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A&B GLOBAL MINING

Exhibit 96.3

Hindustan Zinc Limited – SEC - SK 1300

Technical Summary Report

Rajpura Dariba Mine

Document Version:	**Rev 1**
Customer Name:	**HZL Mine**
Date:	**20 July 2022**
Prepared by:	**ABGM**
Document Number:	**2022-07-25-RDM-SEC**

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TITLE	NAME	SIGNATURE	DATE
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Qualified Person - Reserves	Bill Gillespie		28/07/2022
Managing Director - ABGM	Devendra Vyas		28/07/2022

Disclaimer:

This document will serve only for the Purposes of Hindustan Zinc Limited (HZL) based on information received from the mine and its respective mining operations in India namely: Rampura Agucha Mine; Rajpura Dariba; Sindesar Khurd; Kayad and the four Zawar operations – Balaria, Baroi, Mochia and Zawarmala. The information within this technical report is aligned to the Securities Exchange Commission (SEC), SK-1300 guidelines and the information within is to be use for this purpose only.

LIST OF ABBREVIATIONS:

%	Percentage
^{0}C	degree Celsius
ABGM	A & B Global Mining Consultants
Ag	Silver
BOQ	Bill of Quantities
CAPEX	Capital expenditure
Coeff. Of Variation	coefficient of variation
COG	Cut-off Grade
Con	Concentrate
CSD	calc-silicate dolomites
g/t	grams per ton
GMS	graphite-mica schist
GSSA	Geological Society of South Africa
HDPE	High Density Polyethylene
Hr.	Hour
HZL	Hindustan Zinc Limited
IDW^2	Inverse Distance Weighting to the power of two
INR	Indian Rupee
kA	KiloAmpere
kL	KiloLitre
km	Kilometre
kN/m^2	KiloNewton per square metre
Koz	Kilo Ounces
Kt	Kilo tonne
kV	KiloVolt
lb	Pound
LHD	Load Haul Dumper
LOM	Life-of-Mine
LOM	Life of Mine
m	metre

m^2	Squared Metre
m^3	Cubic Metre
m^3/hr	Cubic metres per hour
mRL	Mean Relative Elevation
Mt	Million tonnes
mtpa	Million tonnes per annum
OGL	Original ground level (original surface elevation)
OK	Ordinary Kriging
OPEX	Operating expenditure
oz	Ounces
Pb	Lead
PbEQ	Lead Equivalent
PFS	Preliminary Feasibility Study
QA	Quality Assurance
QC	Quality Control
RAM	Rampura Agucha Mine
RAUG	Rampura-Agucha underground
RDM	Rajpura Dariba Mines
ROM	Run-of-Mine (ore/rock of economic value containing the target mineral(s)
ROM	Run of Mine
RPEEE	reasonable prospects of eventual economic extraction
SACNASP	South African Council for Natural Scientific professions
SEC	Securities Exchange Commission
SKM	Sindesar Khurd
Std Dev	standard deviation
t	tonnes
TRS	Technical Review
USD	Us Dollar
USD/g	US Dollar per gram
USD/pb	US Dollar per pound
USD/t	US Dollar per tonne

VDS/PDS	Vehicle Detection System / Personnel Detection System
ZAW	Zawar Complex
Zn	Zinc
ZnEQ	Zinc Equivalent

Glossary of Terms

Block model: This is the cubical representation in three dimensions of the Mineral Resource. The block model data is usually constructed using industry accepted geological software packages.

Concentrating: The process of separating milled ore into a waste stream (tailings) and a valuable mineral stream (concentrate) by floatation.

Orebody: A well-defined mineralised rock mass that can be defined or modelled based upon its distinct mineral content or associated rock type/lithology.

Run of Mine (ROM): A loose term used to describe ore produced from the mine available for processing.

Tailings: That portion of the ore from which most of the valuable material has been removed by concentrating and that is therefore low in value and rejected.

Tonne: Metric tonne, equal to 1000 kg, unless otherwise defined.

Total Station: Surveying tool which comprises an electronic theodolite and an electronic distance meter/measurement component.

Note that all physical measurements units used in this report are metric, i.e. based on the International System of Units (SI units), unless otherwise indicated.

Finance

Capital expenditure (CAPEX): Total capital expenditure on mining and non-mining property, plant, equipment, and capital work-in-progress.

Effective tax rate: Current taxation, deferred taxation, and tax normalization as a percentage of profit before taxation.

IRR: Internal Rate of Return (the discount rate at which the project "NPV" becomes zero).

NPV: Net Present Value (cash flow of the project discounted to current day value – includes project OPEX and CAPEX).

Operating expenditure (OPEX): Total operating expenditure for mining and non-mining functions pertaining to the project.

Definitions:

The following definitions apply to this report and are aligned to meanings ascribed in terms of internationally recognized institutions and standards namely the Canadian CIM Definition Standards for Mineral Resources and Mineral Reserves 2014 (CIM), The Australian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves 2012 Edition (JORC) and The South African Code for Reporting of Exploration Results, Mineral Resources and Mineral Reserves 2016 (SAMREC).

Mineral Resources:

A **'Mineral Resource'** is a concentration or occurrence of material of intrinsic economic interest in or on the earth's crust in such form, quality and quantity that there are reasonable prospects for eventual economic extraction. Mineral Resources are further sub-divided, in order of increasing geological confidence, into Inferred, Indicated and Measured as categories.

Inferred Mineral Resource is the part of a Mineral Resource for which quantity, grade (or quality) and mineral content can be estimated with a low level of confidence. It is inferred from geological evidence and assumed but not verified geological or grade continuity. It is based on information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes which may be of limited or uncertain quality and reliability.

Indicated Mineral Resources are economic mineral occurrences that have been sampled (from locations such as outcrops, trenches, pits and drill holes) to a point where an estimate has been made, at a reasonable level of confidence, of their contained metal, grade, tonnage, shape, densities, physical characteristics.

Measured Mineral Resources are Indicated Mineral Resources that have undergone enough further sampling that a 'competent person' or ‘qualified person’ (defined by the norms of the relevant mining code; usually a geologist) has declared them to be an acceptable estimate, at a high degree of confidence, of the grade (or quality), quantity, shape, densities, physical characteristics of the mineral occurrence.

<u>Ore Reserves / Mineral Reserves</u>

An Ore Reserve or Mineral Reserve is the economically mineable part of a Measured Mineral Resource and/or Indicated Mineral Resource. Mineral Reserves are subdivided in order of increasing confidence into **Probable Mineral Reserves** or **Proved Mineral Reserves**.

Probable Mineral Reserve is the economically mineable part of an Indicated Mineral Resource, and in some circumstances, a Measured Mineral Resources. It includes diluting material and allowances for losses which may occur when the material is mined. A Probable Mineral Reserve has a lower level of confidence than a Proved Mineral Reserve but is of sufficient quality to serve as the basis for decision on the development of deposit.

Proved Mineral Reserve is the economically mineable part of a **Measured Mineral Resource**. It includes diluting materials and allowances for losses which occur when the material is mined.

Proved Mineral Reserve represents the highest confidence category of Mineral Reserve estimate. It implies a high degree of confidence in the geological factors and a high degree of confidence in the Modifying Factors. The style of mineralization or other factors could mean that Proved Mineral Reserves are not achievable in some deposits.

Generally the **conversion** of Mineral Resources into Mineral Reserves requires the application of various **Modifying Factors**, including, but not restricted to:

- mining factors
- mineral processing / ore dressing related factors

- metallurgical factors
- infrastructure factors
- economic factors
- marketing factors
- legal factors
- ESG factors: Environmental, Social (including Health and Safety) and Governance.

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1 EXECUTIVE SUMMARY

1.1 Property summary and ownership

The Rajpura Dariba Lead Zinc Mine is located at the southernmost extremity of the Rajpura Dariba Bethumni metallogenic belt in Rajsamand district of Rajasthan. The mining lease covers an area of 1,142.20 hectares and lies between the latitudes of N 24º 55’ 39.66’’ to 24º 57’ 49.70’’ and E 74º 07’ 05.42” to 74º 08’ 44.67” and falls under Survey of India toposheet No.45 L/1.

The Dariba-Bethumni Mineral Belt is located about 80 km NNE of Udaipur and 500 km SW of Delhi and contains the Rajpura Dariba and Sindesar Khurd mines. Mining dates back some 2,500 years and historic mining at the East Lode of Rajpura Dariba progressed to a depth of over 200 m.

The mine was opened in 1982 and Environment Clearance was granted by MoEF, New Delhi for 0.9 MMTPA ore production & 1.2 MMTPA ore beneficiation plant for Rajpura Dariba underground mine with letter no. J-11011/380/2008-IA II(I) dated 4.11.2009. The EC was later amended to 2.0 million TPA (total excavation 2.48 million TPA) & Lead Zinc Ore Beneficiation from 1.2 to 2.5 million TPA (ML No. 166/2008, Area 1142.2106 Ha.) The lease of the land has been extended to 2030 and the Mining Plan approved until May 2030.

1.2 Mineral Resource Statement

The Mineral Resources described in this Item are based on appropriate geoscientific information, economic and technical parameters, and grade and tonnage estimation processes. The Mineral Resource estimates were determined using ordinary kriging (OK) geostatistical methodology and considered sample lengths, grade capping / cutting, the spatial distribution of drill holes and the quality assurance and quality control results for the analytical sample grades determined. Geological modelling and grade estimation used Datamine software.

The Mineral Resources exclusive of the Mineral Reserves as at the end of the last fiscal year are summarised in Table 1, whilst Table 2 summarises the same period where the Mineral Resources are inclusive of the Mineral Reserves. The Mineral Resources are reported at a ZnEQ COG of 3.32%.

Table 1: Rajpura Dariba Mineral Resource Statement (exclusive of Mineral Reserves) – 31 March 2022

Classification	Tonnage	Grade			Metal Content		
	(Mt)	Zn (%)	Pb (%)	Ag (g/t)	Zn (Kt)	Pb (Kt)	Ag (Koz)
Measured	3.0	7.30	2.10	68	222	64	6,610
Indicated	2.2	6.80	2.40	74	153	54	5,346
Measured + Indicated	**5.3**	**7.10**	**2.20**	**71**	**375**	**118**	**11,956**
Inferred	33.6	6.30	1.90	96	2,124	640	104,139
Total	**38.9**	**6.40**	**2.00**	**93**	**2,499**	**759**	**116,095**

The Measured Mineral Resources as a proportion of the total Inclusive Mineral Resource as of 31 March 2022 accounts for ~14% of the tonnes, the Indicated Mineral Resources is ~40%, and the Inferred at ~46%.

Table 2: Mineral Resource Statement (inclusive of Mineral Reserves) – 31 March 2022

Classification	Tonnage	Grade			Metal Content		
	(Mt)	Zn (%)	Pb (%)	Ag (g/t)	Zn (Kt)	Pb (Kt)	Ag (Koz)
Measured	10.5	6.70	1.90	75	708	195	25,164
Indicated	28.9	5.80	1.90	69	1,666	536	63,986
Measured + Indicated	**39.4**	**6.00**	**1.90**	**70**	**2,374**	**732**	**89,150**
Inferred	33.6	6.30	1.90	96	2,126	641	104,250
Total	**73.0**	**6.20**	**1.90**	**82**	**4,500**	**1,372**	**193,399**

1.3 Mineral Reserve Statement

The HZL mine operations and technical teams engage on annual industry statutory evaluation and conduct standard works that is applied across all the mine operation from the geology resource estimations to applying the mine designs and evaluating the potential Mineral Reserves. The HZL Resources and Reserves technical team has kept extensive data that is used annually to do the statutory mineral reserves statements and calculations that is audited and supervised by reputable consultant houses. Each mine undergoes individual assessments and apply the modifying factors, grade cut-off calculation and assumptions.

The deposit is concealed 100m below the surface and thus amenable to underground mining only. The deposit is shallow seated and hence initial feasibility study was carried out for mode of entry and mining method. Due to shallow depth of deposit and low cost of production with decline mining by trackless operations, it was decided to open North decline/ramp for ore production with secondary access via incline. Further, with expansion of mining operation, south decline/ramp was developed to add to ore production capacity.

ABGM collated the data and reviewed the mine designs, input parameters and mine design criteria for the mine operation. A comprehensive analysis and relevant input parameters is applied to the Mineral Resource to develop the Mineral Reserves.

The Mineral Reserve statement (March 2022) suggests RDM has 28.9Mt at 4.9 g/t Zinc, 1.6% Lead and 66 g/t Silver within the minable Ore Reserve. Table 3: Mineral Reserves Estimates (2022)

Ore Reserve summary							
Ore Reserve	Tonnage (Mt)	Grade (Zn %)	(Pb %)	(Ag g/t)	Metal (Zn kt)	(Pb kt)	(Ag koz)
Proved	5.8	5.3	1.4	66	306	84	12,333
Probable	23.1	4.8	1.6	59	1,122	379	43,803
Ore Reserves (Total)	28.9	4.9	1.6	60	1,428	463	56,135

1.4 Geology and Mineralization

The Rajpura Dariba Mine is located at the southern extremity of the Dariba-Bethumni metallogenic belt. The ore bodies are designated as Main Lode (South and North) and East Lode. The structure of the belt is an isoclinal fold with synformal closure at Dariba in the south (steep plunge 55°-60° towards ENE) and antiformal closure in the north. The rocks have suffered at least three phases of deformation. The mineralisation forms the western limb of a concealed NNE-SSW trending broad, open and asymmetric antiformal fold with sub-horizontal to gently northerly plunging fold axis. The upper limit of mineralisation lies at a depth of about 100m below surface. The recent exploration from surface within leasehold between 5700 – 8200N, revealed the continuity of mineralisation in the southern extension. Besides main lens, 15 auxiliary lenses have also been delineated.

The nature of mineralisation is synsedimentary, later remobilised and recrystallised during subsequent polyphase deformation and metamorphism. The principal ore forming minerals are Sphalerite (ZnS) and Galena (PbS). Pyrrhotite is most abundant and ubiquitous gangue while pyrite (FeS) and arsenopyrite (FeAsS) are rare. The rock forming minerals are calcite, dolomite, quartz, mica, garnet, tremolite, argillaceous and carbonaceous materials.

The mineralization in calc-silicate bearing dolomite is mostly confined to structural openings. Ore minerals occur as bands, stringers, disseminations, fracture-filling veins etc. and are recrystallised at places. The economic ore is hosted in two different types of mineralised: calc-silicate dolomites and graphite mica schists. The mineralogy of the RD Mine material is indicated to be relatively complex with zinc and lead minerals occurring as intergrowths and fine disseminations among other sulphide and gangue minerals.

1.5 Metallurgical Testing

The HZL has a network of operations across India and RDM is currently an operating mine with a working CPP with many years of operations behind them. The mineral processing is well understood and there is no need to conduct any additional metallurgical test work at the current operations.

1.6 Mine Design, Optimizations and Scheduling

Ore body of Rajpura Dariba deposit is divided into four lodes i.e. Main, South, North & East Lode. East lode is parallel to south lode in upper extremity but in lower depth, it is parallel to Main & North lode. Each lode is further sub-divided into number of blocks with intervening crown pillar and then further into number of stopes. It is proposed to mine the crown pillars, after complete mining of adjacent block, keeping in view of mineral conservation and overall stope stability & wherever possible optimization of crown pillars will be done to minimize ore blockage in crown pillar.

This mining method is being applied in the mining blocks where the ore body width is narrow and varying from 8 to 15m. The entire strike length is divided into 20m long panels, designated as primary and pillar stopes. The stopes are mined using DTH (115mm) holes for down drilling from the upper drill level. Blasting is done against a slot raise. The stopes are back filled with cement fill after removal fore. Vertical Retreat Mining (VRM) is adopted at Rajpura Dariba Mine. The Mine has undertaken recent studies to attempt to increase the production and adopt a modified mining extraction method. This study was completed in mid-2022 with decisions from the study currently unknown if it will be implemented.

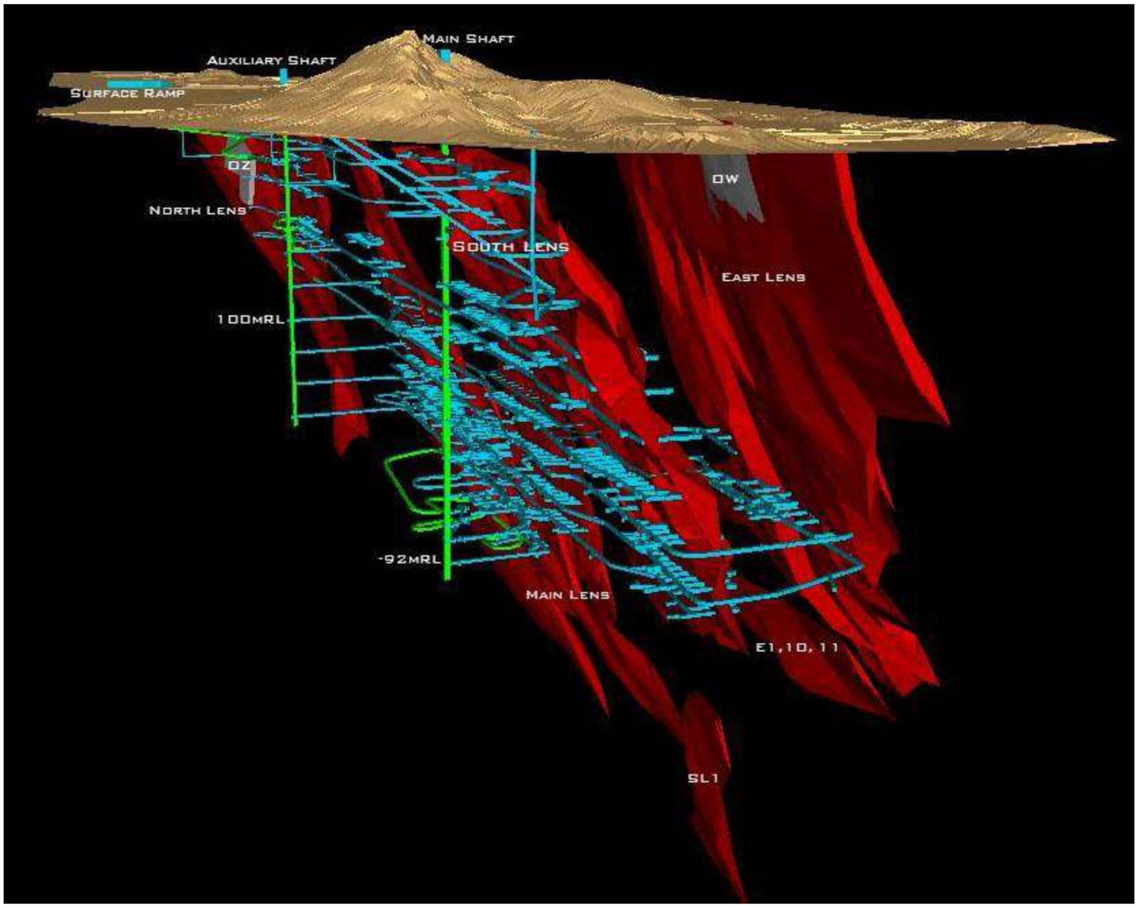


Figure 1: Underground mining Layout and Orebody

The mine is scheduled to produce 1.35mtpa in 2022 and will increase to 2.5mtpa in the next three years and remain there till 2034. An optimisation study was recently completed in mid-2022 and this will be addressed in the near future.

Table 4: RDM – Schedule Summary – 2.5mtpa

Description	Units	Total	F2022	F2023	F2024	F2025	F2026	F2027	F2028	F2029	F2030	F2031	F2032	F2033
Total Reserves Mined														
Ore tonnes	t	**30,985,725**	1,355,721	1,400,004	2,200,000	2,500,000	2,500,000	2,500,000	2,500,000	2,500,000	2,500,000	2,500,000	2,500,000	2,500,000
Pb head grade	%Pb	**1.57**	1.24	1.56	1.54	1.55	1.55	1.55	1.54	1.60	1.60	1.60	1.60	1.60
Zn head grade	%Zn	**4.91**	4.47	5.01	4.84	4.80	4.80	4.80	4.91	5.01	5.01	5.01	5.01	5.01
Ag head grade	g/t Ag	**61.08**	65	61.33	59.90	58.99	58.99	58.99	60.68	61.89	61.89	61.89	61.89	61.89
TMC head grade	%TMC	**6.48**	5.71	6.58	6.38	6.34	6.34	6.34	6.46	6.60	6.60	6.60	6.60	6.60
Pb metal	t	**379,005**	13,055	17088	26408	30154	30154	30154	30106	31134	31134	31134	31134	31134
Zn metal	t	**1,370,612**	56,485	63156	95873	107908	107908	107908	110502	112675	112675	112675	112675	112675
Ag metal	kg	**68,888**	55,355	644	988	1106	1106	1106	1138	1160	1160	1160	1160	1160
Description	**Units**	**Total**	**F2022**	**F2023**	**F2024**	**F2025**	**F2026**	**F2027**	**F2028**	**F2029**	**F2030**	**F2031**	**F2032**	**F2033**
Development														
Ore development	Linear metres	**86,050**	3,050	4,000	6,000	7,000	7,000	7,000	7,000	7,000	7,000	7,000	7,000	7,000
Waste development	Linear metres	**171,915**	6,415	7,500	12,500	14,000	14,000	14,000	14,000	14,000	14,000	14,000	14,000	14,000
Total development	Linear metres	**257,965**	9,465	11,500	18,500	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000

1.7 Mineral Processing

Currently, run-of-mine of RD mine is treated at 1.2 MTPA capacity beneficiation plant. The concentrate is sent for metallurgical treatment at captive smelters for recovering final metal. In existing mill, it is proposed to de-bottleneck/revamp and commission a new beneficiation plant of 1.5 MTPA capacity with advanced technology and improved recovery in 2022-23. Rajpura Dariba Mine, Sindesar Khurd Mine, and upcoming Bamnia Kalan are all part of the Rajpura Dariba Complex having beneficiation plants at site (3 at SKM, 1 at RDM and 1 proposed beneficiation plant at RDM). The proposed plant revamping /commissioning by 2022-23. Currently, RDM beneficiation plant is of 1.2 MTPA capacity. Proposed plant will be of 1.5MTPA capacity. By the time, until the new plant commences, additional ROM shall be sent to SKM mill. And, once, the RDM mill commences, it shall also treat ore of SKM.

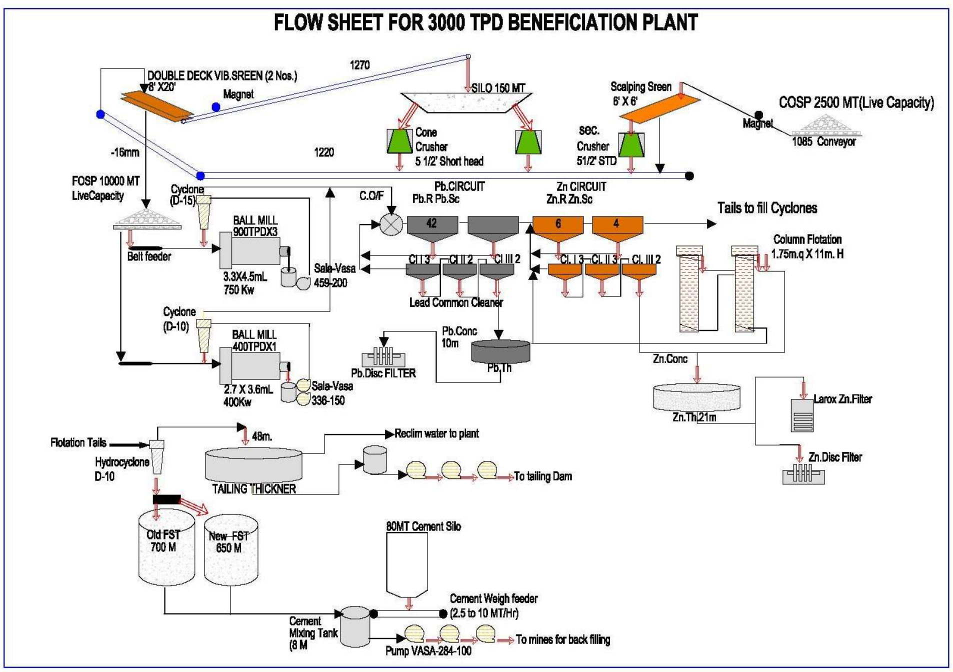


Figure 2: Flowsheet - 3mtpa Beneficiation Plant

1.8 Environmental, Permitting and Community Impact

Environment clearance was granted for 6.0million tpa ore production and 6.5million tpa beneficiation (including treatment of 0.5million tpa ore from other mines) by MoEF&CC vide letter no. J-11015/7/2017-IA.II (M) dated 31-05-2018. CTO for 6 million tpa ore production was granted by RSPCB vide letter no. F(Mines)/Rajsamand(Railmagra)/1715/2017-2018/6402-6406 dated 30- 01-2019.

Water withdrawal permission from Matrikundia Dam. Certificate of non-involvement of national park, sanctuary, Biosphere reserve, wildlife corridor, tiger/elephant reserve in core and buffer zone was granted by vide letter no. dated 22-09-2017.

RDM is doing sufficient work around the environmental assessments and are continuously monitoring all vital statutory aspects required. There is various sites and locations where site monitoring is conducted in regard to the following main elements:

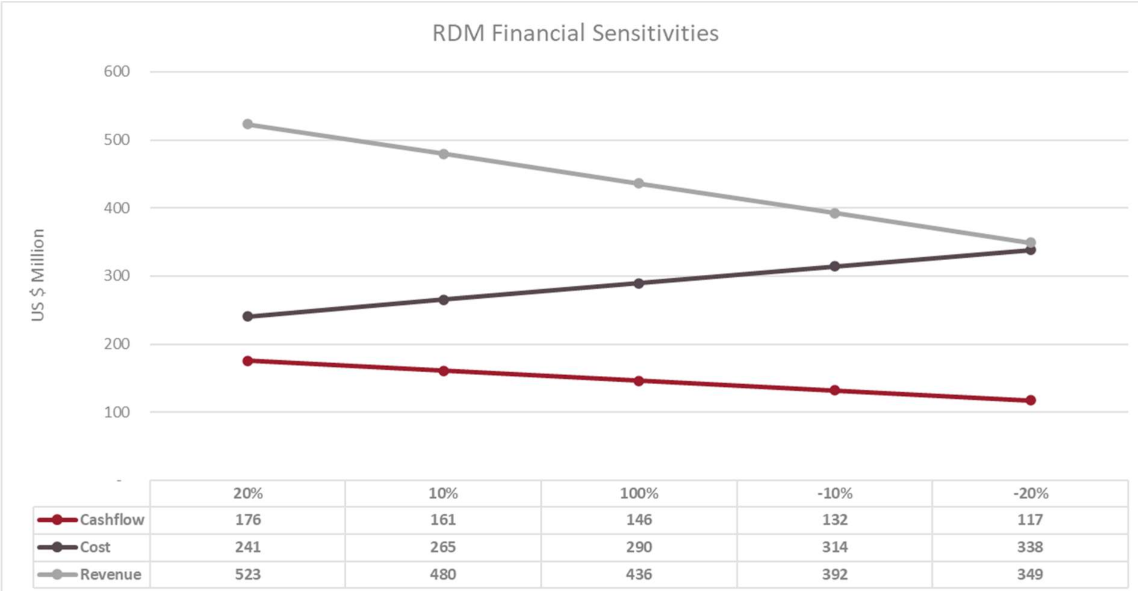
- Land Use
- Water Quality and Management
- Air Quality
- Noise Pollution
- Soil Monitoring
- Tailing disposal

The mine is also engaging with the local communities to ensure alignment with EIA requirements overall. The mine is also planning, reviewing and executing the annual mine closure plan as required by IBM.

1.9 Capital Costs, Operating Costs and Financial Analysis

As this is an operating mine, HZL provided their operational estimates for the mine operations to develop financial sensitivities.

The operating costs for RDM is indicated in this document and financial sensitives indicate that RDM is not very sensitive to economic parameters at plus and minus 20%



	20%	10%	100%	-10%	-20%
Cashflow	176	161	146	132	117
Cost	241	265	290	314	338
Revenue	523	480	436	392	349

Figure 3: RDM Financial Sensitivity Analysis (unit: Million US $)

2 Introduction

2.1 Terms of Reference and Purpose of the Report

A&B Global Mining (ABGM) was commissioned by Hindustan Zinc Limited (HZL) to prepare a review on the Mineral Resources and Ore Reserves – 31 March 2022 Statement, for the following mine operations that are operated by HZL namely:

- Rampura Agucha (RAM)
- Kayad (KDM)
- Sindesar Khurd (SKM)
- Rajpura Dariba (RDM)
- Zawar Mines (ZAW)

This report is a Technical Report Summary (TRS) which summarizes the findings of the review in accordance with Securities Exchange Commission Part 229 Standard Instructions for Filing Forms Regulation S-K subpart 1300 (S-K 1300).

The purpose of this TRS is to report the review of Resource and Reserve Estimates as stated in their Draft document dated 31 March 2022, and to review the data & information received from HZL that will potentially be included in the 2022 Resource and reserve Statement Technical report. The effective date of this report is 29 July 2022.

The quality of information, conclusions, and estimates contained herein is based on the data and information received from HZL and is consistent with the level of effort involved in ABGM's services, based on:

i. information available at the time of preparation,
ii. data supplied by the client, and
iii. the assumptions, conditions, and qualifications set forth in this report.
iv. The time available to complete this review

Any opinions, analysis, evaluations, or recommendations issued by ABGM under this report are for the sole use and benefit of HZL. Because there are no intended third-party beneficiaries, ABGM (and its affiliates) shall have no liability whatsoever to any third parties for any defect, deficiency, error, omission in any statement contained in or in any way related to its deliverables provided under this Report.

2.2 Sources of Information

The information, opinions, conclusions, and estimates presented in this report are based on the following:

- Information and technical data provided by HZL
- Review and assessment of previous investigations
- Assumptions, conditions, and qualifications as set forth in the report
- Review and assessment of data, reports, and conclusions from other consulting organizations and previous property owners.

These sources of information are presented throughout this report and in the References section. The qualified persons are unaware of any material technical data other than that presented by HZL.

ABGM and their associates received a database of information of the HZL operations between 30 June 2022 and 25 July 2022 and reviewed the documents, datasets and information to consolidated into the document presented as of date 29 July 2022.

2.3 List of source materials

HZL provided AGBM with access to a data room housed in EthosData. Here HZL delivered the required documentation and design data from the modelling to the string. Point and wireframes used in the development of the resources model estimates and the reserve estimates.

Figure 4: File Structure and extraction source of data

2.4 Qualified Persons and Details of Inspection

A comprehensive site visit was conducted in the week of 17 July to 25 July 2022. The objectives of the site visits was to conduct the following:

- Physical verification of the mining operations and onsite infrastructure.
- Obtain outstanding information required to complete the technical report.
- Interact with the mine technical team to obtain further clarifications.

Three consultants from ABGM attended the site visits at the various mines.

- **Devendra Vyas:** Managing Director and Principal Mining Engineer
- **Andre van der Merwe:** General Manager and Principal Consultant (Geophysics, Hydrogeology, Geology, Mineral Processing and Environmental Engineering)
- **Pieter Groenewald:** Head – Technical Services and Principal Consultant (Rock Engineering and Hydrogeology)

2.5 Previous Reports on the Project

This is the only SEC -S-K 1300 TRS, A&B Global Mining (ABGM) has submitted for the Hindustan Zinc Limited (HZL) and authors are not aware of any other TRS submitted by prior owners of the project.

3 Property Description and Locations

3.1 Property Location

Both mines are located in close proximity of each other and share some mine infrastructure as part of mining operations.

Rajpura Dariba Mine ("RDM") of Hindustan Zinc Limited (HZL) is located at the southernmost extremity of the Rajpura Dariba Bethumni metallogenic belt in Rajsamand district of Rajasthan. The mining lease covers an area of 1,142.20 hectares (ha) and lies between the latitudes of N 24º 55' 39.66'' to 24º 57' 49.70'' and E 74º 07' 05.42" to 74º 08' 44.67" and falls under Survey of India toposheet No.45 L/1. The Dariba-Bethumni Mineral Belt is located about 80 km NNE of Udaipur and 500 km SW of Delhi and contains the Rajpura Dariba and Sindesar Khurd mines, and the Bamnia Kalan deposit which does not form part of the current study.

The mine was opened in 1982 and Environment Clearance was granted by MoEF, New Delhi for 0.9 MMTPA ore production & 1.2 MMTPA ore beneficiation plant for Rajpura Dariba underground mine vide letter no. J-11011/380/2008-IA II(I) dated 4.11.2009 the EC was later amended to 2.0 million TPA (total excavation 2.48 million TPA) & Lead Zinc Ore Beneficiation from 1.2 to 2.5 million TPA. The lease of the land has been extended to 2030 and the Mining Plan approved until May 2030.

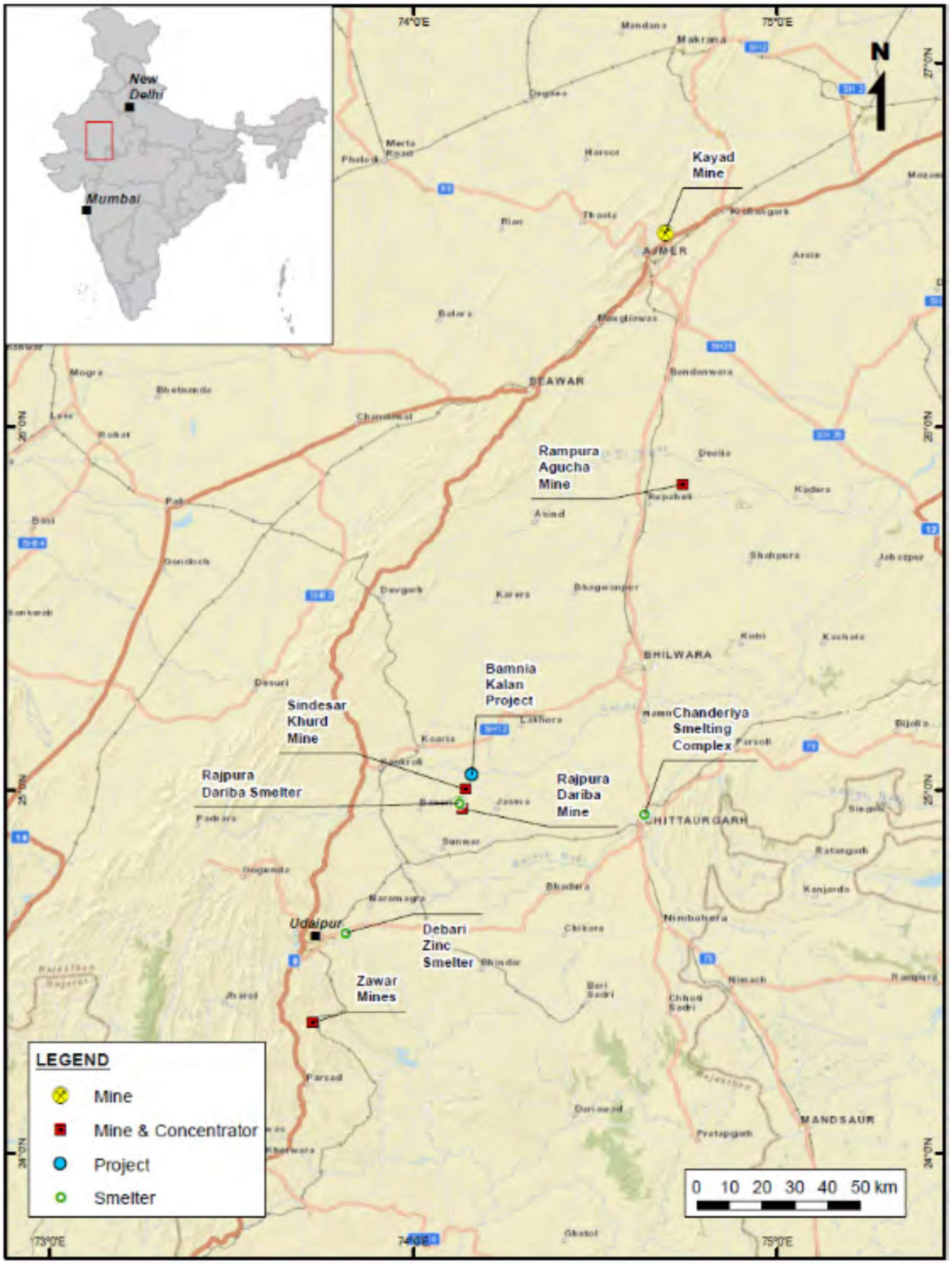


Figure 5: HZL Mine Locations

3.2 Mineral Titles, Claim Rights, Leases and Options

3.2.1 Lease agreements – Details

Table 5: Lease Agreement - Details

Lease Details	(Existing Mine)
Name of Mine	Rajpura Dariba Lead-Zinc Mine
Lat / Long of any boundary point :	A - Lat - 24055'40.8'' Long - 74006'58.0'' B - Lat - 24055'40.9'' Long - 74008'41.4'' C - Lat - 24057'48.3'' Long - 74008'40.8'' D - Lat - 24057'49.0'' Long - 74006'57.7''
Date of grant of lease :	30.05.1970 - M.L.No.166/2008 Expansion of Lead-Zinc Ore Underground Mine from 1.08 to 2.0 million TPA (Total Excavation 2.48 million TPA) & Lead Zinc Ore Beneficiation from 1.2 to 2.5 million TPA at Rajpura Dariba Mine of M/s Hin
Period / Expiry Date :	29.05.2030 as per section 8A (5) of MMDR (Amendment) Act, 2015

3.2.2 Lease agreements – Area

Table 6: Lease Agreement - Area

Forest		Non-Forest	
Forest (Specify)	Area (ha)	Non-Forest	Area (ha)
Nil		Private Land	815.72
		Government Land	124.48
		Grazing Land	124.48
		Others (Settlement)	0
		Total	1142.21

3.2.3 Lease agreements – District

Table 7: Lease Agreement - District

District & State	Rajsamand, Rajasthan
Taluka / Tehsil (Administration Area)	Relmagra
Village	Dariba
Whether the area falls under Coastal Regulation Zone (CRZ)	Not Applicable

3.3 Environmental Impacts, Permitting, Other Significant Factors and Risks

3.3.1 Commitments

No major commitments other than continuous Ambient Air Monitoring. Ambient Air Quality Monitoring (AAQM) stations were set up at Fourteen locations with due considerations to above mentioned points.

3.3.2 Security bonds

Bank Guarantee for degraded land has been submitted and reclamation plan submitted to IBM. The total breakup of land calculated for financial assurance of around 359.23 hectares. Bank guarantee for the same shall be INR 10,80,00,000.

Table 8: Summary of the Security Bonds

Area put in use	Rate/Ha (Rs.)	Bank Guarantee Amount (Rs.)
359.23	3,00,000	10,80,00,000

Bank Guarantee covering amount of Rs.10,87,98,000 (Ten crore, eighty-seven lakhs, nighty eight thousand only) has already been submitted.

Table 9: Details of bank guarantees for financial assurance

Date	Bank	Amount in Rs.
18-04-2020	ICICI, Udaipur	9,066,500
09-06-2020	IDBI, Udaipur	99,731,500
Total		**108,798,000**

3.4 Royalties and Agreements

3.4.1 Joint ventures

RDM is in no current joint venture with third parties or other companies.

3.4.2 Royalty agreements

Lead & Zinc Concentrates are being produced and dispatched from the lease area to the smelters which are located outside the leased area, then royalty shall be chargeable on the processed product i.e. concentrate.

The Lead and Zinc Mineral royalty is to be paid based on London Metal Exchange or London Bullion Market Association price, the royalty shall be calculated at the specified percentage of the average sale price of the metal for the month as published by the Indian Bureau of Mines, for the metal contained in the concentrate of such mineral for the month.

The Rates of royalty declared as per Mine and Mineral (Development and Regulation) Act 1957 and royalty rates are:

- The Royalty for Lead is 14.5% of London Metal Exchange lead metal price chargeable on the contained lead metal in the concentrate produced.
- The Royalty for Zinc is 10% of London Metal Exchange Zinc metal price on ad valorem basis chargeable on contained zinc metal in the concentrate produced.

4 Accessibility, Climate, Local Resources, Infrastructure and Physiography

4.1 Topography, Elevation and Vegetation

4.1.1 Topography

The topography of the area is marked by N-S trending linear ridge with highest elevation of 561MRL. This ridge is flanked on either side by gently undulating surface having an average elevation between 490-500MRL. Main shaft is at 501MRL.The area within leasehold does not include any major streams or river across it, hence not prone to any kind of flood. The drainage is mainly sheet flow. The surface water bodies in the area are characterized by the existence of tanks. The Mataji-Ka-Khera is the main tank located southwest of the Rajpura Dariba Mine. The main source of drainage is River Banas, which is ephemeral and flows at 8.2km aerial distance towards NNE of the deposit.

4.1.2 Drainage Pattern

A dendritic drainage pattern is the most common form and looks like the branching pattern of tree roots. It develops in regions underlain by homogeneous material. That is, the subsurface geology has a similar resistance to weathering so there is no apparent control over the direction the tributaries take. Tributaries joining larger streams at acute angle (less than 90 degrees).

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Although there is a well-defined drainage system with dendritic drainage pattern in the buffer zone, a major part of drainage has been harnessed by constructing minor irrigation projects and tanks. Whatever runoff is produced by the average annual rainfall of 571 mm in the buffer zone, the major part drains as surface runoff after meeting the evapo-transpiration losses, and a part percolates to the zone of saturation.

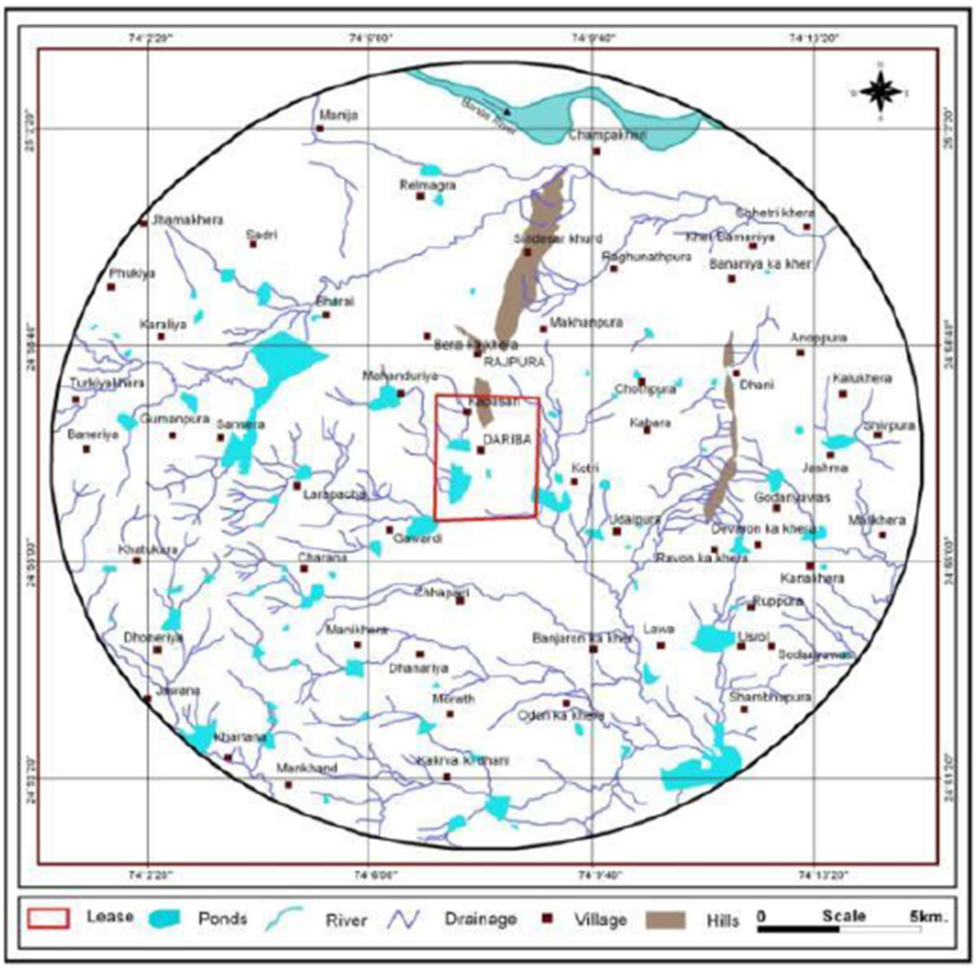

Figure 6: Drainage Map (RDM and SKM)

4.1.3 Vegetation

Vegetation is limited to very slow growing stunted trees, thorny shrubs and some grasses. The other natural vegetation type is ephemeral, occurring only during the monsoon season. Kejri (Prosopis cineraria) is the most prolific and an all purpose tree and its bean shaped fruit, sangri, is eaten as vegetable and used as fodder. The ker fruit is also eaten as vegetable and it has strong and durable wood. The other prominent trees include akaro (Calotropisprocera) and shrubs, the thor (Euphorbia caduca), bordi (Zizypusnummularia), babul (Acacia nilotica) and anwal (Cassia aureculata) etc. perennial grasses sewan (Lasiurussindicus), dhaman (Cenchrusciliaris), boor (Cenchrusjwarancusa) and bharut (Cenchruscatharficus) are also available.

4.2 Accessibility and Transportation to the Property

The nearest railway station and road is Fatehnagar, about 25 km, on Chittorgarh-Udaipur broad gauge line. The deposit is approachable from Rajpura Dariba Mine by a metalled road.

General access to the Dariba area is poor with vehicles having to pass through small villages and on poor and narrow roads. It was reported that in the long term a rail line from the SK Mine and the Dariba complex is being considered and this will also assist with the movement of concentrates and metals in addition to handling engineering and plant consumable supplies.

The nearest connectivity details are given as:

- Nearest Airport- Maharana Pratap Airport (~44.0 km aerial distance towards SW) from mine lease boundary.
- Nearest Railway Station – Bhupas Sagar Railway Station (11.2 km aerial distance towards South South-east), Fatehnagar Railway Station (~13.2 km aerial distance towards SSW) from mine lease boundary.
- Nearest Highway - NH-162A- at a distance of 0.5 km aerial distance towards West and SH-9 (Udaipur-Cittorgarh via Mavli) at a distance of 12.5 km aerial distance towards south from mine lease boundary.

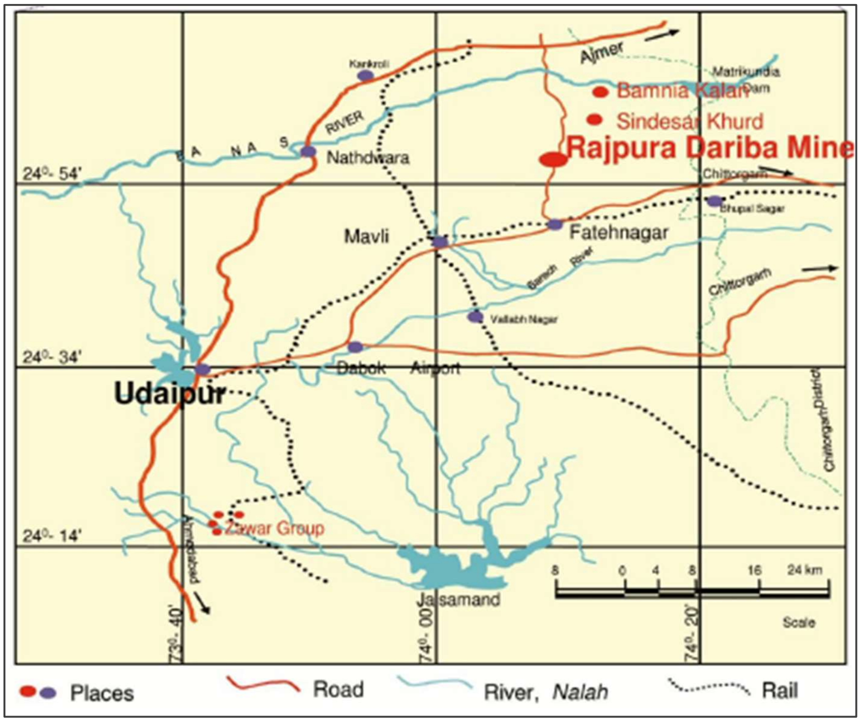

Figure 7: Location of the RD Mine

4.3 Climate and Length of Operating Season

4.3.1 Climate and Meteorology

The climate of the district is generally dry and healthy, and the seasons are on the pattern of those generally in the Deccan. The summer season starts during the middle of February and - continues up to the first week of June. Summer is followed by south-west monsoon which last till the end of September. October and November are the post-monsoon months. December is the coldest month with mean daily maximum and minimum temperatures being 24^{0}C and 10^{0}C respectively. During peak summer, temperature shoots up to 44.6^{0}C. Relative humidity varies from 25% in summer to 82% in winter (Census 2011). Due to the mild weather conditions, the mines can operate throughout the year, and should have no weather-related restrictions.

4.3.2 Rainfall Data

The average rainfall is 800 mm. The rainfall during the period from June-September constitutes about 92% of the annual rainfall.

4.4 Infrastructure Availability and Sources

Rajpura Dariba Mine has all the infrastructure facilities, including a Central Workshop for any major overhauling, maintenance and fabrication job. The power supply to the mine is received from Ajmer Vidyut Vitran Nigam Limited. Two 3.5 MW diesel generator sets have been installed at the mine as standby. Water requirement for industrial and township usage is met from Matrikundia dam built on Banas River about 22 km away. A workforce of 320 persons is employed on company payroll and 1,170 numbers direct contractual labour are engaged to support various operations of the mine. The strength of executives is 87. Besides this, a large number of persons are supporting the other allied activities. The mine has a well-laid township with marketing, recreational and cultural facilities. A 16-bed hospital fully furnished with modern therapeutic equipment manned by specialized staff attends to the medical requirements of the employees and their families. A well-equipped occupational health monitoring facility with X-Ray, audiometry, lung function test, & blood lead level monitoring is available in the unit hospital. One Primary and one Senior secondary DAV school cater to the educational needs of the wards of the employees and local population.

5 History

5.1 Production

The Dariba-Bethumni Mineral Belt is located about 80 km NNE of Udaipur and 500 km SW of Delhi and contains the Rajpura Dariba Mine and Sindesar Khurd mines, and the Bamnia Kalan exploration project. Mining dates back some 2,500 years and historic mining at the East Lode of Rajpura Dariba progressed to a depth of over 200 m. Several older workings in the form of irregular pits, trenches and small diameter shafts are seen around the area; however, some of the abandoned workings are in the form of unlined/ lined shafts showing signatures of past dewatering. In the Dariba area the ancient prospectors had carried out mining up to a depth of 260 m, which makes it the deepest ancient mine in Rajasthan.

Table 10: RDM Production Table

Description	Units	F2017 Actual	F2018 Actual	F2019 Actual	F2020 Actual	F2021 Actual
Ore mined	Mt	0.75	0.90	1.08	1.04	1.22
Ore processed	Mt	0.74	0.96	1.06	0.91	0.99
Zn grade	%	5.28	4.73	5.16	4.99	4.77
Pb grade	%	1.40	1.26	1.45	1.42	1.44
Ag grade	g/t	56.2	47.8	59.6	70.0	84.3
Zn recovery	%	83.8	83.9	83.8	84.2	84.4
Pb recovery	%	69.0	68.6	68.3	69.3	69.6
Ag recovery	%	67.6	68.9	75.0	73.1	57.6
Zn MIC	kt	33	38	46	38	40
Pb MIC	kt	7	8	10	9	10
Ag MIC	koz	902	1,019	1,519	1,501	1,545

5.2 Historical Exploration

In 2022, 43,200 m of drilling was conducted, resulting in more than 80 mineralised intersections. Other surveys included a gravity survey, ATV/OTV Survey, geophysical logging of the drillholes and magnetic measurement on the core for further ground geophysical work.

Underground Exploration drilling produced 10,800 m of core from 127 holes in the period up to February 2022. Due to the fractured nature of the core, triple tube core barrels had to be used to ensure maximum core recovery. This allowed the recovery to improve from 25% to 70% in the intensely fractured zone (North Lode). Long hole (300+ m) drilling was used to reduce time and cost. Dewatering of the North Lode section was done through the drill holes.

5.3 Underground Exploration Highlights:

- Best Practice – Implement of triple tube to enhance core recovery from 25 % to 70% in intense fracture zone (North Lode)
- Exploration with long hole having 300+ m length to reduce time and cost.
- Dewatering through exploratory drilled hole in North Lode section.

Production at RDM has steadily increased from a historical 0.7 Mtpa to over 1.0 Mtpa achieved in F2020 and F2021. Production increases at RDM have been affected by a slow transition from conventional mining to that of fully mechanised and the separation of the mine into four distinct sections.

The mine was opened in 1982 and Environment Clearance was granted by MoEF, New Delhi for 0.9 MTPA ore production & 1.2 MTPA ore beneficiation plant for Rajpura Dariba underground mine with letter no. J-11011/380/2008-IA II(I) dated 4.11.2009. The EC was later amended to 2.0 million TPA (total excavation 2.48 million TPA) & Lead Zinc Ore Beneficiation from 1.2 to 2.5 million TPA (ML No. 166/2008, Area 1142.2106 Ha.) The lease of the land has been extended to 2030 and the Mining Plan approved until May 2030.

6 Geological Setting, Mineralization and Deposit

6.1 Regional Geology

Dariba-Bethumni metallogenic belt comprises an assemblage of medium to high-grade metamorphic equivalents of orthoquartzites, carbonates and carbonaceous facies rocks belonging to Bhilwara Super Group (3.5-2.5Ga) and extends for about 19 km in north-south direction. This cover sequence is underlain by basement rocks (gneisses and schists) of Mangalwar Complex. This is a Lenticular orebody deposit with multiple lenses surrounding the main orebody.

The structure of the belt is as an isoclinal fold (GSI, 1990) having synformal closure at Dariba in south (steep plunge 55°-60° towards ENE) and antiformal closure (shallow plunge 15°-20° towards NE) at Bethumni in north. The rocks have suffered at least three phases of deformation resulting in culminations and depressions.

The regional trend of the formation veers from N-S between Dariba and Rajpura in the south, to N15°E-S15°W between Sindesar Khurd and Sindesar Kalan in the middle and finally to N50°E-S50°W around Bethumni in the north. The rocks generally show moderate to steep dips towards the E/SE.

Base metal deposits of various sizes and grades occur throughout the belt in calc-silicate bearing dolomite and graphite mica schist horizons, the latter in general containing low grade disseminated sulphides of large volumes. The south end of the belt contains multi-metallic sulpho-salt associations.

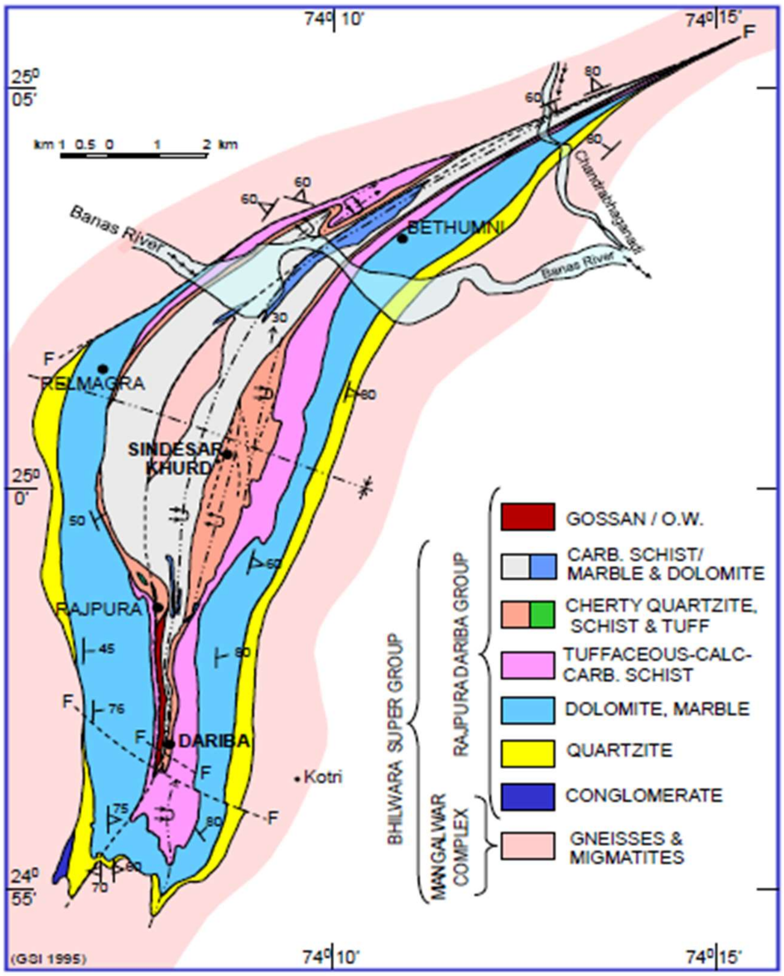

Figure 8: Regional Geological Map for RDM and SKM

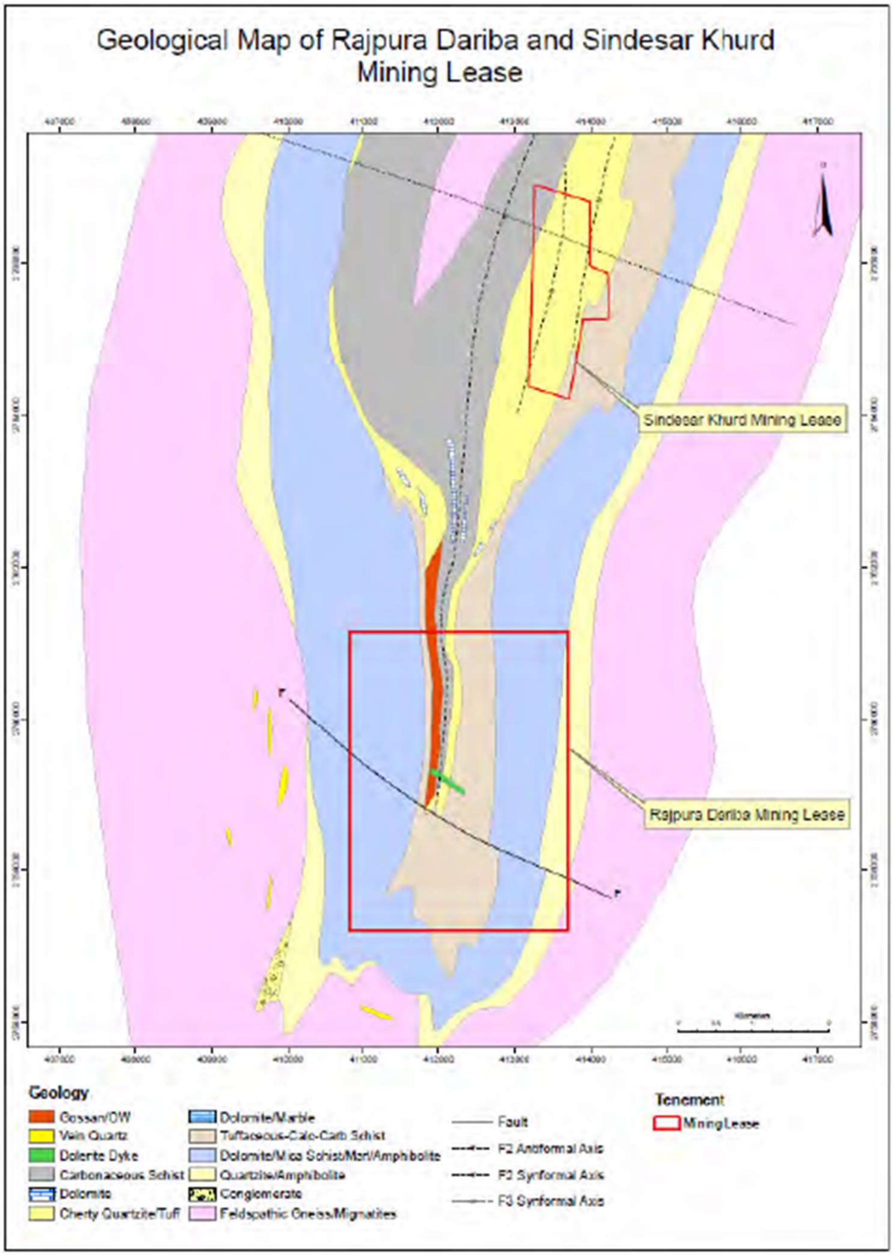

Figure 9: Property Geology Map for RDM and SKM

6.2 Property Geology

The Rajpura Dariba Mine is located at the southern extremity of the belt. The ore bodies are designated as Main Lode and East Lode. Main lode with a N-S strike is further divided into two, viz-à-viz the North lode (900m in length and dipping at 70°-75°E) and the South lode (500m in length and dipping 60°-70°E). The East lode is located about 150 to 200m away from the hanging wall side of the

South lode and has a length of 600m. The area between the South and North Lodes is traversed by 2-10 m wide meta-basic dykes. Four sets of joints are developed due to deformation. Shears are represented by narrow zones of crushing, brecciation and gouging, mostly 0.1-2.0 m wide. These are highly persistent along strike and dip and occur at the contacts and within the ore bodies for South and North Lodes. However, they are not found in East Lode. Faults are of reverse type with low south-easterly dipping planes striking N40°-60°E.

The 17 km long Dariba-Bethumni Mineral Belt comprises medium to high-grade metamorphosed metasediments belonging to the early Proterozoic Bhilwara Supergroup. The sequence forms an isoclinal fold and is surrounded by gneisses and migmatites of the Mangalwar complex.

The main ore minerals are galena and sphalerite and minor silver-bearing fahlore, while pyrite and pyrrhotite are the main sulphide gangue minerals.

The Rajpura Dariba deposit comprises several mineralised lodes: on the west flank of the syncline, the North and South Lodes, which incorporate the Main Lode, and on the east flank of the syncline, the East Lode, comprising E0, E-1, E-10 and E-11. The North, South and East Lodes are 15 to 50 m thick, dip east with the stratigraphy at 65º and have strike lengths of >900 m, 500 m and 600 m respectively. The lodes have been mapped from surface, where a thick robust gossan has been mapped.

More recent exploration undertaken since 2009/10 from surface, has further helped to determine and delineate the mineralisation at depth on both the Main, North and South Lodes, with an oxidised portion referred to as the North Zone. Drilling in the East Lode has also allowed the delineation of further Mineral Resource at depth, and a discrete East Lode at depth.

There remain areas with excellent potential to add resource that require further delineation drilling. These areas are located close to existing underground infrastructure and development, and therefore should be prioritised over exploration of deeper, currently inaccessible areas. In the North Lode, ground stability is affected by a shear zone along the hanging-wall, as well as by dissolution of dolomite by acidic water from adjacent oxidised zones. This area presents a challenge both metallurgically and geotechnically. Shearing is evident throughout the mineralised lenses and causes stability issues and mining difficulties, however, does not appear to affect the grade or geological continuity to any great degree. The extension of the North deposit at depth comprises a large proportion of heavily oxidised material with limited geological knowledge and test work results.

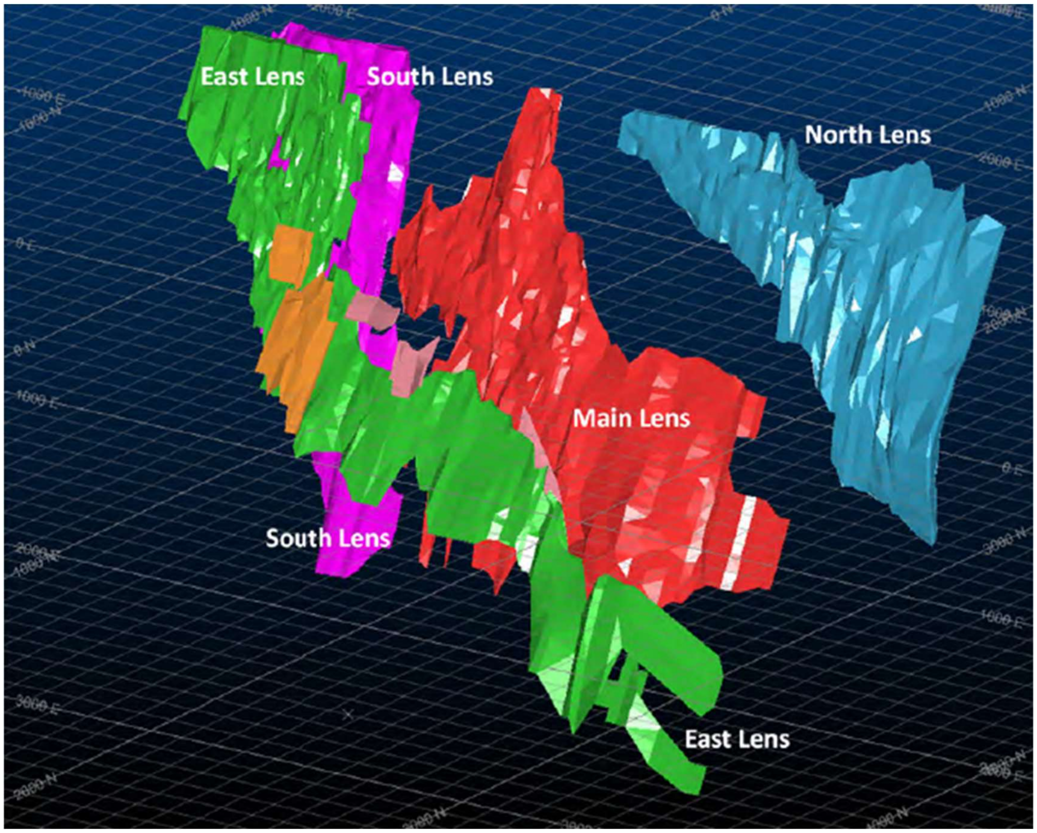

Figure 10: Mineralised Ore Bodies - RDM

6.3 Deposit Types

Mineralisation exhibits lithological, stratigraphic and structural controls and occurs in the form of fracture-filling veins, stringers and disseminations forming tabular to lenticular ore bodies. The mineralization is of probable SEDEX-origin and concentrated in calcsilicate bearing dolomites and in graphite mica schists. The deposit forms part of a larger, regional-scale mineralised belt.

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6.4 Mineralization

A spectacular zone of in situ gossan is found capping the ridge between Dariba (24°57’: 74°08’) and Rajpura (24°58’: 74°08’) villages in Udaipur district over a strike length of 4.5 km with width ranging from 2 m to 40 m. This conspicuous gossan zone was recognized as the principal guide and indicator of base metal mineralization in the area and eventually led to the re-discovery and detailed exploration of the Rajpura - Dariba mineralized belt by the Geological Survey of India between 1963 and 1973.

The nature of mineralisation is synsedimentary, later remobilised and recrystallised during subsequent polyphase deformation and metamorphism. The principal ore forming minerals are sphalerite (ZnS) and galena (PbS). Pyrrhotite is most abundant and ubiquitous gangue while pyrite (FeS) and arsenopyrite (FeAsS) are rare. The rock forming minerals are calcite, dolomite, quartz, mica, garnet, tremolite, argillaceous and carbonaceous materials.

The mineralization in calc-silicate bearing dolomite is mostly confined to structural openings. Ore minerals occur as bands, stringers, disseminations, fracture-filling veins etc. and are recrystallised in places. The mineralization in graphite mica schist is in the form of laminae parallel to schistosity, stringers, blebs and recrystallised massive patches.

The economic ore is hosted in two different types of mineralised environments: calc-silicate dolomites and graphite mica schists. The mineralogy of the RDM material is indicated to be relatively complex with zinc and lead minerals occurring as intergrowths and fine disseminations among other sulphide and gangue minerals. Gangue minerals include dolomite, muscovite, quartz and feldspar. There is also presence of significant level of fine graphite, particularly in the graphite mica schist zone where levels of up 2% carbon are reported (typically 1.7%). The graphite level in the calc-silicate ore is reported to be low. Typical plant feed grades are 5 - 6% Zn and 1.2 – 1.6% Pb with 6-8% Fe. Silver levels are significant at around 80 g/t Ag.

7 Exploration

The HZL complex has undergone extensive exploration since their discovery in the mid-1970’s. In the past few years, exploration has been undertaken by means of diamond drilling underground for two purposes, namely grade control and extension of current mineral envelopes to deeper levels.

7.1 Summary of Exploration Activities

In general, the underground exploration drilling is undertaken during the underground mining activities On-reef drilling is carried out by the mine and constitutes the majority of the meterage drilled.

Table 11: Summary of Exploration Drill for RDM (2017-2022)

Mine/Deposit	F2017		F2018		F2019		F2020		F2021		F2022
	No.Holes	(m)	No.Holes	(m)	No.Holes	(m)	No.Holes	(m)	No.Holes	(m)	(m)
Rajpura Dariba	37	1,598	89	10,838	168	32,435	203	34,717	98	27,639	39,231

7.2 Exploration Work

Mining dates back some 2,500 years and historic mining at the East Lode of Rajpura Dariba progressed to a depth of over 200 m. Pre-1980 historical surface exploration data comprises some 31,146m of drilling information.

Total drilling data for the deposit totals over 960 drillholes for over 235 km, which is split into over 663 drillholes within the mine for over 50 km, over 252 drillholes for over 150 km from deep surface holes, and over 50 holes for over 25 km in the shallower North orebody. During F2021, a total of 203 holes were drilled for 34,717 m of drilling was undertaken at RDM.

7.3 Drilling Technique, Spatial Data & Logging

Due to the advanced status of mine development and resource extraction at RDM, most of the currently reported resource figures in the Main Lode are based on results of underground stope delineation drilling. Routine diamond drilling is undertaken on 25-30 m mid-points and involves drilling of holes at AX diameter of about 50-100 m length, BX is often used for holes less than 50 m in length.

Core recovery in the North Lode is partly very low (often <50% due to shearing and cavities) with close proximity to the deeply oxidized zone, and several holes had to be abandoned before reaching the hanging-wall of the ore zone.

Drilling is undertaken from both surface and underground locations. Core recovery is excellent averaging some 95%, however there are some lower recoveries in core from the Northern oxidised orebody. Drill core appears to be of extremely high quality with excellent recovery, which is only slightly reduced in faulted/sheared areas. There seems to be no major relationships between core recovery and grade.

Gyroscopic downhole surveys are completed using a multi-shot camera (Reflex). Surface Drill Collars are initially located on ground using GPS. Subsequently, these are tied up with Local Grid by the mine survey team using Total Station. Down-hole direction arrows are marked on every core piece by the driller. Similarly run ends and meter pegs are neatly marked and placed. Meter depth is also painted on the core just before the peg. Geologists ensure that run pegs are at the correct locations. UG mine workings are surveyed using Total Station.

Logging practices are adequate for resource estimate purposes. Almost all of the available core, particularly within 100m of the deposit extents on the hanging wall and up to the end of the holes on the footwall side, has been photographed using a digital camera. Only the most basic geotechnical parameters are collected. Geological and geotechnical logging is undertaken on a systematic basis by HZL geologists. All data is logged in hardcopy and entered in to excel before being input into the central database, which is securely stored and backed-up at the office in Udaipur.

Logging is largely qualitative. Certain semi-quantitative metrics are logged: structural data, RQD, fracture frequency and model mineral percentages. Core is well logged and interpreted by competent geologist’s onsite. Limited geotechnical data was recorded.

Note: *Acceptable industry standards were followed with respect to core logging. Recommend more detailed geotechnical logging and recording of structures.*

7.4 Sample Preparation

The following sample splitting and preparation methods are employed:

- 1m length core samples in the visible mineralised zones.
- Separate samples for notably different core recoveries in two contiguous runs.
- Separate samples for visibly significant grade variations (Zn and / or Pb).
- Longitudinal split line is marked along the marked sample so as to ensure equal division of ore portion in the two halves.
- Samples are clearly labelled and there is good control of samples through the preparation and analytical process

It has been suggested that core loss would rather lead to under rather than over estimation of the grades, due to preferential recovery of massive un-mineralised dolomite, as opposed to fractured higher-grade material. The mineralised zone and adjacent country rock are sampled in 1 m intervals, where there is sufficient core recovery, split by capstan core splitter, and crushed and milled to 150 mesh.

Silver values have been added to the underground sample database. Reliable silver values are only available for HZL routine underground drilling, which covers the reserve blocks only, and only small portions of the resource areas, which partly still rely on results of first-phase/historical surface exploration drilling data.

With respect to silver, studies completed to date demonstrate, however, that there appears to exist within the deposit and within individual mineralised lenses, both high and low lead:silver ratios, whose spatial distribution is not yet fully understood. Silver data from recent surface drilling which is accompanied with QAQC validation seems to indicate distinct high and low ratios, with higher ratios in the South Lode South data, East Lode and some of the Main lode and lower ratios in the North lode data and most of the Main lode data.

Note: *Sample preparation is performed diligently and in line with best practices. The dispatch and sample control systems was observed by the CP on site and deemed acceptable. No clear mention of security, transport and chain of responsibility and custody, but no incidents have been reported either.*

7.5 Sample Analysis and QAQC Protocols

Samples are analysed for the following metals:

- Pb, Zn, Fe, Cd, Cu, Co, Sb, Bi, Ni and Mn

by 4-acid digest and ICPOES finish. Ag and As by aqua regia digestion followed by AAS finish.

The primary analytical laboratory, Shiva, introduces its own standards at 1 in 30 samples and repeats the analysis for our every 10th sample. Sample preparation is undertaken by accredited Shiva Analytical Pvt Ltd, Bangalore.

In accordance with the HZL's QA/QC programme consists of:

- Insertion of blank material (quartz/pegmatite) into the numbered sequence as the first sample at the beginning of the mineralization in each sample batch.
- Systematic insertion of certified reference material ("CRM")(GESTAT and OREAS) at frequency of 1 in 25. The choice of CRM is at the discretion of the logging Geologist.
- Random insertion of duplicate pulp checks, at a frequency of 1 in 10.
- Annual umpire assay in HZL's laboratory at RDM.

ABGM has reviewed the QAQC data in detail since 2005 and notes that the performance is good.

A weight / volumetric displacement method is used to assess bulk density, which reconcile well against production data. Bulk density for each sample is measured by volumetric method using Archimedes' Principle. Where correlation s between metal and density measurements is well established, and the adequacy of measurements is sufficient, the bulk density is estimated from regression analysis.

Note: *While bulk density data has been reconciled with production data, independent bulk density analyses should be undertaken at an independent laboratory during the exploration phase to avoid errors.*

7.6 Opinion of adequacy

The QP believe that the procedures used in the sampling are adequate for mineral estimation purposes and reporting of mineral resources and reserves

8 Mineral Processing and Metallurgical Testing

The HZL has a network of operations across India and RDM is currently an operating mine with a working CPP with many years of operations behind them. The mineral processing is well understood and there is no need to conduct any metallurgical test work at the current operations.

9 Mineral Resource Estimate

9.1 Introduction

The Mineral Resources described in this Item are based on appropriate geoscientific information, economic and technical parameters, and grade and tonnage estimation processes. The Mineral Resource estimates were determined using ordinary kriging (OK) geostatistical methodology and considered sample lengths, grade capping / cutting, the spatial distribution of drill holes and the quality assurance and quality control results for the analytical sample grades determined. Geological modelling and grade estimation used Datamine software.

9.2 Geological Models

The zinc (Zn) and lead (Pb) sulphide, and silver (Ag) mineralization at Rajpura Dariba is understood to be a stratabound carbonate-hosted remobilisation deposit type. The deposit forms part of the 17 km long Dariba-Bethumni Mineral Belt. The deposit is hosted by a sequence of medium to high-grade metamorphosed dolomite, carbonaceous chert and graphite chert of the Proterozoic Bhilwara Supergroup within an isoclinal fold and is surrounded by gneisses and migmatites of the Mangalwar Complex. The mineralization is predominantly in stringers, veins and patches and is variable in grade due to a local and highly complex folded structure. Mineralization at the footwall and hanging lithologies is disseminated.

The Rajpura Dariba deposit is subdivided into four mineralised lodes on the limbs of the isoclinal fold. On the western limb of the fold are the North and South zones hosted in calc-silicate-bearing rocks. The Main Lode is hosted within these two zones. The East Lode is on the eastern limb of the fold and consists of the E0, E1, E10 and E11 zones hosted by graphite mica schist, and contains a further separate zone at depth. The North Lode is the extension of the ore body and includes a large proportion of oxidised material. Furthermore, a wide internal waste zone is situated in the upper area of the deposit but fortunately is largely mined out but is modelled as a separate zone.

The strike, dip, dip direction, and thickness of the North, South, Main and East lodes are:

- North: a strike length of ~900 m N-S dipping at ~65^o to the east between ~15 – 50 m thick
- South: a strike length of ~500 m N-S dipping at ~65^o to the east between ~15 – 50 m thick
- Main: a strike length of ~600 m N-S dipping at ~65^o to the east between ~15 – 50 m thick
- East: a strike length of ~600 m N-S dipping at ~65^o to the east between ~15 – 50 m thick.

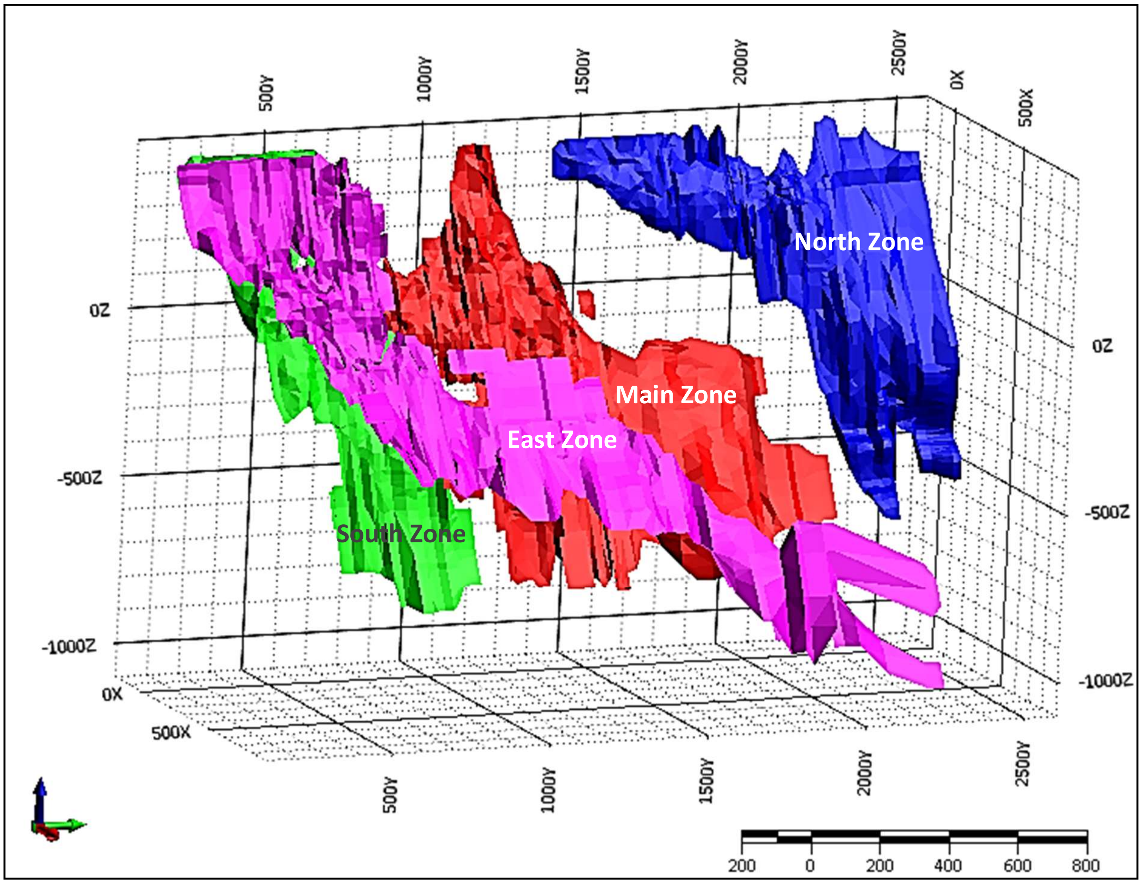


Figure 11 : 3D Representation of the four lodes at Rajpura Dariba

The primary sulphide minerals are sphalerite (ZnS) and galena (PbS), as well as silver-bearing fahlore. The sulphide gangue minerals are pyrite, pyrrhotite and arsenopyrite.

9.3 Block Model Orientation and Dimensions

The wireframes were constructed using cross-sections taken across the ore body with principal sections on a 50 m spacing with and infill sections at ~25 m where necessary. Maximum distance of extrapolation from data was 3 m. A geological cut-off of 3% Zn + Pb cut-off over a 3 m minimum horizontal thickness defined the limits of the mineralized zones.

The wireframes were filled with a block model based on a parent-block size of 10 x 25 x 25 m (across-strike (X) / along-strike (Y) / vertical height (Z)). The block model dimensions were reduced to were reduced to 5 x 12.5 x 12.5 m in areas covered by 25 x 25 m underground drill holes and 50 x 50 x 50 m covered with surface drill holes spaced between 50 – 100 m to greater than 50 – 100 m. Appropriate sub-blocking has been used at mineralisation contacts to honour the geometry and volume.

9.4 Database

The database used for the grade estimates is based on data received from Hindustan Zinc Limited. A total of 1,064 underground and surface drill holes were available for use in generating the wireframes, and grade and tonnage estimates. Approximately 524 km of core has been drilled of which pre-1980 drill hole core accounts for 31,146 m. The cut-off date for the database was the end of F2021. The surface drill holes have an average grid spacing of ≥ 50 x 100 m and 25 x 25 m for underground drill holes.

ABGM has reviewed the drill hole database up to F202 and concluded that the drill hole data is adequate for use in the Mineral Resource estimation process. The historical drill holes were found to have adequate industry standard quality assurance and quality control (QAQC) quality assurance programmes and procedures which allowed for replication, precision and accuracy of the sample grades. Assay results prior to 2015 were also reviewed by previous consultants who concluded that the grade results are satisfactory although short-comings were noted. The reader is directed to Item 8 for sample preparation, analytical techniques and security.

9.5 Exploratory Data Analysis

Table 12: Classical statistics of the four lodes

Deposit	Metal	Minimum	Maximum	No. of Points	Mean	Median	Mode	Coeff. of Variation
North	Zn (%)	0.00	71.10	10,286	7.88	6.28	0.40	0.89
South	Zn (%)	0.00	34.20	7,079	6.69	5.91	0.42	0.85
Main	Zn (%)	0.00	41.80	13,006	7.87	7.32	0.17	0.68
East	Zn (%)	0.00	40.00	5,938	6.86	5.22	3.34	0.85
North	Pb (%)	0.00	62.00	7,080	2.96	1.89	1.09	1.16
South	Pb (%)	0.00	46.00	10,286	2.40	1.55	0.20	1.22
Main	Pb (%)	0.00	31.10	13,006	1.86	1.22	0.17	1.19
East	Pb (%)	0.00	18.53	5,938	1.56	0.97	0.12	1.17
North	Ag (g/t)	0.00	3,850.00	4,848	126.51	75.00	36.00	1.36
South	Ag (g/t)	0.00	1,513.00	11,694	61.36	38.00	3.50	1.34
Main	Ag (g/t)	0.00	7,600.00	6,152	66.88	42.00	24.07	2.78
East	Ag (g/t)	0.00	2,112.00	6,793	61.50	18.00	2.50	2.00

Normal space histograms for the drill hole samples show that Zn (%), Pb (%) and Ag (g/t) represent strongly skewed distributions indicating that the mean is greater than the median value which is greater than the mode. This indicates that the mean value is influenced by higher grade values.

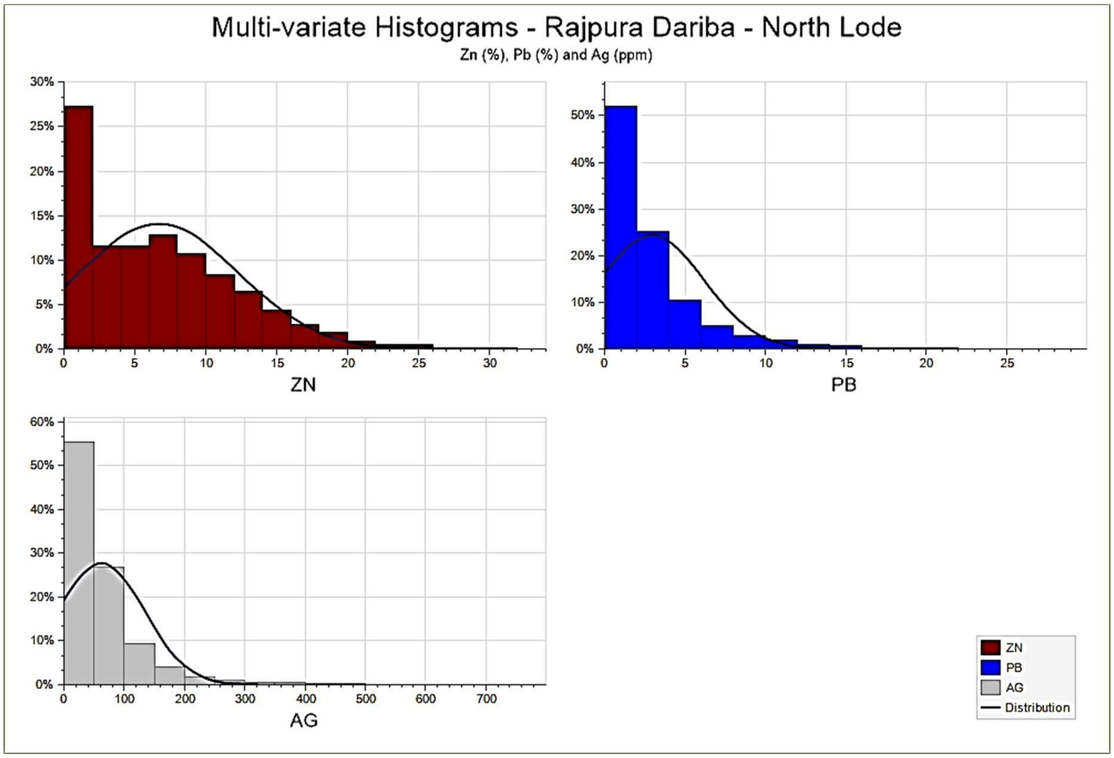


Figure 12: multi-variate histograms of the North Lode drill hole samples for Zn (%), Pb (%), and Ag (g/t)

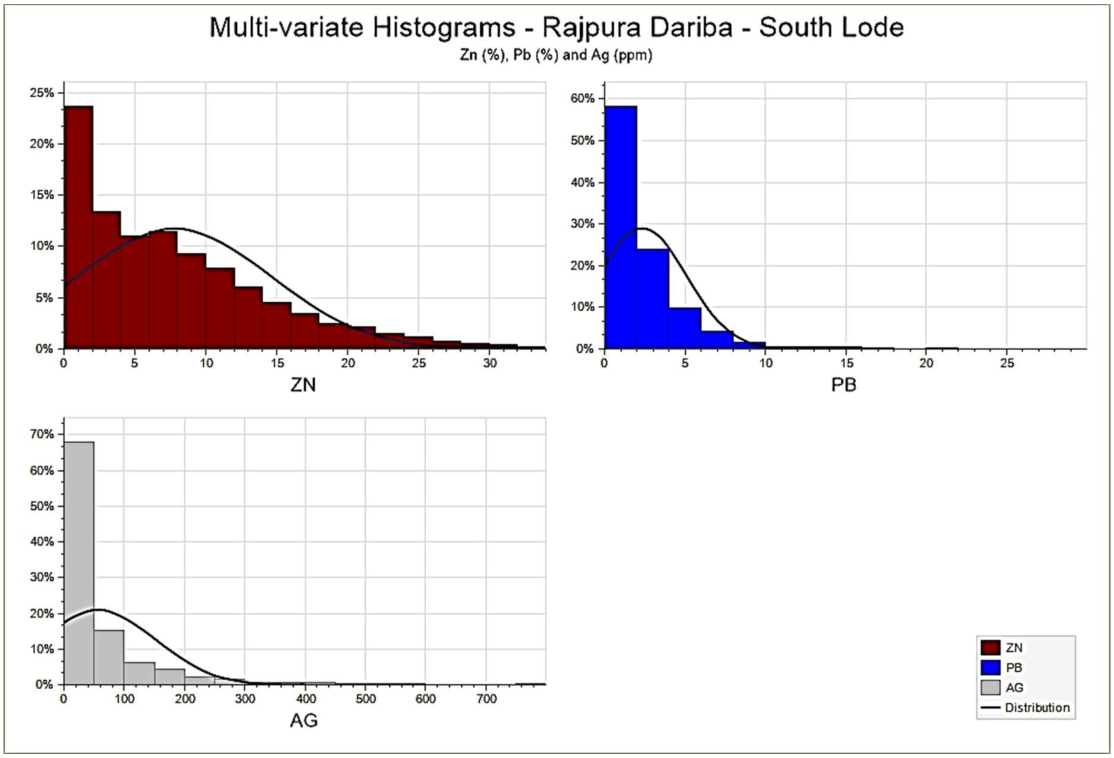


Figure 13: multi-variate histograms of the South Lode drill hole samples for Zn (%), Pb (%), and Ag (g/t)

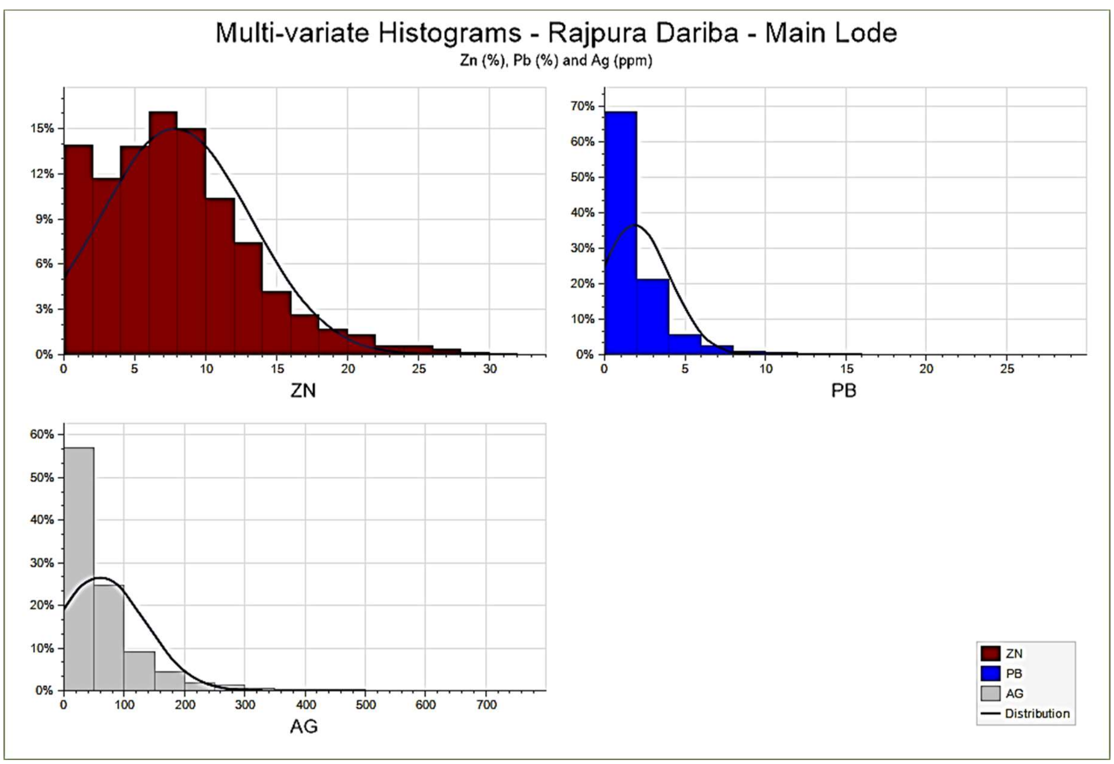


Figure 14: multi-variate histograms of the Main Lode drill hole samples for Zn (%), Pb (%), and Ag (g/t)

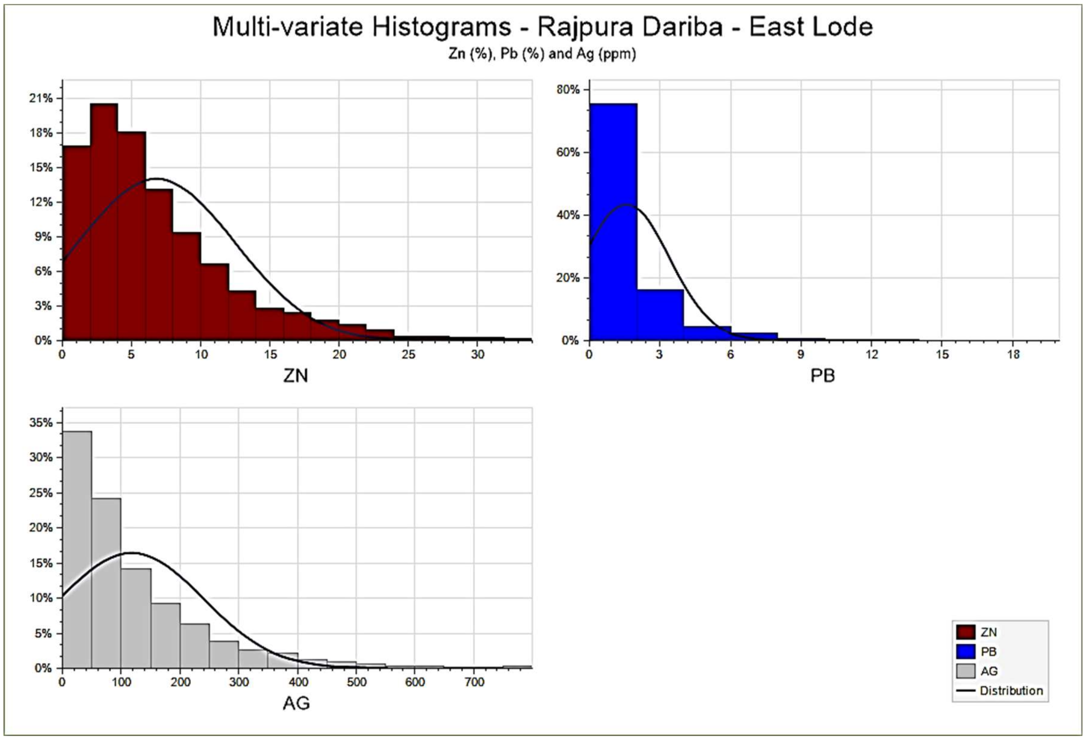


Figure 15: multi-variate histograms of the East Lode drill hole samples for Zn (%), Pb (%), and Ag (g/t)

9.6 Data Compositing

Most of the drill hole samples are 1.0 m in length and were therefore composited to 1.0 m lengths. Data compositing reduces the data population variability and contributes to a more uniform data support for estimation purposes. The drill hole and composite data populations correspond with each other for the normal space histograms drill hole samples demonstrating the data population distribution has been maintained.

9.7 Density Determination

Specific gravity (density) was analysed using the Archimedes' Principle methodology. The Archimedes' Principle measures the weight / volumetric displacement of a sample within air and water. The correlation between the values reconciles well against production data. A fixed density of 3.00 t/m^3 was applied to the volumes.

9.8 Grade Capping / Cutting

Grade capping and cutting removes outlier values which will unduly influence the variability in the estimation process. Outlier values were determined via statistical analyses. Cutting removes the values above a threshold.

Top cutting applied at the North Lode:

- Zn: 22.5%
- Pb: 13.8%
- Ag: 300g/t.

Top cutting applied at the South Lode:

- Zn: 28.5%
- Pb: 13.5%
- Ag: 300g/t.

Top cutting applied at the Main Lode:

- Zn: 22.5%
- Pb: 13.0%
- Ag: 300g/t.

Top cutting applied at the East Lode:

- Zn: 28.0%
- Pb: 9.6 – 13.5%
- Ag: 300g/t.

9.9 Estimation/Interpolation Methods

Ordinary kriging (OK) methodology was used to estimate Zn, Pb and Ag, using hard boundaries and search ellipsoids with anisotropic weighting that encompasses the geological trends were used to both interpolate and extrapolate the Zn, Pb, and Ag grades. Variography and quantitative kriging neighbourhood analysis per load was undertaken to determine the optimal sample weighting and search parameters for input into the estimation process.

Restricted local search applied to some of the zones are as follows:

- North Lode: a minimum of 8 and maximum of 150 samples, a maximum of six composites per drill hole, a search pass of 125 - 250 m (X), 100 - 250 m (Y), and 20 - 30 m (Z) depending on block sizes, and a discretization of 5, 5 and 4 (X, Y, and Z)

- South: a minimum of 8 and maximum up to 150 samples, a maximum of six composites per drill hole, a search pass of 100 - 250 m (X), 75 - 200 m (Y), and 25 - 100 m (Z) depending on block sizes, and a discretization of 5, 5 and 5 (X, Y, and Z)
- Main: a minimum of 8 and maximum up to 125 samples, a maximum of six composites per drill hole, a search pass of 100 - 250 m (X), 150 - 250 m (Y), and 20 - 30 m (Z) depending on block sizes, and a discretization of 6, 6 and 4 (X, Y, and Z)
- East: a minimum of 8 and maximum up to 150 samples, a maximum of six composites per drill hole, a search pass of 100 - 250 m (X), 125 - 200 m (Y), and 20 - 100 m (Z) depending on block sizes, and a discretization of 5, 5 and 4 (X, Y, and Z).

9.10 Reasonable Prospect of Eventual Economic Extraction and Cut-offs

Mineral Resources must demonstrate reasonable prospects for eventual economic extraction (RPEEE). Consideration of geological, mining engineering, processing, metallurgical, legal, infrastructural, environmental, marketing, socio-political and economic assumptions used should satisfy that the project is economically viable eventually.

At Rajpura Dariba confidence can be placed on the geological understanding and models, the mining methods and planning as well as the understanding of the metallurgy, processing legal, infrastructural, environmental, marketing, socio-political and economic assumptions. The reader is referred to the relevant Items within this report for detail and opinions.

The cut-off grade (COG) applied to the Mineral Resources are stated on a Zn equivalent (ZnEQ) basis is 2.78%. To derive the ZnEQ a calculation the relationship between Zn, Pb and Ag is:

- ZnEQ = Zn + (0.448 x Pb) + (0.02023 x Ag).

The COGs used for the Mineral Resource were calculated using on nett smelter return (NSR) values for the individual metals of Pb, Zn and Ag and based on the following:

- at prices of USD 2,057/t, USD 2,759/t and USD 21.24/oz, respectively
- costs based on the F2022 Business Plan
- no mining factors have been applied
- includes planned and unplanned dilution

- no metallurgical factors have been applied; however, metallurgical recoveries were based on metallurgical and smelter performance.

9.11 Classification of Mineral Resources

The level of confidence in the geology and the volume, tonnage and grade estimates determines the classification/s of a Mineral Resource. The lowest level of confidence is an Inferred Mineral Resource and with increasing levels of confidence Indicated followed by Measured Mineral Resources can be classified. The universal requirement across the three categories is the requirement of reasonable prospects of eventual economic extraction (RPEEE) must exist.

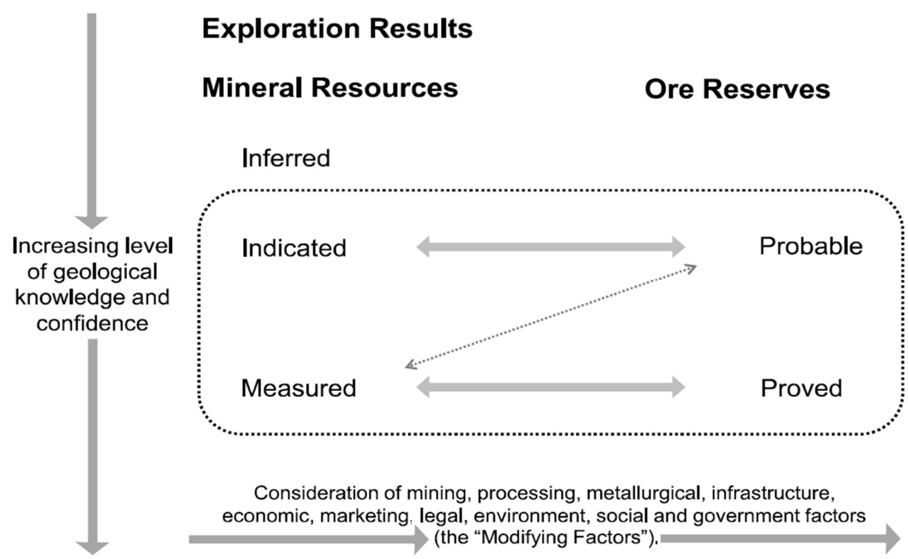


Figure 16: JORC Mineral Resource and Ore Reserve classification framework

Source: The Australasian Code for Reporting Exploration Results, Mineral Resources and Ore Reserves (the JORC Code), p9.

Mineral Resource classification is based on both technical and economic factors, namely:

- geological understanding, continuity and confidence
- grade continuity
- drill hole / sample spatial representativity and spacing
- data quality assurance and control
- appropriate geochemical analytical and density techniques applied

- application of the appropriate estimation methodologies and confidence therein
- RPEEE
- validity and ownership of the relevant government license types such as exploration, and environmental licenses
- consideration of social factors
- legal and governmental risk factors.

Inferred, indicated and Measured classification are based on increasing order of confidence. Various international mineral reporting codes define the criteria required for each confidence category.

An Inferred Mineral Resource is defined as:

- quantity and quality of the grade or quality data is based on 'limited geological evidence and sampling
- geological evidence is sufficient to imply but not verify geological and grade or quality continuity
- has demonstrated RPEEE
- it may not be considered in the assessment of the economic viability of a mining project
- it cannot be converted to Mineral Reserves
- it is expected that most of Inferred Mineral Resources could be upgraded to Indicated Mineral Resources with further exploration (Code of Federal Regulations, 229.1300, 2022).

An Indicated Mineral Resource is defined as:

- quantity and quality of the grade or quality data is sufficient to allow the application of modifying factors in sufficient details that will support mine planning and economic viability
- data has been gathered from adequately detailed and reliable exploration, sampling and testing
- geological evidence is sufficient to assume geological and grade or quality continuity between data points
- has demonstrated RPEEE
- can be converted to a probable Mineral Reserve with the application of reliable modifying factors (Code of Federal Regulations, 229.1300, 2022).

A Measured Mineral Resource is defined as:

- the confidence in the quantity and quality of the grade and scientific data is sufficient to allow the application of modifying factors to support detailed mine planning and final determination of the economic viability of the deposit
- data has been gathered from detailed and reliable exploration, sampling and testing data
- geological and grade or quality continuity between data points has been demonstrated
- has demonstrated RPEEE
- can be converted to a Probable and Proven Mineral Reserve with the application of reliable modifying factors (Code of Federal Regulations, 229.1300, 2022).

The Mineral Resources stated for the previous and most current completed fiscal years were based on these factors. The data spacing for the Measured classification required a minimum of 25 x 25 m spacing, a grid spacing of 50 x 50 m for Indicated classification and a spacing of greater than 50 x 125 m for an Inferred classification.

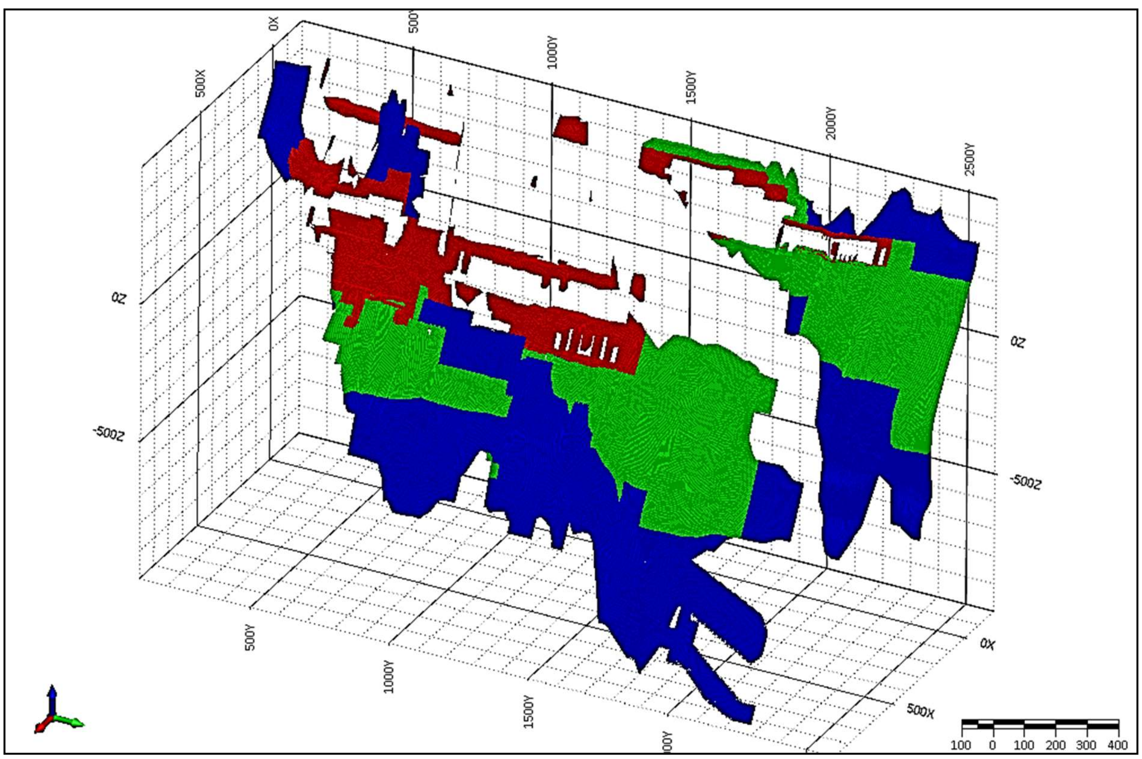


Figure 17: Mineral Resources for Rajpura Dariba– 31 March 2021

Measured Indicated Inferred

9.12 Grade Model Validation

Grade model validation methods included visually and statistically validating the estimated block grades relative against the original sample results and the generation of swath plots. Statistically validation indicated that the data population for the grade estimates mirror those of the sample and composited grades. Swath analysis of the block model estimates for the Zn versus the drill hole and composite grades are relatable indicating the estimates honour the input data population.

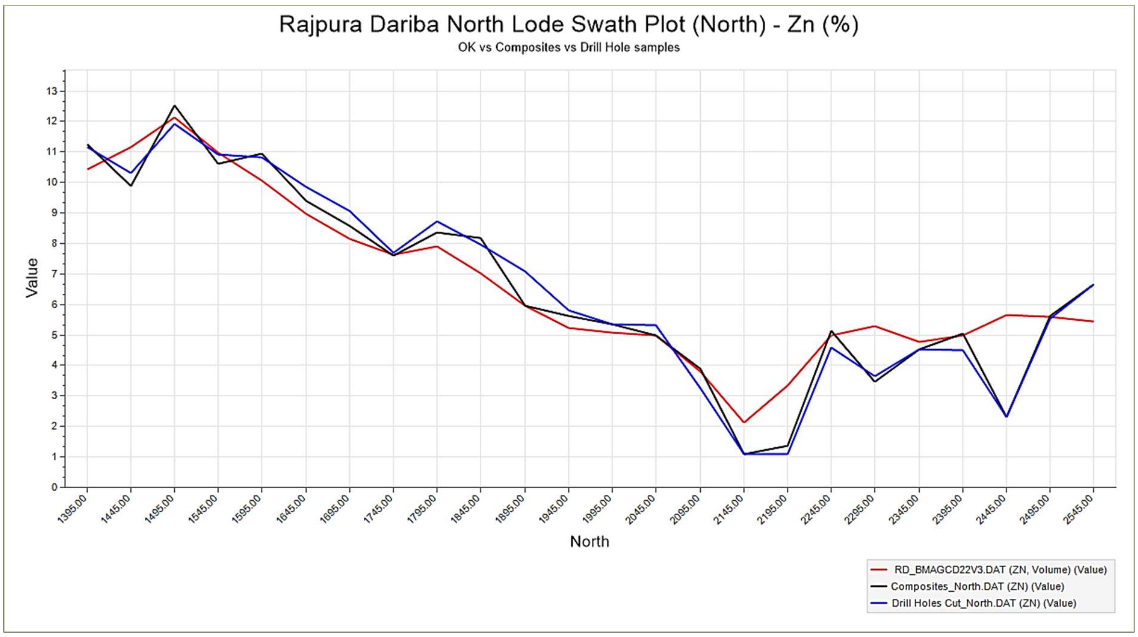


Figure 18: Swath plot (north) for the North Lode block model Zn (%) estimates versus the composite and drill hole grades

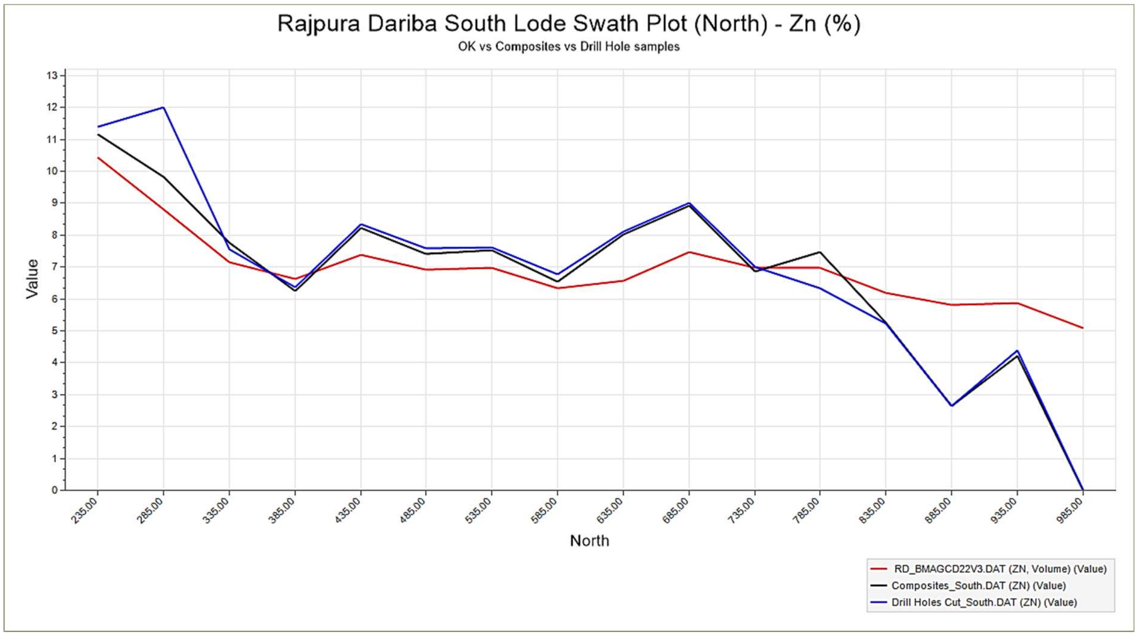


Figure 19: Swath plot (north) for the South Lode block model Zn (%) estimates versus the composite and drill hole grades

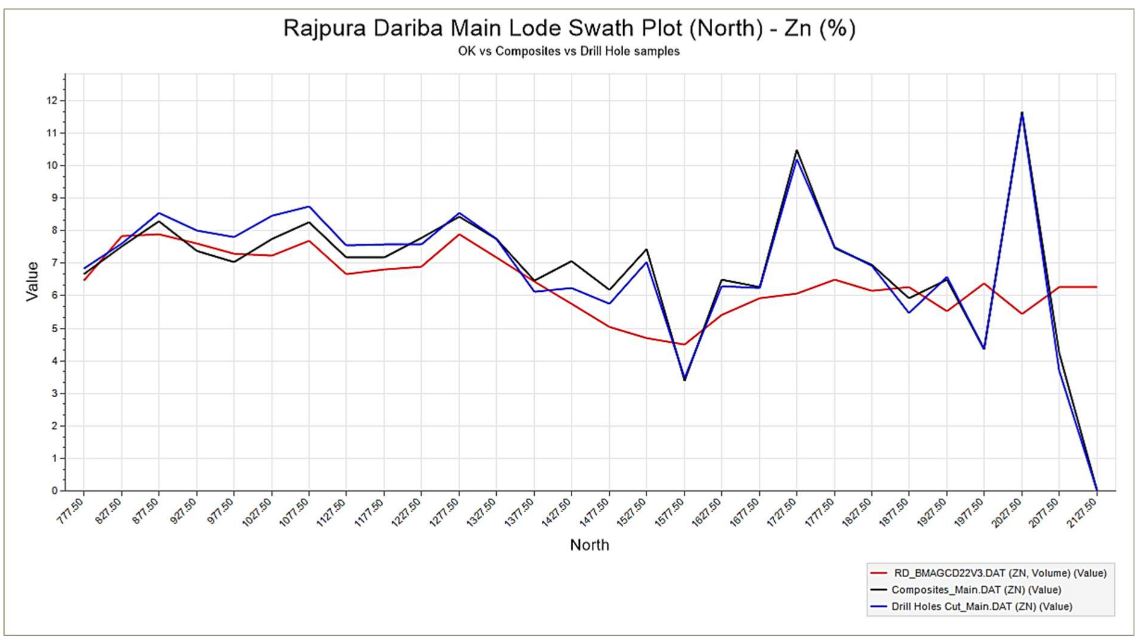


Figure 20: Swath plot (east) for the Main Lode block model Zn (%) estimates versus the composite and drill hole grades

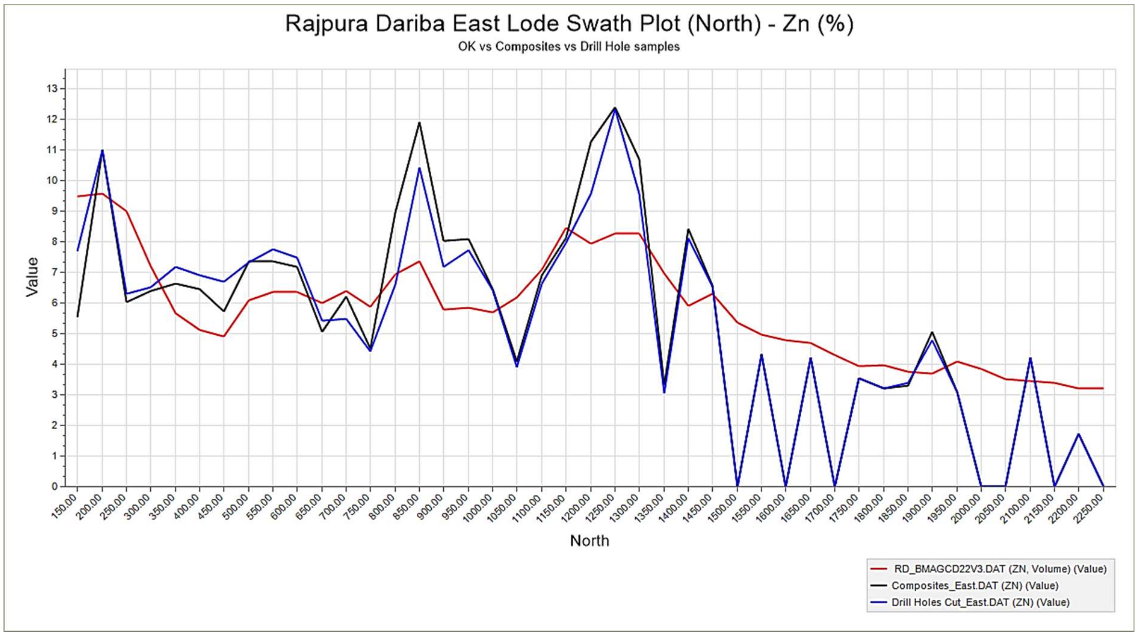


Figure 21: Swath plot (north) for the East Lode block model Zn (%) estimates versus the composite and drill hole grades

ABGM considers that sufficient check calculations have been conducted to conclude that the tonnage and grade estimates are considered valid, however there is room for improvement in terms of the estimation scheme and optimisation of the estimation parameters.

9.13 Mineral Resource Statement

The Mineral Resources exclusive of the Mineral Reserves as at the end of the last fiscal year are summarised in Table 13, whilst Table 14 summarises the same period where the Mineral Resources are inclusive of the Mineral Reserves. The Mineral Resources are reported at a ZnEQ COG of 3.32%.

Table 13: Rajpura Dariba Mineral Resource Statement (exclusive of Mineral Reserves) – 31 March 2022

Classification	Tonnage	Grade			Metal Content		
	(Mt)	Zn (%)	Pb (%)	Ag (g/t)	Zn (Kt)	Pb (Kt)	Ag (Koz)
Measured	3.0	7.30	2.10	68	222	64	6,610
Indicated	2.2	6.80	2.40	74	153	54	5,346
Measured + Indicated	**5.3**	**7.10**	**2.20**	**71**	**375**	**118**	**11,956**
Inferred	33.6	6.30	1.90	96	2,124	640	104,139
Total	**38.9**	**6.40**	**2.00**	**93**	**2,499**	**759**	**116,095**

- Stated as exclusive of Mineral Reserves
- Average relative density of 3.00 t/m^3
- Stated as underground Mineral Resources
- Measured classification is drilled at a 25 x 25 m spacing, 50 m x 50 m for Indicated classification and a spacing of greater than greater than 50 x 125 m for Inferred classification
- The Mineral Resource is limited to a depth from surface of ~1,300 m below surface
- Mineral Resources are reported on a 100% basis
- Totals may not sum due to rounding

The Measured Mineral Resources as a proportion of the total Inclusive Mineral Resource as of 31 March 2022 accounts for ~14% of the tonnes, the Indicated Mineral Resources is ~40%, and the Inferred at ~46%.

Table 14: Mineral Resource Statement (inclusive of Mineral Reserves) – 31 March 2022

Classification	Tonnage	Grade			Metal Content		
	(Mt)	Zn (%)	Pb (%)	Ag (g/t)	Zn (Kt)	Pb (Kt)	Ag (Koz)
Measured	10.5	6.70	1.90	75	708	195	25,164
Indicated	28.9	5.80	1.90	69	1,666	536	63,986
Measured + Indicated	**39.4**	**6.00**	**1.90**	**70**	**2,374**	**732**	**89,150**
Inferred	33.6	6.30	1.90	96	2,126	641	104,250
Total	**73.0**	**6.20**	**1.90**	**82**	**4,500**	**1,372**	**193,399**

- Stated as inclusive of Mineral Reserves
- Average relative density of 3.00 t/m^3
- Stated as underground Mineral Resources
- Measured classification is drilled at a 25 x 25 m spacing, 50 m x 50 m for Indicated classification and a spacing of greater than greater than 50 x 125 m for Inferred classification
- The Mineral Resource is limited to a depth from surface of ~1,300 m below surface
- Mineral Resources are reported on a 100% basis
- Totals may not sum due to rounding

The net material difference between the Mineral Resource at the end of the 31 March 2022 fiscal year and the preceding fiscal year is demonstrated in below. The differences relate to depletion or production, changes in commodity prices, additional resources discovered through exploration, and changes due to the methods employed.

Table 15: Net difference between the 31 March 2022 and 31 March 2021 Minerals Resources exclusive of Mineral Reserves

Classification	Tonnage	Grade			Metal Content		
	(Mt)	Zn (%)	Pb (%)	Ag (g/t)	Zn (Kt)	Pb (Kt)	Ag (Koz)
Measured	-0.9	0.2	0.2	-12	-55	-10	-3,482
Indicated	-2.0	0.9	0.2	7	-95	-37	-3,731
Measured + Indicated	**-2.8**	**0.7**	**0.2**	**-2**	**-150**	**-48**	**-7,214**
Inferred	0.6	-0.2	0.0	-1	-32	11	966
Total	**-2.2**	**1.4**	**0.1**	**0**	**-181**	**-35**	**-6,247**

9.14 Relevant Factors that may affect the Mineral Resource Estimates

It is the opinion of the Qualified Person that the likelihood of high-risk factors affecting the Mineral Resource estimates is low.

Risks that can affect Mineral Resource estimates include:

- Geological model
- Spatial representivity of the drill hole data
- Sample QAQC
- Estimation methodology and assumptions
- Estimation search parameters
- Application of grade capping and/or cutting
- Further drill hole results that may impact the grade and tonnage estimates
- Changes to the parameters used to derive the COGs, such as metal prices, operating costs, metallurgical recoveries.

ABGM is of the opinion that these risks have a low probability of having a material impact on the Mineral Resource estimates.

9.15 Qualified Person's Opinion

Conclusions:

- The geology is understood well, and the geological model is sufficiently detailed to estimate reliable Zn, Pb, and Ag grades
- Historical reviews of the data and QAQC and concluded there is sufficient and spatially representative drill holes to estimate reliable grade and tonnage estimates. Shortcomings in QAQC for older data and in documentation were noted and deems it is suitable inclusion in the Mineral Resource estimation.
- The regression method to determine the missing Ag assay results is appropriate
- The use of Ordinary Kriging is appropriate as is the related estimation parameters applied
- Sufficient estimation model validations have been undertaken and indicate the grade estimates are reliable
- The criteria used to define the Mineral Resource confidence categories are appropriate
- The parameters used to determine the COGs are appropriate
- The Mineral Resources are amenable to underground mining
- The estimation of the grades and tonnages have been performed to industry best practices and conform to the requirements of international Mineral Resource reporting codes
- Successful brown-fields exploration to replace Mineral Resources depleted by production has occurred and is on-going
- The nett differences between the most recent Mineral Resources and the previous fiscal year's Mineral Resources are well understood
- The persons undertaking the estimation and classification of the Mineral Resources are sufficiently experienced to undertake such
- The March 31, 2022, Mineral Resource estimate has been estimated in accordance with the December 26, 2018, SEC S-K1300 regulations.

Dr Heather King who reviewed the Mineral Resource estimates and statements is independent of HZL and registered as a professional with the South African Council for Natural Scientific professions (SACNASP) and the Geological Society of South Africa (GSSA).

The Mineral Resource is based on a geological model prepared by the HZL and Rajpura Dariba technical teams. It has been independently reviewed by the Dr King. Furthermore, the review relies on information provided by HZL, along with technical reports by specialist consultants, and other relevant published and unpublished data, which include relevant geological data and information and reports.

ABGM has endeavoured, by making all reasonable enquiries, to confirm the authenticity and completeness of the technical data upon which the review and Mineral Resource statement has relied. Dr Heather King is suitably qualified and experienced to act as the Qualified Person for the Mineral Resources. Dr Heather King was unable to visit the site.

Recommendations:

- The commodity prices for Zn and Ag be reassessed based on both long-term prices and reliable forecasts
- Alternative geostatistical methodologies be applied in the validation of the OK estimates
- Interpolation and extrapolation of density estimates to facilitate a higher accuracy in the tonnage and metal content estimates
- Consideration of geological and mining loss factors to facilitate a higher accuracy in the tonnage and metal content estimates.

10 Mineral Reserve Estimate

10.1 Basis, Assumptions, Parameters and Methods

The HZL mine operations and technical teams engage on a universal standard that is applied across all the mine operation from the geology resource estimations to applying the mine designs and evaluating the potential Mineral Reserves. The HZL Resources and Reserves technical team has kept extensive data that is used annually to do the annual mineral reserves statements and calculation. Each mine undergoes individual assessments and apply the modifying factors, grade cut-off calculation and assumptions.

10.1.1 Exchange Rates and Financial Assumptions

The exchange rates applied in the cut-off calculation are based on the LME forecasted indicated in the document below. The following rates were used by HZL:

Dollar to INR Conversion	Long term 5yrs
Dollar value in INR	76.65

Information received from HZL indicate the following parameters were used to calculate the cut-off grade.

Historical prices are stipulated below, illustrating the last six years of commodity prices.

Table 16: Historic Commodity Prices

Year	LME Zinc		LME Lead		LBE Silver
(USc/lb)	(USD/t)	(USc/lb)	(USD/t)	(USD/oz)	(USD/oz)
2016	95	2,101	85	1,878	17.1
2017	131	2,892	106	2,327	17.1
2018	131	2,893	102	2,251	15.7
2019	114	2,504	91	2,006	16.2
2020	103	2,278	83	1,836	20.5
2021	120	2,646	88	1,940	23.8

LME Forecast used by HZL for the calculation of the cut-off grades are indicated below. The ten year average of the forecasted prices indicated were used to calculate the cut-off grades.

Table 17: LME Projected Commodity Prices

Particulars	UOM	FY'23	FY'24	FY'25	FY'26	FY'27	FY'28	FY'29	FY'30	FY'31	FY'32	Average
LME - Zinc	$/MT	3,183	2,911	2,684	2,621	2,658	2,706	2,706	2,706	2,706	2,706	2,759
- Lead	$/MT	2,179	2,047	1,974	1,962	1,997	2,082	2,082	2,082	2,082	2,082	2,057
- Silver	$/Troz	22.19	20.47	21.61	21.33	21.30	21.10	21.10	21.10	21.10	21.10	21.24
Ex Rate	Rs/USD	74.94	75.43	76.52	77.73	78.64	79.11	79.51	79.51	79.51	79.51	76.65

The 3 year and 10 year averages is indicated below

Table 18: Next three year average prices

Particulars	UOM	3yr Avg	10yr Avg
LME - Zinc	$/MT	2,926	2,759
- Lead	$/MT	2,067	2,057
- Silver	$/Troz	21.42	21.24
Ex Rate	Rs/USD	75.63	76.65

10.2 Cut-off Grade

A zinc and a lead concentrate are generated at RDM and the principal metal is zinc followed by silver and lead. The COG and NSR assumptions and values used to support the F2022 Ore Reserve estimate are presented in the tables below:

Table 19: Cut-Off Grades and NSR Calculation inputs

Description	Units	Pb Con	Pb Con	Zn Con
Input Assumptions		Pb	Ag	Zn
Commodity Price	USD/t or USD/oz	2,057	21.24	2,759
Commodity Price	USD/t or USD/g	2,057	0.683	2,759
Exchange rate	USD:INR	76.65	76.65	76.65
Average grade	% or g/t	1.1	59.61	4.71
Concentrator recovery	%	68.37	54.25	85.81
Concentrate grade	% or g/t	37.44	1,610	48.64
Moisture content	%			
Payability/ smelter rec	%	95.91	98.886	96.394
Minimum deduction	% or g/t			
Treatment charge	USD/dmt	199.52		214.02
Refining charge	USD/lb or USD/g		0.0239	
Transport cost	USD/dmt			
Freight cost	USD/dmt	3.6473		7.4295
Mineral royalty	%	20.107	9.4149	13.797
NSR Values		Pb	Ag	Zn
Gross payable	USD/dmt	739	1,087	1,294
Treatment charge	USD/dmt	-199.5		-214.0
Refining charge	USD/dmt		-38.1	
Transport cost	USD/dmt			
Freight cost	USD/dmt	-3.6		-7.4
Mineral royalty	USD/dmt	-148.5	-102.4	-178.5
Net payable	**USD/dmt**	**387.0**	**946.7**	**893.7**
Equivalent Grade Calculation				
Metal values	USD/t or USD/g	706.6	0.3	1576.6
Equivalent grade factors	**no**	**0.4**	**0.0**	**1.0**
Equivalent grade	%Zn or %Pb	0.5	1.2	4.7
Total equivalent grade	%Zn or %Pb			**6.4**
NSR	USD/t rom	7.8	19.0	74.3
Total NSR	USD/t rom			**101.0**

10.2.1.1 Modifying Factors and Reconciliation

The mine uses CMS for surveying all stope voids and the results are compared with the mine design though only extensively in the last few years. The results from 111 stope CMS surveys to F2022 is tabulated below in terms of the pre-mining planned stope (includes planned dilution and ore loss) and the post-mining stope. Dilution is principally associated with orebody complexity and the presence of graphite within the ore. For F2022 the average planned and external dilution was 2% and 8% respectively. The mine has, over the last few years, implemented a range of controls and measures principally to improve the stope drilling and blasting performance and quality. The improving and low dilution reported are evidence of the success of this.

Table 20: CMS Stope Reconciliation

Description	Unit	F2017	F2018	F2019	F2020	F2021
		Actual	Actual	Actual	Actual	Actual
Planned Stopes	Mt			0.85	1.14	0.67
Zn grade	%			5.18	4.66	5.1
Pb grade	%			1.15	1.13	1.33
Ag grade	g/t			49.9	46.8	68.8
Mined stopes	Mt			0.68	0.82	0.66
Zn grades	%			5	4.72	4.69
Pb grade	%			1.12	1.14	1.21
Ag grade	g/t			47.3	43.4	62.2
Planned dilution	%			4.1	2.9	2
External dilution	%			9.7	5.6	8.1
Mining recovery	%			84.4	86.4	90.9

Table 21: Mined versus Processed Grades

Description	Unit	F2017	F2018	F2019	F2020	F2021
		Actual	Actual	Actual	Actual	Actual
Mined	Mt	0.71	0.78	0.95	1.04	1.22
Zn grade	%	5.63	5.02	4.92	4.86	4.59
Pb grade	%	1.51	1.14	1.19	1.16	1.18
Ag grade	g/t	59.3	53.6	51.8	55.3	60.7
Processed		0.75	0.8	0.99	0.91	1.22
Zn grade	%	5.17	4.74	4.98	4.85	4.4
Pb grade	%	1.2	1.09	1.19	1.18	1.22
Ag grade	g/t	57	47.7	58	69.5	62.9
Tonnes Factor	%	1.06	1.03	1.04	0.88	1.01
Zn grade factor	factor	0.92	0.94	1.01	1	0.96
Pb grade factor	factor	0.79	0.96	1	1.02	1.03
Ag grade factor	factor	0.96	0.89	1.12	1.26	1.04

10.2.1.2 Dilution

The grades reported as head feed to the plant compare favourably to that projected. The RDM planned modifying factors are tabulated below.

Table 22: External Dilution and Mine Recoveries applied

Lode	External Dilution (%)	External Dilution (%)
South	8.0	90.0
North	5.5	90.0
Main	7.0	90.0
East	8.0	90.0
Crown Pillars	10.0	50.0
Ore Dev	0.0	100.0

10.3 Mineral Reserves

The classification block model reports developed by HZL was scrutinised and the tonnes were evaluated. This classification model is the start point of the Reserve estimation before external dilution and mine recoveries are applied. The model report suggests there is sufficient tonnes and grade in the model that is used by HZL to develop the Reserve Statement drafted in March 2022, to determine the final Mineral Reserves.

The current Reserve statement reports there is 28.9 Mt at 4.9 g/t Zinc, 1.6% Lead and 60 g/t Silver.

Table 23: Mineral Reserves Estimates (2022)

Ore Reserve summary							
Ore Reserve	Tonnage (Mt)	Grade (Zn %)	(Pb %)	(Ag g/t)	Metal (Zn kt)	(Pb kt)	(Ag koz)
Proved	5.8	5.3	1.4	66	306	84	12,333
Probable	23.1	4.8	1.6	59	1,122	379	43,803
Ore Reserves (Total)	28.9	4.9	1.6	60	1,428	463	56,135

The Ore Reserve estimate for RDM has been developed from a fully engineered design and modifying factors established from the use of CMS results and reconciliation. The external dilution and mining recovery factor given below are in line with that achieved. The RDM COG of 2.82% ZnEq (fully diluted) is based on the F2022 Business Plan costs. Although, future reserves are deeper than current mining there are opportunities for cost improvement such as the increase in shaft capacity as well as the performance of equipment and manpower. HZL, therefore considers the current COG to be reasonable for long-term forecasts. HZL recommend that separate COGs for each of the four main orebodies at RDM where there are different types of mining, layouts and access which impact operating costs and for some different metallurgical characteristics.

Production at RDM has steadily increased from a historical 0.7 Mtpa to over 1.3 Mtpa achieved in F2022. Production increases at RDM have been affected by a slow transition from conventional mining to that of fully mechanised and the separation of the mine into four distinct sections. Improvements in terms of connecting the various sections and improvements in ventilation and ore handling have been made but mining capacity has been limited by development performance as well as the shaft capacity. The lack of development access in turn affects the ability to complete infill drilling and provide accurate designs and estimates for future stoping as well as connections for ventilation. Development rates need nearly double to meet the company's targeted production rate of 1.5 Mtpa. Ultimately, considering the production potential of the orebodies HZL would consider a long term production rate of 1.8 Mtpa achievable without significant capital expenditure. This would likely comprise 1.3 Mtpa from the Main and East lodes limited by the upgraded existing shaft for ore hoisting and 0.5 Mtpa from the North lode limited by current reserves and dewatering and blending constraints. As the North lode is independent with ore trucked to surface there is opportunity to increase production depending on exploration potential to the north. The F2021 Ore Reserve is supported by a fully engineered design linked to a LoM mining schedule.

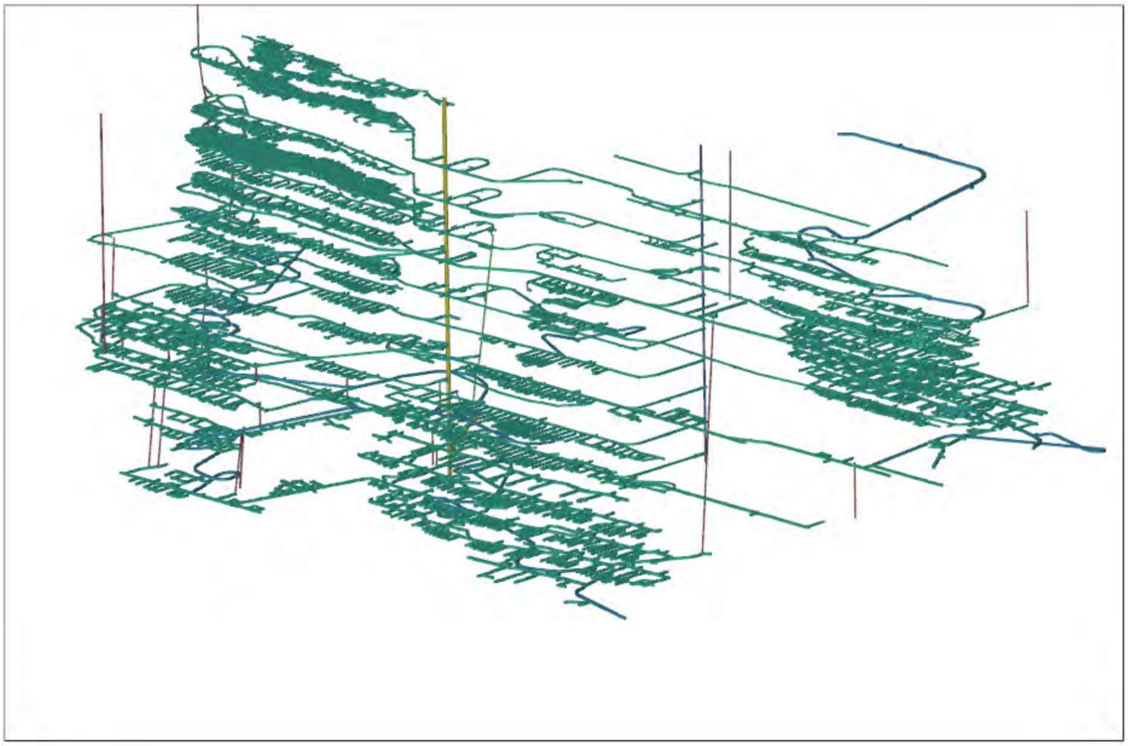


Figure 22: RDM 3D mine design of development and infrastructure

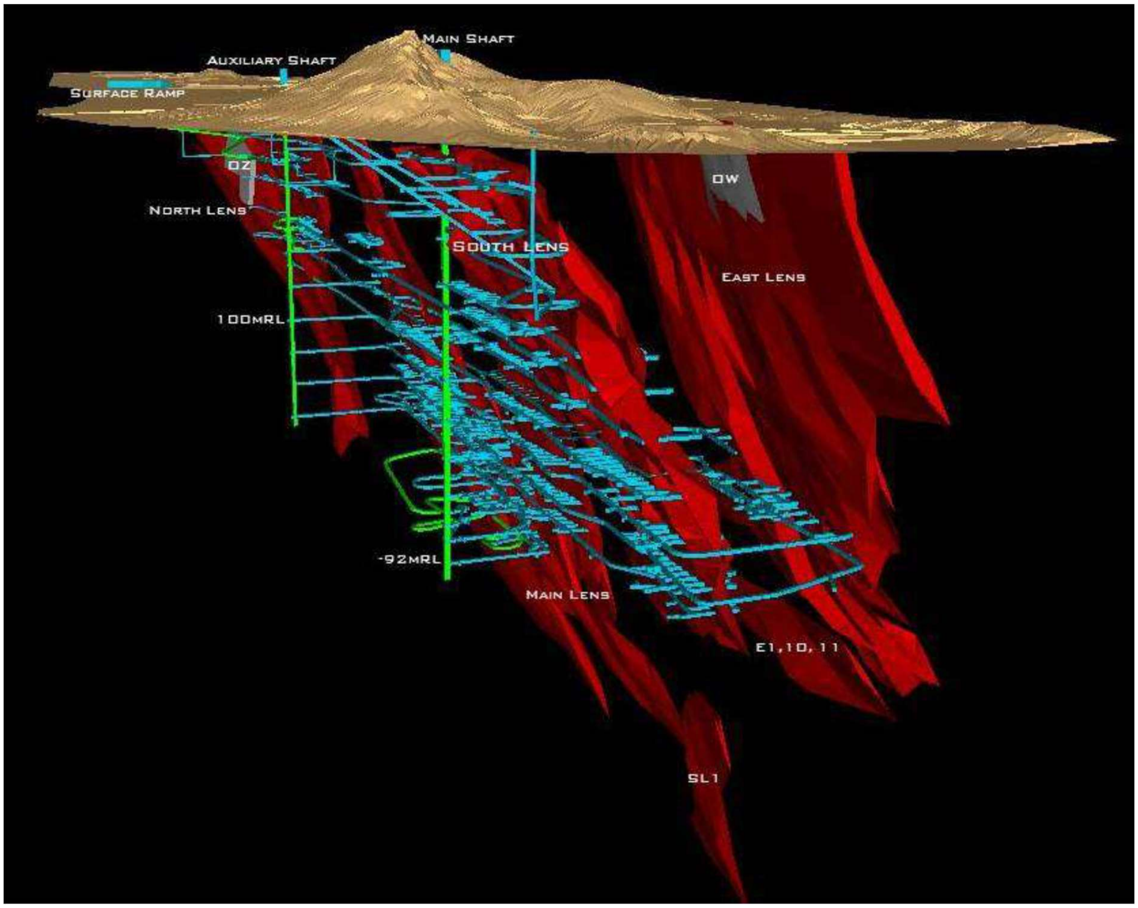


Figure 23: Underground mining Layout and Orebody

10.4 Relevant Factors

Table 24: Input and calculation parameters

No	Description	Units	RDM ZnEq Rajpura Dariba Mine (Res+Rev)		
			Pb Con	Pb Con	Zn Con
			Pb	Ag	Zn
1.00	**Input Assumptions**				
1.01	Commodity Price	USD/t or USD/oz	2,057	21.24	2,759
1.02	Commodity Price	USD/t or USD/g	2,057	0.683	2,759
1.03	Exchange rate	USD:INR	76.65	76.65	76.65
1.04	Average grade	% or g/t	1.10	59.6	4.71
1.05	Concentrator recovery	%	68.4	54.3	85.8
1.09	Concentrate grade	% or g/t	37.4	1,610	48.6
1.10	Moisture content	%			
1.11	Payability/ smelter rec	%	95.9	98.9	96.4
1.12	Minimum deduction	% or g/t			
1.13	Treatment charge	USD/dmt	199.5		214.0
1.14	Refining charge	USD/lb or USD/g		0.024	
1.15	Transport cost	USD/dmt			
1.16	Freight cost	USD/dmt	3.6		7.4
1.17	Mineral royalty	%	20.1	9.4	13.8
2.00	**NSR Values**				
2.01	Gross payable	USD/dmt	739	1,087	1,294
2.02	Treatment charge	USD/dmt	-200		-214
2.03	Refining charge	USD/dmt		-38	
2.04	Transport cost	USD/dmt			
2.05	Freight cost	USD/dmt	-4		-7
2.06	Mineral royalty	USD/dmt	-149	-102	-178
2.07	**Net payable**	**USD/dmt**	**387**	**947**	**894**
3.00	**Equivalent Grade Calculation**				
3.01	Metal values	USD/t or USD/g	707	0.32	1,577
3.02	**Equivalent grade factors**	**no**	**0.448**	**0.02023**	**1.000**
3.03	Equivalent grade	%Zn or %Pb	0.49	1.21	4.71
3.04	Total equivalent grade	%Zn or %Pb			**6.41**
3.05	NSR	USD/t rom	7.8	19.0	74.3
3.06	Total NSR	USD/t rom			**101.0**
4.00	**Costs and COG Calculation**		**F2022 Act**	**F2022 BP**	**F2023 BP**
4.01	Mining	INR/t rom	2,246		2,181
4.02	Processing	INR/t rom	712		728
4.03	Overhead	INR/t rom	0		0
4.04	Transport	INR/t rom			
4.05	Sub-total operating cost	INR/t rom	2,958		2,909
4.06	Corporate, royalty & others	INR/t rom			
4.07	Other costs	INR/t rom			
4.08	Sustaining capex	INR/t rom	446		446
4.09	Sub-total other costs	INR/t rom	446		446
4.10	Total cost	INR/t rom	3,404		3,354
4.11	Total cost (USD)	USD/t rom	44.4		43.8
4.12	Waste development cost	INR/t rom	1,015		1,413
4.13	Economic cut-off margin	%			
4.14	**Diluted %ZnEq Cut-off Grades**				
4.15	Operating cut-off (diluted)	%ZnEq or %PbEq	2.82		2.78
4.16	Section cut-off (diluted)	%ZnEq or %PbEq	3.66		3.94
4.17	Economic cut-off (diluted)	%ZnEq or %PbEq	2.82		2.78
4.18	**Modifying Factors**				
4.19	Planned dilution	%	9.2		9.2
4.20	External dilution	%	7.9		7.9
4.21	Mining recovery	%	75.9		75.9
4.22	**Insitu %ZnEq Cut-off Grades**				
4.23	Operating cut-off (insitu)	%ZnEq or %PbEq	3.32		3.27
4.24	Section cut-off (insitu)	%ZnEq or %PbEq	4.31		4.65
4.25	Economic cut-off (insitu)	%ZnEq or %PbEq	3.32		3.27
5.00	**Cut-off grade formulas**				
5.01			ZnEq for Zn = 1.000 x %Zn		
5.02			ZnEq for Pb = 0.448 x %Pb		
5.03			ZnEq for Cu = 0.000 x %Cu		
5.04			ZnEq for Ag = 0.02023 x g/t Ag		
5.05			Ore Reserve COG = 2.82 %ZnEq (diluted)		
5.06			Mineral Resource COG = 3.32 %ZnEq (insitu)		

11 Mining methods

11.1 Introduction

Ore body of Rajpura Dariba deposit is divided into four lodes i.e. Main, South, North & East Lode. East lode is parallel to south lode in upper extremity but in lower depth, it is parallel to Main & North lode. Each lode is further sub-divided into number of blocks with intervening crown pillar and then further into number of stopes. It is proposed to mine the crown pillars, after complete mining of adjacent block, keeping in view of mineral conservation and overall stope stability & wherever possible optimization of crown pillars will be done to minimize ore blockage in crown pillar. It is proposed to develop all the blocks with access through ramp and second outlet (man pass/ ramp/ shaft etc.). Detailed ventilation circuit is planned for all the blocks. Stoping operations is carried out in primary-secondary sequence to maximize ore recovery commencing from bottom portion of block progressing towards overlying crown pillar. Block wise detailing is carried out for all the lodes.

11.2 Underground Mining

11.2.1 Mode of Entry

The general surface RL of RDM is around 500mRL. The existing working depth of working is varying from 300m in north lode to 620m in main lode. The mine can be approached by 3 accesses from surface shown as under with details:

- Main Shaft (Surface to -92mRL)
    - Total Depth : 611m (501 to -110mRL)
    - Working Depth : 593m (501 to -92mRL)
    - Purpose & Capacity : Man winding (40 persons) & Ore hoisting (0.9mtpa)
- Auxiliary Shaft (Surface to 0mRL)
    - Total Depth : 509mRL (501 to -8mRL)
    - Working Depth : 501m (501 to 0mRL)
    - Purpose & Capacity : Man winding (14 persons)
- Ramp
    - Total Depth : 658m (501 to -157mRL)
    - Purpose & Capacity : Ore hauling (1.0mtpa) & transportation

11.2.2 Description of Mining Methods

Blast Hole Stoping Method (BHS)

This mining method is being applied in the mining blocks where the ore body width is narrow and varying from 8 to 15m. The entire strike length is divided into 20m long panels, designated as primary and pillar stopes. The stopes are mined using DTH (115mm) holes for down drilling from the upper drill level. Blasting is done against a slot raise. The stopes are back filled with cement fill after removal fore.

Vertical Retreat Mining (VRM) was adopted at Rajpura Dariba Mine in consultation with M/s INCO TECH of Canada to increase the safety of man & machineries, high productivity & higher ore recovery compared to Cut & Fill stoping method. This method was first adopted for the stoping of mining block of S-Lode between 212 mRL to 285 mRL. After successful implementation and results this method is being adopted in the current production block of South between 11mRL to 195mRL.The VRM method is being adopted in the ore blocks where the ore body width is more than 25m.

VRM stopes are mined using downward large dia hole (165mm) by ITH drills from upper levels. These holes are charged & blasted using spherical charge technology where L/D ratio greater than 6 (where L is charging length of the hole & D is the diameter of the hole). A slice of 2.5 to 3.0m blasted at a time, thus retreating in upward direction and mucking is done by electric loader at extraction level. The empty stopes are filled by classified mill tailing & cement.

11.2.3 Development and stopping method

Production blocks are accessed through ramp and also connected with second outlet in terms of shaft, manpass, and ramp. General cross section of drives is proposed from 3m (W) x 3m (H) to 5m (W) x 4m (H) for the various purposes depending upon men/ machine movement.

South Lode

The mine was commenced with the stoping and development operation in south lode with cut and fill mining up to 300mRL (S1-S2 Block). However, looking into safety and productivity, mining method was migrated to VRM (Vertical Retreat Method) in blocks below 300mRL. South lode is divided into number of blocks starting from S1 to S9. S1 to S3 blocks are completely mined out and filled. Currently the operation is being carried out in S4 block (195-11mRL). Within 5 years, it is proposed to commence the ore production from S5 block.

Main Lode

Main lode is broadly divided into blocks from M1 to M9. Stoping operation in M1 to M3 block is completed and all the stopes are backfilled. Currently stoping is under operation in M4 block. Within 5 years it is proposed to commence the production from M5 & M6 block. Existing blast hole mining method is proposed in above blocks. Sublevel interval & strike length is kept from 20-35m respectively.

North Lode

North lode is divided into number of blocks from N0 to N6 (in addition to NU, NA, NB, NL1). Currently mining operation is being carried out in N1, N2 & NL1 block. However, it is proposed to commence the ore production from N0 and NU. Within 5 years it is proposed to commence the production from NA & NB block. Ground conditions in north lode are challenging in terms of shears in hang wall, cavity in Ore and strata is water-charged in footwall. In order to mine the orebody successfully, it is imperative to dewater the block in advance from lower levels. Therefore, for the purpose, levels in lower blocks are kept advance of upper blocks where stoping is to be carried out and water is discharged through series of boreholes to extract the water from working.

East Lode

East lode is divided into number of blocks from E1 to E8 (in addition to EU, EA, EB, EC). Mining in east lode was started from E2 (50 to 100mRL) block and completed recently. Currently mining operation is being carried out in E1, EA & EB. Within 5 years it is proposed to commence the production from EB, EC & EU block. There is present old working in east lode from surface to around 205mRL level. Detailed exploration & GPR study has been carried out to find out extents of old working. EU block is planned to be mined be keeping in view of distance of 60m from any water logged area.

11.2.4 System of Winding/ Hoisting

In terms of infrastructure, existing main shaft will be dedicated for hoisting system and shall be uplifted to 1.5 Mtpa ore production capacity, remaining 0.5 Mtpa ore production will be done from ramp connected on surface. In Main Shaft it is proposed to replace the cage by skips. The Auxiliary Shaft will be dedicated for man winding and it is also proposed to enhance its man winding capacity. Transportation of men, material, machineries and services shall be done through Auxiliary Shaft and Surface Ramp.

Hoisting System:

It is proposed to continue the existing system of hauling the muck from stope to orepass at 11mRL. From ore pass, ROM is fed to underground crusher from where it is transported from underground to surface via skip loading station. At surface conveyor belt system is available to transport the ore the beneficiation plant for onwards processing. However, it is proposed to increase the hoisting capacity from 0.9 to 1.5 Mtpa by converting Main Shaft into dedicated hoisting shaft. It is proposed to transport man & material through Auxiliary shaft and surface ramp by means of cage, LMVs & personal carrier. It is proposed increase man winding capacity auxiliary shaft. Waste is proposed to be disposed in underground voids.

Hauling System:

It is proposed to continue the existing system of hauling the muck from stope to surface ore dump via ramp. At ore dump yard, ore is hydraulically broken with hydraulic breaker and the transported to surface crusher for further beneficiation. Ramps shall be developed further for addition of new blocks and transportation of ore, waste, material and manpower. Waste is proposed to be disposed in underground voids.

11.3 Geotechnical Parameters

11.4 Hydrogeological Parameters

The buffer zone of Rajpura- Dariba mine falls in the catchment area of Banas river, which flows through the northern boundary of the lease area. Banas river originates in the eastern slopes of the Aravalli ranges near Kumbhalgarh and after flowing eastwards for about 512 km through districts of Rajsamand, Chittorgarh, Bhilwara, Tonk, and Sawai Madhopur meets Chambal river near Rameshar village in Sawai Madhopur district. The Banas river basin covers an area of 47,052 sq.km .The Banas river after originating in the eastern slopes of Aravali ranges, and traveling through Rajsamand district enters Chittorgarh district near Rashmi. Banas river, within Rajsamand district is joined from left by Chandrabhaga river near village Gangas.

Banas river is an ephemeral river and flows in direct response to rainfall and goes dry during summer months. It is an influent river, recharging ground water all along its course before it meets Chambal river. Banas river has limited flow till mid - December and afterwards dry till monsoon.

11.4.1 Ground Water and Conceptual Model

Physiography of the lease area is characterized by almost flat country with isolated few low ridges. The mineralized fault zone from Dariba to Rajpura is marked by yellowish brown gossan, which forms a conspicuous physiographic feature of the terrain. Similarly, the NNESSW quarzitic ridge, south of Sindesar Kalan is a prominent feature of the area achieving the elevation of 579 metres above msl. There are few tanks near Chokri, Mandara, Relmagara, Jitwas and Armi which get filled up during rainy season and dry up by the summer. There is big size tank near mine known as Mataji Ka Khera and another near village Pipawas.

11.4.2 Groundwater Flow Model

Ground water movement is controlled mainly by the hydraulic conductivity of the crystalline metamorphics and hydraulic gradient. The ground water movement mainly takes place through the fractures and foliations of the crystalline.

The ground water movement is controlled mainly by the hydraulic conductivity of aquifer. A review of the topography and drainage pattern reveals that the general slope of the area is towards southeast, and ranges from 6 m/km to about 7 m/km. The ground water flow also follows the topography and surface water flow direction and moves in southeast direction. However, the hydraulic gradient is moderate and has been observed as 5.88 m/km as calculated from the monitoring of wells of the area.

The main source of ground water recharge is by the rainfall by direct percolation to the zone of saturation. There is well developed drainage in the area due to loamy soils. A significant part of the rainfall is lost as runoff from the area due to thin loamy soils. A limited percentage of rainfall therefore reaches zone of saturation and becomes the part of ground water storage after meeting the evaporation and evapo-transpiration losses. There is also ground water recharge from the return flow of irrigation water pumped from dug wells operated by the cultivators. As there are small tanks and irrigation projects in the buffer zone, an area of 1520 hectares is commanded. The ground water recharge from return flow of irrigation is normally taken as 20% of the total water applied for irrigation. This percentage has been suggested by the Ground Water Estimation Committee for ground water assessment for this part of the state.

11.5 Mine Design Parameters

Table 25: Stope Design Parameters

		North Lode	East Lode	South Lode	Main Lode
2	Strike length of the Stope*	20m	25m	15-25m	20m
3	Width of Stope	Width of the ore Body			
4	Level Interval of Stope*	15-18.	25m	50m	33m
5	Thickness of crown pillar*	32m	37m	32m	38m (max)
6	Thickness of Sill Pillar*				
7	Thickness of Rib pillar*	5m (If necessary)			
8	Size/ shape of Man way	2mx2m			
9	Size/ shape of ore pass	3mx3m			
10	Method of stowing/ back filling	Hydraulic cemented Back Filling (tailing, cement & water)			
11	Method of drainage of stowed water	Provision of UG sumps at 300, 100 & 0mRL			

*All the designed parameters are considered after Geo –Technical study inhouse & conducted by CIMFR/ Scientific agencies/ consultancies

11.6 Mine Schedule

The RDM mine is scheduling 1.4mtpa for the next two years and then ramp up to 2.5mtpa till 2035.

Description	Units	Total	F2022	F2023	F2024	F2025	F2026	F2027	F2028	F2029	F2030	F2031	F2032	F2033	F2034	F2035
Total Reserves Mined																
Ore tonnes	t	**30,985,725**	1,355,721	1,400,004	2,200,000	2,500,000	2,500,000	2,500,000	2,500,000	2,500,000	2,500,000	2,500,000	2,500,000	2,500,000	2,000,000	1,530,000
Pb head grade	%Pb	**1.57**	1.24	1.56	1.54	1.55	1.55	1.55	1.54	1.60	1.60	1.60	1.60	1.60	1.67	1.69
Zn head grade	%Zn	**4.91**	4.47	5.01	4.84	4.80	4.80	4.80	4.91	5.01	5.01	5.01	5.01	5.01	5.00	4.91
Ag head grade	g/t Ag	**61.08**	65	61.33	59.90	58.99	58.99	58.99	60.68	61.89	61.89	61.89	61.89	61.89	63.21	60.49
TMC head grade	%TMC	**6.48**	5.71	6.58	6.38	6.34	6.34	6.34	6.46	6.60	6.60	6.60	6.60	6.60	6.67	6.59
Pb metal	t	**379,005**	13,055	17088	26408	30154	30154	30154	30106	31134	31134	31134	31134	31134	26064	20154
Zn metal	t	**1,370,612**	56,485	63156	95873	107908	107908	107908	110502	112675	112675	112675	112675	112675	89947	67547
Ag metal	kg	**68,888**	55,355	644	988	1106	1106	1106	1138	1160	1160	1160	1160	1160	948	694
Description	**Units**	**Total**	**F2022**	**F2023**	**F2024**	**F2025**	**F2026**	**F2027**	**F2028**	**F2029**	**F2030**	**F2031**	**F2032**	**F2033**	**F2034**	**F2035**
Development																
Ore development	Linear metres	**86,050**	3,050	4,000	6,000	7,000	7,000	7,000	7,000	7,000	7,000	7,000	7,000	7,000	5,500	4,500
Waste development	Linear metres	**171,915**	6,415	7,500	12,500	14,000	14,000	14,000	14,000	14,000	14,000	14,000	14,000	14,000	11,000	8,500
Total development	Linear metres	**257,965**	9,465	11,500	18,500	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	16,500	13,000

11.7 Mining Fleet Requirements

Looking into the production requirement, it was suggested that additional fleet be introduced in the past. All equipment considered with basic safety features like Auto fire suppression system, fall over protection system, rear view camera, spring applied hydraulically release braking system etc. in underground HEMMs. Also mechanization is proposed in different areas of supporting & transportation. However final selection of mining equipment and size may be subjected to some changes on account of variation in ore body, rock mechanics consideration affecting stope dimensions and approval of the statuary authorities. The current fleet as of March 2022 is indicated below.

Table 26: Summary of current mining fleet

Type	Fleet	Caterpillar	Epiroc	Normet	Sandvik	Grand Total
LHD	10t	7	4		2	13
LHD	17t	1			1	2
LHD	7t	1			1	2
LPDT	30t	7	5		4	16
Development Drill	Jumbo		2		9	11
Production Drill& Exploration Drilling	EHY Drill- Solo/Simba/u4		3		1	3
Services	Charmec			1		1
	Scissor Lift			7		7
	Grader	1				1
	LMV	6		4		10
	Miller			2		2
	Passenger Carrier			6		6
	Spraymec			1		1
	Fuel Browser			3		3
	Water Cannon			1		1
	Grand Total	23	14	25	18	80

11.8 Equipment Productivity and Usage

The following production productivity is planned for the primary fleet to achieve the desired ROM. Currently mine is achieving its production targets. The overall utilisation was not observed in the dataset.

Table 27: Productivity of equipment

Fleet Unit	Value	Units
LPDT (Low Profile Dump Truck)	120,000	t/annum
LHD	126,000	t/annum
Jumbo (Development)	900	m/annum
Production Drilling	18,000	m/annum

11.9 Mine Personnel Requirements

The existing operation has direct employment of about 1500 persons. With proposed expansion, additional employment of about 250 persons. There are many opportunities for increase in indirect employment due to mining related activities like transport, small workshops, garages, and due to development of local area.

Investigations/ consulting have been carried out in different fields related to underground mining. Many Indian experts as well as reputed organizations are working in association to carry out mining operations and expansion.

Table 28: Planned Labour and Employee compliments

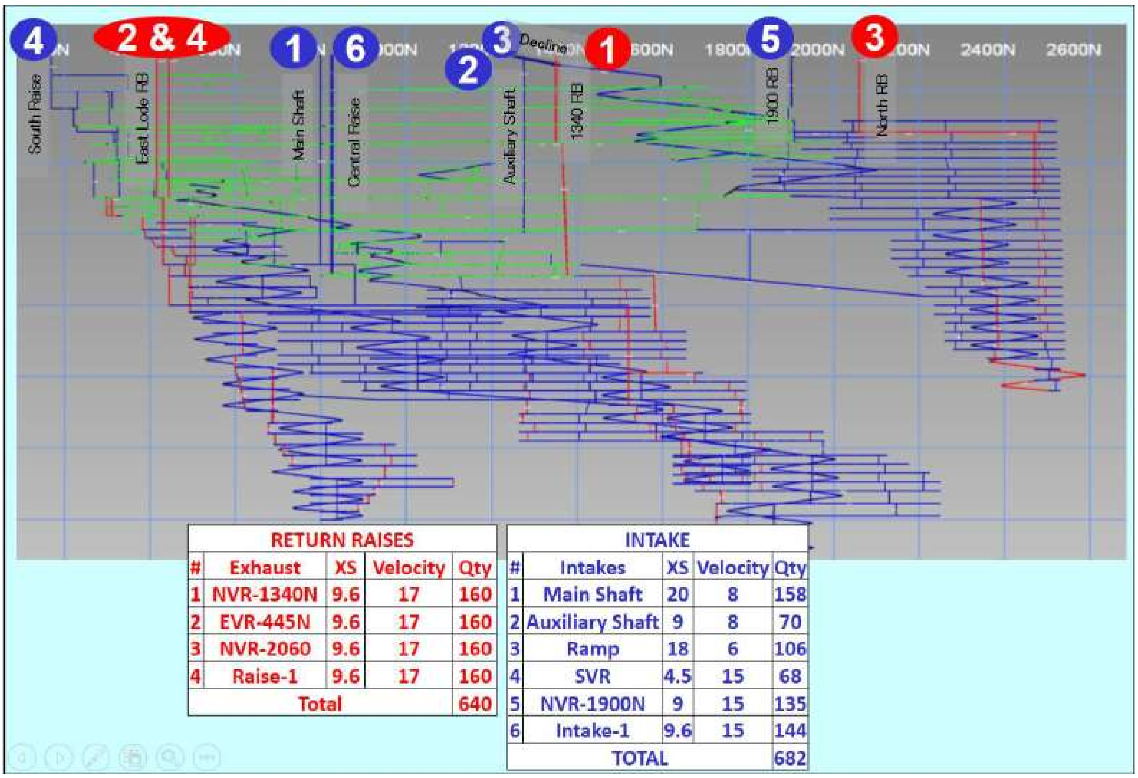
Particulars	2021-22	2022-23	2023-24	2024-25
Mine Officials	100	100	100	100
Highly Skilled	250	350	350	350
Skilled	450	500	500	500
Semi-Skilled	350	400	400	400
Unskilled	350	400	400	400
Total	1500	1750	1750	1750

11.10 Mine Ventilation

Ventilation Plan is finalized with the ventilation network modelling & simulation study. System is designed to meet both the short and long term ventilation requirement. Standards of ventilation are ensured at underground workings. Regular monitoring of Diesel Equipment Emission is ensured. Ventilation requirement is assessed using the engine power of equipment to be deployed for operation and keeping in view the standards of ventilation described as under:

- Minimum air velocity of 30m/min.
- Relative Humidity & Temperature not to exceed 33ºC DBT & 30.5ºC WBT.
- CO and NOx levels in underground atmosphere below 50 ppm and 5 ppm respectively.

Ventilation Monitoring is done by regular measurement at ventilation monitoring stations to ensure standards of ventilation. Shift Engineers & Mining Mates are equipped with CO meters & multi gas detector to measure any gas build-up in underground working. In development headings, auxiliary & booster fans ranging from 20-45cum/sec (1.5-3.0kPa) with 600/ 900/ 1000mm ducting being used for ventilation at development headings. Currently, ventilation capacity of RD Mine is around 330cum/sec and the mine ventilated by a dedicated ventilation fans on surface with the following ventilation circuit:



RETURN RAISES				
#	Exhaust	XS	Velocity	Qty
1	NVR-1340N	9.6	17	160
2	EVR-445N	9.6	17	160
3	NVR-2060	9.6	17	160
4	Raise-1	9.6	17	160
	Total			640

INTAKE				
#	Intakes	XS	Velocity	Qty
1	Main Shaft	20	8	158
2	Auxiliary Shaft	9	8	70
3	Ramp	18	6	106
4	SVR	4.5	15	68
5	NVR-1900N	9	15	135
6	Intake-1	9.6	15	144
	TOTAL			682

Figure 24: Long term ventilation setup

12 Processing and Recovery Methods

12.1 Introduction

Currently, run-of-mine of RD mine is treated at 1.2 MTPA capacity beneficiation plant. The concentrate is sent for metallurgical treatment at captive smelters for recovering final metal. In existing mill, it is proposed to de-bottleneck/revamp and commission a new beneficiation plant of 1.5 MTPA capacity with advanced technology and improved recovery in 2022-23. Rajpura Dariba Mine, Sindesar Khurd Mine, and upcoming Bamnia Kalan are all part of the Rajpura Dariba Complex having beneficiation plants at site (3 at SKM, 1 at RDM and 1 proposed beneficiation plant at RDM). The proposed plant revamping /commissioning by 2022-23. Currently, RDM beneficiation plant is of 1.2 MTPA capacity. Proposed plant will be of 1.5MTPA capacity. By the time, until the new plant commences, additional ROM shall be sent to SKM mill. And, once, the RDM mill commences, it shall also treat ore of SKM. This circulation of ore between the mines' beneficiation plants is to maintain operational flexibility and to utilize the buffer capacities of plants. A new paste fill plant is under commissioning phase for backfilling of 1.8 MTPA capacity with a high head positive displacement pump along with DG set. It is also proposed to introduce a dry stack tailing disposal facility, in which, it is proposed to introduce a technology that a plant will be installed which shall be equipped with thickener and filters. The proposed dry stacking plant commissioning will start by 2022-23.

The existing 1.0 MTPA plant comprises of the following major sections namely

- Surface primary crusher (Common) & Coarse ore Stockpile (COSP)
- Secondary & tertiary crushing
- Grinding and Classification
- Graphite Flotation
- Lead Flotation
- Zinc Flotation
- Concentrate Thickening & Filtration
- Tailing Dewatering and disposal.
- Back filling system

12.2 Process Flow maps

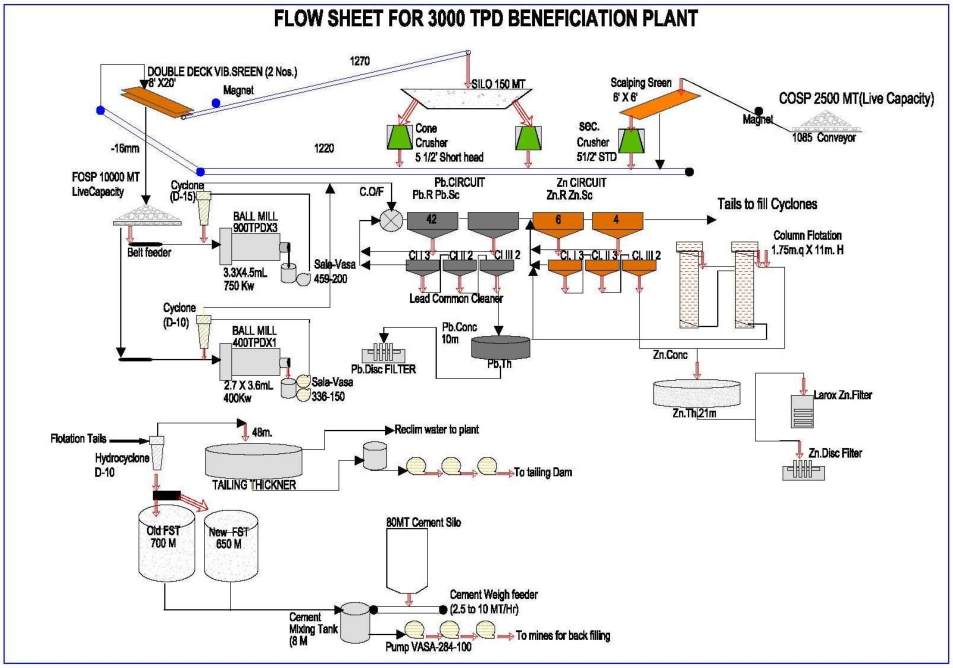


Figure 25: Flowsheet - 3mtpa Beneficiation Plant

12.2.1 Mass Balance

Table 29: Overall Mass Balance

Stream	Solids	Solids	Solids	Water	Pulp	% Solids	Pulp desnsity	Pulp Vol. m3/hr	Aeration	Total pulp vol. (m3/hr	GRADE	
	tph	Sp. Gr	Vol	tph	tph						Pb %	Zn %
Cyclone O/F	126.00	3.0	42.0	167.02	293.02	43	1.4	209.0			1.2	5.0
Lead rougher feed	138.02	3.2	43.1	190.59	328.61	42	1.4	233.7	0.09	256.84	2.0	5.1
Lead rougher conc	12.45	4.5	2.8	15.85	28.30	44	1.5	18.6			15.6	7.3
Lead rougher tail	125.57	3.0	41.9	180.69	306.26	41	1.4	222.6	0.09	244.56	0.5	4.8
Lead scavenger conc	3.04	4.5	0.7	3.87	6.91	44	1.5	4.6			7.9	12.5
Lead scavenger tail	122.52	3.0	40.8	183.79	306.31	40	1.4	224.6			0.3	4.6
Lead return	12.02	3.9	3.1	18.02	30.04	40	1.4	21.1				
Lead cleaner feed	12.45	3.8	3.3	17.92	30.37	41	1.4	21.2	0.12	24.08		
Pb cleaner tail	8.97	3.8	2.4	18.22	27.20	33	1.3	20.6			6.5	7.8
Lead cleaner conc	3.48	4.8	0.7	4.25	7.72	45	1.6	5.0			37.9	5.9
Zinc rougher feed	164.03	3.2	51.9	279.29	443.32	37	1.3	331.2	0.09	363.96		
Zinc rougher conc	27.74	3.8	7.3	30.05	57.79	48	1.6	37.4			1.4	33.5
Zinc rougher tail	136.29	2.8	48.7	276.71	413.00	33	1.3	325.4	0.09	357.57	0.5	3.6

12.3 Crushing, Screening, Ore flow

12.3.1 Surface Primary Crusher

Big boulders of ore from Ramp are being transported by dumpers & are being dumped into surface primary Jaw crusher that converts the boulders into -150mm size & being dumped to COSP through a belt conveyor.

12.3.2 COSP (Course ore stockpile):

Ore is being fed at COSP through surface primary crusher conveyor & conveyor from main shaft hoist. There are four reciprocating feeders (with VFD drives) below this COSP to reclaim the coarse ore and discharge the same on a conveying system for feeding the grinding circuit.

12.3.3 Mineralogical characteristics of Feed/Ore

The ore comprises mainly of Sphalerite, Galena, Pyrite, and Pyrrhotite as ore minerals. The host rock of main lense is Calc-Silicate Dolomite having Dolomite with Calcite, Quartz, and Calc-Silicate Minerals. While in East lense, it is Graphite Mica Schist having Graphite and Biotite.

Table 30: Specification of feed, concentrate and tailings

Type	Pb%	Zn%	Fe%	Ag (ppm)	Cd (ppm)
Feed	1.21	5.04	8.33	59	446
Pb Conc.	37.85	5.92	7.09	1557	938
Zn Conc.	1.96	48.26	7.71	124	4186
Tails	0.24	0.77	8.43	16	66

12.3.4 Primary crushed ore stockpile and reclamation area

Presently, in the existing plant, primary Crushed ore is fed by a main shaft conveyor to a tripper conveyor through the chute at a Transfer House for Coarse Ore stockpiling. The discharge chute arrangement in this existing Transfer House shall be modified and a diverter gate shall be provided in the chute to feed the material either in the existing tripper conveyor or a new conveyor BC-01C. Conveyor BC01C shall feed material to tripper conveyor BC-01 for Coarse Ore stockpiling of the proposed new plant. Reciprocating feeders with variable speed motor are located below the Coarse Ore Stockpile (COSP) to reclaim/extract ore and feed it into SAG Mill. Ventilation system shall be provided in the tunnel portion below the COSP. Service water header with rubber hose will be provided inside the tunnel for housekeeping purpose. Spillage pump shall also be provided in the tunnel for pumping out collected spilled slurry to Mill Area/ nearest plant drain, as required. Dust extracted from dust generation points in COSP area will be connected to a wet dust extraction system located near the COSP area.

12.3.5 Grinding & classification

Grinding and classification stream, of capacity 1.5 MTPA will comprise of single stage grinding and single stage classification. One SAG mill of suitable size will receive ore from COSP via suitably designed belt conveyor. Belt scale installed onto SAG mill feed conveyor will be interlocked with Reciprocating feeders. The rate of feeding to the SAG mill will be monitored and controlled by variation of speed of Reciprocating feeder drive motor. There will be a provision for Mill Gearbox vibration and oil temperature monitoring with local and remote displays. After grinding in the SAG mill, material shall be discharged to a screen. Undersize of the screen will discharge to the sump for formation of slurry. The slurry will be pumped to a Single stage cyclone cluster. The overflow of the cyclone cluster shall gravitate to the flotation circuit. Cyclone underflow will report to double stage flash flotation circuit to recover the lead minerals from grinding mill discharge. Mill cyclone underflow will gravitate to the first stage of flash flotation and concentrate from this will be fed to the second stage of flotation. Concentrate from second stage is collected and pumped to lead regrinding circuit for further liberation. Tails from the flash flotation circuit is collected in a sump and pumped to Ball mill for further grinding. Ball mill discharge will gravitate to the SAG mill discharge sump. The classifying cyclone overflow stream reports to the Trash Removal Screen, prior to flotation circuit in order to remove any trash present. Any trash is collected in the Trash Bin, while the screened slurry gravitates to the Graphite Conditioner. Elemental Sampler and particle sizing Sampler will be provided at the screen underflow pipeline.

12.3.6 Graphite Flotation

A Graphite conditioner of suitable capacity will receive flotation feed from cyclone overflow of the grinding circuit. The conditioner overflow will be delivered to the feed box of graphite flotation circuit. The graphite flotation circuit will consist of rougher and Cleaner bank of suitable size flotation cells. The Graphite rougher concentrate froth will be pumped to first stage graphite cleaner flotation. It consists of single stage column flotation for first stage cleaning purpose. Concentrate from the column flotation is collected and pumped to graphite filter feed tank. The tailing of graphite first stage cleaner cell will be pumped to second stage graphite cleaner scavenger tank cell. Second stage cleaner bank will consist of the required size of flotation cells for cleaning arranged in a cascade formation.

12.4 Flotation

12.4.1 Lead Flotation and Regrinding Area

Graphite rougher tails will be pumped to single stage lead conditioner tank. The conditioner overflow will be delivered to the feed box of lead flotation circuit. The lead flotation circuit will consist of a rougher-scavenger and Cleaner bank. The Rougher bank will consist of the required size of flotation cells for cleaning. The lead rougher concentrate froth will be pumped to Pb regrinding circuit and lea scavenger concentrate will gravitate also to the Pb regrinding circuit. The cleaner bank will consist of the required size of flotation cells for cleaning stage arranged in a cascade formation. The 1st stage cleaner concentrate will be pumped to the 2nd stage cleaner column cell.

Tails from 1st stage cleaner will feed to cleaner scavenger concentrate cells. The lead cleaner scavenger tails from the scavenger bank along with the tailing of lead scavenger cells will be fed to the Zn conditioner, whereas concentrate from the Pb scavenger cleaner will gravitate to Pb regrinding circuit. The concentrate from the lead 2nd cleaner cell (final lead concentrate) will be pumped by a suitable pump to the lead concentrate thickener and tailings of the column flotation cell will feed to 1st cleaner cell bank. After regrinding in the lead regrinding circuit the lead concentrate slurry will be fed to Pb 1st cleaner cell bank.

12.4.2 Zinc Flotation and Regrind Area

Lead tails will be pumped to zinc conditioner tank which shall have sufficient residence time, so that each Conditioning Tank can absorb reagents added to it. Overflow of zinc conditioner tank is fed to the feed box of zinc rougher cell. Each bank is equipped with an automatic valve, pulp level transmitter and air control instrumentation. The Zinc flotation circuit will consist of a rougher-scavenger and Cleaner bank of suitable size flotation cells. The Rougher bank will consist of the required size of flotation cells for cleaning. The Zinc rougher concentrate froth will be pumped to Zn regrinding circuit and Zn scavenger concentrate will gravitate also to the Zn regrinding circuit. A bypass provision is kept for Zinc rougher concentrate to the Zn cleaner 1 circuit. The cleaner bank will consist of the required size of flotation cells for cleaning stage arranged in a cascade formation. The 1st stage cleaner concentrate will be pumped to the 2nd stage cleaner column cell. Tails from 1st stage cleaner will feed to cleaner scavenger concentrate cells. The lead cleaner scavenger tails from the scavenger bank along with the tailing of lead scavenger cells will be fed to the Tailing thickener, whereas concentrate from the Zn scavenger cleaner will be gravitate to Zn regrinding circuit. The concentrate from the lead 2nd cleaner cell (final Zinc concentrate) will be pumped by a suitable pump to the Zinc concentrate thickener and tailings of the column flotation cell will feed to 1st cleaner cell bank. After regrinding in the Zn regrinding circuit the Zn concentrate slurry will be fed to Zn 1st cleaner cell bank.

12.5 Concentrate Thickening and Filtration

12.5.1 Graphite Concentrate Handling

Final concentrate from graphite flotation section, i.e., graphite cleaner concentrate is pumped to filter feed tank which has 12 hrs residence time. Pb & Zn thickener underflow Pump shall have VFD control. Thickened slurry from concentrate filter feed tank will be pumped to the vertical pressure filter. 1no vertical filter press including Cloth centering, Hydraulic oil heater, Filter pressing water tank & pump shall be supplied by HZL. The filter cake is collected on concentrate conveyor and suitable conveying system with reversible conveyor will be installed to transport graphite Filter discharge to new graphite concentrate stockpile. Graphite yard has been considered of different heaps & have two dropping points to be formed by reversible conveyor. We have not considered any further processing system for this final concentrate graphite. There shall be no bypass arrangement provided for graphite flotation and its filtration circuit.

12.5.2 Lead Concentrate Handling

Final concentrate from lead flotation section, i.e., lead cleaner 2(column flotation) concentrate is pumped to High Rate lead concentrate thickener. Pb final concentrate froth pump (1W+1S) will have individual pipeline without any common header feeding to Pb concentrate thickener. Thickened underflow will be pumped to lead filter feed tank. Provision for re-circulation of thickener underflow shall be provided. Pb concentrate thickener u/f pump (1W+1S) will have individual pipeline without any common header feeding to Pb concentrate filter feed tank. Thickener overflow water shall gravitate to lead thickener overflow tank (lead circuit water tank). There shall be suitable flocculent preparation system for the high rate thickener comprising of preparation & dosing of flocculent and automatic feeding system. The flocculent preparation and dosing system shall be common for lead and zinc concentrate thickener. However, dedicated dosing pumps shall be provided for each thickener. Thickened slurry from concentrate filter feed tank will be pumped to the vertical pressure filter. 1nos vertical filter press including Cloth centering, Hydraulic oil heater, Filter pressing water tank & pump shall be supplied by HZL. The filter cake is collected on concentrate conveyor and suitable conveying system will be installed to transport Lead Filter discharge to new Lead concentrate stockpile. Lead stock yard has been considered of single heaps & has one dropping points.

12.5.3 Zinc Concentrate Handling

Final concentrate from zinc flotation section, i.e., zinc cleaner 2 (column flotation) concentrate is pumped to High Rate zinc concentrate thickener. Zn final concentrate froth pump (1W+1S) will have individual pipeline without any common header feeding to Zn concentrate thickener. Thickened underflow will be pumped to zinc filter feed tank. Zn concentrate thickener u/f pump (1W+1S) will have individual pipeline without any common header feeding to Zn concentrate filter feed tank respectively. Provision for re-circulation of thickener underflow shall be provided. Thickener overflow shall gravitate to zinc thickener overflow tank/ zinc circuit water tank having one partition to remove the sediment particles out. Thickened

slurry from concentrate filter feed tank will be pumped to the vertical pressure filter. 2nos vertical filter press including Cloth centering, Hydraulic oil heater, Filter pressing water tank & pump shall be supplied by HZL. The filter cake is collected on concentrate conveyor and suitable conveying system with travelling tripper will be installed to transport Zinc Filter discharge cake to new Zinc filter concentrate stockpile. The Zinc concentrate stockpile shall be of conical shape.

12.6 Tailings, Thickening and Filtration

Zinc scavenger tails shall be pumped (1W+1S) to either tailing high rate thickener or to a cyclone (new to be installed in existing hydro fill plant). There will be dedicated separate piping system for pump delivery to a cyclone cluster which will have also a bypass connection to tailing thickener. One no cyclone cluster (2nos stand by cyclone) to be placed in the existing hydro fill plant. Cyclone overflow will report to the proposed tailing thickener and u/f of the cyclone will be distributed to existing FST and proposed new FST tank (same 320m3 capacity of the existing FST). Cyclone shall be designed for an underflow with max 18% passing (-)37 micron. The proposed new FST tank will have one no agitator. Overflow of the FST tank will be fed to the existing sump pit and underflow of the FST will report to existing mixing tank. There shall be (1W+1S) 100 m3/hr pump to be installed in the said existing sump pit which will pump the slurry to the proposed new Tailing Thickener. An additional spillage sump pit and spillage pump shall be provided near the new FST tank for draining out the new FST tank. Spillage from the additional spillage sump pit shall be pumped to existing mixing tank. We have envisaged that the existing mixing tank and existing sump pit will have enough storage to hold up slurry from this proposed new FST tank. Using suitable flocculent tailing thickener underflow solid consistency will be obtained.

The existing & upcoming plant both are equipped with the process of cyanide neutralization. In existing plant tailing sump is being used as a neutralization tank whereas in upcoming plant there will be a separate neutralization tank. Thickened underflow will be pumped to transfer tank/neutralisation tank. The thickener overflow shall gravitate to lead thickener overflow tank (lead circuit water tank). Provision shall also be provided to recirculate the thickener underflow back to the thickener. Lime will be added in transfer tank/neutralization tank to neutralize tailings. Neutralized tailings will be pumped from neutralisation tank to tailing dam. There will be 2 pump battery/train for pumping tailings from neutralisation tank to tailing dam. 1st pump of the train will be VFD operated in closed loop with level of tank. There will be suitable water flushing system in each battery. Delivery line of each pump train/battery will be fitted with density meter & flowmeter. There will be dedicated seal water pumps (1W+1S) for Tailing Disposal pumps. While number of pumps, pump RPM & the rating of motor supplied will be suitable for pumping the tailing slurry, system will be designed to handle slurry pumping for total length of 4500m & height at top of tailing dam at 526 m.

Table 31: Details of Tailing dam

Particulars		Total
RDM	RDM Prod (Lakh MT)	75.5
	Conc Prod (Lakh MT)	9.06
	Tails Gen (Lakh MT)	66.44
	Filling (Lakh MT)	23.36
	Tails to Dam (Lakh MT)	43.08
SKM	SKM Prod (Lakh MT)	276
	Conc Prod (Lakh MT)	27.6
	Tails Gen (Lakh MT)	248.4
	Filling (Lakh MT)	149.04
	Tails to Dam (Lakh MT)	99.36
Total	Total Prod (Lakh MT)	351.5
	Conc Prod (Lakh MT)	36.66
	Tails Gen (Lakh MT)	314.84
	Filling (Lakh MT)	172.63
	Tails to Dam (Lakh MT)	142.44
	Tailing disposal (in Lakh cum)	89.02

12.7 Reagents and Water

12.7.1 Reagents

The main raw materials used for the project will be different chemicals and cement. The details are as following: As the beneficiation process is physico-mechanical differential froth floatation, the chemicals used only to enhance the physico-mechanical characteristics. Zinc sulphate, copper sulphate, MIBC and Xanthates will be used as depressant, floatation and collectors. Addition of lime will be used to maintain pH of different lead and zinc floatation circuits.

Table 32: Quantity and type of chemicals

Chemical	Gram per ton	Qty Per Annum (in tons)
Copper Sulphate	340	680
Zinc Sulphate	184	368
Sodium Isopropyl Xanthates	103	206
MIBC	85	170
Sodium Cyanide	28	56
Lime	50	100
Nigrosine	15	30

All the raw material will be arranged indigenously and transported by road. The Run of Mine will be transported to beneficiation plant by dumpers and conveyor. The concentrate will be transported to own smelters by covered trucks/ dumpers.

Table 33: Summary of Chemicals stored

Type of Chemical	Use of chemical	Stored Quantity (in MT)
Copper Sulphate	Activator	25
Zinc Sulphate solution	Depressant	15
Sodium Cyanide	Depressant	2.5
Sodium isopropyl Xanthate (SIPX)	Collector	5
Methyl Isobutyl Carbinol (MIBC)	Froth stabilizer	4
Lime	PH stabilizer	6
Nigrosine	Depressant	2

12.7.2 Water

Currently the water requirement for existing operation is around 5800m3/day, which is being sourced from Matrikundia Dam, Mansi Wakal Dam, Ghosunda Dam, & Sewage Treatment Plant from Udaipur. Out of 5800m3/day, 2655m3/day is sourced from the sources as mentioned above (almost from STP, Udaipur) and remaining 3145m3/day water is drawn from the underground water intersection. Zero discharged is being maintained by recycling of water at various stages. In the proposed year there is no proposal for increasing water requirement. For the proposed expansion of 2MTPA, ore production & 2.7MTPA beneficiation plant water requirement is envisaged to be increasing, which is proposed to be taken from STP, Udaipur. Only, water for reagents, laboratories, & potable water will be sourced from fresh water sources.

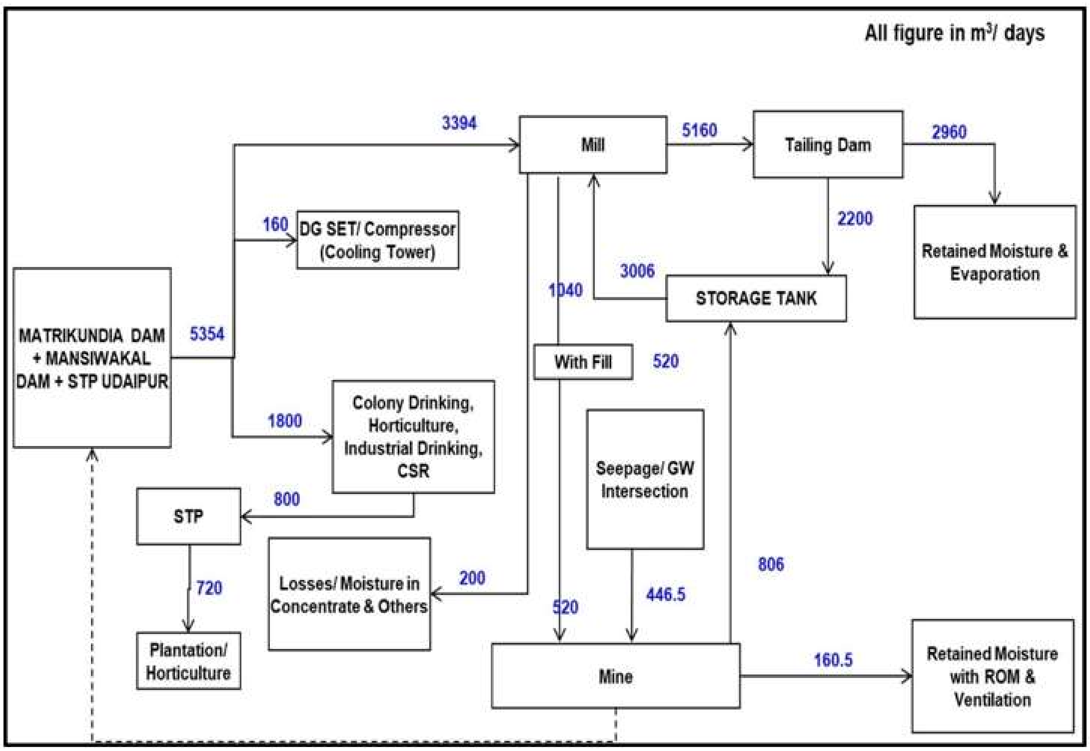


Figure 26: Water Balance for Existing Operations

12.8 Process Control Philosophy

The plant is controlled manually. The mine has skilled manpower to handle the manual plant well. The mine is also investing in modification of the existing plant.

12.9 Conclusions and Recommendations

The Mine has processing plant, which is old, still maintained well. It is worthwhile to note that the mine is considering putting up new 1.5 mtpa state of the art processing plant

12.10 Risks and Opportunities

The existing plant is old and hence needs tight controls on maintenance. The mine is considering putting up new 1.5 mtpa plant for which location has been identified.

13 Primary Surface Infrastructure

13.1 Roads

Rajpura-Dariba mine is located at the southern extremity of Rajpura-DaribaBethumnimetallogenic belt in Rajsamand district, Rajasthan, at a distance of 76 km NNE of Udaipur. The deposit is well connected by a metalled road from Udaipur, Chittorgarh, Bhilwara and District headquarters Rajsamand. The nearest Highway - NH-162A- at a distance of 0.5 km aerial distance towards West and SH-9 (Udaipur-Cittorgarh via Mavli)at a distance of 12.5 km aerial distance towards south from mine lease boundary. The mine is also well accessed from local roads from the surrounding villages.

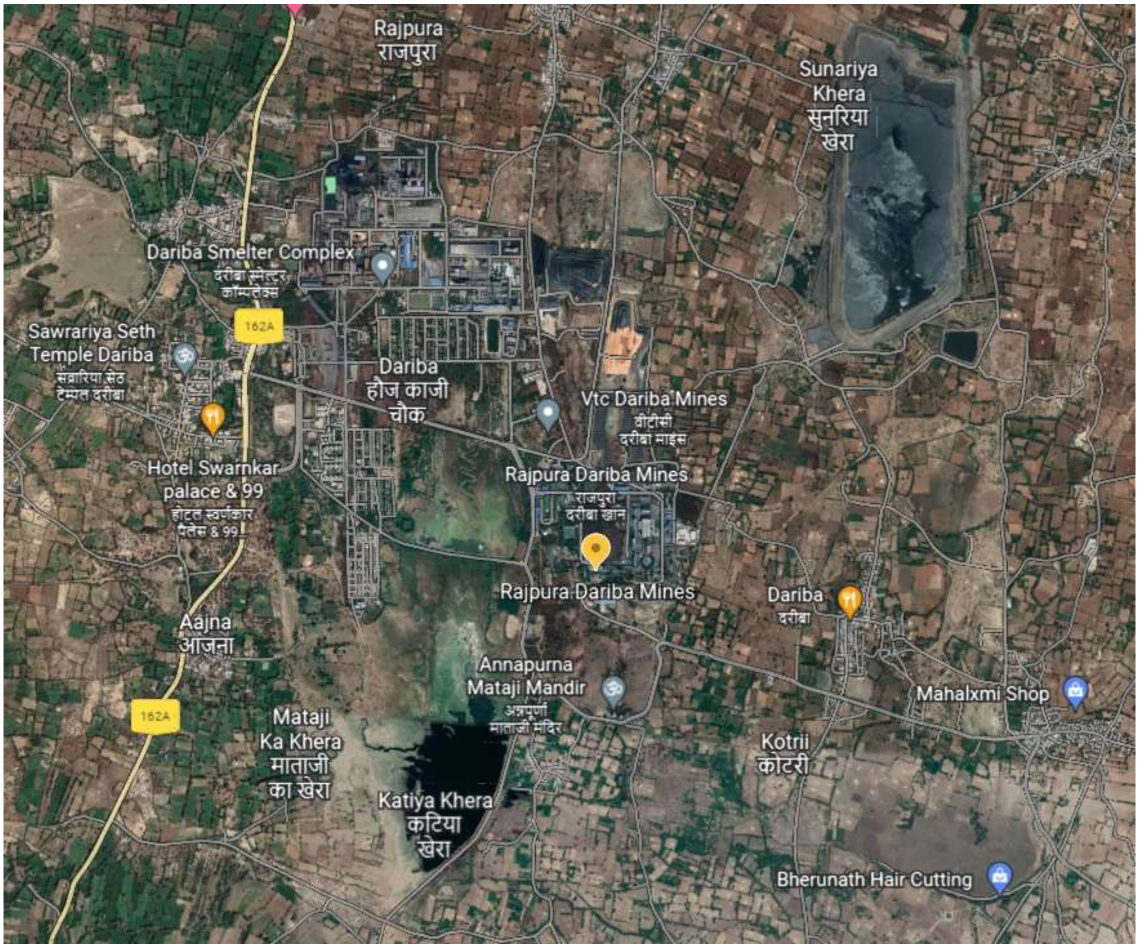


Figure 27: Location of RD Mine and the local Villages with access roads

Existence of public road / railway line, if any nearby and approximate distance The mine area is well connected by metalled road to Udaipur (70km), Chittorgarh (60km), Bhilwara (90Km) and district headquarter Rajsamand (40km). The nearest railway station is Fatehnagar, about 16km on Chittorgarh-Udaipur railway line.

13.2 Tailings Disposal

Zinc scavenger tails shall be pumped (1W+1S) to either tailing high rate thickener or to a cyclone (new to be installed in existing hydro fill plant). There will be dedicated separate piping system for pump delivery to a cyclone cluster which will have also a bypass connection to tailing thickener. One no cyclone cluster (2nos stand by cyclone) to be placed in the existing hydro fill plant. Cyclone overflow will report to the proposed tailing thickener and u/f of the cyclone will be distributed to existing FST and proposed new FST tank (same 320m3 capacity of the existing FST). Cyclone shall be designed for an underflow with max 18% passing (-)37 micron. The proposed new FST tank will have one no agitator. Overflow of the FST tank will be fed to the existing sump pit and underflow of the FST will report to existing mixing tank. There shall be (1W+1S) 100 m3/hr pump to be installed in the said existing sump pit which will pump the slurry to the proposed new Tailing Thickener. An additional spillage sump pit and spillage pump shall be provided near the new FST tank for draining out the new FST tank. Spillage from the additional spillage sump pit shall be pumped to existing mixing tank. We have envisaged that the existing mixing tank and existing sump pit will have enough storage to hold up slurry from this proposed new FST tank. Using suitable flocculent tailing thickener underflow solid consistency will be obtained.

The existing & upcoming plant both are equipped with the process of cyanide neutralization. In existing plant tailing sump is being used as a neutralization tank whereas in upcoming plant there will be a separate neutralization tank. Thickened underflow will be pumped to transfer tank/neutralisation tank. The thickener overflow shall gravitate to lead thickener overflow tank (lead circuit water tank). Provision shall also be provided to recirculate the thickener underflow back to the thickener. Lime will be added in transfer tank/neutralization tank to neutralize tailings. Neutralized tailings will be pumped from neutralisation tank to tailing dam. There will be 2 pump battery/train for pumping tailings from neutralisation tank to tailing dam. 1st pump of the train will be VFD operated in closed loop with level of tank. There will be suitable water flushing system in each battery. Delivery line of each pump train/battery will be fitted with density meter & flowmeter. There will be dedicated seal water pumps (1W +1S) for Tailing Disposal pumps. While number of pumps, pump RPM & the rating of motor supplied will be suitable for pumping the tailing slurry, system will be designed to handle slurry pumping for total length of 4500m & height at top of tailing dam at 526 m. Details of tailing dam is shown in table as under:

Quantity of tailing to be disposed: Around 45% tailing generated from the mill will be utilized for mine back fill. The balance quantity will be disposed by pumping through pipeline to tailing dam. In tailing dam periphery water samples are collected from piezometer wells for monitoring. Presently 6 numbers of piezometer well are installed from where water samples are collected for monitoring purpose. Embankment height will be increased by 3m each time and it will be raised up to 38m, (ultimate height), present level is 22m.

- Tailing thickener under flow is maintained at 1.4 g/cc density and through tailing thickener underflow cone tailing flows to tail pump sump by gravity.
- Four no. Of thickener underflow pumps (three VFD driven) are installed and run in closed loop of pump sump level sensor and density meter is also installed in feed line to the pump sump.
- There will be Spillage Pumps in Tailings thickener area for spillage collection two spillage pumps are installed,1 operating and 1 standby mode.
- The tailing dam height shall be increased up to the 23 m, thereafter dry disposal of tailing will be done, after commissioning of new plant.

13.3 Power and Water

For 2.0 mtpa mining & beneficiation capacity, additional power of 13MW is required for proposed expansion over existing 12.0 MW requirement and shall be met out from Captive Power Plant, Ajmer VidhyutVitran Nigam Limited and Solar Plant. Additional DG Sets of total 1.0 MW capacity (2X500 kVA) having acoustic enclosure is proposed for emergency power.

The water is being drawn from the Matrikundia dam in Banas River through a 22 km pipeline up to the plant. Water consumption of RDM is given below. It is stated that the plant is being operated since last two years on 100% recycle water and it is planned to operate with 100% recycle water in next five years and for future also. In RDM the fresh water is using only for drinking purpose which is supplied for industrial, colony and nearby villages

14 Market Studies

14.1 Introduction

Hindustan Zinc (HZL) is India’s largest and world’s second largest zinc-lead miner. With more than 50 years of operational experience, they have a reserve base of 161.2 million MT and an average zinc-lead grade of 5.9% and mineral resources of 286.7 million MT, our mine life is over 25 years. Their fully integrated zinc operations hold 78% market share in India’s primary zinc industry, and they are the 6th largest silver producers globally with an annual production of 913,000t.

The market was negatively impacted by COVID-19 in 2020 and 2021. Considering the pandemic scenario, the construction activities were stopped temporarily during the lockdown to curb the spread of new COVID-19 cases, thereby decreasing the demand for zinc and lead-based products such as galvanised metal, lead sheets, and others from the construction industry. Furthermore, the demand for lead-acid batteries decreased due to the temporary pause of the automotive manufacturing units during the lockdown. However, the demand for lead-acid batteries, especially valve-regulated lead-acid (VRLA) batteries, from the electronics and telecommunication industry increased during this period, as people opted to work online from their residence, which enhanced the demand in the market studied. With the lifting of restrictions, companies are keen to see a return to pre-2020 levels of activity.

14.2 Zinc

14.2.1 Application Of Zinc

Approximately 14% is used in the production of zinc die casting alloys. Nearly 9% of the zinc is utilized for oxides and chemicals and approximately 10% is used in alloys and castings. Some of the most common applications of zinc are listed below:

- **Galvanising**: Zinc offers one of the best forms of protection for steel against corrosion. It is used extensively in building & construction, infrastructure, household appliances, automobiles, steel furniture and other applications where lasting steel products are required.
- **Zinc Oxide**: The most widely used zinc compound, zinc oxide is used in the vulcanisation of rubber, as well as in ceramics, paints, animal feed, pharmaceuticals and several other products and processes. A special grade of zinc oxide has long been used in photocopiers.
- **Die Castings**: Zinc is an ideal material for die casting and is extensively used in hardware, electrical equipment, automotive and electronic components. Zinc die cast alloys are used in production of highly durable and visually appealing hardware fittings.
- **Alloys**: Zinc is extensively used in making alloys, especially brass, which is an alloy of copper and zinc.

14.2.2 Supply and Demand

The price of zinc is driven mostly by these five factors:

- Chinese Demand
- Chinese Supply
- Global Stocks
- US Demand

As with most industrial commodities, China plays a pivotal role in determining zinc prices. China is the top consumer of refined zinc used in galvanized steel. Therefore, a key indicator of zinc demand in China and elsewhere is steel demand. Decisions about whether to undertake or hold off on infrastructure projects can create huge fluctuations in steel demand. Ultimately, these decisions can flow through to the zinc market. A key factor impacting zinc output in China is the country's increasing environmental awareness. Poor air quality has forced the government to take a harder look at the mining industry as a contributor to pollution. If China curbs the production of zinc to deal with this problem, then the country will be more reliant on imports. This could drive prices higher. The London Metals Exchange (LME) keeps track of global stock levels for zinc and other industrial metals.
Current world production is approximately 13 million tonnes. HZL produces approximately 913,000t of zinc per year and is well established in the market.

Table 34: HZL Product Range

Product	Form	Weight
Special High Grade (SHG)	Standard Ingot	25 kgs
	Jumbo Ingots	1000kgs
Continuous Galvanising Grade (CGG)	Jumbo Ingots	1000kgs
High Grade (HG)	Standard Ingot	25 kgs
	Jumbo Ingots	600 kgs
Prime Western (PW)	Standard Ingot	25 kgs
Electro-Plating SHG (EPG SHG)	Standard Ingot	25 kgs
Hindustan Zinc Die-Cast Alloy (AZDA)	Standard Ingot	9 kgs

14.2.3 Prices

As with all commodities, prices fluctuate. Prices in general are Zinc price predictions from the leading international agencies for the next few years are as follows:

- **The World Bank** in its commodity forecast report estimated that the average spot price for zinc will fall to $2,400 per metric ton (t) in 2022, down from $2,700/t at the end of 2021. After that, a slow growth period will start.
- **The IMF'**s report indicated a completely different expectation: a rise from $2,828/t in the end of 2021 to $2,859 in 2022. For the following period, IMF experts expect a smooth, gradual decline. They predict the price will drop to $2,818/t by 2026.

- **The Industry Innovation and Science Australia**'s prediction is like the World Bank's predictions: they expect a decrease in the zinc spot price from $2,686 at the end of 2021 to $2,362 in 2022, with further slow increase through 2026.
- HZL is using prices as projected by LME as listed below:

Table 35: HZL Financial Model Prices

Particulars	UOM	FY'23	FY'24	FY'25	FY'26	FY'27	FY'28	FY'29	FY'30	FY'31	FY'32	Average
LME - Zinc	$/MT	3,183	2,911	2,684	2,621	2,658	2,706	2,706	2,706	2,706	2,706	2,759
- Lead	$/MT	2,179	2,047	1,974	1,962	1,997	2,082	2,082	2,082	2,082	2,082	2,057
- Silver	$/Troz	22.19	20.47	21.61	21.33	21.30	21.10	21.10	21.10	21.10	21.10	21.24
Ex Rate	Rs/USD	74.94	75.43	76.52	77.73	78.64	79.11	79.51	79.51	79.51	79.51	76.65

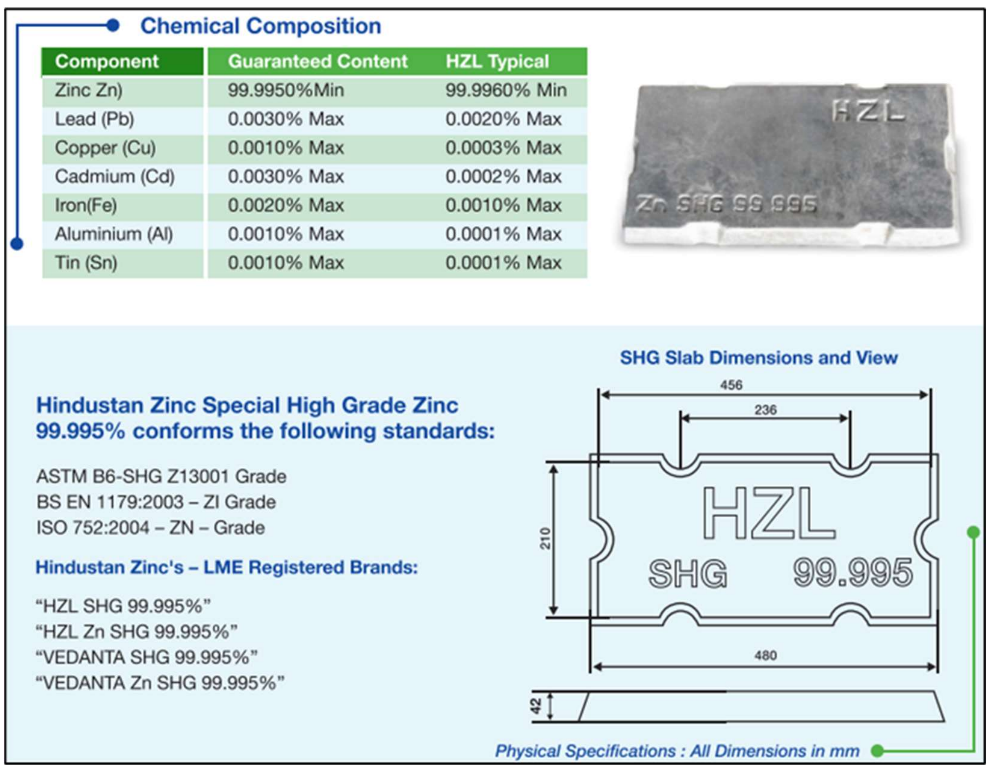
The figure below displays the price for zinc over the last five years. The price projections above agree in general with the historic average prices although it has been as low as US$1,500/t in January 2016 and as high as US$ 4,000/t in April 2022. In our opinion, the recent high price may be because of stock shortages created by the pandemic. These high levels are not sustainable, and we already see a substantial drop in prices which should stabilise at the levels projected by the LME, World Bank and others.

Figure 28: 5-Year Zinc Price in US Dollars

Source: Trading Economics

Figure 29: LME Zinc Contract Prices

Source: LME Website 12 July 2012.



Chemical Composition

Component	Guaranteed Content	HZL Typical
Zinc Zn)	99.9950%Min	99.9960% Min
Lead (Pb)	0.0030% Max	0.0020% Max
Copper (Cu)	0.0010% Max	0.0003% Max
Cadmium (Cd)	0.0030% Max	0.0002% Max
Iron(Fe)	0.0020% Max	0.0010% Max
Aluminium (Al)	0.0010% Max	0.0001% Max
Tin (Sn)	0.0010% Max	0.0001% Max

Figure 30: HZL Zinc Specifications

14.3 Lead

14.3.1 Applications for Lead

The battery sector is the single largest consumer of lead, accounting for around three-quarters of the demand. It can be sub-divided into the following groups:

- **SLI (Starting-Lighting-Ignition) batteries**, which currently accounts for over half of the total lead demand. These are mainly used in cars and light vehicles but are also found in other applications such as golf carts and boats. SLI battery demand in turn can be split into original equipment and replacement, with replacement demand outstripping original equipment demand by about 4:1 in mature markets.
- **Industrial batteries**, which currently consumes around a quarter of the total lead produced. This sector can be split roughly 50:50 into stationery and traction batteries. Stationary batteries are principally used in back up power supply systems; traction batteries are used for motive power in equipment such as forklift trucks and motorised wheelchairs.
- The remainder is used in non-battery applications. The second largest current end use of lead for non-battery applications, accounting for around 20% of lead consumption, is the alloys and chemical industry. Principal markets are for cathode ray tubes used in television screens and computer monitors, for Poly Vinyl Chloride (PVC) stabilisers and for making pigments for industrial use. Cable and other industries account for the remaining 5% of lead demand.

14.3.2 Supply and Demand

Growth in the construction industries was driving the overall market growth for a long time. High demand from renovation in the construction sector, including gutter and gutter joints and metal for roofing materials were propelling the market demand. Now, high demand for the electrical vehicle is influencing lead acid batteries demand emerging as the key driving factor for the market growth. Additionally, vigorous investment in improving telecom networks along with significant development in data centres are expected to enhance the industry position.

However, high production cost with stringent challenging processes is inhibiting the growth of lead market globally.

By the application segment, batteries segment is expected to dominate the market during the forecast period. As lead-acid battery is utilised in the form of stationary batteries, SLI batteries, portable batteries which includes electronics, consumers, telecom, energy storage system and others. SLI batteries have vast application in automobile designing and installation specifically with the automobile's charging system, that allow continuous cycle of charge and discharge in the battery each time the vehicle is in use. Furthermore, development in construction, machineries, and other battery dependent end-product is helping the market to grow.

Regionally, Asia Pacific is expected to dominate the lead market and is expected to grow during the forecast period. Developing countries like Japan, China, and India have boosted the market growth due to an increase in manufactures for machinery and tools across the world. This is expected to drive the market demand in this region.

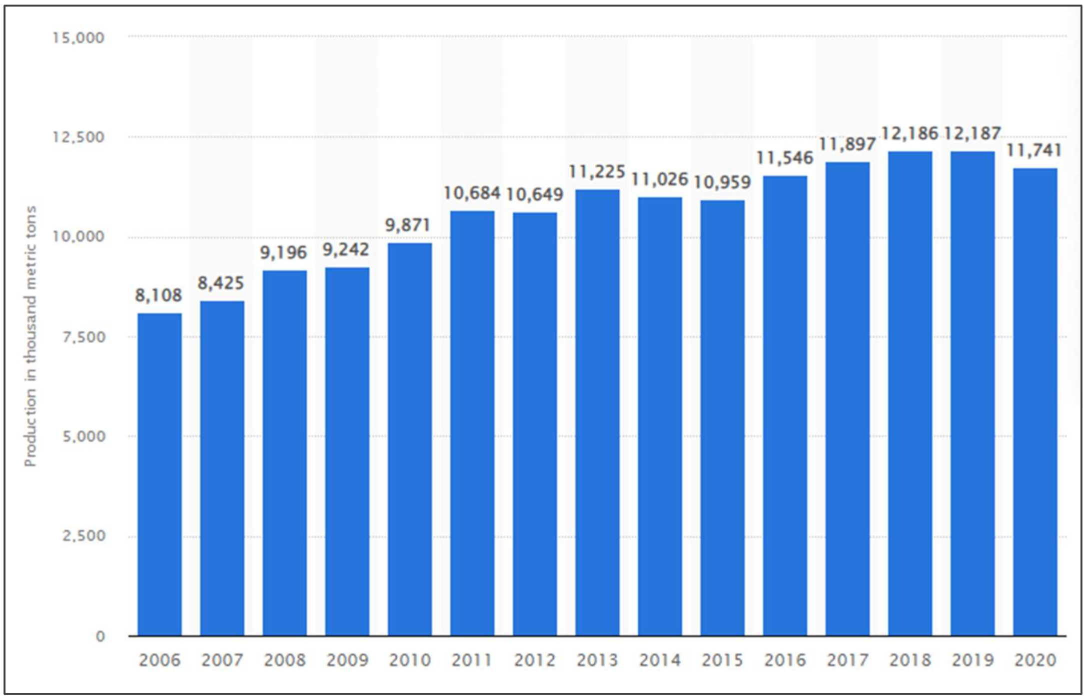


Figure 31: World Production of Lead

Figures above indicates a slow growth over the last 5 years with a slight dip in 2020, possibly due to COVID 19 restrictions. In our opinion, the production will recover and continue the slow growth of pre-pandemic years.

HZL produces lead ingots with a minimum of 99.99% purity which are registered with LME at a level of 210,000 t/a. This is expected to continue for the forecast period.

14.3.3 Prices

As with almost all commodities, prices are cyclical. Based on the 12-month price chart, there appears to be a severe reduction in price from around US$2,400/t to US$1,971 in July 2022. The 10-year price curve indicates that this is probably only a market correction. It is too early to guess at what level the price would stabilise.

Figure 32: 12-Month Price of Lead

Source – Trading Economics

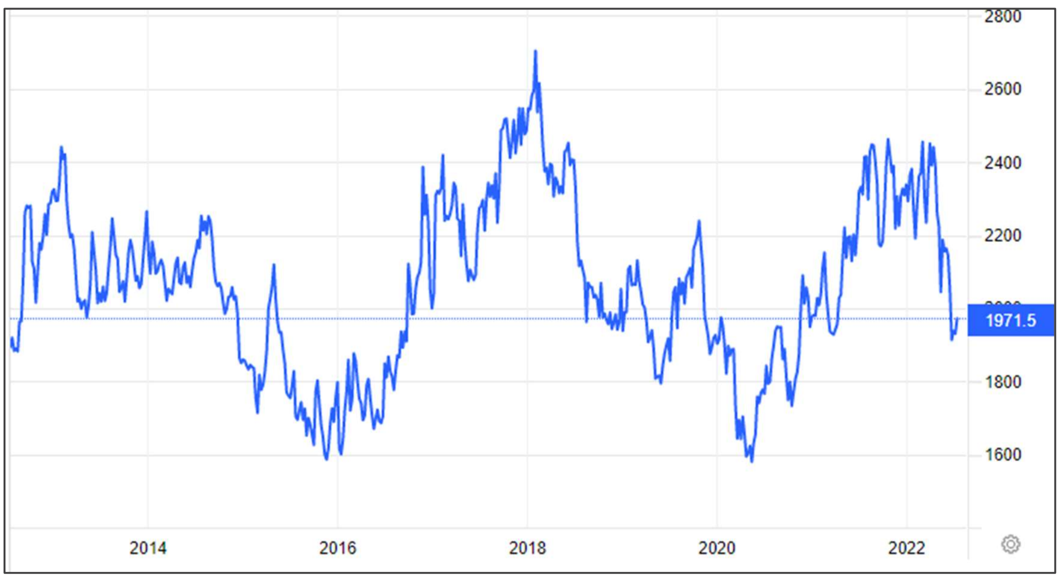


Figure 33: 5-Year Price of Lead

Source – Trading Economics

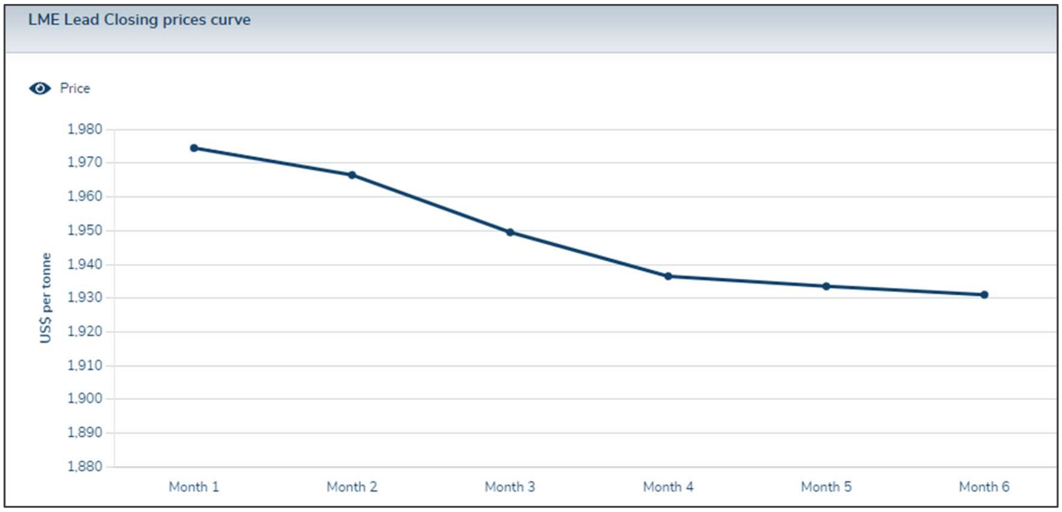


Figure 34: LME Contract Price on July 2022.

Source: LME July 2022

Chemical Composition — **LME Brand : Vedanta 99.99**

Component	Composition- BS EN 12659 : 1999 PB990R	HZL Typical
Lead(Pb)	99.99% Min	99.993%
Silver(Ag)	0.0015% Max	<0.0005%
Arsenic(As)	0.0005% Max	<0.0003%
Bismuth(Bi)	0.0100% Max	<0.0050%
Cadmium(Cd)	0.0002% Max	<0.0002%
Copper (Cu)	0.0005% Max	<0.0005%
Nickel (Ni)	0.0002% Max	<0.0002%
Antimony(Sb)	0.0005% Max	<0.0005%
Tin (Sn)	0.0005% Max	<0.0005%
Zinc(Zn)	0.0002% Max	<0.0002%

Vedanta 99.99% (Bundle Specification)

Ingot Weight	25 Kg (+/- 1.2 Kg)
Ingot Dimensions	85 (+/-2)mm Width | 535(+/-2)mm Length | 75(+/-2) mm Height
Bundle Weight	1050 Kg (+/-50 Kg)
Bundle Configuration	6 ingots/layer x 7 layers | 42 ingots
Bundle Dimension	510(+/-12)mm Width | 535(+/-2) mm Length | 520(+/-14) mm Heig
Strapping	32 mm Tenax strap | 2*2 strapping

Vedanta 99.99 & Vedanta Pb 99.99- Hindustan Zinc Lead Ingots are LME Registere

Figure 35: HZL Lead Specifications

14.4 Silver

The extraordinary events of 2020 have had a profound effect on virtually all markets around the globe and silver has been no exception. The metal's supply/demand fundamentals, investment, prices, trade-flows and inventories have all experienced sensational fluctuations over the past 12 months or so. The effect of the pandemic is set to remain relevant to silver for some time to come. Several key silver mining countries were hit hard by lockdown restrictions, and global silver supply declined. This was more than offset, however, by losses across most of silver's physical demand segments, which suffered as a result of restrictions to economic activity as well as depressed consumer sentiment and/or income loss. This resulted in a large silver market surplus. One notable exception was physical investment. A growing appetite for safe haven assets and, initially, the strength of the gold price all boosted investors' appetite for silver bars and coins last year, culminating in an 8% rise overall.

14.4.1 Applications for Silver

Silver metal has been known since ancient times for its brilliant white metallic lustre with high ductility and malleability properties. The precious metal has varied uses backed by its excellent heat and electrical conductivity levels.

In India, the highest usage of silver is in jewellery, followed by coins & bars silverware and industrial fabrication. With growing Indian economy, silver demand especially in the industrial sector is expected to follow a healthy growth in the coming years with an increased off take especially in electrical and electronics as well as brazing alloys and solders.

14.4.2 Supply and Demand

According to the Silver Institutes report "World Silver Survey 2021", In 2020, global mine production suffered its biggest decline of the last decade, falling by 5.9% y/y to 784.4Moz (24,399t). This was caused by temporary mine closures in several major silver producing countries in the first half of the year as a direct result of the COVID-19 pandemic. Output from primary silver mines declined by 11.9% y/y to 209.4Moz (6,513t). This exceeded the drop that silver by-product output from lead-zinc and gold mines suffered, which fell by 7.4% to 248.3Moz (7,724t) and by 5.7% to 123.3Moz (3,834t), respectively. Countering this trend, silver production from copper mines increased by 3.5% y/y to 198.3Moz (6,169t).

At the county level, the largest declines were in nations which implemented COVID-19 lockdowns that required mines to temporarily halt operations. This led to substantially lower silver production in Peru (-26.1Moz, 810t), Argentina (-10.0Moz, 311t), Mexico (-9.6Moz, 299t) and Bolivia (-7.2Moz, 223t). Despite the disruption caused by the pandemic, mines in other countries were able to continue operating at full capacity throughout the year and output increased in Chile (+9.1Moz, 284t), India (+1.2Moz, 38t) and Australia (+1.2Moz, 37t).

Chemical Composition

Component	Composition
Silver (Ag)	99.99 % Min
Antimony (Sb)	0.0020 % Max
Lead (Pb)	0.0020 % Max
Copper (Cu)	0.0020 % Max
Iron (Fe)	0.0020 % Max
Bismuth (Bi)	0.0015 % Max
Zinc (Zn)	0.0020 % Max
Selenium (Se)	0.0001 % Max
Telurium (Te)	0.0002 % Max
Calcium (Ca)	0.0001 % Max
Magnesium (Mg)	0.0001 % Max
Silicon (Si)	0.0001 % Max
Aluminium (Al)	0.0001 % Max
Arsenic (As)	0.0001 % Max
Cadmium (Cd)	0.0001 % Max
Chromium (Cr)	0.0001 % Max
Cobalt (Co)	0.0001 % Max
Nickel (ni)	0.0001 % Max
Gold (Au)	0.0001 % Max
Platinium (Pt)	0.0001 % Max
Palladium (Pd)	0.0001 % Max
Tin (Sn)	0.0001 % Max
Indium (In)	0.0001 % Max
Manganese (Mn)	0.0001 % Max

Silver Ingot Specification		
Ingot Weight	:	30 Kg
Length (Top)	:	310 mm
Length (Bottom)	:	280 mm
Width (Top)	:	150 mm
Width (Bottom)	:	120 mm
Height	:	75 mm

LBMA Accredited Good Delivery Bars.

Figure 36: HZL Silver Specifications

After rising for two years, global silver demand weakened by 10% in 2020 to 896.1Moz (27,872t) as the impressive gains in physical investment were more than offset by heavy losses in jewellery and silverware. After falling just short of record levels in 2019, industrial fabrication fell 5% last year to a five-year low of 486.8Moz (15,142t). Unsurprisingly, this was overwhelmingly due to the impact of the COVID-19 pandemic on economic activity and, in turn, many silver end-users. Regional performances diverged, with Europe suffering a notable 8% decline, while North America rose by 2%, chiefly through higher demand in such areas as silver powder for photovoltaic (PV) ends. Demand in East Asia also fell overall, although performances were very mixed at the country-level; losses were seen in China, but Japan and Taiwan enjoyed gains.

On a sectoral basis, electronics & electrical demand fell a modest 4% as gains for PV offset losses elsewhere. Other industrial offtake in turn fell 7% as a strong showing for EO catalysts could only partially counter India's heavy losses in this segment. In general, thrifting and substitution had a limited impact on silver use as the price was insufficiently high for long enough to trigger interest and as many areas present little room for further savings.

Strong growth in mine production this year is expected to be followed by continued growth in the medium term. This will be driven by increased output from a number of major operating mines alongside new projects, with a significant contribution coming from primary silver operations in Mexico.

14.4.3 Price

Figure 37: 5-Year Silver Price

(Source – Trading Economics)

In the period 2015 to 2020, the price varied around an average of approximately US$16.5/oz. During the world pandemic, silver offered a haven for storing wealth which is reflected in the average price shooting up to an average above US$24/oz. With the acceptance that the pandemic was over in mid-July 2022, the price is starting to return to earlier levels and may stabilise near to the pre-2020 levels.

15 Environmental Studies, Permitting and Social or Community Impact

15.1 Introduction

The knowledge of present environment of the core and buffer zone of the existing mining area is important to assess the impact of various project activities on environment. The knowledge of present-day environment is also helpful in planning management of environment and planning of mitigation measures. To assess the composite baseline of mine and processing facilities related to the environmental quality of the area, field assessment has been conducted considering following components of the environment, viz. land, meteorology, air, noise, water, soil, biological and socio-economic. The relevant information and data (both primary and secondary) were collected in core as well as buffer zone (10 km distance from the Mine Lease boundary) in accordance with the guidelines of MoEF&CC for undertaking EIA Studies and preparation of Draft EIA/EMP reports.

The Rajasthan State falls in a region of low Seismic hazard zone with the exception being moderate hazard in areas along west state border. It mainly lies in Zones II and III. Several faults have been identified in this region out of which many show evidence of movement during the Holocene epoch.

15.2 Environmental Studies

The projects should not cause any significant impact on the environment of the area, as adequate preventive measures have been adopted to contain various pollutants generated due to the proposed current and proposed expansion projects within permissible limits. Development of Greenbelt / Plantation around the mining lease will minimize the environment pollution and improve the overall aesthetic beauty.

Environmental Monitoring Programme has been and will be continued for various environmental components as per conditions stipulated in Environmental Clearance Letters issued by MoEFCC & Consent to Operate issued by SPCB. Six monthly compliance reports will be submitted every year to Regional Office by 1st of June & 1st of December. Quarterly compliance Report for conditions stipulated in Consent to Operate will be submitted to SPCB on regular basis.

15.2.1 Land Use

Land use studies, delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features were completed. Land use plans of mine lease areas were prepared to encompass preoperational, operational and post operational phases.

Total Mine lease area is 1,142.2ha, out of which 362.66 ha has been acquired as a mining area. There is no requirement to acquire additional land beyond the current allocation. The mine area in operational use will suffice the requirement. Breakup of land use of lease area and acquired area is shown as under:

Table 36: Distribution of Land Use

Particular	Land Use (Ha)
Mine & Smelter Operational use	171.67
Other Use: Residential Colony	41.41
Roads and open spaces	15.58
Green Belt	134
Khatedari Land	578.2
Charagh	27.33
Govt Land	131.03
Public Roads & Others	42.98
Total Area	**1142.2**

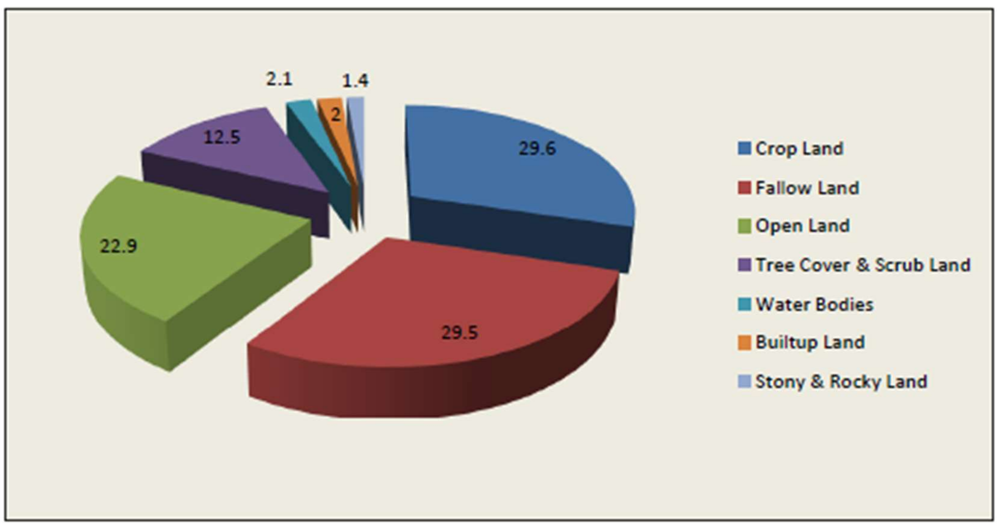


Figure 38: Distribution of Land Use

15.2.2 Climatology

The climate is characterized by sub-tropical dry climate with distinct hot summer, cold winter and rainy monsoon. The maximum temperature rises above 47°C in May-June and down as low as 2°C in December-January.

15.2.3 Air Quality

Ambient air quality monitoring has been carried out within the study areas to determine the baseline concentration of various air pollutants in the ambient air. The ambient air quality depends upon the emission sources, meteorological conditions, and the background concentration of specific pollutants. This helps in providing a data base for predicting impact on the surrounding area due to a project activity. It is a standard to ensure the quality of air environment is in conformity to standards of the ambient air quality during operation phase of the projects.

- The mine sites have provided mechanical ventilators for air circulation
- Wet drilling is being used to suppress the dust generation
- The trucks are being covered with tarpaulin sheets
- Dust generation during working will be minimized by adoption of dust suppression systems at working faces.
- Water spraying on haul road.
- During transportation and unloading points, water sprinkling is being/ will be done to suppress the fugitive emissions.
- The crusher and Screens houses are provided with dust extraction system with outlets
- Development of green belt within lease area & plantation within ML Area is being done.
- Regular monitoring of air quality
- On surface, blacktop paved/ concrete roads
- Deployment of mechanized vacuum road sweeper on surface roads

In 2017 HZL approved the drilling of 4 additional raisebores from surface to achieve ventilation capacity of up to 768 m^3/s which is the peak ventilation requirement. The raisebores were designed at a diameter of 3.5 m. An earlier study indicated that the air was moving at 315 m^3/s, suggesting that some of the existing raises were underutilised.

15.2.4 Noise Pollution

As most mining activities are restricted to underground, the effect on the surrounding population is limited. Regardless, HZL has taken all necessary measures to minimise the noise effects:

- Compressors are installed in isolated building with acoustic enclosures.
- Ventilation fans are provided with silencers

- DG sets have acoustic enclosures.
- All vehicles and machineries used have noise emissions within permissible limits through regular maintenance.
- Improved design of chutes and mill liners.
- Good grindability due to soft ore.
- Regular monitoring of noise level of mining & milling equipment.
- UG HEMM are procured with latest emission standard engines.
- UG HEMMs are equipped with airconditioned cabins thereby attenuating noise level while operating the equipment.
- A green belt is developed to attenuate the noise levels
- Reducing the exposure time of workers to the higher levels of noise
- Provision of personnel protective equipment such as ear plugs, earmuffs etc

The proposed expansion of mining activity involves use of compressors, drill machines, dumpers, loaders, excavators, and ventilation fans. The source noise levels of this equipment are in the range of 80 to 90 dB(A). The following mitigation measures are taken:

- Silencers are provided for stationary machinery such as compressors, DG set, etc,
- Noise insulation is provided to the equipment such as DG sets and enclosures wherever required for reducing the noise emission.
- Transport and mining machinery maintenance are undertaken periodically to reduce vibration, induced noise generations during movement of vehicles.
- Workers are provided with noise protective ear plugs/muffs and its usage shall be compulsory.
- The Greenbelt in and around the mine area to intercept and deflect noise transmission

15.2.5 Surface Water and Wetlands

The study area is drained by the Banas River and its tributaries towards north, northwest, east and is drained by Berach River towards the south of the study area. The river as well as tributaries are ephemeral and flow only in response to heavy precipitation. The Banas originates in Aravalli Hills, approximately 5 km from Kumbhalgarh Fort and flowing southwards, and meets the Gogunda Plateau. It flows through Rajsamand and Relmagra Tehsils and crosses into Chittorgarh and Bhilwara Districts. The predominant drainage pattern in the Western hill ranges is rectangular to sub-rectangular and it is dendritic to sub-dendritic in rest of the area. Drainage pattern in the western hill region is controlled by fractures & joints and in the rest of the area by subsurface lineaments. The lease area is devoid of any surface waterbody such as lake, dam or river. The Banas River flows about 8.2 km towards NNE of the lease. A number of dug wells exist within the study area with diameter varying from 1 m to 6 m and depth ranging from 5 m to 20 m.

15.2.6 Groundwater

The principal source of water in the study area is groundwater. Ground water is the accumulation of water below the ground surface, caused by percolation of rainfall through pores and crevices. Percolated water accumulates when it reaches some impervious strata consisting of confined clay or confined rocks. Open wells and hand pumps are the major groundwater source of drinking water and are also used for limited irrigation.

The occurrence of ground water in the study area is mainly controlled by the topographic and structural features present in the geological formations. The principal source of ground water is precipitation. Out of the total rainfall received, a major part of it is lost as run-off and by evapo-transpiration through soil and vegetation. Only a small part of rainfall infiltrates down to reach ground water body.

The important water bearing formation besides alluvium is the granite gneisses, schists, limestone and phyllites. In the hard rocks the occurrence and movement of ground water is controlled through the foliation/bedding planes, fissures, joints, solution cavities and other structural weak planes. The weathered mantle of the hard rocks yields good discharge of water. In alluvium, ground water occurs in the interstices of unconsolidated sand and gravel. Locally semi-confined conditions are encountered both in hard rock and alluvium.

The ground water movement is controlled mainly by the hydraulic conductivity of the aquifer. A review of the topography and drainage pattern reveals that the general slope of the area is towards southeast, and ranges from 6 m/km to about 7 m/km. The ground water flow also follows the topography and surface water flow direction and moves in southeast direction. However, the hydraulic gradient is moderate and has been observed as 5.75 m/km as calculated from the monitoring of wells of the area.

15.2.7 Soil

The information on soil quality has been arrived by collection and analysis of soil samples from representative locations. To assess the base line characteristics of soil profile of the mine lease area representing project and nearby areas, the samples were analysed for key and chemical parameters. The sampling locations were finalized with the following considerations:

- To enable information on baseline characteristics and,
- To determine the impact of mining activities on soil characteristics.
- To determine the type of plantation

The types of soil occurring in the district are:

- Sandy loam in Bhim, Deogargh and Amet blocks
- Clay Loam in Rajsamand, Relmagra and Khamnor blocks and
- Heavy clay in Kumbalgarh block.

Broadly, the northern, southern and eastern part of the district possesses loam, foot hill soils and black cotton soil with moderate run off, whereas in the western part of the district lithosols and regosols of hills and rocky outcrops having very high run off are prevalent.

Soil infiltration rate varied from 0.6 cm/hr to 4.2 cm/hr with average infiltration rate of 2.35 cm/hr. The cumulative depth to which vertical infiltration took place varied from 3.6 to 16.2 cm by which time, constant infiltration rate was also achieved. Based on National Bureau of Soil Sciences and Land Use Planning (NBSS & LUP) Regional Centre, Udaipur, the soil of the study area is classified as deep and medium brown loamy soils.

The soil analysis indicates that the soil is sandy loam in texture and neutral in nature. The nutrient and organic matter contents are medium, and the soil is normally fertile.

15.2.8 Biological Environment

The survey was undertaken to determine the sensitivities/activities in the core zone area (Rajpura Dariba Lead-Zinc Mine, M.L. No. 166/2008 area 1142.2106 ha.) and buffer area of 10 km radius from the boundary of the mining lease area. The ground herbaceous flora was completely parched or only available near the moist areas. The temperature ranged between a maximum of 39-34°C to a minimum of 28-26°C.

The **natural vegetation** at project site is represented by small natural shrubs and herbs such as Calatropis procera, Tridex procumbens, Solanum nigerum, Euphorbia hirta, Indigofera cordifolia, Parthenium hysterophorum and Sida acuta. The naturally occurring tree species are Butea monosperma and Prosopis juliflora. As a part of the green belt development plan, many individuals of

Dalbergia sisso, Cassia siamea, Azadirachta indica and Leucaena leucocephala have been planted. The plantation has been raised using drip irrigation as a part of water conservation measures.

The majority of water bodies have dried up due to extreme summer conditions, however, perennial water bodies such as Jeetawas pond have aquatic flora such as Eichornia crassipes, Typha augustata, Nelumbo nucifera and Ipomea species.

The **faunal species** occurring at site are limited to a few reptiles, birds and smaller mammals. The common reptilian species observed from the project site are garden lizard (Calotes versicolor and Fan-throated lizard (Sitana ponticeriana). The common avifaunal species observed at the project site are House Sparrow, Dusky-crag Martin, Rock Pigeon, Common Myna, Red-wattled Lapwing, Purple-rumped Sunbird, Grey Francolin and Small-green Bee-eater. Among the mammals, five striped squirrel, jackal, fox and Indian mongoose were observed at site.

15.3 Requirements and Plans for Waste and Tailings Disposal, Site Monitoring, and Water Management

15.3.1 Waste and Tailings Disposal

The RDM Tailings Storage Facility (TSF) currently occupies an area of 80.0 ha and has been in operation since 1981. The current stage has a remaining capacity sufficient for two years of milling. Two further stages, each with a capacity of 3.2 Mm^3 are planned, the first of which has commenced.

In the case of shaft hoisting, there is a requirement for LPDTs to either haul development waste to surface or stopes. As backfill, underground. For this study, ABM has assumed all waste rock is placed back underground into stope voids as rockfill due to limited capacity for hoisting during steady-state production.

Backfilling with production waste will require tipping of waste rock into stockpiles and subsequent transferring by LHD to the stopes. Waste rock will also be required if backfilling with paste fill, to create a suitable tramming surface on top of the paste-fill surface.

The RDM currently utilises a hydraulic fill system with a 5% cement content for backfilling. The hydraulic fill is reticulated through boreholes from the mixing plant located on the surface above the North lode. There is a requirement for a 10% cement content in the initial 7 m high plug at the base of each slope, with the general backfilling of stopes shown below

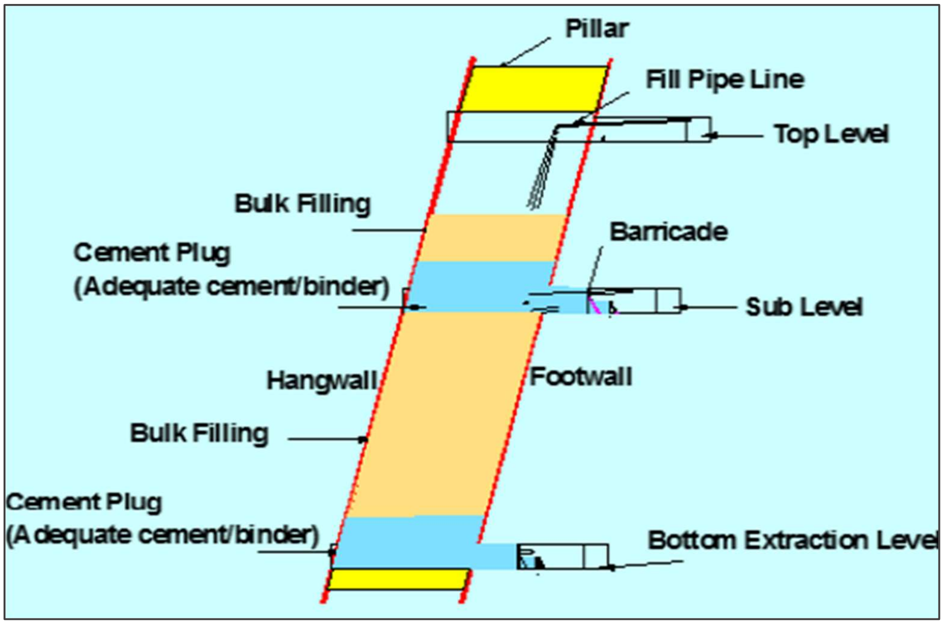


Figure 39: Typical stope backfilling

15.3.2 Site Monitoring

Monitoring will be carried out at the site as per the norms of CPCB. An Environmental Monitoring Programme is conducted for various environmental components as per conditions stipulated in Environmental Clearance Letter issued by MOEF & Consent to Operate issued by SPCB. Six monthly compliance reports are be submitted every year to Regional office of MoEF on 1st of June & 1st of December. Quarterly compliance Report for conditions stipulated in Consent to Operate are submitted to SPCB on regular basis. Monitoring ensures that commitments are being met with. This takes the form of direct measurement and recording of quantitative information, such as amounts and concentrations of discharges, emissions and wastes, for measurement against corporate or statutory standards, consent limits or targets. It also requires measurement of ambient environmental quality in the vicinity of a site using ecological/ biological, physical and chemical indicators. Monitoring includes socio-economic interaction, through local liaison activities or even assessment of complaints.

Table 37: Frequency of monitoring

Description	Frequency of Monitoring
Meteorological Data	Daily
Ambient Air Quality at mine site	Monthly
Water Quality	Monthly
Noise Level Monitoring	Monthly
Soil Quality	Once in six months

15.3.3 Water Management

A dirty water system typically involves the utilization of skid-mounted mono pumps for decline development, being relocated as required. Ground and mine water drain to one or more sumps on each level and is either be pumped to a higher-level sump or pump station or drain through one or more boreholes to lower levels for subsequent pumping.

Water for processing is taken from the RDM TSF with further water obtained from dewatering underground. RDM minimises water requirements by maximising water recycle from the RDM TSF. Monthly water consumption is around 90,000 m^3 and is supplied from a RO plant treating rainwater held in a pond.

The current water balance shows 4,545 m^3/day of water introduced into the mine, of which 1,000 m^3/day is retained underground. With the ramp-up of production to 2.0 Mt/a, an updated water balance along with water management has been designed.

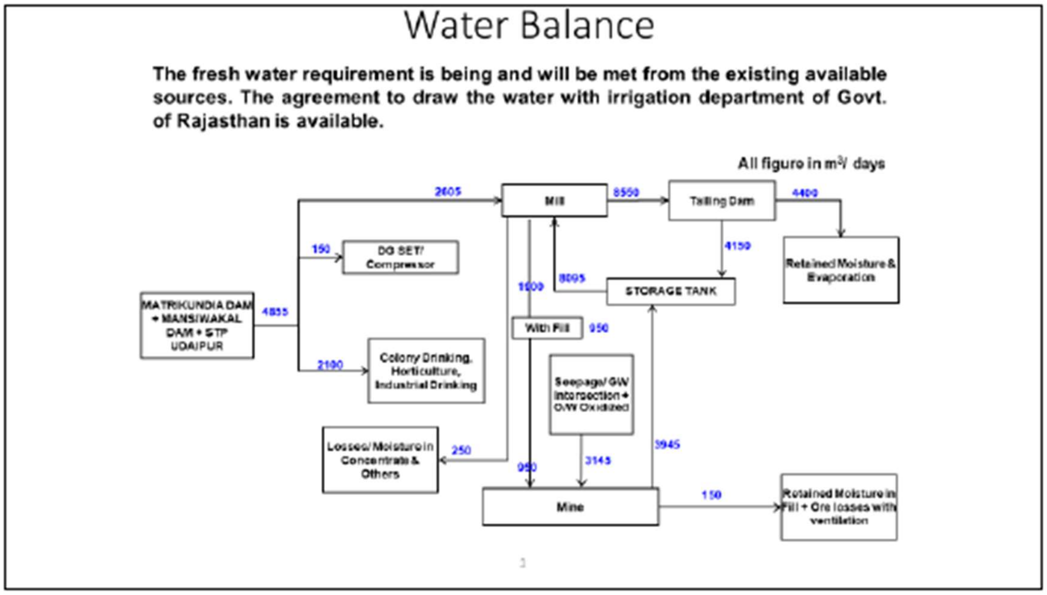


Figure 40: RD Mine water Balance

Domestic wastewater from the mine premises is treated in a sewage treatment plant, from where it is used in greenbelt development, dust suppression and drilling operations. Mine water generated in the mining activity is suitably treated for suspended solids and reused to the maximum extent in wet drilling operations, dust suppression in underground and in sprinkling on surface roads for dust suppression. Hence no wastewater would be let out from the mine. The tailing from existing beneficiation plants is being pumped to the existing lined tailing dam. It is proposed to continue the same and the capacity of lined tailing dam is sufficient till the mine life as the tailings generated are utilized in filling the underground mine voids.

15.4 Required Permits and Status

15.4.1 Community Engagement

An essential part of environmental study which includes demographic structure of the area, provision of basic amenities viz., housing, education, health and medical services, occupation, water supply, sanitation, communication, transportation, prevailing diseases pattern as well as feature of aesthetic significance such as temples, historical monuments etc. at the baseline level. This composite baseline assessment of mine and CPP helps in visualizing and predicting the possible impact, depending upon the nature and magnitude of the project.

The study area (10-km radius) area has a total population of 95,566 according to 2011 census. Total male population is about 50.59 % and total female population is around 49.40%. The average literacy rate 50.65 % in the region.

In addition to the direct and indirect employment opportunity, HZL is already, providing various skills development opportunity through vocational training that would enable people to become self-employed or entrepreneurs. Self-help group activities is also implemented to empower rural women and make them self-sufficient. Assistance being provided to the village population for access to banking facility has helped further increase the access to cheaper funds and financial facilities. Various health camps are being organized with distribution of essential medicines to improve the basic health of the village population in the vicinity of the project site. Educational material, uniform and scholarship incentives are being distributed to the village school children to motivate them through the CSR initiatives, The project proponent kept 2.5% of the total cost of the project based on local needs.

15.4.2 Mine Closure

According to the baseline study in EIA Report, the existing land use pattern indicates that the area has been mined and already degraded.

15.4.2.1 Water Regime

The EIA Report states that the mining activities don't affect the quality of surface and ground water. Mine water is constituted by the seepage of percolating ground water and water added due to mining activities such as drilling. This water is collected underground in sumps, from where it is pumped to surface into storage tanks and recirculated for industrial use. There is no acid drainage. The mill discharge is pumped to a tailings dam.

15.4.2.2 Surface Subsidense

The mining is fully confined to underground at depths that should not affect the surface due to subsidence. As an additional precaution, mined-out stopes are backfilled to protect the underground infrastructure as well as for prevention of potential subsidence.

15.4.2.3 Mined out Land

The mining activity is fully confined to underground. After extraction of the ore, stopes are backfilled with waste, classified tailings and cement.

15.4.2.4 Topsoil Management

No change in the topsoil is anticipated due to the underground mining. The topsoil available around the Rajpura Dariba Mine has been used for plantation purposes when required.

15.4.2.5 Tailings Dam Management

Not applicable as the tailings dam is outside the lease boundary.

15.4.2.6 Tailings Disposal

Currently the tailings from the plant is being pumped to existing tailings dam. It has been proposed that 50% of the tailings be used in the stope backfill.

16 Capital and Operating Costs

16.1 Operating Cost Estimate

ABGM did not undertake any techno-economic assessments on the mining costs, processing costs and fixed royalties. The following operating cost estimates was received from HZL that is used in their financial and budget planning for FY2022 – 2033.

Table 38: Summary of Operating Costs (source HZL)

Particulars	UoM	Yr 2022	Yr2023	Yr 2024	Yr 2025	Yr 2026	Yr 2027	Yr 2028	Yr 2029	Yr 2030	Yr 2031	Yr 2032	Yr 2033	Yr 2034	Yr 2035
Mining Cost	$/MT Ore	29	31	32	34	36	37	39	41	43	45	48	50	53	55
Processing Costs	$/MT Ore	9	10	10	11	11	12	12	13	14	14	15	16	17	18
Development	$/MT Ore	13	14	15	15	16	17	18	19	20	21	22	23	24	25
Smelter Cost															
Zn Metal	$/MT Metal	440	440	440	440	440	440	440	440	440	440	440	440	440	440
Lead Metal	$/MT Metal	533	533	533	533	533	533	533	533	533	533	533	533	533	533
Silver Metal	$/MT Metal	24	24	24	24	24	24	24	24	24	24	24	24	24	24
Overall Cost															
Mining Cost	$ Mn	70	76	126	150	158	165	174	182	191	201	211	222	186	150
Smelter Cost	$ Mn	33	40	60	68	68	68	69	71	71	71	71	71	57	43
Royalty Cost	$ Mn	27	32	48	55	55	55	56	57	57	57	57	57	46	35

16.2 Capital Cost Estimate

No capital cost estimates was evaluated in the limited timeframe of this technical review.

17 Economic Analysis

ABGM did not undertake any techno-economic assessments on the reserves and only evaluated the mining cost and applied the high level mining cost, processing costs and fixed royalties to determine a nominal cashflow with some limited sensitivities.

17.1 Model Parameters

Table 39: Costing and Financial Inputs per annum (supplied by HZL)

Assumption	Yr 2022	Yr2023	Yr 2024	Yr 2025	Yr 2026	Yr 2027	Yr 2028	Yr 2029	Yr 2030	Yr 2031	Yr 2032	Yr 2033	Yr 2034	Yr 2035
Grade														
Zn	4.47	5.01	4.84	4.80	4.80	4.80	4.91	5.01	5.01	5.01	5.01	5.01	5.00	4.91
Pb	1.24	1.56	1.54	1.55	1.55	1.55	1.54	1.60	1.60	1.60	1.60	1.60	1.67	1.69
Silver	65.08	61.33	59.90	58.99	58.99	58.99	60.68	61.89	61.89	61.89	61.89	61.89	63.21	60.49
Recovery-Mill														
Zn	96	96	96	96	96	96	96	96	96	96	96	96	96	96
Pb	96	96	96	96	96	96	96	96	96	96	96	96	96	96
Silver	99	99	99	99	99	99	99	99	99	99	99	99	99	99
Recovery-Smelter														
Zn	96	96	96	96	96	96	96	96	96	96	96	96	96	96
Pb	98	98	98	98	98	98	98	98	98	98	98	98	98	98
Silver	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Impact on Cost														
Mining	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
Zn Premium	180	180	180	180	180	180	180	180	180	180	180	180	180	180
Pb Premium	150	150	150	150	150	150	150	150	150	150	150	150	150	150
Ag Premium	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4

17.2 Taxes, Royalties, Depreciation and Depletion

The normal government taxes have been applied to the models indicated below. The exact percentages were not disclosed by HZL. The royalties applied in the models are indicated in the start of document but can be seen below.

- The Royalty for Lead is 14.5% of London Metal Exchange lead metal price chargeable on the contained lead metal in the concentrate produced.
- The Royalty for Zinc is 10% of London Metal Exchange Zinc metal price on ad valorem basis chargeable on contained zinc metal in the concentrate produced.

17.3 Cashflow Forecasts and Annual Production Forecasts

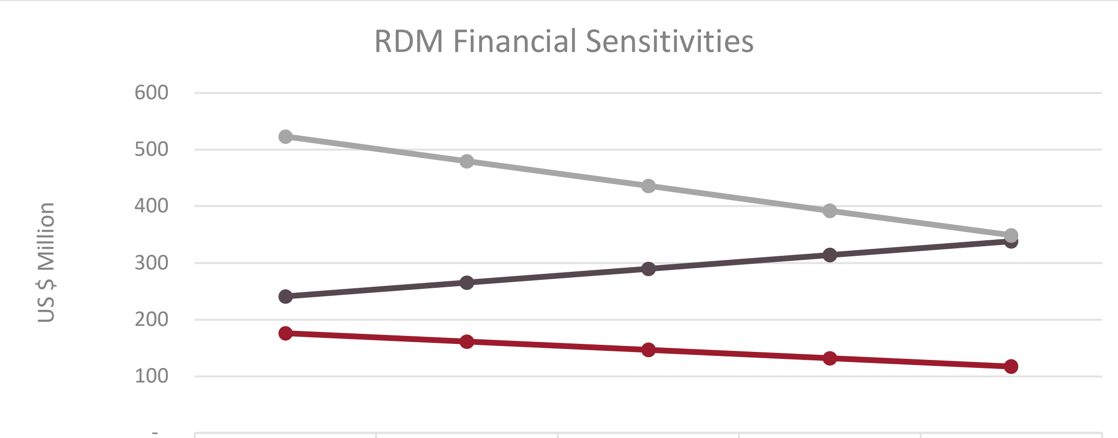
Table 40: Financial model outcome (2023 - 2035)

Particulars	UoM	Yr 2022	Yr2023	Yr 2024	Yr 2025	Yr 2026	Yr 2027	Yr 2028	Yr 2029	Yr 2030	Yr 2031	Yr 2032	Yr 2033	Yr 2034	Yr 2035
Ore production	MT	1,355,721	1,400,004	2,200,000	2,500,000	2,500,000	2,500,000	2,500,000	2,500,000	2,500,000	2,500,000	2,500,000	2,500,000	2,000,000	1,530,000
Zn Metal in Concentrate	MT	58,448	67,643	102,685	115,575	115,575	115,575	118,353	120,681	120,681	120,681	120,681	120,681	96,337	72,346
Lead Metal in Concentrate	MT	16,101	21,011	32,472	37,078	37,078	37,078	37,018	38,283	38,283	38,283	38,283	38,283	32,049	24,782
Silver Metal in Concentrate	KG	87	85	130	146	146	146	150	153	153	153	153	153	125	92
Zn Metal	MT	56,203	65,045	98,740	111,135	111,135	111,135	113,806	116,045	116,045	116,045	116,045	116,045	92,637	69,567
Lead Metal	MT	15,710	20,502	31,683	36,178	36,178	36,178	36,120	37,353	37,353	37,353	37,353	37,353	31,271	24,181
Silver Metal	KG	87	85	130	146	146	146	150	153	153	153	153	153	125	91
Mining Cost	$/MT Ore	29	31	32	34	36	37	39	41	43	45	48	50	53	55
Processing Costs	$/MT Ore	9	10	10	11	11	12	12	13	14	14	15	16	17	18
Development	$/MT Ore	13	14	15	15	16	17	18	19	20	21	22	23	24	25
Smelter Cost															
Zn Metal	$/MT Metal	440	440	440	440	440	440	440	440	440	440	440	440	440	440
Lead Metal	$/MT Metal	533	533	533	533	533	533	533	533	533	533	533	533	533	533
Silver Metal	$/MT Metal	24	24	24	24	24	24	24	24	24	24	24	24	24	24
Royalty															
Zinc	$/MT Metal	364	364	364	364	364	364	364	364	364	364	364	364	364	364
Lead	$/MT Metal	394	394	394	394	394	394	394	394	394	394	394	394	394	394
Silver	$/MT Metal	60	60	60	60	60	60	60	60	60	60	60	60	60	60
Zn LME	$/MT	2,759	2,759	2,759	2,759	2,759	2,759	2,759	2,759	2,759	2,759	2,759	2,759	2,759	2,759
Pb LME	$/MT	2,057	2,057	2,057	2,057	2,057	2,057	2,057	2,057	2,057	2,057	2,057	2,057	2,057	2,057
Ag LBMA	$/Troz	21.24	21.24	21.24	21.24	21.24	21.24	21.24	21.24	21.24	21.24	21.24	21.24	21.24	21.24
Ex Rate	Rs/USD	76.65	76.65	76.65	76.65	76.65	76.65	76.65	76.65	76.65	76.65	76.65	76.65	76.65	76.65
Revenues															
Zn	$ Mn	165	191	290	327	327	327	334	341	341	341	341	341	272	204
Pb	$ Mn	35	45	70	80	80	80	80	82	82	82	82	82	69	53
Ag	$ Mn	66	64	99	111	111	111	114	116	116	116	116	116	95	69
Mining Cost	$ Mn	70	76	126	150	158	165	174	182	191	201	211	222	186	150
Smelter Cost	$ Mn	33	40	60	68	68	68	69	71	71	71	71	71	57	43
Royalty Cost	$ Mn	27	32	48	55	55	55	56	57	57	57	57	57	46	35
Net Cashflow	**$ Mn**	**136**	**153**	**224**	**244**	**237**	**229**	**229**	**229**	**220**	**211**	**201**	**190**	**146**	**99**

17.4 Sensitivity Analysis

A high level sensitivity analysis is illustrated below that indicates the RDM mining operations is in good position with up to 20% variation illustrate and overall positive financial outcome.

Figure 41: RDM Financial Sensitivity Analysis (unit: Million US $)



	20%	10%	100%	-10%	-20%
Cashflow	176	161	146	132	117
Cost	241	265	290	314	338
Revenue	523	480	436	392	349

18 Adjacent Properties

There are no other mine operation located adjacent to the RDM operations, however the SK Mine is in close proximity, and they do in some cases share the same environmental monitoring stations and also employ from the same local area and share common infrastructures.

19 Other Relevant Data and Information

There is an abundance of information and other data that was not fully reviewed by ABGM during this review process as there was not enough time to conduct thorough investigation in all the data sets and documents. However, the key aspects were addressed as far as possible to ensure the relevant data and information required for this technical review was addressed.

20 Interpretation and Conclusions

20.1 Results

The results of the technical review indicate that the property contains a Mineral Resource, and a significant portion of that Mineral Resource converts to a Mineral Reserve. The project / operation has a positive economic outcome given the data, parameters and estimates outlined in the TRS. Due to the short time allocated to conduct this review.

ABGM is satisfied that the mine operation is conducting the required annual statutory work and reviews and submits to the IBM (Indian Bureau of Mines). The mine is compliant in order to develop the data, scrutinize and report on information for the development of Mineral Resources and Reserves in conjunction with their current consultancy professionals.

20.2 Significant Risks

No significant risks was observed during the site visits and neither were any picked up in the data and information provided by HZL.

20.3 Significant Opportunities

No significant opportunities was observed during the site visits and neither were any picked up in the data and information provided by HZL. However some suggestions will be listed in the consolidated report.

21 Recommendations

21.1 Pricing assumptions

Comparing the market research and the current trend of commodity pricing. The assumptions used by HZL seem to be on the higher side to establish the cut-off grades. However, running the sensitivities, all the operations seem to be well established and not sensitive to volatile changes. HZL used the 10 year pricing average in their estimates, the three year LME forecast average seems to be higher than the last 3 year average.

21.2 Environmental, Social Studies

Where information is available, environmental studies are done to an acceptable level for the Indian authorities. In some cases exemplary work is being done, beyond what is strictly necessary. Sites are monitored on strict schedules and the regular submission of updated reports are sufficient for the permits to be renewed again. Standardisation of programmes and procedures is recommended for all operations as this will prevent some areas of not receiving the correct attention. Interaction with and contributions to the local staff and communities appears to be positive with the establishing of medical centres and schools.

21.3 Closure Plans

Mine closure plans are not always easy to see in the provided documents, but the plans appear to be well thought out and implemented. As the mining activities are mostly underground, the effect on the environment is limited to the dust and noise generated due to ore transport and the storage of tailings, a large portion of which is used for backfilling mined stopes.

21.4 Geotechnical Drill Core Logging

The mines need to continue its practise with respect to core logging. Recommend more detailed geotechnical logging and recording of structures.

21.5 Sampling Transportation

Even though no information was provided around this practise, the site inspections proved that core, as well as samples from core, are transported in solid, closed and locked metal containers. Logging, tagging and security of the custody chain for samples are tracked in acQuire database, with unique barcodes and numbers. However it is suggested that the procedures followed need to be documented and recorded better.

21.6 Independent Lab Analysis

It is recommended that regular pulp duplicates are submitted an independent laboratory to be analysed as umpire samples.

21.7 Bulk Density Data

While bulk density data has been reconciled with production data, independent bulk density analyses should be undertaken at an independent laboratory during the exploration phase to avoid errors.

References

- 31161 HZL Audit 2021_Report_Finalr

Annexures	2022/07/14 14:06	File folder	
EIA	2022/07/23 00:05	File folder	
Geophysical_Report	2022/06/29 09:45	File folder	
LOMP_Study	2022/06/29 09:46	File folder	
ModMining_plan_21_25	2022/07/14 14:06	File folder	
Numarical Modeling report	2022/07/14 14:06	File folder	
Ore_Prod_Scheduel_22	2022/06/29 12:38	File folder	
RD_Mine_Plan_Latest	2022/07/25 09:30	File folder	
Annexures.zip	2022/07/14 13:56	WinZip File	293,393 KB
EIA-EMP_PDF_files.zip	2022/07/14 13:55	WinZip File	22,863 KB
Geophysical_Report.zip	2022/06/29 09:31	WinZip File	10,382 KB
LOMP_Study.zip	2022/06/29 09:31	WinZip File	11,536 KB
ModMining_plan_21_25.zip	2022/07/14 13:55	WinZip File	165,031 KB
Numarical_Modeling_report.zip	2022/07/14 13:53	WinZip File	7,499 KB
Ore_Prod_Scheduel_22.zip	2022/06/29 09:30	WinZip File	101 KB
RD_Mine_Plan_Latest.zip	2022/07/25 09:29	WinZip File	25,105 KB
RD-Clarification Data - 14 July updates.rar	2022/07/14 14:12	WinRAR archive	509,342 KB
RR22_LoM_Schedule_0804.xlsx	2022/06/29 09:23	Microsoft Excel Worksh...	20 KB

Figure 42: Files & Folders List - HZL Data and Information Pack – RDM

dmstusub.dat	2022/04/01 19:17	DAT	0 KB
E_DEPL22_pt.dm	2022/04/09 13:10	DM File	44 KB
E_DEPL22_TR.dm	2022/04/09 13:10	DM File	660 KB
E_EXCL_ST.dm	2022/04/01 18:41	DM File	32 KB
E_EXCL22_pt.dm	2022/04/09 13:11	DM File	8 KB
E_EXCL22_TR.dm	2022/04/09 13:11	DM File	96 KB
e_ind22v6pt.dm	2022/04/09 13:11	DM File	8 KB
e_ind22v6tr.dm	2022/04/09 13:11	DM File	12 KB
e_meas22v5pt.dm	2022/04/09 13:11	DM File	8 KB
e_meas22v5tr.dm	2022/04/09 13:11	DM File	16 KB
M_DEPL22_pt.dm	2022/04/09 12:34	DM File	64 KB
M_DEPL22_TR.dm	2022/04/09 12:34	DM File	864 KB
M_DEPL22A_pt.dm	2022/04/01 22:13	DM File	40 KB
M_DEPL22A_TR.dm	2022/04/01 22:13	DM File	656 KB
M_EXCL22_pt.dm	2022/04/09 12:38	DM File	20 KB
M_EXCL22_TR.dm	2022/04/09 12:38	DM File	436 KB
m_ind22v5pt.dm	2022/04/09 12:37	DM File	8 KB
m_ind22v5tr.dm	2022/04/09 12:37	DM File	20 KB
m_meas22v6pt.dm	2022/04/09 12:37	DM File	8 KB
m_meas22v6tr.dm	2022/04/09 12:36	DM File	12 KB
RD_BMAG.dm	2022/02/17 14:20	DM File	447,464 KB
rd_bmage.dm	2022/04/09 12:33	DM File	62,200 KB
rd_bmagecl.dm	2022/04/09 13:19	DM File	959,352 KB
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rd22_east_cpv2_tr.dm	2022/03/27 15:28	DM File	1,188 KB
rd22_east_stpv2_pt.dm	2022/03/25 12:05	DM File	88 KB
rd22_east_stpv2_tr.dm	2022/03/27 15:28	DM File	1,688 KB
RD22_EL_DEPLETION_060422.zip	2022/04/06 13:31	WinZip File	35 KB
rd22_nsm_cpv2_pt.dm	2022/03/25 12:09	DM File	152 KB
rd22_nsm_cpv2_tr.dm	2022/03/27 15:27	DM File	3,300 KB
rd22_nsm_stpv2_pt.dm	2022/03/25 12:09	DM File	376 KB
rd22_nsm_stpv2_tr.dm	2022/03/27 15:26	DM File	8,348 KB
RDM_CLASS_2022_V15.mac	2022/04/09 12:33	MAC File	27 KB
RDM22.rmproj	2022/04/09 13:24	RMPROJ File	126 KB
TongradLog.txt	2022/04/09 13:20	Text Document	78 KB

Figure 43: Data Pack - Resource to Reserve Estimation (DataMine Files)