सत्यमेव जयते

Government of India

Ministry of Mines

2023-24

ANNUAL REPORT

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GOVERNMENT OF INDIA

MINISTRY OF

MINES

ANNUAL REPORT 2023-24

Ministry of Mines

Ministry of Mines	https://mines.gov.in
Geological Survey of India	www.gsi.gov.in
Indian Bureau of Mines	www.ibm.nic.in
National Aluminium Company Limited	www.nalcoindia.com
Hindustan Copper Limited	www.hindustancopper.com
Mineral Exploration & Consultancy Limited	www.mecl.co.in
Jawaharlal Nehru Aluminium Research Development and Design Centre	www.jnarddc.gov.in
National Institute of Rock Mechanics	www.nirm.in

Abbreviations

BEE	Bureau of Energy Efficiency
BGML	Bharat Gold Mines Limited
BISAG	Bhaskaracharya Institute for Space Applications and Geo-informatics
BSE	Bombay Stock Exchange
CGPB	Central Geological Programming Board
CHQ	Central Head Quarter
CIMFR	Central Institute of Mining and Fuel Research
CMPDI	Central Mine Planning & Design Institute
CPCB	Central Pollution Control Board
CPGRAMS	Centralized Public Grievance Redressal and Monitoring System
CSR	Corporate Social Responsibility
DGM	Directorate of Geology & Mining
DGMS	Directorate General of Mines Safety
DMF	District Mineral Foundation
DRM	District Resources Maps
EC	Environmental Clearance
EEZ	Exclusive Economic Zone
EIA	Environment Impact Assessment
EPMA	Electron Probe Micro Analyser
ERP	Enterprise Resource Planning
FC	Forest Clearance
FMCP	Final Mine Closure Plan
FS	Field Season
FY	Financial Year
GCM	Geochemical Mapping
GDP	Gross Domestic Product
GEM	Government e-Market
GIGW	Guidelines for Indian Government Websites
GPM	Geophysical Mapping

GQM	Geological Quadrangle Maps
GR	Geological Report
GSI	Geological Survey of India
GSITI	Geological Survey of India Training Institute
HCL	Hindustan Copper Limited
HINDALCO	Hindustan Aluminium Company Limited
IBAAS	International Bauxite, Alumina and Aluminium Society
IBM	Indian Bureau of Mines
ICC	Indian Copper Complex
ICSG	International Copper Study Group
IEC	Information Education and Communication
IGC	International Geological Congress
IMYB	Indian Mineral Year Book
ITEC	Indian Technical Economic Cooperation
JNARDDC	Jawaharlal Nehru Aluminium Research Development and Design Centre
JWG	Joint Working Group
KABIL	Khanij Bidesh India Limited
KCC	Khetri Copper Complex
KMS	Knowledge Management System
LEWS	Landslide Early Warning System
LME	London Metal Exchange
MCDR	Mineral Conservation & Development Rules
MCP	Malanjkhand Copper Project
MCR	Mineral Concession Rules
MDRD	Minerals Development & Regulation Division
MECL	Mineral Exploration & Consultancy Limited
ML	Mining Lease
MMDR Act	Mines & Minerals (Development and Regulation) Act, 1957
MoC	Ministry of Coal
MoEF & CC	Ministry of Environment, Forest and Climate Change
MoM	Ministry of Mines
MoU	Memorandum of Understanding

MPD	Mineral Processing Division
MSDE	Ministry of Skill Development and Entrepreneurship
MSS	Mining Surveillance System
MT	Magnetotelluric
MTS	Mining Tenement System
MEQ	Micro-Earthquake
NALCO	National Aluminium Company Limited
NER	North Eastern Region
NGCM	National Geochemical Mapping
NGDR	National Geoscience Data Repository
NIRM	National Institute of Rock Mechanics
NLSM	National Landslide Susceptibility Mapping
NMEP	National Mineral Exploration Policy
NMET	National Mineral Exploration Trust
NMI	National Mineral Inventory
NMP	National Mineral Policy
NRSC	National Remote Sensing Centre
NRTC	NALCO Research & Technology Centre
NSDC	National Skill Development Corporation
NSE	National Stock Exchange
NCEGR	National Centre of Excellence in Geoscientific Research
NEA	Notified Exploration Agency
OAMDR	Offshore Areas Mineral (Development & Regulations) Act, 2012
OCBIS	Online Core Business Integrated System
OGP	Obvious Geological Potential
OL	Official Language
OLIC	Official Language Implementation Committee
OSPCB	Odisha State Pollution Control Board
PERC	Project Evaluation and Review Committee
PGRS	Photo Geology and Remote Sensing
PL	Prospecting Licence
PMCP	Progressive Mine Closure Plan

PMKKKY	Pradhan Mantri Khanij Khsetra Kalyan Yojana
PRAGATI	Pro-Active Governance and Timely Implementation
PWDs	Persons with Disabilities
REE	Rare Earth Elements
REIL	Rajasthan Electronics & Instruments Plant
RESCO	A Renewable Energy Service Company
RP	Reconnaissance Permit
RSAS	Remote Sensing and Aerial Survey
RTI	Right to Information
R&D	Research & Development
RMT	Regional Mineral Targeting
SAIL	Steel Authority of India Ltd.
SCSP	Special Component Plan for Scheduled Caste
SDF	Sustainable Development Framework
SDGs	Sustainable Development Goals
SGM	Systematic Geological Mapping
SGPB	State Geological Programming Board
SOP	Standard Operating Procedure
SSAG	Standing Scientific Advisory Group
STM	Specialised Thematic Mapping
SU	State Unit
TCC	Technical-cum-Cost Committee
TL	Thermo Luminescence
TOASS	Twin Otter Airborne Survey System
TSP	Tribal Area Sub-Plan
TW	Territorial Water
UNFC	United Nations Framework Classification
UTs	Union Territories
VC	Video Conference
VPN	Virtual Private Network
WPI	Wholesale Price Index

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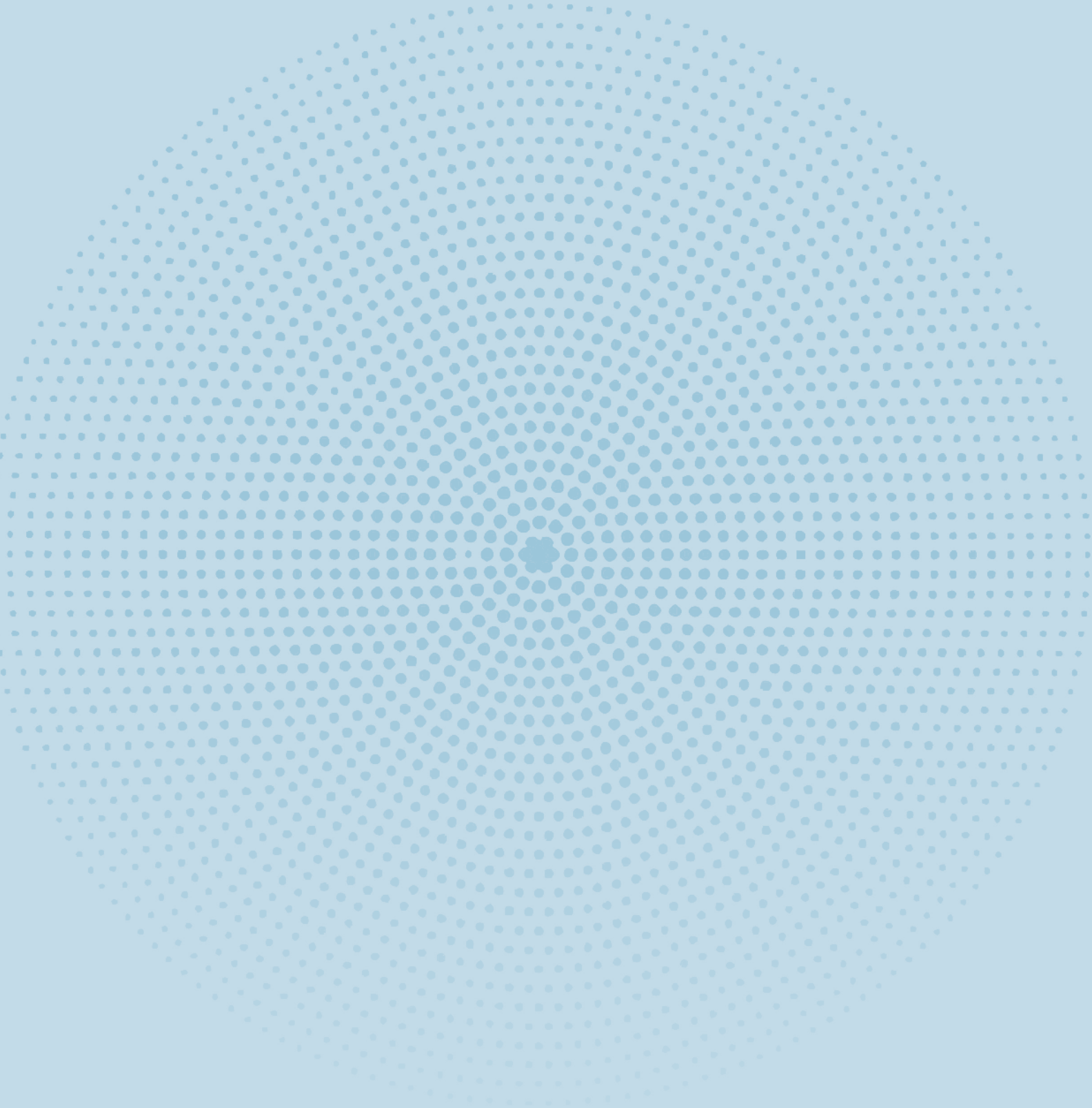


1

Ministry of Mines : An Overview

Ministry of Mines
An Overview

1.1 Vision

(i) India is well endowed with natural resources, particularly minerals, which serve as raw material for many industries, paving a path for rapid industrialization and infrastructural development. This, in turn, will facilitate the economy's ascent to a path of sustained growth and a five trillion-dollar economy.

(ii) During last nine years, the Government has introduced important reforms to open up the mineral sector to ensure its contribution in achieving the national policy goals. Major reforms include enactment of the Mines and Mineral (Development & Regulations) (MMDR) (Amendment) Act, 2015, which made the process of allocation of mineral concessions completely transparent by introducing public auctions with active participation of the State Governments. In the federal set up, States are owners of mineral wealth in their respective territories. For realising the benefits of mineral wealth, States have primary and significant role to come up with auctionable mineral blocks that have clearance, to start production.

(iii) The Vision is to ensure security in minerals, including critical minerals, through enhanced domestic capacity, leverage multilateral and bilateral cooperation for resilient mineral supply chain, enhancing the participation of private sector in mineral exploration, low carbon mining and recycling of used products for minerals/metal extraction, Ease of doing business for transparent & equitable allocation and regulation of mineral resources and technology adaptation and development for efficient exploration and mining.

Role and Organisation of the Ministry

Main Functions

1.2 Ministry of Mines is responsible for survey, exploration and mining of all minerals, other than natural gas, petroleum, atomic minerals and coal. In the case of atomic minerals and coal, activities of the Ministry are limited to regional exploration. The Ministry is responsible for the administration of the Mines and Minerals (Development and Regulation) Act, 1957 (67 of 1957) and rules made thereunder in respect of all mines and minerals other than coal, natural gas and petroleum. The Ministry also administers the Offshore Areas Mineral (Development and Regulation) Act, 2002 and rules made thereunder.

1.3 List of Subjects Allocated to the Ministry of Mines

(a) Legislation for regulation of mines and development of minerals within the territory of India, including mines and minerals underlying the ocean within the territorial waters or the continental shelf, or the exclusive economic zone and other maritime zones of India as may be specified, from time to time by or under any law made by the Parliament.

(b) Regulation of mines and development of minerals other than coal, lignite and sand for stowing and any other mineral declared as prescribed substances for the purpose of the Atomic Energy Act, 1962 (33 of 1962) under the control of the Union as declared by law, including questions concerning regulation and development of minerals in various States and the matters connected therewith or incidental thereto.

(c) All other metals and minerals not specifically allotted to any other Ministry/ Department, such as aluminum, zinc, copper, gold, diamonds, lead and nickel.

(d) Planning, development and control of and assistance to all industries related to mineral wealth dealt with by the Ministry.

(e) Administration and management of Geological Survey of India.

(f) Administration and management of Indian Bureau of Mines.

(g) Metallurgical grade silicon.

Attached Office/Subordinate Office:

1.4 Geological Survey of India (GSI), Headquarters at Kolkata is an attached office and the Indian Bureau of Mines (IBM), Headquarters at Nagpur is a subordinate office of the Ministry.

Public Sector Undertakings

1.5 There are three Public Sector Undertakings under the Ministry of Mines, namely: -

- National Aluminium Company Limited (NALCO), Bhubaneswar;
- Hindustan Copper Limited (HCL), Kolkata; and
- Mineral Exploration and Consultancy Limited (MECL), Nagpur

Autonomous Bodies

1.6 There are two Research Institutions which are Autonomous Bodies of this Ministry:

- Jawaharlal Nehru Aluminium Research Development and Design Centre (JNARDDC), Nagpur;
- National Institute of Rock Mechanics (NIRM), Bengaluru.

Organizational Structure

1.7 The Ministry of Mines is headed by Shri Pralhad Joshi, Hon'ble Minister of Mines who assumed the charge, after the formation of new Government, on 31.05.2019, along with Parliamentary Affairs and Coal. Shri Raosaheb Patil Danve has assumed the charge of Hon'ble Minister of State for Mines along with Railway and Coal after cabinet reorganization/ expansion on 7.07.2021.

1.8 The Secretariat of Ministry of Mines is headed by the Secretary, assisted by one Additional Secretary, three Joint Secretaries, one Joint Secretary & Financial Adviser (common for Ministry of Coal, and Ministry of Mines), one Economic Adviser and Eleven Directors / Deputy Secretaries, one Director (Economic Service), one Deputy Director (OL), one Assistant Director (IES), one Assistant Director (OL). Sanctioned strength and present incumbency of officers/officials in the Ministry of Mines is given at **Table 1.1**. Organisational structure of the Ministry of Mines is shown in **Annexure 1.1**. In view of increase in the work of Ministry of Mines, with the approval of Ministry of Finance and Department of Personnel and Training, two additional post of Directors have been created in the Ministry of Mines.

Table 1.1
Information in r/o Secretariat proper employees as on 31st March, 2024

Group	Sanctioned Strength	Total Number of present incumbents (Including general)	No. of SC/ST/OBC/Women/PH Candidates in present incumbents				
			SC	ST	OBC	Women	PH
Group-A Gazetted	36	33	04	03	03	06	01
Group-B Gazetted	34	21	07	02	05	02	00
Group-B Non-Gazetted	56	40	10	06	15	04	01
Group-C	88	52	11	02	05	08	02
Total	**214**	**146**	**32**	**13**	**28**	**20**	**04**

Contribution of Mining and Quarrying Sector to the Gross Value Added (GVA) of the Nation

1.9 As per the first advanced estimates of National Income for 2023-24 released by the National Statistical Office, Ministry of Statistics and Program Implementation, the 1st AE of GVA of mining and quarrying sector during 2023-24 at 2011-12 prices (at constant prices) is Rs 3,50,870 crore, which shows a growth of 8.1% as compared to PE of GVA during 2022-23 at Rs 3,24,708 crore.

The contribution of mining and quarrying sector is in **Table 1.2**.

Table 1.2
Gross Value Added (GVA): Share/Contribution of Mining and Quarrying (%)

GVA in Rs crore at current prices		
Sector	**2023-24 (1st AE)**	**2022-23 (PE)**
Mining and quarrying	6,17,396	5,83,535
Total	**2,67,12,195**	**2,47,42,871**
Contribution in %	2.31	2.36

AE:- Advanced Estimate; PE : Provisional Estimate
Source: MoSPI, Press Note on First Advanced Estimates of National Income for the year 2023-24.

1.10 Major Highlights/Achievements and Events

National Events/Workshops

1.10.1 During April, as part of the G20 events, the Ministry of Mines organized a side event jointly with the Ministry of New and Renewable Energy (MNRE) on 03.04.2023 at Gandhinagar on "Diversifying Renewables & Critical Minerals Supply Chains to Advance Energy Transition".

1.10.2 The Hon'ble Minister of State for Mines attended the 2nd Scrap Recycling and waste Utilisation Drive which was jointly organized by the Ministry of Mines & Ministry of Steel under Azadi ka Amrit Mahotsav – Circular Economy Campaign at Jalna and Aurangabad on 27.04.2023 & 28.04.2023 in collaboration with Metal Recycling Association of India.

1.10.3 The Hon'ble Minister of Mines, Shri Pralhad Joshi inaugurated the 1st Mining Start-up Summit on 29.05.2023 in Mumbai. It was organized by the Ministry of Mines, in collaboration with Indian Institute of Technology, Bombay. The Summit witnessed the participation of over 50 start-ups, 20 plus leading mining companies and more than 100 budding scientists/ entrepreneurs.

1.10.4 Ministry of Mines observed the Mission Lifestyle for environment (LIFE) with a large number of events/activities during a month-long campaign. A seminar was organized on 23.05.2023 to sensitize the new recruits in the ministry. The Ministry also roped in its field formations for the said campaign and their activities were regularly uploaded on the designated portal merilife.org. Secretary (Mines) administered the LIFE pledge on World Environment day on 05.06.2023 and encouraged everyone to abide by the same in their daily lives.

1.10.5 Hon'ble Minister of Parliamentary Affairs, Coal and Mines Shri Pralhad Joshi released the first report on Identification of

Critical Minerals for India on 28.06.2023 at New Delhi. For the first time, a comprehensive list of 30 critical minerals for the country has been prepared after detailed assessment and consultations with experts from academia, industry and stakeholders based on several factors.

1.10.6 The National Training Conclave 2023 was inaugurated by the Hon'ble Prime Minister of India, Shri Narendra Modi, on 11.06.2023, at Convention Centre, ITPO, Pragati Maidan, New Delhi. During the conclave, the Geological Survey of India Training Institute (GSITI) has been accorded an accreditation certificate (NABET).

1.10.7 Hon'ble Minister of State for Mines inaugurated the awareness camp for students and local people on 07.07.2023 at Ajanta as part of the 75 such camps being organized at geo-heritage sites all over the country by GSI to celebrate the Azadi Ka Amrit Mahotsav which was attended by over 800 people.

1.10.8 The G20 Energy Ministers met in Goa on 22.07.2023 and adopted a Joint Communiqué wherein the role of critical minerals in energy transition was comprehensively mentioned for the first time. The Presidency's Voluntary High Level Principles for collaboration on Critical Minerals for Energy Transitions were also duly noted by the G20.

1.10.9 The Hon'ble President of India, Smt. Droupadi Murmu, conferred the prestigious National Geoscience Awards for the year 2022 on 24.07.2023 at Rashtrapati Bhavan. Ten National Geoscience Awards to 22 Geoscientists under different categories, which includes one National Geoscience Award for Lifetime Achievement, eight National Geoscience Awards under different fields and one National Young Geoscientist Award.

1.10.10 Ministry of Mines, with officials from the Indian Bureau of Mines (IBM) and the Geological Survey of India (GSI), participated in the 26th National e-Governance Conference at Indore and set up a stall for disseminating two major information technology projects - National Geo-science Data Repository of GSI and Mining Tenement System (MTS) of IBM.

1.10.11 The closing ceremony of 75 AYUSH Wellness Camps, organized by the Ministry to mark Azadi ka Amrit Mahotsav, was held on 04.08.2023. In addition to the AYUSH Wellness Camps, other theme-based campaigns viz. 75 geo-heritage camps, 75 metal recycling drives, 75 exploration site visits and Lecture series on rock engineering covering 75 colleges, organized as part of AKAM 2.0, culminated in August.

1.10.12 Hon'ble Minister for Parliamentary Affairs, Coal and Mines launched the first tranche of e-auction of critical and strategic minerals comprising of twenty blocks. The launch was part of the Outreach Programme on "Role of Government & Industry in Driving the Global Action on Critical Minerals" in Bharat Mandapam, New Delhi on 29.11.2023, which was attended by Ambassadors / Mission Heads of G20 countries as well

as representatives of B20 and Ministries/ Departments of Government of India.

1.10.13 For the first time the Ministry of Mines participated India International Trade Fair (IITF) 2023 held from 14th to 27th November, 2023 at Pragati Maidan, New Delhi with the theme "Connecting Beyond Mining" and was conferred with Silver Award under Most Popular Pavilion category. More than 2000 students enthusiastically participated in the workshops on recycling of metals which were organised in mining pavilion. They showed keen interest in the significance of mining industry and mineral in our daily lives and also took digital pledge for not using single use plastic. It was a collaborative effort with the public and private sector mining companies to showcase achievements of the Government in the fields to mining and mineral production through policy reforms leading to Ease of Doing Business. The Mining Pavilion attracted about seventy thousand visitors during the fair. The VR Zone offered an altogether new experience of underground mining metallurgy for the visitors.

1.10.14 As a major fillip to facilitate the coverage of exploration in the country Shri Pralhad Joshi, Hon'ble Minister of Parliamentary Affairs, Coal and Mines launched the National Geoscience Data Repository (NGDR) Portal on 19.12.2023 in a ceremony in New Delhi in the august presence of Shri Raosaheb Patil Danve, Hon'ble Minister of State for Coal, Mines and Railways..

1.10.15 Secretary (Mines) inaugurated a workshop on "Pumped Storage Hydro Power Projects (PSPs) to Augment Green and Clean Energy" focusing on the critical aspects of geology and geotechnical issues for ensuring safe and sustainable DPR of pumped storage Hydro Power Projects (PSPs) jointly hosted by the Geological Survey of India (GSI) and National Institute of Rock Mechanics (NIRM) in Hyderabad on 21.12.2023. He made a special mention of the contribution of NIRM on providing their inputs on the quality assessment of stones being used in the construction of Ram Mandir in Ayodhya.

1.10.16 The 7th India-US forum was held from 27th to 29th January, 2024 at New Delhi. This event was attended by the Secretary (Mines) on 28.01.2024. During the event Secretary stated that both countries would take up joint projects on Geoscientific Data Processing, R&D in the processing of Critical Min-

erals, opportunities for Junior Mining Companies and the recycling of Critical Minerals.

1.10.17 Khanij Bidesh India Limited (KABIL) signed an Exploration and Development Agreement with CAMYEN, a state-owned enterprise of Catamarca province of Argentina, for exploration and mining for 5 Lithium Blocks in Argentina on 15.01.2024. The signing ceremony was virtually attended by the Hon'ble Minister of Parliamentary Affairs, Coal and Mines and Secretary (Mines). From Argentinean side H. E. Shri. Raul Jalil, Governor of Catamarca Province, Argentina and other senior officials of CAMYEN attended the ceremony.

1.10.18 As a part of the Nation's aim to meet Sustainable Development Goals for the coming decades and to fulfil PM's Vision of Aatmanirbhar Bharat, Ministry of Mines launched the third tranche of E-auction of Critical & Strategic Minerals on 14.03.2024 in New Delhi. A total of 7 critical mineral blocks were put up for auction as composite license in this Tranche. These 07 blocks pertain to critical minerals such as Glauconite, Graphite, Nickel, PGE, Potash, Lithium, and Titanium and are spread across the States of Bihar, Jharkhand, Tamil Nadu, Uttar Pradesh and Union Territory of Jammu and Kashmir. Thus, the Central Government has launched auction of a total of 45 Critical & Strategic Minerals till date. The first tranche and second tranche consisting of 20 and 18 blocks, respectively, were launched by Union Minister of Parliamentary Affairs, Coal and Mines.

International Events/ Workshops

1.10.19 Hon'ble Minister of State for Railways, Coal & Mines, Shri Raosaheb Patil Danve led an Indian delegation 'Mining Indaba-2023' Cape Town, South Africa from 6th to 9th February, 2023. An Indian pavilion was also set up to showcase, the strength of Indian Mining and Mineral Sector.

1.10.20 An Indian delegation led by Economic Advisor, Ministry of Mines participated in the CRU's World Copper Conference – 2023 held from 17th to 19th April, 2023 at Santiago, Chile.

1.10.21 An Indian delegation led by Joint Secretary (Mines) attended the 'DRC Mining Week Expo & Conference' held at Lubumbashi, Congo from 14th to 16th June, 2023.

1.10.22 Secretary (Mines) led an Indian delegation to participate in High Level Meeting of International Energy Agency (IEA) on Securing Critical Minerals for a Clean Energy Future held on 28th September, 2023 in Paris, France.

1.10.23 Secretary (Mines) led the Indian delegation to "London Metal Week" Annual gathering and the session on 'Responsible Investment into Critical Mineral Sector from 09th to 10th October, 2023 in London, UK. In a meeting of the Fourth Minerals Security Partnership Principles on 10th October, 2023, Secretary (Mines) shared initiatives such as policy on critical minerals, amendments to the MMDR Act and the identification of 24 strategic and critical minerals.

1.10.24 Hon'ble Minister of State for Mines, Coal & Railways led an Indian delegation to 'International Mining and Resources Conference (IMARC)- 2023' at Sydney, Australia during 31st October to 2nd November, 2023.

1.10.25 A bilateral meeting held on 21.02.2024 in Ministry of Mines, between Sh. Prahlad Joshi, Hon'ble Minister of Parliamentary Affairs, Coal and Mines with Canadian delegation led by Mr. Scott Loe, Hon'ble Premier of Saskatchewan, a province of Canada to explore opportunities for collaborative efforts in joint research and development programs in the realm of critical minerals value chain and the clean energy sector.

1.10.26 Secretary (Mines) led an Indian delegation to participate in Prospector Developers Association of Canada (PDAC)-2024 event held at Toronto, Canada from 3rd to 6th March, 2024. An Indian Pavilion was set up to showcase capability and opportunity in Indian mining and mineral sector. An India Day Session was also held on 04.03.2024 at PDAC-2024.

1.10.27 An Indian delegation led by Ms. Farida M. Naik, Joint Secretary, Ministry of Mines participated in the 'Future Minerals Forum 2024' held at Riyadh, Saudi Arabia from 9th to 11th January, 2024. During the event, Indian delegation shared crucial insights into India's exploration and mining sector. Deliberations were held on the significance of advancing the critical mineral value chain, a focal point in the global economy and other domains like sustainability and green technology.

International Cooperation

1.10.28 The Hon'ble Prime Minister of India and the visiting Australian Prime Minister jointly announced the creation of India–Australia Minerals Scholar Network Focused on critical Minerals and green steel during his visit on 8th to 11th March, 2023.

1.10.29 A Non-Disclosure Agreement (NDA) has been signed between KABIL and a Chilean Government Company, ENAMI, for KABIL's possible participation in Chilean Lithium sector. On 16.05.2023, the Embassy of India at Santiago has furnished a copy of the signed NDA.

1.10.30 As part of the ongoing efforts to identify minerals in overseas countries, a bilateral meeting between Secretary (Mines) and a delegation of Mongolia led by H.E. Ganbold Dambajav, Ambassador of Mongolia in India held on 09.05.2023 regarding a draft MoU on cooperation in the fields of geology and mineral resources between India and Mongolia.

1.10.31 2nd meeting of the JWG between India and Bolivia under the MoU for cooperation in the field of Geology and Mineral Resources was held on 09.06.2023 through virtual mode.

1.10.32 The 5th round of India-Australia Comprehensive Economic Cooperation Agreement (CECA) negotiations on "Critical Minerals" and "2023 Korea-India Mineral Cooperation Round Table" to promote and strengthen cooperation in the field of mineral sector between the two countries were held

on 09.08.2023 and 11.08.2023 respectively, in New Delhi.

1.10.33 A Bilateral meeting held on 21.02.2024 in Ministry of Mines, between Shri Pralhad Joshi, Hon'ble Minister of Parliamentary Affairs, Coal & Mines with Canadian delegation led by Mr. Scott Moe, Hon'ble Premier of Saskatchewan, a province of Canada to explore opportunities for collaborative efforts in joint research and development programs in the realm of critical minerals value chain and the clean energy sector.

1.10.34 An India Delegation led by Additional Secretary, M/o Mines participated in Mining Indaba-2024 event held at Cape Town, South Africa from 5th to 8th February, 2024. An Indian Pavilion was also set up to showcase capability and opportunity in Indian mining and mineral sector. Further, an MoU between Ministry of Mines, Government of India and Government of Republic of Cote d'Ivoire for collaboration in the field of Geology and Mineral Resources has been signed on the sideline of Mining Indaba-2024.

1.10.35 Secretary (Mines) held a meeting with Secretary, Department of Science & Technology (DST) on 08.02.2024. A Memorandum of Understanding (MoU) was signed between Geological Survey of India (GSI) and Survey of India (SOI).

Legislative Reforms

1.10.36 During the month of August 2023, two important Acts under the ambit of Ministry of Mines, namely the Mines and Minerals (Development and Regulation) (MMDR) Act, 1957 and the Offshore Areas Mineral (Development & Regulation) (OAMDR) Act, 2002, have been amended by the Parliament and notified.

1.10.37 The Mineral (Auction) Rules, 2015 has been amended through the Mineral (Auction) Amendment Rules, 2023 vide G.S.R No. 648(E) dated 01.09.2023 to empower the central Government to conduct auction for grant of mining lease or composite licence in respect of minerals specified in part D of the first Schedule of the Act.

1.10.38 The Atomic Minerals Concession Rules, 2016 has been amended through the Atomic Minerals Concession (Amendment) Rules, 2023 vide G.S.R No. 682 (E) dated 22.09.2023 to decriminalize 27 rules as a part of reduction of compliance burden.

1.10.39 In exercise of the powers conferred by Sub-Section (3) of Section 9 of the Mines and Minerals (Development and Regulation) Act, 1957, the Second Schedule of the MMDR Act, 1957 has been amended vide G.S.R. 736 (E) dated 12.10.2023 for specifying rate of royalty in respect of Lithium, Niobium and Rare Earth Elements (REEs).

1.10.40 Minerals (Other than Atomic and Hydro Carbons Energy Mineral) Concession Rules, 2016 had been amended through the Minerals (Other than Atomic and Hydro Carbons Energy Mineral) Concession (Amendment) Rules, 2023 for specifying methodology for calculation of Average Sale Price (ASP)/ Value of Estimated Resources (VER) for Rare Earth Elements (REEs) and Lithium vide G.S.R. 737 (E) dated 12.10.2023.

1.10.41 The Ministry also observed the month – long Special Campaign 3.0 for Disposal of Pending Matters with full fervour. As a run up to the campaign, 27 Rules were de- criminalized, under "easing of rules / process" through amendment of Atomic

Mineral Concession Rules, 2016. Cleanliness campaign were carried out in 382 sites throughout the country freeing up 89,482 sq. feet space with Rs 10.98 cr. Revenue earned from scrap disposal.

1.10.42 The Hon'ble Minister also launched the new regime of exploration License for Critical and deep seated minerals by unveiling the booklet containing four rules, which were notified on 21.02.2024 pursuant to the Amendment to MMDR Act 1957 in 2023.

1.10.43 Union Cabinet on 29.02.2024, approved the proposals of the Ministry of Mines to amend the Second Schedule of the Mines and Minerals (Development & Regulation) Act 1957 to rationalize the royalty rate of 12 critical and strategic minerals, viz. Beryllium, Cadmium, Cobalt, Gallium, Indium, Rhenium, Selenium, Tantalum, Tellurium, Titanium, Tungsten and Vanadium.

1.10.44 In exercise of the powers conferred by sub-section (3) of section 9 of the Mines and Minerals (Development and Regulation) Act, 1957 (MMDR), the Second Schedule to the MMDR Act, 1957 has been amended to specify the rates of royalty of certain critical & strategic minerals vide Notification No. G.S.R. 152 (E) dated 01.03.2024.

Miscellaneous events

1.10.45 The Annual Capacity Building Plan (ACBP) for Ministry of Mines was prepared by Capacity Building Commission and approved by the Ministry in December 2023. ACBP has put in place the plan regarding undertaking the courses on iGOT portal by officers of Ministry on quarterly basis and sending officers on field visits to get exposure of work done by our field organizations under immersion program. The Ministry has onboarded all its employees on iGOT. All the officers of the Ministry completed the 6 compulsory courses on iGOT prescribed by DOPT by December 2023. From January 2024, quarterly targets of courses as per ACBP adopted by Ministry of Mines for quarter January 2024 to March 2024 were assigned to officers. All officers have successfully completed the first quarter of ACBP by March 2024.

1.10.46 HCL has signed the tripartite 8th Wage Settlement before Dy. Chief Labour Commissioner (Central), Kolkata, on 03.01.2023 for revision of Wages and Allowances of Workmen. The Settlement is for a period of 10 yrs w.e.f. 01.11.2017 to 31.10.2027.

1.10.47 The Ministry of Mines handed over 51 geological reports to the State Governments for auction of minerals on the 09.02.2023. These included a Lithium reserve in the Union Territory of Jammu & Kashmir and 5 blocks of Gold apart from other minerals.

1.10.48 The Union Minister of Coal and Mines & Parliamentary Affairs and Australian Minister for Resources on 10.03.2023 announced that 5 target projects (2 lithium and 3 cobalt) have been identified for undertaking due diligence and valuation for investment by KABIL, a Government of India entity.

1.10.49 National Aluminium Company Limited (NALCO) and Hindustan Copper Limited (HCL) have exceeded their CAPEX target, whereas NALCO achieved CAPEX of Rs. 1821.13 crores against the target of 1,800 crores, HCL achieved Rs. 385.27 crores against target of Rs.350.00 crores.

1.10.50 On the initiative of the Hon'ble Prime Minister, India becomes the newest member of the Minerals Security Partnership (MSP) during his visit to USA on 20th–25th June, 2023. India and USA pledged to hasten bilateral collaboration to secure resilient critical minerals supply chains through enhanced technical assistance and greater commercial cooperation and exploration of additional joint frameworks as necessary.

1.10.51 Executive Committee (EC) of National Mineral Exploration Trust (NMET) in its 31st meeting held on 12.09.2023 has approved 12 projects for mineral exploration amounting to Rs. 19.68 Crore including 5 projects of Critical Minerals in different states of the country.

1.10.52 Swachhata Pakhwada culminating into - Swachhata Hi Seva (SHS) 2023, with 40 mega events on 1.10.2023 was observed by the Ministry & its Field Organizations by roping in public participation through shramdan. During the fortnight preceding 1.10.2023, a total of 233 activities were completed with participation from 11191 people leading to 45570 man hours.

1.10.53 Ministry of Mines took part in the Meri Maati Mera Desh campaign of Ministry of Culture and contributed soil from 75 mines in 18 States/UTs covering 12 minerals. The participation of Ministry of Mines in the said campaign showcases the importance of sustainable mining and mineral development in the nation's economic progress.

1.10.54 Secretary (Mines) met with Australian High Commissioner H.E. Phillip Green in a meeting held on 12.12.2023 in Shastri Bhawan to discuss the bilateral relationship between India and Australia in the areas of Mining resources and Critical Minerals and the broader priorities of both the countries.

1.10.55 In the 2nd Tranche of auction, 18 blocks were launched, consisting of 17 composite license and 1 mining license. These blocks consisted of critical and strategic minerals such as Tungsten, Vanadium, Graphite, REE, Glauconite, Phosphorite, Nickel, PGE, Chromium, Cobalt and potash in 8 states viz. Andhra Pradesh-1, Arunachal Pradesh-4, Chattisgarh-3, Karnataka-2, Madhya Pradesh-3, Maharashtra-2, Rajasthan-2, and Tamil Nadu- 1.

1.10.56 For bridging up the gap between R & D and commercialization as also to promote the ecosystem for complete value chain in mining and mineral sector, Ministry of Mines has enlarged the scope of S & T program by launching S & T prism in November 2023, to fund research and innovation in start-ups and MSME. In this row, Sh. Pralhad Joshi, Hon'ble Minister of Parliamentary Affairs, Coal and Mines, on 29.02.2024, handed over letters of financial grants of Rs. 5.96 Crore to five start-ups and MSME, further, on the sidelines of these events, as a part of the Mission Karmayogi Bharat, the Annual Capacity Building Plan (ACBP) for the Geological Survey of India(GSI) was also formally released by Sh. Prahlad Joshi, Hon'ble Minister of Parliamentary Affairs, Coal and Mines.

1.10.57 Secretary (Mines) visited Bharat Gold Mines Ltd (BGML), a closed PSU under the Ministry of Mines, on 21.11.2023 and took a review meeting of BGML. Subsequent to that, following progress was achieved:-

i) Ministry of Mines has appointed Transaction Advisor to assist this Ministry for sale (by auction) of gold tailings of BGML. Accordingly, for recovering valuable metal from the tailing dumps, a proposal to undertake mining operations in areas covering the tailing dumps of the expired KGF mining lease of BGML by invoking special powers conferred under section 17 of the MMDR Act has been sent to State Government for their comments.

ii) The establishments / infrastructure lying in 03 erstwhile mining leases of BGML in the State of Andhra Pradesh have been auctioned through MSTC. The sale proceeds have been deposited in the Hon'ble High Court of Karnataka, after paying MSTC fees and GST.

2

Minerals and Metals in the Country

Minerals and Metals in the Country

National Mineral Scenario

2.1 Minerals are valuable natural resources. They constitute the vital raw materials for many basic industries and are a major resource for development. The history of mineral extraction in India dates back to the days of the Harappan civilization. The wide availability of the minerals provides a base for the growth and development of the mining sector in India.

2.2 The country is endowed with huge mineral resources of fuel, metallic and non-metallic minerals including minor minerals. Mining sector is an important segment of the Indian economy. Since independence, there has been a pronounced growth in the mineral production both in terms of quantity and the value as well. India produces as many as 95 minerals, which includes 4 fuel, 10 metallic, 23 non-metallic, 3 atomic and 55 minor minerals (including building and other materials).

Index of Mineral Production

2.3 Presently the base year of index of industrial production covering mining sector is 2011-12. Based on the overall trend so far the index of mineral production (base 2011-12) for the year 2023-24 (up to feb-24) is estimated to be 126.4 as compared to119.9 of previous year showing a positive growth of 5.4%. The trend of index of mineral production and trend in value of mineral export and import is depicted in **Figure 2.1** and **Figure 2.2** respectively. The value of minerals produced by groups for the last five years is given in **Figure 2.3**.

2.4 The total value of mineral production (excluding atomic and fuel minerals) during 2023-24 has been estimated at ₹1,92,734 crore, which shows an increase of about 2.03% over that of the previous year. During 2023-24, estimated value for metallic minerals is ₹1,10,785 crore or 57.5% of the total value and non-metallic minerals including minor minerals is ₹81,949 crore or 42.5% of the total value. Information on production and value of selected minerals from 2017-18 to 2023-24(E) is given in **Annexure 2.1**. The details of Export and Import of Minerals during the period 2018-19 to 2022-23(E) are given in **Annexure 2.2** and **Annexure 2.3**.

(Value in crore)

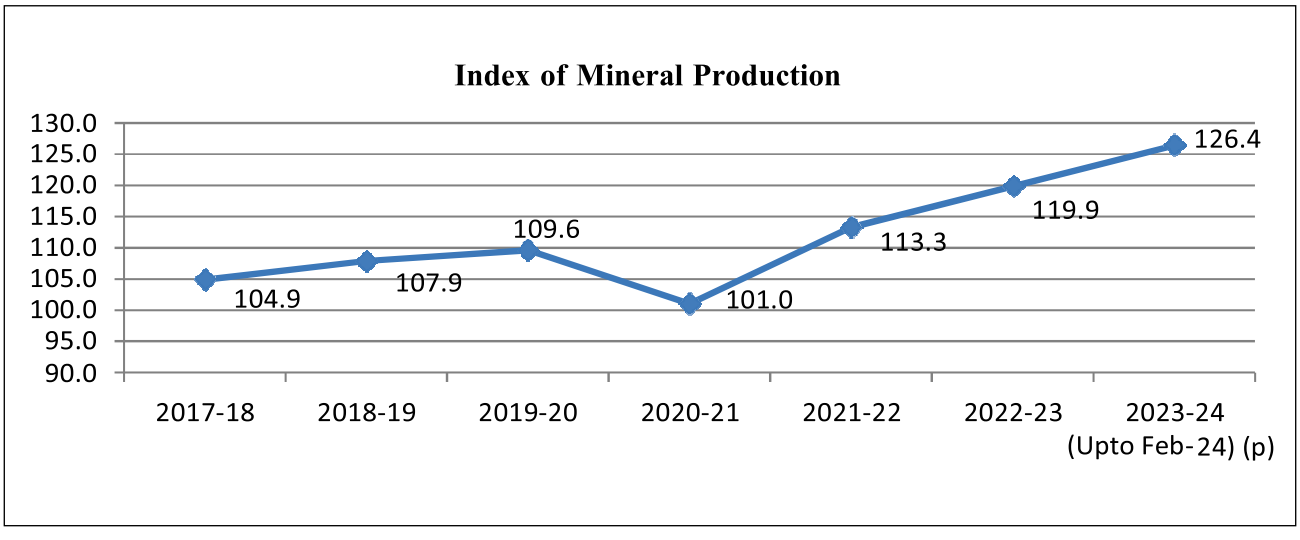


Figure 2.1: *Index of mineral production (Base 2011-12=100)*

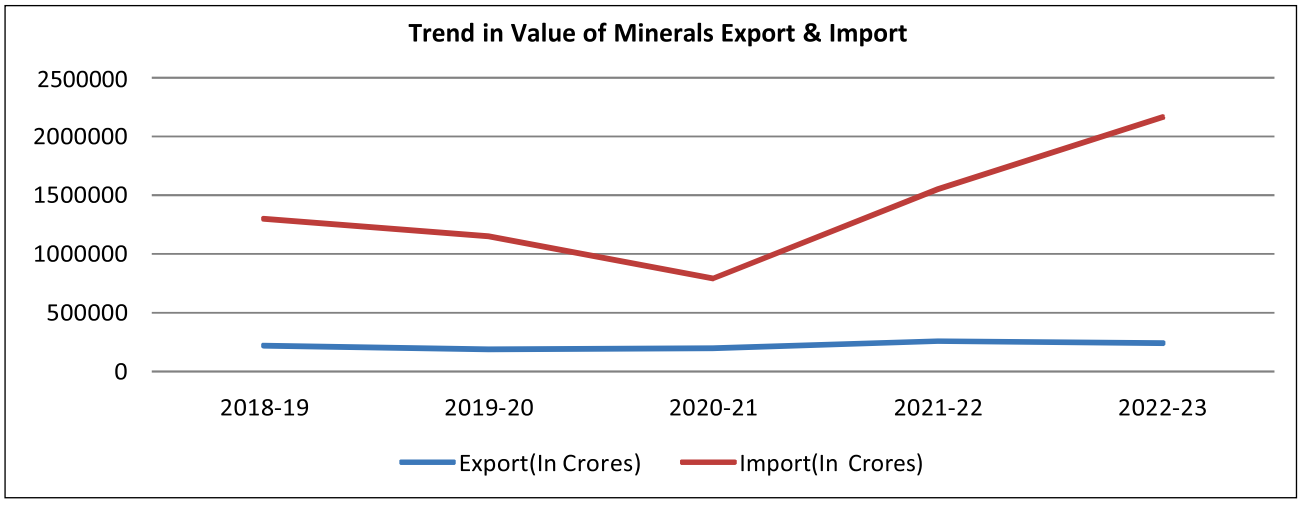


Figure 2.2: *Trends in Value of Mineral Exports & Imports*

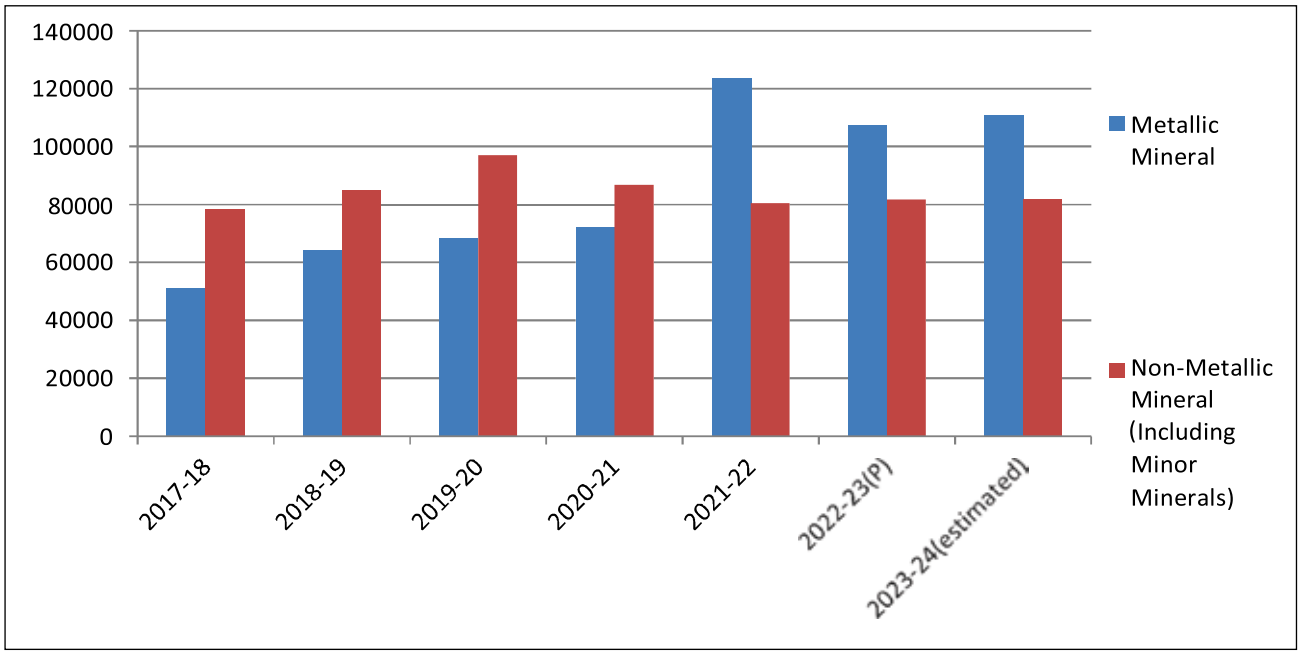


Figure 2.3: *Value of Minerals Production (by groups) (excluding atomic & fuel minerals) (2023-24 figures are estimated)*

Source: MCDR Returns.

Price Trend

2.5 Presently the base year for Wholesale Price Index covering minerals is 2011-12. The WPI for minerals (base 2011-12=100) stood at 219.9 in November 2023 and the corresponding index was 198.5 for November, 2022.

2.6 The minerals included in the wholesale price index are bauxite, chromite, iron ore, copper conc, lead conc., garnet, zinc conc, manganese ore, limestone, phosphorite, and sillimanite.

The wholesale price index for metallic minerals was 202.7 in November, 2023 as compared to 183.4 in November, 2022 and that of other minerals was 279.8 in November, 2023 as compared to 251.5 in November, 2022. Source of this particular information is www.eaindustry.nic.in.

Mining

2.7 Indian mining industry is characterized by many small operational mines. The number of mines which reported MCDR Returns of mineral production (excluding atomic, fuel and minor minerals) in India was 1426 (estimation) in 2023-24 as against 1457 (Provisional) in the previous year.

2.8 Out of 1426 reporting mines, 322 were in Madhya Pradesh followed by Gujarat (162), Karnataka (130), Odisha (122), Andhra Pradesh (120), Chhattisgarh (112), Rajasthan (104), Tamil Nadu (96), Maharashtra (95) and Jharkhand (41) and remaining other states containing 122 reporting mines.

2.9 The numbers of mines reported MCDR Returns are given in **Table 2.1**. Area-wise distribution of Mining Leases all over India pertaining to all minerals excluding fuel, atomic and minor minerals is given in **Table 2.2**.

Table 2.1
Number of Reported MCDR Returns

Sector	2022-23 (P)	2023-24 (P)
All Minerals*	1457	1426
Metallic Minerals	586	564
Non-Metallic Minerals	871	862

**Excluding atomic minerals, fuel mineral and minor minerals. (P): Provisional (E): Estimated*

Table 2.2
Area Wise Status of Lease (Frequency In Hectare) (Other than Atomic, Hydro Carbons Energy & Minor Minerals) as on 31/03/2021(P) (All India)

Frequency (Hectare)	No. of Leases	Lease area (Hectare)
0 to 2	378	488.02
>2 to 5	859	3329.00
> 5 to 10	365	2689.51
>10 to 20	332	4857.11
>20 to 50	397	12978.39
>50 to 100	233	16819.70
>100 to 200	180	25805.24
>200 to 500	196	64065.23
Above 500	155	146976.74
Total	**3095**	**278008.94**

Sources: *Respective State Governments (DGMs/DMGs etc) and list of mines maintained by IBM.*

Note: Data received from respective Regional offices of IBM have also been taken in account wherever necessary (P): Provisional

2.10 The number of underground mines in operation mineral-wise (excluding fuel, atomic minor minerals) is given in **Table 2.3**.

Table 2.3
Number of Underground Mines 2021-22(P) @ (By Principal Minerals)

Minerals	'A' Category	'B' Category	Total
Chromite	3	-	3
Copper	9	-	9
Gold	9	-	9
Lead & Zinc Ore	10	-	10
Manganese	19	1	20
Rock Salt	1	-	1
Vermiculite	-	5	5

@excluding fuel, atomic & minor minerals; Data is based on the List of Mines as on 01.04 .23 provided by the CCoM Office

'A' Category: Mechanized Mines: >150 labour in all or >75 labour in workings below ground;

'B' Category: Other than 'A' category.

2.11 For the year 2023-24, the estimated mineral production (excluding Atomic, Fuel and Minor Minerals) would be from 19 States of which the bulk of value of mineral production of about 97.5% was confined to 8 States only. The order was Odisha with a share of 46% followed by Chhattisgarh

(14%), Rajasthan (13%), Karnataka (12%), Maharashtra (4.6%), and Jharkhand (4.7%) in the total value of mineral production (excluding Atomic, Fuel and Minor Minerals). The estimated contribution of States/UTs in the value of mineral production for 2023-24 is pictorially shown in **Figure 2.4**.

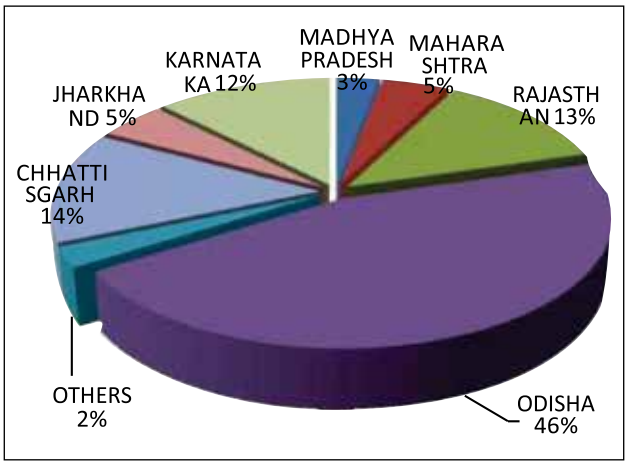


Figure 2.4: *Share of States in Value of Estimated Mineral Production 2023-24 (Excluding Atomic, Fuel Minerals, minor minerals)*

Source: Statutory returns submitted to IBM

2.12 The principal mineral producing States, which have indicated an increase in the value of mineral production during 2022-23 with respect to 2021-22, are Maharashtra (19.4%), Rajasthan (13.6%), Tamil Nadu (10.5%), Madhya Pradesh (3.13%), Meghalaya (33.6%), Assam (8.1%), Uttarakhand (1.4%), and Andhra Pradesh (0.9). However, some of the principal mineral producing States revealed decrease in value of mineral production and those include Jharkhand (-10.5%), Odisha (-13%), Chhattisgarh (- 20.4%), and Karnataka (-22%).

2.13 All India Reserves and Resources of various minerals as on 01.04.2020, as per parameters of UNFC System are given in **Annexure 2.4**.

2.14 During the year 2022-23, the Private Sector contributed for 60% or Rs. 74725 crores (including metallic and non-metallic) in the total value. The minerals which were wholly mined/ recovered by the private sector in 2021-22 were Lead conc, Lime shell, Siliceous earth, Sillimanite, Wollastonite, Zinc conc, Marl and Moulding sand. In 2022- 23, the Private Sector accounted for sizeable 92.6% of Limestone, 69.47% of Chromite, 51.5% of Iron Ore, and 43.8% of Bauxite.

During the year 2022-23, the Public Sector contributed for 40% or Rs. 48831 crore (including metallic and non-metallic) in the total value. The minerals which were wholly mined/recovered by the public sector in 2022-23 were Copper ore and concentrate, Diamond, Rock salt. In 2022-23, the Public Sector accounted for sizeable 99.3% of Fluorite (graded), 98.5% of Tin concentrate, 99.2% of Phosphorite., and 98.4% of Gold Ore.

2.15 As per World Mineral Production, 2017-21, British Geological Survey, India's ranking in 2021 in world production in term of quantity was 2nd in steel (crude/liquid) and aluminium (primary); followed by 3rd in chromite ores & concentrate and zinc (slab); 4th in iron ore; 5th in bauxite; 7th in manganese ore; 11th in copper (refined); 12th in lead (refined); 17th in magnesite and 19th in apatite & rock phosphate. The statistics on indigenous and world production of principal minerals and metals are given in **Table 2.4**.

Table 2.4
Contribution and Rank of India in World Production of Principal Minerals & Metals, 2021

Sector	Unit	Production quantity		Contribution (Percentage)	India's rank in World order $
		World	India*		
Metallic Minerals					
Bauxite	'000 tonnes	342600	22495	6.56	5th
Chromite	'000 tonnes	35100	3785	10.78	3rd
Iron ore	million tonnes	3108	254	8.17	4th
Manganese ore	'000 tonnes	56200	2347	4.17	7th
Industrial Minerals**					
Magnesite	'000 tonnes	34300	113	0.32	17th
Apatite & Rock phosphate	'000 tonnes	222000	1395	0.62	19th
Metals					
Aluminium (primary)	'000 tonnes	67000	4016	5.99	2nd
Copper (refined)	'000 tonnes	24800 1/	484+	1.95	11th
Steel (crude/liquid)	million tonnes	1915	120	5.60	2nd
Lead (refined) e	'000 tonnes	14400 2/	191+	1.32	12th
Zinc (slab)	'000 tonnes	14000	775	5.53	3rd

Source: *World Mineral Production, 2017-2021, British Geological Survey for world production and MCDR returns & individual plants for production with respect to India.*

**: Figures relates to financial year 2021-22*

***: Minerals declared as minor minerals vide Government of India Notification S.O. 423(E) dated 10th February, 2015, are not included due to non-availability of production with respect to India.*

$: India's rank based on production mentioned in World Mineral Production 2017-21;British Geological Survey.

1/ Figures relate to both primary and secondary refined copper, whether electrolytic or fire refined. Metal recovered from secondary materials by remelting alone is excluded.

2/ Figures related to both primary & secondary refined lead and include the lead content of antimonial lead.

+: production of copper refined and lead refined during 2021 was 491 and 893 thousand tones, respectively, as per World Mineral Production, 2017-21 which include both primary and secondary production.

e: Estimated.

Note: Data in respect of World Mineral Production is on calendar year basis, however the data on India's production is based on financial year.

Self-reliance in Minerals and Mineral Based Products

2.16 India continued to be wholly or largely self-sufficient in minerals which constitute primary mineral raw materials that are supplied to industries, such as, iron & steel, cement, etc. India is self-sufficient or near to self-sufficient in bauxite, chromite, iron ore, kyanite, limestone, sillimanite, etc. In spite

of significant production, some ores/minerals are also imported to meet the demand either for blending with locally available mineral raw materials and/or to meet special requirement for manufacturing special qualities of mineral based products. India is deficient in magnesite, manganese ore, rock phosphate, etc. which were imported to meet the domestic demand. To meet the increasing demand of uncut diamonds, emerald and other precious & semi-precious stones by the domestic Cutting and Polishing Industry, India is dependent on imports of raw uncut stones for their value-added re-exports. The Degree of Self-sufficiency in respect of various principal minerals and metals in 2021-22 (P) is furnished in **Table 2.5**.

Table 2.5
Degree of Self-sufficiency in Principal Minerals & Metals, 2020 - 21 (P)

Sl. No.	Commodity	Demand/Domestic Consumption ('000 tonnes)	Supply/Domestic supply ('000 tonnes)	Order of self-sufficiency (%)
Minerals*				
1	Bauxite	25124	22495	90
2	Chromite	4028	3785	94
3	Iron ore	234000	254000	100
4	Kyanite	9	10	100
5	Limestone	408182	392760a	96
6	Magnesite	618	113	18
7	Manganese ore	8734	2347	27
8	Rock phosphate (including apatite)	11053	1395	13
9	Sillimanite	3	5	100
Metals				
10	Aluminium (primary)	2896	4016	100
11	Copper (Cathode)	868b/	484	56
12	Lead (primary)	186c/	191	100
13	Zinc	640d/	775	100

Source: MCDR Returns for production and DGCI&S, Kolkata for export & import.

Apparent consumption = production+ import-export

***: Minerals declared as minor mineral vide Government of India Notification S.O. 423(E) dated 10th February, 2015, are not included due to non-availability of production for the year 2021-22.*

a/ Excludes production of limestone as a minor mineral, calcite & chalk and includes limeshell, limekankar & marl. b/ Based on production of copper cathode and imports & exports of copper & alloys.

c/ Based on production of lead (primary), and imports & exports of lead & alloys. d/ Based on production of zinc (ingots) and imports & exports of zinc & alloys.

Note: Even in cases where almost entire domestic demand is satisfied by domestic supplies, some quantities of certain special quality/ types of minerals and metals are imported to meet the requirement in certain specific end-uses.

Production Trends

Metallic Minerals

2.17 The estimated value of metallic minerals in 2023-24 at Rs. 1,10,785 crore increased by about 3% over the previous year. Among the principal metallic minerals, iron ore contributed Rs. 89617 crore or 80.9%, Zinc concentrate Rs. 8216 crore or 7.4%, and chromite Rs. 3735 crore or 3.4%.

2.18 The estimated production of bauxite at 21.88 million tonnes in 2023-24 decreased by 8.23% compared to the previous year. Four major companies, namely NALCO, Utkal Alumina International Limited, Odisha Mining Corporation, HINDALCO dominated the total mining activities of bauxite of the country in 2023-24. Odisha and Jharkhand are the major bauxite producing states in the country.

2.19 The estimated production of chromite at 3.56 million tonnes in 2023-24 decreased by 23.8% as compared to the previous year. Odisha reported the entire output of chromite (100%) in the country. Tata Steel Mining Ltd., Odisha Mining Corporation (OMC), and Indian Metals & Ferro Alloys Ltd are the major producers of Chromite.

2.20 The estimated production of copper concentrate at 111.68 thousand tonnes in 2023-24 decreased by about 1% as compared to the previous year. Rajasthan and Madhya Pradesh are the major produces of Copper in the country.

2.21 The estimated production of primary gold at 1341 kg in 2023-24 registered decrease of about 6.2% as compared to the previous year. Karnataka was the leading producer of gold accounting more than 99% of the total production. The remaining production was reported from Jharkhand.

2.22 The estimated production of iron ore at about 252.2 million tonnes in 2021-22 registered a decrease of -2.4% over the previous year. Major producer of Iron Ore in the year 2023-24 are NMDC, SAIL, Odisha Mining Corporation, and Tata Steel Limited. Odisha, Karnataka and Chhattisgarh are the major Iron Ore Producing states.

2.23 For the year 2023-24, the estimated production of lead concentrates at 340 thousand tonnes decreased by -9.6% and that of zinc concentrate at 1529 thousand tonnes also showed a decrease of -8.5% over the previous year. Rajasthan accounted for the entire production of lead concentrate and zinc concentrate during the year 2023-24.

2.24 The estimated production of manganese ore at 3.06 million tonnes in 2023- 24 increased by about 8.3% compared to that in the previous year. MOIL continued to be the largest producer of manganese ore, followed by Tata Steel and Sandur Manganese & Iron Ores Ltd in 2023-24, Madhya Pradesh, Maharashtra, and Odisha.

Non-Metallic Minerals

2.25 The estimated value of production of non-metallic minerals at Rs 12601 crore during 2023-24 increased by 3% as compared to the previous year. Limestone retained its leading position by contributing 91.2% of the total estimated value of non-metallic minerals in the year 2023-24, following that, the other non-metallic mineral is Phosphorite (7.7%).

2.26 The production of limestone was at 407 million tonnes in the year 2023-24 increased by 0.3%, as compared to that in the previous year. Limestone is widely produced in India. Major producers of Limestone are Ultratech cement Limited, Shree Cement Limited and Ambuja Cement Limited.

2.27 The production of magnesite at 118 thousand tonnes during 2023-24 increased by 10% as compared to that in the previous year.

Tamil Nadu and Uttarakhand are the major producers of Magnesite in the country.

2.28 The production of phosphorite at 1375 thousand tonnes in 2023-24 has decreased by -30.5% as compared to that in the previous year. Rajasthan contributed more than 90% and the rest was accrued from Madhya Pradesh.

State-wise Mineral Scenario

2.29 Status of mineral rich states of India is at **Annexure 2.5**.

3

Legislative Framework, Mineral Policy and Implementation

Legislative Framework, Mineral Policy and Implementation

National Mineral Policy, 2019

3.1 National Mineral Policy, 2019 has been approved by the Union Cabinet on 28.02.2019.

3.2 National Mineral Policy, 2019 replaced the National Mineral Policy 2008 **("NMP 2008")**. The impetus to review NMP 2008 came about by way of a direction from the Supreme Court vide its judgment dated 02.08.2017 in Writ Petition (Civil) No. 114/2014 titled Common Cause vs. Union of India & Others.

3.3 Objective

The aim of National Mineral Policy 2019 is to have a more effective, meaningful and implementable policy that brings in further transparency, better regulation and enforcement, balanced social and economic growth as well as sustainable mining practices.

3.4 Details

The National Mineral Policy, 2019 includes provisions which will give boost to mining sector such as:

- Introduction of Right of First Refusal for RP/PL holders;
- Encouraging the private sector to take up exploration;
- Auctioning in virgin areas for composite RP cum PL cum ML on revenue share basis;
- Encouragement of merger and acquisition of mining entities;
- Transfer of mining leases & creation of dedicated mineral corridors to boost private sector mining areas;
- Proposes to grant status of industry of mining for private sector and for acquisitions of mineral assets in other countries by private sector;
- Proposes to auction mineral blocks with pre-embedded clearances to give fillip to auction process;
- Proposes to make efforts to harmonize taxes, levies & royalty with world benchmarks to help private sector.

3.5 National Mineral Policy, 2019 focuses on Make in India initiative and gender sensitivity in terms of the vision. In so far as the regulation in minerals is concerned, the main focus of the policy is on ease of doing business by adopting e-Governance, IT enabled systems, awareness and information campaigns. Regarding the role of State in mineral development online public portal with provision for generating triggers at higher level in the event of delay of clearances has been suggested. NMP 2019 aims to attract private investment through incentives while the efforts would be made to maintain a database of mineral resources and tenements under mining tenement system.

The new policy focuses on use of coastal waterways and inland shipping for evacuation and transportation of minerals and encourages dedicated mineral corridors to facilitate the transportation of minerals. The NMP 2019 reiterates the utilization of the district mineral fund for equitable development of project affected persons and areas. NMP 2019 proposes a long-term export-import policy for the mineral sector to provide stability and as an incentive for investing in large scale commercial mining activity.

3.6 The NMP 2019 also introduces the concept of Inter-Generational Equity that deals with the well-being not only of the present generation but also of the generations to come and also proposes to constitute an inter-ministerial body to institutionalize the mechanism for ensuring sustainable development in mining.

3.7 Benefits

The NMP 2019 will ensure more effective regulation. It will lead to sustainable mining sector development in future while addressing the issues of project affected persons especially those residing in tribal areas.

Measures taken to control illegal mining:

3.8 Illegal mining means any reconnaissance or prospecting or mining operation undertaken by any person or a company in any area without holding a mineral concession as required under sub-section (1) of section 4 of the MMDR Act. Section 23C of Mines and Minerals (Development and Regulation) Act 1957, empowers the State Governments to frame rules to prevent illegal mining and the State Government may, by notification in the official gazette, make such rules for preventing illegal mining, transportation and storage of minerals and for the purposes connected therewith in the State.

3.9 There is a three-pronged strategy for prevention of illegal mining viz. constitution of task force by the State Governments at State and District Level, framing of rules under Section 23C of the MMDR Act, 1957 and furnishing of quarterly returns on illegal mining for review to the Central Government.

The details of States who have constituted task force at State level, framed Rules under section 23C of the MMDR Act, 1957 and have furnished quarterly returns on illegal mining to IBM are as follows:

(i) Constitution of State Level Task Force: 22 State Governments have constituted the task force namely, Andhra Pradesh, Assam, Bihar, Chhattisgarh, Goa, Gujarat, Haryana, Himachal Pradesh, Jharkhand, Karnataka, Madhya Pradesh, Maharashtra, Manipur, Mizoram, Nagaland, Odisha, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh, Uttarakhand and West Bengal. The function of the task force is to review the action taken by member departments for checking the illegal mining activities in their respective jurisdiction.

(ii) Framing of Rules under section 23C of MMDR Act, 1957: 21 State Governments have framed the rules under section 23C of MMDR Act, 1957 to curb illegal mining namely, Andhra Pradesh, Bihar, Chhattisgarh, Goa, Gujarat, Haryana, Himachal Pradesh, Jammu & Kashmir, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Nagaland, Orissa, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh, Uttaranchal and West Bengal.

(iii) Receipt of Quarterly returns on illegal mining: The State Government submits quarterly returns on prevention of illegal mining to IBM. These returns contain details such as number of cases detected and action taken there on etc. IBM on receipt of the returns from the various State Governments consolidates the information and sends it to the Ministry at the end of each quarter.

3.10 The MMDR Act, 1957 was amended through the MMDR Amendment Act, 2015. Through MMDR Amendment Act, 2015, Central Government has inserted the following provisions under the MMDR Act with the objective to curb illegal mining in the Country:

a) Penalty for illegal mining has been made more stringent by amendment of the MMDR Act in 2015. Penalties for contravention of Section 4(1) and 4(1A) of the Act have been increased from Rs. 25 thousand per hectares to Rs. 5 Lakh per hectare and the term of imprisonment has been increased from 2

years to 5 years. [Section 21(1) & Section 21(2)]

b) Section 30B of the MMDR Act, 1957 provides for constitution of Special courts by State Governments for speedy trial of Illegal mining/Transportation/Storage cases and 30C of the Act provides that such Special Courts shall be deemed to be a Court of Session.

Details of mines/traders registered with IBM as given in **Table 3.1**.

Table 3.1

Details	Registered as on March, 2024
Mining Leases*	8098
End users	5494
Traders	10474
Stockists	2977
Exporters	1648

**Note: IBM has also requested the State Governments not to issue transit passes for movement of minerals to unregistered operations.*

3.11 The Mineral Conservation and Development Rules, 2017 (MCDR) provides measures to ensure systematic & scientific mining. Rule 45 of the MCDR provides for the mining companies to submit periodic reports on the extraction and disposal of the mined material. Rule 45 of MCDR also facilitates end-to-end national-scale accounting of all minerals produced in the country from the pit head to its end-use, reducing the scope for illegal mining, royalty evasion, etc. The amended Rule 45 now makes it mandatory for all miners, traders, stockist, exporters and end-users of minerals to register and report on the production, trade and utilization of minerals to the State Government(s) and Indian Bureau of Mines.

3.12 Mining Surveillance System

Mining Surveillance System (MSS) is a satellite-based monitoring system which aims to establish a regime of responsive mineral administration by curbing instances of illegal mining activity through automatic remote sensing detection technology.

- Ministry of Mines & Indian Bureau of Mines (IBM) have developed the MSS, with assistance from Bhaskaracharya Institute for space applications and Geo-informatics (BISAG), Gandhinagar and Ministry of Electronics and Information Technology (MeitY).
- The system works on the basic premise that most minerals occur in the continuity and their occurrence is not limited to the lease area but is likely to extend in the vicinity. The MSS checks a region of 500 meters around the existing mining lease boundary to search for any unusual activity which is likely to be illegal mining. Any discrepancy is found is flagged-off as a trigger.
- The MSS is a transparent & bias-free system, having a quicker response time and capability of effective follow-up. The deterrence effect of 'Eyes watching from the Sky' would be extremely fruitful in curbing instances of illegal mining.
- A user-friendly mobile app for MSS has been created and launched on 24th January, 2017 at Gandhinagar for enabling public participation in assisting the governments endeavor to curb illegal mining, which was being used by the inspecting officials to submit compliance reports of their inspections.
- The training of all the States for its adoption of the MSS for minor minerals has also been done.

- Details of triggers generated, verified and cases of unauthorised mining detected are given below:

Phase	Generated	Verified	Unauthorized Mining
Phase-I (Major) (2016-17)	296	287	47
Phase-II (Major) (2018-19)	52	45	5
Phase-II (Minor) (2018-19)	130	104	9
Phase-III (Major) (2021-22)	177	98	12
Phase-IV (Major) (2022-23)	138	40	7

3.13 Mineral Concession System

As per the Amendment to MMDR Act in 2015, the system of allocation of Mineral Concession has been changed from first come first serve basis to a transparent and non-discriminatory auction process. The Amendment has also brought in a uniform tenure of 50 years for Mining Leases.

3.14 The Offshore Areas Mineral (Development and Regulation) Act, 2002 and the Mines and Minerals (Development and Regulation) Act, 1957

a) Ministry of Mines is responsible for the legislation for regulation of mines and development of minerals within the territory of India, including mines and minerals underlying the ocean within the territorial waters or the continental shelf, or the exclusive economic zone and other maritime zones of India. The Ministry is also responsible for the regulation of mines and development of minerals other than coal, lignite and sand for stowing and any other mineral declared as prescribed substances for the purpose of the Atomic Energy Act, 1962 (33 of 1962) under the control of the Union as declared by law. The Ministry is allocated all metals and minerals not specifically allotted to any other Ministry/ Department, such as, aluminium, zinc, copper, gold, diamonds, lead, nickel, etc. and planning, development and control of, and assistance to, all industries related thereto.

b) The Ministry administers the Mines and Minerals (Development and Regulation) Act, 1957 **('MMDR Act, 1957')** and the Offshore Areas Mineral (Development and Regulation) Act, 2002 **('OAMDR Act, 2002')**. In performing its functions, the Ministry is assisted by Geological Survey of India and Indian Bureau of Mines.

3.15 Amendment to the OAMDR Act, 2002:

Article 297 of the Constitution of India vests all minerals in the offshore area in the Union.

The Parliament enacted the OAMDR Act, 2002 to provide for development and regulation of mineral resources in the offshore areas which include the territorial waters, continental shelf, exclusive economic zone and other maritime zones of India. The provisions of the Act and the OAMDR Rules, 2006 came into force with effect from 15th day of January, 2010.

The OAMDR Act, 2002 has been amended through the Offshore Areas Mineral (Development and Regulation) Amendment Act, 2023, w.e.f. 17.08.2023. The OAMDR Act, 2002 is available on web link:

https://www.indiacode.nic.in/bitstream/12345678 9/2040/3/A2003-17.pdf. The salient features of the OAMDR Amendment Act, 2023 are as under:-

- Provision for grant of production lease to private sector only through auction by competitive bidding;
- Introduction of composite license, which is a two stage operating right granted for the purpose of undertaking exploration followed by production operation. Composite license shall also be granted only through auction by competitive bidding to private sector;
- Provisions for grant of operating rights without competitive bidding to a Government or a Government company or a corporation in the mineral bearing areas reserved by the Central Government;
- Provision made that grant of exploration license or production lease in respect of atomic minerals shall be made only to a Government or a Government company or a corporation;
- Removal of the provision for renewal of production lease and introduced provision for a fixed period of fifty years for production lease, similar to the provisions of the MMDR Act, 1957;
- Introduced limit on the area which a person can acquire in respect of any mineral or a group of associated minerals, as may be specified by rules, under one or more operating rights all taken together;
- Establishment of an Offshore Areas Mineral Trust to maintain a non-lapsable fund under the public account of India to ensure availability of funds for exploration, mitigation of adverse impact of offshore mining, disaster relief, research, work for interest and benefit of the persons affected by exploration or production operations, etc.;
- Removed the impasse in the sector, auction has been introduced as the only method of selection for grant of composite license or production lease under sections 12 and 13 of the Act, and all applications received prior to the date of commencement of the OAMDR Amendment Act has become ineligible. Similarly, any holder of exploration license granted pursuant to application received prior to the coming into the force of the OAMDR Amendment Act has also become ineligible for grant of production lease;
- Introduction of timeline of four years (extendable by one year) for commencement of production and dispatch after the execution of production lease and timeline of two years (extendable by one year) for re-commencement of production and dispatch after discontinuation;
- Enabled the Central Government to frame rules for the conservation and systematic development of minerals in offshore areas and for the protection of environment by preventing or controlling any pollution which may be caused by exploration or production operations;
- Provision For Transfer Of Composite License Or Production Lease To Promote Ease Of Doing Business; And
- Increase In Amount Of Fine For Illegal Mining.

3.16 Amendments to the MMDR Act, 1957:-

The MMDR Act, 1957 provides for regulation

of mines and development of minerals in the country. The MMDR Act, 1957 is available on web link– https://www.indiacode.nic.in/bitstream/123456789/1421/3/A1957-67.pdf. The details of various amendments to the MMDR Act, 1957 are as under:-

(i) The Mines and Minerals (Regulation and Development) Amendment Act, 1958 (15 of 1958) (w.e.f. 15.05.1958).

(ii) The Repealing and Amending Act, 1960 (58 of 1960) (w.e.f. 26.12.1960).

(iii) The Mines and Minerals (Regulation and Development) Amendment Act, 1972 (56 of 1972) (w.e.f. 12.09.1972).

(iv) The Mines and Minerals (Regulation and Development) Amendment Act, 1986 (37 of 1986) (w.e.f. 10.02.1987).

(v) The Goa, Daman and Diu Mining Concession (Abolition and Declaration as Mining Leases) Act, 1987 (16 of 1987) (w.e.f. 01.10.1963).

(vi) The Mines and Minerals (Regulation and Development) Amendment Act, 1994 (25 of 1994) (w.e.f. 25.01.1994).

(vii) The Mines and Minerals (Development and Regulation) Amendment Act,1999 (38 of 1999) (w.e.f. 18.12.1999)

(viii) The Mines and Minerals (Development and Regulation) Amendment Act, 2010 (34 of 2010).

(ix) Amendment Act, 2015 (10 of 2015) (w.e.f. 12.01.2015).

(x) The Mines and Minerals (Development and Regulation) Amendment Act, 2016 (25 of 2016) (w.e.f. 06.05.2016).

(xi) The Mineral Laws (Amendment) Act, 2020 (2 of 2020) (w.e.f. 10.01.2020).

(xii) The Mines and Minerals (Development and Regulation) Amendment Act, 2021 (16 of 2021) (w.e.f. 28.03.2021).

(xiii) The Mines and Minerals (Development and Regulation) Amendment Act, 2023 (16 of 2023) (w.e.f. 17.08.2023).

3.17 MMDR Amendment Act, 2023

The MMDR Act, 1957 has been amended through Mines and Minerals (Development and Regulation) Amendment Act, 2023 w.e.f 17.08.2023. The Amendment Act inter -alia, provides the following:-

- Exploration License: Introduction of exploration license for deep-seated and critical minerals. The exploration license granted through auction shall permit the licensee to undertake reconnaissance and prospecting operations for the 29 critical and deep- seated minerals mentioned in the newly created Seventh Schedule to the Act.
- The blocks explored by the exploration license holder would be auctioned for mining lease within the prescribed timeline, which will fetch better revenue to the State Governments. The exploration agency shall be entitled to a share in the auction premium payable by the mining lease holder.
- Deep-seated minerals, such as gold, silver, copper, zinc, lead, nickel, cobalt, platinum group of minerals, diamonds, etc. are difficult and expensive to explore and mine as compared to surficial or bulk minerals and thus share of deep-seated minerals in total mineral production is meager at present. The country is mostly dependent on imports of these minerals.
- The exploration license would facilitate, encourage and incentivize private sector participation in all spheres of mineral exploration for critical and deep seated minerals.

- Delisting of six minerals from the list of atomic minerals: Further, 6 minerals, namely, (i) Beryl and other beryllium-bearing minerals (ii) Lithium-bearing minerals, (iii) Niobium- bearing minerals, (iv) Titanium bearing minerals and ores, (v) Tantallium-bearing minerals and (vi) Zirconium-bearing minerals and ores have been delisted from the list of atomic minerals specified in Part-B of the First Schedule to the Act. These minerals have various applications in space industry, electronics, communications, energy sector, electric batteries and are critical in net-zero emission commitment of India. Due to their inclusion in the list of atomic minerals, their mining and exploration was reserved for government entities. After removal of these minerals from the said list, exploration and mining of these minerals has been opened up for the private sector as well. As a result, exploration and mining of these minerals is expected to increase significantly in the country.

3.18 Auction of critical and strategic minerals by Central Government:

The Amendment Act empowers the Central Government to exclusively auction mining lease and composite license for 24 critical minerals listed in new Part-D of the First Schedule to the said Act. The 6 minerals delisted from the list of atomic minerals have also been included in this list of 24 minerals. As these critical minerals are indispensable for the growth of our economy, authorizing the Central Government to auction concession for these critical minerals would increase the pace of auction and early production of the minerals. Even in case of conduct of auction by the Central Government, the mineral concession shall be granted to the selected bidders by the State Government only and the auction premium and other statutory payments shall accrue to the State Government.

3.19 Other amendments to the MMDR Act, 1957

(i) In exercise of the powers conferred by Sub-Section (3) of Section 9 of the MMDR Act, 1957, the Second Schedule of the Act has been amended vide G.S.R. 736 (E) dated 12.10.2023 for specifying rate of royalty in respect of Lithium, Niobium and Rare Earth Elements (REEs).

(ii) The Second Schedule to the MMDR Act, 1957 has further been amended to rationalise the royalty rate of 12 critical and strategic minerals, viz., Beryllium, Cadmium, Cobalt, Gallium, Indium, Rhenium, Selenium, Tantalum, Tellurium, Titanium, Tungsten, and Vanadium vide Notification No. G.S.R. 152 (E) dated 01.03.2024.

Specification and rationalization of royalty rates of critical minerals has facilitated the auction of mineral blocks of critical minerals.

3.20 Subordinate Legislation

The following rules have been framed and notified in pursuance of the MMDR Act:

(i) The Mineral (Auction) Rules, 2015 has been amended through the Mineral (Auction) Amendment Rules, 2023 to empower the Central Government to conduct auction for grant of mining lease or composite license in respect of critical and strategic minerals specified in Part D of the First Schedule to the Act vide G.S.R No. 648(E) dated 01.09.2023. The Mineral (Auction) Amendment Rules, website on web link: https://mines.gov.in/admin/storage/app/uploads/64f5ab9c5271d1693821852.pdf

(ii) The Atomic Minerals Concession Rules, 2016 has been amended through the Atomic Minerals Concession (Amendment) Rules, 2023 to decriminalize 27 rules as a part of reduction of compliance burden and to simplify the exploration norms for Rare metal and Rare Earth Elements (REE) vide G.S.R No. 682 (E) dated 22.09.2023. The Atomic Minerals Concession(Amendment) Rules, 2023 are available at Ministry of Mines website on web link: https://mines.gov.in/admin/storage/app/uploads/652634e2e50b81697002722.pdf

(iii) The Minerals (Other than Atomic and Hydro Carbons Energy Mineral) Concession Rules, 2016 has been amended through the Minerals (Other than Atomic and Hydro Carbons Energy Mineral) Concession (Amendment) Rules, 2023 for specifying methodology for calculation of Average Sale Price (ASP)/ Value of Estimated Resources (VER) for Rare Earth Elements (REEs), Lithium and Niobium vide G.S.R. 737 (E) dated 12.10.2023. The Minerals (Other than Atomic and Hydro Carbons Energy Mineral) Concession (Amendment) Rules, 2023 are available at Ministry of Mines' website on web link - https://mines.gov.in/admin/storage/app/uploads/65e6e43e9dfae1709630526.pdf

(iv) The Minerals (Other than Atomic and Hydro Carbons Energy Mineral) Concession Rules, 2016 has been amended through the Minerals (Other than Atomic and Hydro Carbons Energy Minerals) Concession Amendment Rules, 2024 notified vide G.S.R. 50(E) dated 21.01.2024 to implement the provision of exploration license, to clarify provisions regarding disposal of minerals below threshold value and for rationalization of penalty for small miners having lease area up to 25 hectares and approved production up to 2.0 lakh tonnes. The Minerals (Other than Atomic and Hydro Carbons Energy Minerals) Concession Amendment Rules, 2024 are available at Ministry of Mines' website on web link- https://mines.gov.in/admin/storage/app/uploads/65fd6174b1a681711104372.pdf

(v) The Mineral Conservation and Development Rules, 2017 have been amended through the Mineral Conservation and Development (Amendment) Rules, 2024 notified vide G.S.R. 51(E) dated 21.01.2024 for implementing provision of exploration license, for rationalization of penalty for small miners having lease area up to 25 hectares and approved production up to 2.0 lakh tonnes and to relax the requirement of submission of mining plan for its review and for submission of self-assessment report for star rating, for the mines where mining or mining operations have been discontinued and such discontinuance has been duly reported. The Mineral Conservation and Development (Amendment) Rules, 2024 are available at Ministry of Mines' website on web link- https://mines.gov.in/admin/storage/app/uploads/65ae5390911361705923472.pdf

(vi) The Mineral (Auction) Rules, 2015 has been amended through the Mineral (Auction) Amendment Rules, 2024 notified vide G.S.R. 49(E) dated 21.01.2024 to implement the provision of exploration license which was introduced through the MMDR Amendment Act, 2023. The Mineral (Auction) Amendment Rules, 2024 are available at Ministry of Mines' website on web link- https://mines.gov.in/admin/storage/app/uploads/65ae5352376011705923410.pdf

(vii) The Minerals (Evidence of Mineral Contents) Rules, 2015 has been amended through the Minerals (Evidence of Mineral Contents) Amendment Rules, 2024 notified vide G.S.R. 52(E) dated 21.01.2024 to implement the provisions of the MMDR Amendment Act, 2023. The Minerals (Evidence of Mineral Contents) Amendment Rules, 2024 are available at Ministry of Mines' website on web link - https://mines.gov.in/admin/storage/app/uploads/65ae53c19cab41705923521.pdf

(viii) The Atomic Minerals Concession Rules, 2016 has been amended through the Atomic Minerals Concession (Amendment) Rules, 2024 which have been notified vide G.S.R. 106(E) dated 14.02.2024 to implement the provisions of the MMDR Amendment Act, 2023. The Atomic Minerals Concession (Amendment) Rules, 2024 are available at Ministry of Mines website on web link: https://mines.gov.in/admin/storage/app/uploads/65e6e33f561941709630271.pdf

(ix) The Minerals (Other than Atomic and Hydro Carbons Energy Mineral) Concession Rules, 2016 has been amended through the Minerals (Other than Atomic and Hydro Carbons Energy Minerals)Concession (Second Amendment) Rules, 2024 which have been notified vide G.S.R 118(E) dated 20.02.2024. Through the said rules, methodology for calculation of Average Sale Price of several critical minerals was specified. The Minerals (Other than Atomic and Hydro Carbons Energy Minerals) Concession (Second Amendment) Rules, 2024 are available at Ministry of Mines website on web link: https://mines.gov.in/admin/storage/app/uplo ads/663482301e1eb1714717232.pdf

3.21 Other Reforms:

(i) Ministry of Mines has issued directions dated 01.06.2023 under section 20A of the MMDR Act 1957 to all State Governments, to dispose the minerals (except the minerals specified under Part A and Part B of the First Schedule of the Act) obtained in any public work, such as road, canals, pond digging or any other government infrastructure development projects carried out by any Government Agency authorized to do so by the Central or State Government. Disposal of such minerals was mandated to be made through auction by the DMG of the State Government or through the Government department executing the work or any other department of the State Government on behalf of the DMG. In the event of failure of auction, the mineral may be supplied to or handed over to State of Central PSU or any other Government entity for its consumption, use or disposal as prescribed for the mineral in the manner as deemed fit by the concerned State Government.

(ii) Ministry of Mines issued directions under Section 20A of the Mines and Minerals (Development and Regulation) Act, 1957 to all State Governments/Union Territories to initiate the process for auction of lapsed mining leases granted under erstwhile Rule 58 of the Mineral Concession Rules, 1960 (MCR, 1960).

(iii) Based on the recommendations of the Committee constituted to examine the issue of misclassification of different grades of iron ore and other minerals, Ministry of Mines, vide letter dated 03.10.2023, issued guidelines to minerals rich State Governments for prevention of misclassification of different grades of iron ore and other minerals by using

various technology measures. The State Governments have been requested to implement the said guidelines by suitably incorporating them in the rules framed under Section 23C of the MMDR Act, 1957.

(iv) In exercise of the powers conferred by sub- section (1) of Section 8 of the Offshore Areas Mineral (Development and Regulation) Act, 2002, an area to the extent of 10277.10 hectares in the Arabian Sea off the coast of Daman has been reserved vide Notification No. S.O. 5411 (E) dated 21.12.2023 for the purposes of the Central Government for grant of composite license by the administering authority to the Jawaharlal Nehru Port Authority under sub-section (3) of section 8 of the said act for exploration and production of sand for reclamation for the proposed development of greenfield port at Vadhavan Maharashtra.

(v) In exercise of the powers conferred under the proviso of clause (b) of sub-section (1) of Section 6 of the Mines and Mineral (Development and Regulation) Act, 1957, the area limit for prospecting license and mining lease in respect of each of the 24 critical and strategic minerals listed in Part-D of the First Schedule to the MMDR Act, 1957 has been increased to 100 Sq. Km and 50 Sq. km. respectively, for each of the States.

(vi) Vide the MMDR Amendment Act, 2021; enabling provisions have been made so that private entities may be notified under Section 4(1) of the MMDR Act for conducting exploration without prospecting license and also for funding of eligible private exploration agencies from NMET. In pursuance of these amendments, the Ministry has accepted the scheme of accreditation of private exploration agencies developed by the QCI-NABET and issued guidelines on 12.08.2021 for notification of accredited private exploration agencies. So far 20 Private Exploration Agencies have been notified for the said purpose.

3.22 Auction of Mineral Blocks:

i. The MMDR Amendment Act, 2015 instituted the system of e-auction for the grant of mineral concession for major minerals with a view to bring in greater transparency and removal of discretion in the allotment.

ii. Subsequent to the 2015 amendment, the MMDR Act was further amended in the year 2020 with the objective of maintaining sustainable mineral production in the country and in the year 2021 with the objective of inter-alia increasing employment and investment in the mining sector, boosting mineral production, time-bound operationalization of mines, increasing the pace of exploration, and auction of mineral resources. Further, the subordinate rules to implement the above reforms have been notified within the stipulated time.

iii. The MMDR Act, 1957 has been further amended through the MMDR Amendment Act, 2023 in FY 2023-24 empowering the Central Government to exclusively auction mining leases and composite licenses for 24 critical minerals and introducing the auction of Exploration License (EL) for deep-seated and critical minerals.

iv. These amendments in the MMDR Act and subsequently in Mineral Auction Rules have resulted in a significant increase in the auction of mineral blocks.

So far, 354 blocks have been auctioned across the 11 major minerals states. It is worth noting that the number of blocks auctioned per year has increased more than 4 times since the reforms of 2021. From 2015-2021, in 6 years, 108 mineral blocks (Mining Lease-99, Composite License-9) were auctioned whereas since 01.04.2021, 246 blocks (Mining Lease -139, CL-107) have been auctioned from FY 2021-22 to FY 2023-24.

v. During the FY 2023-24, a record number of 407 Notice Inviting Tenders were issued by the various State Governments and Central Government. A significant increase of 83% from the previous year. The States of Assam and Uttarakhand issued Notice Inviting Tenders for the first time since the introduction of auction regime in 2015. Further, during the FY 2023-24, 95 mineral blocks (ML-45, CL-50) were successfully auctioned across 10 major mineral states.

The summary of Yearwise/Statewise auctions is as under:

List of Successful auction since 2015, as on 31.03.2024:

Year State	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	Total
Andhra Pradesh	-	1	2	2	-	-	4	11	3	23
Chhattisgarh	3	-	2	-	-	2	2	20	6	35
Gujarat	-	-	3	-	-	4	3	2	6	18
Jharkhand	2	1	1	3	-	-	-	-	3	10
Karnataka	-	7	-	7	4	1	8	11	6	44
Madhya Pradesh	-	1	-	5	2	5	4	29	22	68
Maharashtra	-	-	2	1	10	-	9	6	10	38
Odisha	1	2	2	-	25*	1	9*	10		48
Rajasthan	-	3	2	1	2	-	7	8	31	54
Tamilnadu	-	-	-	-	-	-	-			-
Telangana	-	-	-	-	-	-	-			-
Uttar Pradesh	-	-	-	-	-	-	-	4	3	7
Goa	-	-	-	-	-	-	-	4	5	9
Total	**6**	**15**	**14**	**19**	**43***	**13**	**46***	**105**	**95**	**354**

**Note: - 2 Iron Ore Blocks auctioned in 2019-20 in Odisha were forfeited. The same have been re-auctioned in September, 2021. Therefore, in total 356 mineral blocks were auctioned but in actual, the net figure is 354.*

vi. Largest number of mineral blocks auctioned is of Limestone (110) followed by Iron Ore (106), Manganese Ore (37), and Bauxite (34). The mineral-wise summary is as under:

Mineral-wise Auction Summary as on 31.03.2024

Year Mineral	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	Total
Limestone	4	5	10	5	4	9	18	20	35	110
Iron Ore	1	7	2	9	17	1	13*	33	24	106
Iron Ore & Manganese	0	0	0	0	6	0	1*	2	1	9
Gold	1	1	1	1	0	2	2	5	4	17
Manganese	0	1	0	1	3	0	3	18	11	37
Diamond	0	1	0	0	1	0	-			2
Bauxite	0	0	1	0	5	1	5	14	8	34
Graphite	0	0	0	3	2	0	1	5	1	12
Chromite	0	0	0	0	3	0	-			3
Copper	0	0	0	0	2	0	-		2	4
Kyanite	0	0	0	0	0	0	1			1
Rock Phosp hate	0	0	0	0	0	0	1	3		4
Copper & Gold	0	0	0	0	0	0	1			1
Phosphorite	0	0	0	0	0	0	0	3	2	5
Ni, Cr and a ssociated P GE	0	0	0	0	0	0	0	2		2
Glauconite (Potash)	0	0	0	0	0	0	0	0	2	2
Basemetal	0	0	0	0	0	0	0	0	5	5
Total	**6**	**15**	**14**	**19**	**43**	**13**	**46***	**105**	**95**	**354**

***Note** :- *2 Iron Ore Block auctioned in FY2019-20 in Odisha was forfeited. The same were re-auctioned in September, 2021. Therefore, in total 356 mineral blocks were auctioned but in actual, the net figure is 354.*

3.23 Critical Minerals

Critical minerals are essential for our country's economic development and national security. The lack of availability of these minerals or the concentration of their extraction or processing in a few countries poses a challenge of supply chain vulnerabilities. The future global economy will be underpinned by technologies that depend on minerals such as lithium, graphite, cobalt, titanium and rare earth elements (REE). India has committed to achieve 50% of cumulative electric power installed capacity from non-fossil sources by 2030. Such ambitious plan for energy transition is set to drive the demand for electric cars, wind and solar energy projects and battery storage systems thereby increasing the demand for these critical minerals. Critical and Strategic Minerals are in high demand and the demand is usually met by imports. Critical minerals cater to the needs of sectors like renewable energy, defense, agriculture, pharmaceutical, high-tech electronics, telecommunications, transport, creation of Gigafactories etc.

3.24 Steps taken by Ministry of Mines for Critical and Strategic Minerals

i. India has proactively undertaken a series of initiatives aimed at strengthening the supply chain of critical minerals. The MMDR Act, 1957 amended through the MMDR Amendment Act, 2023 dated 17th August 2023 in FY2023-24 further inserted section 11D in the Act which empowered the Central Government to exclusively auction mining leases and composite licenses in respect of 'critical and strategic mineral' specified in Part D of the First Schedule of the Act.

ii. The revenue generated from these auctions shall accrue to State Governments. Subsequently, royalty encourage more participation in auctions. The Government had specified royalty rates for Platinum Group of Metals (PGM) at 4%, Molybdenum at 7.5%, Glauconite and Potash at 2.5% in March, 2022. Further, the Central Government has specified royalty rates for Lithium at 3%, Niobium at 3% and Rare Earth Elements at 1%.

iii. Subsequently, Central Government has issued Notice Inviting Tender (NIT) "Invitation of Bids for Grant of Mineral Concession of Critical and Strategic Minerals" for 1st, 2nd and 3rd tranches on 29 November 2023, 29 February 2024, and 14 March 2024 respectively. So far, 45 Notice Inviting Tenders for the auction of 38 mineral blocks have been issued by the Central Government.

iv. These critical and strategic minerals blocks consisted of minerals such as Glauconite, Nickel, Chromium, PGE, Potash, Graphite, Molybdenum, Phosphorite, Lithium, Titanium, REE, etc across the States of Bihar, Gujarat, Jharkhand, Odisha, Tamil Nadu, Uttar Pradesh, Chhattisgarh, Andhra Pradesh, Arunachal Pradesh, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan and Union Territory of Jammu and Kashmir.

3.25 Auction of Exploration License Blocks:

i. Taking significant strides towards unlocking the potential of critical and deep-seated minerals, the MMDR Act, 1957 amended through the MMDR Amendment Act, 2023 dated 17.08.2023 in FY 2023-24 further inserted Section 10BA incorporating provisions for grant of Exploration License ("EL") for minerals specified in Seventh Schedule through auction. Further, the Process for grant of Exploration License has been notified in

chapter III A of the Mineral (Auction) Amendment Rules, 2024, with respect to the minerals specified in Seventh Schedule of the MMDR Act.

ii. Accordingly, 20 blocks of critical minerals specified in the Seventh Schedule of the Act have been handed over to 14 states to initiate the auction process for EL. Out of these, 6 States have notified 12 EL blocks for auction as per the following details:

Mineral-wise Auction Summary as on 31.03.2024

S. No.	State	Blocks Name	Mineral	Area (Sq.Km.)	NIT issue Date
1	Karnataka	Devadurga Block	Gold, Copper and Lithium	850	06.03.2024
2	Rajasthan	Chhaba- Nawatala- Patodi Block	REE	574	06.03.2024
3		Srasar-Pallu Dhandhusar-Hardaswali Block	Potash	906.55	
4		Renwal – Rathal – Kaladera Block	REE & RM	789.40	
5	Maharashtra	Jinjgaon	Lead, Zinc, Copper	500	07.03.2024
6		Kurkheda	Diamond	890	
7	Madhya Pradesh	Mohana Block	Diamond & Base-metal	723	11.03.2024
8		Padhar Block	PGE and associated	729	
9	Andhra Pradesh	Pakala-Chandragiri	Rare Earth Elements (REE)	843	11.03.2024
10	Chhattisgarh	Kondagaon Block	Diamond and Minerals of Rare Earth Group (REE)	498	13.03.2024
11		Kondagaon Block		492	
12		Ghoragaon-Sorgaon Block		488	

iii. The Exploration License holders will play a pivotal role in exploring the blocks and identifying areas suitable for Mining Lease auctions, potentially bolstering revenue for state governments. This concerted effort by the Government underscores the commitment to harnessing the potential of critical minerals, fostering economic growth, and advancing the exploration landscape in India.

Details of the Blocks, timelines etc. can be accessed on MSTC e-auction platform at https://www.mstcecommerce.com/auctionhome/mlcln/

3.26 District Mineral Foundation (DMF) and Pradhan Mantri Khanij Kshetra Kalyan Yojana (PMKKKY)

i. DMF is meant to address the long-standing demand of the local people in mining-affected areas for inclusive growth. As per MMDR Amendment Act 2015, the funds for DMF will be met from additional contributions of 30% of royalty by existing miners and 10% of royalty by miners of auctioned mines w.e.f. 12th January 2015. Further, the MMDR Act has been amended through MMDR Amendment Act, 2021 w.e.f

28.03.2021. Sub-section (5) and (6) of Section 9B of the MMDR Act has been amended for clarifying the rates of DMF to be paid by different categories of mines. Details are available on the web link: https://mines.gov.in/admin/storage/app/uploads/6638a345632971714987845.pdf.

ii. On 15/01/2024, the Government of India has issued the revised PMKKKY guidelines and increased the percentage of utilisation in high priority sectors from at least 60% to at least 70%. New sectors of Housing, Agriculture and Animal Husbandry, along with general guidelines regarding convergence of schemes, project management unit, endowment fund and affected areas in more than one district are introduced. Further, new guidelines have also incorporated amendments and addition in the section 'Transparency & Accountability' for the development of online portal by the Central Government for facilitating the administration of DMF, State Level Monitoring Committee, grievance redressal and compliance mechanism. The details are available at the web link: https://mines.gov.in/admin/storage/ckeditor/Revised_Guidelines_PMKKKY_1712904597.pdf

iii. A total of Rs 90,730.07 Crores has been collected under DMFT till 31.03.2024.

iv. Till March 2024, 3,29,775 projects under different sectors have been sanctioned for various programmes/development schemes under DMF/PMKKKY. For the said projects, Rs. 82,030.33 Crores has been allocated and the amount of Rs. 49,844.92 Crores have been spent till 31.03.2024.

State wise Daily Report on utilization of the funds available under District Mineral Fund (DMF) for supplementing and augmenting facilities of medical testing, screening as part of Economic Response to COVID 19 announced under Pradhan Mantri Garib Kalyan Package is as under:

Daily expenditure report for Covid - 19 - DMF funds

Till Mar 2024

S. No.	Name of State	DMF fund available as on 28th March 2020 (Rs.in crore)	DMF fund available as on 31st March 2021 (Rs.in crore)	Cumulative amount spent on activities related to COVID-19 since 28 Mar 2020 (Rs. in crore)
1	Andhra Pradesh	623.12	278.68	139.79
2	Assam	77.5	-	0.65
3	Bihar	84.5	-	0
4	Chhattisgarh*	1190.04	1707.59	106.41
5	Goa	187.89	-	30.53
6	Gujarat	153.52	83.68	26.23
7	Haryana	20.24	-	0
8	Himachal Pradesh	135.66	-	0.43
9	Jharkhand	2056.85	-	22.85
10	Karnataka	1281.64	1211.64	205.04
11	Kerala	2	-	0
12	Madhya Pradesh	1297.65	1185.56	9.24
13	Maharashtra	687.99	-	59.5

S. No.	Name of State	DMF fund available as on 28th March 2020 (Rs.in crore)	DMF fund available as on 31st March 2021 (Rs.in crore)	Cumulative amount spent on activities related to COVID-19 since 28 Mar 2020 (Rs. in crore)
14	Odisha**	3274.18	6418.9	482.72
15	Punjab	26.16	-	0.65
16	Rajasthan	2020.08	2625.28	60.03
17	Tamilnadu	98.93	99.6	17.92
18	Telangana$	1001.2	-	334.08
19	Uttar Pradesh	383.22	423.22	11.29
20	Uttarakhand	74.39	110.62	10.16
21	West Bengal	17.7	-	0.46
	Total	**14694.46**	**14144.77**	**1517.98**

Note: Total balance available in DMF as on 28 March 2020 is 14694.47 cr. and 30% of this comes as approx. 4408 cr.

$As per D.O.No.7/2/2020-MIV, dated 28.03.2020 Rs 334.08 crore from 19 districts has been transferred to Chief Minister's relief fund.

**Chhattisgarh reported correction in COVID19 reporting in Jan 23 for districts Bijapur (5.14 cr. reduced to 2.53 cr.) and Korea (7.66 cr. reduced to 2.63 cr.)*

**Odisha reported reduction of 2.08 Cr. from August 23 COVID19 reporting in September 23*

Active Participation of the Ministry of Mines in India Mobile Congress (IMC), 2023 held from 27th to 29th October, 2023:

3.27 DoT along with Cellular Operators Associations of India (COAI) has jointly hosted India Mobile Congress (IMC) (2023) during 27th to 29th Oct 2023 at Pragati Maidan, New Delhi with the theme 'Global Digital Innovation'. The Hon'ble Prime Minister, Shri Narendra Modi inaugurated the 7th Edition of the India Mobile Congress 2023 at Bharat Mandapam, Pragati Maidan, New Delhi. The IMC 2023 aims to strengthen India's position as a developer, manufacturer, and exporter of key cutting- edge technologies.

3.28 Ministry of Mines actively participated in IMC, 2023, with a special focus on demonstrating the potential use of 4G/5G technology in the mining sector. In this regard, it may be recalled that National Mineral Policy, 2019 emphasizes that the utilization of innovative technology within the mining sector will significantly enhance operational efficiency, productivity, and economic viability. Notably, the policy underscores the need for machinery that facilitates mineral beneficiation processes while prioritizing the safety and well-being of individuals working within mining sites and surrounding areas. Ministry is encouraging adoption of technology in mining operation. Many companies have adopted advance technology in operation like, mineral transport, drilling, excavation, safety measures etc. IMC has provided a platform for Ministry to show case its effect in this area.

3.29 Various companies have collaborated to showcase innovative 5G use cases aimed at revolutionizing mining operations. The Ministry of Mines set up a dedicated 5G stall at IMC 2023, showcasing the following pioneering 5G use cases:

(i) Tata Steel Limited: 5G use case: Tata Steel in its Noamundi iron ore mines, West Singhbhum, Jharkhand has developed Boulder detection on dump body identified as a use case of 5G while loading the dump trucks and sending necessary notification to dump

truck operators and control room so that such dump trucks can be identified and unloaded separately, and boulders are not fed to the crushing plant.

In order to detect oversize boulders, a digital solution has been developed and deployed by M/s Tata Steel Ltd. The image of the rocks on the dump body of the trucks is captured through the camera installed on the excavator and analyzed through AI based deep learning model. The model captures images of all rock fragments in every pass, analyzes the sizes and reports back any oversize boulder by sending a notification to the dump truck operator as well as to the control room. The material on the dump truck with large boulder is then stacked separately. Captive Wi-Fi network is used for image and notification transfer, and observed loss of image transfer due to throughput and coverage issue. While continuing to operate this solution with existing Wi-fi technology, Tata Steel initiated POC for migrating the application network to 5G technology. This technology would help in reducing the loss of image/notification.

(ii) Hindustan Zinc Limited: 5G use case: Live Tele remote operation of a Production Drill machines in Hindustan Zinc's SK Underground Mine, which is at 700 kms away & is at a depth of 700 meters below the ground. This mine has 5.5 % Zinc and Lead and 110 ppm Silver, this is also known as Silver mine.

Visitor to the pavilion could operate the drilling machine in S. K. Mines from the pavilion which showcases the power of 5G in remote operation.

(iii) Ultra Tech Cement Limited Objective: Implementation of integrated Mines Digital Platform using 4G network to improve operational efficiency.

5G use case: Ultratech has developed an integrated Digital platform connecting end- to-end mining chain. The mining equipment is installed with IoT sensors and communicates the real time data through a 4G network and software optimises the resource and help achieving the increased efficiency. The Mine Operational controller executes the tactical planning and controls the mine operation remotely and communicates with field engineers and Operators through 4G network-based voice communication system. The solution offered increased safety and productivity and made a paradigm shift to a new way of mine working.

(iv) Hindustan Copper limited Objective: An innovative AI Vision based Integrated Workers Safety Solution to mitigate the risks of hazardous working conditions in the mining industry to ensure safety compliance using 5G and Artificial Intelligence.

5G use case: The solution at India Mobile Congress demonstrated by Hindustan Copper Limited (HCL) through M/s LivNSenes. The innovation employs 5G connectivity for real time video-based safety insights, digital PPEs, improved productivity and worker safety (Helmets Detection and Alerting). The solution detects PPEs (like Helmets, Vests) under various working conditions including low-light conditions (underground/surface) by use of 5G Technology along with Artificial Intelligence and Machine Vision Technologies. It offers unique features like full and partial human detection, PPEs (Helmets) detection and predictive safety insights in cloud (emergency control room), aids the workers with real-time visual and audio alerts inside

mines, thereby made a paradigm shift in achieving zero accident in Mining Industry. HCL is also in process of implementing the same in Malanjkhand Underground Copper Mines in Madhya Pradesh, which is being developed below opencast mine having reserves and resource of approximately 301.80 million tonne with copper grade of 0.91%. The targeted peak rated capacity is 5 million tonne per annum.

3.30 During the event, the stall of the Ministry of Mines was visited by Secretary (Mines) and other senior officers, demonstrating the adoption of 5G technology in the mining sector. The demonstrations of 5G use case at the Ministry of Mines stall showcase, how 5G technology can significantly improve mining operations, making them safer, more efficient, and environmentally responsible.

3.31 Over 500 visitors from different backgrounds, students, government officers, academia, industry associations, young entrepreneurs and start-ups had visited the Ministry of Mines' stall which demonstrated a significant interest and diverse audience engagement in the showcased 5G use cases for revolutionizing mining operations.

3.32 Revision Applications

- Under Section 30 of the Mines and Minerals (Development and Regulation) Act, 1957 and Rule 35 of the Minerals (other than Atomic & Hydro Carbons Energy Minerals) Concession Rules, 2016, the Ministry of Mines exercises its Revisionary Powers in dealing with the Revision Applications filed by the applicants who are aggrieved by any order passed by the State Government or any other authority. Under Rule 35 and 36 of MCR 2016, detailed procedure for filing and disposal of Revision Application has been prescribed.
- Disposal of Revision Applications has public interface. In order to ensure transparency in disposal of Revision cases, software i.e., ras.nic.in has been implemented for effective monitoring of the Revision Applications, received in the Ministry of Mines. This system keeps track of the various stages of the Revision Applications filed by the applicants till the final disposal of the applications. The system is web enabled and has link on the website of the Ministry of Mines. The salient features of the system are as under: -
  - i. Status of Revision Application is available on website. The Web Link of Status of Revision Application is www.ras.nic.in/WebQuery.aspx
  - ii. Final Orders are available on the website. The Web Link of Status of Revision Application is www.ras.nic.in/WebQuery.aspx
  - iii. Final Order numbers are generated by the system automatically.
  - iv. Hearing details etc. are available on the website;
  - v. Revision Application numbers are generated by the system automatically.
- As far as possible, cases are being heard on a chronological order and their age of pendency.
- The website is accessible by public and the copy of Final Order & Hearing Notices can be downloaded from the Website.
- During 1st January, 2023 to 31st March, 2024, 87 Revision Applications were disposed of by Revisionary Authorities in the Ministry of Mines.

4

Revenue from Mineral Resources

Revenue from Mineral Resources

Royalty - Legal Provisions

4.1 Under the provisions of Section 9(3) of the MMDR Act, 1957, the Central Government may, by notification in the Official Gazette, amend the Second Schedule, so as to enhance or reduce the rate at which royalty shall be payable in respect of any minerals with effect from such date as may be specified in the Notification, provided that the Central Government shall not enhance the rate of royalty in respect of any minerals more than once during any period of three years. Similarly under Section 9A(2) of the Act, the Central Government may, by notificationin the Official Gazette, amend the Third Schedule so as to enhance or reduce the rate at which the dead rent shall be payable in respect of any area covered by mining lease and such enhancement or reduction shall take effect from such date as may be specified in the notification, provided that the Central Government shall not enhance the rate of the dead rent in respect of any such area more than once during any period of three years.

Revision of rates of royalty and dead rent in respect of major minerals (non-coal minerals)

4.2 In exercise of the powers conferred under Section 9(3) of the MMDR Act, 1957, the Central Government has amended the Second Schedule to the said Act and notified the same vide notification No. G.S.R. 630(E) dated 01.09.2014. Further, in exercise of the powers conferred under Section 9A(2) of the above said Act, the Central Government has amended the Third Schedule of the said Act and notified the same vide notification No. G.S.R. 631(E) dated 01.09.2014. Recently, the Central Government/Ministry of Mines has also amended the Second and the Third Schedule to the MMDR Act, 1957 vide Notification No. G.S.R. 621(E) dated 02.09.2019 and G.S.R. 622(E) dated 02.09.2019, respectively. After that the Central Government/Ministry of Mines rescinds the above said both the Notifications vide Notification No. G.S.R. 634(E) and G.S.R. 635(E) dated 05.09.2019, respectively, w.e.f. 02.09.2019.

Further, vide notification No. G.S.R. 204(E) dated 15.03.2022 the Central Government made the amendments in the Second Schedule of the MMDR Act, 1957 for specifying the rate of royalty in respect of Glauconite, Potash, Emerald, Platinum Group of Metals (PGM), Andalusite, Sillimanite, Kyanite and Molybdenum. Furthermore, vide notification No. G.S.R. 736(E) dated 12.10.2023 the Central Government made the amendments in the Second Schedule of the MMDR Act, 1957 for specifying the rate of royalty in respect of Lithium, Niobium (i) Primary (produced from ores other than Columbite- tantalite) (ii) By-product (produced from ores other than Columbite-tantalite), Rare Earth Elements (produced from ores other than Monazite occurring in beach sand minerals). Recently, the Second Schedule of the MMDR Act, 1957 amended vide notification No. G.S.R. 152(E) dated 01.03.2024 for specifying rate of royalty in respect of Zircon and 12 critical and strategic minerals, viz., Beryllium, Cadmium, Cobalt, Gallium, Indium, Rhenium, Selenium, Tantalum, Tellurium, Titanium, Tungsten and Vanadium

4.3 Existing royalty rates for some important industrial use minerals is available at-

https://ibm.gov.in/writereaddata/files/171923095266 7961e85a0a8Rates_of_Royalty_of_major_minerals. pdf.

Royalty accrual for minerals (other than coal, lignite & sand for stowing, atomic and minor mineral) by the various State Governments for the year 2020-21 to 2022-23(P) are given at **Table 4.1**.

Table 4.1
State wise Royalty Accrual of Minerals (Other than Coal, Lignite, Sand for Stowing, Atomic and Minor Minerals) from 2020-21 to 2022-23(P)

(Unit: Lakhs Rupees)

State	2020-21	2021-22	2022-23 (P)
Andhra Pradesh	34016.499	41246.73	43143.96
Assam	1180.58	1476.45	1393.25
Bihar	1079.85	710.39	NA
Chhattisgarh	232022.26	883872.12	NA
Goa	7344.22	9755.24	95.5
Gujarat	24646.037	25165.114	NA
Haryana	NA	NA	NA
Himachal Pradesh	NA	NA	NA
Jammu & Kashmir	NA	NA	NA
Jharkhand	108284.79	279140.34	NA
Karnataka	197466	409280	337486
Kerala	818.104	1060.736	NA
Madhya Pradesh	48175	58112	56393
Maharashtra	16583.50	30453.66	55869.10
Meghalaya	10032.442	12433.485	NA
Odisha	703461	1795922	1082312
Rajasthan	288627.78	367596.65	392193.55
Tamil Nadu	18008.243	17936.39	NA
Telangana	19595.89	22674.06	21076.92
Uttar Pradesh	3804.1	2452.322	NA
Uttarakhand	10.61212	41.15	NA

Source: State Government/DGM offices
P: Provisional; NA: Not Available (Data not received from concerned State Government)

5

International Cooperation

International Cooperation

Objectives:

5.1 Development of the mining sector is critical for a country's industrial development. India even though is endowed with many minerals is at the same time deficient in some of the important minerals. Hence it needs to enhance its geosciences expertise as well as technological abilities along with the acquisition of critical mineral assets abroad. The demand for critical and strategic minerals is expected to grow exponentially due to the country's push for E-mobility and Battery Storage requirements. In order to ensure mineral security, the Ministry of Mines is making its best efforts to establish a resilient supply chain of critical and strategic minerals through acquisition of mineral assets in the source countries through its JV company KABIL. Currently, engagements are underway with select source countries such as Australia, Argentina, Bolivia and Chile etc. which are endowed with the cited critical & strategic minerals specifically Lithium & Cobalt.

5.2 The Ministry of Mines is working continuously to enhance its geological and mineral resource cooperation with mineral-rich nations in order to guarantee the uninterrupted supply of minerals. In order to achieve these objectives, International Cooperation Division has been engaging in collaboration with countries like Australia, Russia, African and Latin American countries. A number of India also participates in various Internationa l Mining events by establishing an India Pavilion5 and also these platforms to create awareness about recent reforms and opportunities in the Indian mining sector to attract foreign investment in Indian mining sector.

Memorandum of Understanding (MoU) signed during the period

5.3 The Central Government has entered into bilateral agreements with the Governments of a number of countries to develop bilateral cooperation with countries that have abundant mineral resources and access to cutting-edge technologies in mineral exploration and development. Moreover, the Ministry of Mines is constantly endeavoring to seek greater engagements overseas in order to ensure mineral security for the Country.

MoU with Cote d' Ivoire

5.4 Memorandum of Understanding (MoU) between India and Republic of Cote d'Ivoire for collaboration in the field of Geology and Mineral Resources has been signed on 5.02.2024 at Cape Town, South Africa by Shri Sanjay Lohiya, Additional Secretary, Ministry of Mines on behalf of Government of India and Mr. Mamadou Sangafiwa Coulibaly, Minister of Mines, Petroleum and Energy on behalf of Government of Cote d' Ivore on the sidelines of Mining Indaba-2024 Event.

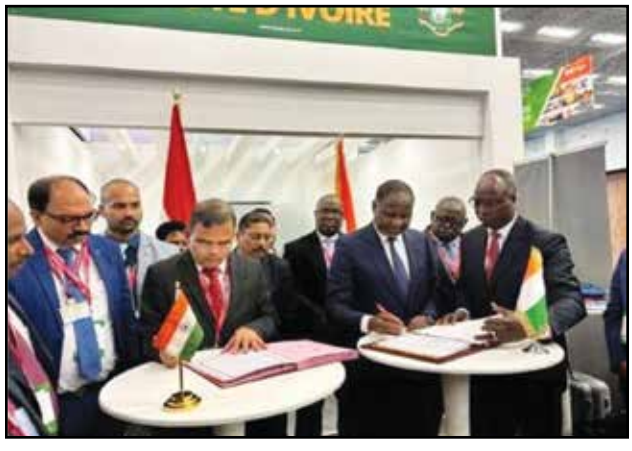


Photo 5.1: Signing of MoU Between India and Republic of Cote d' Ivoire

Bilateral Meetings

5.5 Several bilateral meetings were held with various countries during the year 2023-24 to strengthen further cooperation and collaboration in the fields of Mining, Geology, and Mineral Resources, including critical and strategic minerals.

5.6 Hon'ble Minister for Parliamentary Affairs, Coal and Mines, Shri Pralhad Joshi

had bilateral talks with Hon'ble Minister for Resources and Northern Australia Madeleine King on 10.03.2023 to strengthen the critical mineral supply chain.

Photo 5.2 : Hon'ble Minister for Resources and Northern Australia, Madeleine King meets Hon'ble Minister for Parliamentary Affairs, Coal and Mines Shri Pralhad Joshi along with officials of MoM

5.7 The 3rd Joint Working Group (JWG) Meeting between India and Peru under the Memorandum of Understanding (MoU) in the field of Geology and Mineral Resources was held on 15th March 2023 through virtual mode.

5.8 A meeting between Shri Vivek Bhardwaj, the then Secretary (Mines) with delegation of Mongolia led by H.E. Ganbold Dambajav, Ambassador of Mongolia in India was held on 09.05.2023 in Ministry of Mines, Shastri Bhawan on draft MoU on cooperation in the fields of Geology and Mineral Resources between India and Mongolia.

Photo 5.3 : Secretary Mines meeting with Ambassador of Mongolia

5.9 4th Meeting of the Joint Working Group (JWG) of India and Mozambique under the Memorandum of Understanding (MoU) for cooperation in the field of Mineral Resources was held on 06.06.2023 in Ministry of Mines, New Delhi.

5.10 The 2nd Joint Working Group meeting between India and Bolivia under the Memorandum of Understanding for cooperation in the field of Geology and Mineral Resources was held on 09.06.2023 through VC.

5.11 A meeting between Shri Vivek Bhardwaj, the then Secretary (Mines) with delegation of United Kingdom led by Ms. Christina Scott, Acting High Commissioner of United Kingdom was held on 21.06.2023 in Ministry of Mines, Shastri Bhawan to strengthen co-operation between both countries in the areas of Critical Minerals exploration, extraction, supply chain resilience and circularity

Photo 5.4 : Facilitation of Acting High Commissioner, UK by Secretary Mines

5.12 A meeting between Shri Vivek Bhardwaj, the then Secretary (Mines) with Mr. Barry O'Farrell AO, High Commissioner of Australia was held on 23.06.2023 in Ministry of Mines, Shastri Bhawan to discuss critical and strategic mineral asset acquisition in Australia.

5.13 A meeting between Dr. Veena Kumari Dermal, Joint Secretary (Mines) with

the delegation of the European Union held on 31.07.2023 in Ministry of Mines, Shastri Bhawan to discuss the proposal of India joining Critical Raw Material Club to be established by the EU.

5.14 A meeting between Shri Vivek Bhardwaj, the then Secretary (Mines) and Chilean delegation led by Mr. Sebastian Gomez, Commerce Secretary, Chile held on 08.08.2023 to discuss issues of mutual interest, such as opportunities open up in mining and lithium cooperation between Chile and India.

Photo 5.5 : Secretary Mines, Shri Vivek Bhardwaj headed meeting with delegation of Chile

5.15 A VC meeting under the Chairmanship of Dr. Veena Kumari Dermal, Joint Secretary, Ministry of Mines with Ambassador of Chile to discuss ways to explore future collaboration, held on 05.09.2023 in Ministry of Mines, Shastri Bhawan.

5.16 A meeting between Shri V.L. Kantha Rao, Secretary (Mines) with German delegation led by State Secretary, Federal Ministry for Economic Cooperation and Development (BMZ), Mr Jochen Flasbarth was held on 30.10.2023 in Ministry of Mines, Shastri Bhawan. Discussion was held on converting the abandoned mines into heritage sites to showcase the role such mines played in the economic development of the country.

5.17 A meeting between Dr. Veena Kumari Dermal, Joint Secretary, Ministry of Mines with delegation of the European Union to India led by Mrs. Renita Bhaskar, Minister Counsellor held on 02.11.2023 at Ministry of Mines, Shastri Bhawan regarding proposal on establishing a Critical Raw Materials (CRMs) Club.

5.18 A Bilateral meeting between Dr. Veena Kumari Dermal, Joint Secretary, Ministry of Mines with delegation of Australian High Commission led by Mr. Sanjiva de Silva, Counsellor held on 03.11.2023 at Ministry of Mines, Shastri Bhawan regarding discussion on Australia India Critical Minerals Investment Partnership.

5.19 A Critical Raw Materials Club bilateral meeting with delegation of European Union under the chairmanship of Sh. V. L. Kantha Rao, Secretary, Ministry of Mines was held on 23.11.2023 through Hybrid Mode at Ministry of Mines, Shastri Bhawan. Representatives from NSCS, DOC and MEA participated in the meeting.

5.20 A meeting between Sh. V.L. Kantha Rao, Secretary (Mines) with Australian High Commissioner, H.E. Philip Green held on 12.12.2023 in Ministry of Mines, New Delhi to discuss the bilateral relationship between India and Australia in the areas of Mining, Resources and Critical Minerals, and the broader priorities of both the Governments.

Photo 5.6 : Secretary Mines headed meeting with Australian High Commissioner

5.21 Shri. V.L. Kantha Rao, Secretary, Ministry of Mines has attended 7th India-US

forum event on 28.01.2024 at the Imperial Hotel in New Delhi. During the event Shri V.L. Kantha Rao, Secretary, Ministry of Mines, stated that both countries would take up joint projects on Geoscientific Data Processing, R & D in the processing of Critical Minerals, opportunities for Junior Mining Companies and the recycling of Critical Minerals.

5.22 A meeting between Shri. V.L. Kantha Rao, Secretary, Ministry of Mines with delegation of USA led by Mr. Geoffery Pyatt, Assistant Secretary for Energy Resources, USA was held on 29.01.2024. Objective of the meeting was to have deliberation on exploring opportunities for collaboration in the realms of clean energy and critical minerals, with a focus on leveraging the iCET, MSP, and IPEF platforms for enhanced cooperation.

Photo 5.7 : Secretary Mines headed Meeting with deligation of USA

5.23 A meeting between Shri V. L. Kantha Rao, Secretary, Ministry of Mines with Mr. Tim Gould, Chief Energy Economist, International Energy Agency held on 08.02.2024 in Ministry of Mines, Shastri Bhawan to discuss various dimensions of the sustainable and responsible supply chain of critical minerals for clean energy transition.

Photo 5.8 : Secretary Mines chairing a meeting with International Energy Agency

5.24 A meeting between Dr Veena Kumari Dermal, Joint Secretary, Ministry of Mines with Mr. Sanjiva De Silva, Counsellor, Australian High Commission held on 14.02.2024 in Ministry of Mines, Shastri Bhawan for update on the KABIL CMO partnership post the first meeting of KABIL CMO steering committee.

5.25 A meeting between Shri V. L. Kantha Rao, Secretary, Ministry of Mines with delegation of United Kingdom led by Ms. Christina Scott, Acting High Commissioner, UK held on 20.02.2024 in Ministry of Mines, Shastri Bhawan to discuss about India-UK Tech and Security initiatives as well as cooperation in the areas of Critical Minerals exploration, beneficiation and circularity.

Photo 5.9 : Felicitation of Ms. Christina Scott, Acting High Commissioner, UK by Shri V. L. Kantha Rao, Secretary, Ministry of Mines

5.26 A meeting between Shri Pralhad Joshi, Hon'ble Minister of Mines with Canadian delegation led by Mr. Scott Moe, Hon'ble Premier of Saskatchewan, Canada held on 21.02.2024 in Ministry of Mines, Shastri Bhawan to explore opportunities for collaborative efforts in joint research and development programs in the realm of critical minerals value chain and the clean energy sector.

Photo 5.10

5.27 A preparatory meeting under the chairmanship of Dr. Veena Kumari Dermal, Joint Secretary Ministry of Mines with Zambia held on 20.03.2024 through Hybrid Mode in Ministry of Mines, Shastri Bhawan for finalizing the agenda for the 2nd Joint working group (JWG) meeting between India and Zambia.

5.28 A bilateral meeting between Shri V.L. Kantha Rao, Secretary (Mines) with Dr. Sethuraman Panchanathan, Director, NSF, USA held on 22.03.2024 through VC to discuss about taking Collaborative Projects on Critical Minerals under the initiative on Critical and Emerging Technology (iCET) platform.

5.29 Shri V. L. Kantha Rao, Secretary (Mines) chaired a review meeting with CEO, KABIL on implementation status of KABIL-CAMYEN Agreement through VC on 29.03.2024 in Ministry of Mines, Shastri Bhawan.

Foreign Visits

5.30 An Indian delegation led by Hon'ble Minister of States for Railway, Coal & Mines, Sh. Raosaheb Patil Danve participated in 'Mining Indaba- 2023' Cape Town, South Africa during 6th to 9th February, 2023. An Indian pavilion was also setup at Mining Indaba- 2023 to showcase strength of Indian Mining and Mineral sector.

Photo 5.11 : Hon'ble Minister of States for Railway, Coal & Mines, Sh. Raosaheb Patil Danve at 'Mining Indaba- 2023' Cape Town, South Africa

5.31 Dr. Veena Kumari Dermal, Joint Secretary, Ministry of Mines, participated in I2U2 Business Forum, Abu Dhabi, UAE on 22.02.2023. The I2U2 emerged as a key platform for private and public sector stakeholders from India, Israel, the United States, and the United Arab Emirates to explore potential synergies and to deepen constructive partnerships.

5.32 An Indian delegation led by Shri Vivek Bhardwaj, the then Secretary, Ministry of Mines participated in 'PDAC- 2023' Toronto,

Canada during 5th to 8th March 2023. An Indian pavilion was also setup at 'PDAC- 2023'.

5.33 An Indian delegation led by Shri Shakil Alam, Economic Adviser, Ministry of Mines participated in the CRU's World Copper Conference- 2023 at Santiago, Chile from 17th to 19th April 2023.

5.34 Dr. Veena Kumari Dermal, Joint Secretary, Ministry of Mines participated in the International Lead and Zinc Study Group (ILZSG) and the International Copper Study Group (ICSG) meetings held in Lisbon, Portugal during 26th to 28th April, 2023.

5.35 An Indian delegation led by Dr. Veena Kumari Dermal, Joint Secretary (Mines) attended the 'DRC Mining Week Expo & Conference' held at Lubumbashi, Congo during 14th to 16th June, 2023.

5.36 An Indian delegation led by Shri V.L. Kantha Rao, Secretary (Mines) participated in High Level Meeting of International Energy Agency (IEA) on Securing Critical Minerals for a Clean Energy Future held in Paris, France on 28th September, 2023.

Photo 5.12 : Secretary Mines delivering a Keynote Address at the IEA's Summit, Paris

5.37 An Indian delegation led by Shri Shakil Alam, Economic Advisor, Ministry of mines participated in the International Oil and Mining Expo 2023 held at Ulaanbaatar, Mongolia from 3rd to 5th Oct 2023. An Indian Pavilion was also set up during the exhibition.

Photo 5.13 : Shri Shakil Alam, Economic Advisor at Indian Pavilion in International Oil and Mining Expo 2023

5.38 An Indian delegation led by Shri V.L. Kantha Rao, Secretary (Mines) participated in "London Metal Week" Annual gathering and the session on 'responsible investment into critical mineral sector in London, UK from 09th to 10th October, 2023. During the event the Indian delegation also participated in Fourth Minerals Security Partnership Principals' Meeting on 10th October, 2023.

5.39 For Mines, Coal & Railways participated in 'International Mining and Resources Conference (IMARC) - 2023' at Sydney, Australia during 31st October to 2nd November, 2023. An Indian Pavilion was set up to showcase capability and opportunity in Indian mining and mineral sector.

Photo 5.14 : Hon'ble Minister, of State for MInes, Coal & Railway Shri Raosaheb Patil Danve inaugurating Indian Pavilion at IMARC-2023

5.40 An Indian delegation led by Ms. Nirupama Kotru, Joint Secretary & Financial Advisor, Ministry of Mines has participated in 'Mining Show-2023' held in Dubai, UAE from 21st to 22.11.2023. An Indian Pavilion was set up to showcase capability and opportunity in Indian mining and mineral sector.

5.41 An Indian delegation led by Ms. Farida M. Naik, Joint Secretary, Ministry of Mines participated in the 'Future Minerals Forum 2024' held at Riyadh, Saudi Arabia from 9th to 11th January, 2024. During the event, Indian delegation shared crucial insights into India's exploration and mining sector. Deliberations were held on the significance of advancing the critical mineral value chain, a focal point in the global economy and other domains like sustainability and green technology.

5.42 An Indian delegation led by Shri Sanjay Lohiya, Additional Secretary, Ministry of event held at Cape Town, South Africa from 5th to 8th February, 2024. An Indian Pavilion was also set up to showcase capability and opportunity in Indian mining and mineral sector. Further, An MoU between Ministry of Mines and Govt. of Republic of Cote d'Ivoire for collaboration in the field of Geology and Mineral Resources has been signed on the sideline of Mining Indaba-2024.

Photo 5.15 Inauguration of Indian Pavilion by H. E. Shri Prabhat Kumar, Indian High Commissioner, South Africa and Shri Sanjay Lohiya, Additional Secretary Ministry of Mines

Photo 5.16 : Indian Pavilion at Mining Indaba-2024

5.43 An Indian delegation led by Shri V.L. Kantha Rao, Secretary (Mines) participated in Prospector Developers Association of Canada (PDAC)-2024 event held at Toronto, Canada from 3rd to 6th March, 2024. An Indian Pavilion was set up to showcase capability and opportunity in Indian mining and mineral sector. An India Day Session was also held on 4th March, 2024 at PDAC-2024.

PHOTOGRAPHS PDAC-2024

Photo 5.17

Photo 5.18

Photo 5.19 : Shri VL Kantha Rao, Secretary, Ministry of Mines delivered key note address concluding the India Day Session during PDAC-2024

Khanij Bidesh India Limited (KABIL)

5.44 Acquisition of Strategic minerals in overseas: JV Company among NALCO, HCL and MECL named Khanij Bidesh India Limited (KABIL) has been formed on 8.08.2019 to identify, acquire, develop, process and make commercialize usage of strategic minerals in overseas locations for supply in India. KABIL is focusing on identifying and sourcing battery minerals like Lithium and Cobalt. Engagement with few companies/ projects is underway in Australia, Argentina and Chile.

Australia:

- Under the MOU signed between KABIL and Critical Mineral Office (CMO), Department of Industry, Science and Resources (DISR), Govt. of Australia, the due diligence activity for selection of suitable project for Investment was started by appointing a consultant, PwC Australia in January 2023.
- Shortlisting of 5 projects (2-Lithium projects and 3-Cobalt projects) has been completed in March 2023 and detail due diligence of these projects has been started subsequently. Both the sides are actively pursuing for expediting the due diligence process through regular engagement at various level.
- On 1st November 2023, Sri Raosaheb Patil Danve, Hon'ble MoS for Mines, Coal and Railways held discussions with Ms Madeline King, Hon'ble Minister for Resources, Australia regarding expediting the process of

Argentina:

- In Argentina with reference to the MoU signed with CAMYEN, a state-owned enterprises of Catamarca province, Argentina to establish institutional co-operation for joint development of Lithium minig projects, KABIL decided for exploration and development of 5 lithium blocks of CAMYEN in Catamarca Province, Argentina, in February 2023, by signing an exploration and Development Agreement with CAMYEN.
- KABIL Board approved "Draft Exploration and Development Agreement" with CAMYEN and Proposal for opening of Branch Office in Catamarca in June 2023. Ministry of Mines has given necessary approval to KABIL for entering in to the Agreement.
- On 15.01.2024, KABIL signed an Exploration and Development Agreement with CAMYEN, a state-owned enterprise of Catamarca province of Argentina, for Exploration & mining for 5 Lithium Blocks in Argentina. The signing ceremony was virtually attended by Shri Pralhad Joshi, Hon'ble Minister of Parliamentary Affairs, Coal and Mines and Shri. V. L. Kantha Rao, Secretary, Ministry of Mines, Government of India. Shri Dinesh Bhatia, Ambassador of India to Argentina, also attended the signing ceremony. From Argentinean side H.E Shri. Raul Jalil, Governor of Catamarca Province, Argentina and other senior officials of CAMYEN attended the ceremony. This strategic move not only

strengthens the bilateral ties between India and Argentina but also contributes to the sustainable development of the mining sector.

Photo 5.20 : Signing of Exploration and Development Agreement between KABIL and CAMYEN

Chile:

- Non-Disclosure Agreement (NDA) has been signed with ENAMI, a State-owned mining company of Chile in May, 2023 to evaluate possible business opportunities concerning the exploration, extraction, processing, and commercialization of lithium.
- In November, 2023 KABIL informed ENAMI its interest for taking up the visit of technical team to Chile for geological assessment of the lithium blocks of ENAMY at the earliest and requesting for ENAMY's view on the travel plan. Indian Embassy at Chile has been contacted by KABIL for following up with ENAMY.

G20

5.45 Ministry of Mines, as a part of Energy Transition Working Group (ETWG), was actively involved in the deliberations during India's G20 Presidency from 1st December 2022 to 30th November 2023. Within the G20, was constituted to share and collaborate in accelerating clean, sustainable, affordable and inclusive energy transitions. Total four meetings of Energy Transitions Working Group were held under India's G20 Presidency starting from 5th February, 2023 to 21st July, 2023 in Bengaluru, Gandhinagar, Mumbai and Goa.

Photo 5.21 : Hon'ble Minister Shri Pralhad Joshi Addressed the 1st ETWG meeting in Bangalore

Photo 5.22 : Hon'ble MoS Shri Raosaheb Patil Danve in Energy Transition Working Group

Photo 5.23

5.46 New Delhi Leaders' declaration of G20 has acknowledged the role of critical minerals in energy Transition and a paragraph on critical mineral has been included in the declaration. Further the New Delhi Leaders Declaration also took note of the High-Level Voluntary Principles for collaboration on Critical Mineral for Energy Transition proposed by Government of India.

5.47 To take the deliverables of New Delhi Leader's Declaration Forward Ministry of Mines was actively engaged to ensure that India's narrative is embedded in the future G20 work. Ministry of Mines in coordination with Council on Energy, Environment and Water (CEEW) organized virtual session on "Decoding G20 consensus on critical minerals for energy transition on 31.10.2023.

5.48 Ministry of Mines organized an Outreach Programme on Role of Government and Industry in Driving the Global Action on Critical Minerals and Launch of the First Tranche of Auction of Critical Mineral Blocks by Hon'ble Minister of Mines on 29.11.2023 involving Ambassadors/Mission Heads of various countries as well as representatives of businesses in India and other stakeholders.

Photo 5.24 : Outreach Programme

Photo 5.25 : Launch of the First Tranche of Auction of Critical Mineral Blocks

5.49 The first Energy Transition Working Group (ETWG) Meeting under the Brazilian Presidency held virtually on 19th & 20th February, 2024. Additional Secretary, Ministry of Power highlighted the crucial role of critical minerals and associated supply chains in advancing the global energy transition during his intervention.

6

Attached / Subordinate offices

Attached / Subordinate offices

Geological Survey of India (GSI)

6.1 Founded in 1851, the Geological Survey of India (GSI) started its voyage to search for and assess coal and mineral resources of the country with regional level exploration. In later years, GSI diversified into various geoscientific activities, and have made contributions in geosciences and resultantly, in the economic growth of India.

The key functions of GSI are creation and up-dation of national geoscientific information and assessment of mineral resources. GSI has taken up ground, air-borne and marine surveys, mineral exploration, multi-disciplinary geoscientific, geo-technical, geo-environmental and natural hazard studies, glaciology, seismotectonic and fundamental research.

Organization of GSI Mission

6.2 GSI conceives and formulates its geoscientific programmes under five Missions [viz. Baseline Geoscience Data Generation (Mission-I); Natural Resources Assessment (Mission-II); Geo-informatics (Mission-III); Fundamental, Multi-disciplinary Geoscience and Special Studies (Mission- IV), and Training and Capacity Building (Mission-V)] and executed by the six regions. To ensure smooth planning, coordination and evaluation of programmes, there are three Support Systems [Scientific & Technical Support System (STSS), Administrative Support System (Ad.SS) and Policy Support System (PSS)].

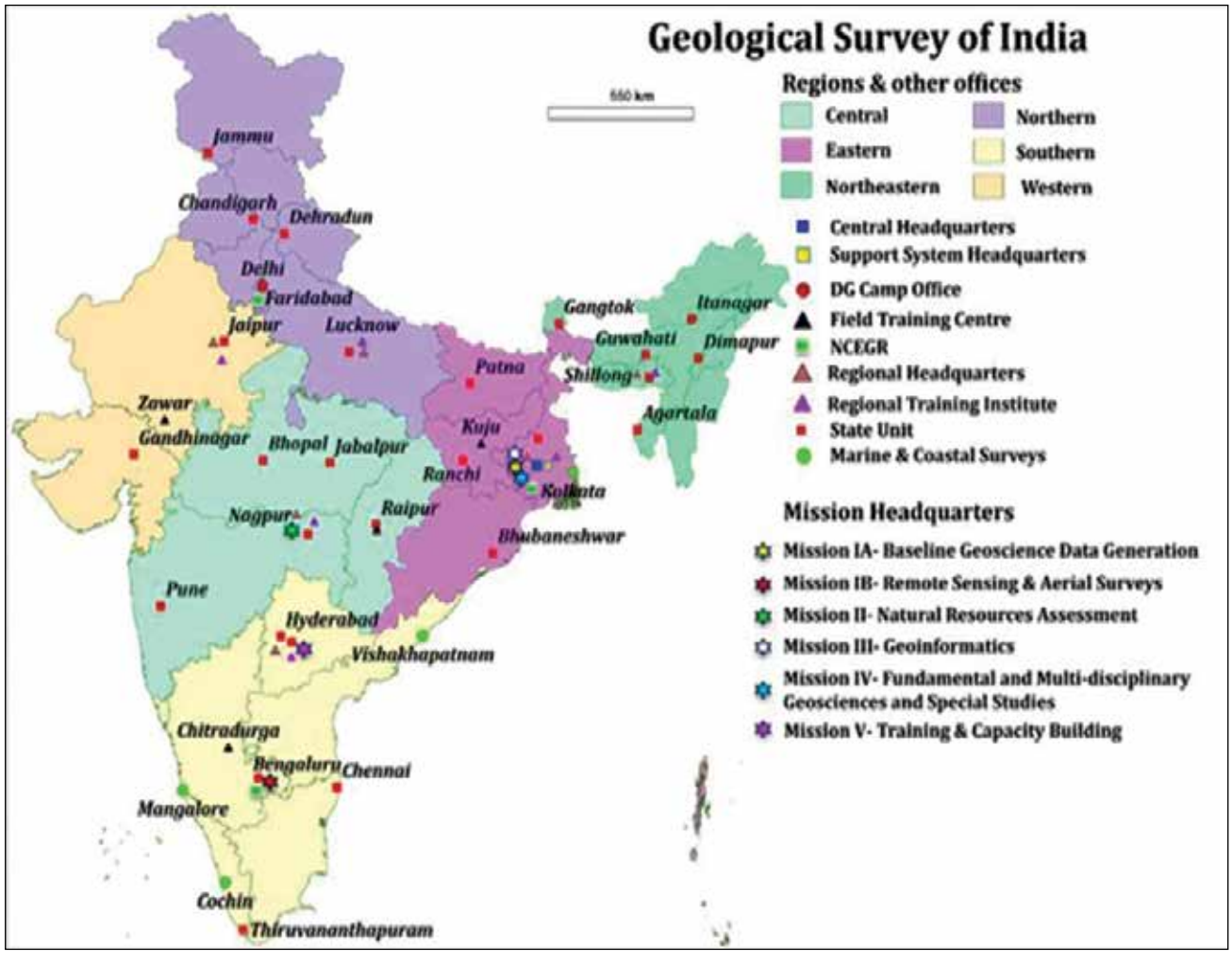


Photo 6.1 Organization of GSI Mission

MISSION - I : Baseline Geoscience Data Generation

The Baseline Geoscience Data Generation (Mission-I) activity involves Ground Surveys (Geological, Geophysical and Geochemical surveys), Marine & Coastal Surveys (Marine Survey within Territorial Water, Exclusive Economic and beyond, Zone, Coastal survey), Remote Sensing and Aerial Surveys (Aero-geophysical Survey; Photo Geology & Remote Sensing-Multispectral and Hyperspectral studies).

GSI is the only organization in India which is actively engaged in three layers of ground mapping (geology, geochemical & geophysics) of the Indian landmass. The integration of all geo-scientific data (Geological, Aero-geophysical, Geophysical, Geochemical and Remote sensing) in GIS platform is also being done for prognostication of potential mineralized belt, to resolve geological problems as well as to do public good geoscience and all data are uploaded in GSI's "BHUKOSH" portal (https://bhukosh.gsi.gov.in/Bhukosh/Public) and in "NGDR" portal (https://geodataindia.gov.in/login) for use of all other stake holders.

6.3 Systematic Geological Mapping

Systematic Geological Mapping (SGM) (1:50,000/63,360 scale) is the most fundamental and basic mapping program of GSI. The whole country, excluding a few patches of inaccessible and difficult terrains, has been covered under this program. Out of the total mappable area of 3.146 million sq.km. of the country, 3.123 million sq.km has already been covered bringing the total coverage to 99.27%. Presently no further SGM is being carried out, as GSI is carrying out second generation Specialized Thematic Mapping on 1:25,000 scale. The SGM data along with all other geoscientific data of GSI are available through 'BHUKOSH' (https://bhukosh.gsi.gov.in/Bhukosh/Public) and "NGDR" portal (https://geodataindia.gov.in/login).

The data generated through SGM is largely used in exploration and other activities. The data generated through this mapping activity has helped to build up the knowledge base and data base for National Geo-scientific information. This knowledge base has been providing the baseline data to earth science related activities of the Nation.

6.4 Specialized Thematic Mapping

Wherever it is felt that the geology is complex, and more information on a specific theme needs to be revealed, Specialized Thematic Mapping (STM) is taken up. This mapping is carried out on 1:25,000 or larger scale. It involves collection of multidisciplinary data, and is backed by advanced laboratory studies. Such thematic mapping will refine and update the existing geological knowledge base in greater detail in the light of available new scientific concepts and advancements in knowledge in different branches of Earth Science. STM plays a pivotal role in natural resource prognostication through generation of spin off on reconnaissance mineral investigation programmes (mostly G4 stage). During FS 2023-24, 0.27 lakh sq. km area has been covered from April, 2023 to March, 2024 with a cumulative achievement of 4.21 lakh sq. km area mapped by STM.

6.5 Geochemical Mapping

The National Geochemical Mapping (NGCM), in implementation since Field Season 2001-2002, aims to create a seamless baseline geochemical base map of 64 elements on 1:50,00 scale for the entire country. (**Annexure 6.1**).

However, presently 62 elements are analysed except Platinum & Palladium (Pt & Pd), these

are only analysed for areas containing basic/ ultrabasic rocks. The data helps in deriving anomalous zone(s) of elemental concentration, which may be prospective for future mineral investigation. The NGCM data along with other geoscientific data helps in generation of reconnaissance mineral investigation programmes (mostly G4 stage). It also finds application in environmental, agricultural, human health and other social concerns. The elemental analyses of NGCM samples are being done in the laboratories of GSI and sometimes outsourced from other government organizations like National Geophysical Research Institute (NGRI), Jawaharlal Nehru Aluminium Research Development and Design Centre (JNARDDC) and National Metallurgical Laboratory (NML) on need basis.

The procedure follows international standards, which are considered benchmarks for deciding anomalous value of different elements for preparation of geochemical anomaly maps. For detailed reports visit website of GSI at www.gsi.gov.in. GSI has completed the geochemical mapping in all accessible areas of country excluding Indo-Gangetic-Brahmaputra Alluvium, parts of Thar Desert and Core Deccan Trap areas in March 2024.

During FS 2023-24, 1.35 lakh sq. km area has been covered from April, 2023 to March, 2024.

The total coverage of mapping under the NGCM programme is 21.36 million sq.km including 0.093 million sq km area covered by the State Governments of Gujarat & Rajasthan under a MoU with GSI. Presently preparation of degree sheet-wise geochemical atlas is under progress.

6.6 Geophysical Mapping

Geophysical mapping under the National Geophysical Mapping Program (NGPM) comprises ground gravity and magnetic survey on 1: 50,000 scale. It aims at generating a baseline ground gravity-magnetic data and prepare geophysical anomaly map of the country. The analysis and interpretation of the NGPM data will facilitate in deriving the crustal architecture and delineating the mineral prospective zones. The results of the NGPM survey are integrated with other available geological data set and further mineral exploration programmes are launched in the favourable areas delineated by integration study. During the FS 2023-24, an area of 1.12 lakh sq. km has been covered by GSI utilizing in-house resources and 0.99 lakh sq. km by outsourcing utilizing NMET fund with a cumulative achievement 14.05 lakh sq. km area covered by NGPM.

6.7 Airborne Survey

Airborne geophysical surveys are being carried out by GSI with the fixed-wing Twin Otter Aircraft Survey System (TOASS) consisting of Magnetic and Gamma Ray Spectrometric Sensors **(Photo 6.2)**. The survey work has been initiated on 18-12-2022 for the Field Season (FS) year 2022-23 over Gaya-Dumka area in parts of Bihar, Jharkhand, and West Bengal. The continued in FS 2023-24 and covered a total 4916 sq.km.

Photo 6.2: Fixed-wing Twin Otter Aircraft Survey System (TOASS)

6.8 Multi-sensor Aero-geophysical surveys over Obvious Geological Potential (OGP) and Adjoining areas of India

Following NMEP, 2016, GSI launched its flagship programme "National Aero-Geophysical Mapping Program" (NAGMP) in April, 2017, to acquire uniform magnetic (horizontal gradiometry) and gamma ray spectrometer data initially over priority areas of 7.78 lakh sq. km Obvious Geological Potential (OGP) areas (in 12 blocks) through outsourcing using NMET fund in Phase-I.

The project is aimed to delineate concealed, deep-seated structure /litho-units capable of hosting mineralization, delineate the extension of the existing mineralized zone, and understating of shallow crustal architecture in the context of mineral occurrence.

The Project Implementing Agencies [PIAs] have been selected through global tendering to carry out the survey. Till March, 2024, a Total of 4.29 Lakh sq. km area has been covered by NAGMP. The current status of work is given below.

A. In the first phase, the NAGMP survey over 6 blocks (Block 1 to 4, 8 and 11) covering 3.55 lakh sq. km area have been covered against the target of 7.78 lakh sq. km in the states of Rajasthan, Gujarat, Madhya Pradesh, Uttar Pradesh, Chhattisgarh, Maharashtra, Andhra Pradesh, Telangana, Tamil Nadu and Karnataka. Based on the acquired data, about 150 target areas for further detailed surveys/ exploration. The aero-geophysical data of 5 blocks acquired during Phase-I of NAGMP program is being shared through "NGDR" portal (https://geodataindia.gov.in/login).

Presently, NAGMP survey over block 6 (covering parts of Andhra Pradesh and Telangana) is in progress and 60514 sq. km area has been covered till March, 2024 out of the target of 76049 sq. km. Further work is in progress.

Cumulative achievement of NAGMP survey is 4.16 lakh sq. km against the 7.78 lakh sq. km target area of Phase-I.

B. In the second phase, the NAGMP survey over block 14 & 15 (covering parts of Gujarat, Rajasthan, Madhya Pradesh and Uttar Pradesh) is under progress and 12941 sq. km area has been covered till March, 2024 out of the target of 120031 sq. km.

6.9 Hyperspectral/Multispectral Remote Sensing

During FS. 2023-24, the Remote Sensing (RS) Divisions has taken up National project on Spectral Geological Mapping (SGM) in OGP areas of the country as a part of baseline geoscience data generation, with an objective of preparation GIS compatible mineral maps on 1: 50,000 scale using ASTER multispectral data for various geo scientific studies over an area of 3.71 lakh sq. km. The 17 thematic layers on surface mineral information will be generated from each ASTER scenes using various digital image processing techniques. The multi hazard zonation project consist of 1400 sq. km in Uttarakhand has also been taken up for preparation of various geohazard zones in parts of Uttarakhand.

6.10 Marine and Coastal Surveys

Since 1983, Marine and Coastal Survey Division (M&CSD) of GSI has carried out 801 cruises so far within the Exclusive Economic Zone (EEZ) of India. GSI acquires baseline data on bathymetry [sea bottom topography], sea surface sediment distribution, sub-seabed characters, gravity, magnetic, etc. within the EEZ of India. An area of 20,42,057 sq. km out

of the total EEZ area of 21,59,620 sq.km (on 1:5,00,000 scale) accounting for 94.55% in EEZ has been covered by systematic seabed mapping till March, 2024.

The compilation and synthesis of the enormous volume of marine geoscientific data resulted in the identification of 5,89,160 sq. km as Offshore Prospective Area (OPA) for marine minerals within EEZ of India. GSI also carries out preliminary and detailed mineral investigation programme wherein an area of 2,94,824 sq.km has been covered by preliminary mineral investigation programmes out of the targeted potential area of 5,89,160 sq.km within the EEZ of India (50% coverage in preliminary exploration target area). These mineral investigation programmes paved the way for demarcation of prospective areas of offshore minerals in the Indian EEZ of different commodities like heavy minerals, sand, lime mud, phosphorite, polymetallic nodules, metalliferous mud and hydrothermal deposits. In addition, GSI has launched seabed mapping in the selected areas within the international waters from the FS 2022-23 and covered an area of 91247 sq.km for generation of baseline data with search for possible mineral occurrences in Ninety East Ridge near Equator, Indian Ocean and in the Laxmi Basin, Arabian Sea.

During 2023-24, GSI carried out systematic seabed mapping over an area of 1507 sq. km out of the targeted area of 1400 sq. km. Further, preliminary marine mineral investigation has been carried out over an area of 15730 sq.km out of the targeted area and close grid mineral investigation has been carried out over an area of 610 sq.km out of the targeted area within the EEZ. The preliminary mineral investigation programme for lime mud in the offshore of Gujarat delineated zones of lime mud and lime sand in the investigation area (Photo 6.3). Taking the offshore survey and exploration data to the next level, GSI has prepared Geological Memorandum of offshore mineral blocks of limemud (3 blocks), heavy mineral (16 blocks), construction sand (9 blocks) and polymetallic crust and nodules (7 blocks) and submitted to the Ministry of Mines. Offshore surveys for filling the data and knowledge gap and to identify the potential mineral zones and further delineation of auctionable mineral blocks will be continued.

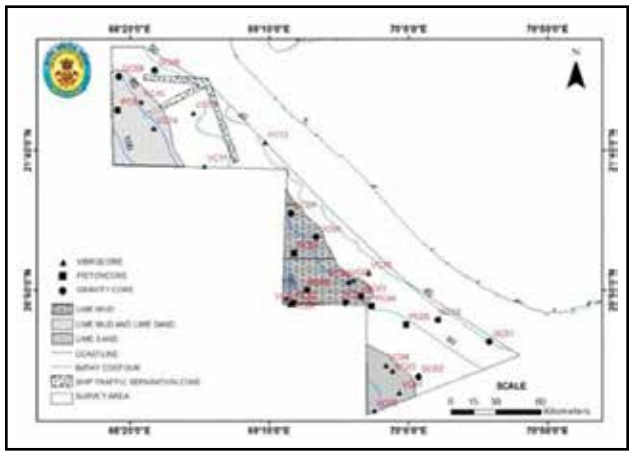


Photo 6.3: Distribution map of lime mud/lime sand in the offshore of Gujarat (Cruise SR-085)

GSI in coordination with other government organizations like CSIR-National Institute of Oceanography (CSIR-NIO) and National Centre for Polar and Ocean Research (NCPOR) carries out mineral exploration within and beyond the Exclusive Economic Zone (EEZ) of the country. In addition to the annual programmes, GSI is participating in the mineral exploration programmes for hydrothermal minerals onboard chartered vessel R/V ArGeo Searcher in the Central India Ocean in coordination with other government organizations like CSIR- National Institute of Oceanography (CSIR-NIO) and National Centre for Polar and Ocean Research (NCPOR).

Mission II: Natural Resources Assessment

6.11 Mineral Resource Assessment

The mineral exploration activities of GSI have been prioritized keeping in view the thrust areas identified by Government of

India and State Governments. GSI carries out 'reconnaissance survey' [G4], 'preliminary exploration' [G3] and 'general exploration' [G2] following the guidelines of United Nations Framework Classification (UNFC) 1997 and Minerals (Evidence of Mineral Contents) Amendment Rules, 2021. During FS 2023-24, a total of 360 mineral exploration programs were taken up by GSI, which include 11 projects on 'offshore mineral investigation', 307 projects on Mineral Exploration [24 on Ferrous Minerals, 45 on Precious Metals and Minerals, 188 on Non-Ferrous and Strategic Minerals (including fertilizer minerals), 50 on industrial Minerals] and 19 projects on Natural energy resources [13 coal, 1 lignite, 2 shale gas and 3 geothermal], 15 Regional Mineral Targeting (RMT) projects, 7 R&D projects and 1 project on Uncover (India).

6.12 Handing over of G2/G3 Reports and Geological Memorandum (GMs)

GSI has handed over 44 (G2/G3) reports to the State Governments in 2023-2024. Out of these, 15 are G2 stage investigation reports and 29 are of G3 stage investigation reports. These G2/G3 reports are of following commodities Copper (8 reports), Manganese (8 reports), Limestone (6 reports), Gold (5 reports), Iron ore (3 reports), Potassium (3 reports), Vanadium (3 reports), Zinc (2 reports), and one each of Basemetal, Dunite, Magnetite, Bauxite, Lithium, and Molybdenum.

Simultaneously, GSI handed over 66 (G4 stage) Geological Reports/Geological Memorandums to various State Governments for auction as Composite Licence. These reports include following commodities, Bauxite (14 reports), Base metal (14 reports), Limestone (8 reports), Iron Ore (8 reports), Gold (7 reports), Manganese (5 reports), Graphite (3 reports), and one (01) report each for Copper, Emarald, Lithium, Manganese, Ni- PGE-Au, Phosphorite and Tin-Tungsten.

Further, as per the MMDR Amendment Act, 2023, which empowers the Central Government to conduct auction for grant of mining lease or composite licence in respect of minerals specified in Part D (critical and strategic minerals) of First Schedule. Consequent upon this amendment GSI has handed over 21 (G2/G3) stage and 5 (G4) stage reports of critical and strategic minerals to Ministry of Mines for auction. The 21 (G2/G3) stage reports comprised of Graphite (3 reports), potash (3 reports), tungsten-lithium (3 reports), REE (2 reports), phosphorite (2 reports), nickel (2 reports) and 1 report each for glauconite, gold-vanadium, graphite-vanadium, manganese-cobalt, molybdenum and tungsten. The 5 (G4) stage reports comprised of Graphite (3 reports) and 1 report each for Ni-PGE and phosphorite.

6.13 Natural Energy Resources [Coal and Lignite]

In 2023-24 (from January 2023 to March 2024), GSI has augmented total coal resources of 2004.58 million tonnes (1090.04 MT G2, 914.54 MT G3) in Mand-Raigarh (Chhattisgarh), Godavari Valley (Telangana) and Ib River (Orissa) coalfields. Lignite resource of 740.57 million tonne has been augmented from Ramanathapuram block from Ramnad Sub-basin, Tamil Nadu. GSI has handed over 22 reports to the Ministry of Coal during this period. Out of these, 19 reports are of Coal and 03 reports of Lignite exploration.

6.14 GEOTHERMAL STUDIES

During FS 2023-24, a total of three (03) geothermal projects, two from Odisha and one (01) from Ladakh Region, have been taken up to delineate and define the geothermal resource and the work is in progress.

Mission III: Geo-informatics

Geoinformatics aims at comprehensive management and effective utilization of all geoscientific information for delivering accurate, up-to-date and comprehensive products and services, and provide crucial support to all users, Missions and stakeholders. The mission is actively involved in maintenance and management of the IT infrastructure, archival of the datasets, IT policy decision and planning for inclusive IT enablement of the organization.

6.15 Mission-III A: Data Repository and Management, Advanced Spatial Data System, IT Infrastructure & Connectivity OCBIS

Portal connecting all users, core processes, data and support systems in a web-based platform. The OCBIS portal consists of 13 Core Modules (with 29 processes), 4 e-Gov applications (with 69 processes) and 14 Support Modules (with 27 processes). The Enterprise Portal highlights the current Field Season programmes and its progress in real-time, the Geoscientific Repository "Bhukosh", Mission Details, Recent circulars, Virtual Museum and Laboratory facilities. Till date 1445 publications, 32 coffee table books, 3081 published maps and 32710 progress reports have been disseminated to users. The OCBIS portal can be viewed from the link: https://www.gsi.gov.in/webcenter/portal/.

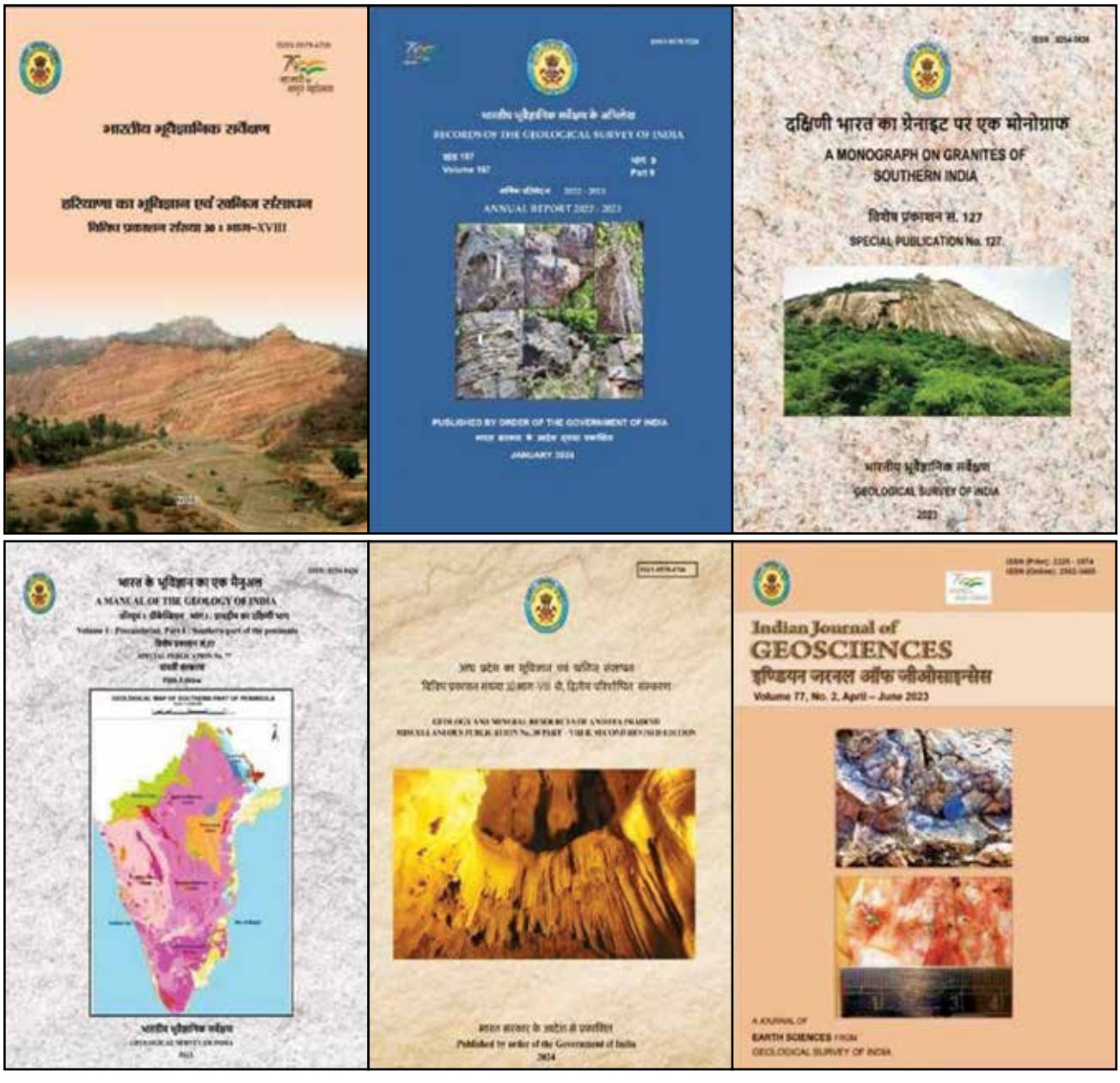
The Bhukosh geoscientific data repository provides OGC Compliant Map Services with latest Geodata base (.gdb) and Map Exchange Document (.mxd) covering 20 themes like Geology, Geophysics, Geomorphology, Geo-chemistry, Mineral, Geochronology, Geothermal, Tectonic, Seismotectonic, Landslide Inventory, NLSM, Meteorites, Glacial retreat etc. which facilitate the users to visualise, query data, create maps, print with dynamic legend and download. A total of 158 geospatial layers with 1,31,46,244 features are available. It also hosts 16407 geophysical datasets (Airborne-13,982 sets, Ground-1449 sets and Marine-976 sets). Till date 1, 73,131 geospatial map data and geophysical data sets have been downloaded among which 1, 43,719 are by registered users. Borehole Information System (BIS) is an application/service which has been developed in FSPMIS module with an aim to digitize the borehole data related information for legacy as well as ongoing Field Season Programme (FSP) exploration reports as well as a feeder database for National Geoscience Data Repository (NGDR). Till date, data of 5337 boreholes have been fed into BIS. The network infrastructure and related services have continuously been upgraded as per industry standard and based on organisational requirements. The meetings/trainings conducted over video conference have increased exponentially over couple of years. IT infrastructure facility at GSI allows officials to update the field data in GSI server right from data collection site through its own custom build field device. As a technological advancement and ease of doing business GSI has already conceptualized WLAN & SDWAN technology and these will be implemented very shortly across all GSI offices.

6.16 Mission-III B: Publication & Library

The GSI publications available in OCBIS portal are categorized as Memoirs, Bulletin Series A, B & C, Records, Special Publications, Miscellaneous Publications, Catalogues, Palaeontologia Indica and Indian Journal of Geosciences (in-house quarterly journal of GSI). A Memoir contains detailed reports on complete surveys and investigations detailing either with a particular region or with a particular mineral in one or more regions. Records mainly cover brief outline of activities of GSI of different Regions and CHQ. The Bulletin

Series A contains work done under economic geology projects and Engineering Geology. Ground water works are dealt under Bulletin Series B and Bulletin Series C documents the basic data generated by various laboratories/ specialized divisions. Special publications include the proceedings of various symposia and seminars organized by GSI as well as a set of papers dedicated to a particular field of study in earth science or of some special projects. Miscellaneous publication is a consolidated document on Geology and mineral resources of different states of India. E-News gets released from different Regions and CHQ annually or biannually. Newsletters of GSI are being prepared and uploaded in GSI portal on monthly basis.

Total 18 scientific publications in form of Bulletin series, Special Publications, Misc. Publications, Records and quarterly journals have been released during April 2023 to March 2024 **(Photo 6.4)**.



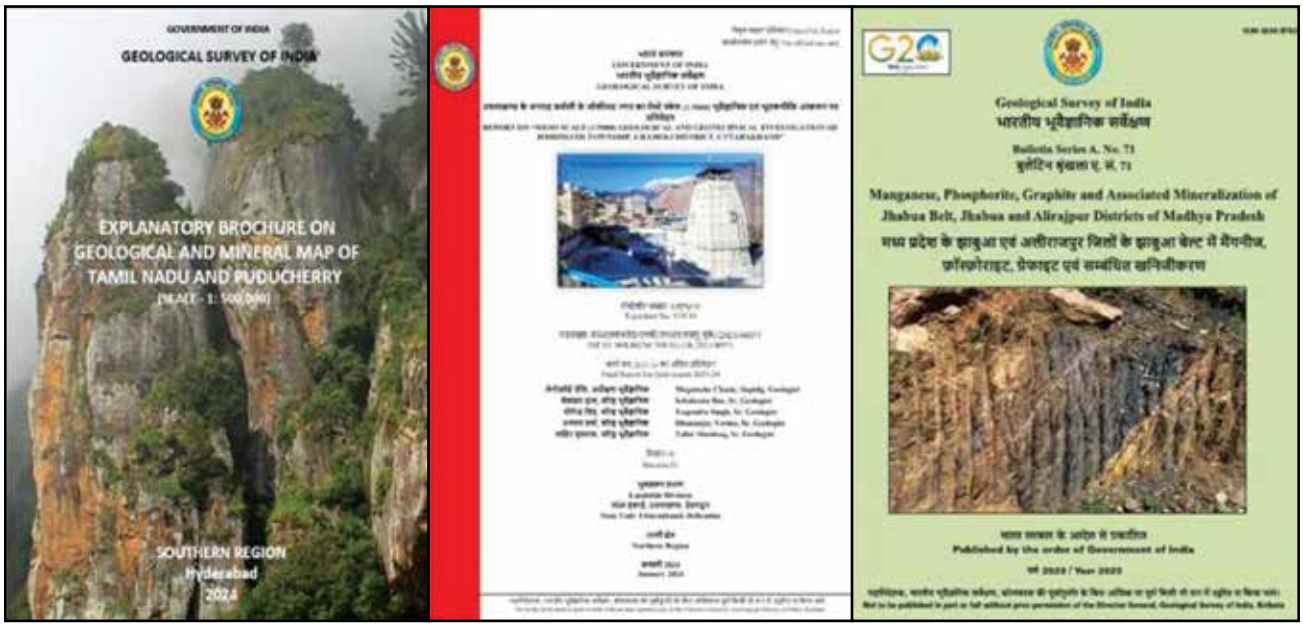


Photo 6.4: Glimpses of GSI Publications available in OCBIS Portal [viz. Memoir, Bulletin Series, Records, Palaeontologia India and Indian Journal of Geosciences]

6.17 Mission-III C: Map, Geoinformatics & Data Integration

This mission is mandated to prepare scrutiny and disseminate both analog and digital geological maps/databases for the entire country. This mission also includes compilation of maps like Geological Quadrangle Maps (GQM), District Resource Maps (DRM), Geological and Mineral maps of States, Mineral belt maps (MBM), Coalfield maps, TW Maps, etc.

The Following maps published in OCBIS: State Geological and Mineral map of Kerala (1: 0.5M scale), Meghalaya, Manipur, Tripura & Mizoram (1: 1M scale), Ladakh (1:0.5M scale) and Goa (1: 0.1M)

The following maps released in 63rd CGPB (Photo 6.5) held in Bhopal, Madhya Pradesh.

1. State Geological and Mineral map of Ladakh (1:0.5M),
2. Tamil Nadu & Puducherry (1: 0.5M),
3. Geology and Mineral Map of Andhra Pradesh on 1:2 million Scale (1: 2M),
4. DRM of North Goa and South Goa (1: 250K).

Mission III C is presently attending to the following projects:

1. State Geological and Mineral maps of Madhya Pradesh (1:0.5M), Assam (1:1M), Arunachal Pradesh (1:1M), Nagaland (1:1M), Odisha (1:0.5M) and Central Region(1:2M) are under progress and Maps of Misc. Pub 30 Uttarakhand (1:2M), Nagaland(1:1M), Manipur(1:1M), Mizoram (1:1M), Tripura (1:1M), Andaman & Nicobar Islands (1:1M), Sikkim (1:2M) are under progress.
2. 130 nos. of DRMs (10 DRMs of MP, 2 DRMs West Bengal, 3 DRMs of Andaman, 16 DRMs of Bihar, 15 DRMs of Odisha, 5 DRMs of Jharkhand, 15 DRMs of Assam, 6 DRMs of Arunachal Pradesh, 6 DRMs of Meghalaya, 5 DRMs of Manipur,10 DRMs of UP, 3 DRMs of Uttarakhand, 10 DRMs of Punjab, Haryana & HP, 6 DRMs of J & K, 7 DRMs of Karnataka, 11 DRMs of Gujarat) are under progress.

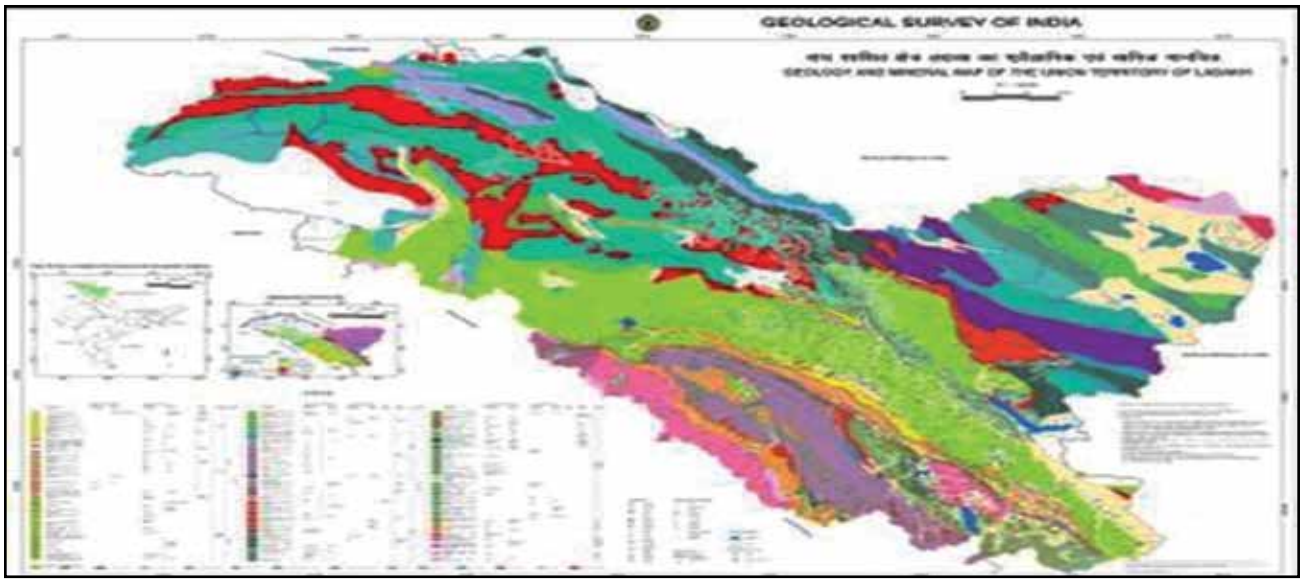
3. 3 nos. Geological Quadrangle Maps (54E, 54O and 63P) of NR
4. 9 Mineral Belt Maps of Gujarat
5. Creation of commodity wise GIS database in Maharashtra, Chhattisgarh, Madhya Pradesh, Bihar, Odisha, Jharkhand, Sikkim, Andhra Pradesh, Telangana & Karnataka.
6. Compilation and preparing a separate geo- database for Thematic Geological Maps in 1:25K scale using STM.
7. Updation of 1:25K scale geodatabase of Central Region, Southern Region, North-eastern Region, Eastern Region. Progress of updation for Western region and Northern Region are also underway.
8. Synthesis and collation of All India National Geochemical Map data (NGCM) and National Geophysical Map data (NGPM) on 1:50,000 scale and their uploading on Bhukosh (OCBIS Geoportal).
9. A total 20 nos. of TW & CZ Maps (Scale 1:50,000 scale) have been scrutinized, approved and published and 08 nos. of TW & CZ maps have been scrutinised and sent to respective division for modification/finalisation.
10. A total of 638 T.S of NGCM (SSS), 485 nos. of T.S Gravity and 494 nos. of T.S Magnetic (scale: 1:50,000) data has been uploaded on Bhukosh OCBIS Geoportal for public access.
11. Creation and finalization of the geodata-base and layout of the Metallogenic Map of India is under progress.
12. Layout of the Mineral Map of India (scale: 1:50,000) has been completed in the Arc-GIS platform.

National Geoscience Data Repository (NGDR)

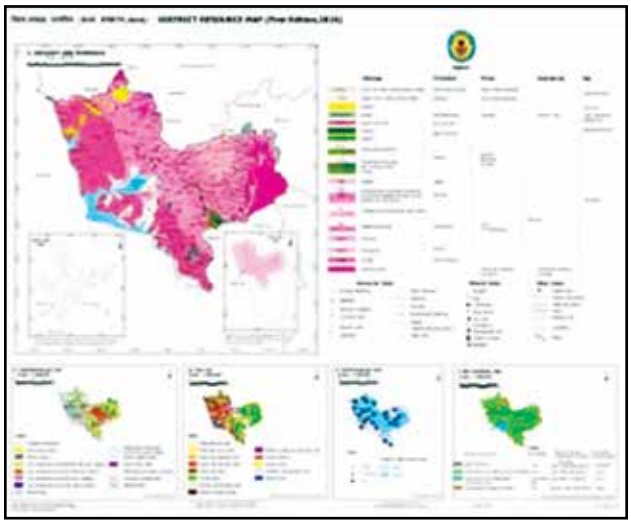
NGDR is a flagship initiative conceptualised by Ministry of Mines as a part of National Mineral Exploration Policy (NMEP), 2016 for hosting all exploration related geoscientific data for dissemination to all the stakeholders so as to expedite, enhance and facilitate the exploration coverage of the country. GSI is the nodal agency for the implementation of NGDR project. The project is being funded by NMET.

The NGDR portal had been inaugurated in the month of December, 2023 by Shri Pralhad Joshi, Union Minister of Parliamentary Affairs, Coal and Mines of India, at New Delhi for public and stakeholders **(Photo 6.6 & 6.7)**. Milestone-3 (Development of Mobile App of NGDR and integration of Milestone-1 & 2 with the map) and Milestone-4 (3D visualization of borehole) and Milestone-5 (Go-Live, System stabilization, Hand holding) of NGDR project has been completed during the tenure. Currently, 40 map services and data layers have been incorporated with NGDR portal. Additional functionalities like proximity calculation, query builder, map printing and downloading in PDF format and on the fly contour generation from geochemical and ground geophysical data has been implemented within NGDR portal. Establishment of NDMAC (NGDR Data Management and Analysis Centre) is also under progress.

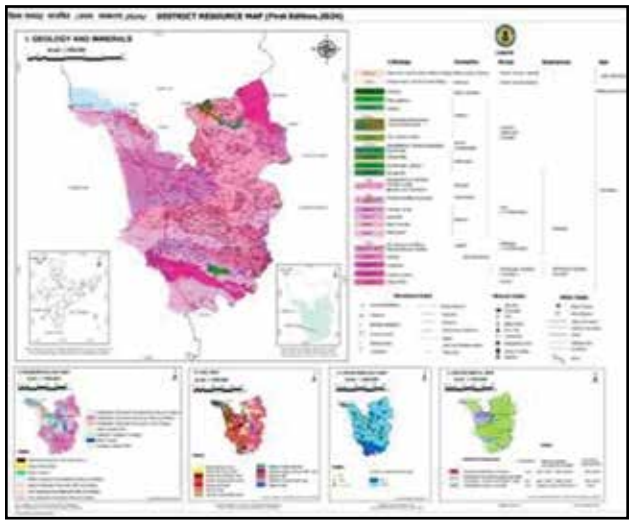
A total 11084 nos. of reports, including 7393 exploration reports and 3691 baseline reports has been handed over in phased manner to BISAG-N for digitization & geodatabase creation. Geodatabase in unified schema have been created by BISAG-N for 10710 reports. 10632 reports have been received by GSI for scrutinization. Geodatabase of 6802 reports have been scrutinized by GSI and sent to BISAG-N for uploading. 6172 reports uploaded to NGDR portal through MERT.



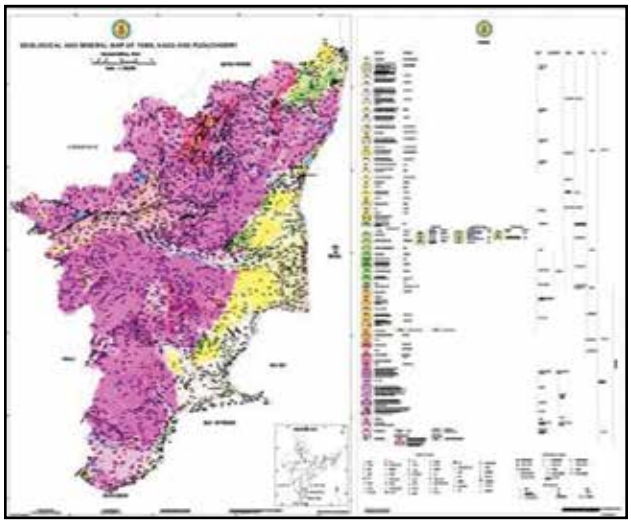
Geology and Mineral Map of the UT of Ladakh



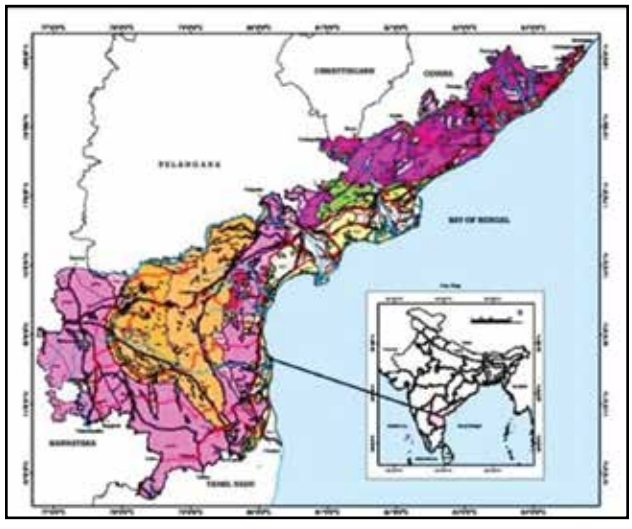
District Resource Maps of North Goa



District Resource Maps of South Goa



Geological and Mineral Map of Tamil Nadu and Puducherry



Geology and Mineral Map of Andhra Pradesh in 1:2 million Scale (Misc.Pub.30)

Photo 6.5: GSI Maps available in OCBIS Portal [viz. Geology and Mineral Map, District Resource Maps, etc

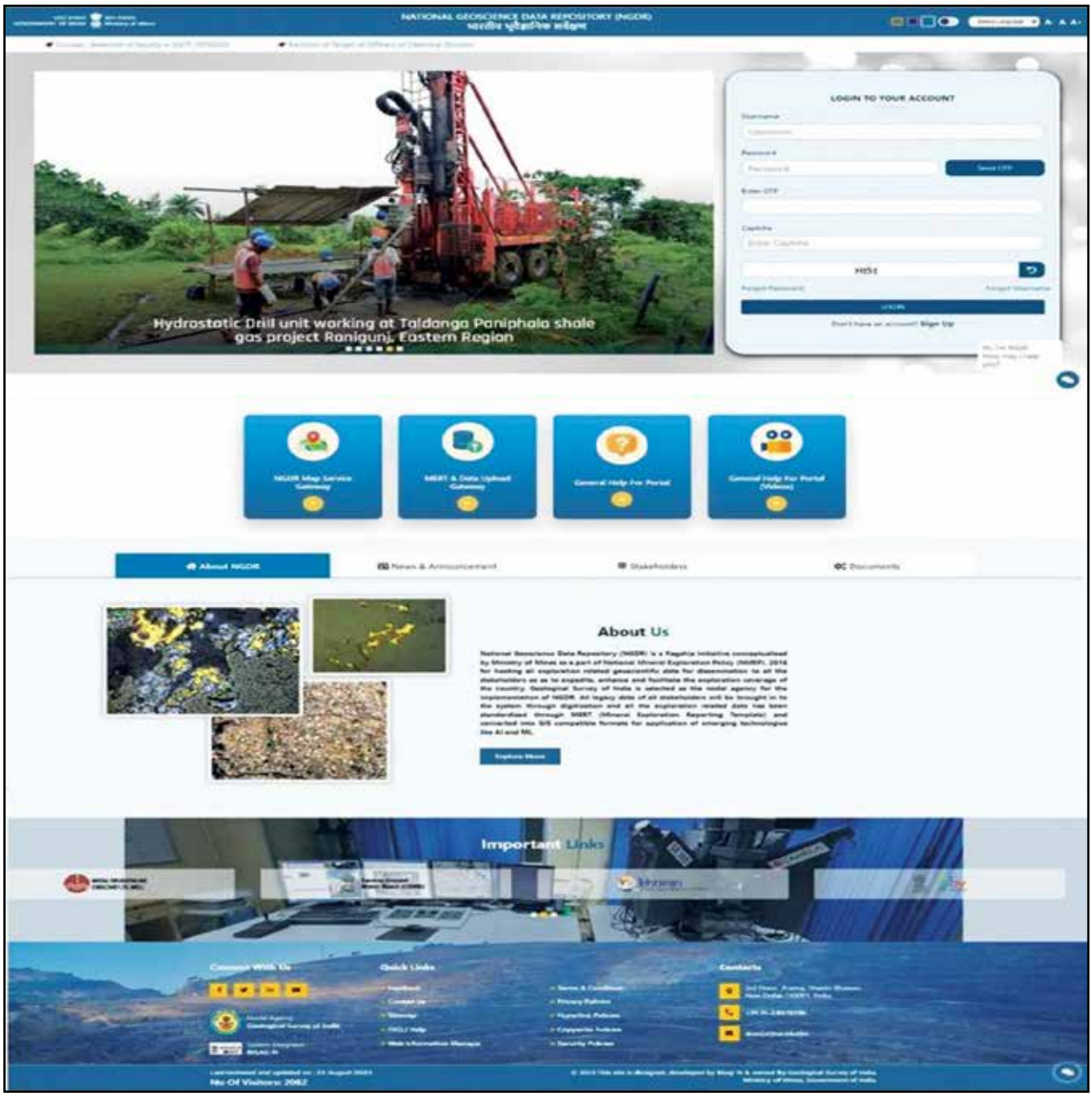


Photo 6.6: Web interface of the newly developed NGDR portal (https://geodataindia.gov.in/login)

Photo 6.7: Launch of NGDR portal at an event at New Delhi

Mission IV: Fundamental, Multi-disciplinary Geoscience and Special Studies

The National Mission–IV, with Headquarters at Kolkata, is making significant contributions towards studies related either to understanding and mitigation of geogenic societal problems or in research and development pertaining to geological controls of economically significant mineral system, terrain evolution, fossils, meteorites, gemstones and many similar aspects of fundamental geology. A huge quantum of work has been oriented towards public benefit in the form of engineering geological studies, slope stability assessment, landslide susceptibility mapping and glaciological studies. The understanding of glacial lake outburst flood (GLOF) and landslide related lake outburst flood (LLOF) have been taken up once again in recent times with renewed vigour. In addition, keeping in view the newer challenges from polluted environment, ground water contamination, river course alteration, river bank instability, global warming and changing sea level increasing number of projects of Mission-IV are now being designed to apply geo-scientific knowledge in assessing and quantifying the environmental hazards as well as to come up with possible mitigation techniques.The R&D programs of Mission-IV are mainly focussed towards understanding of the controls of mineralization of economically significant minerals. In addition, research is in progress on desertification, carbon sequestration in geological environments, possible role of micro-organisms in development of geological landforms, palaeontological study and their implications on biodiversity and climate, meteorite, planetary science, crater deformation, carbon structure and its utilities and many such current topics. GSI is also performing its geoscientific R&D studies in the most extreme parts of the world like the Arctic, Antarctic and the Himalayas GSI.

In order to carry out fundamental and applied research as well as to support the mapping and exploration activities of GSI, the National Mission–IV is equipped with high-end state-of the-art laboratories, a robust R&D infrastructure and expertise in the form of three National Centre of Excellence in Geoscientific Research (NCEGR) situated in Kolkata, Bengaluru and Delhi NCR (Faridabad) and six regional laboratories across the country under Mission-IV.

The Mission IV activities of GSI are structured under three sub-missions viz. 1. Geotechnical Geohazards Management (M-IVA), 2. Climate Change & Eco Systems, Polar Studies, Environmental Geology, Medical Geology & Bio- geohazards (M-IVB), 3. Fundamental Geosciences Research and Development (M-IVC).

During FS 2023-24, 153 items were taken up under Mission-IV which includes 78 items of M-IVA, 33 items of M-IVB and 42 items of M-IVC. The major activities pursued by GSI in M-IVA centre around developmental and societal issues related to Geotechnical projects, Landslide studies and Seismo-tectonic studies.

6.18 Geotechnical Geohazards Management (M-IVA)

During 2023-24, under landslide study, the research project on 'Development and implementation of regional landslide early warning system at two sites Darjeeling Himalaya in West Bengal and Nilgiris hills in Tamil Nadu' was in continuation of the LANDSLIP project initiated in 2017. As part of its endeavour to expand the prototype framework for a regional landslide early forecasting system in India, GSI issued experimental landslide forecast bulletins on daily basis for Darjeeling and Kalimpong district, West Bengal and Nilgiris district, Tamil Nadu and Rudraprayag district, Uttarakhand

w.e.f. 1st June 2023. The issuance of bulletin for Darjeeling, Kalimpong and Rudraprayag was closed on 31.10.2023 after the end of the SW monsoon, whereas it was issued for the Nilgiris district, Tamil Nadu up to 31st January 2024. The evaluation of the various components of model is under progress by GSI. As per the approved strategy plan, similar LEWS experimentation in 11 landslide prone States will be carried out up to 2025.

During 2023-24, projects work is continuing in Himachal Pradesh, Kerala, Karnataka,Sikkim, Assam, Nagaland, Meghalaya and Mizoram. The augmentation of essential infrastructure for establishing a state-of the-art landslide forecasting facility at GHRM Centre, Kolkata is under progress, which will enable GSI, in near future, to operationalize landslide forecasting in India.

In landslide sector, GSI has already prioritized its investigations on meso-scale (1:10,000) and site specific (1:1000/2000) scales for generating more detailed scientific inputs for directly using the same in detailed developmental planning and site-specific landslide mitigations.

During 2023-24, GSI has taken up 31 meso-scale projects and has also taken up detailed site-specific landslide investigations for four active landslides. GSI has completed macro-scale (1:50,000) landslide susceptibility mapping for 4.3 lakh sq. km area spreading over 18 landslide-prone States/UTs by March 31, 2022 and uploaded the above GIS enabled landslide susceptibility map data of 4.3 lakh sq. km. areas on its Bhukosh map portal (https://bhukosh.gsi.gov.in/Bhukosh/Public) for free downloading and use by all stakeholders and the community. Along with the 1:50k landslide susceptibility map, the vital geodata also contains 87,230 landslide incidences as polygons and 30,881 field validated landslides as landslide inventory points with detailed geo- parametric attributes. The national level landslide geodatabase of GSI is now also mirrored with the GIS map portal services of the National Disaster Management Authority (NDMA) through Web Map Service (WMS) for integrating the same vital geodata with an aim to use it for landslide disaster management plans by different landslide prone States/ UTs. GSI on the request of the State Govt. took up work related with ground subsidence issue of Joshimath area on priority and subsequently handed over a detailed Report on Geological & Geotechnical investigation of Joshimath Township, Chamoli District to the Uttarakhand Govt.

Seismotectonic studies are being done through Geodynamic Studies Division (GSD) and Seismo-Geodetic Data Receiving and Processing Centre (SGDRPC) situated at Kolkata. They are carrying out real time recording, monitoring and scientific study of earthquakes through its pan India network of GPS-GNSS stations and seismograph observatories established across the country. A number of 34 Permanent GPS-GNSS stations have already been installed in different parts of the country and data from these locations are being analysed to monitor long term crustal movement and establish strain model by GSD. GSD has completed 3-year long campaign mode GPS survey in the Andaman Islands. The division has taken up a comprehensive item involving DEM-based morphotectonic study, traverse mapping, campaign mode GPS and MEQ (Micro-Earthquake) survey in parts of the Darjeeling-Sikkim Himalayas along the Tista River to elucidate the tectonic control, crustal deformation and dynamicity of the existing fault system. GSD is also providing technical support to the Earthquake Geology divisions of various regional offices of GSI from where campaign mode GPS studies are being carried out in parts of the Himachal Himalaya, Central Indian Tectonic Zone and North Bengal.

SGDRPC is doing acquisition, processing and analysis of Real-Time Seismo-Geodetic data collected from ten (10) broadband seismic observatories. It has completed detailed MEQ survey in parts of North Bihar to understand the seismicity pattern, nature and distribution of seismogenic sources. Besides, resistivity survey was undertaken for the 13th Mile landslide on J.N. Road, East Sikkim District, Sikkim and Gayabari (14th Mile) landslide on NH-55, Darjeeling District, West Bengal during FS 2022-23.

During FS 2023-24, SGDRPC has carried out MEQ studies in parts of Kalaburgi, Vijayapura and Bidar districts of Karnataka, as requested by the state government. Seismic site response studies and resistivity survey are envisaged to be taken up around Mon town area, Mon district, and Wokha- Doyang road corridor, Wokha district, Nagaland. SGDRPC is also working to publish a Compendium on Micro-Earthquake studies undertaken by GSI across the country.

6.19 Climate Change & Eco Systems, Polar Studies, Environmental Geology, Medical Geology & Bio-Geohazards (M-IVB)

Under M-IVB, glaciology projects are being pursued to study the recessional pattern and mass balance of the glaciers in Himalayas, to identify the potential areas for high Glacial Lake Outburst Flood (GLOF) risk and update the inventory of Himalayan glaciers. A total of three (03) items, focussed on glaciological studies, are presently underway in M-IV for FS 2023-24. Polar research, are being carried out from NCEGR, Faridabad. These projects, a total of four (04) items, are mainly devoted to Ice Sheet Dynamics, both in Arctic and Antarctic, with special reference to climate change. In addition, one (01) item is in execution in the Polar region for study of hard rock geology and thematic mapping of the Archaean-Precambrian terrains.

Under the public good geosciences and societal cause projects geogenic contamination of surface/ subsurface water with Arsenic (As), Fluoride (F), Lead (Pb), Uranium (U) and other toxic elements are being studied under Environmental Geology programs in Madhya Pradesh, Bihar, West Bengal, Jharkhand, Assam, Haryana, Punjab, Uttar Pradesh, Andhra Pradesh and Chhattisgarh. A total of fifteen (15) projects are oriented towards understanding of groundwater contamination. Several of these projects are in MoU with CGWB. In addition, work is in progress for understanding of river bank stability and flood susceptibility, coastal susceptibility to wave erosion, soil contamination from e-waste or industrial waste and similar other studies.

6.20 Fundamental Geosciences Research and Development (M-IVC)

In M-IVC, fundamental research is being carried out in three principal branches of geosciences viz., Petrology, Palaeontology, and Geochronology & Isotope Geology. The other branches are Meteorite and Planetary sciences, Gemmology, Himalayan Geology, Volcanology, Quaternary geology and Experimental petrology. The projects of Petrology are invariably designed to understand either the controls of mineralization or potential for mineralization in various geological terrains. A total of twenty-two (22) items are presently being carried out on these lines. Programs of Geochronology & Isotope Geology are also oriented along similar lines. In addition, a few isotope geology teams are working either on environmental issues or on dating of neotectonic events. A total of fifteen (15) projects on Palaeontological studies are devoted towards understanding the evolution of life on earth and its implication towards climatic changes through ages. Additionally, one item (01) is being carried out for

preparation of complete digital repository of all available type fossils/ fossils in collection of GSI curatoria GSI has been declared as the Nodal agency and curator of all Meteorite Falls and Finds within the Indian Territory **(Photo 6.8)**. At present there is a total of 643 meteorites available in the repository. The Meteorite and Planetary Science Division is carrying out classification and characterization of the newly collected meteorites and construction of a new high-end repository cum display gallery for the meteorites in stock. In addition, the Division is engaged in a research program that can contribute simultaneously towards understanding of proliferation of microbes in specific geogenic environment, its implication in groundwater contamination as well as its implication towards understanding of potentiality life on Mars.

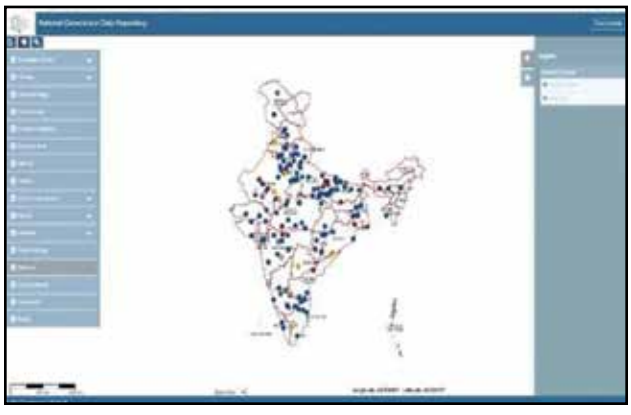


Photo. 6.8: Meteorite Map of India available at NGDR portal (https://geodataindia.gov.in)

The Gemmology Laboratory, NCEGR, Kolkata is extending paid (as per Schedule of Charges) services to public in identifying gems and precious stones including diamond.

In FS 2023-24, 2564 gemstones were tested on payment basis till November, 2023. Further 1638 gemstones were tested for Customs and reports have been provided within stipulated timeframe. A total revenue of Rs 33, 83,137/- was generated from the paid services.Under Mission-IV, out of 153 standard items carried out during FS 2023-24, the outcome of 110 items have direct societal benefits and 22 projects were exclusively focussed on R&D to aid and boost mineral exploration activities of GSI.

Mission V: Training and Capacity Building

6.21 Human Resource Development

Geological Survey of India Training Institute (GSITI) is presently conducting training programmes at nine centres across India. These are 1) Hyderabad, 2) Nagpur, 3) Lucknow, 4) Kolkata, 5) Shillong, 6) Jaipur, 7) Chitradurga (Karnataka), 8) Kuju (Jharkhand) and 9) Raipur (Chhattisgarh). The Hyderabad Centre is designated as the headquarters for all other eight centres imparting field training and has specialized divisions for laboratory and classroom trainings.

In total, from January 2023 to March 2024, 339 training courses were conducted for 15158 participants. Several need-based programmes were conducted on the theme Cyber Security, Awareness and safety for the officers of GSI. Workshops/Seminars were conducted on the application of National Geochemical Mapping programme data and the use of the NGDR portal. Training courses were also conducted on Artificial Intelligence and machine learning. During the period three international courses were conducted for 70 International participants from 34 ITEC countries, under the Indian Technical and Economic Cooperation (ITEC) programme sponsored by MEA, Government of India. In continuation of the Commemoration of 75 years of India's Independence (Azadi ka Amrit Mahotsav), from January 2023 to March 2024 GSITI organized 112 field-based, laboratory-based, e- Lecture/Training sessions from its HQ-Divisions, Regional Training Divisions and Field Training Centres. GSITI could reach 8070 participants across India under the Azadi ka Amrit Mahotsav programme.

Photo 6.9: Participants attending training at GSI Training Institute and FTCs

PSS: Policy Support System

6.22 Central Geological Programming Board (CGPB)

The Central Geological Programming Board (CGPB) is the apex body at the national level under the chairmanship of Secretary, Mines, to coordinate the activities on geological mapping, mineral prospecting and exploration in the country. Similarly, the State Geological Programming Boards (SGPB) in every State to coordinate the geoscientific activities in the States, complementing the CGPB and to interface with CGPB and GSI.

GSI is the Nodal Department (Member Secretary) and the State Geology and Mining Departments, Central Government Agencies, PSUs, Other Ministries and Industry Representatives are the participating members.

Under the chairmanship of the Secretary, Ministry of Mines, Govt. of India, CGPB meeting is being organized annually to discuss the geological programs and the related issues and concerns of the State Governments, central institutes and other stakeholders working in mineral exploration and other geoscience fields. The annual Field Season Program (FSP) of GSI is also placed before the august gathering to avoid duplicity in work.

To keep pace with the major reforms in the mining sector and amendments in the Mines and Minerals (Development and Regulation) Act, 1957 from the year 2015 to 2023, the central government prescribed constitution of various entities at central and district level like NMET and DMF to support the either spectrum of the mineral sector with NMET facilitating mineral exploration and DMF catering to the socio-economic development and welfare of mining affected areas and people. With the continued focus on self-reliance, various private exploration agencieshave been accredited by the Central Government to

undertake prospecting operations and mineral explorations in the country. The CGPB and its twelve committees have been reconstituted vide a series of resolutions, and in the year 2023, the CGPB and its twelve committees have been reconstituted vide resolution dated 18.08.2023, comprising representatives from 12 Ministries/Departments of Govt. of India, Advisor (Minerals), NITI Aayog, 30 Heads of Central Organisations, 06 representatives of Industries, Secretaries (Mining and Geology) of State Governments, Directors of Geology & Mining of States, GSI and any other special invitee with the permission of the Chairman.

Outcome of 62nd CGPB along with focus/main agenda of 62nd CGPB Meeting

The 62nd meeting of the Central Geological Programming Board (CGPB) was held on 09.02.2023 at A.P. Shinde Symposium Hall, NASC Complex, Indian Council of Agricultural Research (ICAR), DPS Marg, Pusa, New Delhi under the Chairmanship of Shri Vivek Bharadwaj, Secretary, Ministry of Mines, Govt. of India. Dr. S. Raju, Director General, GSI, Shri Sanjay Lohiya, Additional Secretary, Ministry of Mines and Shri Janardan Prasad, Additional Director General, GSI have also shared the dais on the occasion. Senior officers of Ministry of Mines, Geological Survey of India (GSI), members from other Central Ministries, State Directorates of Mining and Geology, representatives from private mining industries, PSUs, Mining associations and other stakeholders were also actively participated in this meeting.

The Secretary, Mines & Chairman, CGPB handed over fifteen (15 mineral exploration reports (G2 & G3 stage) to representatives from 10 State Governments, i.e., Andhra Pradesh, Arunachal Pradesh, Bihar, Chhattisgarh, Jammu & Kashmir, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan and Tamil Nadu. Apart from this, 17 reports on Coal and Lignite were also handed over to Ministry of Coal. An exhibition showcasing adoption of Green Mining Technologies by Indian Companies, Advancement in Exploration of Deep seated/Concealed Deposits, New Technology in Marine/Off-shore Exploration, Aero-Geophysical Survey for Mineral Targeting and promotion of Geoheritage Sites in India, was also inaugurated by the Secretary, Mines & Chairman, CGPB.

A total number of 46 new agenda items were obtained from various stakeholders including State Governments, Central Agencies, PSUs, Private Sectors and GSI for discussion in the 62nd CGPB meeting.

The outcome of 62nd CGPB meeting are summarized as under:

- GSI has proposed 37 programmes in collaboration with universities/agencies and under sponsorship of different Govt. authorities etc.
- CMPDI and GSI to focus on the coal exploration programs in North Eastern Region (NER).
- NMDC and Oil India Limited to sign a MoU for identifying lithium in oil brines/ seepages.
- Commodity-wise GIS based status map of precious group of minerals to be shared in the OCBIS portal and NGDR to make it accessible to all State DGMs and other stakeholders.
- State DGMs and private agencies to participate more actively for limestone exploration.
- A research project entitled "Assessment of low-grade Chromite and associated Nickel in the stabilized Mine dumps of Sukrangi Chromite Mines of Odisha Mining Corporation, Jajpur district,

Odisha" has been proposed to be taken up during FS 2023-24 in collaboration with DMG, Odisha.

- A scheme has been issued by Ministry of Mines for the engagement of Notified Private Exploration Agencies for mineral exploration through the NMET fund vide OM dated 10.05.2022. The Notified Private Exploration Agencies shall undertake exploration in respect of the category of minerals and mineral deposits under which it has been notified in consultation with respective State DGMs/DMGs.

Salient points of 19th CGPB Committee meetings

The 19th CGPB Committee Meetings (I to XII) were conducted in the months of September-October and December 2023. The salient points of 19th CGPB Committee meetings are as follows:

- Iron ore and manganese exploration to be carried out at G-3 & G-2 stage respectively.
- A policy to be prepared in collaboration with all the concerned agencies regarding the blending of low grade and high-grade ore for resource/reserve augmentation.
- The members/stakeholders were requested to share data on gold exploration programmes carried out in various cratons and belts for the last 60-70 years for compilation of all India gold exploration data.
- Finalisation of Special Publication on Gold in India has to be done at the earliest.
- State Agencies to expedite the auctioning of GMs and GRs handed over to them.
- Compilation and preparation of known resources of Industrial and Fertiliser minerals (IFMs) on ArcGIS platform.
- Preparing an inventory of trace elements and REEs concentration occurring in Indian coal.
- Search for REE and Li in the youngest granites of NER to be intensified and new alkaline complexes or suite of rocks may be identified for mineral prospecting.
- Second generation of OCBIS Portal sooner to get operational.
- New Field Season Programmes have been proposed by GSI involving Mineral Prospecting and Analysis through Machine Learning (ML) and Artificial Intelligence (AI) by using technology expertise of Mission-III and domain expertise of Mission-I.

63rd CGPB Meeting

The 63rd meeting of the Central Geological Programming Board (CGPB) was held on 22.01.2024 at Kushabhau Thakre International Convention Centre, Bhopal, Madhya Pradesh under the chairmanship of Shri V.L. Kantha Rao, Secretary, Ministry of Mines. Shri Sanjay Lohiya, Additional Secretary, Ministry of Mines; Shri Janardan Prasad, Director General, GSI and Shri Asit Saha, DDG, PSS-P&M, GSI has also shared the dais on the occasion. The meeting attracted the presence of senior functionaries of different Central Ministries/Organisations, State Directorates of Mining & Geology, PSUs, representatives from private mining industry, mining associations and other stakeholders.

For the ensuing year 2024-25, GSI has formulated about 1055 scientific programs for the year 2024-25, which includes 392 Mineral Development projects (G2; G3; G4 and Offshore Explorations) that has the potential to generate auctionable mineral blocks in near future and 133 are the Mineral Discovery Projects (RMT; Research Project; C-MAP; GT; MPA; Multispectral/Hyperspectral projects) having potential for generating areas

for further exploration in G4 stage. Within the exploration activity, the major thrust has been given on the exploration of strategic & critical and fertilizer minerals. A total of 188 projects on strategic and critical minerals including 18 programs on fertilizer minerals have been proposed for FS 2024-25.

Besides, approval of the FSP items of GSI, the Report on Geological & Geotechnical investigation of Joshimath Township, Chamoli District was also unveiled by Shri V.L. Kantha Rao, Secretary, Ministry of Mines for handing it over to Uttarakhand Govt. The Mineral Map of the newly carved out UT of Ladakh was also released on this occasion along with other significant publications of GSI.

During his address, Shri V. L. Kantha Rao, Secretary, Ministry of Mines highlighted the importance of scientific rigor in mining sector. He urged GSI and other exploration agencies to increase the pace of exploration and emphasized on exploration of Critical Minerals. He also urged the State Governments to be more aggressive in implementation of exploration projects through NMET funding. He requested stakeholders to make use of geoscience data available in NGDR portal for smooth exploration process.

A two-hour session was also held for the recently launched National Geoscience Data Repository (NGDR) Portal, to brief stakeholders about this cloud-based portal, that will host all pre- competitive baseline geological and mineral exploration data, making it available to all participants in the mineral and mining sectors.

In the presence of other senior officials, Shri V.L. Kantha Rao, inaugurated an Exhibition on the theme, "Mining and Beyond", in which GSI, PSUs, DMFs, major mining companies, private exploration agencies, startups, Madhya Pradesh Government showcased their achievements. PSUs like Manganese Ore India Ltd. (MOIL), Hindustan Copper Limited (HCL), National Aluminium Company Ltd. (NALCO), Explorations & Consultancy Ltd. (MECL) etc. showcased their best practices and technical advancements in this exhibition.

The outcome of 63rd CGPB meeting are summarized as under:

- Engaging applications of emerging technologies viz. Drone technology, AI/ ML to enhance the mineral exploration activities in the country.
- To formulate a mineral-wise SOP for critical minerals.
- Private Industries and State DGMs/DMGs to engage CSIR labs in the study of critical minerals.
- Sharing of data by all exploration agencies on NGDR.
- All State DGMs/DMGs to provide handholding to the private agencies in preparation and submission of proposals.
- Notified Private Exploration Agencies (NPEAs) to come up with good projects on beneficiation and processing of critical minerals.
- All exploration agencies to take initiatives in offshore mining sector.

Photo 6.10: Release of the Mineral Map of the newly carved out UT of Ladakh by the dignitaries

Photo 6.11: Release of the report on Geological and Geotechnical Investigation on Joshimath Township, Chamoli District, Uttarakhand by the dignitaries

Photo 6.12: Inauguration of exhibition on theme of "Mining and Beyond" at Minto Hall, Bhopal.

Photo 6.13: View of various stakeholders participating in the 63rd CGPB meeting

6.23 Quality Management (QM) Cell of GSI

GSI establishes and maintains standardized procedures as a primary measure of quality control for its various technical activities. This standardization is guaranteed through the development of distinct Standard Operating Procedures (SOPs) for all the technical activities conducted by GSI. Thereafter, it is ensured that each of the projects and items of GSI are executed, strictly adhering to the SOPs. NABL accreditation of the Chemical Laboratories of GSI is done to ensure the quality of the different analyses carried out by the various laboratories of GSI. This also guarantees that the analytical studies being carried out by GSI for incorporation in the technical reports are of international standards and ensures the satisfaction of stakeholders/end-users. As a measure of quality control, randomly selected Technical Reports and Field Season Proposals are externally peer reviewed.

As a part of quality control check of the different standard items being executed by GSI in FS 2023-24, a total of 171 randomly selected proposals were taken up for External Peer Review. The selected proposals of the FS 2023-24 were reviewed by panel of External Experts. The panel comprised of retired personnel from GSI, eminent Professors from Universities and serving professionals from other organizations. Similarly, a total of 163 randomly selected proposals from among the items that GSI, shall be executing during FS 2024-25, has been taken up for External Peer Review after the approval from the competent authority. External Peer Review Process of these project proposals had been completed before the 63rd CGPB Meeting. External peer review of 20% reports of FS 2019-20 submitted during FS 2020-21 & FS 2021-22 has been carried out. Out of the 624 standard reports submitted by the six (06) Regions, Central facilities, Remote Sensing & Aerial Survey and Marine & Coastal Survey Division; 126 reports were randomly selected domain-wise for external peer review. The external peer review process for the reports of FS 2020-21 submitted during FS 2021-22 & FS 2022-

23 has also been initiated and the procedure for the external peer review of the randomly selected reports by external experts is under progress. During FS year 2022-23, Standard Operating Procedure (SOP) for "Spectral Geological Mapping in OGP areas using ASTER data on 1:50000 scale" was drafted and has been scrutinized at all levels.

The SOP has also been Externally Peer Reviewed by two external domain experts and thereafter it has been approved by the Competent Authority. The SOP is formulated in such a way, so as to keep the quality of work at par with the international standards. In similar lines the formulation of the SOP on "Exploration for REE and other trace elements in Gondwana Sediments" has been taken up. The SOP has been sent to subject experts for internal peer review.

6.24 International Cooperation

The international activities of the Geological Survey of India (GSI) continued by way of interaction with numerous international scientific organisations/ bodies and foreign agencies through active involvement in collaborative programmes and scientific projects including participation in seminars/ symposia/ workshops/meetings, etc. Geological Survey of India being the premier earth science organization in the country has been collaborating with other countries for knowledge sharing and technology upgradation.

6.25 Bilateral Collaborative Activities

A. Bilateral Meetings

I. **India-Brazil (CPRM, Brazil):** A virtual technical meeting between GSI and Geological Survey of Brazil (CPRM), Brazil was held on 19.04.2023 to discuss about the collaboration proposal on Marine Geology, especially EIA for mining in seabed. GSI mentioned that GSI wants to acquire knowledge and expertise regarding EIA for mining in seabed. Brazil side indicated that they will first provide lists of guidelines to carry out the assessment, thereafter discussion will be held between GSI and CPRM regarding grey area of GSI within the guidelines provided by CPRM, thus CPRM will help GSI for gaining expertise.

Photo 6.14: Glimpse of meeting between GSI and CPRM, Brazil

An online meeting chaired by Joint Secretary, Ministry of Mines was attended by GSI officer on 17.03.2023, wherein progress of GSI-CPRM, Brazil MoU was discussed.

II. **India-Australia (Geoscience Australia-GA) :** In pursuance of the Memorandum of Understanding (MoU) between GSI and Geoscience, Australia (GA) as well as 3rd ToR under the same MoU, two virtual interactive meetings between Geoscience Australia (GA) and GSI were held. The first one was conducted on 28.04.2023 to discuss about the selection of samples from Uncover Transects (Northern and Southern) and other modalities for Geochronology Secondment as well as guidance for National Geological Data Repository (NGDR) project of GSI from GA. During the meeting GA discussed the procedure of sample selection and

other aspects on geochronology. The progress of work by GSI in NGDR project is also appreciated by GA in the meeting.

Photo 6.15: Glimpse of first meeting between GSI and GA

Second virtual meeting between Geological Survey of India (GSI) and Geoscience Australia (GA), for Geochronology Secondment was conducted on 01.09.2023 to discuss in detail the science questions GSI are hoping to answer using geochronology and to talk about the sampling strategy as well as logistics for sending samples to Australia. GSI informed the progress of the sample collection by the Geochronology secondment team and a detailed discussion was held regarding the samples collected for the geochronological studies (from both transects) and some action points were decided for sending the samples to Australia.

Photo 6.16: Glimpse of second meeting between GSI and Geoscience Australia

A virtual Interactive Meeting between Geological Survey of India (GSI) and Geoscience Australia (GA), for Geochronology Secondment under the 3rd Term of Reference (TOR) was conducted on 23.02.2024 with the aim to have technical discussion regarding 09 geochronology samples (from N-Transect and S-Transect) sent to Geoscience Australia for laboratory study and to confer about the possible dates for the visit of Geochronology four members team of GSI to Geoscience Australia, for Geochronology Secondment under the 3rd Term of Reference (ToR).

Photo 6.17: Glimpse of virtual meeting between GSI and Geoscience Australia to confer about the possible dates for the visit of Geochronology four members team of GSI to Geoscience Australia

III. **India-Mozambique:** One officer attended 4th JWG meeting between India and Mozambique on cooperation in the field of Mineral Resources in the Ministry of Mines, New Delhi on 06.06.2023. Joint Secretary, Ministry of Mines co-chaired the same. The details of various training plans by GSI that can be imparted to Mozambique geoscientists were discussed during the meeting.

IV. **India-Bolivia:** One officer attended 2nd JWG meeting virtually between India and Bolivia on 09.06.2023 led by Joint Secretary, Ministry of Mines. Details of trainings imparted by GSI were discussed and Bolivian side was requested to

convey their requirements, so that GSI can provide customized trainings.

V. **India-Finland (Geological Survey of Finland -GTK, Finland) :** A virtual meeting between GSI and GTK, Finland under the MoU on cooperation in field of Geology and Mineral Resources had been conducted on 14.06.2023 with an aim to discuss on mineral potential and mineral intelligence. Finland side agreed to share necessary information on artificial intelligence and modelling. The meeting was concluded with a very positive thought on future collaboration project and/or apposite training on artificial intelligence, modelling and other advanced techniques to acquire more accuracy in searching of minerals.

Photo 6.18: Glimpse of meeting between GSI & GTK, Finland

A virtual meeting was held on mineral prospectivity modelling and machine learning methodology for mineral investigation between Geological Survey of India and Geological Survey of Finland GTK on 12.01.2024.

Photo 6.19: Glimpse of the meeting on mineral prospectivity modelling and machine learning methodology for mineral investigation between GSI and GTK

VI. **India-USA:** One officer attended a Meeting between Honble Minister of State, DAE and PMO with US Senator on 12.04.2023 at New Delhi, wherein discussion on the ongoing collaboration between GSI with USA institute between GSI and USA was held.

Another meeting with US delegation represented by Department of Energy (DoE), USA with Indian team led by the Member (Energy), NITI Aayog was attended by one officer from GSI conducted on 16.07.2023.

VII. **India-Nepal:** One officer attended the meeting to resolve the issues between India and Nepal, related to draft DPR of Pancheshwar Multipurpose Project towards finalization of DPR held on 21.07.2023 & 22.07.2023, at New Delhi. A review meeting on geo-technical investigation works for drilling and drifting of Sapta Kosi Multipurpose Projects (SKMP) and Sun Kosi Kamla Diversion Multipurpose Projects (SKDMP), Nepal was also attended by one officer at Delhi on 08.11.2023. One officer attended the 5th Meeting of Team of Experts/officials (ToE/O), from 6th to 7th October, 2023 in Kathmandu, Nepal and 17th Meeting of Joint Team of Experts (JTE), from 9th to 11th October, 2023 at Biratnagar, Nepal.

VIII. **India-Bhutan:** One officer attended the meeting on issues related to India-Bhutan Cooperation on flood management, progress made and strategy for resolving them conducted on 29.08.2023, at New Delhi.

Another officer attended 7th meeting of reconstituted Joint Technical Team between the Royal Govt. of Bhutan (RGoB) and Govt. of India (GoI) at Phuentsholing, Bhutan during 5th to 6th October, 2023.

IX. GSI- AMD: One virtual interactive meeting was conducted with AMD on 13.04.2023 to discuss about the ideas, protocols and modalities for the formulation of collaborative programme for capacity building in the field of exploration of critical minerals under the aegis of Sub-Group on Mining of the Working Group on Modernization and Industrial Cooperation under the Intergovernmental Russian-Indian Commission of Trade, Economic, Scientific, Technical and Cultural cooperation. In the meeting it was decided that AMD and GSI will share the grey areas in exploration of critical mineral first, thereafter the collaborative project proposal will be prepared on the basis of interest of the both.

Photo 6.20: Glimpse of meeting between GSI and AMD

X. GSI – CISRO" : A meeting was held between Shri. Janardan Prasad, Director General, GSI, and Dr. Erick Ramanaidou, Research Team Leader, Basin Ore Genesis, Iron Ore, and Critical Minerals, Commonwealth Scientific and Industrial Research Organization (CSIRO), Australia, at the chamber of DG, GSI, CHQ, Kolkata, on 12.12.2023. The aim of the meeting was to discuss the research project 'Targeting and characterizing critical minerals in the most prospective regions of India" as part of the New Policy Proposal (NPP) India Australia on critical metals.

Photo 6.21: Glimpse of meeting between GSI and CISRO

B. Other international activities

International Affairs division continued its endeavor towards providing and facilitating necessary technical and associated inputs/ comments/agenda points/action taken report/ note/talking points to Ministry of Mines, from time to time, UK-India Business Council's 8th edition of 'Doing Business in India Report', EU FTA negotiations on Energy & Raw Material (ERM), 1st JWG meeting on cooperation in the field of Geology and Mineral Resources between India and Bolivia, ATR on 7th Session of Working Group on Priority Investment Projects, ATR of India-Bolivia 1st JWG meeting, progress made on Signed Protocol of the Sub-Group on Mining, G- 20 report, ATR on 3rd JWG between India- Mozambique, India-Peru Joint Commission Meeting, Inputs relating to the Czech Republic, Inter-Ministerial Meeting on 4th India - El Salvador Foreign Office Consultation, talking points for India to Australia to attend Quad summit, agenda points of 2nd JWG meeting between India and Bolivia, inputs for India- Zambia Foreign Office Consultations, inputs on mineral resource of Sri Lanka, necessary inputs related to Surinam, cooperation in mining sector with Cameroon, Foreign Office Consultations with Brazil and Ecuador, Follow-up of the Joint Working Group Meeting between India

and Mozambique, various inputs to Ministry on Canada, Zambia, Brazil and Paraguay, Australia, Zimbabwe, Peru, Russia, Australia, USA, IMC for Japan, Kabil, Madagaskar, Argentina, China collaboration between India and US under the Initiative on Critical and Emerging Technologies (iCET) Framework, New Delhi, cooperation between NITI Aayog and US Department of State and Department of Commerce on 'Proposed Workplan for Carbon Capture and Storage (CCS) etc.

C. Geotechnical Consultancy Services

GSI has been rendering geotechnical consultancy services for various hydroelectric projects of Nepal and Bhutan.

1. One officer from GSI, has been deputed for two years for construction stage geo-technical investigation of Punatsangch-hu-II Hydroelectric Project, Bhutan.
2. One officer has been deputed for three years for construction stage geotechnical investigation of Punatsangchhu-I Hydro-electric Project, Bhutan.
3. One officer has visited Bhutan during 16th February to 19th February, 2023 for geotechnical investigation of different of Punatsangchhu-I Hydroelectric Project, and rendering necessary site-specific suggestions.

D. InternationalVisits/Workshops/ Seminars/ Symposiums/ Exhibitions

I. Dr. S. Ravi, DDG has visited South Africa as part of the Indian delegation led by the Hon'ble Minister of State for Railways, Coal and Mines to participate in 'Mining Indaba- 2023' at Cape Town, South Africa, during 6th to 9th February, 2023. Various meetings held with different companies regarding rapid Core Scanning analysis for quicker exploration decision making, development of mineral processing- metallurgical -extraction technologies for REE, Li. Co and other critical minerals and Rapid XRF analysis with Portable XRF equipment apart from bilateral meetings with various countries.

II. Shri Rajinder Kumar, DDG and Smt Varsha Ashok Aglawe, DDG have visited Canada as part of the Indian delegation led by the Secretary, Ministry of Mines to participate in 'PDAC- 2023' at Toronto, Canada, during 5th to 8th March, 2023. The event has provided a unique opportunity on recent developments in the field of mineral investigation, exploration, surveys, drilling and data storage & study as shown by different countries.

III. Shri Anindya Bhattacharya, DDG and Dr. M.N. Praveen, Director participated in the DRC Mining Week Expo and Conference at Congo from 14th to 16th June, 2023 as a part of Government of India Delegation led by Joint Secretary, MoM.

IV. Dr. M.L. Dora, Director attended the 14th International Platinum Symposium, Cardiff University, U.K from 4th to 7th July 2023. He also presented a research paper on "Age and Ore genesis of Ni-PGM-Bi-Te (critical mineral) prospects associated with unusual ca.2.5 Ga zircon clusters, Gondpipri mafic-ultramafics, central India: Constraints from integrated geochemistry and in-situ U-Pb dating".

V. Dr. Basab Mukhopadhyay, DDG participated in a Webinar promoted by the Center of Excellence for the Brazilian Sea (Cembra) on 19.07.2023 and represented India in this Webinar.

VI. Shri R. Sajeev, Director participated in the Society of Economic Geologists (SEG) 2023 held on 26th to 29th August 2023 at London, U.K. He also delivered a speed

talk on the topic 'Role of Hydrothermal Solution in Base Metal Enrichment in Alwar Basin, Alwar, Rajasthan, India'.

VII. Shri Mohammad Sadiq, Superintending Geologist attended the High-level meeting of International Energy Agency on Securing Critical Minerals for a Clean Energy Future held on 28.09.2023 in Paris, France as Government of India delegation led by Secretary, Ministry of Mines.

VIII. Shri L.M.S. Maura, DDG and Dr. Apurba Banerjee, Director participated in Mongolia International Mining & Oil Expo-2023 scheduled between 3rd to 5th October, 2023 as Government of India delegation led by Economic Advisor, Ministry of Mines.

IX. Shri Satya Narayan Mahapatro, DDG visited Sydney, Australia as part of Indian delegation under the leadership of Hon'ble Minister of State for Mines, Coal and Railways to Australia to participate in International Mining and Resources Conference (IMARC) - 2023 held during the period 31st October to 2nd November, 2023. It was a great opportunity to have first-hand knowledge on new methods, technologies and services being practiced or developed in exploration, mining and beneficiation sectors across the world and possibility of adopting in India.

X. Dr. Debashree Pratap Singh, Director participated in the 19th Annual General Meeting (AGM) of Intergovernmental Forum on Mining, Minerals, Metals and Sustainable Development scheduled between 6th-9th November, 2023 at Geneva, Switzerland as Government of India delegation led by Deputy Secretary, Ministry of Mines.

XI. Dr. Sailendra Singh, DDG attended the 'Mining Show – 2023' scheduled from 21st to 22nd November, 2023 in Dubai, UAE as Government of India delegation led by Joint Secretary, Ministry of Mines.

XII. Dr. Sudip Bhattacharyya, DDG participated in the Future Mineral Forum 2024 held on 9th to 11th January, 2024 in Riyadh, Saudi Arabia.

XIII. Shri Rambabu Pinninti, Geophysicist participated in expedition for near-seabed geophysical surveys using Autonomous Underwater Vehicles in the first leg of the voyage for Hydrothermal Exploration a joint program of MoES held on 1st Feb to 27th March, 2024.

XIV. Shri Pankaj Kumar, DDG and Shri Shareef Mohamed, Director participated in in Mining Indaba- 2024 scheduled between 5th to 8th February, 2024 in Cape Town, South Africa.

XV. Shri Rathindra Lal Sarkar, DDG and Shri Pradeep Kumar Jena, Director participated in PDAC- 2024 scheduled between 3rd to 6th March, 2024 in Toronto, Canada.

XVI. Shri Paradkar Trigun Trivikram, Senior Geologist accompanied the Indian delegation to Mauritania to work out the various modalities of supply of Rock Phosphate to India scheduled on 20th to 22nd March, 2024.

XVII. Dr. Sandip Kumar Roy, DDG participated in the Minerals Security Partnership (MSP) working level meeting on Minerals Recycling/ seminar on Energy Security and Critical Minerals scheduled between 21st to 22nd March, 2024 in Tokyo, Japan.

XVIII. Shri Nagasundaram Mohan, Senior Geologist participated in expedition for near- seabed geophysical surveys using Autonomous Underwater Vehicles

in the second leg of the voyage for Hydrothermal Exploration a joint program of MoES scheduled for one month scheduled from 26.03.2024.

6.26 Collaborative Projects with Other Organizations

During the FY 2023-24, GSI has taken up nineteen (19) collaborative projects with different organizations and institutes like CSIR-NGRI, Indian Register of Shipping, NML, CGWB, OMC, Directorate of Mines-Odisha, Oil India Ltd., IIT Kanpur, IIT Bombay, Savitribai Phule Pune University, Space Application Centre-ISRO, Himachal Pradesh SDMA, SBICAPS, ICAR- Central Institute for Subtropical Horticulture, MECL, HPSDMA, NHAI, ISRO, Survey of India and IMMT etc

STSS: Scientific & Technical Support System

6.27 ISO certification of Chemical Laboratories & Central Headquarters

The Central Chemical Laboratories (XRF and ICPMS laboratories) at GSI, CHQ and the Regional Chemical Laboratories at NR, SR, WR, CR, ER & NCEGR Faridabad along with SU: Chemical Laboratories at Pune, Bhubaneswar and Chennai have been accredited by National Accreditation Board for Testing and Calibration Laboratories, Government of India as per ISO/IEC 17025:2017. For an accredited laboratory to maintain its accreditation status, it is mandatory that the laboratory continue to comply with the The Re-assessment of all the Regional laboratories have been done in the field of Testing as per ISO/IEC 17025:2017. All the laboratories have been participating in Proficiency Testing (PT) GeoPT Program and Inter Laboratory comparison on regular interval, and the performance of the laboratories were found satisfactory, i.e. Z score within ± 2. The newly established Coal Testing Laboratory at GSI, SR Hyderabad was also granted accreditation in accordance with ISO/IEC 17025:2017 in the discipline of chemical testing by the National Accreditation Board for Testing and Calibration Laboratories (NABL) in the month of March 2024. It is the first chemical laboratory of GSI accredited by NABL for the testing of coal for proximate analysis.

Photo 6.22: NABL Accreditation of Coal Testing Laboratory and Inspection Visit by the Lead Assessor

6.28 Modernization program in GSI

The state-of-the-art instrumental facilities of GSI mainly operate under the aegis of National Centre of Excellence in Geoscience Research (NCEGR) with main centre in Kolkata and satellite centres at Bangalore and Faridabad. Existing Laboratory instruments like EMPA, SEM, XRD, Raman Spectroscope, Gemmology, fluid inclusion , TL-CSL Dating, Radiocarbon Dating, Isotope Ratio Mass Spectrometer (IRMS), Laser Ablation Inductively Coupled Plasma Mass Spectrometer (LA-Q-ICPMS) and Laser Ablation Multi -collector Inductively Coupled Plasma Mass Spectrometer (LA-MCICPMS) laboratories are operating successfully along with fundamental laboratories such as petrology and palaeontology , State of the art technology is also being used in GHRM Centre, CHQ, Kolkata in the domains of GPS Geodesy, landslide and INSAR.

In the seamless endeavour to establish GSI as

a world premier geoscientific institute, moderation programme to improve the functioning of GSI in its different spheres of geoscientific activities has been continued during 2023-24. The modernisation programme not only aims for upgradation of the existing analytical facilities/capabilities for generating, processing, interpreting geoscience data but simultaneously to introduce latest technical knowhow, support operational activities of GSI as well as procure/plan high end machineries and scientific equipment in different domains in a phased manner.

High-Resolution Secondary-Ion-Mass Spectrometer (HRSIMS) instrument IMS 1300 HR3 along with accessories and with all ancillary items has been commissioned in the G&IG division, NCEGR, Kolkata **(Photo. 6.9)**. The advanced facility is only 2nd in India and has the potential to analyse different isotopic systems for geological applications in high resolution which will be helpful in mineral targeting studies (with the help of selected isotopes such as Sulphur, Oxygen and Carbon), studies related to public good geosciences (such as environmental, paleoclimate etc.), meteorite study etc. At present calibration/protocol development/standardisation for different light isotopic systematics are in progress and shortly the laboratory will be ready to cater the needs of GSI for approved FSP programs.

Photo 6.23: High-resolution Secondary Ionization Mass Spectrometry (HR-SIMS) at GSI Kolkata

During the period, procurement of high-end machineries such as ICPMS, AAS-GTA, DGPS, Magnetometer and Gravimeters have been completed for generation of high- quality geoscientific data. Work of establishment of National Landslide Forecasting Centre is in progress which will allow a robust forecasting landslide management in the country.

The SEM laboratory, GSI, Kolkata is the process of procuring one FESEM, with secondary Electron detector SE, Backscattered Electron detector BSE and Cathodo luminescence (CL) detectors. FESEM and EDS will be advantageous in studies in the domain of mineral exploration, shale gas exploration, landslide and engineering geology, meteorite and planetary science research apart from petrology and palaeontology. As a part of the up-gradation of the Palynology, Microfossil and Invertebrate Processing Laboratories, procurement of Fume Chamber, Thin section grinding and polishing machine, Centrifuge and upgradation of inverted Biological Microscope with digital camera attachment is in process. An advanced Stereozoom Microscope for the Microfossil Laboratory has also been proposed. Further procurement of EPMA for GSI, Regional office and X-Ray Diffractometer with ancillary units for Mineral Physics division, Kolkata is under process.

Besides the above mentioned major high-end instruments, various other geological, chemical, geophysical, geotechnical and drilling instruments are also in the procured/ planned stages for FY 2023-24, with optimum utilization of the fund.

6.29 Internal Resource Generation

In the FY 2023-24, total Rs. 2,94,90,372 (Rupees two crore ninety-four lakh ninety thousand three hundred seventy-two) only has been generated as Internal Resource and Rs. 30,86,639 (Rupees thirty lakh eighty-six thousand six hundred thirty-nine) only collected as Service Tax and Cess by way of undertaking various commercial activities such

as sponsored commercial geotechnical works; multidisciplinary & fundamental research; sale of maps, unpublished reports; providing analyses of samples (petrological/ chemical/ mineral physics/ geotechnical Labs.), EPMA studies and gem testing etc.

6.30 Activity-wise budget expenditure of GSI against the approved budget grant during FY 2022- 23 and the activity wise total BE grant and expenditure of FY 2023-24 is given in **Annexure 6.2**.

Human Resources

6.31 Out of the total sanctioned strength of GSI i.e. 8676 (*) as on 31.03.2024, 6027 posts are occupied. The group-wise and category-wise details of personnel as on 31.03.2024 are given in **Table 6.1**.

Table 6.1
Statement showing category wise details of sanction & filled up strength in GSI as on 31.03.2024

Statement Showing category-wise details of existing staff of GSI as on 31/03/2024								
Class	Revised Sanctioned Strength As Proposed By The Ministry	Men In Posi-tion	SC	ST	OBC	No.of Wom-en	PH	Total (SC, ST, OBC, Wom-en, PH)
Group-A	3439	2892	450	450	450	450	450	450
Group-B (Gaz.)	912	520	108	61	111	88	8	376
Group-B (NG) (Min.)	3439	2892	450	450	450	450	450	450
Group-B (NG) (Tech.)	890	304	49	30	50	18	6	153
Group-C (Min.)	520	393	60	31	89	61	8	249
Group-C (Tech.)	1232	552	88	59	159	22	11	339
MTS (Erstwhile Gr-D)	1022	1022	159	109	147	133	26	574
TOTAL	**8676(*)**	**6027**	**995**	**580**	**1480**	**1254**	**98**	**4407**

(*) Out of 8676, 28 posts are yet to be created. The Ministry vide letter dated 18.08.2022 has intimated about the creation of 02 posts in Organised Services the details of which has not been conveyed till date. Moreover, 02 posts of Director level have been created in the Ministry in lieu of 02 posts of Director (Geology) of GSI vide MoM letter dated 28.02.2024.

6.32 Public Relation and Media Management

The Public Relation and Media (PRM) Cells are operational in all the regional headquarters of GSI and are working in close coordination with the PRM cell of GSI CHQ, Kolkata. The highlights of GSI's activities and achievements are routinely shared by the PRM cells with the national, regional and local media houses in English, Hindi and Vernaculars using press briefs & press releases, influencer programs, interviews & talk shows etc. as well as through social media posts in all GSI handles. There has been a very consistent increase in the visibility of GSI's activities and achievements in all the media platforms throughout the year. Major emphasis has been given to social media posts for dissemination of information as it provides direct and instant connect to the large number of tech-savvy young people across the country. In the past year GSI has gained about 20,774 new followers in the social media platforms. Total number of 'Impressions' in social media handles including Facebook, Twitter, Instagram, YouTube, LinkedIn and Koo together has touched the figure of around 17,32,186 and the total number of 'Engagement received' (people commented/ shared posts/ Videos Viewed) is around 1,56,262. Apart from social media posts, GSI activities were covered in more than 421

newspaper reports, 25 Television channels and 03 Radio channel broadcasts as well as in 112 online portal and media platforms, taking the total count to 561. The major events covered in these reports include the development of landslide early warning systems, on GSI's major emphasis in critical mineral investigation, on the national and international collaborations of GSI. The information projected in social media and print/electronic media were specific in terms of GSI's accomplishments in the field of mineral augmentation, base line geological data generation and public good geosciences including natural hazards, groundwater contamination, and environmental geoscience.

Major events include 63rd CGPB meeting, workshops on PSP's, NGDR portal, Artificial Intelligence & Machine Learning, Offshore exploration, GSI Foundation Day, Geodiversity Day etc. Additionally, a large number of awareness and sensitization programmes, conducted in all parts of the country under the banners of Azadi Ka Amrit Mahotsav, Swachhta-Hi-Seva, Special Campaign 3.0, involving large number of students, local civic authorities and common people, were also publicised. The contribution of GSI in the economic growth of the country, the remarkable significance of Geo-heritage sites and the importance of their preservation were highlighted during the awareness campaigns.

Especially, the massive cleanliness activities carried out by GSI as part of Swachhata-Hi- Seva-2023 and Special Campaign 3.0 of Government of India, in all offices, field camps, training centres, outstation units as well as at Geo-heritage sites was hugely covered in the media and through social media posts. Twenty-two (22) press brief and press releases were issued and twelve (12) media interviews with established media houses like CNN-NEWS18, PTI, Times of India, India Today etc. as well as with freelance journalists of international repute, were organized involving domain experts of GSI, to ensure authentic data dissemination in the media as well as wider publicity and proper branding of GSI.

The PRM cells, collectively, have helped GSI reach the masses in a faster and more effective manner and enhanced the visibility of GSI.

Photo 6.24: Social Media photos

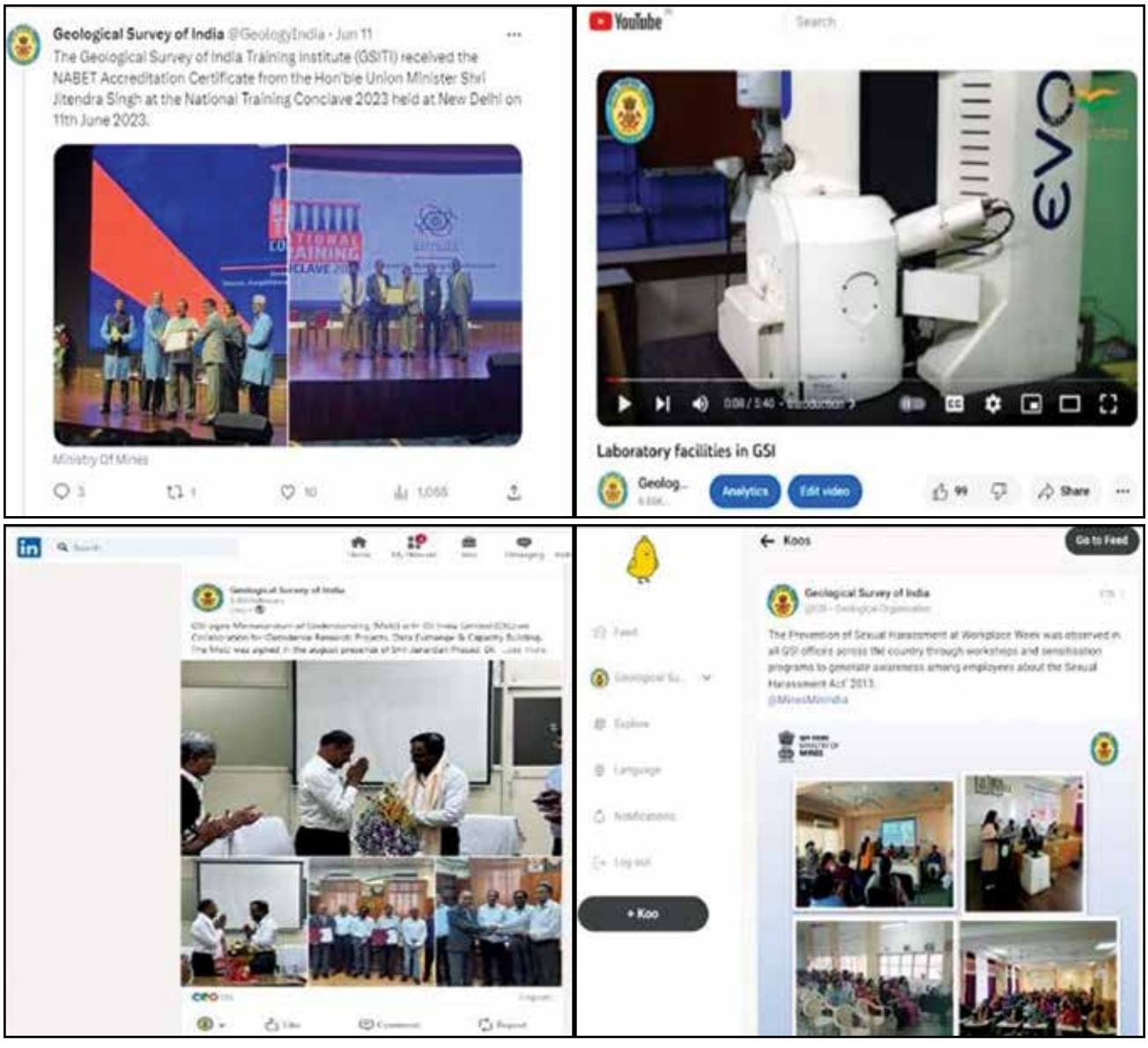


Photo 6.25: Some of the Snippets from the Social media handles of GSI

UNCOVER (India) Projects

6.33 Three pilot scale projects (1) Northern Transect (2) Southern Transect (3) Eastern Transect are taken up by Geological Survey of India involving Geology and Geophysics teamof officers Project "Uncover (India)" is being executed to probe for deep seated/ concealed mineral deposits. During FS 2023-24, two projects (Southern Transect and Eastern Transect) were executed and highlights of the projects are given below.

SOUTHERN TRANSECT

6.34 Deep Crustal Mapping across Western and Eastern Dharwar Cratons for searching concealed and deep-seated mineral deposits, in parts of Andhra Pradesh and Karnataka (PHASE-II).

Project Uncover-Phase-II has focused mainly on the integration of geology, geophysics, and high-end lab data to search deep-seated mineralization across the Southern Transect **(Photo 6.26)**. The detailed geophysical studies carried out at the Tumbiganur, Ramasagaram and Thimasamudram blocks in the south of the Sandur schist belt and in Shirunj & Doni

block in Gadag schist belt to know sub-surface signature. Based on Phase-I work a deep scout borehole (BH-APAB-1) up to 686.5m at Bhadrampalli in the Penakacherla schist belt has been drilled to know the deep-seated signature of data integration of geology and geophysics **(Photo 6.27)**. This borehole intersected the sulphide zones at different depths, mainly 163-169m, 399-406m and 680-684m **(Photo 6.28, 6.31)**. Moreover, Au values up to 0.91 ppm (by MIBK-AAS) with Au grains up to 10 microns have been reported by EPMA in a few samples (n=5) from the 163-169m zone. The EPMA, SEM, LA-ICPMS, fluid inclusion, and Raman spectroscopic studies brought out the nature of the hydrothermal fluid in the Bhdrampalli area. These studies indicate the ore-forming conditions are medium-high temperature, high sulphur fugacity, and medium-deep depth in the Bhadrampalli area. Trace element contents from the pyrite of APAB-1 further suggested that the hydrothermal system of the Bhadrampalli area was influenced by sedimentary components from the subducted slab. The detailed geophysical survey work at the Tumbiganur block revealed the ENE-WSW, NE-SW, and NW-SE trending magnetic lineaments in the covered terrain (thick soil cover). To validate the concealed geophysical anomaly a vertical borehole (BH-APAT-1) up to 300m was drilled to intersect the intersection point of magnetic lineaments. The borehole intersected mafic enclaves at several depths. The EPMA and SEM studies revealed discrete Au and PGE grains in a few samples in borehole no. APAT-1. Gabbroic bodies, lying in the central part of the transect were found near Gooty village.

Detailed petrographic studies of gabbroic samples revealed the presence of the Cr-Spinel and PGE grains. Eventually, a scout borehole up to a depth of 65.5m was drilled in the Gooty area (BH-APAG-1) to understand the depth continuity of the gabbroic body and its associated Ni-PGE mineralization, if any. The borehole intersected a 6.5m gabbroic body in the borehole APAB-1 in association with granitic country rock. The analytical results of the samples show that up to 640 ppm of Ni, 0.16% of Cr, 0.28% of Cu, and the PGEs up to 141 ppb respectively.

In the Gadag schist belt, a semi-regional geophysical and geological mapping on a 1:12,500 scale was carried out in the Shirunj-Yelisurur area in and around western lode **(Photo 6.32)**. A total area about 11.57 sq km was mapped, however, area of 1.03 sq. km targeted for detailed work around Shirunj, which mostly covered by soil except for a few patchy outcrops of meta-basalt and pillowed metabasalt. The country rocks are exposed in the adjacent area, mainly comprised of meta-basalt and pillowed meta-basalt, intruded by the variable dimensions of sheared quartz veins, and are the host for gold mineralization **(Photo 6.33 & 6.34)**. The EPMA and ore petrography studies show the presence of gold grains in association with Co-Ni-bearing arsenopyrite. The presence of Ni in close association with gold also reveals a deep mantle signature. The Fluid inclusion study in quartz veins from adjoining Champian, Hosur, and Venkatpura shafts dump in the western lode by Raman spectroscopy shows the presence of aqueous-carbonic with a domain at CO2, Graphite, and other favourable volatiles like N2 (?), also support the deep-seated signature of the mineralized fluids in the western lode (Fig.8). Based on geology and ground geophysics two boreholes (KGS-1 and KGY-1) were drilled in the western lode of the Gadag schist belt. The highest gold concentration reported from the borehole KGS-1 is 1646 ppb at depths 283.5 to 284m and the base metal concentration from the borehole is Cu-645ppm, Pb-395ppm, and Zn-410ppm respectively. The deepest borehole (KGY-1) in the western auriferous

zone of the Gadag schist belt has intersected several sulphides zones at various depths. The highest gold concentration obtained from the sample is 2.33ppm (75.5 to 76m), and the base metal maximum content is Cu-725ppm, Pb-260ppm, and Zn-330ppm respectively.

Detailed work based on the mineral system studies shows that sedimentary influence magmatic fluid played a vital role in the generation of gold mineralization in the Gadag schist belt. This magmatic fluid took advantage of the deep-rooted shear zone trending between NNW-SSE to NNE-SSE directions. Intrusive granite such as Chabbi, Doni, Mulgund, and Lakundi granites in the Gadag area night have given the heat sources for the fluid transit at the Gadag area. The Gadag schist belt shows the generation of low salinity, hydrothermal alteration, and gold mineralization in the upper crustal domains by fluid phase separation and fluid-wall rock reactions.

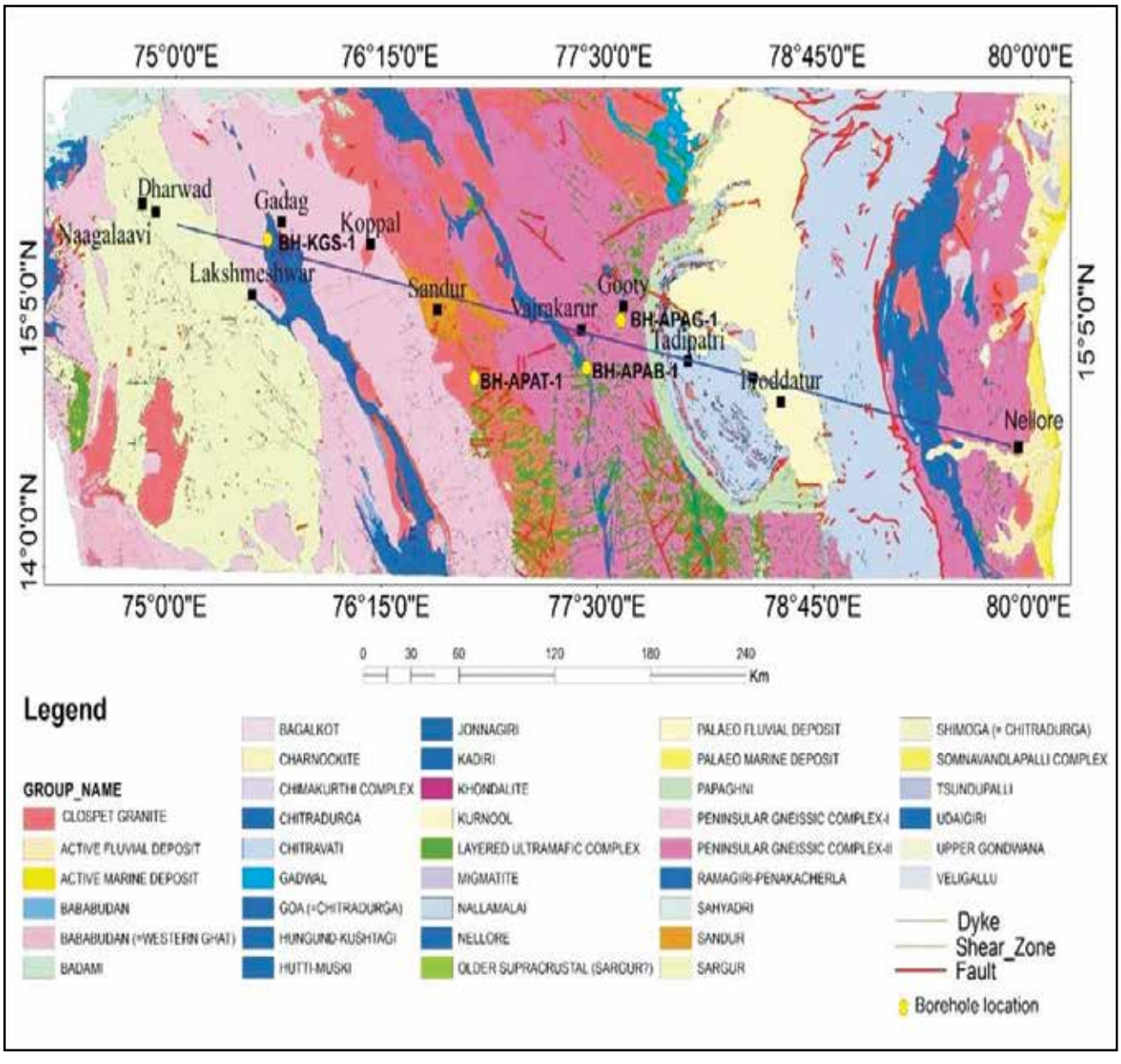


Photo 6.26: Integrated geological map of the project Uncover Southern Transect shows part of the Dharwar craton with the different Geological Groups and borehole locations. The NW-SE trending line shows the transect line of project Uncover.

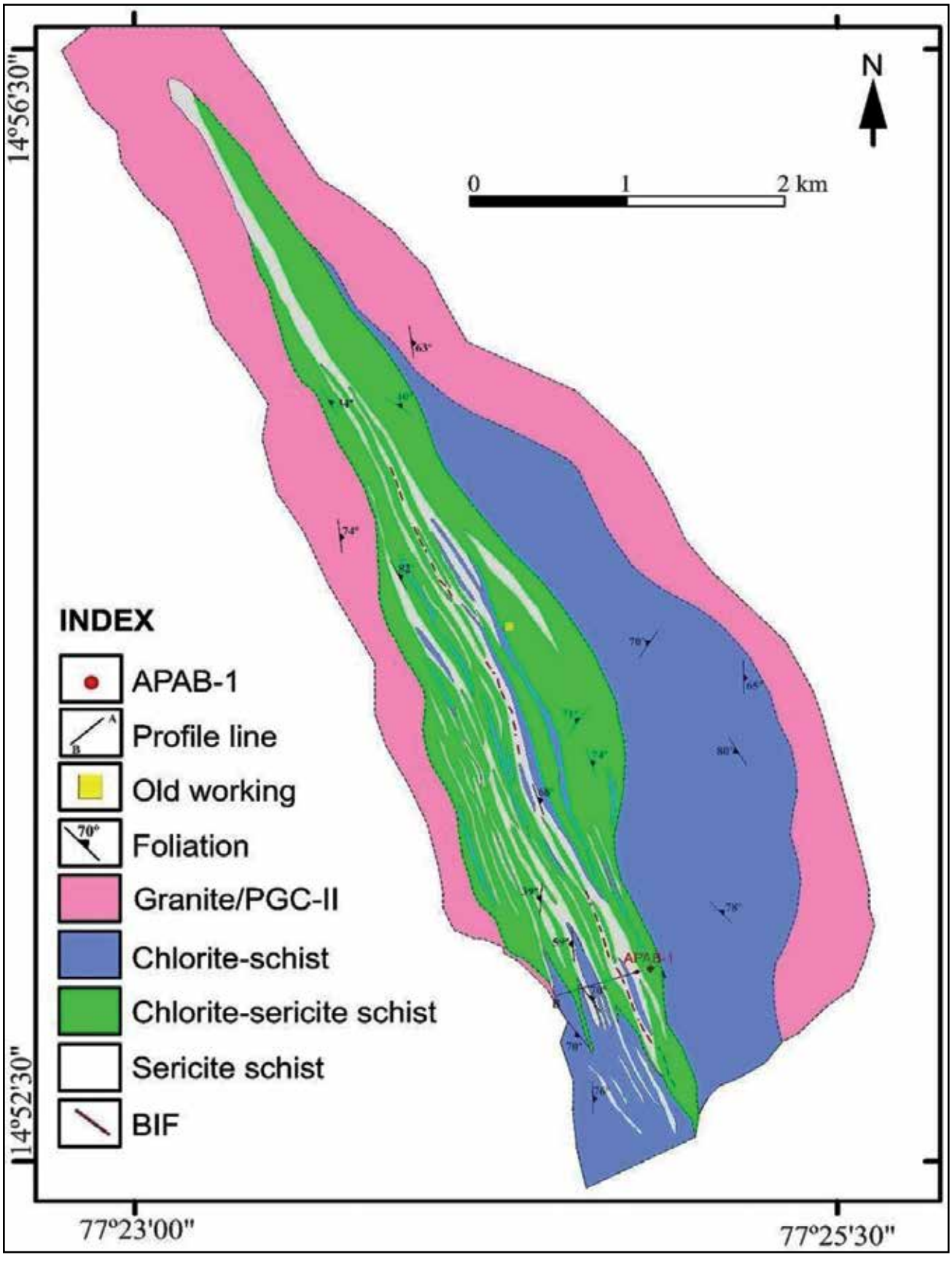


Photo 6.27: Geological map of the Penakacherla schist belt shows the borehole location of the APAB-1 south of the Bhadrampalli old working, lithological variations and major structural features in the area.

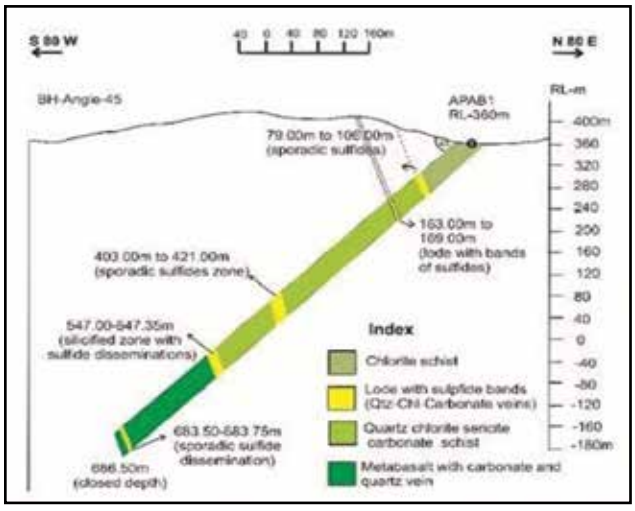


Photo 6.28: Borehole cross-section of APAB-1 at Bhadrampalli shows sulfide zone at different levels.

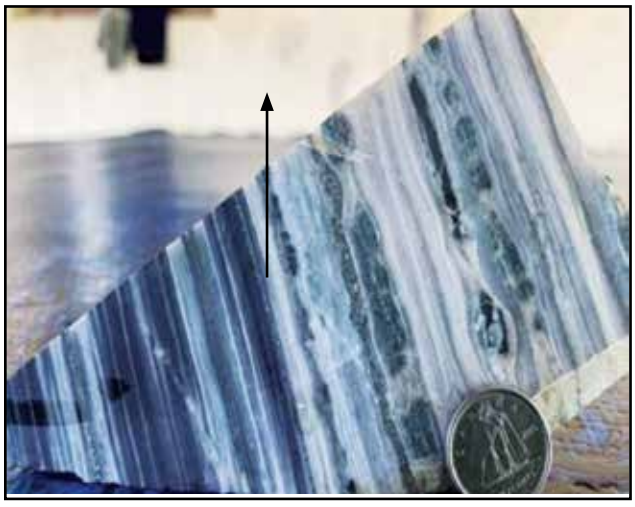


Photo 6.29:Structure and sulphide mineralization in drill core at 168 m depth of the borehole APAB-1.

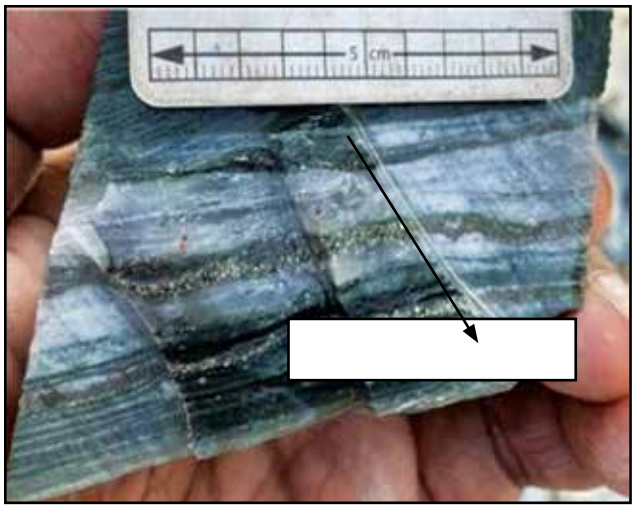


Photo 6.30: Photograph of drill core sample at 163m depth of the BH-APAB-1, Bhadrampalli showing sulphide mineralisation confined along foliation.

Photo 6.31:Photograph of drill core sample showing evidence of shearing at 163-166 m depth of the BH-APAB-1, Bhadrampalli.

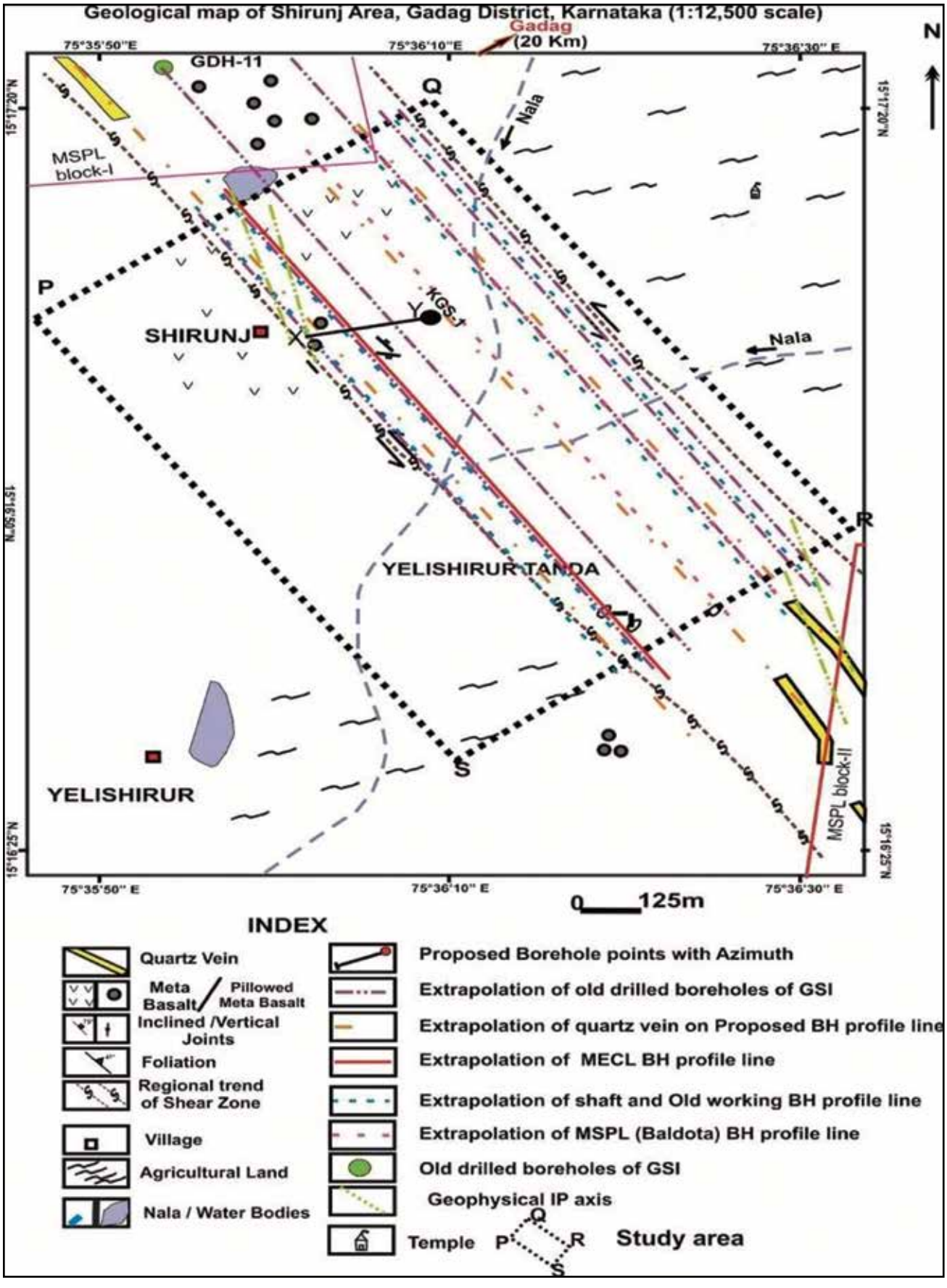


Photo 6.32: Geological map of Shirunj-Yilisurur block in the western lode of the Gadag schist belt, Karnataka, shows the proposed borehole location and major litho-variants in the area.

Photo 6.33: Occurrences of arsenopyrite and pyrite from the Venkatpura, Western lode, Gadag schist belt.

Photo 6.34: Oxidation with minor sulfide dissemination in the meta-basalt, Hosur mine dump Western lode, Gadag schist belt.

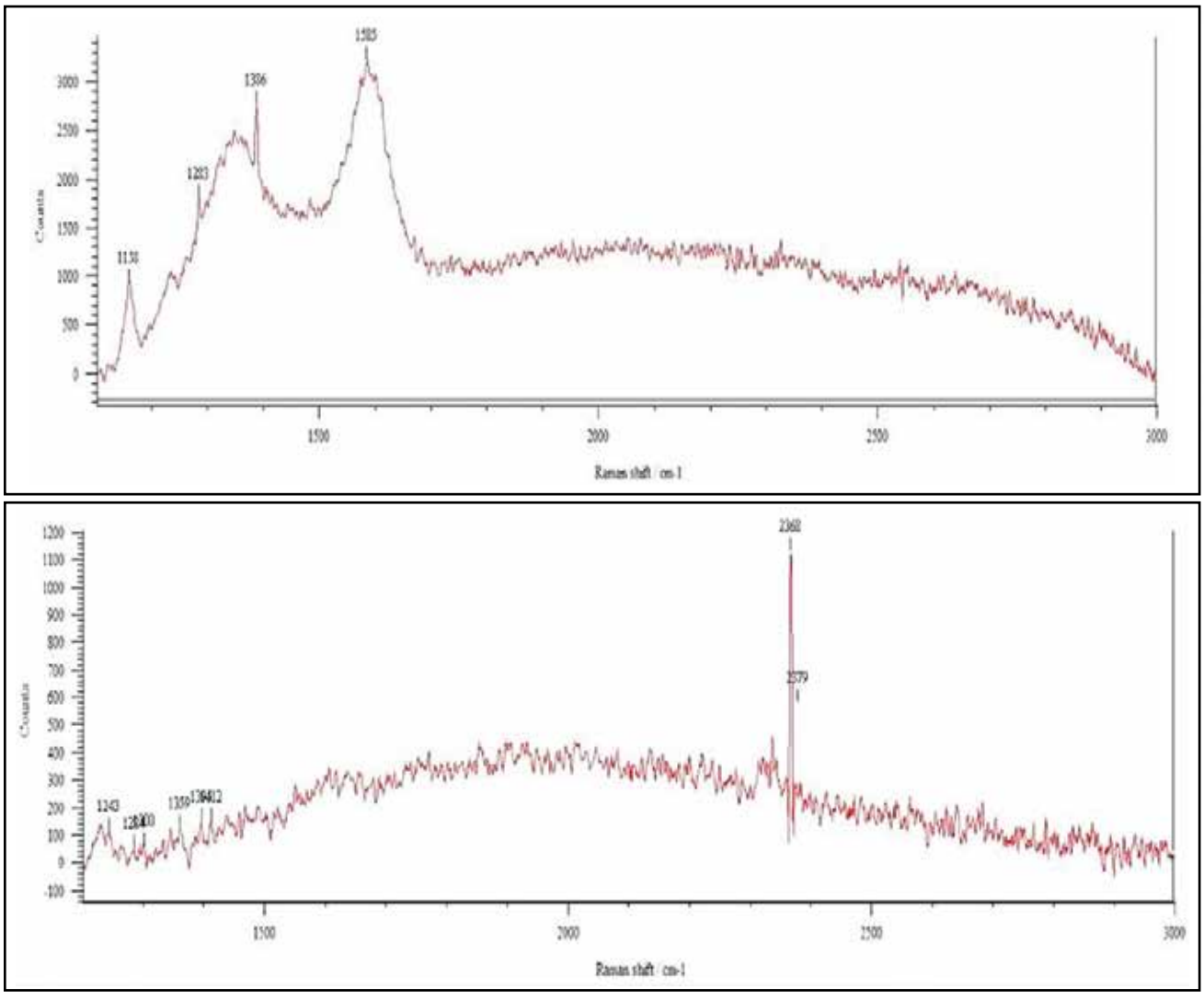


Photo 6.35: Raman spectroscopy shows aqueous-carbonic presence with a domain at CO2 (peak at 1283, 1386) and other favourable volatiles like graphite and N2 (peak 2368), support the deep-seated signature of the mineralized fluids in the western lode, Gadag belt.

EASTERN TRANSECT

6.35 Mapping of deep crustal architecture across Singhbhum Craton and North Singhbhum Mobile Belt covering parts of West Bengal, Jharkhand and Odisha for study of mineral system and to target deep-seated mineralizing environment.

Project Uncover, Eastern Transect started in 2021-2022 spans across the three geological terranes of eastern Indian shield viz. Singhbhum Craton (SC), North Singhbhum Mobile Belt (NSMB), and Chhotonagpur Granite and Gneissic Complex (CGGC). Interfaces of these terranes are marked by crustal scale shear zones viz. Singhbhum Shear zone, South and North Purulia Shear Zones. A crustal model based on high resolution gravity and magnetic data acquired along the transect during the first two years of the project was used along with available regional data to decipher a rise in Moho in the NSMB and moderate northerly dips of the terrane boundary shear zones. The work has clearly brought to light presence of two major splays of Singhbhum Shear Zone within the interior part Neoarchaean-Palaeoproterozopic Dhanjori Basin which holds immense potential for epigenetic copper, uranium and thorium mineralisation. During FS 2023-2024 validation of prognostic model was carried out by scout drilling in Dhanjori Basin and komatiite of Iron Ore Group. The Palaeoarchaean komatiite of Iron Ore Group of rocks in Singhbhum Craton has been targeted for nickel mineralisation where nickel value upto 3300ppm were received from surface rock samples and scout boreholes indicate significant sulphide concentration in the cumulate phases. Moreover, evidences of Cu mineralisation have been proved along splays of Singhbhum Shear Zone within Dhajori Basin where value upto 6000 ppm and 4400ppm from surface sample mineral system for further probing by sustained exploration. In the northern part of the Transect, focus was made on REE mineralisation associated with Proterozoic granitoids and magnetite-apatite rich rocks. Based on synthesis of geochemical data two new areas have been identified for further probing.

Indian Bureau of Mines (IBM)

6.36 The Mineral Policy Conference held in January 1947 resulted in the enactment of the Mines and Minerals (Regulation and Development) Act, 1948, the first legal framework in independent India for the regulation and development of mines. The Mines and Mineral (Regulation and Development) Act, 1948 received the assent of the Governor General on 8th September 1948. The Act empowered the Central Government to regulate mines and oilfields and mineral development on the lines contemplated in the Industrial Policy Resolution of the 6th of April 1948. The deliberations of the conference led to the establishment of the Indian Bureau of Mines in March 1948 as the main regulatory agency for monitoring and supervising mining activity in the country.

6.37 Indian Bureau of Mines (IBM) is a subordinate office under the Ministry of Mines. It is engaged in the promotion of scientific development of mineral resources of the country, conservation of minerals, protection of environment in mines, other than coal, petroleum and natural gas, atomic minerals and minor minerals. It performs regulatory functions with respect to the relevant provisions of Mines and Minerals (Development and Regulation) Act, 1957 and enforcement of the rules framed there under, namely Mineral Conservation and Development Rules, 1988/2017 and Mineral Concession Rules, 1960/ 2016 and Environmental (Protection) Act, 1986 and Rules made there under.

6.38 It undertakes scientific, technoeconomic, research-oriented studies in various aspects of mining, geological studies, ore beneficiation and environmental studies.

6.39 Vision for IBM

The National Mineral Policy, 2019 (NMP) has envisioned on strengthening the regulatory mechanism by incorporating e-governance, including satellite and remote sensing applications, evaluations of miners in terms of their comparative performance on suitable development framework and enforce commitment on part of the mining companies to adopt sustainable development. Accordingly, the vision envisaged is: "IBM to perform as a National technical regulator and to discharge the developmental functions for the sustainable development of the mineral industry and to work as repository of database on mines and minerals".

6.40 Mission

To ensure effective regulation of Indian Mineral Sector which promotes long term benefits for its sustainable growth.

To provide capacity building to State regulatory agencies and also to provide quality technical assistance to the mineral industry, and

To work as data bank on mines and minerals and to disseminate mineral information for policy formulations.

6.41 Objectives

To work as National Technical Regulator operating at national-level designing systems, processes and guidelines for regulation of the mining sector;

To function as a facilitator for creation and improvement of state-level regulatory mechanisms and to facilitate state agencies to ensure adherence to standards and parameters for scientific and systematic mining in the sector;

To work as catalytic agent for development of mineral sector by evolving capability & proficiency in beneficiation techniques; dissemination of knowledge and skills in mining and allied areas through its training facilities; consultancy services.

To play crucial role of that of an Advisor to the Government in matters and issues relating to the mineral sector in areas of short-medium and long-term mineral-wise strategies, mineral taxation and legislative processes.

To play the role of National Repository of mineral data through maintaining a data bank of mines and minerals in the country by developing advanced IT based Mineral Information System enabling the industry to report and access information online, and

To broaden its interactive base and reach out to overseas counter parts through consultations and exchange programmes and to build capacity, skill & expertise through academic and training programmes at institutes of international repute.

6.42 Present Charter of Functions

In the wake of liberalization of the policy regime governing mineral sector and increasing need for adequate environment management as part of systematic and scientific mining, the mandated functions for IBM, as given for notification in Official Gazette vide Resolution dated 03.11.2014. Charters of functions of IBM are available at Indian Bureau of Mines, Nagpur (ibm.gov.in)

6.43 Key Activities and Functions of IBM. In light of the role and charter of IBM, the key functions being performed by IBM can be broadly classified as (i) Regulatory Functions,

and (ii) Developmental Functions. The same are available at: https: //ibm.gov.in/writereaddata/files/06232020153619Functions%20and%20activities%20Indian%20Bureau%20of%20Mines.pdf

Organizational set up of IBM

6.44 I BM has its headquarters at Nagpur, 4 Zonal Offices at Bengaluru, Nagpur, Udaipur and Kolkata, and 13 Regional Offices at Ajmer, Bengaluru, Bhubaneswar, Chennai, Gandhinagar, Goa, Dehradun, Guwahati, Hyderabad, Jabalpur, Nagpur, Ranchi and Raipur. During the year 2017, IBM opened two new skill development centres for sustainable mining practices at Udaipur and Kolkata.

6.45 IBM has modern mineral processing laboratory and pilot plant at Nagpur and well- equipped Regional Mineral Processing Laboratories and pilot plants at Ajmer, Bengaluru.

6.46 Performance of IBM

The activities of IBM have been conducted through the following continuing schemes:

Scheme No. 1. Inspection of mines for scientific and systematic mining, mineral conservation and mine environment;

Scheme No. 2. Mineral beneficiation studies, utilization of low-grade and subgrade ores and analysis of environmental samples;

Scheme No. 3. Technological Upgradation and modernization;

Scheme No. 4. Collection, processing, dissemination of data on mines and minerals through various publications

Scheme No. 5. Mining Tenements System (under implementation)

6.47 These schemes are being implemented by the following divisions of IBM:

Minerals Development & Regulation Division (MDRD);

Mineral Processing Division (MPD); Technical Consultancy, Mining Research and Publication Division;

Mineral Economics Division; Mining and Mineral Statistics Division; and Planning and Coordination Division. Performance relating to various regulatory and development functions of IBM during the year 2023-24 is given hereinafter. The same is also enclosed at **Annexure 6.3**.

6.48 Inspection of Mines

During the year 2023-2024 (January 23 to March 24), 1753 inspections for enforcement of the provisions of Mineral Conservation and Development Rules (MCDR) 2017 and for examination of mining plans/ review of mining plan /mine closure plans were carried out **(Table 6.2)**. Consequent to inspection of mines, 1319 violations were pointed out to 643 mines during January 2023 to March 2024. Total 447 violations were rectified January2023 to March 2024. Mining operations were suspended under Rule 11(2) of MCDR 2017 in 72 mines for not carrying out mining operations in accordance with the approved mining plan/ review of mining plan and recommended 33 cases revoked. A list of principal violations observed during inspection of mines for the year 2023 and January 2023 to March 2024 are given at **Table 6.3**.

Table 6.2
Inspection of mines carried out by IBM during 2024 (January 2023 to March 2024)

Sl. No.	State	No. of Inspections
1	Andhra Pradesh	164
2	Assam	3
3	Bihar	0
4	Chhattisgarh	136
5	Goa	23
6	Gujrat	182
7	Haryana	0
8	Himachal Pradesh	40
9	J & K	9
10	Jharkhand	72
11	Karnataka	163
12	Kerala	1
13	Madhya Pradesh	287
14	Maharashtra	100
15	Manipur	0
16	Meghalaya	28
17	Orissa	188
18	Punjab	0
19	Rajasthan	136
20	Sikkim	0
21	Tamil Nadu	142
22	Telangana	53
23	Uttaranchal	5
24	Uttar Pradesh	21
25	West Bengal	0
	TOTAL	**1753**

Table 6.3
Principal Violations of MCDR, 2017 detected by IBM during 2023 and 2024 (January 2023 to March, 2024)

Rule No	No. of Violations Pointed out 2022	No. of Violations Pointed out 2023 -24, (Jan.23 to March 2024)	Rule description
11(1)	368	452	Rule11 (1) - Mining operations in accordance with mining plans
11(3)	0	1	Rule 11 (3) - Submission of Review of Mining Plan / Scheme of mining
20	0	1	Rule 20 - Notice of opening of mine
23	0	0	Rule 23 - Submission of progressive mine closure plan
26 (2)	83	50	Rule 26 (2) - Responsibility of the holder of mining lease to submit yearly report
27(2)	76	20	Rule 27(2) - Submission of Financial assurance
28(1)	8	4	Rule 28 (1) - Notice of temporary discontinuance of mining operations
31(4)	24	45	Rule 31(4) - Maintenance of plans and sections

Rule No	No. of Violations Pointed out 2022	No. of Violations Pointed out 2023 -24, (Jan.23 to March 2024)	Rule description
33	50	55	Rule 33 - Copies of plans and sections
35, 36, 37, 38, 39, 40, 41, 42, 43, 44	49	120	**Protection of environment:** Rule 35, 36, 37, 38, 39, 40, 41, 42, 43, 44- Sustainable mining, removal and utilization of top soil, Storage of overburden, waste rock Precaution against ground vibrations, Control of surface subsidence, Precaution against air pollution, Discharge of toxic liquid, Precaution against noise, Permissible limits and standards, Restoration of flora respectively.
45(5)(b)	75	3	Rule 45 (5) (b) - Submission of Monthly Return
45(5)(b)	75	44	Rule 45 (5) (b) - Submission of Monthly Return
45(5)(c)	27	18	Rule 45 (5)(c) - Submission of Annual Return
55(1)(c)(i)	15	7	Rule 55(1)(c)(i) - Employment of Whole time Mining Engineer/Geologist
55(1)(c)(ii)	11	5	Rule 55(1)(c)(ii) - Employment of Part time Mining Engineer/Geologist
Others	508	427	
Total	**1379**	**1256**	

Mining Plan, Review of Mining and Mine Closure Plan

6.49 The Mineral (Other than Atomic and Hydro Carbons Energy Minerals) Concession Rules, 2016 and the Mineral Conservation and Development Rules, 2017 stipulate that mining operations are required to be conducted as per an approved Mining Plan and after extraction of minerals, the mines are required to be reclaimed as per an approved Mine Closure Plan. The Mining Plans are approved by the IBM and in case of mines of minor minerals including 31 notified (on dated 10.02.2015) non-metallic or industrial minerals; the powers have been delegated to respective State Governments. The Mine Closure Plan is required to comprise a Progressive Mine Closure Plan (PMCP) prepared for five yearly periods of the successive Review of Mining Plan and a Final Mine Closure Plan (FMCP). Mine Closure Plan is expected to address issues relating to environment protection including air, water and land protection, management of top soil and overburden, reclamation & rehabilitation of land and control on ground vibration, surface subsidence and restoration of flora.

6.50 Till the year, 2024 Financial Bank Guarantees for a value of Rs. 34,59,14,81,555/- i.e, 34591.481555 Million Rupees (As per revised per hectare rate of Rule 27(1) of MCDR, 2017) have been collected.

6.51 During the year 2024 (January 2023 to March 2024), 81 mining plans were approved and 3 not approved, 611 review of Mining Plan were approved and 132 not approved

and 19 final mine closure plans approved and 2 was not approved. State-wise break-up is given at **Table 6.4**.

Table 6.4
State-wise Mining Plans/Review of Mining Plans/Final Mine Closure Plans approved by IBM during 2023- 2024.

Sr No	State	Mining Plans		Review of Mining Plans		FMCP	
		FMCP	FMCP	FMCP	FMCP	FMCP	FMCP
1	Andhra Pradesh	3	0	73	13	2	0
2	Assam	0	0	2	0	0	0
3	Chhattisgarh	10	0	34	27	0	1
4	Goa	8	0	1	1	0	0
5	Gujarat	9	0	65	13	7	0
6	Himachal Pradesh	0	0	7	1	1	0
7	Jammu & Kashmir	0	0	5	0	0	0
8	Jharkhand	0	0	24	0	0	0
9	Karnataka	6	0	61	15	0	0
10	Madhya Pradesh	12	3	120	43	3	0
11	Maharashtra	2	0	37	5	0	0
12	Meghalaya	6	0	4	5	0	0
13	Odisha	12	0	47	4	2	0
14	Rajasthan	12	0	54	0	0	0
15	Tamil Nadu	0	0	58	1	4	1
16	Telangana	1	0	19	4	0	0
	Total	**81**	**3**	**611**	**132**	**19**	**2**

6.52 Monitoring of mining activities using Digital Aerial (Drone and Satellite) Images:

Government of India, Ministry of Mines has amended Mineral Conservation and Development Rules, 2017 in the year 2021 requiring submission of digital aerial images (Drone/Satellite) by the mineral concession holders/preferred bidders to Indian Bureau of Mines (IBM). Every lessee shall submit digital aerial image to IBM. Every lessee shall submit digital aerial image to IBM on or before 1st day of July every year. Further, all mine plans are required to be submitted along with the digital aerial images. The Standard Operating Procedure for submission of digital aerial images to IBM by lessee has been laid down by IBM in April 2022 and made available on IBM website which was modified based on the inputs received from the stake holders and placed on IBM website in April 2023.Vide Gazette Notification No. S.O. 719(E) dated

14.02.2023, the mineral concession holders have been directed to submit a copy of the Digital Aerial Images under Rule 34A of MCD R 2017 to the State Government while submitting Digital Aerial Images to Indian Bureau of Mines. A Drone Data Management System (DDMS) application has been developed in-house by IBM under Mining Tenement System project for online submission of Digital Aerial Images under Rule 34A of MCDR 2017 and was commissioned since 01.06.2023. Since then, all the images are being received online in the server installed at IBM HQ and the data can be used by all the stake holders.

During the year 2023-24 as on March 2024, 1513 digital images have been received on DDMS portal. These digital images are being validated and analysed using GIS by the regional offices for the purpose of MCDR inspections.

For capacity building of IBM officials to process the drone and satellite image data on GIS platform, necessary hands on training on "Basics of GIS & Processing of Drone Survey Data" has been commenced from March 2022. Internal SOP for processing and utilization of Digital Aerial images of mining lease area has been specified for the officers of IBM. A road map has been carved out to train all the technical officials of the Minerals Development and Regulation Division through a series of in-house training program to develop expertise in analysing the aerial images and to make appropriate use of these images in inspection of mines and approval of mining plans. Till March 2024, thirteen training programs over 112 days involving 124 nos. of technical officers have been provided for effective use of digital images by the officers. One workshop was held on 13.01.2023 for stake holders to enlighten about the utility of the drone surveys and issues observed in the data submission so as to ensure better compliance in future. The training and workshop has been conducted by GIS & Remote Sensing Centre, GM&MM Cell, IBM, Nagpur.

6.53 Generation of Land use classification map of mining leases on GIS platform:

An activity to generate land-use classification map of mining leases on GIS platform has been started since September 2020. The information of land-use area has been sought from the lessee through regional offices of IBM in.shp/.kml format. The activity involves plotting of land-use classification map on GIS platform checking & correcting KML or SHP file, conversion of KML file to SHP file, calculation of area of each land-use feature in attribute table and attachment of mine data to land-use attribute table.

Upto December 2022, the land-use data has been received for 1229 mining leases out of which processing of data on GIS platform for all 1229 mining leases has been completed. The geospatial database of land-use was created from the lease-wise details of land put to use for mining activity. This database can be used to generate customized maps & reports viz. state- wise, district-wise, mineral-wise, feature-wise, etc. for land-use classification by query analysis on GIS platform.During the year 2023-24, the existing database of land use classification map of mining leases is being updated based on drone data received and land use classification map of 50 mining leases has been generated till March 2024.

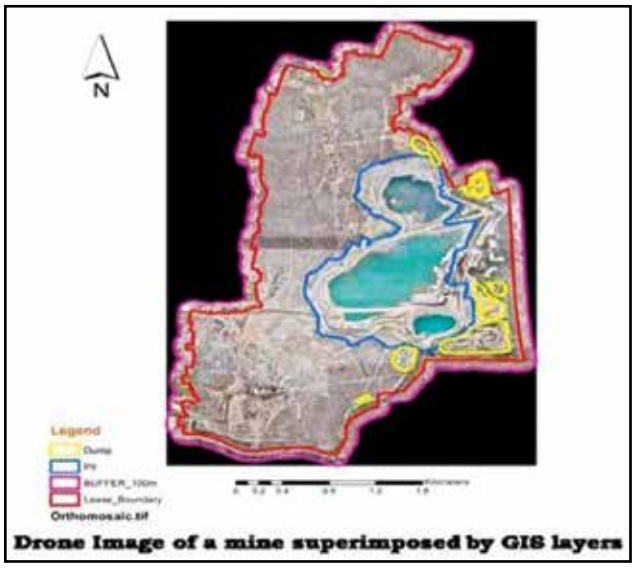


Photo 6.3t

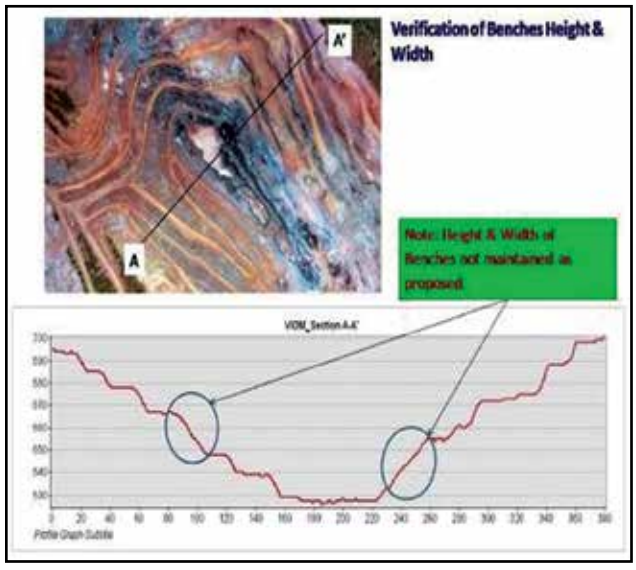
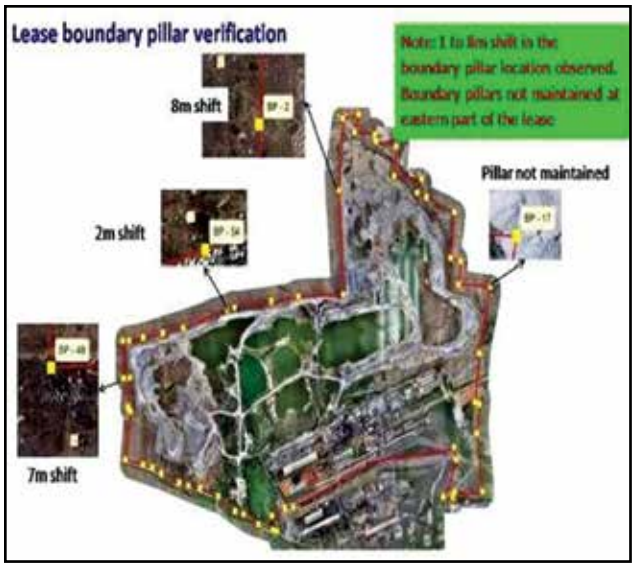
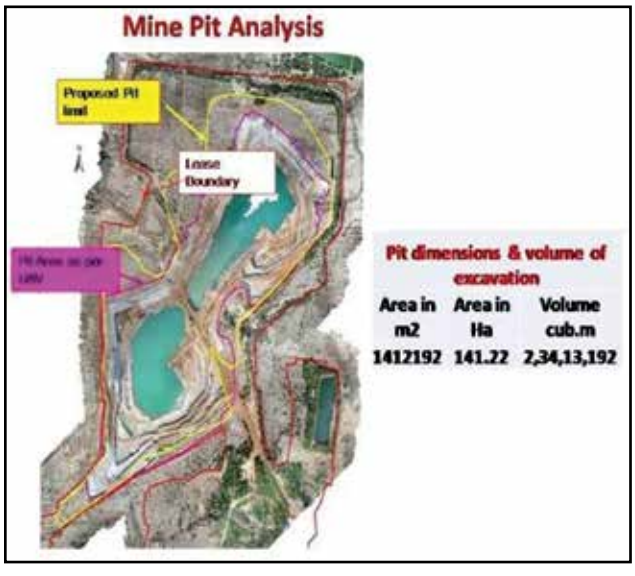


Photo 6.37





Photos 6.38 : Mine Reclamation & Rehabilitation Analysis

Photo 6.39 : Change Detection Analysis

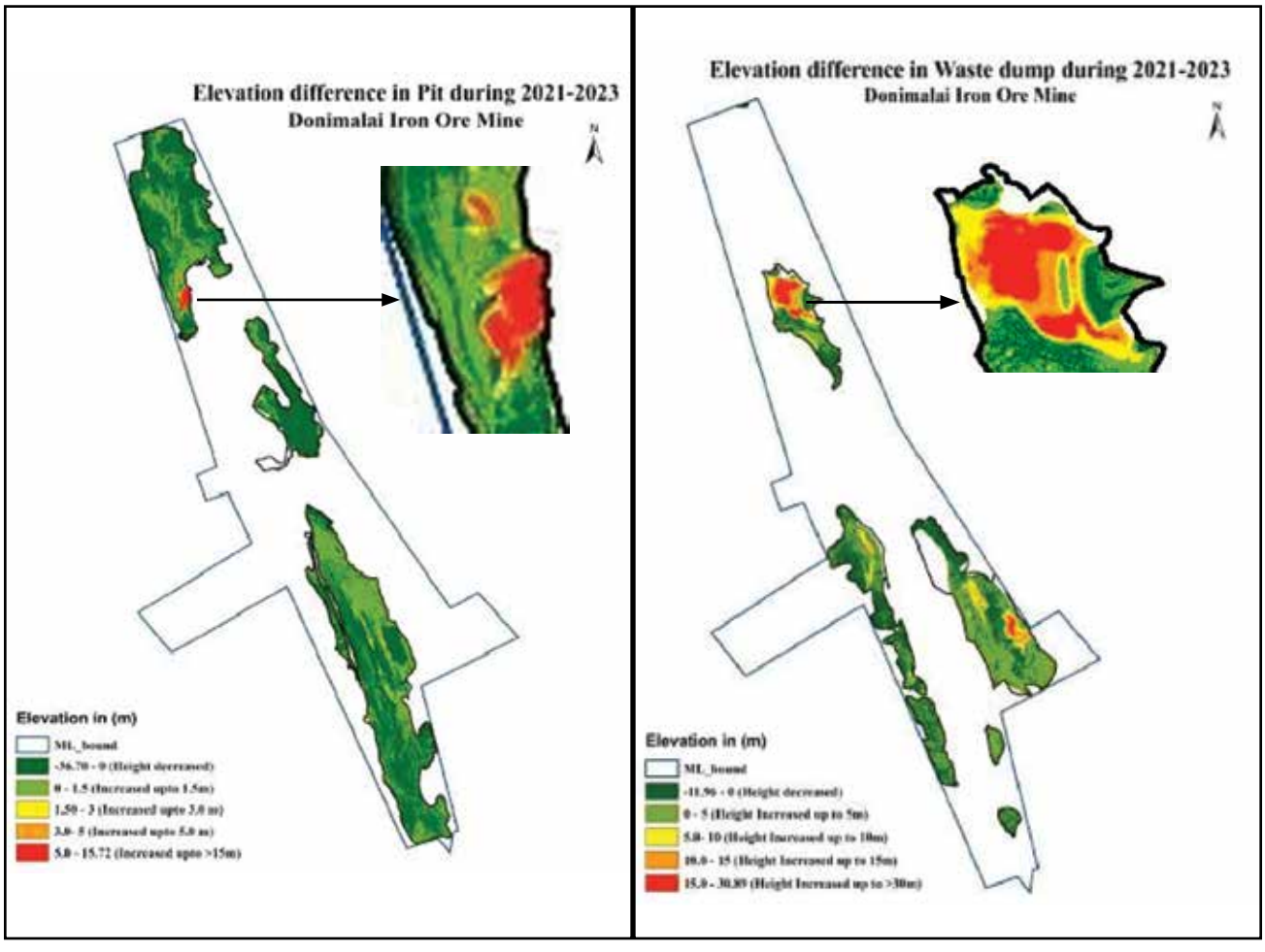


Photo 6.40 : Change Detection Analysis

Mineral Beneficiation

6.54 Mineral Beneficiation - Mineral beneficiation studies including mineralogical studies and chemical analysis are carried out for conservation and development of mineral resources. During the year 2023-24 (January 2023 to March 2024), 56 ore dressing investigations, 31032 chemical analysis, 3618 mineralogical examinations and 01 in-plant study were completed.

Beneficiation studies of Mineral deposits set for auction.

6.55 As per the amended Act, all exploration reports need to be made UNFC (2009) compliant before auctioning of mineral blocks, for which mineral beneficiation study is an important aspect. The exploration indicates only the geological aspect. Beneficiation study indicates the viability of the block for commercial operations in view of feasibility and economics. Thus, beneficiation study has paramount and crucial role for the development of mineral deposits in India.

6.56 Since the year 2016, IBM has been carrying out bench scale beneficiation studies on all G2 Level of exploration samples of GSI, MECL and state DGM's. Till date studies on 145 nos. G2 Level samples of GSI, 15 nos. G2/ G1 level sample of MECL and 11 Nos. G2 level sample of State DGM's have been completed. Beneficiation study on 09 samples of GSI are in progress.

National Mineral Inventory (NMI) as on 01.04.2020

6.57 Quinquennial updation of NMI as on 01.04.2020. The work involved processing, generation of outputs and preparation of comparative statements for finalization of NMI as on 01.04.2020 in respect of 46 major minerals was completed. The two publications titled "National Mineral Inventory as on 01.04.2020-At a glance" and "National Mineral Inventory as on 01.04.2020 - An overview" have been completed and uploaded on IBM website.

Statistical Publications

6.58 IBM disseminates statistical information on mines, minerals, metals and mineral-based industries through various publications. Information on mineral production, stocks, dispatches, employment, inputs in mining, mining machinery and related matters received from the mine owners on statutory basis under the MCDR, 1988 and ancillary statistics on metals production, mineral trade and market prices of minerals, revenue from the mining sector, rent, royalty and cess on minerals, etc. from other agencies is compiled regularly by IBM.

6.59 Published ASP for Minerals and of Metals up to February 2024. Further, IBM started publishing ASP of strategic and critical mineral since September 2023. The statistical publications released during the year 2023-24 include Monthly Statistics of Mineral Production (MSMP) up to advance release of February 2023, Statistical Profiles 2021-22.

Consultancy Services

6.60 IBM provides technical consultancy services on prescribed charges for geological appraisals, survey of the areas, preparation of feasibility study reports, environment impact assessment and environment management plan, selection of suitable mining equipment, evaluation of feasibility report prepared by other consultants, financial institutions, etc. During the year 2023-24, "State of art Automation and Innovative Practices in Indian Non-Coal Mining Sector", publication draft is prepared.

6.61 In 2023-24, IBM Technical Consultancy and Mining Research Division also associated in formulation of offshore rules and Gold ore sampling work carried in with Mineral Processing Division of IBM.

Technical Publications

6.62 IMYB is a flagship publication of IBM which is brought out in three (3) volumes. It consists of Part I having as many as 11 General Chapters, Part II consists of 18 Reviews on metals & alloys and Part III consists of 30 mineral reviews. This publication covers information on minerals and mineral- based commodities, their development, production, resources/ reserves, consumption, trade and policy. It also includes world scenario. IMYB provides a status report of Mining and Mineral Industry in India on an annual basis. This publication has wide readership-both National as well as International.

The IMYB, 2021(data 2020-21), total 59 general/metals & alloys/mineral reviews were prepared, technically edited, finalized and sent to Publication section for print-release after consolidation of all chapters with the statistical data. Total 59 reviews of IMYB 2020(Advance Release) were uploaded on IBM Website.

6.63 Preparation of IMYB, 2022, was taken up for three separate volumes, viz. Volume-I for General Reviews, Volume-II for Metals & Alloys and Volume-III for Mineral Reviews. Total 50 reviews of IMYB 2022(Advance Release) were uploaded on IBM Website. Preparation of remaining reviews is under progress.

6.64 Two Half yearly Bulletins on mineral information (October 2022 to March 2023 & April 2023 to September 2023) and yearly Bulletin on Mining Lease and Prospecting Licenses 2022 are released.

i. Bulletins on Mineral information (BMI) (October 2022 to March 2023) is available at:- 169236058264df5f86c4d7dBMI_40_2.pdf (ibm.gov.in)

ii. Bulletins on Mineral information (BMI) (April 2023 to September 2023) is available at:- 170988057665eab50070eafBMI_Apr_Sept_2023. pdf (ibm.gov.in)

iii. Bulletin on Mining Lease 2022 is available at:https://ibm.gov.in/writereaddata/files/1699612501654e07551c594UPLOADING_BULLETIN_11_ 11_2023.pdf

Training

6.65 IBM is discharging its roles and responsibilities through a mandated charter of functions. In the wake of recent policy initiatives and statutory amendments, IBM needs to enhance its skills in various advanced technologies for mine regulation and development.

Method envisaged for carrying out Training

6.66 The training imparted to IBM personnel is of 2 to 3 days which is being held at Headquarter and its regional offices as well as at two skill development centre located at Udaipur and Kolkata. Nominations are sought in advance. After approval of Competent Authority, training programme is organized through Classroom lectures / presentation by the faculties drawn from IBM as well as Industry.

Presently the trainings are being conducted offline. In last couple of years, IBM personnel had attended training programmes in outside organizations / institutes like GSITI, Kolkata National Remote Sensing Centre, Hyderabad. Accordingly, further training programme, wherever necessary, will be conducted in association with these organizations/ institutions. Further, through bilateral

cooperation with other Countries, capacity building programme will be taken up.

Skills for which Training required for other stakeholders connected to IBM are

6.67 Implementation of provisions of MMDR Amendment Act, 2015 and subordinate legislation framed there under; preparation of Mining Plan/Mining Scheme, including Mine Closure Plan, Mine Reclamation and Rehabilitation; Sustainable Development Framework and Star Rating System for Mines; Mining Surveillance System; Mineral Resources as per United Nations Framework Classification (UNFC); Technological improvements and innovative advances in the areas of mineral processing and beneficiation.

6.68 IBM imparts training to technical and non-technical officials of IBM and also to persons from the mineral industry and other agencies in India and abroad. During the year 2023-24, 16 training programmes have been conducted, in which a total of 349 IBM personnel, 333 Industry officials and 46 from the State Government officials have participated. The total revenue generation from the industry personnel for 2023-24 is Rs 34, 92, 000/- (Rupees Thirty Four Lakh Ninety Two Thousand only). IBM makes its presence in the meetings as organized by GSI/ MECL for its active participation, towards synergic approach. Further, IBM officials are participating in various Training Programmes conducted by other Institutes. In November 2023, 06 (six) personnel of IBM attended 3-day offline training programme for IOs/POs at CBI Academy from 28th to 30th November 2023.

6.69 IBM had initiated its efforts to upload its training modules on iGOT platform, YouTube Channel and IBM website. As per the Ministry's letter dated 05.07.2022 regarding uploading of training courses on iGOT portal, three topics/modules are identified for IBM for lecture videos i.e. (a) Mining reforms, (b) process of Mining lease to LoI & (c)Mining plan Approval. Therefore, IBM has initiated the process for preparing the lecture videos through training centre& expertise available in IBM, and prepared training videos related to the topics. So far, 02 videos have been uploaded on YouTube, 6 courses on i-GoT portal and further preparation of more interactive videos is in progress.

Status of Capacity Building Plan of IBM-reg

Subsequent upon the Review Meeting chaired by Secretary (Mines) on 20.09.2023 on the matter of Mission Karmayogi and Ministry of Mines Letter dated 21.09.2023 regarding "Capacity Building Plan for Employees under the administrative control of M/o Mines", IBM issued Work Order for preparation of Capacity Building Plan of IBM to M/s Ernst & Young LLP on 09.01.2024.

In pursuance of RFQ No. IBM/TC/2023, the said agency submitted its draft Deliverable

1. 'As-Is Assessment of the Department (IBM)' via email dated 23.01.2024. Whereas, Deliverable
2. 'As-Is Assessment of the Training Needs of Employees and Identification of Potential Interventions' (Capacity Needs Analysis) was submitted on 13.02.2024 and draft Deliverable
3. 'Draft Capacity Building Plan with a Roadmap for Implementation' was received on 13.03.2024.

As desired by the Competent authority, M/s Ernst & Young LLP delivered a presentation on 26.03.2024 in the presence of Controller

General (I/c) and senior officials of IBM. Approval of Draft Capacity Building Plan with a Roadmap for Implementation is under process.

Measures for Abatement of Pollution and Environmental Protection

6.70 The IBM undertakes inspections/ studies for the enforcement of provisions of MCDR, 2017 which include provision on protection of mine environment to ensure that due care is being taken by the mine operators. During inspection it ensures that mine operators are taking due care for preservation and utilization of top soil, storage of overburden / waste rocks, reclamation and rehabilitation of land, precaution against ground vibration, control of ground subsidence, abatement measures against air, water- and noise pollution, restoration of flora, etc. in addition to other conservation and developmental measures. Necessary guidance to mine 83 managements/ operators are also given for systematic and scientific development of mine including protection of environment. While approving the mining plans, Review of mining plan and mine closure plans, IBM ensures that environment impact assessment studies have been carried out and to that effect environmental management plan has been incorporated for its effective implementation, besides reclamation and rehabilitation of mined-out areas.

Revenue Generation

6.71 IBM generates revenue through consultancy, training, mineral processing, and sale of publications & data etc. as per approved Schedule of Charges. Revenue generated during 2024 (January 2023 to March 2024) is 2,84,22,437/-. In addition to this, revenue generated during 2023-24 (January 2023 to March 2024) is Rs. 860 Lakh from processing of mining plans/Review of Mining plans and compounding fees & fines.

Computerization

6.72 The Regional (Except Raipur & Gandhinagar RO) /Zonal offices and Headquarters of IBM have been linked through a sophisticated system based on client server architecture established with the help of BRGM, France. Proposal for connecting Raipur & Gandhinagar RO with said system along with VC facility is under process. IBM has well established LAN facility, besides WAN system to communicate and exchange data with Regional, Zonal offices and Headquarter offices. In all RO/ZO offices, VC facility is operational.

6.73 The domain https://ibmreg.nic.in is functional for grant of IBM Registration number and https://ibmreturns.gov.in is also functional for facilitating the stake holder to submit the monthly and annual returns online and for further communications with stake holders in case of refer back cases.

6.74 After introduction of online submission of returns system consequent to the amendments to Rule 45 of MCDR, 1988 vide notification No. 75(E) dated 09.02.2011, the mine owners have commenced submission of monthly and annual returns online. IBM is monitoring and guiding/ encouraging the mine owners and their representatives for online submission of returns. Further, online submission of Returns are mandatory as per the provisions of Rule 45 of MCDR 2017.

6.75 The month-wise monthly returns submitted online are given in **Table 6.5**.

Table 6.5
Month-wise Returns Submitted online (up to March, 2024)

Sl. No.	Month	No. of monthly returns received online
1	January, 2023	3975
2	February, 2023	3972
3	March, 2023	3967
4	April, 2023	3962
5	May, 2023	3951
6	June, 2023	3934
7	July, 2023	3908
8	August, 2023	3886
9	Septemb er, 2023	3880
10	October, 2023	3875
11	Novembe r, 2023	3814
12	Decembe r, 2023	1878
13	January, 2024	1921
14	February, 2024	1899
15	March, 2024	1973

6.76 Mineral Wise Summary of Mining Lease (excluding Atomic, Hydro Carbon Energy and Minor Minerals) as on 31.03.2022(P) (All India) is given in **Annexure 6.4**.

Mining Tenement System (MTS)

6.77 Mining Tenement system (MTS) is a flagship project of Indian Bureau of Mines and it's a unique application, first of its kind in the world. With MTS, IBM envisions digitizing its internal processes of the core modules which in turn can induct a workflow based system to increase the efficiency and transparency in its charter of functions. As part of this project, IBM also envisions conducting enhancements, wherever applicable. The following three modules launched of MTS Project are operating effectively.

Module 1: Registration under Rules 45 of MCDR 2017

Module 2: Monthly and Annual Return filing under Rule 45 of MCDR 2017

Module 3: Mining Plan Approval System (MPAS) for submission of Mining Plan in the online module.

With the launch of Mining Plan Approval system (MPAS), the entire process of approval of mining plan has become online in digital form. The lessee can submit his mining plan, on the click of the mouse and the process has become simpler and less time consuming. This will be step forward toward digital India mission.

Apart from the above, following modules were launched during Jan-Mar 2024:

ASP Module: It was launched on 23.01.2024. The module has automated the system of publication of Average Sale Price (ASP) by IBM with substantial reduction in timelines for publication of ASP.

Star Rating Module: It was launched on 31.03.2024. The module has been launched to facilitate filing and validation of Star Rating templates over MTS from 2024-25 onwards.

Additionally, following portals were developed by MTS Cell for ease of doing business and better monitoring & analysis of mining operations:

Drone Data management System: Rule 34A prescribes submission of Drone imageries for certain category of mines. For facilitation of online submission, Drone Data management System was developed.

Mine Imagery Data Processing and Analysis System (MIDPAS): The system was developed for processing and analysis of mine imagery data submitted along with Mining Plan.

Also, largest Data Centre of 133 TB storage capacity has been installed at IBM premises.

Sustainable Development framework (SDF)

6.78 **Star Rating System:** The Star Rating System is a good governance initiative, designed as a tool for mapping of mining footprints from the view point of Sustainability. The Star Ratings is being awarded, based on evaluation of performance of mines on technological, socio-economic and environmental parameters, giving objective reporting of their activities. It has been instituted as a two-tier system providing self- evaluation templates to be filled in by the mine operator followed by validation through Indian Bureau of Mines. The Star Rating scheme is designed to have an inbuilt compliance mechanism for environment and forest safeguards and has been helpful in recognizing good performers in the sector while encouraging all mining lease holders to strive for excellence.

6.79 All the mine operators are mandated to achieve at least three-star ratings within a stipulated time period of four years from the date of commencement of mining operations or the date of notification of the rules (i.e. March 2017) whichever is later in accordance with Rule 35 of MCDR 2017. Failing which Mining operations are liable to be suspended.

6.80 Based on evaluation of the performance of mining lease holders on the various parameters encompassed by the principals of the Sustainable Development Framework (SDF), validation of self- assessed templates is carried out by IBM and accordingly final ratings are awarded. Selected five star rated mines are recommended for award by Technical Evaluation Committee.

6.81 The selected lease holders of five star rated mines are felicitated during National Conclave on Mines & Minerals held from time to time. The details of year wise awards given to 5 Star rated mines since 2014-15 are given below in **Table 6.6**:

Table 6.6

Performance Year	No. of 5 Star Rated mines selected for award	Felicitation held on
2014-15	9	4-5 July, 2016, Raipur (Chhattisgarh)
2015-16	32	15 February, 2017, New Delhi
2016-17	57	20 March, 2018, New Delhi
2017-18	57	23 November, 2021, New Delhi
2018-19	52	23 November, 2021, New Delhi
2019-20	40	23 November, 2021, New Delhi
2020-21	40	12th July, 2022, New Delhi
2021-22	76	1st March, 2023, Nagpur

6.82 During the year 2023-24, 1254 online templates for the performance year 2022-23 have been filed by the lessees. Validation of the submitted templates for final evaluation is under progress and so far in 608 leases field verification has been completed. The entire process is expected to be completed by 30.05.2024.

Further, on 13.10.2023, a Workshop was organized at Hyderabad for feedback over existing Star Rating System and based on the feedback received from the stakeholders, revised Star Rating Templates were launched on 23.01.2024 by the Hon'ble Union Mines Minister. New Templates are aimed to provide certain relaxations to the small mine owners having lease area less than 25 ha or production capacity upto 50000 T.

Mining Surveillance System

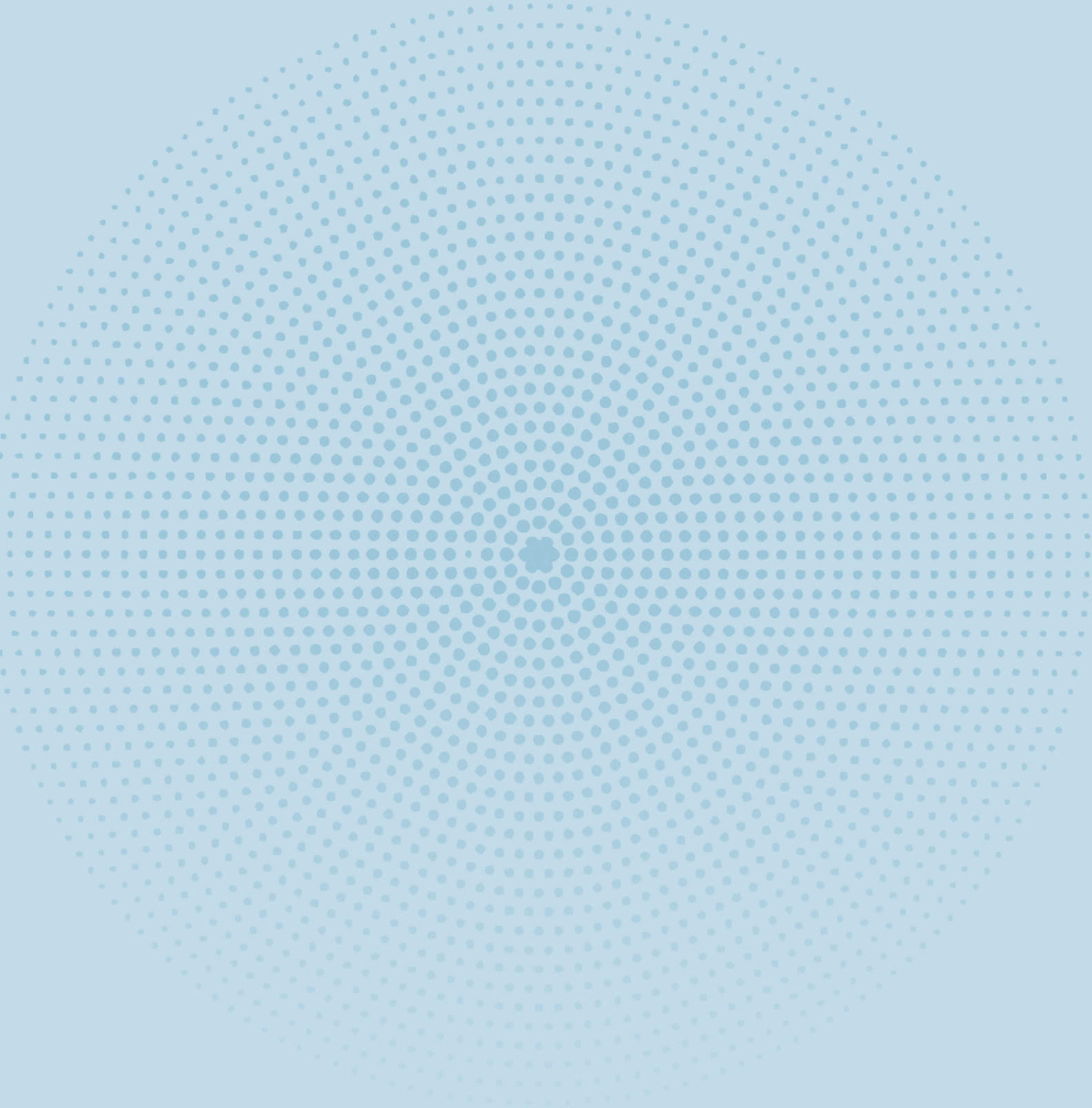
6.83 Mining Surveillance System (MSS) is a satellite-based monitoring system which aims to establish a regime of responsive mineral administration by curbing instances of illegal mining activity through automatic remote sensing detection technology. Detailed information on MSS is given in Chapter 3 of this report.

Human Resources

6.84 The total sanctioned personnel strength of IBM is 1477. The present filled-in strength is 658 as on 1.04.2024. The cadre-wise employment position in IBM as on 1st April 2024 is given in **Table 6.7**.

Table 6.7
Employment of Personnel in IBM as on 1st April 2024

Sr No	Group	Sanctio Ned	Filled	Vacant	SC	ST	OBC	EWS	Women	PH
1	GROUP 'A'	459	147	312	18	05	31	06	00	00
2	GROUP 'B'	250	98	152	13	05	15	13	00	03
3	GROUP 'B' (Non- Gaz)	252	124	128	12	06	30	25	04	06
4	GROUP 'C'	516	289	227	55	20	90	34	06	10
	Total	**1477**	**658**	**819**	**98**	**36**	**166**	**78**	**10**	**19**



7

Central Public Sector Undertakings

Central Public Sector Undertakings

National Aluminium Company Limited (NALCO)

Introduction

7.1 National Aluminium Company Limited (NALCO), a 'Navratna' company under the Schedule 'A' category, was founded on January 7, 1981, with its registered office in Bhubaneswar. It is one of the country's most extensive complexes integrating bauxite, alumina, aluminium production, and power generation. Currently, the Indian government owns 51.28% of NALCO's equity capital. The Company has been operating its captive Panchpatmali Bauxite Mines for the pit head Alumina refinery at Damanjodi, in the District of Koraput in Odisha and Aluminium Smelter & Captive Power Plant at Angul. As a part of green initiative, NALCO has installed 198 MW Wind Power Plants at various locations in India and 850 kWp roof top Solar Power Plants at its premises to join hands for carbon neutrality. From the days of first commercial operation since 1987 the Company has continuously earned profits for last 36 years. NALCO achieved Full capacity Aluminium production of 4.6 lakh tonne, with all 960 POTs in operation in its Aluminium Smelter for the 3rd consecutive year in FY 2023-24.

For details please visit: https://nalcoindia.com/investor-services/annual- reports/

7.2 With its consistent track record in capacity utilization, technology absorption, quality assurance, export performance and posting of profits, NALCO is example of India's industrial might.

7.3 The company is a significant contributor to India's foreign exchange earnings and has been acknowledged as the world's most cost-efficient producer of bauxite and alumina for the past five years.

7.4 NALCO is the first Public Sector Company in the Country to venture into international metal market in a big way with London Metal Exchange (LME) registration since May'89. The Company is listed at Bombay Stock Exchange (BSE) since 1992 and at National Stock Exchange (NSE) since 1999. It boasts of multiple ISO certifications, including ISO 9001, ISO 14001, ISO 45001,ISO 50001, and SA 8000. The Data Centre at NALCO's Corporate Office and the Disaster Recovery Site at the Alumina Refinery have been awarded the ISO 27001:2013 Certification for Information Security Management System, accredited by International Accreditation Services, USA.

Photo 7.1

NALCO Corporate Office, Bhubaneswar

7.5 The Company has diversified to renewable energy sector by commissioning 198 MW wind power plant in four different places i.e. one WPP in Andhra Pradesh, two WPPs in Rajasthan and one in Maharashtra to reduce carbon foot print. Moving ahead, the Company has also utilised the available roof top space in Corporate Office, Township and NRTC (NALCO Research & Technology Centre) at Bhubaneswar and M&R Complex, Damanjodi for setting up of 850 kilowatt peak (kWp) solar power plant.

Existing Operations & their Locations

Bauxite Mines

7.6 The Company has its fully mechanised open cast Bauxite Mines which is one of the most sophisticated and eco-friendly mining operations to be found worldwide, situated on Panchpatmali plateau in Damanjodi, Koraput, in the State of Odisha. The Company is operating two mining leases i.e. Panchpatmali North& Central blocks and Panchpatmali South block.

The mined-out bauxite is transported from the Mine to Refinery by a 14.6-km. long single-flight, multi-curve, variable-speed cable belt conveyor of 1800 TPH capacity.

Photo-7.2
Panchpatmali mine

Alumina Refinery

7.7 The Alumina Refinery is located at Damanjodi, Odisha, approximately 14 km from the Bauxite Mines at Panchpatmali. The Alumina produced is transported to Aluminium Smelter at Angul (Odisha) and to Vizag (Andhra Pradesh) port by rail with NALCO's captive wagons.

7.8 The present normative capacity of Alumina Refinery is 21 lakh tonne per annum. Alumina produced is used to meet Company's requirements for production of primary Aluminium at Smelter. The surplus Alumina that remains after internal consumption is sold in the export markets. A small portion of the total sale is also sold in domestic market.

Photo-7.3
Aluminium Smelter, Angul

Aluminium Smelter

7.9 The Aluminium Smelter is located at Angul, Odisha and approx. 5 km away from the captive thermal power plant. Aluminium produced in the forms of ingots, sow ingots, tee ingots, billets, wire rods, alloy ingots, flat products and chequered sheets are also sold in the domestic market through its stockyards located across the country. The Aluminium produced is also exported through Vizag port and Kolkata Port.

Photo-7.4
Aluminium Smelter

7.10 The Aluminium Smelter entered into production progressively from 1987. The present capacity of Smelter is 4.60 lakh tonne per year. Alumina is converted into primary Aluminium through a smelting process using electrolytic reduction. From the pot-line, the molten Aluminium is routed to the casting units, where the Aluminium can be cast into ingots, sow ingots, tee ingots, billets, wire rods, cast strips, alloy ingots and rolled products.

Captive Power Plant

7.11 The Aluminium Smelter and coal-based pit head captive power plant at Angul are strategically located. The Power Plant is located approximately 5 km away from Aluminium Smelter. The location of captive thermal power plant at Angul is also strategic to the availability and supply of coal.

NALCO sources its major coal requirement for captive thermal power plant from the Talcher coalfields of Mahanadi Coalfield Ltd. (a subsidiary of Coal India Ltd.), located approximately 15 km from Angul. The 18.5 km captive railway system links the captive thermal power plant to the Talcher (Bharatpur) coalfields, enabling transport of the critical and bulk requirement of coal. Recently, the Company has started coal production from its Utkal – D coal mines and using the coal in its captive power plant.

7.12 The captive thermal power plant commenced operations in 1986. Presently the captive thermal power plant has a generation capacity of 1200 MW by way of 10 turbo-generators, each rated at 120 MW. While the captive thermal power plant provides entire electric power requirement of Aluminium Smelter, it also provides a small amount of power to the Alumina Refinery through wheeling.

Photo-7.5
Captive Power Plant

Wind Power Plants

7.13 The 1st wind power plant of capacity 50.4 MW in Gandikota, Andhra Pradesh was commissioned in FY 2012-13 and the 2nd wind power plant of capacity 47.6 MW at Ludarva site, in Jaisalmer, Rajasthan was commissioned in FY 2013-14. The 3rd & the 4th wind power plants of capacity 50 MW at Devikot site, Jaisalmer, Rajasthan and the 50.4 MW Wind Power Plant at Sangli, Maharashtra were commissioned in FY 2016-17.

Photo-7.6
Wind Power Plant, Jaisalmer

Rooftop Solar System

7.14 NALCO utilised the entire available roof top space in Corporate Office, Township and NRTC at Bhubaneswar for setting up of 630 kilowatt peak (KWp) solar power plant. Also, 220 KWp Roof-top Solar PV Plant had been installed at Mines & Alumina Refinery, Damanjodi. The total installed Roof-top Solar PV Plant capacity now stands at 850 KWp.

Photo-7.7
Roof Top Solar facility

Port Facilities

7.15 On the Northern arm of the inner Harbour of Visakhapatnam port on the Bay of Bengal, NALCO has established mechanized storage and ship handling facilities for exporting Alumina in bulk.

Photo -7.8 Port Facility, Vizag

Performance of NALCO

7.16 Physical performance, financial performance and sales performance are presented at **Table 7.1**, **Table 7.2** and **Table 7.3**.

Table 7.1:
Physical Performance of NALCO

(in lakh tonne)

Product	Unit	2019-20 Actual	2020-21 Actual	2021-22 Actual	2022-23 Actual	2023-24 (Target)	2023-24 (Actual)
Bauxite	Lakh tonne	73.02	73.65	75.11	74.57	75.25	75.27
Alumina Hydrate	Lakh tonne	21.61	20.86	21.22	21.23	21.50	21.24
Aluminium Metal	Lakh tonne	4.18	4.19	4.60	4.60	4.60	4.63

Table 7.2
Financial Performance of NALCO

(in Rs. crore)

Sl. No.	Particulars	2019-20 Actual	2020-21 Actual	2021-22 Actual	2022-23 Actual	2023-24 achievement upto Q3	2023-24 Expected
1.	Income *	8,744	9,102	14,478	14,490	9,506	Shall be submitted after Annual Audit 2022-23
2.	Operating Cost**	7,983	7,173	9,664	11,806	7,805	
3.	Interest & Transaction Loss	6	7	23	13	8	
4.	Depreciation & Amortization	530	606	837	716	510	
5.	Profit before Income tax and Dividend	226	1,316	3,955	1,955	1,414	

** Income and expenditure are net of excise duty on sales.*
***Operating cost includes exceptional items.*

Table 7.3
Sales Performance of NALCO

(in lakh tonne)

Product	Unit	2019-20 Actual	2020-21 Actual	2021-22 Actual	2022-23 Actual	2023-24 (Target)	2023-24 (Actual)
Total Alumina/ Hydrate Sale	Lakh Tonne	13.04	12.28	12.33	12.47	12.57	11.68
Aluminium Export	Lakh Tonne	0.57	1.92	1.33	0.25	0.80	0.51
Domestic Aluminium Sale	Lakh Tonne	3.39	2.31	3.24	4.39	3.80	4.19
Total Aluminium Sale	Lakh Tonne	3.96	4.23	4.57	4.64	4.60	4.70

Ongoing Projects

7.17 The major activities during FY 2023-24 pertaining to various projects of NALCO are as under:

a) 5th Stream Refinery:

- Project conceived to be executed through 21 LSTK packages, 16 Work contracts & 119 Supply Items.
- All 21 LSTK packages ordered.
- 14 out of 16 Works contract ordered. Balance 2 work contracts have been tendered out.
- Orders placed for 111 out of 119 supply items. Balance small value items are being placed, as project is progressed.
- Project Execution under progress. As of Mar' 2024- Physical Progress: 63% & Financial Progress: 57%
- The work progress of various packages/works is being monitored closely at various levels to expedite the execution.

b) Development of Pottangi Bauxite Mines:

- Environment clearance, Forest clearance, Consent to Establish obtained.
- Grant Order of Mining Lease issued by GoO.
- Execution of Mining Lease expected shortly.

c) Bauxite Transportation System from South Block of Panchpatmali Mines:

- Order placed for all the packages (04 LSTK & 05 Works) : Rs. 436 Crore
- Site execution activities are in progress.
- Overall project progress as on end of Mar'2024 is 80.48 %.
- The work progress of various packages is being monitored closely at various levels to expedite the execution.

d) Utkal D & E Coal Mines:

- Utkal D Coal Mine opened in Nov'2022.
- Coal Production & Dispatch of 2 Million Tonnes (Full capacity) accomplished from Utkal-D for FY 2023-24.
- Utkal-E Coal Mines: Mining Lease executed. Utkal-E will be combined with Utkal-D. Statutory clearances

for combined mining is under process.

- Pending Issues: Diversion of 13 Ha Forest land for Utkal E; Re-diversion of 299.697 Ha Forest Land of Utkal D&E Combined. Proposals under process.

e) JV with GACL for setting up of 2.7 Lakhs TPA caustic soda plant in Gujarat:

Caustic Soda Plant (CSP) commissioned and started production of Caustic Soda from 17.05.2022. Nalco has started receiving caustic soda supply from GNAL for its Refinery since Aug 2022.

f) Angul Aluminium Park in JV with IDCO:

NALCO in JV with Odisha Industrial Infrastructure Development Corporation (IDCO) is setting up Angul Aluminium Park for promotion of downstream industries to manufacture Conductors, Extrusions, Castings, Foils & other aluminium products. NALCO will facilitate by supplying primary metal i.e. aluminium.

The land acquisition for the project is completed. Constructions of boundary wall and approach road have been completed. Modalities for metal transfer from NALCO to AAPPL have been prepared. The Standard Operating Procedure (SOP) for supply of molten metal to the Units in the Park has been finalized. Administrative building, Aluminium development centre & internal roads of the Aluminium Park have been completed. Four project proponents have been already allotted Land in the Aluminium Park and their work is in progress.

g) Acquisition of Strategic minerals in overseas (KABIL):

JV Company among NALCO, HCL and MECL named Khanij Bidesh India Limited (KABIL) formed on 8th Aug'19 to identify, acquire, develop, process and make commercial use of strategic minerals in overseas locations for supply in India and thus boost "Make in India" initiative of Government of India. At present, KABIL is focusing on identifying and sourcing battery minerals like Lithium and Cobalt. KABIL is exploring options for various mineral deposits in Argentina, Australia and Chile. Engagement with Government agencies, companies/ projects are underway in Argentina, Australia and Chile.

KABIL signed an agreement with CAMYEN in Jan'2024 for exploration and development of five lithium blocks at Catamarca, Argentina. KABIL has submitted "Minimum Prospecting and Exploration Work Program" to CAMYEN for submission to Mining Authorities in Catamarca. KABIL has initiated activities for opening of branch office at Catamarca, Argentina.

h) Brownfield Expansion of Smelter (Capacity: 0.5 million TPA):

Detailed Project Report (DPR) for the project has been prepared. Land acquisition activities and obtaining EC are under process. Rio Tinto Aluminium Pechiney requested for providing technology support. M/s EIL has been engaged for obtaining Environmental Clearance (EC) and Consent to Establish (CTE).

i) Sourcing of Power for Smelter expansion:

Detailed Project Report (DPR) for

installation of 4 × 350 MW units at Captive Power Plant, Angul has been prepared. As an alternative, Consultant has been engaged for evaluation of power sourcing options like setting up a new CPP or expansion of existing CPP or long-term sourcing of power from IPP/ JV/ Third Party. MoU with NTPC has been signed for exploring sourcing of power for Smelter expansion project. MoU with SJVNL for sourcing of renewable power is under discussion.

Information Technology (IT)

7.18 Role of IT in NALCO's Business Functions: Information Technology (IT) is a cornerstone of NALCO's business operations, playing a pivotal role in driving efficiency, transparency, and innovation across the organization.

7.19 Digital enablement: Since 2010, NALCO has undertaken a digital transformation journey, spearheaded by the implementation of Enterprise Resource Planning (ERP). This comprehensive system integrates all core business functions, including sales & distribution, finance & controlling, materials management, human resources and production planning. The ERP system ensures uniformity in processes, enhances information availability, and fosters transparency, empowering informed decision-making.

Additionally, NALCO has made significant strides in digitalizing its operational workflows. The implementation of Plant Maintenance solution has optimized asset utilization, while the adoption of an electronic file handling system (e-Office) across all plants and offices has streamlined document management processes, paving the way towards a paperless office environment. The e-Office Knowledge Management System further enhances accessibility to digitized documents, ensuring secure and controlled sharing of critical information.

7.20 Employee self-service: NALCO has prioritized enhancing employee experience through digitally- enabled self-service applications. Employees can conveniently manage various aspects of their work- life, including payroll, attendance, income tax, appraisal, leave, loans, perquisites, tour, medical reimbursements, and probation confirmation. Moreover, the deployment of a Computerized Hospital Management System at company-owned hospitals in Angul and Damanjodi ensures prompt medical care for employees and associates, fostering a healthy and supportive work environment.

7.21 Digital enablement for stakeholder:

Recognizing the importance of engaging stakeholders, NALCO has introduced several online platforms and mobile applications tailored to their needs. These include:

- Customer Mobile App "NAGINAA": Provides customers with information and networking opportunities.
- Vendor Mobile App "NAMASYA": Facilitates communication and collaboration with vendors, particularly micro and small enterprises.
- Citizen Mobile App "NISARG": Raises awareness about NALCO's Corporate Social Responsibility (CSR) initiatives among citizens.
- Retired Employees Mobile App "Hamesha NALCOnian": Offers access to relevant resources and updates for the retired employees.
- "Suraksha" Mobile App: Streamlines onsite safety inspection reporting at plants, ensuring a secure work environment.

7.22 Cloud based services: NALCO leverages cloud- based services for efficient procurement and invoice management. E-procurement of goods is seamlessly conducted through platforms such as Supplier Relationship Management (SAP SRM), Central Public Procurement Portal (CPPP), and the Government e-Marketplace (GeM). Integration with the Invoice Registration Portal (IRP) enhances transparency and compliance in financial transactions.

7.23 Governance & Monitoring: The organization has implemented various online web-based applications to enhance governance and monitoring. These applications enable real-time monitoring of capital expenditure, fund utilization, compliance management, and vigilance complaint resolution. Such initiatives ensure timely decision- making and effective resource management and statutory compliances.

7.24 Analytics: NALCO harnesses the power of data analytics and visualization tools to monitor and optimize production, sales & distribution, and human resource management processes. Data- driven insights drive strategic decision-making and operational efficiency.

7.25 IT Infrastructure: To ensure uninterrupted service delivery, NALCO has invested in robust IT infrastructure, including:

- Primary Data Center located at Corporate Office, Bhubaneswar, equipped with server virtualization technologies, and hosts all Centralized Applications including ERP and e-Office. Disaster Recovery Data Center is located in a separate seismic zone.
- For increased network availability across locations a state-of-the-art SDWAN technology for an intelligent provisioning of application policies that align to business intent.
- Dual MPLS circuits connecting plants and offices to the Corporate Data Center, ensuring uninterrupted access to applications and services.
- Gigabit Ethernet LAN with Firewall at each plant location and Corporate Office, ensuring network security and integrity.
- Multichannel video conferencing solution facilitating effective communication across all business units.

7.26 Cyber Security: NALCO prioritizes data security and compliance, with the Data Centre and Disaster Recovery site certified as ISO 27001:2013 compliant. Robust IT security measures, including network gateway and endpoint security solutions, ensure protection against cyber threats. Regular audits and adherence to government-mandated cyber security guidelines uphold the integrity and confidentiality of organizational data.

7.27 Adoption of emerging technologies: Blockchain Integration Project: In line with its commitment to innovation, NALCO is currently spearheading a Blockchain Integration Project. This initiative, by leveraging blockchain's immutable ledger technology, aims to integrate blockchain technology with the organization's recruitment app, ensuring tamper-proof records, enhancing transparency, security, and efficiency in the hiring process.

Action Taken on Pollution Control and Environment

7.28 NALCO as a responsible corporate Business Organisation, has given maximum thrust on environment management and pollution control ensuring a cleaner greener and safer environment at all its production units and periphery. All production units are certified to International Standards on Environmental Management Systems (ISO14001) as well as Occupational Health

and Safety Management Systems (ISO 45001) affirming commitment to comply proactively with continual improvement. Further to have cleaner and greener surroundings in all its operating units, 5S principle has been adopted and massive plantation is taken up in and around the plant. All Productions units are running with valid Consents, licenses, authorizations under different statutes.

7.29 The global climatic change scenarios along with global warming have forced the regulators to enforce stringent environmental regulation day by day. However, being cetified to international standards, NALCO proactively take steps to face the challenges of upcoming stringent statutory regulations from time to time and modify its policies and strategy accordingly. Our revision of Sustainable Development policy is an apt step in this direction. A sustainable development report is published by NALCO every year aligned with the international Global Reporting Initiatives (GRI) Standards.

7.30 In our endeavour to keep our environment clean and green we have made capital investment for upgrading our pollution control infrastructure, indulged in massive plantation & afforestation drive and have created awareness around our dwelling for a better planet. For developing awareness on environmental issues, NALCO imparts internal as well external training to its employees, as well as contractor workers on pollution control measures and on prevention of pollution. NALCO encourages active participation of its employees in environmental functions like Earth Day, World Environment Day, Vanamahotsav, Chemical Disaster Prevention Day, Ozone Day, National Pollution Prevention Day etc.

The unit Specific major improvements taken up in the field of environment management at different units of NALCO during the year 2023-24 are as follows:

a) Bauxite Mines:

- 1,20,389 numbers of trees were planted in and around Mines against the target of 1,10,000 numbers of trees. Around 5500 numbers of fruit bearing seedlings were distributed to local villagers to improve awareness about plantation among the villagers.
- Approx 14.3 Ha of mined out area were rehabilitated with plantation.
- 7000 square meter of grass-turfing was carried out inside the Mines as per the target.
- One Miyawaki garden have been established in South block mined out area in an extent of 0.25 Ha with indigenous plant species of 25 varieties including fruit bearing, medicinal, flowering and of timber value towards improvement of biodiversity with creation of dense forest within short span of time.
- A biodiversity conservation policy was developed for Mines.

b) Refinery Plant

- Alumina Refinery achieved 100.70% ash utilization for the year 2023-24.
- 15,084 nos. of trees were planted in and around Alumina refinery.
- 2nd Red Mud Pond construction work is going on and in the final stage of it's completion.
- Project works, for Implementation of Red Mud cake filtration system and dry stacking system, as per CPCB guideline on Handling and Management of Red mud, are on preliminary stage.

- E-Waste have been channelized to authorized collection centre/ Recyler as per E- Waste Management & Handling Rule.
- Hazardous wastes (discarded asbestos and Used oils) are channelized through the authorized agency.
- Plastic wastes (Used filter clothes) are disposed through authorized co-processing cement plant.
- Empty Chemical containers/ Barrels are being disposed through authorized recycler.

c) Smelter Plant:

- To develop green belt, 3,010 Nos. of sapling planted inside Smelter Plant with distribution of 15,500 Nos. of sapling to outside periphery villages during the FY 2023-24.
- CTE for enhancement of Aluminium metal production Capacity from 4.6 Lakh TPA to 4.8 Lakh TPA has been granted by OSPCB under NIPL (No increase in pollution load). Trial CTO for the same is also issued.

d) Captive Power Plant:

- Stack emission is maintained within the specified norm as prescribed by SPCB. To further improve stack emission, revamping of Electrostatic Precipitators has been carried out.
- CPP Nalco has planted 8050 Nos. of plant in the year 2023-24. The plantation done since its inception is covering around 34.68 % of total area.
- Adopted eco-friendly manner of ash disposal to allotted mine void of South Bharatpur after commissioning of most coveted Lean slurry project (LSP). The ash utilization for the year 2023-24 is 89.77%.
- Implemented incentive scheme of Rs 150/MT to Brick manufacturer to enhance ash utilization. In the year 2023-24 (Up to Feb'2024) around 6.59 lakh MT of dry ash has been supplied to Brick manufacturer.
- In the year 2023-24, around 1.57 lakh MT of pond Ash has been supplied to NH for road construction. Further follow up is being done with National highway & State high way to enhance utilization of Pond ash in upcoming project for using in road and flyover construction
- Consent to Establish (CTE) had been received from State Pollution Control Board (SPCB) in Nov'2022 for construction of 5th phase ash mound by increasing height of Ash Pond-II from 115 to 123 MRL (Meter reduced level).
- Zero discharge has been achieved with respect to industrial effluent, ash pond overflow water and sewerage treatment plant treated water which has been certified by State Pollution Control Board.
- During the FY 2023-24, 2,17,80,909 cubic meter water recycled and reused after treatment in CPP from sources like mine void overflow water, rain water harvesting, Industrial Drain water, Ash Pond.

Energy Conservation

7.31 NALCO is having Energy Management System in its energy intensive Production

Units i.e. Refinery, Smelter & CPP and certified to International Standard on Energy Management System (ISO 50001). Unit wise energy conservation measures taken up during FY 2023-24 are as follows:

a) Mines

- Replaced 150 nos. of old conventional 100 W ceiling fans with energy efficient 28 W BLDC fans (Total saving 10 MWh per year).
- Replacement of conventional lights and incandescent bulbs with LED tubes and bulbs
- Successfully Commissioned a 50.76 KWp On- Grid roof top PV solar power plant on 30.06.2023, in addition to its existing 130 KWp capacity. Effort is being made to add another 40 KWp On-Grid roof top solar plant in 2024-25.
- Reduction of HSD oil consumption has been achieved by addition of fuel additives in HEMM, modification in methodology of operations, optimum selection of HEMM for bauxite generation and modification in methodology of loading of excavated ore in Central Block Sector-2 area. Approx. 530 KL of HSD oil has been saved.

b) Alumina Refinery

- Application of HFO additives in Calciners has resulted 1.8% reduction in specific oil consumption.
- GL Header of BAT- A, B & D has been modified (more loops have been removed) in evaporators for better utilization of steam, which has resulted saving of 3542 MT/yr.
- Replacement of low capacity aluminate liquor pump in security filtration has resulted in energy saving of 394 MWh/yr.
- Replacement of conventional lights and incandescent bulbs with LED tubes and bulbs carried out.

c) Smelter

- Graphitization of cathode to reduce specific DC energy consumption in pot line, saving @ 55kwh/MT of hot metal, is going on. Out of total 960 number of pots in operation, 918 number of pots are graphitized.
- A pilot project i.e. "Development of low energy cell technology for Smelter plant (AP2XN)" had been taken up with an objective to reduce specific energy consumption under the development co-operation agreement between Rio Tinto/ Alcan, Canada and NALCO. 15 pots in G02 section of pot lines were under trial operation. After trial, it was found that there is an energy saving of 150 KWH/MT of hot metal compared with reference pots. Nalco has planned to go for trial of AP2XN technology in additional 45 number of pots. For this project, 45 sets of side slabs are being procured.
- Installation of 2nd Anode Slot cutting Machine at Rodding Shop–2 is in progress, with DC Energy saving potential @140 kwh/MT of hot metal. Commissioning is expected to be completed shortly.
- Energy Saving device in breaker assembly has been incorporated in 47 pots with an objective to reduce consumption of compressed air. The

compressed air saving achieved are 62% (approx.) as per the extensive tests conducted.

d) Captive Power Plant:

- Renovation & Modernization of existing Air- Preheater in Unit-2 & 4 with advanced profile heating element, double sealing arrangement and VFD drives, completed in May 2023 & July 2023 respectively. This has resulted in increase in boiler efficiency more than 1% due to reduction in air leakage and increased heat transfer.
- Revamping of Cooling Tower was carried out in Unit - 8, during November 2023, which improved the performance of cooling tower as well as improved condenser vacuum thereby reduction in coal consumption.
- De staging of existing Condensate Extraction Pump (CEP-B) from 7 stages to 6 stages completed in Unit-8, during November 2023, which resulted in reduction of power consumption by 30 kW.
- Chemical cleaning of condensers in Unit # 8 was carried out in November 2023. Improvement in condenser vacuum near to design value has been achieved, thereby resulted in saving of coal.

7.32 Research & Development (R&D)

- NALCO in its pursuit towards organizational growth through sustained development in process, product and technology has setup a R&D Centre named as "NALCO Research and Technology Center (NRTC)" at Gothapatana, Bhubaneswar with state of the art research and development facility, to achieve excellence in the fields of Bauxite, Alumina, Aluminium, Power and allied areas of research including down streams at national and international levels, progressively. Samples received from outside are being analyzed on chargeable basis for generating revenue and samples from Nalco's different units are being analyzed, as and when required.
- Since inception, 44 patents have been filed by NALCO out of which 31 have been granted and 8 have been commercialized. 03 nos. of Patent applications were granted in FY 2023-24. Research Advisory Committee (RAC) meetings are being held periodically to review the R&D activities of the company. Total five numbers technical papers were presented and published in the proceedings of national and international conferences, during the year.
- MOU renewed between BARC & NALCO for 'Development of Chemical Methods and Technologies for Value Added Processes and Products in Aluminium Industry'. Project on "Development of sacrificial bricks from red mud for core catcher of nuclear thermal power plants" is under progress.
- Eighteen (18) numbers of collaborative projects are in progress with various reputed institutes like IIT Bhubaneswar, IIT, Kharagpur, CSIR-IMMT, JNARDDC, CSIR- CECRI etc. Nine (9) collaborative projects awarded during the year.
- Project on "Development of process and suitable medium for selective extraction of Gallium from Plant liquor and setting up a demonstration plant in Refinery" with BARC & Heavy Water Board is in progress.

- Project activity is in progress on 'Technology development for holistic utilization of red mud between three industries, NALCO, HINDALCO & VEDANTA and three research institutes NML, IMMT & JNARDDC. Demonstration trials were conducted at all three institutes and project is being monitored and reviewed on a regular basis.
- Ministry of Mines (MoM) under Satyabhama portal during 2023-24 has approved the pilot plant project to come up at NRTC, Gothapatna for "Recovery of Alumina & REE from Fly ash" jointly submitted by CSIR-Institute of Minerals and Materials Technology (IMMT) and Kalinga Institute of Industrial Technology (KIIT) & NALCO as the industrial partner.
- Development of Process for 4N High pure Alumina (99.99%) and substrate making for its validation in LED application project with JNARDDC, IIT-Bhubaneswar & Anna University is in progress.
- Under the umbrella MOU with BARC, Bauxite certified reference material, CRM BARC - B1201 has been developed successfully and the same has been launched for sale from NALCO website. Development of Alumina CRM is in progress.
- More than 5,540 samples of bauxite, aluminium metal, alumina, coal etc. were tested in NRTC Laboratory.

Procurement

7.33 Against mandatory target of 25% procurement from MSEs, NALCO has achieved 30.64% for the FY 2023-24 (against 29.88% in FY 2022-23).

7.34 Total procurement by the Company from MSEs for the FY 2023-24 including SC/ ST owned & women owned MSEs is Rs.1059.84 crore (against Rs. 960.00 crore in FY 2022-23) out of which procurement from SC/ST owned MSEs is Rs.7.235 crore (against Rs. 11.50 crore in FY 2022-23) & Women owned MSEs is Rs. 108.05 crore (against Rs. 32.01 crore in FY 2022-23).

7.35 Total procurement by the Company through GeM portal is Rs. 3458.8 crore in FY 2023- 24 (against Rs. 4211.97 crore in FY 2022-23).

7.36 Total 651 nos. of reverse auction done in FY 2023-24 (against 220 nos. in FY 2022-23) and notional cost reduction due to reverse auction is Rs. 28.78 crore (against Rs118.05 crore in FY 2022-23).

Industrial Relations

7.37 Industrial Relations: During the year 2023-24, the Company continued to maintain a conducive and cordial Industrial relation climate. The year 2023-24 passed off as yet another year with zero man-days loss on account of labour disputes. Compliance of applicable Labour Laws, adherence to Government Guidelines and consultative decision making, continued to remain the core strengths in dealing with employee benefits and welfare issues. As always, zero tolerance to indiscipline continued to remain the hallmark of IR philosophy.

MoU rating of NALCO during the last five financial years

Year	Composite Score	Grade
2018-19	96.04	Excellent
2019-20	44.70	Fair
2020-21	90.75	Excellent
2021-22	95.03	Excellent
2022-23	65.00	Good

Aluminium Industry in India

7.38 The Indian primary Aluminium industry consists of three major players i.e. National

Aluminium Company Limited (NALCO), Hindalco Industries and Vedanta Ltd., having a total production capacity of 4.13 million tons. The total production of Primary Aluminium metal was about primary producers, i.e., NALCO, Hindalco and Vedanta was 1.90 million tons in FY 2022-23, and 2.21 million tons in FY 2023-24, i.e. increase by 0.31 million tons (approx. 16%) against previous year. It is expected that by 2033, India's Aluminium demand may increase to 9 million tons. India's per capita Aluminium consumption is only 3.1 kg compared to the world average of 12 kg and China's at 31.7 kg.

7.39 A study conducted by CRU has revealed that global aluminium demand will increase significantly by 2030 and that the aluminium sector will need to produce an additional 33.3 Million tons to meet demand growth in all industrial sectors – from 86.2 Million tons in 2020 to 119.5 Million tons in 2030. The study details demand across key industrial sectors and regions in a post-Covid economy. Transportation, construction, packaging and the electrical sectors are the four key sectors that will drive demand, accounting for 75% of the total metal required. Two-thirds of this growth is expected to come from China, which will require 12.3 Million tons, the rest of Asia adding a further 8.6 Million tons, North America 5.1 Million tons and Europe 4.8 Million tons. Together, these four regions alone will account for more than 90 per cent of the additional aluminium required globally.

According to the report, decarbonisation policies plus a shift from fossil fuels in the transport sector will see an increase in EV production to 31.7 Million tons in 2030 (compared to 19.9 in 2020). Renewable energy demands will also see a rise in demand for aluminium for solar panels, as well as replacing existing copper cabling for power distribution. In total, the electric sector will require an additional 5.2 Million tons by 2030. The construction sector will require an additional 4.6 Million tons by the end of the decade. Urbanisation will account for 44% of growth, coming from Asia (excluding China). Aluminium packaging will rise from 7.2 Million tons in 2020 to 10.5 Million tons in 2030, driven by an increase in the popularity of canned drinks across North America, Europe and China. A surge in demand for environmentally friendly packaging combined with new products is also behind the increase.

7.40 Aluminium is an important input to a number of technologies critical to the energy transition and a significant source of CO2. Direct emissions from the global aluminium sector have been steadily rising. Therefore countries transit to clean technologies, in response to the urgent need for climate action and sustainable lifestyles, the shift to a 'Net Zero' economy is expected to be metal-intensive and aluminium has been identified as one of the critical metals that will aid clean energy solutions, green technologies and sustainable systems. Aluminium is a lightweight material, which is ideal for use in EVs, 'Green Buildings' and power cabling. Based on the International Energy Agency's projections for a sub- two degrees global warming scenario, consistent with the Paris Agreement (Beyond 2°C Scenario or B2DS), demand (including recycled aluminium and scrap) could increase from the present level by 80% to around 170Mt by 2050. It is estimated, in this context, that to cater to this huge spurt in demand, up to 28.5% increase in global primary aluminium production shall be required (from around 70 Mt in 2023 to 90Mt in 2050), while the rest may be met from secondary sources and scrap.

7.41 The Global Primary Aluminium production for the FY 2023-24 is estimated to be 71.162 million tons against world consumption of 70.724 million tons, resulting in market surplus of 0.438 million tons.

Primary Aluminium prices has slumped around 11.57% in FY 2023-24 with respect to FY 2022-23. The major factors which may have affected the price are subdued demand, economic deceleration in the Western world, inflationary pressures, elevated bank interest rates, escalating energy costs, and geopolitical crises collectively contributes to the uncertainty in the aluminium industry. On a positive outlook, the primary catalyst for aluminium demand is expected to be the transportation industry, with the electric vehicle sector playing a significant role in driving this demand. The renewable energy sector may also play a vital role in the demand generation of aluminum. The aluminium recycling sector contributes significantly to sustainability, as industry leaders actively pursue strategies to decarbonize their manufacturing processes, with a dedicated emphasis on achieving future net-zero emissions. China is progressively transitioning towards greater utilization of hydropower and other renewable energy sources for producing low –carbon aluminium.

7.42 Indian Aluminium demand has so far remained resilient to economic headwinds and performed well in FY 2023-24. India's economic indicators send some positive signals while demand from end-users points to a mixed picture. As per RBI, India's GDP growth outlook is expected to be 7.3 % YOY for FY 2023-24 as compared to 7.2% for 2022-23. Inflation is expected to reduce to 5.4% in FY 2023-24 from 6.7% in FY 2022-23. India has a projection to reduce carbon emissions by 1 billion tonnes by 2030 and also intends to reduce oil import dependency. Hence, Government of India envisages faster adoption and promotion of EVs as a means to achieve these objectives. The future of the EV market is bright, and aluminium will continue to play a significant role in driving innovation and sustainability in this exciting and dynamic industry.

The Aluminium industry in India faces several daunting challenges including rising imports, and escalating production and logistical costs. The industry's sustainability is also affected by non-competitive energy costs and severe shortage of coal allotted to the Non-power sector. Corrective measures such as rationalization of duties, rectification of the inverted duty structure on critical inputs etc. is expected to improve cost competitiveness of the industry, as well as attract fresh new investment. India has sufficient domestic capacity to meet the country's aluminium demand of about 4.5 million MT. The Indian Primary aluminium industry is well resourced to expand further and contribute significantly to the country's economic growth, development and wealth creation.

7.43 The total domestic production of Aluminium metal by Aluminium producers in the year 2020-21 to 2023-24 is given at **Table 7.4**.

Table 7.4
Production of Aluminium in India

(Figs. in Tons)

Sl No.	Producer	2020-21	2021-22	2022-23	2023-24
1	NALCO	4,18,522	4,60,000	4,60,000	4,63,428
2	HINDALCO	12,40,917	13,03,517	13,49,862	13,70,742
3	VEDANTA GROUP	19,70,477	22,69,083	22,87,689	23,58,813
	Total	**36,29,916**	**40,32,600**	**40,97,551**	**41,92,983**

(Note: Production figures pertaining to other primary producers are based on available market data)

7.44 TThe sales figure of Aluminium (Domestic Sales of Aluminium & Export Sales of Aluminium in India are given at **Table 7.5** and **Table 7.6**.

Table 7.5
Domestic Sales of Aluminium

(Figs. in Tons)

Sl No.	Producer	2020-21	2021-22	2022-23	2023-24
1	NALCO	2,30,643	3,23,809	4,38,876	4,18,946
2	HINDALCO	4,80,279	6,38,702	6,84,421	8,13,834
3	VEDANTA GROUP	6,36,378	6,05,510	7,75,198	9,78,706
	Total	**13,47,300**	**15,68,021**	**18,98,495**	**22,11,486**

(Note: Domestic sales figures pertaining to other primary producers are based on available market data)

Table 7.6
Export Sales of Aluminium

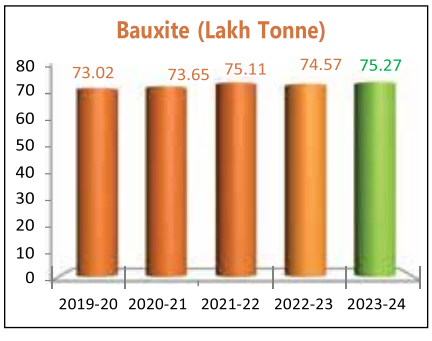
(Figs. in Tons)

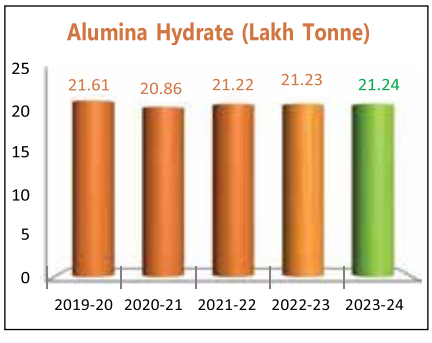
Sl No.	Producer	2020-21	2021-22	2022-23	2023-24
1	NALCO	1,92,174	1,33,085	25,214	51,163
2	HINDALCO	7,80,206	6,67,233	6,63,188	5,55,010
3	VEDANTA GROUP	13,56,740	16,64,724	15,10,452	13,79,979
	Total	**23,29,120**	**24,65,042**	**21,98,854**	**19,86,152**

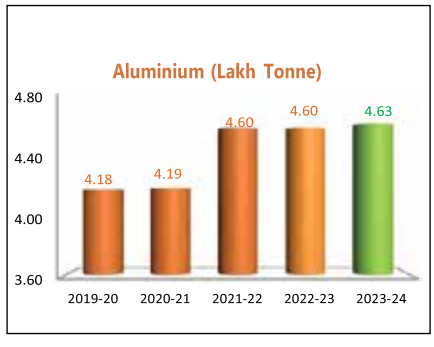
(Note: Export sales figures pertaining to other primary producers are based on available market data)

Trends of Production & Sales Parameters

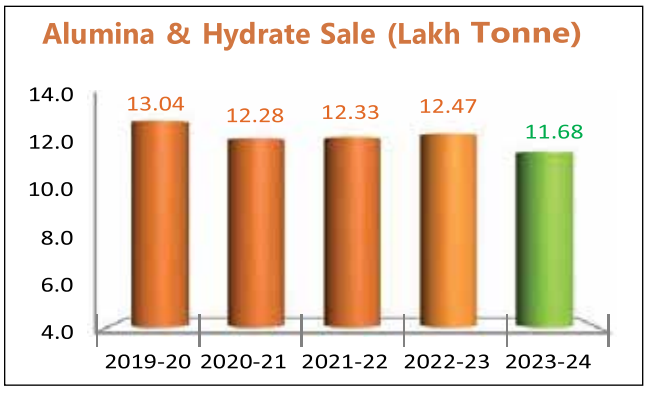
Production

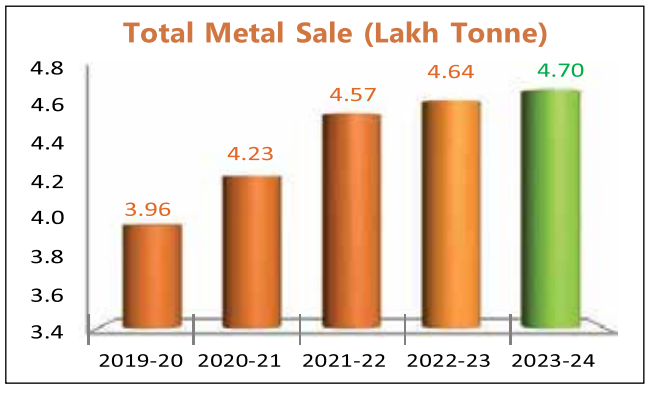






Sales





Hindustan Copper Limited (HCL)

Introduction

7.45 Hindustan Copper Limited (HCL), a Miniratna Category-I, Government of India (GoI) Enterprise under the administrative control of the Ministry of Mines, was incorporated on 9th November 1967 under the Companies Act., 1956. It was established as a Govt. of India Enterprise to take over all plants, projects, schemes and studies pertaining to the exploration and exploitation of copper deposits from National Mineral Development Corporation Ltd. It is the only company in India engaged in mining of copper ore and owns all the operating mining lease of Copper ore. Major activities of HCL include mining, ore beneficiation and converting of refined copper metal into continuous cast rod (CCR) as downstream product. HCL have five units - one each in the states of Rajasthan, Jharkhand, Madhya Pradesh, Gujarat and Maharashtra. HCL is a listed company on BSE and NSE, with 66.14 % equity owned by the Government of India.

Highlights of year (01.01.2023 to 31.03.2024)

- In Financial year 2023-24, Malanjkhand Copper Project (MCP) Unit has achieved ore production of 2.55 Million tonne which is 106% of the target of 2.40 Million tonne and 18% higher than FY 2022-23. Khetri Copper Complex (KCC) Unit has achieved ore production of 1.23 million tonne which is 103% of the target of 1.20 Million tonne and 11% higher than FY 2022-23.
- The Metal in Concentrate (MIC) production for FY 2023-24 of the company reached 27,404 tonne which is 11% higher than of 24, 760 tonne for FY 2022-23.
- Taloja Copper Project (TCP) Unit has achieved 27,833 tonne of CCR production (for third party tolling) of FY 2023-24 which is higher by 21,275 tonne as compared to 6,558 tonne for FY 2022-23.
- HCL was achieved Capex for FY 2023-24 was Rs.518.14 Crore against the target of Rs. 350 Crore.
- The Board of Hindustan Copper Limited in its meeting held in Kolkata on 13.02.2024 has approved the Financial Results for the nine- month ending December 2023 for FY 2023-24. The turnover was around 3% higher than the preceding nine-month ending December 2022.

  The Profit Before Tax achieved during the nine- month ending December 2023 was Rs 227.14 crore on a Turnover of Rs 1132.14 crore as compared to Rs 221.76 crore on a Turnover of Rs. 1101.94 Crore as achieved in nine months ending in Dec. 2022.
- HCL has paid dividend of Rs.58.84 crore to the Government of India. Total dividend pay- out to the Shareholders is Rs. 88.97 crore on 27.10.2023.
- The Company has added 66.59 million tonnes of Copper Ore in its reserves and resource base during FY 2022-23. As on 01.04.2023, the total Reserve & Resource of Copper Ore within HCL's mining leases is 698.44 million tonnes of ore with average grade of 0.96% copper.
- HCL has signed the tripartite 8th Wage Settlement before Dy. Chief Labour Commissioner (Central), Kolkata, on 03.01.2023 for revision of Wages and Allowances of Workmen. The Settlement is for a period of 10 years w.e.f. 01.11.2017 to 31.10.2027.

- A Memorandum of Understanding (MoU) for collaborative and sponsored research projects was signed between HCL & IITISM_DHANBAD on 03.01.2023 for enhancing production through modifying mining methods with application of technologies, improvement of productivity and safety in mines, environmental clearance etc.

Photo 7.9

- HCL and Telecommunication Consultants India Limited (TCIL) signed an MOU on 28.10.2023 at Indian Mobile Congress 2023 at Pragati Maidan Delhi to showcase used cases of 5G technology in its mines.

Photo -7.10

- KCC unit has won 1st Prize in Mineral Conservation in 33rd Mines Environment & Mineral Conservation Week 2022-23 along with being 2nd Prize in Environment Monitoring, Publicity & Propaganda and 3rd prize in Publicity & Propaganda, Afforestation, Overall Performance.
- Indian Copper Complex (ICC) unit has won Overall First in Overall Performance in the 29th Mines Environment & Mineral Conservation Week 2021-22 of along with being Winner in Afforestation, Publicity & Propaganda, Systematic and scientific Development, Environmental Monitoring, Sustainable Development, Waste Dump Management, Reclamation & Rehabilitation and Overall Second in Overall Performance.
- MCP unit was adjudged for 5 Star Rating Award for the year 2021-22 for excellence in all the set norms in the Mining industry.

Photo 7.11

- MCP unit has won various prizes in the Metalliferous Mine Safety Week 2022-23 like 1st Prize in First Aid Team Competition, Cable Bolt Operator Trade Test, Mine Workings, Occupational Health, Safety & Welfare and 2nd Prize in Mine Plans & Record, Storage, Transport & Use of Explosive, Electrical Equipment & Installations, Overall UG Mine without Winder & various Trade test and 3rd prize in Safety Management Plan (SMP) & Emergency Preparedness.
- Prizes won by KCC unit in underground Metal Mines Category in the 36th Mines Safety Week 2022-23, Ajmer Region are as follows: -

Khetri Copper Mine: -

- Storage transport & use of explosive, Electrical equipment & Installations: 1st Prize
- Plant, Machinery maintenance & operation of winder: 2nd Prize

- Overall performance, Occupational health & safety and welfare amenities, vocational training and first aid: 3rd Prize

Kolihan Copper Mine: -

- Occupational health and safety: 1st Prize
- Overall Performance, Vocational Training & First Aid, Mine working & Plan: 2nd Prize
- Electrical Equipment Installation, Plant, Machinery & Maintenance, Publicity & Propaganda: 3rd Prize
- HCL has won the 35th CFBP (Council for Fair Business Practices) Jamnalal Bajaj Award for fair business practices, period- 2022-23, in the category of Manufacturing Enterprises- Large at Mumbai on 16.05.2023.

Photo 7.12

- HCL won "The ASSOCHAM Business Excellence Award for Smart Waste Management Initiative" of the Year at the Indian Mining and Minerals Conclave held in Kolkata on 30.06.2023.
- HCL has been declared winner of Indian Institute of Metals (IIM) Non-Ferrous Best Performance Award under the category of Large Integrated Manufacturing Plant.
- HCL has attended the ceremony of National Geoscience Award – 2022, held on 24.07.2023 at Rashtrapati Bhawan Cultural Center (RBCC), New Delhi. The awards were presented by Hon'ble President of India Smt. Droupadi Murmu, in the august presence of Shri Pralhad Joshi, Hon'ble Minister of Parliamentary Affairs, Coal and Mines along with Shri Raosaheb Patil Danve, Hon'ble Minister of State for Railways, Coal & Mines.
- The list of prizes won by MCP unit in 2023. Underground Mines category during the Celebration of 32nd Mines Environment & Mineral Conservation (MEMC) Week Council 2022-23 at Jabalpur on 18.03.2023 are as follows.
  - 1st Prize in Overall performance, Mineral Beneficiation & Waste Management.
  - 2nd Prize in Systematic and Scientific Development
  - 3rd prize in Reclamation and Rehabilitation
- HCL won the prize for the "best stall" in the exhibition "Alluring Rajasthan" held at Udaipur, Rajasthan from 23rd-25th Feb.'2023 and "best pavilion" in the 26th National Exhibition "Contribution to make Advanced, Powerful and Great India" held at Kolkata on 24.08.2023 on in celebration of India's G20 Presidency.

Photo -7.13

- MCP unit's copper mine have been declared Winner of the National Safety Award in the large opencast metalliferous mines category for Longest Injury Free Period.

- HCL signed a MoU with Mineral Exploration and Consultancy imited on 25.08.2023 for a duration of three years to carry exploration and allied works within its mining leases in Jharkhand, Madhya Pradesh and Rajasthan.

o HCL attended Future Minerals Forum was launched under the chairmanship of His Excellency Bandar Alkhorayef, Saudi Minister of Industry and Mineral Resources, on 12.01.2023.

o HCL has issued employment offer letters to 171 candidates for different post (128 Executives and 43 Non-Executives) during different Rozgar Melas conducted during the year.

Photo 7.14

- HCL was the nodal organization and on behalf of Ministry of Mines, Govt. of India, had set up a Pavilion in Mining Indaba Conference 2023 at Capetown during 06.02.2023 to 09.02.2023. Hon'ble Union Minister of State of Railways, Coal & Mines Shri Raosaheb Danve & Hon'ble Minister of Mining & Labor Department, Govt. of Madhya Pradesh Shri Brijendra Pratap Singh inaugurated the Pavilion.

Photo 7.15

- HCL participated in the ICDC Copper Conference 2023, held in Mumbai on 23.02.2023 and also participated in the 43rd National Seminar/Webinar on 24.02.2023 based upon "Capacity Expansion through extensive exploration & innovations for sustainable growth in Non-ferrous Mineral Industries" held at Khetrinagar, KCC.

- A National Seminar on "Deep Mining Solutions for a Sustainable Future" was organized under the aegis of the Malanjkhand Technical Association (MTA), a professional body of Malanjkhand Copper Project on 29.04.2023.

- Meeting of Standing Committee on Coal, Mines & Steel was held on 02.05.2023 at Leh and Coorg on 22.08.2023. The subject of the meeting for HCL was "Self-Reliance in mineral and metal with reference to Copper Industries".

- Hindustan Copper Limited celebrated the 9th International Yoga Day on 21.06.2023 across all its Units and Offices.

- As a part of Azadi Ka Amrit Mahotsav (AKAM), HCL is organizing Wellness camp (with Emphasis on AYUSH) across all its Units. As per directives from Ministry, there will be a theme-based celebration of Azadi Ka Amrit Mahotsav (AKAM).

- HCL had organized month long awareness campaigns on Mission LiFE like outreach activities, seminars, quiz, bicycle rallies etc. before the World Environment Day on 05.06.2023. World Environment Day was celebrated at all units and offices of HCL.

- C&AG has conducted supplementary audit of financial statements of HCL for year ended 31st March, 2023 under Section 143(6)(a) of the Companies Act, 2023.

- Shri Sarbananda Sonowal, Union Minister of AYUSH, and Ports, Shipping and Waterways, was the Chief Guest at the Closing Ceremony of AYUSH Wellness Camps organized by HCL on 04.08.2023 in New Delhi in the presence of Shri Vivek Bharadwaj, Secretary, Ministry of Mines. CMD, HCL, Director (Operations) & Director (Mining) were also present on the occasion.

Photo 7.16

- HCL took a pledge on the occasion of Organ Donation Day (Angdaan Mahotsav) across all units of HCL on 03.08.2023 to celebrate and commemorate 75 years of independence of India, as per directives of Ministry of Health and Family Welfare.
- "Meri Maati Mera Desh" Abhiyan was carried out in all the Units and Offices of HCL with great fervor on 14.08.2023. In the occasion, CMD, HCL, also administered the Panch Pran Shapath to the employees of HCL Corporate Office in Kolkata.
- On the occasion of the National Sports' Day, celebrated on 29.08.2023 employees took the Fit India pledge to lead active and healthy lifestyle and to take sports as an integral part of their lives Sports activities were also organized across the Units of HCL as well as Corporate Office.
- Hindi Diwas - 2023 was organized at the corporate office of Hindustan Copper Limited on 14.09.2023. CMD, HCL laid emphasis on the use of official language for conducting the official work using the latest technology.
- HCL participated at the 6th Eastern India Regional Conference & Exhibition organized by ISTD during 15th-16th September 2023 at Biswa Bangla Convention Centre, New Town, Kolkata.

Photo -7.17

- HCL participated with a Pavilion Stand at the CPSEs Roundtable and Exhibition 2023 on Corporate Social Responsibility being held from 25th-26th September, 2023, at Pragati Maidan, New Delhi.

Photo 7.18

- HCL participated with a Pavilion Stand at Bharat Pride Expo 2023, which was held in Hyderabad from 27th-29th September, 2023.
- HCL team devoted to the Mission of "Ek Tareekh Ek Ghanta Ek Saath" on 01.10.2023 for an active community engagement in progress by cleaning of Ward No. 72, Padmapukur, Kolkata – 700025. Such massive engagements were also undertaken at all Units of HCL for massive outreach in this mega drive of "Ek Tareekh Ek Ghanta Ek Saath".

Photo 7.19

- H.E. Mr MP Singh, Indian Ambassador to Mongolia, inaugurated the Indian Pavilion at the 12th Mongolian Mining and Oil Expo, 2023, at Ulaanbaatar, Mongolia, on 03.10.2023. HCL was the Nodal PSU for setting up of Indian Pavilion at the Expo in Ulaanbaatar on behalf of Ministry of Mines. A team of delegation from Ministry of Mines, and other PSUs took part in the conference.

Photo 7.20

- HCL is proud to be a part of Fit India Freedom Run 4.0 in observance of "Swachh Bharat Swasth Bharat". As part of Fit India Campaign, employees of HCL actively devoted at least 30 minutes to physical fitness and make a resolution to remain fit.
- Employees from HCL participated in e pledge as part of Khadi Mahotsav which is being organised from 2nd - 3lst Oct.2023 and did their bit towards Atmanirbhar Bharat.
- The birth anniversary of Sardar Vallabhai Patel, the architect of national integration of independent India is observed as Rashtriya Ekta Divas (National Unity Day) on 31st Oct. every year. HCL observed the National Unity Week from 25th-31st Oct. 2023. E - Pledge was administered by Secretary (Mines) on the occasion of Rashtriya Ekta Diwas through VC mode. HCL employees were participated in the pledge taking ceremony on the occasion of Rashtriya Ekta Diwas (National Unity Day) on 31.10.2023.
- Hon'ble Minister of Mines, Coal & Railways, Shri Raosaheb Danve, inaugurated the Indian Pavilion at IMARC event in Sydney, Australia on 31.10.2023. HCL participated with its delegation at IMARC event.

Photo 7.21

- Vigilance Awareness Week 2023 was celebrated in HCL between 30.10.2023 to 03.11.2023, wherein various programs like session on Ethics & Governance, Practices & procedures involved in procurement through GeM portal, Vendors grievance redressal meet was organized along with various other activities. As a prelude to Vigilance Awareness Week '23, a session on conceptual framework of preventive vigilance along with relevant case studies were presented by CVO.
- HCL celebrated the 3rd Janjatiya Gaurav Divas 2023 during the period commencing from 15th -26th November, 2023.

Photo 7.22

- The National Foundation for Communal Harmony (NFCH), an autonomous organization under the Ministry of Home Affairs observes Communal Harmony Campaign Week every year from 19th-25th November. HCL observed Communal Harmony Campaign Week from 19th-25th November 2023 and the Flag Day was observed on 24.11.2023.
- Shri V L Kantha Rao, Secretary, Ministry of Mines, Govt. of India, visited the Corporate Office of Hindustan Copper Limited in Kolkata on 08.11.2023 to review the activities of the Company. Functional Directors of HCL joined Secretary (Mines) in the valedictory function of 10th International Mining, Equipment & Minerals Exhibition (IME) held at Eco Park, Kolkata.

Photo 7.23

- HCL has set up a stall at the Ministry of Mines Pavilion at the India International Trade Fair (IITF) 2023, organized by India Trade Promotion Organization (ITPO) at Pragati Maidan, from 14th-27th Nov. 2023. The theme of HCL Stall at the Mining Pavilion was on "Connecting Beyond Mining" was a success with a robust footfall.

Photo 7.24

- HCL observed Swachhata Pakhwada during the 2nd fortnight from 16th-30th Nov, 2023. Few of its salient features were observing Clean Mines, targeting adjoining villages to make ODF, launching of pilot schemes of zero waste mines, Mass plantation drive etc which will have an impact on the Mining sector. Secretary (Mines) administered the Swachhta Pledge on 21.09.2023 under the Swachhta hi seva campaign. CMD, HCL along with all Functional Directors and Senior Officers of HCL undertook the pledge and attended the event through VC.
- Samvidhan Diwas (Constitution Day) was celebrated across all Units of HCL on 26.11.2023 to commemorate the adoption of the Constitution of India. HCL employees have actively participated in Online reading of the Preamble to the Constitution and have taken Online Quiz on "Bharat: Loktantra ki janani". Preamble reading ceremony was also organized in the chairpersonship of Secretary (Mines) through VC.
- Secretary (Mines), Shri V. L. Kantha Rao visited Khetri Copper complex, Rajasthan, on 05.12.2023 to review the performance of the Unit.

Photo 7.25

- HCL attended the National Apprentice-ship Promotion Scheme at Kaushal Bha-van, New Delhi which was inaugurated by Hon'ble Minister of Education, Skill Development & Entrepreneurship.
- HCL has set up a pavilion at the 10th Indian National Exhibition-cum-Fair themed on "Self- Reliant India: Future Leader of the World" organized by Bengal Human Research Foundation from 6th-10th Dec '23. The exhibition was participated by many other CPSUs and Govt. Organizations. HCL won the first prize in the exhibition.

Photo 7.26

- HCL observed "Veer Bal Diwas" on 26.12.2023 in the memory of the supreme sacrifice of Sahibzada Zorawar Singh and Sahibzada Fateh Singh. HCL paid homage to the young martyrs with a heartfelt floral tribute.
- 56 sewing machines were distributed to women at Ramakrishna Mission, Khetri Nagar, under the CSR initiative on 03.01.2024. This initiative of HCL will go a long way in for women's empowerment.
- A guide Booklet on Menstrual Hygiene Management has been released under CSR initiative. The Booklet was distributed among 5000 girl students of Bisra Block at MCP unit.
- Hon'ble Minister of Mines, Coal & Parliamentary affairs and Hon'ble Chief Minister of Madhya Pradesh visited the HCL stall at 'Mining & Beyond' exhibition of 2nd Mining Ministers conference at Bhopal on 23.01.2024, where a miniature model of Ram Mandir, Ayodhya was displayed. HCL had supplied Copper Strips & Copper Wire Rods for joining the rocks in Ram Mandir construction.

Photo 7.27

- HCL organized a Vendor's Meet on 08.01.2024 at Kolkata, where Vendors joined the meeting physically as well as virtually.
- HCL Stall at the Vibrant Gujarat Global Trade Show 2024 in Gandhinagar buzzed with activities as VG Global Trade Show emerges as one of the most prestigious platforms for business networking, knowledge sharing & strategic partnerships for inclusive growth & sustainable development.

Photo 7.28

- HCL-MCP team received the 5-star rating memento at Mines Environment and Mineral Conservation (MEMC) Week celebrated under the aegis of IBM, Jabalpur region on 13.01.2024.

Photo 7.29

- National Youth Day was celebrated at Ramkrishna Mission, at KCC unit, in a grand manner on the occasion of Swami Vivekananda Jayanti.
- 61st Annual Metalliferous Mines Safety Week (MMSW) competition 2023 has been celebrated under the aegis of DGMS, CHAIBASA REGION on 21.01.2024 in Ranchi. The event was attended by Director (Mining) and ICC team wherein several awards were won by ICC team.
- Secretary (Mines) inaugurated 63rd CGPB Meeting & Pavilion of participating organizations including HCL on 22.01.2024 at Bhopal. The event was attended by CMD, HCL. In the sideline of CGPB, Ministry of Mines organized 2nd edition of the National Mines Ministers' Conference on 23.01.2024 which was attended by Hon'ble Minister of Mines, Coal & Parliamentary affairs, Chief Minister of MP. Secretary (Mines), Addl. Secretary (Mines), JS (Mines) and other officials of Ministry also attended the program.
- KABIL, a JV Company between NALCO, HCL and MECL, signed an agreement with Camyen SE - a state-owned enterprise of Argentina on 15.01.2024. This is the first ever Lithium exploration & mining project by a JV of PSUs. Hon'ble Minister of Mines, Coal & Parliamentary affairs attended the signing event virtually.
- Mining Indaba, 2024 was held between 5th - 8th Feb'2024 at Cape Town, South Africa. HCL was the nodal organization showcasing Indian Mining Sector on behalf of MoM, GoI. INDIA pavilion was inaugurated on 05.02.2024 by Mr Prabhat Kumar, High Commissioner of India to South Africa and Mr Sanjay Lohiya, Addl. Secy., Ministry of Mines, GoI.

Photo 7.30

- HCL participated in the ICDC Copper Conference held at Mumbai on 22.02.2024.

- The 34th MEMC week closing ceremony was organized by IBM, Ajmer region, at JK Cement Works, Nembhada. Khetri mine of KCC won 1st prize in Environmental Monitoring, 3rd prize in overall performance category in UG Mines, Publicity & Propaganda and Mineral conservation. Kolihan mine of KCC won 2nd prize in Publicity & Propaganda and 3rd prize in Waste Dump Mgt. respectively on 17.03.2024.
- A 45-day-long training programme on Tailoring & Small Business was held for 20 local young women by MCP unit under its CSR scheme where Certificates & sewing machines were given to all.
- MCP unit's Mines won the following awards at the 1st MMSW 2023 at Parasia (MP).
  - 1st prize in Electrical Equipment & Installation & Vocational Training and First-aid
  - 2nd prize in Overall & Transport and Use of Explosive.
- Special lecture on 'Nutrition for Working Women' was delivered on occasion of International Women's Day, 2024 which was organized at HCL Corporate Office.
- A plantation drive under Corporate Social Responsibility scheme was organized at KCC unit on 14.03.2024.
- MCP unit, under its CSR Programme provided support for library development and promotion of sports in 44 schools of Birsa Block and handed over Books, Book Shelves and Sports kits to these schools.
- Director (Mining) of HCL had taken part at the International Conference on Nonferrous Metals & Material Science 2024 organized by The Indian Institute of Metals, Kolkata Chapter on 29.03.2024.

THE CAPITAL STRUCTURE OF THE COMPANY (as on 31st March, 2024): -

a) Authorised Capital:

i)	180 crore Equity shares of ₹ 5/- each	- ₹ 900 crore
ii)	20 lakh Preference shares of ₹ 1000/- each	- ₹ 200 crore
	TOTAL:	**- ₹ 1100 crore**

b) Issued, Subscribed and Paid-Up Capital

i)	96,70,24,020 equity shares of ₹ 5/- each	- ₹ 483,51,20,000/-

CAPACITIES OF HCL'S MINES, SMELTERS AND WIRE ROD PLANT: -

Present capacities of HCL's Mines, Smelters and Wire Rod plant are given in **Table 7.7**, **Table 7.8** and **Table 7.9**.

Table 7.7
Ore Milling Capacity of HCL

Location of Mines	Ore milling Capacity (million tonnes per annum)
Khetri Copper Complex (KCC), Rajasthan	1.8
Malanjkhand Copper Project (MCP), M.P.	2.5
Indian Copper Complex (ICC), Jharkhand	0.4
Total	**4.7**

Table 7.8
Refined Copper Production Capacity of HCL

Location of Smelters	Refined Metal Capacity (Tonnes per annum)
Indian Copper Complex (ICC), Jharkhand	18,500*
Gujarat Copper Project (GCP), Jhagadia	50,000*
Total	**68,500**

** Production under temporary Suspension.*

Table 7.9
Production Capacity of Wire Rod Plant of HCL

Location of Plant	Capacity (Tonnes per annum)
Taloja Copper Project (TCP), Maharashtra	60,000
Total	**60,000**

PHYSICAL PERFORMANCE: Physical performance details of HCL are as under:

Table 7.10
Physical Performance of HCL

Product	Actual for the previous two years		Target for FY 2023-24	Actual for FY 2023-24	Actual for the period Jan'23-Mar'23
	FY 2021-22	FY 2022-23			
Ore Production ('000 Tonnes)	3570	3346	3900	3782	1053
Metal in Concentrate (MIC) (Tonnes)	24741	24760	34500	27404	6477
Refined Copper (Cathode) (Tonnes)	621	7	-	-	3.96
Wire rod (Tonnes) (Tolling)	1241	6558	6000	27833	2046

**As per the business plan of the Company, Copper concentrate of MCP, KCC and ICC origin are being sold directly in the market.*
***Production of wire rod (Tonnes) is based on tolling of 3rd Party cathodes.*

Financial performance: Financial performance details of HCL are as under:

Table 7.11
Financial Performance of HCL

(in crore)

Sl No	Product	Actual for the previous two years		Target for FY 2023-24	For the Period Apr'23 to Dec'23	Actual for the period Jan'24-Mar'24	Actual for the period Jan'23-Mar'23
		FY 2021-22	FY 2022-23				
1.	Turnover	1812.21	1660.63	(*)	1132.14	(*)	558.69
2.	Net Profit/ (Loss) before Tax (PBT)	381.72	395.68	(*)	227.14	(*)	173.90
3.	Net Profit/ (Loss) after tax (PAT)	373.78	295.31	(*)	171.10	(*)	132.14

**HCL being a listed Company, price sensitive data may not be disclosed unless the audited result is published.*

Sales performance: Sales performance details of HCL are as under

Table 7.12
Sales Performance of HCL

Product	Actual for the previous two years		Target for FY 2023-24	Actual for FY 2023-24	Actual for the period Jan'23- Mar'23
	FY 2021-22	FY 2022-23			
Total Copper Sales (MT)	25807	24727	34500	25636	8576

MINE EXPANSION SCHEMES:

7.46 The Company's strategy is to aggressively expand its mine and ore beneficiation capacities. Such a strategy would also enable the company to sustain its profitability even at significantly lower copper prices and also position it to remain a dominant copper player in the country.

7.47 The Company has plans to increase its mining capacity from current level of around 4.0 million tons per annum to 12.2 million tons per annum in phase –I (under implementation) through expansion of existing mines, re-opening of closed mines and opening of new mines. During financial year 2023- 24, HCL has achieved an ore production of 3.78 million tonnes.

7.48 HCL carried out surface exploration drilling & underground definition drilling in FY 2023-24 to the tune of 25,385 meters and 24443.05 meters for enhancing copper ore reserve and resources within its mining leases. New work for surface drilling at Kendadih & Khetri Mines awarded in FY 2023-24. Above exploration work was funded by HCL through its own resources.

7.49 R & D Activities

- Scientific Study and numerical modelling at Malanjkhand underground Copper Mine by CIMFR.
- Consultancy proposal for the study & recommendation on the effect of opencast blast vibrations on underground workings, the effect of underground stope (ring) blasting on surface structures and the study of explosive characteristics.
- Slope Monitoring Study of Malanjkhand Mine for a period of three years (2023 to 2025) by CIMFR, Dhanbad.
- Process audit and capacity augmentation of MCP Concentrator plant under R&D works.
- The work of scientific study for optimizing rock fragmentation at Kolihan Copper Mine has been awarded to M/s IIT-ISM Dhanbad.
- M/s IIT, Kharagpur has conducted Three-Dimensional Numerical Modeling studies for assessing the stability of stopes and pillars at Khetri Copper Mine of KCC to ensure the stability of stopes and surrounding area in underground mines.
- The work of stability analysis and support plan of stopes between 246 mRL and 184 mRL and between 184 mRL and 124 mRL in Chandmari Copper Mine has been completed by M/s IIT- Kharagpur.
- The work of Hydrology study in Chandmari Mine Lease has been completed by M/s IIT-ISM Dhanbad.
- The initiative has been taken to overcome the problem of deterioration in

metallurgical results and improvement in recovery front of KCC concentrator plant by an expert agency M/s. IBM, Nagpur.

- Khetri Copper Complex has adopted Geophysical Exploration techniques as new technology in Exploration and subsequently the work of validation.
- The work of subsidence study for Khetri and Kolihan Mine leases has been awarded to M/s IIT-ISM Dhanbad.
- Subsidence Monitoring Survey of Surda Mining Lease, Kendadih Mining Lease and Rakha Mining Lease for Three (03) years.

7.50 Energy Conservation

- Conventional motors in continuous running equipments in all plant areas were replaced by conventional motor and motor starters with the energy efficient VFD drive systems & energy efficient motors, to improve efficiency and reduction in energy consumption as well.
- Energy consumption is constantly monitored at the mines, plants and townships with a view to achieve overall reduction. In place of conventional lights, LED lights are installed in all five units to save energy and environment. Total Rs. 65.83 Lakhs have been saved in FY 2023-24 by replacing conventional lights by these LED lights.
- "IE3 energy efficient motors" has been made the standard specification, for motor procurement, across all applications in the units of HCL.
- Approximately 17.25 Lakh unit of solar electricity has been generated by the installed Solar Power Plants across various units at HCL resulting in a saving of Rs. 71.72 Lakhs during FY 2023-24.
- HCL has saved electricity charges of Rs. 774.06 Lakhs approx. during FY 2023-24 by taking various initiatives like reduction of contract demand, power factor improvement, TOD Rebate in Electricity Bill & introducing energy efficient equipment etc. across various units.

7.51 Harvesting Renewable Energy

The project for design, supply and installation of solar power plant of various capacities under RESCO model of MNRE has been carried out across HCL with the help of M/s REIL. Out of total 1656.5 KWp solar plant installed in HCL, 1595.5 KWp carried out under RESCOmodel and remaining under CAPEX mode.

7.52 Environment

- Two piezometers and Eight PTZ Cameras for seepage sumps are installed at designated places of MCP unit.
- Continuous Ambient Air Quality Measuring Station (CAAQMS) has been installed at Town Administration building premises of MCP unit and the information is uploaded in MPPCB Portal live. Real Time Online Water Monitoring System installed at Chhinditola is functioning properly and the data is transmitted live on MPPCB Portal. Online flow meter with telemetry system have been installed at two different locations (a) Mine dewatering pipeline near reclamation pond, (b) Intake well pipe line near Water Treatment Plant.
- At MCP unit, mineral handling area has been provided with dust control arrangements. At primary crusher and transfer points water sprinkling system and at secondary & tertiary crushing and screening area water scrubber system is in place. Regular water sprinkling

over haul road is being done through three nos. water tankers. Wet drilling is practiced to reduce fugitive emissions.

- Separate pumping and dedicated pipeline installed at MCP unit for collection and complete recycling of mine and dump Seepage water. Mine pit water is being recycled through multistage pumping arrangement and collected in recycled holding pond near concentrator plant. From the recycled holding pond it is being supplied to Concentrator plant process. Since inception the project has carried out extensive tree plantation in open areas available within and around the mine premises in consultation with expert agency i.e. Madhya Pradesh Rajya Van Vikash Nigam Limited. The good housekeeping is being practiced at MCP unit.
- Plantation of around 800 saplings have been completed in Khetri Copper Complex including mines, plant and township areas.
- 100% of Mine discharge water/STP treated water at KCC unit is getting recycled in the system by using it in the mineral processing plant/ concentrator plant. The air borne dust during various mining operations is regularly suppressed by proper water sprinkling arrangements. Water spraying system on conveyor belt has been installed and effective operation of Rotocyclone has been implemented in concentrator plant for control of dust. Milli Second delay detonators are used in blasting to control noise & ground vibration and to get better fragmentation.Wet drilling is practiced invariably for reducing the generation of dust during drilling operation.
- Construction of Roof Top Rain water harvesting and recharge pond is under progress at Ghatsila College by ICC unit. 02 Nos. of Rain water harvesting-cum-ground water recharge system each for Mosabani Concentrator Plant and Hospital has been done at ICC unit.
- Quarterly monitoring (Ambient Air and Noise) through JSPCB appointed Labs has been done for Surda, Rakha, Kendadih, Mosabani plant, Moubhandar works and works Hospital of ICC unit.
- Ambient air monitoring, recycled surface water and ground water quality monitoring of Mosabani Concentrator plant by NABL and MoEF&CC Certified agency as per CTO at ICC unit.
- Observation of Mission LiFE programme with different activities of good Environmental practices like Rain water harvesting, Utilization of grey water, Cleaning of plastic waste from River side Bed, Prabhat pheri, panting completion, Yoga, promoting use of glass /clay bottle instead of plastic bottle for drinking water has been carried out.
- 100 number of saplings have been planted and Environment awareness activity has been carried out across ICC on Occasion of World Environment Day. 10,000 nos. local fruit bearing tree sapling distributed among local villager.

7.53 Information technology (IT) initiatives

The following IT initiatives, spanning all operational areas taken up by the Company for bringing about dynamism, transparency and business efficiency, are being maintained and updated. Major initiatives are:

➢ **Enterprise Resource Planning (ERP) implementation**

Maintaining ERP (Oracle e-Biz Suite R12.1.3) implementation has enabled

HCL to adopt a centralized business management platform based on which the entire company has been thoroughly unified, increased real-time visibility of critical business parameters, thereby strengthening financial management & spares control, supply chain management, customer service and HR functions. Audited financial results have been finalized within scheduled planned time.

- **On-Line Performance Management System**

  On-Line Performance Management system of Executive in Grade E-0 to E-7 has already been implemented and is functioning smoothly.

- **E-Procurement/EPS**

  Procurement of Stores & Spares items above 2.0 lakh continues to be done through Enterprise Procurement System (EPS), conducted by third party namely National Informatics center (NIC). E-reverse auction for procurement of high value item is in place.

- **On-line Recruitment**

  On-line recruitment module developed and is in operation at HCL. It is well-integrated with payment gateway to accept the online forms for recruitment. Through the module HCL can operate multiple online recruitment processes in parallel.

- **VIDEO Conferencing**

  Video Conferencing implemented throughout HCL, to reduce the TA & DA bills against executive tours. Also, Executives facilitated to interact with external agencies from their place.

- **Bill Tracking and Payment Status for Vendors**

  On-line Bill tracking and Payment status system implemented through our website for vendors to track their bills and payment released against their bills as on date against various contracts.

- **Digital Board implementation**

  For better flow of information related to Board & its Board subcommittee meetings, a digital board software from M/s DESS TECHNOLOGY LTD. is under implementation. This software will help to keep the records of Boards & its committee meeting online and database will be kept in Server. Training for the same has been done & software will get live soon.

7.54 Sustainable development

HCL adheres to the sustainable development requirement as per the guidelines and policy of the Department of Public Enterprises (DPE). Following projects are implemented under sustainable development plan for the year 2023-24:

1. New underground (u/g) mine at MCP which is under development below the existing open cast mines will have special features like backfilling of voids by using copper ore tailings (Known as paste fill technology). The back-filling operation of u/g void will avoid the surface disposal of copper ore tailings reducing thereby the pollution load due to solid waste generated by the project.

2. Significant progress has been done towards implementation of roof top solar plant across the organization. Total 1656.50 KWp solar plant implementation completed till date under RESCO & CAPEX model. Additional 1000 KWp

solar plant at KCC & 5500 KWp Solar plant at MCP are in proposed stage.

3. Covering top soil through plantation at the waste rock dump.

4. Waste management initiatives including waste reduction.

   - 28 nos. disused radioactive sources laying in concentrator plant of MCP unit have been disposed off through Board of Radiation and Isotope Technology, Department of Atomic Energy, to avoid radiation exposure.
   - Proposal for construction of new reservoir of 10 lakh Cu M capacity at MCP unit to store excess rain water dewatered from Mines, Tailing dam and surrounding areas for use during off- season.
   - Repaired MSRL pipes (used in main tailing disposal lines) and very old cyclone header pipes are being used in and around open discharge area in Tailing dam of MCP unit instead of procuring new MS ERW pipes. Recycling of sand filter drain water in Water Treatment Plant into process water by new submersible pump.
   - Minimum amount of waste is generated in underground mine development activities at KCC unit. Most of the waste generated is disposed in underground void stopes and a minimum amount is hoisted to surface for disposal in surface waste dump yard fulfilling the statutory requirements.
   - 184.15 kg of Bio Medical Waste of ICC (W) Hospital is being safely disposed at Jharkhand State Pollution Control Board approved TSDF (Treatment Storage and Disposal Facility) of M/S Adityapur Waste Management. Lifting of slag kept at designated area of ICC unit & followed by stone pitching and covered with good Earth at Tumandungri slag dump site.

5. Water conservation by recycling of mine water and adoption of rain water harvesting system across the Units has been implemented.

7.55 MoU Ratings achieved by HCL

Table 7.13

Year	Grade
2020-2021	Very Good
2021-2022	Good
2022-2023	Good

7.56 Reserves & Resources

India has very limited known reserves of copper ore exploitable for copper production. The total resources of copper ore in the country as on 1.4.2020 are estimated at 1660.87 million tonnes with about 12.20 million tonnes of copper metal. Of these 163.89 million tonnes (9.87%) fall under Reserve category containing 2.16 million tonnes of copper metal and the balance 1496.98 million tonnes (90.13%) are 'Remaining Resources' containing 10.03 million tonnes of copper metal.

Rajasthan is credited with 867.85 million tonnes ore (52.25%) containing 4.63 million tonnes of copper metal, Jharkhand 251.46 million tonnes ore (15.14%), containing 2.78 million tonnes of copper metal, Madhya Pradesh 386.66 million tonnes ore (23.28%), containing 3.66 million tonnes copper, and the rest 9% are accounted for by other states

namely Andhra Pradesh, Gujarat, Haryana, Karnataka, Maharashtra, Meghalaya, Nagaland, Odisha, Sikkim, Tamil Nadu, Telangana, Uttarakhand and West Bengal (As per Indian Mineral year book 2020). India's share of world reserve is around 0.31% only. According to United States Geological Survey (USGS), total global copper reserves amount to 890 million tonnes (Mt) of copper (The World Copper Factbook 2023). Globally, Chile has the largest reserves of copper followed by Australia, Peru, Russia, Mexico, USA, Indonesia, China are the other countries.

The mean undiscovered totals for porphyry and sediment-hosted deposits are 3,100 million tons and 400 million tons respectively, resulting in a global total of 3,500 million tons of copper. With identified copper resources currently estimated at 2,100 million tons, total copper resources (undiscovered + identified) are estimated at 5,600 million tons *(Source: The World Copper Factbook 2023).*

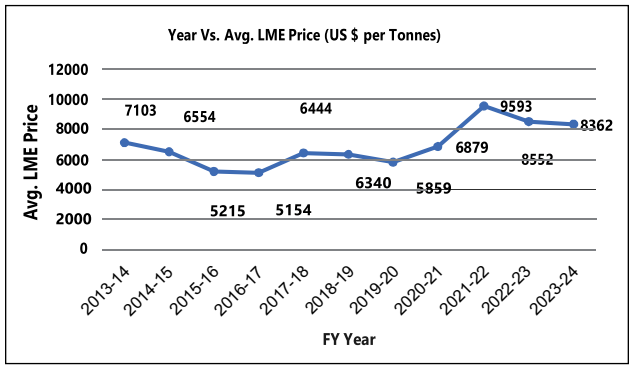
HCL holds around two-fifths of the copper ore reserves and resources in India with an average grade 1.32%. As on 1.4.2023, HCL has reserves (proved & probable) of about 2.13 million tonnes in terms of copper metal and total reserves and resource of 6.71 million tonnes in terms of copper metal (i e., 698.44 million tonnes of ore with average grade of 0.96% based on UNFC system).

7.57 Price of Copper

The price of copper is linked to London Metal Exchange (LME) price. The price of MIC is derived based on the LME price after adjustment of ruling TC/RC (Treatment & Refining Charge). The TC/RC is market driven dynamic parameter which depends on supply and demand of copper in the international market.

The year wise trend of average LME price per tonne of copper is indicated below:

Table – 7.14



HCL is the only Company having captive mines, whereas private producers have to depend on import of copper concentrate to operate their smelter & refining plants and their profitability is dependent on the international variation in Treatment Charges and Refining Charges but they offset the risk of LME copper price volatility through hedging.

7.58 Copper Industry in India

Copper finds widespread use in a wide range of application in all major sectors namely, construction, electric & electronic products, industrial machinery & equipment, transportation equipment & consumer and general products.

At present, the demand for copper minerals in the country for primary copper production is met through two sources i.e. copper ore mined from indigenous mines and imported concentrates. The indigenous mining activity among the primary copper producers is limited to only Hindustan Copper Limited (HCL). The other primary copper producers in the private sector import the required mineral in the form of concentrate.

Currently, three major players dominate the Indian copper industry. Hindustan Copper Limited (HCL) in Public Sector (Annual Refining Capacity: 0.685 lakh tonnes), M/s Hindalco Industries Ltd. (Annual Refining Capacity: 5.00 lakh tonnes) and M/s Sesa Sterlite Ltd in private sector (Annual Refining Capacity:2.16 lakh

tonnes), having current total installed refined copper capacity in the country is 7.85 lakh tonnes. It is reported that M/s Adani Group is installing custom copper smelter refinery complex named as Kutch Copper Limited of capacity 1 million tonnes in a phased manner.

Capacity & Production of cathode is given below.

Table 7.15

Commodity	Installed Capacity (Lakh tonnes)	Producti on during FY 2022-23 (Lakh tonnes)	Production during the period (Apr'23 to Feb'24)
a) HCL	0.685	0.000073	Nil
b) Sesa Sterlite Ltd.	2.16	1.48	1.34
c) Hindalco Ind. Ltd. (Unit: Birla Copper)	5.00	4.07	3.30
Total	**7.85**	**5.55**	**4.64**

#Source: Monthly Summary on Non – Ferrous minerals & Metals, Ministry of Mines

7.59 Refined Copper Consumption

The Indian demand is expected to be strong on the back of improved outlook for Industrial and infrastructure growth. The government's thrust on power sector, smart city, Housing for all, ambitious plan of harnessing renewable energy resources, electric vehicles, Infrastructure development,

Atmanirbhar Abhiyan and Make in India spells good news for copper industries. The per capita copper consumption in India is expected to increase from the current level of 0.6 Kg to 1 kg in coming years. The average per capita copper consumption in the world is 3.2 kg.

Copper is essential to EV technology and its supporting infrastructure, and the increase in the electric vehicles in the market will have a substantial impact on copper demand.

If India's per capita copper consumption moves towards the per capita copper consumption levels in the rest of the world, India's copper market has the potential for significant growth.

The global demand for copper continues to grow, world refined usage has more than tripled in the last 50 years, thanks to expanding sectors such as electrical and electronic products, building construction, industrial machinery and equipment, transportation equipment, and consumer and general products.

Demand of copper is increasing due to progress of implementation of electric vehicle worldwide with associated charging infrastructure, decarbonization policy push by US and EU and more and more emphasis on green energy to mitigate climate change. The antimicrobial properties of copper are finding newer application in view of global pandemic situation. Copper being the green metal has been considered as a core driver for moving the global economy toward net zero emissions. Copper has been termed as new oil.

As the global economy moves toward net zero carbon emissions through energy transition, the role of Copper remains pivotal as the most efficient conductive material, indispensable for capturing, storing and transporting the green energy. Hence significant rise in demand of copper has been predicted on account of thrust on low carbon economy.

7.60 Mineral Exploration & Consultancy Limited (MECL)

Introduction

Mineral Exploration & Consultancy Limited (MECL), a Miniratna I CPSE under the Ministry of Mines, has a rich history since its inception in 1972. Operating as a premier national mineral exploration agency, its mission is "To provide high quality, cost effective and time bound geo-scientific services for exploration & exploitation of minerals". MECL conducts regional and detailed exploration of mineral acreages on behalf of State Governments, Directorate of Geology and Mines and major mining companies. With over five decades of experience, MECL provides integrated mineral exploration services, including Geological Reports and consultancies, to Central and State Governments, as well as CPSEs.

MECL's state-of-the-art facilities encompass surface and sub -surface exploration techniques and drilling rigs, advanced software for geological modelling, surface and subsurface geophysical logging instruments, environmental and remote sensing analytical facilities and advanced geo chemical laboratories. The company is poised for expansion, planning to enhance its exploration capability through the acquisition of modern equipment.

Collaborating with State Government Departments, MECL prepares mineral exploration proposals to the National Mineral Exploration Trust (NMET) a funding mechanism created under Ministry of Mines, Govt of India. Upon assignment, MECL conducts mineral exploration, providing Geological Reports for mineral block auctions. Additionally, MECL undertakes mineral exploration assignments for major mining companies and Central and State PSEs and private miners.

The company is actively involved in the exploration of coal and lignite resources in collaboration with organizations like CMPDIL and NLCIL. MECL has also engaged with the North-eastern States for exploration activities in the North Eastern States, showcasing a commitment to national mineral resource development initiatives.

MECL is also providing consultancy services for mineral block auction to Central and State Government. MECL is engaged with Ministry of Mines for preparation & demonstration of mineral blocks to provide technical support and services for critical mineral auction process. Similar services are being provided to Madhya Pradesh and Goa Government also.

The authorised share capital and paid up equity of the company are Rs.125.00 crore and Rs.119.55 crore, respectively. The equity is fully held by Government of India. The Company's registered office & operational headquarter is at Nagpur. The pan India operation involving exploration of minerals at remote location are controlled & monitored from Nagpur. For details please visit at www.mecl.co.in.

The core strength of MECL lies in its highly qualified and experienced team, comprising Geologists, Geophysicists, Analytical Chemists, Drilling Engineers, mud engineers, IT professionals and Surveyors etc. Supported by skilled technical and scientific staff and state-of-the-art digital infrastructure reflects a robust composition, emphasizing its commitment to excellence in mineral exploration and consultancy.

7.61 Physico-Financial Performance 2021-22, 2022-23 and 2023-24

MECL has completed over 1642 projects / geological report and established 202.33 Billion Tons of resources in various mineral deposit During FY 2023-24. The Physical &

Financial performance of MECL in last 3 years are given below:

Table 7.16
Physical Performance of MECL

Particulars	FY 2021-22	FY 2022-23	FY 2023-24
Mineral Acreages Auctioned	13	8	1
Geological Reports of NMET	11	12	32
Total Geological Reports	40	40	44
Borehole Geophysical Logging (lakh metres)	1.78	1.04	2.31
Geological Mapping (Sq. km.)	705	1,246	1609.92
Chemical Analysis (lakh samples)	0.96	0.93	1.07
Exploratory Drilling (lakh metres)	3	68,500	621
Total meterage	**2.62**	**2.35**	**3.49**
Exploratory Drilling Mineral wise (lakh metres)	1	2,16,000	1,37,000
Coal	1.74	1.59	2.72
Lignite	0.42	0.17	0.21
Other	0.46	0.60	0.56

Table 7.17
Financial Performance

(in crore)

Particulars	FY 2021-22	FY 2022-23	FY 2023-24**
Total Revenue	237.62	230.03	313.29
Profit After Tax	20.21	13.94	70.46

***Provisional*

7.62 MECL Achievements during 2023- 24:

During FY. 2023-24, MECL has demonstrated tremendous performance across all parameters, surpassing the milestones of the last two years. MECL has successfully completed 348,704 meters of exploratory drilling represents a substantial growth of 48% compared to the performance of the previous fiscal year and submitted 44 geological reports, encompassing both Energy and Non- Energy Minerals covering various mineral commodities such as Copper, Iron ore, Manganese, Graphite, Potash, coal and lignite etc., contributing a substantial 16,284.03 million tonnes to the National Mineral Inventory.

- **Financials:** MECL has achieved remarkable growth in revenue from operations during FY 2023- 24, reaching Rs. 313.29 crore (Provisional) represents a significant increase of 54% compared to Rs. 202.85 crore in the previous fiscal year.
- **Performance in NMET funded projects:** During the FY 2023-24 exploration for various minerals has been carried out by MECL in 51 blocks on behalf of National Mineral Exploration Trust (NMET). Throughout the fiscal year

2023-24, MECL received approval for 35 new exploration projects with estimated cost of Rs.122.85 crore. Additionally, Rs.32.45 crore was allocated for the creation of the National Facility for capacity augmentation in MECL through the procurement of geophysical and geological instruments (Hyperspectral Core Scanner). During the FY 2023-24, MECL has submitted 32 Geological reports and MECL has executed work of Rs. 69.27 crore in new as well as spill over blocks. A total of 6621.13 million tonnes of mineral resources have been added to National Mineral Inventory. In FY 2023-24, a total of 13 auctionable blocks have been identified from submitted GR's which include 8 blocks for bulk minerals, 3 blocks for critical minerals and one each for base metals and emerald. MECL has taken up a prestigious project on exploration for sapphire / Ruby gem stone in Neelamkhan area of Kishtwar district J&K. MECL has completed Phase-I work including geological mapping, sampling from Scree/tallus to evaluate the secondary deposition of gem stones.

- **Consultancy service for auction of Critical Minerals:** MECL has been nominated as Technical advisor to assist MoM for auction of critical and strategic mineral blocks. Total 38 mineral blocks are identified and put up for auction in two tranches of NIT issued.
- **Capacity Augmentation:** A total of four drilling rigs, each with a capacity to drill up to 1500 meters, were acquired as part of capacity development initiatives in exploratory drilling. Further NMET has approved establishment of the National Facility aimed at augmenting capacity within MECL through procurement of geophysical and geological instruments, to enhance the organization's capabilities. A budget allocation of Rs. 32.45 crore was designated for the establishment of this National Facility.

Organization of Hackathon-2024 For Development of a conversational chatbot designed to answer test queries regarding NGDR, acts, rules, and regulations within the mineral sector through Hackathon. Event was commenced on 28-03-2024. A total of 12 teams from 6 engineering college in and around Nagpur are participating in this event with their mentor professors.

Photo 7.31

Team MECL carrying out Exploration work in Neelam Khan area, Kishtwar District, Jammu & Kashmir (UT).

7.63 Work Carried Out by MECL in North Eastern Region

MECL has been associated with mineral exploration activities and geo-technical studies for the development of mineral industry in the North Eastern Region since 1977.

During the year 2023-24, MECL has carried out reconnaissance survey for Copper & REE in Tarku-Damthong block, District: East Total 74.71 sq km area was covered with Geological Mapping and surface sample Geological report preparation of the same work in progress.

Further, MECL is also carrying out detailed exploration of Coal (Promotional Coal

blocks on behalf of CMPDIL) in Bishnupur Block and its Nimgaon Block in Tinsukia District of Assam. Exploratory drilling is in progress in these blocks. MECL is keen for development of North Eastern States. Hence with focus on North Eastern Region to augment exploration, MECL has signed MoU with Government of Assam and taken exploration for Coal in Khotarda block, Mikir hills district is under progress.

7.64 Action Taken on Abatement of Pollution and Environment:

MECL is dedicated to conserving natural resources and protecting the environment throughout its operations to promote sustainable growth. It conducts exploration activities without causing significant pollution and conducts environmental studies to gather baseline data on various aspects like geology, air quality, noise and socio-economic factors. These studies are included in geological reports as and when required and provided to state governments for Environmental Impact Assessment (EIA) during exploration activities. Additionally, MECL has formulated a Corporate Environment Policy aimed at executing exploration operations in an environmentally responsible manner. The policy emphasizes using non-polluting technologies, maintaining machinery to minimize environmental impact, and ensuring compliance with environmental regulations. It also promotes conservation and fosters awareness employees about environmental responsibilities. The detailed policy can be found on the MECL website. The detailed policy is available on www.mecl.co.in.

In addition, MECL has taken proactive steps to promote green initiatives within its premises. It Temi-has established an herbal garden aimed at Sikkim. preserving indigenous plant species and promoting biodiversity. This garden not only serves as a green space but also contributes to environmental education and research efforts. Furthermore, MECL has set up a compost plant to manage organic waste generated it its premises. By composting organic materials, MECL reduces environmental footprint and produces nutrient-rich compost for use in landscaping and agricultural activities. These initiatives reflect MECL's holistic approach towards environmental stewardship and sustainability.

7.65 Research & Development

MECL is actively engaged in innovative Research and Development (R&D) projects to enhance its exploration capabilities and operational efficiency. The company has already acquired a state-of-the-art digital drill core scanner for high-resolution scanning of drill cores, further the labs are in the process of advancement by adding additional high technology instruments, facilitate detailed mineral assemblage studies and assessments. This advancement will enable us laying the groundwork for a comprehensive digital library. Moreover, MECL is actively enhancing technology by investing in additional resources and exploring deep drilling techniques, poised to unlock new insights into mineral exploration.

Furthermore, MECL is spearheading research endeavors in drill fluid technology to ensure the safety and efficiency of borehole drilling operations. These efforts exemplify MEC's unwavering commitment to leveraging cutting-edge innovations to propel exploration efforts forward.Through the integration of digital billing techniques and ongoing advancements in exploration technology, MECL is poised to redefine industry standards, solidifying its position as a leader in mineral exploration and resource management.

7.66 Information Technology (IT)

MECL being a service and consultancy sector organization has a well-equipped Information Technology Centre to support the access, analyze and process the enormous amount technical data. MECL's IT department plays a crucial role in facilitating the efficient management of vast technical data, particularly in handling geological reports for diverse exploration projects like promotional and contractual exploration, well as NMET funded projects . Central to effort is the successful integration of SAP solution, known as "Khanij Sanjeevani," automates various business processes finance, marketing, exploration, project coal management, and human resources. This comprehensive system not only enhances operational efficiency but also ensures requirements. Embracing evolving workplace dynamics, the company has adopted virtual meetingsolutions like video conferencing, facilitating seamless interactions with government agencies, project managers and internal teams.

In addition to maintaining and enhancing existing inhouse web applications like "MECL Connect, "Vigilance Clearance System" and "Quarter core Management" to streamline operations, core Management" to streamline operations, applications like "MyPlot" and "MINEXP" ensure optimal performance and functionality. Ongoing digitization projects, including the implementation of E-Office, website revamp to comply with GIGW 3.0 standards, underscore MECL's commitment leveraging technology for operational efficiency and process optimization. Other initiatives such as participation in hackathons, SAP ERP upgrade, development of online complaint and systems further demonstrate MECL's dedication to embracing digital transformation across its operations.

7.67 Business Development Activity

Throughout the Financial Year 2023-24, MECL's Business Development & Commercial Division has been steadfast in its efforts to secure contractual work from both private and public entities. Through a combination of competitive techno-commercial offers, collaboration via MoU agreements, and bilateral negotiations, MECL has actively pursued opportunities for expansion. As a result of these endeavours, the total value of available work reached a provisional figure of more than 450 Cr. as of March 31, 2024. This encompasses projects as from a diverse range of clients, including this esteemed organizations such as GSI, HCL, ERP NALCO, RSMML, NMDC, FAGMIL, and NTPC, which among others. Additionally, MECL has spanning undertaken NMET-funded projects, promotional exploration work on behalf of the Ministry of Coal (MoC) and exploration activities for NON-CIL coal blocks through collaborative efforts with CMPDIL. Continuous outreach efforts target prospective clients across government, PSU and private sectors, aiming to secure business for sustainable growth. Moreover, MECL has solidified partnerships through Memorandums of Understanding (MoUs) with key entities.

MoUs with key entities:

- Extension of ongoing MoU with GSI for exploration drilling of energy minerals.
- Memorandum of Agreement (MoA) with GSI, Eastern Region & GSI Northern region for NGPM survey
- MoU with Hindustan Copper Limited (HCL) for geological investigations/ exploration in various mines and Leasehold areas of HCL.
- Ongoing MoUs: Central Mine Planning and Design Institute (CMPDIL) – valid for 5 years up to 28.04.2026; Directorate

of Mines & Geology, Govt. of Goa (DMG, Goa) – valid for 5 years up to 18.07.2026; Directorate of Geology and Mining, Madhya Pradesh (DGM, MP) and Madhya Pradesh State Mining Corporation Limited (MPSMCL) – valid for 5 years up to 23.11.2026; Directorate of Geology & Mining, Govt. of Assam (DGM, Assam) – valid for 5 years up to 07.12.2026.RITES Ltd.- valid for 5 years up to 24.03.2027.

MECL's is proactively engaged in exhibitions and events related to exploration and mining. From participating in domestic events like the 1st Mining Startup Summit at IIT Bombay, Mumbai and the Govt. Achievements & Scheme Expo 2023 at Pragati Maidan, New Delhi, to regional events such as Ujjwal Rajasthan 2023 in Udaipur, Rajasthan, MECL consistently demonstrates its commitment to industry engagement.

Moreover, MECL extends its presence to international platforms, showcasing its global outreach and participation. This includes organizing "The Mining Show-2023" in Dubai, UAE, on behalf of the Ministry of Mines, Government of India and attending conferences like 'IMARC-23' in Sydney, Australia and the International Mining and Oil Expo-23 in Ulaanbaatar, Mongolia. MECL's global footprint

Photo 7.32 : India pavilion inauguration at the Dubai Mining show-2023 by Mrs. Nirupama Kotru, Jt. Secretary & FA, Ministry of Mines, Government of India.

Photo 7.33 : Free side Chat on The Topic. 'Exploring Waste Management Solutions to Transform Mine Sustainability & Improve Profitability' at the Dubai Mining Show, 23

Photo 7.34 : CMD, MECL explaing the model drilling Rig to Shri VL Kanta Rao, Secretary (Mines) at Mining Pavelien, Pragati Maidan, New Delhi

Photo 7.35 : Signing of MoU between Geological Survey of India (GSI) and Mineral Exploration and Consultancy Limited (MECL)on 31.08.2023.

Photo 7.36 : Shri Indra Dev Narayan, CMD MECL addressed on the topic of "Unlocking the Potential of Critical Mineral in India with a special Emphasis on its Economics and Supply Chain Management."

7.68 Central Manufacturing Unit

The central workshop and manufacturing unit, Reginal Maintenance Centre and Instrumentation Center serve as a crucial hub for MECL's operations, providing essential engineering support to field activities. This facility specializes in the repair and overhaul of drilling rigs & equipment, Geophysical instrument, analytical instruments and vehicles, ensuring their optimal functionality. Moreover, it plays a pivotal role in manufacturing of various spares and accessories required for both coring and non- coring drill machines.

Equipped with advanced CNC lathe machines, the workshop fabricates drill tubulars and other essential components. In the fiscal year 2023-24, the facility successfully manufactured a total of 23,986 items, including 926 TC bits, 1132 Diamond bits, 9064 drill rods and 12,864 other drill accessories. This in-house manufacturing capability has significantly contributed to ensuring timely supply of essential items for drilling operations, thereby minimizing downtime for drill rig. This initiative aligns with the "Make in India" initiative, reflecting MECL's commitment to developing indigenous capabilities and contributing to the nation's self-reliance goals.

7.69 Energy Conservation

MECL is committed for energy conservation through various initiatives aimed at reducing energy consumption and promoting sustainability:

- MECL is actively transitioning from age-old drill rigs to state-of-the-art Hydrostatic drill rigs. These new rigs boast advanced technology, offering superior fuel efficiency and high-performance capacity. Additionally, MECL conducts regular maintenance activities aimed at enhancing fuel efficiency and minimizing carbon emissions.
- Installation of Solar Power Plants: MECL has embarked on a journey to replace conventional energy sources with non-conventional renewable sources. A total of 245 KW of solar power plants have been installed across various MECL premises.
- Implementation of Smart Building Concepts in common areas and corridors of newly constructed facilities like the Geo-Chemical lab building. This includes automated lighting systems that switch off in the absence of manpower, thereby reducing overall energy consumption.

- Timer-based automatic on/off LED street lights have been installed in MECL premises, enhancing energy efficiency and reducing unnecessary power consumption.
- MECL operates an existing solar PV plant with a total capacity of 276.28 KW, comprising 245 KWp for on-grid and 31.28 KWp for off-grid systems installed in the CHQ building. Processes are underway for the installation of an additional solar plant on the available place.

Bharat Gold Mines Ltd. (BGML):-

7.70 Operations of BGML were closed in 2001 and the Central Cabinet, in 2006, decided to dispose off the assets and liabilities of BGML through an open global tender, with First Right of Refusal in favour of the Co-operative society formed by the ex- employees of the Company. The matter went into litigation and Hon'ble Supreme Court in July 2013 permitted UoI to proceed with the global tender. However, as a lot of time lapsed, various changes in mining laws and other issues had taken place and therefore, the decision of Cabinet could not be implemented yet.

7.71 When the implementation of Cabinet decision for sale of assets of BGML through global tender became difficult in the changed scenario, the issue of deciding future course of action for BGML was discussed in the Ministry and it was decided to explore other options for BGML which was needed to be preceded by exploration of dumps and mining areas to assess the resources and Techno Economic Feasibility Study (TEFS) of the same. Ministry of Mines, accordingly, constituted a Monitoring Committee on 18.04.2019 to suggest a way forward for BGML consisting of CMD, MECL, MD, BGML and officers from Geological Survey of India, Indian Bureau of Mines and Ministry of Mines. The task of Monitoring Committee was to get legal review, asset valuation and hiring of Technical Consultant for doing Techno-Economical Feasibility Report (TEFR).

7.72 Accordingly, Mineral Exploration Corporation Limited (MECL) was assigned for exploration of dumps & two unmined blocks (i.e. Mectagart and Oriental) of BGML, MECL submitted its report in 2018. For identifying mineral resources in the other areas of BGML, exploration was also undertaken by MECL between September 2020 and February 2021 at Betraswamy and Doddabeta Blocks of BGML, MECL submitted its report in March, 2021. Simultaneously, Non Ferrous Materials Technology Development Centre (NFTDC) under the S & T schemes of M/o Mines had also conducted a study on Gold Ore Tailings of BGML. NFTDC submitted its TEFR in February 2021.

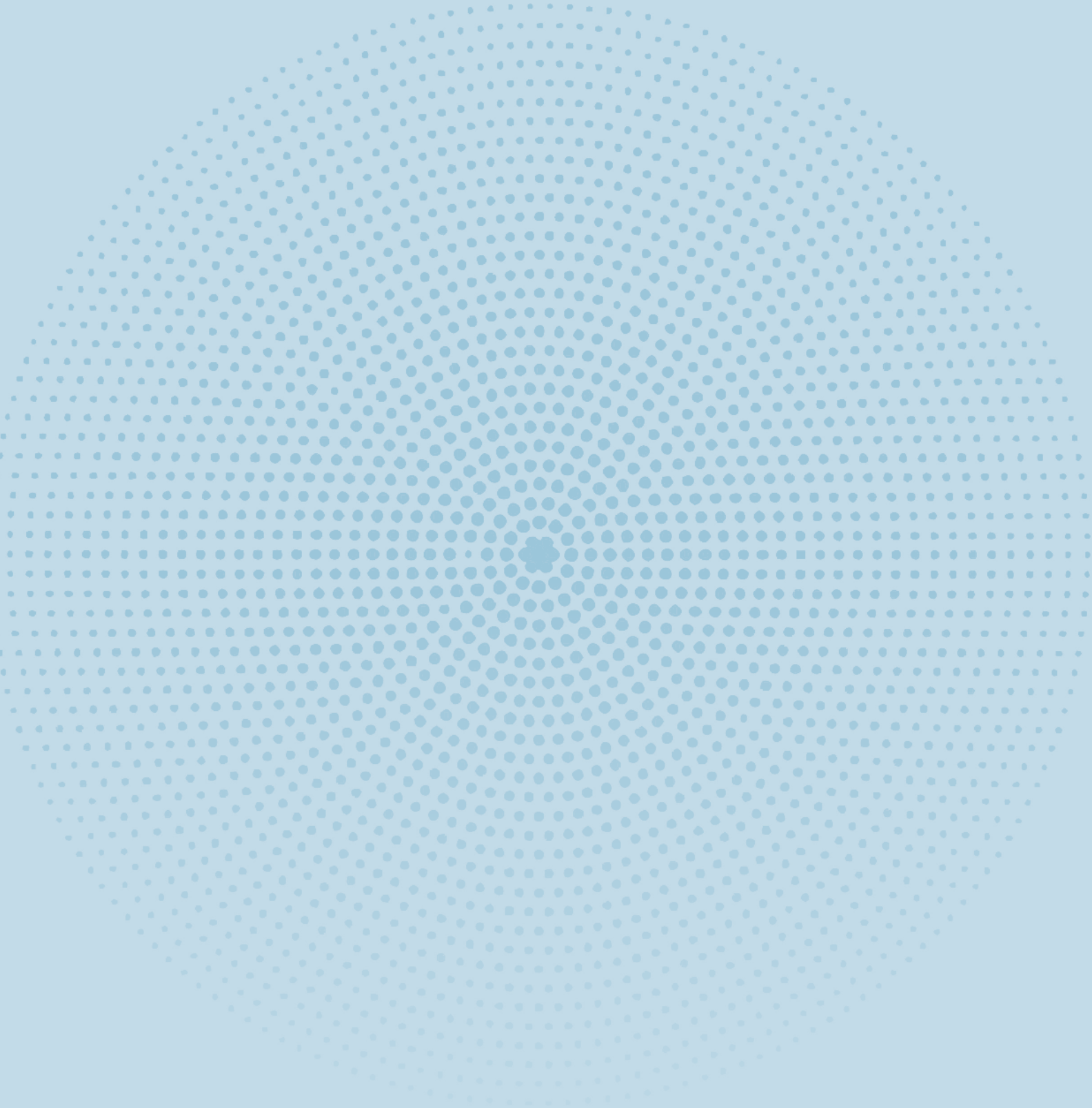
7.73 The Techno-Economical Feasibility Report for tailing dumps of BGML and the exploration reports of MECL were given to the Management Consultant hired for reviewing the legal status, undertake valuation of the assets and financial due diligence for recommending possible alternatives for BGML. The anagement Consultant has submitted its report. Accordingly, Ministry of Mines is exploring future course and other viable option for BGML.

7.74 There has been a long pending issue of Record of Rights, Tenancy and Crops (RTC) and Mutation of the 12109 acres and 28 guntas of BGML land in Kolar Gold Fields. So far, BGML has received RTC and Mutation over an area of 10307.70 acres. RTC and Mutation of remaining 1802 acres land is in progress.

7.75 All employees of the BGML at the time of closure were retrenched by giving Special Terminal Benefit Package (STBP). BGML also sold sital area of residential accommodation

to 2812 retrenched ex- employees of BGML as one of the components of STBP benefits on concessional rate and not charged any amount for building/structure. However, title deeds could not be transferred to the beneficiaries because the properties were earlier not reflected in the name of BGML in land records of Government of Karnataka. Now the land has been mutated in the name of BGML and BGML is in the process of issuing Possession Certificates to around 2000 STBP beneficiaries in the first phase An event for distribution of Possession Certificate to STBP beneficiaries was organized at BGML on 27.02.2024. Around 900 Possession Certificates were distributed and remaining will be distributed shortly.

7.76 Alongside, Ministry of Mines has appointed 'Transaction Advisor' to assist this Ministry for sale (by auction) of gold tailings of BGML. Accordingly, for recovering valuable metal from the tailing dumps, a proposal to undertake mining operations in areas covering the tailing dumps of the expired KGF mining lease of BGML by Invoking special powers conferred under section 17 of the MMDR Act has been sent to State Government for their comments.



8

Science, Technology and Autonomous Bodies

Science, Technology and Autonomous Bodies

Research & Development

Introduction

8.1 Recognizing the paramount importance of safety, economy, speed and the efficiency in extraction of mineral resources and in its convergence into viable economic alloys and metals, National Mineral Policy has accorded higher priority to Research and Development (R&D) programmes. For fructification of principles as enunciated in the National Mineral Policy, guidelines for support to 'Mining Research' was issued in May 2013 and revised in August 2023. With a view to promoting R&D in the mining sector, Ministry of Mines has launched a comprehensive Science & Technology Programme which includes (i) Research and Development (R&D) component, (ii) Information Education and Communication (IEC) component, (iii) Promotion of Research and Innovation in Startups and MSMEs in Mining, Mineral Processing, Metallurgy and Recycling Sector (S&T-PRISM) component.

Science & Technology Programme - Research and Development (R&D) component

8.2 The underlying principle behind R&D component is to foster utilisation of the available mineral resources judiciously, economically efficiently and in an environmentally sustainable manner. Under the R&D component of the Science & Technology Programme, Research projects are funded through grant–in–aid. The broad thrust areas for supporting research in mining sector include(i) Prospecting exploration for strategic and rare earth minerals; (ii) Research in mining methods, which includes rock mechanics, mine designing, mining equipment, energy conservation, environmental protection and mine safety; (iii) Improve efficiency in process, operations, recovery of by-products and reduction in specification and consumption norms; (iv) Research in metallurgy and mineral beneficiation techniques to utilize lower grade and finer size ores; (v) Extraction of value-added products from mine waste, plant tailings etc.; (vi) Development of new alloys and metal related products, etc.; (vii) Evolve low capital and energy saving processing systems; (viii) Production of materials of high purity. Ministry of Mines has launched SATYABHAMA (Science and Technology Yojana for Aatmanirbhar Bharat in Mining Advancement) Portal for Science and Technology Programme Scheme of Ministry of Mines. The SATYABHAMA Portal can be accessed at https://research.mines.gov.in/.

8.3 Based on scrutiny which passes through different stages of evaluation including presentation of shortlisted projects before the Project Evaluation and Review Committee (PERC) and final approval of an inter-ministerial Standing Scientific Advisory Group (SSAG) chaired by Secretary (Mines), grants are given to the projects submitted by R&D institutions.

8.4 During the Financial Year 2023-24, 15 project proposals have been recommended by PERC for approval of SSAG. Out of these, 14 project proposals, which are considered as relevant to the identified priorities, have been approved by SSAG for grant-in-aid by the Ministry under S&T programme. The details are available at research.mines.gov.in.

Science & Technology Programme-Information Education and Communication (IEC) Component

8.5 The purpose of this component of the Scheme is to create awareness regarding issues relating to the mining and mineral sector by organizing or being associated with

promotional events, like seminars, workshops, exhibitions etc. evaluation studies, surveys, awareness programmes, consultation with stakeholders, organization of national and international events/conference, creating audio-visual publicity materials and propagation of policies and programmes. During 2023-24, a grant of Rs. 2 lakhs was given to Central University of Himachal Pradesh for organizing 3 days National Workshop on "Geodynamics in Himalaya & Disaster Management (Geo-Him 2023)", 06-08 Nov 2023 and Rs. 9 lakhs was given to Jawaharlal Nehru Aluminum Research Development and Design Centre (JNARDDC), Nagpur for organizing 3 days' International Analytical Science Congress 2024 (IASC – 2024) - 22-24 Feb 2024, Nagpur.

8.6 The detailed guidelines are available at https://research.mines.gov.in/.

Science & Technology Programme - Promotion of Research and Innovation in Startups and MSMEs in Mining, Mineral Processing, Metallurgy and Recycling Sector (S&T-PRISM) component

8.7 Ministry of Mines has decided to promote Research and Innovation in Startups and MSMEs and has brought out guidelines for "Promotion of Research and Innovation in Startups and MSMEs in Mining, Mineral Processing, Metallurgy and Recycling Sector (S&T-PRISM)" in November, 2023. Proposals have been invited from eligible beneficiaries for funding so as to enable them to graduate to a level where they will be able to raise investments from angel/Venture Capitalist or they will reach a position to seek loans from commercial banks/financial institutions. The funding is positioned to act as a bridge between development and commercialization of innovative technologies/products/services in a relatively hassle free manner.

8.8 The main idea of the S&T-PRISM is translation of research into technology (product/process/services) but not to carry out open ended fundamental research. Investigations must lead to innovation or new product/process ready for demonstration or pilot scale deployment (not only publication/ patent)

8.9 Jawaharlal Nehru Aluminium Research Development and Design Center, Nagpur, an autonomous body under the administrative control of Ministry of Mines is the Implementing Agency for S&T – PRISM.

8.10 Selected Startups and MSMEs will be provided mentorship or incubation support and technical advisory support during entire project development period and additionally for two years from the date of Technical Completion, by a Facilitation & Mentorship Team under the Implementing Agency. Scope of Mentoring Support will include Advisory, Networking, Tapping Resources, Piloting, Business Planning, Funding Raising. Further, piloting opportunity for supported Startups and MSMEs, shall be provided in the mining, mineral processing, metallurgy and recycling sector. Preference is given to Startups/ MSMEs of North East Region and women led enterprises. During 2023-24, a total of 56 Start-ups/MSME participated out of which 5 have been selected for funding.

"Grants for Creation of Capital Assets" Component for up-gradation of R&D facilities

8.11 The quality of R&D hinges upon availability of state-of-the-art research facilities the country. Apart from the initiatives of the public and private enterprises in the mining sector, R&D activities are also being pioneered

by the two autonomous bodies functioning under Ministry of Mines i.e. (i) Jawaharlal Nehru Aluminium Research Development & Design Centre (JNARDDC), Nagpur and (ii) National Institute of Rock Mechanics (NIRM), Bengaluru During the financial year 2023-24, grant of Rs. 6.92 crore was released to JNARDDC and Rs. 3.88 crore was released to NIRM for up-gradation of R&D facilities under "Grants for Creation of Capital Assets" Component.

8.12 Grants for Creation of Capital Assets and Grant-in-aid-Salaries provided to the autonomous institutions under Ministry Mines during 2023-24 is given in **Table 8.1 Table 8.2** respectively.

Table 8.1
Grants for Creation of Capital Assets

Institute	Amount (Rs.in crore)
JNARDDC	6.92
NIRM	3.88

Table 8.2
Grant-in-aid-Salaries

Institute	Amount (Rs.in crore)
JNARDDC	4.45
NIRM	2.5

Jawaharlal Nehru Aluminium Research Development and Design Centre (JNARDDC), Nagpur

8.13 JNARDDC is a Central Government Autonomous Body under Ministry of Mines. This "Centre of Excellence" was set up in 1989 with a view to provide major R&D support system for the emerging modern aluminium industry in India.

8.14 JNARDDC is an ISO/IEC-17025:2017 & ISO-17034:2016 NABL accredited lab and is also recognized as a scientific & industrial research organization by the Department of Scientific & Industrial Research, Ministry of Science & Technology, Government of India. It is the only institute of its kind in India pursuing the cause of R&D from bauxite to finished product under one roof.

8.15 The objective of the Centre is to assimilate the technology available in the country and abroad for the production of alumina, aluminium, aluminium alloys as well as to develop technical know-how for the basic engineering process and downstream areas. Centre provides training to the personnel employed in the Indian aluminium industries. The new objective to promote and develop recycling industry and transition to a circular economy in Non-Ferrous Metal Sector has been added.

8.16 JNARDDC has made key contributions in the areas of beneficiation, characterization, technological evaluation, upgradation of bauxites, Bayer process modeling, reduction of energy consumption and environmental pollution in smelter, development of alloys, product development, effective utilization of aluminium industry residue such as red mud, dross, spent pot lining and scrap for both primary and secondary industry. The annual reports are available at http://www.jnarddc.gov.in/en/rti/rti_annual_rep ort.aspx

8.17 Major activities

The Centre completed seven projects and nineteen R&D projects are in progress for various government and non-government organization. The details are mentioned in ***Annexure 8.1***.

8.18 Designated Sector Expert

JNARDDC is the designated aluminium sector expert for the following key authorities :-

- **NITI Aayog** -
    - REE (Rare Earth Element) extraction

from red Mud and coal fly ash

- Strategy paper on Resource efficiency in aluminium sector

- **Bureau of Energy Efficiency (BEE), Ministry of Power –**
  - Sector expert for "National Mission for Enhanced Energy Efficiency"- PAT 2/3/4 cycle
- **(BIS) Bureau of Indian Standards**
  - Guidelines for Al-scrap
  - The Standard for aluminium alloys
- **Referee Lab for Coal –**
  - JNARDDC is nominated referee lab for coal sample analysis of third party sampling of coal by CSIR-CIMFR, Dhanbad.
- **MoM (Ministry of Mines)**
  - Zero waste policy for the non-ferrous primary and secondary sector
  - Metal Recycling Authority (MRA) - to carry out the functions earmarked for MRA as stipulated in the "National Non-Ferrous Metal Scrap Recycling Framework 2020."
  - Implementing agency for promoting startups and MSMEs through the S&T- PRISM program.

Shri Pralhad Joshi, Hon'ble Union Minister of Coal, Mines & Parliamentary Affairs handed over the letters of financial grants to selected 5 start-ups working in the Mining sector on 29.02.2024 at Pragati Vihar, New Delhi. (1) Ashvini Rare Earth Private Limited, Pune (2) Caliche Private Limited, Shillong (3) Cellark Powertech Private Limited, Bhubaneswar (4) Ln Indtech Services Private Limited, Bhubaneswar & (5) Saru Smelting Private Limited, Meerut. For the first time, S&T(Mines) funding was extended towards start-ups and MSMEs with JNARDDC, Nagpur as the implementing agency in presence of Shri V L Kantha Rao, Secretary (Mines) & Chairman of Apex Committee and Dr Anupam Agnihotri, Director, JNARDDC Nagpur & Chairman, TEC.

Photo: 8.1

Photo: 8.2

8.19 Seminars and Conferences

- 27th International Conference on Non-ferrous Metals (ICNFM-2023), Ranchi 07th-08th July, 2023 Ranchi, India; www.nonferrousmeet.net/

Photo: 8.3

- Meet on "Geo- technological Evaluation of Bauxite deposits" at JNARDDC on 18.08.2023

- Brainstorming session on "Quality and quantity assessment of plateau top lateritic bauxite using advance remote sensing technology" with NRSC- ISRO, Hyderabad; 27.10.2023, JNARDDC, Nagpur
- 41st International Conference and Exhibition (ICSOBA -2023); 05th-08th Nov, 2023 at Dubai UAE
- 11th International IBAAS-2023 Conference & Exhibition; International Bauxite, Alumina and Aluminium Society, Nagpur 04th-06th Dec, 2023
- International analytical science congress 2024 (IASC – 2024) – VNIT & JNARDDC, Nagpur 22th-24th Feb 2024
- Dr. Agnihotri, Director JNARDDC was deputed by the Ministry of Mines for attending the Global Conference on Battery Recycling and Critical Minerals at Seoul, South Korea, Dec 2023

Photo: 8.4

Photo: 8.5

8.20 Patent

Four patents were granted for various innovative process and products developed by JNARDDC .

SN	Details of the granted patent
1	A process for preparation of aluminium hydroxide with low soda content. No. 455707 on 29.09.2023
2	"Development of process for revitalization of high alumina castables from residual Aluminium dross. No. 471016 on 21.11.2023
3	A process for removal of iron oxide, silica and enrichment of alumina in ferruginous, siliceous and aluminous laterite by physical separation process No. 483133 on 15.12.2023
4	A process for conversion of saprolite into refractory aggregate. No. 507474 on 06.02.2024.

8.21 Technical Testing & Consultancy work:-

a) Third party referee sample analysis of around 30,000 coal samples provided by CIMFR, Dhanbad and QCI, New Delhi and others.

b) Characterization of around 6,500 samples for trace and rare earths element analysis in soil and sediments for GSI Jaipur and other regions

c) Characterization of bauxite, Lime stone, graphite, Pulp (iron ore) and rare earth elements of around 5000 samples for OMECL, Bhubaneshwar.

d) Characterization of around 3,500 iron ore samples under process for M/s Lloyd Metals and Energy Ltd of Surjagarh Iron mine, Gadchiruli, Maharashtra.

e) Characterization of around 4000 miscellaneous and different mineral samples for MECL, Nagpur.

8.22 Inauguration of new facilities / labs

Shri V L Kantha Rao, IAS, Secretary to the Government of India, Ministry of Mines reviewed the activities of JNARDDC on 21.10.2023. He inaugurated 3 new lab facilities (Fire Assay Lab for precious metals, Microscope & Microhardness tester of Downstream Lab).

V L Kantha Rao, Secretary (Mines) inaugurating new labs at JNARDDC

Photo : 8.7

- In addition to the above, the Recycling Promotion Division was set up in JNARDDC to promote recycling activities. JNARDDC is also in the process of setting up an Incubation Centre for promoting startups and MSMEs.

❖ **Awards / Recognition**

- Dr Anupam Agnihotri was awarded the prestigious ISAS - Dr Raja Ramanna Award 2023 and Dr U Singh, HoD (Analytical) was awarded the ISAS Analytical Scientist for the year 2023 at the International Analytical Science Congress 2024.

Photo: 8.8

Photo: 8.9

- Dr. Paparao Mondi, Scientist received the best paper award by Indian Society of Analytical Scientists-2024 held at VNIT & JNARDDC, Nagpur

- Dr Priyanka Nayar, Scientist of JNARDDC was awarded the first prize in 11th International IBAAS-2023 Conference & Exhibition; International Bauxite, Alumina and Aluminium Society, Nagpur 04-06 Dec, 2023 for the paper "Preparation of 2- Propanol Aluminium Salt (AIP) as an Intermediate for 4N pure alumina without employing a catalyst.

Photo: 8.10

- Dr Anas N S was appreciated as one of the best presenters for his oral presentation

at the "International Conference on Metallurgical Engineering" organized by IIT-BHU during 26th-28th Oct, 2023.

Photo: 8.11

8.23 Finances

The Centre achieved an Internal revenue generation of 21.89 crores against target of 17 crore in 2023-24. A revenue budgetary grant of Rs. 4.45 crore for salary component and 6.92 crore for creation of capital assets was allocated by Ministry of Mines in 2023-24 for the Centre.

National Institute of Rock Mechanics

8.24 The National Institute of Rock Mechanics (NIRM), is an autonomous Research Institute under Ministry of Mines, Government of India. Set up in 1988 under Societies Act, 1860, NIRM has its Head Office (HO) at Bengaluru and Registered Office (RO) at Kolar Gold Fields in Karnataka. The scientific work force of the institute carried out field and laboratory investigations, basic and applied research for solving complex problems in civil, mining, hydel, environmental and critical infrastructure sectors. The work carried out spans over Rock Mechanics and Rock Engineering.

8.25 The NIRM scientific solutions are site- specific and the investigations are tailor-made to address the geoscientific and geoengineering problems during surface and underground excavations. Over 35 years NIRM has been in service of the nation and the sustenance of the industry connect for seeking solutions is an endorsement of its dedicated and focussed services.

8.26 The Institute has scientists skilled in 9 specialised areas working from its head office at Bengaluru with one testing laboratory at Kolar Gold Fields, Karnataka.

Key area of NIRM activities are

- Engineering Geology
- Engineering Geophysics
- Engineering Seismology
- Geomechanics and Ground Control
- Geotechnical Engineering
- Seismotectonics
- Numerical Modelling
- Testing Services
- Rock Blasting and Excavation Engineering

8.27 In addition to providing scientific solutions through independent scientific services, NIRM also works in interaction with academia and indutry in order to cater to the demands of the industry and increasing number of geoscientific projects.

NIRM scientists work hard to earn higher skills and degrees like PhD in advanced areas of their specialisation. This enables two way opportunities for upgradation of knowledge, skill and high quality scientific solutions.

8.28 NIRM-GSI MoU: NIRM and GSI have signed an MoU in March 2024 under the instruction of the Ministry of Mines for collaboration in Pumped Storage Projects (PSP). With modern equipment and a coherent team of experienced and dedicated Scientists, NIRM combines research activities and consulting services to provide customised solutions for a wide range of rock mechanics

and rock engineering problems. GSI a premier organisation engaged in fundamental and multi- disciplinary geoscientific activities in the country since 1851. GSI has been providing geoscientific inputs for ongoing infrastructure development projects under Water Resources Development Projects and Nuclear Power Projects with its skills in e ngineering geological and geotechnical services.

8.29 NIRM had successfully conducted advanced lectures series through AKAM (75 years of Indian Independence) technical weekly lectures with the participation of industry experts and scientists of the organisation. NIRM provides training, conducts basic and advanced lecture programmes to upgrade the skills of its scientific workforce continuously and impart awareness and skills to industry partners, associates for the benefit of the industry executives.

8.30 NIRM services contribute to India's infrastructure strength : NIRM contributions have been significant in terms of value addition to planning, design, excavation and construction stages of minor and major projects. NIRM investigations and reports are appreciated and incorporated in various project decisions and regulations in mining, civil, hydel and critical infra sectors. Optimisation of method/techniques in mining, tunnelling and other large underground excavations have minimised hazards, improved productivity thereby reducing cost of projects thus indirectly contributing to project cost efficiency and national spending on such projects.

8.31 NIRM in International Arena: NIRM work is recognised and approached by various industries in India, Sri Lanka, Bhutan and Nepal. NIRM is associated with civil and hydel projects in Bhutan and Nepal for more than 2 decades now. Myanmar, Gulf are some of the regions where NIRM has found such opportunities and is striving to work with concerned industry to provide services across the borders.

8.32 Glimpse of NIRM Scientific Outcome: The Kirthai-II Hydroelectric project (930 MW) is a runoff of the river with a 121 m high concrete gravity dam scheme to come up on the river Chenab in Padder Tehsil, Kishtwar district, Jammu & Kashmir. All the components of Kirthai II H. E. Project will be housed in the Pias Granites, which appear generally fresh, massive, and hard. The in-situ direct shear parameters of rock mass are one of the important engineering parameters required for the stability analysis and design of the rock structures was completed in an exploratory drift. This is crucial for Engineering Geological Investigations for the Railway Tunnels for the Proposed Electrification of Hassan (HAS) – Subrahmanya Road (SBHR) in Mysuru Division, South Western Railway was carried out for rock mass classification and excavated portion of tunnels between Donigal and Subrahmanya characterization of bracket areas of unlined Road of Hassan (HAS). Comprehensive report

Photo: 8.12

Photo: 8.13

with identifications of geological defects

in the excavated tunnel surface of bracket areas and recommendations for treatments based on rock mass characterization and site geological conditions was done.

Plate 1: 1st Collapse from face-IV, ingress of debris flow on 7th January 2023

Plate 2: 1st time pipe roofing was done on 27th April 2023

Photo: 8.14

Analysis of geotechnical and geodetic instrumentation data for critical reaches / excavations like draft tube tunnels V and VI, tail race tunnel, downstream surge chamber and additional surge tunnels was carried out using numerical modelling tools. Notably, there are no physical deformation indications on the downstream wall surface at RD 70. Based on instrumentation monitoring post-excavation indicates stable conditions. Physical observations are recommended for the downstream wall from RD 75 to 195. The geodetic monitoring showed negligible deformations during the reporting period. The total station survey recorded a maximum total displacement of 36 mm at RD 70 EL 593.2 D/S until the last month of reporting

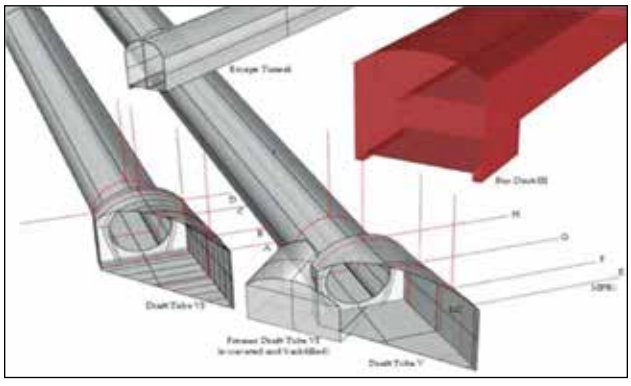


Photo: 8.15 Layout showing installation locations for DT V and DT VI

Photo: 8.16
NIRM scientists at Tunnel No. 6 Dimapur-Kohima Rail line

The design of support for different rock classes and the methodology for underground excavation to expedite the progress. The geotechnical interpretative report anticipates that tunnels 6, 7, and 10 will mostly encounter rock classes III, IV, and V, with less of classes VI and VII. Numerical design processes require comprehensive data on rock mass characteristics, properties, in-situ stresses, and intended excavation sequence. Yielding support systems are recommended in situations where squeezing rock conditions arise due to extremely poor rock mass conditions and areas of high stress concentration. A proper three- dimensional (3D) numerical modelling analysis is recommended for better assessing the stability of the tunnel excavation. It is recommended to create 3D geological logs that encompass the entire circumference of the tunnel. Incorporating intermediate adits throughout the tunnel alignment can provide extra working faces for tunnel excavation and reduce the total time needed for the excavation.

NIRM scientists provided support through guidance on seismic network installation, health of the monitoring system, and overall coverage of the underground mines for improving the monitoring efficacy. In addition, review of the quality of data being received, analysis of the seismic events, evaluation of seismic hazard was carried out with seismic

event-based back analysis and for forecasting probable hazard and production. Seismic hazard closer to stoping operations was done development strategy. The maximum probable ML of a seismic event at RAM was forecast as ML2.8

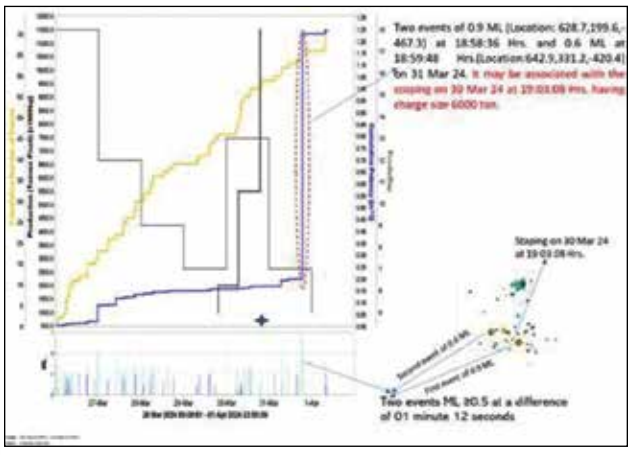


Photo: 8.17
Analysis of seismic events and mining shows the change of seismic source parameters with time during production cycle

NIRM provided advanced excavation strategy for two major underground structures at PHPA-II, Bhutan. Poor geological rockmass conditions encountered in the excavation stretches was successfully tackled by adopting site specific excavation techniques. Excavation of additional surge tunnels (AST-S2 and AST-S1) was successfully completed by adopting heading and benching method in water charged weak rockmass conditions without hampering the activities in the adjacent tunnels. Draft tube V and VI was successfully excavated and supported by adopting suitable controlled blasting techniques.

Photo: 8.18

Suitable controlled blast designs implemented to excavate the tunnels controlled the over break to less than 8%, while average overbreak recorded in the gallery was 0.27m. NIRM has taken all the necessary precautionary measures in designing the blast to reduce the influence of blast induced ground vibrations on the surrounding rockmass and structures. Any underground excavations need a systematic blasting approach to overcome serious damage to the surrounding rockmass and structures to enhance the safety of men and machineries. NIRM strongly recommends that blasting activities for further excavation.

8.33 NIRM Performance: The institute has 90 ongoing sponsored projects, of longer and shorter duration, in progress and have completed submission of technical recommendation to majority of them (50) through technical reports to various industries. Projects worth 15.24 Cr are completed during this period. The flow of work at NIRM is strongly dependent on industry requirements and projects running at national and state level which is always variable. As NIRM strives to work towards financial sustainability, the requirements for sustaining its high-quality services require financial support in terms of capital upgradation and skilled human resources.

8.34 NIRM Scientific Publications: In addition to providing timely solutions to industries, NIRM has published 18 technical papers through national and international conferences, symposium, peer reviewed journals and other technical publications. Including technical reports, the publications are 66 for this period.

8.35 List of Projects during April 2023-March 2024:

1. NDT of critical components and HEMM equipment testing at Zawar Mines, M/s. HZL, Rajasthan.

2. NDT of winder vital parts, structural stability test, HEMM and its load bearing components of Kayad mine.
3. Quality checking of raw granite blocks for new Anubhava Mantap project Basavakalyan.
4. Quality checking of granite stones to be used for construction of Shri Ram temple at Ayodhya.
5. Review of engineering geological/ geotechnical mapping and characterization of rock mass for the Bherughat and twin tunnels, portals areas of 4 laning of Tejajinagar to Balwara section of NH-347BG, Madhya Pradesh.
6. Engineering geological investigation of the railway tunnels for the proposed electrification of Hassan (HAS) Subrahmanya Road (SBHR) in Mysore Division Southwestern Railway.
7. Construction stage Eng. Geological mapping of the foundation floor of on-site emergency support centre for Tarapur Atomic Power Station, Maharashtra.
8. Engineering Geological investigation of balance stretch of tunnel alignment for realignment (ch:1800 to 3300 m) of Sengulam Augmentation Scheme (85 MU) Idukki dist, Kerala.
9. Review of Eng. Geological Investigation of 1.2 Km Twin tunnels of Six-lane Access controlled greenfield highway section of NH- 150C at Kurnool Andhra Pradesh.
10. Geophysical investigation to characterise the overburden rock mass and to locate the shallow aquifers along the hydro tunnel alignment of Sengulam Augmentation scheme, Idukki District, Kerala.
11. Geophysical investigation to assess the cause of cracks in the SCADA control room building of HPCL Mangalore.
12. Geophysical survey for assessment of contamination of ground around the bio-compost yard of Sri Chamundeshwari sugars ltd.
13. Guidance and support to Micro seismic monitoring at Rampura Agucha Mine, Hindustan Zinc Ltd.
14. Mine & Dump slope stability analysis for Lloyds metals & Energy ltd. Surjagarh, Gadchiroli, Maharashtra.
15. Assessment of Granite Building Stone quarry of Thomas OD at Resurvey Nos: 234/1, 234/2 & 234/5 in Muppiyanadu vilage, Vythri Taluk, Waynad district Kerala. For an extent of 1.3307 Ha.
16. To carry out in situ direct shear test at the powerhouse area of Kirthal-II, HE Projects Jammu & Kashmir.
17. Dilatometer test at Nalla Somanadri (Gattu) Lift Irrigation Scheme (NSLIS)
18. Consultancy services for Geotechnical studies for GMDC's Ambaji Multimetal and Kadipani Expansion Mines/Projects.
19. Slope stability studies for left bank slope / Abutment of concrete dam of Subansiri Lower Hydroelectric project (200 MW) NHPC LTD.
20. Numerical Modelling studies for optimisation of Mining parameters at the open cast mines (Kadipani fluorspar and Kadipani Expansion Project) of GMDC Ltd Gujarat.
21. Numerical Modelling studies for Optimisation of mining parameters at Ambaji underground mine of GMDC Ltd. Gujarat.
22. Technical guidance for controlled blasting and monitoring of ground vibration for the excavation of hard rock Malabar hill sets, RIL Mumbai(Phase-2).

23. Optimisation of blast design parameters and monitoring of blast vibration at Utkal D Coal Mines Chendipada, Angul dist, Odisha.

24. Study on providing safe charges for blasting conducted to construct turbine building of unit 5 & 6 of Kaiga atomic power plant, Kaiga.

25. Phase II Extension-3 Monitoring of ground vibration and air overpressure due to blasting carried out for construction of unit 5& 6 of Kaiga atomic power plant, Kaiga, Karnataka.

26. Extension of Technical Guidance Services for Excavation of various powerhouse complex components of Punatsangchhu-II (1020 MW) Hydroelectric project by controlled blasting, Punatsangchhu-II hydroelectric project authority (PHPA-II) Bhutan.

27. Seismotectonic Evaluation for the proposed Jaitapur Nuclear Power Plant within 50 km of radius, Jaitapur, Corporation of Maharashtra.

28. Seismotectonic Evaluation - feasibility study for the propose IREL, Chatrapur, Ganjam District, Odisha.

29. Macro Landslide Hazard Zonation Mapping in the area surrounding the proposed chutka Madhya Pradesh Atomic Power Project at Village-Chutka, District- Mandla, Madhya Pradesh.

30. QA support for the ongoing Geological/ Geotechnical investigations at Mahi Banswara Rajasthan Atomic power project, Banswara Rajasthan.

National Mineral Exploration Trust (NMET)

8.36 The National Mineral Exploration Trust (NMET) was established by the Central Government by notification dated 14.08.2015 in pursuance of sub section (1) of Section 9C of Mines and Minerals (Development & Regulation) Amendment Act, 2015 with the objective to expedite mineral exploration in the country. The NMET Rules were also notified on 14.08.2015. As per the Act, the holders of Mining Lease and Prospecting Licence-cum-Mining Lease shall pay to the Trust, a sum equivalent to 2 percent of the royalty paid in terms of the Second Schedule of the Act to the State Government, simultaneously with payments of royalty.

8.37 NMET has two-tier structure. The overall control, periodical reviews and policy directions of the Trust vest with the Governing Body (GB) and the Executive Committee (EC) is managing, administering and supervising the day-to-day activities of the Trust. The GB is chaired by Hon'ble Minister of Mines and had its annual meeting on 26.06.2023. EC is chaired by the Secretary, Ministry of Mines. EC had five meetings during F.Y. 2023-24 and approved 89 different projects during its meeting. Besides, a Technical-cum-Cost Committee (TCC) has also been constituted to evaluate the technical as well as cost parameters of the project proposals submitted by Notified Exploration Agencies (both public and private) for NMET funding. The TCC recommends the suitable proposals to EC for approval. During F.Y. 2023-24, 12 meetings of TCC were conducted where more than 500 projects were evaluated and reviewed for NMET funding.

8.38 The total NMET fund accrued as on 31st March, 2024 is ₹5349.91 Cr. and total expenditure of NMET till 31st March, 2024 is ₹ 900.64 Cr., out of which ₹296.27 Cr. has been incurred during the financial year 2023-24.

8.39 During the year, a total of 12 meetings of TCC, five meetings of EC and one meeting of GB were held. A total of 89 projects including

72 no. of mineral exploration projects, eight baseline geosciences project, eight Projects of Financial assistance for procurement and one project under S&T PRISM scheme for start-ups and MSMEs were approved by the EC with estimated cost of ₹ 502.49 Cr. Since establishment, a total of 378 projects have been approved by EC for NMET funding, out of which 317 projects are of mineral exploration, 24 projects for baseline geosciences data generation, 37 Projects of financial assistance and one project for S&T PRISM. Out of 317 mineral exploration projects carried out by Notified Exploration Agencies (NEAs), 185 projects have been completed so far. Among these, thirteen blocks (one Limestone and one coal blocks of Madhya Pradesh, one Limestone block of Chhattisgarh, two Limestone blocks of Rajasthan, three iron ore blocks of Odisha, one phosphorite block of Uttar Pradesh, two manganese blocks of Maharashtra, one coal block of Jharkhand and one Limestone block of Karnataka) have been successfully auctioned.

8.40 National Aero-Geophysical Mapping Program (NAGMP) with Magnetic-Gradiometry and Radiometric Surveys has been taken up by GSI through NMET Fund to acquire uniform aero-geophysical data, initially over the areas of Obvious Geological Potential (OGP) followed by coverage of whole country by engaging Project Implementing Agencies (PIA) with an objective to (1) Acquire high resolution baseline aero- geophysical data, (2) Identify new target areas for mineral prognostication, (3) Understanding subsurface geological and structural set up. The OGP area has been divided into Blocks-1 to 12 and Blocks-13 to 22 for acquisition of baseline geoscience data. Under NAGMP, the survey and data acquisition work of OGP Blocks-1, 2, 3, 4 and 11 have been completed. Based on integration of these aero-geophysical data with archived geophysical, geological and known mineralization data, a total of 110 potential blocks have been identified for follow up action. The Survey work and data acquisition over OGP Blocks-5, 6, 7, 8, 9, 10, 12, 14 and 15 are in progress. The objective of aero-geophysical survey is to cover the whole OGP areas at a short time span and to quickly identify areas to be taken up for more detailed heliborne surveys. This will serve as an important tool for enhancing exploration work for mineral sector and also make available the aero-geophysical data for various stake holders through the National Data Repository to provide aid to exploration activities.

8.41 National Geoscience Data Repository (NGDR) project has been approved by EC and Geological Survey of India (GSI) has been declared as nodal agency for implementation of the project. The NGDR portal was launched by Hon'ble Minister of Mines on 19.12.2023. The National Geoscience Data Repository (NGDR) creation project was conceptualized by the Ministry of Mines (MoM) as part of the National Mineral Exploration Policy (NMEP), 2016. The project was launched with a vision to make available all geological, geochemical, geophysical and mineral exploration data in the public domain on a digital geospatial platform to the world. The NGDR Portal has all baseline geo-science data by Central and State Government agencies and mineral concession holders on a Single Point of Truth (SPOT). NGDR functions as a single window system for on-demand mineral exploration and baseline geosciences data repository over an interoperable platform. The greater goal of this initiative is to increase the investment attractiveness of the mining sector in India.

8.42 The National Geophysical Mapping Program (NGPM) was initiated in 2002-03 by GSI, which is systematically generating gravity and magnetic data in a station density (one station/2.5 sq.km) to cover the entire country with preference to OGP areas. The OGP area

was taken on priority with a view to identify potential zones for mineral occurrences. This will pave way to target concealed/ deep seated deposits to augment mineral resources. The mapping will lead to the preparation of 1mGal gravity and 50nT magnetic anomaly contour maps of the country. One NGPM project has been approved by EC to carry out gravity and magnetic survey over priority areas. The work is under progress.

8.43 An incentive of ₹ 23.86 Crore was provided to 11 States for auction of mineral blocks during F.Y. 2023-24

8.44 NMET has provided financial assistance for procurement of machinery / equipment / instruments / upgradation of existing software and other latest technology and instruments for 8 projects amounting to 45.10 Crore of Central PSU and State DGMs/ DMGs aimed at strengthening technical infrastructure.

8.45 With an objective to enhance the participation and engagement of Notified Private Exploration Agencies (NPEAs) in mineral exploration and enable funding of these agencies through National Mineral Exploration Trust (NMET), NMET has formulated and circulated a scheme for directly funding the projects of Critical and Deep-seated minerals as specified in Part 'D' of First Schedule and VII Schedule of MMDR Act, 1957 to NPEAs. Since the launch of scheme in December, 2023 15 projects have been sanctioned to NPEAs by NMET. A total of 26 projects amounting to ₹ 29.12 Crores have been sanctioned to NPEAs so far.

8.46 Under the S&T PRISM Scheme of Ministry of Mines, NMET as adopted the scheme with the approval of Hon'ble Minister of Mines and approved one projects amounting to ₹ 1.20 Crore of the start-up on the recommendation of the APEX Committee of S&T PRISM.

Circular Economy & National Non-ferrous Metal Scrap Recycling Framework, 2020

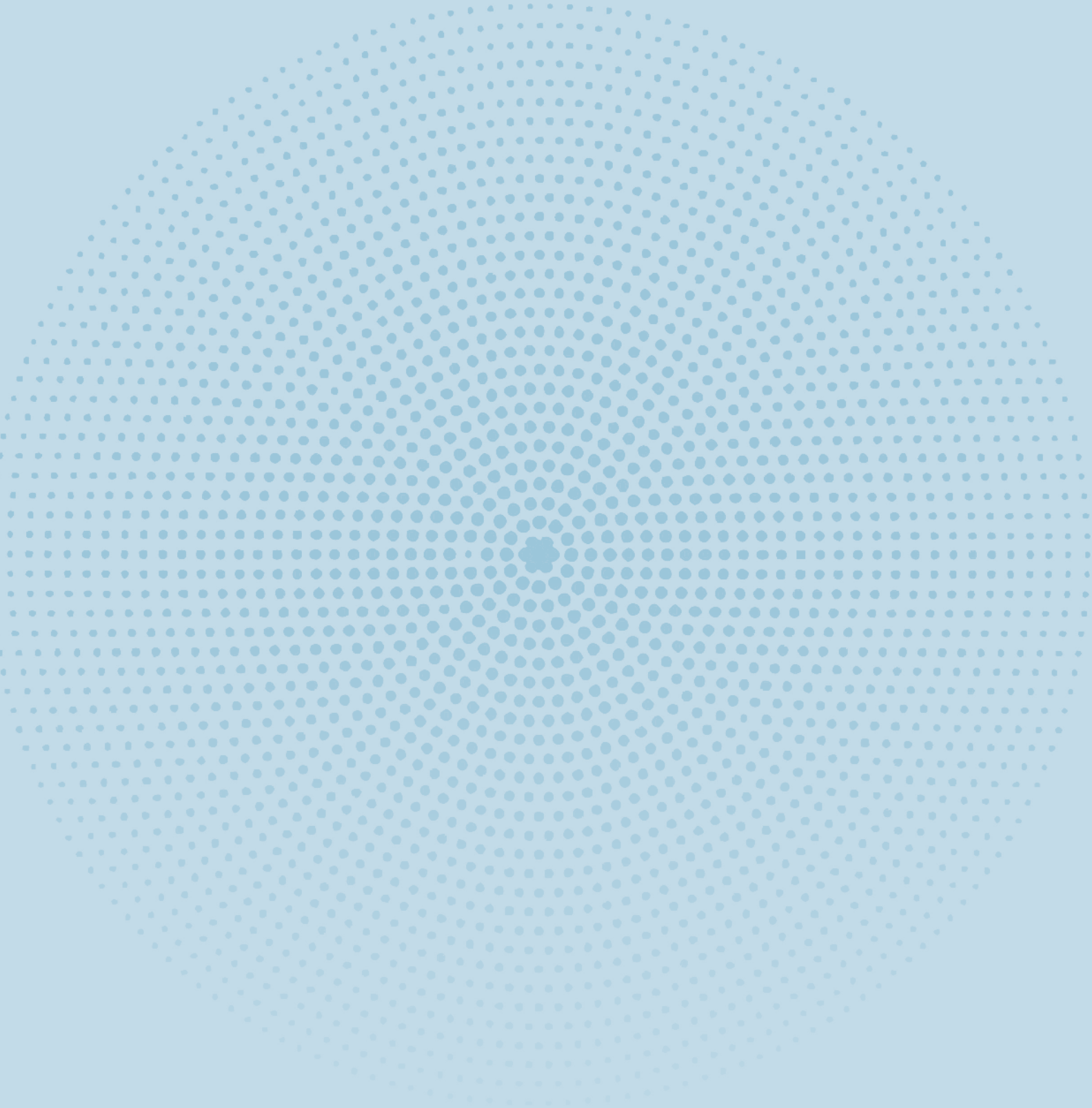
8.47 India is one of the fastest growing economies in the world. Strong domestic demand coupled with several reforms that the government has undertaken are on track to maintain the economic growth momentum going forward. As non-ferrous metals find widespread applications across the economy, the current policy measures provide a tremendous opportunity for the development of the Indian non-ferrous metals industry in the future.

8.48 One of the key challenges faced by the non-ferrous metals industry is its heavy dependence on import of metal scrap. A major share of metal scrap demand is served by imports owing to the underdeveloped metal Thematerial recycling rates in India are well below global standards and is mostly scrap collection, segregation and processing infrastructure in the domestic market. conducted in the informal sector. Thus, strengthening material recycling, including metal recycling under the formal sector can provide a good opportunity to cut down scrap imports.

8.49 At the core of an effective material recycling eco system is a systematic, organized and user-friendly collection, segregation and sorting process. Strengthening this value chain by segregating waste at source and then channelizing the disaggregated scrap through a network of scrap pickers and collectors and eventually to the scrap recycler through appropriate policy interventions would earn rich dividends.

8.50 In this context, in FY 2020-21, Ministry of Mines has published the

National Non-Ferrous Metal Scrap Recycling Framework, 2020 to promote a formal and well- organized recycling ecosystem by adopting energy efficient processes for recycling leading to lower carbon footprints and to work towards sustainable development and inter-generational equity. Major objectives of the framework include: to minimize the effect of end-of-life products on landfills and environmental pollution by promoting an environmentally sound processing and recycling system for secondary industry; to work towards economic wealth creation, job creation and increased contribution to GDP through metal recycling; to shift towards a circular Economy in the coming years for base metals, critical raw materials and other essential material, etc. The framework can be accessed at https: //mines.gov.in/writereaddata/UploadFile/NFMScrapRecyclingFramework3. pdf



9

Corporate Social Responsibility

Corporate Social Responsibility

National Aluminium Company Limited (NALCO)

9.1 Periphery Development & CSR Initiatives

- CSR policy of NALCO is compliant with schedule –VII (section 135) of Companies Act 2013 and DPE Guidelines. The Company allocates 2% of average net profit of last 3 financial years as CSR fund as per Companies Act, 2013.
- The company has spent Rs. 50.83 crore (Provisional un-audited figure) in the FY 2023-24 on various CSR projects against the mandated CSR obligation of Rs 48.15 crore.

9.2 Highlights on CSR activities for the financial year 2023-24 are furnished below:

i) Health Care Initiatives

1. **Door Step Health Service by Mobile Health Unit (MHU):** NALCO runs eight Mobile Health Units (MHUs) in and around 250 peripheral villages, providing medical treatment to over 100,000 patients annually. Around 1.18 lakh patients benefitted in FY 2023-24.

2. NALCO has provided financial support in FY 2023-24, for upgradation and procurement of health care facilities i.e. (i) Up-graadation of Community Health Centers (CHCs) in Koraput district (ii) Procurement of battery operated ambulance & Mortuary Freezer Cabinet for SCB Medical College & Hospital, Cuttack (iii) Procurement of wild animal rescue vehicles for State Wild Life Organization.

ii) Education Initiatives

1. **Indradhanush:** For bringing the tribal students to the mainstream of education, NALCO has sponsored 1191 students from Maoist dominated periphery villages of Koraput district for formal education in 3 reputed residential schools in Odisha.
2. **Nalco Ki Ladli:** In line with Beti Bachao, Beti Padhao' Mission of GoI, NALCO has provided financial assistance to Meritorious girl students of BPL families at Angul and Damanjodi sector. Till date 816 girls are supported to complete their high school education.
3. NALCO is providing quality education to periphery students in vernacular medium schools at Angul and Damanjodi.

iii) Iconic City Projects:

NALCO has taken the responsibility of Shri Jagannath Temple, Puri & its

surrounding under PM's Iconic Shrine Development Programme to upgrade the infrastructure & maintain cleanliness. The Company has given special emphasis on Renovation and beautification of Gandhi Park as a tourist spot, temple illumination, beautification of Puri town with thematic painting based on Jagannatha culture, operation of Battery- Operated Vehicle from Jagannath Ballav Math to Shree Jagannath Temple, Railway Station for differently-abled passengers, senior citizens & sick people, RO based water posts at different locations inside Puri Town.

iv) Art & Culture

NALCO provided Financial Assistance towards organization of Tribal Festival (PARAB), Koraput and for organization of Zilla Mahostav, Angul.

9.3 Training & Development

In order to enhance the functional and behavioural competency of its employees and to align the individual need with the business objective of the organization towards increasing production and productivity as well as to improve business culture in the organization, there has been an unstinting effort by the Company to impart skill and behavioural training to its employees. In its commitment for corporate social accountability and good corporate governance, the company also imparts skill development training to contract workers, apprentices, students from managerial and technical institutes as well as for local populations.

- Total 10,851 training man-days provided to regular employees during the year 2023 – 2024.
- 418 executives were given virtual as well as external training on management development programme during 2023-24 from reputed National organisations.
- In-house skill development programmes organized for 9,001 Security personnel, contract labours and trainees across the company during 2023-24.
- 1135 apprentice trainees were engaged during FY 2023-24, which is 23.29 % of total regular employees and 6.47% of total employees including contractual workers engaged by different contractors.
- 1,262 students from different technical and management institutes across the country had undergone summer internship programme in various functional disciplines.

Hindustan Copper Limited (HCL)

9.4 HCL's CSR Policy revolves round the principles laid down in the Sustainable Development Goals (SDGs), Companies Act, 2013, Company (Corporate Social Responsibility) Rules, 2014 and Department of Public Enterprise Guidelines on CSR.

9.5 The actual expenditure on the CSR activities during last two financial years and current financial year is given in the table below.

CSR expenditure during last two financial years and current financial year

(Rs. in lakhs)

Financial Years	Required Spent (2 % of average net profit (PBT) of last three FYs)	Spent
2021 -22	-	77.19
2022 -23	-	118.3
2023 -24	321.59	266.92

Note: # The CSR budget for FY 2023-24 is Rs.321.59 lakhs (Rs. 576.19 lakhs minus Rs.254.60 lakhs. Set-off for the excess expenditure made during FY 2020-21, FY 2021-22, & FY 2022-23).

9.6 The total CSR Budget allocation for FY 2023-24 is Rs. 377.64 lakhs inclusive of carried forward [the unspent amount of Rs.53.52 lakhs and savings of Rs.2.54 lakhs of FY 2022-23]. The allocation has been done for important ongoing projects having direct impact on communities around company's operation.

Major projects planned are as under.

1. Drinking Water
2. Health Camps and Nutrition
3. Livelihoods
4. Plantation and Sports

A tractor along with water tanker & trolley was handed over to BIT Sindri, Jharkhand under CSR FY 2023-24 to tackle the water crisis in BIT Sindri.

5. Conservation of Environment

6. Rural Development Projects

The projects are being implemented in the target communities with the help of State Government, NGO and other agencies.

Mineral Exploration & Consultancy Limited (MECL)

9.7 MECL has established a comprehensive Corporate Social Responsibility (CSR) Policy to address various social and environmental concerns. During the fiscal year 2023-24, MECL allocated Rs. 169.01 Lakhs towards CSR initiatives aimed at uplifting women, weaker sections, elderly individuals, and the broader community. These efforts encompass initiatives focused on healthcare improvement and environmental sustainability, benefiting individuals from all segments of society, including General, SC, ST, and OBC categories. In the healthcare sector, MECL focuses on enhancing medical facilities in underserved areas. This includes the procurement of essential medical equipment for Government Primary Health Centres (PHC) and hospitals in strategic locations like Ghatshila (Jamshedpur, Jharkhand), Raigarh (Chhattisgarh) and Namchi (Sikkim). Additionally, MECL supports healthcare facilities by providing Anesthesia Workstations to organizations such as the Shree Astha Foundation in Indore, Madhya Pradesh. Furthermore, MECL strives to improve accessibility to education and healthcare for Persons with Disabilities (PwDs) by procuring a school van, healthcare equipment and establishing Smart Classes at the Pahal Institute for Social Change in Indore, Madhya Pradesh.

9.8 In line with its commitment to environmental sustainability, MECL undertakes initiatives to reduce carbon footprint and promote renewable energy sources. This includes procuring 50 solar street lights for Hazaribagh, Jharkhand, contributing to the reduction of conventional energy consumption. Furthermore, MECL installs solar grid-tied systems with a capacity of 10 KVA in various villages across Hazaribagh, Jharkhand, promoting clean and renewable energy sources to mitigate environmental impact.

9.9 Citizen's Charter

Dr. Ch. Sreerama Murthy, General Manager (HR) has been nominated as Nodal Officer w.e.f. 01.06.2014 and the same has been intimated to the Ministry along with the required details.

10

Progressive Use of Hindi

Progressive Use of Hindi

Introduction

10.1 The Ministry of Mines continues to take steps to ensure compliance of the Official Language Policy of the Government of India in the Ministry of Mines as well as in its attached / subordinate offices and PSUs. The compliance of Section 3(3) of the Official Languages Act, 1963 is ensured. As per rule 5 of Official Languages Rules, 1976, during the year (up to March, 2024) out of the 1956 letters received in Hindi 633 letters were for information only and replies thereof were not required and the remaining 1323 letters were replied to in Hindi.

Hindi Advisory Committee

10.2 Hindi Advisory Committee is a high level committee to administer the implementation of Official Language policies. This committee is constituted under the chairmanship of Hon'ble Minister of Mines. Apart from the Hon'ble Members of Parliament, many linguists are also included in the committee. This committee oversees the Official Language policies of the Government and its implementation in the Ministry and the offices under its administrative control and gives due advice to the offices concerned for necessary action. In this regard, Hindi Advisory Committee was reconstituted on 13.04.2022. The meeting of Hindi Advisory Committee of Ministry of Mines was held on 13.12.2023 in New Delhi.

Official Language Implementation Committee (OLIC)

10.3 Official Language Implementation Committee (OLIC) has been constituted in the Ministry under the chairmanship of Economic Advisor. Meeting of the Official Language Implementation Committee is required to be organized every quarter in which the quarterly progress reports of the sections regarding the progressive use of Official Language Hindi are discussed meaningfully. The last meeting of Official Language Implementation Committee (OLIC) was held on 21.03.2024 under the chairmanship of Economic Advisor, the progressive of use of Hindi in official work in various sections was reviewed and officers representing different divisions/sections were asked to increase correspondence in Hindi with offices located in region 'A' and region 'B' and to achieve other targets set by the Department of Official Language in the Annual Programme for the year 2023-24.

Official Language Inspection

10.4 According to the Annual Program for the year 2023-24 of the Department of Official Language, Ministry of Home Affairs, the Ministry/Departments are required to conduct Official Language inspection of at least 25% of the offices located outside the headquarters. Official language inspection of three subordinate / attached offices of the Ministry of Mines on 10.07.2023 IBM & MECL and on 11.07.2023 JNARDDC, Nagpur respectively was done by the Ministry till March 2024. During these inspections the status of progressive use of Official Language Hindi in three above offices was reviewed and suitable suggestions were given in the context of achieving the target set in the Annual Programme 2023-24.

Inspection by the Committee of Parliament on Official Language

10.5 Parliamentary Committee on Official Language inspected GSI, operation west coast II, Marine and Coastal Survey Division, Kochi on 04.01.2023, GSI , SU, Kerala & Lakshadweep, Trivandrum on 05.01.2023, GSI, S.U., M.P. Bhopal on 17.01.2023, IBM, RCOM, Raipur on 23.05.2023, GSI, SU, Raipur on 24.05.2023, GSI, NR, Lucknow on 17.06.2023, IBM, RCOM, Ranchi on 13.07.2023. HCL, Indian

Copper Complex, East Singhbhum, GSI, SU, Jharkhand on 14.07.2023, GSI, SU, Bihar, Patna on 14.07.2023, GSI, Pune on 12.09.2023, IBM Ajmer on 03.10.2023, DGCO, GSI on 06.10.2023 GSI Gandhinagar on 12.01.2024, HCL Taloja Mumbai on 14.02.2024, NALCO Mumbai on 14.02.2024, RCOM, IBM Goa on 16.02.2024, HCL Delhi on 12.03.2024. While appreciating the status of correspondence in Hindi in these organizations, the Committee suggested some measures to improve the usage of Hindi in other areas of official work. Necessary actions on assurances given to the Committee has been or being taken by the offices concerned.

Website of the Ministry

10.6 The website of the Ministry serves as a vital link with the masses. The material on website is available in bilingual form. Material available on website is updated from time to time by concerned sections. The website of the Ministry is https://mines.gov.in

Implementation Measures of Official Language Policy

10.7 In order to ensure the compliance and implementation of the Official Language Policy, workshops are also organized from time to time in the Ministry. All the computers of the office have been made Unicode enabled to facilitate the official work in Hindi.

Workshops and Internal Inspection

10.8 To remove the difficulties & hesitation of the officers/employees to carry out their official work in Hindi, workshops are conducted from time to time. Four workshops were conducted 21.06.2023, 05.09.2023, 27.10.2023 and 19.03.2024. As per the annual programme issued by D/o Official Language, M/o Home Affairs regarding the internal inspections, 10 sections have been inspected. One day workshop was organised to train the officials to work on E-office in Hindi.

Organizing Official Language Fortnight / Month

10.9 In the Ministry of Mines from 14th September, 2023 to 29th September, 2023 Hindi Fortnight was organized. During this period various competitions were organized. The Hindi Fortnight Prize Distribution event was organized on 21.11.2023 to felicitate the winners of the different competitions. In the said event Shri Sanjay Lohiya, AS (Mines) awarded certificates and books to the winners. Also on the occasion of Hindi Diwas the messages of Hon'ble Minister of Home Affairs and Hon'ble Minister of Mines were circulated to the attached/sub-ordinate offices of the Ministry with the aim to increase and promote Hindi in the official work.

Special Initiative taken by Attached/ Sub- ordinate Offices and PSUs of the Ministry for promoting use of Hindi in official Work

10.10 Geological Survey of India (GSI) is an attached office of Ministry of Mines. Since its inception (1851 AD) GSI is dealing with geo-scientific and technical activities of the country. GSI is also imparting state of the art training to the geo-scientists of the country and abroad with its Training Institute having Headquarter at Hyderabad and RTD's. Despite being a scientific and technical organization, GSI is also engaged in promoting the use of Hindi in its various offices.

10.11 In compliance with the Official Language provisions in Indian Constitution, Official Language Act, 1963, Official Language Rules, 1976 and the instructions issued by the

Government of India, Ministry of Home Affairs, Department of Official Language from time to time, Geological Survey of India is continuously implementing the Official Language Policies. Various works are carried out in the offices for the propagation of official language, various incentive schemes are implemented and progress in propagation of official language Hindi is also reviewed from time to time. The details of the official language related works done by Geological Survey of India during the period from 01.01.2023 to 31.03.2024 are as follows:

Official Language Implementation Committee (OLIC)

10.12 As per the directives of Government of India, Ministry of Home Affairs, Department of Official Language, the Official Language Implementation Committee has been constituted in all the Offices of Geological Survey of India under the chairmanship of the administrative head of the office and regular meetings are being held in every quarter. During the said period, the meeting of the Official Language Implementation Committee of Central Headquarters was held on 03.02.2023, 29.05.2023, 17.08.2023, 19.10.2023 and 13.02.2024.

Town Official Language Implementation Committee (TOLIC)

10.13 Geological Survey of India, Central Headquarters is nominated as Head of Town Official Language Implementation Committee, Office-3 and the Director General, GSI is ex-officio Chairman of this committee. At present, there are 65 members of this committee. The half-yearly meeting of the committee was held on 29.05.2023 and 09.11.2023 under the chairmanship of the Director General, GSI, in which half-yearly Hindi reports were reviewed. Similarly, NRO office is the Head of Lucknow TOLIC and its meetings are being conducted as per the prescribed calendar of the Official Language Department.

Official language inspection of offices

10.14 In order to assess the progress made in the use of Hindi in various offices of the Geological Survey of India, Official Language Inspection of five (05) subordinate Offices and ten (10) division/sections has been done by GSI, CHQ, Kolkata during this period. Besides, Official Language Inspection of their subordinate State Units and division/sections has been done by Regional Headquarters.

Inspection of GSI office by Parliamentary Committee on Official Language

10.15 During the said period, official language inspection of the following ten offices of the Geological Survey of India was completed successfully by the Hon'ble Parliamentary Committee on Official Language:

1. Marine and Coastal Survey Division, Kochi on 04.01.2023
2. State Unit: Kerala, Thiruvanantpuram on 05.01.2023
3. State Unit: Madhya Pradesh, Bhopal on 17.01.2023
4. State Unit: Chattisgarh, Raipur on 24.05.2023
5. Northern Region, Lucknow on 17.06.2023
6. State Unit: Bihar, Patna on 14.07.2023
7. State Unit: Jharkhand, Ranchi on 14.07.2023
8. State Unit: Maharastra, Pune on 12.09.2023

9. DGCO, New Delhi on 06.10.2023
10. State Unit: Gujarat, Gandhinagar on 12.01.2024

The Committee expressed satisfaction regarding the implementation of the official language in the above offices and also appreciated the official language work and achievements being done by the Geological Survey of India.

Training, Workshops and Seminar

10.16 The offices of Geological Survey of India are organizing Hindi Workshop on regular basis as per the directives of Government of India, Ministry of Home Affairs, Department of Official Language. In this order, Hindi Workshops at CHQ, Kolkata were organized as per the following detail:

- On 28.06.2023, a workshop was organized on the subject of work in official language in E- office.
- On 22.09.2023, a workshop was organized on the subject How to fill QPR in Hindi.
- On 28.12.2023, a workshop was organized on the subject 'Bhoojal me floride sandushan or iske prabhav'.
- On 13.02.2024, a workshop was organized on the subject 'Bhooskhalan aapda purvanuman'.

10.17 To provide Hindi training to all personnel of GSI within the time-limit prescribed by the Department of Official Language, Ministry of Home Affairs, officials are being nominated for Prabodh, Praveen, Pragya and Parangat classes under Hindi Teaching Scheme. These classes are held twice a year i.e. January-May and July-November. In addition, intensive training classes for Hindi language training are also being organized. Typists and stenographers are being nominated in a phased manner for Hindi typing and stenography training.

All India Annual Official Language Review Meeting

10.18 Under the aegis of Geological Survey of India, Central Headquarters and in the chairmanship of Shri N.V. Nitanvare, Additional Director General and Head of the Department, GSI, Northern Region, Lucknow, a two-day All India Annual Official Language Review Meeting and Scientific and Technical Official Language Seminar has been jointly organised by Geological Survey of India, Central Headquarters on 18-19 January 2024 at GSI, State Unit: Punjab, Haryana and Himachal Pradesh, Chandigarh, in which a total of 70 officials participated. In-house Hindi magazine 'Bhoomanthan' edition-10 of GSI, Central Headquarters and a summary compilation of the research papers of Scientific and Technical Official Language Seminar were released by the senior officers present on the stage. This two-day annual official language review meeting and scientific and technical official language seminar were organized in parallel sessions. In the review meeting, the annual evaluation report 2022-23 related to the official language of a total of 40 subordinate offices of the Geological Survey of India was reviewed, in which the annual evaluation of 21 offices was done in two sessions held on 18.01.2024 and review of the annual report of the remaining 19 offices was done in two sessions on 19.01.2024. After review, three offices were given awards and certificates for their excellent contribution in the implementation of the official language. Also, three excellent Hindi in-house magazines published by various offices of the Geological Survey of India in the year 2022-23 were given awards and certificates. Four sessions were organized in the Scientific and Technical Official Language Seminar, in which 15 research articles were presented

in two sessions held on 18.01.2024 and the remaining 16 research articles were presented in two sessions on 19.01.2024. During this event, awards and certificates were given to three scientists who presented excellent scientific and technical research papers.

- Scientific and Technical Official Language Seminar was organized by GSI, Southern Region, Hyderabad on 27.09.2023 in which 10 technical research papers were presented.
- Scientific and Technical Official Language Seminar was organized by GSI, State Unit: Maharashtra, Pune on 28.12.2023 in which 22 technical research papers were presented.
- Scientific and Technical Official Language Seminar was organized by GSI, State Unit: Karnataka and Goa, Bangalore on 16.08.2023 in which 11 technical research papers were presented.
- Scientific and Technical Official Language Seminar was organized by GSI, State Unit: Gujarat, Gandhinagar on 08.01.2024 in which 10 technical research papers were presented.
- Scientific and Technical Official Language Seminar was organized by GSI, State Unit: Rajasthan, Jaipur on 28.06.2023 in which 14 technical research papers were presented.
- Scientific and Technical Official Language Seminar was organized by GSI, Central Region, Nagpur on 22.02.2024 in which 19 technical research papers were presented.

Hindi Fortnight / Week / Day

10.19 Hindi Fortnight, 2023 was successfully organized at Geological Survey of India, CHQ, Kolkata. The grand inauguration of this year's Hindi Diwas was done in Pune during the third All India Official Language Conference under the chairmanship of Honourable Shri Amit Shah, Home affairs and Cooperation Minister, in which officials of the offices of GSI participated and Hindi Diwas started from the same platform. Thereafter, various competitions and closing ceremony related to Hindi Week/Fortnight celebrations were organized in the respective offices. Accordingly, Hindi fortnight was organized at Geological Survey of India, CHQ, Kolkata from 19.09.2023 to 29.09.2023, under which various competitions such as: Hindi typing, Hindi essay writing, Hindi dictation, Hindi noting and drafting, Hindi Antakshri, Hindi Poetry recitation, and Hindi quiz etc. were organized.

The participants were awarded and felicitated at the closing ceremony. Along with this, the officials who made excellent contribution in the promotion of official language Hindi were also felicitated by certificate on this occasion.

Translation Work

10.20 Regarding implementation of Section 3(3) of Official Language Act, the Gazette Notifications, Summaries, Office Orders, Circulars, Tender Notices, RTI Materials, documents to be presented in the house or houses of Parliament and other correspondence of GSI were translated from English to Hindi and vice versa as per the requirement. Accordingly, compliance of Rajbhasha Niyam 1976, Rule 5 were also ensured. In addition to that, Abstracts of reports related to various survey programs of the Geological Survey of India were also translated into Hindi. Hindi translation of the material related to 84 geo-heritage sites, compiled and studied by the GSI, was completed.

In-House Hindi magazines and other publications

10.21 In-house Hindi magazines namely

'Bhugaurav' edition-21 of Western Region, Jaipur, 'Bhusandesh' edition-10 of Northern Region, Lucknow, 'Narmada' edition-12 of Central Region, Nagpur, 'Akanksha' edition-6 of Southern Region, Hyderabad, 'Indradhanush' edition-6 of North-Eastern Region, Shillong, 'Chetna' edition-23 of Training Institute, Hyderabad, 'Vihang' edition-13 of Remote Sensing and Aerial Survey, Bangaluru, 'Sabarmati' edition-6 of State Unit: Gujarat, Gandhinagar, 'Maruvani' edition-2 of State Unit: Rajasthan, Jaipur, 'Dhauli' edition-17 of State Unit: Odisha, Bhubaneswar, 'Markandeya' edition 4 of State Unit: Punjab, Haryana and Himachal Pradesh, Chandigarh, 'Tawi' edition-3 of State Unit: Jammu and Kashmir, Jammu, 'Kanchenjunga' edition-3 and 4 of State Unit: Sikkim, Gangtok, Lichchavi' edition-7 (b) of State Unit: Bihar, Patna, 'Advika' edition-4 of State Unit: Andhra Pradesh, Hyderabad, 'Bhauma Kairali' edition-2 of State Unit: Kerala, Thiruvananthapuram, 'Vasudha' edition-2 of State Unit: Karnataka and Goa, Bangaluru, 'Pranhita' edition-1 of state unit Telangana, Hyderabad, 'Sahyadri' edition-2 of state unit Maharashtra, Pune were published. E-Varta (News magazine) edition-1 and 2 were published by Southern Region, Hyderabad. Apart from this, monthly e-news in Hindi is being published.

10.22 Implementation of Hindi Incentive Schemes in Geological Survey of India (GSI):

To promote the use of Hindi in the Official work the following Incentive schemes are being implemented in Geological Survey of India:-

- Cash award and personal Pay to the Officers/ Employees for passing the Prabodh, Praveen, Pragya, Hindi Typing, and Stenography Examinations under the Hindi Teaching Scheme of Government of India, Ministry of Home Affairs.
- Cash award to the Officers/Employees for noting and drafting in Hindi.
- Officers and employees who have made outstanding contributions for the propagation of Official Language Hindi are honoured on Hindi Day.

10.23 Portal of GSI in Bilingual Form

According to the policy of the Government of India, the work of Bilingual of the portal of Geological Survey of India is going on continuously. Currently GSI portal is opening in Hindi by default. Most of the content in the portal is available in Bilingual form and the work of Bilingual of the remaining content is being done in a phased manner on priority basis. A sub-folder is available in the department to display the works and activities related to Hindi.

10.24 Review of Quarterly Progressive Report (QPR) of Regions

The review of Quarterly Progressive Report (QPR) of all regions and Missions is carried out regularly and feedback is given for necessary action. In addition to that the QPRs of sub-ordinate Offices are being reviewed by the concerned Regional Offices.

10.25 Indian Bureau of Mines (IBM)

Indian Bureau of Mines is implementing the policy of official language of the Govt. of India in the headquarters as well as all Subordinate offices of IBM very effectively. IBM has its headquarters at Nagpur, Maharashtra which falls in 'B' region. Six subordinate offices of IBM fall in 'A', one subordinate office falls in 'B' region and the rest of the 07 Subordinate offices fall in 'C' region. All the subordinate offices of IBM have achieved all the targets mentioned in Annual Programme of the Department of Official language. During

2023-24, the details of the progress and achievement related to Hindi implementation are as follows:

10.26 Meetings of the Departmental Official Language Implementation Committee:-

The 125th, 126th, 127th and the 128th meetings of the Departmental Official Language Implementation Committee were held on 12.04.2023, 07.07.2023, 16.10.2023 and 08.01.2024 respectively. In all regional offices, the meetings of the Departmental Official Language Implementation Committee are regularly held, and reports are sent to the headquarters.

10.27 Hindi Fortnight:-

The Hindi Fortnight was successfully organized at IBM headquarters from 14.09.2023, to 29.09.2023. As per the directions of the department of official language, Ministry of Home Affairs, New Delhi, Hindi Diwas was celebrated on 14th of September 2023 at Pune, Maharashtra in centralized way. During the fortnight, various competitions such as Hindi Essay, Hindi Noting and Drafting, Hindi Translation, Story writing based on pictures, Hindi Extempore Speech and Hindi Quiz were organized.

10.28 Award for Original Noting and Drafting Hindi Encouragement Plan by Indian Bureau of Mines (IBM) :-

For the Year 2022-23, Under the Original Noting and Drafting Hindi Encouragement Plan, 70 persons of 15 Offices of Indian Bureau of Mines were awarded.

10.29 Publication of Khan Bharti :-

During 2023, Indian Bureau of Mines has brought out its Hindi In-House Magazine namely 'Khan- Bharti' which was released by the Hon'ble Secretary, Ministry of Mines, Shri V.L. Kantha Rao. Then the 10th issue of 'Khan-Bharti' (second time in current year) has also been brought out as E- Magazine which was released on 01.03.2024 on the occasion of the Foundation Day of Indian Bureau of Mines.

10.30 Rajbhasha Inspection by Parliamentary Official Language Committee:-

Language Inspection by the third sub-committee of the Parliamentary official language committee of Raipur Regional office, Ranchi Regional office, Ajmer Regional office and Goa Regional Office took place on 23.05.2023, 13.07.2023, 03.10.2023 and 16.02.2024 respectively.

10.31 Official Language Award to Goa, Chennai, Dehradun and Bhuwaneshwar Regional Offices:-

During the year, Goa, Chennai, Dehradun and Bhuwaneshwar Regional Offices of Indian Bureau of Mines received the official language Award for excellent implementation of Official Language by the Department of Official Language, Ministry of Home Affairs.

10.32 To improve the usage of Hindi in official dealings, IBM organized various workshops at IBM Headquarters and its regional offices. Further, inspections were carried out to various divisions and sections of IBM headquarters and its regional/ zonal/ RMPL office locations to check the implementation status of official language. During the year, different important technical and administrative documents were translated into Hindi. About 90 pages of the Annual Report of the Ministry of Mines, for the year 2022-23 were translated into Hindi. At the same time, about 30 pages related to Standing Committee on Coal and Steel were also translated into Hindi.

National Aluminium Company Limited (NALCO)

10.33 Measures for Implementation of Official Language Policy :-

- Progressive use of Hindi is being implemented as per provision of Official Language Act, 1963 and Official Language rules 1976.
- NALCO holds the Chairmanship position of TOLIC, Bhubaneswar and Angul. Scheduled meetings have been organized at both the locations involving all local PSUs Offices. In this regard, Company's efforts have been appreciated in the meetings by the representatives of RIO, Government of India.
- The website of the company is being regularly updated in bilingual; Hindi and English.
- Hindi Fortnight 2023 was observed at Corporate Office, Production Units and Regional Offices of the company to encourage the use of Hindi in official work and various competitions were organised among employees and students.
- In order to encourage the member offices for implementation of the official language, while ensuring the participation of the member offices; review of Hindi Training was done by the support of Deputy Director (East) – Training.
- Inspection of NALCO and some of its members offices by Draft and Evidence Sub Committee of Parliamentary Committee on Official Language conducted with satisfactory remarks.
- Hindi workshops were organised on 26.04.2023 with faculty support of Sh. Nirmal Kumar Dubey, Office In-charge of Regional Implementation Office (East), MHA, Kolkata.
- Workshops and quiz competitions were organised for the members of TOLIC(U), Bhubaneswar under the banner of TOLIC(U) on 26.06.2023 and 20.02.2024.
- On the occasion of World Hindi Day, 'Sumitra Nandan Kavya Path' competition was organised on 10.01.2024 for the members of TOLIC(U), Bhubaneswar under the banner of TOLIC(U).
- Faculty assistance on Unicode and tools and techniques of Hindi computing was provided to the member offices of TOLIC, Bhubaneswar.
- A quiz competition and workshop of member offices of TOLIC was organised on 20.02.2024.

10.34 Hindustan Copper Limited (HCL)

- During the year 2023-24, from 14th-29th September, 2023 Hindi Diwas / Week/ Fortnight was organized in all the Units / Offices including the Corporate Office of HCL. During this period, various programs were organized to promote the propagation of the Official Language. In HCL, on this occasion, Hindi Competitions on various subject, like Hindi Essay Writing, Translation and Hindi Noting-drafting Competition were organized for non-Hindi speaking and Hindi speaking employees separately and Passage Reading Competition only for Non-Hindi speaking employees. A Hindi typing competition on computer was also organized. The winning participants of all the competitions were encouraged by giving prizes and certificates in the closing ceremony.

- Hindustan Copper Limited has been awarded the Fourth Prize by Town Official Language Implementation Committee (Undertaking), Kolkata in the category of Corporate Office for the best performance in the field of Official Language during the year 2023-24.
- The meeting of the Official Language Implementation Committee is held regularly in HCL. In addition, Hindi workshop is also organized. Nomination of participants from Hindustan Copper Limited as ensured for various competitions organized by various CPSEs for promotion of Official Language under the aegis of Town Official Language Implementation Committee.
- In order to enhance the knowledge and arouse the interest in the official language Hindi of the officers/employees of the company, a Hindi word and its sentence is prepared every day in bilingual form and displayed on the notice board for everyone to read and follow.
- The progressive use of Hindi is being reviewed regularly at the Board meetings of Company. The Company's in-house journal "Tamralipi" is published in Hindi and English and distributed among employees regularly. The recruitment advertisement is also published bilingual. At the time of superannuation, all the employees are given Service Certificate in Hindi. The Hindi translation of Annual Report, MoU, Outcome Budget and various other jobs of the Company were done in year 2023-24.

10.35 Mineral Exploration & Consultancy Limited (MECL):

Official Language Implementation Committee:

The Corporation's Official Language Implementation Committee, chaired by the Chairman-cum-Managing Director, conducted timely meetings to review the status of Hindi activities. Necessary orders and guidelines were issued as required.

Official Language Inspections:

To ensure Hindi progress, the Hindi Inspection Committee, formed by the Chairman with two members, inspects Hindi works in each office/ Division based on quarterly data. They provide directives and submit inspection reports for further action.

Measures for Implementation of Official Language Policy:

Training, Workshops and Seminars

Regular one-day Hindi workshops were organized wherein technical and non-technical personnel received training on Hindi policy and language-related knowledge.

Organization of Rajbhasha Fortnight / Month

Hindi Diwas celebrated annually on September 14th followed by a successful fortnight. Employees and their families participated in competitions aimed at promoting Hindi language usage. Awards were distributed by the Chairman-cum-Managing Director.

Translation Work :

The Hindi section translates important documents such as office orders, circulars, press releases, and tender notices under Section 3(3) to promote Hindi usage.

In-house Magazine:

Our internal Hindi magazine "KHANIJ PRAVAH" is now being published quarterly, in which apart from company news, employees are invited to publish self-written essay and various articles and it includes rules and provisions pertaining to the official language. Unveiled during Consultative Committee

meeting held on 13.12.2023 at Parliament Annex, New Delhi.

Special initiatives undertaken by Public Sector Undertakings (PSUs) to promote the use of Hindi in official work include:

- Implementation of a special cash reward scheme for Hindi usage.
- Establishment of an annual cash prize scheme in memory of Late Shri Shankar Dayal Singh.
- Organization of a city-level Hindi competition in Nagpur annually under the banner of NARAKAS (Ka-1).
- Production of a booklet with standardized Hindi notes and routine letters in Hindi.
- Procurement of Hindi literature books ensuring ample resources for the promotion and enrichment of Hindi language skills among employees.

10.36 Jawaharlal Nehru Aluminium Research Development and Design Centre (JNARDDC)

Progressive use of Hindi

A Hindi workshop was organized at JNARDDC on 17th August 2023. Mr. Ravi Shukla, renowned Hindi scholar and HoD of Bharatiya Vidya Bhavan, Abu Dhabi, UAE, threw light on various aspects of Hindi literature and working knowledge of Hindi. JNARDDC continued its efforts to promote the progressive use of Hindi. The Centre celebrated Hindi Pakwhada during 14-29 September 2023 which included several competitions. Director, JNARDDC emphasized the need for further use of hindi in day-to-day official use of the Centre's activities.

11

Exploration Activities In the North-Eastern Region

Exploration Activities in the North-Eastern Region

Geoscience Activities in the North-Eastern Region

Introduction

11.1 Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Tripura and Sikkim are the eight states located in the North Eastern part of the country. The geomorphological and geological setup of North Eastern Region (NER) is entirely different from other parts of country. Geologically, North-East India represents a stratigraphic sequence which ranges from pre-Cambrian to Quaternary sequence. The oldest geological rock sequence of the region is represented by pre-cambrian gneissic complex of Meghalaya plateau and the Karbi-Anglong plateau. The Himalayas, occupying the northern border of the region consist of varied rock types ranging in age from Proterozoic to early Palaeozoic in age whereas foot hills of the Himalayas comprise of Tertiary rocks. The other part of the region is covered by Cretaceous -Tertiary rocks belonging to age from Eocene to Pliocene whereas the Brahmaputra valley forms the extensive Assam plains tectonically surrounded from all sides between Eastern Himalayas in the north, Indo- Myanmar Range in the west and south west and Gneissic Complex of Shillong Plateau towards south.

Work done by Geological Survey of India (GSI) in North Eastern Region

11.2 Major activities of Geological Survey of India (GSI), North Eastern Region (NER), include baseline data generation through geological, geochemical & geophysical mapping, mineral exploration, compilation and generation of different types of maps and publications, fundamental researches & public good geosciences like landslide/ geotechnical/ earthquake studies. GSI is continually striving for the development of NER states through augmentation of above activities and helping the states of NER by virtue of training, capacity building by providing various training courses to a number of officers of State DGMs of NER. GSI, NER is perpetually extending technical and scientific supports by providing chemical analyses and petrological studies of representative samples of the different state DGMs, as per their requests.

Geological Mapping on 1:25,000 scale

11.3 During FS 2022-23, a total of six Systematic Thematic Mapping (STM) programme on 1:25,000 scale, including one RP item have been taken up in NER of which two items were taken up in Arunachal Pradesh, one in Assam, two in Meghalaya and one in Sikkim. During the period from 1st January, 2023 to 31st March, 2023, an area of 577 sq km had been covered **(Annexure - 11.1)**.

11.4 During FS 2023-24, a total of seven Systematic Thematic Mapping (STM) programme on 1:25,000 scale have been taken up in NER of which two items are being executed in Arunachal Pradesh, one in Assam, two in Meghalaya, one in Nagaland and one in Sikkim. During the period from 1st April 2023 to 31st March, 2024, an area of 1441 sq km has been covered **(Annexure - 11.2)**.

Fig. 11.1: a. Tight F1 folding of quartz rich compositional layer in biotite gneiss. B. Recline F2 fold with AP 225/55/ NW. c. Development of Bt and sub-grain formation parallel to F2 axis. d. Type 3 hook shaped fold with AP NS/ Subvertical

Geochemical Mapping (GCM)

11.5 Geochemical Mapping (GCM) is being carried out by GSI in different parts of NER to generate the baseline regional geochemical data with elemental distribution pattern. This is being done with the objective of identifying the targeting areas for search of mineral deposits.

11.6 A total of 30 items of Geochemical Mapping on 1:50,000 scale with collection of samples in grid pattern had been taken up during the FS 2022-23 in parts of Arunachal Pradesh, Assam, Meghalaya, Tripura, Mizoram and Manipur-Nagaland. An area of 9345 sq km has been covered during the period from 1st January 2023 to 31st March 2023 **(Annexure - 11.3)**.

11.7 Total 48 items of Geochemical Mapping on 1:50,000 scale with collection of samples in grid pattern is being executed during the FS 2023-24 in parts of Arunachal Pradesh, Assam, Manipur-Nagaland, Tripura & Mizoram.

An area of 34606 sq km has been covered during 1st April 2023 to 31st March 2024 **(Annexure - 11.4)**.

Geophysical Mapping (GPM)

11.8 Geophysical Mapping (GPM) has been taken up with an objective to prepare gravity-magnetic anomaly maps so as to delineate sub surface geological structures. These studies along with the geological and geochemical maps help in postulating conceptual models to focus on potential/probable target areas of interest for mineral exploration in deep as well as shallow levels.

11.9 As a part of FS 2022-23 two GPM Items had been executed by GSI, NER. During the period 1st January 2023 to 31st March 2023 a total area of 2016 sq km had been covered **(Annexure - 11.5)**.

11.10 Two GPM items in South-East Hills districts, Meghalaya and East Khasi and East Jaintia Hills districts, Meghalaya is being executed during FS 2023-24 and an area of 2800 sq km have been covered during the period from 1st April 2023 to 31st March, 2024 **(Annexure - 11.6)**.

Photo Geology and Remote Sensing (PGRS)

11.11 Two items of Photo Geology and Remote Sensing (PGRS) had been taken up on 1:50,000 Scale during FS 2022-23 to carry out the alteration zone mapping in West Garo Hills, North Garo Hills, East Garo Hills and South Garo Hills district of Meghalaya using ASTER data for residual deposits. The total target of 3650 sq km had been completed during the period from 1st January 2023 to 31st March 2023 **(Annexure - 11.7)**.

11.12 During the FS 2023- 24, two items of Photo Geology and Remote Sensing (PGRS) is being executed on 1:50,000 Scale in parts of Meghalaya, Assam and Sikkim states by using ASTER data. A total area of 21150 sq km has been completed during the period from 1st April 2023 to 31st March 2024 **(Annexure - 11.8)**.

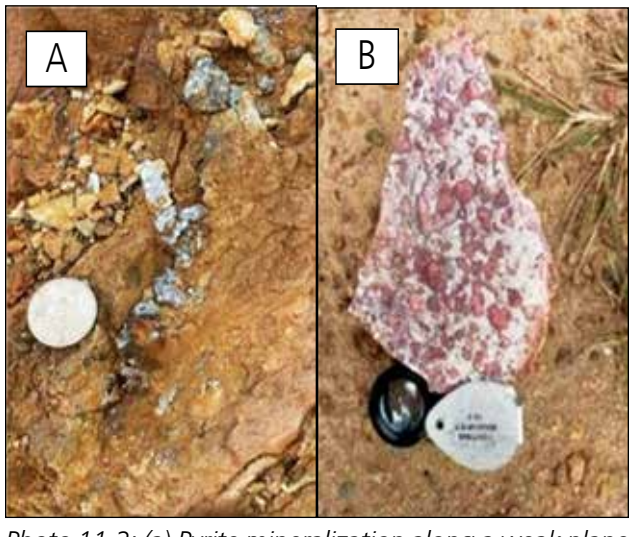


Photo 11.2: (a) Pyrite mineralization along a weak plane in gneisses of AMGC, Umlieh, (b) Bauxite over gneisses of AMGC, Pamphyrnai

Mineral Exploration in NER

11.13 The major mineral resources in NER that are partially explored include coal, limestone, dolomite, graphite, lateritic bauxite, clay, quartzite, sillimanite etc. Besides, occurrence of low-grade iron ore, base metal sulphides and minor incidences of nickel, cobalt, lithium, vanadium, molybdenum, gallium, gold, tin, tungsten, Platinum Group of Elements (PGE) and Rare Earth Elements (REE) are reported.

GSI has given special thrust on the mineral exploration and development activities in North Eastern Region through resource appraisal of various mineral commodities including minerals in which our country is deficient. The entire activity is being planned to be supplemented by baseline data generation through geochemical mapping, geophysical mapping, specialized thematic mapping in order to generate concurrent synthesis of database to help in delineating areas for prognosticated mineral search. During recent time, impetus has been given on critical and strategic commodities like Vanadium, graphite, REE, Molybdenum and lithium to meet the demand of industry for green energy.

The Geological Survey of India has in addition to the accredited programmes in exploration work, also accorded priority for creation of multi- thematic database for data dissemination to invite and attract private investments in mineral sector.

During FS 2022-23, a total of twenty-two items (5 G3 and 17 G4 Item) has been taken up in the states of Arunachal Pradesh, Assam, Meghalaya, Manipur and Nagaland while, in FS 2023-24, a total of twenty-five items (7 G3, 17 G4 and1 RP Item) have been taken up in the states of Arunachal Pradesh, Assam, Meghalaya, Manipur, Nagaland and Sikkim of North East India. The commodity-wise and stage-wise details of the projects are given in **(Annexure - 11.9)**.

During the period from 1st January, 2023 to 31st March, 2024, an area of 1273.8 sq km of LSM, 15.978 sq km of DM and 3995.41 m of Drilling has been carried out.

Photo 11.1: Onsite testing of physical parameters of Brine water at Kupa Brine, Yisi area, Phek District, Nagaland

Photo 11.2: Malachite stains and iron leaching in quartz vein, Gangtok district, Sikkim

Photo11.3: Contact between Carbonaceous phyllite (graphite and vanadium bearing) and quartz-mica schist, Sito area, Lower Subansiri district, Arunachal Pradesh

Photo 11.4: Gossanised quartzite at Mawnianglah, East- Khasi Hills district, Meghalaya

Photo 11.5: Thickly bedded limestone of Shella Formation near Chekso village, Dima Hasao district, Assam

Photo 11.6. Nodule bearing shale, Chemme nala, Lower Siang, Arunachal Pradesh

Photo 11.7: Outcrop at a mine exposing a coal band about 60 cm within the Jenam Formation, Barail Group. Dark grey to dark brownish, soft and friable carbonaceous shales associated with clay occupying roof and bottom of coal. Project: Coal, Mekokla-Akuk-Lakhuti, Nagaland.

Publications by GSI, NER

11.14 (A) During FS 2023-24, the following items on Publications and Maps have been taken up:

- Publication of Records of GSI, Vol. 157, Pt. 4 (Extended Abstract for F.S. 2022-23 of North Eastern India). Publication of Bulletin Series-B: Seismic Hazard Assessment of selective towns of North East India.
- Compilation and updation of District Resource Maps (DRM's) of East Jaintia Hills, West Jaintia Hills, East Khasi Hills, West Khasi Hills, South West Khasi Hills, Eastern West Khasi Hills, East Garo Hills, North Garo Hills, West Garo Hills, South Garo Hills, South West Garo Hills and Ri Bhoi Districts of Meghalaya on 1:250,000 scale in GIS Platform.
- Compilation & updation of District Resource Maps of West Karbi Anglong, Kamrup (M), Dima Hasao, Hojai, Majuli, Charaideo, Chirang, South Salmara Mankachar, Udalguri & Bajali Districts of Assam on 1: 250,000 scale in GIS Platform.
- Compilation and updation of District Resource Map (DRM's) of Kamjong, Kangpokpi, Jiribam, Kakching and Noney Districts of Manipur on 1:250,000 scale in GIS platform.
- Compilation and preparation of District Resource Maps (DRM's) of Siang, East Siang, West Siang, Leparada, Lower Siang, Kamle Districts of Arunachal Pradesh on 1:250,000 scale in GIS Platform.
- Creation of Legacy Borehole Data Repository (LBDR) in FSPMIS, NER. Since initiation of project LBDR, NER (i.e. from April, 2022 till March, 2024) from 57 nos.

of reports the details (deviation, recovery, lithology, chemical data) of 659 nos. of boreholes have been uploaded through FSPMIS, Borehole Information module. During FS 2022-23, from 29 nos. of reports including 1 no. coal report the details of a total 248 nos. of borehole details have been uploaded in GSI Portal. During FS 2023-24 (from April, 2023 till March, 2024) from 28 nos. of reports a total 411 nos. borehole details have been uploaded in GSI OCBIS Portal.

11.14 (B) Detailed publications and maps were released during FS 2023-24 as a part of Public Goods Geoscience: :

- Publication of Bulletin Series-B: Geotechnical Investigation of Hydel projects in Arunachal Pradesh.
- Limestone deposit of Litang Valley, Jaintia Hills District, Meghalaya, Vol-I (2nd edition): Bulletin Series –A, No-63.
- Publication of Miscellaneous Publication No. 30 Pt IV, Vol. 2 (II) (Geology and Mineral Resources of Meghalaya, 3rd edition).
- Publication of Records of GSI, Vol. 153, Pt. 4 (Extended Abstract for FS 2018-19) of NER).
- Publication of GSI Records, Vol. 154, Part 4, Extended Abstracts of Progress Reports for FS: 2019-20 of North Eastern India.
- Geotourism sites of North East India. (E-Coffee table book)
- Publication of GSI Records, Vol. 155, Part 4, Extended Abstracts of Progress Reports for FS: 2020-21 of NE India.
- Publication of Records of GSI, Vol. 156, Pt. 4 (Extended Abstract for FS 2021- 22 of NER).

Un-priced Publications (E-News of GSI, NER, Shillong)

- E-News volume 32(i&ii) from April to September 2022(uploaded in OCBIS)
- E-News volume 32(iii & iv) from October 2022 to March 2023(uploaded in OCBIS)
- E-News volume 33(i&ii) from April to September 2023 (uploaded in OCBIS)

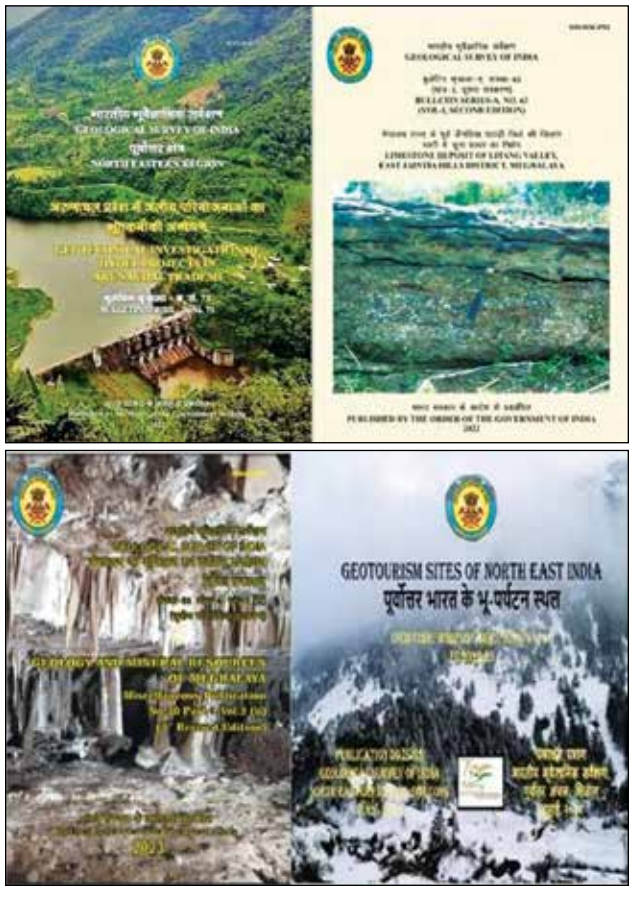


Photo 11.8

Photo 11.9 Cover page of few Publications released duArinngn uFaSl 2R0e2p2o-2rt3-2&0 F2S3 -220423-24

The following projects were executed by Map & Cartography Division, GSI, RHQ, NER, Shillong during FS 2023-24.

- 6 nos. of DRMs of Meghalaya; 12 nos. of DRMs of Assam; 6 nos. of DRMs of Arunachal Pradesh; 11 nos. of DRMs of Nagaland; 6 nos. of DRMs of Sikkim have been approved and uploaded to the portal.
- State Geology & Mineral Maps in 1:1M scale of Tripura, Mizoram, Meghalaya & Manipur have been approved and uploaded to the portal.
- State Geology & Mineral Maps in 1:1M scale of Assam, Nagaland & Arunachal Pradesh are under finalization.
- Geology and Mineral Map of North-Eastern India in 1:2M scale is under finalization stage.
- The gap areas in 1:50 K geodatabase was updated and submitted to CHQ on high priority basis for uploading in NGDR portal
- 2nd Edition 50K geodatabase of NER has been prepared and submitted.
- Compilation of 1:25K geodatabase of NER was completed and submitted.

Research and Development
Petrological Studies

11.15 Two Research items had been undertaken during FS 2022-23 (a) Comprehensive study on mode of occurrence and genesis of vanadium mineralization in the carbonaceous phyllite of Proterozoic Khetabari Formation, Bomdila Group, Lower Subansiri and West Siang districts, Arunachal Pradesh with an aim to work out the petrogenesis of the Vanadium prospects of Arunachal Pradesh and (b) Petrological characterisation and petrogenesis of Early Cretaceous Dyke Swarm

emphasizing lamprophyre dykes of Garo Hills areas, Shillong Plateau, North East India with objectives for petrological characterization and petrogenesis of early Cretaceous dyke swarm (emphasizing lamprophyre) of Garo Hills areas, Meghalaya. The Items also envisages working out the possibilities of diamond mineralization in the lamproite dyke swarms of Garo Hills of Meghalaya.

11.16 During current FS 2023-24, two research items are being executed, one in East Garo Hills, West Khasi Hills and Ri-Bhoi districts of Meghalaya to investigate REE, RM and strategic minerals dispersion and distribution in lateritic profiles developed over granitoids and granite gneiss. Another item i.e., Early Cretaceous dyke swarm of Garo Hills areas, Meghalaya, which is a continued from FS.2022-23, has been taken up to evaluate the tectono-magmatic evolution of these dykes and to delineate their diamond/mineral potentiality.

Photo 11.10: Field photograph of Lamprophyre with biotite gneiss of AMGC [Loc. Garo Hills, Meghalaya].

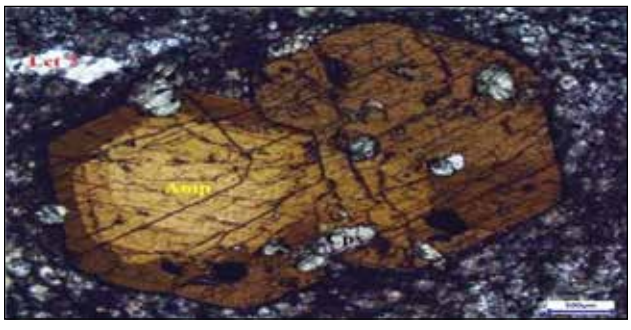


Photo 11.11: Euhedral Amp. Phenocryst with Cpx inclusion in Sannite (Lamprophyre).

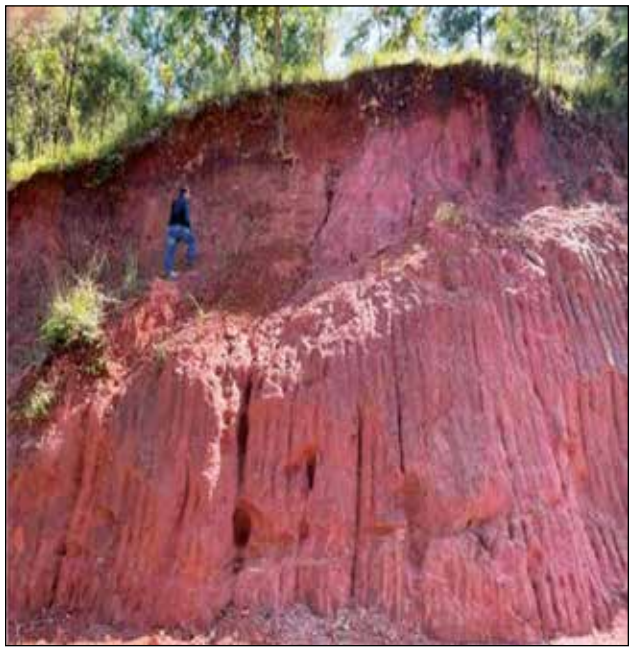


Photo 11.12 Laterite developed over granite gneiss [Loc. West Khasi Hills, Meghalaya].

Paleontological Studies

11.17 During FS 2022-23, two Research items had been taken up in Paleontology Division, GSI, NER viz., (1) Taxonomic study of Sauropods from the Upper Cretaceous Mahadek Formation of Meghalaya and (2) Study of the mega-invertebrate fauna from the Surma Group in Garo Hills Meghalaya and North Cachar Hills of Assam and their paleoenvironmental and palaeo-biogeographical significance.

11.18 During FS 2023-24, one research item is being executed, which is continued from FS. 2022-23 viz., (1) Taxonomic study of Sauropods from the Upper Cretaceous Mahadek Formation of Meghalaya with objectives to understand the taxonomic affinity and palaeo-biogeographic correlation. The paleontological item in Meghalaya has been very successful and fossil remains of dinosaurs have been reported. The Titanosaurian Sauropod teeth have been discovered from the South West Khasi Hills District of Meghalaya and this is the first-ever reporting of dinosaurian teeth-fossils in the North-Eastern part of India.

Photo 11.13: Partially and poorly preserved ulna of Titanosauria (Sauropod forelimb bone).

Photo 11.14: Partially preserved Femur of Titanosauria (Sauropod hindlimb bone).

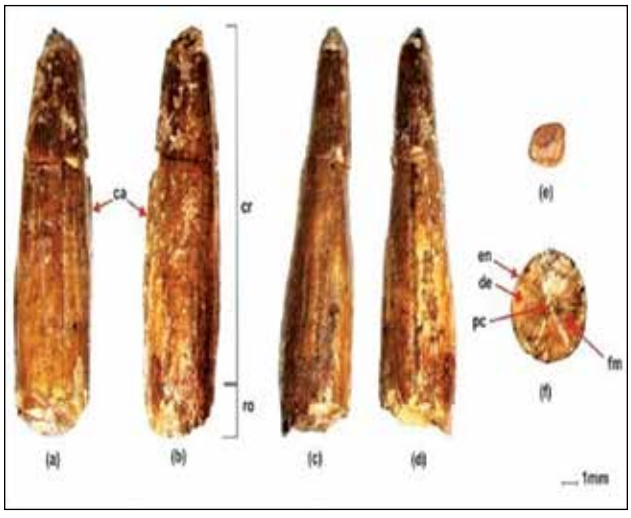


Photo 11.15: Smaller tooth with enamel textures: (a) Lingual view with lateral carina (ca), (b) Labial view showing lateral carina (ca), crown (cr) and root (ro), (c) Distal view, (d) Mesial view, (e) Crown apex of the tooth and (f) basal view with enamel (en), dentine (de), pulp cavity (pc) and ferrous stains (fm).

Geotechnical Investigations

11.19 Presently the country is committed towards clean energy/green energy. North Eastern Region has a huge role towards as it has huge hydropower generation potential. Northeastern states of India's, with their mountainous topography and perennial streams, have the largest hydropower potential of our country. Together, Arunachal Pradesh, Sikkim, Assam, Meghalaya, Manipur, Mizoram, Nagaland and Tripura account for almost 40 percent of the total hydropower potential of the country. Arunachal Pradesh among the other states has the maximum potential. The state producing hydro power from river basins like Kameng, Subansiri, Siang, Lohit and Dibang. The total production is about 35,000 MW at 60% load factor (CEA) i.e., about 90% of the total hydropower resources of NER. GSI, NER is intimately associated with the development of all the hydel power projects in NER. GSI, NER conducts geotechnical studies at various stages of geotechnical investigation to identify suitable sites for locating dams, powerhouses, selecting tunnel alignments and suggesting remedial measures during construction.

Besides, Hydro-Electric project, GSI also carried out geotechnical investigation of various transport and communication projects. The North East is located at a crossroads between three major economies - East Asia, South Asia and Southeast Asia. Therefore, development of transport and communication system is quite important for the development of our country.

11.20 During the FS 2022-23, GSI, NER has taken up one construction stage Hydroelectric Project (HE) investigation (Lower Lopili HE Project, Dima Hasao and West KarbiAnglong districts, Assam, 110 MW), three DPR stage Geotechnical investigations viz., Oju HE project upper Subansiri District, Arunachal Pradesh, Haora Irrigation Project, West Tripura

District, Tripura and Champaicherra Irrigation Project, West Tripura District, Tripura. Besides, this nine investigations under transport and communication projects were investigated viz., Geotechnical assessment of the vulnerable stretches along Dimapur-Peren road (NH-129A), Peren District, Nagaland; Geotechnical assessment of the vulnerable stretches along Kohima-Jessami road (NH-29), Kohima District, Nagaland; Slope stability assessment of the vulnerable stretches along Akegwo-Akash bridge (NH-202), Phek District, Nagaland; Geotechnical assessment of the construction sites for the Dimapur-Kohima new broad gauge railway line project, Dimapur District, Nagaland; Geotechnical assessment of the slope instability along Lumding-Badarpur section of railway line project, Dima Hasao District, Assam; Geotechnical assessment along Jiribam-Imphal broad gauge railway line, Imphal West & Noney districts, Manipur; Slope stability assessment of 45 MLD water treatment plant site at Chinkheiching, East Imphal District, Manipur; slope stability of the Lumshnong limestone mine, East Jaintia Hills District, Meghalaya and slope stability study of the Meghalaya Cements Limited mines, Thangskai village, Meghalaya.

11.21 During the FS 2023-24, GSI, NER has taken up four investigations under water resource development project viz., one construction stage HE project (Lower Kopili Hydroelectric Project, Dima Hasao and West KarbiAnglong districts, Assam, 110MW), three DPR stage Geotechnical investigations viz. Mawblei Hydroelectric Project (140MW), West Khasi Hills District, Meghalaya; Geotechnical investigations of Umngi Hydroelectric Project (62MW), East & South-West Khasi Hills districts Meghalaya and Geotechnical investigations of Burisuti Irrigation Project, Chirang District, Assam. Besides, these two investigations under transport and communication projects were studied viz., Geotechnical assessment of Mynrieng Living Root Bridge, Pynursla, Meghalaya and Geotechnical assessment along Kohima-Jessami Road (NH-29), near village Chizami, Phek District Nagaland, Slope stability assessment of the Jamunanagar Limestone mine, Assam and Geotechnical assessment of proposed site for underground structure at Jagiroad, Assam.

Apart from the above sponsored projects, a pilot project on geotechnical mapping in and around New Shillong city, in parts of East Khasi Hills and Ri-Bhoi districts, Meghalaya have been initiated by GSI with objectives to mainly generate baseline geotechnical database and to suggest probable areas that may be geologically suitable / feasible for infrastructure development.

Phot 11.16: View of different dam blocks under construction on the left Abutment, Kopili Hydroelectric Project (110MW).

Landslide Hazard Studies

11.22 During FS 2022-23, Twelve (12) Mesoscale Landslide Susceptibility Mapping projects have been taken up out of which nine items have been taken up on the request of State Government. Further, GSI has taken up the following project in NER:

- Development of experimental system of rainfall threshold based regional landslide forecasting in Assam, Meghalaya, Mizoram, Nagaland.

- Development and validation of experimental Landslide forecasting system in Sikkim.
- Monitoring of landslide and ground movements using satellite-based InSAR and ground-based 3D Terrestrial Laser Scanner (TLS) around Mangan, in Sikkim.
- Primary objective of all the landslide items is sustainable development of the entire region.

11.23 During FS 2023-24, Nine (9) Mesoscale Landslide Susceptibility Mapping projects have been taken up out of which five projects are on the request of State Government. In addition, two site specific landslide investigations have been undertaken based on the request of State Government. Further GSI has taken up the following project in NER:

- Development of experimental system of rainfall threshold based regional landslide forecasting in Assam, Meghalaya, Mizoram and Nagaland.
- Development and validation of experimental Landslide forecasting system in Sikkim.
- Primary objective of all the landslide items is sustainable development of the entire region.

Photo 11.17: Cracks and subsidence in the road along NH-61, Wokha, Nagaland

Photo 11.18: View of Pathing Slide, Namchi District, Sikkim being mapped by GSI, NER.

Earthquake Studies

11.24 Two regular projects had been taken up in NER on Seismic Microzonation and earthquake studies during FS 2022-23 on the request of the State government of Assam and Tripura. The Seismic Microzonation of two towns of Dharmanagar, Tripura and Tinsukia, Assam had been carried out. The work involved integrated studies of seismic source, seismic response through geological, geotechnical and geophysical parameters and their relation to seismic susceptibility following guidelines of GSI, 2017.

11.25 Two regular projects are being executed in NER on Seismic Microzonation and earthquake studies in the current FS 2023-24 on the request of the State government of Tripura and Assam. The Seismic Microzonation of two towns' of Udaipur, Tripura and Tinsukia, Assam has been taken up. The projects are being carried out in line with the guidelines of GSI, 2017.

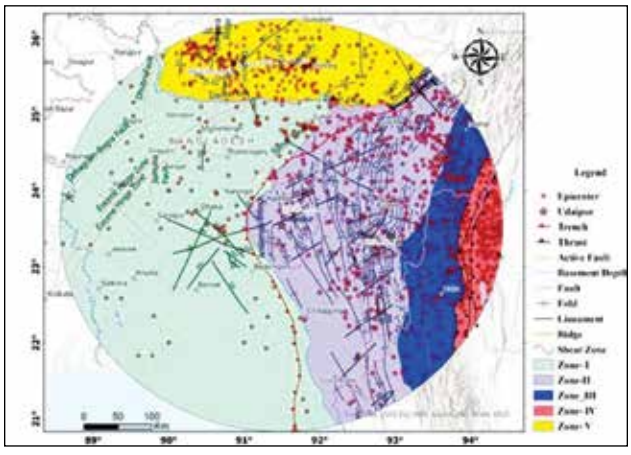


Photo 11.19: Distribution of earthquake epicenters of varying magnitude around 300 km radius of Udaipur city, Tripura.

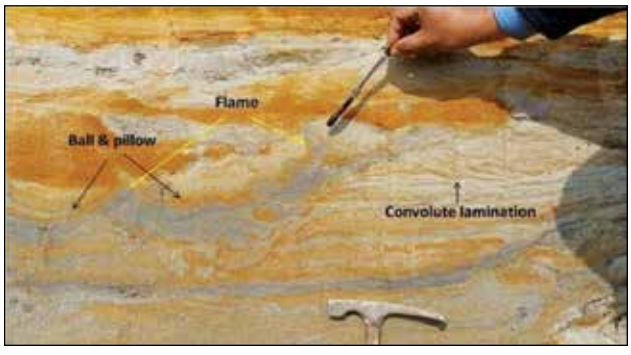


Photo 11.20: Soft sediment deformation structures observed along Chota Tingrai River sections, Tinsukia

Environmental Geology

11.26 During FS.2022-23, the following five projects are being undertaken on Environmental Geology:

i. Geo-environmental hazard study of flood and erosion-prone Brahmaputra River banks areas in Morigaon and Nagaon districts of Assam.

ii. Integrated geo-environmental appraisal of Guwahati city to assess the causes and remedies of urban flood.

iii. Geo-environmental impact of coal mining around Changki-Mangkolemba area, Mokokchung District, Nagaland.

iv. Geo-environmental appraisal and river hazard zonation map to ascertain the societal impact of pollution, erosion, shifting and flooding caused by Manu River in Kailashahar, Kumarghat and Longthari valley sub-divisions in Unakoti and Dhalai districts of Tripura.

v. Geo-environmental appraisal in parts of East Garo Hill, West Khasi Hills, Meghalaya Goalpara and Kamrup, Assam with special emphasis on fluoride and other toxic elemental contamination.

11.27 During FS.2023-24, the following two projects are being undertaken on environmental Geology:

i. Study on Uranium, Lead, Arsenic, Fluoride and Mercury contamination of groundwater in the industrial areas of North Guwahati, Kamrup (M) District, Assam: A collaborative study by GSI and CGWB.

ii. Geo-environmental hazard study of flood and erosion-prone river banks areas of Brahmaputra River at Dibrugarh and Tinsukia district of Assam.

Photo 11.21: Bank erosion along the bank of Brahmaputra at Rohmoriah, Dibrugarh District, Assam.

Photo 11.22: Collapse of Geobags due to toe erosion along the bank of Brahmaputra River at Rohmoriah, Dibrugarh District, Assam

11.28 Budget and expenditure of the North Eastern Region for the Financial Year 2023-24 is given in **Table-11.1**.

(Rs. in crore)

Table-11.1

Sl. No.	Name of Activities	BE (2023-24) for NER	Actual Expenditure in NER (F.Y. 2023-24 up to 31st March, 2024)
1	2	3	4
1	Survey & Mapping (M-I)	0.63	2.96
2	Mineral Exploration (M-II)	1.40	2.86
3	Information & Dissemination (-III)	0.04	0.64
4	Research & Development (M-IVC)	0.44	0.79
5	Investigation (M-IVB)	0.30	0.62
6	Human Resource Development (M-V)	0.08	0.11
7	Tribal Area Sub Plan (TASP)	0.00	3.02
8	Modernisation & Replacement (MV & ME)	0.90	0.70
9	Direction & Administration / ASA / Other Exp.	61.51	86.60
	Grand Total	**65.30**	**98.30**

Note :- As per MoF guidline, 10% of GBS is allotted for North Eastern Region (NER) In every financial year. However, for execution of all activities in NER, additional fund is allotted from GSI non NER budget based on requirement.

Work done by IBM in North Eastern Region

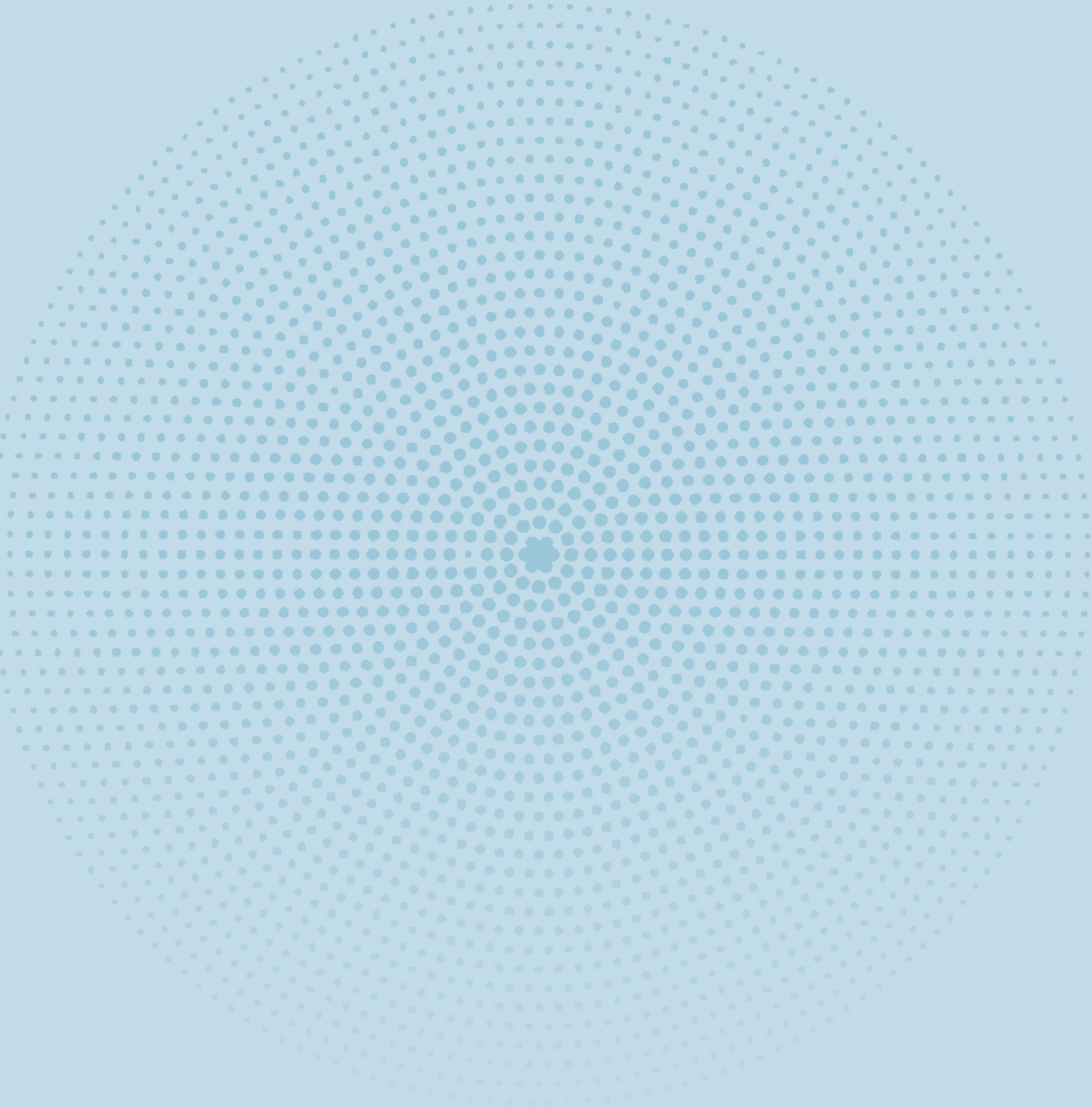
11.29 The Regional Office of Indian Bureau of Mines (IBM) at Guwahati continued to undertake inspection of mines and studies on development of resources in North- Eastern Region. During the year 2023 (1st January to 31st March 2024), 31 nos. of inspections were carried out for enforcement of provisions of MCDR, 2017 and for processing and disposal of mining plan/review of mining plan. The details of inspections, results and follow up actions thereof are given below: -

Parameter	Deta ils
No. of inspections	Total - 31 Nos. MCDR– 16 Nos. MP/RoMP/FMCP– 15 Nos. Check-up/Others–00 Nos.
No. of violations issued	27 Nos.
No. of rules violated	45 Nos. [Rule 11(1), 11(4), 12(4), 14(3),31(4), 33, 35(2), 45(7), 55(1)(3), & 56(2) of MCDR 2017]
No. of show cause notices issued	06 Nos. (incl. notices issued on the basis of office scrutiny)
No. of mines where violations not complied even after issue of show cause notice	01 Nos.
Action taken: Court case – Suspension –	 0 Nos. 0 Nos.

Work Carried Out by MECL in North Eastern Region

11.30 MECL has been associated with mineral exploration activities and geo- technical studies for the development of mineral industry in the North Eastern Region since 1977. During the year 2023- 24, MECL has carried out reconnaissance survey for Copper & REE in Temi-Tarku- Damthong block, District: East Sikkim. Total 74.71 sq km area was covered with Geological Mapping and surface samples. Geological report preparation of the same work is in progress.

11.31 Further, MECL is also carrying out detailed exploration of Coal (Promotional Coal blocks on behalf of CMPDIL) in Bishnupur Block and Nimgaon Block in Tinsukia District of Assam. Exploratory drilling is in progress in these two blocks. MECL is keen for development of North Eastern States. Hence with focus on North Eastern Region to augment exploration, MECL has signed MoU with Government of Assam and taken exploration for Coal in Khotarda block, Mikir hills district is under progress.



12

Welfare Activities for SCs/STs, Women, Minorities & Persons with Disabilities

Welfare Activities for SCs/STs, Women, Minorities & Persons with Disabilities

Welfare of Scheduled Castes (SCs), Scheduled Tribes (STs), Women and other Weaker Sections

Ministry of Mines

12.1 The Ministry of Mines, with its attached office, subordinate office and the Public Sector Undertakings and Autonomous Bodies under its administrative control follow the Government guidelines with regard to welfare of weaker sections of the society, in letter and spirit. For upliftment of weaker sections of society, PSUs identify and implement a number of programmes in the peripheral area of their units/locations.

12.2 A number of activities like community education programmes, facilitating availability of drinking water, development/repair of approach roads of surrounding areas, arranging health awareness programmes and medical camps in rural areas have been undertaken by the PSUs for upliftment of the community in and around their townships as part of their social responsibility.

Welfare of Women and other Sections

12.3 Internal Complaint Committees (ICC) have been constituted to look into cases of sexual harassment of women at work place for Ministry of Mines as well as organizations under its administrative control in accordance with The Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013.

12.4 Ministry of Women & Child Development has developed an online complaint Management System titled Sexual Harassment electronic –Box (SHe-Box) (www.shebox.nic.in) to receive complaints related to Sexual Harassment at workplace. The complaints received in She-Box portal are disposed on priority basis as per extant rules/ guidelines.

12.5 The Geological Survey of India (GSI), attached office of Ministry of Mines and Indian Bureau of Mines (IBM) subordinate office under Ministry of Mines have also undertaken a number of activities for the welfare of Scheduled Caste (SC)/Scheduled Tribe (ST), Other Backward Class (OBC), persons with disabilities (PWD) and other weaker sections of the Society.

12.6 Measures have been undertaken for officials belonging to SC, ST, OBC and PwD communities for strict compliance of filling all the posts against vacancies reserved for them as per order issued by the Govt. of India/ Ministry of Mines / DoP&T from time to time. Reservation has been followed strictly in case of their employment/promotions wherever applicable.

12.7 SC/ST/OBC cell have been established in Headquarters as well as in the respective Regional offices under supervision of the Liaison Officer to address difficulties faced by these communities and also to initiate appropriate measures for resolving their issues.

12.8 The total strength of employees in the Ministry of Mines (Secretariat) and the representation of SC/ST/OBC and other weaker sections at the end of Financial Year 2023-24 may be seen at **Table 1.1.**

National Aluminium Company Limited (NALCO)

12.9 The Company follows the Presidential Directives issued from time to time on reservation of SC/ST persons in employment. The Company has constituted cells exclusively for the welfare of SC/ST employees at its Corporate Office and Units. Periodic meetings are held at Complex level and Corporate level to discuss issues related to SC/ ST employees.

The following concession/relaxations are given to SC/ST candidates in the matter of direct recruitment.

(a) Age relaxation of 5 years.

(b) Exemption from payment of application fee.

(c) Re-imbursement of travelling expenses for attending both written test and interviews.

(d) Relaxation of experience up to one year.

(e) Relaxation in qualifying marks for eligibility.

(f) Relaxation of 10% marks both in written test and interview (for posts requiring interview).

- Relaxation/concession in promotions - relaxation of 10% of marks both in written test and interview is given to SC/ST employees in promotion up to lowest rung of Group-A.
- 10% reservation in A & B type quarters & 5% in C, D & E type quarters is given to SC/ST employees in allotment of residential quarters.
- Liaison Officers have been appointed for each of the units for implementing the Presidential Directives as well as to look after the welfare of SC/ST employees. SC/ST cell has also been constituted under the control of the respective Liaison Officers to ensure prompt disposal of grievances and representations of SC/ST employees.
- 20% of the scholarships are reserved for the children of SC/ST employees under Nehru Memorial Scholarship awarded to the children of NALCO employees along with relaxation of 10% in marks.
- Invariably in all the selection committees/boards for recruitment and the departmental promotion committees for promotion, an officer from SC/ST category of appropriate status is included as one of the members in order to take care of the interest of the SC/ST candidates.

12.10 Minority Welfare

A member of the minority community is associated in the selection committees for recruitment in order to give a fair deal to the minority community. Advertisement to fill up the vacancy position is notified in regional languages in order to encourage the minority candidates about recruitment especially in Group- 'C' & 'D' posts.

12.11 The Persons with Disability (PWDs)

The Company has been making efforts to achieve representation of PWDs (Divyangs) in all posts in Group: A, B, C & D as per Section-34 of the Rights of Persons with Disabilities Act, 2016. From 19th April, 2017 onwards, 4% of vacancies are being reserved for persons with disabilities as provided in the Act. As on 31st March, 2024, there are 91 Persons with Disability in employment of the Company in various identified posts. An 'Equal Opportunity Policy' as required under the Act has been formulated and the same has been widely circulated in addition to web-hosting. The different facilities/establishments of the Company have been made accessible as required under the Rights of Persons with Disabilities Act, 2016 and the 'Accessible India' campaign. However, these are being constantly monitored to bring about further improvement in the facilities.

12.12 Perspective Plan for Women Welfare

The Company has adopted the principle of equal opportunity to the women employees in the matter of employment. The Company as on 31st March, 2024 has 322 nos. of women employees at different levels and categories.

The ladies clubs in all units have extended necessary assistance for carrying out their various activities which in turn enhances their leadership and organizing capabilities in addition to welfare of the society.

Manpower Strength

12.13 National Aluminium Company Limited (NALCO)

Employment of SC/ST/Ex-SM/PWD/LDP/ Minorities in the Company as on 31st March, 2024 is given in **Table 12.1**

Table 12.1

Group	Total No of Employees	SC	ST	EX-SM	PWD	LDP	Minority
Executives	1589	243	143	0	31	24	59
Non-executives	3285	510	791	7	60	1340	112
Total	**4874**	**753**	**934**	**7**	**91**	**1364**	**171**

It may be seen from above that every third employee of the organization belongs to SC or ST Community.

Hindustan Copper Limited (HCL)

Employees Participation in Management

12.14 Employees Participation in Management over the years has been the backbone of harmonious Industrial Relations in the Company. The successful operation of various Bi-partite forums at all three levels, namely, at the Apex level, Unit level and Shop floor level has immensely contributed in the smooth performance of the Company.

Perspective Plan for Women Welfare

Internal Committees have been constituted and amended from time to time in all the Units/ Offices of the company for the prevention of sexual harassment of women in work place, the details of the Committees and their members are available in the employee section of HCLs website. A provision in this regard has also been incorporated in the Conduct, Discipline and Appeal Rules of HCL.

Representation of SC/ST and OBC

12.15 The representation of SC, ST and OBC employees out of the total manpower of 1302 as on 31.03.2024 is 19.05%, 10.52% and 20.20% respectively.

12.16 Other Welfare Measures:

- Contributory Post-Retirement Medical Scheme (CPRMS) is in vogue and is a Medi- claim Scheme for Retired Employees, Spouse of Retired Employees & Spouse of deceased retired employees of Hindustan Copper Limited. The Scheme is renewed annually.
- The retired employees of the Company and their spouses are extended medical treatment at the Company's Hospitals at the Projects.
- The Company also extends support to 'Mahila Samity' and other institutions / NGOs in their endeavor to run 'Health

Camps' for the local population under CSR programme.

- In the townships of the Company located at Khetri, Malanjkhand and Ghatsila as well as in other places of work, the employees of different caste, creed, religion, live together and celebrate all religious festivals with pomp and gaiety.
- The Company maintains Cultural Clubs for the employee at all the production Units.

Industrial Relations :

12.17 Industrial Relations situation in all the Units of the Company continued to be harmonious and peaceful during the year 2023-24.

Redressal of Public Grievances

12.18 All grievances are received from Centralized Public Grievance Redress and Monitoring System's (CPGRAMS) website of https://pgportal.gov.in. The grievances are being regularly monitored and are suitably disposed off. During 01.01.2023 to 31.03.2024, 171 public grievances were received and there was previous carry forward of 06 grievances as on 01.01.2023. Total 170 cases were disposed-off during the year and as on 31.03. 2024.

12.19 The status of implementation of the persons with disability act, 1995.

During last few years, there has been limited recruitment in the company. Therefore, there was hardly any scope of fresh inductions of physically challenged persons. In addition, the mining operations of the Company being hazardous in nature, the scope of engagement of physically challenged persons is limited. The number of physically challenged persons employed in the Company as on 31.03.2024 is as under: -

Table 12.2

Group	Number of Persons with Disabilities (PwDs)
A	14
B	0
C	7
D	3
Total	**24**

Manpower strength

The manpower strength of the Company as on 31.03.2024 is 1302.

Table 12.3

Category	SC	ST	OBC	General	Total
Executives (Nos.)	89	26	123	301	539
Non-Executives (Nos.)	159	111	167	326	763
Total (Nos.)	**248**	**137**	**290**	**627**	**1302**

Human Resource Development

Training and Development of all levels of employees is given due priority by HCL to increase efficiency and effectiveness. Special emphasis was given to organization building and shaping right attitudes, team building and work culture besides preparing employees to understand the trends in fast changing technology/switching over to latest technology for achieving higher results in production, productivity and profitability.

Mineral Exploration & Consultancy Limited (MECL)

Welfare of SC/ST, Women and Weaker section

12.20 The category wise employment position including General /SC/ST/OBC/Minorities/

Women (As on 31.03.2024) in the company is given in **Table 12.4**

Table 12.4
Employment of Personnel as on 31.03.2024

Group	Total No. of employees	General	SC	ST	O.B.C	EWS	Minorities	Women
A	255*	126	36	13	76	04	12	25
B	28	9	05	02	12	00	00	00
C	541	177	97	31	231	05	21	29
D	-	-	-	-	-	00	-	-
Total	**824***	**312**	**138**	**46**	**319**	**09**	**33**	**54**

** Excluding Directors.*

Employment under all categories (Group-wise) including General/ EWS/ SC/ ST/ OBC/ Minority/Women from 01.01.2023 to 31.03.2024::

Group	Gen	SC	ST	OBC-NCL	EWS	Total	Minority	Women
A	03	03	01	06	01	14	-	02
B	-	-	-	-	-	-	-	-
C	-	-	-	-	-	-	-	-
D	-	-	-	-	-	-	-	-
Total	**03**	**03**	**01**	**06**	**01**	**14**	**0**	**02**

MECL upholds its commitment to gender equality by providing equal opportunities to women employees, with service rules uniformly applicable to both male and female staff. The company operates a successful crčche facility to support working mothers, and women employees are entitled to maternity benefits in accordance with established rules.

Furthermore, MECL adheres to the Sexual Harassment of Women at Workplace (Prevention, Prohibition, and Redressal) Act, 2013, by maintaining an Anti-Sexual Harassment policy. An Internal Complaints Committee (ICC) has been established to address any complaints of sexual harassment, covering all employees including permanent, contractual, temporary, and trainees.

Additionally, in compliance with the Rights of Persons with Disability Act, 2016, MECL has implemented an Equal Opportunity Policy as directed by the Ministry of Social Justice & Empowerment. This policy ensures fair treatment and opportunities for individuals with disabilities within the organization.

Indian Bureau of Mines (IBM)

Reservation of Vacancies for Persons with Disabilities

12.21 IBM is strictly following the various instructions of the Government issued from time to time regarding reservation of vacancies for PWDs in respect of Group A, B and C posts. As on 1st April 2024, 19 physically handicapped persons were under employment in IBM.

Welfare Activities for SC/ST, Women, Minorities and PWD's

12.22 Women employees constitute about 12 per cent. Training is imparted to women employees in the field of technical as well as administrative matters.

12.23 An Internal Complaints Committee constituted under the provisions of Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013 is active in Indian Bureau of Mines to redress the complaints, if any, of the victims of sexual harassment at work place in a time bound manner with proactive approach strictly within the stipulations of the Act.

Jawaharlal Nehru Aluminium Research Development and Design Centre (JNARDDC)

12.24 The Centre is following the various government guidelines w.r.t PWD, SC, ST and OBC reservation. The process for recruitment of one post of OBC is underway. The newly renovated washrooms were provided with paracolic facilities for greater accessibility to physically challenged employees. Women employees were made aware about the various aspects of "The Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013" by a workshop conducted by Senior Admin Officer of JNARDDC.

Geological Survey of India (GSI)

12.25 The Geological Survey of India, an attached office of the Ministry of Mines, has undertaken a number of activity for welfare of the SCs/STs/OBCs/PWDs & other weaker sections and is following the rules and regulations as issued by the DoP&T from time to time so far as employment through SSC and UPSC is concerned.

12.26 Liaison Officers have been designated at each Regional Office of the Department and CHQ for the purpose of acting as the Nodal Authority and the SC/ST Cells have been put under their direct control to ensure that representation of personnel belonging to the weaker sections are being properly disposed of and the difficulties faced by them in service matters are being addressed and adequate welfare meeasures are being taken. LO SC/ ST Meetings are also being held periodically in different, offices of the department. Special emphasis is also given by each and every Cadre Controlling Authority towards proper maintenance of the Reservation Rosters as well as yearly inspection of rosters by the concerned Liaison officers of the different Regional offices to ensure prescribed representation of the SC/ST/OBC/PWD & other weaker sections in employment/promotion, wherever applicable.

Women's Welfare

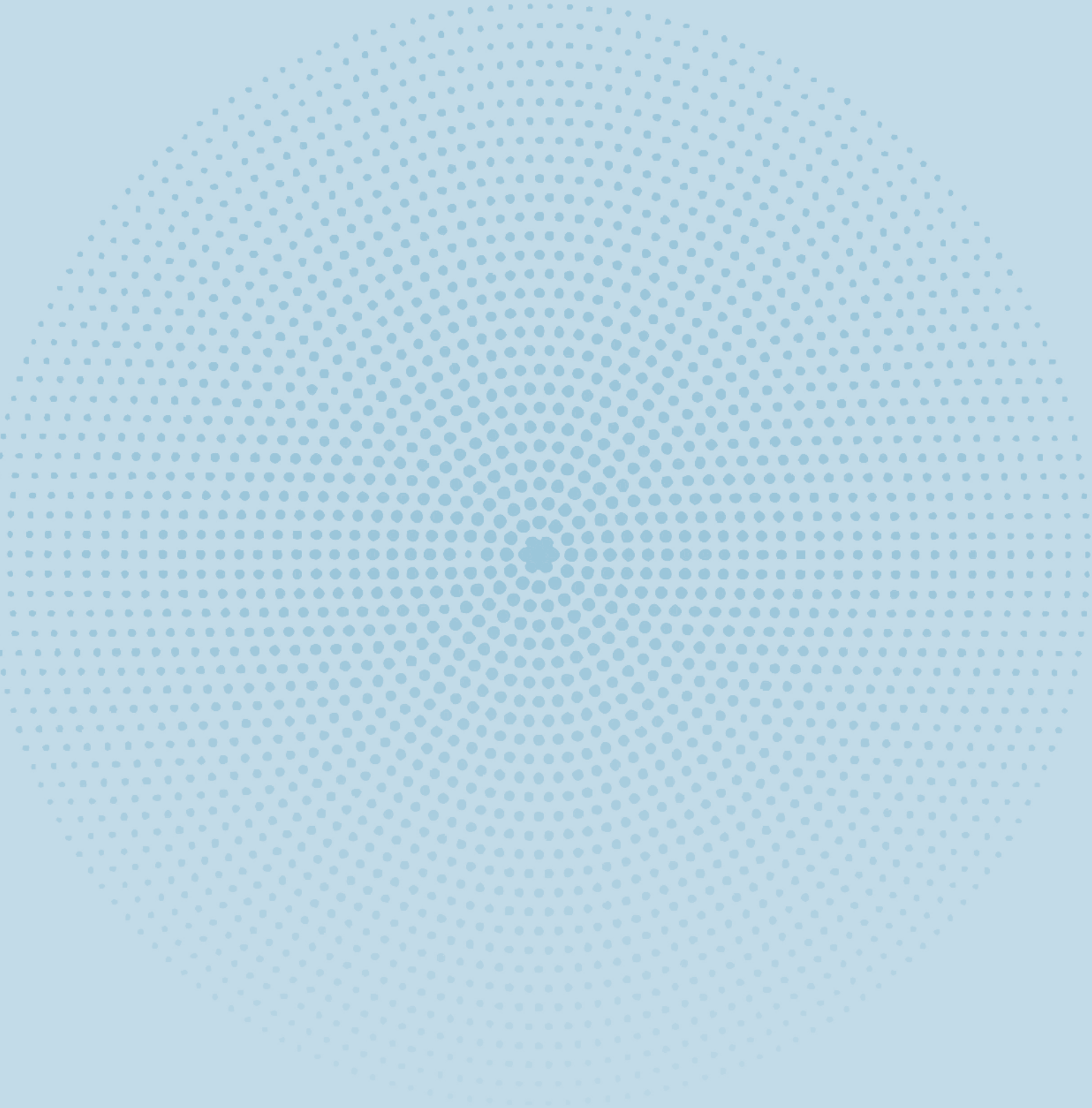
12.27 Internal Complaint Committee (ICC) has been constituted in different Regional offices of GSI including CHQ to look into the cases of sexual harassment of women at workplace.

12.28 The total strength of employees in the GSI and the representation of SC/ST/OBC and other weaker sections during the year 2023 is given in **Table 12.5.**

Table 12.5
Statement Showing category-wise details of existing staff of GSI as on 31.03.2024

Class	Revised sanctioned strength as proposed by the Ministry	Men in position	SC	ST	O.B.C	No.of Women	PH	Total (SC, ST, OBC, Women, PH)
Group-A	3439	2892	450	225	840	802	29	2346
Group-B (Gaz.)	912	520	108	61	111	88	8	376
Group-B (NG) (Min.)	661	634	81	65	84	130	10	370
Group-B (NG) (Tech.)	890	304	49	30	50	18	6	153
Group- C (Min.)	520	393	60	31	89	61	8	249
Group- C (Tech.)	1232	552	88	59	159	22	11	339
MTS (Erstwhile Gr-D)	1022	732	159	109	147	133	26	574
Total	**8676(*)**	**6027**	**995**	**580**	**1480**	**1254**	**98**	**4407**

(*) Out of 8676, 28 posts are yet to be created. The Ministry vide letter dated 18.08.2022 has intimated about the creation of 02 posts in Organised Services the details of which has not been conveyed till date. Moreover, 02 post of Director level have been created in the Ministry in lieu of 02 posts of Director (Geology) of GSI vide MoM letter dated 28.02.2024.



13

Budget and Audit Paras

Budget and Audit Paras

Budget Allocation for the year 2023-24 and 2024-25

13.1 Budgetary support under Revenue and Capital is obtained for different schemes implemented by Geological Survey of India (GSI), Indian Bureau of Mines (IBM), and the S&T programme. Revenue provision is also obtained for GSI, IBM, Secretariat (Proper), NMET Secretariat, Grants-in-Aid to Autonomous bodies, etc. A brief summary of Demands for Grants (2024-25) is given in **Table 13.1**.

Table 13.1: Summary of Demands for Grants

(Rs.in crore)

Sl. No.	Name of the Organisation	2022-23		2023-24		2024-25
		BE*	RE**	BE	RE	BE
1	Secretariat (Proper)	43.64	43.64	45.00	46.20	70.48
2	Geological Survey of India	1205.17	1251.91	1308.60	1345.58	1300.00
3	Indian Bureau of Mines	113.00	105.25	122.48	113.84	135.00
4	Grants to MECL (for KABIL)	10.00	0.00	0.00	0.00	0.00
5	Bharat Gold Mines Limited- Grants	6.00	6.70	6.70	5.58	8.00
6	S&T Programme/ Other Programme (6.1 to 6.6)	30.19	32.45	28.82	28.82	27.58
6.1	NIRM	9.42	9.17	6.38	6.38	3.50
6.2	JNARDDC	12.70	11.60	11.37	11.37	11.00
6.3	IC	0.35	0.35	0.37	0.37	0.38
6.4	NMA	0.70	1.33	0.70	0.70	0.70
6.5	Other Research Programme	7.02	10.00	10.00	10.00	12.00
7	NMET	100.00	250.00	400.00	1296.50	400.00
	Total	**1538.19**	**1722.40**	**1905.22**	**2865.34**	**1968.64**

**BE: Budget Estimate*
***RE: Revised Estimate*

GSI Budget Allocation

13.2 For FY 2024-25, GSI has proposed an outlay of Rs. 1732.90 crore (Rev. - Rs. 1558.70 crore & Capital- Rs. 174.20 crore) in BE stage. Out of this total proposed outlay, GSI has been allotted budget grant of Rs.1300.00 crore (Rev. - Rs. 1265.74 crore & Capital- Rs. 34.26 crore), including Rs. 65.60 crore for all activities of NER. The allotted outlay for Establishment Expenditure is Rs. 986.00 crore with major salary, allowances & LTC components of Rs.954.00 crore and Rs.81.09 crore for administrative support activities & other expenditure. The allotted outlay for GSI Missions (I to V) activities is Rs.167.15 crore and Capital outlay is Rs.34.26 crore for modernization & replacement activities of GSI. Apart from this, Rs.20.55 crore and Rs.10.95 crore is provided under SCSP and TSP Head respectively which is to be utilised for the missions' activities.

Activity-wise details of budget provision are summarized below-

a. Under 'Survey & Mapping' head (Mission-I) an amount of Rs. 73.25 crore has been allocated for operation and maintenance of three GSI vessels for 2024-25 to Shipping Corporation of India (SCI), operation & maintenance of the TOASS airborne Survey System, execution of ground survey projects e.g. Specialized Thematic Mapping (STM), Geochemical Mapping (GCM), Geophysical Mapping (GPM) etc.

b. Under 'Mineral Exploration' (Mission-II), Rs 63.52 crore has been allocated for execution of the mineral exploration programmes of GSI including payment towards the outsourced drilling. Every year GSI is taking up G4, G3 and G2 stage exploration programmes (as per UNFC) with a view to augment resources for various mineral commodities including energy minerals (coal & lignite) in different parts of the country.

c. Under 'Information & Dissemination' (Mission-III), Rs 14.00 crores has been allocated out of which Rs. 1.00 crore has been allocated for printing & publication of journals, maps, reports etc., Rs. 12.00 crore has been allocated for repair & maintenance which includes payments related to the operation/ maintenance of OCBIS, Oracle Annual Technical Services and other miscellaneous activities under IT in all offices of GSI and Rs. 1.00 crore has been allocated for Digital Equipments which includes purchase of consumables and other miscellaneous activities under IT in all offices of GSI.

d. Under Mission-IV, Rs. 11.00 crore has been allotted for 'Research & Development' activity; Rs. 3.20 crore has been allotted for multidisciplinary 'Specialized investigations' and Rs. 0.08 crore has been allotted for polar studies in Antarctica.

- Under 'Research & Development' head fund has been provisioned for taking up fundamental research and development programmes, execution of field work in research and development activities, AMC of the laboratory instruments and equipment of GSI and also for the expenditures towards procurement of laboratory consumables.
- Under 'Specialized Investigations' & 'other exploration (Antarctica)' heads funds have been provisioned for execution of field work of Geotechnical investigation on societal issues, landslide studies, seismological studies, studies related to climate change and eco- systems, environmental, medical geology, glaciology etc. and expedition to Antarctic, Arctic regions, miscellaneous expenditure related to AMC and maintenance of seismic and Geo-technical laboratories.

e. Under 'Training (Human resource development)' head (Mission-V), Rs. 2.10 crore has been allocated for carrying out various training courses e.g. orientation courses, thematic refreshers course, promotion linked training programme, courses for international participants for capacity building of GSI personnel as well as geoscientists from other geological institutes.

f. As per the mandatory guidelines of Government of India, Rs. 10.95 crores has been allocated under 'Tribal area Sub Plan (TSP)' head and Rs. 20.55 crore has been allocated under 'Scheduled

Caste Sub Plan (SCSP)' head for welfare service to the ST/SC people indirectly and utilization of the funds under mandated Mission- I, II, IV & V field activities and capacity building programmes falling in Scheduled Tribe and Scheduled Cast dominated areas in different parts of the country.

g. Under 'Modernisation & Replacement' head, capital grant of Rs. 34.26 crore has been allocated out of which Rs. 4.25 crore has been allocated for procurement of motor vehicles to carry out field activities, Rs. 20.00 crore for procurement of machinery and equipment to improve the capabilities in the field as well as GSI laboratories with an aim to generate quality earth science data contemporary in nature, Rs. 9.00 crore for procurement of information, computer, telecommunication (ICT) equipments for digital transformation of GSI's activities, Rs. 0.01 crore as a token amount for Infrastructural Assets for the procurement of two nos. coastal vessels for (GSI) as a replacement for the existing two coastal vessels and Rs. 1.00 crore for furniture and fixtures.

h. Under the Administrative Support Activities, Rs. 81.09 crore has been allocated out which Rs 67.09 crore has been allocated to meet the expenditure on domestic & foreign travel expenses, office expenses, rent, rates and taxes for land & building, professional services and Rs. 14.00 crore has been kept under 'Other Expenditure' head which includes minor civil & electrical works and repair & maintenance of different GSI buildings, supply & material, clothing & tentages, advertisement & publicity and other revenue expenditure.

i. Under 'Establishment Expenditure' Rs. 986.00 crore has been allocated out of which Rs. 530.00 crore has been allocated under Salary head, Rs. 420.00 crore for allowances, Rs. 4.00 crore for leave travel concession and remaining fund has been allocated for various establishment expenditures such as wages, rewards, medical treatment, Swachchta Action Plan etc.

The distribution of outlay for the allotted budget grant for 2024-25 is given in the **Table 13.2.**

Table 13.2: Proposed/Allotted Total Budget Grant 2024-25

(Rs. in lakhs)

GEOLOGICAL SURVEY OF INDIA			
Head	**GSI**	**NER**	**Total**
Establishment Expenditure			
Administrative Support (Object Class I)			
Salary	49700.00	3300.00	53000.00
Wages	1700.00	0.00	1700.00
Rewards	230.00	0.00	230.00
Medical treatment	750.00	0.00	750.00
Allowance	39600.00	2400.00	42000.00
Leave Travel Concession	395.00	5.00	400.00
Office Expenses (Voted)	300.00	0.00	300.00
Fuels and Lubricants	50.00	0.00	50.00

GEOLOGICAL SURVEY OF INDIA			
Head	**GSI**	**NER**	**Total**
Repair & Maintenance	120.00	0.00	120.00
Swachchta Action Plan	50.00	0.00	50.00
Total	**92895.00**	**5705.00**	**98600.00**
Administrative Support Activities (ASA) (ASA) (Object Class III)			
Domestic Travel Expenses (DTE)	3339.00	250.00	3589.00
Foreign Travel Expenses (FTE)	60.00	0.00	60.00
Office Expenses (OE)	2250.00	250.00	2500.00
Rents, Rates and Taxes (RRT) for land & building	370.00	30.00	400.00
Professional Services	158.00	2.00	160.00
Total (A)	**6177.00**	**532.00**	**6709.00**
Other Expenditure (Object Class III)			
Materials & Supplies	48.00	2.00	50.00
Advertising & Publicity	145.00	5.00	150.00
Minor civil & electrical works	1100.00	0.00	1100.00
Other Revenue Expenditure	95.00	5.00	100.00
Total (B)	**1388.00**	**12.00**	**1400.00**
Total Est. Exp. + Total ASA (A)+ Total Other Expenditure (B)	**100460.00**	**6249.00**	**106709.00**
Other Central Expenditure			
Activities / Mission			
Survey & Mapping (Mission-I) (Object Class III)			
Wages	470.00	30.00	500.00
Fuels and Lubricants	80.00	20.00	100.00
Repair & Maintenance	6225.00	0.00	6225.00
Other Revenue Expenditure	475.00	25.00	500.00
Total	**7250.00**	**75.00**	**7325.00**
Mineral Exploration (Mission-II) (Object Class III)			
Wages	1340.00	60.00	1400.00
Fuels and Lubricants	730.00	20.00	750.00
Repair & Maintenance	2.00	0.00	2.00
Other Revenue Expenditure	4140.00	60.00	4200.00
Total	**6212.00**	**140.00**	**6352.00**
Information Dissemination (Mission-III) (Object Class III)			
Other Expenditure			
Printing and Publication	98.00	2.00	100.00
Repair &Maintenance	1200.00	0.00	1200.00
Digital Equipment	100.00	0.00	100.00
Total	**1398.00**	**2.00**	**1400.00**

GEOLOGICAL SURVEY OF INDIA			
Head	**GSI**	**NER**	**Total**
Specialized Investigation (Mission-IVA) (Object Class III)			
Wages	118.00	12.00	130.00
Fuels and Lubricants	32.00	8.00	40.00
Other Revenue Expenditure	140.00	10.00	150.00
Total (C)	**290.00**	**30.00**	**320.00**
Other exploration (Antarctica) (Mission-IV B) (Object Class III)			
Other Revenue Expenditure (D)	8.00	0.00	8.00
Total Spl. Investigation + Antarctica (C+D)			
Research & Development (Mission-IVC) (Object Class III)			
Wages	108.00	12.00	120.00
Material &Supplies	388.00	12.00	400.00
Fuels and Lubricants	30.00	0.00	30.00
Repair & Maintenance	400.00	0.00	400.00
Other Revenue Expenditure	130.00	20.00	150.00
Total	**1056.00**	**44.00**	**1100.00**
Training (Mission-V) (Object Class III)			
Training Expenses	205.00	5.00	210.00
Tribal Sub Plan (TSP) (Object Class V)			
Other Revenue Expenditure	1095.00	0.00	1095.00
Scheduled Caste Sub Plan (SCSP) (Object Class V)			
Other Revenue Expenditure	2055.00	0.00	2055.00
Total (Revenue)	**120029.00**	**6545.00**	**126574.00**
Capital Expenditure (Object Class VI)			
Motor Vehicle	425.00	0.00	425.00
Machinery & Equipment	2000.00	0.00	2000.00
Information, Computer, telecommunication (ICT) equipment	895.00	5.00	900.00
Infrastructural Assets	1.00	0.00	1.00
Furniture and fixture	90.00	10.00	100.00
Total (Capital)	**3411.00**	**15.00**	**3426.00**
GRAND TOTAL (Revenue + Capital)	**123440.00**	**6560.00**	**13000.00**

IBM Budget Allocation

13.3 The Demands for Grants i.e. sanctioned Budget Estimates for the Financial Year 2023-24 is Rs.122.48 crores including Rs.20.97 crores under IBM Activities and Rs.101.51 crores under Establishment received vide Ministry's Letter dated 24.02.2023. Head-wise cum Scheme-wise breakup of Activities & Establishment Budget is given in **Table 13.3**.

Table 13.3

(Rupees in Lakhs)

S.N.	Object Heads	Estt.	Activities						Total	NER	Total Activities	Grand Total
			Sch. No.1	Sch. No.2	Sch. No.3	Sch. No.4	Sch. No.5	Other Heads				
Revenue Section :-												
1	Salaries	5275.00	32.50	6.50	3.25	3.25	0.00	0.00	0.00	81.50	127.00	5402.00
2	Wages	10.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.50	4.50	14.50
3	Rewards	35.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	36.00
4	Medical Treatment	150.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	150.00
5	Allowances	2920.00	17.50	3.50	1.75	1.75	0.00	0.00	24.50	46.50	71.00	2991.00
6	Leave Travel Concession	62.00	2.00	2.00	2.00	2.00	0.00	0.00	8.00	1.00	9.00	71.00
7	Domestic Travel Expenses	145.00	5.00	5.00	5.00	5.00	0.00	0.00	20.00	5.00	25.00	170.00
8	Foreign Travel Expenses	20.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.00
9	Office Expenses	570.00	10.00	5.00	5.00	5.00	0.00	0.00	25.00	5.50	30.50	600.50
10	Rent, Rates & Taxes for Land and Buildings	50.00	9.00	0.00	0.00	0.00	0.00	0.00	9.00	16.00	25.00	75.00
11	Printing & Publication	0.00	0.00	0.00	10.00	0.00	0.00	0.00	10.00	0.00	10.00	10.00
12	Rent for others	90.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	90.00
13	Materials & Supplies	25.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.00
14	Fuels & Lubricants	0.00	11.00	1.00	1.00	1.00	0.00	0.00	14.00	1.00	15.00	15.00
15	Advtertising & Publicity	0.00	3.00	0.00	0.00	0.00	0.00	0.00	3.00	0.00	3.00	3.00
16	Minor civil & electric works	710.00	10.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00	10.00	720.00
17	Professional Services	35.00	5.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	5.00	40.00
18	Repair & Maintenance	30.00	3.00	0.00	0.00	0.00	0.00	0.00	3.00	1.00	4.00	34.00
19	Other Revenue Expeuditure	24.00	10.00	10.00	10.00	6.00	0.00	0.00	36.00	5.00	41.00	65.00
20	Mining Tenement System (ORE)	0.00	0.00	0.00	0.00	0.00	900.00	0.00	900.00	0.00	900.00	900.00
21	Trainin Expenses	0.00	0.00	0.00	0.00	0.00	0.00	10.00	10.00	0.00	10.00	10.00
22	Swachtta Action Plan (ORE)	0.00	0.00	0.00	0.00	0.00	0.00	20.00	20.00	0.00	20.00	20.00
23	Digital Equipmen (I.T.)	0.00	0.00	0.00	0.00	0.00	0.00	15.00	15.00	5.00	20.00	20.00

S.N.	Object Heads	Estt.	Activities						Total	NER	Total Activities	Grand Total
			Sch. No.1	Sch. No.2	Sch. No.3	Sch. No.4	Sch. No.5	Other Heads				
24	Special Component Plan for Scheduled Castes (ORE)	0.00	0.00	0.00	0.00	0.00	0.00	174.00	174.00	0.00	174.00	174.00
25	Tribal Area Sub-Plan (ORE)	0.00	0.00	0.00	0.00	0.00	0.00	90.00	90.00	0.00	90.00	90.00
TOTAL (REVENUE) :		**10151.00**	**119.00**	**34.00**	**39.00**	**25.00**	**900.00**	**309.00**	**1426.00**	**169.00**	**1595.00**	**11746.00**
26	Machinery & Equipment	0.00	0.00	0.00	0.00	0.00	0.00	330.00	330.00	0.00	330.00	330.00
27	Information, Computer, Telecomunications (ICT) equipment.	0.00	0.00	0.00	0.00	0.00	0.00	76.00	76.00	5.00	81.00	81.00
28	Furniture and Fixtures	0.00	0.00	0.00	0.00	0.00	0.00	55.00	55.00	0.00	55.00	55.00
29	Other Capital Expenditure (NER)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	36.00	36.00	36.00
Total (Capital) :-		**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**461.00**	**461.00**	**41.00**	**502.00**	**502.00**
GRAND TOTAL:		**10151.00**	**119.00**	**34.00**	**39.00**	**25.00**	**900.00**	**770.00**	**1887.00**	**210.00**	**2097.00**	**12248.00**

1. Scheme No. 1 - Inspection of Mines for Scientific and Systematic Mining, Mineral Conservation and Mines Environment
2. Scheme No. 2 - Mineral Beneficiation studies utilization of low grade and sub grade ores and analysis of Environmental samples
3. Scheme No. 3 - Technological Upgradation and Modernisation
4. Scheme No. 4 - Mines and Minerals through various publications
5. Scheme No. 5 - Computerised Online register of Mining Tenement System.

13.3.(1): The Sanctioned Revised Estimates for the Financial Year 2023-24 is Rs.113.84 crores including Rs.18.33 crores under IBM Activities and Rs.95.51 crores under Establishment received vide Ministry's Letter dated 11.01.2024 and Revised RE received vide letter of even number dated 16.01.2024. Head-wise cum Scheme wise breakup of Activities & Establishment Budget is given in Table 13.3 (1).

Table 13.3 (1)

(Rupees in Lakhs)

S.N.	Object Heads	Estt.	Activities						Total	NER	Total Activities	Grand Total
			Sch. No.1	Sch. No.2	Sch. No.3	Sch. No.4	Sch. No.5	Other Heads				
Revenue Section:-												
1	Salaries	4375.00	32.50	6.50	3.25	3.25	0.00	0.00	45.50	81.50	127.00	4502.00
2	Wages	10.00	1.00	1.00	1.00	1.00	0.00	0.00	4.00	0.50	4.50	14.50
3	Reward	35.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	36.00
4	Medical Treatment	110.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	110.00
5	Allowances	3220.00	17.50	3.50	1.75	1.75	0.00	0.00	24.50	46.50	71.00	3291.00
6	Leav Travel Concession	62.00	2.00	2.00	2.00	2.00	0.00	0.00	8.00	1.00	9.00	71.00
7	Domestic Travel Expenses	160.00	5.00	5.00	5.00	5.00	0.00	0.00	20.00	5.00	25.00	185.00

			Activities									
S.N.	Object Heads	Estt.	Sch. No.1	Sch. No.2	Sch. No.3	Sch. No.4	Sch. No.5	Other Heads	Total	NER	Total Activities	Grand Total
8	Foreign Travel Ex-penses	20.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.00
9	Office Expenses	580.00	10.00	5.00	5.00	5.00	0.00	0.00	25.00	5.50	30.50	610.50
10	Rent, Rates & Taxes for Land and Building	70.00	9.00	0.00	0.00	0.00	0.00	0.00	9.00	16.00	25.00	95.00
11	Printing & Pub-lications	0.00	0.00	0.00	10.00	0.00	0.00	0.00	10.00	0.00	10.00	10.00
12	Rent for others	75.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	75.00
13	Materials & Sup-plies	25.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.00
14	Fuel & Lubricants	0.00	7.00	1.00	1.00	1.00	0.00	0.00	10.00	1.00	11.00	11.00
15	Advtertising & Publicity	0.00	3.00	0.00	0.00	0.00	0.00	0.00	3.00	0.00	3.00	3.00
16	Minor civil & Elec-trical Works	710.00	10.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00	10.00	720.00
17	Professional Ser-vices	45.00	5.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	5.00	50.00
18	Repairs & Maintenance	30.00	3.00	0.00	0.00	0.00	0.00	0.00	3.00	1.00	4.00	34.00
19	Other Revenue Ex-peuditure	24.00	10.00	10.00	10.00	6.00	0.00	0.00	36.00	5.00	41.00	65.00
20	Mining Tenement System (ORE)	0.00	0.00	0.00	0.00	0.00	900.00	0.00	900.00	0.00	900.00	900.00
21	Training Expenses	0.00	0.00	0.00	0.00	0.00	0.00	10.00	10.00	0.00	10.00	10.00
22	Swachtta Action Plan (ORE)	0.00	0.00	0.00	0.00	0.00	0.00	20.00	20.00	0.00	20.00	20.00
23	Digital Equipment (IT)	0.00	0.00	0.00	0.00	0.00	0.00	19.00	19.00	5.00	24.00	24.00
24	Special Com-ponent Plan For Scheduled Castes (ORE)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	Tribal Area Sub-Plan (ORE)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total (Revenue) :		**9551.00**	**115.00**	**34.00**	**39.00**	**25.00**	**900.00**	**49.00**	**1162.00**	**169.00**	**1331.00**	**10882.00**
26	Machinery and Equipments	0.00	0.00	0.00	0.00	0.00	0.00	330.00	330.00	0.00	330.00	330.00
27	Information, Com-puter, Telecomuni-cation (ICT) equipment.	0.00	0.00	0.00	0.00	0.00	0.00	81.00	81.00	5.00	86.00	86.00
28	Furniture and Fix-tures	0.00	0.00	0.00	0.00	0.00	0.00	50.00	50.00	0.00	50.00	50.00

S.N.	Object Heads	Estt.	Activities						Total	NER	Total Activities	Grand Total
			Sch. No.1	Sch. No.2	Sch. No.3	Sch. No.4	Sch. No.5	Other Heads				
29	Other Capital Ex-penditure	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	36.00	36.00	36.00
Total (Capital) :-		**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**461.00**	**461.00**	**41.00**	**502.00**	**502.00**
Grand Total:-		**9551.00**	**115.00**	**34.00**	**39.00**	**25.00**	**900.00**	**510.00**	**1623.00**	**210.00**	**1833.00**	**11384.00**

1. Scheme No. 1 - Inspection of Mines for Scientific and Systematic Mining, Mineral Conservation and Mines Environment
2. Scheme No. 2 - Mineral Beneficiation studies utilization of low grade and sub grade ores and analysis of Environmental samples
3. Scheme No. 3 - Technological Upgradation and Modernisation
4. Scheme No. 4 - Mines and Minerals through various publications
5. Scheme No. 5 - Computerised Online register of Mining Tenement System.

Audit

13.4 As on 31.03.2024 there are 37 C&AG Audit Paras and 40 Internal Audit Paras are pending in the Ministry of Mines. The latest status of these Audit Paras are as under:

Internal Audit Paras for the Financial Year 2023-24

Sl. No.	Organization	Opening Balance as on 01.04.2023	Paras settled during the FY 2023-24	Balance as on 31.03.2024
1	Sectt. Proper	18	17	01
2	PAO	19	19	00
3	GSI	219	182	37
4	IBM	43	41	02
5	JNARDDC	12	12	00
Total		**311**	**271**	**40**

Cag Audit Paras for the Financial Year 2023-24

Sl. No.	Organization	Opening Balance as on 01.04.2023	Paras settled during the FY 2023-24	Balance as on 31.03.2024
1	GSI	01	00	01
2	NMET	01	00	01
3	NALCO	56	46	10
4	HCL	05	00	05
5	JNARDDC	05	04	01
6	MECL*	07	08	19
Total		**75**	**58**	**37**

** As the opening balance on 01.04.2023, the pendency in CAG Audit Para in respect of MECL was 7. During the FY 2023-24, 20 more fresh CAG Paras were raised, out of which 8 have been settled. Now, 19 Paras in respect of MECL are still pending.*

Status of Outstanding Audit Paras as on 01.04.2024

Sl. No.	File No.	Name of Unit	Current F.Y. (2023-24)	One year old including current F.Y.(2022-23)	Two year old (2021-22)	Three year old (2020-21)	Four year old (2019-20)	Five year old (2018-19)	More than five year old	Total
1	12	US (Cash), M/o Mines							1	1
2	100	US (Cash), M/o Mines								0
3	83	Dir, GSI, CHQ, Kolkata			2				1	3
	83A	Dir, GSI, CHQ, Kolkata			1					1
4	101	DGCO, Pushpa Bhawan			1				1	2
5	102	Dir, RSAS, GSI, Bengulure								0
6	38	Dir,GSI, Train-ing Inst, Hyder-abad								0
7	57	PAO, IBM, Nag-pur								0
8	37	PAO,GSI Hy-derabad								0
9	11	Pr. Cum PAO, M/o Mines								0
10	92	PAO, GSI, Shillong								0
11	15	PAO, GSI, Jaipur								0
12	48	PAO, GSI, Nagpur								0
13	21	PAO, GSI, Bengaluru								0
14	27	PAO, Lucknow								0
15	73	PAO, CAO, Kol-kata								0
16	74	DDG, GSI, ER, HQ, Kolkata							1	1
	75	Dir., GSI, Eng. Drilling Divi-sion, Kolkata								0
	81	NERM-IIB, Coal Drilling Division, Kolkata								0
	82	DDG, GSI, M-IIB, Coal, Kolkata								0
17	89	DDG, GSI, SU: Orissa, Bhu-baneshwar								0
18	26	DDG, GSI, SU: Jharkhand Ran-chi								0
19	88	DDG, GSI, ER, SU: Bihar, Patna				1				1
20	78	DDG, GSI, SU: Sikkim & A&N, Kolkata						1		1
21	46	GSI, SU: T.N. Chennai								0
22	47	GSI, SU: Kerala, Trivendrum								0
23	22	Director, SU: Karnataka, Goa	9							9

Sl. No.	File No.	Name of Unit	Current F.Y. (2023-24)	One year old including current F.Y.(2022-23)	Two year old (2021-22)	Three year old (2020-21)	Four year old (2019-20)	Five year old (2018-19)	More than five year old	Total
24	41	Dir, GSI, Ge-ographics Div. Hyderabad								0
25	43	Dir, GSI,SU: Andhra, SR, Hyderabad			2					2
26	45	Dir, GSI, Engeering Division SR Hyderabad							1	1
27	40, 44	DDG, Gsi, SR, HQ, Hyderabad								0
28	119	SU: Telangana, SR, GSI, Hyder-abad								0
29	25	DDG,GSI, Marripalam, Vi-zag								0
30	23	DDG, GSI, Marine & Coastal survey Division, Mangalore	5							5
31	24	Dir., GSI Ma-rine& Coastal Survey Division, Coachin								0
32	79	Dir., OPEC-I, Marine and Coastal Survey Division, Kolka-ta								0
33	17	GSI, Drilling Division WR, Jaipur								0
34	20	DDG, GSI, SU: Gujrat								0
35	18	DDG, SU: Ra-jasthan								0
36	19	DDG, WR HQ, GSI Jaipur		2					3	5
37	35	DDG, GSI, J&K Jammu								0
38	33	DDG: SU: HP & Punjab, Chan-digarh								0
39	28	DDG, NR, Lucknow							1	1
	40	DDG, Drilling division, Luck-now								0
	41	Dir, GSI, Geo-physics Division, NR								0
40	29	DDG, SU: Lucknow								0
41	36	DDG, GSI, SU: J&K, Kashmir								0
42	34	DDG, GSI, SU: UK, Dehrdun								0
43	14	DDG, NCEGR, GSI, Faridabad			1					1
44	51	DDG, GSI,CR, SU: Maharash-tra,Nagpur								0

Sl. No.	File No.	Name of Unit	Current F.Y. (2023-24)	One year old including current F.Y.(2022-23)	Two year old (2021-22)	Three year old (2020-21)	Four year old (2019-20)	Five year old (2018-19)	More than five year old	Total
45	53	Director, GSI, Operation Pune							2	2
46	56	Dir, GSI, MP, Jabalpur								0
47	55	DDG, SU: Chat-tishgarh								0
48	49	DDG, HQ, CR, Nagpur								0
49	54	DDG, SU: MP, Bhopal								0
50	50	Dir, GSI,CR, ENG. Drilling Division Nag-pur								0
51	93	GSI, Drilling Division, NER, Shillong								0
	52	DDG, GSI, NER, Shillong							1	1
52	99	Dir, GSI , SU: Tripura, Mizoram								0
53	95	Dir, GSI, Assam, Guhawati							1	1
54	97	DDG, GSI, Arunachal Pradesh, Itanagar								0
55	96	Dir, GSI, SU: Manipur, Naga-land, Dimpur								0
56	90	Dir, GSI, SU: sikkim, Gangtok								0
57	58	CGM (HQ), Nagpur								0
58	67	RCOM, Goa								0
59	65	RCOM, Kol-kata								0
60	70	RCOM, Deh-radun								0
61	64	RCOM, Benga-luru								0
62	63	RCOM Chennai								0
63	71	RCOM Jab-alpur			1					1
64	72	RCOM, Udaipur								0
65	60	RCOM, IBM								0
66	110	RCOM, IBM, Bhubaneshwa r								0
67	69	RCOM, IBM,								0
68	68	RCOM, IBM, Ranchi								0
69	66	RCOM, Hyder-abad								0
70	105	MMPLPP, Nagpur			1					1
71	62	Controller of Mines, Nagpur								0
Total			**14**	**2**	**9**	**1**	**0**	**1**	**13**	**40**

14

Miscellaneous

Miscellaneous

National Informatics Centre (NIC)

IT Support by NIC at Ministry of Mines

14.1 National Informatics Centre (NIC) of the Ministry of Electronics and Information Technology is providing network backbone and e-Governance support to the Ministry of Mines. The following are the IT Services that NIC is providing to Ministry of Mines.

Management Information Systems for the Ministry

14.2 Ministry of Mines with the help of NIC is implementing various decision support system required for better planning, monitoring and decision making. The key advantage for the MIS websites / applications is to reduce the Ministry's workload and increase overall transparency in its function. The computerization has been done in the area of Science and Technology Schemes, Registration under Rule 45 of MCDR, Revision Applications, e-indent, Conference Hall Booking. A dashboard depicting production, performance and other relevant information of Ministry and its offices is developed. NIC in the Ministry has re- engineered Ministry's website (https://mines.gov.in) using latest state of art CMS driven technology in open source. The following MIS are operational:

a) Satyabhama - a Web Portal for Science and Technology Schemes (https://research.mines.gov.in) to promote research in mining sector.

b) Dashboard of Ministry of Mines(http://dashboard.mines.gov.in)

c) Revision Application System (RAS) (https://ras.nic.in)

d) Registration under Rule 45 of MCDR Rules 2017 (https://ibmreg.nic.in)

e) Intra-mines Web portal (Covers e-Indent of various stationary items and cleaning material, online booking of Conference Rooms, Service Request and also to facilitate financial support through Canteen Bill Processing System to officer for hospitality management as per Govt. of India rule). This service is operational on Local Area Network of the Ministry.

f) Non-Ferrous Metal Import Monitoring System (NFMIMS).

g) IBM Registration System under Rule 45 of MCDR Rules 2017 based on Form "K".

Support for e-Governance Applications

14.3 The following e-Governance applications have been implemented and supported by NIC in the Ministry:

- Public Financial Management System
- e-Office and SPARROW
- eVisitor System
- ACC Vacancy Monitoring

Local Area Network (LAN)

14.4 LAN has been established in the Ministry, which interconnects various officers/staff in the Ministry. There are approximately two hundred users connected to the LAN. All kind of trouble shooting is done by NIC to facilitate the smooth functioning of internet on user machines with the help of FMS team of the Shastri Bhawan Network Centre. EDR/EPP is installed on clients for advance protection from virus, malware etc as per Govt. of India Standards.

Wi-fi Support

14.5 Ministry of Mines has been made Wi-fi enabled by NIC-Mines team. Form processing for Wi-fi connection and device configuration is done by NIC Mines Team. As on date, more

than 16 Wi-fi access points are installed in the Ministry covering 'A' and 'D' Wings. Trouble shooting of Wi-fi related problems is done on regular basis.

Videoconferencing Support

14.6 Videoconferencing of the Ministry Officials with the State Governments, Subordinate Offices, PSUs and PRAGATI VC is being facilitated by the NIC-Mines team. There are 9 VC studios operational in Ministry of Mines. To cater to the excessive demand of VC, 5 exclusive Web VC rooms (Links) have been created for Ministry of Mines to organise VC from any remote location having internet connectivity. Approximately 950 VC meetings have been conducted over the video conferencing system of NIC.

Email/VPN Cloud Support

14.7 Email requests of the Ministry Officials are processed by NIC Mines Team as and when required. Requests related to Virtual Private Network (VPN) accounts to access the e-Office from networks other than NIC net are also processed through NIC team of Ministry of Mines. NIC is also Managing Cloud Hosting of various websites of Ministry.

IT support to Associated Offices of the Ministry

14.8 Besides the routine coordination work at Ministry of Mines, the team is also extending support to all the associated offices of the Ministry (through NIC staff) such as:

i. Indian Bureau of Mines (IBM) – for Registration System and for conducting video conferencing sessions with the Ministry.

ii. Geological Survey of India (GSI) – for conducting video conferencing sessions with the Ministry.

iii. PSUs of Ministry of Mines- for conducting video conferencing sessions with the Ministry.

E-Office

14.9 The e-office is e-governance application and has been implemented in the Ministry of Mines from May 2013.

14.10 The following modules have been successfully adopted:

- **eFile (File Management System)–** eFile, an integral part of eoffice suite is a system designed for the Government departments, PSUs and Autonomous bodies to enable a paperless office by scanning, registering and routing the correspondences along with creation of file, noting, referencing, correspondence attachment, draft for approvals and finally movement along with tracking of efiles. Ministry of Mines is presently active with the version of WAW Portal. WAW platform provides a unified integrated interface to their applications and acts as a single window for the officials to work seamlessly in the virtual environment.
- The current version of eoffice is eFile 7.3.9 released on 1.02.2024. Improved PDF Viewing: Accurate Page Numbers in Recent and TOC Sections for Enhanced Referencing.
- **Enhanced Note-to-Correspondence Referencing:** Dual Display of Individual and TOC Page Numbers for Improved Clarity.
- **Improving User Experience:** Introducing 'Loading' Functionality to Address Network Delays in Note-to Correspondence Referencing.
- **eHRMS 2.0:** The previous version of e- HRMS (Human Recourse Management

System) has been revamped and has been implemented in the Ministry from 01.04.2023. The latest version of e-HRMS running in this Ministry is 2.0. Manav Sampada (appropriate name for Human Capital, being the most important factor for the success of any Government, Organization,or Company) is a standard ICT solution for the Government Sector, addressing maximum requirement of State Governments related to personnel management. The first and basic objective of Manav Sampada is to provide a generic and product based solution to the State/Central Government organizations for better management of personnel through electronic service record. It further assists the top management in knowing the exact number of employees, the retirement pattern and additional requirement in coming year for planning recruitments, funds required for retiring employees, reallocation of surplus employees to other Departments/Organisations within the State, ACR/Property Return status, seniority lists etc.

Website of Ministry

14.11 Website of Ministry has been redesigned using latest state-of–the-Art technology. It is a CMS driven system with ease in operation and management. The site is security audited and also got STQC clearance as per required for all Government website. NIC Website provides on various comprehensive information subjects like Acts & Rules and working of the Ministry, Right to Information Act, National Mineral Policy and information about the Indian Mineral Sectors, current status of the Revision Applications and Mineral Concession Cases, Annual Report of the Ministry and provides links to its PSUs and offices. The website is bilingual. Website of the Ministry (https://mines.gov.in) is "Guidelines for Indian Government Websites" (GIGW) 3.0 compliant.

eSamiksha

14.12 eSamiksha is a real-time on-line system for monitoring of follow-up action on the decisions taken during the presentations made by different Ministries/Departments to the Prime Minister, Centre-State-Coordination issues, observations made by Cabinet, recommendations made by Committee of Secretaries,etc. The follow-up action in respect of all issues concerning other Ministries/ Departments and State Governments is to be updated by the concerned Ministry/ Department/Agency on the eSamiksha portal and replies to the issues raised by the Ministries/ Departments and State Governments are taken up on priority basis and status is uploaded on eSamiksha portal every month. Ministry of Mines has been regularly monitoring the follow-up action in respect of eSamiksha portal.

Skill Development

14.13 The Ministry of Mines (MoM) with the cooperation of the Ministry of Skill Development and Entrepreneurship (MSDE) has undertaken steps for skill development for increasing productivity and accelerated, sustainable and inclusive growth in the mining sector. The process of Skill development started with signing of Memorandum of Understanding (MoU) by MoM, alongwith its PSUs (NALCO, HCL and MECL), with MSDE and the National Skill Development Corporation (NSDC). The apprenticeship training initiative undertaken by the CPSEs for the last 3 years is given in **Table14.1**

Table 14.1
Apprenticeship Training

Name of CPSE	No. of apprentices engaged in 2020-21	% of total manpower	No. of apprentices engaged in 2021-22	% of total manpower	No. of apprentices engaged in 2022-23	% of total manpower	No. of apprentices engaged in 2023-24	% of total manpower
NALCO	895	15.41%	1135	20.56%	1394	26.85%	1135**	23.29%
HCL	168	2.39%	128	1.93%	146	1.97%	137*	1.8%
MECL	51	2.7%	65	2.7%	47	2.9%	45	2.7%

*** Employee strength is 4874 on 31st March, 2024. In Nalco, no contractual staff engaged directly in its role.*

**Operations at Indian Copper Complex, Ghatsila, Jharkhand suspended, hence no apprentice engaged and the same has been informed to respective Regional Directorate of Skill Development & Training (RDAT). Taloja Copper Project, Raigad, Maharashtra has resumed its operations recently and the process of engagement on 10 seats shall be initiated shortly. Khetri Copper Complex, Khetri Nagar, Rajasthanis in the process of document verification for engagement of apprentices on 290 seats. Unfilled 114 seats of Malanjkhand Copper Project, Malanjkhand, Madhya Pradesh will be notified shortly.*

Geological Survey of India (GSI)

14.14 In order to enhance the competency of the GSI employee, the skill development and capacity enhancement being done through field and hands-on training in the domains of Geological, Geophysical and Geochemical mapping; techniques of Mineral Investigation and 3D-Statistical Modelling of Mineral Resources; Geo- scientific data handling techniques and integration; Fundamental and Advanced Research Methodologies in Geosciences and Public-Good Geosciences; Processing and interpretation of Aero geophysical data as well as Multi-seismic marine data; Training on Artificial Intelligence and Machine Learning and their applications in Geoscience; Techno-administration including Grievance and Vigilance, HR Management and Financial Management, Gender Sensitization etc.

14.15 Methods envisaged for carrying out training are Field demonstration at relevant geological sites; Hands-on training at geo- scientific laboratories; Classroom training on Geoscientific techniques and their advancements; Classroom training on Administration and Management; Domain-specific (Basic, Refresher and Advanced) training through classroom lectures, at field sites as well as in the laboratories; Training on Artificial Intelligence and Machine Learning and their applications in Geoscience; Training in collaboration with reputed agencies/ academic institutes. The trainings were primarily conducted through offline, online or blended modes. GSITI website (https://training.gsiti.gsi.gov.in/) offers 33 asynchronous self-paced online training programmes. GSITI has onboarded 32 online courses in the iGOT Karmayogi portal.

14.16 Skills for which training is required for other stakeholders connected to GSI are Geoscientific investigations, Mineral Investigation techniques and 3D-Modelling of Mineral Resources; Operation of geoscientific equipment and relevant software in the domain of geosciences; Imparting Basic, Refresher and Advanced training in a specific domain through lectures, laboratory demonstrations and field sites demonstration. Apart from the above, Ministry of External Affairs (MEA) sponsored training programmes under the Indian Technical and Economic Cooperation (ITEC) and ISRO-sponsored training

programmes under the National Natural Resources Management Survey (NNRMS) are being conducted.

14.17 Between January 2023 and March 2024, a total of 15,158 individuals underwent training. This included 3881 personnel from the Geological Survey of India (GSI), 3137 personnel from stakeholder organizations connected to GSI such as State DGMs, State and Central Organizations engaged in geoscientific investigations and 70 international participants from 34 countries. Additionally, 8,070 participants from various academic institutions across the country received training under outreach programme Azadi Ka Amrit Mahotsav.

Indian Bureau of Mines (IBM)

14.18 Indian Bureau of Mines (IBM), according to its charter of functions, needs to enhance its skills in various advanced technologies for mine regulation and development.

14.19 The IBM personnel are imparted trainings at Headquarter for 2-3 days and at its regional offices as well as at two skill development centres located at Udaipur and Kolkata. Nominations are sought in advance. After approval of Competent Authority, training programme is organized through Classroom lectures/presentation by the faculties drawn from IBM as well as Industry. Presently the trainings are being conducted offline. In last couple of years, IBM personnel had attended training programmes in outside organizations / institutes like GSITI, Kolkata National Remote Sensing Centre, Hyderabad. Accordingly, further training programme, wherever necessary, will be conducted in association with these organizations / institutions. Further, through bilateral cooperation with other Countries, capacity building programme will be taken up.

14.20 IBM imparts training to technical and non-technical officials of IBM and also to persons from the mineral industry and other agencies in India and abroad. During the year 2023-24, 16 training programmes have been conducted, in which a total of 349 IBM personnel, 333 Industry officials and 46 from the State Government officials have participated. The total revenue generation from the industry personnel for 2023-24 is Rs 34, 92, 000/- (Rupees Thirty Four Lakh Ninety Two Thousand only). IBM makes its presence in the meetings as organized by GSI/ MECL for its active participation, towards synergic approach. Further, IBM officials are participating in various Training Programmes conducted by other Institutes. In November 2023, 06 (six) personnel of IBM attended 3-day offline training programme for IOs/POs at CBI Academy from 28th to 30th November 2023.

14.21 IBM had initiated its efforts to upload its training modules on iGOT platform, YouTube Channel and IBM website. As per the Ministry's letter Dated 05.07.2022 regarding uploading of training courses on iGOT portal, three topics/modules are identified for IBM for lecture videos i.e. (a) Mining reforms, (b) process of Mining lease to LoI & (c)Mining plan Approval. Therefore, IBM has initiated the process for preparing the lecture videos through training centre & expertise available in IBM, and prepared training videos related to the topics. So far, 02 videos have been uploaded on YouTube, 6 courses on i-GoT portal and further preparation of more interactive videos is in progress.

Capacity Building Plan of IBM:

14.22 Subsequent upon the Review Meeting chaired by Secretary (Mines) on 20.09.2023 on the matter of Mission Karmayogi and Ministry of Mines Letter dated 21.09.2023 regarding "Capacity Building Plan for Employees under

the administrative control of M/o Mines", IBM issued Work Order for preparation of Capacity Building Plan of IBM to M/s Ernst & Young LLP on 09.01.2024.

14.23 In pursuance of RFQ No. IBM/TC/2023, the said agency submitted its draft Deliverable 1: 'As-Is Assessment of the Department (IBM)' via email dated 23.01.2024. Whereas, Deliverable 2: 'As-Is Assessment of the Training Needs of Employees and Identification of Potential Interventions' (Capacity Needs Analysis) was submitted on 13.02.2024 and draft Deliverable 3: 'Draft Capacity Building Plan with a Roadmap for Implementation' was received on 13.03.2024.

14.24 M/s Ernst & Young LLP delivered a presentation on 26.03.2024 in the presence of Controller General (I/c) and senior officials of IBM. Approval of Draft Capacity Building Plan with a Roadmap for Implementation is under process.

National Aluminium Company Limited (NALCO)

14.25 Skills for which training is required for employees of NALCO are:

a) **Behavioural skills:** Leadership, Labour laws, EQ, legal drafting skill, etc.

b) **Functional skills:** (i) Safety, (ii) Electrical, (iii) PLC skill, (iv) O&M of Testing and safety of materials handling equipment, (v) Digitisation skill- PLC & System Automation, etc.

14.26 Working as per international standard- (i) SA 8000, (ii) Internal Audit, (iii) Productivity improvement & measurement, (iv) Quality management, Project execution skill of employees, Contract handling skill for employees, Presentation skill for employees, Communication skill for employees, Negotiation skill for employees, e-procurement, inventory management.

14.27 Method for imparting training: In house through internal faculties, external faculties of national repute, from premier management/technical institute etc, and through equipment provider.

Mineral Exploration & Consultancy limited (MECL):

14.28 MECL is at the forefront of empowering its workforce through proactive skill development initiatives, geared towards excelling in the dynamic realm of mineral exploration. Through a holistic training framework, MECL prioritizes enhancing technical competencies for geological exploration technologies. Leveraging collaborations with esteemed National Institutions and industry experts, employees gain access to cutting-edge training resources, ensuring they stay abreast of the latest advancements in the field. Moreover, personalized employee development plans coupled with soft skills training cultivate well-rounded professionals capable of navigating challenges and fostering innovation. MECL's commitment to continuous improvement underscores its dedication to nurturing a highly skilled workforce adept at meeting the evolving demands of the mineral exploration sector. Furthermore, skill development initiatives extends to encompass advanced areas such as 3D ore body modelling using sophisticated modelling software and geophysical survey analysis facilitates precise exploration planning and resource estimation, while specialized training in geophysical survey techniques ensures comprehensive data collection and interpretation. By integrating these advanced skills, MECL maintains a competitive edge in mineral exploration, enabling informed decision-making and optimizing resource efficiency.

14.29 MECL has provided training to its employees, as per the following details:

Table 14.2

No. of employees trained from January-December 2023	No. of employees trained from January-March 2024
301	89

Jawaharlal Nehru Aluminium Research Development and Design Centre (JNARDDC):

14.30 The skill development initiative of JNARDDC has focus on following:

a) Advanced awareness training on Lab management system as per ISO/IEC 17025:2017 and ISO-17034:2016.

b) 3 months internal induction training for newly recruited employees.

c) Training program on for Scientists/ Technologists.

d) Specialized Training program for industry personnel.

e) Vocational training / Internship programs for PG / B.Tech / M.Tech students.

14.31 Under the above ambit, the following programs were conducted:

- The newly recruited employees are undergoing 3 months internal induction training.
- 3 employees successfully completed "Certificate Course & Workshop on Mechanical Testing of Materials" coordinated by the Department of Metallurgical and Materials Engineering at VNIT Nagpur in 2023.
- Dr. MD Najar, Principal Scientist participated in the workshop organized by Indo-UK Centre for Environment Research and Innovation (IU-CERI) on "Low Carbon Technology for Valorization of Industrial Waste at New Delhi on 31.05.2023.
- Mr K. J. Kulkarni, Senior Scientific Officer underwent one-week transformative training program on "Sensitization Program on Developing Disaster Management Plans journey of empowerment during 19th - 23rd June 2023 at National Institute of Disaster Management (NIDM), Delhi.
- Around 35 employees and staff participated in 75 AKAM Awareness programs – PAN India (which included 84 Waste Utilization & Scrap Recycling Drives (Al, Cu, Pb, Zn & Steel) including industry visit and awareness conference in 5 colleges and 22 ZP schools of 11 districts of Vidarbha region (April – Aug 2023).
- 33 PG and Engineering students from PAN India 8 colleges were provided short term internship training program. They included students from Ambedkar College Nagpur, VNIT Nagpur, YCCE Nagpur, Government Polytechnic Nagpur, St. Francis De Sales College Nagpur, Hislop College Nagpur, COEP Technological University Pune and UIET CSJM University Kanpur.

  Besides the above, all the 51 employees have completed the earmarked courses as per CNA and the 6 (Six) courses mandated by DoPT on iGOT Karmayogi platform.

Hindustan Copper Limited (HCL)

14.32 Skills for which training is required for employees of HCL are Mines Refresher Training, Fire Fighting Training, First Aid Training, Safety Training, Soft Skills Training, Fitters, Mechanics, Riggers, Welders, Mine Surveyor Assistant, Loader & hauling operation, Blasters, Winding engine operators for underground shaft, Mining mate, HEME operators, Drilling

machine operators, Ball Mill operations for beneficiations, Pump operators for mine dewatering, etc.

14.33 Methods for imparting training: Training by own faculty at the Vocational Training Centers in Khetri Copper Complex (KCC), Malanjkhand Copper Complex (MCP), Indian Copper Complex (ICC). Training imparted In-House through Internal and External Faculties as well as sending employees to various Centre of Excellence.

14.34 Skills for which training is required for other stakeholders connected to HCL are Loader & hauling operation, Blasters, Winding engine operators for underground shaft, Electrician, Mechanical, Fitter, Welder, General Technician, Machinist, Crane Operator, Carpenter, Plumber, Draftsman, Turner.

National Institute of Rock Mechanics (NIRM)

14.35 NIRM scientists have upskilled themselves on topics of core competence in rock mechanics and rock engineering pertaining to slope stabilisation challenges, slope engineering, mining projects and condition monitoring of structures NIRM imparted training to industry engineers, associates in scientific projects through onsite training and virtual online programmes.

14.36 The scientific work force of the institute carried out drills and training for field and laboratory investigationsfor solving complex problems in civil, mining, hydel, environmental and critical infrastructure sectors. The work carried out spans over Rock Mechanics and Rock Engineering.

14.37 Many project sites required Non-Destructive Testing (NDT) services like Reverse Bend Testing, Torsion Testing, Impact Testing, Compression Test, Tensile Strength, Visual Testing, Dye-Penetrant Test, Magnetic Particle Test, Ultrasonic Testing, Vibration Test, Noise analysis, IR Thermography, Wire Rope Defecography, Soil / Rock Testing, on-site and off-site training are imparted to contract staff periodically.

14.38 Scientists and technical staff remain updated on industry requirements through workshops, training, seminar/conference. From time to time whenever the requirement for such upskilling is seen employees enrol themselves or deputed for such programmes.

Redressal of Public Grievances

14.39 Department of Administrative Reforms & Public Grievances (DAR&PG) has implemented a web based Centralized Public Grievance Redressal and Monitoring System (CPGRAM) vide which grievances pertaining to concerned Ministries / Department are forwarded for redressal. An Under Secretary has been designated as the Nodal Officer of Public Grievances. During the period 01.01.2023 to 31.03.2024, 1355 Public Grievances were received and 35 pending cases were brought forward from the year 2022. A total of 1324 Public Grievances have been disposed of during the period and the remaining cases have been referred to the concerned Organization / Authority for taking further necessary action in the matter.

14.40 Details of action taken on the public grievances of this Ministry and its attached / subordinate offices from 01.01.2023 till 31.03.2024 are given in **Table 14.3.**

Table 14.3

Organization	No. of public grievances pending as on 31.03.2022	Public grievances received during 01.01.2023 to 31.03.2024	Disposed cases during 01.01.2023 to 31.03.2024	Pending cases as on 31.03.2024
Ministry of Mines	35	1355	1324	66
Geological Survey of India (GSI)	3	233	222	14
Indian Bureau of Mines (IBM)	6	67	65	8
National Aluminium Company Limited (NALCO)	0	42	42	0
Hindustan Copper Limited (HCL)	6	125	117	14
Mineral Exploration & Consultancy Limited (MECL)	1	24	25	0
JNARDDC	0	4	4	0
NIRM	0	0	0	0

Vigilance Cases

14.41 During the year 2023-24 (from 01.01.2023 till 31.03.2024) details pertaining to vigilance division of this Ministry and its attached/ subordinate offices is given below in **Table 14.4:**

Table 14.4

Organization	No. of complaints pending as on 31.12.2022	Complaints received during 01.01.2023 to 31.03.2024	Disposed cases during 01.01.2023 to 31.03.2024	Pending cases as on 31.03.2024
Ministry of Mines, New Delhi	06	27	31	02
Geological Survey of India (GSI)	10	56	31	35
Indian Bureau of Mines (IBM)	03	21	22	02

14.42 The details of disciplinary cases arising from vigilance complaints from 01.01.2023 till 31.03.2024 are given in **Table14.5.**

Table 14.5

Organization	No. of Disciplinary cases	Nature of the penalty recommended	Status (as on 31.03.2024)
Ministry of Mines, New Delhi	7	Major: 06 Minor: 01	Pending: 07
Geological Survey of India (GSI)	29	Major/Minor/ Exoneration/Warning Memo	Pending: 18 Disposed:11
Indian Bureau of Mines (IBM)	NIL	NIL	NIL

14.43 Vigilance Awareness Week was observed from 30.10.2023 to 05.11.2023 in the Ministry as well as in subordinate / Attached offices of the Ministry. During the week, Essay, Quiz and debate competitions related to vigilance activities were organized in Ministry.

Geological Survey of India(GSI)

14.44 A glimpse of Vigilance activities carried out at GSI from 01.01.2023 to 31.03.2024:

a) The main focus of Vigilance Division is to promote a culture of Preventive Vigilance. Accordingly, 20 (twenty) chief technical examiner (CTE) type inspections were carried out. Further, a list of potentially sensitive sections were prepared and the said sections were inspected by a committee under the chairmanship of an officer chosen from other Divisions/ Sections. Total 187 of such Inspections were carried out. The outcome of the inspections in appropriate cases, was shared with the Competent Authority for system improvement. To promote awareness on vigilance trainings/ workshops were organised. Guidelines issued by the CVC from time to time have been circulated through online GSI portal for wide dissemination amongst employees.

b) As a prelude to Vigilance Awareness Week – 2023 and three months campaign (16.08.2023 to 15.11.23) had been undertaken as per direction of Central Vigilance Commission. Vigilance Awareness Week – 2023 had been observed from 30.10.2023 to 05.11.2023 on the theme "Say no to corruption; commit to the Nation" as advised by Central Vigilance Commission. During the said occasion various seminars/ discussions/presentations and competitions amongst the employees on pertinent topics were organised. Here is a brief of few lectures-

- Presentation on PIDPI had been conducted by Shri Manoj Kumar Maurya, Chief Vigilance Officer, GSI. The lecture was also made available pan India GSI offices through video conferencing. More than 350 plus participants were associated with the programme through online mode apart from the in-house participants.
- A lecture on PIDPI was delivered by Shri Subrata Sarkar, Chief Workshop Engineer, Eastern Railway and Ex-CVO Hindustan Copper Limited. It was an in-house presentation. More than 60 participants were present during the lecture session.

- Shri Abu Sufian, Ex-DDG, GSI delivered a lecture on the Systems and Procedures of Organization (Operated from Bangalore) in Kolkata. He explained about CCS (Conduct) Rule, CCS (CCA) Rules, constitution, and constitutional safeguard to civil servant, vigilance, vigilance angle, morals, conduct rules, complain handling mechanism.
- Shri Tarak Nath Mandal Technical Officer Dept. of IT&E, Government of West Bengal delivered a talk on Cyber Hygiene and Security. He pointed out how to protect the computer system, network digital data and assets form theft, damaged, unauthorized access and wide range of online fraud.
- A training-cum-interactive session on public procurement was conducted on 05.10.2023 where a lecture had been delivered along with slide shows through M.S. Power Point by Shri Somnath Hansdah, CVO, NALCO with the presence of all India GSI officers/ officials through online mode i.e. video conferencing.
- A Seminar on capacity building (Ethics and governance) was conducted by Shri Manoj Kumar Maurya, CVO, GSI on 18.10.2023, through slide shows with the presence of all India GSI officers/ officials through online mode i.e. video conferencing.
- A Newsletter in the name of "Vigilance वाणी" was published for the first time on this occasion during Vigilance Awareness Week. GSI held 06 Awareness Gram Sabha in remote villages in state unit offices to percolate the message of vigilance awareness amongst the larger sections of the society. Grievance Redressal Camp were arranged in GSI offices. As an outreach activities various vigilance awareness programmes/ competitions like quiz, cartoon, slogans, painting, rangoli, posters and walkathon / marathon / cyclathon etc. were organised in schools and colleges to spread vigilance awareness amongst the college and school students by GSI offices located throughout the country. Evening Choupals/ folksongs/puppet shows etc. were also organised.

c) GSI has appointed two Independent External Monitors (IEMs) to oversee the implementation of Integrity Pact as per Standard Operating Procedure (SOP) circulated by Central Vigilance Commission (CVC). Meetings with the IEMs are held every quarter.

d) In GSI portal a dedicated system is there to lodge complains by the employees and by citizens directly to CVO through online mode. This has been improved further to make system easy to use. Vigilance status of the employees are maintained online by GSI and Vigilance Clearance is processed through online mode by CVO office. Annual Immovable Property Returns are examined with available data. For faster processing, an online system for generating provision of 'Exception Report in AIPR' has been developed in GSI.

e) A separate menu named Vigilance was placed in GSI portal. This Vigilance menu has been made user friendly for

employees and citizens. Here, process of lodging online complaints, Vigilance Administration of the Organisation and Different Procurement Manuals of DoE (Department of Expenditure) was placed as sub-menus. Online complaint system at GSI was improved and made user friendly for employees as well as for outside citizens.

Glimpse of different vigilance activities at different GSI offices

Photo: 14.1Celebration of National Unity Day in Kolkata

Photo: 14.4 Group Display of PIDPI poster by Employees of CR, Nagpur

Photo: 14.2 A lecture under PIDPI is under progress at Central Headquarters, GSI, Kolkata

Photo: 14.5 Shri. Anil Giri, AO, GSI, delivering a talk on Awareness on Public Interest Disclosure and protection of Informers Resolution

Photo: 14.3 Walkathon arranged by OPWC-1, in connection with Vigilance Awareness week to spread the message.

Photo: 14.6 The lecture on Ethics in Governance was delivered by Shri S.S.Bissa, IAS (Retd.).

Photo: 14.7 Guest Speaker to present on Procurement related matters in Kolkata

Photo: 14.8 Employees of the GSITI, Hyderabad displaying the Posters on Vigilance Awareness Week-2023

Photo: 14.9 For wider awareness of PIDPI resolution, the PIDPI poster was displayed at the Sand Dunes, Thar Desert, Jaisalmer, Rajasthan on 27.09.2023 (World Tourism Day).

Photo: 14.10 Vigilance awareness programme was conducted at the Geo-heritage site of Akal Fossil Wood Park, Jaisalmer, Rajasthan.

Photo: 14.11 Students, Faculty members, Shri. Narsimha Reddy, Principal of the School along with GSITI officialsat Regatta School participated in the Programme.

Photo: 14.12 Students, Faculty members, Shri. Narsimha Reddy, Principal of the School along with GSITI officials at Regatta School participated in the Program.

Photo: 14.13 Officials of GSI, participating in the essay writing competition on theme " Significance of Ekta Diwas"

Photo: 14.14 SLecture on "Preventive Vigilance in Public Procurement" by Dr. Anjan Kumar Chatterjee, ADG & NMH-II (Retd.) at GSI, CR, Nagpur

14.45 Vigilance Section Indian Bureau of Mines (IBM)

Complaints handled by Vigilance Section, IBM:

a) Number of Complaints received: 21

b) Number of Complaints disposed: 19

c) Number of Complaints under scrutiny (as on 31.03.2024): 02

Inspections carried out by CVO, IBM: Inspection of Goa Regional Office, IBM was made by CVO, IBM during the period.

Following 01 Nos. of MPLN / RMPLN scrutinized under CTE Type examination during the period January 2023 to December 2023:

Sl.No.	CTE Type examinations
1.	CTE type examination for Mica Quartz, Feldspar and Vermiculite of Shri G. Bharat over an extent of 12.05 Acres in Sl.No. 535/P of Gokulabrindavanam Village, Sydapuram Mandal, Nellore district Andhra Pradesh

- 01 Pension related file of an IBM employee was inspected under Preventive Vigilance Measures in IBM during the period.
- During the period Agreed List /ODI list were prepared for the year 2023.
- In total 64 Annual Immovable Property returns for the year ending 31.12.2023 in respect of employees of IBM were scrutinized by this office, no adverse observations were made.
- 02 Training Programs for New Entrants as well as Mid-Career Training for the officers and Staff of IBM were organized.
- In 01 case system improvement were suggested by this office.
- Various rules and guidelines in pertinent matters as issued from time to time by DOPT, CVC, etc. have been circulated through Head of Office, IBM to all Zonal & Regional Offices of IBM.
- This year as a precursor to Vigilance Awareness Week – 2023, Central Vigilance Commission decided to focus on six different preventive vigilance measures in a move towards inculcating the true spirit of participative vigilance. The six different parameters such as PIDPI Awareness, Capacity Building, Identification and Implementation of Systemic Improvements Record Management, Leveraging of IT for Complaint Disposal, Updation of

Circulars / Guidelines / Manuals and Disposal of complaints were introduced as a preventive measure tool towards combating corruption within the organization, which were well received by IBM.

- During the Vigilance Awareness Week, various in-house activities / programs such as Essay, Debate, Quiz, Poster, Slogan, Speech competitions were organized in all the Zonal, Regional and Headquarter of IBM for employees and their family members and also outreach activities organized in schools for students to create awareness regarding common issues related to vigilance and create an atmosphere motivated towards weeding out corruption and unethical practices.

Swachh Bharat Abhiyan Ministry of Mines

14.46 Ministry of Mines and PSUs/attached offices under the Ministry of Mines organized the following Swachhta fortnights under the Swachh Bharat Abhiyan:

i) 15.09.2015 to 31.09.2015
ii) 12.12.2015 to 27.12.2015
iii) 01.03.2016 to 15.03.2016
iv) 16.06.2016 to 31.06.2016
(v) 16.12.2017 t0 31.12.2017
(vi) 16.10.2018 to 31.10.2018
(vii) 16.11.2019 to 30.11.2019
(viii) 16.11.2020 to 30.11.2020.
(ix) 16.11.2021 to 30.11.2021.
(x) 16.11.2022 to 30.11.2022
(xi) 16.11.2023 to 30.11.2023

Activities under Swachh Bharat Mission

14.47 Ministry of Mines has ensured in its day-to-day activity that toilets, rooms and corridors are kept clean. Waste item bins have been strategically placed to ensure that things are not thrown around. It has also been ensured that people don't spit or smoke in the premises or use gutka and other chewable items. Posters have been placed at various places to bring home this message. Administration carries out inspections to ensure cleanliness.

Removal / Disposal of waste / condemned items and vehicles

14.48 The Ministry has ensured all those items which were old/ unserviceable to keep specific space marked by CPWD. The Ministry does not have any condemned vehicle in its premises.

Seepage of condensed water of ACs

14.49 Ministry of Mines has ensured that water seeping through ACs are properly drained out without any accumulation.

Proper cabling of cable TV/dish antenna wires

14.50 All the electrical cables/TV cables have been placed inside the conduit pipes and it is ensured that there are no loose wires hanging around. The false ceilings in the corridors have been strengthened.

Fire safety measures

14.51 Instruction has been issued to ensure that all electrical points are switched off after closing of the office.

Daily Sanitization of Premises of Ministry of Mines

14.52 Ministry of Mines has ensured that daily sanitization of corridors, rooms and lift lobby in premises of Ministry of Mines, Shastri Bhawan is conducted.

Right to Information Act, (RTI)

14.53 The Ministry of Mines and its subordinate office, attached office, Autonomous Bodies and Public Sector Undertaking (PSUs) have appointed Central Public information Officers and Appellate Authorities. The List of Nodal Officer, CPIOs and Appellate Authorities in Ministry of Mines is given in **Annexure 14.1**. The Ministry has also set up a 'Public Information Cell' for processing of the requests received from the public under the RTI Act, 2005 and for their monitoring. During the year 2023-24 (1st January, 2023 to 31st March, 2024), the Ministry received 970 applications under the RTI Act, which were timely responded. 54 Appeals received against the decisions of the CPIOs were disposed of by the concerned Appellate Authorities within the stipulated time frame. The status regarding receipt and disposal of RTI Applications, First Appeals and Second Appeals w.r.t. the Ministry and its office is given at **Table 14.6, Table 14.7 and Table 14.8** respectively.

14.54 Azadi ka Amrut Mahotsav (JNARDDC) 75 AKAM Awareness programs were undertaken PAN India (which included 84 Waste Utilization & Scrap Recycling Drives (Al, Cu, Pb, Zn & Steel) including industry visit and awareness conference in 5 colleges and 22 ZP schools of 11 districts of Vidarbha region (April – Aug 2023).

Address by Shri Raosaheb Danveji, Hon'ble Minister of State for Railways & Coal along with Ministry of Mines & Coal dignitaries at Jalna AKAM event

Member of Parliament, Jamnagar & Devbhoomi Dwarka- Ms. Poonamben Maadam along with Ministry of Mines & Coal dignitaries at Jamnagar AKAM event

14.55 The National Unity Week (JNARDDC)

The National Unity Week was celebrated from 25th to 31st October, 2023, a part of the "Meri Maati Mera Desh" campaign which was a unique and innovative way of celebrating the 77th anniversary of India's freedom. On 27th Oct 2023 Dr A Agnihotri, Director, JNARDDC, Dr Ishwar Das, Group Head, along with Ms Swati Singh of NRSC- ISRO, Hyderabad, Dr A K Nandi, Emeritus Scientist, Dr Ajay Deshpande and Dr Vivek Kale of MRSAC, Nagpur, Mr S Das, ORSAC, Bhubaneshwar, Mr R Anant Kumar, Assistant Vice President, Sterlite Power Transmission Ltd. And JNARDDC around 65 employees and staff took a pledge under "Meri Mati Mera Desh" program in National Unity Week. It's a nationwide campaign to send the soil from their native places of historical significance to the Ministry of Culture. On 30.10.2023 the employees undertook the pledge to Say no to corruption and pledge their commitment to the Nation. As a culmination event on the 31.10.2023 in commemoration of the 148th birth anniversary of Sardar Vallabh bhai Patel – the Iron Man of India, Director, JNARDDC administered the unity pledge in English and Hindi and flagged off the 3 km run from Gate no.1 of JNARDDC Technical Campus which saw a enthusiastic participation of around 85 employees and external contractual staff.

14.56 Azadi ka Amrut Mahotsav (NIRM)

NIRM had successfully conducted advanced lectures series through AKAM (75 years of Indian Independence) technical weekly lectures with the participation of industry experts and scientists of the organisation. NIRM provides training, conducts basic and advanced lecture programmes to upgrade the skills of its scientific workforce continuously and impart awareness and skills to industry partners, associates for the benefit of the industry executives.

Table 14.6
RTI Application/Request Status (w.e.f. 1st January, 2023 to 31st March, 2024)

Organizations	Previous Pendency	No. of cases				Pendency			
		No. of RTI / Requests / Applications received during the period	Disposal	Information denied under section 8 (1), 9, 11, 24 & other of RTI Act	Balance	0-3 Months	4-6 Months	7-9 Months	10-12 Months
Ministry of Mines (Sect.)	0	970	941	7	22	22	0	0	0
GSI	11	1276	1210	35	42	42	0	0	0
IBM	8	666	640	13	21	21	0	0	0
NALCO	16	567	404	157	22	22	0	0	0
HCL	3	302	231	57	17	16	1	0	0
MECL	1	104	102	0	3	3	0	0	0
JNARDDC	0	20	19	1	1	0	0	0	0
NIRM	0	8	8	0	0	0	0	0	0

Table 14.7
RTI Appeals Status (w.e.f. 1st January, 2023 to 31st March, 2024)

Organizations	No. of cases					Pendency			
	Previous Pendency	No. of 1st Appeals received during the period	Disposal	No. of Appeals rejected/ information denied under Section	Balance	0-3 Months	4-6 Months	7-9 Months	10-12 Months
Ministry of Mines (Sect.)	0	54	49	0	5	5	0	0	0
GSI	3	164	163	0	4	4	0	0	0
IBM	1	50	47	2	2	2	0	0	0
NALCO	1	87	84	0	4	4	0	0	0
HCL	0	50	35	15	0	0	0	0	0
MECL	0	8	8	0	0	0	0	0	0
JNARDDC	0	1	1	0	0	0	0	0	0
NIRM	0	1	1	0	0	0	0	0	0

Table 14.8
CIC Second Appeal Status (w.e.f. 1st January, 2023 to 31st March, 2024)

Organizations	No. of Cases				
	Previous Pendency	No. of 2nd Appeals filed in CIC	Decided		
			In favour of Appellant	In favour of Organization	Balance
Ministry of Mines	0	5	0	5	0
GSI	0	2	0	2	0
IBM	0	1	0	1	0
NALCO	0	12	3	9	0
HCL	0	7	1	6	0
MECL	0	0	0	0	0
JNARDDC	0	0	0	0	0
NIRM	0	0	0	0	0

Government e-Market (GeM) Portal

14.57 Ministry of Mines has been procuring various items it needs through GeM portal those which are available on GeM. During the period from 01.01.2023 to 31.03.2024. the Ministry procured items worth Rs.5.78 crore through GeM. Total 1247 orders were placed on the GeM portal during period from 01.01.2023 to 31.03.2024 by the Ministry of Mines.

Quality Control Orders (QCOs)

14.58 The Ministry of Mines is laying emphasis on strengthening the quality control eco-system for non-ferrous metals sector in the country. Ministry of Mines has notified three Quality Control Orders (QCOs) on 31.08.2023, namely Aluminium and Aluminium Alloys QCO, Copper QCO and Nickel QCO. These QCOs will come into effect from 01.12.2024. These QCOs mark the first technical regulations from Ministry of Mines under the BIS Act. These QCOs mandate compulsory certification under the appropriate Indian Standards (IS) for the domestic production and import of aluminium and aluminium alloy, copper and for nickel powder.

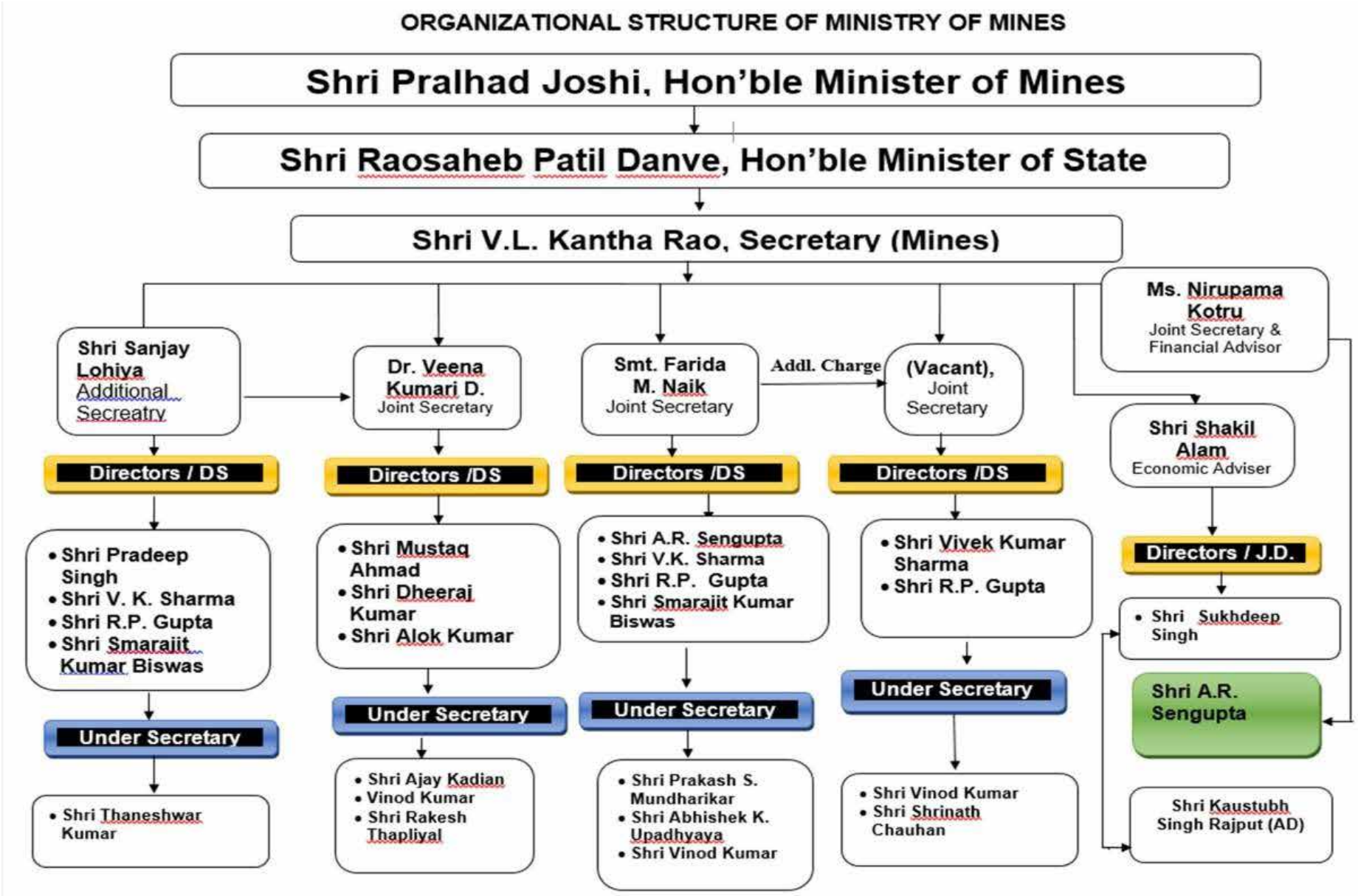
Annexures

Annexures

- Annexure 1.1 Organizational Structure of Ministry of Mines
- Annexure 2.1 Production of MCDR minerals for last five years (2017-18 to 2023-24(E))
- Annexure 2.2 Export (including Re-export) of Minerals for the period 2018-19 to 2022-23
- Annexure 2.3 Import (including Re-import) of Minerals for the period 2018-19 to 2022-23
- Annexure 2.4 Reserves/Resources of Minerals as on 1.4.2020 (P) : India
- Annexure 2.5 Scenario of Mineral Rich States (Excluding Atomic, Fuel Minerals & Minor minerals)
- Annexure 6.1 Details of Elements Analysed in NGCM
- Annexure 6.2 Year-wise / activity-wise financial performance of GSI against the approved budget outlay during F.Y. 2023-24 and be grant and expenditure upto December, 2023 and last quarter (Jan 2024 to Mar, 2024) of F.Y. 2023 and fund utilization during calendar year 2023
- Annexure 6.3 Performance related to various regulatory and development functions of IBM during the year 2023-24 (January 2023 to March 2024)
- Annexure 6.4 Mineral Wise Mining Lease (Other than Atomic, Hydro Carbons Energy and Minor Minerals) as on 31.03.2022(P)(All India)
- Annexure 8.1 Detailed time-lines and outcomes of ongoing and completed projects of JNARDDC, Nagpur
- Annexure 11.1 During FS 2022-23, a total of six items of Systematic Thematic Mapping (STM) on 1:25,000 scale, including one RP items have been taken up in NER of which two items were taken up in Arunachal Pradesh, one in Assam, two in Meghalaya and one in Sikkim. During the period from 1st January 2023 to 31st March, 2023, an area of 577 sq. km had been covered respectively.
- Annexure 11.2 During FS 2023-24, a total of seven items of Systematic Thematic Mapping (STM) on 1:25,000 scale have been taken up in NER of which two items are being executed in Arunachal Pradesh, one in Assam, two in Meghalaya, one in Manipur Nagaland and one in Sikkim. During the period from 1st April 2023 to 31st March, 2024, an area of 1441 sq. km has been covered.

- Annexure 11.3 A total of 30 items of Geochemical Mapping on 1:50,000 scale with collection of samples in grid pattern had been taken up during the FS 2022-23 in parts of Arunachal Pradesh, Assam, Meghalaya, Tripura & Mizoram and Manipur-Nagaland. An area of 9345 sq km has been covered during the period from 1st January 2023 to 31st March 2023.
- Annexure 11.4 Total 48 items of Geochemical Mapping on 1:50,000 scales with collection of samples in grid pattern is being executed during the FS 2023-24 in parts of Arunachal Pradesh, Assam, Manipur-Nagaland and Tripura & Mizoram. An area of 34606 sq km has been covered during 1st April 2023 to 31st March 2024.
- Annexure 11.5 As a part of FS 2022-23 two GPM Items had been executed by GSI, NER. During the period 1st January 2023 to 31st March 2023 a total area of 2016 sq km had been covered.
- Annexure 11.6 Two GPM items in South-East Hills districts, Meghalaya and East Khasi and East Jaintia Hills districts, Meghalaya is being executed during FS 2023-24 and an area of 2800 sq km have been covered during the period from 1st April 2023 to 31st March, 2024 .
- Annexure 11.7 Two items of Photo Geology and Remote Sensing (PGRS) had been taken up on 1:50,000 Scale during FS 2022-23 to carry out the alteration zone mapping in West Garo Hills, North Garo Hills, East Garo Hills and South Garo Hills district of Meghalaya using ASTER data. The total target of 3650 sq km had been completed during the period from 1st January 2023 to 31st March 2023.
- Annexure 11.8 During the FS 2023- 24, two items of Photo Geology and Remote Sensing (PGRS) is being executed on 1:50,000 Scale in parts of Meghalaya, Assam and Sikkim states by using ASTER data. A total area of 21150 sq. km has been completed during the period from 1st April 2023 to 31st March 2024.
- Annexure 11.9 Details of mineral exploration items taken up in NER during FS 2022-23 and 2023- 24.
- Annexure 14.1 List of Nodal Officers, CPIOs and Appellate Authorities in Ministry of Mines.

Annexure 1.1 Organizational Structure of Ministry of Mines



Annexure 2.1. Production of MCDR minerals for last five years (2017-18 to 2023-24(E) (Value in ` Crore)

Minerals	Unit	017-18		2018-19		2019-20		2020-21		2021-22		2022-23(P)		2023-24(E)	
		Production	Value	Production	Value	Production	Value	Production	Value	Production	Value	Production	Value	Production	Value
Bauxite	Tonne	22786106	15784173	23689619	17836033	21825227	16299333	20380548	16793447	22494049	25281596	23844337	27371722	21881617	24714270
Chromite	Tonne	3480941	32037005	3970691	36850747	3929260	32134395	2830413	21862796	3785624	47969166	3557289	46174178	2710704	37353960
Copper Concentrate	Tonne	141988	7706612	143668	8846151	124586	8448405	108718	8533354	115314	11024312	112745	11438445	111680	11643791
Copper Ore	Tonne	3678002	0	4134702	0	3952472	0	3272915	0	3569632	0	3326337	0	3411259	0
Gold Ore	Tonne	549683	0	567291	0	595511	0	437669	0	474994	0	633514	0	684314	0
Gold Primary	Kg	1650	4770022	1672	5267696	1742	6495723	1127	5475470	1407	6761018	1430	7635661	1341	7390620
Iron Ore	Tht	201424	347131037	206495	453465828	244083	496430578	205042	527292469	253693	1005710587	258356	834085189	252214	896178682
Lead & Zinc Ore	Tonne	12613866	0	13752295	0	14479032	0	15455342	0	13271179	0	16744080	0	14859552	0
Lead Concentrate	Tonne	306398	11429413	358369	16316913	351746	18260831	376923	18810483	282277	15402484	376666	24383294	340381	24695456
Manganese Ore	Tonne	2599814	19907475	2832314	21640166	2910186	18849100	2703313	17415460	2692408	22068504	2826481	23366830	3061427	23689342
Silver	Kg	557691	21179042	679386	25824756	609340	25616104	705796	42664424	647156	42126921	713620	43805077	617119	0
Tin Concentrate	Kg	16758	11347	21212	14627	15530	10337	15238	9603	109	308	45429	51850	22024	21848
Zinc Concentrate	Tonne	1539657	49799273	1456804	56083826	1446824	60438503	1513996	63127101	1486968	71309997	1670207	91320182	1528517	82162866
Metallic Mineral			**509755399**		**642146743**		**682983309**		**721984606**		**1247654894**		**1109632427**		**1107850835**
Apatite	Tonne														
Asbestos	Tonne														
Diamond	Carats	39699	374110	38437	539062	28816	352472	13917	147696	266	18051	388	61473	53	3075
Emerald	Kg	0	0	0	0	0	0	0	0	0	0	0	0		0
Fluorite (Graded)	Tonne	1314	8646	1079	8117	1315	8844	1052	8018	1237	9430	0	0	5870	0
Garnet	Tonne	158276	1618904	123404	1746757	568	1775	7114	26378	8182	24660	9859	36217	14923	80207
Graphite	Tonne	33649	28229	39030	36233	34674	55907	35386	87147	62888	122148	94789	180152	137511	160932
Iolite	Kg	0	0	73	684	90	579	16	73						0
Kyanite	Tonne	7818	23277	4889	15757	3498	12728	4925	9251	9320	17267	2765	5320	3035	12351
Limeshell	Tonne	14765	51445	7534	27780	4600	18730	0	0	100	231	240	628	841	2640
Limestone	Tht	340417	80995697	379975	89584488	362664	89482721	349120	86484125	391988	102005401	405551	110881014	406838	114951313
Magnesite	Tonne	195055	593650	146875	408287	102554	351947	74661	314677	113497	554771	107525	502587	118287	598255
Marl	Tonne	1969796	331290	1890308	349420	2148854	412464	2216414	417183	1853482	383279	1461668	316762	1327440	327057
Moulding Sand	Tonne	7100	1804	14805	4145	12905	3766	14363	4150	17583	5256	17260	5322	21652	8413
Phosphorite	Tonne	1515645	3668267	1421086	3883571	1400189	4731314	1455829	4694525	1394959	6648070	1978450	12354618	1375352	9675266
Rock Salt	Tonne	47	421	17	160	130	1447	486	14156	286	712	1002	4849		0
Selenite	Tonne	469	939	2906	5812	2154	4206	402	602	716	902	0	0	10714	6331
Siliceous Earth	Tonne	86662	53164	80237	50206	19367	11710	23823	14686	33898	22837	32070	17368	47217	22546
Sillimanite	Tonne	81638	671690	69919	564498	13221	37903	11110	13987	3432	8283	1437	3757	677	2704
Vermiculite	Tonne	6054	7075	2992	3708	2774	3347	1260	2157	3060	3765	2303	1610	1087	790
Wollastonite	Tonne	153049	126025	184063	172013	124757	139695	103902	122210	108335	149156	110793	151761	101881	154909
Non-Metallic Mineral		**88554631**		**97400698**		**95631554**		**92361022**		**109974220**		**124523437**		**126006788**	

Source: MCDR return
(P) : Provisional

Annexure 2.2 : Export (including Re-export) of Minerals for the period 2018-19 to 2022-23

(Value in ₹ '000)

Super Group Comm Name	Unit	2018-19		2019-20		2020-21		2021-22		2022- 23(P)	
		Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Natural Gas	TON	73574	3802681	52408	2202387	17992	658242	3	883	23	93848
Abrasive (natural)	TON	80436	1380074	92241	1568206	23411	376713	14106	236450	4689	42219
Alabaster	TON	12	129	27	256	4	184	++	11	52	1732
Alumina	TON	1389105	46982487	1330038	30900409	1265941	28280781	1487035	47334417	2014428	64237704
Andalusite	TON	100	2659	19	1240	9	476	18	1233	19	1515
Antimony Ores And Conc.	TON	++	6	--	--	--	--	--	--	--	--
Arsenic Sulphide (natural)	TON	25	212	++	69	277	1697	51	505	++	++
Asbestos	TON	1112	33914	1001	31011	299	11991	1906	68026	3286	217449
Ball Clay	TON	213999	497944	153658	398714	170915	410109	266680	664037	993811	3779211
Barytes	TON	2114610	11781173	2221693	12896670	1010894	6261470	1874837	11075666	2445691	16613885
Bauxite	TON	1509738	3045300	524229	1421269	240841	951442	378081	1005256	177535	479019
Bentonite	TON	1693046	5846662	1647485	5674970	1557484	5215656	1585962	5850483	1375350	6607488
Borax	TON	2353	238103	2977	359860	2996	414601	4725	656472	4151	818305
Building And Monumental Stones Nes	TON	9137308	10806105	12612479	15692854	13134116	24200968	13295779	24912268	12276938	20638218
Calcite	TON	39251	303449	36433	273950	23867	155049	24789	163372	27892	208639
Chalk	TON	1199	7736	1317	8022	1104	6155	1129	7557	1057	7330
Chromite	TON	39273	1337693	33898	867910	2872	71979	2625	89710	33881	904154
Clay (others)	TON	44195	428742	50365	476744	45346	402787	49635	361745	34138	314150
Coal(ex Ligbite)	THT	1305	9500065	1045	5929549	2943	5736794	1314	11233701	1165	15001652
Coal,gas Water Etc. (except Gaseous Hydrocarbons)	TON	++	100	--	--	--	--	++	2	++	1
Coal:lignite	THT	2	254653	3	319838	2	234709	1	203336	1	90369
Cobolt Ores And Conc.	TON	1	4496	2	9478	--	--	--	--	--	--
Coke	TON	101863	2205464	111507	2383337	207412	4771075	1299461	41017403	365897	15566657
Copper Ores And Conc.	TON	181642	16627621	212659	20450948	82463	7689376	34827	3964549	26336	2435371
Corundum (natural)	TON	101	2149	--	--	62	137	89	241	59	144

Super Group Comm Name	Unit	2018-19		2019-20		2020-21		2021-22		2022- 23(P)	
		Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Diamond		**	1758167200	**	1400336074	**	1258209200	**	1893641728	**	1837280521
Diatomite	TON	27893	273001	4302	72842	3240	69439	1964	58544	1901	62622
Dolomite	TON	78010	308053	91431	349684	95892	349090	113380	391843	77124	307324
Earth Clay	TON	3650	38825	2652	18037	3881	22220	3775	53782	9432	96235
Emerald (cut And Uncut)		**	23026249	**	17387875	**	5316603	**	10808861	**	17096852
Felspar (cut And Uncut)		**	338518	**	203185	**	198059	**	254062	**	275473
Felspar (natural)	TON	655913	3310611	640709	3225696	705280	3931135	763219	4194510	716776	4292153
Fire Clay	TON	4665	40928	5172	41898	5324	43606	4473	45578	8654	48207
Flint	TON	790	10393	1195	8014	406	2953	570	5837	976	8675
Fluorspar	TON	533	23410	1368	51562	474	22436	844	43463	1024	65899
Garnet(Cut And Uncut)		**	494842	**	366806	**	280824	**	378455	**	484011
Garnet(abrasive)	TON	104344	1783920	74697	1254539	76799	1265586	81270	1433741	103398	1903765
Granite	TON	6811728	102014060	6678131	102248504	7522159	113279766	7572368	126460352	6632215	125512876
Graphite(natural)	TON	402	22960	607	32629	716	42994	764	46963	2239	120029
Gypsum	TON	175269	684490	151722	578922	213061	723888	220634	765738	191717	574560
Iron Ore	THT	16149	92626090	36625	186092710	57723	362556021	26494	241480427	21168	144299670
Kaolin	TON	446358	1709970	431536	1929478	287260	1610489	339591	2398327	490071	3440275
Kieselguhr	TON	61	1341	113	2399	27	917	28	516	41	3329
Kyanite	TON	283	4872	143	2627	252	9033	1655	15376	297	8631
Lead Ores And Conc.	TON	37	2007	3	202	9	1076	12	1595	137	7521
Limestone	TON	3883757	4947503	3760402	4656567	3528973	42939083	12160342	4551537	2515714	3124865
Magnesite	TON	6268	204287	5453	147073	5477	171020	5384	173809	5263	239139
Manganese Ore	TON	55845	138120	58198	254643	82363	974940	113606	588189	1557	21566
Marble	TON	385241	8757384	310613	9010909	295085	10082272	324267	11352007	265229	11941092
Mica	TON	152494	6200102	116854	4909143	144121	5733785	151706	6594832	115898	5557843
Molybdenum Ores And Conc.	TON	6	81	3	3023	45	43181	++	120	60	223955
Nickel Ores And Conc.	TON	50	1619	++	++	--	--	20	5183	--	--
Niobium Or Tantalum Ores And Conc.	TON	++	790	361	943	++	217	++	18	105	1007
Nickel Ores And Conc.	TON	50	1619	++	++	--	--	20	5183	--	--

Super Group Comm Name	Unit	2018-19		2019-20		2020-21		2021-22		2022- 23(P)	
		Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Niobium Or Tantalum Ores And Conc.	TON	++	790	361	943	++	217	++	18	105	1007
Ochre	TON	3491	65042	2934	72045	4126	71626	6085	103351	4580	105155
Other Minerals Nes	TON	3817136	5538145	3643829	4587040	3842874	4244574	3419980	5523312	4610149	8875576
Precious And Semi-precious Stones (cut And Uncut):total		1827026	14493857	2620113	12083066	1302266	23463605	1298993	50616826	1192004	20516238
Preciuos Metal Ores And Concentrates	KG	50001	484	--	--	260175	5435	26253	1265	26070	318
Quartz And Quartzite	TON	793394	5702081	944041	6087293	772127	6213690	965159	7559270	1069301	9221459
Rock Phosphate	TON	1651	46794	257	2015	825	5602	540	11316	532	19359
Salt (Other Than Common Salt)	TON	12755381	14627311	11681705	13681149	8260913	10571743	8863780	13393717	13631830	24294751
Sand (excl. Metal Bearing)	TON	3390	24451	1894	32610	1178	13630	619	17107	2761	4882
Sandstone	TON	1032376	13570942	795763	10434171	794445	11220825	691771	11282294	406815	5822370
Silica Sand	TON	3152	27793	2391	14934	43061	63008	825	4928	767	5944
Sillimanite	TON	9984	111874	1025	14961	4998	94359	3120	64355	2161	73954
Slate	TON	80536	2180250	61143	1983349	66335	2453970	68569	2733090	50909	2505184
Steatite	TON	259520	3764807	250649	3583316	283303	4364076	324593	5201974	338297	5626721
Sulphur (exc. Sublimed PrecipitedAnd Colloidal)	TON	479650	4332470	802175	3872834	802713	4328627	1290620	21010532	1554999	33267617
Tin Ores And Conc.	TON	++	54	++	1	--	--	--	--	++	17
Titanium Ores and Conc.	TON	359971	6566847	246203	4995763	246534	5348323	215910	6155343	143607	7288953
Tripoli Earth	TON	--	--	--	--	--	--	--	--	10	556
Tungsten Ores And Conc.	TON	34	43180	--	--	--	--	13	7139	--	--
Vanadium Ores and Conc.	TON	10	2320	10	10801	--	--	--	--	--	--
Vermiculite	TON	583	7251	634	7902	853	11573	1263	21780	989	12888
Witherite	TON	++	87	++	156	++	104	++	128	11	762
Wollastonite	TON	13786	279115	14582	298591	13716	311809	11705	282266	12847	365656
Zinc Ores And Conc.	TON	2078	71169	317	15828	399	20716	1762	46757	43877	182437
Zirconium Ores and Conc.	TON	89	4469	1	78	++	21	++	180	43	15779
Grand Total		**	**2191682036**	**	**1896831578**	**	**1966539540**	**	**2578629646**	**	**2423263731**

Source: DGCI&S, Kolkata
(P): Provisional -- : Nil ; ++ : Negligible ** : Not Additive

Annexure 2.3: Import (including Re-import) of Minerals for the period 2018-19 to 2022-23

(Value in ₹ '000)

Super Group Comm Name	Unit	2018-19		2019-20		2020-21		2021-22		2022-23(P)	
		Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Natural Gas	TON	21544664	738878610	24416607	684667281	25054872	583289424	23417029	1005206968	19852386	1372095889
Abrasive (natural)	TON	4941	74317	4234	59872	3221	55212	3718	78311	1994	65016
Alabaster	TON	1378	39474	1040	32801	826	27872	1572	59681	2388	113198
Alumina	TON	2856524	102946453	1844483	49829384	2334786	57491719	2549567	82447635	2407867	89152924
Andalusite	TON	14263	355232	17618	425962	15217	428831	10419	344730	14168	599795
Antimony Ores and Conc.	TON	7496	1609649	7656	1265983	5977	1072406	4555	1499919	6460	2708869
Arsenic Sulphide (natural)	TON	7	557	7	995	4	570	18	2119	12	448
Asbestos	TON	364107	12253121	361163	12432333	308506	11851124	437511	16631390	404154	22940349
Ball Clay	TON	175253	1579468	126794	1115239	65828	765439	93855	1134427	34761	715449
Barytes	TON	11498	266740	15436	427967	11691	313860	16577	523859	14241	476940
Bauxite	TON	2254595	13364136	2246681	10817757	3034041	13709540	3009079	18963241	3596098	23423723
Bentonite	TON	57232	868080	72618	882272	90933	1019395	142010	2131123	119280	1861091
Borax	TON	181625	5886234	176421	5644322	194448	6337254	223368	7973967	198719	10161598
Building And Monumental Stones Nes	TON	201754	850408	47971	523956	16327	360034	44482	422105	545687	926601
Calcite	TON	71713	346401	63458	302799	67643	374975	41688	290721	55362	381332
Chalk	TON	254	6143	105	4131	66	2661	64	2197	41	2191
Chromite	TON	162663	3154448	124693	2065047	156211	2257733	245710	4232459	111291	2969916
Clay (others)	TON	17482	319967	20961	317309	12562	241521	14245	279441	7152	355004
Coal(ex Ligbite)	THT	235355	1709323903	248545	1527478152	215260	1160506410	208636	2288189160	237678	3836139804
Coal:lignite	THT	1	8171	1	5170	1	5746	1	9495	2	19282
Cobolt Ores and Conc.	THT	1	4476	2	9253	++	325	1	6917	++	1766
Coke	THT	4933340	120756969	2912775	61067396	2463036	44821773	2501153	81047701	3639296	136398611
Copper Ores And Conc.	THT	823938	121462018	821555	86675247	415136	59071579	1018934	223814328	1178921	273744293
Corundum (natural)	THT	--	--	--	--	1	79	++	10	++	9
Diamond		**	1779709897	**	1487354319	**	1283511854	**	2056382187	**	2077695939
Diatomite	THT	3647	139462	4950	152229	7099	212766	1787	94373	3722	243082
Dolomite	THT	5869534	6743265	5539814	6555288	3505151	5075300	5510404	9682992	5672340	9944292

Super Group Comm Name	Unit	2018-19		2019-20		2020-21		2021-22		2022-23(P)	
		Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Earth Clay	THT	18	4254	2	343	3	450	2	247	--	--
Emerald (cut And Uncut)		**	36592287	**	24403510	**	7997796	**	16560915	**	32333990
Felspar (cut And Uncut)		**	96750	**	83631	**	8094	**	22005	**	43069
Felspar (natural)	TON	9490	100613	8198	101216	13187	78978	2795	54485	2107	52870
Fire Clay	TON	1293	88521	1896	100241	2326	100595	898	58418	1137	61115
Flint	TON	6886	76018	6279	62362	9209	85170	8611	83205	7874	82200
Fluorspar	TON	265443	7281833	239589	7225937	220573	6090596	286224	7792038	310173	11509548
Garnet(Cut And Uncut)		**	169836	**	184466	**	97335	**	183591	**	303072
Garnet(abrasive)	TON	422	6410	391	6189	345	14712	140	1789	30	929
Granite	TON	61960	1940629	56169	1846960	37304	1320021	35032	1279464	38427	1660364
Graphite(natural)	TON	47057	2328880	41405	1863220	40153	1808218	54047	2651642	45994	2939533
Gypsum	TON	6186253	9473416	5460746	8415195	4762012	7372934	5632758	11823817	6128694	13798597
Iron Ore	THT	12807	59136708	1245	9409772	766	8445221	6683	35389345	1790	15947473
Kaolin	TON	229733	3581700	231662	3933899	237144	4431804	223127	5048415	220124	7423589
Kieselguhr	TON	42	3994	66	9247	10	1543	++	64	6	520
Kyanite	TON	997	27590	1112	33476	1238	42080	1668	53418	1354	63110
Lead Ores And Conc.	TON	1499	85468	3283	166725	5473	325104	5325	255224	5558	294381
Limestone	TON	24397169	36665171	25639508	37429909	22797801	32911759	27582767	49014650	29736036	62593636
Magnesite	TON	464365	11120844	365053	9468163	364577	7657838	510898	13106490	502837	15431256
Manganese Ore	TON	2784473	48484512	4316572	41282100	4058590	55242138	6500149	96424799	4641809	82621009
Marble	TON	997194	20190596	951361	17923694	645253	12032307	1073654	21110673	1453668	29835923
Mica	TON	3684	1172720	3645	1280925	2987	1252020	3338	1319896	4068	1594113
Molybdenum Ores And Conc.	TON	11028	13606784	7901	9809780	9177	8848441	9114	15470962	10436	23316669
Nickel Ores And Conc.	TON	++	169	++	204	37	6404	106	16165	20	369
Niobium Or Tantalum Ores And Conc.	TON	156	264455	16	21764	2	489	2	488	1	242
Ochre	TON	38	11796	188	35754	391	82224	648	149495	438	153565
Other Minerals Nes	TON	683347	2821858	641544	2995670	544580	2325905	678649	4316773	1154993	4704343
Petroleum (crude)	THT	226452	7981583190	220869	7281122511	188182	4396561618	220034	9139168005	236665	13027071596

Super Group Comm Name	Unit	2018-19		2019-20		2020-21		2021-22		2022-23(P)	
		Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Precious And Semi-precious Stones (cut And Uncut):total		**	48292001	**	41191154	**	47935435	**	128825205	**	229220056
Preciuos Metal Ores And Concentrates	KG	201	159	273	736	10743	48509	799178	2376644	2541828	7346355
Quartz And Quartz-ite	TON	1662	54632	1155	40682	1098	50333	7792	211384	5854	306024
Rock Phosphate	TON	7519155	56379205	7654867	54205952	7781423	53709109	9659818	104667349	9091591	151370002
Salt (Other Than Common Salt)	TON	78712	472879	65263	466170	98042	645494	69549	512396	98986	908453
Sand (excl. Metal Bearing)	TON	390328	843983	198862	502131	57812	400291	5121	348319	5717	319717
Sandstone	TON	48	973	28	693	16	480	130	2691	28	1709
Silica Sand	TON	60896	400142	21392	218841	21356	238740	57095	527973	162087	747250
Sillimanite	TON	99	2403	609	10781	606	11571	801	13972	58	3424
Slate	TON	225	6867	111	3818	49	3784	109	5741	83	6744
Steatite	TON	7028	324573	5809	325939	5332	344649	9978	407255	10395	545770
Sulphu (exc. Sub-limed PrecipitedAnd Colloidal)	TON	1346775	15219696	1235102	8239656	1463291	10948268	1895211	35362092	1337789	26766634
Tin Ores And Conc.	TON	6	1259	++	206	2	899	++	299	++	366
Titanium Ores And Conc.	TON	97307	3013231	138042	3965292	78747	3440562	111653	5292058	68000	4969119
Tripoli Earth	TON	8	238	19	1116	--	--	19	1174	++	2
Tungsten Ores And Conc.	TON	461	64520	447	69234	121	9104	151	14800	423	142414
Vanadium Ores And Conc.	TON	2658	451825	7006	349104	999	77967	5869	436744	3661	209238
Vermiculite	TON	610	16154	416	11024	696	17234	1096	25520	2292	73873
Witherite	TON	++	96	7	263	++	10	--	--	--	--
Wollasonite	TON	26483	331612	22616	294800	24049	370375	30625	675667	41436	877192
Zinc Ores And Conc	TON	1422	38776	101	2667	804	9530	720	24772	1041	39415
Zirconium Ores And Conc.	TON	76077	8084381	56166	6073420	68675	6993378	94839	11260337	82831	15163201
Total		**	**12991864206**	**	**11515303006**	**	**7913202918**	**	**15513800326**	**	**21635991450**

Source: DGCI&S, Kolkata
(P): Provisional -- : Nil ; ++ : Negligible ** : Not Additive

Annexure 2.4 Reserves/Resources of Minerals as on 1.4.2020 (P) : India

Mineral	Unit	Reserves				Remaining Resources								Total
		Proved	Probable		Total	Feasibility	Pre-feasibility		Measured	Indicated	Inferred	Reconnaissance	Total	Resources
		STD111	STD121	STD122	(A)	STD211	STD221	STD222	STD331	STD332	STD333	STD334	(B)	(A+B)
Andalusite	000 tonnes	0	0	0	0	0	0	0	0	58040	56210	11800	126050	126050
Antimony														
Ore	tonne	0	0	7503	7503	0	0	592	0	0	10588	0	11180	18683
Metal	tonne	0	0	75	75	0	0	5.92	0	0	174	0	179.92	254.92
Apatite	tonne	27715	0	1680	29395	499149	0	0	2281521	11481250	5801338	1017646	21080904	21110299
Asbestos	tonne	0	0	0	0	2488022	3113446	4062376	100687	2527959	10557777	57800	22908067	22908067
Bauxite	000 tonnes	560865	15553	70076	646493	268398	128409	316835	526286	843058	2044653	184116	4311754	4958248
Borax	tonne	0	0	0	0	0	0	0	0	0	0	74204	74204	74204
Chromite	000 tonnes	40635	15229	22672	78535	52696	10545	44395	1630	53008	70440	20435	253150	331685
Cobalt (Ore)	million tonnes	0	0	0	0	0	0	0	30.63	2	0.28	12	44.91	44.91
Copper														
Ore	000 tonnes	128267	20045	15580	163891	83102	111376	41368	135884	340902	778987	5360	1496979	1660870
Metal	000 tonnes	1664.12	313.64	183.81	2161.57	873.59	428.09	246.48	1655.35	2748.95	4051.37	31.69	10035.52	12197.09
Diamond	carat	847400	0	159	847559	0	0	0	304601	1524317	29047514	0	30876432	31723991
Diatomite	000 tonnes	0	0	0	0	634	0	0	0	0	2251	0	2885	2885
Emerald	Kg	0	0	0	0	0	0	0	0	0	0	55869	55869	55869
Fluorite	tonne	228393	163860	11988	404241	9340556	771934	768573	1727945	6239589	1578067	161575	20588239	20992480
Garnet	tonne	8539521	50946	5	8590472	1835546	1624128	4622014	138905	10226601	28066885	902574	47416654	56007126
Gold														
Ore(Primary)	tonne	20271400	3420000	36700	23728100	4498133	3821500	1741321	9658248	109446798	238863938	126476333	494506270	518234370
Metal(Primary)	tonne	79.26	13.44	0.06	92.76	16.93	9.11	5.64	22.05	159.41	236.26	65.1	514.5	607.26
Ore(Placer)	tonne	0	0	0	0	0	0	0	0	2552000	23569000	0	26121000	26121000
Metal(Placer	tonne	0	0	0	0	0	0	0	0	2.29	3.57	0	5.86	5.86
Graphite	tonne	4386467	0	4176944	8563411	7964326	3461288	6166401	796464	10679490	31827080	142165128	203060176	211623587
Iron Ore (Haematite)	000 tonnes	4559856	508158	1141020	6209034	3181005	2404790	2005363	1010484	1805532	4827512	2614185	17848870	24057905

Mineral	Unit	Reserves				Remaining Resources								Total
		Proved	Probable		Total	Feasibility	Pre-feasibility		Measured	Indicated	Inferred	Reconnaissance	Total	Resources
		STD111	STD121	STD122	(A)	STD211	STD221	STD222	STD331	STD332	STD333	STD334	(B)	(A+B)
Iron Ore (Magnetite)	000 tonnes	71930	385	130508	202823	307652	16082	72127	1513168	2036982	6383274	695507	11024791	11227614
Kyanite	tonne	393358	331193	122314	846865	1331061	940452	1864398	561680	3577402	96560462	0	104835455	105682321
Lead & Zinc														
Ore	000 tonnes	28791	63331	11153	103275	4627	23663	13784	51613	196911	368094	4530	663222	766497
Lead Metal	000 tonnes	503.70	1188.47	208.02	1900.19	140.42	534.83	286.02	1117.33	2283.43	6607.77	0	10969.80	12869.99
Zinc Metal	000 tonnes	2356.56	4592.03	489.46	7438.05	448.15	1121.12	599.62	3540.38	5840.74	14080.66	101.65	25732.32	33170.37
Lead+Zinc Metal	000 tonnes	0	0	0	0	0	0	0	0	0	120.76	22.37	143.13	143.13
Limestone	000 tonnes	14701910	1065305	3261256	19028470	7665106	6442697	9261072	7528921	32250068	135833401	9579524	208560789	227589259
Magnesite	000 tonnes	57934	6354	1782	66070	80983	24858	40132	59010	59652	128104	309	393047	459118
Manganese Ore	000 tonnes	61510	6081	7450	75041	76106	51162	80580	29600	61205	117986	11944	428583	503624
Marl	tonne	50825000	17210000	110000	68145000	26474477	4189000	0	0	0	390000	0	31053477	99198477
Molybdenum														
Ore	tonne	0	0	0	0	0	1500000	0	2382000	3269204	19884394	167800	27203398	27203398
Contained MoS2	tonne	0	0	0	0	0	1050	0	1599.54	1733.29	12457.39	50.34	16890.56	16890.56
Nickel Ore	million tonnes	0	0	0	0	0	21	21	31	53	63	0	189	189
Perlite	000 tonnes	0	0	0	0	140	683	595	0	0	0	988	2406	2406
Platinum Group of Metals (PGM)	tonnes of metal contained	0	0	0	0	0	0	0	0	11.66	7.4	1.86	20.92	20.92
Potash	million tonnes	0	0	0	0	0	0	0	0	18151	4125	814	23091	23091
Pyrite	000 tonnes	0	0	0	0	27129	0	32597	9590	77729	1527356	0	1674401	1674401
Rare Earth Elements (REE)	tonne	0	0	0	0	0	0	0	0	430353	26042.49	3332	459727.49	459727.49
Rock Phosphate	tonne	27103158	0	3772935	30876093	13669080	29796846	34526541	2879833	3539750	186657066	9308275	280377392	311253485
Rock Salt	000 tonnes	0	3860	0	3860	3360	940	4620	0	0	0	0	8920	12780
Ruby	Kg	0	0	0	0	0	429	3296	0	0	1623	0	5349	5349
Sapphire	Kg	0	0	0	0	0	0	0	0	0	450	0	450	450

Mineral	Unit	Reserves				Remaining Resources								Total
		Proved	Probable		Total	Feasibility	Pre-feasibility		Measured	Indicated	Inferred	Reconnaissance	Total	Resources
		STD111	STD121	STD122	(A)	STD211	STD221	STD222	STD331	STD332	STD333	STD334	(B)	(A+B)
Sillimanite	tonne	7968445	3655	290200	8262300	503301	23406	20549508	4771654	17630364	16115664	4411195	64005091	72267391
Silver														
Ore	tonne	61604192	67971000	40870828	170446020	2330000	18445543	53914460	41320000	70926000	211261729	0	398197732	568643752
Metal	tonne	2155.3	4981.73	570.04	7707.07	172.2	824.44	663.67	3881.88	4575.73	12442.92	0	22560.84	30267.91
Sulphur (Native)	000 tonnes	0	0	0	0	0	0	0	0	0	210	0	210	210
Tin														
Ore	tonne	2075	0	25	2101	22594540	3213	31330134	168457	561080	29063370	0	83720794	83722895
Metal	tonne	963.19	0	10.8	973.99	33384.66	1116.41	54089.46	813.29	231.63	13147.46	0	102782.91	103756.9
Titanium	tonne	15914697	64860	19068	15998625	10928991	91828	0	2610618	49666080	344212444	3598565	411108526	427107150
Tungsten														
Ore	tonne	0	0	0	0	2230000	0	173063	23276152	23259954	23912049	16581246	89432464	89432464
Contained WO3	tonne	0	0	0	0	3568	0	450	19298.8	16994.84	99772.15	4566.28	144650.07	144650.07
Vanadium														
Ore	tonne	0	0	0	0	276530	1720000	4108100	0	232000	18297225	0	24633855	24633855
Contained V2O5	tonne	0	0	0	0	1106.12	2835	6032.4	0	487.2	54133.29	0	64594.01	64594.01
Vermiculite	tonne	1562108	0	28888	1590996	76900	71397	25956	9800	20179	552279	8716	765227	2356223
Wollastonite	tonne	2388641	190739	101598	2680978	4563016	1245009	8559760	0	3325042	4597200	137461	22427488	25108466
Zircon	tonne	669466	0	0	669466	422758	4225	0	140926	39300	1019770	47456	1674435	2343901

Note : Figures rounded off.P : Provisional

Annexure 2.5: Scenario of Mineral Rich States (Excluding Atomic, Fuel Minerals & Minor minerals)

Sl. No.	State	Value	Reporting Mines	Share of the State in country's production of MCDR minerals
1	ANDHRA PRADESH	13423744	120	Limestone(90%), Manganese Ore(10%)
2	ASSAM	609080	4	Limestone(100%)
3	BIHAR	327984	1	Limestone(100%)
4	CHHATTISGARH	185111147	112	Iron Ore(92%), Limestone(7%)
5	GOA	0	14	
6	GUJARAT	7146420	162	Limestone(77%), Bauxite(21%)
7	HIMACHAL PRADESH	2742102	27	Limestone(100%)
8	JAMMU AND KASHMIR	297134	19	Limestone(100%)
9	JHARKHAND	51583905	41	Iron Ore(94%), Bauxite(6%)
10	KARNATAKA	134138589	130	Iron Ore(86%), Limestone (6%), Gold(6%)
11	KERALA	317936	1	Limestone(100%)
12	MADHYA PRADESH	34861675	322	Limestone(49%), Manganese Ore(22%), Copper (18%)
13	MAHARASHTRA	33721395	95	Iron Ore(61%), Manganese Ore(25%), Limestone (12%)
14	MEGHALAYA	4127730	17	Limestone(100%)
15	ODISHA	541884080	122	Iron Ore(87%), Chromite(9%),Bauxite(4%)
16	RAJASTHAN	209025616	104	Zinc(44%), Silver(21%), Limestone(13%), Lead(12%)
17	TAMIL NADU	8203880	96	Limestone(93%), Magnesite(4%)
18	TELANGANA	5877673	34	Limestone(99%), Manganese Ore(1%)
19	UTTAR PRADESH	689063	3	Limestone(100%)
20	UTTARAKHAND	73598	2	Magnesite(100%)
			1426	

Source: MCDR Returns

ANNEXURE- 6.1 DETAILS OF ELEMENTS ANALYSED IN NGCM

Packages	Instruments	Elements to be detected
A	**XRF (24 elements)**	**SiO_2 (1000 ppm), Al_2O_3 (1000 ppm), Fe_2O_3 (1000 ppm), Tio_2(100 ppm), CaO (1000 ppm), MgO (1000 ppm), MnO (30 ppm), Na_2O (1000 ppm), K_2O (1000 ppm), P_2O_5 (100 ppm), Ba (50 ppm), Cr (15 ppm), Cu (1 ppm), Ga (5 ppm), Bb (5 ppm), Ni (2 ppm), Pb (2 ppm), Sc (3.5 ppm), V (20ppm), Y (5 ppm), Zn (10 ppm), Zr (5 ppm).**
B	GF-AAS	Au (ppb)
D	AAS with FIAS	Se (0.2 ppm)
E	ISE	F (100 ppm)
F	GF-AAS	Cd (0.1 ppm), Ag (0.02 ppm)
G	DMA	Hg (5 ppb)
H (Fusion Method)	ICP-MS (23 elements)	14 REE viz. La (1 ppm), Ce (2 ppm), Pr (0.5 ppm), Nd (0.5 ppm, Sm (0.5ppm), Eu (0.5 ppm), Gd (0.5 ppm) Tb (0.5 ppm) Dy (0.5 ppm), Ho (0.05 ppm), Er (0.5 ppm), Tm (0.5 ppm), Yb (0.5 ppm), Lu (0.5 ppm), and 9 other elements, viz. U (0.5 ppm), Ta (0.2 ppm), Ge (0.5 ppm), Be (0.3 ppm), Hf (0.5 ppm), Sn (1 ppm), As (1 ppm), Rb (3 ppm), Th (4 ppm).
I	FA-ICPMS/GFASS	**Pt (0.3 ppb) & Pd (0.2 ppb) (LLD not achievable)**
J (Acid Digestion method)	ICP-MS (9 elements)	**In (0.03 ppm), Tl (0.05 ppm), Cs (2 ppm), W (0.5 ppm), Mo (0.5 ppm), Sb (0.2 ppm), Bi (0.1 ppm), Te (0.02 ppm), Li (5 ppm).**
Water (A)		**pH, EC, HCO_3, Cl-, SO_4^{-2}, NO_3^-, Ca^{+2}, Na^{+1}, K^{+1}, PO_4, SiO_2 (upto ppm level)**
Water (B)	ICP-MS	**Li (10 ppb), Be (0.1 ppb), Al (25 ppb), Sc (10 ppb), Ti (5 ppb), V (5 ppb), Cr (5 ppb), Mn (0.5 ppb), Co (0.05 ppb), Ni (1 ppb), Cu (0.5 ppb), Zn (2 ppb), Ga (0.1 ppb), As (1 ppb), Rb (0.1 ppb), Sr (0.1 ppb), Y (0.01ppb), Mo (0.5 ppb), Ru (0.02 ppb), Rh (0.01 ppb), Ag (0.02 ppb), Cd (0.01ppb), Sn (0.3 ppb), Sb (0.02 ppb), Cs (0.02 ppb), Ba (1 ppb), La (0.03 ppb), Ce (0.04 ppb), Pr (0.01 ppb), Nd (0.03 ppb), Sm (0.03 ppb), Eu (0.03 ppb), Gd (0.02 ppb), Tb (0.01ppb), Dy (0.01ppb), Ho (0.01 ppb), Er (0.01 ppb), Tm (0.01 ppb), Yb (0.01ppb), Lu (0.01 ppb), Hf (0.05 ppb), Ta (0.03 ppb), W (0.5 ppb), Ir (0.01 ppb), Pt (0.03 ppb), Au (0.01ppb), Tl (0.01ppb), Pb (0.5 ppb), Bi (0.02 ppb), U (0.02 ppb), Fe (10 ppb).**
Water (C)		**Hg, F (upto ppb level)**

#Presently, analysis under package C is not carried out, instead Li, which was earlier analysed under Package C is in in Package J.

Annexure 6.2: Year wise / activity-wise financial performance of GSI against the approved budget outlay during F.Y. 2023-24 and be grant and expenditure upto december, 2023 and last quarter (January 2024 to March, 2024) of F.Y. 2023 and fund utilization during calendar year 2023.

(Rs In crore)

	F.Y. 2022-23						F.Y. 2023-24					Calendar Year 2023	
	Total BE Grant	**Total RE Grant**	**Expenditure (April,22 to Dec,22)**	**Availabl e RE Grant from Jan,23 to Mar, 2023**	**Expenditu re from Jan, 23 to Mar, 2023**	**Total Expenditure**	**Total BE Grant**	**Total RE Grant**	**Expenditure (April,23 to Dec 23)**	**Expenditure from Jan, 24 to Mar, 24)**	**Total Expenditure**	**Budge t from Jan 2023 to Dec., 2023**	**Expenditure from January 2023 to Dec, 2023**
Activities	**1**	**2**	**3**	**4 (2-3)**	**5**	**6 (3+5)**	**7**	**8**	**9**	**10**	**11 (8+9)**	**12 (4+9)**	13 (5+9)
Survey & Mapping (Mission-I)	108.92	115.75	99.58	16.17	15.96	115.54	135.00	123.40	118.13	5.05	123.18	134.30	134.09
Mineral Exploration (Mission-II)	52.70	63.0	48.15	14.85	14.78	62.93	63.00	66.15	50.72	15.34	66.06	65.57	65.50
Information Dissemination (Mission-III)	45.50	35.0	23.32	11.68	11.67	34.99	23.60	10.70	10.23	0.45	10.68	21.91	21.9
Spl. Invest & Other Exploration (Antarctica) (Mission-IV)	3.48	3.08	2.10	0.98	0.89	2.99	3.50	3.34	1.84	1.36	3.20	2.82	2.73
R&D (Mission-IV)	15.5	16.37	11.93	4.44	4.10	16.03	16.50	17.40	13.05	4.25	17.30	17.49	17.15
HRD (Mission-V)	2.0	2.0	1.68	0.32	0.32	2.0	2.10	2.10	1.40	0.70	2.10	1.72	1.72
Tribal Area Sub Plan (TSP)	20.0	20.70	14.54	6.16	6.10	20.64	17.50	18.40	17.46	0.91	18.37	23.62	23.56
Schedules Caste Sub Plan (SCSP)	31.1	32.45	31.17	1.28	1.25	32.42	33.50	35.24	24.23	10.92	35.15	25.51	25.48
Administrative Support Activities (ASA)	99.86	91.16	81.03	10.13	8.92	89.95	105.30	109.83	95.69	13.95	109.64	105.83	104.62
Establishment Expenditure	768.61	821.85	681.50	140.35	139.90	821.40	836.50	888.37	736.73	147.52	884.25	877.08	876.63
Total Revenue Fund	**1147.67**	**1201.36**	**995.0**	**206.36**	**203.9**	**1198.90**	**1236.50**	**1274.93**	**1069.48**	**200.45**	**1269.93**	**1275.85**	1273.38
Capital (Modernization & Replacement)	57.50	57.50	31.30	26.20	24.56	55.86	72.10	71.52	38.66	32.75	71.41	64.86	63.22
Total GSI Fund (Rev + Capital)	**1205.17**	**1258.86#**	**1026.30**	**232.56**	**228.46**	**1254.76**	**1308.60**	**1346.45***	**1108.14**	**233.20**	**1341.34**	**1340.71**	1336.60
% of Fund utilized against RE						**99.67%**					**99.62%**		

Total RE grant received Rs. 1251.91 crore for FY 2022-23. An additional amount of Rs.6.95.00 crore [SCSP-Rs.1.35 crore; TSP-Rs.0.70 crore; Salary-Rs.4.00 crore; OE-Rs.0.90 crore] has been provided to GSI vide Re-appropriation dated 16.12.2022; 08.02.2023; 14.02.23 & 15.03.2023 over and above RE-2022-23 [Rs.1251.91 crore].

* Total RE grant received Rs.1345.58 crore for F.Y 2023-24. An additional amount of Rs. 0.87 crore [Adv. & Publicity-Rs. 0.70 crore; Rs. 0.17 crore] has been provided to GSI vide Re-appropriation dated 01.02.2024 and 22.03.2024 over and above RE-2023-24[Rs.1345.58 crore]

Annexure 6.3: Performance related to various regulatory and development functions of IBM during the year 2023-24 (January 2023 to March 2024)

Sl. No.	Item	Annual Target	Achievement
1	Inspections (MCDR/MP/RMP/ FMCP)	1509	1754
2	Updating of National Mineral Inventory (NMI) adopting UNFC.	Release of NMI for all the minerals	Quinquennial updation of NMI as on 01.04.2020: The work involved processing, generation of outputs and preparation of comparative statements for finalization of NMI as on 01.04.2020 in respect of 46 major minerals was completed. The two publications titled "National Mineral Inventory as on 01.04.2020-At a glance" and "National Mineral Inventory as on 01.04.2020 - An overview" have been completed and uploaded on IBM website.
3	Drone Application	Use of Drone Technology.	A register of receipt of drone/ satellite data submitted by the lessees under rule 34A of MCDR 2017 is being maintained at IBM. During the year 2023-24 as on March 2024, 1513 mining leases data was received. Till March 2024, thirteen training programs over 112 days involving 124 nos. of technical officers have been provided for effective use of digital images by the officers. A Drone Data Management System (DDMS) application has been developed in- house by IBM under Mining Tenement System project for online submission of Digital Aerial Images under Rule 34A of MCDR 2017 and was commissioned since 01.06.2023
4	MSS	Generation of Triggers, sending to State Govt. for field verification	In fourth phase (2022-23), 138 Triggers for Major Minerals have been generated and sent to respective state Governments for field verification. So far field verification reports in respect of 40 triggers for major minerals have been received out of which unauthorized mining in seven cases of major minerals have been confirmed by the state governments.

Sl. No.	Item	Annual Target	Achievement
5	Generation of Land use classification of mining leases on GIS platform:	As per Ministry's direction, the information on Land use classification in shape/ KML files received from the lessee through Regional Offices was processed on GIS platform & finalized for each lease separately.	Cumulative progress so far up to December 2022 is: i) Total valid data received (.kml/.shp file) from lessee- 1229 Nos. (899Nos. Working; 330 Nos. Nonworking) ii) Data processed in GIS- 1229 Nos. (iii) land use classification map of 50 mining leases has been generated till March 2024.
6	OD Investigations	50	56
7	Chemical Analysis (No. of radicals)	31250	31032
8	Mineralogical Studies	2500	3618
9	In Plant Studies/ Plant visits	---	01
10	Technical Consultancy & Mining Research Activity	---	• Associated in formulation of offshore rules • "State of art Automation and Innovative Practices in Indian Non-Coal Mining Sector", draft is ready for publication. • Gold ore sampling work carried in association with M.P.D., IBM.
11	Training programmes by IBM.	16	16 training programmes have been conducted, in which a total of 349 IBM personnel, 333 Industry officials and 46 from the State Government officials have participated. • 633 IBM employees have completed 6 mandatory iGoT courses • 6 video lecutres of domain modules uploaded on iGoT platform • 8 video lectures of domain modules uploaded on IBM website • 2 video lectures uploaded on IBM you tube channel • Draft Capacity Building Plan prepared by engaging EY

Sl. No.	Item	Annual Target	Achievement
12	Development of various modules of MTS	Development of MTS	Registration, Returns and Mining Plan Modules of MTS were launched in 6th Mining Conclave on 12.7.2022. Development, testing & rolling out of following modules during 2023-24: ● Average Sale price (ASP) on 23.01.2024 ● Star Rating System on 31.03.2024 Development of following modules on 28.03.2024: ● World Mineral Intelligence (WMI) ● ML Directory ● National Mineral Inventory (NMI) Other Activities: ● Registration/ MPAS has been successfully integrated with NSWS portal ● Development of a Data Centre of 131 Terra bytes capacity at MTS Cell for storage of drone/satellite images ● Development, testing & roiling out of Drone Data Management System (DDMS) on 01.06.2023 ● Development of Mine Imagery Data Processing & Analysis System (MIDPAS) on 01.09.2023 ● Organized two sensitization workshops at Udaipur (01.03.2024) and Jabalpur (19.03.2024)

Annexure-6.4 : Mineral Wise Mining Lease (Other than Atomic, Hydro Carbons Energy and Minor Minerals) as on 31.03.2022 (P) (All India)

Sl. No.	Mineral	No. of Leases	Lease area (Hect.)
1	Amethyst	2	5.83
2	Apatite	1	13.47
3	Bauxite	335	23817.25
4	Borax	1	159.00
5	Chromite	19	3293.07
6	Copper ore	9	3916.85
7	Diamond	2	275.96
8	Emerald	1	46.32
9	Epidote	1	4.05
10	Fluorite	10	326.24
11	Garnet	28	154.68
12	Gold	10	6934.49
13	Graphite	32	1342.11
14	Iolite	5	61.26
15	Iron ore	321	50142.48
16	Kyanite	14	231.11
17	Lead & zinc ore	11	7274.25
18	Limeshell	25	1072.15
19	Limestone	1856	160922.08
20	Magnesite	36	2313.54
21	Manganese ore	217	10503.80
22	Moulding sand	6	39.24
23	Perlite	1	144.88
24	Rock phosphate	7	1534.24
25	Rock salt	1	8.12
26	Sapphire	1	673.40
27	Semi-precious stones	16	255.04
28	Selenite	04	625.35
29	Siliceous earth	35	271.71
30	Sillimanite	2	33.34
31	Stibnite	1	40.47
32	Tin	15	319.17
33	Vermiculite	55	951.30
34	Wollastonite	15	302.69
	Total	**3095**	**278008.94**

Sources: Respective State Governments (DGMs/DMGs, etc.) and list of mines maintained by IBM.

Note: The data received fromIBM have taken in account for preparation of All India Directory of List of Mines/ Mining leases. Data received from respective Regional offices of IBM have also been taken in account wherever necessary.

Annexure 8.1: Detailed time-lines and outcomes of ongoing and completed projects of JNARDDC, Nagpur

Completed projects: 07

S. No.	Project Title	Outcomes
1.	N-49: Demonstration cum heat treatment, leaching-recycling and liming study of JNARDDC-NALCO process (by utilising 50-60 kg batch of 1st cut SPL); NALCO Bhubaneshwar Mar 2022: 1 yr	Based on the success of bench scale studies (1kg) for detoxification of 1st cut SPL material and recovery of caustic and fluoride, JNARDDC undertook the Demonstration cum heat treatment, leaching-recycling, and liming study of JNARDDC-NALCO process by utilizing 50-60 kg batch of 1st cut SPL. The report provided the mass balance, CAPEX and OPEX for scaling up the process to a commercial level.
2.	P-61: TPN:59025 Instrument for Realtime measurement of anode current distribution of aluminium electrolysis cell. Dept of Science and Technology (DST, New Delhi) Mar 2021 (2y 9m)	The lead to the development of an instrument which will be able to make real-time continuous measurements of ACD in place of the existing manual measurement system for its successful commercialization in the industry.
3.	S-35: Geo-technological evaluation of Bauxite and Laterite deposits of Chhattisgarh State by using Geospatial technology under Smart Mining 4.0 (Chhattisgarh Council of Science & Technology, Government of Chhattisgarh, Raipur) Mar 2022 (2 yrs)	There is currently limited geo-technological information about Chhattisgarh bauxite and laterite deposits to confirm utilisation for metallurgical and non-metallurgical applications. Accordingly, JNARDDC joined with the Chhattisgarh Council of Science & Technology, Government of Chhattisgarh, Raipur, to undertake this project. The project lead to the creation of a digital database which will be highly useful in identifying suitable deposits for industrial applications using geo-informatics technology. It will assist the state govt in auctioning blocks. Efforts will be made to make the database available through the Mobile APP.
4.	S-36: Solid-state recycling of aluminium chips (waste) for production of billets for pilot scale extrusion Mar 2022 (2 yrs)	This project studied the process to utilise aluminium swarf/ chips (waste) of AA6063 and AA2024, which are generated during the machining of components, to produce aluminium billets for extrusion.
5-7	S-43, 44 & 45: Techno-Economic survey of Copper, Lead and Zinc recycling industry in India: Dec 2022 (1 yr)	The final report consisting of the survey will assist the Ministry of Mines in establishing the techno-economic status of the copper, lead and zinc recycling industry in the country and in due course help in the formulation of policies of the recycling industry.

Ongoing projects : 19

S. No.	Project Title with timeline	Outcomes / Remarks	Completion target
1.	S-37 / P-63: Technology Development for Holistic Utilization of Red Mud for Extraction of Metallic Value & Residue Utilisation [NML, Jamshedpur, IMMT, Bhubaneshwar, NALCO, HINDALCO & VEDANTA] under the aegis of NITI Aayog Oct 2021 (3 yrs)	Under the NITI Aayog initiative, the primary industries and 3 R&D labs have joined hands to develop feasible processing options for all metal extraction and REE enrichment from red mud and further research, development and commercialisation to other industries. The outcome will lead to the development of a Master Flowsheet for selected grades of red mud with energy and material balance equipped with techno- economic feasibility.	Oct-2024
2.	S-38: Red mud valorisation to achieve zero waste, conversion of residue into diagnostic x-ray shielding tiles after recovery of scandium (CSIR-AMPRI, Bhopal): Mar 2022 (2 yrs)	The main objective of this project is to convert red mud into economically useful, high- energy X-ray and gamma-ray shielding blocks suitable for building radiation therapy bunkers, nuclear power plants, food sterilisation plants, etc., and thereby promote the zero-waste concept.	Mar-2024
3.	S-39: Development of medium strength Al- Mg-Si (AA6082 based) alloy for high-end strategic applications (extruded or drawn tubes) (IIT Gandhinagar) May 2022 (2 yrs)	The aluminium tube industry is currently battling with low strength of the finished product using AA6082 alloy. This project aims to develop a medium-strength Al-Mg-Si (AA6082) based alloy with optimized composition and heat treatment schedule and achieve higher mechanical properties. Developing and indigenization of material for national space, aerospace and defence applications.	May-2024
4.	S-40: Un-diluted Recycling of Cast Aluminium Alloys Containing High Fe Impurity Suitable for SMEs (BML MUNJAL University, Gurgaon and Ramakrishna Engineering College, Coimbatore) May 2022 (2 yrs)	Presently the standard operating procedure to convert the Fe-rich ß-phase inter- metallics in aluminium alloys is unavailable. Hence JNARDDC, with its partners, has undertaken this project to address this need of the aluminium recycling industry to enhance the Fe tolerance of aluminium alloys. Removal of Fe in recycled aluminium will improve mechanical and metallurgical properties and reduce the cost by about 15% compared to dilution with primary aluminium. The findings will evolve the technical know-how for Fe reduction/ modification for recycling Zorba and assorted turnings scraps to suit SMEs and Aluminium scrap recycling industries.	May-2024

S. No.	Project Title with timeline	Outcomes / Remarks	Completion target
5.	S-41: Production of Onyx grade ATH (sodium bicarbonate route) using low-grade Bauxite from Kutch region of Gujarat. S&T(Mines) (Kalinga Institute of Industrial Technology, KIIT, Bhubaneshwar and industry partner - NIKNAM Chemicals Pvt. Ltd) July 2022 (2 yrs)	The Kutch bauxite deposits of Gujarat are low-grade ore due to low alumina and high iron and silica content. Hence it remains unutilised as it cannot be used for alumina production. The project aims to develop a novel process for obtaining onyx-grade ATH through the bicarbonate route. The innovative process may have multiple technical and operational advantages to produce onyx grade ATH, which is used to manufacture solid surface cast polymers/ synthetic marble applications. The product ATH for synthetic marble/onyx application will also be validated.	Jul-2024
6.	S-42: Fabrication of Al2O3 containing cellulose-based Ag NPs encapsulated collagen dressing and investigation of its therapeutic opportunities in diabetic wound healing (Kalinga Institute of Industrial Technology, Bhubaneshwar) Dec 2022 (2 yrs)	Chronic wounds are conventionally addressed using various FDA-approved silver- based formulations and other biomaterials. To overcome this issue an alternative material viz alumina (Al2O3) is being tried in wound management devices. R&D on Al2O3 will be done at JNARDDC and KIIT will use its facility at the School of Biotechnology for tests and validation related to animal toxicity and will source biological samples from its hospital (KIMS) for the developed healing material.	Dec-2024
7.	S-46: Development of low-cost filler material utilizing Lithomargic clay for the paint industry as per IS 68 2006 standard (Industry partner: Mundle Paint and Chemicals, Bhandara) Mar 2023 (2 yrs)	The bauxite deposits of Central India are associated with lithomargic clay resources. However, these resources are not used by mine owners as well as the aluminium industry. The project aims to utilize Lithomargic clay for the development of low-cost filler material for the paint industry as per IS:68 (2006) standards and to validate the product (filler) as per norms of Indian standards for the paint industry.	Mar-2025
8.	S-47: Development of prototype aluminium seat frame for passenger buses. (Joint project with Automotive Research Association of India) Jan 2023 (2 yrs)	The existing seat structure is made of steel material for a 2x2 passenger bus seat frame which weighs about 15-18 Kg per seat. The project aims to design and develop lightweight aluminium seat frames for passenger bus applications. Replacing it with medium-strength alloys such as AA6061, and AA6082 will bring a saving of 5-6 Kgs/seat. With the collaboration of ARAI, it is proposed to simulate the die design, die fabrication and extrude the profiles and validate the prototype of aluminium seat frame for passenger vehicles as per AIS 023 standard.	Jan-2025

S. No.	Project Title with timeline	Outcomes / Remarks	Completion target
9.	S-48 : Process for production of ATH with high whiteness using non-metallurgical grade bauxite by following soda sintering process : S&T(Mines) (With Institute of Chemical Technology (ICT) Mumbai Indian Oil Campus Bhubaneswar and Industry Partner : NIKNAM Chemicals PVT. Ltd) Jan 2024 (2 yrs)	Project aims for production of ATH with high whiteness using non-metallurgical grade bauxite by following soda sintering process leading to value addition	Jan-2026
10.	S-49 : An optimal approach for the retrieval of value-added substances from secondary aluminum black dross : S&T(Mines) Sri Ramakrishna Engineering College, Coimbatore Industry Partner : Phoenix Alloys Jan 2024 (2 yrs)	Project aims for retrieval of value-added substances from secondary aluminum black dross	Jan-2026
11.	N-47: Development of Process for 4N High Pure Alumina (HPA) and Substrate Making for its Validation in LED applications; Mar 2021(2½ Years) NALCO, Bhubaneswar Odisha: (IIT, Bhubaneswar & Anna Univ)	The project aims to develop an indigenous process to prepare 4N (99.99%) pure- grade alumina (HPA) that has the potential for use in LED applications.	Dec-2023
12.	N-48: Development of DC cast Al Alloy for Yoke in automobile applications, NALCO Bhubaneshwar (with ARAI Pune) May 2022 (2 Years)	An automotive yoke is usually made of steel or cast iron. Aluminium alloys are widely used in automotive applications due to their excellent strength-to-weight ratio, significantly reducing fuel consumption and enabling them to meet emission norms. The project aims to develop a new DC cast Al Alloy followed by the development of the prototype yoke used in automobile applications.	May-2024
13.	N-50: Kinetic study of different unit operations like digestion and desilication. NALCO, Bhubaneshwar Jul 2023 : (1½ yr)	The objective of this work is to study the digestion kinetics of process bauxite of NALCO and a mixture of process and desilicated bauxite at various parameters. Desilication kinetics will also be studied. Finally, the results will be evaluated using a suitable software at NALCO	Dec-2024

S. No.	Project Title with timeline	Outcomes / Remarks	Completion target
14.	N-51: Development of DC cast Al Alloy for Yoke in automobile applications, NALCO Bhubaneshwar (with ARAI Pune) May 2022 (2 Years)	The objective of the project is to carry out a comparative study by detailed thermal balance analysis of two numbers of cast house furnaces (highly efficient and low efficient) and explore the possibilities for improvement in energy efficiency.	Nov-2024
15.	P65:EE:53 Recycling coal mine to reuse as a value-added building material to promote a circular economy, Ministry of Coal (CPMDIL, BIT Mesra & VNIT): Sept 2023 (2 yrs)	The project aims to develop mix designs from coal mine overburden (COM) in homogenized slurry form for making building elements (panels, bricks and concrete) by heat treatment and geopolymer processes for their prospective use in urban and rural housing.	Sep-2025
16.	P67: Coal mine overburden alkali-activtated composites (CMOAAC) for pre-fabricated 3D volumetric construction elements & system thereof (3DVCES) CPMDIL, IIT-BHU & VNIT): Dec 2023 (2 yrs)	The objective is to review, design and develop the coal mine overburden alkali activated construction products (CMOAAC) for pre-fabricated 3D elements of viscoelastic materials by using alkali based additives which has prospective use in mass housing applications.	Dec-2025
17.	P-66 : Utilization of aluminium dross in synthetic slag preparation for secondary steel making" Daiki Aluminium Industry India Pvt. Ltd, Sricity, AP Dec 2023 (2 yrs)	The project aims to utilize aluminium dross in synthetic slag preparation for secondary steel making leading to effective utilization of industrial waste.	Dec-2025
18.	P-68 : Evaluation of CGM (Crystal growth modifier) Kiberlite Chemicals Pvt Ltd. Bangalore	Project aims to evaluate performance and dosages for optimization of CGM	Jun-2024
19.	P-69 : Performance evaluation of Dewatering aid (DEWA-369) chemicals Abhitech Energycon Ltd. Mumbai	Project aims to evaluate dewatering aid.	Jun-2024

Annexure 11.1: During FS 2022-23, a total of six items of Systematic Thematic Mapping (STM) on 1:25,000 scale, including one RP items have been taken up in NER of which two items were taken up in Arunachal Pradesh, one in Assam, two in Meghalaya and one in Sikkim. During the period from 1.01.2023 to 31.03.2023, an area of 577 sq. km had been covered respectively.

FS: 2022-23

Sr. No.	Item Type	Title of the Item	State	Target Achieved from 1.01.2023 to 31.03.2023
1	STM	Specialised Thematic Mapping in Koloriang-Sarli-Sakehugu-Damin areas to establish tectonic setting, geochemistry and geochronology of Se La and Bomdila groups and to precisely constrain the age of metamorphism of both the Groups in KurungKumey District, Arunachal Pradesh and to assess the economic potentiality of the study area	Arunachal Pradesh	108
2	STM	Specialised Thematic Mapping to establish tectonic setting, geochemistry and geochronology of Lumla Formation with respect to Se La and Bomdila groups and assess economic potentiality in Tawang-Lumlaareas, Tawang District, Arunachal Pradesh	Arunachal Pradesh	5
3	STM	Specialized Thematic Mapping in Belughat-Samelangso areas of KarbiAnglong district, Assam to delineate different litho units of AMGC, Shillong Group and to establish structural implication of Kaliyani shear zone for possible mineralization.	Assam	90
4	STM	Specialised Thematic Mapping around Phutamati-Jangrapara-Dandarigiri area to unravel the tectono-metamorphic evolution in northwestern part of AMGC, West Garo Hills district, Meghalaya.	Meghalaya	125
5	RP	Specialised Thematic Mapping to establish the lithofacies variation and depositional settings of Mahadek Formation around Ranikor, Lawbah, Mustoh and Dawki areas in South West and East Khasi Hills, East and West Jaintia Hills Districts of Meghalaya.	Meghalaya	156
6	STM	Specialized Thematic Mapping for delineation and characterization of Main Central Thrust (MCT) by mapping in parts of West & South Districts, Sikkim	Sikkim	93

Annexure 11.2: During FS 2023-24, a total of seven items of Systematic Thematic Mapping (STM) on 1:25,000 scale have been taken up in NER of which two items are being executed in Arunachal Pradesh, one in Assam, two in Meghalaya, one in Manipur Nagaland and one in Sikkim. During the period from 1.04.2023 to 31.03.2024, an area of 1441 sq. km has been covered.

FS: 2023-24

Sr. No.	Item Type	Title of the Item	State	Target Achieved from 1.04.2023 to 31.03.2024 (in sq km)
1	STM	Specialized Thematic Mapping to establish lithostratigraphy, tectonic setting, geochemistry and geochronology of Pari Mountain Gneiss, Bomdila Group and Dibang Group of rocks and assess economic potentiality in Lalpani- Tidding-Wakro areas, Lohit district Arunachal Pradesh	Arunachal Pradesh	220
2	STM	Specialised Thematic Mapping to establish tectonic setting, geochemistry and geochronology of Lumla Formation with respect to Se La and Bomdila groups and assess economic potentiality in Tawang-Lumlaareas,Tawang District, Arunachal Pradesh	Arunachal Pradesh	220
3	STM	Specialized Thematic Mapping in Kaphitali-Daboka-Parokhuwa areas of KarbiAnglong district, Assam to establish igneous complex and to bring out the structural implication of Kaliyani shear zone for possible mineralization.	Assam	220
4	STM	Specialized Thematic Mapping around Phutamati – Jangrapara -Dandarigiri area to unravel the tectono-metamorphic evolution in western part of AMGC, North and West Garo Hills district, Meghalaya.	Meghalaya	220
5	STM	Specialized Thematic Mapping in parts of the Palaeogene Sediments of Jaintia and Garo Groups, in parts ofSouth West Khasi Hills and South Garo Hills districts.	Meghalaya	110
6	STM	Specialised thematic mapping around Kohima-Viswema-Kezoma area, Nagaland to resolve the conundrum ofDisang-Barail contact	Manipur-Nagaland	220
7	STM	Specialized Thematic Mapping of Rangit Window and to demarcate the geometry & kinematics of associated duplex system vis a vis characterization of the alkaline ultra-potassic syenite/Lamprophyres patches inthe area of South and West Districts (Namchi, Gyalshing and Soreng Districts) of Sikkim.	Sikkim	231

Annexure 11.3: A total of 30 items of Geochemical Mapping on 1:50,000 scale with collection of samples in grid pattern had been taken up during the FS 2022-23 in parts of Arunachal Pradesh, Assam, Meghalaya, Tripura & Mizoram and Manipur-Nagaland. An area of 9345 sq km has been covered during the period from 1.01.2023 to 31.03.2023.

FS. 2022-23

Sr. No.	Item Type	Title of the Item	State	Target Achieved from 1.01.2023 to 31.03.2023 (in sqkm)
1	NGCM	Geochemical mapping in toposheet nos. 83E/5 & 83E/9 covering parts of Lower Subansiri districts of Arunachal Pradesh	Arunachal Pradesh	268
2	NGCM	Geochemical mapping in toposheet no.82P/16 covering parts of Lower Dibang Valley district, Arunachal Pradesh.	Arunachal Pradesh	239
3	NGCM	Geochemical mapping in toposheet no. 78M/14 covering parts of Tawang district of Arunachal Pradesh.	Arunachal Pradesh	16
4	NGCM	Geochemical mapping in toposheet no. 92A/01 covering parts of Lohit district of Arunachal Pradesh	Arunachal Pradesh	356
5	NGCM	Geochemical mapping in toposheet nos. 83I/1 and 83I/ 5 covering parts of Kamle and Upper Subansiri districts of Arunachal Pradesh	Arunachal Pradesh	296
6	NGCM	Geochemical mapping in Toposheet No. 83D/13 covering parts of Cachar District, Assam	Assam	248
7	NGCM	Geochemical mapping in toposheet no. 83B/13 and 83B/14 covering parts of Sonitpur and Nagaon Districts of Assam and East Kameng District of Arunachal Pradesh.	Assam	508
8	NGCM	Geochemical mapping in toposheet no. 83F/16 covering parts of Golaghat&KarbiAnglong districts of Assam and Wokha district of Nagaland	Assam	272
9	NGCM	Geochemical mapping in toposheet nos. 83B/9 and 83B/10covering parts of Sonitpur and Nagaon Districts of Assam and West Kameng district of Arunachal Pradesh.	Assam	388

Sr. No.	Item Type	Title of the Item	State	Target Achieved from 1.01.2023 to 31.03.2023 (in sqkm)
10	NGCM	Geochemical Mapping in parts of toposheet no. 78G/14 & 78 G/15 in West Garo Hills District, Meghalaya.	Meghalaya	525
11	NGCM	Geochemical mapping in parts of Toposheet No. 78K/04, 8, 12, 16 & 78O/04 covering West Garo Hills, South Garo Hills & South West Khasi Hills districts, Meghalaya.	Meghalaya	331
12	NGCM	Geochemical mapping in Toposheet No. 78K/3 covering parts of West Garo Hills districts, Meghalaya	Meghalaya	398
13	NGCM	Geochemical mapping in Toposheet no. 83G/15 in parts of Tamenglong, Senapati districts of Manipur and Peren District of Nagaland	Manipur-Nagaland	222
14	NGCM	Geochemical mapping in Toposheet no. 83G/16 in parts of Senapati and Kangpokpi districts, Manipur	Manipur-Nagaland	271
15	NGCM	Geochemical mapping in toposheet no. 83L/4 in parts of Tengnoupal and Chandel districts of Manipur.	Manipur-Nagaland	282
16	NGCM	Geochemical mapping in T.S. No. 83H/15 in parts of Bishnupur, Kakching and Churachandpur districts of Manipur	Manipur-Nagaland	260
17	NGCM	Geochemical mapping in Toposheet no. 83H/16 in parts of Churachandpur and Chandel districts of Manipur.	Manipur-Nagaland	300
18	NGCM	Geochemical mapping in Toposheet no. 83J/04 in parts of Wokha and Kohima districts of Nagaland and Golaghat District of Assam	Manipur-Nagaland	237
19	NGCM	Geochemical mapping in Toposheet no. 83J/08 in parts of Kohima, Mokokchung, Zunheboto, and Wokha Districts of Nagaland	Manipur-Nagaland	295
20	NGCM	Geochemical mapping in Toposheet no. 83J/12 in parts of Mokokchung, Tuensang, and Zunheboto districts, Nagaland	Manipur-Nagaland	185

Sr. No.	Item Type	Title of the Item	State	Target Achieved from 1.01.2023 to 31.03.2023 (in sqkm)
21	NGCM	Geochemical mapping in Toposheet No. 83J/11 in parts of Mokokchung, Tuensang, and Longleng districts, Nagaland	Manipur-Nagaland	206
22	NGCM	Geochemical Mapping in toposheet no 83D/12, covering parts of Kolasib&Mamit Districts of Mizoram; Hailakandi district of Assam.	Tripura-Mizoram	348
23	NGCM	Geochemical mapping in Toposheet no. 83H/16 in parts of Churachandpur and Chandel districts of Manipur.	Tripura-Mizoram	451
24	NGCM	Geochemical Mapping in toposheet no. 84A/15, covering parts of Aizawl &Serchhip districts, Mizoram.	Tripura -Mizoram	339
25	NGCM	Geochemical Mapping in toposheet no.84A/11, covering parts of Aizawl, Mamit&Lunglei districts, Mizoram.	Tripura-Mizoram	316
26	NGCM	Geochemical Mapping in toposheet no.84A/13, covering parts of Aizawl and Saitual districts, Mizoram.	Tripura-Mizoram	422
27	NGCM	Geochemical Mapping in toposheet no.84A/14, covering parts of Aizawl, Saitual&Serchhip districts, Mizoram.	Tripura-Mizoram	434
28	NGCM	Geochemical mapping in toposheet no. 83D/08 covering parts of North Tripura district of Tripura, Karimganj and Hailakandi districts of Assam and Mamit district of Mizoram.	Tripura -Mizoram	284
29	NGCM	Geochemical mapping in toposheet no. 83D/04 covering parts of North Tripura and Unakoti districts of Tripura.	Tripura-Mizoram	305
30	NGCM	Geochemical mapping in toposheet no. 84A/01 & parts of 84A/02 covering parts of North Tripura, Dhalai and Unakoti districts of Tripura.	Tripura-Mizoram	343

Annexure 11.4: Total 48 items of Geochemical Mapping on 1:50,000 scales with collection of samples in grid pattern is being executed during the FS 2023-24 in parts of Arunachal Pradesh, Assam, Manipur-Nagaland and Tripura & Mizoram. An area of 34606 sq km has been covered during 1.04.2023 to 31.03.2024.

FS: 2023-24

Sr. No.	Item Type	Title of the Item	State	Target Achieved from 1.04.2023 to 31.03.2024 (in sq km)
1	NGCM	Geochemical mapping in toposheet nos. 83N/5 & 83N/9 covering parts of Longding, Tirap and Changlang districts of Arunachal Pradesh	Arunachal Pradesh	624
2	NGCM	Geochemical mapping in Toposheet No. 83G/06 covering parts of Karbi Anglong East and Dima HasaoDistricts,Assam&Peren District, Nagaland.	Assam	344
3	NGCM	Geochemical mapping in Toposheet No. 83G/07 covering parts of Dima Hasao District, Assam and Peren District, Nagaland &Tamenglong district, Manipur.	Assam	700
4	NGCM	Geochemical mapping in Toposheet No. 83J/03 covering parts of Jorhat &Golaghat Districts, Assam and Wokha District, Nagaland	Assam	691
5	NGCM	Geochemical mapping in Toposheet No. 83J/06 covering parts of Jorhat District, Assam and Mokochung District, Nagaland.	Assam	690
6	NGCM	Geochemical mapping in Toposheet No. 83D/11 covering parts of Hailakandi and Aizwal districts, Assam and Mizoram.	Assam	702
7	NGCM	Geochemical mapping in Toposheet No. 83D/10 covering parts of Cachar, Hailakandi and Karimganj districts, Assam.	Assam	700

Sr. No.	Item Type	Title of the Item	State	Target Achieved from 1.04.2023 to 31.03.2024 (in sq km)
8	NGCM	Geochemical mapping in Toposheet no. 83F/01 and 83F/05 covering parts of Biswanath District of Assam and PekkaKessang and Papum Pare Districts of Arunachal Pradesh.	Assam	1260
9	NGCM	Geochemical mapping in toposheet No. 83H/01covering parts of Cachar, DimaHasao districts of Assam and Jiribam, Noney&Tamenglong districts of Manipur.	Assam	700
10	NGCM	Geochemical mapping in toposheet no. 83D/14 covering parts of Cachar and Hailakandi district of Assam	Assam	700
11	NGCM	Geochemical mapping in Toposheet No. 83D/9 & part of toposheet no 83D/5 covering parts of Cachar, Hailakandi and Karimganj districts, Assam.	Assam	904
12	NGCM	Geochemical mapping in toposheet no. 83F/9 covering parts of Sonitpur, Lakhimpur, and Sibsagar districts of Assam and East Kameng district of Arunachal Pradesh	Assam	929
13	NGCM	Geochemical mapping in parts of Toposheet No. 83D/05 & 06 covering parts of Cachar, Karimganj and Hailakandi Districts, Assam	Assam	960
14	NGCM	Geochemical mapping in Toposheet No. 83D/07 covering parts Kari-mganj and Hailakandi districts of Assam and North Tripura District of Tripura	Assam	702
15	NGCM	Geochemical mapping in Toposheet No. 83G/13covering parts of Go-laghat district of Assam and Dimapur, Kohima and Wokha districts of Nagaland	Assam	695

Sr. No.	Item Type	Title of the Item	State	Target Achieved from 1.04.2023 to 31.03.2024 (in sq km)
16	NGCM	Geochemical mapping in T.S. No. 83G/11 in parts of Peren District, Nagaland and Tamenglong District, Manipur	Manipur-Nagaland	728
17	NGCM	Geochemical mapping in Toposheet No. 83G/8 in parts of Tamenglong District, Manipur and CacharDistrict,Assam	Manipur-Nagaland	698
18	NGCM	Geochemical mapping in Toposheet No. 83G/10 in parts of Peren and Chumukedima districts, Nagaland and KarbiAnglong district, Assam	Manipur-Nagaland	695
19	NGCM	Geochemical mapping in Toposheet no. 83G/12 in parts of Perendistrict, Nagaland and Tamenglongdistrict,Manipur	Manipur-Nagaland	698
20	NGCM	Geochemical mapping in toposheet no. 83G/14 in parts of Kohima, Chumukedima and Peren districts of Nagaland and Senapati district of Manipur	Manipur-Nagaland	695
21	NGCM	Geochemical mapping in Toposheet no. 83H/12 and 83E/09 in parts of Churachandpur district of Manipur	Manipur-Nagaland	738
22	NGCM	Geochemical mapping in parts of Imphal West, Imphal East and Kangpokpi districts of Manipur in T.S. No.83H/13.	Manipur-Nagaland	700
23	NGCM	Geochemical mapping in parts of Imphal West, Imphal East, Thoubal, Bishnupur, Kakching and Senapatidistricts of Manipur in T.S. No. 83H/14	Manipur-Nagaland	700
24	NGCM	Geochemical mapping in Toposheet no. 83J/07 in parts of Mokokchung, Wokha districts of Nagaland andSibsagar District of Assam	Manipur-Nagaland	691

Sr. No.	Item Type	Title of the Item	State	Target Achieved from 1.04.2023 to 31.03.2024 (in sq km)
25	NGCM	Geochemical mapping in Toposheet No. 83J/10 in parts of Mokokchung, and Longleng districts of Nagaland andSibsagar district of Assam	Manipur-Nagaland	728
26	NGCM	Geochemical mapping in T.S.No. 83L/6 in parts of Kamjong&Tengnoupal districts of Manipur.	Manipur-Nagaland	658
27	NGCM	Geochemical mapping in toposheet no. Parts of 84E/05 & 84E/06 covering parts of Champhai&Khawzawl districts of Mizoram.	Tripura-Mizoram	875
28	NGCM	Geochemical mapping in parts of toposheet no. 84A/7, 84A/8 and 84B/5 covering parts of Lunglei and Mamit districts of Mizoram.	Tripura-Mizoram	744
29	NGCM	Geochemical mapping in toposheet no. parts of 84E/07 & 84E/08 covering parts of Champhai&Khawzawl districts of Mizoram.	Tripura-Mizoram	709
30	NGCM	Geochemical mapping in toposheet no. 84A/12 covering parts of Lunglei, and Serchhip districts of Mizoram.	Tripura-Mizoram	708
31	NGCM	Geochemical mapping in Toposheet No. 83G/13covering parts of Go-laghat district of Assam and Dimapur, Kohima and Wokha districts of Nagaland	Tripura-Mizoram	705
32	NGCM	Geochemical mapping in toposheet no. 84A/16 covering parts of Lunglei, Serchhip and Hnahthialdistricts of Mizoram	Tripura-Mizoram	709
33	NGCM	Geochemical Mapping in parts of Toposheet no. 84A/06& 84A/07, covering parts of Mamit district, Mizoram.	Tripura-Mizoram	789

Sr. No.	Item Type	Title of the Item	State	Target Achieved from 1.04.2023 to 31.03.2024 (in sq km)
34	NGCM	Geochemical mapping in toposheet no. 84B/09covering parts of Lunglei, district of Mizoram.	Tripura-Mizoram	710
35	NGCM	Geochemical Mapping in toposheet no.78P/15 and 83D/03, covering parts of Unnakoti, North Tripura district, Tripura &Karimganj district, Assam.	Tripura-Mizoram	575
36	NGCM	Geochemical Mapping in toposheet no 84B/12and 84B/16, covering parts of Saiha and Lawngtlai Districts of Mizoram.	Tripura-Mizoram	731
37	NGCM	Geochemical mapping in toposheet no. 84E/3 covering parts of Serchhip, Khawzawl and Champhai districts of Mizoram	Tripura-Mizoram	728
38	NGCM	Geochemical Mapping in toposheet no 84E/01, covering parts of Saithul, Khawzawl and Champai districts of Mizoram	Tripura-Mizoram	705
39	NGCM	Geochemical Mapping in toposheet no 84F/03 and 84F/04, covering parts of Saiha Districts of Mizoram.	Tripura-Mizoram	683
40	NGCM	Geochemical Mapping in toposheet 84B/11 & B/12, covering parts of Lawngtlai district of Mizoram	Tripura-Mizoram	704
41	NGCM	Geochemical mapping in toposheet no. 84E/4 covering parts of Hnahthial, Serchhip, Khawzawl and Champhai districts of Mizoram.	Tripura-Mizoram	644
42	NGCM	Geochemical Mapping in toposheet no. 84B/15, covering parts of Lawngtlai&Saiha Districts of Mizoram.	Tripura-Mizoram	713

Sr. No.	Item Type	Title of the Item	State	Target Achieved from 1.04.2023 to 31.03.2024 (in sq km)
43	NGCM	Geochemical Mapping in toposheet 84F/01 & 02, covering parts of Hnahthial, Lawngtlai&Saiha Districts of Mizoram	Tripura-Mizoram	690
44	NGCM	Geochemical mapping in toposheet no. 83D/15 covering parts of Aizawl and Kolasib districts of Mizoram and Cachar district of Assam	Tripura-Mizoram	702
45	NGCM	Geochemical mapping in toposheet no. 84B/10 covering the parts of Lunglei and Lawngtlai districts of Mizoram.	Tripura-Mizoram	625
46	NGCM	Geochemical mapping in toposheet no. 84B/13 covering parts of Lunglei and Saiha districts of Mizoram.	Tripura-Mizoram	710
47	NGCM	Geochemical mapping in toposheet no. 84B/14 covering parts of Lunglei, Saiha and Lawngtlai districts of Mizoram.	Tripura-Mizoram	711
48	NGCM	Geochemical mapping in toposheet no. 84E/2 covering parts of Saitual, Khawzawl and Champhai districts of Mizoram.	Tripura-Mizoram	706

Annexure 11.5: As a part of FS 2022-23 Two GPM Items had been executed by GSI, NER. During the period 1.01.2023 to 31.03.2023 a total area of 2016 sq km had been covered.

FS. 2022-23

Sr. No.	Item Type	Title of the Item	State	Target Achieved from 1.01.2023 to 31.03.2023
1	GPM	Ground Gravity-Magnetic Survey under National Geophysical Mapping Programme in Toposheet Nos. 78K/ 1 & 2 covering parts of North, West and Southwest Garo Hills	RHQ	1026
2	GPM	Ground Gravity-Magnetic Survey under National Geophysical Mapping Programme in Toposheet Nos. 78K/ 3 & 7 covering parts of West, South and Southwest Garo Hills districts, Meghalaya.	RHQ	990

Annexure 11.6: Two GPM items in South-East Hills districts, Meghalaya and East Khasi and East Jaintia Hills districts, Meghalaya is being executed during FS 2023-24 and an area of 2800 sq km have been covered during the period from 1.04.2023 to 31.03.2024

FS: 2023-24

Sr. No.	Item Type	Title of the Item	State	Target Achieved from 1.04.2023 to 31.03.2024 (in sq km)
1	PGRS	Ground Gravity-Magnetic Survey under National Geophysical Mapping Programme in Toposheet Nos.78K/11 (Part), 78K/12, 78G/14,78G/15 covering parts of South, East Garo Hills districts, Meghalaya, Dhubri District, Assam	RHQ	1400
2	PGRS	Ground Gravity-Magnetic Survey under National Geophysical Mapping Programme in Toposheet Nos.78O/4,78O/12,83C/6 covering parts of East Khasi Hills, East Jaintia hills districts of Meghalaya, Karbi Anglong district of Assam	RHQ	1400

Annexure 11.7: Two items of Photo Geology and Remote Sensing (PGRS) had been taken up on 1:50,000 Scale during FS 2022-23 to carry out the alteration zone mapping in West Garo Hills, North Garo Hills, East Garo Hills and South Garo Hills district of Meghalaya using ASTER data. The total target of 3650 sq km had been completed during the period from 1.01.2023 to 31.03.2023.

FS: 2022-23

Sr. No.	Item Type	Title of the Item	State	Target Achieved from 1.01.2023 to 31.03.2023 (in sq km)
1	PGRS	Alteration zone mapping in West Garo Hills, East Garo Hills, North Garo Hills districts, Meghalaya using ASTER data falling in toposheets no. 78K/1, 78K/2, 78K/5, 78K/6, 78K/7, 78K/9, 78K/10, 78K/11	RHQ	1700
2	PGRS	Alteration zone mapping in East Garo Hills, South Garo Hills & West Khasi Hills districts, Meghalaya using ASTER data falling in toposheets no. 78K/5, 78K/6, 78K/7, 78K/9, 78K/10, 78K/11, 78K/13, 78K/14, 78K/15	RHQ	1950

Annexure-11.8: During the FS 2023- 24, two items of Photo Geology and Remote Sensing (PGRS) is being executed on 1:50,000 Scale in parts of Meghalaya, Assam and Sikkim states by using ASTER data. A total area of 21150 sq. km has been completed during the period from 1.04.2023 to 31.03.2024.

FS: 2023-24

Sr. No.	Item Type	Title of the Item	State	Target Achieved from 1.04.2023 to 31.03.2024 (in sq km)
1	PGRS	Spectral Geological/Surface mineral mapping using space borne multispectral ASTER data on 1:50,000 scale in OGP areas of Assam Meghalaya Gneissic Complex, Shillong Group, Alkaline Complexes	RHQ	9930
2	PGRS	Spectral Geological/Surface mineral mapping using space borne multispectral ASTER data on 1:50,000 scale in OGP areas of Sikkim Himalayan belt, Assam Meghalaya Gneissic Complex, Sylhet traps.	RHQ	11220

Annexure-11.9: Details of mineral exploration items taken up in NER during FS 2022-23 and 2023-24.

FS: 2022-23

Sl. No.	Title	State	Commodity
1	Preliminary exploration for limestone in Sikilangso block, Dima Hasao district, Assam	G3	Limestone
2	Preliminary investigation for placer gold in Geruamukh block, Dhemaji District, Assam	G3	Placer Gold
3	Preliminary exploration for REE and associated minerals in Krawgaon block, Jashora Alkaline Complex, West Karbi Anglong district, Assam.	G3	REE
4	Reconnaissance survey for Mo, REE and associated mineralisation in and around Magursila area, Kamrup (Metro) district, Assam.	G4	Mo, REE
5	Reconnaissance survey for REE and associated minerals in Anjakpani-Rionpahar area of Diju valley, Nogaon and Karbi Anglong districts, Assam.	G4	REE
6	Reconnaissance survey for REE and associated minerals in and around Paschim Nagaon and Sonaikuchi areas, Kamrup (Metro) and Morigaon Districts, Assam.	G4	REE
7	Reconnaissance Survey for Cr, Ni, PGE and associated minerals around Kamjong-Pihang- Bhungpa villages, Manipur Ophiolite Belt, Kamjong District, Manipur	G4	Cr, Ni, PGE
8	Reconnaissance survey for lithium bearing brine waters in and around Hutsu and Phor areas, Phek District, Nagaland	G4	Lithium
9	Reconnaissance survey for REE in Girujan Clay around Jharnapani, Dimapur District, Nagaland.	G4	REE
10	Reconnaissance survey of coal around Satsukba and Sahaphumi area of Mokokchung District, Nagaland	G4	Coal
11	Reconnaissance survey for limestone in Khongjiri and Khongka area, Kiphire District, Nagaland	G4	Limestone
12	Reconnaissance survey for Polymetallic - molybdenum, tungsten, REE, lithium, and associated mineralization around Mylliem and Lailynkhwir area, East Khasi Hills district, Meghalaya.	G4	Polymetallic

Sl. No.	Title	State	Commodity
13	Reconnaissance survey for REE and associated elements in parts of Seinduli Pluton in West Khasi Hills District, Meghalaya	G4	REE
14	Reconnaissance survey for Lithium and associated mineralization in andaround Williamnagar-Nengkhra area East Garo Hills District, Meghalaya	G4	Lithium
15	Reconnaissance survey of Tungsten and associated mineralization in Rongjeng-Darugri-Nongchram Block, East Garo Hills, District, Meghalaya.	G4	Tungsten
16	Reconnaissance survey for REE, lithium and associated mineralization around Amjong, Umtrai and Umlaber area, Ri-Bhoi district, Meghalaya	G4	REE, Lithium
17	Reconnaissance survey for reappraisal for sillimanite, lithium and associated mineralization in Mangsang- Niangbrakithim Block, East Garo hill District, Meghalaya	G4	Sillimanite, lithium
18	Preliminary Exploration for Vanadium, graphite and associated minerals around Sito-Sikhe areas, Lower Subansiri District, Arunachal Pradesh	G3	Vanadium, graphite
19	Preliminary Exploration for Vanadium, Graphite and associated minerals around Pakro block, PakkeKessang district, Arunachal Pradesh	G3	Vanadium, graphite
20	Reconnaissance survey for phosphorite mineralisation in meta-sedimentary sequence of Bomdila Group in Menga area, Upper Subansiri District, Arunachal Pradesh.	G4	Phosphorite
21	Reconnaissance survey for Lithium from deep seated brine pools in and around Pullung, Paniduriya, Borduria and Kaimoi area of Tirap district, Arunachal Pradesh.	G4	Lithium
22	Reconnaissance survey for vanadium and graphite mineralisation in the metasedimentary sequence of Bomdila Group of rocks in and around SikuAngu and Lipu, West Siang District, Arunachal Pradesh	G4	Vanadium, graphite

FS: 2023-24

Sl. No.	Title	UNFC Stage	Commodity
1	Preliminary exploration for vanadium, graphite and associated minerals around Kugitago - Miya areas, Lower Subansiri district, Arunachal Pradesh	G3	Vanadium, graphite
2	Reconnaissance survey for REE in Techipu area, KurungKumey District, Arunachal Pradesh.	G4	REE
3	Reconnaissance survey for limestone of Chilliepam Formation of Bomdila Group in and around Hugu and Sakehugu area Kurung Kumey district, Arunachal Pradesh	G4	Limestone
4	Reconnaissance survey for limestone in and around Puging-Paling-Janbo - Likor areas, Upper Siang district, Arunachal Pradesh.	G4	Limestone
5	Reconnaissance survey for phosphorite mineralisation in Lower Gondwana rocks in Garu - Gensi area, Lower Siang District, Arunachal Pradesh.	G4	Phosphorite
6	Preliminary exploration for vanadium, graphite, limestone and associated mineralisation in the metasedimentary sequence of Bomdila Group of rocks in Daba Gamlin block, West Siang District, Arunachal Pradesh	G3	Vanadium, graphite, Limestone
7	Preliminary exploration for REE and associated minerals in Krogaon block, Jashora Alkaline Preliminary exploration for REE and associated minerals in Krogaon block, Jashora Alkaline	G3	REE
8	Preliminary exploration for limestone in Krungming Block, Dima Hasao district, Assam	G3	Limestone
9	Reconnaissance survey for REE and associated mineralisation in Chelear - Rongpham area, West KarbiAnglong District, Assam.	G4	REE
10	Reconnaissance survey for placer gold in and around Dikrang River basin, Lakhimpur and Sonitpur districts,Assam.	G4	Placer Gold

Sl. No.	Title	UNFC Stage	Commodity
11	Reconnaissance survey for REE and associated minerals in coal and associated clay beds in and around Lido-Tikok - Tipangpani area, Tinsukia District, Assam.	G4	REE
12	Reconnaissance survey for re-appraisal for base metal in the Shillong group of rocks around Mawlong block, East Khasi Hills District, Meghalaya.	G4	Basemetal
13	Reconnaissance survey of REE, Li and associated mineralisation in central parts of South Khasi Batholith near Pariong, Sohma areas in South West Khasi Hills district, Meghalaya	G4	REE, Li
14	Reconnaissance survey of REE, Sn, Li and associated mineralization around Mawphir area of South Khasi Batholith in South West Khasi Hills district, Meghalaya.	G4	REE, Sn, Li
15	Reconnaissance survey for REE, lithium and associated mineralization around Kyllang Nongthymmai and Mawjasksaw, West Khasi Hills district, Meghalaya.	G4	REE, lithium
16	Reconnaissance survey for REE and associated mineralization in and around Purduwa area, Ri-Bhoi district, Meghalaya.	G4	REE
17	Reconnaissance Survey for limestone to the west of Siju Area, South Garo Hills District, Meghalaya.	G4	Limestone
18	Reconnaissance survey of limestone around Chokpot Area, South Garo Hills District, Meghalaya.	G4	Limestone
19	Preliminary Exploration for Limestone in Khunti Block, Litang Valley, East Jaintia Hills District, Meghalaya.	G3	Limestone
20	Reconnaissance survey for lithium and associated mineralisation in Darang area, South Garo Hills and East Garo Hills District, Meghalaya.	G4	Lithium
21	Petrogenesis of gold bearing mafic-ultramafic rocks of Naga Hills Ophiolite (NHO) around Sutsu - Washello, Phek District, Nagaland: Constrain from mineral chemistry, geochemistry and isotopic studies.	RP	Gold

Sl. No.	Title	UNFC Stage	Commodity
22	Preliminary investigation of iron ore around Purr-Sutsu, Phek District, Nagaland.	G3	Iron
23	Preliminary exploration for nickeliferous laterite in Naga Hills Ophiolite near Mollen, Phek, Nagaland.	G3	Nickel
24	Reconnaissance survey for coal around Lakhuti, Akuk and Mekola, Wokha District, Nagaland.	G4	Coal
25	Reconnaissance survey for gold and associated minerals in between Lingdum and Tumin area, Gangtok district Sikkim.	G4	Gold

Annexure 14.1: List of Nodal Officers, CPIOs and Appellate Authorities in Ministry of Mines

Nodal Officer (RTI)	CPIO (RTI)	ACPIO (RTI)
Shri Sukhdeep Singh, Joint Director Room No.: 315-A, D Wing, III Floor, Shastri Bhawan, New Delhi - 110 001 Tel No.: 23073046 E-mail: sukhdeep.singh1@gov.in	**Sh. Rakesh Thapliyal Under Secretary** Room No.: 303,D Wing III Floor, Shastri Bhawan, New Delhi - 110001 Tel No. : 23380610 E mail- rakesh.thapliyal83@nic.in	**Sh. Ketan Meena Section Officer** Room No.: 305-D Wing, III Floor, Shastri Bhawan, New Delhi – 110 001 Tel No.: 23384225 Email: ketan.meena@gov.in

Sl. No.	CPIO	Subject matter dealt (Section)	Appellate Authority
1.	**Sh. Prakash S. Mundharikar Under Secretary** Room No.: 303-D Wing, III Floor, Shastri Bhawan, New Delhi - 110001 Tel No. : 23381631 E-mail : prakash.m69@nic.in	Parliament	**Shri Smarajit Kumar Biswas, Director** Room No.: 312-D Wing, III Floor, Shastri Bhawan, New Delhi - 110 001 Tel No.: 23387223 E-mail: smarajit.kr@gov.in
		Establishment	**Shri A.R. Sengupta, Director** Room No.: 309-D Wing, III Floor, Shastri Bhawan, New Delhi – 110001 Tel No. :23381172 E-mail : ar.sengupta@nic.in
		Administration (including Cash, Library & Records, R & I)	
		ACC/ Board level postings for PSU/ Attached Offices/ Subordinates Offices/ Autonomous Bodies	**Shri R. P. Gupta, Director** Room No.: 101-D Wing, Ist Floor, Shastri Bhawan, New Delhi - 110 001 Tel No.: 23388487 E-mail: rp.gupta01@nic.in

Sl. No.	CPIO	Subject matter dealt (Section)	Appellate Authority
2.	**Sh. Vinod Kumar Under Secretary** Room No.: 303-D Wing, III Floor, Shastri Bhawan, New Delhi - 110001 Tel No. : -23383946 E-mail : vinod.kr71@nic.in	Vigilance	**Shri Smarajit Kumar Biswas, Director** Room No.: 312-D Wing, III Floor, Shastri Bhawan, New Delhi - 110 001 Tel No.: 23387223 E-mail: smarajit.kr@gov.in
		Metal-III (Copper & related matters, HCL, etc.)	**Shri Vivek Kumar Sharma, Director** Room No.: -308 D Wing, III Floor, Shastri Bhawan, New Delhi - 110001 Tel No.: - 23388345 E-mail: vksharma.ofb@gov.in
		Mines VI Desk (Area Reservation & Relaxation) and Court Cases pertaining to Mines- VI Section (Act, Legislation & Policy issues) Legislation & legal matters, All Rule & Policy related work LIMBS (All Legal cases) Monitoring and Coordination of all legal matter. Offshore Mining, OAMDR related work and Illegal mining of Beach Sand Minerals	**Shri Mustaq Ahmad, Director** Room No.: 313-D Wing, III Floor, Shastri Bhawan, New Delhi - 110001 Tel No. : 23383576 E-mail: mustaqahmad.dad@gov.in

Sl. No.	CPIO	Subject matter dealt (Section)	Appellate Authority
3.	**Sh. Rakesh Thapliyal Under Secretary Room** No.: 303,D Wing III Floor, Shastri Bhawan, New Delhi - 110001 Tel No. : 23380610 E mail- rakesh.thapliyal83@nic.in	Mines IV Section: Review of Auction by State Govt. Auction by Central Government, Asset Monetization	**Shri. Dheeraj Kumar, Deputy Secretary** Room No.: -307 D Wing III Floor, Shastri Bhawan, New Delhi - 110001 Tel No.: - 23388061 E-mail: dheeraj.kumar83@gov.in
		Mines IV Section : Review of operationalization of blocks, Sand Mining & DMF, PMKKKY, NITI Aayog's related references	**Shri. Manish Kumar, Deputy Secretary** Room No.: 315-D Wing, III Floor, Shastri Bhawan, New Delhi – 110001 Tel No. : 23070260 E-mail: ms285.ifs@nic.in
		Public Grievance & Public Information Cell and RTI Matters	**Shri Sukhdeep Singh, Joint Director** Room No.: 315-A, D Wing, III Floor, Shastri Bhawan, New Delhi - 110 001 Tel No.: 23073046 E-mail: sukhdeep.singh1@gov.in
4.	**Sh. Shrinath Chauhan Under Secretary** Room No.: 115-A, F Wing, I Floor, Shastri Bhawan, New Delhi - 110001 Tel. No: 23382516 E-mail : vikas.raj@nic.in	Metal-I (Aluminium & Bauxite matters and NALCO etc.)	**Shri Vivek Kumar Sharma, Director** Room No.: -308 D Wing, III Floor, Shastri Bhawan, New Delhi - 110001 Tel No.: - 23388345 E-mail: vksharma.ofb@gov.in
		Metal- IV (Science and Technology projects & institutions including NIRM, & JNARDDC	**Shri R. P. Gupta, Director** Room No.: 101-D Wing, Ist Floor, Shastri Bhawan, New Delhi - 110 001 Tel No.: 23388487 E-mail: rp.gupta01@nic.in

Sl. No.	CPIO	Subject matter dealt (Section)	Appellate Authority
		Metal-I (Aluminium & Bauxite matters), (NALCO, KABIL etc.)	**Sh. Sanjeev Verma, Director** Room No.: 315-D Wing, III Floor, Shastri Bhawan, New Delhi - 110001 Tel No. : 23070260 E-mail : sanjeev.verma79@gov.in
5.	**Sh. Abhishek Kumar Upadhyaya Under Secretary** Room No.: 314-D Wing, III Floor, Shastri Bhawan, New Delhi - 110001 Tel No. : -23384743 E-mail : ak.upadhyaya@nic.in	National Conclave on Mines and Minerals Conferences/ Workshop/Meetings	**Shri Smarajit Kumar Biswas, Director** Room No.: 312-D Wing, III Floor, Shastri Bhawan, New Delhi - 110 001 Tel No.: 23387223 E-mail: smarajit.kr@gov.in
		Coordination	
		Information Technology	**Shri Vivek Kumar Sharma, Director** Room No.: -308 D Wing, III Floor, Shastri Bhawan, New Delhi - 110001 Tel No.: - 23388345 E-mail: vksharma.ofb@gov.in
6.	**Sh. Thaneshwar Kumar Under Secretary** Room No.: 302 D Wing III Floor, Shastri Bhawan, New Delhi – 110001 Tel No.: - 23382818 E-mail: k.thanshwar@nic.in	Mines I: (Exploration Matters) (MECL, GSI), All Technical matters including exploration and Survey, National Geo-science Award, Budget, FSP etc. (Including IGC matters)	**Shri Pradeep Singh, Director** Room No.: 306-D Wing, III Floor, Shastri Bhawan, New Delhi - 110001 Tel No. : 23385329 E-mail dirtech.mom@nic.in
		Mines II (GSI Establishment matters)	**Shri. Manish Kumar, Deputy Secretary** Room No.: 315-D Wing, III Floor, Shastri Bhawan, New Delhi – 110001 Tel No. : 23070260 E-mail: ms285.ifs@nic.in

Sl. No.	CPIO	Subject matter dealt (Section)	Appellate Authority
		Mines III (IBM Matters, IBM Estt. & Budget Matters, MTS, MSS, Star Rating etc.	**Shri R. P. Gupta, Director** Room No.: 101-D Wing, Ist Floor, Shastri Bhawan, New Delhi - 110 001 Tel No.: 23388487 E-mail: rp.gupta01@nic.in
7.		Integrated Finance	**Shri Alok Kumar, Deputy Secretary** Room No.: -303 D Wing, III Floor, Shastri Bhawan, New Delhi - 110001 Tel No.: - 23385189 E-mail: aalok.kumar@nic.in
8.	**Sh. Yogesh Agarwal Assistant** Room No.: 114-F Wing, I Floor, Shastri Bhawan, New Delhi – 110 001 Tel No.: 23071006 E-mail: nmet- mines@gov.in	NMET Cell	**Shri. Manish Kumar, Deputy Secretary** Room No.: 315-D Wing, III Floor, Shastri Bhawan, New Delhi – 110001 Tel No. : 23070260 E-mail: ms285.ifs@nic.in
9.	**Smt. Bandana M Tirkey Deputy Director** Room No.: 301-D Wing, III Floor, Shastri Bhawan, New Delhi - 110001 Tel No. : 23383085 E-mail: bandana.m@gov.in	Official Language Hindi	**Shri Alok Kumar, Deputy Secretary** Room No.: -303 D Wing, III Floor, Shastri Bhawan, New Delhi - 110001 Tel No.: - 23385189 E-mail: aalok.kumar@nic.in

Sl. No.	CPIO	Subject matter dealt (Section)	Appellate Authority
10.	**Sh. Nitin Bharti** **Section Officer** Room No.: 301-D Wing, III Floor, Shastri Bhawan, New Delhi - 110001 Tel No. : 23384225 E-mail : mines5.mom@nic.in	Mines V Policy, DGFT matters, Illegal Mining (all cases except Beach Sand Minerals), Royalty Study Group	**Shri. Manish Kumar, Deputy Secretary** Room No.: 315-D Wing, III Floor, Shastri Bhawan, New Delhi – 110001 Tel No. : 23070260 E-mail: ms285.ifs@nic.in
11.	**Sh. Omkar Singh** **Section Officer** Room No.: 301-D Wing, III Floor, Shastri Bhawan, New Delhi - 110001 Tel No. : 23384225 E-mail : ic.dom@nic.in	International Cooperation (including KABIL, G20 Matters etc)	**Sh. Ajay Kumar Kadian Under Secretary** Room No.: 314-D Wing, III Floor, Shastri Bhawan, New Delhi - 110001 Tel No. : 23070376 E-mail: ajay.kadian@nic.in
12.	**Sh. Dileep Kumar Meena** **Section Officer** Room No.: 112-F Wing, I Floor, Shastri Bhawan, New Delhi - 110001 Tel No. : 23385206 E-mail : dileep.kr52@nic.in	Metal-II (Other Metals related matters and BGML, HZL etc.)	**Shri Vivek Kumar Sharma, Director** Room No.: -308 D Wing, III Floor, Shastri Bhawan, New Delhi - 110001 Tel No.: - 23388345 E-mail: vksharma.ofb@gov.in

सत्यमेव जयते

Government of India

Ministry of Mines

Shastri Bhawan, Dr. Rajendra Prasad Road,
New Delhi-110001

https://mines.gov.in