Half Yearly Compliance Report
2026
01 Jun(01 Oct - 31 Mar)

Acknowledgement

Proposal Name	Mahan Underground Coal mine
Name of Entity / Corporate Office	J K CEMENT LIMITED
Village(s)	BUDHERI
District	SINGRAULI

Proposal No.	IA/MP/CMIN/559641/2025
Plot / Survey / Khasra No.	N/A
State	MADHYA PRADESH
MoEF File No.	IA-J-11015/17/2025-IA-II(M)

Category	Coal Mining
Sub-District	Singrauli
Entity's PAN	*****0355R
Entity name as per PAN	J K CEMENT LIMITED

Compliance Reporting Details

Reporting Year	2026
Remarks (if any)	Environmental Clearance for the project was granted on 19.02.2026, the present compliance report covers the applicable compliance period from 19.02.2026 to 31.03.2026 only.
Reporting Period	01 Jun(01 Oct - 31 Mar)

Details of Production and Project Area

Name of Entity / Corporate Office J K CEMENT LIMITED

	Project Area as per EC Granted	Actual Project Area in Possession
Private	4.190	0
Revenue Land	2.063	0
Forest	975.497	975.497
Others	N/A	N/A
Total	981.75	975.497

Others Area

Sr. no	Other Name	Area Granted	Area Actual
1	Mahan Underground Coal Mine	981.75 Ha	981.75 Ha

Production Capacity

Sr. no	Product Name	units	Valid Upto	Capacity	Production last year	Capacity as per CTO
1	Coal	Million Tons per Annum (MTPA)	N/A	1.2	0	

Conditions

Visit Remarks

Last Site Visit Report Date:	N/A
Additional Remarks:	Environmental Clearance for the project was granted on 19.02.2026, the present compliance report covers the applicable compliance period from 19.02.2026 to 31.03.2026 only.

Note: This acknowledgement is as per the details submitted by project proponent. In no way is this document to be considered as conclusion on any action on the compliance of the project. This is strictly for the project proponent's reference purpose.

JK Cement Ltd.
CIN: L17229UP1994PLC017199
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+0124-6919000 admin.prismt@jkcement.com
www.jkcement.com

Ref. No.: JKCL/MCM/2026/30 **Date: 11.05.2026**

To,
The Regional Officer (WZ)
Ministry of Environment, Forest and Climate Change (MoEF&CC)
Kendriya Paryavaran Bhawan
E-5, Arera Colony, Link Road-3, Ravi Shankar Nagar
Bhopal – 462016
E-mail: rowz.bpl-mef@nic.in

Subject: Submission of Six-Monthly Compliance Report for the compliance period October 2025 to March 2026 for proposed Mahan Underground Coal Mine (1.2 MTPA) by M/s JK Cement Limited, Singrauli, Madhya Pradesh – Environmental Clearance reg.

Ref: (i) File No. IA-J-11015/17/2025-IA-II(M)
(ii) Environmental Clearance granted on 19.02.2026 (EC Identification No. EC25A0102MP5268543N)

Respected Sir/Madam,

This is with reference to the Environmental Clearance granted vide letter dated 19.02.2026 for the proposed Mahan Underground Coal Mine (having production capacity of 1.2 MTPA within the Mining Lease area of 981.75 Ha) by M/s JK Cement Limited, located at Villages Amiliya & Budher; Tehsil Mada & Sarai; District Singrauli, Madhya Pradesh.

In compliance with the conditions stipulated in the Environmental Clearance and in accordance with the provisions of the EIA Notification, 2006 (as amended), please find enclosed herewith the Six-Monthly Compliance Report for the compliance period October 2025 to March 2026.

Since the Environmental Clearance for the project was granted on 19.02.2026, the present compliance report covers the applicable compliance period from 19.02.2026 to 31.03.2026 only.

The report provides the status of compliance of Environmental Clearance conditions, implementation of Environmental Management Plan (EMP) measures, and relevant environmental monitoring details. All applicable statutory and environmental safeguards are being complied with in letter and spirit.

This is submitted for your kind information and record.

Thanking you,

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Yours faithfully,
For M/s JK Cement Limited

(Authorized Signatory)
Name: Lalan Kumar
Designation: Project Head

Enclosures:

1. Six-Monthly EC Compliance Status Report for the period 19.02.2026 to 31.03.2026

Soft copy sent by e-mail to (Cc):

i. Member Secretary, MP Pollution Control Board, Bhopal
ii. Regional Officer, MP Pollution Control Board, Singrauli
iii. Regional Director, CPCB, Bhopal
iv. Deputy Director General of Forest (C), MoEF&CC, Integrated Regional Office, Bhopal
v. The Director, MoEF&CC, Indira Paryavaran Bhavan, New Delhi

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EC Identification No. EC25A0102MP5268543N File No. IA-J-11015/17/2025-IA-II(M) - Mahan Underground Coal Mine		
Specific Conditions		
S. No.	**EC Conditions**	**Compliance Status**
1.1	Project proponent shall comply with all the conditions prescribed by the MPPCB in the CTE dated 28.11.2025.	All conditions stipulated in the Consent to Establish (CTE) vide Consent No. CTE-63434 dated 28.11.2025 (Annexure -1) issued by the MPPCB shall be fully complied with upon grant of Stage–II Forest Clearance (FC) and obtaining the Consent to Operate (CTO).
1.2	No water body shall be diverted for the instant proposal, as committed by the project proponent. The recommendations of the watershed management plan shall be implemented within 2 years from the date of commencement of mine operation.	No diversion of any water body is involved in the project, as committed. The mine planning ensures that natural drainage and existing water bodies remain undisturbed. Implementation of the approved Watershed Management Plan shall be undertaken within 2 years from the date of commencement of mine operations. Necessary soil and water conservation measures will be executed in a phased manner in accordance with the approved plan.
1.3	As committed, no depillaring under the Road and water bodies shall be done.	As committed, no depillaring under roads and water bodies is proposed or being carried out. Mine planning ensures adequate safety barriers are maintained, and all operations are in compliance with the approved mining plan and statutory provisions.
1.4	Project proponent shall install the solar lights within the ML area, schools, hospitals and mine infrastructure. Also, project proponent shall provide facilities such as RO plants, provision for sanitary water and education and sports facilities in the 4 nos of schools located in close vicinity of the ML area. Thick plantation shall be carried out around these schools with the native species within 2 years from the date of grant of EC by planting saplings of not less than 4 feet height.	The Environmental Clearance (EC) was granted on 19.02.2026. However, Stage–II Forest Clearance (FC) and Mining Lease (ML) grant are still pending; hence, as per statutory provisions, no on-ground work has been initiated. All activities stipulated in the EC conditions shall be implemented in a phased manner from FY 2026–27 and will be completed within the stipulated timeline of 2 years from the commencement of operations.
1.5	The coal transportation shall be done by tarpaulin covered trucks and plantation with the native species (of height not less than 4 feet) shall be done on both the side of the entire transportation road. Further PP shall also explore to deploy EV dumpers for transportation of coal. PP shall carryout regular maintenance of the potholes on roads, repair and maintenance of roads, scrapping of material fallen on roads, and removal of scraps from mining areas.	Coal transportation shall be carried out through tarpaulin-covered trucks. Plantation with native species (saplings of minimum 4 ft height) shall be undertaken along both sides of the transportation road. The project proponent shall also explore the deployment of EV dumpers for coal transportation. Regular road maintenance, including pothole repair, removal of spilled material, and clearing of scrap from mining areas, shall be ensured. All these measures shall be implemented in a phased manner upon commencement of operations.
1.6	Project proponent shall fully compensate for the damage to property, infrastructure, or community assets which may arise due to subsidence, as committed.	The project proponent shall fully compensate for any damage to property, infrastructure, or community assets arising due to subsidence, as committed. As mining operations have not yet commenced, no subsidence-related impacts have occurred to date. Necessary provisions and mechanisms shall be established to assess and provide compensation, if required, during the operational phase.

1.7	The budget proposed for PH is Rs. 503 Lakhs. The budget proposed shall be kept in a separate account and audited annually. Project proponent shall implement the action plan to address the issues raised during public hearing within a time frame of 5 years from the date of grant of EC. PP shall submit the progress report regarding the implementation of action plan to concerned RO along with the six-monthly compliance report. In addition to this, PP shall strengthen the existing Primary Health Centre (PHC) & Community Health Centre (CHC) in the study area for better public health.	A budget of Rs. 503 Lakhs proposed for Public Hearing (PH) commitments shall be maintained in a separate account and shall be audited annually. The project proponent shall implement the action plan to address issues raised during the public hearing within a period of 5 years from commencement of operations. All PH commitments shall be initiated from FY 2026–27 in accordance with the approved action plan. Progress on implementation shall be submitted to the concerned Regional Office along with the six-monthly compliance reports. The project proponent shall also strengthen the existing Primary Health Centre (PHC) and Community Health Centre (CHC) in the study area to improve public health facilities. All activities shall be undertaken in a phased manner upon commencement of operations.
1.8	PP shall implement the protective measure proposed in Environment Management Plan (EMP) in a time-bound manner. The budget earmarked for the same is Rs 2018.5 Lakhs as capital cost and Rs 149.23 Lakhs/Annum (recurring) and should be kept in separate accounts and audited annually. The implementation status along with the amount spent with documentary proof shall be submitted to the concerned Regional Office for the activities carried out during the previous year.	The project proponent shall implement the protective measures proposed in the Environment Management Plan (EMP) in a time-bound manner. The budget earmarked, i.e., Rs. 2018.5 Lakhs (capital cost) and Rs. 149.23 Lakhs per annum (recurring cost), shall be maintained in separate accounts and shall be audited annually. The implementation status, along with expenditure details and supporting documentary evidence, shall be submitted to the concerned Regional Office for the activities carried out during the previous year. All measures shall be implemented in a phased manner from FY 2026–27, upon receipt of all statutory clearances and commencement of operations.
1.9	PP shall pay to farmers of agricultural land if there is any loss due to pollution found by concerned District Commissioner as per extent rules or norms. Suitable measures for enrichment of nitrogen in the soil will be taken up for improving soil fertility and effective steps will be taken to support the farming community in enhancing the production.	The project proponent shall compensate farmers for any loss or damage to agricultural land due to the project, including pollution-related impacts, as assessed by the District Administration, in accordance with applicable norms. Measures for soil fertility improvement, including nitrogen enrichment, and support to enhance agricultural productivity shall be undertaken. All measures shall be implemented in a phased manner once mining-related activities and production commence.
1.10	No waste shall be dumped on the forestland. PP shall use the waste generated during the installation of mine shaft and mine incline in infrastructure development.	No waste shall be dumped on forest land. The waste generated during installation of the mine shaft and incline shall be utilized in infrastructure development, as proposed.

Standard EC Conditions for (Mining of minerals)

Statutory Conditions

S. No.	EC Conditions	Compliance Status
1.1	The Environmental Clearance shall be subject to orders of Hon'ble Supreme Court of India, Hon'ble High Courts, NGT and any other Court of Law, from time to time, and as applicable to the project.	The project proponent shall abide by all applicable orders/directions issued by the Hon’ble Supreme Court of India, Hon’ble High Courts, National Green Tribunal (NGT), and any other Court of Law from time to time, as applicable to the project.
1.2	Mining shall be carried out as per the approved Mining Plan (including Mine Closure Plan) abiding by mining laws related to coal mining and the relevant provisions under CMR, 2017 and circulars issued by Directorate General of Mines Safety (DGMS) from time to time.	Mining operations shall be carried out in accordance with the approved Mining Plan (including Mine Closure Plan), in compliance with applicable mining laws related to coal mining, the provisions of Coal Mines Regulations (CMR), 2017, and guidelines/circulars issued by the Directorate General of Mines Safety (DGMS) from time to time. All measures shall be implemented upon commencement of mining operations.
1.3	Mining activities shall not be carried out in the forestland, until the Stage - II Forestry Clearance is obtained under the relevant provisions of Van (Sanrakshan Evam Samvardhan), Adhiniyam, 1980, for 975.497 ha of forestland involved in the ML area.	Mining activities shall not be undertaken in forest land until the requisite Stage–II Forest Clearance is obtained under the provisions of the Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 for the forest land involved in the ML area. The grant of Stage–II Forest Clearance is currently under process, and no work shall be initiated in forest land until the same is obtained.

1.4	The project proponent shall obtain prior approval / clearance from the National Board for Wildlife, if applicable.	As the project area does not fall within any notified Protected Area or Eco-Sensitive Zone; hence, clearance from the National Board for Wildlife (NBWL) is not envisaged at this stage. However, if required at any stage, the project proponent shall obtain prior approval from NBWL in accordance with applicable statutory provisions before commencement of relevant activities.
1.5	In case of the presence of Schedule-I species in the study area, the project proponent shall prepare a Conservation Plan & Wildlife Management Plan which shall be approved by the Chief Wildlife Warden. The recommendations of the approved Conservation Plan / Wildlife Management Plan shall be implemented in consultation with the State Forest Department. The implementation report shall be furnished along with the six-monthly compliance report (in case of the presence of Schedule-I species in the study area).	A site-specific Wildlife Conservation Plan has been prepared by an accredited consultant and approved by the PCCF (Wildlife), Bhopal vide letter dated 29.12.2025 (Annexure -2), with a total plan outlay of Rs. 344 Lakhs. The recommendations of the approved plan shall be implemented in consultation with the State Forest Department. The implementation status of the Wildlife Conservation Plan shall be submitted to the concerned authorities along with the six-monthly compliance reports, as applicable. All measures shall be undertaken in a phased manner upon commencement of operations.
1.6	The project proponent shall obtain Consent to Operate under the provisions of Air (Prevention & Control of Pollution) Act, 1981 and the Water (Prevention & Control of Pollution) Act, 1974 from the concerned State Pollution Control Board/ Pollution Control Committee.	A fresh application for Consent to Operate (CTO) for development and installation of environmental monitoring systems has been submitted on 11.03.2026. The application is currently under process and pending submission of requisite statutory clearances. Upon receipt of the same, the application shall be processed further for grant of CTO, in accordance with applicable provisions.
1.7	The project proponent shall obtain the necessary permission from the Central Ground Water Authority for groundwater abstraction & usage prior to commencement of mining. The proponent shall also obtain necessary permissions for drawl / usage of surface water, if applicable, prior to commencement of mining.	Necessary permission from the Central Ground Water Authority (CGWA) for groundwater abstraction has been obtained for an initial period of 2 years vide NOC No. NOC/MIN/MP/2025/11462/N dated 25.08.2025, and the same has been submitted to the concerned authorities. A copy of the CGWA NOC is enclosed as an Annexure - 3 for reference .
1.8	Solid/hazardous waste generated in the mines needs to addressed in accordance to the Solid Waste Management Rules, 2016/Hazardous & Other Waste Management Rules, 2016 and subsequent amendments.	Agreed. Solid and hazardous waste generated from the mine shall be managed in accordance with the provisions of the Solid Waste Management Rules, 2016 and the Hazardous & Other Wastes (Management and Transboundary Movement) Rules, 2016, including subsequent amendments. Necessary systems and practices shall be implemented to ensure compliance during the operational phase.
1.9	In case of diversion of water body / road / railway lines / transmission line, approval for the same from competent authority shall be submitted, as applicable.	No diversion of any water body, road, railway line, or transmission line is envisaged in the project. However, in case any such diversion becomes applicable, necessary approval from the competent authority shall be obtained prior to undertaking such activities.
1.10	Permission of power supply to be taken from the concerned authority for meeting power demand of the project site.	Necessary steps for obtaining power supply through a 33 kV HT line for meeting the power demand of the project site have already been initiated by the Project Proponent. The proposal for power connectivity has been submitted to the concerned authority, i.e., M.P. Poorvi Kshetra Vidyut Vitaran Company Limited (MPPKVVCL), and the same is under active processing.
1.11	The annual peak production at any given time shall not exceed the limit as prescribed in the EC.	Agreed. The Project Proponent shall strictly adhere to the Environmental Clearance (EC) conditions, and the annual peak production at any given time shall not exceed the limits as prescribed in the EC.
1.12	Validity of EC shall be as per life of the mine as mentioned in EC letter or 30 years, whichever is earlier, as per EIA Notification, 2006 and its amendments therein.	Agreed. The validity of the Environmental Clearance (EC) shall be as per the life of the mine as mentioned in the EC letter or 30 years, whichever is earlier, in accordance with the provisions of the EIA Notification, 2006 and its subsequent amendments. The Project Proponent shall ensure strict compliance with the stipulated validity conditions.

1.13	In case of change in mining method from UG to OC, prior approval of the Ministry of Environment, Forests and Climate Change (MoEFCC) shall be obtained.	Agreed. In case of any proposed change in mining method from Underground (UG) to Opencast (OC), prior approval of the Ministry of Environment, Forest and Climate Change (MoEFCC) shall be obtained, as applicable. Further, it is submitted that mining operations shall be carried out in Underground (UG) mode only, and no change in mining method is envisaged. An undertaking (Annexure - 9) to this effect has already been submitted to the EAC and FAC.
Air Quality Mitigation Measures And Monitoring		
S. No	**EC Conditions**	**Compliance Status**
2.1	Coal handling points like stockyards / sidings shall be equipped with effective control measures like water sprinkling, fog cannons, wind barriers, vertical greenery systems.	Agreed. Coal handling points such as stockyards/sidings shall be provided with effective dust suppression and control measures including water sprinkling systems, fog cannons, wind barriers, and vertical greenery systems, as applicable. Further, all necessary pollution control equipment and environmental monitoring systems will be installed after obtaining the statutory clearance and Consent to Operate (CTO) from the competent authority for development activities and installation of pollution control equipment. The Project Proponent shall ensure implementation of all prescribed environmental safeguards prior to commencement of full-scale operations.
2.2	Transportation of coal, to the extent if permitted by road, shall be carried out by covered trucks. Effective control measures such as regular water sprinkling/rain gun/ fog cannons /mist sprinkling, etc., shall be installed in critical areas like coal transport roads, loading/unloading and transfer points.	Agreed. Transportation of coal, to the extent permitted by road, shall be carried out through covered trucks to prevent fugitive emissions. Further, effective dust control measures such as regular water sprinkling, rain guns, fog cannons, and mist sprinkling systems shall be installed and operated in critical areas including coal transport roads, loading/unloading points, and transfer stations to minimize air pollution. The Project Proponent shall ensure strict implementation of all prescribed environmental safeguards during transportation activities.
2.3	Transportation of the coal through the existing road, passing through any new village shall be avoided. In such cases, it is proposed to construct a 'bypass' road, such that the impact of sound, dust and accidents could be appropriately mitigated. Major approach roads shall be black topped / made with concrete and properly maintained.	Agreed. Transportation of coal shall be carried out through the designated existing road network only. No new village road will be used for coal transportation, and movement shall be restricted to the already established and approved transport routes, thereby avoiding any habitations not presently en route. Further, all major approach and haul roads shall be maintained in good condition and shall be suitably blacktopped / concreted, as applicable, to ensure safe and efficient transportation while minimizing dust generation, noise, and accident risks. The Project Proponent shall ensure regular maintenance of transport roads and implementation of appropriate mitigation measures for environmental protection and public safety.
2.4	Vehicular emissions shall be kept under control and regularly monitored. All the vehicles engaged in coal transportation shall operate only after obtaining 'PUC' certificate from the authorized pollution testing centres. The proponent must strive to use electric vehicles / eco-friendly fuel based vehicles as far as possible.	Agreed. Vehicular emissions shall be kept under control through regular monitoring and maintenance of all transport vehicles engaged in coal transportation. It is further submitted that all vehicles shall operate only after obtaining valid Pollution Under Control (PUC) certificates from authorized pollution testing centres, and compliance shall be ensured on a continuous basis. The Project Proponent shall also make best efforts to promote the use of electric vehicles and/or eco-friendly fuel-based vehicles, wherever feasible, in order to minimize environmental impacts and support sustainable transportation practices.

2.5	In order to prevent particulates getting airborne and in order to mitigate dust concentrations, proper housekeeping shall be maintained by the project.	Agreed. Proper housekeeping shall be maintained at the project site on a regular basis to prevent particulate matter from becoming airborne and to effectively mitigate dust concentrations. Necessary dust suppression and cleanliness measures shall be implemented and ensured throughout all operational areas as part of the environmental management plan.
2.6	Plantation in core zone and along the coal transportation route shall be taken up for control of air pollution. Native tree species shall be selected for plantation.	Agreed. Plantation activities shall be undertaken in the core zone as well as along the coal transportation routes for effective control of air pollution and improvement of the local microclimate. Native and locally adaptive tree species shall be selected for plantation in accordance with the approved plantation scheme and ecological suitability of the area. The Project Proponent shall ensure survival and maintenance of plantation through regular monitoring.
2.7	It shall be ensured that the ambient air quality parameters conform to the norms prescribed by the Central/State Pollution Control Board.	Agreed. It shall be ensured that ambient air quality parameters remain within the prescribed norms of the Central/State Pollution Control Board. Regular monitoring shall be carried out as per the approved Environmental Monitoring Plan, and necessary mitigation measures shall be implemented promptly in case of any exceedance to ensure continuous compliance.
2.8	For ambient air quality monitoring, at least 4 sampling sites shall be established (of which 1 shall be situated in the upwind direction, 1 in core zone and balance 2 shall be located in the buffer zone - in downwind direction and near receptors) for monitoring of pollutants. The frequency of monitoring for core zone shall be as per Coal Mine Standards GSR 742 (E) dated 25.09.2000 and for buffer zone shall be as per NAAQS, 2009. Location of the stations shall be decided based on the meteorological data, topographical features and environmentally and ecologically sensitive receptors in consultation with the State Pollution Control Board. The monitoring reports shall be submitted to Regional Office of MoEF&CC and SPCB/CPCB as a part of the six monthly compliance report.	Agreed. For ambient air quality monitoring, a minimum of four sampling locations shall be established, including one in the upwind direction, one in the core zone, and the remaining two in the buffer zone covering downwind areas and sensitive receptors, as applicable. Monitoring frequency in the core zone shall be carried out as per Coal Mine Standards GSR 742(E) dated 25.09.2000, and in the buffer zone as per the National Ambient Air Quality Standards (NAAQS), 2009. The exact locations of monitoring stations shall be finalized based on meteorological data, topographical conditions, and identification of environmentally/ecologically sensitive receptors, in consultation with the State Pollution Control Board. Further, the monitoring reports shall be submitted regularly to the Regional Office of MoEF&CC and the SPCB/CPCB as part of the six-monthly compliance reports.
2.9	The project shall install an automatic weather monitoring station in the core zone. At least 2 online ambient air quality monitoring stations (CAAQMS) for monitoring of PM10, PM2.5, SO2, NOx shall be installed - one in core zone and one in buffer zone, in consultation with the SPCB. The data from the CAAQMS shall be connected to CPCB server as well as SPCB server. The calibration of CAAQMS installed shall be carried out as per the calibration protocol for CAAQMS system specified by CPCB and records shall be maintained.	Agreed. An automatic weather monitoring station shall be installed in the core zone for continuous meteorological data recording. Further, at least two online Continuous Ambient Air Quality Monitoring Stations (CAAQMS) for monitoring of PM10, PM2.5, SO_2, and NOx shall be installed - one in the core zone and one in the buffer zone - in consultation with the State Pollution Control Board (SPCB). The real-time data from the CAAQMS shall be integrated and transmitted to both CPCB and SPCB servers as per regulatory requirements. Calibration of the installed CAAQMS shall be carried out in accordance with the CPCB prescribed calibration protocols, and all relevant records shall be properly maintained for verification and compliance purposes.
Water Quality Mitigation Measures And Monitoring		
S. No	**EC Conditions**	**Compliance Status**

3.1	The water pumped out from the mine (seepage water / mine effluent), after treatment, shall be utilized for industrial purpose viz. dust suppression on roads, plantation, and for domestic uses, etc. Balance water after treatment, if any, shall be discharged into surrounding water bodies with prior permission from concerned SPCBs/PCCs.	Agreed. The water pumped out from the mine (seepage water/mine effluent), after appropriate treatment, shall be reutilized for industrial purposes such as dust suppression on haul roads, plantation activities, and other permissible uses including domestic requirements, wherever applicable. Further, any surplus treated water, if remaining after internal utilization, shall be discharged into nearby surface water bodies only after obtaining prior approval from the concerned State Pollution Control Board (SPCB), in compliance with applicable environmental norms and discharge standards.
3.2	Industrial wastewater from workshop and/or coal handling plant, if any, shall be properly collected and treated so as to conform to the standards prescribed under the Environment (Protection) Act, 1986 and the Rules made thereunder, and as amended from time to time.	Agreed. Industrial wastewater generated from the workshop and/or coal handling plant, if any, shall be properly collected and treated through appropriate treatment systems to ensure compliance with the standards prescribed under the Environment (Protection) Act, 1986 and the Rules made thereunder, as amended from time to time. Regular monitoring shall be carried out to ensure adherence to the stipulated discharge norms.
3.3	Sewage treatment plant of adequate capacity shall be installed for treatment of domestic wastewater. The treated water, after conforming to the prescribed norms shall be reused.	Agreed. A Sewage Treatment Plant (STP) of adequate capacity shall be installed for the treatment of domestic wastewater generated from the project. The treated effluent shall conform to the prescribed norms and shall be reused for suitable purposes such as plantation and other non-potable applications, thereby ensuring maximum reuse and zero/near-zero discharge, as applicable.
3.4	Garland drains (of suitable size, gradient and length) around the critical areas i.e. mine shaft and low-lying areas including coal stockyards, shall be designed keeping at least 50% safety margin over and above the peak sudden rainfall and maximum discharge in the area adjoining the mine sites. The sump capacity shall also provide adequate retention period to allow proper settling of silt material of the surface runoff. The garland drains shall be regularly desilted, particularly after monsoon and maintained properly.	Agreed. Garland drains of suitable size, gradient, and length shall be provided around critical areas such as mine shafts, low-lying areas, and coal stockyards. The system shall be designed with at least 50% safety margin over and above the peak sudden rainfall and maximum anticipated discharge in the adjoining mine area. Further, adequate sump capacity shall be provided to ensure sufficient retention time for settling of silt and suspended solids from surface runoff. The garland drains and associated sump system shall be regularly inspected and desilted, particularly after the monsoon season, and maintained in good operational condition to ensure effective storm water management and environmental protection.
3.5	Appropriate embankment shall be provided along the side of the river/nallah flowing near or adjacent to the mine. The embankment constructed along the river/nallah boundary shall be of suitable dimensions and critical patches shall be strengthened by stone pitching on the river front side, stabilized with plantation so as to withstand the peak water pressure preventing any chance of mine inundation.	Agreed. Appropriate embankments shall be provided along the side of the river/nallah flowing near or adjacent to the mine, wherever applicable. The embankments, as required, shall be designed with suitable dimensions to ensure structural stability against peak flow conditions. Further, wherever critical stretches are identified, these shall be strengthened with stone pitching on the river-facing side and stabilized through suitable plantation, as applicable, to enhance slope stability and erosion control, thereby ensuring adequate protection against any potential inundation of the mine area.
3.6	In case of diversion / straightening of any river / nallah, the same shall be done only after approval is granted by Water Resources Department / Irrigation Department / approved regulatory agency of the concerned state. Mitigation measures or management plan proposed under EIA/EMP as well as regulatory agencies as a part of the diversion plan shall be duly complied with.	No diversion or straightening of any river or nallah is involved in the project.
3.7	Project proponent shall provide a rain water-harvesting pond in ML area in the core zone.	Agreed. Rainwater harvesting structures shall be developed as per the approved watershed management plan (Annexure -4) within the mining lease area. The implementation shall be carried out in coordination with the State Forest Department, and the Project Proponent shall provide necessary financial support for the execution of the same.

3.8	The effluent discharge (mine water, workshop effluent, CHP wastewater (if applicable), STP if applicable) - shall be monitored in terms of the parameters and frequency notified under the Coal Industry Standards vide GSR 742 (E) dated 25th September, 2000 and as amended from time to time by the Central Pollution Control Board. The effluent samples must include raw effluent (i.e. upstream of treatment facility) as well as treated water (i.e. outlet stream from treatment facility). The monitoring reports shall be submitted to Regional Office of MoEF&CC and SPCB/CPCB as a part of the six monthly compliance report.	Agreed. The effluent discharge including mine water, workshop effluent, CHP wastewater (if applicable), and STP effluent (if applicable) shall be monitored for the prescribed parameters and frequency as per Coal Industry Standards vide GSR 742(E) dated 25th September, 2000 and as amended from time to time by CPCB. It is further agreed that monitoring shall include both raw effluent (upstream of treatment facilities) and treated effluent (outlet of treatment facilities). The monitoring reports shall be regularly submitted to the Regional Office of MoEF&CC and SPCB/CPCB as part of the six-monthly compliance reports.
3.9	Project proponent shall install ground water monitoring piezometers prior to commencement of production in line with NOC issued by CGWA. The water level will be monitored for all piezometers and the record will be shared with the Regional Office (CGWB).	Agreed. Groundwater monitoring piezometers shall be installed prior to commencement of production in line with the CGWA NOC, and groundwater levels shall be regularly monitored for all piezometers with proper records maintained and shared with the Regional Office of CGWB as required. It is further assured that all conditions stipulated in the CGWA NOC shall be strictly complied.
Noise Prevention And Monitoring		
S. No	**EC Conditions**	**Compliance Status**
4.1	Adequate measures shall be taken for control of noise levels as per Noise Pollution Rules, 2016 in the work zone environment. Operational safety norms for worker safety as prescribed by DGMS for UG coal mines must be adhered to.	Agreed. Adequate measures shall be implemented for control of noise levels in the work zone environment in accordance with the Noise Pollution (Regulation and Control) Rules, 2016. Further, all operational safety norms and guidelines prescribed by DGMS for underground coal mines shall be strictly adhered to ensure occupational health and safety of workers.
4.2	In case of installation of conveyors, DG sets, etc., adequate noise attenuation measures including acoustic barriers must be installed to control noise pollution.	Agreed. Adequate noise attenuation measures including acoustic enclosures, acoustic barriers, and other engineering controls shall be provided, as applicable, to ensure effective control of noise pollution and compliance with the prescribed standards.
4.3	The noise level monitoring shall be carried out as per the prescribed DGMS guidelines in the core zone to assess noise exposure of the workmen at vulnerable points in the mine premises, and report in this regard shall be submitted to the RO of MoEF&CC on six-monthly basis.	Agreed. Noise level monitoring shall be carried out as per the prescribed DGMS guidelines in the core zone to assess noise exposure of workmen at vulnerable locations within the mine premises. The monitoring results shall be duly recorded and the compliance report shall be submitted to the Regional Office of MoEF&CC on a six-monthly basis as part of the EC compliance reporting.
4.4	Ambient noise levels shall be monitored at strategic locations (at least 4 locations of which 2 to be located within the core zone at coal loading point and workshop respectively and remaining 2 to be located in buffer zones near receptors and along coal transportation route). The monitoring reports shall be submitted to Regional Office of MoEF&CC and SPCB/CPCB as a part of the six monthly compliance report.	Agreed. Ambient noise levels shall be monitored at strategic locations, including at least four stations - two within the core zone (at coal loading points and workshop) and the remaining two in the buffer zone near sensitive receptors and along the coal transportation route. The monitoring shall be carried out as per applicable guidelines, and the results shall be properly documented. The monitoring reports shall be submitted to the Regional Office of MoEF&CC and SPCB/CPCB as part of the six-monthly compliance reports.
Risk And Subsidence		
S. No	**EC Conditions**	**Compliance Status**
5.1	Project proponent shall include adequate provisions w.r.t risk management to ensure safety of personnel engaged in mining operations and work zone environment must be maintained in conformity of relevant DGMS norms.	Agreed. Adequate provisions for risk management shall be incorporated to ensure the safety of personnel engaged in mining operations. The work zone environment shall be maintained in strict conformity with the relevant DGMS norms and statutory safety guidelines, and all necessary preventive and control measures shall be implemented to ensure safe mining operations.

5.2	Regular monitoring of subsidence movement on the surface over and around the working areas and its impact on natural drainage pattern, water bodies, vegetation, structure, roads and surroundings shall be continued beyond post closure period as specified in the Mine Plan/Mine Closure Plan Guidelines issued by MoC from time to time. In case of observation of any high rate of subsidence beyond the limit prescribed, appropriate effective mitigation measures shall be taken to avoid loss of life and materials. Cracks should be effectively plugged in with ballast and clay soil/suitable material.	Agreed. Regular monitoring of subsidence movement on the surface over and around the working areas, along with its impact on natural drainage patterns, water bodies, vegetation, structures, roads, and surrounding environment, shall be carried out and continued beyond the post-closure period in accordance with the Mine Plan/Mine Closure Plan Guidelines issued by the Ministry of Coal from time to time. In case any high rate of subsidence beyond the prescribed limits is observed, appropriate and effective mitigation measures shall be promptly undertaken to ensure safety of life and property. Any surface cracks, if developed, shall be effectively sealed and stabilized using suitable materials such as ballast and clay soil or other appropriate fill materials.
5.3	A separate team for subsidence monitoring and surface mitigation measures shall be created at project level and continuous monitoring & implementation of mitigation measures be carried out.	Agreed. A separate team for subsidence monitoring and implementation of surface mitigation measures shall be constituted at the project level. The team shall be responsible for continuous monitoring of subsidence-prone areas and timely implementation of necessary mitigation measures in accordance with the approved Mine Plan/Mine Closure Plan and applicable DGMS/Ministry of Coal guidelines.
5.4	Thorough inspection of the mine lease area for any cracks developed at the surface due to mining activities below ground shall be carried out to prevent inrush of water in the mine. Native tree species shall be selected and planted over areas affected by subsidence.	Agreed. Thorough inspection of the mine lease area shall be regularly carried out to identify any surface cracks developed due to underground mining activities, so as to prevent ingress of water into the mine workings. Any such observations shall be promptly attended with suitable preventive and remedial measures. Further, native tree species shall be selected and planted over areas affected by subsidence, and the plantation/reclamation activities shall be undertaken in consultation with the State Forest Department, as part of ecological restoration measures in accordance with the approved plantation and mine closure plan.
Land Reclamation		
S. No	**EC Conditions**	**Compliance Status**
6.1	Digital Survey of entire lease hold area/core zone using Satellite Remote Sensing survey shall be carried out at least once in three years for monitoring land use pattern and report in 1:50,000 scale or as notified by Ministry of Environment, Forest and Climate Change (MoEF&CC) and shall be submitted to MoEF&CC/Regional Office (RO).	Agreed. Digital survey of the entire lease hold area/core zone using Satellite Remote Sensing techniques shall be carried out at least once in three years for monitoring land use and land cover pattern. The survey shall be undertaken within three years from the date of grant of Environmental Clearance, and the report shall be prepared in 1:50,000 scale or as may be notified by MoEF&CC from time to time. The findings shall also be submitted as part of the six-monthly compliance reports to MoEF&CC/Regional Office, as applicable.
6.2	Post-mining land be rendered usable as specified in the Guidelines for Preparation of Mine Closure Plan, issued by the Ministry of Coal dated 31st January, 2025 and subsequent amendments. The post closure land form must be safe & stable and should incorporate repurposing activities like renewables, energy efficiency etc. as feasible.	Agreed. Post-mining land shall be rendered usable in accordance with the Guidelines for Preparation of Mine Closure Plan issued by the Ministry of Coal dated 31st January, 2025 and subsequent amendments. The post-closure landform shall be ensured to be safe and stable, and shall incorporate suitable repurposing activities such as renewable energy and energy efficiency initiatives, as feasible and applicable.
6.3	The project proponent shall make necessary alternative arrangements, if grazing land is involved in core zone, in consultation with the State government to provide alternate areas for livestock grazing, if any. In this context, the project proponent shall implement the directions of Hon'ble Supreme Court with regard to acquiring grazing land.	Agreed. In the event that grazing land is involved in the core zone, necessary alternative arrangements shall be made in consultation with the State Government to provide suitable alternate areas for livestock grazing, if required. The Project Proponent shall also ensure compliance with the directions of the Hon’ble Supreme Court with regard to acquisition and use of grazing land, as applicable.

6.4	Project proponent shall implementation the 'Ek Ped Maa Ke Naam' Campaign, which was launched on 5th June 2024 on the occasion of the World Environment Day to increase the forest cover across the Country. This plantation drive is other than green belt development. The action in this regard shall be submitted concerned RO in six monthly report.	Agreed. The Project Proponent shall implement the 'Ek Ped Maa Ke Naam' campaign, launched on 5th June 2024 on the occasion of World Environment Day, to contribute towards enhancing forest cover across the country. The plantation drive shall be undertaken annually on World Environment Day, in addition to the regular green belt development activities. The details of the plantation drive, including progress and implementation status, shall be submitted to the concerned Regional Office as part of the six-monthly compliance reports.
6.5	Greenbelt shall be developed in 14.808 ha area, i.e. approx. 1.5% of the total ML area and approx. 62% of the total disturbed area i.e. 24 ha. A 5-10m wide greenbelt, consisting of at least 3 tiers around mine boundary shall be developed as greenbelt and green cover within 3 years from the date of obtaining the EC by planting the saplings of not less than 4 feet height as per CPCB/ MoEF&CC, New Delhi guidelines. Local and Native species shall be planted with a density of 2500 trees per hectare. Total no. of 21,663 saplings shall be planted of not less than 4 feet height. Besides this, total green cover will be developed into 38.808 Ha area along with that, 15,000 number of saplings will be planted along the coal transportation route. PP shall also focus on community plantation and shall distribute 15,000 fruit bearing species to the nearby villagers to plant and nurture the same.	Agreed. Greenbelt shall be developed over 14.808 ha (approx. 1.5% of ML area and 62% of disturbed area) within 3 years from EC grant, including a 5–10 m wide 3-tier greenbelt along the mine boundary, in line with CPCB/MoEF&CC guidelines. A total of about 21,663 saplings (native species, ≥4 ft height) shall be planted at 2500 trees/ha, along with 15,000 saplings along the coal transportation route and 15,000 fruit-bearing saplings for community plantation. The greenbelt/plantation development shall be implemented in a phase-wise manner as per the plantation plan, with regular monitoring of survival rate and progress.
6.6	Watershed plan with gap Planation in Forest area shall be made with the help of Forest department and should be implemented accordingly. Budgetary provision should be submitted accordingly.	Agreed. Watershed management plan along with gap plantation in forest areas already prepared in consultation with the State Forest Department and shall be implemented accordingly. Necessary budgetary provisions for the same is made and submitted to Forest Department, ensuring effective implementation and ecological restoration in line with the approved plan (Annexure - 4).
Public Hearing And Human Health Issues		
S. No	**EC Conditions**	**Compliance Status**
7.1	Implementation of the time bound action plan on the issues raised during the public hearing shall be ensured. The project proponent shall undertake all the tasks/measures as per the time bound action plan submitted with budgetary provisions during the public hearing.	Agreed. The time-bound action plan on the issues raised during the Public Hearing shall be strictly implemented. The Project Proponent shall undertake all proposed tasks and mitigation measures as per the submitted action plan, including the allocated budgetary provisions, within the stipulated timelines, and ensure periodic monitoring and compliance reporting.
7.2	Land oustees shall be compensated as per the norms laid down in the R&R policy of the company/State Government/Central Government, as applicable. Adequate facility of drinking water, plantation and other social amenities should be provided to established R&R villages.	No land acquisition and no Rehabilitation & Resettlement (R&R) is involved in the project. However, adequate facilities such as drinking water supply, plantation development, and other social amenities shall be provided in the nearby villages through CSR activities, in consultation with the local administration, as part of the project's community development initiatives.
7.3	The work zone environment shall be maintained as prescribed under Coal Mines Regulations, 2017 & DGMS (complying with provisions regarding illumination, temperature, humidity, dust, noise, etc.)	Agreed. The work zone environment shall be maintained in strict compliance with the Coal Mines Regulations, 2017 and applicable DGMS guidelines, ensuring adherence to prescribed standards regarding illumination, temperature, humidity, dust, noise, and other occupational health and safety parameters.

7.4	The project proponent shall undertake occupational health survey for initial and periodical medical examination of the personnel engaged in the project and maintain records accordingly as per the provisions of The Mines Act, 1952 and rules made thereunder and DGMS circulars. Besides regular periodic health check-up, 20% of the personnel identified from workforce engaged in active mining operations shall be subjected to health check-up for occupational diseases and hearing impairment, if any, as per Clause No. 123, 124 & 125 of Coal Mines Regulations, 2017.	Agreed. The Project Proponent shall undertake occupational health surveillance including initial and periodic medical examinations of personnel engaged in the project, and maintain proper records in accordance with the provisions of the Mines Act, 1952, rules made thereunder, and DGMS circulars. Further, in addition to regular health check-ups, 20% of the workforce engaged in active mining operations shall be subjected to specific health screening for occupational diseases and hearing impairment, if any, in compliance with Clause Nos. 123, 124 & 125 of the Coal Mines Regulations, 2017.
7.5	Personnel (including outsourced employees) working in core zone shall wear protective respiratory devices and shall also be provided with adequate training and information on safety and health aspects.	Agreed. All personnel, including outsourced employees, working in the core zone shall be provided with and shall mandatorily use appropriate personal protective respiratory devices. Further, adequate training and awareness shall be imparted to all such personnel regarding occupational safety and health aspects to ensure safe working practices in compliance with applicable DGMS guidelines.
7.6	Skill training as per safety norms specified by DGMS shall be provided to all workmen including the outsourcing employees to ensure high safety standards in mines.	Agreed. Skill training in accordance with DGMS safety norms shall be imparted to all workmen, including outsourced employees, to ensure adherence to high safety standards in mining operations and to promote safe working practices.
7.7	Effective arrangement shall be made to provide and maintain sufficient supply of drinking water at suitable points, for all the persons employed.	Agreed. Effective arrangements shall be made to ensure adequate and uninterrupted supply of potable drinking water at suitable locations for all persons employed in the project, and the same shall be regularly maintained in accordance with applicable statutory requirements and health standards.
7.8	The project proponent shall follow the mitigation measures provided in this Ministry's OM No.Z11013/5712014-IA.I1 (M) dated 29th October, 2014, titled 'Impact of mining activities on habitations-issues related to the mining projects wherein habitations and villages are the part of mine lease areas or habitations and villages are surrounded by the mine lease area'.	Agreed. The Project Proponent shall strictly follow the mitigation measures stipulated in MoEF&CC OM No. Z-11013/57/2014-IA.II (M) dated 29th October, 2014 regarding the "Impact of mining activities on habitations", as applicable to mining projects wherein habitations and villages are located within or in the vicinity of the mine lease area. All necessary safeguards shall be implemented to minimize impacts on nearby habitations.
Others		
S. No	**EC Conditions**	**Compliance Status**
8.1	The project shall comply with the recommendations of the additional studies like Traffic Study, Biodiversity Management Plan, Carbon Footprint Assessment, as applicable.	Agreed. The Project Proponent shall comply with the recommendations of additional studies such as Traffic Study, Biodiversity Management Plan, and Carbon Footprint Assessment, as applicable, and ensure their effective implementation as part of the overall environmental management framework of the project.
8.2	In pursuant to the Ministry's OM dated 18/07/2022. PP shall also create awareness among the people working in the project area as well as in its surrounding area on the ban on Single Use Plastic (SUP) in order to ensure compliance of Ministry's Notification published by the Ministry on 12/08/2021.	Agreed. In compliance with the Ministry's OM dated 18/07/2022 and Notification dated 12/08/2021 regarding the ban on Single Use Plastic (SUP), the Project Proponent shall create awareness among workers as well as the surrounding communities to ensure effective implementation and compliance of the said provisions within and around the project area.
8.3	The project shall align its activities towards some SDGs and submit the details in its six-monthly compliance report on routine basis.	Agreed. The Project Proponent shall align its activities with relevant Sustainable Development Goals (SDGs) and shall regularly report the details of such initiatives in the six-monthly compliance reports submitted to the concerned authorities.
8.4	Efforts should be made to reduce energy and fuel consumption by conservation, efficiency improvements and use of renewable energy.	Agreed. Efforts shall be made to reduce energy and fuel consumption through conservation measures, efficiency improvements, and adoption of renewable energy sources. Feasibility of solar energy utilization and electric vehicles (EVs) shall also be explored and implemented, wherever practicable, as part of the project's sustainable development initiatives.

8.5	Post closure monitoring of air quality, water, land & soil etc. shall be carried out by NABL accredited laboratories and analysed with EMP measures at regular interval. A suitable recommendation in this regard, shall be furnished to RO, MoEF&CC for compliance. The data used for analysis shall be obtained from routine environmental monitoring, continuous air / water QMS, etc.	Agreed. Post-closure monitoring of air, water, land, and soil shall be carried out through NABL accredited laboratories at regular intervals, and the results shall be analyzed in line with EMP measures. The data shall be derived from routine environmental monitoring and continuous AQMS/monitoring systems, and suitable recommendations shall be submitted to the Regional Office of MoEF&CC for compliance.
8.6	Third Party Environmental Audit shall be undertaken once in every three years through reputed institutes or scientific agencies.	Agreed. Third-party environmental audit shall be undertaken once in every three years through reputed institutes or scientific agencies, and the findings shall be duly complied with and submitted to the concerned regulatory authorities as required.
Corporate Environment Policy		
S. No	**EC Conditions**	**Compliance Status**
9.1	The company shall have a well laid down environmental policy duly approved by the Board of Directors. The environmental policy should prescribe for standard operating procedures to have proper checks and balances and to bring into focus any infringements/deviation/violation of the environmental/forest/wildlife norms/conditions. The company shall have defined system of reporting infringements/deviation/violation of the environmental/forest/wildlife norms/conditions to shareholders/stake-holders	Agreed. The Company already has a well-defined Environmental Policy (Annexure - 5)duly approved by the Board of Directors, a copy of which is attached for reference. The Company also has a structured system for reporting such matters, if any, to shareholders and stakeholders in a transparent manner.
9.2	A separate Environmental Cell both at the project and company head quarter level, with adequate qualified personnel shall be set up under the control of senior executive, who will directly report to the Head of the organization.	Agreed. A separate Environmental Cell at both project and company headquarters level shall be established with adequate qualified personnel under a senior executive reporting directly to the Head of the organization. The Environmental Cell shall be made fully functional upon receipt of all statutory clearances.
9.3	Action plan for implementing EMP and environmental conditions along with responsibility matrix of the company shall be prepared and shall be duly approved by competent authority. The year wise funds earmarked for environmental protection measures shall be kept in separate account and not to be diverted for any other purpose. Year wise progress of implementation of action plan shall be reported to the Ministry/Regional Office along with the Six-Monthly Compliance Report.	Agreed. An action plan for implementation of the EMP and environmental conditions along with a responsibility matrix shall be prepared and duly approved by the competent authority. The year-wise funds earmarked for environmental protection measures shall be maintained in a separate account and shall not be diverted for any other purpose. The year-wise progress of implementation of the action plan shall be regularly reported to the Ministry/Regional Office along with the six-monthly compliance reports.
Miscellaneous		
S. No	**EC Conditions**	**Compliance Status**
10.1	The project proponent shall make public the environmental clearance granted for their project along with the environmental conditions and safeguards at their cost by prominently advertising it at least in two local newspapers of the District or State, of which one shall be in the vernacular language within seven days of receipt of EC and in addition, this shall also be displayed in the project proponent's website permanently.	Agreed. The Environmental Clearance (EC) grant details have already been duly published in two local newspapers, namely Star Samachar and Singrauli Mirror, on 24.02.2026 (Annexure - 6). Further, the EC copy has been permanently displayed on the Company's official website on 25.02.2026 (Annexure -7), in compliance with the stipulated requirements.
10.2	The copies of the environmental clearance shall be submitted by the project proponents to the Heads of local bodies, Panchayats and Municipal Bodies in addition to the relevant offices of the Government who in turn has to display the same for 30 days from the date of receipt.	Agreed. The copies of the Environmental Clearance (EC) have already been duly submitted by the Project Proponent to the Heads of local bodies, Panchayats, and Municipal Bodies, as well as to the relevant Government offices, within one week of the EC grant. The acknowledgements/receipts of submission are enclosed for kind reference (Annexure - 8).
10.3	The project proponent shall upload the status of compliance of the stipulated environment clearance conditions, including results of monitored data on their website and update the same on half-yearly basis.	Agreed. Environmental monitoring shall be carried out and data uploaded on the Company's website on a half-yearly basis after obtaining all statutory clearances.
10.4	The project proponent shall submit six-monthly reports on the status of the compliance of the stipulated environmental conditions on the website of the ministry of Environment, Forest and Climate Change at Parivesh portal.	Agreed. The Project Proponent shall submit six-monthly compliance reports on the MoEF&CC PARIVESH portal.

10.5	The monitoring data w.r.t environmental parameters shall be uploaded on the company's website and displayed at the project site at a suitable location. The circular No.J-20012/1/2006-lA.11 (M) dated 27th May, 2009 issued by Ministry of Environment, Forest and Climate Change shall also be referred in this regard for its compliance.	Agreed. Environmental monitoring data shall be uploaded on the Company's website and displayed at the project site, in compliance with MoEF&CC Circular dated 27.05.2009.
10.6	The project proponent shall submit the Environmental Statement for each financial year in Form-V to the concerned State Pollution Control Board, as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently and put on the website of the company.	Agreed. The Project Proponent shall submit Form-V (Environmental Statement) annually to SPCB and upload it on the Company's website.
10.7	The project authorities shall inform to the Regional Office of the MoEFCC regarding commencement of mining operations.	Agreed. The Project Authorities shall inform the Regional Office of MoEF&CC before commencement of mining operations.
10.8	The project authorities must strictly adhere to the stipulations made by the State Pollution Control Board and the State Government.	Agreed. The Project Authorities shall strictly adhere to all stipulations prescribed by the State Pollution Control Board and the State Government.
10.9	The project proponent shall abide by all the commitments and recommendations made in the EIA/EMP report, commitment made during Public Hearing and also that during their presentation to the Expert Appraisal Committee.	Agreed. The Project Proponent shall adhere to all commitments and recommendations made in the EIA/EMP report, Public Hearing, and EAC presentation.
10.10	No further expansion or modifications in the mine shall be carried out without prior approval of the Ministry of Environment, Forests and Climate Change (MoEF&CC).	Agreed. No expansion or modification shall be undertaken without prior approval of MoEF&CC.
10.11	Concealing factual data or submission of false/fabricated data may result in revocation of this environmental clearance and attract action under the provisions of Environment (Protection) Act, 1986.	Agreed. Concealment of facts or submission of false/fabricated data may lead to revocation of the EC and action under the Environment (Protection) Act, 1986.
10.12	The Ministry may revoke or suspend the clearance, if implementation of any of the above conditions is not satisfactory.	Agreed. The Ministry reserves the right to revoke or suspend the Environmental Clearance in case of unsatisfactory compliance with the stipulated conditions.
10.13	The Ministry reserves the right to stipulate additional conditions if found necessary. The Company, in a time bound manner, shall implement these conditions.	Agreed. The Ministry may stipulate additional conditions, if required, and the Company shall comply with and implement them in a time-bound manner.
10.14	The Regional Office of this Ministry shall monitor compliance of the stipulated conditions. The project authorities should extend full cooperation to the officer (s) of the Regional Office by furnishing the requisite data / information/monitoring reports	Agreed. The Project Authorities shall cooperate with the Regional Office and provide all required data and monitoring reports for compliance verification.
10.15	The above conditions shall be enforced, inter-alia under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986, Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 and the Public Liability Insurance Act, 1991 along with their amendments and Rules and any other orders passed by the Hon'ble Supreme Court of India / High Courts and any other Court of Law relating to the subject matter.	Agreed. The conditions shall be enforced under applicable environmental laws and rules, including Water Act, 1974; Air Act, 1981; EP Act, 1986; HW Rules, 2016; and PLI Act, 1991, as well as orders of Hon'ble Courts.

M.P. Pollution Control Board

E-5, Arera Colony Paryavaran Parisar, Bhopal - 16 MP Tele : 0755-2466191, Fax-0755-2463742

Annexure - 1

Consent Order

RED-LARGE | **CTE-Fresh** | **PCB ID: 172870**

Outward No:124211,28/11/2025 | **Consent No:CTE-63434**

To,

The Occupier,
M/s. Mahan Underground Coal Mine (M/s J K Cement Limited),
Village: Amiliya and Budher, Tehsil-Manda and Sarai,
District – Singrauli (M.P.)- 486886

Subject: Grant of NOC/ or Consent to Establish under section 25 of the Water (Prevention & Control of Pollution) Act,1974 and under section 21 of the Air (Prevention & Control of Pollution) Act, 1981 for the purpose of obtaining Environment Clearance.

Ref: Your Application Receipt No. 1416075 Dt. 17/11/2025 and last communication received on Dt.13/11/2025

Without prejudice to the powers of this Board under section 25 of the Water (Prevention & Control of Pollution) Act,1974 and under section 21 of the Air (Prevention & Control of Pollution) Act,1981 and without reducing your responsibilities under the said Acts in any way, this is to inform you that this Board grants Consent to Establish up to **31/10/2030** for setting up of Underground Coal Mine located between longitudes 82°22'30" to 82°24'49" E and latitudes 24°00'28" to 24°02'32" N at Village: Amiliya and Budher, Tehsil-Manda and Sarai, District – Singrauli (M.P.)- 486886 and-

SUBJECT TO THE FOLLOWING CONDITIONS :-

a. Location: Village: Amiliya and Budher, Tehsil-Manda and Sarai, District – Singrauli (M.P.)- 486886 located between longitudes 82°22'30" to 82°24'49" E and latitudes 24°00'28" to 24°02'32" N

b. The Mining Lease Area: 981.75 Ha

c. Product & Production Capacity:

Product /Activity	Production Capacity
Mining of Coal (Underground)	**1.2 Million Ton/year**

Special Condition:-

(1) For any change in above industry shall obtain fresh consent from the Board.
(2) Mine management shall obtain Environmental Clearance from MoEF&CC under EIA Notification, 2006.
(3) Management shall ensure installation of Fog Canons/Mist Sprayers for various locations in the mine area such as near CHP, Coal Stock yard, transportation route to railway siding, along the internal roads, Rain guns around periphery (East, west, North & south) directions, erection of 18 feet wind breaking wall around coal sock yard & 2 no. of CAAQMS, Deployment of Road sweeping machines, Semi automatic tarpaulin cover system & Sensor based wheel washing system at all Exit barriers.
(4) Mine Management shall install Over Land Conveyor (OLC) for transportation of coal from mine to Nearby Railway siding or shall extend of railway siding up to mine premises. Transportation of coal through road shall be avoided.
(5) Mine management shall ensure installation of adequate capacity ETP & STP and arrangement for utilization of the treated industrial/Domestic effluents.
(6) Industry shall have to use the Tarpaulin cover with minimum 400 GSM thicknesses. The automatic mechanical covering system shall be used in coal transporting vehicles.
(7) Mine management shall install PTZ Cameras at various strategic points to monitor above covering system in Coal transporting vehicles.

The consent (for operation) as required shall be granted to your industry after fulfillment of all the conditions mentioned above. For this purpose you shall have to make an application to this Board in the prescribed proforma at least two months before the expected date of commissioning of your industry. The applicant shall not operate the unit without obtaining consent for operation from the Board and shall not bring in to use any out let for the discharge of effluent and gaseous emission.

Enclosures:-

* ***Conditions under Water Act***
* ***Conditions under Air Act***
* ***General conditions***

By the order of Chairman, MPPCB

CC to :-

ng Officer, (Mining Section), Collector Office Singrauli Dist. Singrauli (M.P.) for inform
Mining Corporation, Arera Hills, Jail Road, Bhopal (M.P.) for necessary action please.
ficer, Regional office, MPPCB, Singrauli (M.P.)

Validity unknown
Digitally Signed by A. A. Mishra, Member Secretary
Date: 28/11/2025 05:02:55 PM

ACHYUT ANAND MISHRA
Member Secretary

(Organic Authentication on AADHAR from UIDAI Server)
TPAV # 4P6W2PR494

CONDITIONS PERTAINING TO WATER (PREVENTION & CONTROL OF POLLUTION) ACT 1974 :-

1. **The daily trade effluent shall be treated & reused in the process/mine spraying. The daily quantity of sewage generated shall not exceed 30.0 KL/day, which shall be treated in the STP & reused inside mine premises.**

2. Trade Effluent Treatment:-

The applicant shall provide comprehensive effluent treatment system as per the proposal submitted to the Board and maintain the same properly to achieve following standards-

Parameter	Standard Limit	
pH	Between	5.5 – 9.0
Suspended Solids	Not exceed	100 mg/l.
BOD3 Days 27 °C	Not exceed	30 mg/l.
COD	Not exceed	250 mg/l.
Oil and grease	Not exceed	10 mg/l.

Parameter	Standard Limit	
TDS	Not exceed	2100 mg/l.
Chlorides	Not exceed	1000 mg/l.

For other parameters general standards of discharge as notified under EP Act 1986 and standards notified by MPPCB from time to time shall be applicable.

3. Sewage Treatment :-

The applicant shall provide comprehensive sewage treatment system as per the proposal submitted to the Board and maintain the same properly to achieve following standards-

Parameter	Standard Limit *	
pH	Between	5.5 – 9.0
Suspended Solids	Not exceed	100 mg/l.
BOD_3 Days 27 °C	Not exceed	30 mg/l.
COD	Not exceed	250 mg/l.
Oil and grease	Not exceed	10 mg/l.
Fecal coliform	Not exceed	1000 MPN/100 ml

*** The operator of the STP shall comply with the standards notified vide G.S.R. 1265(E) under sections 6 and 25 of the Environment (Protection) Act, 1986 by the Ministry of Environment, Forest and Climate Change New Delhi dated 13th October, 2017.**

4. The acidic mine water discharge (if any) shall be treated up to prescribed Standards in series of settling tanks and shall reused in the process, for dust suppression, for green belt devolvement/gardening and water supply within the premises. The industry should operate & maintain its ETP for the treatment of acidic mine water and it shall be reused for beneficial purposes inside the premises. The treated mine water shall not be discharged in natural water bodies.

5(A).The Project Proponent is advised to obtain permission of CGWA for ground water extraction, installation of Piezometer and digital flow meter separate digital water meters to measure the consumption of ground water as per order of Hon'ble NGT in case no. 438/2018. The connectivity of the above meters shall be given to server of MPPCB. Also the data shall be submitted online through XGN monthly patrak/statements.

5(B). The Water meter preferably electromagnetic/ultrasonic type with digital flow recording facilities shall be installed at out let of ETP to measure the flow of waste water and data shall be submitted online through XGN monthly patrak /statements.

Sr	Water Code (Qty in KL/Day)	WC : 3116.48	WWG : 3111.48	Water Source
1	Domestic Purpose	35.0	30.0	Borewell
2	Dust Suppression	1154.0	0.0	Mine Water
3	Mine Water Discharge	0.0	3081.480	Mine Water
4	UG Mine activity, Workshop	1187.480	0.0	Mine Water
5	Plantation / Horticulture	740.0	0.0	Mine Water

6. Any change in production capacity, process, raw material used etc. and for any enhancement of the above prior permission of the Board shall be obtained. All authorized discharges shall be consistent with terms and conditions of this consent. Facility expansions, production increases or process modifications which result new or increased discharges of pollutants must be reported by submission of a fresh consent application for prior permission of the Board.

7. All treatment/control facilities/systems installed or used by the applicant shall be regularly maintained in good working order and operate effectively/efficiently to achieve compliance of the terms and conditions of this consent.

8. The Consent does not authorize or approve the Construction of any physical structures or facilities or the undertaking of any work in any water course or within its high flood level (HFL) area.

9. The specific effluent limitations and pollution control systems applicable to the discharge permitted herein are set forth as above conditions.

10. Compilation of Monitoring data-

i. Samples and measurements taken to meet the monitoring requirements specified above shall be representative of the volume and nature of monitored discharge. ii. Following promulgation of guidelines establishing test procedures for the analysis of pollutants, all sampling and analytical methods used to meet the monitoring requirements specified above shall conform to such guidelines unless otherwise specified sampling and analytical methods shall conform to the latest edition of

the Indian Standard specifications and where it is not specified the guidelines as per standard methods for the examination of Water and Waste latest edition of the American Public Health Association, New York U.S.A. shall be used.

11. Recording of Monitoring Activities & Results-

i. The applicant shall make and maintain online records of all information resulting from monitoring activities by this Consent.

ii. The applicant shall record for each measurement of samples taken pursuant to the requirements of this Consent as follows:

(i) The date, exact place and time of sampling
(ii) The dates on which analysis were performed
(iii)Who performed the analysis?
(iv)The analytical techniques or methods used and
(v)The result of all required analysis

iii. If the applicant monitors any Pollutant more frequently as is by this Consent he shell include the results of such monitoring in the calculation and reporting of values required in the discharge monitoring reports which may be prescribed by the Board. Such increased frequency shall be indicated on the Discharge Monitoring Report Form.

iv. The applicant shall retain for a minimum of 3 years all records of monitoring activities including all records of Calibration and maintenance of instrumentation and original strip chart regarding continuous monitoring instrumentation. The period of retention shall be extended during the course of any unresolved litigation regarding the discharge of pollutants by the applicant or when requested by Central or State Board or the court.

12. Reporting of Monitoring Results:-

Monitoring Information required by this Consent shall be summarized and reported by submitting a Discharge Monitoring report on line to the Board.

13. Limitation of discharge of oil Hazardous Substance in harmful quantities:-

The applicant shall not discharge oil or other hazardous substances in quantities defined as harmful in relevant regulations into natural water course. Nothing in this Consent shall be deemed to preclude the institution of any legal action nor relive the applicant from any responsibilities, liabilities, or penalties to which the applicant is or may be subject to clauses.

14. Limitation of visible floating solids and foam:-

During the period beginning date of issuance the applicant shall not discharge floating solids or visible foam.

15. Disposal of Collected Solid waste/sludge-

All hazardous waste/sludge shall be disposed of as per the Authorization issued under Hazardous & other waste (M&TM) Rules 2016. And/other Solids Sludges, dirt, silt or other pollutant separated from or resulting from treatment shall be disposed of in such a manner as to prevent any pollutant from such materials from entering any such water Any live fish, Shall fish or other animal collected or trapped as a result of intake water screening or treatment may be returned to eaters body habitat.

16. Provision for Electric Power Failure-

The applicant shall assure to the consent issuing authority that the applicant has installed or provided for an alternative electric power source sufficient to operate all facilities utilized by the applicant to maintain compliance with the terms and conditions of the Consent.

17. Prohibition of By pass system of treatment facilities-

The diversion or by-pass of any discharge from facilities utilized by the applicant to maintain compliance with the terms and conditions of this Consent in prohibited except :

i. where unavoidable to prevent loss of life or severe property damage, or

ii. Where excessive storm drainage or run off would damage any facilities necessary for compliance with the terms and conditions of this Consent. The applicant shall immediately notify the consent issuing authorities in writing of each such diversion or by-pass in accordance with the procedure specified above for reporting non-compliance.

18. Industry/Institute/mine management shall submit the information online through XGN in reference to compliance of consent conditions.

19. In case of any discharge found outside of unit premises the unit may be liable to pay environmental compensation as per NGT orders O.A. no 593/2017dated 22.02.2021 and the industry shall be punishable or court case may be filed by the Board under provisions of the Water (Prevention & Control of Pollution) Act, 1974.

Sector Specific Water condition:-

1. The mine management shall ensure arrangements to maintain zero discharge conditions as far as possible. The Mine management shall optimize the water abstraction from the surface water source, if any, by utilizing the mine discharge for spraying on haul roads, mine area and loading & unloading area after proper treatment. The treated mine discharge shall also be utilized for sanitary purposes by providing separate supply lines, dust suppression and for plantation in order to ensure zero discharge status as far as possible.

2. Rain water harvesting shall be undertaken to recharge ground water source and status of implementation shall be submitted to the Board. Hydro-geological study of the area shall be reviewed annually. In case any adverse effect on ground water quality and quantity is observed, mining shall be stopped and resumed only after applying mitigating steps

to restore.

3. Garland drain of appropriate size, gradient and length shall be constructed for both mine pit and for waste dump & sump capacity shall be designed keeping 50% safety margin over and above peak sudden rainfall (based on 50 years data) and maximum discharge in the area adjoining the mine site. The garland drain shall be stone pitched /lined to prevent the erosion. Sump capacity shall also provide adequate retention period to allow proper settling of silt material. Sedimentation pits shall be constructed at the corners of the garland drains and de-silted at regular intervals. Mine Management shall construct proper Garland drains & sump of appropriate size before onset of monsoon.

4. Siltation ponds shall be constructed to treat the mine water. Facility shall be provided to check the quality of siltation pond water shall be regularly monitored and mitigation measure shall be taken.

5. Mine management shall ensure OB dump stabilization & it's reclamation to minimize erosion and siltation of d/s water bodies during heavy rains. Mine management shall prepare & submit an action plan for the utilization of fly ash in OB or mine void in compliance of the fly ash Notification for the fly ash generated by the coal produced by the mine.

6. The Mine management shall install STP for treatment of domestic wastewater and ETP (settling tanks with oil skimmers) for treatment of Industrial Effluent up to the prescribed standards.

7. The construction of ETP & STP shall be done simultaneously with the other civil work of the project.-Mine management shall prepare an action plan for the utilization of fly ash in construction works, road construction, near-by low-lying areas/ mines, brick manufacturing etc. Mine management shall ensure proper and timely maintenance of STP so as to ensure quality of treated effluent within the prescribed limits.

8. The mine management shall comply with the conditions of the Environmental Clearance granted to the mine by MoEF&CC and compliance submitted to this office from time to time.

9. Industrial wastewater from coal handling plant and mine water shall be properly collected and treated so as to conform to the standards prescribed under the Environment (Protection) Act, 1986 and the Rules made thereunder, and as amended from time to time. Oil and grease trap shall be installed before discharge of workshop effluent. Sewage treatment plant of adequate capacity shall be installed for treatment of domestic wastewater.

10. PP shall ensure that entire UG mine seepage will be pumped to the surface into the sedimentation tank. It will be 100% reutilized within mine for sprinkling & greenbelt irrigation. Excess treated shall be given to nearby farmers for irrigation, villagers for non- potable other use, nearby industries or discharged into nearby stream after ensuring compliance to prescribed norms and prior permission from MPPCB.

11. PP shall develop at least four surface water bodies of adequate water holding capacity at all four directions within mining lease area to recharge the ground water level.

12. PP shall provide check dams with adequate capacity across nearby stream.

CONDITIONS PERTAINING TO AIR (PREVENTION & CONTROL OF POLLUTION) ACT 1981 :-

1. The applicant shall provide comprehensive air pollution control system consisting of control equipments as per the proposal submitted to the Board with reference to generation of emission and same shall be operated & maintained continuously so as to achieve the level of pollutants to the following standards:-

Name of section	Control equipment to be installed	SPM/RSPM/SO_X/NO_X (mg/NM^3) (Annual Average)
Loading-unloading, Haul road, Coal Transportation Road, CHP, Railway Siding, Blasting, Drilling, OB Dumps etc	Dust Collector, Dust Suppressor, Green Belt, Water Sprinkler, Wind Breaking Wall	430 / 215/80/80 (24 Hr. Average : 600/300/120/120)

2. The Ambient air quality norms are prescribed in MoEF gazette notification no. GSR/826(E), dated: 16/11/09. Some of the parameters are as follows:

a. Particulate Matter (less than 10 micron) - 100 $\mu g/m^3$ (PM10 $\mu g/m^3$ 24 hrs. basis)
b. Particulate Matter (less than 2.5 micron) - 60 $\mu g/m^3$ (PM2.5 $\mu g/m^3$ 24 hrs. basis)
c. Sulphur Dioxide [SO2] (24 hrs. Basis) - 80 $\mu g/m^3$
d. Nitrogen Oxides [NOx] (24 hrs. Basis) - 80 $\mu g/m^3$
e. Carbon Monoxide [CO] (8 hrs. Basis) - 2000 $\mu g/m^3$

3. The industry shall take adequate measures for control of noise level generated from industrial activities within the premises less than 75 dB(A) during day time and 70 dB(A) during night time.

4. The industry/unit shall make the necessary arrangements for control of the fugitive emission from any source of emission/section/activities.

5. All other fugitive emission sources such as leakages, seepages, spillages etc shall be ensured to be plugged or sealed or made airtight to avoid the public nuisance.

6. The industry/ unit shall ensure all necessary arrangements for control of odour nuisance from the industrial activities or

process within premises

7. All the internal roads shall be made pucca to control the fugitive emissions of particulate matter generated due to transportation and internal movements. Good housekeeping practices shall be adopted to avoid leakages, seepages, spillages etc.

8. Industry shall take effective steps for extensive tree plantation preferably of the local tree species within or around the industry/unit premises for general improvement of environmental conditions.

9. In case of emission found exceeding prescribed standards, the unit may be liable to pay environmental compensation as per NGT orders O.A. no 593/2017dated 22.02.2021 and the industry shall be punishable or court case may be filed by the Board under provisions of the Air (Prevention & Control of Pollution) Act, 1981.

Sector Specific Air condition:-

1. Mine management shall strictly comply with the directions of the Hon'ble NGT in the matter 276/2013 (Ashwani Kumar Dubey vs. Govt. of India & Others) and shall report accordingly to Board with regard to stoppage of coal transportation by road.

2. Mine management shall install continuous ambient air quality monitoring station at suitable location preferably village side in consultation with the Board. The real time data so generated shall be uploaded on company website and linked it with website of CPCB & MPPCB. In addition, data should also be displayed digitally at entry and exit gate of mine lease area for public display.

3. Mine management shall provide continues water sprinkler systems / rain gun at suitable locations on the road side and also provide proper pollution control arrangements to control the fugitive emission generates due to transportation of Coal .

4. Vehicular emissions should be kept under control and regularly monitored for compliance of emission norms. Vehicles used for transporting the mineral should be covered with tarpaulins and optimally loaded. As far as possible road transportation shall be avoided.

5. Extensive tree plantation shall be done on both sides of Mineral transportation roads and around mining lease area. The tree plantation shall be carried out in phased manner preferably with local species. Good housekeeping practice shall be adopted by the Mine. More plantations with species like Neem, Pipal, Mango, Jamun, Kathal etc shall be planted. Mine management shall submit a proper proposal for green belt development in MP portion of mine lease hold area.

6. The mine shall take effective steps for safe and scientific reclamation of over burden, steps shall be taken to keep the geological structure in the natural form by biological reclamation of mines.

7. Mine management shall take appropriate steps to maintain the eco-system of the area through environmental conservation program and the record shall be submitted to the Regional office of the Board annually.

8. Mines management shall provide progressive plantation on the over burden for stabilization of over burden and prevent the soil erosion.

9. Crushers at the CHP (if any) shall be operated with high efficiency bag filters. Mine management shall have to provide automatic water spraying system for the CHP, Coal stock yard and haul roads.

10. Mine management shall provide fencing all around the mining lease area to prevent the occurrence of accidental hazard.

11. Mine management shall setup an online or manual coal ash monitoring system for raw, or blended or beneficiated coal supplied to thermal power plants as per the MoEFCC OM dated 26/08/2015 and submit the report to MPPCB.

12. Coal handling plant and coal loading and unloading in railway wagons / trucks should be provided with adequate number of high efficiency dust extraction / suppression system. Loading and unloading areas including all the operated. Dust control measures shall be adopted at pit head & coal transfer point of the mining machines as per the need.

13. Major approach roads shall be black topped and properly maintained

GENERAL CONDITIONS:

1. MANAGEMENT & DISPOSAL OF FLY ASH:-

MoEF &CC, GOI has issued notification dated 31.12.2021 regarding procedures & mandate to increase utilization of fly ash generated by the thermal power plants through the Coal mines under extended producers responsibility. This notification No.SO 5481 (E) dated 31.12.2021 has been published suppressing the previous Fly Ash Utilization Notification dt 14.09.199 as amended.

Following paras no. 3 & 4 of part B at page no. 16 of the notification are reproduced for taking necessary action at your end –

(3) It shall be obligatory on all mines located within 300 Kilometres radius of thermal power plant to undertake backfilling of ash in mine voids or mixing of ash with external overburden dumps under extended

Producer Responsibility (EPR). All mine owners or operators (Government, Public and Private sector) within three Hundred kilometres (by road) from coal or lignite based thermal power plants, shall undertake measure to mix at least 25 percent of ash on weight to weight basis of the materials used for external dump of overburden, backfilling or stowing of mine (running or abandoned as the case may be) as per the guidelines of the Director General of Mines Safety (DGMS).

Provided that such thermal power stations shall facilitate the availability of required quality of ash by delivering ash free of coast and bearing the cost of transportation or transportation arrangement decided on mutually agreed terms and mixing of ash with overburden in mine voids and dumps shall be applicable for the overburden generated from the date of publication of this notification and the utilisation of ash in the said activities shall be carried out in accordance with guidelines laid down by the Central Pollution Control Board, Director General of Mines Safety and Indian Bureau of Mines.

Explanation- For the purpose of this sub paragraph, it is also clarified that the provisions of ash free of cost and free transportation shall be applicable, if thermal power plants serve a notice on the mine owner for the same and the mandate of using 25 percent of ash for mixing with overburden dump and filling up of mine voids shall not be applicable unless a notice is served on the mine owner by thermal power plan

(4) (i) All mine owners shall get mine closure plans (progressive and final) to accommodate ash in the mine voids and the concerned authority shall approve mine plans for disposal of ash in mine voids and mixing of ash with overburden dumps. The Ministry of Environment Forest and Climates Change (MOEFCC) has issued guidelines on 28th August, 2019 regarding exemption of requirement of Environment Clearance of thermal power plants and coal mines along with the guidelines to be followed for such disposal.

(ii) The Ministry in consultation with Central Pollution Control Board (CPCB), Director General of Mine Safety (DGMS) and Indian Bureau of Mines (IBM) may issue further guidelines time to time to facilitate ash disposal in mine voids and mixing with overburden dumps and it shall be the responsibility of mine owners to get the necessary amendments of modification in the permission issued by various regulatory authorities within one year from the date of identification of such mines.

2. The non hazardous solid waste arresting in the industry/unit/unit premises sweeping, etc. be disposed off scientifically so as not to cause any nuisance/pollution. The applicant shall take necessary permission from civic authorities for disposal to dumping site. If required.

Non Hazardous Solid wastes:-

Type of waste	Quantity	Disposal
Scrap/ Plastic packing material wood, card board, gunny begs etc	Record should be maintained	Re-Use/Sale to M.P. Pollution Control Board's authorized party

3. The applicant shall allow the staff of Madhya Pradesh Pollution Control Board and/or their authorized representative, upon the representation of credentials:
   a. To inspect raw material stock, manufacturing processes, reactors, premises etc to perform the functions of the Board.
   b. To enter upon the applicant's premises where an effluent source is located or in which any records are required to be kept under the terms and conditions of this Consent.
   c. To have access at reasonable times to any records required to be kept under the terms and conditions of this Consent.
   d. To inspect at reasonable times any monitoring equipment or monitoring method required in this Consent: or,
   e. To sample at reasonable times any discharge or pollutants.

4. This consent is transferable in nature, in case of any change in ownership / management, the new owner / partner / directors / proprietor shall immediately apply for the consent with new requisite information.

5. The issuance of this Consent does not convey any property rights in either real or personal property or any exclusive privileges, nor does it authorize any invasion of personal rights, nor any infringement of Central, State or local laws or regulations.

6. Industry shall install separate electric metering arrangement for running of pollution control devices and this arrangement shall be made in such fashion that any nonfunctioning of pollution control devices shall immediately stop electric supply to the production and shall remain tripped till such time unless the pollution control device/devices are made functional.

7. This consent is granted in respect of Water pollution control Act 1974 or Air Pollution Control act, 1981 and does not relate to any other Department/Agencies. License required from other Department/Agencies have to be obtained by the unit separately and have to comply separately as per there Act / Rules.

8. Balance consent fee, if any shall be recoverable by the Board even at a later date.

9. The applicant shall submit such information, forms and fees as required by the board not letter than 180 day prior to the date of expiration of this consent.

10. The industry/unit shall establish a separate environmental cell, headed by senior officer of the unit for reporting the environmental compliances. The industry/ Unit shall submit environmental statement for the previous year ending 31st March on or before 30th September every year to the Board.

11. Industry shall obtain membership of Emergency Response Center of the Board if needed.

12. Knowingly making any false statement for obtaining consent or compliance of consent conditions shall result in the imposition of criminal penalties as provided under the section 42(g) of the Water Act or section 38 (g) of the Air Act.

13. After notice and opportunity for the hearing, this consent may be modified, suspended or revoked by the Board in whole or in part during its term for cause including, but not limited to, the following :

(a) Violation of any terms and conditions of this Consent.
(b) Obtaining this Consent by misrepresentation of failure to disclose fully all relevant facts.
(c) A change in any condition that requires temporary or permanent reduction or elimination of the authorized discharge.

14. On violation of any of the above-mentioned conditions the consent granted will automatically be taken as canceled and necessary action will be initiated against the industry.

15. The industry/unit shall also monitor the treated wastewater flow and report the same online through monthly patrak/statements.

16. The applicant shall take samples and measurement to meet the monthly requirements specified above and report online through XGN the same to the Board.

17. Ambient air quality at the boundary of the industry/unit premises shall be monitored and reported to the Board regularly on quarterly basis

18. The record of electricity consumption for running of pollution control equipment shall be maintained and submitted to the Board every month.

Additional condition:-

1. The Mine management shall ensure the arrangements for disposal of Non-Hazardous solid waste generated from the unit to the authorized venders only.
2. Authorization under Hazardous Waste and other waste (Management & Transboundary Movement) Rules, 2016 shall be obtained at the time of consent to operate, if applicable.
3. The industry shall provide arrangements for fire safety & emergency.
4. Project proponent shall strictly follow the Construction & Demolition Waste Management Rules, 2024 as applicable.
5. The industry shall strictly comply with CPCB/SPCB/MoEF&CC/Hon'ble NGT norms time to time.
6. As directed in the Fly Ash Utilization Notification Issued by MoEF & CC, GOI on dt 31.12.2021; The PP shall initiate all necessary actions from the project level to ensure time bound compliances listed in the notification to start utilization of fly ash in the OB dumps without delay.

Consent to establish as required under the Water (Prevention & Control of Pollution) Act, 1974 and under the Air (Prevention & Control of Pollution) Act, 1981 is granted to your mine subject to fulfillment of all the conditions mentioned above. The Project Proponent shall submit an application to this Board through XGN for obtaining the Consent for Operation before two months of the commencement of production. The applicant without valid consent (for operation) of the Board shall not bring in to use any outlet for the discharge of effluent and gaseous emission.

For and on behalf of
M.P. Pollution Control Board

By the order of Chairman, MPPCB

ACHYUT ANAND MISHRA
Member Secretary

(Organic Authentication on AADHAR from UIDAI Server)
TPAV # 4P6W2PR494

Annexure - 2

कार्यालय प्रधान मुख्य वन संरक्षक (वन्यजीव) एवं मुख्य वन्यजीव अभिरक्षक, मध्य प्रदेश
भू–तल, सी–ब्लॉक, वन भवन, लिंक रोड़ नं.–2, तुलसी नगर, भोपाल–462003
दूरभाष : 0755–2674248, 2524275, फैक्स : 0755–2674206 E-mail : pccfwl@mp.gov.in

क्रमांक / वन्यजीव / व.त.अ.–1 / Mine-242 / 10857 भोपाल, दिनांक 29/12/25

प्रति,

हेड (कोल माइन्स)
मेसर्स जेके सीमेंट लिमिटेड
महान कोल माइन्स
प्रिज्म टॉवर, 6 फ्लोर निनानिया स्टेट,
ग्वाल पहाड़ी गुरूग्राम 122102 हरियाणा

विषय :– **Submission of Site-Specific Wildlife Conservation Plan for Mahan Underground Coal Mine of 1.2 MPTA rated production capacity, over an area of 981.75 Ha. located at Villages: Amiliya and Budher, Tehsil Mada and Sarai, District Singrauli M.P. by M/s JK Cement Limited.**

संदर्भ :– मुख्य वन संरक्षक, रीवा वृत्त रीवा का पत्र क्रमांक / मा.चि. / 2025 / 8493 दिनांक 06.11.2025 एवं 9363 दिनांक 08.12.2025

उपरोक्त विषयांतर्गत संदर्भित पत्र से आपके द्वारा जेके सीमेंट लिमिटेड की महान अंडरग्राउंड कोल माइन ग्राम अमिलिया, बुधेर, तहसील भाड़ा, सरई, जिला सिंगरौली में स्थित रकबा 975.497 हेक्टेयर वनभूमि एवं राजस्व भूमि 6.253 हेक्टेयर इस प्रकार कुल 984.75 हेक्टेयर भूमि के संबंध में भारत सरकार द्वारा पर्यावरणीय स्वीकृति दिनांक 09.08.2025 से जारी टी.ओ.आर. में अधिरोपित शर्त क्रमांक 1.44 के पालन में प्रस्तावित माइन स्थल से 10 कि.मी. परिधि में पाये जाने वाले फ्लोरा–फॉना के संरक्षण एवं संवर्धन हेतु 10 वर्षों के लिए रूपये 1.38 करोड़ की वन्यजीव संरक्षण योजना, वरदान इन्वायरोनेट एलएलपी, गुरगांव से तैयार कराकर इस कार्यालय के अनुमोदन हेतु प्रेषित वन्यजीव संरक्षण योजना मुख्य वन संरक्षक, रीवा वृत्त रीवा द्वारा पत्र दिनांक 06.11.2025 के माध्यम से इस कार्यालय को प्रेषित की गई है। उक्त वन्यजीव संरक्षण योजना में परीलक्षित कमियों की पूर्ति हेतु इस कार्यालय के पत्र दिनांक 11.11.2025 से लेख किया गया था।

उक्त वन्यजीव संरक्षण योजना में परीलक्षित कमियों पूर्ति कर प्रस्तुत संशोधित वन्यजीव संरक्षण योजना वनमण्डलाधिकारी सामान्य वनमण्डल सिंगरौली पत्र क्रमांक / मा.चि. / 7148 दिनांक 28.11.2025 से मुख्य वन संरक्षक, रीवा वृत्त को प्रेषित किया गया था जिसे मुख्य वन संरक्षक, रीवा वृत्त द्वारा संदर्भित पत्र दिनांक 08.12.2025 से 10 वर्षों के लिए 344.00 लाख संशोधित वन्यजीव संरक्षण योजना अनुशंसा सहि इस कार्यालय को अनुमोदन हेतु प्रेषित की गई है।

वनमण्डलाधिकारी, सिंगरौली एवं मुख्य वन संरक्षक, रीवा वृत्त द्वारा अनुशंसित वन्यजीव संरक्षण योजना में सिंगरौली वनमण्डल के लिए रूपये 344.00 लाख प्रावधानित किये गये हैं तथा इस राशि का Miscellaneous Administration and Monitoring expenses (@2% of the total costs हेतु राशि रूपये 5.63 लाख तथा Escalation cost and unforeseen expenditure @20% of total costs की राशि रूपये 56.34 लाख सम्मिलित है। जिसके मुख्य घटक एवं प्रावधानित राशि निम्नानुसार है:–

Table 5.2 Activities Under Each Management Intervention along with Year-wise Allocation of Budget

Sl. No		Management Interventions	Area/ Unit /Nos	Unit Cost (Rs. In Lakh)	Total Cost (Rs. In Lakh)	Year-wise Financial Target (Rs. in Lakh)									
						1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
1	**Watch & Ward**														
	1.1	Engagement of Van Sahayak for 10 Years	1	0.15/ month	18.00	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80
	Purchase of Camera Traps, Dragon Torch and Thermal Night Vision Binocular														
	1.2	a) Camera Traps	100 Nos.	0.20/ Unit	20.00	20.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Sl. No

Sl. No		Management Interventions	Area/ Unit /Nos	Unit Cost (Rs. In Lakh)	Total Cost (Rs. In Lakh)	Year-wise Financial Target (Rs. in Lakh)									
						1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
		b) Dragon Torches	80 Nos.	0.05/ Unit	4.00	4.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		c) Thermal Night Vision Binoculars:	20 Nos.	0.30/ Unit	6.00	6.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.3	Provision for Mnitoring cum Rescue vehicle (Mahindra Bolero Camper	01 No.	15.00/ Unit	15.00	15.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.4	Incentives/prize sfor informers	LS	0.20/ year	2.00	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
	Sub Total				65.00	47.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
2	**Wildlife Habitat Enhancement and Improvement works**														
	2.1	Development of groves by planting various species (Ficus sp., Mangifera indica, Grewia sp., Syzygium sp.,m Ziziphus sp., Cofdia domestica (etc) as a prorgessive plantation	03 Ha.	5.00/ ha.	15.00	5.00	5.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2.2	Meadow Development 05 Ha. land of will be developed at the cost of 2,00,000 Rs. per Hectare as meadow patches by land furrowing and seed/root stock spread watering and its maintenance for on e subsequest year.	05 Ha.	2.00/ Ha.	10.00	2.00	2.00	2.00	2.00	2.00	0.00	0.00	0.00	0.00	0.00
	2.3	Eradication of Weeds	-	0.70/ Year	7.00	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70
	2.4	Providsion of Salt Lick	30 Nos.	0.10/ point	3.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2.5	Grant for Forest Nursery to raise quality saplings of Tectona grandis Dalbergia latifolia and Chloroxylon swietenia		0.40/ year	4.00	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40
	2.6	Contor Treanch and Percolation Ponds		0.52/ year	5.20	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52

Sl. No		Management Interventions	Area/ Unit /Nos	Unit Cost (Rs. In Lakh)	Total Cost (Rs. In Lakh)	Year-wise Financial Target (Rs. in Lakh)									
						1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
	2.7	Construction of Well Boundary in 04 villages around the 10 Km. periphery of the Mine area	20 Nos.	0.15/ unit	3.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Sub total				**47.20**	**10.62**	**10.62**	**10.62**	**3.62**	**3.62**	**1.62**	**1.62**	**1.62**	**1.62**	**1.62**
3	**Integrated Forest Fire Management:**														
	3.1	Engagement of Fire Wather 02 no. of Fire watchers will be engaged for a period of 04 months March to June for 10 years @wage rate of Rs. 392.00/day (02 no.x Rs. 392/- x30 days x 04 months x 10 years) i.e. Rs.9.41 Lakh	02 Nos.	015/ Per	36.00	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60
	3.2	Procurement of Fire Fighting Eqipument		20.00	20.00	20.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Sub-Total				**56.00**	**23.60**	**3.60**	**3.60**	**3.60**	**3.60**	**3.60**	**3.60**	**3.60**	**3.60**	**3.60**
4	**Speial provision for minimizing human-animal conflicts**														
	4.1	Awarness Promotion		1.0 lakh/year	10.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	4.2	Free distribution of Seedling/saplings/seeds Teak seedlings and grafted seedelings of fruit bearing plants (Ber, Mahua, Guava etc) in equal proportion will be distributed. It is proposed to distribute 20,000 such seedlings@Rs. 20 each	20000 Nos.	0.50 lakh/ year	5.00	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
	4.3	Incentives for reducing maize crop area near to forests		1.0 lakh/ year	10.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	4.4	Installattion of Solar Street lamp/light in			10.00	5.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Sl. No		Management Interventions	Area/ Unit /Nos	Unit Cost (Rs. In Lakh)	Total Cost (Rs. In Lakh)	Year-wise Financial Target (Rs. in Lakh)									
						1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
		wildlife affected villages and its maintance													
	Sub-total				**35.00**	**7.50**	**7.50**	**2.50**	**2.50**	**2.50**	**2.50**	**2.50**	**2.50**	**2.50**	**2.50**
5	**Monitoring and Evaluation**														
	5.1	Monitoring Vehicles (Motorcycles)	05 Nos.	1.25 /Bike	7.50	7.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5.2	Watch Tower	02 Nos.	20/ Twoer	40.00	20.00	20.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Sub-Total				**47.50**	**27.50**	**20.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
6	**6. Safety and Precautions**														
	6.1	Safety precautions signage, fluorescent sign boards			7.00	3.00	3.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Sub-Total				**7.00**	**3.00**	**3.00**	**1.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
7	**7. Vaccination/immunization, Rescue and Release**														
	7.1	Vaccination of domestic animals		1.0/each	10.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	7.2	Animal Rescue and Release Cage/safe birds and snakes capture eqipments	2 No.	3/per cage	6.00	6.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Sub-Total				**16.00**	**7.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**
8	**Corpus fund for Miscellaneous Works(for Division Level)**														
	8.1	Corpus fund for Miscellaneous works (for Division Level)			8.00	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
	Sub-Total				**8.00**	**0.80**	**0.80**	**0.80**	**0.80**	**0.80**	**0.80**	**0.80**	**0.80**	**0.80**	**0.80**
	Total				**281.70**	**127.20**	**48.52**	**21.52**	**13.52**	**13.52**	**11.52**	**11.52**	**11.52**	**11.52**	**11.52**
9	Miscellaneous Administration and Monitoring expences@2% of the total cost				5.63	2.54	0.97	0.43	0.27	0.27	0.23	0.23	0.23	0.23	0.23
10	Escalation Cost and unforseseen expenditure@20% of total cost				56.34	25.40	9.70	4.30	2.70	2.70	2.30	2.30	2.30	2.30	2.30
	Grand Total				**343.67**	**154.96**	**59.19**	**26.25**	**16.49**	**16.49**	**14.05**	**14.05**	**14.05**	**14.05**	**14.05**
	Or Says				**344**	**Rs. Three Crore Forty Four Lakh Only**									

वनमण्डलाधिकारी, सामान्य वनमण्डल सिंगरौली एवं मुख्य वन संरक्षक, रीवा वृत्त द्वारा अनुशंसित संशोधित वन्यजीव संरक्षण योजना के पृष्ठ क्रमांक 106 से 123 में उल्लेखित फ्लोरा–फौना की सूची एवं उनके संरक्षण एवं संवर्धन के लिये पृष्ठ क्रमांक 63 से 68 पर दर्शाये गये कार्यों के लिए रूपये 344.00 लाख की 10 वर्षों की प्रस्तुत वन्यजीव संरक्षण योजना का अनुमोदन किया जाता है। उक्त अनुमोदित वन्यजीव संरक्षण योजना की एक प्रति मुख्य वन संरक्षक, रीवा एवं एक प्रति वनमण्डलाधिकारी, सिंगरौली वनमण्डल को उपलब्ध करायें।

प्रकरण में भारत सरकार/राज्य शासन की अंतिम स्वीकृति उपरांत समय–सीमा में वन्यजीव संरक्षण योजना में वन्यप्राणी प्रबंधन हेतु प्रावधानित कार्यों हेतु योजना में प्रावधानित राशि रूपये 344.00 लाख (रूपये तीन करोड़ चौवासलीस लाख मात्र) एक मुश्त मध्यप्रदेश टाइगर फाउंडेशन सोसायटी के भारतीय स्टेट बैक, मुख्य शाखा, टी.टी. नगर, भोपाल

के बचत खाता क्रमांक 10571048460 आई.एफ.एस.सी कोड SBIN0001308 में जमा की जाकर वनमण्डलाधिकारी, वनमण्डल सिंगरौली एवं इस कार्यालय को अवगत कराना सुनिश्चित करेंगे तथा वन्यजीव संरक्षण योजना में प्रावधानित कार्यो को समय–सीमा में पूर्ण करायेंगें।

संलग्न :–उपरोक्तानुसार।

(शुभरंजन सेन)
प्रधान मुख्य वनसंरक्षक (वन्यजीव) एवं
मुख्य वन्यजीव अभिरक्षक म.प्र.
भोपाल, दिनांक 29/12/25

पृ0 क्रमांक/वन्यजीव/वतअ.–1/MINE-242/ 10858

प्रतिलिपि :–

1. अपर प्रधान मुख्य वन संरक्षक (भू–प्रबंध) वन भवन, भोपाल की ओर सूचनार्थ एवं आवश्यक कार्यवाही हेतु प्रेषित। उपरोक्त प्रकरण में वन संरक्षण अधिनियम, 1980 के अंतर्गत आपके स्तर से जारी अंतिम अनुमति में अनुमोदित वन्यजीव संरक्षण योजना में प्रावधानित राशि रूपये 344.00 लाख आवेदक संस्था द्वारा वनमण्डलाधिकारी, सामान्य वनमण्डल सिंगरौली को एक मुश्त उपलब्ध कराने एवं योजना में प्रावधानित कार्यो को समय–सीमा में पूर्ण कराये जाने की शर्त अधिरोपित करने एवं शर्तों का पालन प्रतिवेदन प्रस्तुत करने की शर्त अधिरोपित किये जाने का कष्ट करें।
2. मुख्य वन संरक्षक, रीवा वृत्त रीवा की ओर अनुमोदित वन्यजीव संरक्षण योजना की एक प्रति सहित सूचनार्थ एवं आवश्यक कार्येवाही हेतु प्रेषित।
3. वनमण्डलाधिकारी, सामान्य वनमण्डल सिंगरौली की ओर उक्त अनुमोदित वन्यजीव संरक्षण योजना की एक प्रति सहित सूचनार्थ एवं आवश्यक कार्यवाही हेतु प्रेषित है। प्रकरण में भारत सरकार/राज्य शासन की अंतिम स्वीकृति के उपरांत माइन प्रारंभ होने के पूर्व वन्यजीव संरक्षण योजना में कराये जाने वाले कार्यों के लिए प्रावधानित राशि एक मुश्त आवेदक संस्था से प्राप्त कर प्रावधानित कार्यों का समय सीमा में क्रियान्वयन किया जाना सुनिश्चित करें तथा तत्संबंध में की गई कार्यवाही से अवगत कराया जावे।
4. प्रबंधक, मध्यप्रदेश टाइगर फाउंडेशन सोसायटी, मध्यप्रदेश भोपाल की ओर सूचनार्थ एवं आवश्यक कार्यवाही हेतु प्रेषित।

प्रधान मुख्य वनसंरक्षक (वन्यजीव) एवं
मुख्य वन्यजीव अभिरक्षक म.प्र

भारत सरकार
जल शक्ति मंत्रालय
जल संसाधन विभाग,
केंद्रीय भूमि जल प्राधिकरण
GOVERNMENT OF INDIA
MINISTRY OF JAL SHAKTI
DEPARTMENT OF WATER RESOURCES,
RIVER DEVELOPMENT & GANGA REJUVENATION
CENTRAL GROUND WATER AUTHORITY

सत्यमेव जयते

भूजल निकासी हेतु अनापत्ति प्रमाण पत्र
NO OBJECTION CERTIFICATE (NOC) FOR GROUND WATER ABSTRACTION

PROJECT NAME **JK Cement Ltd Mahan Coal Mine**		
PROJECT ADDRESS **Mahan Coal Mine, Singrauli Main Basin. District Singrauli**		PIN CODE **486886**
STATE **MADHYA PRADESH**	DISTRICT **SINGRAULI**	TOWN/BLOCK **BAIDHAN**
COMMUNICATION ADDRESS **JK CEMENT LIMITED, Prism Tower, Ninaniya Estate, Gwal Pahari, Gurugram-122102**		
ADDRESS OF CGWB REGIONAL OFFICE **Block-1, 4th Floor, Paryawas Bhawan Area Hills, Jail Road, Bhopal - 462011, Madhya Pradesh**		

1. NOC NO. **NOC/MIN/MP/2025/11462/N**	2. DATE OF ISSUANCE **25/08/2025**
3. APPLICATION NO. **MIN/MP/2025/11462**	4. APPLICATION TYPE **Mining**
5. PROJECT STATUS **New Project**	6. NOC TYPE **New**
7. VALID FROM **25/08/2025**	8. VALID UP TO **24/08/2027**
9. WATER QUALITY TYPE **Fresh Water**	10. AREA TYPE CATEGORY **Safe** (GWRE - **2024**)

11. Ground Water Abstraction Permitted

GW Abstraction		Dewatering		Total	
m^3/day	m^3/year	m^3/day	m^3/year	m^3/day	m^3/year
35.01	12778.65	**0.00**	0.00	**35.01**	12778.65

12. Details of Ground Water Abstraction /Dewatering Structures

EXISTING 0					PROPOSED 2					TOTAL 2				
DW	DCB	BW	TW	Pu	DW	DCB	BW	TW	Pu	DW	DCB	BW	TW	Pu
0	0	0	0	0	0	0	2	0	0	0	0	2	0	0

*DW-Dug Well; DCB-Dug-cum-Bore Well; BW-Bore Well; TW-Tube Well; Pu Pumps;

13. No. Of Mine Pits

EXISTING	PROPOSED	TOTAL
0	0	0

Validity of this NOC shall be subject to mandatory compliance of the following conditions:

Phase I (within 30 days)

1. Installation of tamper proof digital water flow meter with telemetry on all the abstraction structure(s) is mandatory for all users seeking No Objection Certificate. Intimation regarding their installation shall be updated in Self-Compliance Module (Phase-I) of BhuNeer APP portal within 30 days of grant of No Objection Certificate.

Phase II (within 11 months)

1. Proponents shall mandatorily get water flow meter calibrated from an authorized agency once in a year.
2. Construction of purpose-built observation wells (piezometers) for ground water level monitoring is mandatory as per Section 14 of Guidelines. Water level data shall be made available to CGWA through web portal. Detailed guidelines for construction of piezometers are given in Annexure-II of the notified guidelines.
3. Proponents shall monitor quality of ground water from all the abstraction structure(s) once in a year. Water samples from bore wells/ tube wells / dug wells shall be collected during April/May every year and analyzed in NABL accredited or Govt. approved laboratories for basic parameters (cations and anions), heavy metals, pesticides/ organic compounds etc. Water quality data shall be made available to CGWA through the web portal.

4. In case of mining projects, additional key wells in core as well as buffer zones of the mine shall be established in consultation with the Regional Director, CGWB for ground water level monitoring four (4) times a year (January, May, August and November).
5. In case of mining project, the firm shall submit water quality report of mine discharge/ seepage from Govt. approved/ NABL accredited lab.
All the above-mentioned mandatory compliance conditions are to be filed online in BHUNEER APP (https://cgwa-bhuneer.mowr.gov.in)timely.

General Conditions:

1. Application for renewal can be submitted online from 90 days before the expiry of NOC. Ground water withdrawal, if any, after expiry of NOC shall be illegal & liable for legal action as per provisions of Environment (Protection) Act, 1986 and amendment thereto, if any.
2. This NOC is subject to prevailing Central/State Government rules/laws/norms or Court orders related to construction of tube well/ground water abstraction structure / recharge or conservation structure/discharge of effluents or any such matter as applicable.
3. This NOC is being issued without any prejudice to the directions of the Hon'ble NGT/court orders in cases related to ground water or any other related matters.
4. No additional ground water abstraction and/or de-watering structures shall be constructed for this purpose without prior approval of the Central Ground Water Authority (CGWA).
5. The proponent shall seek prior permission from CGWA for any increase in quantum of groundwater abstraction as permitted in NOC.
6. Proponents shall install roof top rain water harvesting in the premise as per the existing building bye laws.
7. Proponents, who have installed/constructed rain water harvesting and artificial recharge structures shall continue to regularly maintain the water conservation structures.
8. The project proponent shall take all necessary measures to prevent contamination of ground water in the premises failing which the firm shall be responsible for any consequences arising thereupon.
9. Industries which are likely to cause ground water pollution, e.g. Tanning, Slaughter Houses, Dye, Chemical/ Petrochemical, Coal washeries, pharmaceutical, other hazardous units etc. (as per CPCB list), no recharge measures shall be taken up by such firms inside the plant premises. The runoff generated from the rooftop shall be stored and put to beneficial use by the firm. The firm need to undertake necessary well head protection measures to ensure prevention of ground water pollution as per Annexure III of the notified guidelines
10. Wherever feasible, requirement of water for greenbelt (horticulture) shall be met from recycled / treated waste water.
11. Wherever the NOC is for abstraction of saline water and the existing wells (s) is /are yielding fresh water, the same shall be sealed and new tubewell(s) tapping saline water zone shall be constructed within 3 months of the issuance of NOC. The firm shall also ensure safe disposal of saline residue, if any.
12. Unexpected variations in inflow of ground water into the mine pit, if any, shall be reported to the concerned Regional Director, Central Ground Water Board.
13. This NOC does not absolve the proponents of their obligation / requirement to obtain other statutory and administrative clearances from appropriate authorities.
14. This NOC does not imply that other statutory / administrative clearances shall be granted to the project by the concerned authorities. Such authorities would consider the project on merits and take decisions independently of the NOC.
15. In case of change of ownership, new owner of the industry will have to apply for incorporation of necessary changes in the No Objection Certificate with documentary proof within 6 months of taking over possession of the premises.
16. In case of new infrastructure projects having ground water abstraction of more than 20 m3/day, the firm/entity shall ensure implementation of dual water supply system in the projects.
17. In case of infrastructure projects, paved/parking area must be covered with interlocking/perforated tiles or other suitable measures to ensure groundwater infiltration/harvesting.
18. In case of coal and other base metal mining projects, the project proponent shall use the advance dewatering technology (by construction of series of dewatering abstraction structures) to avoid contamination of surface water.
19. In the self-compliance report, the PP shall submit details of Drilling Agency/ Agencies, which has/ have constructed BW(s)/ TW(s) along with undertaking to the effect that all necessary measures have been taken as per directions of Hon'ble Supreme Court provided in Annexure-VII of guidelines dated 24.09.2020 in respect of abandoned/ failed BW(s)/ TW(s)/Piezometer(s), if any. The PP is advised to engage registered drilling agency/agencies. In the event of any mishap/ unfortunate incident due to negligence in taking measures for prevention of accident due to falling in Bore Well, both PP and concerned drilling agency shall jointly be held responsible and penal action as per extant Government rules shall be taken.
20. Non-compliance of the conditions mentioned above is likely to result in the cancellation of NOC and legal action against the proponent. In case of violation of any NOC conditions, the applicant shall be liable to pay the penalties as per Section 16 of Guidelines

Annexure - 4

Comprehensive Hydrological Report on

Watershed Management Plan for Forest Area with Strategies for Rainwater Harvesting, Soil Moisture Conservation and Implementation of Gap Plantation Measures

Sponsor: JK Cement Limited

Studied by:

Estb: 1988

Studied for:

SATYESH BRINECHEM PRIVATE LIMITED

Hydro-Geosurvey Consultants Private Limited

CERTIFICATE NO.: NABET/GWCO/IA/GW003

C-103, Shastri Nagar, Jodhpur- 342003
Phone: - 0291-2431754
Web: www.hydrogeosurvey.com, E-mail: - hydro.geosurvey@yahoo.com

September, 2025

Comprehensive Hydrological Report on Watershed Management Plan for Forest Area with Strategies for Rainwater Harvesting, Soil Moisture Conservation and Implementation of Gap Plantation Measures

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1.0 INTRODUCTION

JK Cement Ltd. is among India's leading manufacturers of grey cement and a global leader in white cement production. Since its inception in 1975 with the establishment of its flagship grey cement plant in Nimbahera, Rajasthan, the company has consistently supported India's infrastructure needs through high-quality products and cutting-edge technology.

JK Cement Ltd has been awarded the Mahan Coal Block (MCB) in Madhya Pradesh's Singrauli district, marking its second success in acquiring commercial coal blocks. The mine holds geological reserves of about 107.4 million tonnes of coal and has a peak-rated production capacity of 1.2 million tonnes annually.

This acquisition follows JK Cement's earlier win of the West of Shahdol (South) coal block. The company aims to use coal from these mines to meet the energy needs of its existing cement plants and upcoming projects, while any surplus will be sold commercially.

The Ministry of Environment, Forest and Climate Change (MoEF&CC), vide ToR No. TO25A0102MO5566899N dated 9th August 2025, has directed J K Cement Ltd. to prepare and submit a comprehensive Watershed Management Plan for the forest areas falling within the Mining Lease (ML) boundary. The plan shall emphasize soil and water conservation through the construction of water harvesting structures to augment groundwater and surface water resources. Further, the plan should incorporate gap plantation in degraded forest patches to enhance vegetative cover, improve soil stability, and support biodiversity enrichment. By integrating hydrological interventions with ecological restoration, the proposed measures will strengthen watershed health, mitigate erosion, and ensure long-term environmental sustainability within the ML area.

Executive Summary:

The 981.75 ha. project area lies in the Mahan Coal Field of Singrauli, a gently undulating forested terrain draining eastward towards the Rihand system via short, seasonal streams. Regional forests are tropical dry deciduous, with Shorea robusta (Sal) dominant where canopy persists; degradation and runoff have increased with development pressures in the coalfield belt.

Singrauli's coal belt sits at the northern edge of the Son–Mahanadi master basin; physiography and hydrology are controlled by low relief, dendritic drainage, and a strong monsoon regime. Investing in watershed-scale ecological works is the most cost-effective and holistic pathway to stabilize fragile

slopes, secure water resources, and regenerate forest ecosystems - delivering resilience for local communities while reducing the cumulative footprint of mining.

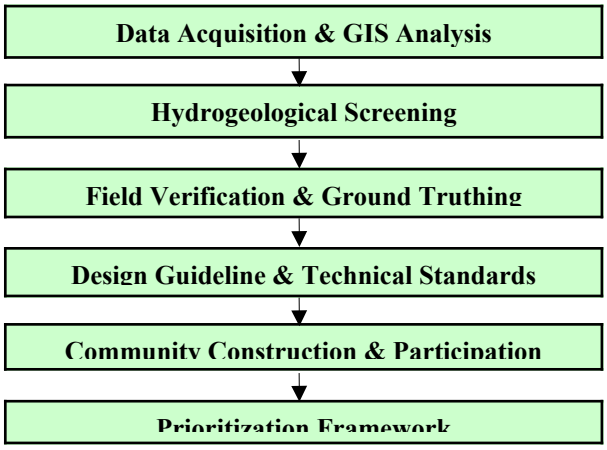
Objectives:

- Delineate the watershed system of the project area using GIS and DEM.
- Identify degraded forest patches and high runoff/erosion zones.
- Design technically feasible water harvesting structures.
- Develop a gap plantation plan with native species.
- Integrate soil and water conservation measures with community livelihood enhancement.

Methodology

The methodology adopted for the study is presented below in the form of a flow chart, supplemented with detailed descriptions of each step.

Watershed Management Plan Methodology



- **Data & GIS Analysis** – Use SOI toposheets and SRTM DEM to derive elevation, slope, drainage networks, flow accumulation, and watershed boundaries.
- **Hydrological Screening** – Apply stream-order analysis to delineate catchments, identify runoff concentration zones, and shortlist sites for water harvesting structures.
- **Field Verification** – Conduct walk-over surveys to validate drainage lines, check bank material, identify seepage zones, and perform quick soil/texture assessments.
- **Design Guidance** – Ensure conformity with the CGWB Master Plan (2020) and technical standards for gabions, check dams, percolation tanks, and recharge structures.

- **Community Consultation** – Integrate local inputs on site preference, operation and maintenance commitments, and anticipated co-benefits (fodder, NTFP, livelihood support).
- **Prioritization Framework** – Apply multi-criteria scoring (runoff potential, degree of degradation, accessibility, constructability) to rank interventions for phased implementation.

2.0 CLIMATE

There is no IMD meteorological station near the plant area, the nearest station being at Sidhi, which is about 63 km (aerial distance) from the Mahan Coal Block (MCB). However, the climatic conditions excluding the rainfall are not differentatMCB.

Climate Classification: According to the Köppen classification, the region falls under a tropical to semi-tropical climate.

Seasonal Division: The year can broadly be divided into four distinct seasons:

- Winter Season (mid-December – February)
- Summer and Pre-Monsoon Season (March – May)
- Monsoon Season (June – September)
- Post-Monsoon Season (October – November)

2.1 Temperature

Winter Season (November – February): The winter season extends from November to the end of February. January is the coldest month, with the mean daily maximum temperature recorded at **24.8°C** and the mean daily minimum at **8.7°C**.

Summer Season (March – Mid-June): With the onset of summer from March, both day and night temperatures rise rapidly. May is the hottest month, recording a mean daily maximum temperature of 41.8°C and a mean daily minimum of 26.0°C.

Monsoon Season (Mid-June – September): The arrival of the monsoon brings an appreciable drop in temperatures. In July, the mean maximum daily temperature is observed at **32.9°C**.

Post-Monsoon Season (October): By the end of September, with the onset of the post-monsoon season, day temperatures drop slightly. In October, the mean daily maximum temperature is recorded at **32.8°C**.

The monthly mean temperature values corresponding to these seasons are presented in **Table-1**.

Table-1: Meteorological data as recorded at IMD Sidhi

Month	Temperature		Relative Humidity		Mean Wind Speed	Mean Cloudiness	
	Mean Daily Max °C	Mean Daily Min °C	08:30 %	17:30 %	Km/hr	08:30 Oktas	17:30 Oktas
Jan	24.8	8.7	76	47	1.1	1.2	1.1
Feb	27.4	11.3	69	40	1.5	1.1	1.0
Mar	33.1	15.8	51	27	1.9	0.8	1.0
Apr	39.0	21.6	38	21	2.0	0.7	1.2
May	41.8	26.0	39	24	2.4	0.8	1.6
Jun	38.8	27.4	58	46	3.4	2.8	4.1
Jul	32.9	25.4	80	72	3.4	5.2	5.9
Aug	31.9	25.0	83	76	2.6	5.2	5.7
Sep	32.3	24.0	81	71	2.2	3.7	4.5
Oct	32.8	19.9	73	52	1.2	1.3	1.7
Nov	29.7	13.7	71	47	0.8	0.7	0.7
Dec	25.9	9.0	73	49	0.8	0.7	0.7
Annual mean	**32.5**	**18.9**	**66**	**48**	**1.9**	**2.0**	**2.4**

2.2 Rainfall

Average annual rainfall of the area is based on rainfall data recorded at Singrauli **(Table-2)**, the district headquarters rain gauge station (32 NE from MCB). Average annual rainfall has been observed as 1099 (1098.91) mm. Rains are received in almost all the months of the year but rains are minimum to nil during summer months.

Table-2: Rainfall in mm recorded at Singruli rain gauge station

S. No.	Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1.	1999	0.0	0.0	0.0	0.0	0.0	202.8	443.2	309.4	337.6	26.7	0.0	0.0	**1319.7**
2.	2000	0.0	0.0	0.0	0.0	0.0	89.0	460.0	303.0	427.0	0.0	0.0	0.0	**1279.0**
3.	2001	0.0	0.0	0.0	0.0	6.0	194.0	554.0	193.0	101.0	154.0	0.0	0.0	**1202.0**
4.	2002	0.0	11.5	0.0	0.0	31.9	92.8	129.4	292.8	252.0	60.0	0.0	0.0	**870.4**
5.	2003	6.0	52.0	0.0	0.0	0.0	162.0	219.0	599.6	429.3	66.1	0.0	0.0	**1534.0**
6.	2005	3.0	47.0	0.0	0.0	5.0	189.0	322.0	273.0	142.0	18.0	0.0	4.0	**1003.0**
7.	2006	0.0	0.0	76.0	19.0	0.0	59.0	314.0	431.0	52.0	0.0	29.0	0.0	**980.0**
8.	2007	0.0	91.0	53.0	10.0	0.0	82.0	238.0	181.0	249.0	44.0	0.0	0.0	**948.0**
9.	2008	26.0	6.0	0.0	7.0	28.0	150.0	152.0	243.0	61.0	5.0	0.0	0.0	**678.0**
10.	2009	2.0	0.0	0.0	0.0	0.0	4.0	234.0	210.0	169.0	64.0	90.0	0.0	**773.0**
11.	2010	4.0	0.0	0.0	0.0	0.0	10.0	352.0	226.2	215.0	117.0	0.0	0.0	**924.2**
12.	2011	3.5	13.0	0.0	0.6	25.0	265.5	401.0	451.0	600.7	25.0	0.0	0.0	**1785.3**
13.	2012	55.0	0.0	0.0	0.0	0.0	51.0	387.0	521.0	192.0	0.0	25.0	0.0	**1231.0**
14.	2013	0.0	71.2	31.0	15.0	0.0	89.5	456.5	155.2	106.0	117.0	0.0	0.0	**1041.4**
15.	2014	5.0	21.0	14.5	0.0	0.0	70.0	229.0	159.5	123.0	41.0	0.0	0.0	**663.0**
16.	2015	40.8	0	66	21.1	3	65	232.7	298.4	18.3	52	0	2.3	**799.6**
17.	2016	18	3.7	10	0	7	74.5	394.7	415.3	272.1	103	0	0	**1298.3**
18.	2017	6	7.3	7.5	0	24	97.7	368.8	126	218	11.6	0	0	**866.9**
19.	2018	0	5.6	0	3.5	9	56.6	314.4	385.5	141.6	0	0	0	**916.2**
20.	2019	13.4	13	37.1	21.8	7.4	68.8	334.5	407.7	400.3	33.8	0	57.2	**1395**
21.	2020	25	38.2	32.6	15	57.5	335.9	217.5	272.7	235.8	54.7	4.9	5.1	**1294.9**
22.	2021	1.3	2.3	0.5	1.3	151.1	323.6	338.7	378.7	214.8	22.9	0	5.1	**1440.3**
23.	2022	15.3	17.4	0	0	13.5	112.1	123.7	355.8	213.4	87.7	0	0	**938.9**
24.	2023	0	0	39.5	8.9	32.8	102.7	172.9	236.4	211	147.3	1	33.4	**985.9**
25.	2024	14.1	24.8	17.5	4.8	5.4	64.9	231.1	681.3	235.5	17.6	0	7.8	**1304.8**

Annual average rainfall: 1099 (1098.91)mm, Source: https://mpwrd.gov.in

2.3 Humidity

Relative humidity during the southwest monsoon is generally over 60%. During the rest of the year, air is normally dry. Relative humidity was observed in the range between 26% and 85%, with the mean value of 62%.

2.4 Winds

Winds are generally light to moderate, except during the south west monsoon season, when these are moderate to strong. Mean wind speed is highest in June/July (3.4 km/hour) and lowest in November/December (0.8 km/hour) with an average of 1.9 km/hr.

2.5 Cloudiness

Southwest Monsoon Season

During the southwest monsoon, skies are generally **moderately to heavily clouded**, and on certain days remain completely overcast. In the months of **July and August**, the mean cloudiness exceeds **5 Oktas**, with cloud cover generally higher in the evenings compared to the mornings.

Rest of the Year

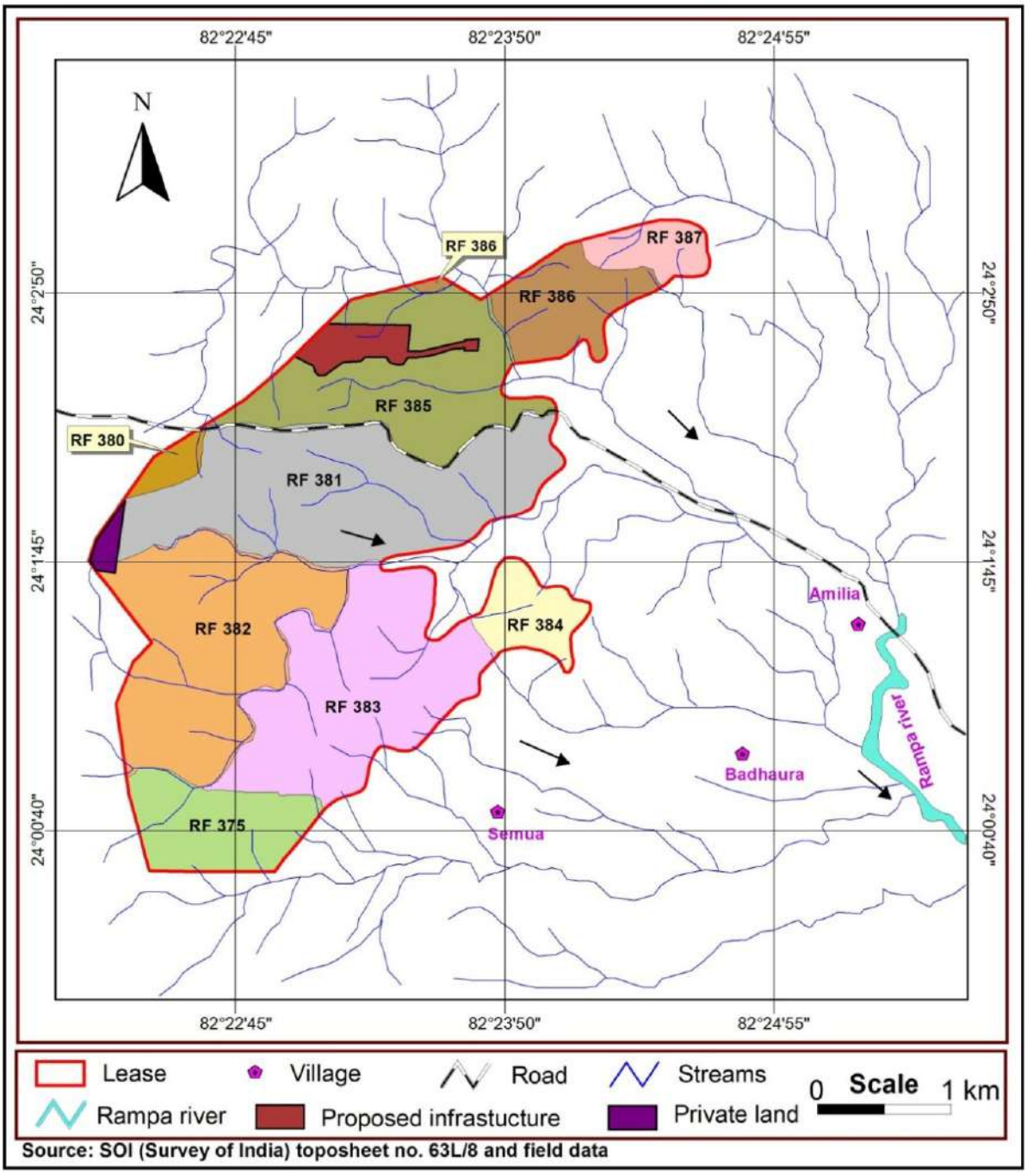
Outside the monsoon period, skies are **mostly clear to lightly clouded**, offering comparatively brighter conditions.

3.0 STUDY AREA & PHYSIOGRAPHY

Administrative location: Mahan Coal Field covering parts of Amilia (Tehsil Manda) and Budher (Tehsil Sarai), Singrauli District, MP. Villages such as Amilia, Semua, Badhaura lie within the influence zone**(Figure-1).**

Regional setting: TheSingrauli coalfield occupies ~2,200 km² at the northern margin of the Son–Mahanadi basin; topography is gently undulating with low to moderate slopes, ideal for small watershed interventions.

Figure-1: Drainage map of the study area



Source: SOI (Survey of India) toposheet no. 63L/8 and field data

3.1 Topography:

Terrain: Approximately 90 % of the buffer zone consists of a hilly forest area **(Figure-2).**

Hills: The area consists of hills with forest land within MCB, contributing to the overall topographic variation with sloping NW to SE.

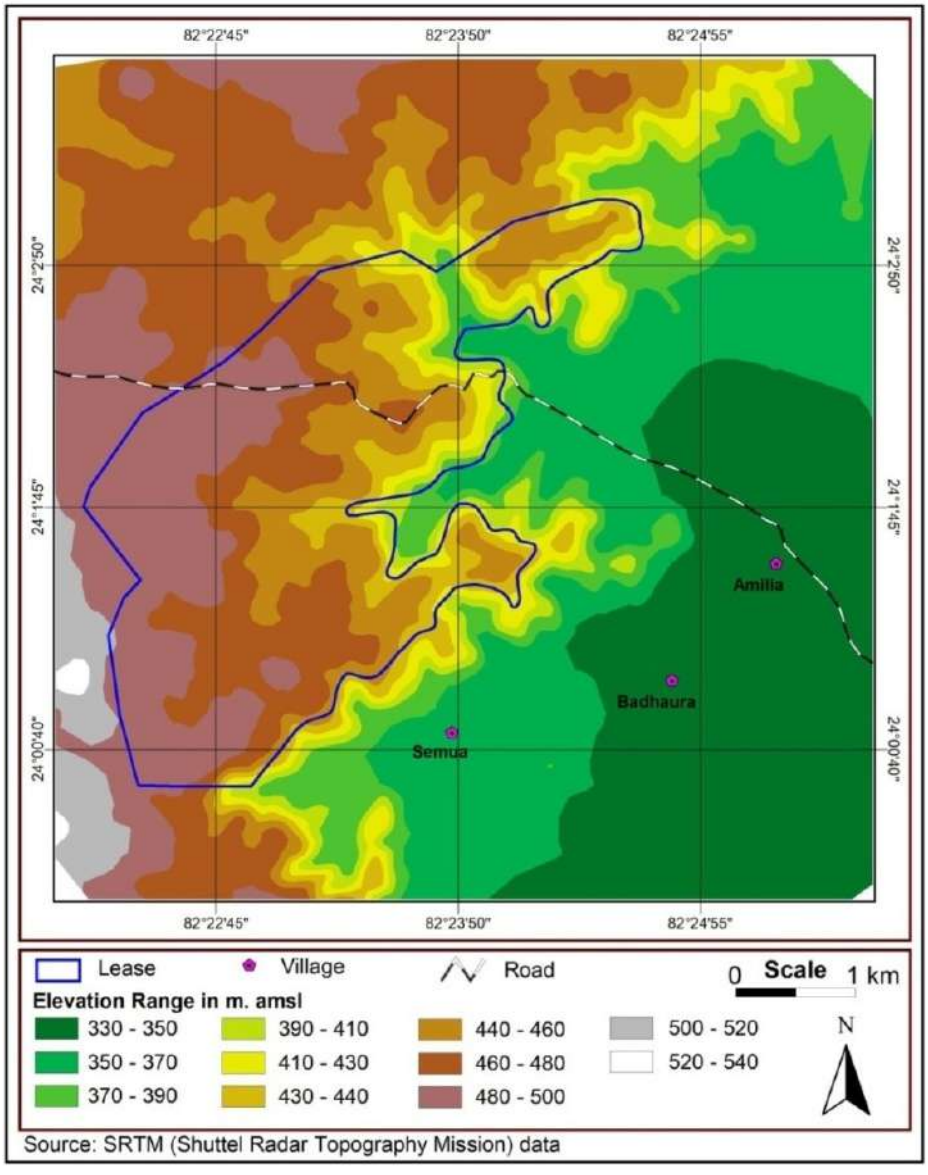
Elevation: The elevation varies:

- Within the study area is 340 to 540 mamsl (above mean sea level).
- Within Mahan Coal Block is 350 to 500 m amsl (above mean sea level).

Slope: The overall slope of the area ranges from 30 to 50 (m/km) towards the south-east direction. This gradient influences the natural drainage and surface patterns in the area.

Figure-2 provides a visual representation of the elevation variation across the study area, highlighting the south-western parts' elevation differences.

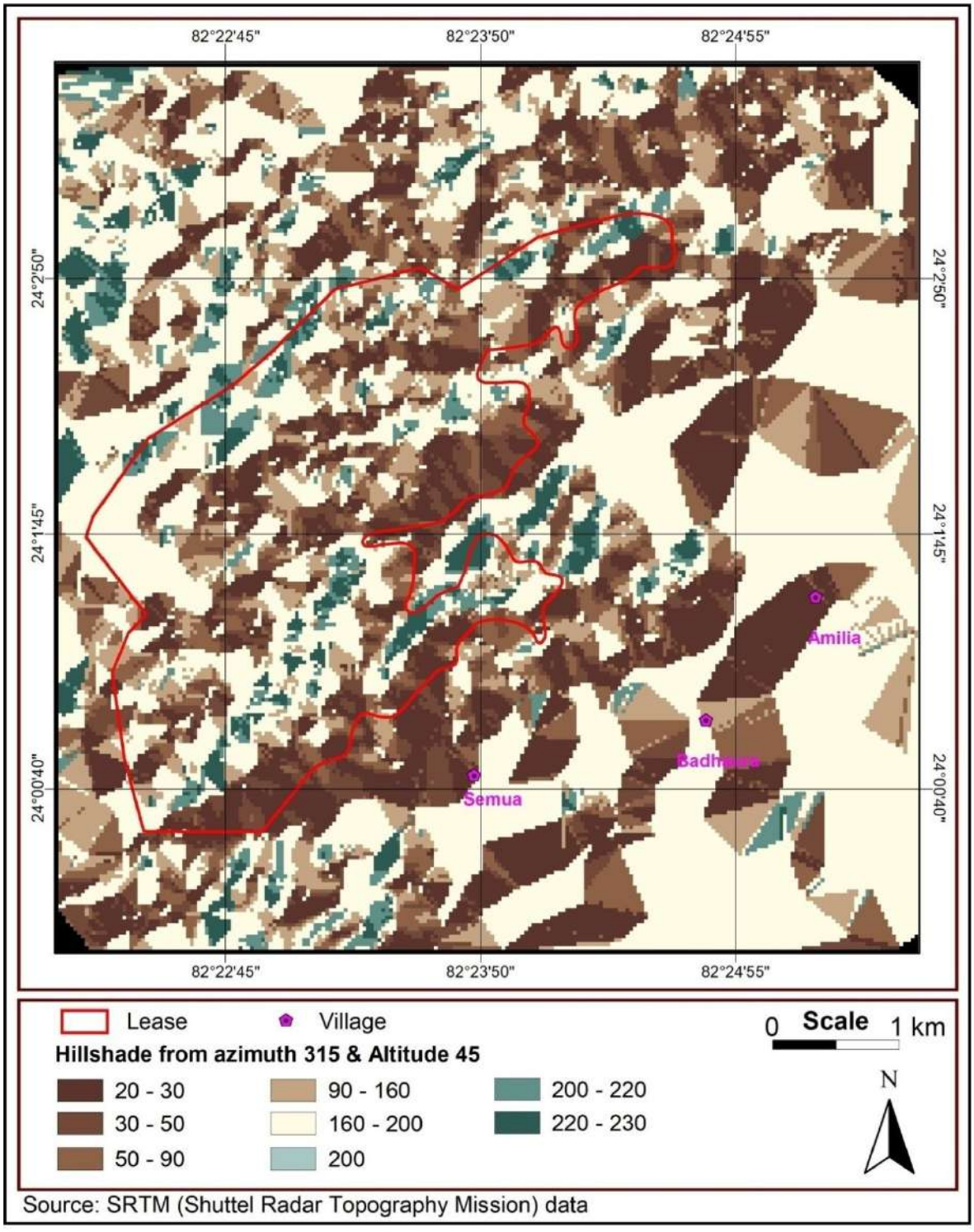
Figure-2: Digital Elevation Model (DEM) of the study area



3.2 Hillshade map of the study area

The aspect map is derived from DEM (Digital Elevation Model) and presented here as **Figure-3.**

Figure-3: Hill-shade map of the study area



Hill–shade & Elevation Interpretation:

- **Hill-shade Parameters**: Illumination from **azimuth 315° (northwest)** and **altitude 45°** simulates shadows to highlight terrain relief.

- **Elevation Classes (meters)**:

  - **20–30, 30–50, 50–90** (light to dark brown) → Low-lying valleys & gently sloping terrain.
  - **90–160, 160–200** (beige/light brown) → Moderate elevation uplands.
  - **200–220, 220–230** (green shades) → High ridges & hilltops.

MCB Area Terrain:

- The **lease boundary (red line)** covers a mix of **moderate to high-elevation terrain**, mostly **50–200 m** with some patches above **200 m**.
- The terrain is **undulating to hilly**, with ridges and valleys visible.
- Central and northern portions of the lease show **steeper relief (90–200 m)**.
- Western & south-western zones within lease show **lower elevation (50–90 m)** pockets.

Villages & Accessibility:

- **Semua village** lies close to the southern-central boundary of the lease area.
- **Amilia and Badhaura villages** lie **east** of the lease, outside the boundary, in relatively **lower terrain (90–160 m)**.
- Villages are located near flatter zones, suggesting **settlement in gentler topography** compared to rugged lease terrain.

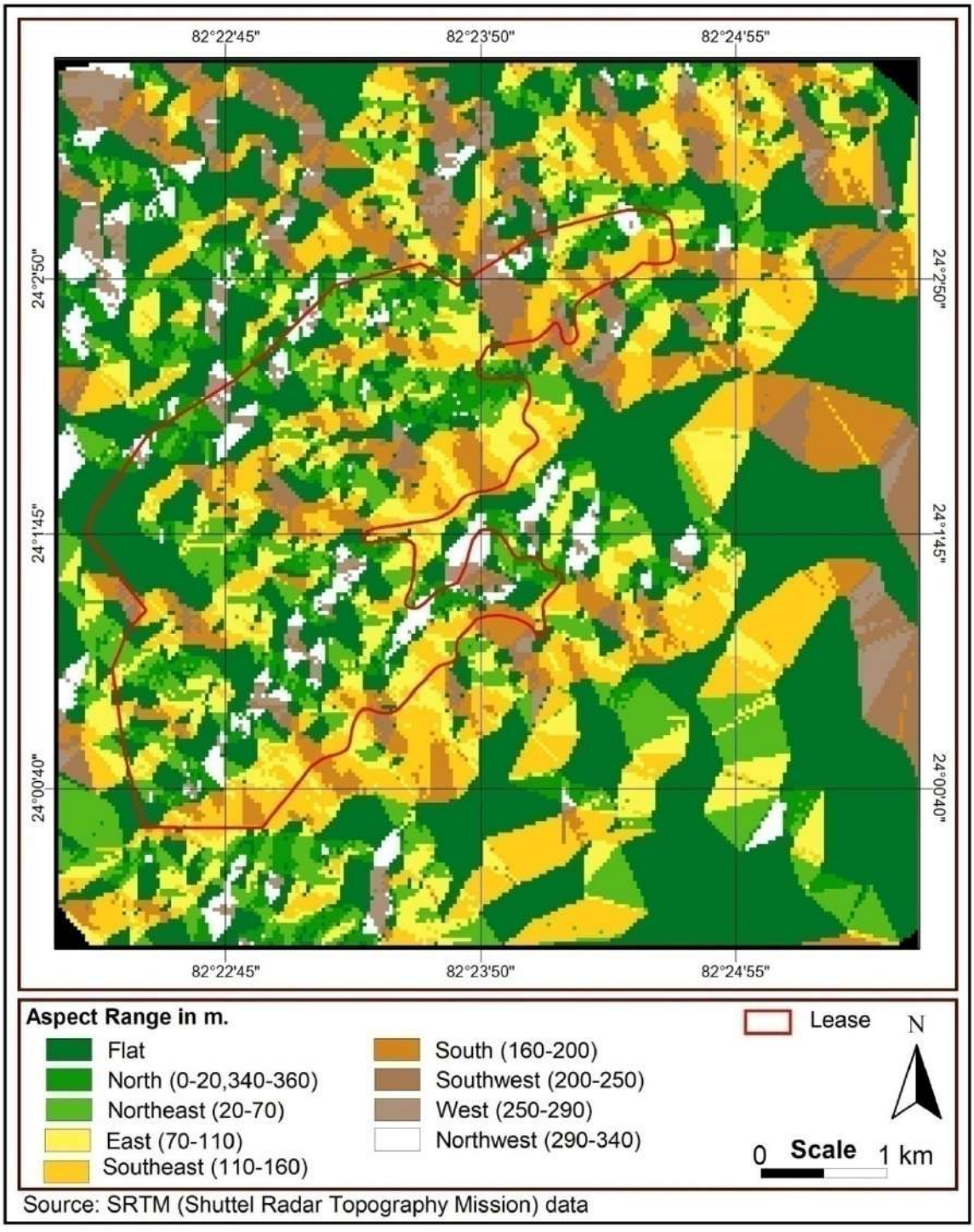
Key Interpretation:

- The lease area is situated in a **hilly and rugged landscape**, with elevations mostly between **50–200 m**, peaking above **220 m**.
- **Steeper slopes** are visible in the northern and central parts, indicating potential challenges for accessibility, construction, or mining.
- Villages are located **outside or on the periphery**, mostly in **moderate to lower elevation areas**, likely chosen for easier habitation and agriculture.
- Hydrological implication: Valleys and depressions (lighter zones, 20–50 m) may serve as **natural drainage pathways** or potential recharge areas.

3.3 Aspect Map of the study area

The aspect map (a map that shows the direction of slope for every point on the terrain) is derived from DEM (Digital Elevation Model) and presented here as **Figure-4.**

Figure-4: Aspect map of the study area



Aspect Ranges in degrees):

- **Flat**: Green
- **North (0–20°, 340–360°)**: Dark green
- **Northeast (20–70°)**: Light green
- **East (70–110°)**: Yellow
- **Southeast (110–160°)**: Orange
- **South (160–200°)**: Brown
- **Southwest (200–250°)**: Grey-brown
- **West (250–290°)**: Grey
- **Northwest (290–340°)**: White

Observations:

- The lease area contains a mix of flat, east and southeast-facing slopes, with scattered patches of west, southwest, and northwest aspects.
- Flat zones (green) dominate much of the central and western portions.
- Southeast and east-facing slopes (yellow to orange) are concentrated toward the southern and south-eastern areas.
- West and southwest slopes (grey, brown) are more common on the north-eastern edge.
- The aspect distribution will influence drainage, vegetation growth, soil moisture, and suitability for water recharge structures.

Applications:

- **Water Harvesting**:
  - Southeast slopes may favor runoff collection.
  - Flat areas are suitable for ENBs, CNBs, or farm ponds.
- **Reforestation/Vegetation:**
  - North-facing slopes generally retain more moisture → good for plantation.

4.0 HYDROGEOLOGY OF STUDY AREA

4.1 Geology of the area

The geology of the district reveals the occurrence of various rock formations as old as Granites of Achaean age to the Alluvium of Recent age. The other important formations outcropping in the district are Deccan trap of cretaceous – Eocene, Gondwanas of Paleozoic to Mesozoic, Sandstone Shale and limestone of Vindhayans and Phyllites, Quartzites, Schist, Gneisses and Granites of Archean age.

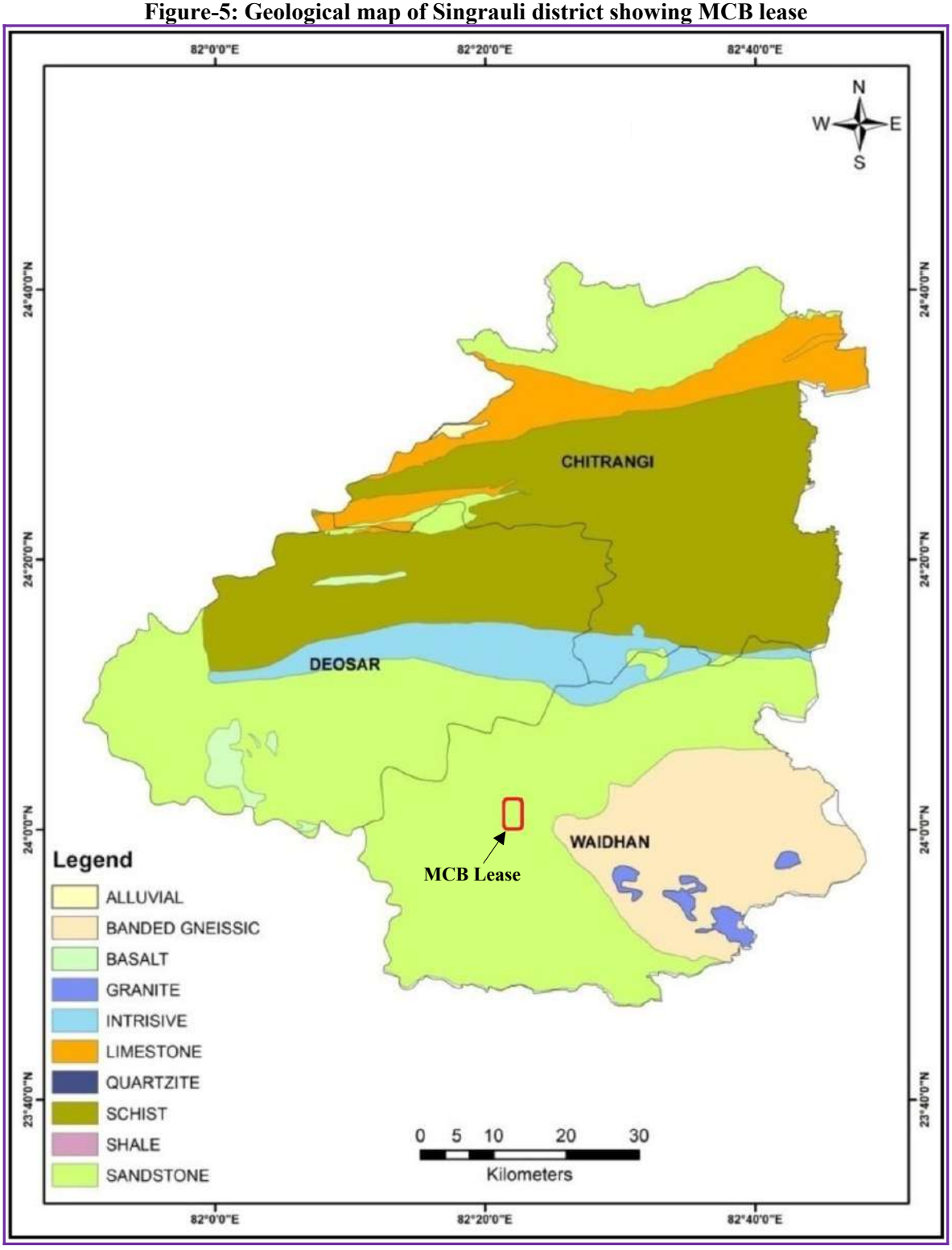
The Geology of the area is Sandstone Kaimu and Semru series of Vindhyansis shown in the Geological Map in **Figure-5.** The general Stratigraphic succession of the district is given as under**(Table-3)**:

Table-3:General Stratigraphic Succession

Period	Series/stage	Lithology	
Recent Pleistocene	Alluvium	Alluvium and soil cap comprising clay, sand gravel etc.	
Cretaceous to Eocene	Deccan Traps	Basaltic Lava flows	
Permian to up carboniferous	Gondwanas	Upper Gondwana formation Ranging formation Talchir formation	Sandstone Shale Coal, Conglomerate and Glouconite
Cambrian	Vindhyans	Kaimur SeriesSemri Series	Porcellinite Sandstone Orthoquortzite and Conglometry
Pre Cambrian	Archeans	Phyite, Quartzites, Granite, Schist, Gneisses metabasic sedimentary andIntrusive	

The districtSingrauliis underlain by various geological formations, forming differenttypes of aquifers in the area. Main geological units of the area are Gondwana formations and Archaeans. The principal aquifers in the area are weathered andfractured granitic gneiss, schist, phyllites sandstone and alluvial. The occurrenceand movement of ground water in hard rock primarily depends on the degree ofinterconnection of secondary pores/voids developed by fracturing and extent ofweathering. The hydrogeological map of area is prepared and presented in **Figure-6.**

Figure-5: Geological map of Singrauli district showing MCB lease



Source: Aaquifer Mapping and Management of Ground Water Resources, Singrauli District, Madhya Pradesh North Central Region,
Bhopal, 2021-2022

A. Archaeans

The Archaean rocks comprising mostly granitic gneiss, schist, phyllite, andquartzite cover approximately 40% of the total district area. Quartz veins arecommon features and occur as thin strings. The Archaean rocks are mainlycovering the part of Deosar and Chitrangi blocks and some parts of WaidhanBlock. These rocks do not have primary porosity. The weathered part of thecrystalline is the aquifer for open well and shallow tube wells. The thickness ofthese zones in the entire district area ranges from 2.5 to 30.0 m. In thisformation, aquifers also occur where the rocks are jointed and fractured. Theopen wells that exist in this formation range in depth of 4.0-19.0 mbglgenerally the column of water available during pre-monsoon season varies from4.0-19.0 m. The general yield potential of Archaean formation is less than 120lpm (7.2 m^3/hr). However at places the yield potential in deeper aquifer is found to the tuneof 450 lpm (7.2 m^3/hr). Transmissivity of the aquifers in the formation is 0.19 to 27.68 sqm per dayas per pumping test reports of exploratory wells constructed by CGWB in 2021-2022.

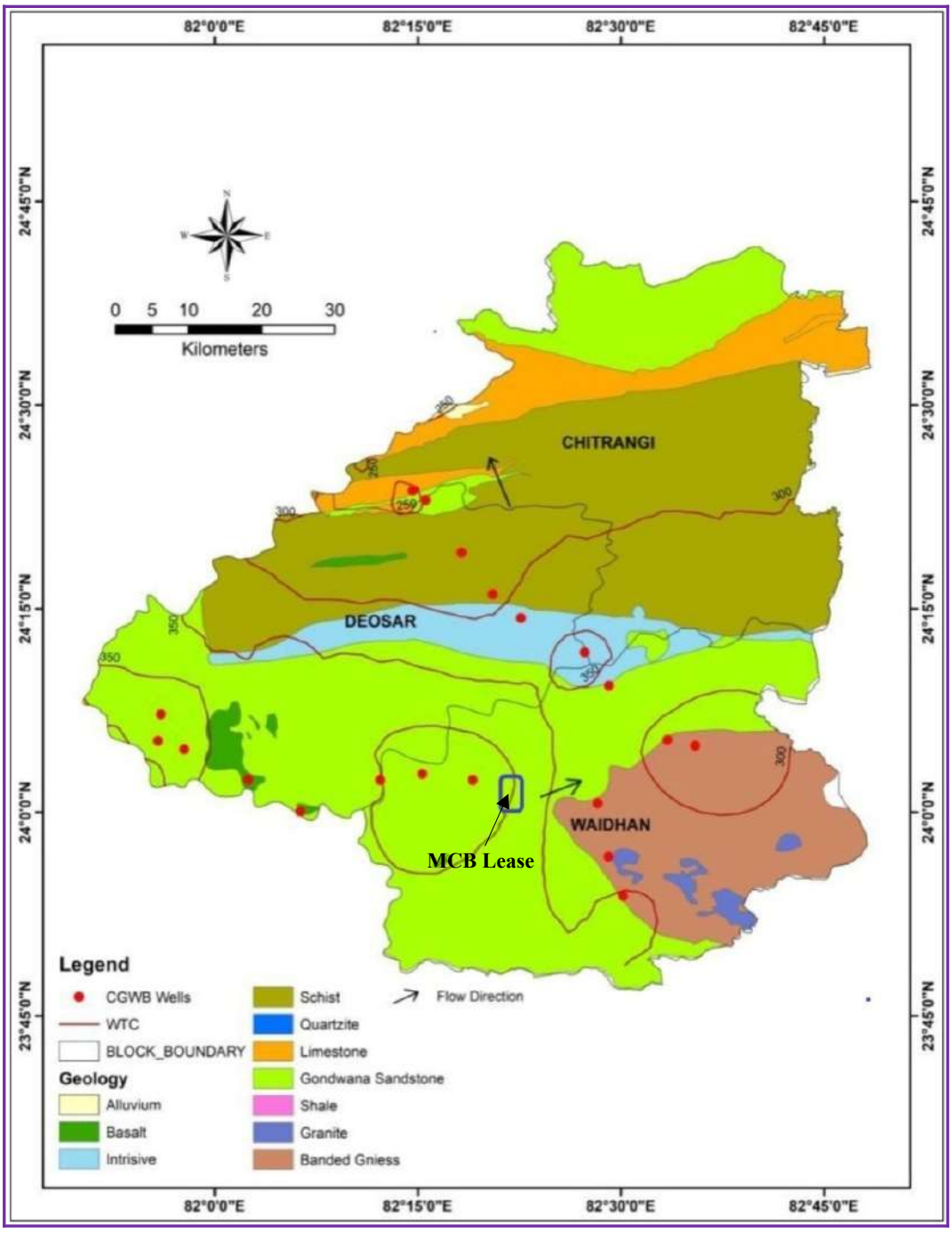
B. Gondwana Formations

The Gondwana formations comprise succession of sandstone, shales, andclays with seams of coal lying over the crystalline Archaean rocks. Gondwanaformations are represented by Talchir formation occupying the northern part ofWaidhan and southern part of Deosar block of the district. In Gondwanaformations groundwater occurs mostly in sandstone of semi consolidated innature. The wells located in topographic lows and piercing the TalchirSandstones yield vary between 100 (6m^3/hr.)to 300 lpm (18 m^3/hr.) tapping semi confined andunconfined aquifers. The depth to water level in the upper gondwana formations varies between 0.80 and 10.50 mbgl in post monsoon and between 5.6 to 10.65mbgl in pre monsoon. The well discharge varies between 0.50 (0.03 m^3/hr.)to 1 lps (0.06 m^3/hr.). Dug wellswith diameter varying between 2 to 5 m with 6.85 to 17.15 m depth piercing thefull thickness of weathered Jointed and fractured zones are observed in thisformation.

C. Alluvium

The Alluvium comprising unconsolidated sand silt and clay mainly occursinsmall patches in the northwest part of Chitrangi block along the Son River andconfluence of Mayar and Kanchan river. Marginal alluvium thickness varies from 60to 100 m. Potential aquifers occur in water table conditions with yield ranging from300 (18 m^3/hr.)to 500lpm (30 m^3/hr.). The water table is sloping towards Son River and its tributariesas result of their effluent nature.

Figure-6: Hydrogeological map of Singrauli district showing MCB lease



Source: Aaquifer Mapping and Management of Ground Water Resources, Singrauli District, Madhya Pradesh North Central RegionBhopal, 2021-2022.

4.2 Geomorphology:

The district as a whole constitutes a hilly terrain most part of the district is covered by Kaimur hilly ranges. The district is divided into three physiographic divisions:

(i) Kaimur hilly ranges

(ii) The Central part hilly ranges and

(iii) Southern hilly ranges.

In the district three main river flows along with several tributaries rivers the major rivers are the son, Gopal and Rihand. The Kaimur range stretching from NE and SW direction and covered most part of the district. The central part of the district forms a series of hill ranges. The Southern part of district the elevation of hills ranges varies between 365 and 488m above MSL. The general slope of the area is towards North east. The entire district is drained by the above - mentioned 3 major rivers and their tributaries forma a part of the Ganges drainage System. The pattern of drainage is dendrite in hectare excepting the localized radial pattern in the hilly terrain.

5.0 DELINEATION OF THE WATERSHEDS

The study area is covered by **three major watersheds (Figure-7)**:

- **North-Eastern watershed**
- **Central watershed**
- **Southern watershed**

These watersheds play a crucial role in surface water distribution and groundwater recharge.

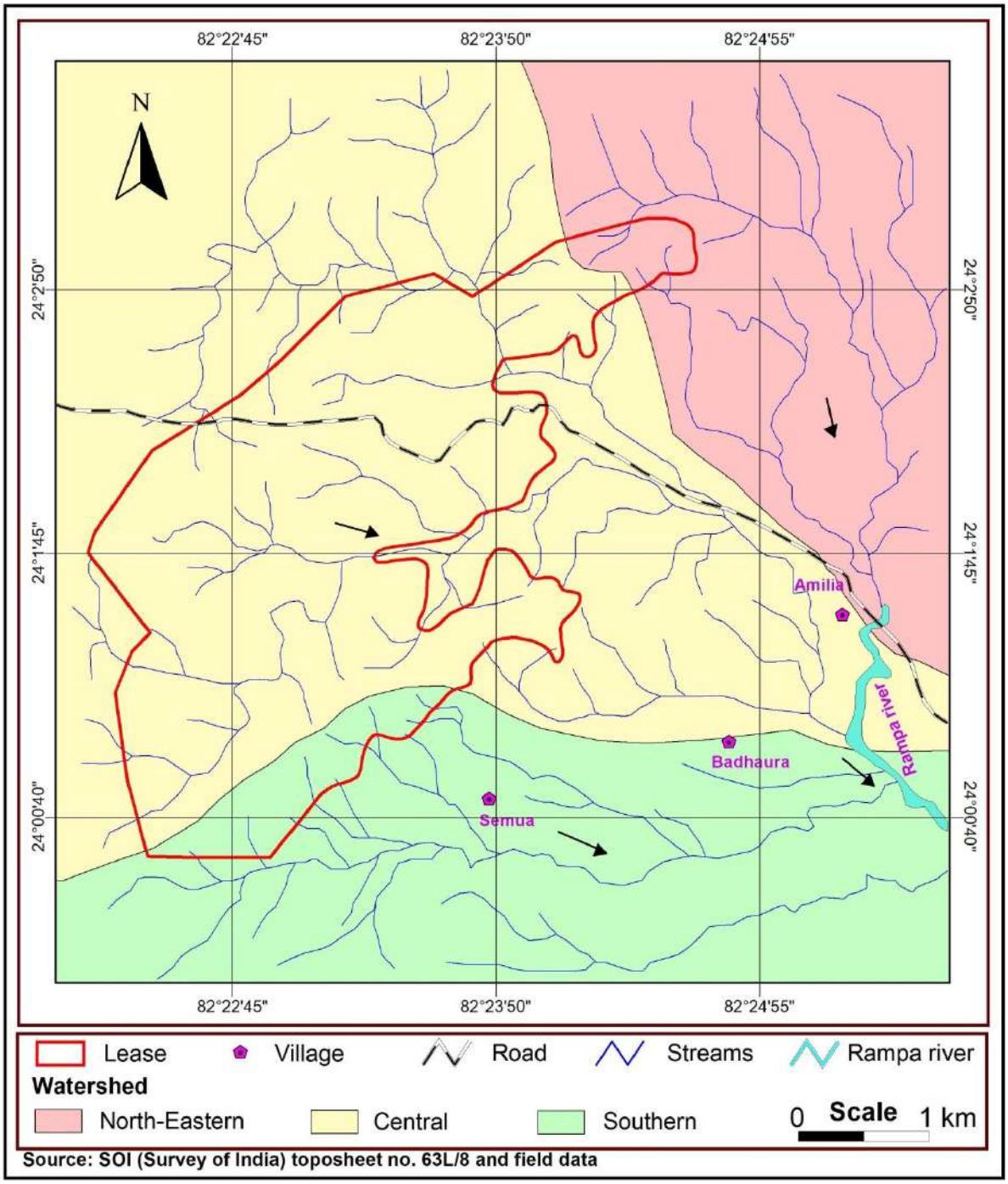
Watershed Demarcation:

- The boundaries of the watersheds have been determined based on surface water divides.
- Surface water divides refer to topographic high points that separate one drainage basin from another.

Hydrology and Physiography:

- The hydrology (water movement and distribution) and physiography (landforms and physical features) of each watershed are significant for understanding water availability.
- A detailed discussion on the hydrology and physiography of both watersheds follows.

Figure-7: Watershed Map of the study area



5.1 Hydrology and Physiography of North-Eastern Watershed

1. Location and Coverage:

- The **North-EasternWatershed** is in the **north-east part** of the study area.
- It plays a crucial role in surface water drainage and groundwater recharge.

2. Drainage Pattern:

- The watershed exhibits a **dendritic drainage pattern**, which is characterized by a tree-like branching network of streams. The streams are flowing towards N to S within study area.
- This pattern indicates uniform resistance to the underlying rock and relatively hilly topography.

3. Elevation Variation:

- The **elevation above mean sea level (mRL)** within the watershed varies as follows:
  - **~470mRL** in the **northern part**.
  - **~360mRL** in the **southern part**.
- This variation in elevation influences the flow direction and velocity of surface water.

4. Areal Extent and Gradient:

- The **total area** of the **North-Eastern watershed** is approximately **8.85 km²**.
- The **gradient** of the watershed is about **25.58 meters per kilometer (m/km)**, indicating a moderately steep slope.

5. Catchment Yield and Runoff:

- The **catchment yield** of the watershed is estimated at **4.86 million cubic meters (m³)**.
- This estimation is based on:
  - An average annual rainfall of 1099 mm**(Ref: Table-2).**
  - An average surface runoff coefficient of 50%, considering the watershed's mostly hilly terrain and soil composition.

6. Soil Composition:

- The watershed is primarily covered with **sandy clay and loamy soil**, which influences infiltration and runoff characteristics.

5.2 Hydrology and Physiography of Central Watershed

1. Location and Coverage:

- The **CentralWatershed** is in the **central part** of the study area.
- It plays a crucial role in surface water drainage and groundwater recharge.

2. Drainage Pattern:

- The watershed exhibits a **dendritic drainage pattern**, which is characterized by a tree-like branching network of streams. The streams are flowingtowards NW to SE within study area.
- This pattern indicates uniform resistance of the underlying rock and relatively hilly topography.

3. Elevation Variation:

- The **elevation above mean sea level (mRL)** within the watershed varies as follows:
  - **~500mRL** in the **north-western part**.
  - **~350mRL** in the **south-easternpart**.
- This variation in elevation influences the flow direction and velocity of surface water.

4. Areal Extent and Gradient:

- The **total area** of the **Central watershed** is approximately **23.98 km^2**.
- The **gradient** of the watershed is about **25.20 meters per kilometer (m/km)**, indicating a moderately steep slope.

5. Catchment Yield and Runoff:

- The **catchment yield** of the watershed is estimated at **13.18 million cubic meters (m^3)**.
- This estimation is based on:
  - An average annual rainfall of 1099mm**(Ref: Table-2).**
  - An average surface runoff coefficient of 50%, considering the watershed's mostly hilly terrain and soil composition.

6. Soil Composition:

- The watershed is primarily covered with **sandy clay and loamy soil**, which influences infiltration and runoff characteristics.

5.3 Hydrology and Physiography of Southern Watershed

1. Location and Coverage:

- The **SouthernWatershed** is in the **Southern part** of the study area.
- It plays a crucial role in surface water drainage and groundwater recharge.

2. Drainage Pattern:

- The watershed exhibits a **dendritic drainage pattern**, which is characterized by a tree-like branching network of streams. The streams are flowing towards W to E within study area.
- This pattern indicates uniform resistance to the underlying rock and relatively hilly topography.

3. Elevation Variation:

- The **elevation above mean sea level (mRL)** within the watershed varies as follows:
  - **~510mRL** in the **western part**.
  - **~350mRL** in the **eastern part**.
- This variation in elevation influences the flow direction and velocity of surface water.

4. Areal Extent and Gradient:

- The **total area** of the **Central watershed** is approximately **10.86 km^2**.
- The **gradient** of the watershed is about **28.42 meters per kilometer (m/km)**, indicating a moderately steep slope.

5. Catchment Yield and Runoff:

- The **catchment yield** of the watershed is estimated at **5.97 million cubic meters (m^3)**.
- This estimation is based on:
  - An average annual rainfall of 1099mm**(Ref: Table-2).**
  - An average surface runoff coefficient of 50%, considering the watershed's mostly hilly terrain and soil composition.

6. Soil Composition:

- The watershed is primarily covered with **sandy clay and loamy soil**, which influences infiltration and runoff characteristics.

5.4 Strange's run-off

Strange's Rainfall–Runoff Relationship, (developed by W.L. Strange and widely applied in India), is an empirical method used to estimate surface runoff from rainfall based on catchment characteristics, particularly in regions where detailed hydrological records are not available.

The method classifies catchments into good, average, and bad types, depending on their permeability, vegetation cover, and geological conditions: good catchments with permeable soils and

high vegetation allow more infiltration and generate less runoff, average catchments produce moderate runoff, while bad catchments, typically rocky and sparsely vegetated, yield high, rapid runoff and are prone to flash flooding. Its significance lies in providing a simple, low-data requirement tool for estimating water availability, which is especially useful for planning soil and water conservation measures, sizing check dams, percolation tanks, contour bunds, and other water harvesting structures.

In the context of MCB, the method is particularly relevant because the landscape presents a heterogeneous mix of forests and rocky outcrops, which behave like bad catchments generating quick runoff, erosion, and siltation, alongside forest patches and agricultural land, which function as average to good catchments with higher infiltration and more sustained baseflow. Given the undulating terrain with moderate to steep slopes, Strange's runoff relationship becomes critical for identifying runoff potential zones, guiding afforestation and gap plantation efforts, planning water harvesting interventions, and mitigating risks of erosion and flooding in disturbed mining lease areas.

In short, it provides a practical and reliable framework for aligning afforestation and watershed strategies with the hydrological realities of Singrauli's degraded yet ecologically sensitive landscape.

The dependability of rainfall has been calculated on the basis of last 28 years rainfall, as indicated in **Table-2** where water availability has been considered for arriving at 25%, 50% and 75% dependability **(Table-4, 5 & 6)**, respectively.

Table-4: Rainfall data (arranged in descending order, mentioning serial number /order number m) of each year's rainfall

S.N., i.e. order number (m)	Rainfall in descending order in mm	Year of Occurrence	S.N., i.e. order number (m)	Rainfall in descending order in mm	Year of Occurrence
1	2011	1785.3	14	2023	985.9
2	2003	1534	15	2006	980
3	2021	1440.3	16	2007	948
4	2019	1395	17	2022	938.9
5	1999	1319.7	18	2010	924.2
6	2024	1304.8	19	2018	916.2
7	2016	1298.3	20	2002	870.4
8	2020	1294.9	21	2017	866.9
9	2000	1279	22	2015	799.6
10	2012	1231	23	2009	773
11	2001	1202	24	2008	678

12	2013	1041.4	25	2014	663
13	2005	1003			

Table-5. Calculation of order number (m)

	Rainfall dependability percentage		
	p=25%	**p=50%**	**p=75%**
m =	N x p/100	N x p/100	N x p/100
	N= 25, p = 25	N= 25, p = 50	N= 25, p = 75
m =	6 (6.25)	13 (12.5)	25

Here,

m = Order number

N = The available rainfall data of the past N years is first of all arranged in the descending order of magnitude

p = Dependability percentage

The rainfall value tabulated above in Table-4, the Order No. 6, 13 and 25 has the values of 1304.8 mm, 1041.4 mm and 663 mm, respectively.

So, $\mathbf{P_{25\%} = 130.48\ cm}$

$\mathbf{P_{50\%} = 104.14\ cm}$

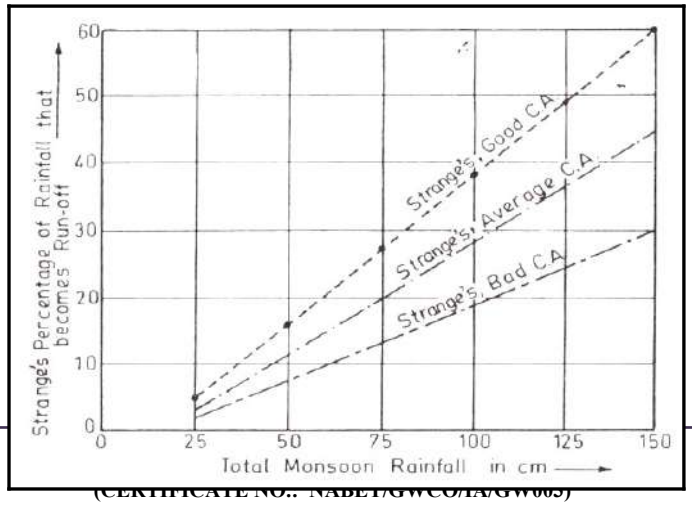
$\mathbf{P_{75\%} = 66.30\ cm}$

Average value of Strange's Run off percentage is calculated from Strange's monsoon rainfall-runoff curves **(Figure-8)** considering the catchment area as average and the Runoff % for the area is:

Table-6. Runoff % at 25%, 50% and 75% dependability of rainfall

S. No.	dependability of rainfall
1.	Runoff % at 25% dependability of rainfall = 52%
2.	Runoff % at 50% dependability of rainfall = 39%
3.	Runoff % at 75% dependability of rainfall = 24%

Figure-8: Strange's monsoon rainfall-runoff curves



Although there are many values of surface runoff percentage for different types of catchment areas, Strange's method generally classifies the catchment areas in three categories as Good Catchment area, Average catchment area and Bad catchment area. The following types of terrain are considered as Good, Average and Bad catchment by Strange's rainfall –runoff curves.

a) **Strange's good CA –** Hilly areas or having high slopes with good forestation produce higher surface runoff

b) **Strange's average CA –** Plain land with low slopes with alluvial soils produces moderate surface runoff as in Gangetic alluvial plains

c) **Strange's Bad CA** – Sandy or sandy loamy soil surface that soaks more water due to high porosity creates poor surface runoff as in deserts.

Although the study area is hilly and rocky with high slopes but is devoid of forestation and therefore the runoff coefficient is taken as 50 % for CNB & 60 % for ENB the calculations**(Table-7& 8).**

Table-7: Runoff Coefficient (C Value)

Land use and topography	Soil type		
	Sandy loam	Clay and silt loam	Tight clay
Cultivated land			
Flat	0.30	0.50	0.60
Rolling	0.40	0.60	0.70
Hilly	0.52	0.72	0.82
Pasture land			
Flat	0.10	0.30	0.40
Rolling	0.16	0.36	0.55
Hilly	0.22	0.42	0.60
Forest land			
Flat	0.10	0.30	0.40
Rolling	0.25	0.35	0.60
Hilly	0.30	0.50	0.60
Populated area			
Flat	0.40	0.55	0.65
Rolling	0.50	0.65	0.80

Note: The value of the rational method runoff coefficient can vary from close to 0 to 1.0. A low *C* value indicates that most of the water is retained for a time on the ground surface and soaks into the ground, where as a high *C* value means that most of the rainwater runs off immediately.

Source: Suresh 1997

Table-8: Values of runoff coefficient factor (C) for different soil conditions in India

Type of Vegetation	Slope Range (%)	Runoff Coefficient (C) in		
		Sandy Loam Soil	Loam / Loam Clay Soil	Stiff Clay Soil
Woodland and forests	0-5	0.1	0.3	0.4
	5-10	0.25	0.35	0.5
	10-30	0.3	0.5	0.6
Grassland	0-5	0.1	0.3	0.4
	5-10	0.16	0.36	0.55
	10-30	0.22	0.42	0.6
Agricultural land	0-5	0.3	0.5	0.6
	5-10	0.4	0.6	0.7
	10-30	0.52	0.72	0.82

Source: Manual on Artificial Recharge of Ground Water, Ministry of Water Resources, CGWB.

6.0 Delineation of Micro-Catchment Areas for RWH Structures

Using **Digital Elevation Model (DEM) analysis** and the existing **drainage network**, micro-catchment areas for each proposed recharge structure were delineated **(Figure-9).** The delineation applied **standard watershed analysis techniques**, including contour mapping, flow direction, and flow accumulation derived from the DEM. This approach ensures accurate estimation of the contributing catchment for each structure, which is essential for optimizing groundwater recharge and minimizing downstream losses.

6.1 Rationale for Proposed Recharge Structures

Increasing **water scarcity** and **erratic rainfall variability** have underscored the urgency of adopting sustainable water conservation measures. In **hilly and undulating terrains**, small-scale **runoff harvesting structures** serve as critical interventions to:

- Recharge shallow and deep aquifers
- Reduce runoff velocity and soil erosion
- Improve soil moisture and enhance agricultural productivity

Among various techniques, **Concrete Nala Bunds (CNBs)** and **Earthen Nala Bunds (ENBs)** are two of the most widely adopted watershed management interventions. This study prioritizes these structures as **core strategies for water harvesting and runoff regulation**.

Wherever a continuous stretch of **50–100 m** is available, **supporting contour trenches** are also recommended. These promote **in-situ soil moisture conservation, slope stabilization**, and increase the efficiency of CNBs and ENBs in regulating runoff.

6.2 Technical Description of Recharge Structures

Earthen Nala Bunds (ENB):

- **Definition**: Small embankments constructed across seasonal nalas using locally available earth.
- **Function**: Arrest surface runoff, create temporary impoundments, and promote percolation to recharge aquifers.
- **Suitability**: Small catchments with gentle slopes, moderate runoff, and where low-cost solutions are required.
- **Limitations**: Susceptible to erosion or breaching during high flows; requires regular upkeep.

Concrete Nala Bunds (CNB):

- **Definition**: Permanent masonry or reinforced concrete structures constructed across nalas.
- **Function**: Provide durable checks to runoff, form storage pools, and enhance recharge while enabling downstream irrigation.
- **Suitability**: Medium–large catchments, high runoff volumes, and steeper slopes where longevity is essential.
- **Advantages**: Long service life, higher storage capacity, and minimal post-construction maintenance.

Summary: ENBs are **cost-effective, semi-permanent soil structures**, whereas CNBs are **engineered, permanent interventions**. Both are selected according to catchment size, slope, and hydrological load.

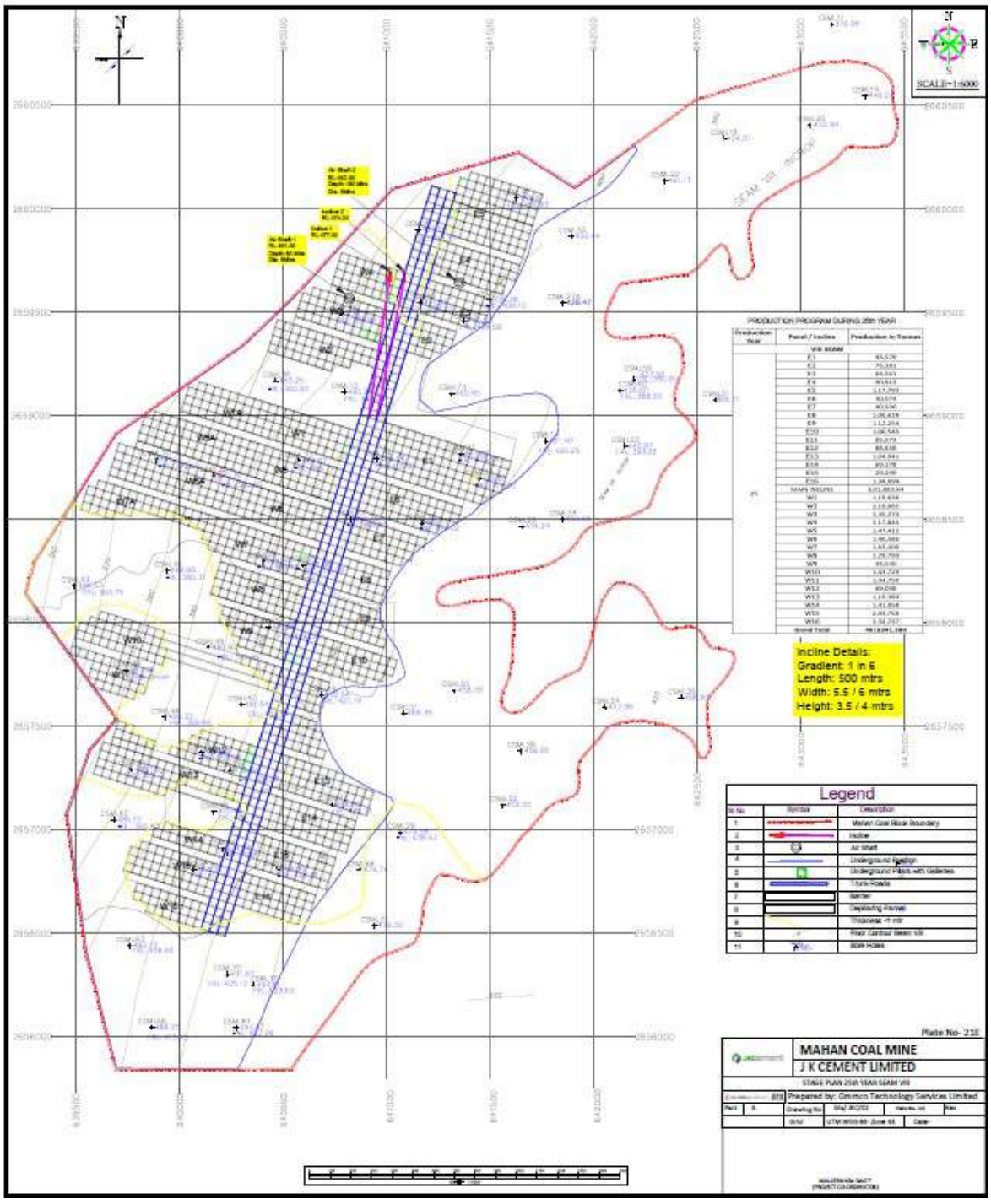
6.3 Proposed Recharge Structures within MCB Area

6.3.1 Location and Context

A total of **thirteen recharge structures**are proposed within the MCB block, concentrated on the eastern portion of the mining lease area. This segment of the lease has been designated as a **non-working zone** of the underground coal mines, making it the most appropriate site for groundwater

recharge interventions. The placement has been carefully selected to maximize hydrological benefit while ensuring structural and operational safety**(Figure 9).**

Figure 9: Spatial Extent of Underground Mine Workings



6.3.2 Geological Considerations

The geological setting of the area is characterized by **sedimentary formations**, which are inherently more susceptible to ground settlement and subsidence when disturbed by mining activities. This factor has been central to the planning and siting of recharge structures.

6.3.3 Subsidence Risk and Buffer Zone

To mitigate risks, a **safety buffer of 60 metres** has been incorporated. This means that the topmost mining level is maintained at least 60 m below the natural ground surface. While this buffer reduces the likelihood of surface instability, residual subsidence risk remains in zones directly overlying active mining operations.

6.3.4 Exclusion of Mining-Affected Areas

As a precautionary measure, areas directly underlain by underground mine workings have been **excluded from the construction of recharge structures**. This ensures that the integrity of recharge facilities is not compromised by ground movement or structural weakness.

6.3.5 Structure Types and Design

The proposed recharge plan comprises:

- **7 Concrete Nala Bunds (CNB)**
- **6 Earthen Nala Bunds (ENB)**

These structures are located on **first- and second-order streams**, specifically designed to intercept seasonal flows with **minimal submergence beyond the natural stream channel**.

Key design parameters:

- **Height:** 1.0–2.0 m
- **Length:** 25–50 m
- **Spacing:** Additional downstream structures placed at intervals of 200–500 m.

Excess water will either **overflow** or **percolate** through these structures, ensuring gradual recharge of the shallow aquifers while maintaining the flow continuity downstream. The precise locations of the proposed structures are illustrated in **Figure-10**.

6.3.6 Design Rationale

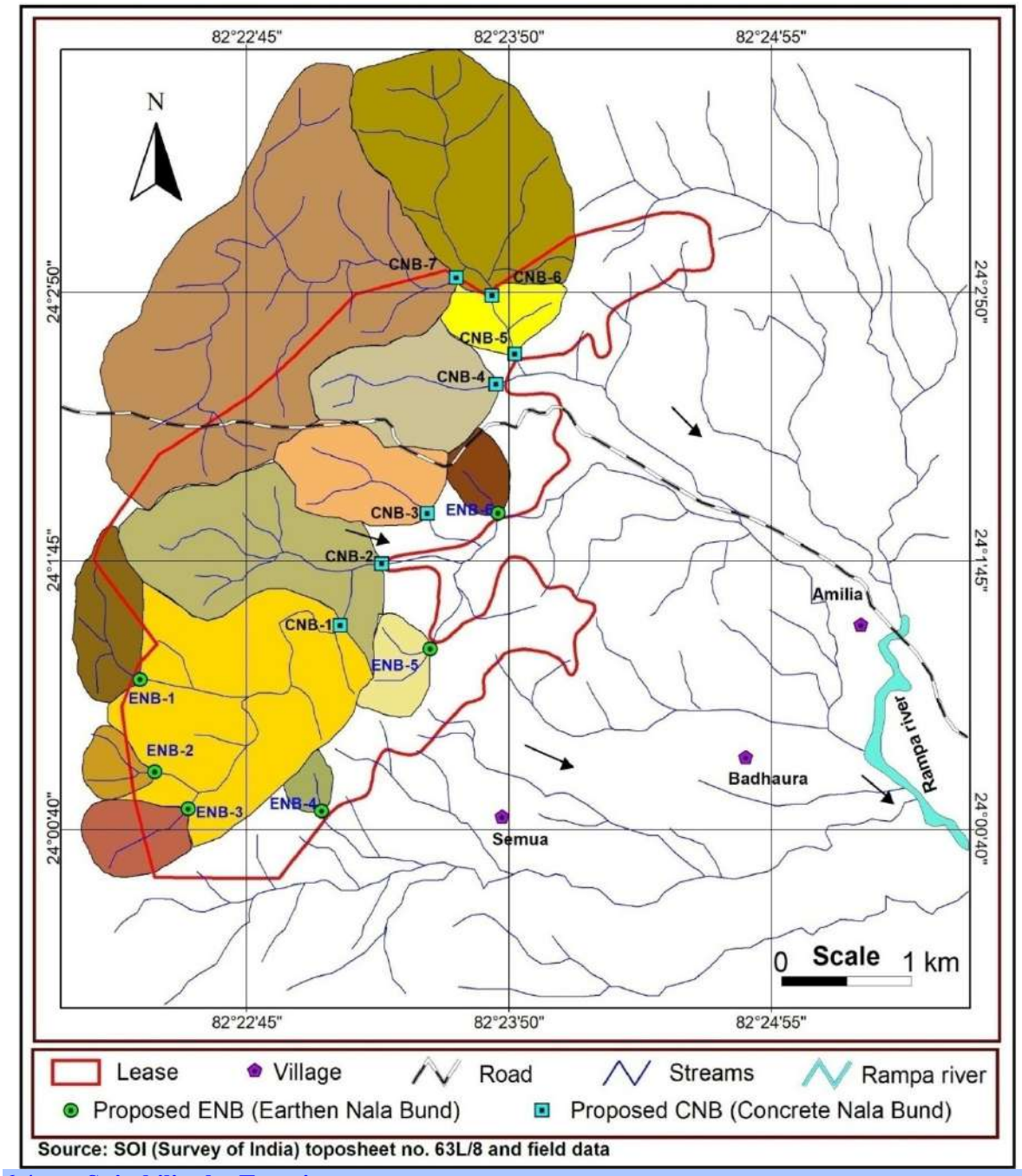
The proposed recharge structures are therefore restricted to geologically stable, non-mined sections of the eastern lease area. This approach balances two objectives:

- **Maximizing aquifer replenishment potential** by intercepting surface runoff and enhancing infiltration.
- **Minimizing geotechnical risks** by avoiding zones with potential for settlement or collapse.

6.3.7 Conclusion

By confining construction to the non-working eastern sector and employing a combination of **CNBs and ENBs**, the project ensures effective recharge of shallow aquifers without compromising mining safety. The cascading design of structures, supported by careful siting and spacing, reflects a cautious yet forward-looking approach to integrated mine water management.

Figure-10: Proposed Recharge Structure Locations across the MCB Lease Area



6.4 Suitability by Terrain

The general recharge structures in hilly terrain are given below in **Table-9.**

Table-9: General Recharge Structures in Hilly Terrain

Slope (%)	Terrain Condition	Suitable Structures	Sizing Guidelines
>20% (Very Steep)	Hilltops, ridges, rocky outcrops	- Staggered Contour Trenches (SCT) - Vegetative barriers - Gabion structures	SCT: 0.5–1.0 m × 0.5 m; spacing 15–20 m Gabion: 1–2 m high

		- Stone bunds	
10–20% (Moderately Steep)	Mid-slopes, shallow soils	- Continuous Contour Trenches (CCT) - Contour bunds - Loose boulder check dams	CCT: 0.5–1.0 m × 0.5–0.7 m; spacing 20–30 m Bunds: 1.5–2 m high
5–10% (Gentle Slopes)	Lower cultivated uplands	- Nala bunds (ENB/CNB) - Check dams - Farm ponds - Recharge shafts	Bund: 10–30 m crest, 2–4 m high Pond: 10–20 m × 10–20 m × 2–3 m
<5% (Valley Bottoms)	Stream valleys, flat lands	- Percolation tanks - Anicuts - Recharge ponds/wells	Tank: 0.5–2 ha, 3–5 m depth Anicut: nala width, 2–6 m high

6.5 Comparative Analysis of ENB v/s CNB

The comparison of ENB (Earthen Nala Bund) & CNB (Cemented Nala Bund) is given below**(Table-10).**

Table-10: ENB vs CNB in Hilly Areas

Parameter	ENB (Earthen)	CNB (Concrete)
Material	Compacted soil	Masonry/Concrete
Cost	Low	High
Durability	2–5 years	15–20+ years
Catchment Suitability	Small streams, moderate runoff	Larger streams, high runoff
Slope Suitability	2–10%	>10%
Storage Capacity	Moderate	Moderate to high
Construction Time	Few days	Weeks–months
Maintenance	Frequent	Minimal
Impact	Local recharge & erosion control	Regional recharge & flood moderation

6.6 Hydrological Planning and Benefits

- **ENBs** are sited along smaller drainage lines at mid-to-upper slopes, capturing localized runoff.
- **CNBs** are placed along stronger drainage lines, particularly in central and northern sectors, to withstand higher discharges.

Combined Outcomes:

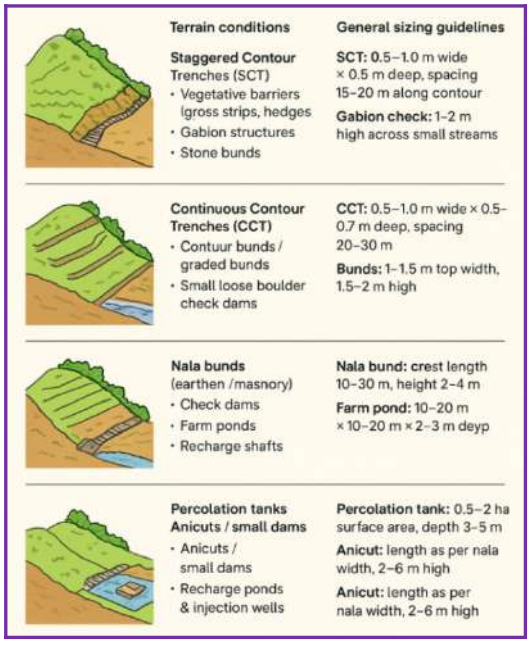
- Moderation of runoff velocity
- Increased infiltration and percolation
- Enhanced groundwater recharge
- Reduction in soil erosion

Benefits to Study Area:

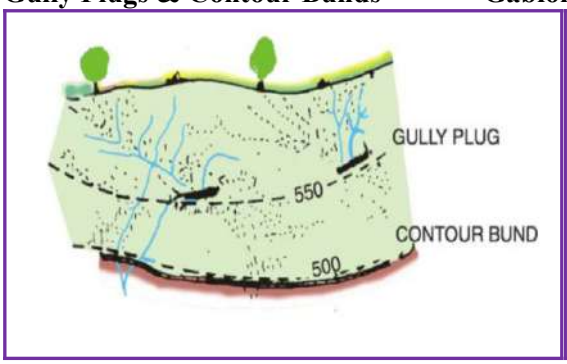
- **Water Conservation**: Harvests monsoonal runoff, prevents downstream loss.
- **Aquifer Recharge**: Improves well yields and sustains groundwater availability.
- **Soil Moisture Enhancement**: Supports multiple cropping and reduces drought risks.
- **Eco-Restoration**: Reduces erosion, mitigates siltation, and maintains ecological stability.

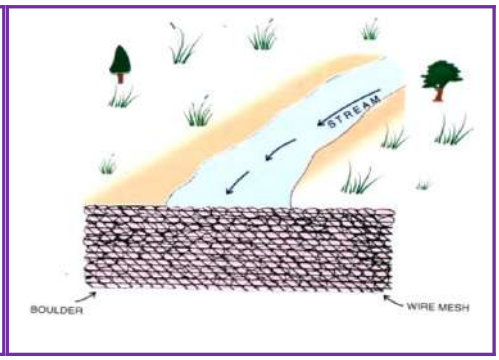
6.7 General Recharge Structures in Hilly Terrain

The commonly used recharge structures in hilly areas are given below:



Gully Plugs & Contour Bunds **Gabion Structures**





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6.8 Field Study Photographs

The photographs were taken during field investigations to document existing site conditions and water management practices. They depict hydrogeological features, drainage channels, recharge structures, and representative geological formations. These visuals complement field observations and provide supporting evidence for interpretation, analysis, and preparation of the technical report**(Photograph-1 to 11).**

Photoplate-1

Photoplate-2

Photoplate-3

Photoplate-4

Photoplate-5 **Photoplate-6**

Photoplate-7

Photoplate-8

Photoplate-9

Photoplate-10

Photoplate-11

7.0 DELINEATION OF MICRO-WATERSHEDS FOR PROPOSED RAINWATER HARVESTING STRUCTURES AND NET RECHARGE

The following sections present the delineated micro-watersheds for each proposed rainwater harvesting (RWH) structure, detailing their respective catchment areas, gradients, submergence zones, and estimated storage and recharge capacities. To aid clarity, two sample calculations—one for a Concrete Nala Bund (CNB) and another for an Earthen Nala Bund (ENB)—are also provided.

7.1 Recharge through CNB & ENB by harvesting surface runoff of hills-for CNB-1 & ENB-1

7.1.1 Concrete Nala Bund (CNB-1)

The locations and specifications of the proposed Concrete Nala Bunds (CNBs) are provided in **Table-11, while Figure-10** illustrates their respective catchments. For instance, CNB-1 encompasses a catchment area of 2141682 m² (214.17 ha) and is estimated to contribute **1115174 m³** of runoff, based on a surface runoff coefficient of 0.5 for the first-order stream

1. Catchment Characteristics

- **Catchment area:**2141682 m² (214.17 ha)
- **Runoff coefficient:** 0.5 (for first-order stream)
- **Average annual rainfall:** 1.0414 m (1041.4 mm)

Catchment Yield Calculation:

Catchment Yield=2141682×0.50×1.0414=**1115174 m³**

The catchment is estimated to generate **1115174 m³ (1.115 mcm) of runoff annually**.

2. Storage Capacity of Recharge Structure:

- Pond volume created by CNB-1:**2,315 m³**

3. Pond Replenishment Frequency:

- Expected number of fillings during monsoon: **4–5 times**
- Taking 5 spells:

Total pond water available = 2,315 × 5 = 11,575 m^3

4. Recharge Estimation:

Considering **50% recharge efficiency** due to highly weathered and fractured sandstone:

Net Recharge=11,575×0.5=**5788 m^3(Table-12 & 13).**

So,CNB-1 structure is expected to contribute about 5,788 m³ of groundwater recharge annually.

7.1.2 Earthen Nala Bund (ENB-1)

The locations and specifications of the proposed Earthen Nala Bunds (ENBs) are presented in **Table-11**, with their corresponding catchments illustrated in **Figure-10**. For example, ENB-1 has a delineated catchment area of 471544 m² (47.15 ha) and is expected to generate approximately 91,240 m³ of runoff, calculated using a surface runoff coefficient of 0.6 for the first-order stream

1. Catchment Characteristics

- **Catchment area:**471544 m² (47.15 ha)
- **Runoff coefficient:** 0.6 (for first-order stream)
- **Average annual rainfall:** 1.0414 m (1041.4 mm)

Catchment Yield Calculation:

Catchment Yield= 471544 ×0.60×1.0414=**294640 m³**

The catchment is estimated to generate **294640 m³ (0.295 mcm) of runoff annually**.

2. Storage Capacity of Recharge Structure:

- Pond volume created by ENB-1:**2,029 m³**

3. Pond Replenishment Frequency:

- Expected number of fillings during monsoon: **4–5 times**
- Taking 5 spells:

Total pond water available = 2,029 × 5 = 10,145 m³

4. Recharge Estimation:

Considering **50% recharge efficiency** due to highly weathered and fractured sandstone:

Net Recharge=10,145×0.5=**5073 m³**

So,ENB-1 structure is expected to contribute about 5,073 m³ of groundwater recharge annually(Table-12 & 13).

Table-11: Co-ordinates, area and gradient of proposed CNB & ENB

S. No.	Structure	Longitude	Latitude	Catchmentarea of CNB/ENB(m^2)	Gradient (m/m)
1.	CNB-1	24° 1'29.77"N	82°23'09.06"E	2141682	21.60
2.	CNB-2	24° 1'44.35"N	82°23'19.16"E	1399400	44.87
3.	CNB-3	24° 1'56.31"N	82°23'30.23"E	656804	54.35
4.	CNB-4	24° 2'26.95"N	82°23'46.93"E	822661	82.44
5.	CNB-5	24° 2'34.09"N	82°23'51.44"E	311286	24.39
6.	CNB-6	24° 2'47.90"N	82°23'45.89"E	1867718	53.58
7.	CNB-7	24° 2'52.17"N	82°23'37.26"E	3974451	35.88
8.	ENB-1	24° 1'16.94"N	82°22'20.53"E	471544	16.63
9.	ENB-2	24° 0'55.06"N	82°22'24.18"E	175195	58.50
10.	ENB-3	24° 0'46.34"N	82°22'32.27"E	340717	30.30
11.	ENB-4	24° 0'45.80"N	82°23'04.68"E	108545	78.42
12.	ENB-5	24° 1'24.23"N	82°23'30.97"E	264926	82.44
13.	ENB-6	24° 1'56.36"N	82°23'47.39"E	196744	92.46
			Total	**0**	

Table-12: Details of proposed CNB & ENB

S. No.	Structure	CNB & ENB detail		Stream Gradient (m/km)	Length of stored water (m)	Submerged area (ha.)	Water storage capacity (m^3) (X)
		Length (m)	Height (m)				
1.	CNB-1	25	2.0	21.60	92.59	0.23	2315
2.	CNB-2	30	1.5	44.87	33.43	0.10	752
3.	CNB-3	25	2.0	54.35	36.80	0.09	920
4.	CNB-4	30	1.5	82.44	18.20	0.05	409
5.	CNB-5	25	2.0	24.39	82.00	0.21	2050
6.	CNB-6	25	2.0	53.58	37.33	0.09	933
7.	CNB-7	30	1.5	35.88	41.81	0.13	941
8.	ENB-1	30	1.5	16.63	90.20	0.27	2029
9.	ENB-2	25	2.0	58.50	34.19	0.09	855
10.	ENB-3	25	2.0	30.30	66.01	0.17	1650
11.	ENB-4	30	1.5	78.42	19.13	0.06	430
12.	ENB-5	25	2.0	82.44	24.26	0.06	607
13.	ENB-6	30	1.5	92.46	16.22	0.05	365
					Total	**00**	**355**

Table-13:Hydrologic characters of proposed CNB & ENB

S. No.	Pond No	Catch-ment area of structure (m^2)	Run off Coeff-icient	Rain fall (m) (From strange equation)	Catch-ment yield(m^3)	No. of Fills	Water storage capacity (m^3)	Net availability of water for ground water recharge (m^3)	Net Recharge through check dam (m^3)
		(A)	(B)	(C)	(A*B*C)	D	X	(D*X)=E	E/2
1.	CNB-1	2141682	0.50	1.0414	1115174	5.00	2315	11575	5788
2.	CNB-2	1399400	0.50	1.0414	728668	5.00	752	3760	1880
3.	CNB-3	656804	0.50	1.0414	341998	5.00	920	4600	2300
4.	CNB-4	822661	0.50	1.0414	428360	5.00	409	2045	1023
5.	CNB-5	311286	0.50	1.0414	162087	5.00	2050	10250	5125
6.	CNB-6	1867718	0.50	1.0414	972521	5.00	933	4665	2333
7.	CNB-7	3974451	0.50	1.0414	2069497	5.00	941	4705	2353
14.	ENB-1	471544	0.60	1.0414	294640	5.00	2029	10145	5073
15.	ENB-2	175195	0.60	1.0414	109469	5.00	855	4275	2138
16.	ENB-3	340717	0.60	1.0414	212894	5.00	1650	8250	4125
17.	ENB-4	108545	0.60	1.0414	67823	5.00	430	2150	1075
18.	ENB-5	264926	0.60	1.0414	165536	5.00	607	3035	1518
19.	ENB-6	196744	0.60	1.0414	122934	5.00	365	1825	913
Total		**0**			**13.54**		**65**	**14256**	**71280**

7.2 Micro-Watershed Based Presentation of CNB and ENB Structures

To provide greater clarity on the location and design of the 13 proposed Rainwater Harvesting (RWH) structures-including details on siting, dimensions, local topography, elevation, stream patterns, and supporting geospatial information-the overall catchment has been divided into four Parts. Each part highlights a subset of Concrete Nala Bunds (CNBs) and Earthen Nala Bunds (ENBs), illustrated with clear maps and descriptions to make the interventions easy to understand and visualize.

7.2.1 CNB & ENB Part-A

5 **locations**: ENB-1 to ENB-5is proposed**(Figure-11).**These are generally along smaller tributaries or moderate slope areas where runoff can be impounded.

The one CNB is proposed as CNB-1.This is usually along main drainage channels with higher flow, requiring stronger structures.

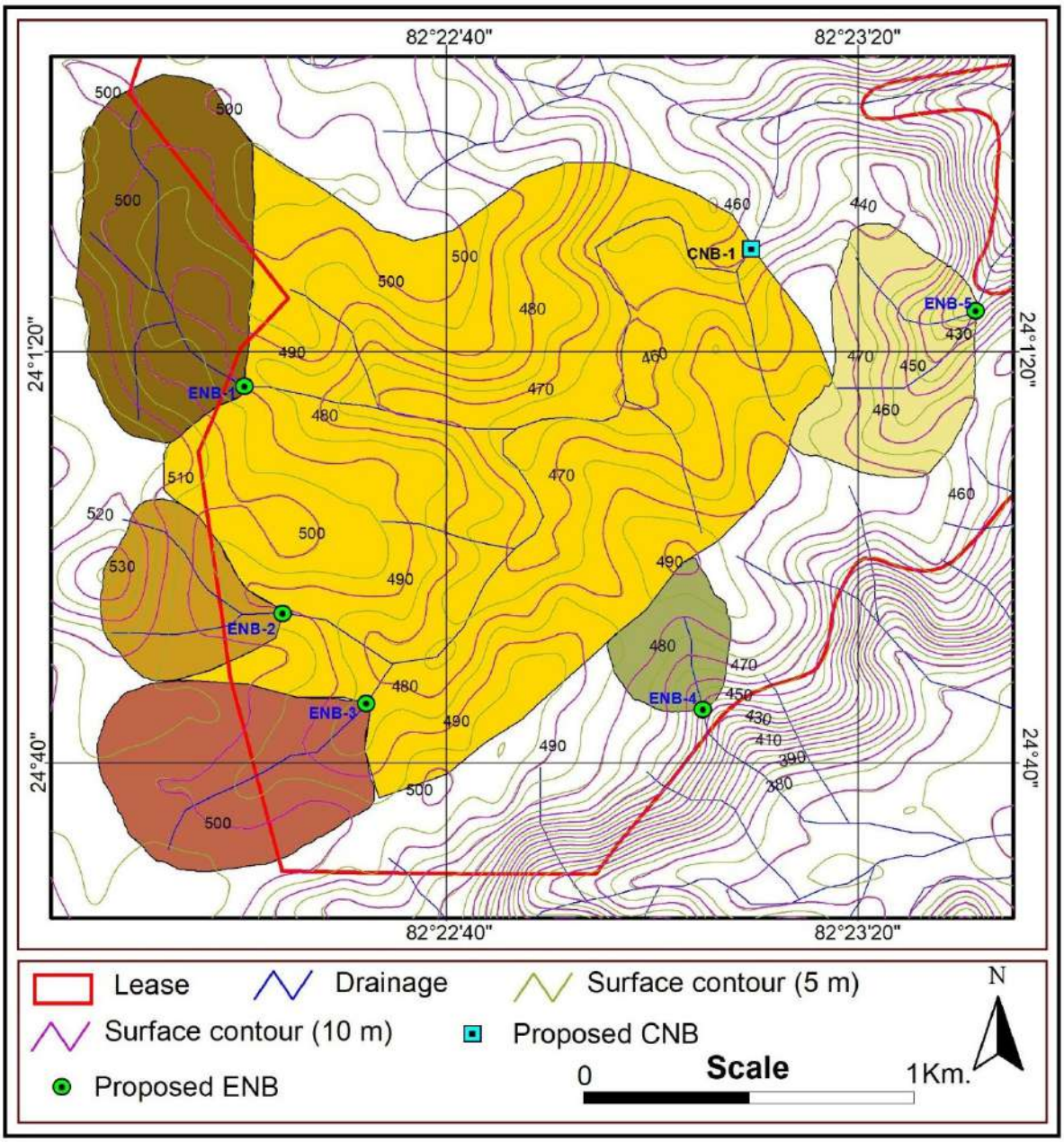
Topographical Interpretation:

Higher Elevation Areas (500–530 m): Found in the western part of the area. These form the catchment zone generating runoff.

Moderate Elevation (470–490 m): Covers central lease area intercepting flow earlywith several proposed ENBs (ENB-1 to ENB-5).

Lower Elevation (390–450 m): Found in the eastern and south eastern side near ENB-4 and CNB-1.These are the discharge areas where water accumulates.

Figure-11: Stream network and catchment area of CNB & ENBs (Part-1)



(ENB & CNB Specification)

Structure No.	ENB-1	ENB-2	ENB-3
Easting	82°22'20.53"E	82°22'24.18"E	82°22'32.27"E
Northing	24° 1'16.94"N	24° 0'55.06"N	24° 0'46.34"N
Catchment area (m^2)	471544	175195	340717
Catchment Yield (m^3)	294640	109469	212894
Average water storage (m^3)	3608	481	928
Net-availability of water(m^3)	18040	2405	4640

Net recharge(m^3)	**9020**	**1203**	**2320**

Structure No.	ENB-4	ENB-5	CNB-1
Easting	82°23'4.68"E	82°23'30.97"E	82°23'9.06"E
Northing	24° 0'45.80"N	24° 1'24.23"N	24° 1'29.77"N
Catchment area (m^2)	108545	264926	2141682
Catchment Yield (m^3)	67823	165536	1115174
Average water storage (m^3)	765	849	1302
Net-availability of water(m^3)	3825	4245	6510
Net recharge(m^3)	**1913**	**2123**	**3255**

7.2.2 CNB & ENB Part-2

3 **locations**:CNB-2,CNB-3 and ENB-6 are proposed**(Figure-12).**

Earthen Nala Bunds (ENB):

- **ENB-6** → Located in the **north-eastern upland** (around 380 m contour), designed to intercept runoff at the headwater zone.

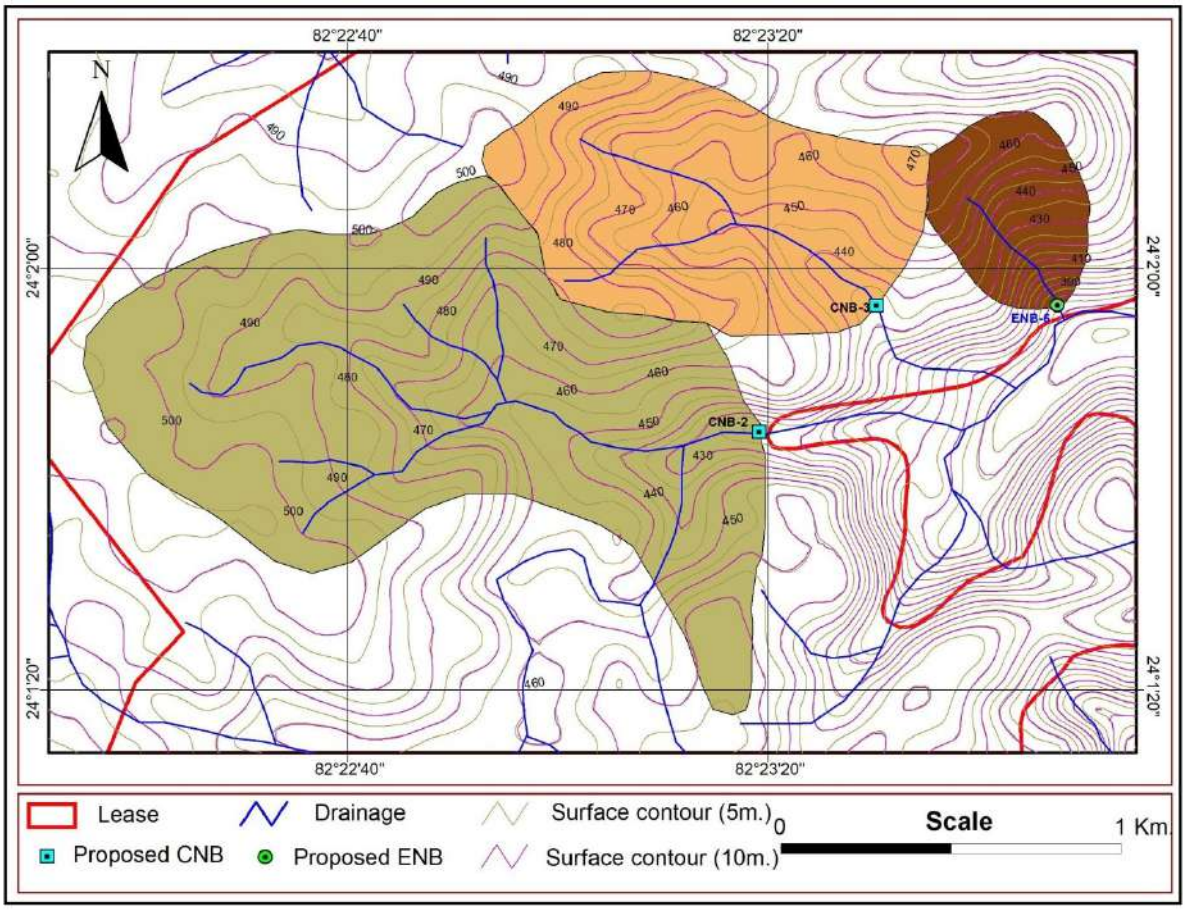
Contour Nala Bunds (CNBs):

- **CNB-2** → Planned in the **central drainage line** (425 m contour), where upper streams converge, providing effective runoff storage.
- **CNB-3** → Located north-east of CNB-2, along another **second-order stream** at ~435 m contour, strengthening the cascade system.

Interpretation:

- **ENBs** are concentrated in the **upper catchments** to intercept runoff at its origin and increase recharge in higher elevation zones.
- **CNBs** are placed in the **middle and lower drainage courses** to control concentrated flows, prevent erosion, and support groundwater recharge in downstream areas.
- Together, they form a **multi-tiered system**: ENBs provide the first line of runoff control in uplands, while CNBs strengthen storage and recharge in lower terrain.

Figure-12: Stream network and catchment area of CNB & ENB (Part-2)



(ENB & CNB Specification)

Structure No.	ENB-6	CNB-2	CNB-3
Easting	82°23'47.39"E	82°23'19.16"E	82°23'30.23"E
Northing	24° 1'56.36"N	24° 1'44.35"N	24° 1'56.31"N
Catchment area (m^2)	196744	1399400	656804
Catchment Yield (m^3)	122934	728668	341998
Average water storage (m^3)	865	1337	1840
Net-availability of water(m^3)	4325	6685	9200
Net recharge(m^3)	**2163**	**3343**	**4600**

7.2.3 CNB & ENB Part-3

2 CNBs as CNB-4and CNB-7 are proposed**(Figure-13).**

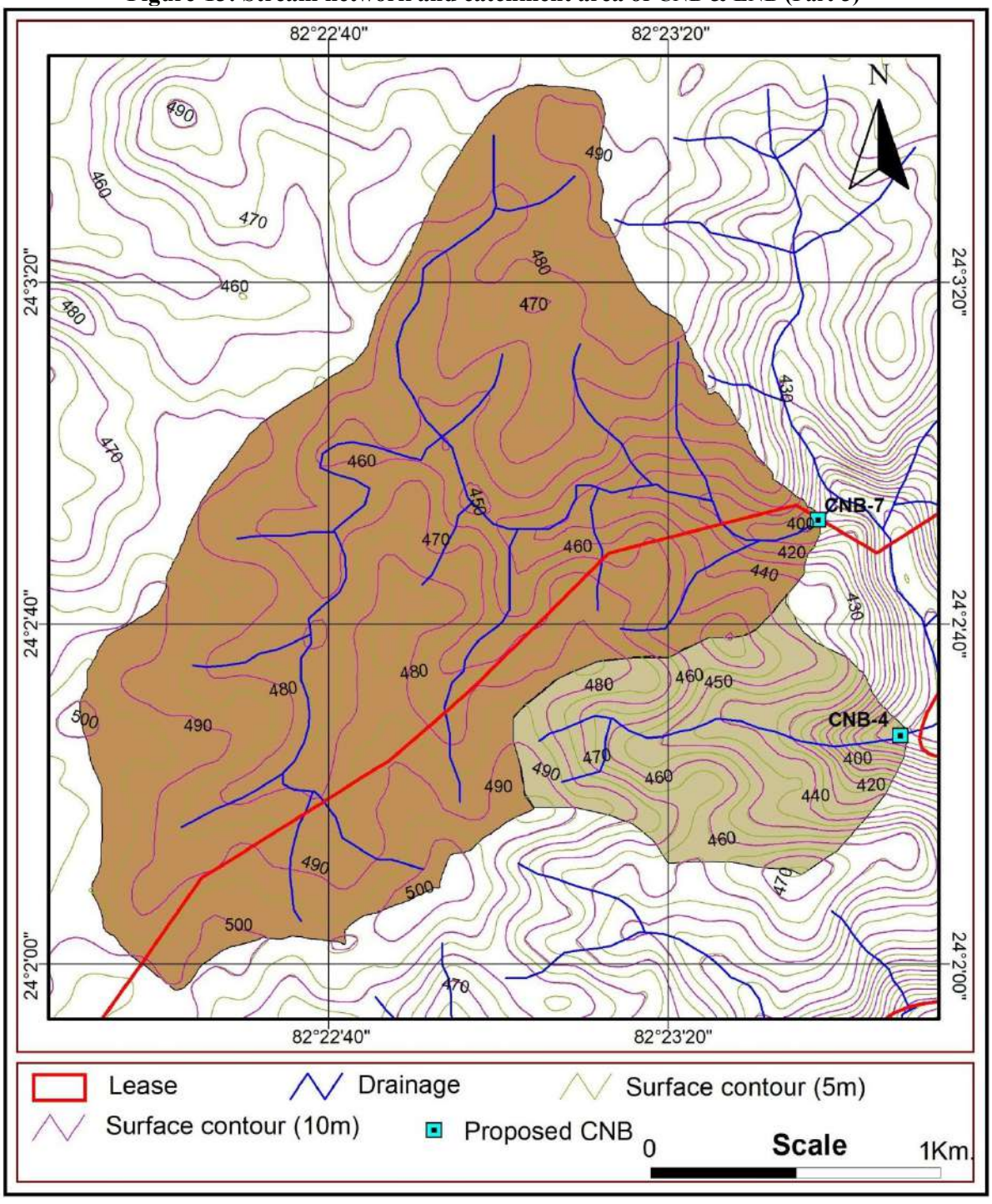
CNB-4 location: Northern side of the lease area, near 390–380 m contour zone across a small nala draining eastwards to captures runoff from eastern uplands,

Purpose: Recharges downstream groundwater toward lower catchment.

CNB-7 location: Northern side of the lease area, near 400–390 m contour zone across a nala draining eastwards to captures runoff from western uplands,

Purpose: Recharges downstream groundwater and prevents soil erosion toward lower catchment.

Figure-13: Stream network and catchment area of CNB & ENB (Part-3)



(ENB & CNB Specification)

Structure No.	CNB-4	CNB-7
Easting	82°23'46.93"E	82°23'37.26"E
Northing	24° 2'26.95"N	24° 2'52.17"N
Catchment area (m^2)	822661	3974451
Catchment Yield (m^3)	428360	2069497
Average water storage (m^3)	970	1951
Net-availability of water (m^3)	4850	9755
Net recharge (m^3)	**2425**	**4878**

7.2.4 CNB & ENB Part-4

The**Figure-14** shows two proposed CNBs, marked as CNB-5 and CNB-6. Their locations are strategically chosen based on drainage alignment, slope, and contour levels:

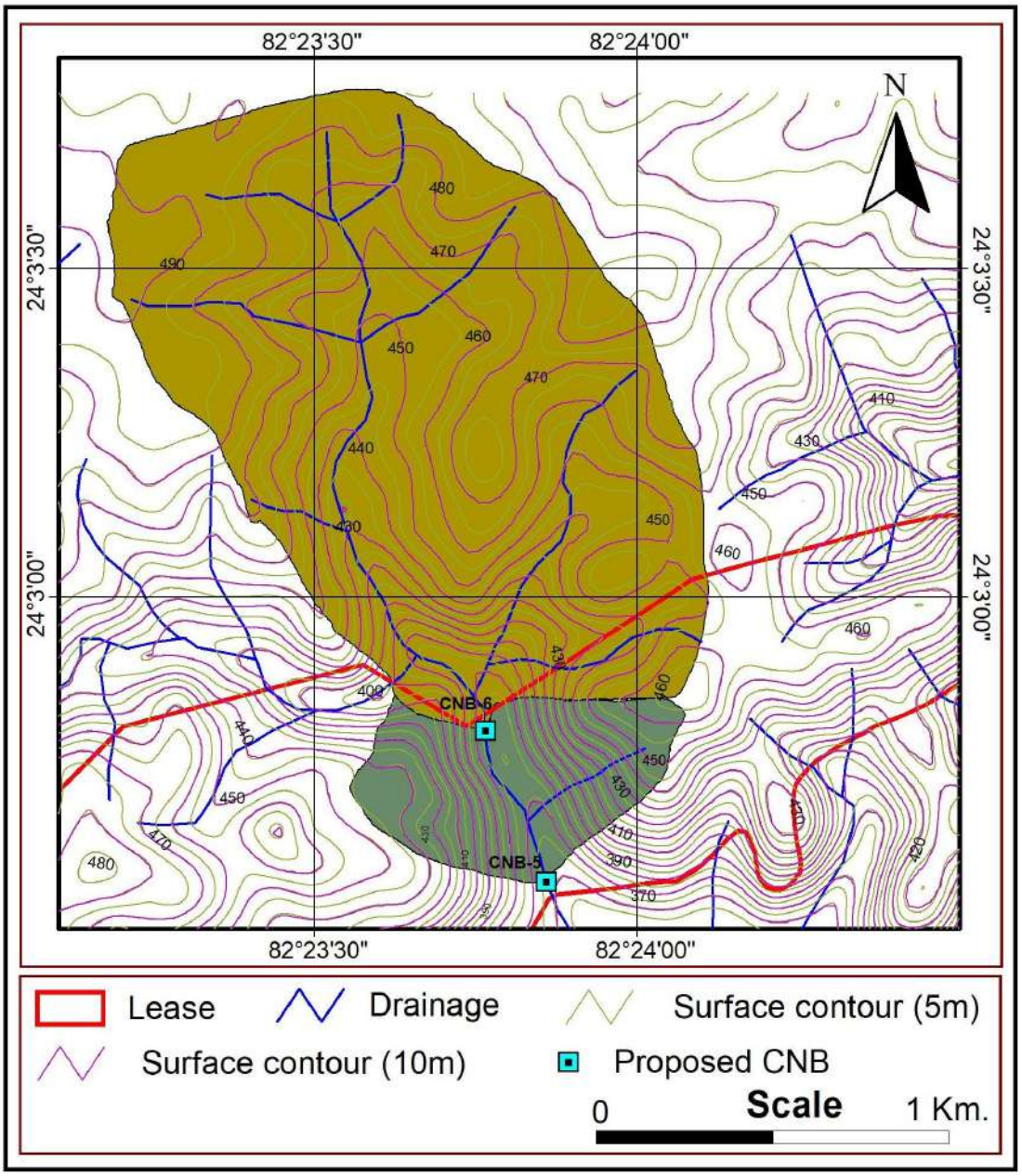
- **CNB-5:**
  - Located near the central drainage channel.
  - Situated where multiple drainage lines converge, maximizing water retention.
  - Positioned on contour around **370–380 m**, ensuring good catchment coverage.
  - Ideal to slow runoff from upper hilly region (470–490 m elevation).
  - This acts as a secondary check structure, storing overflow from CNB-6 and further reducing soil erosion.

- **CNB-6:**
  - CNB-6 is located upstream drainage line same as CNB-5.
  - Situated where multiple drainage lines converge, maximizing water retention.
  - Positioned near contour ~390 m, covering lower catchment area.
  - Ideal to slow runoff from upper hilly region (470–490 m elevation).

Recharge Potential:

CNB is located downstream where water spreading area is available for percolation.

Figure-14: Stream network and catchment area of CNB & ENB (Part-4)



(ENB & CNB specification)

Structure No.	CNB-5	CNB-6
Easting	82°23'51.44"E	82°23'45.89"E
Northing	24° 2'34.09"N	24° 2'47.90"N
Catchment area (m^2)	311286	1867718
Catchment Yield (m^3)	162087	972521
Average water storage (m^3)	3280	1680
Net-availability of water	16400	8400

Net recharge	**8200**	**4200**

7.3 Total ground water recharge through recharge structures

The total groundwater recharge expected from the 13 proposed structures-comprising 7 Concrete Nala Bunds (CNBs) and 6 Earthen Nala Bunds (ENBs)-is summarized in **Table-14,** along with the structural dimensions considered for the calculations.

Table-14: Specific dimensions of individual RWH structure along with total ground water recharge

S. No.	Structure	CNB & ENB detail		Length of stored water (m)	Submerged area (ha.)	Water storage capacity (m^3)	Net availability of water for ground water recharge (m^3)	Net Recharge through check dam(m^3)
		Length (m)	Height (m)					
1.	CNB-1	25	1.5	69.44	0.17	1302	6510	**3255**
2.	CNB-2	30	2.0	44.57	0.13	1337	6685	**3343**
3.	CNB-3	50	2.0	36.80	0.18	1840	9200	**4600**
4.	CNB-4	40	2.0	24.26	0.10	970	4850	**2425**
5.	CNB-5	40	2.0	82.00	0.33	3280	16400	**8200**
6.	CNB-6	45	2.0	37.33	0.17	1680	8400	**4200**
7.	CNB-7	35	2.0	55.74	0.20	1951	9755	**4878**
8.	ENB-1	30	2.0	120.26	0.36	3608	18040	**9020**
9.	ENB-2	25	1.5	25.64	0.06	481	2405	**1203**
10.	ENB-3	25	1.5	49.50	0.12	928	4640	**2320**
11.	ENB-4	30	2.0	25.50	0.08	765	3825	**1913**
12.	ENB-5	35	2.0	24.26	0.08	849	4245	**2123**
13.	ENB-6	40	2.0	21.63	0.09	865	4325	**2163**
				Total	**0**	**450**	**24.5**	**616.93**

7.4 Cost Estimate of CNB and ENB proposed

This note provides a comparative cost estimate for construction of Cement Nala Bund (CNB) using rubble masonry and Earthen Nala Bund (ENB) in Singrauli District, Madhya Pradesh. Estimates are based on typical rural PWD/DSR rates (2025) and practical construction practices in the region. Values are indicative and may vary with site conditions, quarry leads, labour availability, and hydraulic design requirements.

7.4.1 Cement Nala Bund (CNB) - Masonry in Cement Mortar:

J K Cement, being a cement manufacturing company, will procure cement directly from its nearest production unit. The procurement cost is significantly lower-less than 50% of prevailing market rates-and these reduced values have been appropriately reflected in the cost estimates.

For a structure of 25 m length and 2 m height, built in rubble stone masonry (cement–sand mortar 1:5 or 1:6), with apron, cut-off trenches, and short wing walls**(Table-15).**

Table-15: Cost estimate for a CNB calculated with cement sourced internally at concessional rates

Component	Quantity (ROM)	Unit Rate (₹)	Amount (₹ Lakh)
Excavation & dressing	120 m³	240/m³	0.29
Rubble masonry in CM (body + cutoffs + wings)	78 m³	2,200/m³	1.72
PCC apron (0.30 m × 3 m × 25 m)	22.5 m³	3,250/m³	0.73
Stone pitching (upstream)	105 m²	500/m²	0.53
Pointing / plaster	60 m²	220/m²	0.13
Weep holes & sundries	L.S.	—	0.25
Contractor OH&P (8%)	—	—	0.45
Total Estimated Cost			**≈ 4.10 Lakh**

Indicative total cost: ₹ 4.10 lakh.

With value engineering (thinner apron, shorter wings, minimal pitching), the cost may be reduced to ₹3.2 – 3.8 lakh.

A very lean 'wall-only' build (25 m × 2 m × 0.8 m, no apron, minimal foundation) may cost only ₹2–3 lakh, but carries higher risk of scour and reduced service life.

7.4.2 Earthen Nala Bund (ENB):

For a bund of 25 m length and ~2 m height, primarily constructed in compacted earth with stone pitching and a small gabion spillway **(Table-16).**

Table-16: Estimated Construction Cost of ENB Structure

Component	Quantity (ROM)	Rate	Amount (₹ lakh)
Earthwork (excav, fill, compaction)	360 m³	220/m³	0.792
Selective pitching (toe + bands + spillway zone)	70 m²	450/m²	0.315
Gabion spillway & apron (optimized)	3.0 m³	32,000/m³	0.960
Turfing, drains, sundries	L.S.	—	0.100
Subtotal			**2.167**
Contractor OH&P (8%)	—	—	0.173
Total (before contingency)			≈ 2.34
Contingency (5%) ***(optional)***	—	—	≈ 0.12
Grand Total			**≈ 2.46–2.50**

Indicative total cost: ₹2.50 lakh.

This assumes local borrow/quarry leads and standard compaction.

With reduced pitching/apron and short leads, costs can be brought closer to ₹2.25 lakh.

References:

1. Central Ground Water Board (CGWB), Government of India. Manual on Artificial Recharge of Ground Water. New Delhi: Ministry of Water Resources, 2007.
2. Madhya Pradesh Water Resources Department. Unified Schedule of Rates (USR), 2024–25. Bhopal: WRD, Government of Madhya Pradesh.
3. IIT-Bombay, Department of Civil Engineering. Performance Evaluation of Cement Nala Bunds (CNBs) in Maharashtra. Technical Report, 2019.
4. National Bank for Agriculture and Rural Development (NABARD). Watershed Development Guidelines. Mumbai: NABARD, latest edition.
5. Central Water Commission (CWC). Manual on Small Hydraulic Structures / Minor Irrigation Structures. New Delhi: CWC, Government of India.
6. Government of Madhya Pradesh — Rural Works Tenders (2024–25). Award data for small masonry check dams and earthen nala bunds in Singrauli District and adjoining areas.

7.5 General design of ENB and CNB

A general design of Cemented Nala Bund (CNB) and Earthen Nala Bund (ENB) along with spillway arrangements is presented in **Figures 15 and 16.**

Figure-15: General design of Cemented Nala Bund (CNB)

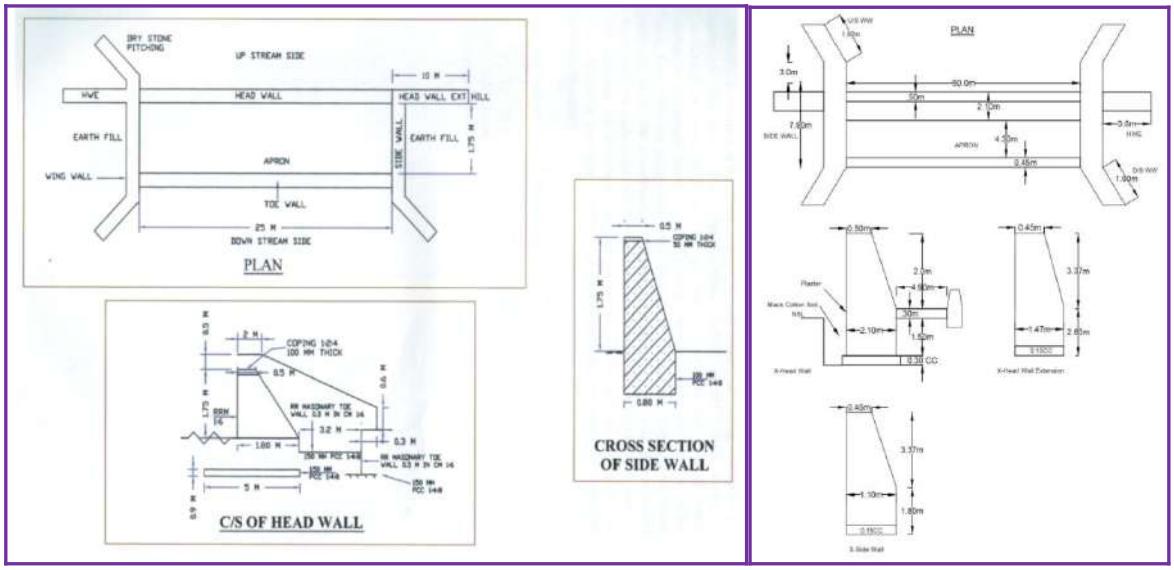
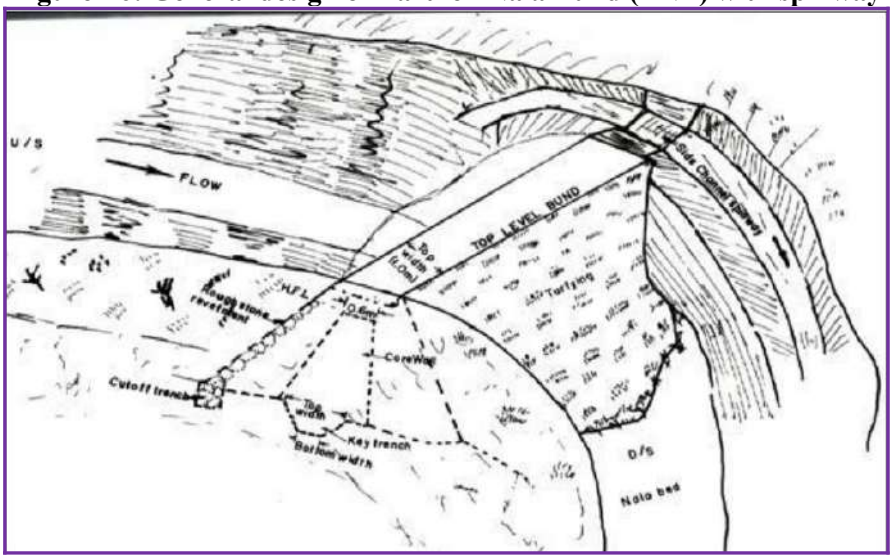


Figure-16: General design of Earthen Nala Bund (ENB) with spillway



8.0 INTEGRATED CONSERVATION STRATEGY FOR SOIL, MOISTURE, AND WATER RESOURCES IN MAHAN COAL BLOCK

The Mahan Coal Block, with its characteristic silty sandy loam soils averaging around 20% natural moisture, presents both opportunities and challenges for soil and water management. While this soil type is moderately fertile and allows good infiltration, it is also susceptible to surface runoff, erosion, and seasonal moisture deficits if left untreated. Given the ecological sensitivity of the coal-bearing landscape and the need to maintain productivity in surrounding areas, an integrated soil and water conservation plan has been designed to balance land stability, erosion control, and water security.

Structural Measures:

At the core of the plan are structural interventions designed to intercept runoff and reduce erosive forces.

- **Earthen Nala Bunds (ENBs):** These will be constructed across smaller drainage lines. Built from compacted earth with stone pitching and a small gabion spillway, ENBs will slow down runoff, encourage localized recharge, and serve as modest water-holding structures for livestock and agriculture. Their cost-effectiveness makes them suitable for multiple locations across the minor streams.
- **Cement Nala Bunds (CNBs):** On larger drainage lines where flows are heavier and erosion risks are higher, masonry CNBs are proposed. These rubble masonry structures provide

greater durability, act as permanent checks against gully erosion, and create perennial or seasonal water pools that can support supplementary irrigation and community water needs. CNBs also play a significant role in groundwater recharge due to their ability to hold back water for extended periods.

Slope Management:

On undulating and sloping terrain, **contour trenches** will be dug following the natural contour lines. These shallow trenches act as micro-barriers, spreading runoff evenly along the slope. They reduce the velocity of surface water, increase infiltration, and improve the availability of moisture in the root zone. In silty sandy loam soils, which are naturally permeable, contour trenches help retain sufficient water to support vegetation while preventing uncontrolled runoff and soil loss.

Vegetative Measures:

To reinforce these physical structures, **forestation in gap** areas has been proposed. Afforestation and assisted natural regeneration will be carried out in degraded and exposed patches using native and fast-growing species. Vegetative cover stabilizes loose soil, reduces splash erosion, and enriches the soil with organic matter. Over time, the root systems of trees and grasses bind the soil matrix, while their canopy reduces the direct impact of raindrops, further mitigating erosion. The improved vegetative environment also enhances biodiversity, provides micro-climatic benefits, and improves carbon sequestration.

Integrated Impact:

The synergy of ENBs, CNBs, contour trenches, and forestation will provide a multi-layered defense against soil and water degradation. Together, these measures will:

- Conserve topsoil and reduce sediment load in streams.
- Recharge groundwater and sustain local wells.
- Increase soil moisture availability for crops and vegetation.
- Expand green cover and improve ecosystem resilience.
- Support local livelihoods by stabilizing land and providing water security.

This integrated approach ensures that the soil-water-vegetation system of the Mahan Coal Block evolves into a resilient and sustainable landscape, capable of withstanding climatic variability and supporting both ecological and community needs.

9.0 GAP PLANTATION

Objectives:

1. Ecological Restoration: Rebuild native dry deciduous forest cover dominated by Sal and its associates.
2. Soil & Water Conservation: Arrest erosion, improve infiltration, and enhance groundwater recharge.
3. Livelihood Support: Strengthen local communities through NTFP species (Tendu, Mahua, Amla).
4. Carbon Sequestration & Climate Mitigation: Enhance carbon sink potential.
5. Mining Impact Mitigation: Offset cumulative ecological impacts of mining operations.

9.1 Data source

To delineate the gap area within the Mahan Coal Block (MCB), a land use map was generated by integrating multiple thematic layers**(Figure-17 & 18).** Cloud-free satellite imagery was procured from the National Remote Sensing Centre (NRSC), Hyderabad, for this purpose. The details of the imagery utilized are presented in **Table-17** below.

Table-17: Imagery specification of 2013

S. No.	Specifications	
1.	Satellite ID	CARTOSAT-2E
2.	Sensor	MX
3.	Gen Agency	NRSC
4.	Date of Pass	21-Mar-2024
5.	No of Bands	4
6.	Band Numbers	1234
7.	Date of Dump	21-Mar-2024
8.	Dumping Orbit No	37396
9.	Imaging Orbit No	37396
10.	Datum & Zone Numver	WGS84& 44
11.	Generation Date Time Remarks=Generated by SAC-DPGS at NRSC	08-Sep-2025 11:36:58

Figure-17: Satellite imagery of study area with gap area identified within MCB

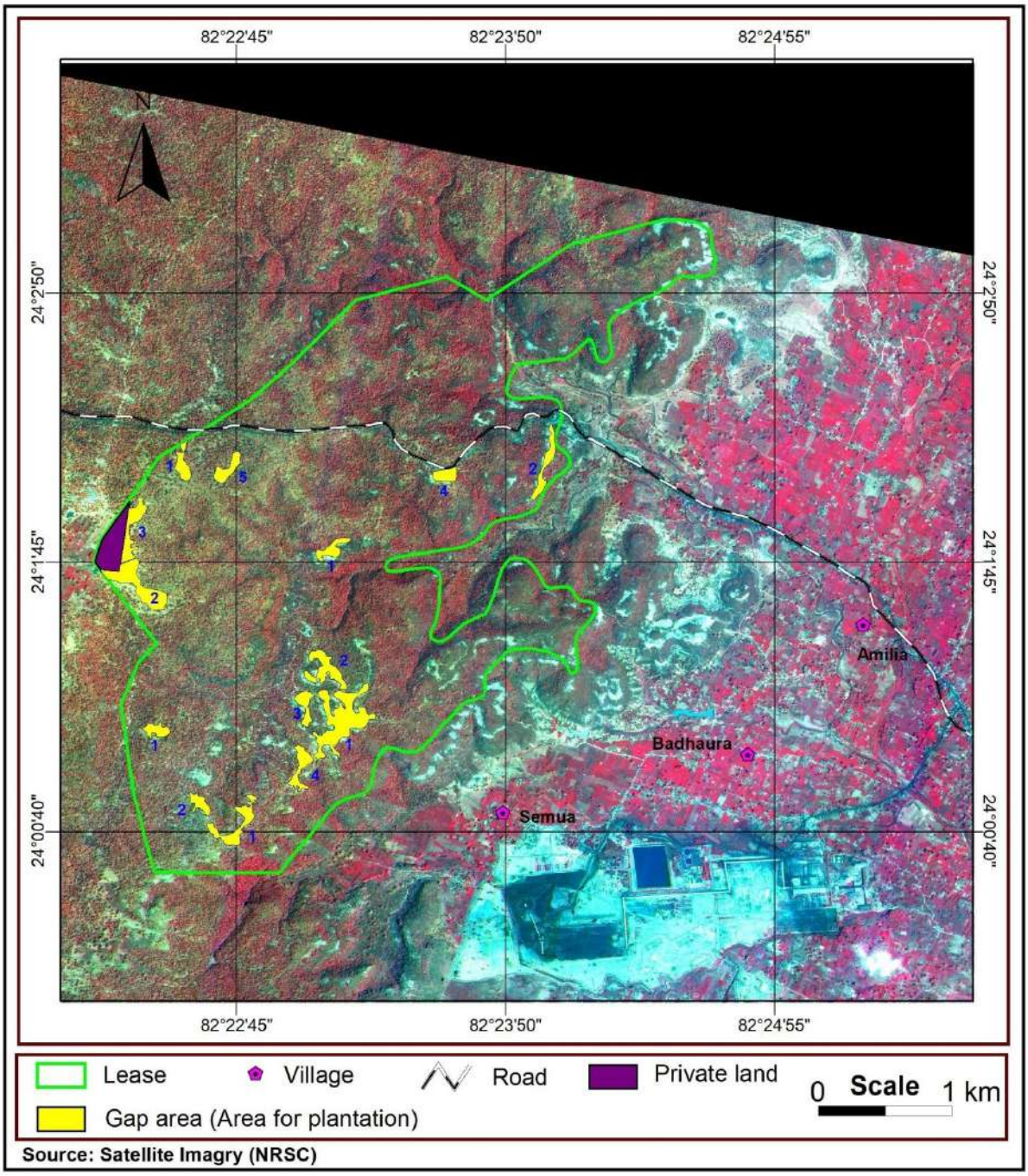
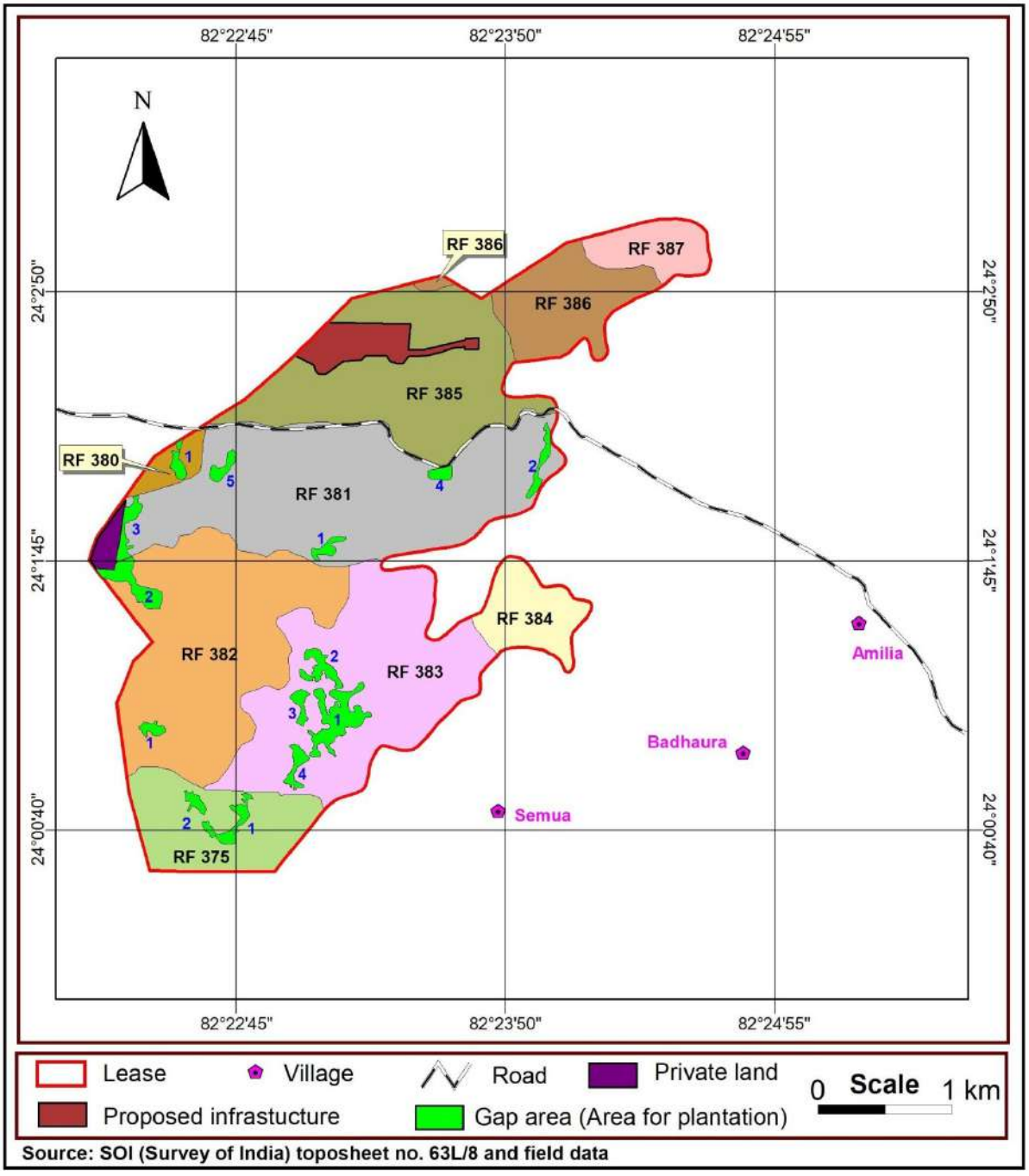


Figure-18: Gap areas identified in MCB



The gap areas delineated through satellite imagery have been tabulated below, indicating the corresponding Reserve Forest (RF) number, geographic location, and spatial extent to facilitate planning of afforestation measures.

As per the evaluation criteria, gap areas less than 0.2 ha in size may be excluded from the present forestation program, as they are considered ecologically insignificant and operationally unviable for plantation. In addition, it is essential to ascertain through field verification that no rocky outcrops are present within the identified sites. Although due care has been exercised during image interpretation to select only those areas with adequate soil depth, the possibility of exposed rocky sub-strata cannot be fully ruled out. Since such areas lack regeneration potential, they will not be suitable for plantation activities**(Table-18).**

Table-18: Locations of gap identified in the different Reserve Forests

RF 375				
Gap number	**Latitude**	**Longitude**	**Area (in sq. mtr.)**	**Area (Hectares)**
1	24° 0'42.23"N	82°22'46.43"E	32350	3.24
2	24° 0'46.85"N	82°22'35.20"E	12820	1.28
RF 380				
1	24° 2'7.17"N	82°22'30.67"E	16403	1.64
RF 381				
1	24° 1'47.32"N	82°23'06.98"E	16008	1.6
2	24° 2'09.94"N	82°23'59.17"E	23065	2.31
3	24° 1'47.17"N	82°22'18.16"E	24415	2.44
4	24° 2'05.59"N	82°23'34.37"E	13774	1.38
5	24° 2'05.90"N	82°22'41.01"E	17953	1.80
RF 382				
1	24° 1'04.48"N	82°22'24.37"E	13178	1.32
2	24° 1'42.05"N	82°22'17.14"E	51522	5.15
RF 383				
1	24° 1'05.55"N	82°23'09.73"E	91206	9.12
2	24° 1'18.80"N	82°23'05.27"E	34578	3.46
3	24° 1'10.81"N	82°23'00.76"E	16554	1.66
4	24° 0'56.20"N	82°22'59.90"E	21889	2.19
		Total	**385715**	**38.59**

9.2 Plantation Design

The proposed plantation program has been designed to restore ecological functionality, improve site productivity, and ensure long-term sustainability of forest resources in the identified gap areas. The design framework emphasizes optimal spacing, scientifically determined planting density, and site-specific planting techniques to maximize survival and growth under varying soil and climatic conditions.

Standard spacing of **2 × 2 m** (approximately 2,500 seedlings per hectare) has been adopted to promote early canopy closure within 3–4 years, thereby suppressing invasive weed growth, reducing the risk of fire, and enhancing overall plantation stability in degraded landscapes. This initial dense stocking strategy also increases the probability of survival under stress conditions. Thinning operations proposed at **6–7 years** will reduce stand density to about 1,200–1,500 trees per hectare, forming the basis of a stable, well-managed permanent stand.

Planting techniques have been tailored to soil conditions, with pit sizes of **45 × 45 × 45 cm** in normal soils and **60 × 60 × 60 cm** in rocky terrains, supplemented with a pit mixture of topsoil, compost/FYM, and rock phosphate to enhance nutrient availability. Mulching with organic material and integration of water conservation measures such as contour trenches, crescent bunds, staggered trenches, and percolation pits further strengthen the survival and growth prospects of planted stock.
The plantation program also places strong emphasis on **species composition**, ensuring that species selection aligns with ecological suitability, site resilience, and long-term objectives of biodiversity enhancement and carbon sequestration. The selection of appropriate native and site-adapted species will further augment ecological restoration while contributing to sustainable resource management.The key aspects are consolidated below:

9.2.1 Spacing:

- Standard spacing: 2 × 2 m (≈ 2,500 seedlings per hectare).
- Rationale: Dense stocking accelerates canopy closure (3–4 years), suppresses invasive weeds, reduces fire risk, and maximizes survival in degraded landscapes.

9.2.2 Planting Density:

- 2,500 seedlings/ha initially.
- After thinning at 6–7 years, ~1,200–1,500 trees/ha retained as permanent stand.

9.2.3 Planting Technique:

- Pits: 45 × 45 × 45 cm in normal soils; 60 × 60 × 60 cm in rocky soils.
- Pit mixture: topsoil + compost/FYM (3:1) + 50–100 g rock phosphate.
- Mulching: 5–8 cm organic mulch at pit base.
- Water conservation: contour trenches, crescent bunds, staggered trenches, percolation pits.

9.3 Species Composition

Aligned with the indigenous tree cover of the Singrauli block, the plantation species composition has been structured to ensure ecological suitability and effective implementation. The key elements are consolidated below:

9.3.1 Model A-Standard Sites (2,500 seedlings/ha)

Species	%	Nos./ ha	Remarks
Sal (*Shorea robusta*)	30	750	Keystone species, long-term canopy
Saja (*Terminalia tomentosa*)	8	200	Timber associate
Dhaura (*Lagerstroemia parviflora*)	7	175	Hardy associate
Bija (*Pterocarpus marsupium*)	5	125	Timber & medicinal
Tendu (*Diospyros melanoxylon*)	8	200	NTFP (leaves for bidi)
Palash (*Butea monosperma*)	8	200	Hardy, fodder & dye
Sendha (*Boswellia serrata*)	6	150	Gum resin, rocky soils
Mahua (*Madhuca indica*)	7	175	NTFP, cultural
Amla (*Phyllanthus emblica*)	6	150	NTFP, fruit
Jamun (*Syzygiumcumini*)	3	75	Fruit
Khair (*Acacia catechu*)	6	150	Soil binder, catechu
Bamboo (*Bambusa* spp.)	6	150	Soil binder, livelihood
Total	**100**	**2,500**	

9.3.2 Model B-Rocky / Sandstone Sites (2,500 seedlings/ha)

Species	%	Nos./ha	Remarks
Sal (*Shorea robusta*)	20	500	Core canopy
Saja (*Terminalia tomentosa*)	6	150	Timber
Dhaura (*Lagerstroemia parviflora*)	5	125	Hardy associate
Bija (*Pterocarpus marsupium*)	4	100	Timber
Tendu (*Diospyros melanoxylon*)	12	300	NTFP
Palash (*Butea monosperma*)	12	300	Hardy, drought tolerant
Sendha (*Boswellia serrata*)	12	300	Medicinal gum
Mahua (*Madhuca indica*)	6	150	NTFP
Amla (*Phyllanthus emblica*)	6	150	Fruit
Jamun (*Syzygiumcumini*)	2	50	Fruit
Khair (*Acacia catechu*)	7	175	Soil binder
Bamboo (*Bambusa* spp.)	8	200	Soil binder
Total	**100**	**2,500**	

9.4 Soil & Water Conservation Integration:

- Check dams/anicuts (gabion or earthen) along drainage lines as suggested in previous sections.
- Contour trenches (0.5 m × 0.3 m) at 5–10 m intervals.

- Percolation pits (1 × 1 × 1 m) on slopes.
- Bamboo strips planted along contours for soil binding.
- Integration with gap plantation to ensure soil moisture retention.

9.5 Maintenance & Protection:

- Casualty replacement: 20–30% in years 1–3.
- Thinning: Start at year 6–7.
- Protection measures: Brushwood/live fencing, community guards.
- Community participation: Joint Forest Management Committees (JFMCs) to be given usufruct rights (Mahua, Tendu, Amla).

9.6 Cost Framework (per hectare, Year 1–3)

The Optimized Cost Estimate for Plantation in MCB is given below as **Table-19.**

Table-19: Optimized Cost Estimate for Plantation in MCB, Singrauli District, MP

Item	Unit	Qty/ha	Rate (₹)	Approx. Cost (₹/ha)	Notes on Optimization
Pit digging (45 × 45 × 45 cm)	Pit	2,000–2,200	15–18	35,000	Mechanized augers / reduced spacing for hardy species.
FYM/Compost application	Kg	8,000–10,000	2–2.5	22,000	Local sourcing from gaushalas; partial replacement with green manure.
Seedling procurement	Seedling	2,000–2,200	8–10	18,000	Government nurseries / temporary field nursery establishment.
Planting & mulching	Per pit	2,000–2,200	7–8	15,000	Community labor / SHG engagement, crop residue mulching.
Soil & water conservation	Lump sum	—	—	15,000	Trenches, bunds supported under MGNREGA convergence.
Fencing / protection	Lump sum	—	—	10,000	Live fencing (agave, gliricidia) + partial barbed sections.
Maintenance (3 years)	Yearly (3 yrs)	—	—	30,000	Village/JFM committees engaged for watering, gap-filling.
Total Estimated Cost / ha	—	—	—	**1,45,000**	Over 3 years.

(Indicative cost, based on MPFD plantation norms &MoEFCCafforestation schemes; may vary with terrain and logistics.)

Elaboration:

- Pit Digging: Using tractor-mounted augers reduces both labor intensity and cost, while also ensuring uniform pits. Spacing can be slightly increased (2,000–2,200 pits/ha) depending on species mix.
- FYM/Compost: Instead of full external procurement, on-site green manure crops (dhaincha, sunhemp) can supplement organic matter at a fraction of the cost.
- Seedlings: Government forest nurseries in MP typically provide seedlings at subsidized rates.
- Planting & Mulching: Mobilizing local SHGs and using agricultural residues for mulching helps cut expenses while ensuring better survival.
- Soil & Water Conservation: Costs can be partly absorbed under watershed or MGNREGA programs, especially in a district like Singrauli where such schemes are active.
- Fencing/Protection: Instead of complete barbed-wire fencing, live fencing supplemented with thorny bushes or partial fencing of vulnerable patches is more economical and sustainable.
- Maintenance: Engagement of local committees ensures survival, while spreading costs over three years prevents large upfront expenditure.

9.7 Monitoring & Evaluation:

- Survival % at Years 1, 3, and 5.
- Growth performance: height and girth increment.
- Soil & water indicators: infiltration rate, soil moisture content.
- Community benefits: NTFP collection records, JFMC participation.

9.8 References:

- MoEFCC (2018). Compensatory Afforestation Guidelines.
- ICFRE (2015). Best Practices for Rehabilitation of Degraded Forest Lands.
- Madhya Pradesh Forest Department (2020). Working Plan Guidelines for Dry Deciduous Forests.
- Singh, J.S. & Singh, S.P. (1992). Forest Ecology and Environment.
- FAO (2010). Guidelines on Planted Forest Management in the Tropics.

10 CONCLUSIONS

1. Rainwater Harvesting (RWH)

As per the Terms of Reference (ToR) of the Ministry of Environment, Forest and Climate Change (MoEF&CC), a watershed management programme has been designed for the Mahan Coal Block of JK Cement Ltd., Singrauli District, Madhya Pradesh. Using high-resolution satellite data, DEMs, and

drainage mapping, micro-watersheds were delineated and 13 potential rainwater harvesting sites were identified.

For estimation purposes, a 25 m span × 2 m height structure has been taken as a representative example:

- **Concrete Nala Bunds (CNBs): ≈ ₹4.10 lakh per structure**
- **Earthen Nala Bunds (ENBs): ≈ ₹2.50 lakh per structure**

These costs are based on concessional cement procurement (less than 50% of market rates) from JK Cement's own plant, reducing the effective construction cost of CNBs. Actual costs may vary depending on site-specific design dimensions (span, height, and local conditions). Complementary structures such as contour trenches and allied measures have also been proposed to maximize water harvesting efficiency.

Field verification confirmed the technical feasibility of the sites, considering slope, soil profile, thalweg alignment, and stream proximity. Together, these interventions are expected to create a groundwater recharge potential of **~0.0356 MCM**, ensuring sustainable water availability with minimal environmental disturbance.

2. Soil–Moisture Conservation

To strengthen and extend the benefits of the proposed water harvesting structures, a complementary set of soil–moisture conservation (SMC) interventions has been planned. These measures comprise contour trenches, bund formation, vegetative barriers, and slope stabilization works strategically located across the lease area. Together, they serve to enhance infiltration, regulate surface runoff, and significantly reduce soil erosion, thereby improving the long-term hydrological balance of the watershed.

For effective implementation, a dedicated budget provision of approximately **₹5.0 lakh** has been earmarked. This allocation is in addition to the provision of ~₹15,000 per hectare already considered under the GAP afforestation proposal (Table 19) for trenches and bunds related to soil–moisture conservation. By integrating these measures with rainwater harvesting efforts, the program ensures not only the retention and gradual recharge of rainwater but also the sustained growth of vegetation cover, the prevention of land degradation, and the reinforcement of overall watershed stability within the Mahan Coal Block lease area.

3. Gap Plantation

Alongside water and soil measures, a comprehensive afforestation and gap plantation programme has been designed. Using native and site-suitable species, the plan seeks to restore degraded patches and fill canopy gaps.

The programme is costed at **~₹1.45 lakh** per hectare for a 3-year cycle, covering pit excavation, manure application, seedling procurement, planting, mulching, protection/fencing, and maintenance (weeding, replacement, watering). Beyond ecological restoration, this will improve soil-moisture regimes, enhance biodiversity, strengthen carbon sequestration, and provide socio-economic co-benefits such as habitat regeneration and livelihood support for surrounding communities.

Therefore, this integrated three-pillar strategy—Rainwater Harvesting (CNBs/ENBs of varying dimensions), Soil–Moisture Conservation and Gap Plantation not only fulfills the ToR of MoEF&CC but also positions JK Cement Ltd. as a leader in ecological stewardship. Together, these measures ensure enhanced groundwater recharge, ecological resilience, and socio-environmental sustainability in the Singrauli region.

for Hydro-Geosurvey Consultants Pvt. Ltd.,

(Dr. V.B. Khilnani)
Managing Director

JKCement	Environment Policy	Policy No: FY25/CESD/04 Supersedes: Environment Policy (01) Pages: 1 of 1 Date of Issue: 23/01/2025 Effective Date: 23/01/2025

Environment Policy

JK Cement Limited (JKCL) promotes environmental protection as a core value in its operations. The company is dedicated to maintain a clean, green, and healthy environment by adhering to responsible practices and continuously improving its efforts in sustainability and resource conservation. JKCL is committed to:

- Ensure full compliance with all relevant laws, regulations, industry standards, and best practices, while adopting any additional measures necessary to go beyond regulatory expectations.
- Make environmental due diligence a core requirement for all upcoming Greenfield and Brownfield projects ensuring the protection of human health and the environment.
- Ensure clearly defined roles and responsibilities for all personnel involved in managing, performing, and verifying activities related to environmental and occupational health & safety (OH&S).
- Optimize resource utilization to enhance environmental management and ensure effective operation of pollution control equipment.
- Implement advanced technologies and robust practices to minimize emissions from our operations, ensuring compliance with regulatory standards & go beyond compliances.
- Set clear, measurable objectives and targets aimed at reducing environmental impacts, such as greenhouse gas (GHG) emissions, air pollutants, and other critical parameters, promoting a culture of continuous improvement.
- Review all active goals and targets at a minimum every 05 years to ensure consistency in our progress. Targets shall be recalculated and revalidated as necessary to align with evolving regulations and requirements.
- Continuously monitor and enhance environmental performance across all units in the areas of air, water, and waste through regular reviews, inspections, and audits.
- Build awareness among all stakeholders on environmental issues and compliance with relevant regulations through training and regular capability building sessions.
- Continuously enhance the effectiveness of our environmental management through a systematic approach for preventing, mitigating, and controlling environmental impacts, across our operations.

The policy shall be reviewed and updated as necessary to align with evolving regulations and best practices. Any amendments will be communicated to all stakeholders in a timely manner.

Approved By:

A.K. SARAOGI
Deputy Managing Director & CFO

Annexure - 6

अमर वाणी
अधर्म की सेना का सेनापति झूठ है। जहाँ झूठ पहुँच जाता है वहाँ अधर्म-राज्य की विजय-दुंदुभी अवश्य बजती है।
- सुदर्शन

रीवा, सतना व भोपाल से एक साथ प्रकाशित

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सार्वजनिक सूचना

यह सूचित किया जाता है कि महान भूमिगत कोयला खदान परियोजना को पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय (MoEF&CC), भारत सरकार द्वारा दिनांक 19.02.2026 को पर्यावरण स्वीकृति (Environmental Clearance) प्रदान की गई है।

परियोजना का विवरण निम्नलिखित है:

- परियोजना का नाम: महान अंडरग्राउंड कोल माइन (Mahan Underground Coal Mine)
- क्षेत्र: कोयला खनन (Coal Mining)
- परियोजना प्रवर्तक (Project Proponent): जे के सीमेंट लिमिटेड
- उत्पादन क्षमता: 1.2 मिलियन टन प्रति वर्ष (1.2 MTPA)
- स्थान: ग्राम – अमिलिया एवं बुधेर जिला सिंगरौली, राज्य – मध्य प्रदेश
- पर्यावरण स्वीकृति संख्या: EC25A0102MP5268543N
- फाइल संख्या: IA-J-11015/17/2025-1A-II(M)
- जारीकर्ता प्राधिकरण: पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय, भारत सरकार

उक्त पर्यावरण स्वीकृति पत्र 'PARIVESH' पोर्टल (https://parivesh.nic.in) पर उपलब्ध है। साथ ही, पर्यावरण स्वीकृति की प्रति कंपनी की आधिकारिक वेबसाइट पर भी उपलब्ध है। यह सूचना आम जनता, स्थानीय निवासियों एवं सभी संबंधित पक्षों को अवगत कराने के उद्देश्य से प्रकाशित की जा रही है।

परियोजना प्राधिकारी
जे. के. सीमेंट लिमिटेड

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दैनिक सांध्य
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सार्वजनिक सूचना

यह सूचित किया जाता है कि महान भूमिगत कोयला खदान परियोजना को पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय (MoEF&CC), भारत सरकार द्वारा दिनांक19.02.2026को पर्यावरण स्वीकृति (Environmental Clearance) प्रदान की गई है।

परियोजना का विवरण निम्नलिखित है:

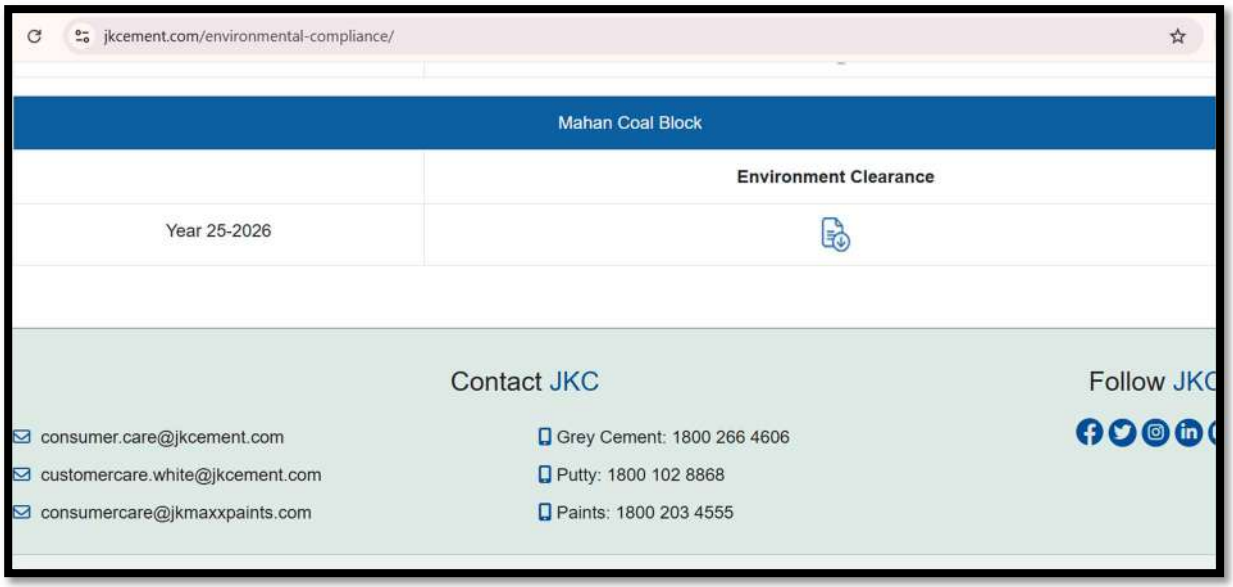
- परियोजना का नाम: महान अंडर ग्राउंड कोल माइन (Mahan Underground Coal Mine)
- क्षेत्र: कोयला खनन (Coal Mining)
- परियोजना प्रवर्तक (Project Proponent):जेके सीमेंट लिमिटेड
- उत्पादन क्षमता: 1.2 मिलियन टन प्रति वर्ष (1.2 MTPA)
- स्थान: ग्राम -अमिलिया एवं बुधेर , जिला -सिंगरौली, राज्य -मध्यप्रदेश
- पर्यावरण स्वीकृति संख्या: EC25A0102MP5268543N
- फाइल संख्या: IA-J-11015/17/2025-IA-II(M)
- जारीकर्ता प्राधिकरण: पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय, भारत सरकार

उक्त पर्यावरण स्वीकृति पत्र 'PARIVESH' पोर्टल (https://parivesh.nic.in) पर उपलब्ध है। साथ ही, पर्यावरण स्वीकृति की प्रति कंपनी की आधिकारिक वेबसाइट पर भी उपलब्ध है। यह सूचना आम जनता, स्थानीय निवासियों एवं सभी संबंधित पक्षों को अवगत कराने के उद्देश्य से प्रकाशित की जा रही है।

परियोजना प्राधिकारी
जे. के. सीमेंट लिमिटेड

Mahan Coal Block - EC Publication on Company's Site

(https://www.jkcement.com/environmental-compliance/)



Annexure - 8

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Ref. No.: JKCL/MCM/2026/11 **Date: 23.02.2026**

प्रति,

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4. मुख्य कार्यपालन अधिकारी, जनपद पंचायत, बैढ़न , जिला-सिंगरौली (म.प्र.)
5. महाप्रबंधक, जिला व्यापार एवं उद्योग केन्द्र, जिला-सिंगरौली (म.प्र.)
6. कार्यालय ग्राम पंचायत, ग्राम-जमगड़ी, तहसील-सरई, जिला-सिंगरौली (म.प्र.)
7. कार्यालय ग्राम पंचायत, ग्राम-अमिलिया, तहसील-माड़ा, जिला-सिंगरौली (म.प्र.)

विषय: महान अंडरग्राउंड कोल माइन परियोजना की पर्यावरण स्वीकृति (Environmental Clearance) की प्रति प्रेषित करने बाबत।

सन्दर्भ: पर्यावरण स्वीकृति EC Identification No.: EC25A0102MP5268543N, फाइल संख्या: IA-J-11015/17/2025-IA-II(M), दिनांक: 19/02/2026.

महोदय,

आपको सूचित किया जाता है कि मेसर्स जे.के. सीमेंट लिमिटेड द्वारा ग्राम - अमिलिया एवं बुधेर, तहसील - माड़ा एवं सरई, जिला - सिंगरौली (म.प्र.) में प्रस्तावित महान अंडरग्राउंड कोल माइन (उत्खनन क्षमता 1.2 MTPA, लीज क्षेत्र 981.75 हेक्टेयर) परियोजना हेतु र्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय, भारत सरकार, द्वारा दिनांक 19.02.2026 को पर्यावरण स्वीकृति (Environmental Clearance) प्रदान की गई है।

अतः नियमानुसार पर्यावरण स्वीकृति की प्रति जन-सामान्य की जानकारी हेतु आपके कार्यालय में अभिलेखार्थ एवं अवलोकनार्थ प्रेषित की जा रही है।

वास्ते, मेसर्स जे.के. सीमेंट लिमिटेड

J.K. Cement Ltd. Singrauli (M.P.)

ललन कुमार
प्राधिकृत अधिकारी

संलग्न: पर्यावरण स्वीकृति पत्र की प्रति।

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पावती

मेसर्स जे.के. सीमेंट लिमिटेड द्वारा ग्राम - अमिलिया एवं बुधेर , तहसील - माड़ा एवं सरई, जिला - सिंगरौली (म.प्र.) में प्रस्तावित महान अंडरग्राउंड कोल माइन (उत्खनन क्षमता 1.2 MTPA, लीज क्षेत्र 981.75 हेक्टेयर) परियोजना हेतु पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय, भारत सरकार, द्वारा दिनांक 19.02.2026 को पर्यावरण स्वीकृति (Environmental Clearance) प्रदान की गई है।

अतः नियमानुसार पर्यावरण स्वीकृति की प्रति जन-सामान्य की जानकारी हेतु आपके कार्यालय में अभिलेखार्थ एवं अवलोकनार्थ प्रेषित की जा रही है।

क्रमांक	कार्यालय/विभाग का नाम पता	नाम हस्ताक्षर व मोहर
1.	कलेक्टर एवं जिला दण्डाधिकारी, जिला-सिंगरौली (म.प्र.)	
2.	क्षेत्रीय कार्यालय, म.प्र. प्रदूषण नियंत्रण बोर्ड, जिला-सिंगरौली (म.प्र.)	23/02/26
3.	मुख्य कार्यपालन अधिकारी, जिला पंचायत, जिला-सिंगरौली (म.प्र.)	24/2/26
4.	मुख्य कार्यपालन अधिकारी, जनपद पंचायत, बैढ़न , जिला-सिंगरौली (म.प्र.)	24.02.2026 आवक जनपद पंचायत बैढ़न
5.	महाप्रबंधक, जिला व्यापार एवं उद्योग केन्द्र, जिला-सिंगरौली (म.प्र.)	24/2/26
6.	कार्यालय ग्राम पंचायत, ग्राम-जमगड़ी, तहसील-सरई, जिला-सिंगरौली (म.प्र.)	25/02/2026 सरपंच ग्राम पंचायत क्षेत्र जमगड़ी जनपं.बैढन,जिला-सिंगरौली (म.प्र.)
7.	कार्यालय ग्राम पंचायत, ग्राम-अमिलिया, तहसील-माड़ा, जिला-सिंगरौली (म.प्र.)	25.02.2026

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Annexure - 9

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Undertaking Regarding Underground Mining Operation

I, Lalan Kumar, Authorized Signatory for JK Cement Limited, having our registered office at Prism Tower, 5th Floor, Ninaniya Estate, Gwal Pahari, Grugram-12202, Haryana India, hereby provide the following undertaking with respect to underground mining operation for the proposed Mahan Coal Mine:

We Confirm that the proposed coal mine is exclusively designed for underground (UG) mining and will not be converted to opencast (OC) mining under any circumstances. All activities shall strictly conform to underground mining only.

For JK Cement

Lalan Kumar
(Authorized Signatory)
Mahan Coal Mine