HEAVY MINERALS LIMITED

INHAMBANE MINERAL RESOURCE ESTIMATE

MAY 2021

Prepared by: Paul Leandri and Greg Jones

DISCLAIMER

This report has been prepared by GNJ Consulting Pty Ltd ATF GNJ Consulting Trust ('GNJ Consulting') on behalf of Heavy Minerals Limited ('HML'). While all care has been taken in the preparation of the report and while the information it contains is believed to be reliable at the time of preparation and within any limitations and qualifications stated, neither the Client nor GNJ Consulting guarantee its accuracy. Use of the report in whole or in part by a third party shall be at that user's sole risk.

Any use of the term 'ore' in this report does not give or imply any guarantee of commercial viability.

This report shall not be made public, in whole or in part, without the written agreement of GNJ Consulting and copies shall not be provided to any third party without this disclaimer.

GNJ Consulting Pty Ltd ATF GNJ Consulting Trust
(ABN 68 654 653 546)
(ACN 163 261 069)

PO Box 2372
Bunbury WA 6231

Mobile: +61 429 685 084
email: gnjconsulting@outlook.com

Print Date: 26 May 2021

Number of copies: 1

EXECUTIVE SUMMARY

1 INTRODUCTION AND BACKGROUND

On 1 May 2014 Heavy Minerals Limited (HML, previously Mozmin Resources Pty Ltd) undertook drilling and sampling of its Inhambane mineral tenements. Subsequently GNJ Consulting Pty Ltd (GNJ Consulting) was retained to carry out geological modelling, resource estimation and JORC technical reporting on the resultant mineralisation that was identified from this preliminary drilling programme. This resource estimation work was then reviewed by Mr Paul Leandri who also supervised the drilling and sampling programme for HML. Mr Leandri prepared this report in conjunction with Greg Jones and this report encompasses all the exploration, drilling, sampling and resource estimation work completed during the initial drill out phase of the Inhambane Project.

2 LOCATION AND HISTORY

HML currently has the right to a mineral sand concession in southern Mozambique called Inhambane. The Inhambane project is located on a mining license application immediately to the north of two mineral leases held by Rio Tinto (Figure 2.1).

The Inhambane Project is located in the South of Inhambane Province. The tenement lies across the borders of the Inhambane and Jangamo districts. The Inhambane tenement originally formed part of a larger Rio Tinto tenement application in 2001. The Rio Tinto tenements were reduced to two smaller tenements to meet legislation and the lower third of what now makes up the Inhambane tenement was left vacant.

During 2001 Rio Tinto conducted exploration across the lower third of the Inhambane tenement with good results showing reasonable THM grades. In 2013 HML partnered with a Mozambique Company +258 LDA to secure the tenement and HML currently owns 70% of +258 LDA which in turn owns 100% of the tenement.

The original tenure was an exploration license, 4658L of 197.57 km^2. This was subsequently reduced to 193.81 km^2 by the Department of Mines in Mozambique. A mining concession was applied for, 10255C which covers an area of 183.55 km^2. As a consequence of the change in tenure size and movement in tenure boundary the southernmost portion of the resource and one line of drilling has been cut out of the current tenement. A subsequent re-application of tenure to has been made to amalgamate new vacant ground into the mining concession application.

HML conducted due diligence on the tenement in early 2014 which was followed up by a successful drilling program and assay program which delivered a resource in early 2015.

This resource estimation work represents the maiden resource for the Inhambane Project. It is possible that informal resource estimates were carried out by Rio Tinto after they conducted drilling in the area, however these are not on the public record.

Rio Tinto conducted hand auger drilling over the southern third of the HML Inhambane tenement.

3 GEOLOGY

The Inhambane province is part of the coastal region of southern Mozambique which forms part of the Mozambique basin, which is up to 400 km wide, with an onshore area of about 270 000 km^2 and a long axis of about 1200 km (Förster 1975; Matthews et al., 2001).

The bulk of the titanium and zircon sand mineralisation are associated with at least 160 m of older marine-intertidal-aeolian sediments that include three generations of the stable older palaeodunes (D1, D2 and D3) which occur inland of the coastline and overlie a package of marine-intertidal sediments (Porter, 2016). These units are variously distributed throughout the project area in varying thickness and occurrence.

Unit D3 is the most important in terms of economic geology, with an average of 3.3% Total HM and low slime content (average of <5%), making it potentially amenable to low-cost mining methods such as dozer trap or dredging. These are overlain by the contemporary aeolian D4 unit and alluvial material (Porter, 2016).

The better heavy sand mineralisation at Mutamba occurs within the three main zones of Jangamo, Dongane and Ravene, all of which have relatively similar mineralisation characteristics. The combined ilmenite, rutile and zircon economic HM content is 60 to 80% THM, with the bulk of the mineralisation hosted by the D2, D3 and Fluvial units. The THM grain-size distribution for Mutamba has a range 90 to 210 µm, with 50% of HM grains >142 µm. The overall slime content for Mutamba is 7.1% and typically comprises kaolinite and illite, with lesser amounts of smectite, chlorite and mica.

The tenement is located over a seaward dune system trending towards a landward dune system. These Dune systems are separated by a drainage line with associated lakes and swamps. The Rio Tinto dune system lies within the seaward dune system. Both dune systems host concentrations of minerals such as ilmenite, altered ilmenite, zircon and rutile. HML has a focus on topographical based structures and as such has identified six initial target areas. The Quaternary formations in these areas consist mostly of alluvium deposits and sand dunes (coastal and inland).

4 EXPLORATION ACTIVITIES

Following a review of the regional and local geological setting a total of 6 target areas were identified as those areas with the greatest thickness of sediment which will likely yield the greatest resource tonnage and hence those should be targeted preferentially. A target generation map (Figure 4.2) shows these areas from A through to F.

Drilling was commenced on Target A given the proximity to the easiest access to the tenement and the likelihood of a successful drilling program (based on historical results). It was decided that once positive HM indications were being returned from drilling to drill the target to a point where both the exploration team and the resource geologist were comfortable with the drill spacing and observed mineralisation to support an Inferred Mineral Resource estimate.

A total of 41 holes were drilled for 1783 m. The current tenure has reduced the drilled holes within secured tenure to a total of 33 for 1399.5 m. Drilling was carried out by a Auga Terra (Mozambique-based drilling company) using a truck mounted air core drill rig and NQ sized rods. Aircore drilling was used to obtain samples at 1.5 m intervals which generated about 8 kg of material that was split down to 1.5 - 2.5 kg using the cone splitter at the bottom of the sample cyclone.

The cyclone used for sampling was a Metzke Fixed Cone Splitter with Transition (Figure 4.4). Samples were subsequently split down to approximately 1 - 1.5 kg. The smaller split samples were labelled and bagged for export to the primary laboratory for processing. Any wet or damp samples were allowed to dry prior to the splitting stage. A total of 1175 samples were taken of which 832 were submitted for assay representing approximately 71% of the total samples. The current tenure hosts 922 sample intervals of which 635 were submitted for assay representing approximately 69% of samples. Samples selected for assaying were then securely transported back to Australia for processing through Diamantina Laboratories in Perth.

Subsequent to heavy mineral float sink analysis, mineral assemblage composites were prepared based on geological interpretation and observations from logging and visual observation of heavy mineral sachets. A total of 3 mineral assemblage composites were prepared and submitted to ALS in Perth for QEMSCAN analysis.

5 DATA ANALYSIS

From all of the supplied data an MS Access database was created to store all information in a relational database. This included the development of duplicate and standard sample queries. A number of minor issues were observed and corrected and these were traced back to some of the original logging capture process (and subsequently corrected).

Drill hole RL's were assumed as correct based on the DGPS survey pickup. Checking against topography was not considered given that the original topography was based on SRTM data.

The representivity of samples was checked by comparing the split weights of samples at the beginning and ending of each drill rod (effectively the 1st half versus the 2nd half of the rod).

The rate of submission of duplicate analysis for the Inhambane deposit was 1 in 40 for both laboratory and rig duplicates (Table 5.1) for a combined repeat ratio of 1 in 20. The laboratory was blind to the field duplicates and as part of their normal procedure, the laboratory duplicates were taken regardless of whether they fell on client samples or internal laboratory standards.

Overall the duplicate lab and field samples showed good precision and lab and company standards that were submitted as part of the drill hole program QA/QC also returned values within the expected mean and calculated mean (within 2 standard deviations).

6 INTERPRETATION AND WIREFRAMING

It was identified early on in the literature study and then confirmed during the drilling program that distinct lithological horizons could be identified in the project area. Dunal units dominate the bulk of the geology of the Inhambane area and are characterised by high elevation dunes and ferric oxide staining of the sand grains.

The dunal units are subdivided into three progressively younger and more mineralised units, two of which are marked distinct from the first, with higher SLIMES and generally as poorly mineralised. This unit overlies a hard clay dominated, intertidal unit and forms the shield onto which successive dunal units have been deposited. There also exist some fluvial deposited sand units forming distinct geographical outlines that mirror present-day drainage patterns.

7 GEOLOGICAL AND GRADE MODELLING

Preparation of the geological grade model was based on a combination of coding model cells in drill holes inside closed wireframes solids, and below wireframe surfaces including geology and basement. Modelling convention has the largest parent cell size possible used which is generally based on half the distance between holes of the dominant drill hole spacing in the X and Y dimensions. Cell dimensions are generally used such to avoid the use of overly small cells that imply a level of refinement in the model that is not justified by the drill hole spacing.

The dominant drill grid spacing for the Inhambane deposit is 250 x 500 x 1.5 m. This would indicate parent cell dimensions in XYZ of 125 x 250 x 1.5 m and following testing with different cell sizes this was the parent cell size that was chosen for the final model. Given the early stage of exploration for the Inhambane project and the uncertainty in the accuracy of topography away from and in between drill holes, it was decided that a smaller sub cell breakdown was not warranted. Subsequent exploration and modelling exercises may be able to make better use of detailed topography surveys such as LiDAR.

Inverse distance cubed was used along with nearest neighbour to interpolate grades, logged indices and mineral assemblage composite id numbers into the block model. Experimental variograms were developed from the drilling, however were not used to define the search ellipses. Search ellipses were developed through a number of trial runs, testing the grade interpolation vs drill hole grades each time until a satisfactory distribution comparison was achieved (Section 8.2.2). All drill holes (41 original holes) and assays (832 assays) were used for the geological interpretation and grade interpolation given that they were part of the original tenure under 4658L. To reduce the size of the resource to accommodate the change in tenure, the model has been trimmed and re-reported to honour the new boundary.

GNJ Consulting has developed a dynamic ellipsoid modelling technique which is similar to a number of commercial available methodologies. This dynamic ellipsoid technique is referred to as dip, trend and plunge (DTP) modelling.

The DTP process essentially uses dip, trend and plunge (from the digitised trends) strings to control the search ellipse orientation for sub zones within the model to account for variations in the dip, trend and plunge of mineralisation. This is a completely flexible routine and is very useful for wide, thin and extremely elongate strandlines particularly in mineral sands even when changes in dip, trend and plunge are very subtle.

The average bulk density was selected as 1.7 gcm^{-3}. This is an average bulk density applied across the entire resource estimate. It was selected based on the experience of the Competent Person, the average HM and SLIMES grades and given that the average bulk density of quartz sand is 1.6 gcm^{-3}.

8 MODEL VALIDATION

The volume model and drill hole file was validated on-screen against the geology and basement wireframes to ensure zone allocation had been correctly assigned. The volume model was validated to ensure that adequate resolution was obtained with the use of sub-cells.

On reviewing the grade interpolation there was no smearing of grades observed between zones, but minor smoothing of higher grades (from high drill hole grades to lower model grades) and lower grades (from low drill hole grades to higher model grades).

The model was interrogated to see if any cells were not estimated and whether cells were estimated in the first, second or third estimation pass as expected given the surrounding sampling density. To this end the search volume field flag, EST, was used to cross check the interpolation parameters. None of the domains remained un-estimated for drill assay primary grades.

Population distributions were calculated for the two critical assay fields; HM and SLIMES as both normal and log normal distributions. These populations were further isolated to hard coded ZONE unique values. Bend histograms were prepared for drill hole and model results for each domain and the key assay fields HM and SLIMES and were compared with acceptable representation of drill hole grades in the model. Swathe plots were prepared for comparison of key assay grades along the long axis of the interpreted strike of mineralisation. These showed an acceptable representation of drill hole grades into the block model.

The assignment of mineralogy was made by nearest neighbour to the block model constrained by domains as per the individual drill hole assays.

9 RESULTS

Consideration has been given to the reasonable prospects for eventual economic extraction for the Inhambane prospect. Factors such as current mineral sands prices, likely mining methodology, thickness of mineralised intervals, mineral recoveries and high level costs for mining and processing have all been applied to the Mineral Resource at the nominated HM cut-off grade. These are detailed in Section 9.1.

The classification of the Inhambane Mineral Resource estimate has been assigned an Inferred Mineral Resource category and is supported by criteria as follows:

- drill hole spacing;
- the quality of QA/QC sampling; and
- the distribution of mineral assemblage composites.

This is the maiden Mineral Resource estimate for the Inhambane project and is entirely an Inferred category.

The drill spacing is currently wide spaced and geology and mineralisation continuity is only inferred at this stage. There are demonstrated and continuous layers of mineralisation within ZONE 5 which may be indicative of strandline development and preservation, however the wide spaced drilling does not allow for the confirmation of this. The potential uncertainty of this classification can be demonstrated by the one attempt at infill drilling which resulted in identifying a washout of mineralisation (which are rare, however can be encountered in marine strandline deposits).

The quality of QA/QC sampling was to a recommended industry standard and well supports selected Mineral Resource categories. The inclusion of company blind samples and twin drilling would further enhance the QA/QC aspect and therefore confidence in the Mineral Resource estimate, however this has not been undertaken at this stage.

The sample support and distribution of mineral assemblage composites is to an adequate level of density to infer an overall global average of mineral assemblage. The current tonnage assignment to each mineral assemblage composite is well below what would be considered to be an adequate degree of resolution to infer a high level of confidence for monthly production rates. Despite the small number of composite samples those results do broadly infer a HM to trash mineral ratio that may be economically favourable across the area drilled.

In addition to all of the criteria discussed in this section there is also the consideration of the cut-off-grade used to report the Mineral Resource estimate. Cut-off grades and grade tonnage figures and discussion are presented in Section 9.3.

The selection of the HM cut-off grade used for reporting was selected based on the following criteria:

- deposits within Mozambique and within comparable depositional settings and with similar to lower value mineralogy are utilising cut-off grades of approximately 1.3 to 2.9% HM;
- the grade tonnage curves show inflexion points at 1.5 and 2.5% HM, indicating a natural grade and tonnage break point.

It was agreed between the Competent Persons to utilise a cut-off grade of 2 per cent HM to account for the value of the VHM (valuable heavy mineral) content and to align with an average of inflexion points on the grade tonnage curves.

The Mineral Resource statement for the Inhambane deposit is presented in Table 1 below and the Mineral Resource outline with JORC Categories is presented in Figure 9.1. This table conforms to guidelines set out in the JORC Code (2012) and is formatted for external reporting.

The Inhambane project comprises an Inferred Mineral Resource of 51 Mt @ 3.4 per cent HM and 5 per cent slimes containing 1.7 Mt of HM. The breakdown of the Mineral Resource category is as follows:

- an Inferred Resource of 51 Mt @ 3.4 per cent HM and 5 per cent slimes containing 1.7 Mt of HM with an assemblage of 60 per cent ilmenite, 2 per cent rutile, 5 per cent zircon and 4 per cent leucoxene.

Table 1: Mineral Resource Statement for the Inhambane deposit as at April 2021

Summary of Mineral Resources(1)						HM Assemblage(2)					
Mineral Resource Category	Material (Mt)	In Situ HM (Mt)	HM (%)	SL (%)	OS (%)	Altered Ilmenite (%)	Primary Ilmenite (%)	Rutile (%)	Leucoxene (HiTi) (%)	Zircon (%)	Trash (%)
Inferred	51	1.7	3.4	5	-	29	31	2	4	5	30
Grand Total	**51**	**1.7**	**3.4**	**5**	**-**	**29**	**31**	**2**	**4**	**5**	**30**

Notes:

(1) Mineral resources reported at a cut-off-grade of 2% HM.

(2) Mineral assemblage is reported as a percentage of in situ HM content.

The supporting criteria for the resource classification is presented in Appendix 4 in alignment with the reporting requirements for Table 1 from the JORC Code (2012). The Mineral Resource figures presented in Table 1 are consistent with guidelines from the JORC Code (2012) with respect to reporting significant figures in addition to the experience of the Competent Person, Mr Greg Jones.

10 RECOMMENDATIONS

Recommendations for further work to improve or refine the Mineral Resource estimate for the Inhambane deposit have been identified for a number of areas.

The following points are recommended to be considered by HML for follow-up action or attention:

- further develop QA/QC procedures to include twin drilling and internal company blind field standards for submission to laboratories for analysis;
- opportunities to test the presence of strandline style mineralisation within the interpreted marine/alluvial sequence which was not previously identified as an Exploration Target;
- consideration of the refining the mineralogical and quality characterisation test work for the deposit to determine the true potential saleability of ilmenite; and
- further infill drilling for the Inhambane project and target testing at other identified sites in the project region.

TABLE OF CONTENTS

DISCLAIMER 1
EXECUTIVE SUMMARY 2
TABLE OF CONTENTS 8
LIST OF APPENDICES 9
LIST OF FIGURES 9
LIST OF TABLES 11
1 INTRODUCTION AND BACKGROUND 12
1.1 SCOPE OF WORK 12
1.2 TERMS OF REFERENCE 12
2 LOCATION AND HISTORY 13
2.1 LOCATION 13
2.2 HISTORY 13
2.3 PROJECT OWNERSHIP AND TENURE 13
2.4 LAND USE AND ENVIRONMENT 13
2.5 PREVIOUS WORK 14
2.5.1 DRILLING HISTORY 14
2.5.2 RESOURCE ESTIMATION 16
3 GEOLOGY 17
3.1 REGIONAL 17
3.2 LOCAL 18
4 EXPLORATION ACTIVITIES 20
4.1 DRILLING 23
4.2 DRILL HOLES AND COLLARS 24
4.3 SURVEY CONTROL 25
4.4 SAMPLING: PROCEDURE AND LOGGING 25
4.5 ASSAYING 29
4.6 MINERAL ASSEMBLAGE COMPOSITES 30
4.6.1 DESCRIPTION OF QUANTITATIVE MINERALOGICAL ANALYSIS (QEMSCAN) 30
4.6.2 SUMMARY OF MINERALOGY 30
5 DATA ANALYSIS 33
5.1 DRILLING AND ASSAYING 33
5.2 ASSAY QA/QC 34
5.2.1 DUPLICATE ASSAY ANALYSIS 34
5.2.2 DUPLICATE SCATTERPLOT AND CP PLOT ANALYSIS 35
5.2.3 FIELD DUPLICATES: HM 35
5.2.4 FIELD DUPLICATES: SLIMES 35
5.2.5 LABORATORY DUPLICATES: HM 36
5.2.6 LABORATORY DUPLICATES: SLIMES 37
5.3 STANDARD CONTROL CHARTS 38
5.3.1 LABORATORY STANDARDS 39
6 INTERPRETATION AND WIREFRAMING 40
6.1 TOPOGRAPHY 40
6.2 BASEMENT 40
6.3 GEOLOGY ZONE 3 40
6.4 GEOLOGY ZONE 5 40
6.5 GEOLOGY ZONE 6 41
6.6 GENERALISED STRANDLINE LOCATIONS 41

7 GEOLOGICAL AND GRADE MODELLING 43
7.1 METHODOLOGY 43
7.2 MODEL PROTOTYPE 43
7.3 MODELLING PARAMETERS 44
7.3.1 ESTIMATION PARAMETERS 44
7.3.2 SEARCH PARAMETERS 45
7.4 DIP, TREND AND PLUNGE (DTP) MODELLING 46
7.5 GENERAL MODEL FORM 46
7.6 BULK DENSITY 48
8 MODEL VALIDATION 49
8.1 VOLUME MODEL AND DRILL HOLES 49
8.2 RESOURCE MODEL 50
8.2.1 VISUAL INSPECTION 50
8.2.2 STATISTICAL PRESENTATION 51
8.3 GRAPHICAL PRESENTATION 53
8.3.1 HM COMPARISON BY ZONE 54
8.3.2 SLIMES COMPARISON BY ZONE 54
8.4 BULK DATA 55
8.4.1 STATISTICAL REVIEW 55
8.4.2 GENERAL COMMENTARY 56
9 RESULTS 58
9.1 DISCUSSION OF REASONABLE PROSPECTS OF EVENTUAL ECONOMIC EXTRACTION 58
9.2 RESOURCE CLASSIFICATION 59
9.3 RESOURCE STATEMENT (2012 JORC CODE SUPPORTING STATEMENT) 62
9.4 GRADE TONNAGE CURVES 62
10 RECOMMENDATIONS 64
11 REFERENCES 65
12 COMPETENT PERSON STATEMENT 66
12.1 QUALIFICATIONS 66
12.2 DECLARATION (EXPLORATION RESULTS) 66
12.3 DECLARATION (MINERAL RESOURCES) 66

LIST OF APPENDICES

APPENDIX 1: SECTIONS SHOWING HM AND SLIMES GRADES IN DRILL HOLES AND MODELS
APPENDIX 2: PLANS SHOWING SELECTED FIELD HEAT MAPS IN SUMMARY BLOCK MODEL FOR TOTAL MODEL (ZONES 3 AND 5)
APPENDIX 3: SUMMARY DRILL HOLE INFORMATION (COMPOSITED INTERVALS > 2% hm)
APPENDIX 4: RESOURCE STATEMENT SUPPORTING COMMENTARY (AFTER TABLE 1, JORC CODE 2012

LIST OF FIGURES

Figure 2.1: Location of Inhambane deposit within the Inhambane Project. 15
Figure 3.1: Stratigraphic column after Dumouchel, et al (2016) 19
Figure 4.1: Location of 31 m contour of significance and the topographic highs 20
Figure 4.2: Planned exploration drilling targets and proposed drill holes 22
Figure 4.3: Top: drill rig, support truck and cyclone set up on site. Bottom: trumpet style mineral sands air core bit 23

Figure 4.4: Metzke Fixed Cone Splitter and Cyclone 26
Figure 4.5: Comparison of visual HM estimates versus assayed HM 26
Figure 4.6: Close up of lower grades for visual HM estimates versus assayed HM 27
Figure 4.7: Location of drill holes within the Inhambane deposit (showing the type section A-B for Figures 6.1) and the local grid vs UTM 28
Figure 4.8: Diamantina flowsheet for HM, SLIMES and OS analysis for Inhambane Project 29
Figure 4.9: Photo-micrographs of IN-Z3-001 (left) and IN-Z5-001 (right) - approximately 2.5 - 3.0 cm field of view 32
Figure 4.10: Composite sample locations (oblique view looking north-west) 32
Figure 5.1: Average split weight by depth (indicated by sample position either 1 or 2) 34
Figure 5.2: Summary statistics and CPP for field duplicates: HM 35
Figure 5.3: Normal scatterplot of field duplicate samples for HM 35
Figure 5.4: Summary statistics and CPP for field duplicates: SLIMES 36
Figure 5.5: Normal scatterplot of field duplicate samples for SLIMES 36
Figure 5.6: Summary statistics and CPP for laboratory duplicates: HM 37
Figure 5.7: Normal scatterplot of laboratory duplicate samples for HM 37
Figure 5.8: Summary statistics and CPP for laboratory duplicates: SLIMES 38
Figure 5.9: Normal scatterplot of laboratory duplicate samples for SLIMES 38
Figure 5.10: Control chart and key data points for Diamantina Standard: HM 39
Figure 5.11: Control chart and key data points for Diamantina Standard: SLIMES 39
Figure 6.1: Section 16350 mN showing the interpretation of the contact between ZONE 3 and ZONE 5 and basement (10 x Z-axis) 41
Figure 6.2: Generalised east and west strandline locations 42
Figure 7.1: Oblique view looking north-west showing dip strings for DTP routine 47
Figure 7.2: Oblique view looking north showing trend strings for DTP routine 47
Figure 7.3: Cut-away section of the block model showing all of the domains (upper sand package (ZONE=3), lower sand package (ZONE=5) and basement (ZONE=200) with the small domain of ZONE=6 shown within ZONE=5 48
Figure 8.1: Cross-section looking north through 16350 mN showing model and drill hole coding (15 x Z-axis) 49
Figure 8.2: North-south section looking east through 9260 mE showing model and drill hole coding (15 x Z-axis) 49
Figure 8.3: East-west section at 16350 mN showing model and drill hole HM (15 x Z-axis) 50
Figure 8.4: East-west section at 15350 mN showing model and drill hole SLIMES (15 x Z-axis) 51
Figure 8.5: Oblique view looking north-west of the Inhambane block model showing HM grade distribution 51
Figure 8.6: Model and drill hole normal and lognormal distributions for HM [ZONE=3] 52
Figure 8.7: Model and drill hole normal and lognormal distributions for HM [ZONE=5] 52
Figure 8.8: Model and drill hole normal and lognormal distributions for SLIMES [ZONE=3] 53
Figure 8.9: Model and drill hole normal and lognormal distributions for SLIMES [ZONE=5] 53
Figure 8.10: Comparison of model vs. drill hole grades [ZONE=3, HM] 54
Figure 8.11: Comparison of model vs. drill hole grades [ZONE=5, HM] 54
Figure 8.12: Comparison of model vs. drill hole grades [ZONE=5, SLIMES] 55
Figure 8.13: Comparison of model vs. drill hole grades [ZONE=5, SLIMES] 55
Figure 9.1: JORC Mineral Resource outline 61
Figure 9.2: Grade tonnage curve for Inhambane (material tonnes vs HM grade) 63
Figure 9.3: Grade tonnage curve for Inhambane (HM tonnes vs HM grade) 63

LIST OF TABLES

Table 1: Mineral Resource Statement for the Inhambane deposit as at April 2021 6
Table 2.1: Current and historical tenure in the immediate proximity of the Inhambane Project 13
Table 4.1: Summary of drilling and assaying for the Inhambane project (4658L) 24
Table 4.2: Summary of drilling and assaying for the Inhambane project (10255C) 24
Table 4.3: Inhambane mineralogy summarised from the ALS QEMSCAN analysis 31
Table 4.4: Mineralogical abbreviations and their definitions (aligned by colour)......................31
Table 5.1: Duplicate samples and rate of submission...34
Table 7.1: Description of model zones, wireframes and fill direction.....................................43
Table 7.2: Model cell size, origin and number of cells to prepare volume model 44
Table 7.3: Estimation parameters for grade and index field interpolation...............................45
Table 7.4: Search parameters for grade and index field interpolation (search ellipse) 45
Table 8.1: HM tonnage by MACNUM (filtered on HM>2) 56
Table 9.1: Mineral Resource Statement for the Inhambane deposit as at April 2021 62

1 INTRODUCTION AND BACKGROUND

1.1 SCOPE OF WORK

On 1 May 2014 Heavy Minerals Limited (formerly Mozmin) undertook drilling and sampling of its Inhambane mineral tenements. Subsequently GNJ Consulting Pty Ltd (GNJ Consulting) was retained to carry out geological modelling, resource estimation and JORC technical reporting on the resultant mineralisation that was identified from this preliminary drilling programme. This resource estimation work was then reviewed by Mr Paul Leandri who also supervised the drilling and sampling programme for HML. Mr Leandri prepared this report in conjunction with Greg Jones and this report encompasses all the exploration, drilling, sampling and resource estimation work completed during the initial drill out phase of the Inhambane Project.

The details of the scope of work are presented below:

- review and analyse all available QA/QC data from the Inhambane drilling;
- prepare a geological interpretation of the Inhambane Project;
- prepare wireframe surfaces and solids of gross geological and grade domains;
- construction of a 3-D geological resource model in Datamine; and
- preparation of a stand-alone JORC Technical Report for Mineral Resources in accordance to guidelines from the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves 2012 Edition (JORC Code).

1.2 TERMS OF REFERENCE

For the purpose of this report, the following commonly used terms are defined for the reader. This is to ensure that language is clear for contemporary association of historical terms. There are other abbreviations used throughout the report and these are defined on an as-required basis.

- ZONE - used to refer to a coded field used in the resource estimation for the identification of hard boundaries in drill hole and model files.
- Datamine - used in place of CAE Studio to describe the software and file form used in the 3-D geological block modelling package now owned and marketed by CAE Mining.
- THM and HM - used synonymously in this document for exactly the same meaning (THM equals total heavy mineral, and HM equals heavy mineral).

2 LOCATION AND HISTORY

2.1 LOCATION

HML currently has the right to a mineral sand concession in southern Mozambique called Inhambane. The Inhambane project is located on a mining license application immediately to the north of two mineral leases held by Rio Tinto (Figure 2.1).

The Inhambane Project is located in the South of Inhambane Province. The tenement lies across the borders of the Inhambane and Jangamo districts.

2.2 HISTORY

The Inhambane tenement originally formed part of a larger Rio Tinto tenement application in 2001.

The Rio Tinto tenements were reduced to two smaller tenements to meet legislation and the lower third of what now makes up the Inhambane tenement was left vacant.

During 2001 Rio Tinto conducted exploration across the lower third of the Inhambane tenement with good results showing reasonable THM grades.

In 2013 HML partnered with a Mozambique Company +258 LDA to secure the tenement and HML currently owns 70% of +258 LDA which in turn owns 100% of the tenement.

The original tenure was an exploration license, 4658L of 197.57 km^2. This was subsequently reduced to 193.81 km^2 by the Department of Mines in Mozambique. A mining concession was applied for, 10255C which covers an area of 183.55 km^2. As a consequence of the change in tenure size and movement in tenure boundary the southernmost portion of the resource and one line of drilling has been cut out of the current tenement. A subsequent re-application of tenure to has been made to amalgamate new vacant ground into the mining concession application (Table 2.1).

HML conducted due diligence on the tenement in early 2014 which was followed up by a successful drilling program and assay program which delivered a resource in early 2015.

2.3 PROJECT OWNERSHIP AND TENURE

The HML tenure is 100% owned by Mozambique Company +258 LDA of which HML owns 70%.

Table 2.1: Current and historical tenure in the immediate proximity of the Inhambane Project

Company Name	Tenement Number	Granted	Expiring	Area Ha	Area Km²	Borders on	Note
+258 LDA (Pretty Company LDA)	4658L	26/07/2011	14/03/2017	19757.4	197.57		Extension till 14/03/2020
+258 LDA (Pretty Company LDA)	4658L	26/07/2011	14/03/2017	19381.2	193.81		
+258 LDA (Pretty Company LDA)	10255C	Pending		18354.90	183.55		Pending grant
Rio Tinto	1336L	04/05/2006	04/05/2014	11611.7	116	SW	
Rio Tinto	566L	25/08/2003	25/08/2013	15982.6	160	SE	

2.4 LAND USE AND ENVIRONMENT

The current tenement covers 183.55 km^2 of ground primarily consisting of sand dunes with light grasses and palm trees. It is lightly populated with few inhabitants.

The local inhabitants are subsistence farmers growing local vegetable crops in small plots.

2.5 PREVIOUS WORK

In 2001 Rio Tinto conducted exploration across the lower third of the HML Tenement with good results showing reasonable THM grades. These results have been viewed at the Ministry of Mines in Mozambique.

2.5.1 DRILLING HISTORY

Rio Tinto conducted hand auger drilling over the southern third of the HML Inhambane tenement.

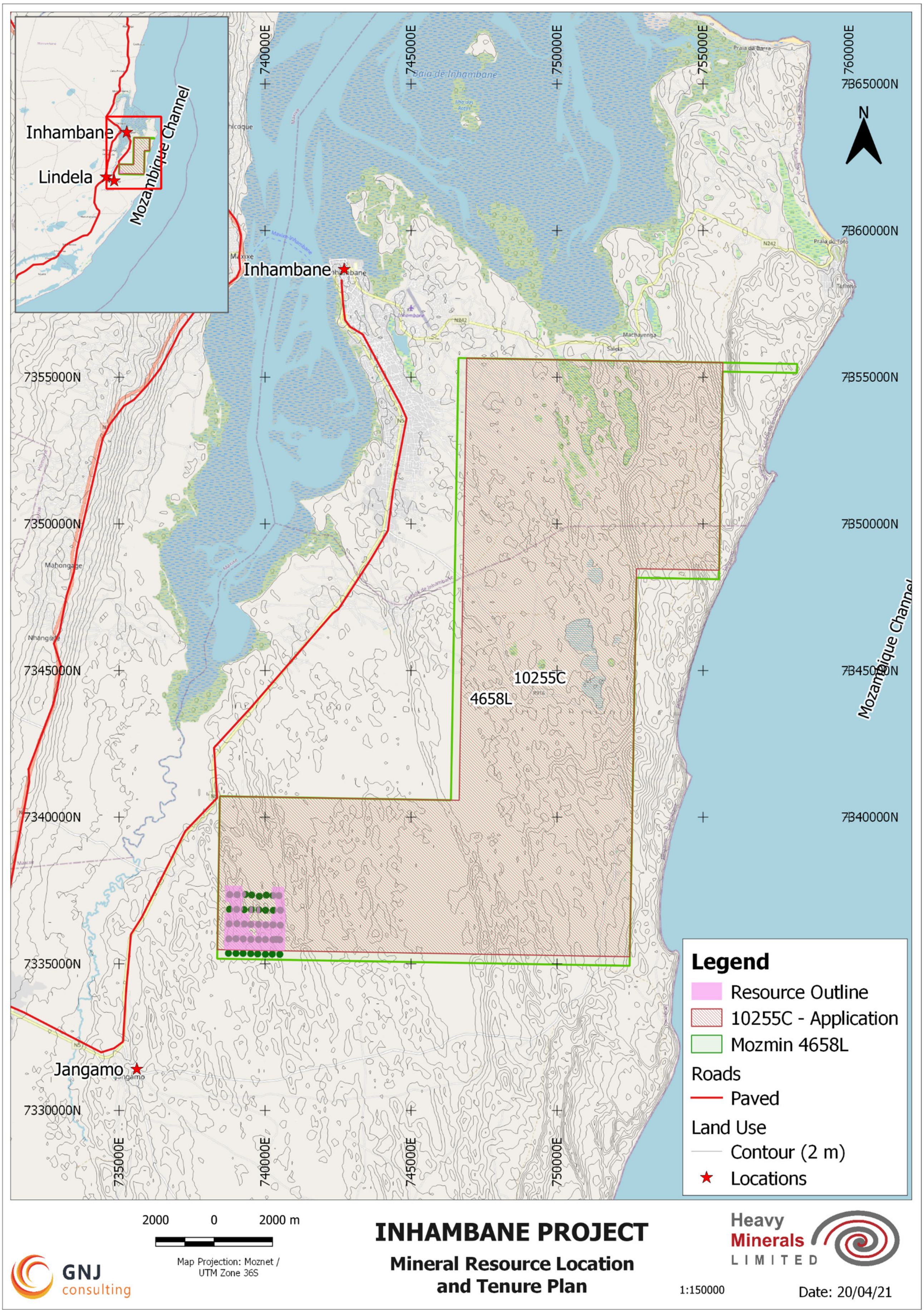


Figure 2.1: Location of Inhambane deposit within the Inhambane Project.

2.5.2 RESOURCE ESTIMATION

This resource estimation work represents the maiden resource for the Inhambane Project. It is possible that informal resource estimates were carried out by Rio Tinto after they conducted drilling in the area, however these are not on the public record.

3 GEOLOGY

3.1 REGIONAL[1]

The Inhambane province is part of the coastal region of southern Mozambique which forms part of the Mozambique basin, which is up to 400 km wide, with an onshore area of about 270 000 km^2 and a long axis of about 1200 km (Förster 1975; Matthews et al., 2001).

The Mozambique basin is a complex sequence of Cretaceous to Quaternary age sedimentary rocks and unconsolidated sand deposits which rest unconformably on Karoo Supergroup sedimentary and volcanic rocks (Salman and Abdula 1995; Schlüter 2008; Emmel et al., 2011). The base of the post-Karoo sedimentary sequence comprises a very thick continental sediment known as the Red Beds Formation (Cilek 1989; Mashaba and Altermann 2015). The Red Beds are overlain by glauconitic sandstones and arenaceous limestones of the Maputo Formation, defining a transition to marine conditions during the Neocomian (Salman and Abdula 1995). The remainder of the Cretaceous is represented by a variety of rock types that are of marine, continental and transitional origin, suggesting tectonic activity caused differential uplift (Förster 1975; Salazar et al., 2013 Salazar).

The bulk of the overlying Cenozoic succession is a shallow-marine facies typical of a passive continental margin (Salman and Abdula 1995; Rutten et al., 2008), made up of two sedimentary cycles separated by an unconformity. These comprise a Palaeocene to Eocene cycle of glauconitic sand, clays and marls, and an Oligocene to Neogene cycle, that comprises terrigenous deposits of the Limpopo River and Zambezi River deltas. The interval between the Limpopo and Zambezi Rivers remained a shallow-water environment during the Neogens and comprises the Inharrime, Temane and Jofane Formations (Salman and Abdula 1995). An extensive regression at the end of the Pliocene to early Pleistocene produced a widespread set of coast-parallel dunes, alluvial river terraces and lacustrine deposits, gradually progressing seaward (Förster 1975; Wright 1998).

The current coastal plain is an extensive low-lying zone of unconsolidated Quaternary to Recent sediments (Palalane et al., 2015), separated from the Ocean by both older stable palaeodunes and active dunes. The cordon of active dunes are up to 2 km wide, and in many places >100 m above sea level (Momade and Achimo 2004). Modern beach rock is intermittently exposed along the exposed high-energy wind and wave-dominated shore (Armitage et al., 2006; Peché 2012), commonly comprising cemented calcareous sandstone (Cilek, 1985). Wright (1998 Wright, I. 1998). Coastal erosion processes in conjunction with rapid Quaternary sea level change in Mozambique, caused unconsolidated coastal sediments to undergo numerous cycles of erosion, transport and deposition, which allow winnowing of enriched secondary sources of more resistant minerals, including rutile, ilmenite and zircon, into localised HM placer deposits.

The bulk of the titanium and zircon sand mineralisation are associated with at least 160 m of older marine-intertidal-aeolian sediments that include three generations of the stable older palaeodunes (D1, D2 and D3) which occur inland of the coastline and overlie a package of marine-intertidal sediments (Porter, 2016). These units are variously distributed throughout the project area in varying thickness and occurrence.

Unit D3 is the most important in terms of economic geology, with an average of 3.3% Total HM and low slime content, making it potentially amenable to low-cost dredge mining methods. These are overlain by the contemporary aeolian D4 unit and alluvial material (Porter, 2016).

D1 is the oldest aeolian deposit overlying the Intertidal unit, and is composed of a dark red to red-brown silt-rich (>20%) palaeodunal quartz sand, with an average THM of 1.3%, although its high slime content precludes it from being considered part of the mineralised envelope. In the Jangamo zone, D1 forms a core onto which subsequent aeolian sands were deposited and is associated with some of the highest elevation in the area. Most of unit D1 is completely obscured by a variety of younger sediments (Porter, 2016).

[1] Description of regional geology after Porter (2017) and Dumouchel, et al (2016)

D2 is the most common unit overlying D1, and comprises is light to dark orange-brown quartz sand with an average slime content of 8%. The contact between D1 and D2 is mostly defined by a distinct drop in the slime content from about 18 to 20% to 8% respectively. Sediment interpreted to represent D2 palaeodunes has an average of 2.8% THM and is an economically important unit.

D3 overlies D2 and comprises a generally looser and more free-flowing quartz sand sequence, that occurs in a long, low series of parabolic landforms with NW-SE axes, interpreted as aeolian sediments. The D2 to D3 contact is best defined by the slime characteristics, with the latter averaging about 6.3%.

D4 is mainly composed of yellow-white and grey free-flowing quartz sand which overlies D3, and represents the modern frontal dune system adjacent to the contemporary coastline. These modern frontal dunes are still mobile with extensive areas of exposed, un-vegetated sand with an average grade of 2.7% THM.

The better heavy sand mineralisation at Mutamba occurs within the three main zones of Jangamo, Dongane and Ravene, all of which have relatively similar mineralisation characteristics. The combined ilmenite, rutile and zircon economic HM content is 60 to 80% THM, with the bulk of the mineralisation hosted by the D2, D3 and Fluvial units. The THM grain-size distribution for Mutamba has a range 90 to 210 µm, with 50% of HM grains >142 µm. The overall slime content for Mutamba is 7.1% and typically comprises kaolinite and illite, with lesser amounts of smectite, chlorite and mica.

The Mutamba and similar sized Chilubane deposit, some 150 km along the coat to the WSW, have a reported globally significant 'Exploration Target' of 7 to 12 Gt of mineralised sand @ 3 to 4.5% THM, comprising >140 Mt of ilmenite and 10 to 15 Mt of contained rutile + zircon (Dumouchel, Hees and Alvin, 2016).

3.2 LOCAL

From literature review and interpretation of supplied maps, basement is a fine, intertidal marine unit that is flat with a gentle dip of -0.75 m/km from west to east and -0.5 m/km south to north through the tenement. A stratigraphic column describing the relationship of the various Quaternary to Recent sediments in the project area (Figure 3.1).

The large, red, clay-rich dune (D1) with very low HM enrichment, overlies the intertidal basement and itself becomes the base to mineralisation. This unit is older, it resides sub-parallel to the current coast and occupies the areas of highest relief.

The tenement is located over a seaward dune system trending towards a landward dune system. These Dune systems are separated by a drainage line with associated lakes and swamps. The Rio Tinto dune system lies within the seaward dune system. Both dune systems host concentrations of minerals such as ilmenite, altered ilmenite, zircon and rutile. HML has a focus on topographical based structures and as such has identified six initial target areas. The Quaternary formations in these areas consist mostly of alluvium deposits and sand dunes (coastal and inland).

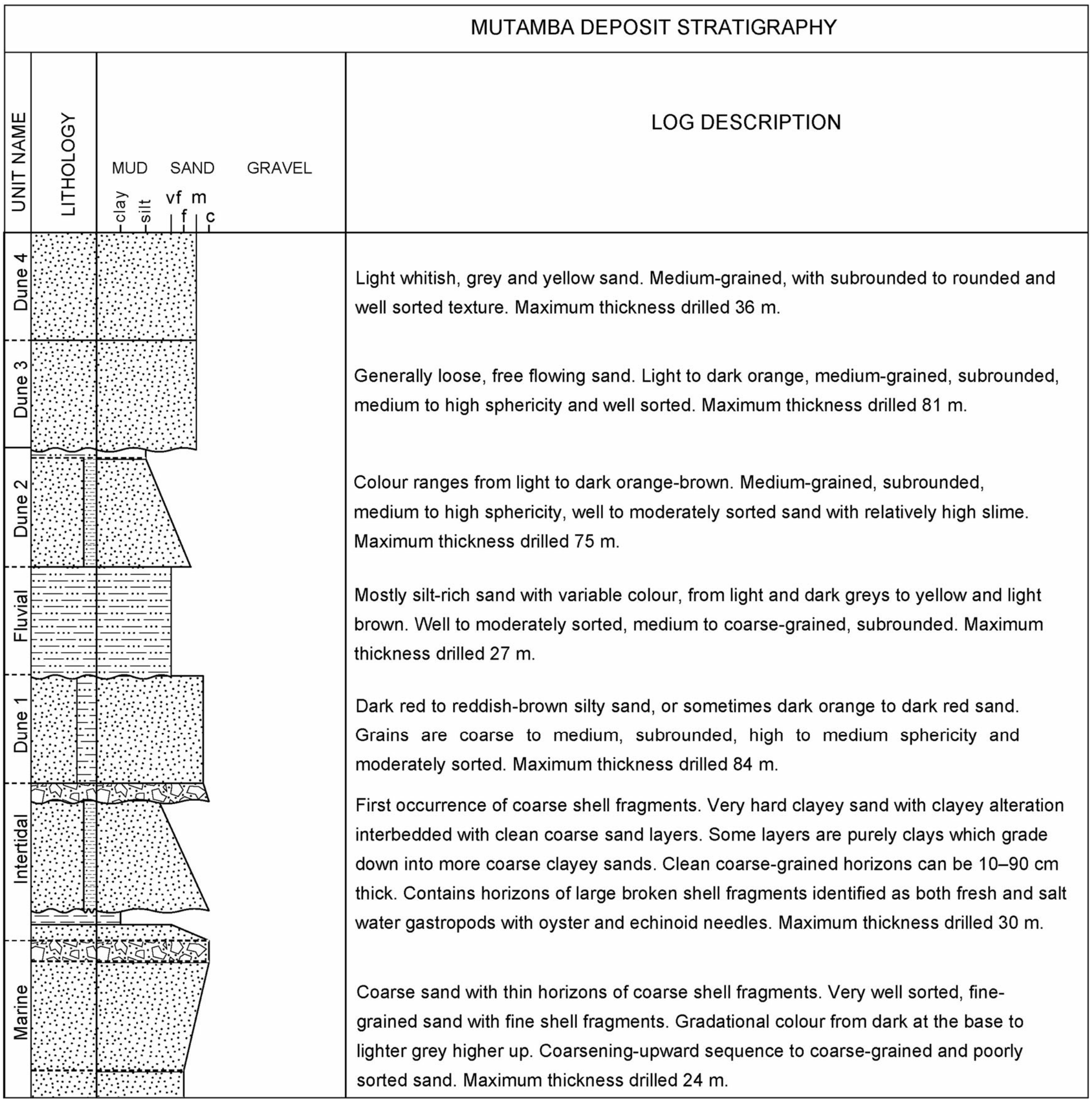


Figure 3.1: Stratigraphic column after Dumouchel, et al (2016)

4 EXPLORATION ACTIVITIES

The regional geology of the Inhambane project was reviewed and targets identified by a combination of:

- understanding the spatial extent of mineralised units and potential base of mineralisation (Mining-atlas.com, 2017); and
- the resultant preparation of a 3D model in ArcGis (Stockwell, 2013) that comprises topography and basement layers and from which drill depths can be interpreted at a designated surface grid pattern.

Drill sites were initially located at a 1 km by 1 km grid over 4658L and drill depths interpreted from surface to a sloping basement (with corners at heights indicated on Figure 4.1). Drilling was then pared back to those surface areas higher than 31 m Above Sea Level (ASL). Regionally, mineralised dune sequences appear to commence from 20 m ASL. This reduces the area of interest on 4658L and the quantity of drill holes required to test it, whilst ensuring dune and fluvial units are tested and a minimum potential ore thickness of 20 metres is maintained (note that references to 4658L are applicable to 10255C).

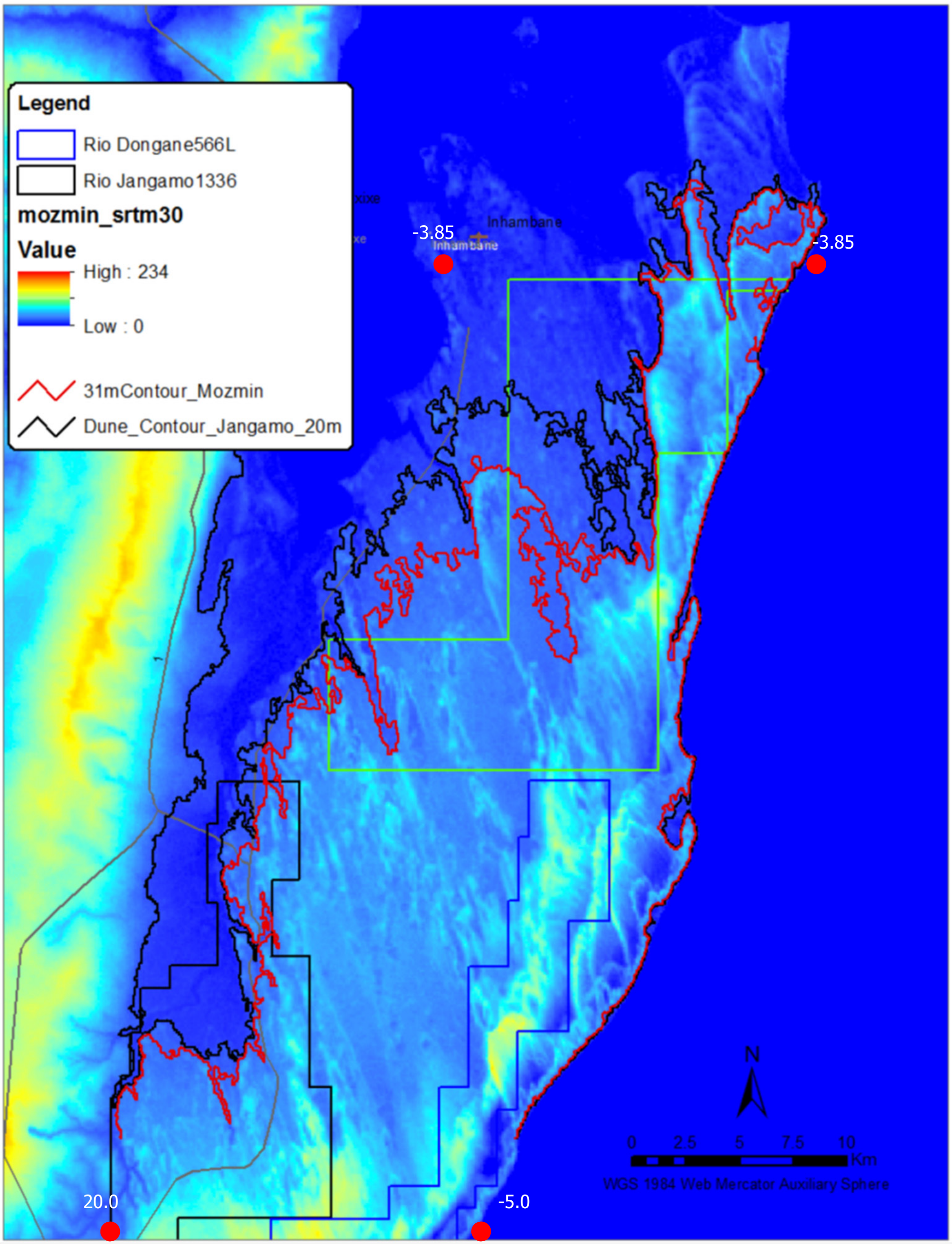


Figure 4.1: Location of 31 m contour of significance and the topographic highs

Further holes were removed as they were coincident with surface water or extraneous and of insufficient areal extent to deliver mineable volumes (Stockwell, 2013).

From there it was possible to identify target areas as those areas with the greatest thickness of sediment which will likely yield the greatest resource tonnage and hence those should be targeted preferentially. A target generation map (Figure 4.2) shows these areas from A through to F.

Drilling has already been carried out on Target A which has resulted in the delineation of an Inferred Mineral Resource.

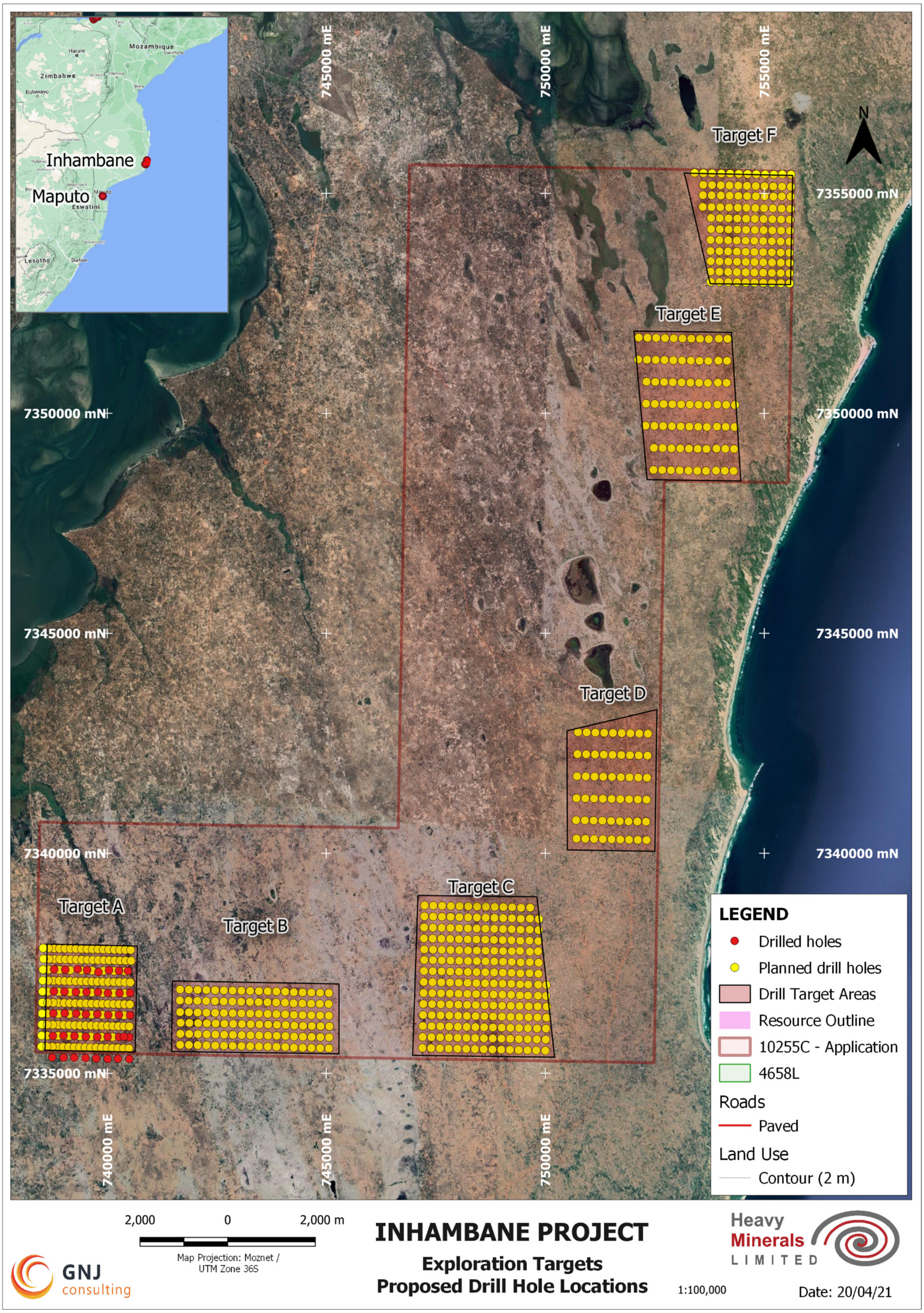


Figure 4.2: **Planned exploration drilling targets and proposed drill holes**

It was decided to commence drilling on Target A given the proximity to the easiest access to the tenement and the likelihood of a successful drilling program. It was decided that once positive HM indications were being returned from drilling to drill the target to a point where both the exploration team and the resource geologist were comfortable with the drill spacing and observed mineralisation to support an Inferred Mineral Resource estimate.

4.1 DRILLING

The drilling was conducted by contract drilling company Auga Terra, using a 510 RC 4WD truck mounted drill rig with an adjustable mast capable of holding a 3 m length drill rod. The drill rig had a support truck with an Atlas Copco Compressor.

The aircore drilling technique was used to drill the Inhambane project and all samples were drilled dry without water injection. Minimal water was encountered down hole and low SLIMES levels were encountered resulting in minimal losses from the cyclone and minimal chances of contamination. Aircore is considered a standard industry technique for evaluating HM mineralisation and is a form of reverse circulation drilling where the sample is collected at the drill bit face and returned inside the inner tube.

The rod diameter used was 76 mm (NQ) and the rods are 3 m long. All of the holes were drilled vertically using a visual alignment (not spirit level). This was considered adequate for the preliminary nature of the exploration drilling. Figure 4.3 below shows views of the drill rig, support truck and cyclone setup and typical drill bit used for mineral sands drilling.

Figure 4.3: Top: drill rig, support truck and cyclone set up on site. Bottom: trumpet style mineral sands air core bit

The majority of samples downhole were taken at 1.5 metre intervals (with the exception of the first 2 m which was sampled and stored separately for the purpose of quarantine processing). 2 m was selected as the 1st interval due to Australian Federal regulations requiring that the top 2 m be submitted for quarantine. Rather than submit 2×1.5 m sample intervals to cover the 2 m requirement it was decided to adjust the drilling length of the first interval. The small number of samples (approximately 40) and the depth of the holes meant that the impact of differing sample lengths on the resource estimation was considered to be negligible.

Target A was drilled on a 500 m x 250 m grid. A moderate degree of confidence in the geological models and grade continuity between drill holes has been established for Inhambane and forms part of the support for the Mineral Resource classification. The drill hole locations are presented in Figure 4.6.

4.2 DRILL HOLES AND COLLARS

Drill hole, collar and assay data was generated directly from the following sources:

- drill hole logging information was captured electronically into an MS Excel spreadsheet;
- collar location information was collected directly from handheld GPS and entered manually into an MS Excel spreadsheet;
- assay data was received from the nominated company laboratory (Diamantina) in the form of Excel spreadsheets which were then uploaded into an MS Access database for further validation and checking; and
- all data was compiled into an MS Access database for cross-referencing, checking out of range values and hole lengths and for the preparation of QA/QC queries.

A summary of the supplied drill hole data is presented in Table 4.1 below. A subsequent table of drilling results for tenement 10255C is presented in Table 4.2.

Table 4.1: Summary of drilling and assaying for the Inhambane project (4658L)

Deposit	Drilling Co.	Drill Series	Method	Date	Holes	Metres	Samples	Assays	Assayed
Inhambane	Agua Terra	IN	Air Core	2014	41	1783	1175	832	70.8%
Total					**41**	**1783**	**1175**	**832**	**70.8%**

Table 4.2: Summary of drilling and assaying for the Inhambane project (10255C)

Deposit	Drilling Co.	Drill Series	Method	Date	Holes	Metres	Samples	Assays	Assayed
Inhambane	Agua Terra	IN	Air Core	2014	33	1399.5	922	634	68.8%
Total					**33**	**1399.5**	**922**	**634**	**68.8%**

Drill hole information was then exported from the database into Datamine for the preparation of drill hole files. This necessitated a modification of header information prior to being imported into Datamine (which was undertaken using standard routines).

The collar locations were provided in UTM (Moznet / UTM zone 36S) and a rotation and translation was carried out to generate local X and Y co-ordinates. All interpretations, wireframing and modelling was undertaken in the local grid[2].

[2] The majority of resource estimators will preferentially operate using a local mine grid with drill lines oriented east-west to make all aspects of the resource estimation and validation considerably easier. It also allows for easier transfer of models into other packages without having to manage the specific rotation algorithms.

For the purpose of the geological interpretation and resource modelling a local grid was set up along the long axis of the deposit so that the majority of drill lines were east-west and model cells were aligned north-south along that long axis. This allows for a simplification of the geological interpretation and subsequent model preparation, interpolation and analysis.

4.3 SURVEY CONTROL

Drill hole collars were positioned using hand held GPS (a Garmin 62S) with RL's also supplied by hand held GPS or estimated from SRTM. Follow up DGPS RL's were collected by a professional surveying team. These were used in the final drill hole collar positions and to prepare the local topography.

As mentioned earlier for the purpose of the geological interpretation and modelling a local grid was set up along the long axis of the deposit so that the majority of drill lines were east-west and model cells were aligned north-south along that long axis. This allows for a simplification of the geological interpretation and subsequent model preparation, interpolation and analysis.

The UTM grid Zone is 36S and the projection is based on the Moznet spheroid.

The rotation and truncation of the grid is as follows:

- 1.2 degrees or a rotation from 1.2° east of north to north.
- 730,000 m subtracted from the easting coordinate and 7,320,000 m subtracted from the northing coordinate.

The local grid is shown in Figure 4.7 Inhambane with reference northing and eastings to correspond to local grid swath plots for assays and mineralogy.

4.4 SAMPLING: PROCEDURE AND LOGGING

Aircore drilling was used to obtain samples at 1.5 m intervals which generated about 8 kg of material that was split down to 1.5 - 2.5 kg using the cone splitter at the bottom of the sample cyclone. The cyclone used for sampling was a Metzke Fixed Cone Splitter with Transition (Figure 4.4).

Samples were subsequently split down to approximately 1 - 1.5 kg. The smaller split samples were labelled and bagged for export to the primary laboratory for processing. Any wet or damp samples were allowed to dry prior to the splitting stage. The sampling method and sample size dispatched for processing is considered appropriate and reliable based on accepted industry practices and experience. Blind field duplicates were taken from the opposite side of the cone splitter and then accordingly split down using the same approach as the regular sampling.

Initially the sample collection unit was assembled without the cyclone dump box section leading to sample hangup. This was identified very early in the drill program leading to the first 3 holes to be redrilled.

The comparison of visually estimated HM vs assayed HM showed that the correlation is quite skewed (Figures 4.5 and 4.6 - zoomed in around the origin). There is a tendency to understate the estimated HM compared with the assayed HM.

This is a bias that is preferable to overstating the estimated HM (especially if there is a field cut-off-grade to be used for the selection of samples for assaying). The downside to this is that if the field estimation is out of sync with the actual grades and there is a rigorously adhered to cut-off grade for sample selection, then some samples that may be grade bearing are not submitted for assay. This has been observed in a couple of locations where mineralised intervals have stopped due to sampling cessation, and a small number of examples where the end of hole finished in mineralisation.

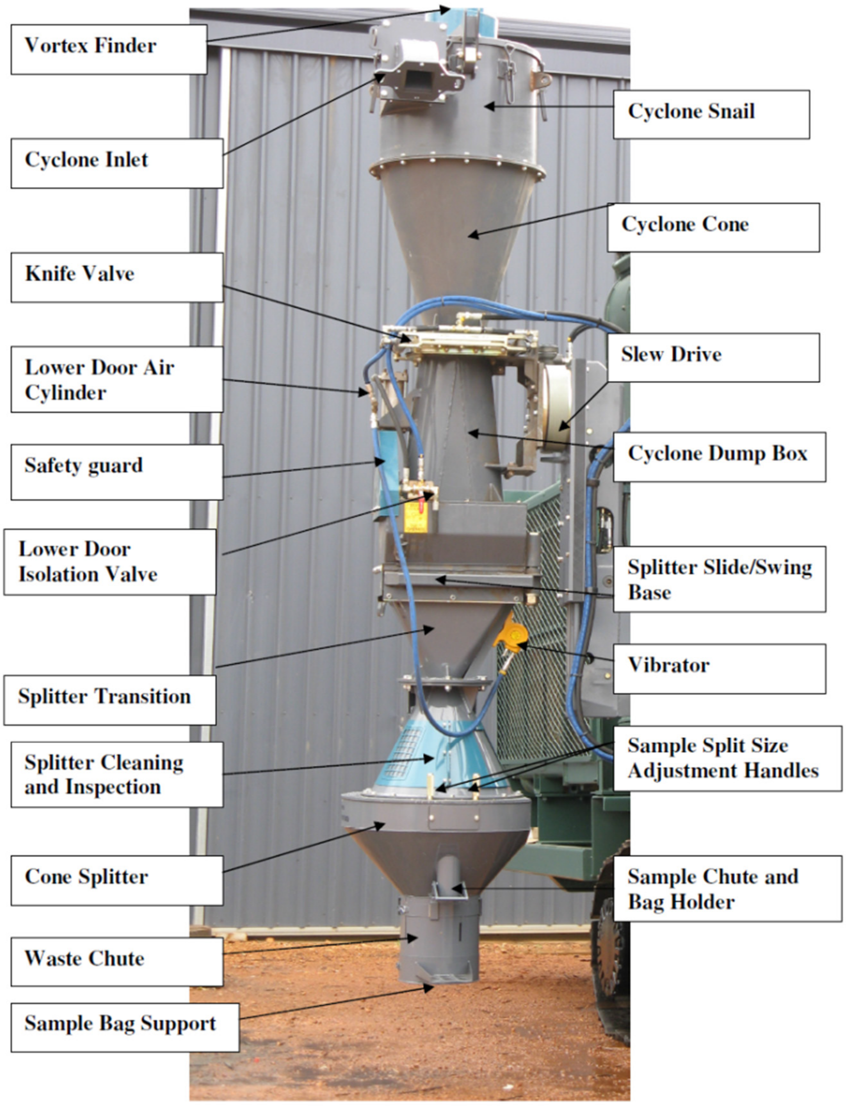


Figure 4.4: Metzke Fixed Cone Splitter and Cyclone

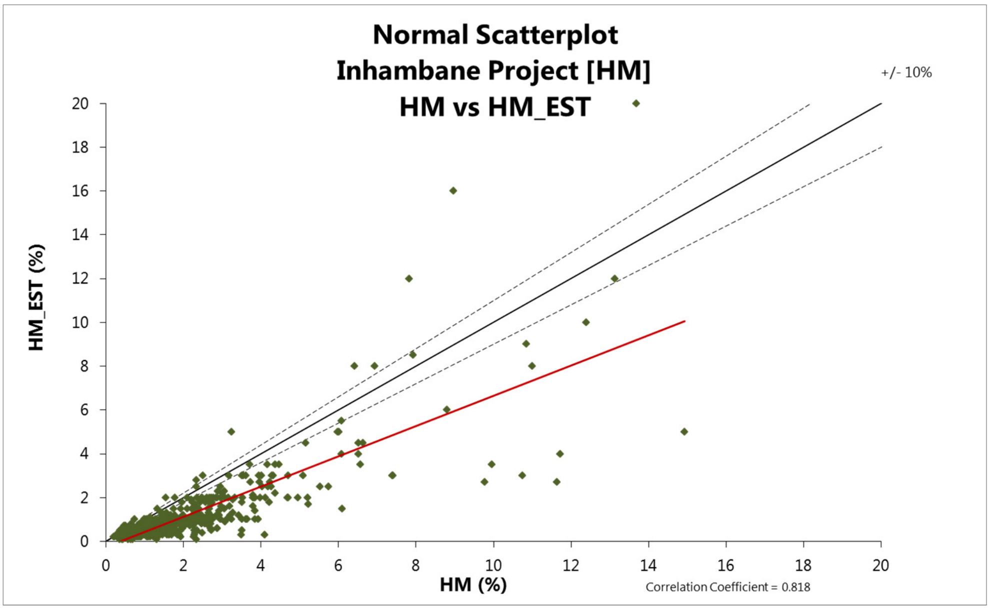


Figure 4.5: Comparison of visual HM estimates versus assayed HM

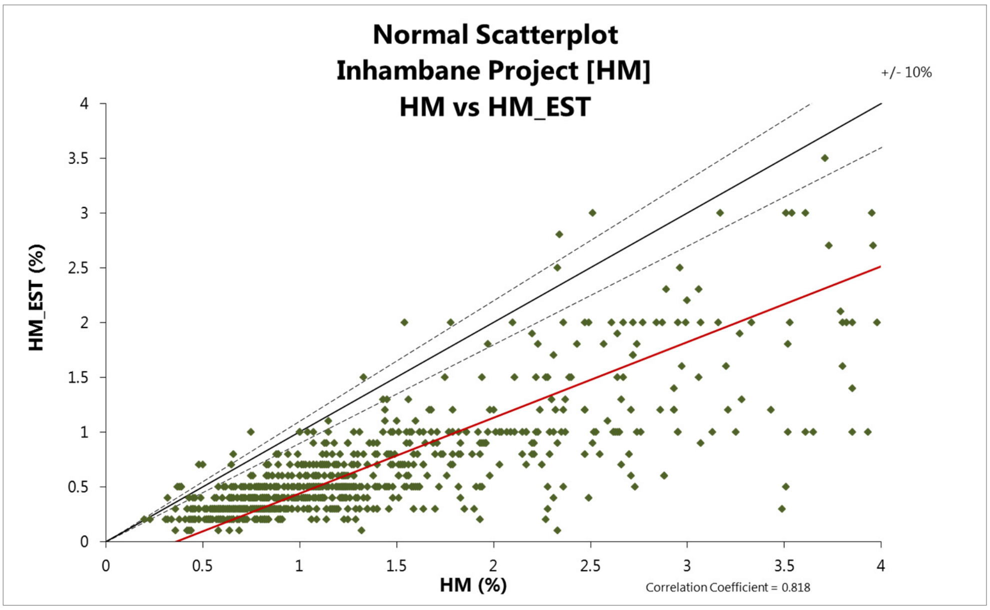


Figure 4.6: Close up of lower grades for visual HM estimates versus assayed HM

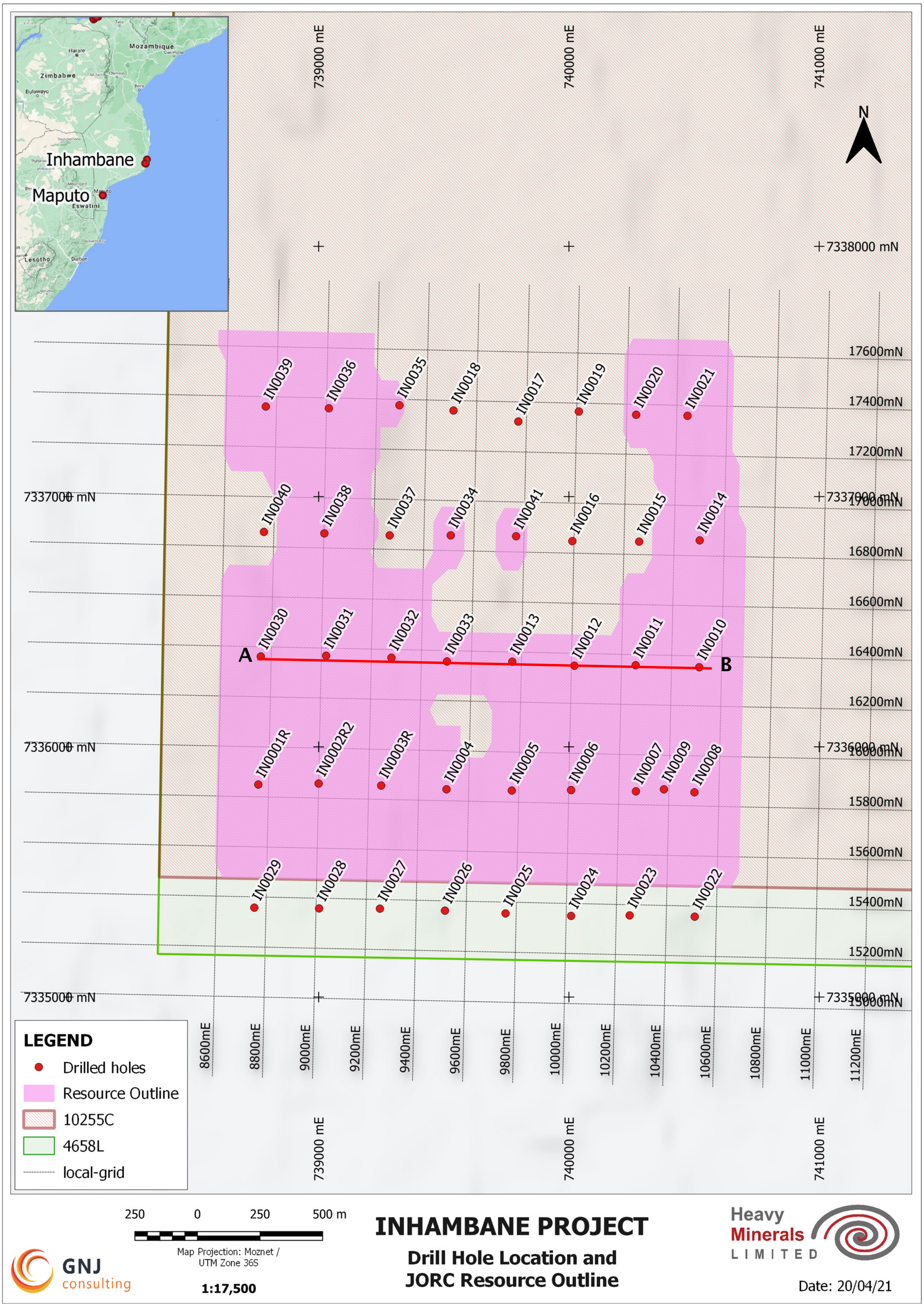


Figure 4.7: Location of drill holes within the Inhambane deposit (showing the type section A-B for Figures 6.1) and the local grid vs UTM

4.5 ASSAYING

Assaying for the Inhambane Project drilling was carried out by Diamantina in Perth. Not all samples were selected for assaying (approximately 71% of collected samples were submitted for assay - refer Table 4.1). The criteria used to select samples for assay was defined by visual estimates of HM greater than 0.2%. If samples were at 0.2% or below and appeared within an interval of grades above that cut-off then those low grade samples were also selected for assay. Further discussion on the handling of assay grades in the block modelling is covered in section 5.1.

Sample processing is described below:

- Diamantina performed initial analysis of sizing, slimes (clay), oversize and HM content. Sizing bins were defined based on industry standards. The -2 mm heavy mineral fraction of samples were subjected to heavy liquid separation ('HLS') by tetra-bromo-methane ('TBE') and then composited for QEMSCAN analysis by ALS Perth.
- Refer to Figure 4.8 for a description of the Diamantina assay flowsheet.
- A total of 3 composites were created from HM sinks collected from the Inhambane exploration drilling. This is considered to be appropriate for the preliminary exploration stage.
- To ensure that the composites were representative of each of the mineralised zones, each composite was made up of samples taken along and across strike within each identified strandline based on preliminary inspection and logging of HM sinks (sachet logging). All attempts were made to combine material from domains of similar HM grade and mineralogy.

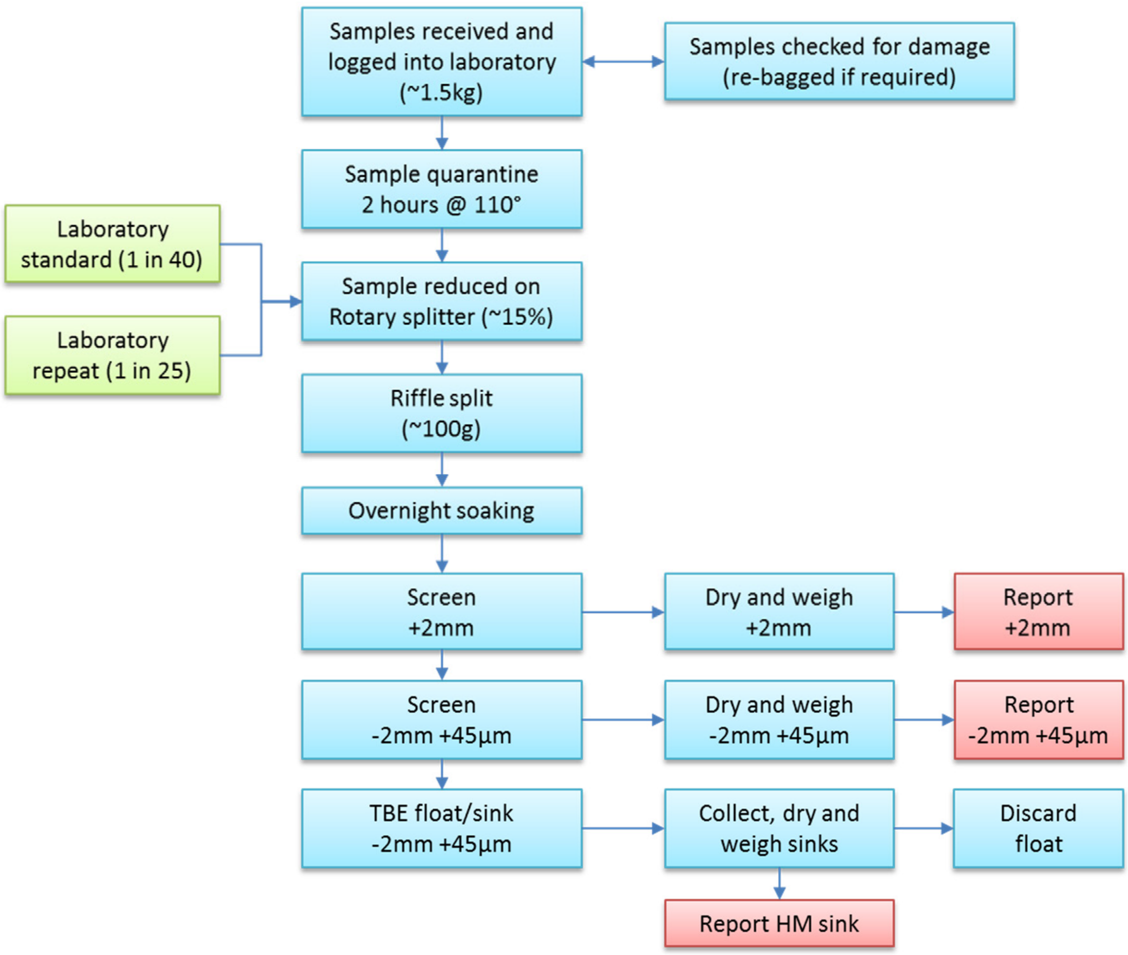


Figure 4.8: Diamantina flowsheet for HM, SLIMES and OS analysis for Inhambane Project

4.6 MINERAL ASSEMBLAGE COMPOSITES

Mineral assemblage composites are designed to test the mineralogical and chemical characteristics of the heavy mineral suite to enable meaningful economic evaluation to be undertaken for any given heavy mineral sand deposit. There are a wide range of techniques available ranging from grain point counting to QEMSCAN analysis and through to complex gravity, magnetic and electrostatic separation methods in order to mimic wet and dry separation plant performance.

Bulk sample composites were prepared by HML with guidance from GNJ Consulting in order to create a preliminary mineralogical break down of the Inhambane deposit. These composites are generated by completing a geological and stratigraphic interpretation of the primary drill holes, down hole logging and assaying. Samples from domains with similar geological characteristics have been grouped together.

A total of 3 composite samples were created from HM sinks collected from the Inhambane project (Figure 4.9). To ensure that the composites were representative of each of the mineralised zones, each composite was made up of HM concentrates (sinks) weighted on the contributing HM grades, taken along and across strike within the deposit based on preliminary inspection and logging of HM sinks (sachet logging). The location of the composite samples is shown in Figure 4.10.

The composited samples were submitted to ALS Metallurgy (Perth) for QEMSCAN analysis. This procedure is discussed in the next section.

4.6.1 DESCRIPTION OF QUANTITATIVE MINERALOGICAL ANALYSIS (QEMSCAN)

QEMSCAN is the name for an integrated automated mineralogy and petrography solution providing quantitative analysis of minerals, rocks and man-made materials. QEMSCAN is an abbreviation standing for Quantitative Evaluation of Minerals by SCANning electron microscopy, and a registered trademark owned by FEI Company since 2009.

The samples that were submitted to ALS were riffle split to produce sub-samples of suitable size for making QEMSCAN polished sections. Each sub-sample was mixed with size-graded, high purity graphite to ensure particle separation and discourage density segregation. The sample-graphite mixtures were then set into moulds using a two-part epoxy resin, producing a representative sub-sample of randomly orientated particles. After curing, the resin blocks were cut back to expose a fresh surface and progressively ground and fine-polished. Passing QA/QC checks, the sections were carbon coated for electron beam conductivity and presented to the QEMSCAN for analysis.

The samples were analysed using QEMSCAN technology in PMA (Particle Mineral Analysis) mode. The scan was performed with a pixel spacing set at 5 µm. A random selection of particles for each sample was analysed.

A wide range of mineral characteristics are reported from the QEMSCAN analysis including mineral abundance on both a pixel and particle assignment, particle images, elemental deportment (on both a pixel and particle assignment) and calculated average grain and particle sizes.

It should be noted that QEMSCAN is only a preliminary mineralogical assessment technique and one of its limitations is an inability to predict final product characterisation and performance of wet and dry mineral separation performance. Therefore it should be used in conjunction with other physical separation techniques in order to provide more valuable characterisation information.

4.6.2 SUMMARY OF MINERALOGY

The detailed mineral analysis by QEMSCAN analysis allows for important valuable heavy minerals such as ilmenite, zircon and rutile to be estimated as stand-alone mineral groups and also allows for a detailed breakdown of trash minerals which can be grouped into larger 'buckets' such as magnetic and non-magnetic other. Critical trash minerals can be identified such as chrome, monazite, kyanite and sillimanite and garnet as these can have particularly important impacts on the recovery of valuable heavy mineral species.

From the detailed QEMSCAN analysis we have created a summary mineral breakdown (Table 4.3) and used this to apply to the defined mineral composites that will be interpolated into the block model.

Table 4.3: Inhambane mineralogy summarised from the ALS QEMSCAN analysis

MACNUM	ILMA	ILM	RUTI	ZIRC	LEUC	KYASIL	CHRM	MONA	STAU	GARN	NMOTH[1]	MOTH[2]
IN-Z3-001	22.6	33.1	1.3	3.9	3.1	4.8	5.1	0.2	0.8	0.0	14.9	10.2
IN-Z5-001	34.3	31.7	1.8	5.3	3.9	2.8	5.3	0.4	0.6	0.0	8.7	5.2
IN-Z5-002	31.7	28.7	1.8	4.4	3.9	3.9	4.6	0.3	1.1	0.0	14.1	5.6

Notes:

1 refer to Table 4.3 for the definition of minerals included in non-magnetic others

2 refer to Table 4.3 for the definition of minerals included in magnetic others

The bulk samples are referred to as MACNUM (mineral assemblage composite number) in the resource model and associated files. The MACNUM field values are referenced by a prefix IN (for Inhambane) and are numbered based on domain (Z3 and Z5) and then sequentially.

All fields were checked for out of range values and a check of the sum of the assemblage to 100 per cent was also conducted.

The following abbreviations (Table 4.4) have been used for each of the mineral species. The definition of VHM (often used by the mineral sands sector to differentiate deposits and their comparative values) here is the sum of rutile, ilmenite and altered ilmenite, leucoxene and zircon.

Table 4.4: Mineralogical abbreviations and their definitions (aligned by colour)

Mineral Grouping from ALS QEMSCAN analysis	IN-Z3-001	IN-Z5-001	IN-Z5-002	Mineral Group	MACNUM for block model IN-Z3-001	IN-Z5-001	IN-Z5-002
	Mass%						
Rutile	1.1	1.5	1.3	RUTI	1.3	1.8	1.8
HG leucoxene	0.4	0.6	1.1				
LG leucoxene	2.9	3.6	3.4	LEUC	3.1	3.9	3.9
Altered ilmenite	22.6	34.3	31.7	ILMA	22.6	34.3	31.7
Ilmenite	33.1	31.7	28.7	ILM	33.1	31.7	28.7
Ulvospinel	10.2	5.2	5.6				
Ti-hematite							
Other Ti minerals and intergrowths							
Goethite/limonite							
Chromite	5.1	5.3	4.6	CHRM	5.1	5.3	4.6
Corundum				NMOTH	14.9	8.7	14.1
Monazite	0.2	0.4	0.3	MONA	0.2	0.4	0.3
Zircon	3.9	5.3	4.4	ZIRC	3.9	5.3	4.4
Quartz							
Andalusite/kyanite/sillimanite	4.8	2.8	3.9	KYASIL	4.8	2.8	3.9
Staurolite	0.8	0.6	1.1	STAU	0.8	0.6	1.1
Garnet				GARN	0.0	0.0	0.0
Epidote				MOTH	10.2	5.2	5.6
Amphibole							
Tourmaline/kaolinite							
Olivines/pyroxenes							
Silicates	6.1	8.3	13.7				
Other minerals	8.8	0.4	0.3				
TOTAL	100	100	100		100	100	100

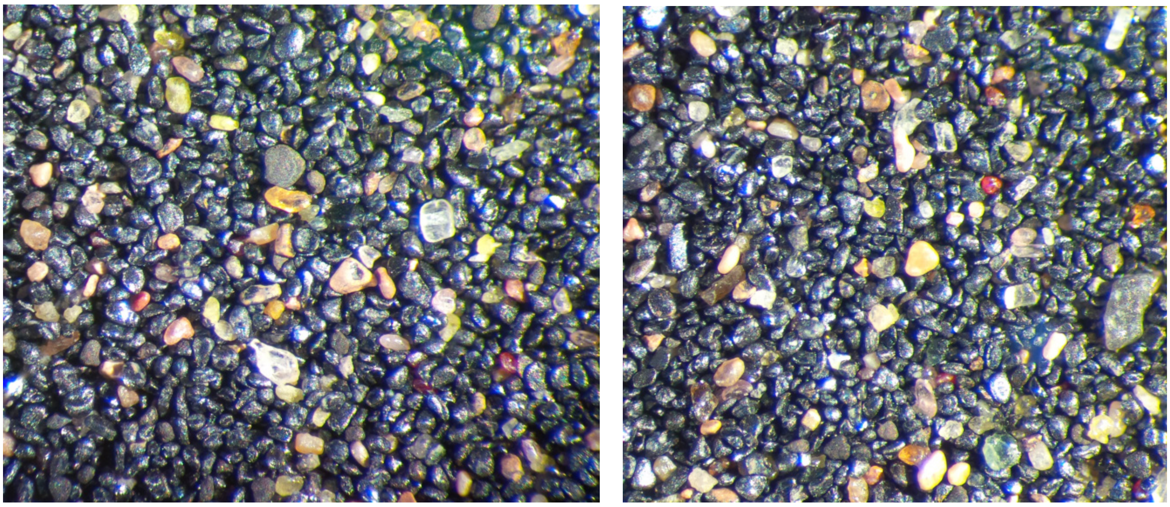


Figure 4.9: Photo-micrographs of IN-Z3-001 (left) and IN-Z5-001 (right) - approximately 2.5 - 3.0 cm field of view

Figure 4.9 shows composite samples under reflected light. The grains are well rounded and well sorted, indicative of a mature winnowing environment. Some ilmenite exhibits mild oxidation and the levels of trash mineral commensurate with the analysis from the QEMSCAN.

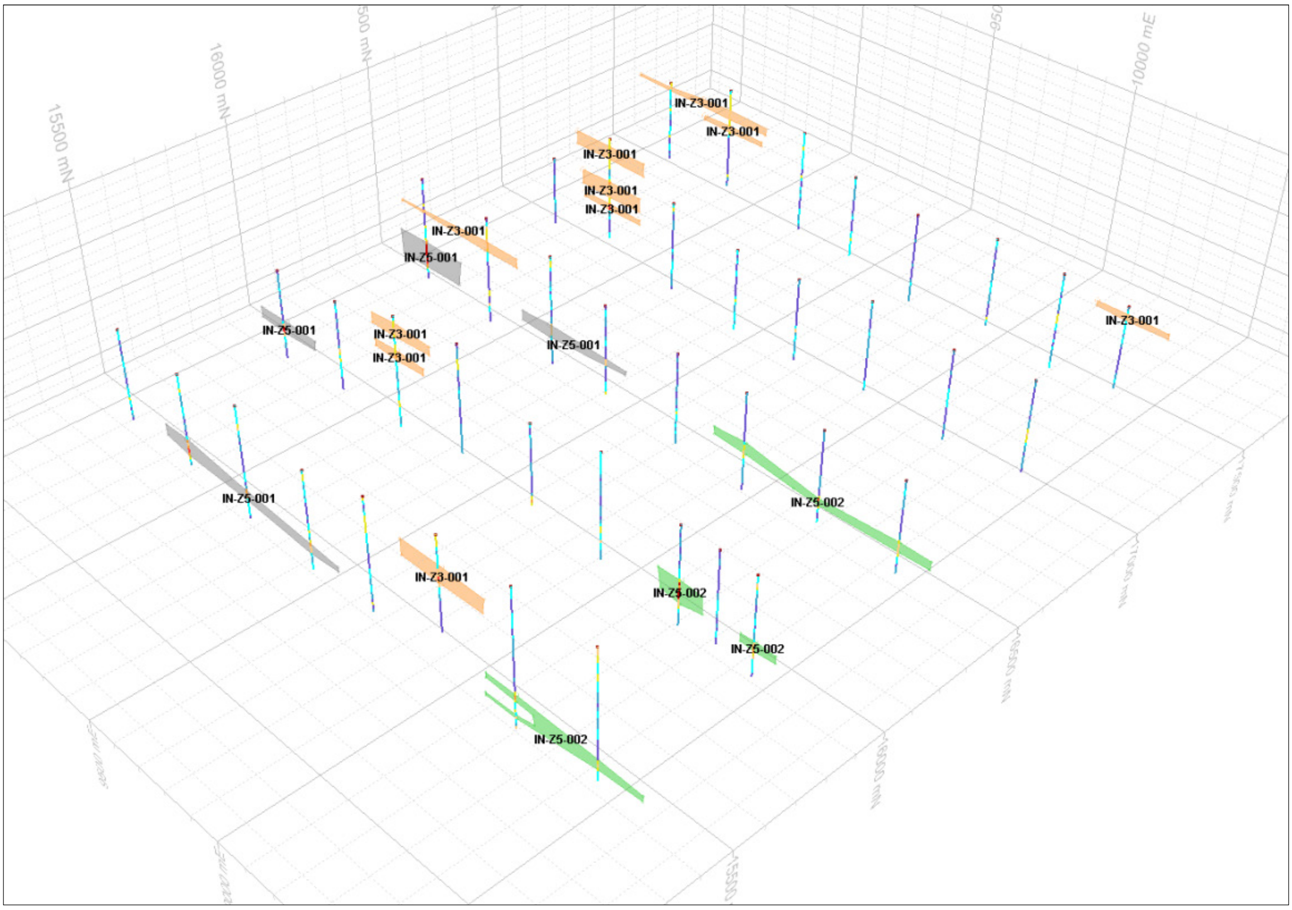


Figure 4.10: Composite sample locations (oblique view looking north-west)

5 DATA ANALYSIS

This section covers the review of supplied / collected data and any remedial work that was undertaken to correct and modify that data.

5.1 DRILLING AND ASSAYING

All collar, logging, geology and sampling information was supplied as MS Excel spreadsheets. Assay information was supplied from Diamantina Laboratories ('Diamantina') also in the form of MS Excel spreadsheets.

From all of the supplied data an MS Access database was created to store all information in a relational database. This included the development of duplicate and standard sample queries. A number of minor issues were observed and corrected and these were traced back to some of the original logging capture process (and subsequently corrected).

Following database compilation, key tables were exported to CSV files which were then imported to Datamine. Standard drill hole de surveying was carried out in Datamine to produce a single precision drill hole file.

Once the drill hole file was created in Datamine it was loaded into the Design window and reviewed. Out of range collar locations were reviewed as well as checks and balances for key field and data ranges.

The following steps were undertaken to correct for out of range or missing values in the drill hole file:

- checking for missing intervals;
- for intervals that were not assayed, the HM was set to the estimated HM and SLIMES, SAND and OS were left blank; and
- setting below detection values to an appropriate value (typical industry practice has this at half the detection limit, so for HM this was 0.05. SLIMES, SAND and OS absent values were left as absent).

Drill hole RL's were assumed as correct based on the DGPS survey pickup. Checking against topography was not considered given that the original topography was based on SRTM data.

The representivity of samples was checked by comparing the split weights of samples at the beginning and ending of each drill rod (effectively the 1st half versus the 2nd half of the rod). The original sample weights were not recorded, however cone and quartering was carried out on samples recovered from the cyclone, which were then weighed. The split samples therefore are representative of the original sample (considering the final split as an equal subset ratio of the original sample).

The sample weights were analysed for each of the positions within the drill rod and those results are presented in Figure 5.1. The 1st position is identified by label 1 and the 2nd position identified by label 2.

There is a minor amount of bias between sample position 1 and sample position 2 however it does tend to switch backwards and forwards and the overall weight differential between the 2 sample positions is considered not significant enough to impact on sample representivity.

The final drill hole and sample file created in Datamine for the geological / mineralisation interpretation and grade interpolation was called dholes4.dm.

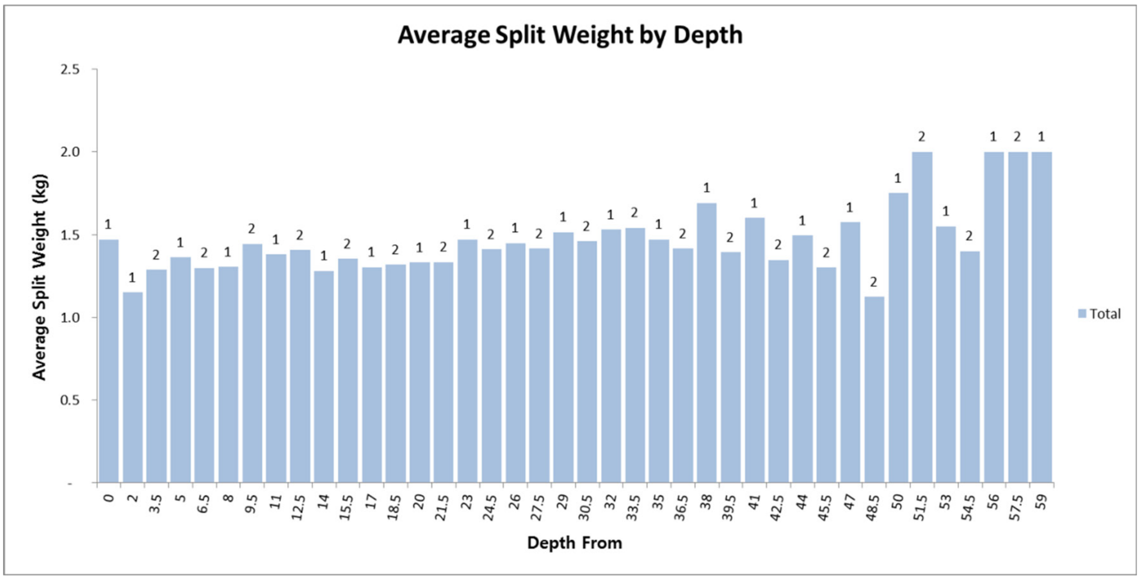


Figure 5.1: Average split weight by depth (indicated by sample position either 1 or 2)

5.2 ASSAY QA/QC

This section covers assay QA/QC for the Inhambane deposit. It includes a discussion on duplicate assaying, a qualitative duplicate precision analysis and scatterplot analysis for both laboratory repeats and rig duplicates. The HM and SLIMES assay fields are analysed using precision plots along with the scatterplot analysis for normal distributions. The OS field was an overall minor constituent analysis and was not considered to be significantly important in the QA/QC analysis.

5.2.1 DUPLICATE ASSAY ANALYSIS

Out of a total of 1175 samples included as part of the data set, a total of 832 samples were assayed which represents a high sampling rate of 71 per cent.

The rate of submission of duplicate analysis for the Inhambane deposit was 1 in 40 for both laboratory and rig duplicates (Table 5.1) for a combined repeat ratio of 1 in 20. The laboratory was blind to the field duplicates and as part of their normal procedure, the laboratory duplicates were taken regardless of whether they fell on client samples or internal laboratory standards.

Table 5.1: Duplicate samples and rate of submission

Deposit	Samples	% by Type	Field Duplicates	Field Standards	Lab Duplicates	Lab Standards
Inhambane	832	100%	21	0	21	20
TOTAL	**832**	**100%**	**21**	**0**	**21**	**20**

Deposit	Samples	% by Type	Submission Rate (FD)	Submission Rate (FS)	Submission Rate (LD)	Submission Rate (LS)
Inhambane	832	100%	1 in 40	0	1 in 40	1 in 42
TOTAL	**832**	**100%**	**1 in 40**	**0**	**1 in 40**	**1 in 42**

5.2.2 DUPLICATE SCATTERPLOT AND CP PLOT ANALYSIS

The normal scatterplot simply shows the distribution of paired repeat sample points for each of HM and SLIMES. A trendline has been overlain on each of the plots and can indicate a potential bias in the sampling populations.

5.2.3 FIELD DUPLICATES: HM

The field duplicates for HM have performed quite well with only one significant outlier above the cut-off-grade of 2 per cent HM (Figure 5.2 and 5.3). The Spearman correlation coefficient indicates a high degree of correlation between the two data sets. There is a small amount of deviation in the higher grade ranges as demonstrated by the cumulative probability plot.

	HM	HM Duplicate	% Diff
Total Number of Pairs	21	21	
minimum	0.52	0.55	5.8
lower quartile	0.86	0.84	(2.3)
median	1.23	1.09	(11.4)
average or mean	1.48	1.51	2.2
geometric mean	1.27	1.28	0.9
Log estimate mean	1.48	1.51	1.8
upper quartile	1.79	1.76	(1.7)
maximum	3.52	3.87	9.9
coefficient of variation	0.6041	0.6435	6.5
standard deviation	0.89	0.97	8.9
variance	0.80	0.94	18.6
log variance	0.3110	0.3282	18.6
correlation coefficient	0.9837		
log correlation coefficient	0.9887		
rank (spearman) correlation	0.9831		
pair wise rel std dev	0.0613		
residual std dev	0.2		

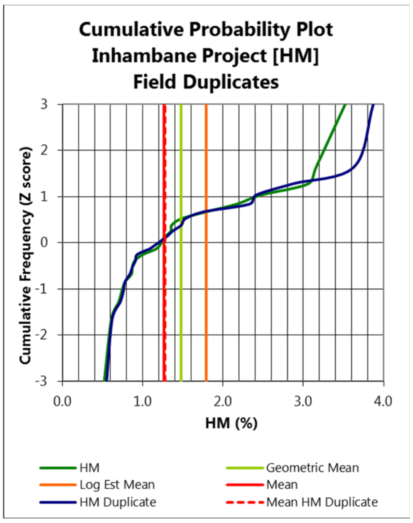


Figure 5.2: Summary statistics and CPP for field duplicates: HM

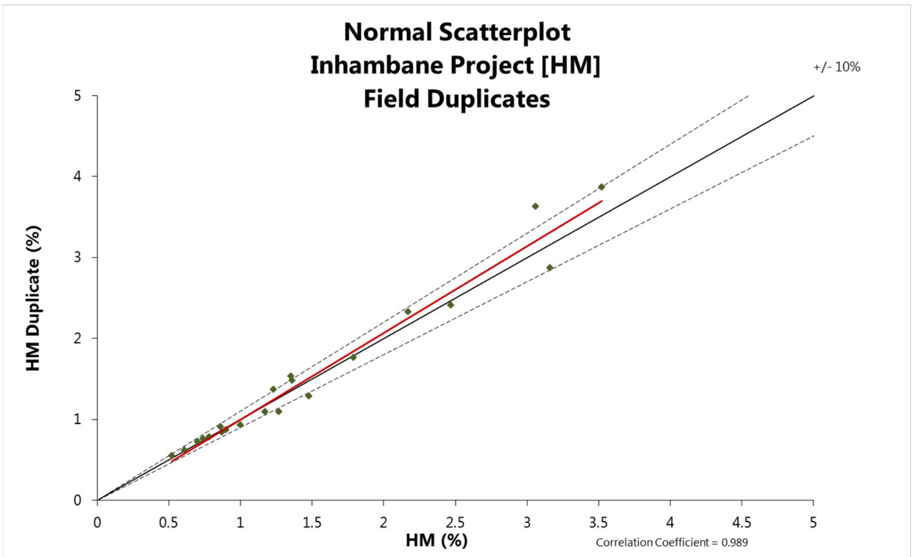


Figure 5.3: Normal scatterplot of field duplicate samples for HM

5.2.4 FIELD DUPLICATES: SLIMES

The field duplicate performance for SLIMES has been generally acceptable with a modest Spearman correlation coefficient (Figure 5.4). There are a couple of outliers at the lower end of the grade range

(Figure 5.5). The cumulative probability plot shows the differences between the two populations which is also demonstrated by the percentage differences in key distribution metrics. Overall results are reproducible and because the values are low it is possible see a greater percentage difference.

	SLIMES	SLIMES Duplicate	% Diff
Total Number of Pairs	21	21	
minimum	2.16	1.80	(16.7)
lower quartile	3.26	2.99	(8.3)
median	4.53	4.34	(4.2)
average or mean	4.57	4.50	(1.6)
geometric mean	4.26	4.10	(3.7)
Log estimate mean	4.58	4.54	(0.8)
upper quartile	5.43	5.88	8.3
maximum	10.42	9.46	(9.2)
coefficient of variation	0.4084	0.4313	5.6
standard deviation	1.87	1.94	4.0
variance	3.49	3.77	8.1
log variance	0.1431	0.2028	8.1
correlation coefficient	0.9512		
log correlation coefficient	0.9384		
rank (spearman) correlation	0.9416		
pair wise rel std dev	0.1167		
residual std dev	0.6		

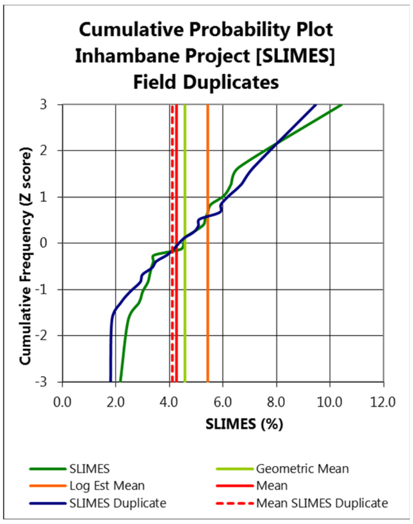


Figure 5.4: Summary statistics and CPP for field duplicates: SLIMES

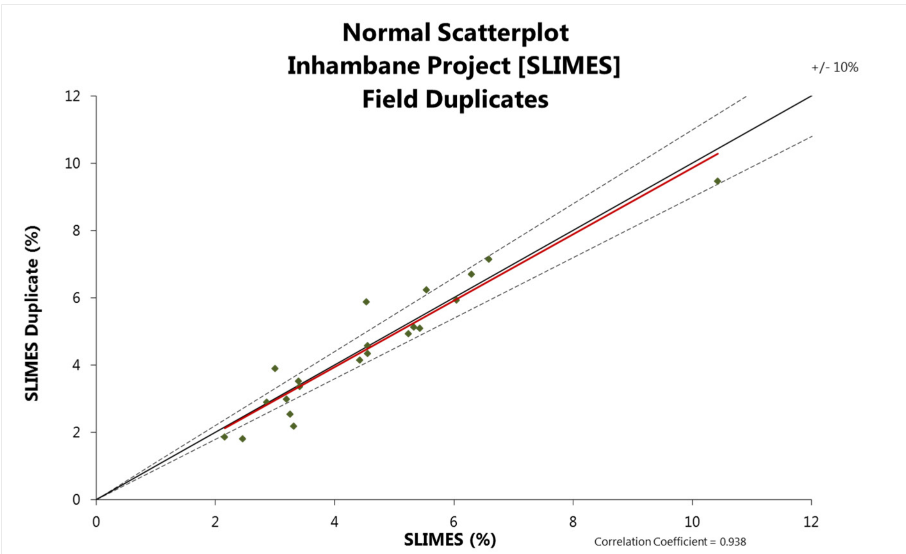


Figure 5.5: Normal scatterplot of field duplicate samples for SLIMES

5.2.5 LABORATORY DUPLICATES: HM

The laboratory duplicates show an extremely high degree of reproducibility with a Spearman correlation coefficient of 0.9948 and this coupled with the cumulative probability plot shows that there is a high degree of similarity between the two populations (therefore suggesting that the laboratory splitting and analysis procedure is highly repeatable) - Figure 5.6. Any assay failures by the laboratory are communicated to the client and repeat of the sample batch is undertaken. No assay failures were identified by the laboratory during the course of assaying for HML.

	HM	HM Duplicate	% Diff
Total Number of Pairs	21	21	
minimum	0.46	0.47	2.2
lower quartile	0.73	0.72	(1.4)
median	1.26	1.27	0.8
average or mean	1.75	1.76	0.5
geometric mean	1.30	1.31	0.5
Log estimate mean	1.68	1.70	0.6
upper quartile	1.76	1.79	1.7
maximum	8.96	8.91	(0.6)
coefficient of variation	1.0578	1.0505	(0.7)
standard deviation	1.85	1.85	(0.2)
variance	3.43	3.42	(0.4)
log variance	0.5184	0.5210	(0.4)
correlation coefficient	0.9996		
log correlation coefficient	0.9990		
rank (spearman) correlation	0.9948		
pair wise rel std dev	0.0231		
residual std dev	0.1		

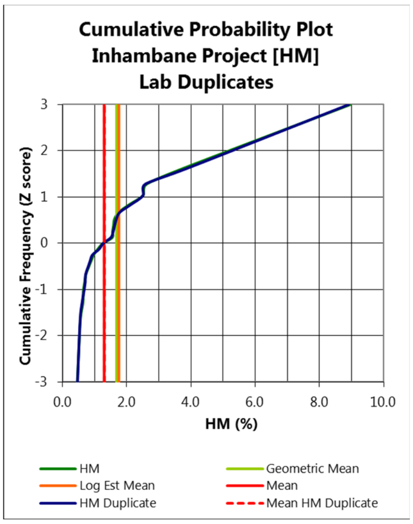


Figure 5.6: Summary statistics and CPP for laboratory duplicates: HM

The normal scatterplot (Figure 5.7) backs up the similarity between the two population sets.

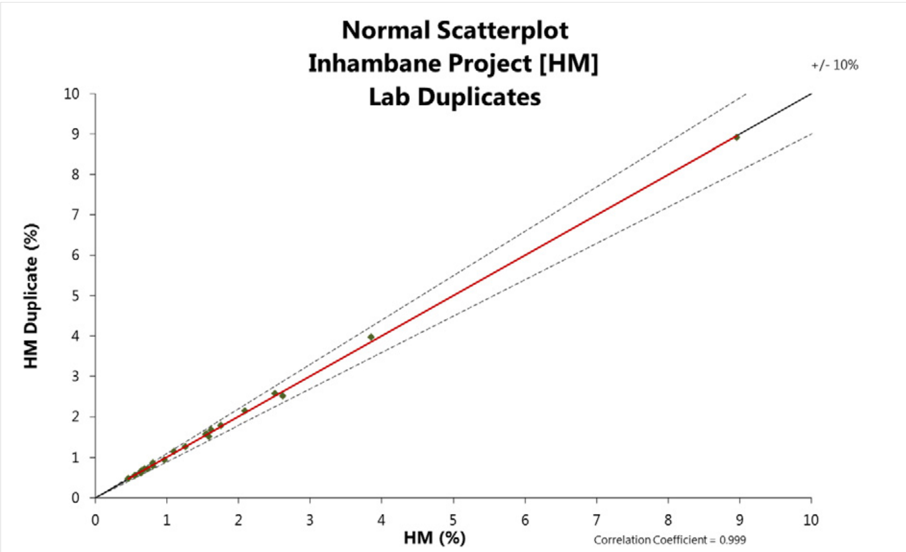


Figure 5.7: Normal scatterplot of laboratory duplicate samples for HM

5.2.6 LABORATORY DUPLICATES: SLIMES

The laboratory duplicates for SLIMES show a high degree of reproducibility with a Spearman correlation coefficient of 0.9766 and this coupled with the cumulative probability plot shows that there is a reasonable degree of similarity between the two populations (therefore suggesting that the laboratory splitting and analysis procedure is repeatable for SLIMES) - Figure 5.8.

	SLIMES	SLIMES Duplicate	% Diff
Total Number of Pairs	21	21	
minimum	1.23	1.18	(4.1)
lower quartile	3.49	3.63	4.0
median	4.57	4.41	(3.5)
average or mean	4.61	4.52	(2.0)
geometric mean	4.28	4.21	(1.7)
Log estimate mean	4.68	4.59	(1.9)
upper quartile	5.11	5.06	(1.0)
maximum	8.43	7.99	(5.2)
coefficient of variation	0.3667	0.3522	(3.9)
standard deviation	1.69	1.59	(5.9)
variance	2.86	2.53	(11.4)
log variance	0.1750	0.1698	(11.4)
correlation coefficient	0.9870		
log correlation coefficient	0.9868		
rank (spearman) correlation	0.9766		
pair wise rel std dev	0.0493		
residual std dev	0.3		

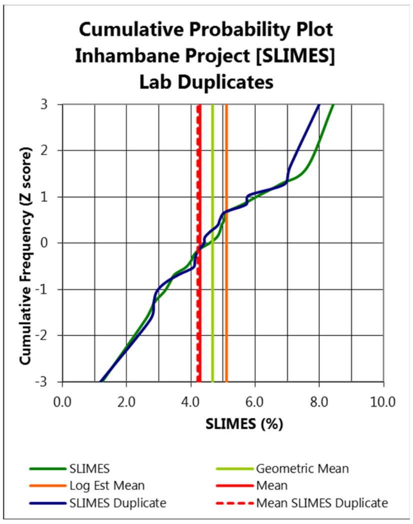


Figure 5.8: Summary statistics and CPP for laboratory duplicates: SLIMES

Figure 5.9 indicates two sample datasets that are highly correlated although it is possible to say that there may be a slight hint of bias toward the original SLIMES values versus the duplicate SLIMES values. It is not likely that this bias is of significant concern and on a small data population for duplicate comparison (21 samples) it is possible to produce false positives/false bias. Only one outlier (outside the +/- 10% lines of significance) has been recorded.

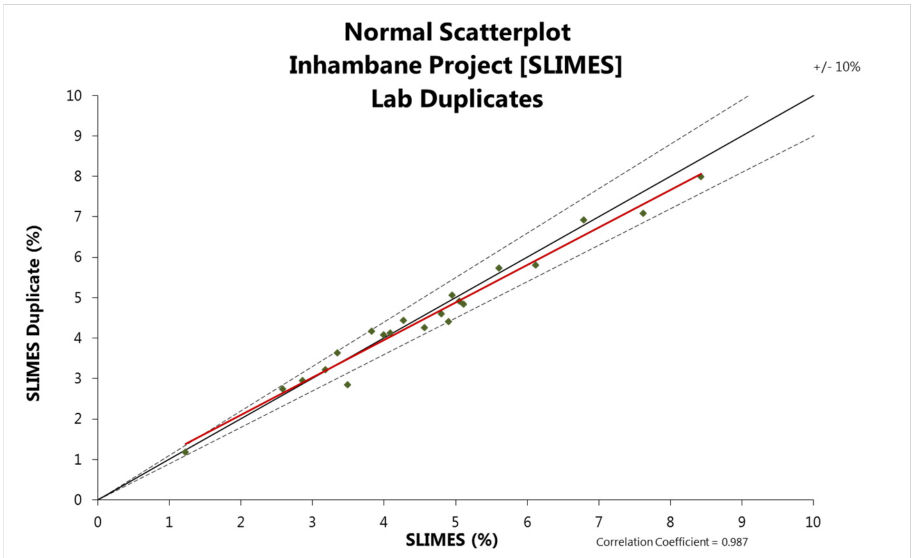


Figure 5.9: Normal scatterplot of laboratory duplicate samples for SLIMES

5.3 STANDARD CONTROL CHARTS

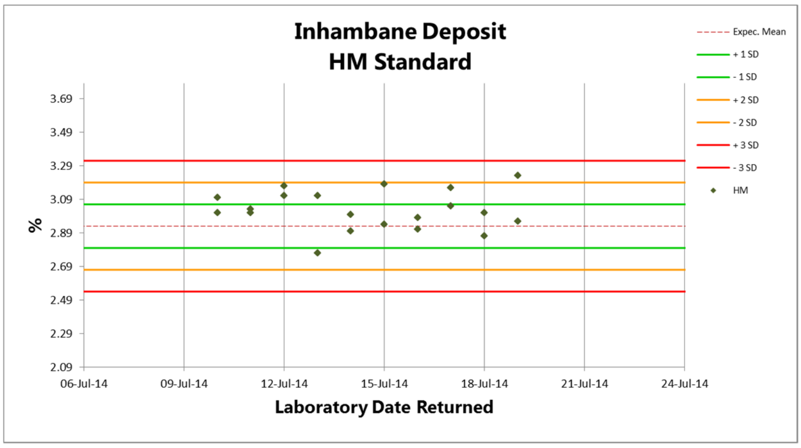
As part of the quality control of the assay process it is standard practice to insert samples with known controlled values with known tolerances or standard deviation. Commercially available standards are difficult to obtain and were not used for this particular drilling program. QA/QC was fulfilled by the use of duplicate field samples (split on the drill rig) and by laboratory duplicates and laboratory inserted standards.

The control charts for the laboratory standards show the key metrics for each chart (calculated mean and standard deviation performance against the expected mean and standard deviation). Also presented are the number of samples either below or above the expected mean which can be an indicator of bias.

It is important to be able to capture the date when standard samples were processed so that this can be correlated to potential lab issues. The dates presented in these control charts were captured from the date that the batch of assays was processed and loaded into Diamantina's database. This results in 'clumping' of the standard results and makes it difficult to determine whether any drift is present.

5.3.1 LABORATORY STANDARDS

This section discusses the performance of the laboratory standards.

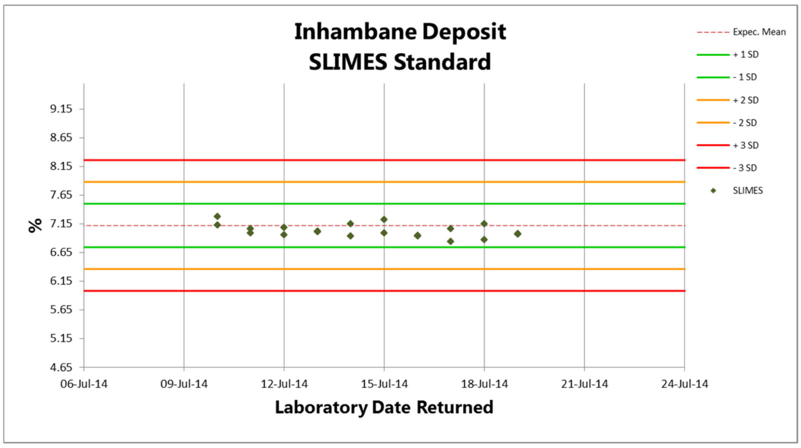


Category	Value	% Count
1 SD	12	60%
2 SD	7	35%
3 SD	1	5%
outside	-	0%
Expec. Mean	2.93	
Calc. Mean	3.03	
Above Expec. Mean	16	
Below Expec. Mean	4	
% perf vs Expec. Mean		3.2%
Expec. SD	0.130	
Calc. SD	0.117	

Figure 5.10: Control chart and key data points for Diamantina Standard: HM

Overall the performance for the laboratory inserted standards shows a close correlation to the expected results with the calculated standard deviation overall much tighter than that of the expected standard deviation.

The majority of results fall within two standard deviations. Figure 5.10 shows a positive bias between the expected mean vs the calculated mean. This is only of the order of 0.1 per cent HM however.



Category	Value	% Count
1 SD	20	100%
2 SD	-	0%
3 SD	-	0%
outside	-	0%
Expec. Mean	7.12	
Calc. Mean	7.03	
Above Expec. Mean	5	
Below Expec. Mean	15	
% perf vs Expec. Mean		-1.3%
Expec. SD	0.380	
Calc. SD	0.113	

Figure 5.11: Control chart and key data points for Diamantina Standard: SLIMES

All of the results for the SLIMES standard assays fall within 1 standard deviation of the expected mean which constitutes a very tight result. This does bring into question the original assaying to generate the Standard Reference Material results (was the original assaying relaxed to generate a larger standard deviation than what was really representative for the sample population).

Overall the expected mean and calculated mean are quite close and the performance of the standard indicates that assay procedure was well followed resulting in reproducible results (giving us a high level of confidence that the general assay population results are representative of what is in the ground).

6 INTERPRETATION AND WIREFRAMING

This section covers all of the geological interpretation, string digitising and subsequent wireframing undertaken for the preparation of the Inhambane final grade model and subsequent Mineral Resource estimation.

It was identified early on in the literature study and then confirmed during the drilling program that distinct lithological horizons could be identified in the project area. Dunal units dominate the bulk of the geology of the Inhambane area and are characterised by high elevation dunes and ferric oxide staining of the sand grains.

The dunal units are subdivided into three progressively younger and more mineralised units, two of which are marked distinct from the first, with higher SLIMES and generally as poorly mineralised. This unit overlies a hard clay dominated, intertidal unit and forms the shield onto which successive dunal units have been deposited. There also exist some fluvial deposited sand units forming distinct geographical outlines that mirror present-day drainage patterns.

6.1 TOPOGRAPHY

A topographic DTM was originally sourced from SRTM data however this was discarded for resource estimation block modelling on the basis that it formed a very poor correlation with the drill hole collars which were located with DGPS level of accuracy. Therefore the drill hole collars were used to create the topography DTM.

6.2 BASEMENT

The interpreted basement was identified as being elevated in SLIMES and predominantly very coarse to grit sized sand (albeit with some medium grained sand).

6.3 GEOLOGY ZONE 3

ZONE 3 ranges in thickness from 2 m to 41 m with an average thickness of 17 m. This ZONE is present across the entire deposit extent and is variable in thickness from east to west and north to south, being thicker in the western half of the project to the north and thickening to the east in the southern half the project.

It ranges in HM grade from 0.05 to 8.96 per cent and in SLIMES grade from 1.4 to 13.1 per cent.

ZONE 3 is characterised by an upper brown to orange brown sand with approximately 2 to 6 per cent clay on average. This brown to orange brown sand represents the youngest aeolian sequence in the project area. Towards the base of ZONE 3 the colour becomes light brown. The orange brown sequence is the main mineralised horizon within this geological unit. This domain is most likely Dune 2 or 3 of Dumouchel et al, 2016 - likely a combination of both.

6.4 GEOLOGY ZONE 5

ZONE 5 ranges in thickness from 2 m to 41 m with an average thickness of 24 m. This ZONE is present across the entire deposit extent and is more consistent in thickness throughout the project area being thicker on the eastern half of the deposit and thinning slightly to the west.

It ranges in HM grade from 0.05 to 14.9 per cent and in SLIMES grade from 1.2 to 14.8 per cent.

ZONE 5 is characterised at the upper contact with ZONE 3 by a transition into a light grey to light brown coloured sand unit. The SLIMES grades for this domain are also on average around 3 to 7 per cent. It is likely that this unit represents a fluvio-marine sequence with higher grade mineralisation present that is traceable across adjacent drill holes, and along strike. The colour variation for this unit varies from light grey through to grey and then dark grey, with interspersed yellows and browns near the basal contact.

Figure 6.1 shows the shows the interpreted outline of strand like mineralisation within ZONE 5. These outlines were not used to constrain grade interpolation but are presented for a diagrammatic representation of mineralisation within this domain.

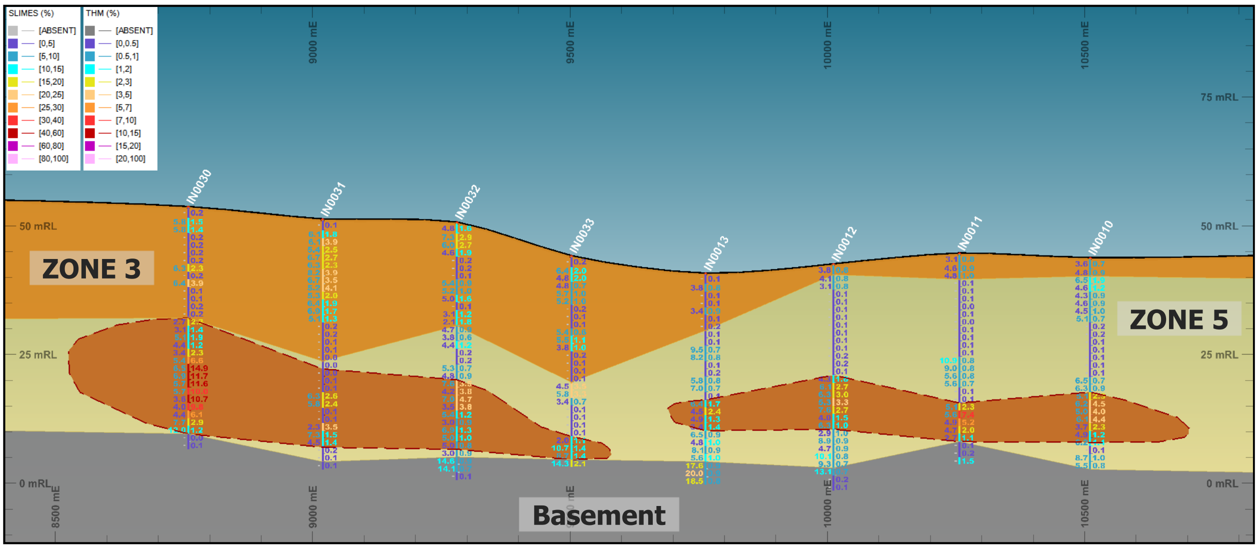


Figure 6.1: Section 16350 mN showing the interpretation of the contact between ZONE 3 and ZONE 5 and basement (10 x Z-axis)

6.5 GEOLOGY ZONE 6

This domain is characterised by a single drill intersection that is located on the eastern margin of the drilled area and located on the second southernmost line. This domain has been interpreted as being a washout of HM mineralisation that is located on each adjacent drill hole on the section line. The geology log for that particular hole describes a medium grained sand with a dominantly brown colour, whereas the holes either side are grey to dark grey and well mineralised.

Without the benefit of closely spaced drilling or some kind of intact core recovery drilling (sonic drilling or triple tube core) it is difficult to ascertain what the extent of any potential washout might be.

6.6 GENERALISED STRANDLINE LOCATIONS

The main aim of the geological interpretation was to ensure that the predominant sand packages were identified and used to grossly constrain the grade interpolation. Within these sand packages (and as an exercise this was constrained to ZONE 5) individual potential strandlines were identified often with elevated HM grades, but more characteristically with distinct colour and slime grade to identify them as distinct to the mineralised portions of those units. Figure 6.3 below shows the generalised interpretation of these strandlines. With the Inferred Mineral Resource level of confidence and the wide spaced drilling it was decided against wireframing and using these potential strandlines for grade interpolation as they could potentially overestimate HM grade within such discrete volumes.

This generalised interpretation identified two potential north striking strand lines, one on the eastern side of the area drilled, and the second on the western side. The identification of these separate zones of mineralisation drove the distinction between mineral assemblage composites.

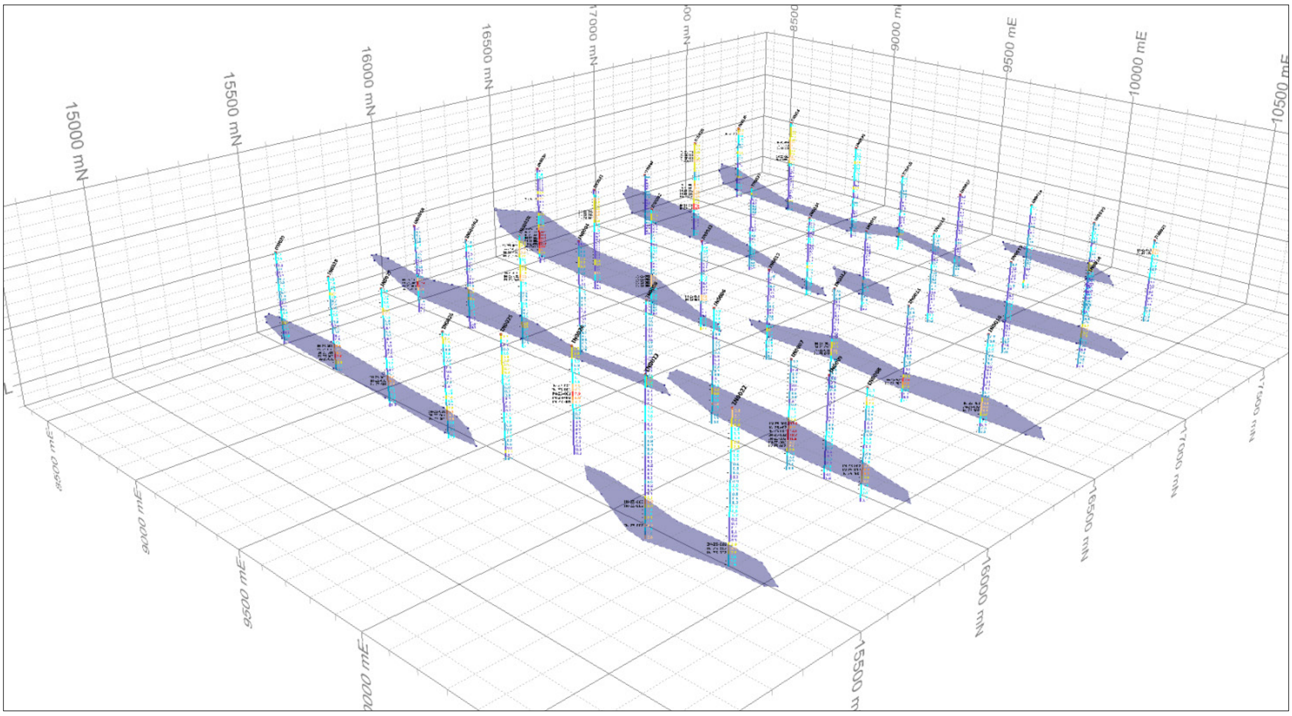


Figure 6.2: Generalised east and west strandline locations

7 GEOLOGICAL AND GRADE MODELLING

This section covers all the aspects of the geological and grade modelling of the Inhambane deposit. It covers the methodology and approach to preparing the volume model, calculation of the model prototype, all of the estimation and search parameters as well as the dip, trend and plunge modelling which has been developed and refined by GNJ Consulting.

7.1 METHODOLOGY

Construction of the geological grade model was based on a combination of coding model cells in drill holes inside closed wireframes solids, and below wireframe surfaces including geology and basement. The allocation of model zones and a description of each is shown in Table 7.1 below. A field called TOPSOIL was also applied to the block model as a 0.4 m layer at the very top of the model (this uses the topography surface translated down 0.4 m). The field TOPSOIL was used and TOPSOIL=1 was the key value used to identify that zone. This was done in order to allocate costs for optimisation work for mine planning and Ore Reserve development in the future or to calculate tonnages and volumes of topsoil for stripping. This material is included in the Mineral Resource report.

Table 7.1: Description of model zones, wireframes and fill direction

Model Zone	Domain	Wireframe	Fill Direction	Description
3	low grade sand	dune2tr/pt	inside	Low grade sand with minor clay and locally concentrated envelopes of elevated HM grade confined to orange brown dunes.
5	low grade sand	stratr/pt	inside	Low grade sand with minor clay and locally concentrated envelopes of elevated HM grade.
6	low grade sand	alluvtr/pt	inside	Low grade sand with minor clay located in a singular drill hole.
200	limestone basement	basetr/pt	down	Basement as defined by low grade HM and higher clay than average (generally >10%)

7.2 MODEL PROTOTYPE

Modelling convention has the largest parent cell size possible used which is generally based on half the distance between holes of the dominant drill hole spacing in the X and Y dimensions. Cell dimensions are generally used such to avoid the use of overly small cells that imply a level of refinement in the model that is not justified by the drill hole spacing.

Convention in model estimation practices holds that a model cell size that is half the distance between drill holes and drill sections is the minimum recommended cell size. There is also then the issue of volume variance in the block model exceeding that of the drill hole and assay spacing (by having many more model cells than drill hole assays). This volume variance effect can be demonstrated by performing a Kriging Neighbourhood Analysis (KNA).

In practice however the KNA does not always lead to the most practical result and the experience of the Competent Person and interpolation results from different cell sizes can determine what the final selected cell size is.

The dominant drill grid spacing for the Inhambane deposit is 250 x 500 x 1.5 m. This would indicate parent cell dimensions in XYZ of 125 x 250 x 1.5 m and following testing with different cell sizes this was the parent cell size that was chosen for the final model. Given the early stage of exploration for the Inhambane project and the uncertainty in the accuracy of topography away from and in between drill holes, it was decided that a smaller sub cell breakdown was not warranted. Subsequent exploration and modelling exercises may be able to make better use of detailed topography surveys such as LIDAR.

The summary of the parent cell, model origin and number of cells is presented In Table 7.2. The selected X and Y model origin coordinates are such that the model cell centroid is centred on the dominant drill hole

X and Y coordinates (but given the irregular spacing of drill holes this rarely happened). The rationale for this being that the grade in the drill hole assay is the best in ground representation of the grade at the centre of the drill hole and so should have the greatest chance of influencing the model cell grade in the interpolation.

Sub-cell splits of 4 x 4 in the X and Y and to the nearest 20 cm in the Z direction were used to control sub-cell splitting of parent cells.

Table 7.2: Model cell size, origin and number of cells to prepare volume model

DIRECTION	PARENT CELL SIZE	MODEL ORIGIN	NUMBER OF CELLS	DISTANCE COVERED	MAX MODEL EXTENT
X	125	8437.5	18	2250	10687.5
Y	250	14725.0	13	3250	17975.0
Z	1.5	-10.0	57	85.5	75.5

* all distances in metres

7.3 MODELLING PARAMETERS

This section covers the modelling parameters used to interpolate grade and index fields into the volume model. It discusses both the preliminary dip, trend and plunge process as well as the primary grade and index field interpolation.

7.3.1 ESTIMATION PARAMETERS

The following estimation parameters were used for the primary grade, non-numeric (mineral assemblage composite ID) and index fields (hardness). These fields and their nomination are presented in Table 7.3. Inverse distance cubed was used along with nearest neighbour to interpolate grades and values into the block model. Experimental variograms were developed from the drilling, however were not used to define the search ellipses. These were developed through a number of trial runs, testing the grade interpolation vs drill hole grades each time until a satisfactory distribution comparison was achieved (Section 8.2.2).

Reference fields for HM were captured (MINDIST and NUMSAM along with EST to determine the search ellipse used and to assist with grade interpolation validation). The reference field BSEST captured the search ellipse used to interpolate MACNUM to the model. These two reference fields EST and BSEST are important for validating the grade interpolation (equivalent to an estimation run in Surpac).

The header fields used in the estimation parameter file refer to:

- VALUE_IN: name of field to be estimated;
- SREFNUM: search volume reference number (defined in Table 7.4);
- IMETHOD: Estimation method (2 = Inverse Distance Power IDP, 1 = Nearest Neighbour);
- ANISO: 1 = distances defined by the search volume, 2 = distances defined by ANDIST 1,2 and 3;
- POWER: Weighting power for IMETHOD when IDP is used;
- SVOL_F: records which estimation pass the value is estimated for HM and MACNUM;
- NUMSAM_F: records the number of samples used in estimation of each cell

Inverse distance cubed estimation was used with parent cell estimation applied, whereby sub-cells are assigned the grade estimated for the corresponding parent cell volume. A discretisation array of 2 x 2 x 1 was used for the parent cell array.

Table 7.3: Estimation parameters for grade and index field interpolation

ZONE	VALUE_IN	VALUE_OU	SREFNUM	IMETHOD	ANISO	POWER	SVOL_F	MINDIS_F	NUMSAM_F	ANANGLE1	ANANGLE2	ANANGLE3	ANDIST1	ANDIST2	ANDIST3
3	HM		1	2	1	3	EST	MINDIST	NUMSAM	0	0	0	200	600	1.5
3	SL		1	2	1	3				0	0	0	200	600	1.5
3	OS		1	2	1	3				0	0	0	200	600	1.5
3	SAND		1	2	1	3				0	0	0	200	600	1.5
3	MACNUM		2	1	1	0	BSEST			0	0	0	200	600	1.5
3	HARD		1	1	1	0				0	0	0	200	600	1.5
5	HM		1	2	1	3	EST	MINDIST	NUMSAM	0	0	0	200	600	1.5
5	SL		1	2	1	3				0	0	0	200	600	1.5
5	OS		1	2	1	3				0	0	0	200	600	1.5
5	SAND		1	2	1	3				0	0	0	200	600	1.5
5	MACNUM		2	1	1	0	BSEST			0	0	0	40	1200	1.5
5	HARD		1	1	1	0				0	0	0	40	1200	1.5
6	HM		1	2	1	3	EST	MINDIST	NUMSAM	0	0	0	40	1200	1.5
6	SL		1	2	1	3				0	0	0	40	1200	1.5
6	OS		1	2	1	3				0	0	0	40	1200	1.5
6	SAND		1	2	1	3				0	0	0	40	1200	1.5
6	MACNUM		2	1	1	0	BSEST			0	0	0	40	1200	1.5
6	HARD		1	1	1	0				0	0	0	40	1200	1.5
200	HM		1	2	1	3	EST	MINDIST	NUMSAM	0	0	0	40	1200	1.5
200	SL		1	2	1	3				0	0	0	40	1200	1.5
200	OS		1	2	1	3				0	0	0	40	1200	1.5
200	SAND		1	2	1	3				0	0	0	40	1200	1.5
200	MACNUM		2	1	1	0	BSEST			0	0	0	40	1200	1.5
200	HARD		1	1	1	0				0	0	0	40	1200	1.5

7.3.2 SEARCH PARAMETERS

The search parameters for the grade interpolation were used as shown in Table 7.4.

The header fields used in the search parameter file refer to:

- SREFNUM: Search volume reference number assigned in estimation parameter file;
- SANGLE 1,2,3: Search angles which are set as part of dip/trend/plunge modelling;
- SAXIS 1,2,3: Order of rotation around axis to determine orientation of search ellipse;
- SMETHOD: defines the search volume method is this case 2 = ellipsoid;
- SDIST1 = search ellipse radii across strike (X axis), SDIST2 = search ellipse radii along strike (Y axis), SDIST3 = search ellipse radii in the 'Z' orientation;
- OCTMETH=0 refers to fact that octant based sample selection criteria was NOT used;
- MINIMUM1/MAXIMIM1 etc =Minimum number samples for estimation of assay fields (2) and the maximum was (16);
- SVOLFAC: multiplying factor for 2nd and 3rd estimation pass if required;
- MAXKEY=2 means each cell estimate can use a maximum of two samples from any individual drill hole.

Table 7.4: Search parameters for grade and index field interpolation (search ellipse)

SREFNUM	SMETHOD	SDIST1	SDIST2	SDIST3	SANGLE1	SANGLE2	SANGLE3	SAXIS1	SAXIS2	SAXIS3	OCTMETH	MINOCT	MINPEROC	MAXPEROC	MINNUM1	MAXNUM1	SVOLFAC2	MINNUM2	MAXNUM2	SVOLFAC3	MINNUM3	MAXNUM3	MAXKEY
1	2	300	700	6	0	0	0	3	2	1	1	2	1	8	2	16	2	3	16	4	1	16	2
2	2	1000	3000	6	0	0	0	3	2	1	0	1	1	1	3	16	2	3	16	4	1	16	1

The maximum samples per drill hole was set to 2 and the requirement for a minimum of two samples and maximum of 16 samples to be used for a block to be estimated. Therefore at least two drill holes were used in each cell estimate with domain blocks estimated using on average using between 9 and 10 samples. An octant based search was employed to prevent drill holes at the edges of the deposit from pushing their influence too far. This in conjunction with the DTP approach has resulted in a reasonable grade interpolation with only limited smoothing and a reasonable representation of drill hole grades into the model cells (as evidenced by the visual and statistical examination of the model versus drill hole data).

7.4 DIP, TREND AND PLUNGE (DTP) MODELLING

GNJ Consulting has developed a dynamic ellipsoid modelling technique which is similar to a number of commercial available methodologies. This dynamic ellipsoid technique is referred to as dip, trend and plunge (DTP) modelling.

The DTP process essentially uses dip, trend and plunge (from the digitised trends) strings to control the search ellipse orientation for sub zones within the model to account for variations in the dip, trend and plunge of mineralisation. This is a completely flexible routine and is very useful for wide, thin and extremely elongate strandlines particularly in mineral sands even when changes in dip, trend and plunge are very subtle.

Dip values are estimated from dip strings digitised for each zone at a regular spacing perpendicular to the strike of the mineralisation. Trend strings are digitised for each zone and these are based on demonstrated grade continuity identified between drill lines. The trend strings are digitised parallel to the high grade core of the strand or body of mineralisation. Each trend string segment is snapped to the corresponding set of dip strings which ensure that the plunge component (in the north-south or long axis orientation) is reflected in the trend strings. It is important that the change in plunge is maintained at a consistent rate along the length of the orebody so that radical changes in plunge are not created.

For the Inhambane deposit the changes in strike, trend and plunge are very subtle and the DTP routine is used out of familiarity with the method for its self-auditing function (if the strings are malformed then the routine fails to execute a meaningful result).

Search ellipse orientations used during estimation of the assay fields are based on the AVE_DIP, AVE_PLG and AVE_BRG field values estimated and these are validated to ensure they correctly represented the orientation of the relevant dip and trend strings.

These average orientations are then assigned to each search ellipse in the search parameter file fields, SANGLE1, 2 and 3. There is no doubt that the DTP process allows for a more robust grade interpolation especially where there are constant and differential changes in DTP along the orebody length and width.

Interpretation of the DTP values is validated against the SUBZONE template to check for out of range values so that the user does not get to the end of the grade interpolation only to find that a malformed string has resulted in a completely unrealistic DTP value.

The dip and trend strings used to control the orientation of the search ellipse are presented in Figures 7.1 and 7.2 respectively.

7.5 GENERAL MODEL FORM

The block model as generated and with the domains identified is presented below in Figure 7.3.

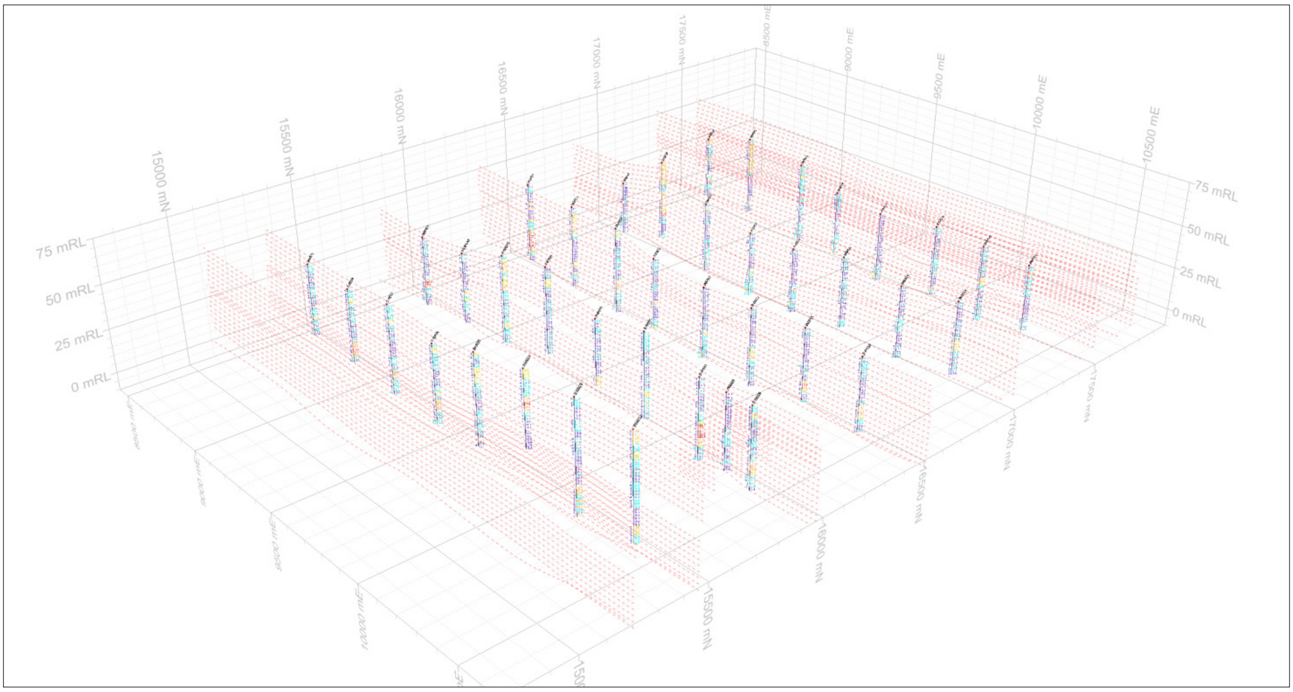


Figure 7.1: Oblique view looking north-west showing dip strings for DTP routine

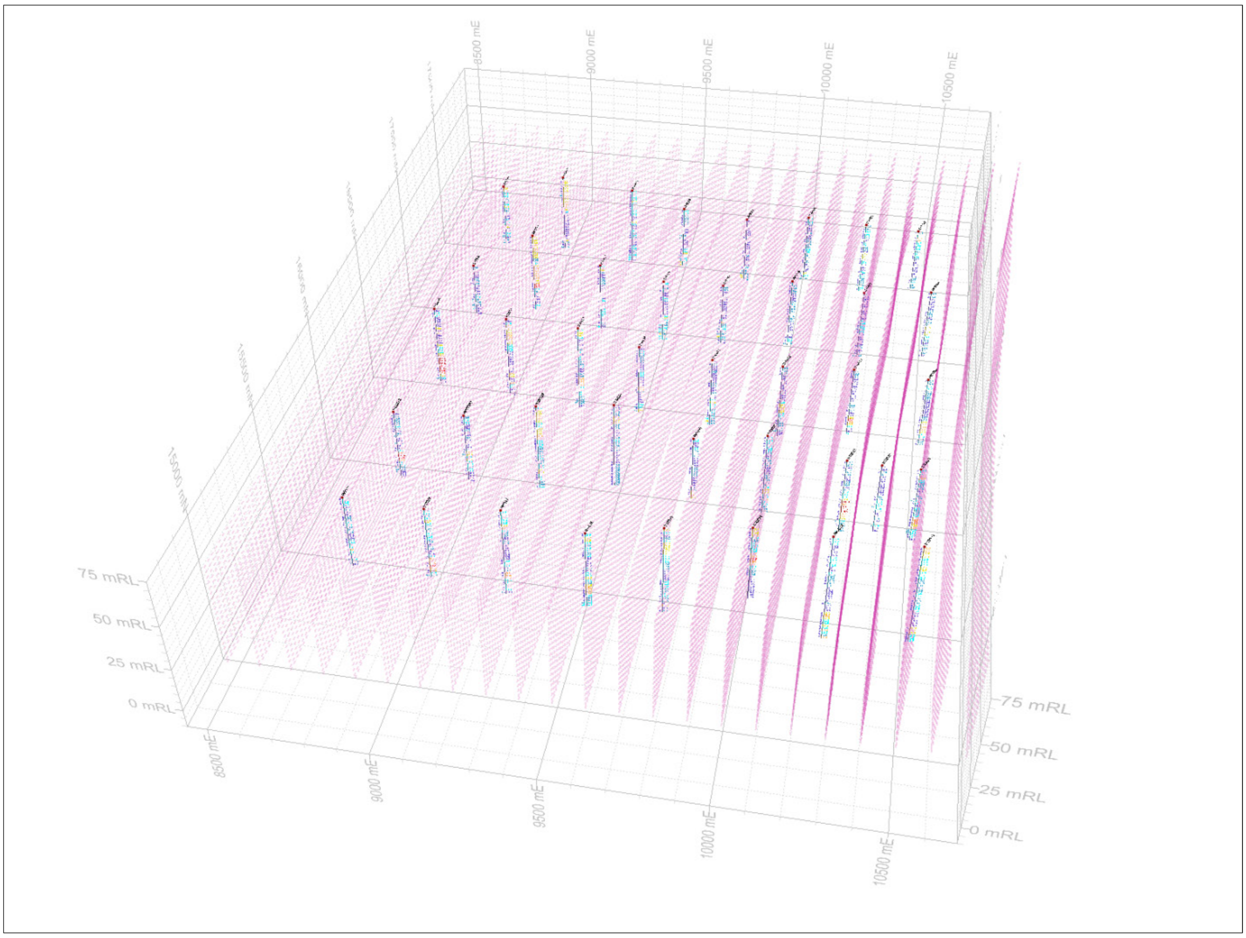


Figure 7.2: Oblique view looking north showing trend strings for DTP routine

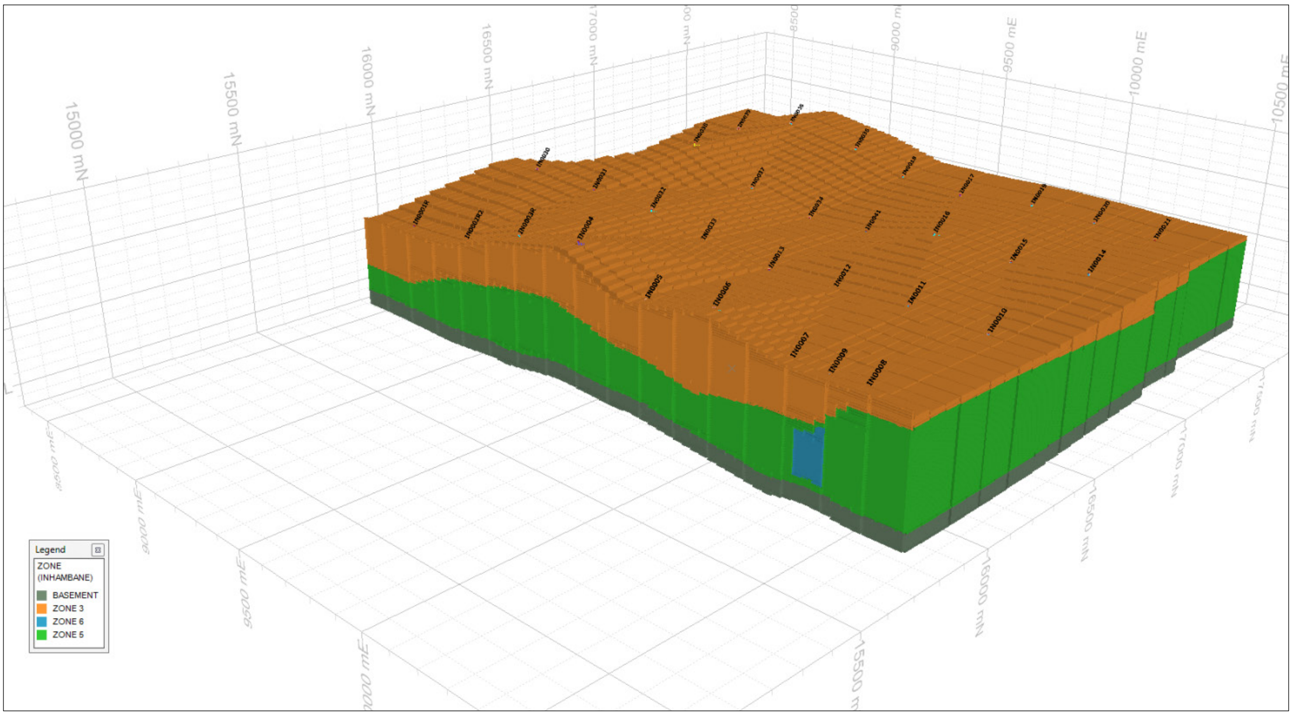


Figure 7.3: Cut-away section of the block model showing all of the domains (upper sand package (ZONE=3), lower sand package (ZONE=5) and basement (ZONE=200) with the small domain of ZONE=6 shown within ZONE=5.

7.6 BULK DENSITY

The average bulk density was selected as 1.7 gcm^{-3}. This is an average bulk density applied across the entire resource estimate. It was selected based on the experience of the Competent Person, the average HM and SLIMES grades and given that the average bulk density of quartz sand is 1.6 gcm^{-3}.

The conversion of volume to tonnage is simply:

cell volume * 1.7 = tonnage

8 MODEL VALIDATION

8.1 VOLUME MODEL AND DRILL HOLES

The volume model and drill hole file was validated on-screen against the geology and basement wireframes to ensure zone allocation had been correctly assigned. The volume model was validated to ensure that adequate resolution was obtained with the use of sub-cells. The location of the model cells with respect to drill section spacing (as outlined above) was checked.

Typical domain geometries in cross-section and plan showing the main zones are presented in Figures 8.1 and 8.2.

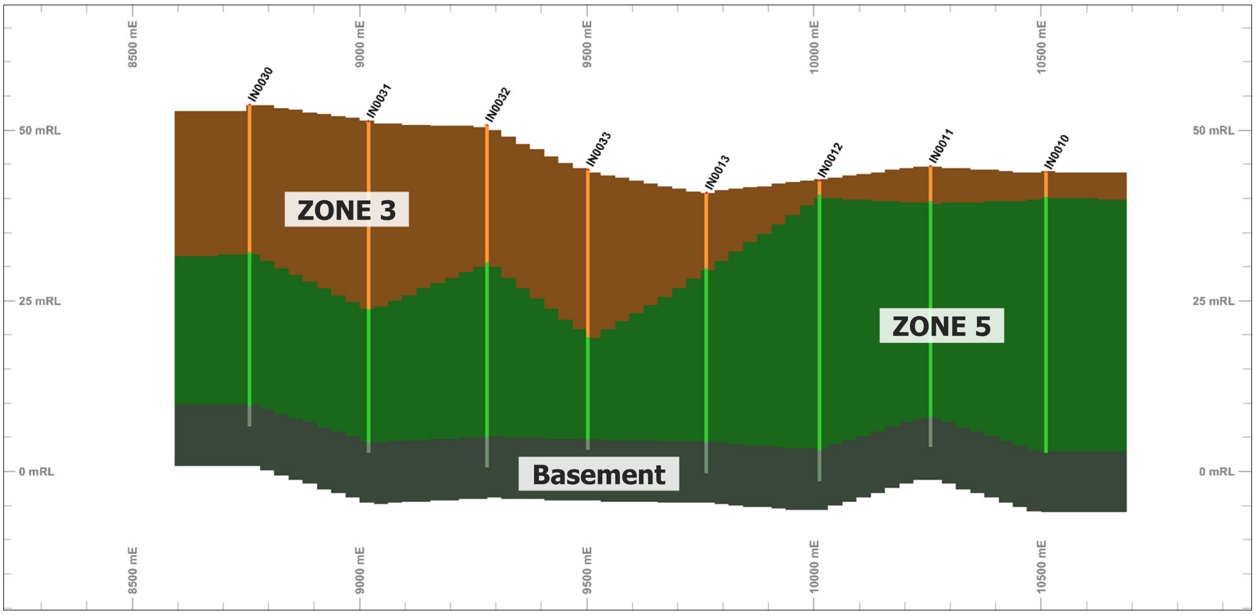


Figure 8.1: Cross-section looking north through 16350 mN showing model and drill hole coding (15 x Z-axis)

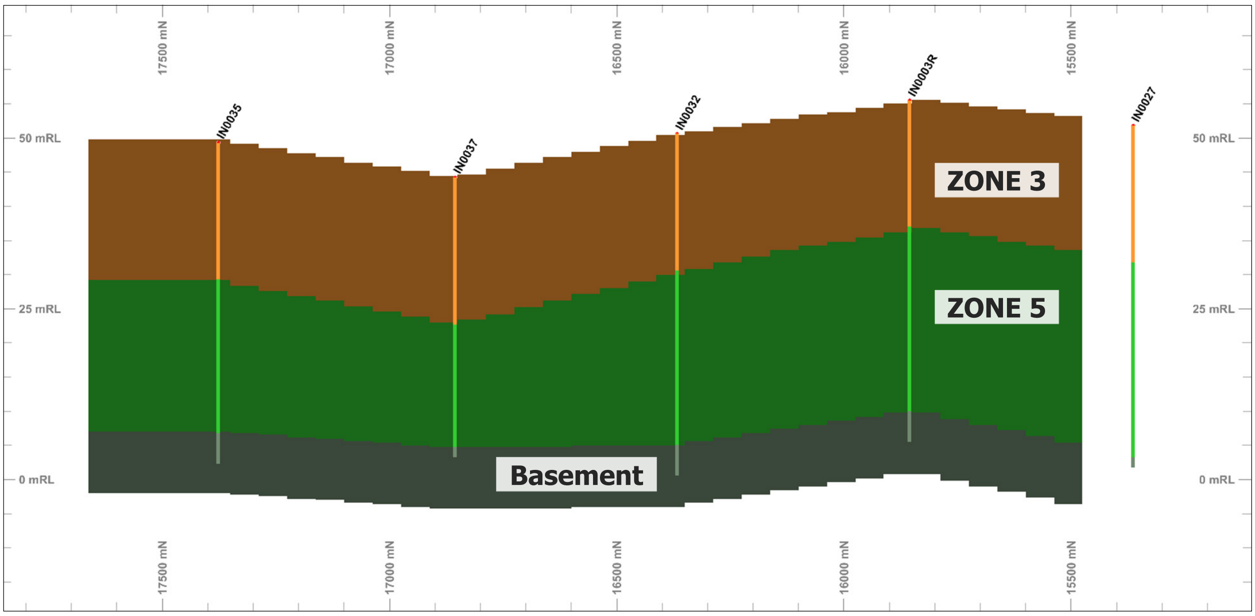


Figure 8.2: North-south section looking east through 9260 mE showing model and drill hole coding (15 x Z-axis)

8.2 RESOURCE MODEL

The resource model was interpolated for key assay grade fields, logging fields and non-numeric fields. A number of interpolation runs were undertaken before finally settling on the search ellipse and estimation parameters as presented in Section 7.

8.2.1 VISUAL INSPECTION

On-screen validation of the resource estimates was conducted by viewing the coded drill holes with the estimates for each field. The model was interrogated in east-west, north-south and oblique cross sections with the model viewed at 125 m intervals throughout the deposit (which corresponded with the centroid of model cells in the X direction). The model cells were annotated with the value of the field under review, which allowed observation of the variation of cell values at and in between drill hole locations. There was no smearing of grades between zones, but minor smoothing of higher grades (from high drill hole grades to lower model grades) and lower grades (from low drill hole grades to higher model grades).

The model was interrogated to see if any cells were not estimated and whether cells were estimated in the first, second or third estimation pass as expected given the surrounding sampling density. To this end the EST field was used to cross check the interpolation parameters. None of the domains remained un-estimated for drill assay primary grades. Any uninterpolated cells were assigned mean grades for the corresponding ZONE for each field (with the exception of index fields such as HARD where values were set to 1).

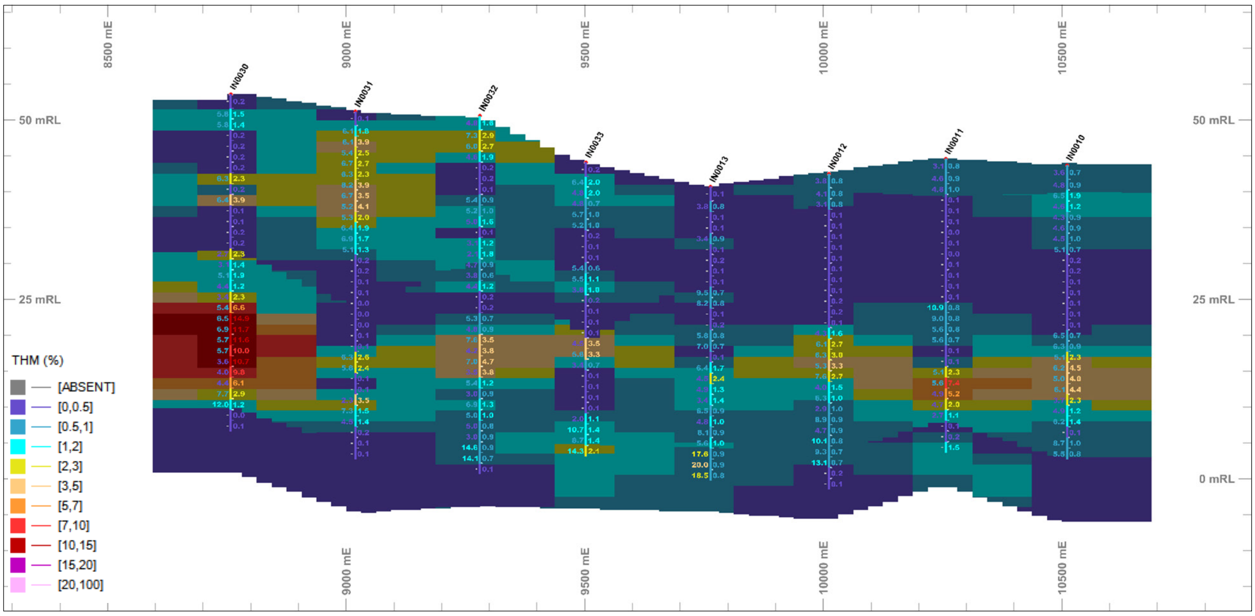


Figure 8.3: East-west section at 16350 mN showing model and drill hole HM (15 x Z-axis)

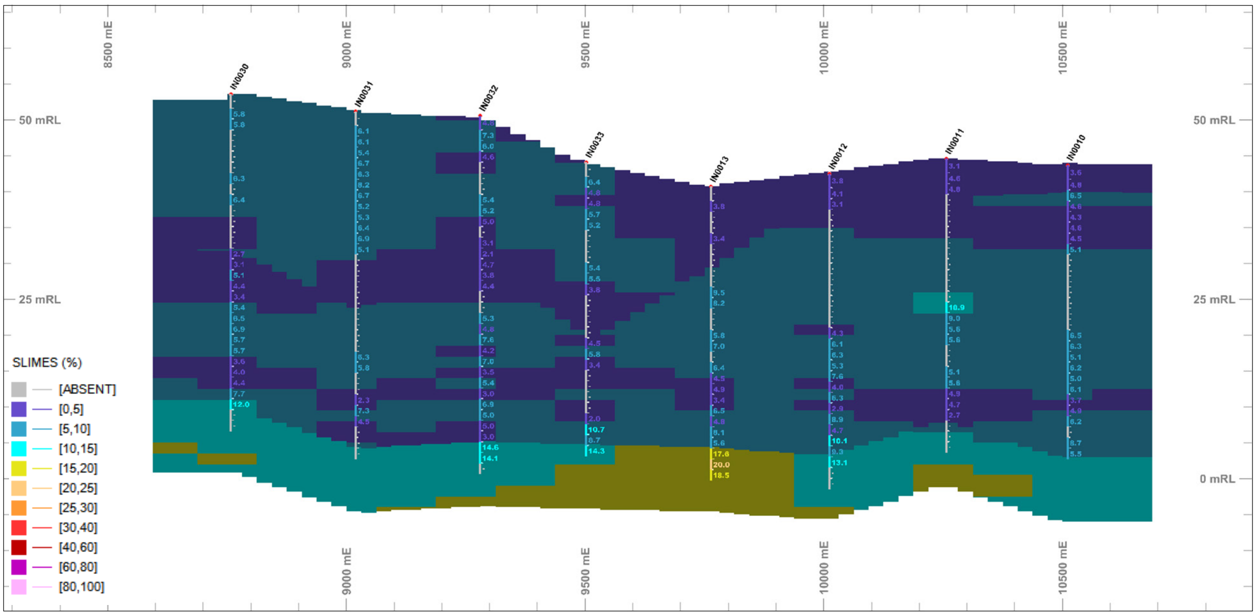


Figure 8.4: **East-west section at 15350 mN showing model and drill hole SLIMES (15 x Z-axis)**

An oblique view of the block model showing HM grade distribution is presented below in Figure 8.5.

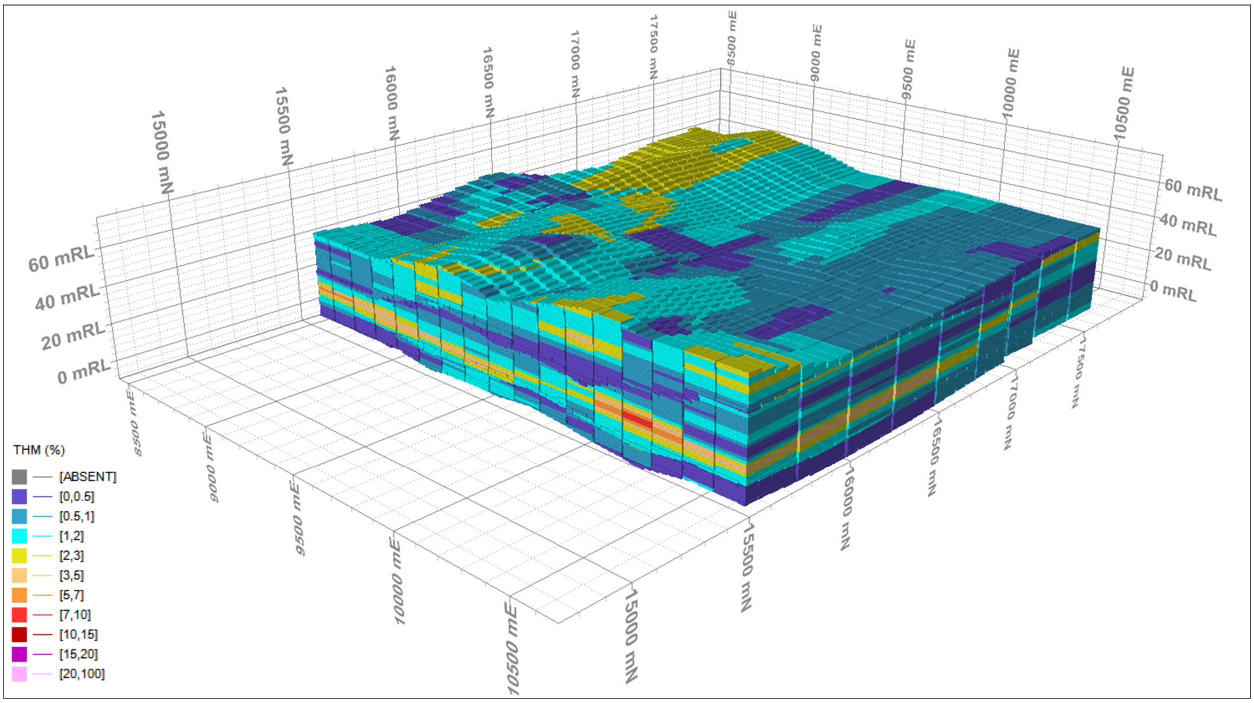


Figure 8.5: **Oblique view looking north-west of the Inhambane block model showing HM grade distribution**

8.2.2 STATISTICAL PRESENTATION

Population distributions were calculated for the two critical assay fields; HM and SLIMES as both normal and log normal distributions. These populations were further isolated to hard coded ZONE unique values. The characteristics of drill hole versus model population distributions can also be seen in Section 8.3 which shows the visual spatial distribution of drill hole versus model averages plotted by northing (commonly called swath plots). The correlation for most fields is satisfactory with variances within acceptable limits.

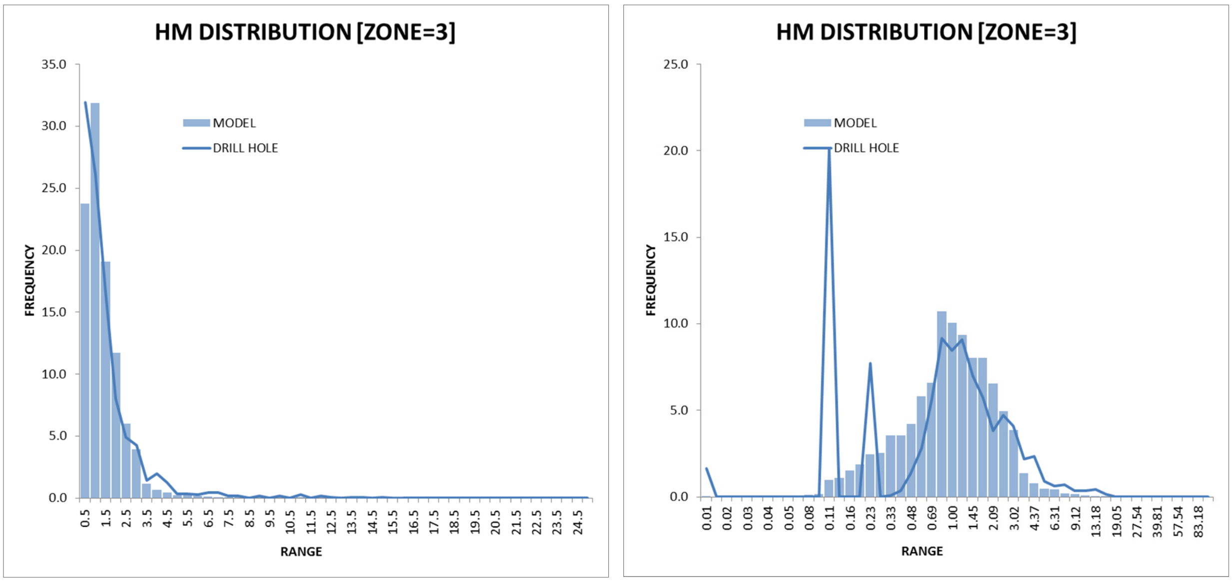


Figure 8.6: Model and drill hole normal and lognormal distributions for HM [ZONE=3]

Figure 8.6 shows the normal and lognormal distribution for HM from the drill hole and model files for ZONE=3. The model distribution is tighter than that of the drill hole distribution, however not by much. The overall interpolation for HM in the block model is deemed to be effective. Both the normal and log normal distributions for model vs drill hole are close and the interpolation has been very effective. This can be attributed in a large part to the dynamic search ellipse honouring the various HM grade trends and geological strike and dip variations as well as the generally tighter grade range (a lack of extreme outliers results in less smoothing). We would expect the local and global estimates for both zones within the model to be very effective.

There is a minor filling out of the model grades in the very low grade part of the curve, however given these are well below the selected cut-off grade for resource reporting they are not considered to be of significance.

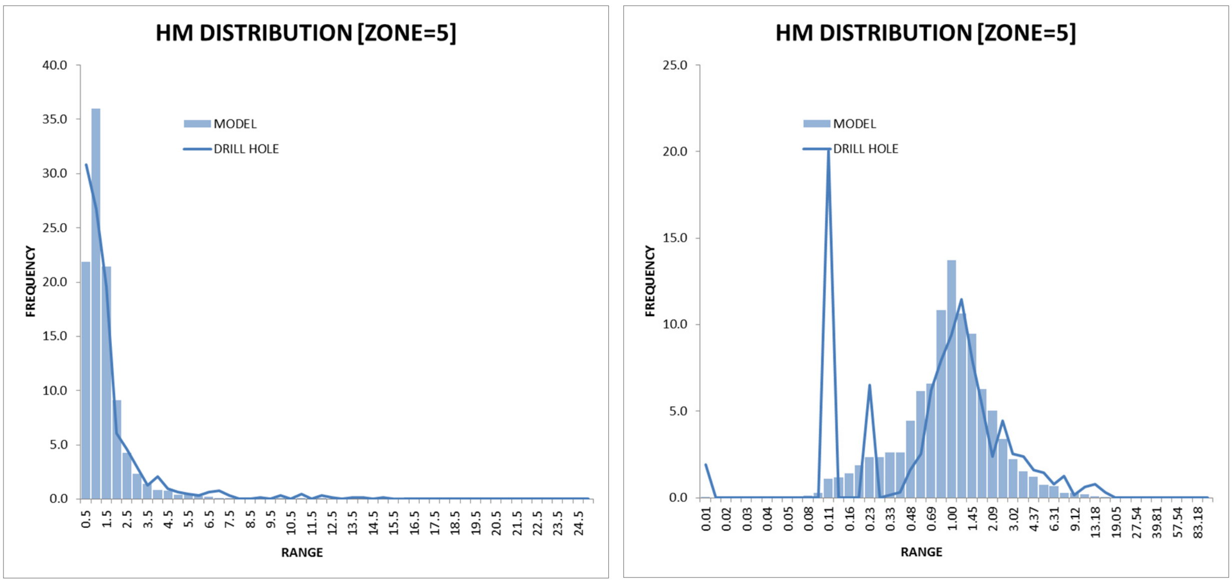


Figure 8.7: Model and drill hole normal and lognormal distributions for HM [ZONE=5]

Figure 8.7 shows the distributions for ZONE=5 and the distributions are very similar to those in ZONE=3. In our opinion the interpolation has been effective given the parameters and backed up by our visual inspection of the drill hole versus model grades.

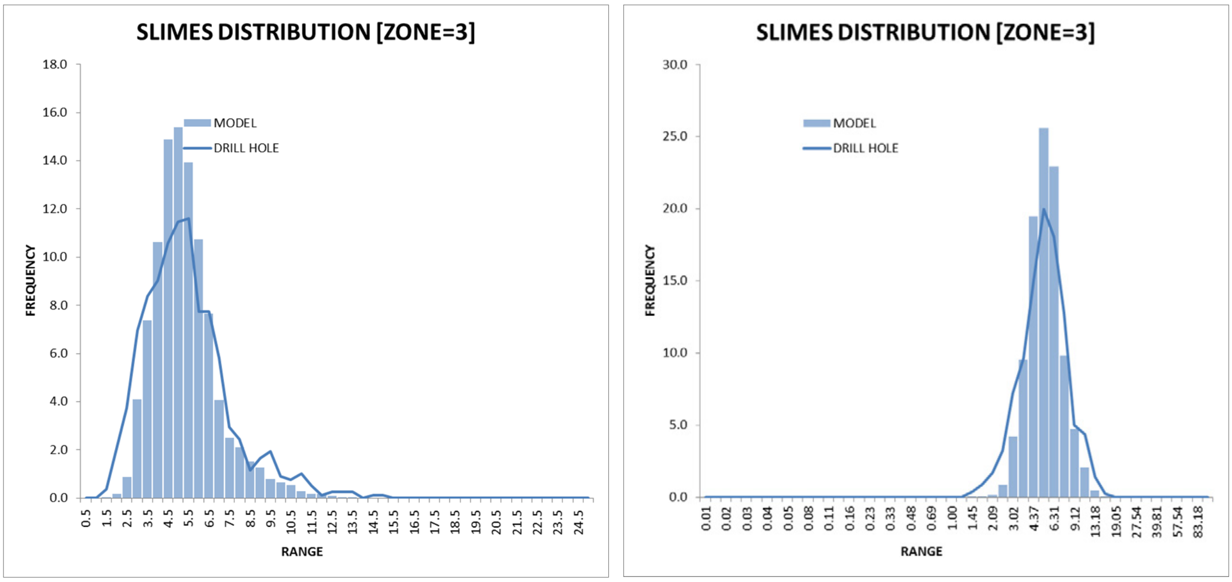


Figure 8.8: Model and drill hole normal and lognormal distributions for SLIMES [ZONE=3]

Figure 8.8 shows the normal and log normal model distribution for SLIMES from the drill hole and model files. Both normal and log normal distributions show a very close distribution between drill hole and model grades with only a minor amount of smoothing at the top and bottom of the distribution.

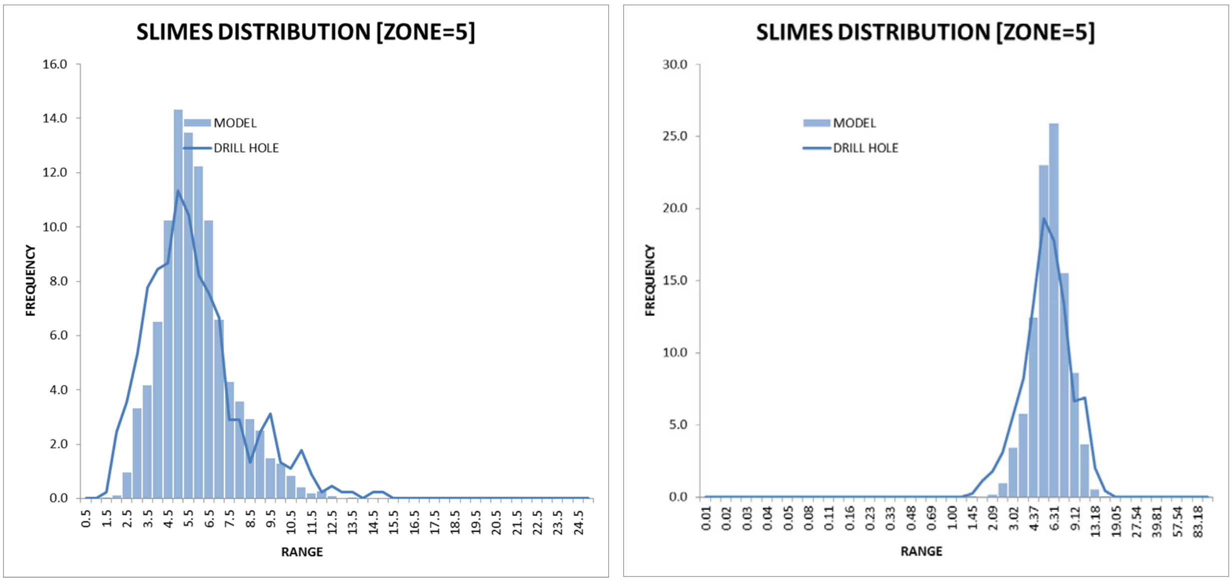


Figure 8.9: Model and drill hole normal and lognormal distributions for SLIMES [ZONE=5]

Figure 8.9 shows the distributions for SLIMES for ZONE=5. The interpolation in this domain has resulted in some smoothing especially at the bottom end of the distribution for drill hole grades. The normal distribution for SLIMES shows a more normal bell shaped distribution with very little skew. There is a reasonable degree of smoothing and this is considered normal behaviour for a population with a large range of values.

8.3 GRAPHICAL PRESENTATION

Another method of comparing the effectiveness of the interpolation is to calculate and compare assay averages by model and drill hole northing. A field named BLKNUM was set in both the model and drill hole file to represent the best average northing and this was done incrementally on northings equivalent to the drill line intervals. The results were then reported on the field BLKNUM and by ZONE to so as to compare the weighted averages from the primary assay fields that were interpolated during the modelling process. The results are presented below in Figures 8.10 to 8.13.

Commentary on each of the figures is provided at the bottom of each page. All results were calculated on a cut off of HM greater than 1 per cent.

8.3.1 HM COMPARISON BY ZONE

HM interpolation throughout ZONE=3 and ZONE=5 (Figure 8.10 and 8.11) shows an excellent representation of drill hole HM into the block model with only minor smoothing (in ZONE=3).

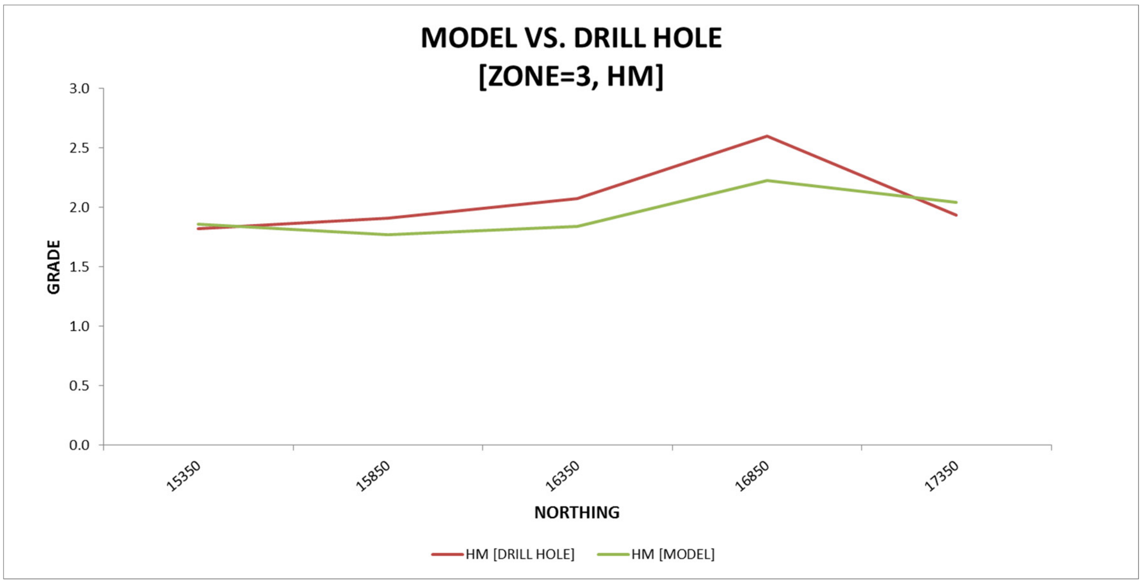


Figure 8.10: Comparison of model vs. drill hole grades [ZONE=3, HM]

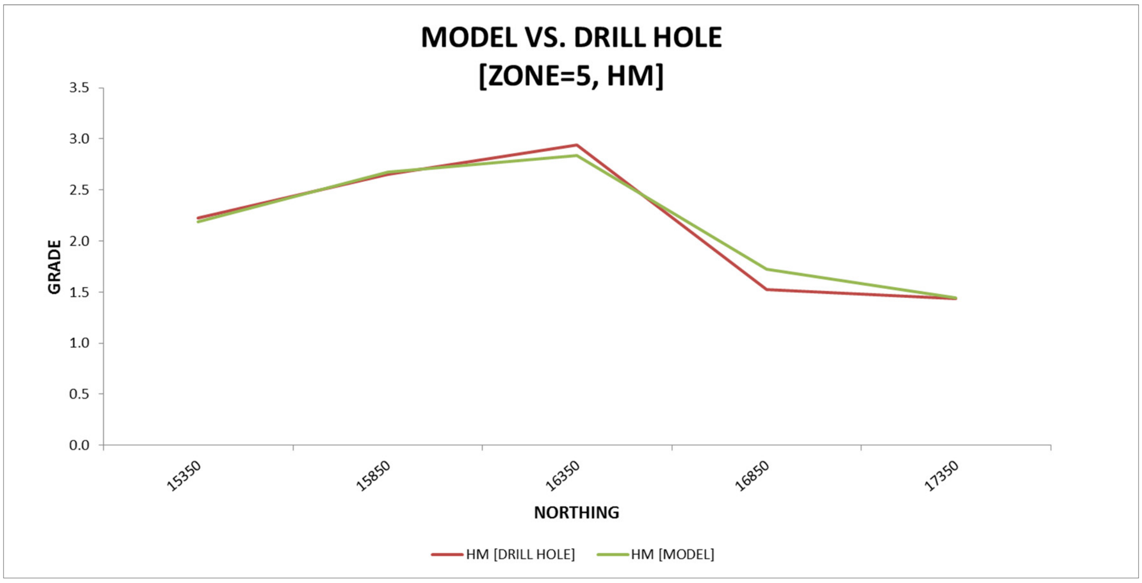


Figure 8.11: Comparison of model vs. drill hole grades [ZONE=5, HM]

8.3.2 SLIMES COMPARISON BY ZONE

SLIMES interpolation throughout ZONE=3 and ZONE=5 (Figures 8.12 and 8.13) shows a very effective interpolation where drill hole grades have been honoured in the block model.

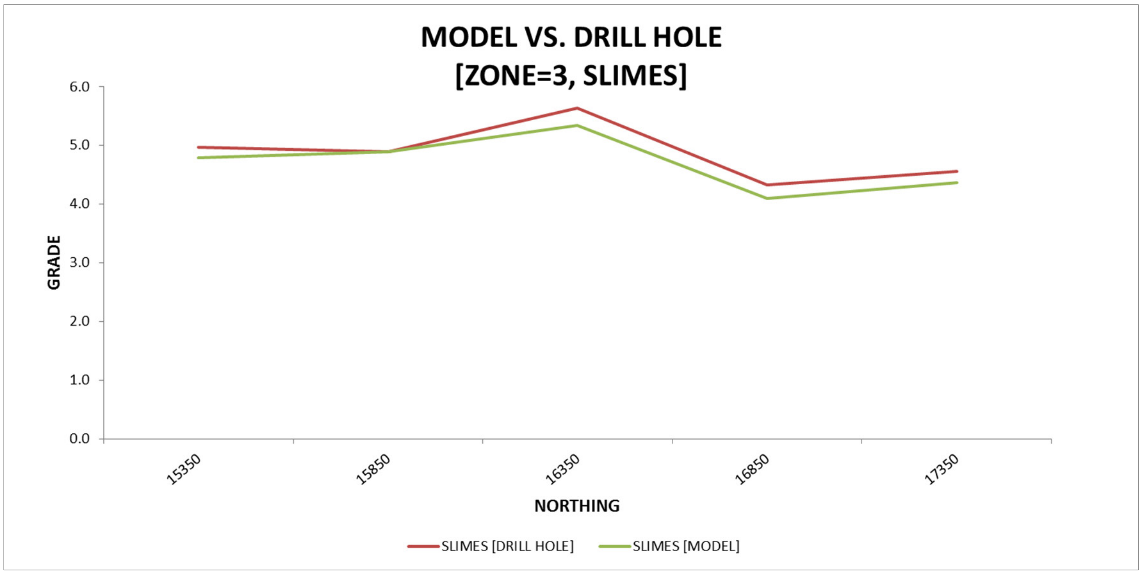


Figure 8.12: Comparison of model vs. drill hole grades [ZONE=5, SLIMES]

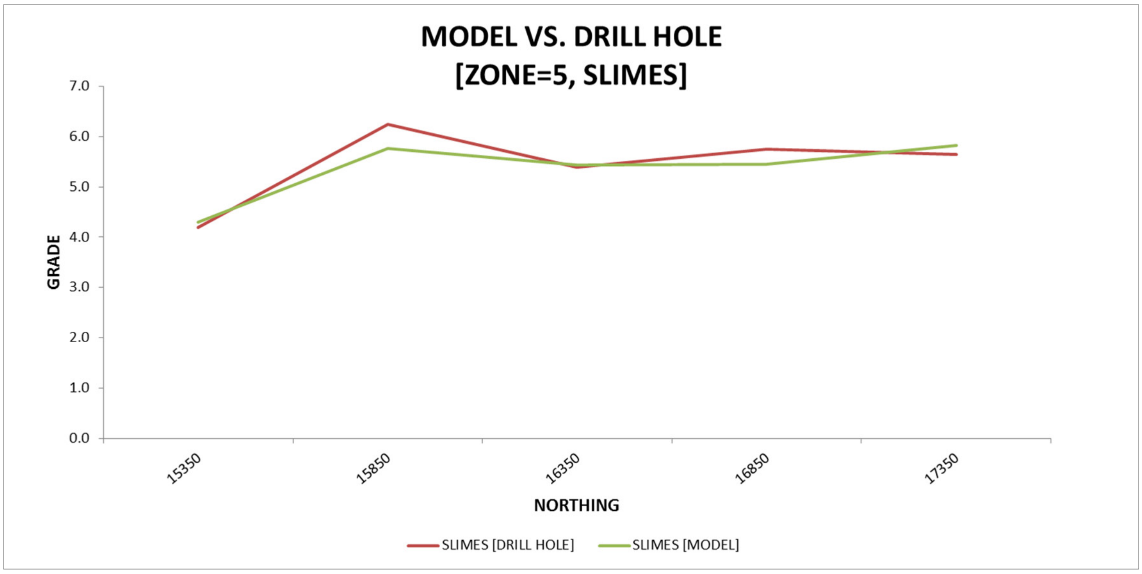


Figure 8.13: Comparison of model vs. drill hole grades [ZONE=5, SLIMES]

8.4 BULK DATA

8.4.1 STATISTICAL REVIEW

The distribution of bulk data within each of the two main zones in the model was validated by reviewing the distribution of the BSEST field from the interpolation and checking that an appropriate search ellipse was used for the interpolation. Once the MACNUM interpolation was deemed satisfactory then a review of the tonnage allocation to each composite was undertaken.

Bulk data was joined into the model and the model was reported on ZONE and MACNUM to check the HM tonnage assigned to each bulk.

Table 8.1: HM tonnage by MACNUM (filtered on HM>2)

MACNUM	TONNES (Mt)	THM TONNES (Mt)	Weighted %	THM	ILMA	ILM	RUTI	ZIRC	LEUC	KYASIL	CHRM	MONA	STAU	GARN	NMOTH[1]	MOTH[2]
IN-Z3-001	23.2	0.608	35%	2.6	22.6	33.1	1.3	3.9	3.1	4.8	5.1	0.2	0.8	0.0	14.9	10.2
IN-Z5-001	14.6	0.646	37%	4.4	34.3	31.7	1.8	5.3	3.9	2.8	5.3	0.4	0.6	0.0	8.7	5.2
IN-Z5-002	13.5	0.489	28%	3.6	31.7	28.7	1.8	4.4	3.9	3.9	4.6	0.3	1.1	0.0	14.1	5.6
	51.2	**1.743**	**100%**	**3.4**	**29.5**	**31.3**	**1.6**	**4.6**	**3.6**	**3.8**	**5.0**	**0.3**	**0.8**	**0.0**	**12.4**	**7.1**

Notes:

1 non magnetic others (minus kaynite, sillimanite) - includes andalusite, quartz and unidentified others

2 magnetic others (minus monazite, garnet) - includes epidote, geothite, hematite and unidentified others

There are a number of different approaches to determining how appropriately the MACNUM assignment has performed. An appropriate tonnage may be one that would be reflective of a typical parcel of HM from a production scenario (either shift, or a week, or a month).

If an average monthly production from a mining scenario at the Inhambane deposit is represented by 30,000 to 40,000 tonnes of HM we can review the reported tonnage per bulk as:

- a percentage of the total model; or
- as a percentage of each ZONE; or
- as a percentage of the mineral resource above the nominal cut-off grade.

The most reasonable approach would be to review the MACNUM assignment based on the reported resource estimate above the nominal cut-off grade. Table 8.1 shows the MACNUM assignment for the entire reported resource (greater than the cut-off-grade 2 per cent HM). If we assume a mining rate of 1200 tph, 24 hours a day, 7 days a week and with a 95% utilisation, then in a year approximately 10 million tonnes of material will be mined.

Using the average HM grade reported (3.3 per cent HM) this translates to approximately 330 kt HM per annum (not taking recoveries into account) or approximately 28 kt per month.

If we consider the tonnages in Table 8.1 and taking into consideration this production rate we see that none of the existing mineral assemblage composites cover the sample resolution that satisfies the average monthly production. The mineral assemblage composites roughly represent one third each of the total HM tonnage. Another method of determining whether or not enough samples have been taken to characterise the mineralogy is to review the variability of the composites. In this case a population of three composites is not nearly enough to provide anything other than an indicative overview of the global mineralogy of HM mineralisation in the area drilled.

8.4.2 GENERAL COMMENTARY

The ratio of VHM[3] to trash minerals is roughly 72:28 which is a strong ratio and indicative of concentration and winnowing effects that are still upgrading the value of the HM. Whilst the QEMSCAN reveals a significant proportion of altered ilmenite, the QEMSCAN program identifies this altered ilmenite as being not 100% primary (and therefore the degree of alteration may only be low - in the order of 53 to 54% TiO_2). The ilmenite fraction is likely to be low TiO_2 and possibly limited to slagging feedstock. There are low to modest levels of rutile and zircon which is typical of the assemblage in this region of the Mozambique coastline, however we would also point out that these are higher values than what are typically seen from the really large dunal deposits such as Chibuto. There are also elevated leucoxene grades, however whether these can be deported into a combined rutile and high titanium product is yet to be demonstrated.

3 VHM in this case is the sum of ILMA, ILM, RUTI, ZIRC AND LEUC

QEMSCAN analysis does have limitations such as being unable to provide quality parameters for mineral species that are important when predicting what a potential final market might be. One of the quality aspects for ilmenite from this region of Mozambique is high levels of chrome in the ilmenite which must be removed prior to processing by pigment plants. The levels of free chromite are quite high and whilst it is possible to remove this material during dry plant concentration is also indicative of potentially intrinsic and intergranular chrome within ilmenite.

More sophisticated bench scale type separation and test work is required to ascertain the true quality of recoverable and saleable ilmenite and what the grade of that product might represent.

Other techniques such as those utilised by Process Mineralogical Consulting Ltd (their proprietary SEM-EDX method) could provide a viable alternative, giving access to oxide mineralogy for mineral species as well as a more comprehensive breakdown of the mineralogy, especially with respect to ilmenite classification.

The preparation of plans showing summary block model values was completed. These plans are presented in Appendix 2 and show the grades and distribution of HM, SLIMES, key VHM mineralogy species as well as the average thickness of the mineralisation above the cut-off grade of 2% HM. Using this cut-off grade and the thickness accumulation of material above and below the cut-off, a ratio of waste to ore can be calculated. This waste to ore ratio is presented along with the total tonnage of material and HM as contained in ground as heat maps.

No minimum thickness was specified to generate the accumulated averages and tonnes. The waste material in a given vertical column of cells is that which lies above the lower most cell which meets the reporting or cut-off grade criteria. To put that another way, the Datamine process used to accumulate cells looks at each column of cells in isolation, picks the deepest point where the cut-off grade meets or exceeds the reporting criteria and then flags all cells overlying with either a "waste" (below cut-off grade) or "ore" (above cut-off grade) value. This flag value is then used to generate the resource report which becomes the Mineral Resource estimate.

9 RESULTS

This section covers the Mineral Resource reporting for the Inhambane prospect, discussion around reasonable prospects of eventual economic extraction and justification for the Mineral Resource JORC Classification.

9.1 DISCUSSION OF REASONABLE PROSPECTS OF EVENTUAL ECONOMIC EXTRACTION

Consideration has been given to the reasonable prospects for eventual economic extraction for the Inhambane prospect. Factors such as current mineral sands prices, likely mining methodology, thickness of mineralised intervals, mineral recoveries and high level costs for mining and processing have all been applied to the Mineral Resource at the nominated HM cut-off grade.

The Mineral Resource estimate reported in Table 9.1 has been tested with the following high level range of costs[4]:

- $2-$3/BCM for overburden removal;
- $1-$2/tonne for mining cost;
- $30-$40/t HMC for processing cost; and
- $10-$15/t HMC for transport cost.

,and the following range of mineral prices[5]:

- $150-$250/t of ilmenite;
- $800-$1000/t of rutile;
- $1200-$1500/t of zircon; and
- $500-$700/t of leucoxene.

The other primary consideration that was taken into account was the approximate stripping ratio which was estimated to be an average of 1.7:1. The overall average thickness of mineralisation was 14 m (ranging from 2 to 32 m) and the average thickness of sub cut-off grade material lying above was 25 m (ranging from 0 to 50 m).

The recovery estimates for HMC was between 90 and 95% and overall combined wet and dry recoveries for mineral species was between 85 and 95% for ilmenite, rutile and zircon and between 45 and 55% for leucoxene.

The minimum thickness of mineralisation that was considered for deposit continuity was 2 m (comprising 0.32% of the HM tonnes), otherwise almost 90% of the HM tonnage is hosted by mineralisation thickness greater than 8 m.

The mining method considered most appropriate for this style of low slime and thick deposit would be dozer trap (also one of the cheapest methods other than dredging which would be highly unlikely to be considered due to the low clay/slime and absence of significant water table). It should be noted that the mining cost applied for this particular estimate is well above what would be considered as standard for a dozer trap scenario.

4 Note that all dollars are AUD

5 It should be noted that these prices are conservative compared with current pricing in 2021

Under the potential economic factors outlined above the Inhambane prospect does show robustness at the selected HM cut-off grade and in the opinion of the Competent Person, has reasonable prospects for eventual economic extraction.

It should be clearly understood that this discussion of reasonable prospects of eventual economic extraction does not in any way constitute an Ore Reserve estimate as there are many other Modifying Factors that need to be considered.

9.2 RESOURCE CLASSIFICATION

The classification of the Inhambane Mineral Resource estimate has been assigned an Inferred Mineral Resource category and is supported by criteria as follows:

- drill hole spacing;
- the quality of QA/QC sampling; and
- the distribution of mineral assemblage composites.

This is the maiden Mineral Resource estimate for the Inhambane project and is entirely an Inferred category.

The drill spacing is currently wide spaced and geology and mineralisation continuity is only inferred at this stage. There are demonstrated and continuous layers of mineralisation within ZONE 5 which may be indicative of strandline development and preservation, however the wide spaced drilling does not allow for the confirmation of this. The potential uncertainty of this classification can be demonstrated by the one attempt at infill drilling which resulted in identifying a washout of mineralisation (which are rare, however can be encountered in marine strandline deposits).

Of the 41 holes drilled on the Inhambane prospect, a there were a total of 21 intercepts of >5 m length above the cut-off grade of 2% HM. Of these, there were 3 greater than 15 m in length with average grades over each length of 8.7%, 2.9% and 4.7% HM. These holes do have some influence over the HM tonnage and this is reflected in the final resource classification.

The quality of QA/QC sampling was to a recommended industry standard and well supports selected Mineral Resource categories. The inclusion of company blind samples and twin drilling would further enhance the QA/QC aspect and therefore confidence in the Mineral Resource estimate, however this has not been undertaken at this stage.

The sample support and distribution of mineral assemblage composites is to an adequate level of density to infer an overall global average of mineral assemblage. The current tonnage assignment to each mineral assemblage composite is well below what would be considered to be an adequate degree of resolution to infer a high level of confidence for monthly production rates. Despite the small number of composite samples those results do broadly infer a HM to trash mineral ratio that may be economically favourable across the area drilled.

In addition to all of the criteria discussed in this section there is also the consideration of the cut-off-grade used to report the Mineral Resource estimate. Cut-off grades and grade tonnage figures and discussion are presented in Section 9.3.

The selection of the HM cut-off grade used for reporting was selected based on the following criteria:

- deposits within Mozambique and within comparable depositional settings and with similar to lower value mineralogy are utilising cut-off grades of approximately 1.3 to 2.9% HM;
- the grade tonnage curves show inflexion points at 1.5 and 2.5% HM, indicating a natural grade and tonnage break point; and

- the consideration of high level economic factors and other factors leading to a reasonable prospect of eventual economic extraction.

It was agreed between the Competent Persons to utilise a cut-off grade of 2 per cent HM to account for the value of the VHM (valuable heavy mineral) content and to align with an average of inflexion points on the grade tonnage curves.

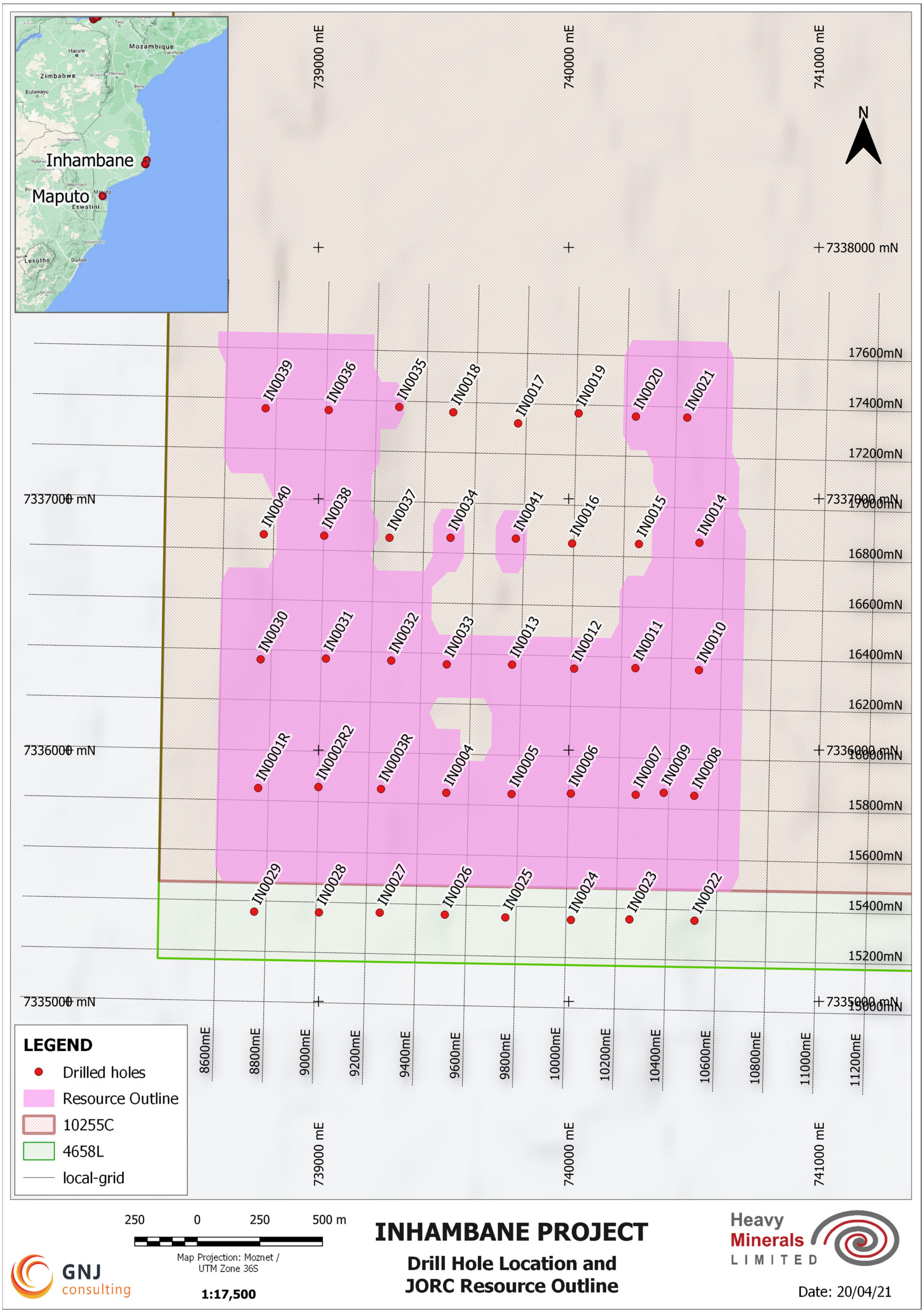


Figure 9.1: JORC Mineral Resource outline

9.3 RESOURCE STATEMENT (2012 JORC CODE SUPPORTING STATEMENT)

The Mineral Resource statement for the Inhambane deposit is presented in Table 9.1 below and the Mineral Resource outline with JORC Categories is presented in Figure 9.1. This table conforms to guidelines set out in the JORC Code (2012) and is formatted for internal reporting only.

The Inhambane project comprises an Inferred Mineral Resource of 51 Mt @ 3.4 per cent HM and 5 per cent slimes containing 1.7 Mt of HM. The breakdown of the Mineral Resource category is as follows:

- an Inferred Resource of 51 Mt @ 3.4 per cent HM and 5 per cent slimes containing 1.7 Mt of HM with an assemblage of 60 per cent ilmenite, 2 per cent rutile, 5 per cent zircon and 4 per cent leucoxene.

Table 9.1: Mineral Resource Statement for the Inhambane deposit as at April 2021

Summary of Mineral Resources(1)						HM Assemblage(2)					
Mineral Resource Category	Material (Mt)	In Situ HM (Mt)	HM (%)	SL (%)	OS (%)	Altered Ilmenite (%)	Primary Ilmenite (%)	Rutile (%)	Leucoxene (HiTi) (%)	Zircon (%)	Trash (%)
Inferred	51	1.7	3.4	5	-	29	31	2	4	5	30
Grand Total	**51**	**1.7**	**3.4**	**5**	**-**	**29**	**31**	**2**	**4**	**5**	**30**

Notes:

(1) Mineral resources reported at a cut-off-grade of 2% HM.

(2) Mineral assemblage is reported as a percentage of in situ HM content.

The supporting criteria for the resource classification is presented in Appendix 4 in alignment with the reporting requirements for Table 1 from the JORC Code (2012). The Mineral Resource figures presented in Table 9.1 are consistent with guidelines from the JORC Code (2012) with respect to reporting significant figures in addition to the experience of the Competent Person, Mr Greg Jones.

9.4 GRADE TONNAGE CURVES

Grade tonnage curves for the Inhambane deposit were calculated at various cut-off-grades to demonstrate the relationship to HM grade and tonnages for both material and HM contained tonnes. The selection of cut-off-grades was made in increments of 0.1 per cent HM either side of the selected cut-off-grade of 2 per cent HM, up to a cut-off-grade of 5 per cent HM.

The material tonnage verses HM grade is presented in Figure 9.2 which shows some inflection points in the tonnage curve. These points of inflection can be used to potentially pick key cut-off grade points and this figure shows that 1 per cent, 1.5 and 2.5 to 3 per cent HM are significant inflection points. There is a district drop off in tonnage at higher cut-off-grades indicating that at the current drill spacing there is no large volume of high grade material to potentially boost production for the drilled area.

Similar inflection points exist for the HM tonnage curves although these are much more subtle. What is interesting to note is that at lower cut-off grades there is a change in the stripping ratio given that the dune is entirely mineralised. Converting more of the dune material to resource drops the stripping ratio significantly.

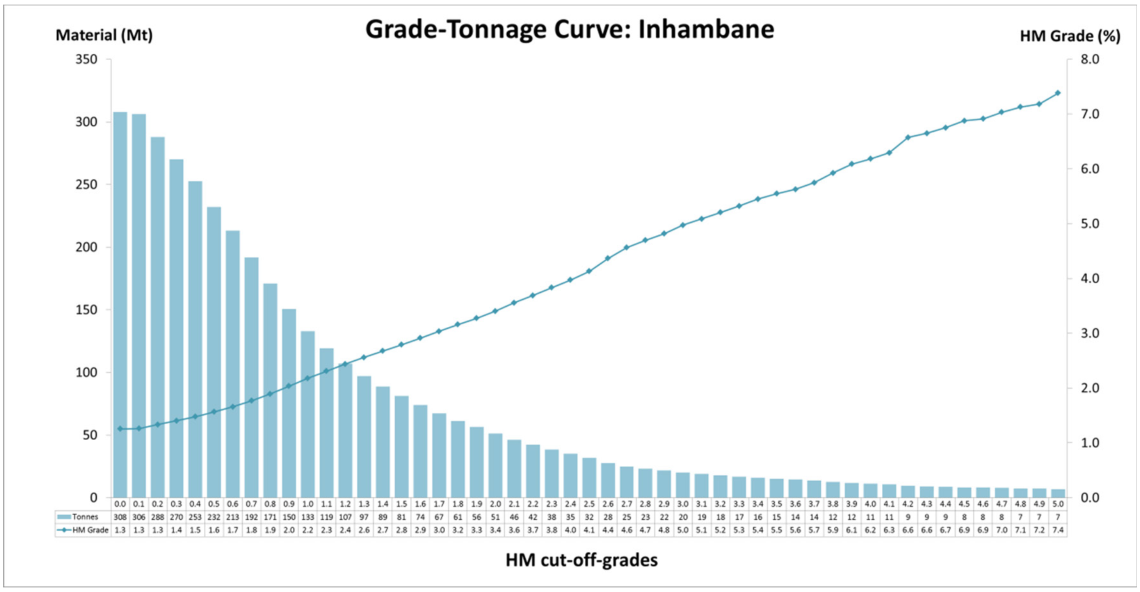


Figure 9.2: Grade tonnage curve for Inhambane (material tonnes vs HM grade)

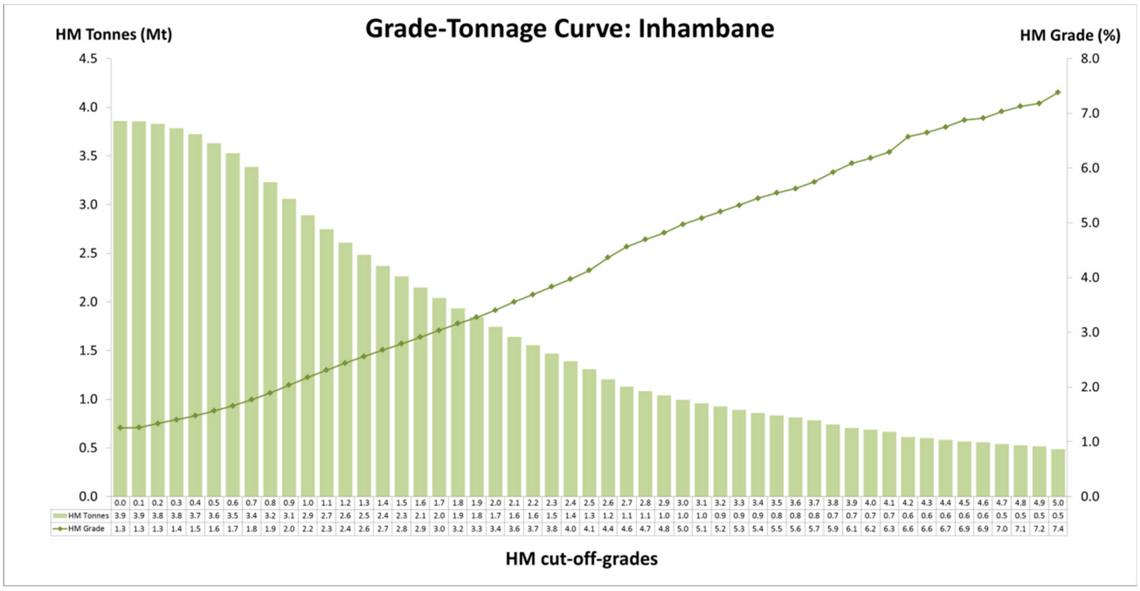


Figure 9.3: Grade tonnage curve for Inhambane (HM tonnes vs HM grade)

10 RECOMMENDATIONS

Recommendations for further work to improve or refine the Mineral Resource estimate for the Inhambane deposit have been identified for a number of areas.

The following points are recommended to be considered by HML for follow-up action or attention:

- further develop QA/QC procedures to include twin drilling and internal company blind field standards for submission to laboratories for analysis;
- opportunities to test the presence of strandline style mineralisation within the interpreted marine/alluvial sequence which was not previously identified as an Exploration Target;
- consideration of the refining the mineralogical and quality characterisation test work for the deposit to determine the true potential saleability of ilmenite; and
- further infill drilling for the Inhambane project and target testing at other identified sites in the project region.

11 REFERENCES

Cilek, V. 1989. Industrial minerals of Mozambique, Prague, Czech Geological Office. Available at: http://www.infomine.com/publications/docs/Cilek1989.pdf [Accessed 04 February 2016].

Cilek, V. 1985. Heavy mineral accumulations in coastal Mozambique. Transactions of the Czechoslovakian Academy of Sciences, 95, (1), 91 p.

Dumouchel, J., Hees, F. and Alvin, M.P., 2016 - Coastal evolution and associated titanium sand mineralisation of Jangamo district, Inhambane Province, Mozambique: in Trans. IMM (incorp. AusIMM Proc.), Section B, Appl. Earth Sc. v.125, pp. 140-152.

Emmel, B., Kumar, R., Ueda, K., Jacobs, J., Daszinnies, M. C., Thomas, R. J. and Matola, R. 2011. Thermochronological history of an orogen-passive margin system: an example from northern Mozambique. Tectonics, 30. doi:10.1029/2010TC002714.

Förster, R. 1975. The geological history of the sedimentary basin of southern Mozambique, and some aspects of the origin of the Mozambique Channel. Palaeogeography, Palaeoclimatology, Palaeoecology, 17, 267–287.

Mashaba, V. and Altermann, W. 2015. Calculation of water saturation in low resistivity gas reservoirs and pay-zones of the Cretaceous Grudja Formation, onshore Mozambique basin. Marine and Petroleum Geology, 67, (2015), 249–261.

Matthews, A., Lawrence, S. R., Mamad, A. V. and Fortes, G. 2001. Africa in perspective: Mozambique basin may have bright future under new geological interpretation. Oil and Gas Journal, 99, 70–75.

Mining-atlas.com. (2017). Jangamo. [online] Available at: https://mining-atlas.com/project/Jangamo-Mineral-Sands-Mine-Project.php [Accessed 01 Oct. 2017].

Palalane, J., Larson, M., Hanson, H. and Juizo, D. 2015. Coastal erosion in Mozambique: governing process and remedial measures. Journal of Coastal Research. doi:10.2112/JCOASTRES-D-14-00020.1.

Porter GeoConsultancy, 2016. Mutamba - Jangamo, Dongane, Ravene, Mozambique (information page). [online] Available at: http://www.portergeo.com.au/database/mineinfo.asp?mineid=mn1552 [Accessed 01 October 2017]

Rutten, R., Makitie, H., Vuori, S. and Marques, J. M. 2008. Sedimentary rocks of the Mapai Formation in the Massingir-Mapai region, Gaza Province, Mozambique. Geological Survey of Finland Special Paper, 48, 251–262.

Salazar, U., Baker, D., Francis, M., Kornpihl, D. and West, T. 2013. Frontier exploration offshore the Zambezi delta, Mozambique. First Break, 31, 135–144.

Salman, G. and Abdula, I. 1995. Development of the Mozambique and Ruvuma sedimentary basins, offshore Mozambique. Sedimentary Geology, 96, (1995), 7–41.

Schlüter, T. 2008. Geological Atlas of Africa, 2nd ed, Berlin, Springer, 180–183.

Stockwell, R. 2013. Mozmin Resources Pty Ltd: Inhambane Drill Review and Proposal. Consultant Report

Wright, I. 1998. South African east coast heavy mineral mining and the development of Mozambique's heavy mineral industry, in Pan-African Conference on Sustainable Integrated Coastal Management, Report 165, 203–208, International Oceanographic Commission, UNESCO, Paris.

12 COMPETENT PERSON STATEMENT

12.1 QUALIFICATIONS

The reporting and compilation of the Inhambane Exploration Results has been carried out by Mr Paul Leandri and the Mineral Resource estimate and associated statement has been compiled and prepared by Mr Greg Jones (Principal, GNJ Consulting Pty Ltd).

Mr Leandri is a qualified geologist with over 30 years of experience in exploration geology and resource evaluation. He is a Member of the Australian Institute of Geoscientists (AIG) and a Member of the Australasian Institute of Mining and Metallurgy (AusIMM) and has experience to qualify as a Competent Person under the Australasian Code for reporting of Exploration Results, Mineral Resources and Ore Reserves, 2012 Edition (JORC Code, 2012).

Mr Jones is a qualified geologist with over 25 years' experience in geology and resource evaluation. He is a Member of the Australasian Institute of Mining and Metallurgy (AusIMM) and has experience to qualify as a Competent Person under the Australasian Code for reporting of Exploration Results, Mineral Resources and Ore Reserves, 2012 Edition (JORC Code, 2012).

The Mineral Resource quoted in this report is based on information compiled by Mr Leandri and at the time of preparation of this estimate Mr Leandri was employed as a contractor by Heavy Minerals Limited.

12.2 DECLARATION (EXPLORATION RESULTS)

The Exploration Results collected and prepared for the use in the Inhambane Mineral Resource as presented in this report has been prepared under the guidelines of the JORC Code (2012).

I, Paul Leandri, confirm that I am the Competent Person for the Exploration Results section of this report and:

- I have read and understood the requirements of the 2012 Edition of the Australasian Code for reporting of Exploration Results, Mineral Resources and Ore Reserves (JORC Code, 2012);
- I am a Competent Person as defined by the JORC Code (2012), having a minimum of five years' experience that is relevant to the style of mineralisation and type of deposit described in the report and to the activity for which I am accepting responsibility;
- I am a Member of the AIG; and
- I have reviewed the report to which this Consent Statement applies.

I, Paul Leandri do declare that I do not have any material interest or entitlement, direct or indirect, in the securities of Heavy Minerals Limited. Paul Leandri commenced providing geological services to Heavy Minerals Limited in May 2014. Fees for the preparation of this report are on a time and materials basis.

I verify that the Report (210523 [MOZ001] Inhambane Mineral Resource Estimation and Geological Report [JORC Technical Report]) is based on and fairly and accurately reflects the form and context in which it appears, information in my supporting documentation relating to Exploration Results.

12.3 DECLARATION (MINERAL RESOURCES)

This Inhambane Mineral Resource as presented in this report has been prepared under the guidelines of the JORC Code (2012).

I, Greg Jones, confirm that I am the Competent Person for the Mineral Resources section of this report and:

- I have read and understood the requirements of the 2012 Edition of the Australasian Code for reporting of Exploration Results, Mineral Resources and Ore Reserves (JORC Code, 2012);
- I am a Competent Person as defined by the JORC Code (2012), having a minimum of five years' experience that is relevant to the style of mineralisation and type of deposit described in the report and to the activity for which I am accepting responsibility;
- I am a Fellow of the AusIMM; and
- I have reviewed the report to which this Consent Statement applies.

GNJ Consulting has a material interest or entitlement, direct or indirect, in the securities of Heavy Minerals Limited. GNJ Consulting commenced providing geological services to Heavy Minerals Limited in June 2014. Fees for the preparation of this report are on any value attributed to a share allocation on the successful listing of Heavy Minerals Limited.

I verify that the Report (210523 [MOZ001] Inhambane Mineral Resource Estimation and Geological Report [JORC Technical Report]) is based on and fairly and accurately reflects the form and context in which it appears, information in my supporting documentation relating to Mineral Resources.

26 May 2021

GREG JONES
BSc (Hons) (Geology), FAusIMM
Principal
GNJ Consulting Pty Ltd

210523 [moz001] inhambane mineral resource estimation and geological report [jorc technical report].docx

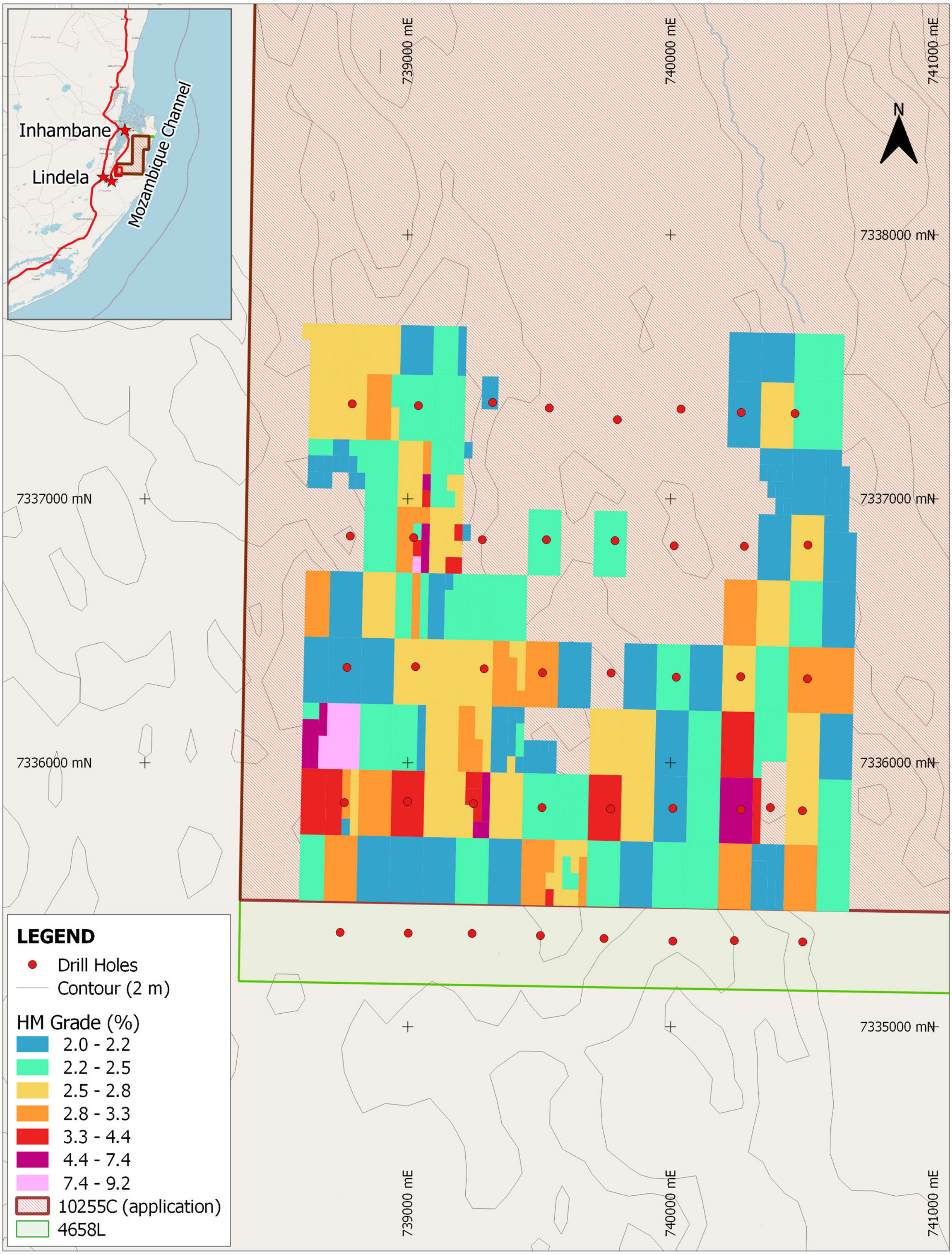
PAGE DELIBERATELY LEFT BLANK

APPENDIX 1: SECTIONS SHOWING HM AND SLIMES GRADES IN DRILL HOLES AND MODELS

**PAGE DELIBERATELY
LEFT BLANK**

APPENDIX 2: PLANS SHOWING SELECTED FIELD HEAT MAPS IN SUMMARY BLOCK MODEL FOR TOTAL MODEL (ZONES 3 AND 5)

PAGE DELIBERATELY LEFT BLANK



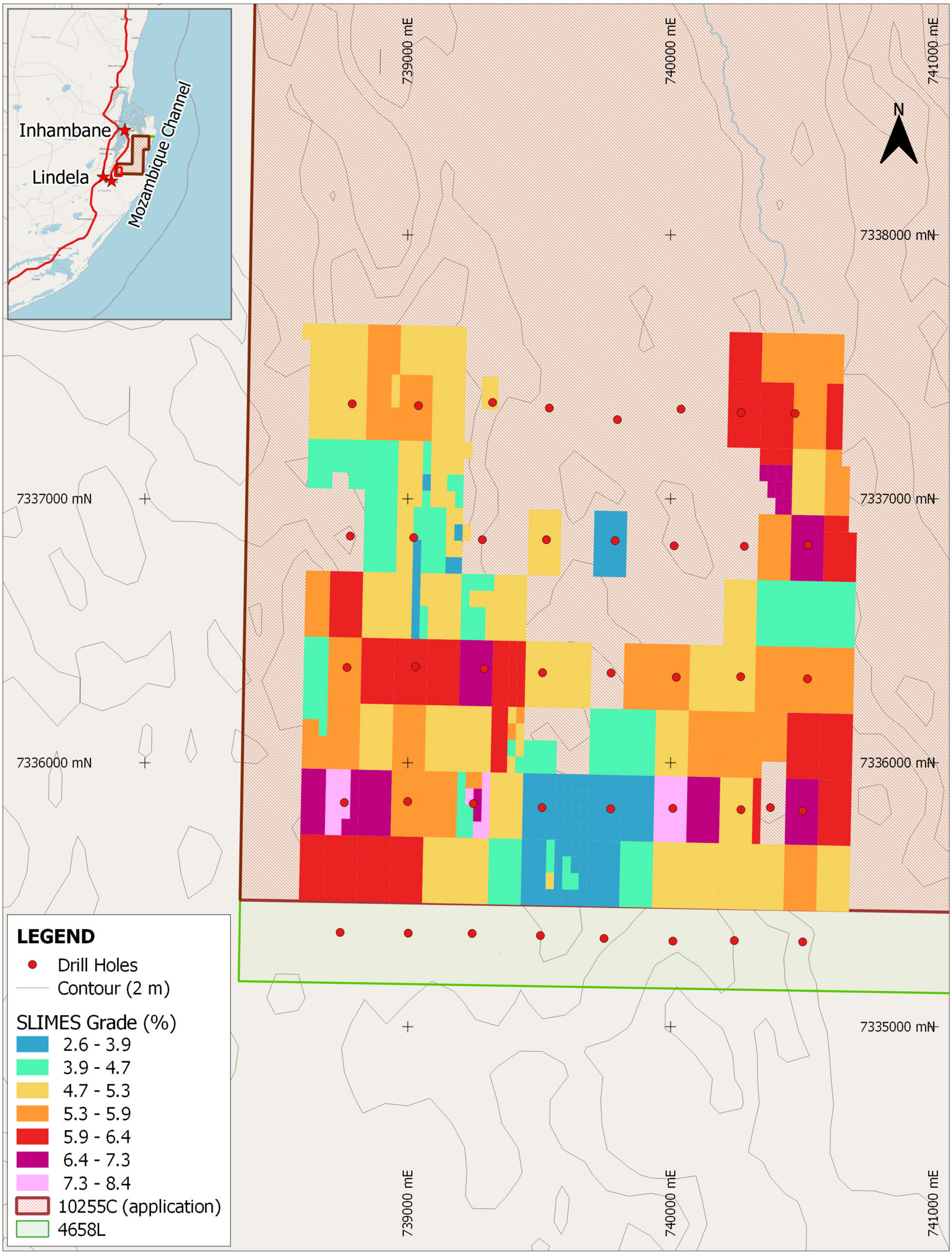
Map Projection: Moznet / UTM Zone 36S

1:17500

INHAMBANE PROJECT

Summary Resource Model
HM Grade (%)

Date: 19/05/21



250 0 250 500 m

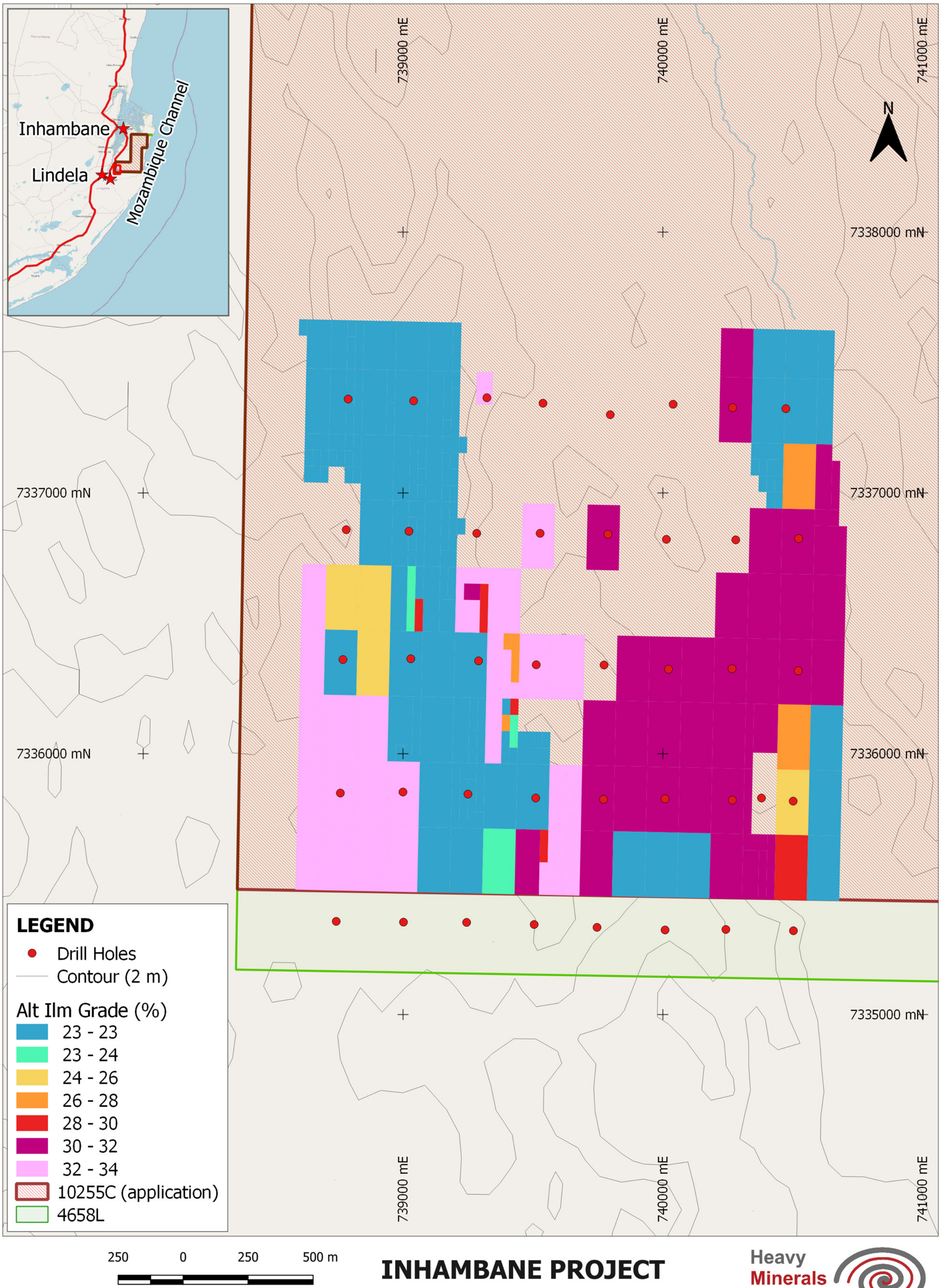
Map Projection: Moznet / UTM Zone 36S

1:17500

INHAMBANE PROJECT

Summary Resource Model SLIMES Grade (%)

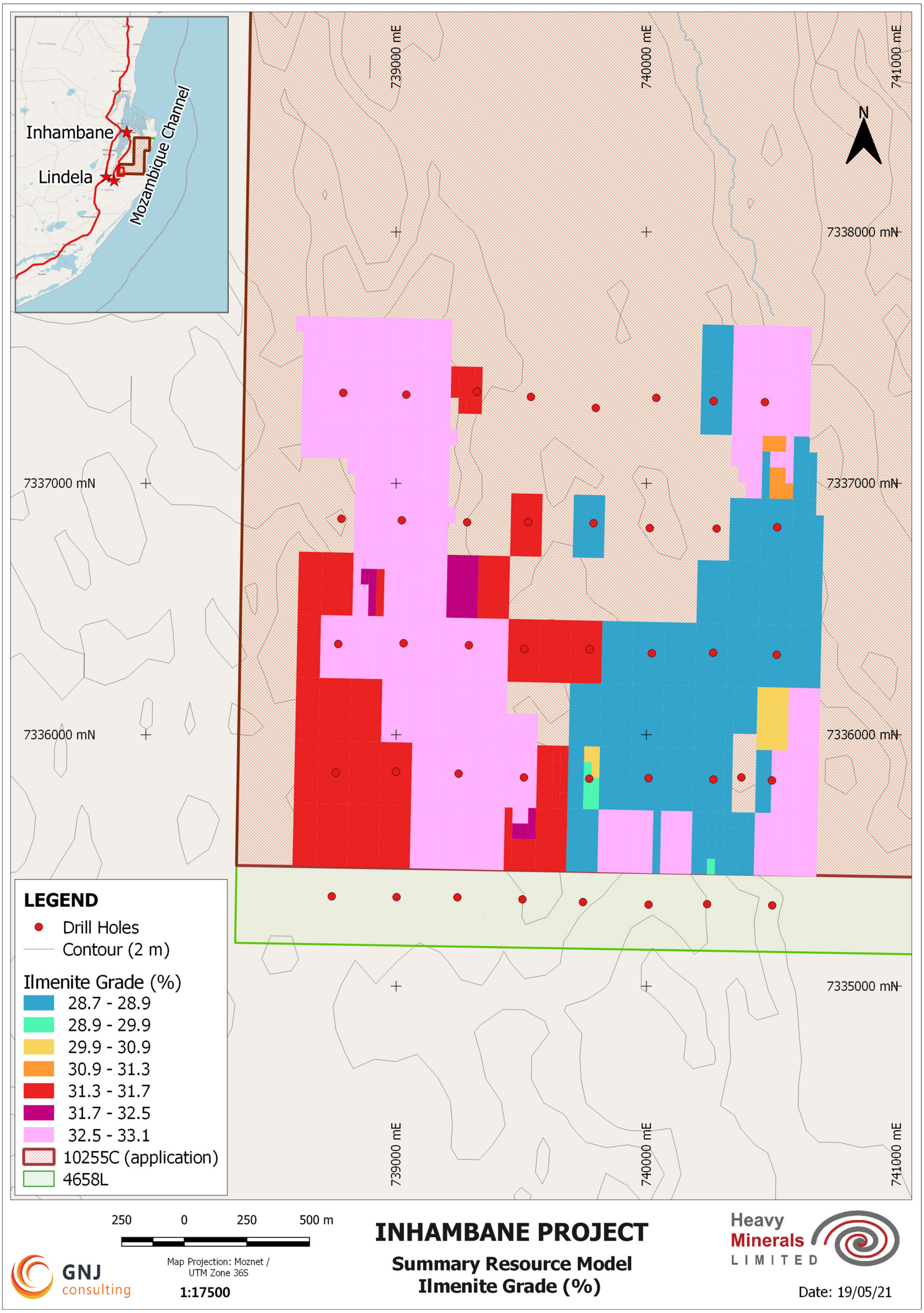
Date: 19/05/21

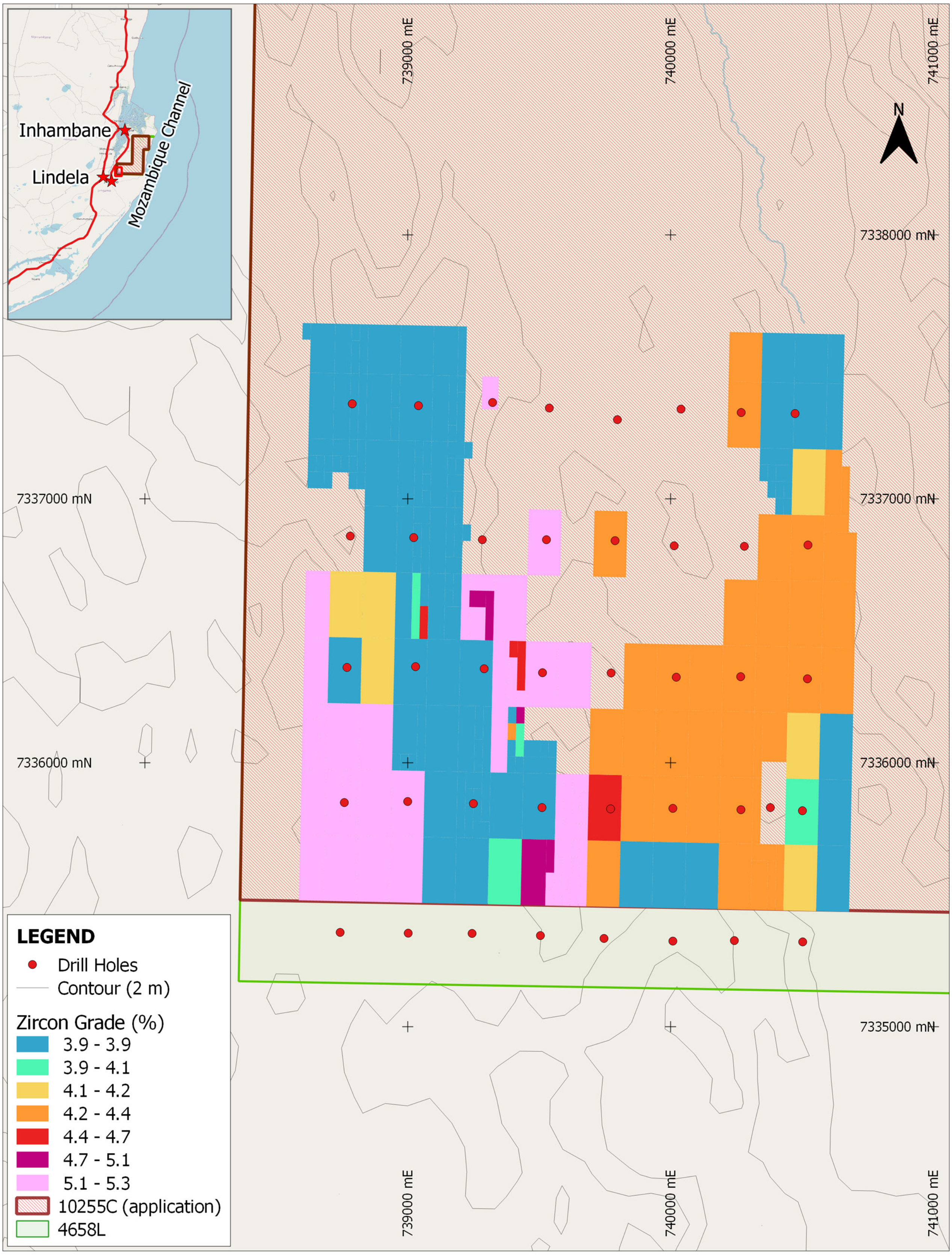


INHAMBANE PROJECT

Summary Resource Model
Altered Ilmenite Grade (%)

Date: 19/05/21

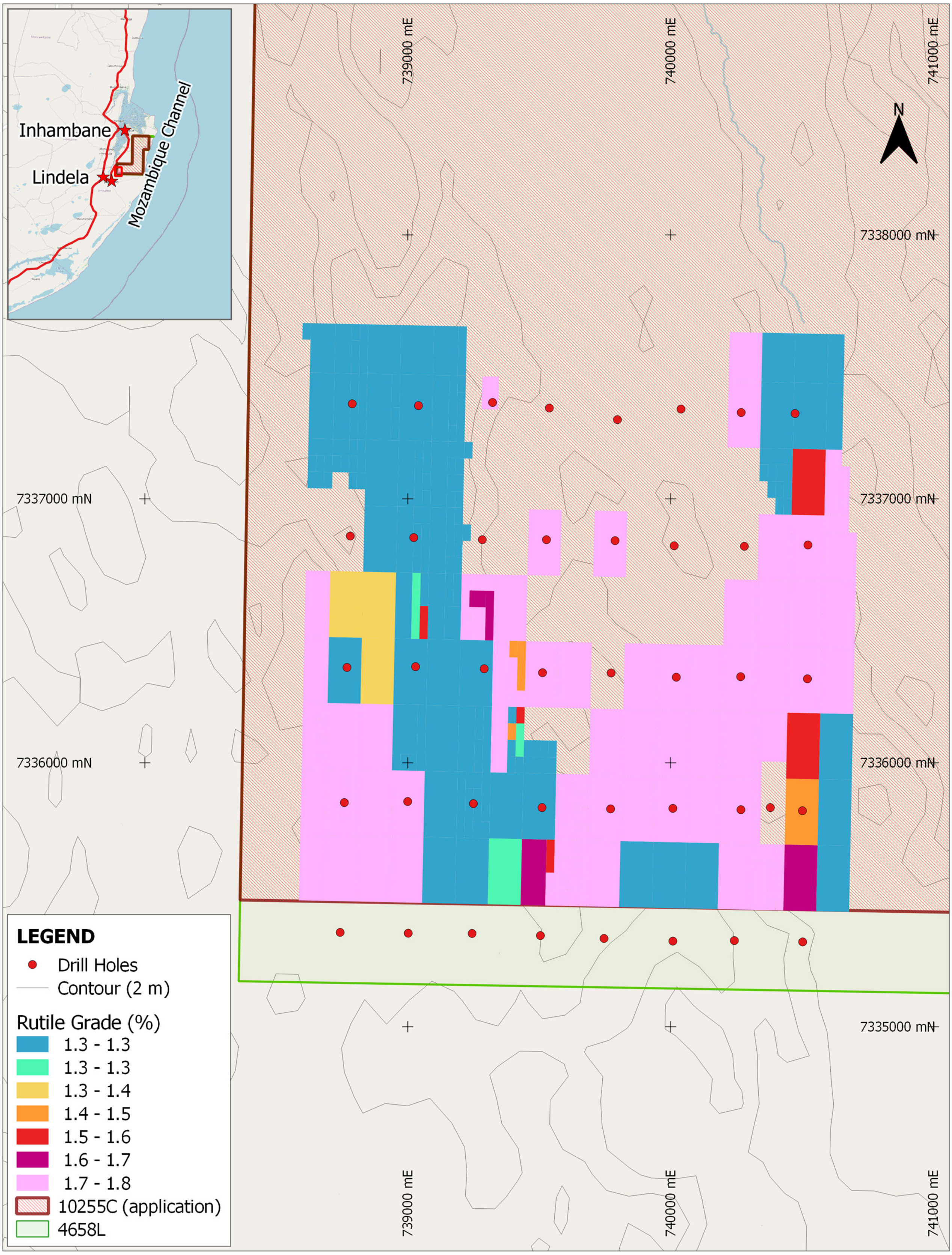

739000 mE
740000 mE
741000 mE
N
7338000 mN
7337000 mN
7336000 mN
7335000 mN
Inhambane
Lindela
Mozambique Channel
LEGEND
Drill Holes
Contour (2 m)
Ilmenite Grade (%)
28.7 - 28.9
28.9 - 29.9
29.9 - 30.9
30.9 - 31.3
31.3 - 31.7
31.7 - 32.5
32.5 - 33.1
10255C (application)
4658L
250 0 250 500 m
Map Projection: Moznet / UTM Zone 36S
1:17500
INHAMBANE PROJECT
Summary Resource Model
Ilmenite Grade (%)
Heavy Minerals LIMITED
Date: 19/05/21



INHAMBANE PROJECT

Summary Resource Model
Zircon Grade (%)

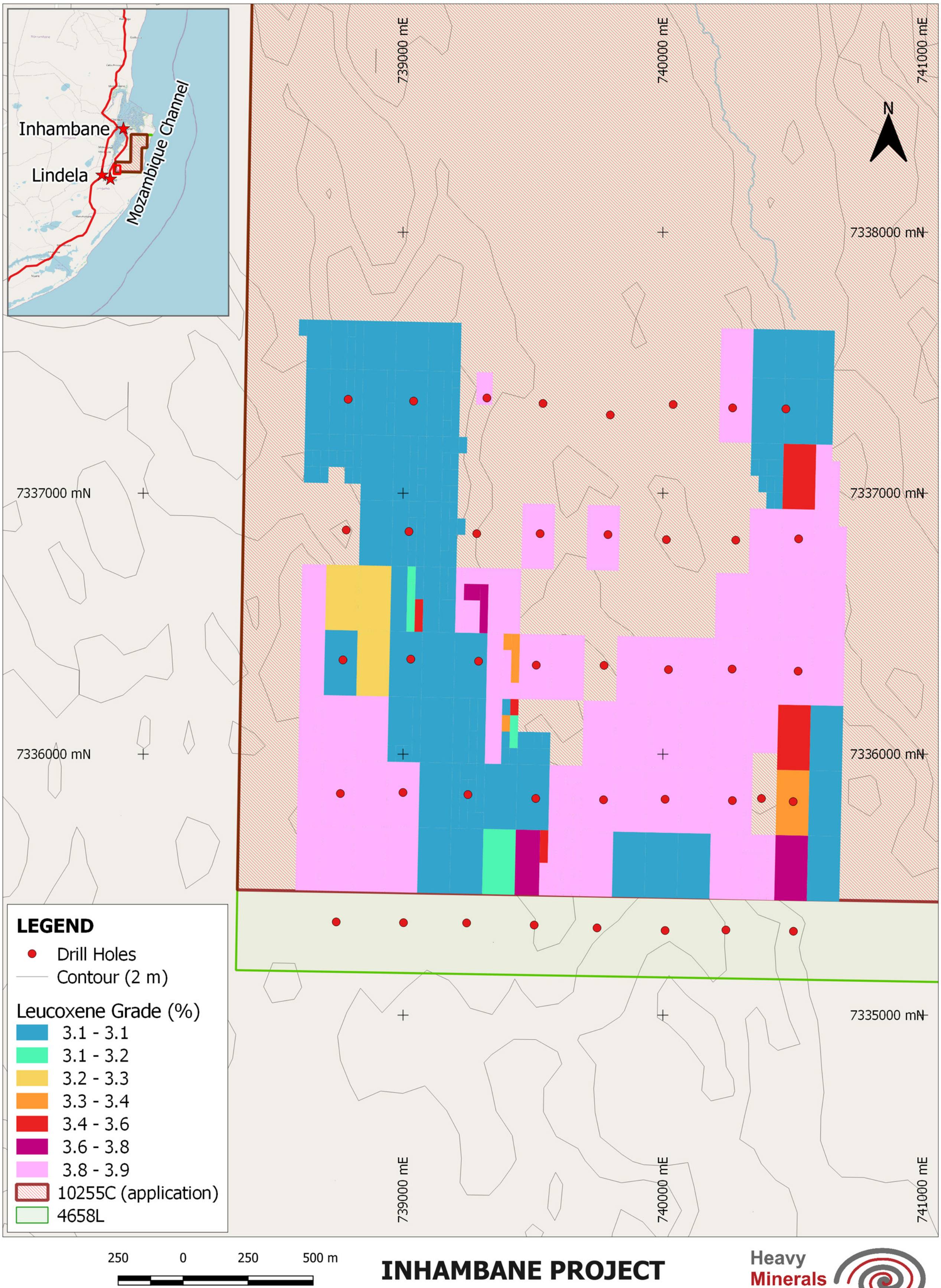
Date: 19/05/21



INHAMBANE PROJECT

Summary Resource Model
Rutile Grade (%)

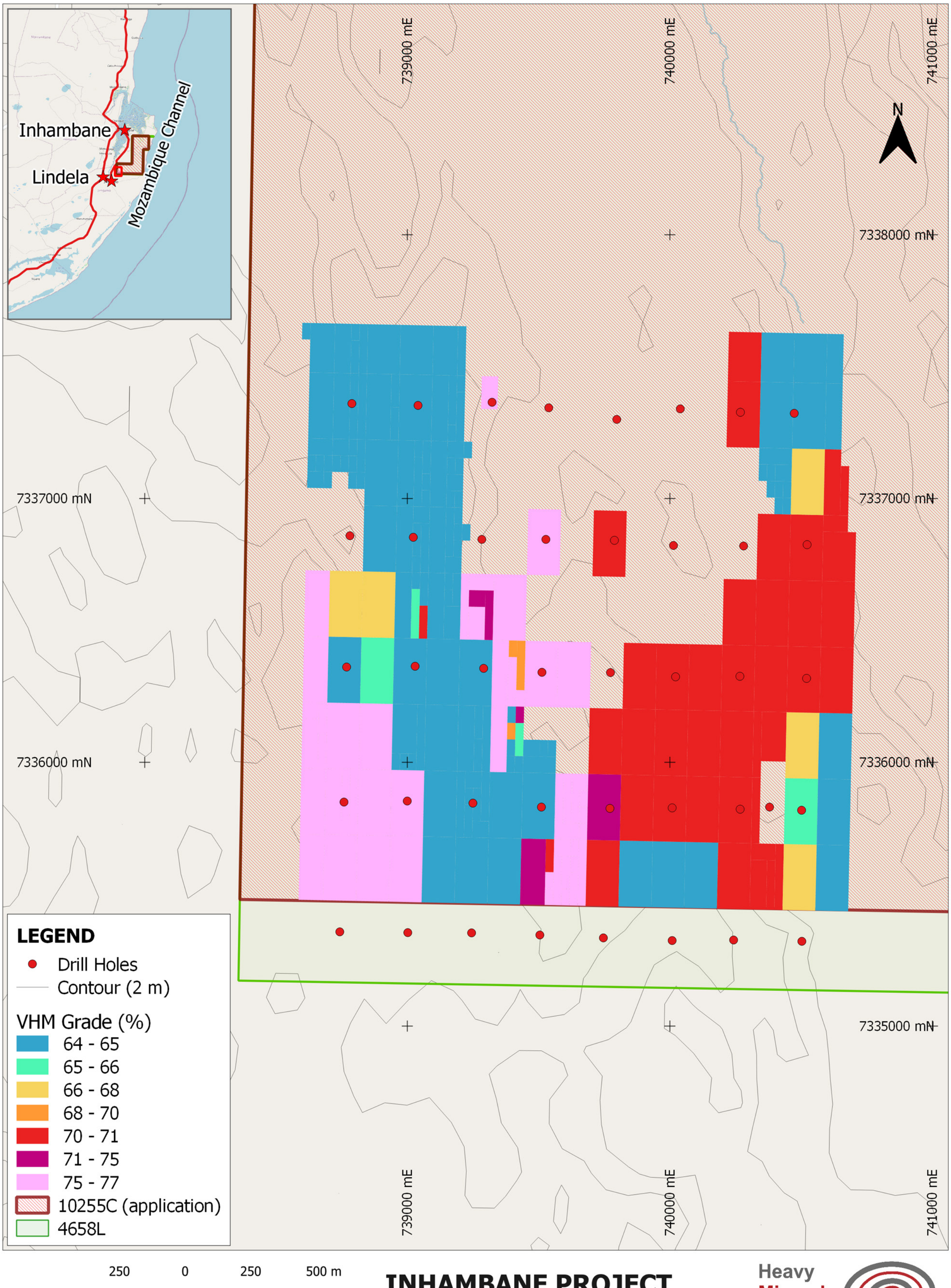
Date: 19/05/21



INHAMBANE PROJECT

Summary Resource Model Leucoxene Grade (%)

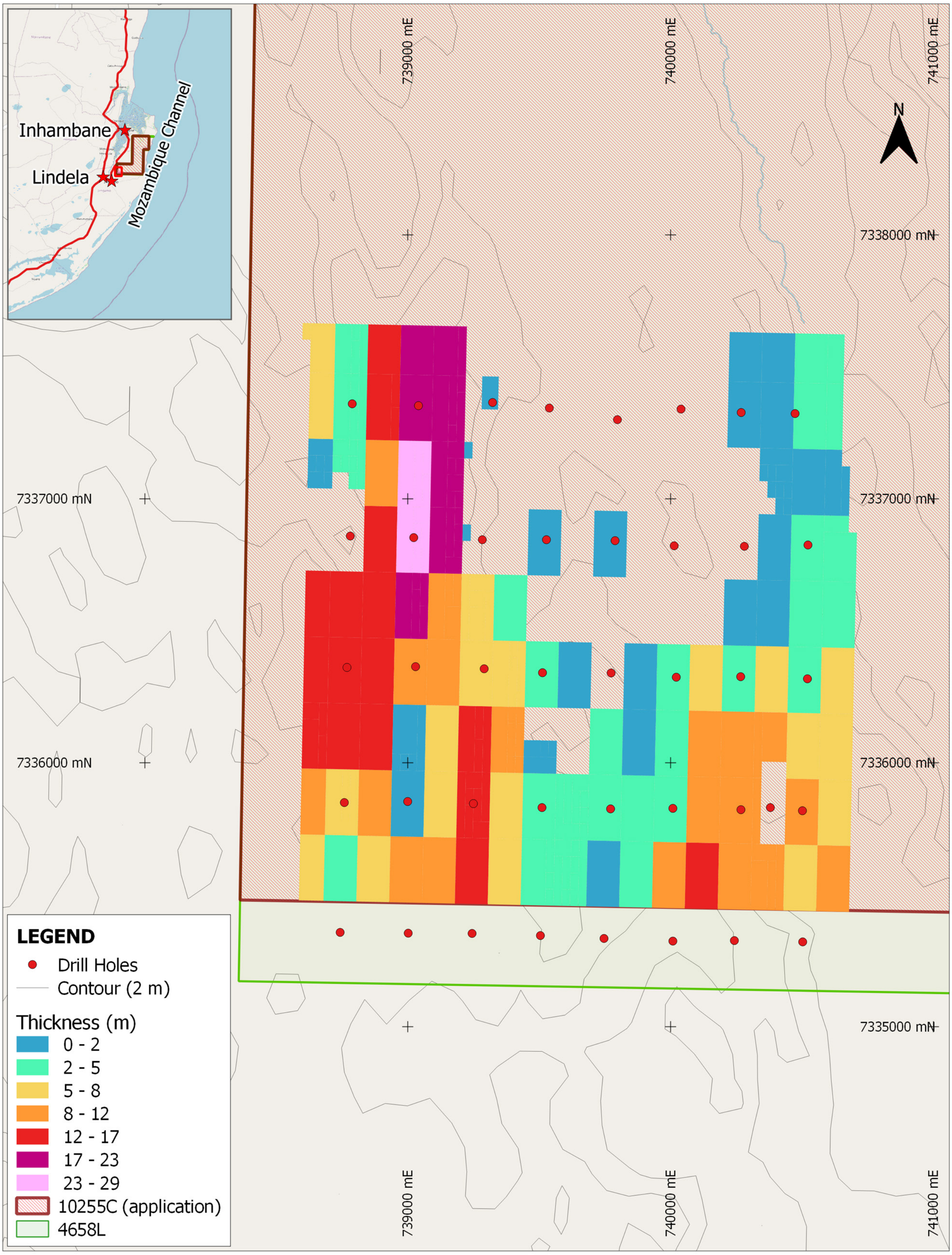
Date: 19/05/21



INHAMBANE PROJECT

Summary Resource Model
VHM Grade (%)

Date: 19/05/21



250 0 250 500 m

Map Projection: Moznet / UTM Zone 36S

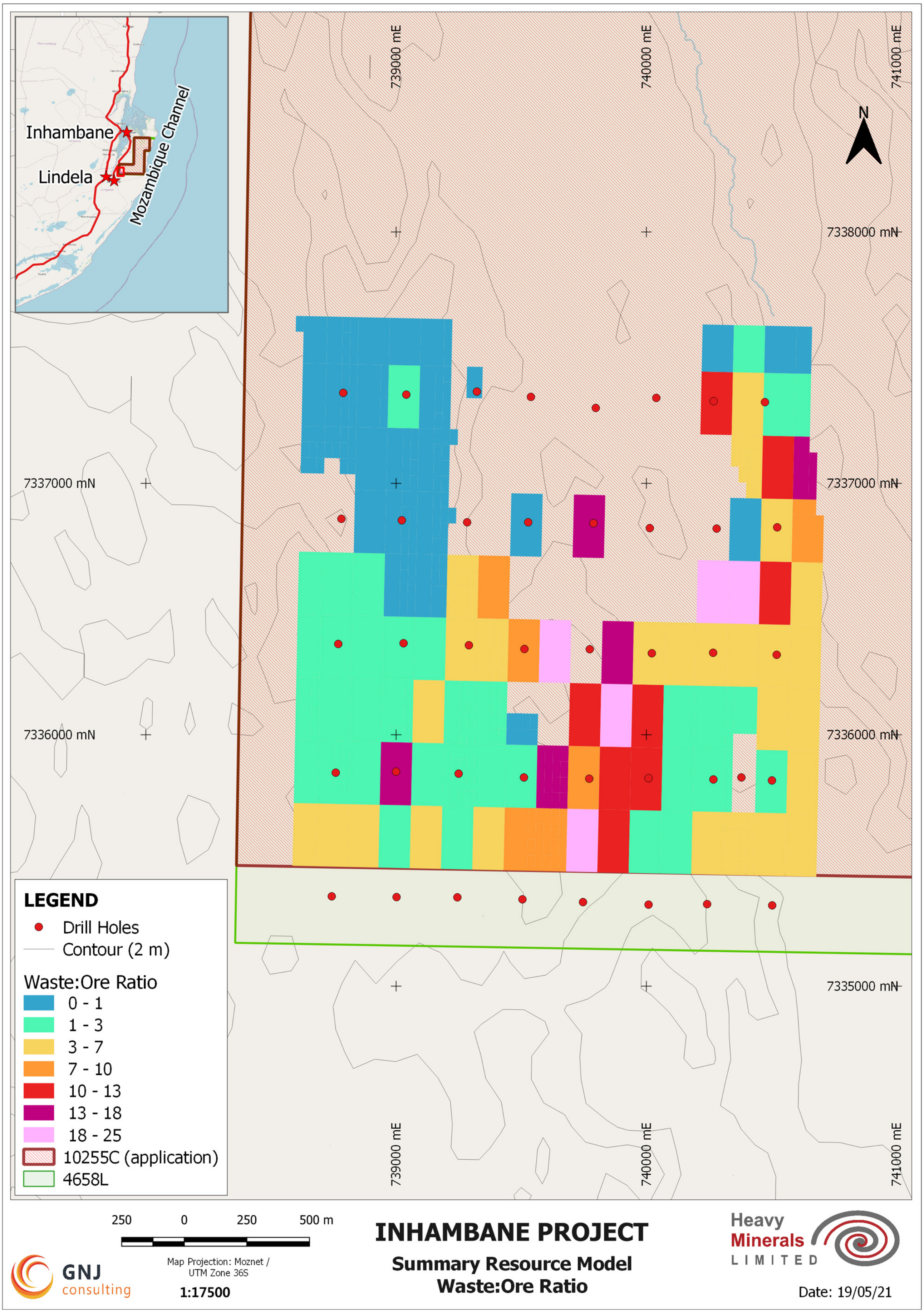
1:17500

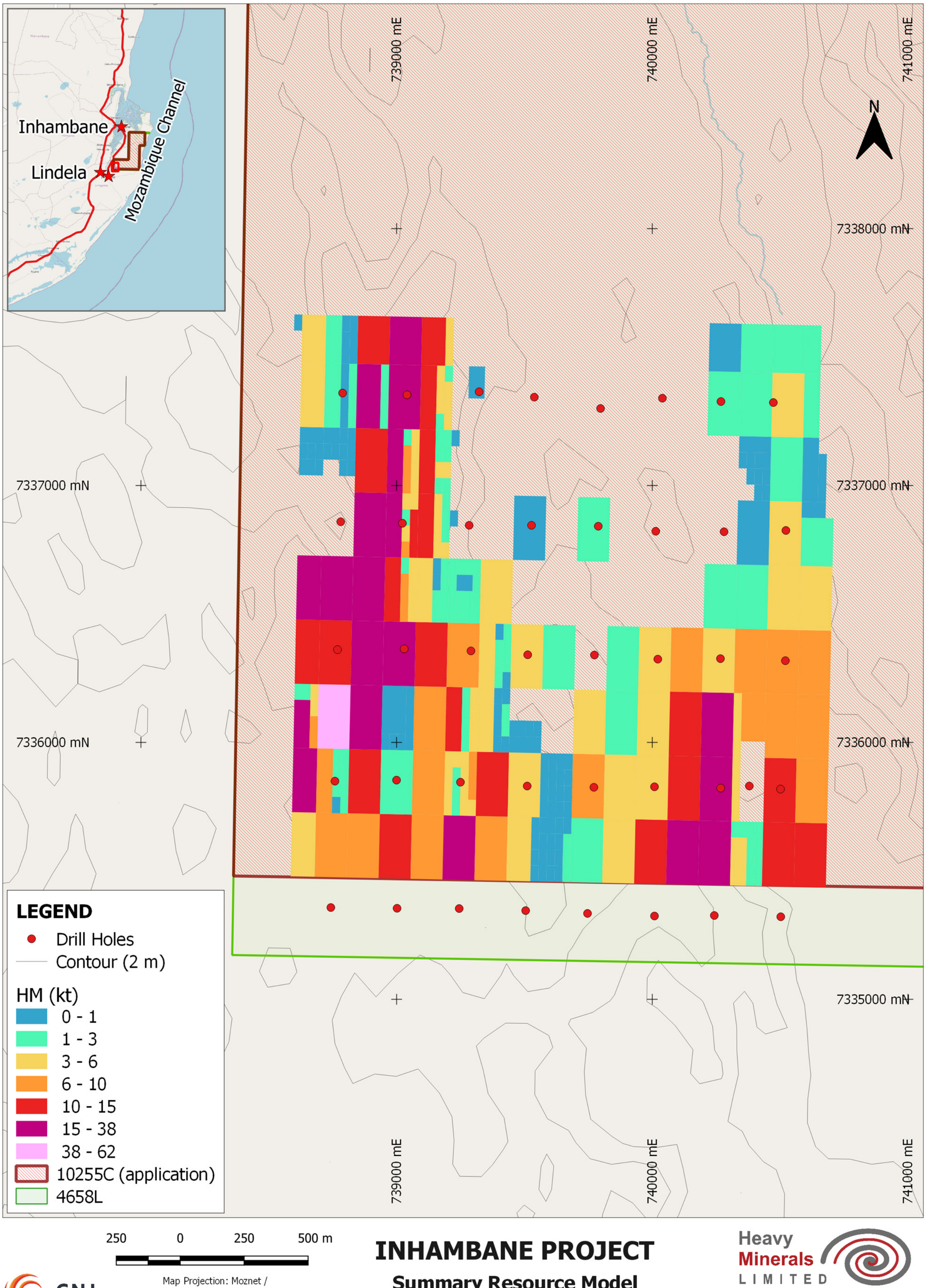
INHAMBANE PROJECT

Summary Resource Model
Mineralisation Thickness (m)

Heavy Minerals LIMITED

Date: 19/05/21

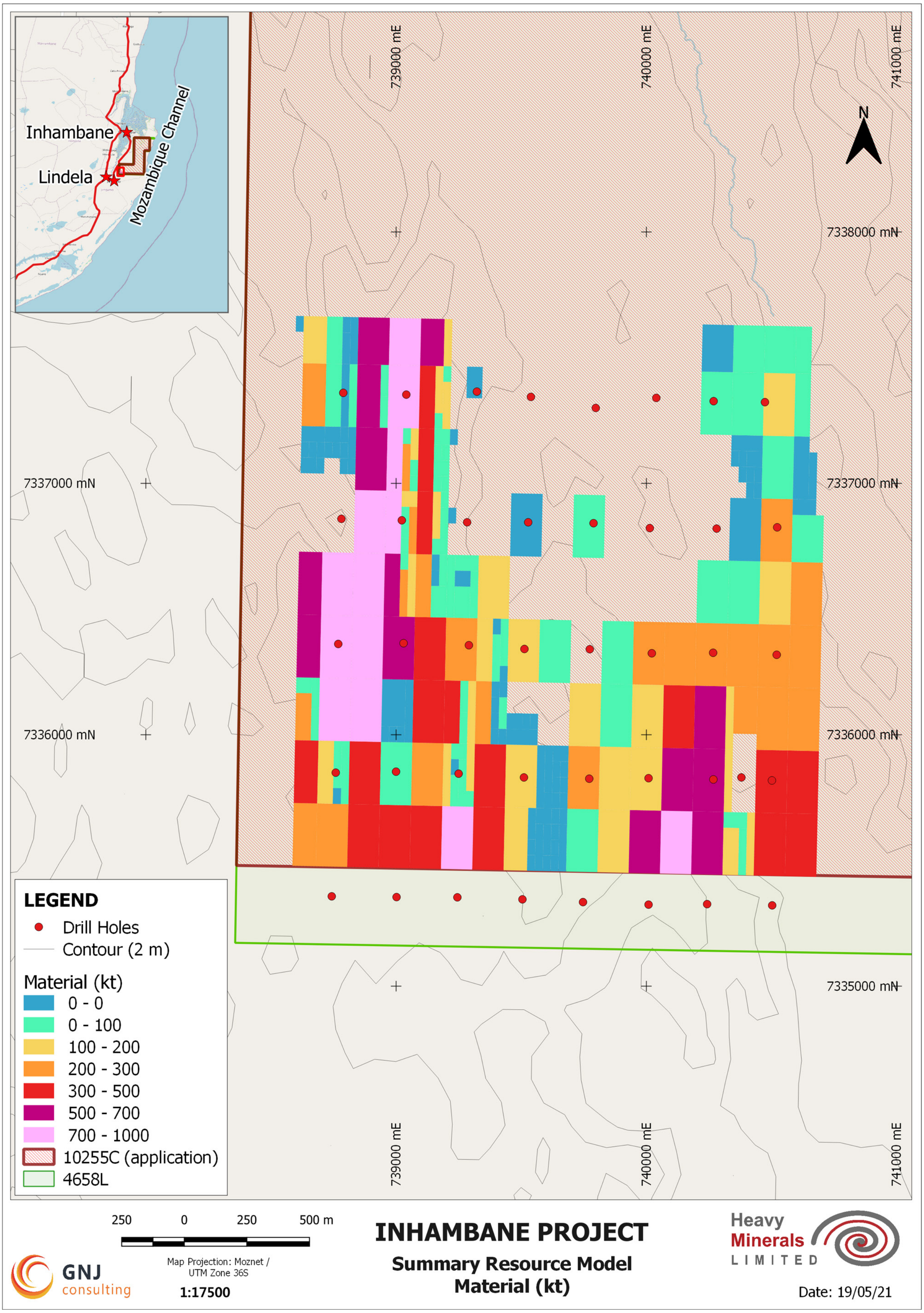

Inhambane
Lindela
Mozambique Channel
739000 mE
740000 mE
741000 mE
N
7338000 mN
7337000 mN
7336000 mN
7335000 mN
LEGEND
Drill Holes
Contour (2 m)
Waste:Ore Ratio
0 - 1
1 - 3
3 - 7
7 - 10
10 - 13
13 - 18
18 - 25
10255C (application)
4658L
250 0 250 500 m
Map Projection: Moznet / UTM Zone 36S
1:17500
INHAMBANE PROJECT
Summary Resource Model
Waste:Ore Ratio
Date: 19/05/21



INHAMBANE PROJECT

Summary Resource Model
HM (kt)

Date: 19/05/21



Inhambane
Lindela
Mozambique Channel
739000 mE
740000 mE
741000 mE
7338000 mN
7337000 mN
7336000 mN
7335000 mN
N
LEGEND
Drill Holes
Contour (2 m)
Material (kt)
0 - 0
0 - 100
100 - 200
200 - 300
300 - 500
500 - 700
700 - 1000
10255C (application)
4658L
250 0 250 500 m
Map Projection: Moznet / UTM Zone 36S
1:17500
INHAMBANE PROJECT
Summary Resource Model
Material (kt)
Heavy Minerals LIMITED
Date: 19/05/21

APPENDIX 3: SUMMARY DRILL HOLE INFORMATION (COMPOSITED INTERVALS > 2% HM)

**PAGE DELIBERATELY
LEFT BLANK**

BHID	X	Y	Z	FROM	TO	LENGTH	ZONE	EST_HM	OS	SLIMES	HM
IN0001R	8759	15849	15.5	24.5	30.5	6	5	5.8	0	7.6	7.1
IN0002R2	9000	15858	21.6	21.5	24.5	3	5	2.4	0	8.4	3.1
IN0002R2	9000	15858	17.9	26	27.5	1.5	5	0.7	0	6.6	2.2
IN0003R	9250	15855	49.8	2	9.5	7.5	3	2.0	0	4.8	3.1
IN0003R	9250	15855	40.0	12.5	18.5	6	3	2.3	0	7.3	3.5
IN0003R	9250	15855	36.3	18.5	20	1.5	5	1.8	0	9.1	4.2
IN0003R	9250	15855	16.0	38	41	3	5	1.4	0	5.9	2.2
IN0004	9511	15846	53.8	6.5	11	4.5	3	1.1	0	4.3	2.2
IN0005	9772	15846	14.0	32	36.5	4.5	5	3.0	0	2.9	3.4
IN0006	10009	15853	20.7	32	35	3	5	0.9	0	5.6	2.5
IN0006	10009	15853	15.5	38	39.5	1.5	5	1.2	0	3.9	3.4
IN0007	10268	15854	15.5	23	36.5	13.5	5	7.1	0	4.3	7.8
IN0008	10502	15855	39.9	3.5	6.5	3	5	2.1	0	6.3	2.7
IN0008	10502	15855	12.2	29	36.5	7.5	5	2.2	0	5.6	4.3
IN0010	10511	16355	14.0	26	33.5	7.5	5	2.1	0	5.2	3.5
IN0011	10257	16357	12.6	29	35	6	5	1.6	0	5.0	4.2
IN0012	10012	16350	16.5	23	29	6	5	1.5	0	6.3	2.9
IN0013	9763	16361	14.0	26	27.5	1.5	5	1.5	0	4.5	2.4
IN0014	10502	16862	23.2	21.5	27.5	6	5	2.1	0	5.0	2.7
IN0018	9508	17360	12.1	29	30.5	1.5	5	1.0	0	5.9	2.0
IN0019	10008	17367	6.2	36.5	38	1.5	200	0.4	0	13.3	2.5
IN0020	10238	17358	22.2	18.5	23	4.5	5	1.4	0	6.4	2.3
IN0021	10443	17359	36.9	3.5	6.5	3	5	1.9	0	7.3	3.4
IN0030	8758	16361	41.8	11	12.5	1.5	3	0.5	0	6.3	2.3
IN0030	8758	16361	38.8	14	15.5	1.5	3	1.4	0	6.4	3.9
IN0030	8758	16361	31.3	21.5	23	1.5	5	0.2	0	2.7	2.3
IN0030	8758	16361	18.6	27.5	42.5	15	5	2.7	0	5.3	8.7
IN0031	9019	16370	41.7	3.5	15.5	12	3	0.7	0	6.3	3.1
IN0031	9019	16370	16.2	33.5	36.5	3	5	1.0	0	6.0	2.5
IN0031	9019	16370	11.0	39.5	41	1.5	5	0.5	0	2.3	3.5
IN0032	9280	16367	47.1	2	5	3	3	0.6	0	6.6	2.8
IN0032	9280	16367	17.1	30.5	36.5	6	5	2.2	0	5.6	4.0
IN0033	9503	16357	18.1	24.5	27.5	3	5	1.2	0	5.2	3.4
IN0033	9503	16357	3.8	39.5	41	1.5	200	1.0	0	14.3	2.1
IN0034	9507	16861	13.8	23	24.5	1.5	5	1.2	0	4.2	2.7
IN0035	9291	17376	42.0	6.5	8	1.5	3	0.7	0	3.5	2.0
IN0035	9291	17376	28.5	20	21.5	1.5	5	1.5	0	4.9	2.3
IN0036	9009	17359	43.3	2	21.5	19.5	3	1.8	0	5.2	2.9
IN0036	9009	17359	13.3	41	42.5	1.5	5	0.5	0	6.0	2.4
IN0037	9263	16856	41.5	2	3.5	1.5	3	1.0	0	3.8	2.2
IN0038	9002	16858	51.4	0	14	14	3	1.4	0	4.5	2.7
IN0038	9002	16858	32.4	18.5	33.5	15	3	4.6	0	2.8	4.7
IN0039	8757	17360	43.5	0	3.5	3.5	3	1.4	0	5.2	2.8
IN0039	8757	17360	32.0	12.5	14	1.5	3	0.1	0	2.4	2.3
IN0039	8757	17360	18.5	26	27.5	1.5	5	1.0	0	4.1	2.0

BHID	X	Y	Z	FROM	TO	LENGTH	ZONE	EST_HM	OS	SLIMES	HM
IN0041	9735	16859	15.3	23	24.5	1.5	5	3.5	0	2.2	3.7

APPENDIX 4: RESOURCE STATEMENT SUPPORTING COMMENTARY (AFTER TABLE 1, JORC CODE 2012

**PAGE DELIBERATELY
LEFT BLANK**

Section 1 Sampling Techniques and Data		
Criteria	**Explanation**	**Comment**
Sampling techniques	*Nature and quality of sampling (eg cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheld XRF instruments, etc). These examples should not be taken as limiting the broad meaning of sampling.*	*The deposit was sampled using Reverse Circulation Air-Core (RCAC), top drive rotary open hole.*
	Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.	*An estimate was made of the approximate size of the samples expected based on the drilling interval, the size of the drill rod and the split taken from the drill rig sampling cyclone. The size of the split was in line with expectations.*
	Aspects of the determination of mineralisation that are Material to the Public Report. In cases where 'industry standard' work has been done this would be relatively simple (eg 'reverse circulation drilling was used to obtain 1 m samples from which 3 kg was pulverised to produce a 30 g charge for fire assay'). In other cases more explanation may be required, such as where there is coarse gold that has inherent sampling problems. Unusual commodities or mineralisation types (eg submarine nodules) may warrant disclosure of detailed information.	*RCAC drilling was used to obtain a 1.5 to 2 m samples from which approximately 1.2-2.5 kg was collected using a Metzke Fixed Cone Splitter with Transition. The sample was then split down to approximately 1 kg for transport back to Diamantina Laboratories in Perth, Australia for assaying. The sample was then dried, de-slimed (material less than 45 µm removed) and then oversize (material +2mm) was removed* *Approximately 100 g of the resultant sample was then subjected to a heavy mineral (HM) float/sink technique using tetra-bromo-ethane (TBE: SG=2.92-2.96 gcm^{-3}).* *The resulting HM concentrate was then dried and weighed. Some of the HM concentrate samples were grouped together to form mineral assemblage composite samples.* *These mineral assemblage composite samples then were subjected to QEMSCAN analysis.*
Drilling techniques	*Drill type (eg core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc) and details (eg core diameter, triple or standard tube, depth of diamond tails, face-sampling bit or other type, whether core is oriented and if so, by what method, etc).*	*RCAC drilling accounts for 100 per cent of the total drilling. All holes are drilled vertical with no downhole surveying to confirm hole direction. The size of the drill rods used for the drilling program was NQ.*
Drill sample recovery	*Method of recording and assessing core and chip sample recoveries and results assessed.*	*Drill sample recovery was considered to be quite good with sample weights as expected (based on the size of the drill rods, sampling interval and split size). Ground conditions were dry to damp and considered ideal for air core drilling in sand. Heavy groundwater flow can adversely affect sand recovery and influence the preferential segregation of heavy mineral from quartz sand and clay.*

Criteria	Explanation	Comment
	Measures taken to maximise sample recovery and ensure representative nature of the samples.	*Sampling on the drill rig was observed to ensure that the cyclone remained clean. The cyclone was washed at the end of each hole and cleaned with hammering or scraping as required.*
	Whether a relationship exists between sample recovery and grade and whether sample bias may have occurred due to preferential loss/gain of fine/coarse material.	*The representivity of samples was checked by comparing the split weights of samples at the beginning and ending of each drill rod (effectively the 1st half versus the 2nd half of the rod). The original sample weights were not recorded, however cone and quartering was carried out on samples recovered from the cyclone, which were then weighed. The split samples therefore are representative of the original sample (considering the final split as an equal subset ratio of the original sample).* *The sample weights were analysed for each of the positions within the drill rod and those results are presented in Figure 5.1. The 1st position is identified by label 1 and the 2nd position identified by label 2.* *There is a minor amount of bias between sample position 1 and sample position 2 however it does tend to switch backwards and forwards and the overall weight differential between the 2 sample positions is considered not significant enough to impact on sample representivity.*
Logging	*Whether core and chip samples have been geologically and geotechnically logged to a level of detail to support appropriate Mineral Resource estimation, mining studies and metallurgical studies.*	*HML collected detailed qualitative logging of geological characteristics to allow a robust geological interpretation to be carried out.*
	Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc) photography.	*Logging of RCAC samples recorded estimated slimes, washing, colour, lithology, dominant grainsize, coarsest grainsize, sorting, induration type, hardness, estimated rock and estimated HM.*
	The total length and percentage of the relevant intersections logged.	*All drill holes were logged in full and approximately 68 per cent of samples were assayed and used in the resource estimation exercise.*
Sub-sampling techniques and sample preparation	*If core, whether cut or sawn and whether quarter, half or all core taken.*	*No core samples were taken due to the unconsolidated nature of the material being drilled and sampled as well as the disaggregation process during air core drilling.*
	If non-core, whether riffled, tube sampled, rotary split, etc and whether sampled wet or dry.	*Samples were recovered from the cone splitter beneath the cyclone. Samples were then transported to a core yard where they were subsequently dried, cone and quartered to a smaller subsample more appropriate for transport back to Australia.*

Criteria	Explanation	Comment
		The final sample size was approximately 1 kg and considered to be appropriate compared with the grain size of the material being sampled.
	For all sample types, the nature, quality and appropriateness of the sample preparation technique.	*Sample preparation is consistent with contemporary industry practices.*
	Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.	*QA/QC in the form of laboratory and rig duplicates were used to monitor laboratory performance. Laboratory and rig duplicates were submitted at the rate of approximately 1 in 40 each for a combined submission rate of one in 20. The rig duplicates were collected from the sampling apparatus at the rate of approximately 1 every 40th interval sampled, given the next sample number in sequence, then submitted for assay. Separate duplicate samples were not collected during the cone and quartering after drying in Mozambique.*
	Measures taken to ensure that the sampling is representative of the in situ material collected, including for instance results for field duplicate/second-half sampling.	*Analysis of sample duplicates was undertaken by standard geostatistical methodologies to test for bias and to ensure that sample splitting was representative. Assay results of samples and their field duplicates were compared and no systemic differences observed, implying that bias had not been introduced by the cone splitter.*
	Whether sample sizes are appropriate to the grain size of the material being sampled.	*Given that the grain size of the material being sampled is sand and approximately 70 to 300 µm, an approximate sample size of 1 kg is more than adequate.*
Quality of assay data and laboratory tests	*The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.*	*Assaying was carried out at Diamantina laboratory in Perth, a laboratory that specialises in assay analysis for the mineral sand industry. Every 25th sample was duplicated in the laboratory and a laboratory standard was inserted at a rate of 1 in 40. HM was separated from light minerals by a sink/float process using TBE.* *The sample analysis process produced the following assays:* - *heavy mineral ('HM') > 45 µm, <2 mm, > 2.96 SG* - *slime ('SL') < 45 µm* - *oversize ('OS') > 2 mm* *To maintain QA/QC, two duplicate assaying procedures were implemented.* *Every 20th sample in the laboratory was split and both sub-samples processed through the entire assaying procedure.*

Criteria	Explanation	Comment
		Two samples were collected at the rig at every 40th sample and subjected to the complete assaying process. The laboratory was blind to these duplicates. *The HM mineralogy was determined by compositing HM concentrates (sinks) from the same geological domain or ore zones in order to obtain sufficient HM on which to conduct a mineralogical examination.* *The mineralogy composites were selected based on the geological zones along and between lines of drilling. This resulted in 3 samples being taken across entire deposit. One from ZONE 3 and 2 from ZONE 5.* *The heavy mineral from each sample was subjected to QEMSCAN analysis through the ALS laboratory in Perth.*
	For geophysical tools, spectrometers, handheld XRF instruments, etc, the parameters used in determining the analysis including instrument make and model, reading times, calibrations factors applied and their derivation, etc.	*Not applicable*
	Nature of quality control procedures adopted (eg standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (ie lack of bias) and precision have been established.	*All assaying for the Inhambane deposit was carried out by Diamantina Laboratories.* *Duplicate samples were submitted however blind field standards were not submitted by HML as part of the drilling program at the Inhambane deposit.*
Verification of sampling and assaying	*The verification of significant intersections by either independent or alternative company personnel.*	*Verification of intersections was limited to checking for variance between logged estimates of grade and the assayed grades. No significant variances were identified that warranted any re-assay.*
	The use of twinned holes.	*No holes were twinned during the drilling program.*
	Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.	*Data collected by HML was entered digitally in the field and uploaded to Microsoft Access and managed as a database.*
	Discuss any adjustment to assay data.	*Minor adjustments to assay data was made prior to model interpolation, including setting of absent data to half the value of assay threshold values. No obvious outliers were identified during data analysis.*
Location of data points	*Accuracy and quality of surveys used to locate drill holes (collar and down-hole surveys), trenches, mine workings and other locations used in Mineral Resource estimation.*	*HML surveyed drill holes by differential global positioning system ('DGPS').*

Criteria	Explanation	Comment
	Specification of the grid system used.	*The grid system used is the Moznet spheroid and the grid is UTM Zone 36 South). Modelling was conducted in a rotated local mine grid.*
	Quality and adequacy of topographic control.	*Topographic control was inadequate from available satellite tomography and so drill hole collars which had been surveyed in via DGPS were used instead.*
Data spacing and distribution	*Data spacing for reporting of Exploration Results.*	
	Whether the data spacing and distribution is sufficient to establish the degree of geological and grade continuity appropriate for the Mineral Resource and Ore Reserve estimation procedure(s) and classifications applied.	*Based on the experience of GNJ Consulting the data spacing and distribution through the drill hole programs Is considered adequate for the assigned Mineral Resource classifications. Holes were drilled at approximately 250 m across Inferred strike of mineralisation and 500 m along strike.*
	Whether sample compositing has been applied.	*No sample compositing or de-compositing has been applied. The majority of sampling was taken on 1.5 m intervals with minor 2 m intervals.*
Orientation of data in relation to geological structure	*Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.*	*Sample orientation is vertical and approximately perpendicular to the dip and strike of the mineralisation resulting in true thickness estimates. Drilling and sampling is carried out on a regular rectangular grid that is broadly aligned to the strike of the orebody mineralisation.*
	If the relationship between the drilling orientation and the orientation of key mineralised structures is considered to have introduced a sampling bias, this should be assessed and reported if material.	*No bias caused by orientation of drill holes anticipated from drilling vertical holes into a mineral sands deposit.*
Sample security	*The measures taken to ensure sample security.*	*All samples are numbered, with samples split and residues stored along with HM sinks. Samples were collected from the cyclone on the drill rig and collected into numbered bags for transport back to the core yard for drying and sub splitting. Residual sample was retained on-site and the sub split sample for assay was re-bagged, sealed in packaging materials for transport back to Australia. The uppermost 2 m of each drill hole was bagged and transported in a separate batch to be processed through quarantine as per Australian International Quarantine Regulations for soil samples. This was done to minimise the cost of having approximately 1.6 tonnes of sample go through quarantine and a treatment process.* *The samples that bypassed the quarantine process were transported directly to Diamantina Laboratories for checking in and subsequent assay. Quarantine samples*

Criteria	Explanation	Comment
		were transported directly to Intertek for quarantine treatment and from there couriered to Diamantina for assaying.
Audits or reviews	*The results of any audits or reviews of sampling techniques and data.*	*There are no existing audits or reviews. This represents the maiden resource estimate for the Inhambane project.*

Section 2 Reporting of Exploration Results

Criteria	Explanation	Comment
Mineral tenement and land tenure status	*Type, reference name/number, location and ownership including agreements or material issues with third parties such as joint ventures, partnerships, overriding royalties, native title interests, historical sites, wilderness or national park and environmental settings.*	*The resource lies within the granted exploration licence 4658L. Tenure is 100% owned by Mozambique Company +258 of which HML owns 70%. Subsequent to drilling* a *mining concession was applied for, 10255C which covers an area of 183.55 km2. As a consequence of the change in tenure size and movement in tenure boundary the southernmost portion of the resource and one line of drilling has been cut out of the current tenement. A subsequent re-application of tenure to has been made to amalgamate new vacant ground into the mining concession application.*
	The security of the tenure held at the time of reporting along with any known impediments to obtaining a licence to operate in the area.	*At the time of reporting all tenure was secure and any administrative costs or fees were fully paid up.*
Exploration done by other parties	*Acknowledgment and appraisal of exploration by other parties.*	*Previous tenement holders in the area, Rio Tinto, conducted hand auger drilling over the southern half of the 4658L tenement.*
Geology	*Deposit type, geological setting and style of mineralisation.*	*The deposit style is a combination of dunal and fluvial/marine sediments. Heavy mineral accumulations are preserved throughout the stratigraphic sequence.*

Criteria	Explanation	Comment
Drill hole Information	*A summary of all information material to the understanding of the exploration results including a tabulation of the following information for all Material drill holes:* - *easting and northing of the drill hole collar* - *elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar* - *dip and azimuth of the hole* - *down hole length and interception depth* - *hole length.* *If the exclusion of this information is justified on the basis that the information is not Material and this exclusion does not detract from the understanding of the report, the Competent Person should clearly explain why this is the case.*	*There are a number of drill holes that have a modest contribution to the overall HM tonnage of the deposit mineralisation (the top 25% of holes with contributions of length times HM grade are listed as follows:* *IN0003R, IN0007, IN0022, IN0023, IN0026, IN0030, IN0031, IN0036, IN0038.* *Other drill hole results contribute to the identification of the wide and thick zone of mineralisation via multiple intersections of drill holes. The composited drill hole listing is presented in Appendix 3.*
Data aggregation methods	*In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (eg cutting of high grades) and cut-off grades are usually Material and should be stated.*	*No grade cutting was undertaken, nor compositing or aggregation of grades made prior or post the grade interpolation into the block model. Selection of the bottom basal contacts of the mineralised domains were made based on discrete logging and grade information collected and assayed by HML.*
	Where aggregate intercepts incorporate short lengths of high grade results and longer lengths of low grade results, the procedure used for such aggregation should be stated and some typical examples of such aggregations should be shown in detail.	*Not applicable - all samples are 1.5 m long, except the first sample below ground surface which was 2 m long.*
	The assumptions used for any reporting of metal equivalent values should be clearly stated.	*No metal equivalents were used for reporting of Mineral Resources.*
Relationship between mineralisation widths and intercept lengths	*These relationships are particularly important in the reporting of Exploration Results.*	*All drill holes are vertical and perpendicular to the dip and strike of mineralisation and therefore all interceptions are approximately true thickness.*
	If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported.	*Drill holes are inferred to intersect the mineralisation approximately perpendicularly.*

Criteria	Explanation	Comment
	If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (eg 'down hole length, true width not known').	
Diagrams	*Appropriate maps and sections (with scales) and tabulations of intercepts should be included for any significant discovery being reported These should include, but not be limited to a plan view of drill hole collar locations and appropriate sectional views.*	*Refer to Appendix 1 and main body of report.*
Balanced reporting	*Where comprehensive reporting of all Exploration Results is not practicable, representative reporting of both low and high grades and/or widths should be practiced to avoid misleading reporting of Exploration Results.*	*Reporting of results is restricted to Mineral Resource estimates generated from geological and grade block modelling.*
Other substantive exploration data	*Other exploration data, if meaningful and material, should be reported including (but not limited to): geological observations; geophysical survey results; geochemical survey results; bulk samples – size and method of treatment; metallurgical test results; bulk density, groundwater, geotechnical and rock characteristics; potential deleterious or contaminating substances.*	*Samples of HM to be determined for mineral assemblage were created by compositing HM sink fractions from drill hole samples interpreted to have intersected the same geological horizon and mineralisation, and for which viewing of the HM sinks suggested similar assemblage grades.* *Samples have not yet been tested for in situ density.*
Further work	*The nature and scale of planned further work (eg tests for lateral extensions or depth extensions or large-scale step-out drilling).*	*Further work via infill mineral assemblage composite sampling is recommended in order to further the confidence in the current Inferred Mineral Resource.* *Exploration by geophysical and drilling is planned on other parts of the tenement.*
	Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.	*Refer to Appendix 1 and main body of report.*

Criteria	Explanation	Comment
Section 3 Estimation and Reporting of Mineral Resources		
Criteria	**Explanation**	**Comment**
Database integrity	*Measures taken to ensure that data has not been corrupted by, for example, transcription or keying errors, between its initial collection and its use for Mineral Resource estimation purposes.*	*The surveying, logging and assay data is stored in a Microsoft Access database.* *The drill logs were recorded electronically at the rig for the HML drilling program, and the hole locations recorded by hand-held GPS at the time of drilling.* *Each field of the drill log database was verified against allowable entries and any keying errors corrected at the time by the logger.* *At the completion of each hole, an entry was made to a hand-written drilling diary. The diary recorded the hole name, date, depth, number of samples, time of start and finish, a description of the location of the hole in relation to the last hole and other things. Such a diary provides valuable evidence if there is an error in hole naming or surveying.*
	Data validation procedures used.	*Visual and statistical comparison was undertaken to check the validity of results.*
Site visits	*Comment on any site visits undertaken by the Competent Person and the outcome of those visits.*	
	If no site visits have been undertaken indicate why this is the case.	*No site visit was undertaken by the GNJ Consulting during the modelling exercise as they are familiar with the deposit and style of mineralisation. Mr Paul Leandri supervised the drilling and sampling activities for the duration of the program.*
Geological interpretation	*Confidence in (or conversely, the uncertainty of) the geological interpretation of the mineral deposit.*	*The geological interpretation was undertaken by GNJ Consulting using all logging and sampling data and observations. The geological interpretation is inferred due to the wide spaced drilling, however the geological characteristics of the host units is consistent and traceable between holes both across and along the inferred strike of the mineralisation.*
	Nature of the data used and of any assumptions made.	*Interpretation of geological surfaces or domains to be used in block modelling were determined utilising HM sinks and geology logging.*
	The effect, if any, of alternative interpretations on Mineral Resource estimation.	*Any alternative geological interpretations would necessitate a reassignment of mineral composite ID (for mineral assemblage testwork). These are carefully selected to align with discrete geological domains and a re-assignment of those domain boundaries would require new mineral composites to be assayed or for those composite ID's to be removed from the interpolation.*

Criteria	Explanation	Comment
		An alternative interpretation would entail preparing tighter mineralised envelopes in order to constrain grade above a certain cut-off. At this stage of the resource estimation confidence this is not considered a valid approach.
	The use of geology in guiding and controlling Mineral Resource estimation.	*The Mineral Resource estimate was controlled by the geological / mineralised surfaces and beneath the topographic surface.*
	The factors affecting continuity both of grade and geology.	*The Inhambane deposit sits within a number of dune and fluvial/marine depositional settings. A washout has been interpreted to have removed mineralisation in the area of drill hole IN0009 (which did not intersect mineralisation recorded from holes immediately to the east and west.*
Dimensions	*The extent and variability of the Mineral Resource expressed as length (along strike or otherwise), plan width, and depth below surface to the upper and lower limits of the Mineral Resource.*	*The Mineral Resource reported is within the portion of the Inhambane tenement drilled by HML to date (10255C Mining Concession application), and extends for approximately 2.3 km long, 2 km wide and approximately 25 to 35 m thick on average. Mineralisation is present from surface over a large portion of the deposit, although should be qualified by saying that mineralisation above the 2% HM cut-off grade was only intersected in 5 holes. A total of 36 of the 41 holes drilled contained drill hole intercepts above cut-off grade. The average composite length per drill hole above the HM cut-off grade was 8.2 m with a minimum of 1.5 m and a maximum of 29 m.*
Estimation and modelling techniques	*The nature and appropriateness of the estimation technique(s) applied and key assumptions, including treatment of extreme grade values, domaining, interpolation parameters and maximum distance of extrapolation from data points. If a computer assisted estimation method was chosen include a description of computer software and parameters used.*	*The mineral resource estimate was conducted using CAE Mining software (Datamine). Inverse distance weighting techniques were used to interpolate assay grades from drill hole samples into the block model and nearest neighbour techniques were used to interpolate index values and nonnumeric sample identification into the block model.* *The regular dimensions of the drill grid and the anisotropy of the drilling and sampling grid allowed for the use of inverse distance methodologies as no de-clustering of samples was required.* *Appropriate and industry standard search ellipses were used to search for data for the interpolation and suitable limitations on the number of samples and the impact of those samples was maintained. An inverse distance weighting to the power of 3 was used so as not to over smooth the grade interpolations.* *Hard domain boundaries were used and these were defined by the geological surfaces that were interpreted, however a moving or dynamic search ellipse was used to account for variations in the dip, trend and plunge of mineralisation.*

Criteria	Explanation	Comment
	The availability of check estimates, previous estimates and/or mine production records and whether the Mineral Resource estimate takes appropriate account of such data.	*This was the maiden mineral resource estimate carried out for the Inhambane project.*
	The assumptions made regarding recovery of by-products.	*No assumptions were made during the resource estimation as to the recovery of by-products.*
	Estimation of deleterious elements or other non-grade variables of economic significance (eg sulphur for acid mine drainage characterisation).	*All potentially deleterious elements were included as part of the mineral composite analysis and were included in the modelling report.*
	In the case of block model interpolation, the block size in relation to the average sample spacing and the search employed.	*For the Inhambane deposit the average parent cell size used was approximately half that for the average drill hole spacing in the north-south and east-west directions (which was 500 x 250 x 1.5 m) and the same as the dominant sample spacing down hole. This resulted in a parent cell size of 250 x 125 x 1.5 m.*
	Any assumptions behind modelling of selective mining units.	*No assumptions were made regarding the modelling of selective mining units however it is assumed that a form of dry mining will be undertaken and the cell size and the sub cell splitting will allow for an appropriate dry mining ore reserve to be prepared. Any other mining methodology will be more than adequately catered for with the parent cell size that was selected for the modelling exercise for the deposit.*
	Any assumptions about correlation between variables.	*No assumptions were made about correlation between variables.*
	Description of how the geological interpretation was used to control the resource estimates.	*The Mineral Resource estimate was controlled to an extent by the geological / mineralisation and basement surfaces.*
	Discussion of basis for using or not using grade cutting or capping.	*Grade cutting or capping was not used during the interpolation because of the regular nature of sample spacing and the fact that samples were not clustered nor wide spaced to an extent where elevated samples could have a deleterious impact on the resource estimation.* *Sample distributions were reviewed and no extreme outliers were identified either high or low that necessitated any grade cutting or capping.*

Criteria	Explanation	Comment
	The process of validation, the checking process used, the comparison of model data to drill hole data, and use of reconciliation data if available.	*Validation of grade interpolations were done visually In CAE Studio (Datamine) software by loading model and drill hole files and annotating and colouring and using filtering to check for the appropriateness of interpolations.* *Statistical distributions were prepared for model zones from both drill holes and the model to compare the effectiveness of the interpolation. Along strike distributions of section line averages (swath plots) for drill holes and models were also prepared for comparison purposes.*
Moisture	*Whether the tonnages are estimated on a dry basis or with natural moisture, and the method of determination of the moisture content.*	*Tonnages were estimated an assumed dry basis. This is based on estimates for in situ bulk density for quartz sand (1.6 gcm^{-3}) and the contributions of weight from HM and SLIMES to a typical bulk density algorithm. A bulk density of 1.7 gcm^{-3} was selected and is consistent with other estimates used throughout the mineral sands industry.*
Cut-off parameters	*The basis of the adopted cut-off grade(s) or quality parameters applied.*	*Cut-off grades for HM were used to prepare the reported resource estimate. These cut-off grades were defined by GNJ Consulting as being conservative for typical comparative example deposits and mineralogy suites.*
Mining factors or assumptions	*Assumptions made regarding possible mining methods, minimum mining dimensions and internal (or, if applicable, external) mining dilution. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential mining methods, but the assumptions made regarding mining methods and parameters when estimating Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the mining assumptions made.*	*No specific mining method is assumed other than potentially the use of dry mining via dozer trap. This allows for a moderately selective mining process while still maintaining bulk economies of scale. A minimum thickness was assumed for the reporting of the mineral resource as being 2 m for continuity of pits (less than 0.5% of the contained HM tonnes) and 90% of the HM tonnage is hosted by 8 m thickness or greater.* *Given the thickness of the Inhambane prospect (average of 14 m) this is not considered to be an issue for dozer trap or any other contemporary dry mining technique. A lower cut-off grade would allow for more material to be mined, leading to thicker mining sequences and a lower stripping ratio.* *Reasonable mining and processing costs, mineral prices and mineral recoveries were considered for reasonable prospects of eventual economic extraction. These are detailed in Section 9.1.*

Criteria	Explanation	Comment
Metallurgical factors or assumptions	*The basis for assumptions or predictions regarding metallurgical amenability. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential metallurgical methods, but the assumptions regarding metallurgical treatment processes and parameters made when reporting Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the metallurgical assumptions made.*	*No metallurgical assumptions were used in the preparation of the Mineral Resource. All of the grade values of the mineral assemblage are considered to be within acceptable limits for economic exploitation.* *For consideration of reasonable prospects of eventual economic extraction, a range of recoveries for mineral species was considered and these are detailed in Section 9.1*
Environmental factors or assumptions	*Assumptions made regarding possible waste and process residue disposal options. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider the potential environmental impacts of the mining and processing operation. While at this stage the determination of potential environmental impacts, particularly for a greenfields project, may not always be well advanced, the status of early consideration of these potential environmental impacts should be reported. Where these aspects have not been considered this should be reported with an explanation of the environmental assumptions made.*	*No assumptions have been made regarding possible waste and process residue however disposal of by-products such as SL, sand and oversize are normally part of capture and disposal back into the mining void for eventual rehabilitation. This also applies to mineral products recovered and waste products recovered from metallurgical processing of heavy mineral.*
Bulk density	*Whether assumed or determined. If assumed, the basis for the assumptions. If determined, the method used, whether wet or dry, the frequency of the measurements, the nature, size and representativeness of the samples.*	*A bulk density of 1.7 gcm^{-3} was selected and is consistent with other estimates used throughout the mineral sands industry. This was considered by GNJ Consulting to be a conservative approach.*
	The bulk density for bulk material must have been measured by methods that adequately account for void spaces (vugs, porosity, etc), moisture and differences between rock and alteration zones within the deposit.	*No measurements of density of in situ materials have yet been acquired.*

Criteria	Explanation	Comment
	Discuss assumptions for bulk density estimates used in the evaluation process of the different materials.	*A bulk density of 1.7 gcm^{-3} was selected and is consistent with other estimates used throughout the mineral sands industry.*
Classification	*The basis for the classification of the Mineral Resources into varying confidence categories.*	*The resource classification for the Inhambane deposit was based on the following criteria: drill hole spacing; the quality of QA/QC processes; and the distribution of mineral assemblage composites. All the estimated mineralisation above the cut-off criterion has been classified as Inferred Resources because there is information to infer there is mineralisation of the tenor estimated, but that information is insufficient to ascribe a higher level of confidence to the estimates.*
	Whether appropriate account has been taken of all relevant factors (ie relative confidence in tonnage/grade estimations, reliability of input data, confidence in continuity of geology and metal values, quality, quantity and distribution of the data).	*The classification of the Inferred Mineral Resources for the Inhambane deposit were supported by all of the criteria as noted above.*
	Whether the result appropriately reflects the Competent Person's view of the deposit.	*As a Competent Person, GNJ Consulting Principal Greg Jones considers that the result appropriately reflects a reasonable view of the deposit categorisation.*
Audits or reviews.	*The results of any audits or reviews of Mineral Resource estimates.*	*No audits or reviews of the new Mineral Resource estimate for the Inhambane deposit has been undertaken at this point in time.*
Discussion of relative accuracy/ confidence	*Where appropriate a statement of the relative accuracy and confidence level in the Mineral Resource estimate using an approach or procedure deemed appropriate by the Competent Person. For example, the application of statistical or geostatistical procedures to quantify the relative accuracy of the resource within stated confidence limits, or, if such an approach is not deemed appropriate, a qualitative discussion of the factors that could affect the relative accuracy and confidence of the estimate.*	*There was no geostatistical process undertaken for the interpolation (such as variography or conditional simulation) during the resource estimation of the Inhambane deposit.*
	The statement should specify whether it relates to global or local estimates, and, if local, state the relevant tonnages, which should be relevant to technical and economic evaluation. Documentation should include assumptions made and the procedures used.	*The broad spacing of drill holes and method of creating the resource model imply the estimates of Mineral Resources are global rather than local.*

Criteria	Explanation	Comment
	These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.	*No previous history of mining mineral sands with the tenement.*