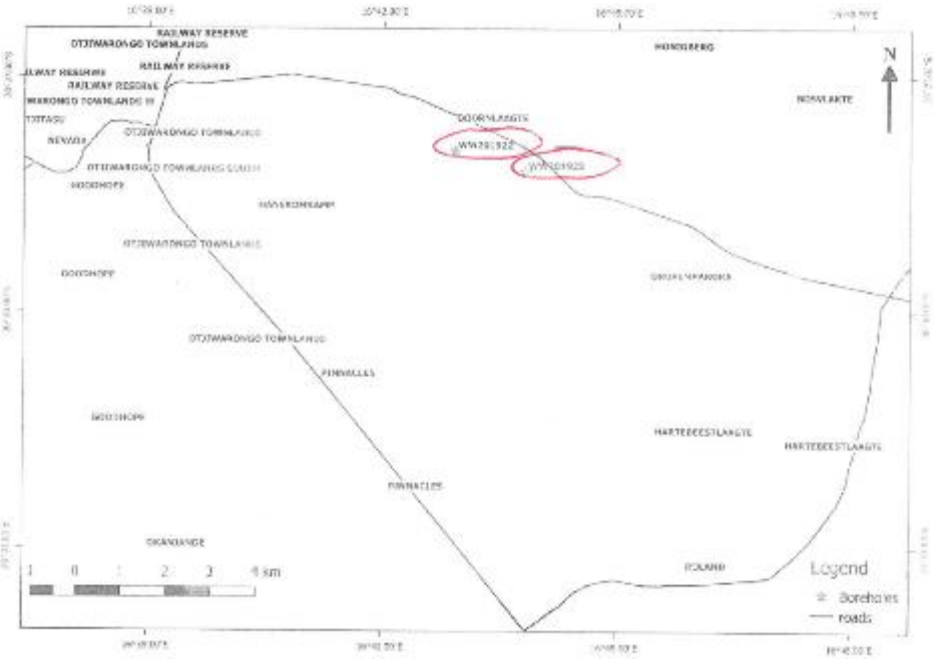

Figure 20-2: Permitted Farm Doornlaagte Borehole Siting

20.2.2.2 Okorusu Processing Plant

The water abstraction permit nr 11472 for Farm Okorusu was issued on 17 October 2019 to abstract 640,000m3 of water per year from borehole nr WW205415 for the use in mining purposes. The permit expired on 16 October 2021.

Application for renewal of the water permit was submitted to the Department of Water Affairs on 6 October 2021.

20.3 SOCIAL/COMMUNITY REQUIREMENTS

20.3.1 Public Participation

A public participation plan should be compiled at the initiation of the project to identify the role players and detail the public participation activities. This will ensure that stakeholders are not overlooked and that that effective methods for communication are used. Public participation is requirement of an EIA process.

The main objective of public participation is to disseminate relevant information about the project and to gather information from stakeholders towards an environmentally and socially sound project.

A stakeholder database was developed as part of the 2020 amendment (Hook, 2020) and includes Government Ministries, Local and regional government councillors and key officers, Government Parastatals, affected landowners. It is recommended that this database be updated for the purpose of the amendment application.

20.3.2 Analysis of Social Issues

No social issues of concern have been identified at the time of writing of this report.

20.4 MINE CLOSURE

Mine closure plans needs to be developed for the Okanjande Graphite project for the closure of Open Pits, Waste Dumps, Tailings Storage Facility, Process Pant Buildings and Infrastructure; as well as general surface rehabilitation.

The open pit mining at Okanjande lends itself to a number of risks which need to be considered during the development of closure plans. These risks were identified in 2014 Environmental Impact Assessment conducted by Namib Hydrosearch:

- *"If the mine pit remains unfilled after mining activity ceases it is likely to fill by groundwater seepage to a level in equilibrium with the surrounding groundwater table. The inflow rates are expected to be high when the pit is excavated but later flow are likely to be at low rates.*
- *This could lead to the formation of low pH, high sulphate and TDS water in the pit with possible dissolved metals that is concentrated by loss of water through evaporation. This will particularly apply to seepage from the pit walls above the water level and during seasonal fluctuations of flow and water levels.*

- *The deep water levels, low hydraulic conductivity, limited water in the dewatered tailings or deposited dry tailings and the addition of neutralising agents to the tailings could all work to ensure the security of the groundwater. Inflow rates into the mine pit are estimated to be low and could be neutralised if found to be acidic. If surface water is diverted away from the mine structures groundwater contamination through direct infiltration can be avoided. Namib Hydrosearch (2014) concluded that the general impact of the mine is seen to be limited and can further be reduced by implementing the recommended mitigation measures for possible impacts and by continuously monitoring the effectiveness of the mitigation measures during the operation and closure phases of the mine.*

Risk Mitigation measures were recommended by Namib Hydrosearch for inclusion in a Mine Closure plan:

- *Berms should be constructed to channel runoff away from the entire north-western boundary of the TSF to avoid erosion and damage to the embankments and possible mixing with effluent in TSF perimeter trenches. The runoff should be discharged to the natural drainage channel in these directions. No runoff should enter the perimeter trench or reach the embankment of the TSF.*
- *Berms on the upslope side would stop runoff entering the stockpiles or mine pit given the relatively small volumes of runoff expected. The runoff is to be diverted away from the stockpiles towards the southwest flowing natural drainage. Contact or mixing of runoff with the stockpile material or effluent is to be avoided.*
- *The proximity to the contact zones along the north-west and south-east side require that the trenches are lined and any effluent collected and directed to the RWD. Sufficient depth of the perimeter trench is required to intercept any lateral flow along the soil zone.*
- *The Rock Waste Dump (RWD) needs to be lined with strip drains to prevent seepage. Steps will also have to be taken to minimise the retention time in the RWD and to pump this water as a priority for use in the plant. The RWD will be designed to accommodate storm water (1:100 rainfall event) and to contain surface runoff from the TSF. Dilution of the effluent to a significant level is expected under these conditions.*
- *Diversion of storm water drainage with berms and peripheral trenches to collect seepage water is recommended together with close monitoring. On closure of the mine the stockpiles are to be graded to encourage runoff and limit infiltration. The surface is to be covered with soil and vegetated. The protective berms diverting surface flow are to remain to avoid any erosion of the soil cover.*
- *The addition of crushed limestone (marble) to the stockpile to raise the pH and precipitate metals in the long term is recommended. On closure of the mine the stockpiles are to be graded to encourage runoff and limit infiltration. The surface is to be covered with soil and vegetated. The protective berms diverting surface flow are to remain to avoid any erosion of the soil cover.*
- *Secure the pit against inflow of surface runoff water and discharge.*
- *The suitability of the water accumulated in the mine pit for use in the plant is to be evaluated.*
- *The mine pit could be dosed with acid neutralisation material such as marble or limestone. Reactions may be hindered by formation of 'armour' of $Fe(OH)3$ and has to be ground to sand size particles for effective neutralisation in the long term (The Global Acid Rock Drainage Guide). By implementing the*

recommended monitoring measures, it will be possible to define if and when the equilibrium can be reached. The monitoring program should be adjusted going forward based on these results.

- *On closure the mine pit should be cordoned off to avoid access and use by animals and humans.*
- *Rock Waste Dumps and Remaining Stockpiles: On closure of the mine the stockpiles are to be graded to encourage runoff and limit infiltration. The surface is to be covered with soil and vegetated. The protective berms diverting surface flow are to remain to avoid any erosion of the soil cover.*

21 CAPITAL AND OPERATING COST ESTIMATES

(Prepared by CREO Engineering Solutions (Pty) Ltd.)

21.1 INTRODUCTION

The Okanjande overall capital and operating cost estimate was developed by Creo Engineering Solutions Pty Ltd, MSA Group and Knight Piésold Consulting Pty Ltd, with input from Northern Graphite Corporation. The cost estimates were developed to support a nominal mining rate of 631,450t/a. The process facility cost estimate is based on a nominal throughput capacity of 631,450t/a and producing on average 31,877t/a of graphite concentrate per year.

21.2 ESTIMATE ACCURACY

The cost estimates have been prepared in accordance with the recommended practices of the American Association of Cost Engineers (AACE) and are considered to have an accuracy of +40 -30% overall and are discussed in greater detail in the following sections.

21.3 PROJECT CURRENCY AND EXCHANGE RATES

The currency for the cost estimate is expressed in 2nd Quarter 2022 US dollars. No provision is included for potential future cost escalation.

The following foreign currency exchange rates apply to CAPEX and OPEX estimates in this study:

- NAD 15.60 : USD 1.00

21.4 BASE DATE

The base date of the estimate is 31 May 2022 and will be subject to contract price adjustment and escalation as from the estimate base date.

21.5 SCOPE OF ESTIMATES

The scope of facilities addressed in the cost estimate includes the following major elements:

- Mining (OPEX Only)
    - Drill and Blast
    - Load and Haul
    - Re-Handling
    - Ore Transport
- Comminution (CAPEX and OPEX)

  - Crushing (Jaw Crusher)
  - Ore Transport (PBS Trucking System)
  - Material Handling and Stockpiling
  - Grinding (AG and Rod Mill)
  - Material Handling (Loading and Conveyors)
  - Classification (Screening)
  - Iron Removal (LIMS)
- Flotation (CAPEX and OPEX)
  - Roughers (Repurposed)
  - Cleaners (Repurposed)
  - Polishing (Existing and New)
  - Classification (Screening)
- Dewatering and Bagging (CAPEX and OPEX)
  - Thickening (Existing)
  - Filtration (Existing)
  - Drying (Existing)
  - Classification (Existing)
  - Bagging (Existing)
- Tailings Storage (CAPEX and OPEX)
  - Tailings Dam
  - Decantation stations
  - Decantation Dam

21.6 CAPITAL COST

21.6.1 CAPEX Summary

21.6.1.1 Initial Capital

The initial project capital expenditure for the Okorusu Process Plant, excluding the new TSF 3A, is given in Table 21-1. The majority portions of the initial capital are required for the construction of the new Grinding circuit and infrastructure.

Table 21-1: Okanjande Initial Process Plant CAPEX Summary – excluding TSF 3A

DIRECT FIELD COSTS	US$	%IDFC	%TCC
Mechanical	2,173,642	29%	21%
Civil & Earthworks	811,540	11%	8%
Structural	1,426,055	19%	14%
Piping & Valves	267,155	4%	3%
Platework	199,951	3%	2%
Electrical & Instrumentation	1,391,084	19%	14%
SUBTOTAL: DIRECT FIELD COSTS	**6,269,427**	**84%**	**61%**
Cost of Services During Construction	1,211,561	16%	12%
TOTAL: INSTALLED DIRECT FIELD COSTS	**7,480,988**	**100%**	**73%**
INDIRECT FIELD COSTS			
Transport	512,497	7%	5%
EPCM Allowance	793,513	10.6%	8%
Owner Teams Cost	500,000	7%	5%
SUBTOTAL INSTALLED COST	**9,286,997**	**124%**	**90%**
Contingency Allowance	1,000,000	13%	10%
TOTAL CAPITAL COST	**10,286,997**	**138%**	**100%**

Table 21-2 presents the initial capital related to the construction of the new tailings dam facility: TSF 3A. TSF 3A is assumed unlined to store non potentially acid generating (NPAG) tailings from the early life of mine weathered ore.

Table 21-2: TSF 3A Initial Capital

DIRECT FIELD COSTS	US$	%IDFC	%TCC
Mechanical	225,000	6%	5%
Civil & Earthworks	1,825,612	46%	38%
Structural	52,500	1%	1%
Piping & Valves	808,567	20%	17%
Platework	10,000	0%	0%
Electrical & Instrumentation	250,537	6%	5%
SUBTOTAL: DIRECT FIELD COSTS	**3,172,216**	**80%**	**66%**
Cost of Services During Construction	772,057	20%	16%
TOTAL: INSTALLED DIRECT FIELD COSTS	**3,944,273**	**100%**	**82%**
INDIRECT FIELD COSTS			
Transport	39,443	1%	1%
EPCM Allowance	243,590	6%	5%
Owner Teams Cost	0	0%	0%
TOTAL INSTALLED COST	**4,227,305**	**107%**	**88%**
Contingency Allowance	591,641	15%	12%
TOTAL CAPITAL COST	**4,818,946**	**122%**	**100%**

The total initial capital is given in Table 21-3.

Table 21-3: Total Initial Installed Capital (Process Plant & TSF 3A)

DIRECT FIELD COSTS	US$	%IDFC	%TCC
Mechanical	2,398,642	21%	16%
Civil & Earthworks	2,637,152	23%	17%
Structural	1,478,555	13%	10%
Piping & Valves	1,075,721	9%	7%
Platework	209,951	2%	1%
Electrical & Instrumentation	1,641,621	14%	11%
SUBTOTAL: DIRECT FIELD COSTS	**9,441,643**	**83%**	**63%**
Cost of Services During Construction	1,983,618	17%	19%
TOTAL: INSTALLED DIRECT FIELD COSTS	**11,425,260**	**100%**	**76%**
INDIRECT FIELD COSTS			
Transport	551,939	5%	4%
EPCM Allowance	1,037,102	9%	7%
Owner Teams Cost	500,000	4%	3%
TOTAL INSTALLED COST	**13,514,302**	**118%**	**89%**
Contingency Allowance	1,591,641	14%	11%
TOTAL CAPITAL COST	**15,105,943**	**132%**	**100%**

The initial capital distribution is given in Table 21-4.

Table 21-4: Initial Capital Distribution

Area	Installed Direct Field Costs US$	Total Capital Costs US$
Site Wide Services & Infrastructure	0	0
Mining and Stockpiles	0	0
Crushing	0	0
Milling	6,057,805	8,455,507
Flotation	1,216,068	1,562,395
Concentrate Dewatering	39,985	54,562
Screening & Bagging	12,032	15,192
Tailings Disposal	4,227,305	4,818,946
Reagent Handling	11,623	14,939
Utilities	143,474	184,402
General Facilities & Buildings	0	0
Total Direct Field Costs	**11,708,293**	**15,105,943**

21.6.1.2 Life of Mine Capital

The Initial Capital costs cover both the initial Process Plant and TSF 3A capital costs. The TSF 3B expansion will be required for the deposition of fresh ore material and is scheduled for construction in year 5.

A sustaining capital provision of 1% of Initial Direct Field cost was made annually (Table 21-5). Closedown costs for the TSF reclamation was determined by KP. A working capital provision was made based on 4 months of anticipated annual operational cost.

Table 21-5: Okanjande Life of Mine Capital costs

Capital Class	Description	Cost US$
Initial Capital	Process Plant and TSF 3A	15,105,943
Expansion Capital	TSF 3B	9,116,308
Sustaining Capital	1% of Initial Direct Field Costs Annually	631,880
Close-down costs	TSF 3A & 3B Reclamation, KP 2021	3,920,116
Working Capital	1 Third of Year 1 OPEX	5,483,062
Total LOM Capital		**34,257,308**

21.6.2 Basis of CAPEX Estimate

The estimate is developed based on a mix of material take-offs and factored quantities and costs, semi-detailed unit costs and work packages for major equipment supply.

The structure of the estimate is a build-up of the direct and indirect cost of the current quantities; this includes the installation/modification/rectification/construction costs, contractor construction distributable costs, bulk and miscellaneous material and equipment costs, any subcontractor costs and freight. Source data used for developing the estimate included:

- Process design basis and criteria
- Process flow diagrams
- Drawings and Sketches
- Major Equipment list for new equipment
- Minor equipment list from the existing operations requiring refurbishments, modifications or removal.
- Budgetary quotes for major equipment
- In-house historical data from similar recent in country projects
- Multiple site visits and equipment inspections on existing equipment together with historical information reviews and reports.

The pricing and delivery information for quoted equipment, material and services was provided by suppliers based on the market conditions and expectations applicable at the time of developing the estimate. The estimate in this report is based on information provided by suppliers and assumes there are no problems associated with the supply and availability of equipment and services during the execution phase.

21.6.2.1 Direct Field Costs

The direct costs were estimated by CREO. All equipment and material requirements are based on the design information available for the 2022 PEA.

A factored cost was prepared for the following items associated with the new equipment:

- Civils and Earthworks
- Structural Steel
- Platework
- Piping & Valves
- Electrical and Instrumentation

21.6.2.1.1 Mechanical Equipment

Costs for mechanical equipment are based on an equipment list developed of all the new major equipment required for the process as well as the existing installed equipment to be repurposed. Costs are based on budgeted quotes for all major equipment and historical estimates and knowledge for the refurbishment of the existing installed equipment. The costs for the refurbishment of the existing equipment were also considered from several site inspections conducted. Where costs were not available, reasonable allowances were made.

Installation costs for mechanical equipment is factored based on the equipment supply costs or equipment type.

Budgetary quotes were obtained for the following major equipment items:

- Milling Section (Mills and Auxiliary equipment)
- Flotation Section (New polishing Mills)

21.6.2.1.2 Civils and Earthworks

Major earthworks were factored and include costs for the construction of the ore tipping pad as well as the platforms for the milling, conveying and flotation circuits. The civil costs were also factored based on benchmarked percentages from a similar project.

21.6.2.1.3 Structural Steel

For the Milling Circuit, the structural steel estimate was obtained from material take-offs from an initial structural layout. Masses used to determine the main structural members were taken from major equipment supplier budgetary proposal documents. The Milling Circuit accounts for the majority of structural steel costs for the project.

For the remainder of the process plant, structural steel costs are factored based on percentages of mechanical equipment cost experience obtained from similar projects. Factored percentages have been aligned to include providing for the structures associated with the milling section.

21.6.2.1.4 Platework

The platework costs are factored based on percentages of mechanical equipment cost experience on similar projects.

21.6.2.1.5 Piping and Valves

The piping and valves costs were factored based on percentages of mechanical equipment cost experience on similar projects.

21.6.2.1.6 Electrical and Instrumentation

The E&I costs were obtained through a budgetary enquiry process on the supplied equipment required. This included the distributed network equipment and in-plant electricals. Preliminary material take-offs were obtained from existing and future mechanical equipment, layouts together with its associated electrical loads. Instrumentation and control costs were obtained through a budget enquiry on all the major items and factorising the minor components. The existing control philosophy was also considered during this costing estimate.

21.6.2.2 Indirect Field Costs

21.6.2.2.1 Transport

Transport costs are included in the estimated. These costs have been estimated as 7% of the project direct costs.

21.6.2.2.2 EPCM Allowance

The EPCM allowance caters for engineering, procurement services, construction services, quality control, survey support, safety, etc. These costs have been estimated as 10.6% of the project direct costs as the bulk of these costs will only be applicable to the new expansion activities.

21.6.2.2.3 Owner's Team Costs

Owner's costs are included in the estimated. These costs have been estimated as 7% of the project direct costs.

21.6.2.2.4 Contingency

Contingency has been applied at 13% of the direct field costs.

21.6.3 Mining Capital Cost Estimate

The Okanjande mine infrastructure has been established and no further capital is required. Contract mining will be applied and as such no capital is budgeted by Northern Graphite for a mining fleet.

21.6.4 Process Plant Capital Cost Estimate

21.6.4.1 Site Wide Services and Infrastructure

The Okorusu Process plant is well established and site wide services and infrastructure were inspected and found to be in an acceptable condition for the restart of operations. No capital cost allowance was made for site wide services and utilities in this study.

21.6.4.2 Crushing and Screening

Primary crushing will be contracted together with mining and as such no capital cost allowance was made for crushing in this study.

21.6.4.3 Milling

The milling circuit will consist of the following major equipment:

- Hopper feeder (Mining Contractor scope and cost)
- Stockpile feed conveyor (70m, Mining Contractor scope and cost)
- Stockpile drawdown feeders (x3)
- AG mill feed conveyor with tramp magnet and belt scale
- AG mill with feed chute and trommel screen on the discharge
- Trommel screen oversize / scats bunker
- Common mill sump for the AG and Rod Mill with recirculation pumps
- Hydro-cyclone for classification
- Flash flotation cell, not installed initially.
- Rod mill
- Low Intensity Magnetic Separator (LIMS)
- Magnetic Rejects bunker
- Flash flotation concentrate batching transfer tank, agitated
- Flotation Feed buffer tank, agitated

Multiple budgetary quotes were obtained for the mechanical equipment, with the exception of the circulation pumps where existing equipment will be re-used (Table 21-6).

Table 21-6: Milling Mechanical Cost

Major Equipment	Description	Mechanical Supply Cost
Hopper Feeder	Mining Contractor Supplied	0
Stockpile Conveyor	Mining Contractor Supplied	0
Stockpile Drawdown Feeders	3 of	46,719
Mill Feed Conveyor	81m	38,109
Tramp Magnet		8,196
Common Sump		15,000
LIMS	900x900mm	24,839
Cyclone Cluster		59,672
SAG Mill	5.5x1.8m, 1.25MW	731,557
Rod Mill	4.0x3.0m, 630kW	309,836
Trommel screen and oversize chute		41,639
Total Milling Mechanical Cost		**1,275,567**

Direct and Indirect capital costs for the Milling circuit are given in Table 21-7.

Table 21-7: Milling Total Capital Cost

Discipline	Estimate Method	Discipline Costs
Mechanical	Basic Design, Quotes	1,275,567
Civil & Earthworks	Factorized	739,829
Structural	Basic Design, BOQ, Quotes	1,260,874
Piping & Valves	Factorized	237,255
Platework	Factorized	165,824
Electrical & Instrumentation	Basic Design, BOQ, Quotes	1,166,895
Cost of Services During Construction	Factorized	1,211,561
Transport	Factorized	459,204
EPCM Allowance	Factorized	726,937
Owner Teams Cost	Factorized	363,468
Contingency Allowance	Factorized	848,093
Total Milling Capital Costs		**8,455,507**

21.6.4.4 Flotation

Initial mechanical costs for the Flotation circuit were derived from estimates for the maintenance and refurbishment of existing flotation equipment and is given in Table 21-8. The largest contributor to flotation circuit mechanical costs are due to a new polishing scrubber #1 and 2 new polishing vertical stirred media mills, for which budgetary quotes were obtained.

Table 21-8: Flotation Mechanical Cost

Major Equipment	Description	Mechanical Supply Cost
Safety	Maintain, Refurbish	1,500
Comminution	Basic Design, Quotes	562,300
Mass Transport	Maintain, Refurbish	77,625
Classification	Basic Design, Quotes	6,750
Vessels / Storage	Maintain, Refurbish	3,000
Mixing	Maintain, Refurbish	76,500
Auxiliary	Maintain, Refurbish	0
Total Flotation Mechanical Cost		**727,675**

Direct and Indirect capital costs for the Flotation circuit are given in Table 21-9.

Table 21-9: Flotation Total Capital Cost

Discipline	Estimate Method	Discipline Costs
Mechanical	Basic Design, Quotes for Polishing Mills	727,675
Civil & Earthworks	Factorized	68,795
Structural	Factorized	155,621
Piping & Valves	Factorized	29,107
Platework	Factorized	27,652
Electrical & Instrumentation	Factorized	207,218
Cost of Services During Construction	Factorized	0
Transport	Factorized	33,288
EPCM Allowance	Factorized	66,576
Owner Teams Cost	Factorized	116,662
Contingency Allowance	Factorized	129,800
Total Flotation Capital Costs		**1,562,395**

21.6.4.5 Concentrate Dewatering

Initial Mechanical capital costs for the Concentrate Dewatering circuit are solely due to estimates for the maintenance and refurbishment of existing equipment and is given in Table 21-10.

Table 21-10: Concentrate Dewatering Mechanical Costs

Major Equipment	Description	Mechanical Supply Cost
Safety	Maintain, Refurbish	375
Mass Transport	Maintain, Refurbish	6,900
Classification	Maintain, Refurbish	16,200
Vessels / Storage	Maintain, Refurbish	3,750
Auxiliary	Maintain, Refurbish	5,138
Total Concentrate Dewatering Mechanical Cost		**32,363**

Direct and Indirect capital costs for the concentrate dewatering circuit are given in Table 21-11.

Table 21-11: Concentrate Dewatering Total Capital Costs

Discipline	Estimate Method	Discipline Costs
Mechanical	Summarized Mechanical	32,363
Civil & Earthworks	Factorized	1,204
Structural	Factorized	1,816
Piping & Valves	Factorized	150
Platework	Factorized	1,230
Electrical & Instrumentation	Factorized	3,223
Cost of Services During Construction	Factorized	0
Transport	Factorized	6,473
EPCM Allowance	Factorized	0
Owner Teams Cost	Factorized	3,836
Contingency Allowance	Factorized	4,268
Total Concentrate Dewatering Capital Costs		**54,562**

21.6.4.6 Screening and Bagging

Initial Mechanical capital costs for the Screening and Bagging section are solely due to estimates for the maintenance and refurbishment of existing equipment and is given in Table 21-12.

Table 21-12: Screening & Bagging Mechanical Costs

Major Equipment	Description	Mechanical Supply Cost (US$)
Safety	Maintain, Refurbish	938
Mass Transport	Maintain, Refurbish	300
Classification	Maintain, Refurbish	1,200
Vessels / Storage	Maintain, Refurbish	1,200
Auxiliary	Maintain, Refurbish	6,000
Mobile Equipment	Maintain, Refurbish	300
Total Screening & Bagging Mechanical Cost		**9,938**

Direct and Indirect capital costs for the screening and bagging section are given in Table 21-13.

Table 21-13: Screening & Bagging Total Capital

Discipline	Estimate Method	Discipline Costs
Mechanical	Summarized Mechanical	9,938
Civil & Earthworks	Factorized	123
Structural	Factorized	557
Piping & Valves	Factorized	46
Platework	Factorized	378
Electrical & Instrumentation	Factorized	990
Cost of Services During Construction	Factorized	0
Transport	Factorized	722
EPCM Allowance	Factorized	0
Owner Teams Cost	Factorized	1,154
Contingency Allowance	Factorized	1,284
Total Concentrate Dewatering Capital Costs		**15,192**

21.6.4.7 Tailings Disposal

TSF site 3 from the KP TSF study was selected for construction of the new tailings storage facilities. The TSF will be constructed in 2 stages:

1. TSF 3A – Will cater for 3.2Mt of tailings resulting from the treatment of Okanjande Weathered Ores. This tailings facility will be un-lined and will be constructed as part of initial project capital
2. TSF 3B – Will cater for 2.6Mt of tailings resulting from the treatment of fresh ore containing sulphides, which could generate acid through sulphide oxidation. This tailings facility will be lined and will be constructed in year 5.

The total capital cost associated with the Okorusu TSF 3A has been estimated at US$ 4.82 million, inclusive of instrumentation, engineering and permitting. A summary of these costs is presented in Table 21-14. The high-level capital cost estimates have been developed to +/-50% and the unit rates were developed by KP based on recent construction projects.

The total Capital cost associated with the Okorusu TSF 3B has been estimated at US$ 9.12 million, inclusive of instrumentation, engineering and permitting. A summary of these costs is presented in Table 21-15.

The following key items were considered for the cost estimate:

- Bush clearance and topsoil stripping of the TSF area
- The starter wall embankment construction (including box-cut)
- Foundation preparation of the TSF basin
- An underdrainage system placed over the liner to reduce the risk of elevated phreatic surface in the tailings and increase water recycle
- Lining for TSF 3B: The TSF liner system, which has been assumed as a HDPE liner over a low permeability layer of locally sourced material, and a geotextile layer.
  - 300g/m^2 bidim,
  - 1.5mm HDPE liner,

- basin foundation preparation, and
- 300mm low permeability clay layer (can be sourced from the historical borrow pits identified as part of the Graphite TSF construction)

- The RWD construction works:
  - Basin excavation
  - Embankment wall
  - Basin preparation
  - 1.5 mm HDPE geomembrane and a geotextile layer.

Table 21-14: TSF 3A Initial Capital Cost Estimate

DIRECT FIELD COSTS		%IDFC	%TCC
Mechanical	225,000	6%	5%
Civil & Earthworks	1,825,612	46%	38%
Structural	52,500	1%	1%
Piping & Valves	808,567	20%	17%
Platework	10,000	0%	0%
Electrical & Instrumentation	250,537	6%	5%
SUBTOTAL: DIRECT FIELD COSTS	**3,172,216**	**80%**	**66%**
Cost of Services During Construction	772,057	20%	16%
TOTAL: INSTALLED DIRECT FIELD COSTS	**3,944,273**	**100%**	**82%**
INDIRECT FIELD COSTS			
Transport	39,443	1%	1%
EPCM Allowance	243,590	6%	5%
Owner Teams Cost	0	0%	0%
TOTAL INSTALLED COST	**4,227,305**	**107%**	**88%**
Contingency Allowance	591,641	15%	12%
TOTAL CAPITAL COST	**4,818,946**	**122%**	**100%**

Table 21-15: TSF 3B Expansion Capital Cost Estimate

DIRECT FIELD COSTS		%IDFC	%TCC
Mechanical	175,000	2%	2%
Civil & Earthworks	5,970,289	78%	65%
Structural	52,500	1%	1%
Piping & Valves	654,221	9%	7%
Platework	10,000	0%	0%
Electrical & Instrumentation	202,289	3%	2%
SUBTOTAL: DIRECT FIELD COSTS	**7,064,299**	**92%**	**77%**
Cost of Services During Construction	624,680	8%	7%
TOTAL: INSTALLED DIRECT FIELD COSTS	**7,688,980**	**100%**	**84%**
INDIRECT FIELD COSTS			
Transport	76,890	1%	1%
EPCM Allowance	197,091	3%	2%
Owner Teams Cost	0	0%	0%
TOTAL INSTALLED COST	**7,962,961**	**104%**	**87%**
Contingency Allowance	1,153,347	15%	13%
TOTAL CAPITAL COST	**9,116,308**	**119%**	**100%**

Table 21-16: Combined LOM TSF CAPEX Estimate

DIRECT FIELD COSTS		%IDFC	%TCC
Mechanical	400,000	3%	3%
Civil & Earthworks	7,795,901	67%	56%
Structural	105,000	1%	1%
Piping & Valves	1,462,788	13%	10%
Platework	20,000	0%	0%
Electrical & Instrumentation	452,826	4%	3%
SUBTOTAL: DIRECT FIELD COSTS	**10,236,515**	**88%**	**73%**
Cost of Services During Construction	1,396,737	12%	10%
TOTAL: INSTALLED DIRECT FIELD COSTS	**11,633,252**	**100%**	**83%**
INDIRECT FIELD COSTS			
Transport	116,333	1%	1%
EPCM Allowance	440,681	4%	3%
Owner Teams Cost	0	0%	0%
TOTAL INSTALLED COST	**12,190,266**	**105%**	**87%**
Contingency Allowance	1,744,988	15%	13%
TOTAL CAPITAL COST	**13,935,254**	**120%**	**100%**

The following qualifications have been made with regards to the above-mentioned capital cost estimates:

- P & G's have been assumed as 30% of the total works.

- Lump sum allowances and assumed percentages have been developed for selected items based on recent and relevant experience.
- No NPV discounting has been applied to the costs.
- A contingency of 15% has been allowed to the costs.
- The Capital estimate of Knight Piésold was increase by US$150k to allow for pumping and piping infrastructure to and from the site 3 TSF.
- Engineering design and EIA permitting has been estimated and allowed for.

The existing TSF monitoring system includes six piezometers and four inclinometers as documented in the Care and Maintenance Monitoring Plan (Knight Piésold, 2021b). A cost for similar monitoring facilities is included for these new tailings dams.

Table 21-17 below summarises the cost estimate for the installation of the monitoring system to be installed on TSF 3A. TSF 3A consists of seven cross sections of three piezometers each, 14 surface inclinometers and three ground additional ground water monitoring boreholes. An allowance has been made for site establishment and demobilization of the contractor completing the scope of work and the engineering fees associated with the design and site supervision of the installation of the monitoring system.

Table 21-17: TSF 3A Monitoring System Cost Estimate.

Construction Description	Capital Cost (US$)
Mobilization and Demobilization	11,183
Geotechnical Instrumentation	186,387
Engineering	9,879
Sub-Total all item	207,449
Recommended Contingency (15%)	31,117
Grand Total	**238,566**

21.6.4.8 Reagent Handling

Initial Mechanical capital costs for the Reagent Handling section are solely for the maintenance and refurbishment of existing equipment and is given in Table 21-18.

Table 21-18: Reagent Handling Mechanical Costs

Major Equipment	Description	Mechanical Supply Cost (US$)
Mass Transport	Maintain, Refurbish	7,200
Classification	Maintain, Refurbish	300
Vessels / Storage	Maintain, Refurbish	1,200
Mixing	Maintain, Refurbish	900
Auxiliary	Maintain, Refurbish	0
Total Reagent Handling Mechanical Cost		**9,600**

Direct and Indirect capital costs for the reagent handling section are given in Table 21-19.

Table 21-19: Reagent Handling Total Capital

Discipline	Estimate Method	Discipline Costs
Mechanical	Summarized Mechanical	9,600
Civil & Earthworks	Factorized	119
Structural	Factorized	539
Piping & Valves	Factorized	45
Platework	Factorized	365
Electrical & Instrumentation	Factorized	956
Cost of Services During Construction	Factorized	0
Transport	Factorized	960
EPCM Allowance	Factorized	0
Owner Teams Cost	Factorized	1,115
Contingency Allowance	Factorized	1,241
Total Reagent Handling Capital Costs		**14,939**

21.6.4.9 Utilities

Initial Mechanical capital costs for Utilities are solely due to estimates for the maintenance and refurbishment of existing equipment and is given in Table 21-20.

Table 21-20: Utilities Mechanical Costs

Major Equipment	Description	Mechanical Supply Cost (US$)
Mass Transport	Maintain, Refurbish	62,400
Classification	Maintain, Refurbish	2,400
Vessels / Storage	Maintain, Refurbish	29,550
Mixing	Maintain, Refurbish	150
Auxiliary	Maintain, Refurbish	24,000
Total Reagent Handling Mechanical Cost		**118,500**

Direct and Indirect capital costs for utilities are given in Table 21-21.

Table 21-21: Utilities Total Capital Costs

Discipline	Estimate Method	Discipline Costs
Mechanical	Summarized Mechanical	118,500
Civil & Earthworks	Factorized	1,469
Structural	Factorized	6,648
Piping & Valves	Factorized	551
Platework	Factorized	4,503
Electrical & Instrumentation	Factorized	11,803
Cost of Services During Construction	Factorized	0
Transport	Factorized	11,850
EPCM Allowance	Factorized	0
Owner Teams Cost	Factorized	13,764
Contingency Allowance	Factorized	15,314
Total Reagent Handling Capital Costs		**184,402**

21.6.4.10 General Facilities and Buildings

The Okorusu Process plant is well established and general facilities and buildings were inspected and found to be in an acceptable condition for the restart of operations. No capital cost allowance was made for additional general facilities and buildings in this study.

21.7 OPERATING COSTS

Total operating cost estimates for the Okanjande Project are presented in Table 21-22. The unit operating costs are based on total mined material of 10.14Mt, of which 6.1Mt is mineralized material and 4.05Mt is waste. The estimated mine life is ten years plus one year of pre-mining/construction. Processing will continue into Year 11.

Mining Operating costs include Drill and Blast for Ore and Waste, Load and Haul for Ore and Waste, Mobilization and P&G's. Ore hauling costs are based on hauling of ore with PBS system 60t payload side-tipper trucks.

Process operating costs include comminution, flotation, dewatering, drying, classification, and bagging. Tailings management, labour, power, water, packaging, reagents and consumables are also included together with product transportation and refining costs.

General & Administrative (G&A) costs as per Table 21-22, include all standard site general and administration costs, as well as Security Services, Surface Rights Charges, External Services, Royalties and Concentrate Sales costs. The unit cost for mineralized material processed is based on the total ore tonnes from the Okanjande mine and total graphite concentrate produced from the Okorusu processing plant. The basis for these rates is 6.1Mt Ore and 308kt of graphite concentrate.

Table 21-22: Summarized Operating Costs (Total Life of Mine)

Operating Costs (C1)	(US$ 10^6)	$/t Ore Processed	$/t Concentrate Produced
Mining	47.28	7.75	153.61
Ore Haulage	37.84	6.21	122.96
Processing	90.08	14.77	292.65
G&A	63.41	10.40	206.00
Total	**238.61**	**39.14**	**775.22**

21.7.1 Exclusions

The following cost contributors were not accounted for in the OPEX estimate:

- Scope changes
- Escalation beyond the second quarter of 2022
- Financial cost
- Schedule delays
- Operating permits
- Currency fluctuations
- Reagent and Fuel Pricing fluctuations

21.7.2 Basis of Operating Costs

Mining costs are based on engaging a contract miner and budgetary proposals received in 2022.

Ore hauling costs are based on local logistics service providers' estimates and factorized for PBS system 60t side tipping haul trucks.

Processing labour costs were developed from the anticipated manpower staffing plan. Labour rates were applied with consideration for burden and overtime. The specific rates were based on the estimator's judgment from experience from Namibian processing plants and average salaried rates. Power was estimated based on the current local utility rate of US$0.11/kWh and the power consumption estimates from the electrical load list. Variable costs for reagents and consumables were applied based on recent test work results, historical consumption rates and current local pricing for reagents. Budgetary quotes for all major reagents and consumables were obtained from primary suppliers in the region. Fixed cost elements were derived from factoring and from previous operating budgets for the process

The supervisory and administrative support staff was sized to accommodate direct front line supervision for operations, as well as provide adequate support personnel for technical services, management, environmental, and administration.

21.7.3 Mining Operating Cost

Contractor mining will be applied for the Okanjande mine and mining costs are based on the outcome of a contractor mining proposal comparison completed in 2021. Drilling and Blasting costs are based on third party costs. Load and Haul costs are based on 1km maximum hauling with contractor fleet.

Table 21-23: Mining Operating Cost Estimate (Total Life of Mine)

Operating Costs	(US$ 10^6)	$/t Ore Processed	$/t Concentrate Produced
Ore Mining Costs Variable	23.90	3.92	77.66
Waste Mining Costs Variable	15.06	2.47	48.94
Mining Costs Fixed	8.31	1.36	27.01
Total	**47.28**	**7.75**	**153.61**

21.7.4 Ore Hauling Operating Cost Estimate

Ore hauling costs are based on mining contractor proposals for ore haulage using the PBS system 60t side tipping haul trucks.

Table 21-24: Ore Hauling Operating Cost Estimate

Ore Hauling Unit Rate	UOM	Standard
Bulk Haul Rate	NAD/km	35.43
Round trip Hauling Distance	km round trip	164
Payload	t	60
Ore Hauling Unit Rate	**USD/t**	**6.21**

21.7.5 Processing Plant Operating Cost Estimates

The major processing cost elements include variable costs such as Process General (front-end rehandling costs, grinding media), Tailings Management, Power (Okorusu Site all), Water (Okorusu Site All), Concentrate

Packaging plus Reagents and Chemicals. Fixed costs cover Labour, Process Maintenance and Miscellaneous Consumables.

Table 21-25: Total Processing Operating Cost Estimate (Life of Mine)

Operating Costs	(US$ 10^6)	$/t Ore Processed	$/t Concentrate Produced
Process General	5.24	0.86	17.03
Tailings Management	2.90	0.48	9.42
Consumables – 251iscellaneous	1.04	0.17	3.38
Process Maintenance	10.95	1.80	35.58
Labour	25.68	4.21	83.45
Power	25.36	4.16	82.41
Water	2.10	0.34	6.81
Concentrate Packaging	7.81	1.28	25.36
Reagents / Chemicals	8.99	1.48	29.22
Total	**90.08**	**14.77**	**292.65**

21.7.5.1 TSF Operating Costs

Tailings management costs were obtained from the Knight Piésold (KP) TSF study conducted in 2021. TSF Management costs include routine construction of the upstream self-raising outer walls using cyclones. Operational costs include routine maintenance and upkeep associated with the TSF (i.e., pipe and valve replacements, cleaning out of trenches, maintenance of toe drains, etc.). Consulting services include collecting and reporting on TD monitoring data (i.e., pipe and valve replacements, cyclone repairs, cleaning out of trenches, etc.) through site visits and inspections with reporting, monitoring data review and quarterly summaries and Ad-Hoc technical support.

Table 21-26: TSF Operating Cost Estimate

TSF Operating Costs	Annual Costs US$
TSF Deposition Management Costs	208,682
TSF Operational Costs	12,400
Consulting Services – Engineer of Record	80,000
Total Per Annum	301,082
Rate per Annual Dry Tonne of Tailings	**0.50**

21.7.5.2 Labour

A labour complement was developed based on the previous operational structure together with some optimization in areas where it was deemed necessary (Table 21-27). Salary scales are based on experience with typical current Namibian salaries for positions in mines and processes of similar complexity and size.

Table 21-27: Labour Complement

Position	Headcount
Management	**6**
General Manager	1
Mine Manager	1
Process Manager	1
Engineering Manager	1
Administration Manager	1
Geologist*	1
Finance and Administration	**18**
Management & services	3
Procurement	2
Administration/Clerks	10
Health, Safety & Environmental	3
Processing	**32**
Management – Foremen	4
Process plant operators	20
Laboratory assistants	8
Engineering	**22**
Mechanical and Boilermaker**	6
Electrical	6
C&I	2
Assistants	8
Total	**78**

Table 21-28: Annual Labour Cost Estimate

Labour Costs	Annual Costs US$
Management	626,923
Finance and Administration	184,615
Processing	88,462
Engineering	115,385
Total	**1,015,385**

21.7.5.3 Reagents and Consumables

Reagents and consumables were based on historic consumption rates and updated quotes from primary suppliers in the region.

Table 21-29: Reagents and Consumables Operating Cost Estimate

Reagents and Consumables	Unit Costs
Diesel – Flotation	2.91
Flocculent- Concentrate	0.10
Water Treatment	0.19
MIBC	5.15
Diesel – Dryer	17.50
Miscellaneous	3.37
Total	**29.22**

21.7.5.4 Power

The power cost estimate is based on the large power load for existing installed equipment as well as future installed equipment. Provision was made for small power requirements as well as contingency. The NamPower 2021 electrical pricing schedule was applied.

Table 21-30: Power Operating Cost Estimate

AREA DESCRIPTION	UOM	Annual
Installed Large Power	kW	4,390
Small Power, Offices & Contingencies	15%	439.026
Load Factor	%	80%
Effective Load	kW	3,863
Process Throughput	t/a	631,450
Effective Consumption	kWh/a	23,819,151
Unit Rate	US$/kWh	0.11
Annual Cost	**US$/a**	**2,626,869**

21.7.6 General and Administration Cost Estimate

General and Administration cost estimate is based on factorization of costs from plants of similar size and complexity as well as reigning Namibian taxation laws and recent concentrate shipment costs.

A fixed allowance was made for external services, mainly in the form of consulting.

Royalties are based on the reigning Namibian Tax legislation and is calculated as 2% of revenue.

Concentrate Sales costs are made up of Transport, Port Fees, Customs and Duties and Shipping fees on FOB in Rotterdam basis. Rates used are based on budgetary quotes received.

Table 21-31: General and Administration Operating Cost Estimate (Total Life of Mine)

Operating Costs	(US$ 10^6)	$/t Ore Processed	$/t Concentrate Produced
Security Services	0.31	0.05	0.99
Surface Rights Charges	0.37	0.06	1.20
External Services	2.74	0.45	8.91
G&A	6.62	1.09	21.51
Royalty	9.23	1.51	30.00
Concentrate Sales Cost	44.14	7.24	143.40
Total	**63.41**	**10.40**	**206.00**

22 ECONOMIC ANALYSIS

(Prepared by CREO Engineering Solutions (Pty) Ltd.)

This PEA is preliminary in nature. The current basis of Project information is not sufficient to convert the in-situ Mineral Resources to Mineral Reserves, and Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability. The PEA results are only intended as an initial, first-pass review of the Project economics based on preliminary information.

This PEA is based on technical and economic assumptions which will be evaluated in more advanced studies. The PEA is based on the Mineral Resource estimate in section 15 (effective date November, 2021). The PEA is based on a production plan that includes material in Measured and Indicated classifications from the Okanjande Mineral Resource model. This PEA Report validates an open pit mining operation that recovers graphite mineral from the ground to be sold at a profit. The methods used to generate this PEA are consistent with good industry practice and meet the required standards for project design and estimation. The financial analysis methodology is consistent with current practice and is consistent with the stage of the Okanjande project's development.

The economic analysis of the Project assumed constant 2nd Quarter 2022 US dollars and was performed on an annual basis beginning at the start of Year 0 when operating permits are assumed to have been issued. Construction was assumed to require 1 year with processing of mineralized material through the Okorusu processing plant to start at the beginning of year 1.

This PEA assumes a new Milling circuit will be constructed at the Okorusu site and the existing processing infrastructure will be reconfigured for suitability to process the Okanjande graphite ore.

The PEA estimated graphite concentrate recovery and concentrate grade is based on historical test work and recent metallurgical tests conducted on grab samples from existing weathered ore stockpiles as well as fresh ore drill core samples. Tests conducted simulated the process flow of the reconfigured Okorusu graphite flotation plant. The relevant test work was completed by SGS Lakefield laboratories in Canada.

22.1 PRINCIPLE ASSUMPTIONS

22.1.1 Resource

No Reserve has been declared at the time of this study. In 2021 MSA completed a mining study and the 10-year mining at 4.0% TCG cut-off grade was selected for the study. See Table 22-1

Table 22-1: 10-Year Mine plan for 4.0% TGC cut-off

Mineral Resource Assumptions	Value	UOM	Comments
Weathered			
Measured and Indicated Tonnes	2,540,623	Mt	MSA, Mining Report
Measured and Indicated Graphite Grade	5.03%	% TGC	MSA, Mining Report
Contained Graphite	127,881	t	MSA, Mining Report
Fresh			
Measured and Indicated Tonnes	3,556,327	Mt	MSA, Mining Report
Measured and Indicated Graphite Grade	5.44%	% TGC	MSA, Mining Report
Contained Graphite	193,293	Kt	MSA, Mining Report
Total			
Measured and Indicated Tonnes	6,096,950	Mt	MSA, Mining Report
Measured and Indicated Graphite Grade	5.27%	% TGC	MSA, Mining Report
Contained Graphite	321,174	Kt	MSA, Mining Report

22.1.2 Mining

Mining assumptions are based on the outcomes of the mining study completed by MSA in 2021.

Table 22-2: Mining Assumptions for Economic Evaluation

Mining Production	Value	UOM	Comments
Ore Mining Rate- Mean	609,695	t/a	CES, MSA Mine Plan
Ore Mining Rate – Steady State	631,450	t/a	CES, MSA Mine Plan
Waste Mining – Mean	404,504	t/a	CES, MSA Mine Plan
Strip Ratio	0.7	ratio	CES, MSA Mine Plan
Life-of-Mine	10	years	MSA, Mining Report

22.1.3 Processing

Processing assumption flow out of the mining assumptions and plant performance targeted by the Client. See Table 22-3.

Table 22-3: Processing Assumptions for economic evaluation

Process Production	Value	UOM	Comments
Crushing			
Annual Throughput	631,450	t/a	MSA, 2021
Standard Operating Days	261	d/a	Northern Graphite, 2021
Standard Operating Hours	12	h/d	Northern Graphite, 2021
Availability	92.0%	%	Northern Graphite, 2021
Utilization	90.0%	%	Northern Graphite, 2021
Effective Utilization	82.8%	%	CES, calculated
Mean Crush Rate – Instantaneous	244	t/h	CES, calculated
Milling			
Annual Throughput (80tph)	631,450	t/a	Northern Graphite, 2021
Standard Operating Days	365	d/a	Northern Graphite, 2021
Standard Operating Hours	24	h/d	Northern Graphite, 2021
Availability	92.0%	%	Northern Graphite, 2021
Utilization	90.0%	%	Northern Graphite, 2021
Effective Utilization	82.8%	%	CES, calculated
Mean Grinding Rate (dry)	87	t/h	CES, calculated
Flotation			
Throughput (dry)	87	t/h	Northern Graphite, 2021
Grade	5.3%	%	METPRO
Recovery	92.0%	%	METPRO
Concentrate Grade	96.0%	%	METPRO
Mass pull	5.0%	%	CES, Calculated
Concentrate Production (dry)	31,877	t/a	CES, Calculated
Tailings			
Tailings deposition feed moisture	% H2O m/m	70%	CES assumption
TSF Site 3A	Mt (dry)	3.2	KP, 2021
TSF Site 3B	Mt (dry)	2.6	KP, 2021

22.1.4 Financial, Taxes, Royalties and Levies

Financial assumptions were based on information from reputable sources and are listed in Table 22-4.

Table 22-4: Financial assumptions

Financial Assumptions	Value	UOM	Comments
Discount Rate	8%	%	CES
Exchange Rate	15.60	NAD:USD	www.Exchangerates.org.uk, 31 May 2022
Royalties	2.0%	%	KPMG, 2021
Graphite Flake Price	1,500.00	USD/t TCG	NG, 2022
Corporate Income Tax, Namibia	37.5%	%	PWC, Dec 2021
Depreciation Period	3	a	NG, EY 2022

22.2 KEY PERFORMANCE INDICATORS

The Okanjande Project will process 6,096,695t of graphite mineralized material at an average of 5.27%TGC to produce a total of 307,791t of Graphite concentrate at a grade of 96%TGC. See Table 22-5.

With mining costs projected at US$7.75/t ore mined and processing costs at US$325.25/t concentrate produced an overall C1 cost of US$775.22/t concentrate is achieved. Life of mine capital expenses come in at US$93.49/t concentrate produced. See Table 22-6.

Table 22-5: Project Overall KPI's

Project KPIs	UOM	
Measured and Indicated Resource – Weathered	Mt, %TGC	5.9Mt @ 4.21% TGC
Measured and Indicated Resource – Fresh	Mt, %TGC	1.2Mt @ 4.35% TGC
Post Tax NPV @8% CoC	US$	65,058,495
Post Tax IRR	%	62%
Post Tax and Royalty Undiscounted Cashflow	US$	120,732,276
Post Tax Payback Period	a	2
Pre Tax NPV @8% CoC	US$	107,261,317
Pre Tax IRR	%	82%
Pre Tax and Royalty Undiscounted Cashflow	US$	194,306,354
Pre Tax Payback Period	years	2

Table 22-6: Key Project Cost Indices

Cost Indicators	UOM	Cost Index (US$)
Mining & Haul OPEX/t Concentrate	$/t con	276.57
Mining OPEX/t Total Mined	$/t total mined	4.66
Mining OPEX/t Ore Mined	$/t Ore mined	7.75
Process OPEX/t Concentrate	$/t con	325.25
Process OPEX/t Graphite Concentrate produced	$/t concentrate	16.42
Total OPEX/t Concentrate	$/t con	601.82
Total C1 Cost/t Concentrate	$/t con	775.22
Total CAPEX/t Concentrate	$/t con	93.49
Total Expenses/t Concentrate	$/t con	868.71

The resulting NPV after tax and royalties is US$65M at a discount rate of 8%. The life of mine cashflow after taxes and royalties is US$120.1M. The project Payback period is 2 years after initial capital outlay.

22.3 CASH FLOW

The projected annual production and cash flow (after-royalty and after-tax) for the Okanjande project is listed in Table 22-7. Mining production ramp-up is expected to be rapid due to the brownfield's status of the mine. The estimated payback period assuming the average basket graphite price of $1,500 is 2 years. The reduction in cash flow in year 5 is due to the construction of the tailings facility expansion 3B.

Table 22-7: Okanjande Project Cash Flow

Year		Ore Mining	Ore TCC	Ore Hauled and Processed	Concentrate Produced and Shipped (dry)	Revenue from Graphite Con Sales	Total OPEX	Total Off-the-top Costs[1]	Total CAPEX	Total Taxable Income[2]	Income Tax	Net Profit After Tax	Cumulative Net Profit After Tax
		t/a	%TGC	t/a	t/a	US$/a	US$/a	US$/a	US$/a	US$/a	US$/a	US$/a	US$
0	2022	-	-	-	-	-	(1,714,608)	-	(15,105,943)	-	-	(16,820,551)	(16,820,551)
1	2023	410,442	22,903	410,442	21,948	32,922,579	(16,449,185)	(3,805,850)	(5,483,062)	882,307	(330,865)	6,853,617	(9,966,934)
2	2024	631,450	31,257	631,450	29,954	44,931,614	(19,166,853)	(5,194,095)	-	15,535,352	(5,825,757)	14,744,909	4,777,975
3	2025	633,179	30,456	631,450	29,107	43,660,821	(21,205,621)	(5,047,191)	(78,985)	17,381,680	(6,518,130)	10,810,894	15,588,869
4	2026	631,450	31,888	631,450	30,556	45,833,375	(20,127,531)	(5,298,338)	(78,985)	20,354,849	(7,633,068)	12,695,452	28,284,321
5	2027	631,449	30,927	631,450	29,641	44,461,145	(18,121,179)	(5,139,708)	(9,195,293)	18,082,504	(6,780,939)	5,224,026	33,508,347
6	2028	631,450	31,951	631,450	30,617	45,926,085	(17,461,901)	(5,309,055)	(2,245,858)	19,315,083	(7,243,156)	13,666,115	47,174,462
7	2029	633,180	34,572	631,450	33,034	49,551,039	(17,814,799)	(5,728,100)	(78,985)	22,168,095	(8,313,036)	17,616,120	64,790,581
8	2030	631,450	35,677	631,450	34,184	51,276,133	(17,770,094)	(5,927,521)	(78,985)	26,777,242	(10,041,466)	17,458,067	82,248,649
9	2031	631,450	34,540	631,450	33,107	49,660,550	(17,710,471)	(5,740,760)	(78,985)	26,130,335	(9,798,876)	16,331,459	98,580,108
10	2032	631,450	37,003	631,450	35,448	53,172,537	(17,376,713)	(6,146,745)	(78,985)	29,570,093	(11,088,785)	18,481,308	117,061,416
11	2033	-	-	3,458	194	291,188	(316,485)	(33,661)	3,729,819	(696,030)	-	3,670,860	120,732,276
12	2034	-	-	-	-	-	-	-	-	(610,743)	-	-	120,732,276
13	2035	-	-	-	-	-	-	-	-	(584,414)	-	-	120,732,276
Total		**6,096,950**	**321,174**	**6,096,950**	**307,791**	**461,687,066**	**(185,235,440)**	**(53,371,025)**	**(28,774,247)**	**194,306,354**	**(73,574,078)**	**120,732,276**	

1 Royalties and Concentrate Sales costs

2 After Depreciation and carried forward losses

22.4 SENSITIVITY ANALYSIS

The sensitivity of the PEA with regards project NPV was evaluated in terms of the main revenue drivers – Graphite Price and Graphite recovery, as well as the main cost drivers – Power, Ore Mining Cost, Ore Hauling Cost and NAD : USD exchange rate. All sensitivities were based on the change of the sensitivity parameters over a range of -80% to +80% change from their base case values. The sensitivity parameters were ranked based on their absolute slopes in terms of NPV per percentage change per parameter. See Table 22-8.

Table 22-8: Sensitivities Ranking (absolute slopes)

Parameter	UOM	Absolute Slope	Ranking
Graphite Basket Price	US$/t	197	1
Graphite Recovery	%	153	2
Exchange Rate	N$: US$	92	3
Concentrate Sales Costs	US$/t	17	4
Ore Hauling Costs	US$/t	15	5
Capital Cost	US$/t	15	6
Power Cost	N$/kWh	10	7
Ore Mining Costs Variable	US$/t	9	8

As per Figure 22-1, the project NPV is highly sensitive towards both Graphite Pricing followed Graphite Recovery (based on slope) and Namibian dollar to US dollar exchange rate.

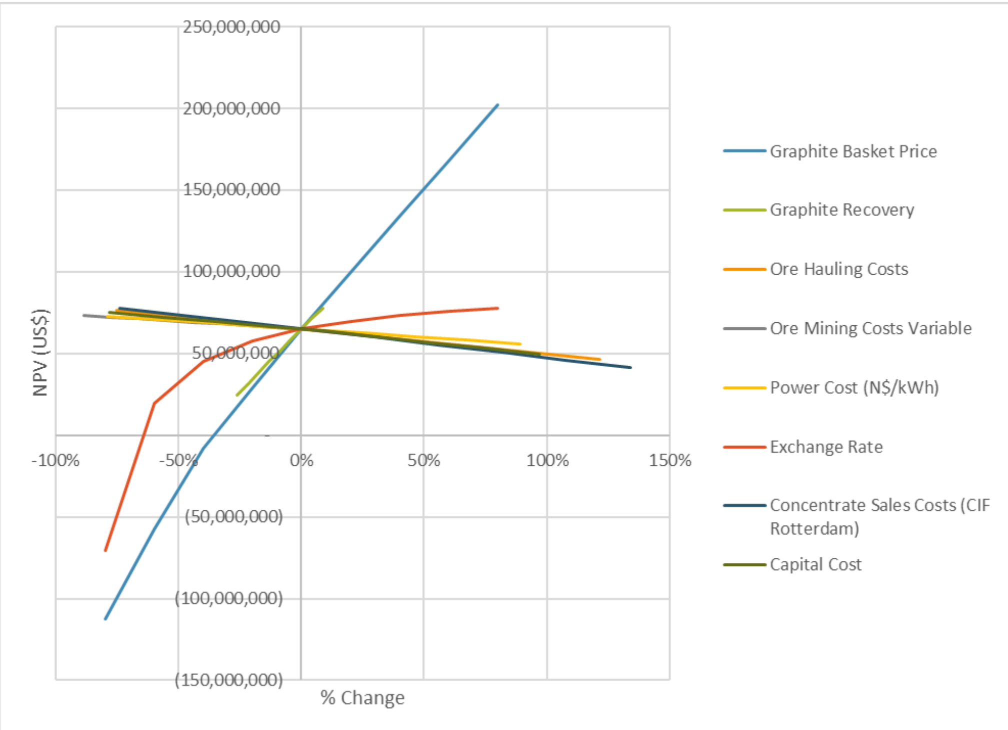

Figure 22-1: Project NPV Sensitivity wrt to main Revenue and Cost Drivers (after Tax)

In terms of sensitivity towards operational cost drivers the project NPV is most sensitive to Concentrate sales Costs, Ore Hauling Costs and Power Costs.

Based on the high sensitivity towards Graphite pricing (Table 22-9), mining and processing strategies should be aimed at maximizing graphite concentrate quality in terms of flake size and purity above all else.

Table 22-9: Project Sensitivity towards Graphite Pricing (after Tax)

Graphite Basket Price	NPV	IRR	Payback	Variance
300	(112,602,899)	#NUM!	13	-80%
600	(57,656,361)	#NUM!	13	-60%
900	(8,195,909)	1%	11	-40%
1,200	28,853,249	32%	4	-20%
1,500	65,007,077	62%	2	0%
1,800	99,357,162	88%	2	20%
2,100	133,707,247	114%	2	40%
2,400	168,057,333	139%	1	60%
2,700	202,407,418	164%	1	80%

While the project NPV is also highly sensitive towards Graphite recovery (Table 22-10), the probable range of variation in recovery is relatively small compared to probable changes in graphite pricing.

Table 22-10: Project Sensitivity towards Graphite Recovery (after Tax)

Graphite Recovery	NPV	IRR	Payback	Variance
68%	24,588,433	28%	4	-26%
72%	31,370,126	34%	4	-22%
76%	38,151,775	40%	3	-17%
80%	44,933,380	45%	3	-13%
84%	51,714,942	51%	2	-9%
88%	58,496,459	57%	2	-4%
92%	65,007,077	62%	2	0%
96%	71,410,073	67%	2	4%
100%	77,813,047	71%	2	9%

The Project NPV also becomes sensitive towards negative changes in exchange rates below N$8 : US$1 (Table 22-11), however this is unlikely to occur in the short term (<5 years). In addition, the full effect of major currency exchange rate changes are complex and beyond the scope of the current level of economic analysis.

Table 22-11: Project Sensitivity towards Exchange Rate (after Tax)

Exchange Rate	NPV	IRR	Payback	Variance
3.12	(70,297,929)	#NUM!	13	-80%
6.24	19,782,895	22%	6	-60%
9.36	45,082,100	43%	3	-40%
12.48	57,710,775	55%	2	-20%
15.60	65,007,077	62%	2	0%
18.72	69,706,860	66%	2	20%
21.84	73,062,306	70%	2	40%
24.96	75,577,928	72%	2	60%
28.08	77,533,890	74%	2	80%

The most sensitive C1 Cost element is that of Concentrate Sales costs. This may be partially due to the current worldwide shortage in shipping containers, shortages in bulk shipping routes and impacts of the current war in Ukraine on fuel prices and logistics.

Table 22-12: Project Sensitivity towards Concentrate Sales Costs (CIF Rotterdam)

Concentrate Sales Costs (CIF Rotterdam)	NPV	IRR	Payback	Variance
28.68	78,410,620	72%	2	-80%
57.36	75,059,735	70%	2	-60%
86.04	71,708,849	67%	2	-40%
114.72	68,357,963	64%	2	-20%
143.40	65,007,077	62%	2	0%
172.08	61,656,191	59%	2	20%
200.76	58,171,401	56%	2	40%
229.44	54,618,136	53%	2	60%
258.12	51,064,872	50%	2	80%

Based on budgetary quotes received during 2021, it is expected that ore hauling costs will exceed that of the actual mining costs. This is due to the 80km haul route on Namibian national roads and is based on the PBS trucking system. Future expansion studies should investigate opportunities to establish a process plant at the mine site, which will eliminate the need for ore transport. See Table 22-13.

Table 22-13: Project Sensitivity towards Ore Hauling Costs

Ore Hauling Costs	NPV	IRR	Payback	Variance
1.24	76,914,564	72%	2	-80%
2.48	73,937,692	70%	2	-60%
3.72	70,960,821	67%	2	-40%
4.97	67,983,949	64%	2	-20%
6.21	65,007,077	62%	2	0%
7.45	62,030,205	59%	2	20%
8.69	58,996,553	56%	2	40%
9.93	55,855,864	53%	2	60%
11.17	52,715,175	51%	2	80%

Total project capital cost (Initial capital and expansion capital) impact on NPV is ranked 6th overall in terms of the parameters analysed. Advanced studies will need to pursue capital reduction strategies during the value engineering stages. See Table 22-14.

Table 22-14: Project Sensitivity towards Project CAPEX (Initial & Expansion)

Capital Cost	NPV	IRR	Payback	Variance
4,863,616.17	75,445,378	153%	2	-80%
9,727,232.34	72,835,803	109%	2	-60%
14,590,848.50	70,226,228	86%	2	-40%
19,454,464.67	67,616,652	72%	2	-20%
24,318,080.84	65,007,077	62%	2	0%
29,181,697.01	62,018,248	54%	2	20%
34,045,313.18	58,758,565	47%	3	40%
38,908,929.34	55,498,883	41%	3	60%
43,772,545.51	52,239,200	37%	3	80%

As expected, power costs exhibited relatively high sensitivity towards the project NPV. This is driven by the power requirements of the comminution circuit. See Table 22-15.

Table 22-15: Project Sensitivity towards Power Costs

Power Cost (N$/kWh)	NPV	IRR	Payback	Variance
0.34	73,038,915	69%	2	-80%
0.69	71,043,810	67%	2	-60%
1.03	69,048,705	65%	2	-40%
1.38	67,053,600	64%	2	-20%
1.72	65,058,495	62%	2	0%
2.06	63,063,390	60%	2	20%
2.41	61,068,285	58%	2	40%
2.75	59,027,471	57%	2	60%
3.10	56,922,576	55%	2	80%

Of the parameters studied, Ore Mining Costs ranked the lowest in terms of sensitivity towards project NPV.

Table 22-16: Project Sensitivity towards Ore Mining Costs

Ore Mining Costs Variable	NPV	IRR	Payback	Variance
0.78	72,579,240	69%	2	-80%
1.57	70,699,054	67%	2	-60%
2.35	68,818,867	65%	2	-40%
3.14	66,938,681	64%	2	-20%
3.92	65,058,495	62%	2	0%
4.70	63,178,308	60%	2	20%
5.49	61,298,122	59%	2	40%
6.27	59,391,200	57%	2	60%
7.06	57,407,547	55%	2	80%

22.5 TAXES, ROYALTIES AND OTHER INTERESTS

22.5.1 Namibian Corporate Income Tax for non-Diamond Mining Companies

The Namibian Corporate Income Tax rate for non-Diamond Mining Companies is 37.5% and was applied as such in this economic analysis.

22.5.2 Value Added Tax

Any legal entity with an annual taxable turnover of greater the N$500,000 is required to register for Value Added Tax (VAT). Value-added tax is payable on the taxable value of all goods sold or imported. The standard rate is 15%. Direct exports of goods and services are zero-rated, and such VAT was not considered as part of this study. However, VAT rebates will be applicable on services and goods purchased within Namibia. The effect of VAT rebates was not considered in this economic analysis.

22.5.3 Export Processing Zone

Northern Graphite's Okanjande Project could potentially be set up to qualify for Namibia Export Processing Zone or EPZ status. The Namibian Government is phasing out EPZ status by 2025. Potentially this project could maintain its previous EPZ status with tax savings for the first 2 years of operation.

"New enterprises that export produce to countries outside the Southern African Customs Union (SACU) can qualify for EPZ status. The benefits of an EPZ enterprise are:

- *Relief from corporate income tax, import duties, VAT and stamp duties but excluding tax on employees' income and withholding tax on dividends;*
- *Grants for 75% of training costs;*
- *Foreign currency bank accounts, free of exchange control."* – Namibia Tax Reference and Rate card, PWC 2021

This is an opportunity for cost savings which needs to be investigated but was not considered in this economic analysis.

22.5.4 Withholding Tax Payable and Double Taxation Agreements

Namibia has Withholding Tax and Double Taxation Agreements with certain countries. However, Canada does not fall in the list of treaty countries and as such this was not considered in this economic evaluation.

22.5.5 Depreciation

Cost recovery for capital invested was estimated using standard depreciation schedules. The estimated cost recovery for calculation of Namibia income tax consisted of a 3 years 100% declining balance calculation, based on initial and expansion capital.

22.5.6 Royalties

Royalties are levied in terms of the Namibian Prospecting and Mining Act as a percentage of the market value of the minerals extracted by licence holders in the course of finding or mining any mineral or group of minerals.

Graphite concentrate will fall into the group of minerals "Semi-precious stones/Industrial metals/Non-Nuclear fuel minerals" for which the Royalty rate is 2%. Royalties were considered on this basis in the economic evaluation.

23 ADJACENT PROPERTIES

(Taken from the MSA Group Report Technical Report titled "Northern Graphite Corporation, Okanjande Mineral Resource Estimate, Namibia" with effective date 29 November 2021)

The Okanjande Mining Licence (ML196) is surrounded by an EPL 4717, which is also held by Imerys-Gecko (35,050 ha). Adjacent to this licence, to the northwest, is an EPL (7123) held by Cobe Investment CC (valid until 08/10/2023) for a range of minerals including industrial minerals (20,966 ha). To the north is an EPL (5847) held by Kunene Resources (Pty) Ltd for precious stones and industrial minerals (6,869 ha). This EPL is valid to 15/07/2022.

To the southeast is an EPL held by Josua Neshuku, EPL 7113 which expired in August 2021. To the south-east is EPL 6734 held by Osino Gold Exploration and Mining (Pty) Ltd which expires on 09/06/2023. All adjacent properties are EPLs granted for precious minerals, dimension stone and industrial minerals.

To MSA's knowledge, there are no other mining licences for graphite in the region and/or there is no reported economic graphite mineralization on the adjacent licences.

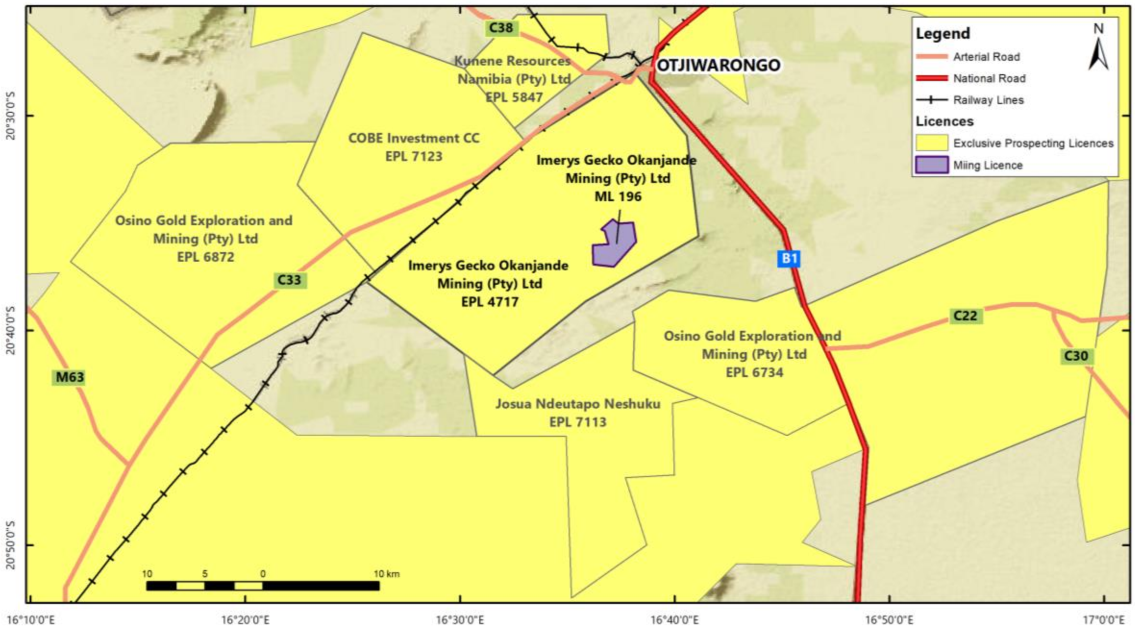

Figure 23-1: Adjacent Properties (Source:Namibia Felxicadastre)

24 OTHER RELEVANT DATA AND INFORMATION

(Prepared by CREO Engineering Solutions (Pty) Ltd.)

None of the contributors are aware of any additional relevant data that might materially impact the interpretation and conclusion of this PEA Report

25 INTERPRETATIONS AND CONCLUSIONS

(Prepared by CREO Engineering Solutions (Pty) Ltd.)

This report was prepared by a group of independent consultants, all qualified persons as defined by NI 43-101, to demonstrate the economic viability of open pit mining and processing, based upon the estimated Mineral Resources at the Okanjande Project (MLP). This report provides a summary of the results and findings to the level that would be expected for a Preliminary Economic Assessment. Standard industry practices and assumptions have been applied in this PEA.

This report is based on all available technical and scientific data available as of 31 May 2022, the effective date of this PEA Report.

25.1 PROJECT STUDY

This PEA study is preliminary in nature and is based on technical and economic assumptions which will be evaluated in more advanced studies. The PEA is based on the Mineral Resource estimate in Chapter 14 (effective date December 2021). The PEA is based on a production plan that includes material in Measured and Indicated classifications from the Okanjande Resource model. This report validates that the Project would support an open pit mining operation to recover graphite from the ground to be sold at a profit.

Estimated Mineral Resources were assumed to be processed with commonly utilized graphite recovery methods. Upgrading of graphite ore through flotation process are commonly applied.

Under the base case assumptions for the Project, the PEA indicates an undiscounted pre-tax cash flow of US$164.3M, and a post-tax NPV at 8% discount rate of US$65.1M. The resulting post-tax IRR is 62% for an initial capital investment of US$15.1M.

The results of sensitivity analyses of post-tax cash flow and post-tax IRR show that the project is most sensitive to graphite price and recovery. Breakeven graphite price is US$926.43/t and post-Tax NPV doubles at US$2,068.20/t.

The base case assumptions demonstrate that the Project would produce an average of 31,877 tonnes per year of graphite concentrate at an average grade of 96% contained carbon as graphite over life-of-mine. The Project will produce 307,791 tonnes of graphite concentrate over the 10-year life-of-mine.

25.2 GEOLOGY AND EXPLORATION

An Independent Technical Report relating to the estimation of mineral resources was previously prepared and compiled by MSA under the supervision of the QPs at the request of Northern Graphite Corporation. This Independent PEA Report has been prepared in accordance with the provisions of National Instrument 43-101 Standards of Disclosure for Mineral Projects.

The PEA Report provides a summary of the Mineral Resource estimate based on the drilling campaign undertaken up to September 2018. The Okanjande graphite deposit has demonstrated its potential for a large tonnage variable grade graphite deposit. The continuity of the deposit is well-defined. The current Mineral Resource is reported within pit shells.

The Mineral Resource Estimate demonstrates the potential of the Okanjande Project.

25.3 MINERAL PROCESSING AND METALLURGY DEVELOPMENT

The mineral process and metallurgy for this project has been developed since the late 1980's. While the process flow implemented for the project by Imerys-Gecko encountered difficulties achieving nameplate throughput and concentrate grade, the flowsheet was not based on successful test work conducted previously.

The mineral processing test work program completed at SGS in 2021 indicated that the modifications made to the flow sheet could improve on the process flow sheet implemented by Imerys-Gecko and corresponded well with early test work and pilot campaigns conducted in the 1990's.

Based on the latest test work conducted improved recovery and flake distribution was achieved when compared to the test work conducted by MINTEK in the 1990's and 2015.

25.4 MINING

This 10-year mining plan (4%TGC cut-off) considers the mining of weathered as well as fresh graphite bearing material. The weathered material can be treated at the modified Okorusu Fluorspar plant, and this can be done for the first 5 years of the mine plan at a 4%TGC cut-off grade. Once the fresh material is accessed Northern will be required to design the waste rock dump (WRD) at Okanjande and the tailings storage facility (TSF) at Okorusu to handle acid generating material. All testing to date indicates that the same processing flowsheet can be used for both fresh and hard rock.

If the cut-off grade is increased, the above adjustments to process the fresh graphite bearing material will be required sooner.

25.5 PROCESSING

A new comminution circuit will provide sufficient capacity to liberate graphite flake from the Okanjande ore for down-stream processing through the modified Okorusu flotation circuit. The modifications to the Okorusu graphite flotation circuit will correct the processing difficulties experienced by Imerys-Gecko and the flow sheet was tested and verified through a test work program completed at SGS in 2021. Tests indicated that the new modified process flow is expected to exceed performance in terms of recovery and concentrate grade, compared to the Imerys-Gecko flow sheet as well as that of the MINTEK flow sheet developed in the 1990's.

The existing concentrate dewatering, drying, classification and bagging plant constructed by Imerys-Gecko is fit-for-purpose and will require no modifications or upgrades to achieve nameplate throughput and performance.

25.6 ENVIRONMENTAL STUDIES AND PERMITTING

Both the Okorusu and Okanjande sites currently have ECCs in terms of the Environmental Management Act. It is necessary to amend both these ECC to incorporate the proposed changes of the project. This will first and foremost entail engagement with the MEFT as the regulating agency. The process to follow will entail two separate Scoping Studies with impact assessments of the new activities, and an updated EMP.

The impact assessment and EMPs should be informed by appropriate specialist studies where necessary. In this regard, a Geohydrological study should be included, as well as an Air Quality Study and Social Impact Assessment. The amendment process should also undergo a public participation process as required by the EMA.

25.7 CAPITAL AND OPERATING COSTS

The cost estimates were developed to support a nominal mining rate of 631,450t/a. The process facility cost estimate is based on a nominal throughput capacity of 631,450t/a and producing 31,877/a of upgraded and bagged graphite flakes per year. The cost estimates have been prepared in accordance with the recommended practices of the American Association of Cost Engineers (AACE) and are considered to have an accuracy of +40 - 30%.

The Capital Cost estimate was developed based on a mix of material take-offs and factored quantities and costs, semi-detailed unit costs and work packages for major equipment supply. Operating costs estimates derived from quotes for contractor mining, crushing and ore transport as well quotes for reagents, consumables, fuel, power and water provision. Consumption values were based on mass balance, load lists and historic process consumptions from the Imerys-Gecko processing period.

25.8 ECONOMIC ASSESSMENT

This PEA confirms that the project presents very robust economics and will generate a product for which there is an increasing demand that is likely to continue well into the future. Should graphite prices continue to increase as a result of this demand the positive economic benefit of this project can be expected to improve even further.

25.9 RISKS AND UNCERTAINTIES

The current design of these facilities is considered to meet PEA requirements. The qualified persons have reviewed areas critical to a successful project to identify key risks. General risks associated with mining projects include but are not limited to:

- General business, social, political, regulatory and business competition;
- Change in project parameters as development plans are advanced;
- Labour costs and other costs of production;
- Lower graphite price;
- Compliance with laws and regulations or other regulatory requirements;
- Availability of management, technical and skilled operations personnel.

Identified Project risks are listed in specific items that follow with a relative risk rating. The identified risk areas are not ordered in rank of importance due to the relative early stage of development:

- **Geology** – resource quantity and quality (grade) – generally low risk. The risks identified include lack of local accuracy measure in some of the data due to lack of CRM, variability of density in the weathered zone, and poor accuracy for sulphur assays based on the CRM results for sulphur.
- **Mining** – pit slope geotechnical conditions – considered low risk due to this being a brownfields project with approximately 2 years of mining completed at the currently considered mining parameters.
- **Processing** – recent test work data indicates good graphite recovery and concentrate grade characteristics - considered moderate risk due to lack of continuous closed-circuit testing for the modified process flow sheet. Piloting recommended for future studies.
- **Environmental Permitting** – New Tailings Storage Facilities will require new environmental permitting. Moderate Risk based on aggressive project schedule.
- **Construction Schedule** – preliminary integration of permitting and construction planning – moderate risk due to low level of detail in construction and permitting schedule.

- **Capital Cost** – based on budgetary quotes from mainly Chinese suppliers and preliminary designs at this stage – high risk due to lack of detailed designs and fixed quotes.
- **Capital Cost** – Tailings geochemistry has not been well defined and could impact the lined area required for tailings disposal. Moderate risk due to cost of lining system and lack of geochemistry testing.
- **Capital Cost** – Waste rock geochemistry has not been well defined and could result in the requirement of a lining system for the WRD. Moderate risk due to the cost of a lining system and lack of geochemistry testing.
- **Operating Cost** – Cost of Sales / Concentrate Shipping. High short-term risk due to current worldwide shortage of shipping containers and container vessels. Consider alternative sales terms and shipping contracts.
- **Operating Cost** – Diesel Pricing. Moderate Risk short-term risk due to current global fuel price increase trends.
- **Power Supply** – Limited spare capacity of power supply and infrastructure for expansion or additional power requirements. Low risk.
- **Land** – Existing mining claims and existing processing plant – low risk. Gecko Minerals Namibia controls the land position for the processing plant, surface rights agreements in place.

25.10 OPPORTUNITIES

- **Mining** – Potential to reduce costs through a competitive bidding process
- **Resource** – The Okanjande deposit hosts a hard rock resource of 24,200,00t of mineralized material with 1,287,000t of contained graphite in the measured and indicated category and 7,200,00t of mineralized material with 359,000t of graphite in the inferred category (@3.1%TGC cut-off grade and $1,200/t Graphite price). The Company may wish to undertake a Preliminary Economic Assessment with respect to building a large new processing plant at the mine site with the capability of producing 100,000-150,000t/a of graphite concentrate. This will significantly reduce operational costs due to the elimination of ore transport requirements as well as economies of scale.
- **Exploration** – There is ample evidence of significantly more mineralisation in the region, but this need to be quantified by exploration and drilling
- **Processing** – Consider flash flotation in milling circuit for increased large flake recovery.
- **Processing** – Investigate Rutile recovery from graphite flotation tails and existing TSF facility.
- **Processing** – Investigate concentrate upgrading technologies: Chemical and Physical treatments of concentrate to remove impurities.
- **Taxes, Royalties and Other Interests** – There are approximately US$50M in tax losses carried forwards relating to previous operations that could potentially be used to reduce taxable income. This issue requires further investigation by the Company's tax advisors.
- **Land** – Existing mining claims and existing processing plant – low risk. Gecko Minerals Namibia controls the land position for the processing plant, surface rights agreements in place.

26 RECOMMENDATIONS

(Prepared by CREO Engineering Solutions (Pty) Ltd.)

This PEA study is preliminary in nature and is based on technical and economic assumptions which need to be evaluated in more advanced studies. The detail developed is sufficient for a PEA level study. However, additional work would be required to meet a pre-feasibility level.

26.1 MINING AND GEOLOGY

It is recommended additional work continue to further define the deposit as outlined below:

- Assaying of the unsampled drillholes which intersected mineralization;
- Further drilling to determine the margins of the resource and evaluate regional exploration targets;
- Mining inputs and Modifying Factors are to be sourced for the deposit;
- Optimisation of the Mineral Resource to be undertaken;
- Mine design and schedule to be produced; and
- Mineral Reserve to be estimated in the medium-term.

The cost for the additional exploration and Mining studies is estimated at $385K and $77K respectively.

26.2 METALLURGY AND PROCESSING

The current PEA is based on the outcomes of historic mineral processing and a recent bench scale flow sheet confirmation test program. It is recommended to complete additional test programs that include closed circuit or locked-cycle tests as well as continuous process testing. Samples should be collected to represent the expected mill feed for the first 1-2 years of operation to determine the metallurgical response. Locked-cycle tests are estimated at $35k.

It is recommended to leverage the existing onsite metallurgical laboratory facilities to set up flotation testing as well analytical assaying of both process and metallurgical test work samples. The onsite analytical lab will also be required to provide the assay certificates for the final concentrates of the commercial plant. A reconciliation of available site laboratory equipment was ongoing at the time of writing of the PEA Report.

26.3 ENVIRONMENTAL

It is recommended the following work be undertaken in connection with environmental activities:

- Extend topographic surveys to select the best location for the waste rock dumps and overburden piles;
- Complete geochemistry testing on tailings and waste rock to define storage and closure requirements.
- Study options for a water management strategy to take into consideration the future graphite plant process water requirement and site water management;
- Continue on-going consulting and environmental studies required to support permitting requirements and to optimize the site layout;
- Identify environmental requirement for site closure and estimate the cost;
- Define mine closure plans;

The cost for the additional environmental studies is estimated at $100K.

26.4 CAPITAL AND OPERATING COSTS

The following studies are recommended in to be undertaken to improve estimate confidence levels and follow up on potential cost saving opportunities. These studies are estimated at $40k to complete.

- Owner vs. Contract Crushing on Site
- Shipping studies
- Tax Studies
- Alternative packaging options

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28 APPENDICES

28.1 WATER ABSTRACTION PERMITS

REPUBLIC OF NAMIBIA

MINISTRY OF AGRICULTURE, WATER AND LAND REFORM

Telephone: (061) 2087228
Fax: (061) 2087697
Enquiries: J N Mouton
Reference: PD 145

Department of Water Affairs
Private Bag 13193
Windhoek
9000

REPUBLIC OF NAMIBIA
MINISTRY OF AGRICULTURE, WATER AND LAND REFORM
05 JUL 2021
Private Bag 13184 Windhoek
Directorate of Water Resource Management

The Managing Director
Imerys Gecko Okanjande Mining (Pty) Ltd
P O Box 81307
Olympia
WINDHOEK

Dear Sir

APPLICATION FOR THE RENEWAL OF PERMIT NO. 11163 FOR THE ABSTRACTION OF GROUNDWATER FOR MINING PURPOSES ON THE REMAINING PORTION (OSDAM) OF THE FARM OKANJANDE NO. 145, OTJIWARONGO DISTRICT

1. The above-mentioned application has been approved. Attached please find permit number 111 63 which authorizes the abstraction of groundwater for mining purposes.

2. You are kindly requested to comply with all the permit conditions, especially conditions number 4 and 5.

Percy W. Misika
EXECUTIVE DIRECTOR

All official correspondence must be addressed to the Executive Director

Figure 28-1: Water Abstraction Permit - Farm Okanjande

REPUBLIC OF NAMIBIA

MINISTRY OF AGRICULTURE, WATER AND LAND REFORM

Telephone:	(061) 2087222	Department of Water Affairs
Fax:	(061) 2087697	Private Bag 13193
Enquiries:	C. Pieters	Windhoek
Reference:	PD 299	9000

Imerys Gecko Okanjande Mining (Pty)Ltd
P O Box 81307
Olympia
Windhoek

APPLICATION FOR THE RENEWAL OF PERMIT NO. 10946 FOR THE ABSTRACTION OF GROUNDWATER FOR MINING PURPOSES FROM ON THE FARM DOONRNLAAGTE NO. 299, OTJIWARONGO DISTRICT

1. The above-mentioned application has been approved. Attached please find permit number 10946 which authorizes the abstraction of water for the mining purposes.

2. You are kindly requested to comply with all the permit conditions, especially conditions number 4 and 5.

3. Please be informed that a high amount of over abstraction of the given quota can lead to the withdrawal of the permit.

EXECUTIVE DIRECTOR
2021 -07- 13
Republic of Namibia
Ministry of Agriculture, Water and Land Reform

Percy W Misika
EXECUTIVE DIRECTOR

All official correspondence must be addressed to the Executive Director

Figure 28-2: Water Abstraction Permit - Farm Doornlaagte

COPY

Form WA-002

FOR OFFICIAL USE ONLY
FILE REFERENCE NO. ....
DATE RECEIVED ....
CASE NO. ....

REPUBLIC OF NAMIBIA
MINISTRY OF AGRICULTURE,
WATER AND LAND REFORM

06 OCT 2021

Private Bag 13184, Windhoek
Directorate of Water Resource Management

Name: The Manager
Title: Imerys Gecko Okanjande Mining (Pty) Ltd
Postal address of applicant:
POBox 81307, Olympia, Windhoek, Namibia
Telephone: 225826
Area code: 061
Date: 30/09/2021

The Under Secretary
Department of Water Affairs
Division: Law Administration
Private Bag 13193
WINDHOEK

APPLICATION FOR A PERMIT TO UTILIZE A CONTROLLED WATER SOURCE

1. This application is for authorization (Delete which is not applicable)

1.1 To utilize water for mine water supply purposes from an existing water source or sources, which had already received a permit for use before, but where the permit has lapsed.

2. A complete application form is attached for your consideration.

P.P. [signature]
SIGNATURE OF APPLICANT

Figure 28-3: Application for Water Abstraction Permit Renewal - Farm Okorusu

28.2 LICENSES AND PERMITS

Table 28-1: Mineral Licenses

Permit	Permit #	Site	Company	Authorizing Entity	Validity	Remarks
Mining license	ML90, ECC 00148	Okorusu	Gecko	Ministry of Mines and Energy	08-Jan-30	Renewal application submitted to MME on 29 March 2018; No impact on Imerys operations
Mining license	ML196	Okanjande	JV		8-Feb-42	Reporting to be submitted on monthly and annual basis. Christo submitting reports
Exclusive prospecting license	EPL4717 ECC APP - 002078	Okanjande	JV		5-Mar-23	application for amendment 19 May 2017, changes of commodities and size granted; renewal application submitted to MME on 5 Mach 2018 by DM; notice of renewal received from Jeremiah/MME, awaiting endorsed EPL certificate; DM to submit exploration reports on quarterly basis to MME 2 yr renewal on 5/3/21
Exclusive prospecting license	EPL5046,	Okorusu	Gecko		11-Oct-20	No impact on Imerys operations; pending renewal; launched with MME 9 July 2020
Permit for removal of minerals or sale or disposal of any minerals	33094	Okorusu	JV		31-Mar-19	Ore Transport permit: renewable as and when required

Table 28-2: Water Licenses

Permit	Permit #	Site	Company	Authorizing Entity	Validity	Remarks
Groundwater Abstraction Permit Doornlaagte	10 946	Okanjande	JV	Ministry of Agriculture, Water and Forestry	30-Jun-23	Abstraction of water for mining purposes_ boreholes to be used: WW201922 and WW201923; Nil returns submitted for 2016 & 2017; permit was renewed on 10 April 2018; allows for abstraction of 90 000 m3/year; application for renewal to DWA submitted 12 May 2021
Industrial Effluents disposal permits (TSF)	396	Okorusu	JV		30-Sep-04	New application launched on 8-Jul-16; Reporting and monitoring data required. Chemical analysis of water samples not satisfactory
Effluence Disposal Permit (village & Hostel)	755	Okorusu	JV		7-Aug-24	effluent water did not meet the standard; Sanitec to empty saptic tanks completely. Re-sampling and testing thereafter; Reporting and monitoring data required. Renewal application submitted on 18 Oct 2018 to Elise Mbandeka/MAWF, Dept WaterEnvironment; new permit obtained on 24 Sept 2019;
Effluence Disposal Permit (mine offices and workshops)	754	Okanjande	JV		7-Aug-24	new permit
Water abstraction and conveyance permit	10551	Okorusu			18-Jan-21	Homestead conveyance permit
	10552	Okorusu			18-Jan-21	Homestead abstraction permit
	10820	Okorusu			19-Jan-21	Kilo-40 conveyance permit
Water abstraction and conveyance permit	11163	Okanjande	JV		5-Jun-23	Abstraction of groundwater for mining purpose; boreholes to be used: WW203555 and WW203557; OK busy with Mercy on renewal application; Water abstraction records to be reported to DWA on monthly basis. Renewal granted 5 July 2021
Water abstraction and conveyance permit	31575	Okanjande	JV		6-Apr-18	Renewal in Progress
New OKU abstraction well	11472	Okorusu	JV		6-Oct-21	meeting held with Mercy/DWA on 22 Nov 2018, application emailed to Mercy/DWA on 24 Nov 2018; New well: WW205415; abstraction permit received Nov2019; 640 000m3/y

Table 28-3: Environmental and Forestry Permits

Permit	Permit #	Site	Company	Authorizing Entity	Validity	Remarks
Species removal permit						up to date
Forestry removal permit	122019			Ministry of Agriculture, Water and Forestry	28-Jan-17	Permits issued for a 3 month period only; Only needs renewing if the particular task is not completed in that period; thus there is no need to renew this as the haul road is fully functioning and no further clearing is required.
Clearance certificate ML196	ECC-01730	Okanjande	JV	Ministry of Environment and Tourism	11-Nov-24	Only for Okanjande
Clearance certificate	ECC 00148	ML90 and 179; Okorusu	Gecko	Ministry of Environment and Tourism	22-Sep-19	Environmental Clearance for the environmental scoping report and environmental management plan for the proposed mine expansion on mining license 90 and 179, North West of Otjiwarongo
Clearance certificate	18/9/2017	Okanjande	JV	Ministry of Environment and Tourism	18-Sep-20	Environmental Clearance Certificate for the exploration activities on exclusive Prospecting License 4717
Clearance certificate	29/5/2393	Okorusu	JV	Otjiwarongo, Otjozondjupa region	14-Feb-21	Environment clearance for Okorusu Fluorspar's Exploration Program on exclusive prospecting license 5046; No impact on Imerys operations

Table 28-4: Accessory and General Permits

Permit	Permit #	Site	Company	Authorizing Entity	Validity	Remarks
Accessory works permit (Diesel Tanks)		Okorusu	JV	Ministry of Mines and Energy	Issued: 17-Feb-05	Permanent
Diesel installation Certificate	CI/35/2000	Okorusu	JV	Ministry of Mines and Energy	Issued: 18-Sep-00	Permanent
Diesel installation Certificate		Okanjande	JV			Temporary
Petrol installation Certificate	CI/36/2000	Okorusu	JV	Ministry of Mines and Energy	Issued: 18-Sep-00	Permanent
Used mineral oil permit	06/2014	Okorusu	JV	Ministry of Mines and Energy	8-Jan-15	Reclaim up to 60 000 l used oil per annum, for storage of used mineral oil @ Okorusu Mine; Permit not renewed to date; certifcates for oil removal and disposal are on file. Need to follow-up with Phillip on status. Permit valid for only 1 year.
Explosives magazine permits	W293	Okorusu	Gecko	Ministry of Safety and Security	Issued: 03-Aug-07	Permanent; Not applicable to Imerys operations
	W294	Okorusu	Gecko		Issued: 03-Aug-07	Permanent; Not applicable to Imerys operations
Registration Certificate / Certificate of Fitness	I30-15/09/2016	Okorusu & Okanjande	JV	MTI		
Single Factory Export Processing Zone Enterprise Certificate EPZ	142	Okorusu	JV	MTI	27-Feb-20	Quarterly reports being submitted by Christo? NB: EPZ status lapses if less than 60 employed
Declaration of Continuous Operations			JV	Declaration of Continuous Operations	1-Aug-20	
Social Security Registration	30107525	Okorusu	JV		Permanent	
Workmans Compensation		Okorusu	JV		Permanent	
Removal and Transport Permit		Okanjande	JV	MME	31-Mar-19	renewal application filed, not issued by MME yet

28.3 ENVIRONMENTAL CLEARANCE CERTIFICATES

ECC – 01730 Serial: yc8pPd1730

REPUBLIC OF NAMIBIA

MINISTRY OF ENVIRONMENT, FORESTRY AND TOURISM

OFFICE OF THE ENVIRONMENTAL COMMISSIONER

ENVIRONMENTAL CLEARANCE CERTIFICATE

ISSUED

In accordance with Section 37(2) of the Environmental

Management Act (Act No. 7 of 2007)

TO

Imerys Gecko Okanjande Mining (Pty) Ltd.
P. O. Box 81307, Olympia, Windhoek.

TO UNDERTAKE THE FOLLOWING LISTED ACTIVITY

The Proposed Continuation, Development and Expansion of the Okanjande Graphite Mine on ML196 held by Imerys Gecko Okanjande Mining, Including the Processing of Graphite Ore and By-Products, Accessory Works Operations and the Storage and Dispensing of Fuel within the Mining Licence, Otjozondjupa Region.

Private Bag 13306
WINDHOEK NAMIBIA
16 NOV 2021

ENVIRONMENTAL COMMISSIONER

Issued on the date: 2021-11-11

Expires on this date: 2024-11-11

(See conditions printed over leaf)

Reduce
Reuse
Recycle

This certificate is printed without erasures or alterations

ECC –

CONDITIONS OF APPROVAL

1. This environmental clearance is valid for a period of 3 (three) years, from the date of issue unless withdrawn by this office
2. This certificate does not in any way hold the Ministry of Environment and Tourism accountable for misleading information, nor any adverse effects that may arise from these activities. Instead, full accountability rests with the proponent and its consultants
3. This Ministry reserves the right to attach further legislative and regulatory conditions during the operational phase of the project
4. All applicable and required permits are obtained and mitigation measures stipulated in the EMP are applied particularly with respect to management of ecological impacts.
5. Strict compliance with national heritage guidelines and regulations is expected throughout the life-span of the proposed activity, therefore any new archaeological finds must be reported to the National Heritage Council for appropriate handling of such.

Figure 28-4: Okorusu ECC

ECC – 01996

Serial: OZE7Ln1996

REPUBLIC OF NAMIBIA

MINISTRY OF ENVIRONMENT, FORESTRY AND TOURISM

OFFICE OF THE ENVIRONMENTAL COMMISSIONER

ENVIRONMENTAL CLEARANCE CERTIFICATE

ISSUED

In accordance with Section 37(2) of the Environmental

Management Act (Act No. 7 of 2007)

TO

Imerys Gecko Okanjande Mining (Pty) Ltd
P. O. Box 81307, Windhoek

TO UNDERTAKE THE FOLLOWING LISTED ACTIVITY

The Exploration of Graphite in the Okanjande farm area on Exclusive Prospecting License (EPL) 4717, Otjiwarongo District, Otjozondjupa Region.

MINISTRY OF ENVIRONMENT, FORESTRY AND TOURISM
Private Bag 13306
WINDHOEK, NAMIBIA
23 FEB 2022
ENVIRONMENTAL COMMISSIONER
REPUBLIC OF NAMIBIA

ENVIRONMENTAL COMMISSIONER

Issued on the date: 2022-02-20

Expires on this date: 2025-02-20

(See conditions printed over leaf)

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NAMIBIA TRASH BIN

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ECC –

CONDITIONS OF APPROVAL

1. This environmental clearance is valid for a period of 3 (three) years, from the date of issue unless withdrawn by this office
2. This certificate does not in any way hold the Ministry of Environment, Forestry and Tourism accountable for misleading information, nor any adverse effects that may arise from these activities. Instead, full accountability rests with the proponent and its consultants
3. This Ministry reserves the right to attach further legislative and regulatory conditions during the operational phase of the project
4. All applicable and required permits are obtained and mitigation measures stipulated in the EMP are applied particularly with respect to management of ecological impacts.
5. Strict compliance with national heritage guidelines and regulations is expected throughout the life-span of the proposed activity, therefore any new archaeological finds must be reported to the National Heritage Council for appropriate handling of such.

Figure 28-5: Okanjande ECC

28.4 NAMIBIAN ENERGY COSTS

SCHEDULE OF APPROVED TARIFFS (2021/2022)

NAMPOWER (PTY) LTD

TIME OF USE TARIFF SCHEDULE

TYPE	CUSTOMER SERVICE CHARGE	POINT OF SUPPLY CHARGE		MAXIMUM DEMAND CHARGE		NETWORK ACCESS CHARGE	
	N$/Customer /Month	N$/PoS/Month		N$/kVA	N$/kW	N$/kVA	N$/kW
		No Diversity/ = < 10 MW	With Diversity/ > 10 MW	Peak and Standard		All Periods	
Tariff > 33kV	10,250.00	4,950.00	6,720.00	96.37	105.60	89.71	98.31
Tariff =< 33 kV	10,250.00	4,950.00	6,720.00	100.22	109.83	93.30	102.26

TYPE	CHARGES				
	PERIODS			LEVIES	
	Peak	Standard	Off-peak	NEF LEVY	ECB LEVY
	c/kWh	c/kWh	c/kWh	c/kWh	c/kWh
Energy Tariff > 33kV	141.31	105.98	70.65	1.600	2.120
Energy Tariff =< 33 kV	144.13	108.09	72.07	1.600	2.120
Losses >33kV	15.44	11.58	7.72	-	-
Losses =< 33kV	15.75	11.81	7.88	-	-
Reliability	10.48	10.48	10.48	-	-
Long Run Marginal Cost	-	-	-	-	-

- ***Notified Maximum Demand (NMD) Penalty Charge***

The NMD Penalty Charge shall be 100% of the ECB approved NamPower Maximum Demand Charge PLUS Network Access Charge on capacity utilised over and above the customer's contractual NMD, exceeding for three (3) consecutive months, payable as from month three (3).

TIME PERIODS FOR TIME-OF-USE TARIFFS (2021/2022)

Time Periods	Namibian Time		Time Periods
Day	Peak	Standard	Off-peak
Week Day	**07h00 – 10h00**	**06h00 – 07h00**	**00h00 – 06h00**
	17h00 – 20h00	**10h00 – 17h00**	**22h00 – 24h00**
		20h00 – 22h00	
Saturday		**07h00 – 12h00**	**00h00 – 07h00**
		18h00 – 21h00	**12h00 – 18h00**
			21h00 – 24h00
Sunday			**00h00 – 24h00**

28.5 MASS BALANCE

Northern Graphite Namibia 80 tph Mass Balance - 5.3% C(g)Head Grade	Mass	Solids		Water	Slurry			
	%	t/h	S.G	t/h	t/h	m3/h	% solids	SG
Rod Mill								
Hydrocyclone Feed	100.0	90.0	2.70	206.7	296.7	240.0	30.33	1.24
Cyclone Overflow	100.0	90.0	2.70	206.7	296.7	240.0	30.33	1.24
Cyclone Underflow	250.0	225.0	2.75	107.7	332.7	189.5	67.63	1.76
Graphite Rougher								
Rougher feed	100.0	90.0	2.70	206.7	296.7	240.0	30.33	1.24
Rougher concentrate	9.7	8.7	2.50	14.4	23.1	17.9	37.72	1.29
Rougher concentrate wash water				2.1				
Rougher concentrate & wash water	9.7	8.7	2.50	16.5	25.2	20.0	34.62	1.26
Rougher tailings	90.3	81.3	2.75	192.3	273.6	221.8	29.71	1.23
Polishing Mill #1								
Polishing mill feed	9.70	8.7	2.50	16.5	25.2	20.0	34.62	1.26
Polishing mill discharge	9.70	8.7	2.50	16.5	25.2	20.0	34.62	1.26
Polishing mill wash water				14.6				
Polishing mill discharge & wash water	9.70	8.7	2.50	31.0	39.8	34.5	21.95	1.15
1st Cleaner Flotation								
1st Cleaner Feed	9.70	8.7	2.50	31.0	39.8	34.5	21.95	1.15
1st Clnr concentrate	6.20	5.58	2.45	9.2	14.8	11.5	37.72	1.29
1st Clnr concentrate wash water				1.3				
1st Clnr concentrate & wash water	6.20	5.58	2.45	10.5	16.1	12.8	34.62	1.26
1st Clnr tailings	3.50	3.15	2.70	21.8	25.0	23.0	12.61	1.09
Polishing Mill #2								
Polishing mill feed	6.20	5.58	2.45	10.54	16.1	12.8	34.62	1.26
Polishing mill wash water				9.3				
Polishing mill discharge & wash water	6.20	5.58	2.45	19.8	25.4	22.1	21.95	1.15
2nd Cleaner Flotation								
2nd Cleaner Feed	6.60	5.94	2.45	30.5	36.4	32.9	16.32	1.11
2nd Clnr concentrate	5.99	5.39	2.35	14.4	19.8	16.7	27.27	1.19
2nd Clnr concentrate wash water				5.1				
2nd Clnr concentrate & wash water	6.09	5.48	2.35	19.5	25.0	21.8	21.95	1.14
2nd Clnr tailings	0.61	0.55	2.55	16.1	16.6	16.3	3.30	1.02
3rd Cleaner Flotation								
3rd Cleaner Feed	6.09	5.48	2.35	24.3	29.8	26.6	18.42	1.12
3rd Clnr concentrate	5.69	5.12	2.35	13.7	18.8	15.8	27.27	1.19
3rd Clnr concentrate wash water				4.6				
3rd Clnr concentrate & wash water	5.69	5.12	2.35	18.2	23.3	20.4	21.95	1.14
3rd Clnr tailings	0.40	0.36	2.35	10.6	11.0	10.8	3.28	1.02
4th Cleaner Flotation								
4th Cleaner Feed	5.69	5.12	2.35	18.2	23.3	20.4	21.95	1.14
4th Clnr concentrate	5.59	5.03	2.35	13.4	18.4	15.6	27.27	1.19
4th Clnr concentrate wash water				4.5				
4th Clnr concentrate & wash water	5.59	5.03	2.35	17.9	22.9	20.0	21.95	1.14
4th Clnr tailings	0.10	0.09	2.35	4.8	4.9	4.8	1.84	1.01
Classification Screen								
Screen feed	5.59	5.03	2.35	17.9	22.9	20.0	21.95	1.14
Screen wash water				10.7				
Screen oversize	3.34	3.01	2.35	1.8	4.8	3.1	62.79	1.56
Screen undersize	2.25	2.03	2.35	26.8	28.9	27.7	7.02	1.04
Coarse Stirred Media Mill								
Coarse Stirred media feed	3.34	3.01	2.35	1.8	4.8	3.1	62.79	1.56
Coarse Stirred media dilution water				10.4				
Coarse Stirred media mill discharge	3.34	3.01	2.35	12.2	15.2	13.5	19.80	1.13
Coarse Stirred media mill wash water				0.0				
Coarse Stirred media discharge & wash water	3.34	3.01	2.35	12.2	15.2	13.5	19.80	1.13

Northern Graphite Namibia 80 tph Mass Balance - 5.3% C(g)Head Grade								
Coarse Cleaner 1 Flotation								
Coarse cleaner 1 feed	3.49	3.14	2.35	16.9	20.0	18.2	15.67	1.10
Coarse cleaner 1 concentrate	3.34	3.01	2.35	6.2	9.2	7.5	32.53	1.23
Coarse cleaner 1 concentrate wash water				4.5				
Coarse cleaner 1 concentrate & wash water	3.34	3.01	2.35	10.7	13.7	12.0	21.95	1.14
Coarse cleaner 1 tailings	0.15	0.14	2.35	10.7	10.8	10.7	1.25	1.01
Coarse Cleaner 2 Flotation								
Coarse cleaner 2 feed	3.34	3.01	2.35	10.7	13.7	12.0	21.95	1.14
Coarse cleaner 2 concentrate	3.19	2.87	2.35	6.0	8.8	7.2	32.53	1.23
Coarse cleaner 2 concentrate wash water				1.7				
Coarse cleaner 2 concentrate & wash water	3.19	2.87	2.35	7.7	10.5	8.9	27.27	1.19
Coarse cleaner 2 tailings	0.15	0.14	2.35	4.7	4.9	4.8	2.77	1.02
Dewatering Flotation								
Dewatering flotation feed	2.25	2.03	2.35	26.8	28.9	27.7	7.02	1.04
Dewatering flotation concentrate	2.25	2.03	2.35	7.2	9.2	8.1	21.95	1.14
Dewatering flotation wash water				4.8				
Dewatering flotation concentrate & wash water	2.25	2.03	2.35	12.0	14.1	12.9	14.39	1.09
Dewatering flotation tailings	0.00	0.00	2.35	19.6	19.6	19.6	0.00	1.00
Fine Stirred Media Mill 1								
Fine stirred mill 1 feed	2.25	2.03	2.35	12.0	14.1	12.9	14.39	1.09
Fine stirred media mill 1 dilution water				0.0				
Fine stirred media mill 1 discharge	2.25	2.03	2.35	12.0	14.1	12.9	14.39	1.09
Fine stirred media mill 1 wash water				0.0				
Fine stirred media mill 1 discharge & wash water	2.25	2.03	2.35	12.0	14.1	12.9	14.39	1.09
Fine Cleaner 1 Flotation								
Fine cleaner 1 feed	2.35	2.12	2.35	16.4	18.5	17.3	11.42	1.07
Fine cleaner 1 concentrate	2.10	1.89	2.35	6.7	8.6	7.5	21.95	1.14
Fine cleaner 1 wash water				2.0				
Fine cleaner 1 concentrate & wash water	2.10	1.89	2.35	8.7	10.6	9.5	17.79	1.11
Fine cleaner 1 tailings	0.25	0.23	2.35	9.7	9.9	9.8	2.27	1.01
Fine Cleaner 2 Flotation								
Fine cleaner 2 feed	2.20	1.98	2.35	11.1	13.1	11.9	15.17	1.10
Fine cleaner 2 concentrate	2.10	1.89	2.35	6.7	8.6	7.5	21.95	1.14
Fine cleaner 2 wash water				2.0				
Fine cleaner 2 concentrate & wash water	2.10	1.89	2.35	8.7	10.6	9.5	17.79	1.11
Fine cleaner 2 tailings	0.10	0.09	2.35	4.4	4.4	4.4	2.03	1.01
Fine Cleaner 3 Flotation								
Fine cleaner 3 feed	2.10	1.89	2.35	8.7	10.6	9.5	17.79	1.11
Fine cleaner 3 concentrate	2.00	1.80	2.35	6.4	8.2	7.2	21.95	1.14
Fine cleaner 3 wash water				1.9				
Fine cleaner 3 concentrate & wash water	2.00	1.80	2.35	8.3	10.1	9.1	17.79	1.11
Fine cleaner 3 tailings	0.10	0.09	2.35	2.3	2.4	2.4	3.71	1.02
Concentrate Pressure filter Feed Tank								
Concentrate Pressure filter Feed Tank	5.19	4.67	2.35	19.0	23.7	21.0	19.73	1.13
Concentrate Pressure Filter								
Pressure filter feed	5.19	4.67	2.35	19.0	23.7	21.0	19.73	1.13
Pressure filter filtrate	0.00	0.00	2.35	18.3	18.3	18.3	0.00	1.00
Pressure filter cake	5.19	4.67	2.35	0.7	5.4	2.7	86.44	1.99
Concentrate Dryer								
Concentrate dryer feed	5.19	4.67	2.35	0.7	5.4	2.7	86.44	1.99
Concentrate dryer offgas	0.00			0.7	0.72	0.7	0.00	1.00
Dried Product	5.19	4.67	2.35	0.0	4.7	2.0	99.69	2.34
Tailings Thickener								
Thickener feed	94.8	85.3	2.66	254.3	339.6	286.4	25.12	1.19
Thickener O/F	0.00		1.00	218.3	218.3	218.3	0.00	1.00
Thickener U/F	94.8	85.3	2.66	40.8	126.2	72.9	67.63	1.73

28.6 GRAPHITE PRICING

Table 28-5: Okanjande Graphite Concentrate Basket Price Determination

Flake Size µm	Flake Size %	May 31, 2022 Benchmark*	Basket Contribution	Freight Added	Basket Contribution
+50	11.0%	$ 1,475.00	$ 162.25	$ 1,775	$ 195.25
+80	48.0%	$ 1,200.00	$ 576.00	$ 1,500	$ 720.00
+100	24.0%	$ 1,115.00	$ 267.60	$ 1,415	$ 339.60
-100	17.0%	$ 835.00	$ 141.95	$ 1,135	$ 192.95
	100.0%		**$ 1,147.80**		**$ 1,447.80**

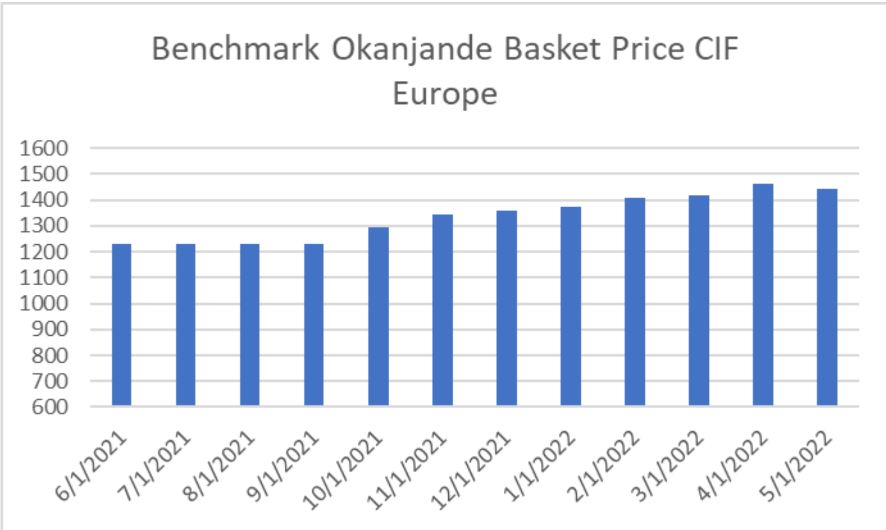

Figure 28-6: Benchmark Price Okanjande CIF Europe