NEYVELI UTTAR PRADESH POWER LIMITED
(A JOINT VENTURE OF NLC INDIA LTD. and UP RAJYA VIDYUT UTPADAN NIGAM LTD.)
OFFICE OF THE CHIEF GENERAL MANAGER/PROJECT HEAD
PACHWARA SOUTH COAL MINE PROJECT,
Shanta Bhavan, Behind SBI Bank, LIC Colony
DUMKA- 814 101, JHARKHAND, INDIA,
CIN: U40300UP2012GOI053569 GSTIN: 09AAECN3221F1Z8
E-Mail: pachwara.south@nlcindia.in, TEL: 06434-236147.

Lr No. NUPPL/PSCMP/ CGM/FC/2024/03/ 19 Date: 18.03.2024

To,

The Divisional Forest Officer,
Dumka Forest Division,
Dumka- 814101,
Jharkhand, India.

Sub:	**Compliance to the EDS raised by MoEF & CC, Communicated through Letter No. 8-37/2022-FC; dt. 08.03.2024 in respect of the FC proposal of Pachwara South Coal Block.**
Ref:	Proposal No. FP/JH/MIN/59823/2020 Dated 20/11/2020 for seeking prior approval of Central Government under Section 2 of the Forest (Conservation) Act,1980 for diversion of forest area.

Dear Sir,

Vide letter no 8-37/2022-FC dated 08.03.2024 from MoEF & CC, we are hereby submitting the point wise compliance as under:

Sl. No	EDS	Reply
1.	The State Government has submitted a revised part of mining plan, which is not in conformity with the purpose wise break-up as proposed in the proposal. Therefore, the State Govt. shall ensure that the land use plan in the revised mining plan is in conformity with the area proposed for diversion. Moreover, the State Government has not submitted copy of revised mining plan which needs submission.	The Mining Plan including Mine Closure Plan was prepared in the year 2020 where Land schedule utilised was certified by the revenue department. Later on during the scrutiny of the Forest Diversion Proposal, involvement of Forest Land was found more and accordingly the FC proposal was modified. This issues has been addressed through Minor Revision of the Mining Plan as per the provision of the Ministry of Coal's Guideline (Pt. No. 1.3 B) **(Annexure – IA)** for Preparation of Mining Plan and Mine Closure Plan. The revised Mining Plan including Mine Closure Plan is furnished as **Annexure-IB**.
2.	The State Government has informed that infrastructure area comprising 10.313 ha is now relocated in the backfilled area where the nature of land is non-forest. However, as per revised part of mining plan, backfilled area proposed over 371.76 ha is forest land which is contradictory and need clarification.	The whole of the project area of Pachwara South Coal Mine is coal bearing. The mine has been designed in such a way that it doesn't involve any additional land outside the allotted Geological Block boundary for Dumping and Infrastructure laying. The infrastructure area shown in the approved mining plan is actually above the backfilled (backfilled after extraction of coal) area whose nature of land is forest. However, addressing to the observation of Forest Advisory Committee(FAC) held on 20.10.2023, the same infrastructure area comprising 10.313 ha is

BIJURAJIT DAS
Chief General Manager/Project Head
Pachwara South Coal Mine Project
NUPPL, Dumka (Jharkhand)

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		now relocated in the backfilled area where the nature of land is non forest. Necessary corrections has been addressed in the proposal in accordance with the Revised (Minor Revision) Mining Plan including Mine Closure plan. Infrastructure plan as per earlier approved Mining plan and as per the Revised (Minor Revision) Mining plan including Mine closure Plan is attached as **Annexure II.**
3.	The State Government has not furnished KML file showing the proposed route for transportation of the coal. The same need to be furnished.	Coal Transportation from Pachwara South Coal Mine involves road transportation through existing road along the northern bank of Bansloi river upto Amrapara and thereafter upto Kurwa Siding (Dumka) where dedicated siding for Pachwara South coal Mine is being constructed. The route of coal transportation is shown in **Annexure-III** and the KML file has been attached in CD format.
4.	The State Government has not furnished KML file for the revised CA site identified for CA. The same need to be furnished.	The relevant KML files of revised CA land was submitted earlier. However we are submitting the relevant KML file in CD format.
5.	The State Govt. has still not submitted the KML file indicating the different components of the project including those proposed to be taken on non-forest land which needs submission.	The KML file indicating the different components of the project including those proposed to be taken on non-forest land was submitted on 15.12.2023. However, we are submitting the KML file in CD format.

Please find above compliance report for your kind perusal and further necessary actions.

Thanking you.

Yours faithfully,
For **Neyveli Uttar Pradesh Power Ltd.**

Chief General Manager/Project Head,
PSCMP, NUPPL.

SURAJIT DAS
Chief General Manager/Project Head
Pachwara South Coal Mine Project
NUPPL, Dumka (Jharkhand)

F. No. 34011/28/2019-CPAM
Government of India
Ministry of Coal

ANNEXURE-IA

Shastri Bhawan, New Delhi
The 29th May 2020

Office Memorandum

Subject: Guidelines for Preparation, Formulation, Submission, Processing, Scrutiny, Approval and Revision of Mining plan for the coal and lignite blocks.

Undersigned is directed to state that the guidelines for formulation of Mining plan and Mine Closure Plan has been amended. It has been decided by the Government that all coal (including lignite) mining operations in India shall henceforth be governed as per modified guidelines enumerated below.

1. **Mining Plan:** All coal (including Lignite) mining operation in India shall henceforth be governed as per these modified guidelines listed below and henceforth, the Mine Closure Plan and Final Mine Closure Plan shall be integral part of Mining Plan. Separate approval of Mine Closure Plan/ Final Closure Plan has been done away with. The Guideline/format for formulation of Mining plan is enumerated at **Appendix – I.**

1.1. **Implementation of the approved Mining Plans shall be sole responsibility of the mine owner.** Mining operations shall be undertaken in accordance with the duly approved mining plan. The mining plan once approved shall be valid for the balance life of the Mine, provided that any modification(s) of the mining plan is approved by the competent authority and such approval of the modified mining plan shall remain valid for the estimate balance life of the mining plan. Modification of the approved mining plan during the operation of a mining lease also requires prior approval.

1.2. The mining plan shall cover prescription for different phases of life of the mine as stage plan. The Stage plan for 1st year, 3rd year, 5th year, year of achieving rated capacity of the mine, Final year (i.e. at the end of mine life) and post closure shall be submitted at the time of initial submission of mining plan. The project proponent shall submit a **report/information** consisting **a.** compliance status with respect to approval condition of mining plan and grounds specified at para 1.3A; **b.** stage plan for next five years; **c.** revised balance life of the mine; and **d.** revised calculation of ESCROW amount with respect to revised balance life, to Coal Controller, CCO, Kolkata with a copy of the same to Administrative Section dealing with the allocation/allotment of the block and section dealing with approval of mining plan at MoC/CCO, **for information**. Such report/information must be submitted at least 180(one hundred eighty) days before the expiry of 5 (five) year, starting from the commencement of the Mineral Concession (Amendment) Rules, 2020 or the date of execution of the duly executed mining lease deed, whichever is later. Information desired above must bear certificate of **Qualified Person/ Accredited Mining Plan preparing Agency** and have approval of the respective company board. Non submission of such information during the stipulated time may result in withdrawal of mine opening permission or cancellation of the approved mining plan, as may be decided by CCO.

The Mining Plan approved prior to issue of this Guideline will qualify for submission of such report/information at least 180(one hundred eighty) days prior to expiry of 5 (five) year from the date of notification of the Mineral Concession Amendment Rules 2020.

1.3.(A) The mining plan may be modified for **a.** for change in method of mining; **b.** for facilitating increase in sanctioned peak capacity that is in excess of one hundred and fifty per cent of the

sanctioned rated capacity; **c.** change in leased area; **d.** in the interest of safe and scientific mining; **e.** conservation of minerals; **f.** for the protection of environment; **g.** addition of reserve by way of proving of reserve in the existing lease area; **h.** for changes in final mine closure conditions; or **i.** and such other change that may be determined by the Central Government. While submission of revision/ modification of mining plan the reason for revision/ modification shall be specified in writing by the lessee.

(B) Notwithstanding anything contained in clause (A) above, for other minor changes, the project proponent is empowered to make modification with the approval of the respective company board. These minor changes shall cover **a.** changes in land type within the leased area; **b.** changes in HEMM deployment plan; and **c.** changes in location of infrastructure within the leased area. The project proponent shall submit specific report of such minor changes to Coal Controller, CCO, Kolkata with a copy of the same to Administrative Section dealing with the allocation/allotment of the block and section dealing with approval of mining plan at MoC/CCO, for information.

1.4. The Mining Plan submitted for approval shall have prior approval of the concerned Board of the Company.

1.5. The base date of the Mining Plan should be taken as cut-off date on which the extractable reserve, balance life etc. has been quantified.

1.6. The proposed leased area in the Mining Plan shall include the area specified in the mining lease within which mining operations can be undertaken and includes the non-mineralized area required and approved for the activities falling under the definition of mine as referred in The Mines Act 1952.Evacuation route, R&R and Employee Township area outside the block will not be part of the Mining plan.

1.7. Pre-mining land ownership/land type furnished in the mining plan will be of indicative in nature along with data source at its footnote (viz. from topo sheet, cadastral plan etc.).

1.8. The excavation/ mining area envisages in the mining plan must be restricted within the allotted/vested geological block boundary/existing mining lease and if the project area is confined within the allotted block boundary/existing mining lease, a certificate to this effect is to be provided by the **Qualified Person/ Accredited Mining Plan preparing Agency** preparing the mining plan. The certificate must be made on the Conceptual Plan depicting Cardinal Point Co-ordinates (shape co-ordinates) of the project boundary, Lease boundary and Geological Block boundary (binding co-ordinates given in the vesting order).

1.9. Under provisions of Rule 16 of MCR 1960, State Government is custodian of the exploration data. As such in the cases, where the project area extends beyond the block boundary/existing mining lease the Mines and Geology Department of the concerned State Government shall issue a certificate specifying (a) intent of the State Government for grant of lease beyond the vested geological boundary; (b) non-existence of coal/ lignite in the area beyond the vested/allotted geological block boundary/existing mining lease to rule out the issue of encroachment. The application for issue of certificate from the Mines and Geology Department of the State Government must be supported with proof of the non-existence of coal/lignite in the area under reference (along with their Cardinal Point coordinates) duly certified by custodian agency viz. CMPDIL/ SCCL in case of coal and NLCIL in case of lignite.

Where the project area extends beyond the block boundary/existing mining lease, the certificate issued by the Mines and Geology Department of the concerned State Government must be attached in the Mining Plan.

1.10. In case of allotted/auctioned coal/lignite blocks, the mining plan may be revised for extraction of more coal on year to year basis.

Provided that the mining plan shall be revised for extraction of less coal on year on year basis only under following circumstances: a. if the remaining extractable reserve of the coal mine is less than

3(three) times of the rated Capacity of the current Approved Mining Plan; b. Change in method of mining from Opencast to Underground necessitated due to change in geo-mining conditions. However, revision of Mining Plan for extraction of less coal would be subject to prior approval of the Nominated Authority.

1.11. The approval of the revised Mining Plan shall not result in changes in the terms and conditions or efficiency parameters mentioned in the CMDPA/Allotment Agreement signed at the time of allotment/vesting for the auctioned/allotted blocks without prior approval of the nominated authority or Central Government, as the case may be. However, efficiency parameters mentioned in the CMDPA/Allotment Agreement shall be linked to the rated capacity of the mine.

1.12. The project proponent shall envisage the action plan for exploration and liquidation of the balance reserve yet to be projectised.

1.13. The project proponent shall take all necessary precautions regarding safety of mine workings and persons deployed therein and shall adhere to all the statutory clearances with regards to safety.

1.14. Proposed project area envisaged in the mining plan shall not encroach into any other adjacent coal block unless permitted to do so by the Ministry of Coal in writing.

1.15. The approval of the Mining Plan is without prejudice to the requirement of approvals from competent /prescribed authority under the relevant rules/ regulations etc.

1.16. The project proponent shall submit an undertaking that the mine shall be operated as per the Environment Clearance (EC) & Forestry Clearance (FC) for the project.

1.17. **Statutory Obligation:** The legal obligations, if any, which the lessee is bound to implement, like special conditions imposed while execution of lease deed, approval of Mining Plan, conditions imposed by the Ministry of Environment, Forest and Climate Change (MoEF&CC), Central Pollution Control Board (CPCB),State Pollution Control Board (SPCB), Directorate General of Mines Safety (DGMS) or any other organizations describing the nature of conditions and compliance positions thereof, should be indicated in the Mining Plan.

2. Mine closure Plans: Mine Closure Plans will have two components viz. i) Progressive or Concurrent Mine Closure Plan, and ii) Final Mine Closure Plan. Progressive Mine Closure Plan would include various land use activities to be done continuously and sequentially during the entire period of the mining operations, whereas the Final Mine Closure activities would start towards the end of mine life, and may continue even after the reserves are exhausted and/or mining is discontinued till the mining area is restored to an acceptable level. The Mine closure details of the Mining Plan should be oriented towards the restoration of land back to its original as far as practicable or further improved condition.

2.1. Mining is to be carried out in a phased manner along with reclamation and afforestation work in the mined-out area.

2.2. Progressive mine closure plan shall be prepared for a period of every five years from the beginning of the mining operations. These plans would be examined periodically in every five years period and to be subjected to third party monitoring by the agencies approved by the Central Government, like Central Mine Planning and Design Institute Ltd. (CMPDIL), National Environmental Engineering Research Institute (NEERI), Indian Institute of Technology (IIT-ISM) or any other institutes/ organizations/ agencies specified from time to time for the purpose.

2.3. Various project specific activities viz. mined-out land details & their technical and biological restoration plan, water quality management, infrastructure to be retained and demolished, disposal of mining machinery, etc. shall be furnished in the relevant paras. Where the backfilling of the mine void is being carried out as part of regular mining operation, it shall not be included in the list of progressive mine closure activities. However, in case, where the backfilling of mine void is to be carried out specifically for closure of the mine, quantum of such overburden and the mine closure fund earmarked for the purpose must be included in the list of activities to be taken up for mine closure in the mining plan at the time of submission itself.

2.4. The Government may at any time before the closure of mine require certain activities to be included in the mine closure plans, which it may consider necessary for the safety and conservation of environment, or in compliance with any modification/ amendment in the relevant legislation.

2.5. **Abandonment cost:** The total cost for carrying out such activities shall be estimated for assessment of abandonment cost of the mine involving progressive and final mine closure activities such as barbed wire fencing all around the working area, dismantling of structures/demolition and cleaning of sites, rehabilitation of mining machinery, plantation, physical/biological reclamation, landscaping, biological reclamation of left-out overburden dump, filling up of de-coaled void, post environmental monitoring, supervision charges, power cost, protective and rehabilitation measures including their maintenance and monitoring, miscellaneous charges etc. for the specified post closure period.

2.6. **Escrow Account Calculation:** In August 2009 it was estimated that typically closure cost for an opencast mine was around rupees six lakhs per hectare of the total project area and rupees one lakh per hectare for underground project area at the-then price level. Accordingly vide letter dated 7th January 2013 a guideline for mine closure was issued which needed modification in these rates based on the wholesale price index (WPI) as notified by Government of India from time to time while preparing the Mining plan and Mine Closure Plan. The escalated rate (based on the current base year i.e. 01.04.2019) is Rupees Nine Lakh per hectare in opencast and Rupees one lakh fifty thousand per hectare for underground Mine. These rates will be considered as Base Rate to be applicable from 01.04.2019, which may change as specified from time to time by the Government of India.

[Exemplary Calculation: {(Rs 6 lakhs x 1.561 linking factor for base year 2004-05 x WPI 121.1 as on April 2019) / (WPI as on August 2009)} = Rupees 8.75 lakh, rounded to Rupees 9 (nine) lakhs per hectare in case of Opencast project].

Henceforth, these rates will stand modified based on the wholesale price index (WPI) as notified by Government of India from time to time. Annual closure cost is to be computed considering the total project area of the mine multiplied by escalated rate (at the above mentioned rates) and dividing the same by the balance life of the mine in years. An amount equal to the annual cost is to be deposited each year throughout the mine life compounded @5% annually.

[For example if the annual cost works out to Rs 100, then in the first year the amount to be deposited will be Rs 100, in the second year 100x(1+5%)^1, in the third year 100x(1+5%)^2 and so on.]

Further, in case of the mine, where escrow account is already open, the annual closure cost is to be computed considering the total project area at the above mentioned rates minus the amount already deposited and dividing the same by the balance life of the mine in years and annual cost as arrived should be compounded @5% annually.

2.7. **Financial Assurance:** The Mining Company/ Mine Owner as a part of Financial Assurance will open a Fixed Deposit Escrow account, with the Coal Controller Organization (on behalf of the Central Government) as exclusive beneficiary prior to commencement of any activities on the land/project area of the mine and shall submit the same to Coal Controller Organization (CCO) before the permission is given for opening the mine. The mining company shall cause the payment to be deposited at the rate computed as indicated at Para 2.6. The owner of the company may select the Schedule Bank where the Escrow account is to be opened and inform the same to the Coal Controller, CCO, Kolkata.

2.8. Coal Controller, Kolkata shall get the WPI (used for escalation of closure cost at the time of formulation of Mining plan) updated, at the time of opening of Escrow account. The mine owner/ company including all public/ private sector companies shall deposit the yearly amount in a Schedule Bank in accordance with Para 2.6. Coal Controller, **Kolkata shall also get the**

information, submitted under to para 1.2, verified and get the yearly closure cost modified with respect to the latest WPI in accordance with para 2.6.

2.9. Final Mine Closure: The details of the Mining Plan (covering Final Mine Closure Plan envisaging the details of the updated cost estimates for various mine closure activities and the Escrow Account already set up, shall be submitted to the approving authority for approval at least five years before the intended final closure of the mine.

2.10. Final Mine Closure would be considered to be completed only after acceptance of the third-party audit report by the Coal Controller on the compliance of all provisions of Mine Closure Plan. Any Institute/ Organization/Agency as may be specified by the Government for this purpose may be engaged for Third Party audit to create a self-sustained ecosystem. Failure of restoration within the specified period may result in forfeiture of Escrow Account created as per Para 2.6& 2.7. The details of the Final Mine Closure Plan along with the details of the updated cost estimate for various mine closure activities and escrow account already set up shall be submitted at the time of approval of final mine closure plan.

2.11. **Time Scheduling for abandonment:** The Action plan for carrying out all abandonment operations (progressive and final mine closure) should be furnished in the form of bar chart for a period of life of the mine plus post closure period. Post closure period shall be taken as3 (three) years for Underground mines and Opencast mines having stripping ratio lesser than 6(six) MM^3/Te & 5 (five) years for mines having stripping ratio more than 6(six) MM^3/Te.

2.12. **Implementation of the approved Mine Closure Plan shall be sole responsibility of the mine owner.** Mining is to be carried out in a phased manner i.e. continuation of mining activities from one phase to other indicating the sequence of operations depending on the geo-mining conditions of the mine. Up to 50% of the total deposited amount including interest accrued in the ESCROW account may be released after every five years in line with the periodic examination of the Closure Plan as per Para 2.2. The amount released should be equal to expenditure incurred on the progressive mine closure in past five years or 50% whichever is less. The balance amount shall be released to mine owner/leaseholder at the end of the final Mine Closure on compliance of all provisions of Closure Plan. This compliance report should be duly signed by the lessee and certify that said closure of mine complied all statutory rules, regulations, orders made by the Central or State Government, statutory organisations, court etc. and certified by the Coal Controller.

2.13. **Responsibility of the mine owner:** It is the responsibility of the mine owner to ensure that the protective measures contained in the mine closure plan including reclamation and rehabilitation works have been carried out in accordance with the approved mine closure plan and final mine closure plan.

2.14. The owner shall submit to the Coal Controller a yearly report before 1st July of every year setting forth the extent of protective and rehabilitative works carried cut as envisaged in the approved mine closure plans (Progressive and Final Closure Plans).

2.15. The money to be provided per hectare of total Project Area for the purpose is to be deposited every year on commencement of any development activity on the land for the mine after opening a Fixed Deposit Escrow Account prior to obtaining mine opening permission from Coal Controller. Mining company/owners including all Public Sector Undertakings shall deposit the yearly amount in a Scheduled Bank. If the Mine owners fail to deposit the required annual amount in accordance with Para 2.6, 2.7 & 2.8, the Government can withdraw the mining permission.

2.16. The funds so generated are towards the security to cover the cost of closure in case the mine owner fails to complete the relevant closure activities. The prime responsibility of mine closure shall always lie with the mine owner, and in case these funds are found to be insufficient to cover the cost of final mine closure including the areas covered in Para 2.3 2.6, 2.7, 2.8 & 2.9 above. The mine owner shall undertake to provide the additional fund equivalent to the gap in

funding before five years of Mine Closure failing which it may be recovered by such other methods as the competent authority may deem fit in this regard.

2.17. **Final Closure Certificate:** The Mine owner shall be required to obtain a mine closure certificate from Coal Controller to the effect the protective, reclamation, and rehabilitation work in accordance with the approved Mining plan covering final mine closure provisions/activities have been carried out by the mine owner for surrendering the reclaimed land to the State Government.

2.18. The balance amount at the end of the final Mine Closure shall be released to mine owner on compliance of all provisions of Closure Plan duly signed by the mine owner to the effect that said closure of mine complied with all statutory rules, regulations, orders made by the Central or State Government, statutory organizations, court etc. and duly certified by the Coal Controller. This should also indicate the estimated extractable coal reserves and coal actually mined out.

2.19. If the Coal Controller has reasonable grounds for believing that the protective, reclamation and rehabilitation measures as envisaged in the approved mine closure plan in respect of which financial assurance was given has not been or will not be carried out in accordance with mine closure plan, either fully or partially, the Coal controller shall give the mine owner a written notice of his intention to issue the orders for forfeiting the sum assured at least thirty days prior to the date of the order to be issued after giving an opportunity to be heard.

3. Formulation of Mining Plan by Qualified Person (QP) or Accredited Mining Plan Preparing Agency (MPPA):

3.1. System of granting Recognition to a person for preparation of mining plan u/s 22C of MCR 1960 & preparation of mining plan only by RQP u/s 22B of MCR 1960 shall be done away with, after commencement of the Mineral Concessions (Amendment) Rules, 2020.

3.2. After commencement of Mineral Concession (Amendment) Rule 2020, no mining plan shall be accepted unless it is prepared by Qualified Person (QP) or Accredited Mining Plan Preparing Agency (MPPA).

3.3. Quality Council of India (QCI) or National Accreditation Board for Education and Training (NABET) shall be engaged for accrediting following entities:

(i) Accredited Prospecting Agency (APA) for undertaking prospecting operations and preparation of geological reports for Coal and Lignite Mines, and

(ii) Mining Plan Preparing Agency (MPPA) for preparation of mining plan (for Coal, Lignite Mines and Sand for Stowing)

3.4. The Quality Council of India (QCI) or National Accreditation Board for Education and Training (NABET)shall grant accreditation in accordance with such standards and procedures as specified in schedule VI of Mineral Concession (Amendment) Rule 2020.

3.5. Qualified Agency (QP) or Mining Plan Preparing Agency (MPPA) who prepares mining plan for a block/mine, shall have recognition from the concerned company board that the qualification of the QP or accreditation of the MPPA has been duly verified and is in line with the relevant provision of the MCR 1960.

4 Submission, Processing and Scrutiny of Mining Plan

4.1 **On and from the date of publication of order and upto the expiry of period of nine months from the commencement of the Mineral Concession (Amendment) Rules, 2020**, every mining plan submitted for approval/modification shall be accompanied with a non-refundable application fee specified from time to time in this regard, for the project area specified in the mining plan.

4.2 **On and from the expiry of period of nine months from the commencement of the Mineral Concession (Amendment) Rules, 2020**, every mining plan submitted for approval/modification

shall be accompanied with a non-refundable application fee specified from time to time in this regard, for the project area specified in the mining plan and peer/expert review done by any accredited mining plan preparing or reviewing agency at their (applicant's) own cost. During examination of the Mining Plan by the internal committee of MoC, if it is felt that a review by expert or by specialized agency is required, the committee may recommend referring the mining plan to such expert/agency with the approval of the MP approving authority. Charges for the expert review shall be borne by the applicant.

4.3 All pages (including cover page, plates and Annexures) shall bear the signature & stamp furnishing details of the QP/Accredited Mining Plan preparing Agency (MPPA) in physical mode of submission and e-signature/digital signature during the online system of submission.

4.4 Ministry of Coal is in process of development of on-line portal for submission and approval of mining plan. system of acceptance of Physical copy shall be continued till the development/operationalization of online portal for submission and approval of mining plan.

4.4.1 **Submission to Physical Copy Mining Plan to Ministry of Coal:**

4.4.1.1 The project proponent shall submit one soft copy and four hard copies of Mining Plan (draft)- one each to the concerned Administrative Section of the Ministry of Coal for the concerned block, Section of MoC/CCO dealing with approval of Mining plan, Coal Controller, CMPDIL/ Extended office of CCO & the dispatch receipt of the speed post (confirming that the draft Mining Plan has been sent).The contact details and correspondence address of the section dealing with the approval of Mining plan, administrative section for the mine, members of the committee etc. shall be updated time to time, on the website of the Ministry of Coal/Coal Controller Organisation.

4.4.1.2 The project proponent shall incorporate the observation (if any) and submit the mining plan (after incorporating the compliance to the observation) to section of MoC/CCO dealing with approval of Mining plan, concerned administrative section of the Ministry of Coal, Coal Controller and CMPDIL/ Extended office of CCO.

4.4.1.3 **Submission of Mining Plan (after incorporating compliance) to Ministry of Coal:** The project proponent shall submit 04 (Four) hard copies & 01 (one) soft copy of modified Mining Plan and the compliance to the observations along with copy of the dispatch receipt of the Speed Post (confirming that the modified Mining Plan has been sent to section of MoC/ CCO dealing with approval of Mining Plan, concerned administrative section of the Ministry of Coal, Coal Controller, and CMPDIL/ Extended office of CCO).

4.4.1.4 The procedure of submission at Para 4.3.1 will be replaced by process of submission at para 4.3.2 on development of portal for online submission and approval of Mining Plan.

4.4.2 **Online System of Submission of Mining Plan for Approval:**

4.4.2.1 Project proponent shall register online, using registered official mail ID.

4.4.2.2 For the purpose of preparation of Mining plan through a QP or MPPA, project proponent shall share a temporary login with QP/MPPA. This temporary login shall be valid till the preparation and approval of mining plan only.

4.4.2.3 The QP/MPPA shall upload the Mining plan through the temporary login and submit it to the project proponent; QP/MPPA once submits the mining plan to the project proponent, he shall not be able to modify.

4.4.2.4 The Project Proponent shall make payment of processing charges/fees online as specified from time to time by Ministry of Coal;

4.4.2.5 The Project Proponent shall after incorporating relevant company board approvals submit the mining plan to the Approving Authority; The mining plan submitted to approving authority shall become visible to Administrative Section for the respective block, section of MoC/CCO dealing

with approval of Mining plan, members of the Internal Committee, Coal Controller, CMPDIL/ Extended office of CCO, simultaneously. System of SMS alerts shall be available at all stages;

4.4.2.6 Observations of the Committee Members shall be uploaded online and the project proponent shall also submit Mining Plan, after incorporating compliance, online

5 Scrutiny & Processing of Mining Plan

5.1.1 The current system of getting the mining plan scrutinized through CMPDI, Ranchi shall continue. Ministry of Coal is in process of creating an extended office of Coal Controller Organization at Delhi which shall be delegated with the work of processing and scrutiny of mining Plan. A letter to this effect shall be issued separately.

5.1.2 CMPDIL/Extended office of CCO at Delhi shall scrutinize the mining plan and submit comments to section of MoC/CCO dealing with approval of Mining plan within Fifteen (15) days of receipt of the Mining Plan. Non-submission of comments within the stipulated time may be presumed as "no comment" from CMPDIL/Extended office of CCO; CMPDIL/ Extended office of CCO at Delhi, if consider necessary to make a physical verification of the site/site visit for scrutiny of the mining plan, may make such site visit/physical verification of the site, however, no relaxation in the time line as specified above may be given.

5.1.3 Administrative Section of the Ministry of Coal (dealing with the block) shall scrutinize the mining plan with respect to Vesting order/ allotment order and CMDPA signed with allottee at the time of allotment and submit observations to section of MoC/CCO dealing with approval of Mining plan (till the development of portal for Mining plan approval) within Fifteen (15) days of receipt of the Mining Plan. Non-submission of comments within the stipulated time may be presumed as "no comment" from the administrative section;

5.1.4 Members of the Internal Committee shall examine the mining plan from Technical and administrative angle based on the observations of the Administrative Section (dealing with the respective block) and CMPDIL/Extended office of CCO and the peer/expert review report submitted with the mining plan and submit observations to section of MoC/CCO dealing with approval of Mining plan (till the development of portal for Mining plan approval) within Fifteen (15) days of receipt of the Mining Plan. Non-submission of comments within the stipulated time may be presumed as "no comment" from the administrative section. Members of the internal committee, CMPDIL/Extended office of CCO may raise observation twice only. The observation raised shall be communicated directly to the project proponent for incorporating the same in the mining plan. The project proponent shall make presentation in the meeting of the internal committee for scrutiny.

5.1.5 Section of MoC/CCO dealing with approval of Mining plan shall communicate the observation (if any) to the project proponent for compliance till the development of online system for submission, processing, and approval of mining plan.

5.1.6 Subsequent, to development of online portal for submission, processing, and approval the observations of the internal committee members shall be uploaded directly on the portal, which will be visible to the project proponent. A timeline of 15 days shall be available for the internal committee members to upload the comments. Non-submission of comments within the stipulated time may be presumed as "no comment".

6 Timeline for submission of Compliance:

Once the observation of the Scrutiny of the mining plan is communicated either in hard copy, mail or online, the Project Proponent is required to submit the mining plan after incorporating the compliance to the observation within a period of 15 days of the communication, failing which the mining plan submitted for approval shall be rejected.

Provided that any such application may be entertained after the said period of 15 Days, if the applicant satisfies the approving authority that he had sufficient cause for non-submission of mining plan (after incorporating the compliance) in time. However, in any case this period may not be extended beyond 30 days from the date of receipt of communication of the observation.

7 Approving Authority:

7.1 On and from the date of publication of order and up to the expiry of period of nine months from the commencement of the Mineral Concession (Amendment) Rules, 2020, the powers to approve mining plan for all categories of coal and lignite mines and sand for stowing shall be exercisable by Project Adviser, Ministry of Coal.

7.2 On and from the expiry of period of nine months from the commencement of the Mineral Concession (Amendment) Rules, 2020, the power to approve mining plan for all categories of coal and lignite mines including sand for stowing shall be exercisable by the Coal Controller, CCO, Kolkata, a subordinate office of Government of India in the Ministry of Coal.

7.3 The person delegated to approval of Mining Plan under sub-section (1) of section 26 read with clause (b) of sub-section (2) of section 5 of the Mines and Minerals (Development and Regulation) Act, 1957 (67 of 1957) (hereinafter, the 'Act') may seek help of an Internal committee constituted for the purpose.

7.4 The approving authority shall dispose of the application for approval of the Mining Plans within a period of 30 days from the date of receiving of such application (The Mining Plan received on or before 30th of Current Month will be considered in the ensuing meeting). Provided that the aforesaid period of 30 days shall be applicable only if the Mining Plan is complete in all respect, and in case of any modifications subsequently suggested after the initial submission of the Mining Plan for approval, the said period shall be applicable from the date on which modified mining plan is re-submitted.

8 Internal Committee for Scrutiny of Mining Plan:

8.1 Members of the Internal Committee shall examine the mining plan from Technical and administrative angle based on the observations of the Administrative Section dealing with the respective block & CMPDIL/ Extended office of CCO.

8.2 The internal committee shall recommend the mining plan for "Approval" or "Rejection". In case of recommendation for Rejection, the committee shall record the reason for Rejection.

8.3 Till the opening of CCO office at Delhi, the internal committee shall consist of:

1. Director (Technical), MoC, Member Secretary
2. Director/ Deputy Secretary, MoC of the section dealing with the allocation/allotment of the respective block, Member
3. Coal Controller or his representative, Member
4. Director level officer of CMPDIL, Member
5. Director/Deputy Secretary, Nominated Authority, Member

8.4 After opening of CCO office at Delhi, the internal committee shall consist of:

1. Director level officer of CCO having relevant working experience., Member
2. Director/ Deputy Secretary of the section dealing with the respective block, Member
3. Head of Regional Coal Controller Office (having relevant working experience in mine planning), CCO Regional Office New Delhi, Member Secretary
4. Any other technical person having working experience of not less than 15 (fifteen) years in mine planning, Member

9 Communication of Approval:

9.1 In case of allotted/auctioned mine, section dealing with approval of Mining Plan shall communicate the decision of the approving authority within a period of 5 (five) working days in form of a letter confirming "in-principle approval" of the Mining Plan to the project proponent

with a copy of the same to the Nominated Authority, Govt. of India. Final approval of the Mining Plan in such cases shall be communicated by the section dealing with approval of Mining Plan, only on receipt of applicable payments and its confirmation from the Nominated Authority, Govt. of India.

9.2 While for mines other than auctioned/allotted mines, section dealing with approval of Mining Plan shall communicate the decision of the approving authority within a period of 5 working days.

10 Revision:

10.1 Any person aggrieved by any order made or direction issued in respect of mining plan by an officer competent to approval mining plans shall within 30 days of the communication of such order or direction, apply to the Secretary (Coal), Ministry of Coal for a revision of such order or direction thereon.

10.2 On receipt of any application for revision the authority shall give the aggrieved person a reasonable opportunity of being heard and may within 30 days confirm, modify or set aside the order or direction and his decision thereon shall be final.

11 **This Guideline** supersedes the previous orders and are without any prejudice to any other relevant rules and regulations, such as those issued by the State Governments, Ministry of Environment, Forest and Climate Change, Ministry of Labour and Employment, etc.

(Hitlar Singh)
Under Secretary to the Government of India

To,

All the existing Coal and Lignite block allocates

Copy to: -

1. All Joint Secretaries, MoC.
2. Coal Controller, Coal Controller's Office, 1- Council House Street, Kolkata.
3. CMD, CIL, Newtown, Rajarhat, Kolkata-700156, W.B
4. CMD, NLCIL, Cuddlore, Distt. Neyveli- 607801 (Tamil Nadu).
5. CMD, Singareni Collieries Company Limited (SCCL), Kothagudem Collieries, Khammam Distt.(A.P).
6. Tech. Director (NIC) - with the request to place it to Website of the Ministry of Coal.

DETAILS TO BE FURNISHED IN THE MINING PLANS FOR COAL/LIGNITE BLOCKS

A. Cover Page

The Cover page should contain the following information:

(i) Name of the Mining Plan and Mine Closure Plan /Final Mine Closure Plan

(ii) Indication, if it is a Modified Mining plan seeking approval under Rule 22E of MCR 1960, it should be marked as **"Modified Mining Plan with Modification No"** i.e. First Modification, Second Modification etc.

(iii) Name of the Coal/Lignite Block area (Acre/Hectare/Sq. Km.)

(iv) Name of the Coalfield and its location i.e. District and State

(v) Name and address of the Applicant

(vi) Targeted capacity

a. Rated capacity : ____ Mty)

b. Peak Capacity (@ 150% of the rated capacity) : in ____Mty,

(vii) Name of the **Qualified person/ Accredited Mining Plan preparing agency (MPPA)**preparing the mining plan with details

B. Index of Chapters of the Mining Plan (Including Mine Closure Plan) / Mine Closure Plan or Final Mine Closure Plan

Sl No.	*Chapters*	***Page No***
1	Checklist	
2	Project Information	
3	Exploration, Geology, Seam Sequence, Coal Quality and Reserve	
4	Mining	
5	Safety Management	
6	Infrastructure Facilities proposed and their Location	
7	Land Requirement	
8	Environment Management	
9	Progressive & Final Mine Closure Plan	

C. Index for List of Annexure

D. Index of List of Plans/ Drawing Attached enclosed as Plates

E. List of Abbreviations used.

(viii) All Plans must be colored distinctly with proper legends.

CHECKLIST

Details		(✔ / ✖)
	Expert-review Report	
Text	Project Information	
Text	Exploration, Geology, Seam Sequence, Coal Quality and Reserve	
Text	Mining	
Text	Safety Management	
Text	Infrastructure Facilities proposed and their Location	
Text	Land Requirement	
Text	Environment Management	
Text	Progressive & Final Mine Closure Plan	
Annexure	Copy of allotment order /Vesting order.	
Annexure	Certificate of **Qualified person/ Accredited Mining Plan preparing agency (MPPA)**if the project area is confined within the vested/allotted block boundary/**existing mining lease** and Where the project area extends beyond the block boundary, a certificate of **Qualified person/ Accredited Mining Plan preparing agency (MPPA)**should be supported with a certificate of State Government mines and Geology department must be attached, which should specify (a) intent of the state government for grant of lease beyond the vested geological boundary/**existing mining lease**; (b) non-existence of Coal/ Lignite in the area beyond the vested/allotted geological block boundary/**existing mining lease** to rule out the issue of encroachment and use of coal bearing area (beyond the vested/allotted block boundary/**existing mining lease**) in the mining plan	
Annexure	Approval of the Company Board	
Annexure	Copy of earlier approval of mining plan.	
Annexure	Plan / chart showing schedule of Implementation of Mine closure activities (progressive and final closure) with duration of important activities	
Annexure	**Expert-Review Report carried out be an Accredited Mining Plan Preparing Agency (MPPA)**	

Details		(✔ / ✖)
Annexure	Other document (if any)	
Plates	Location plan	
Plates	Plan certified by **Qualified person/ Accredited Mining Plan preparing agency (MPPA)**if the project area is confined within the vested/allotted block boundary/**existing mining lease** and where the project area extends beyond the block boundary, a Plan certified by **Qualified person/ Accredited Mining Plan preparing agency (MPPA)**should be supported with a plan with cardinal co-ordinates duly certified by the Mines and Geology Department of the concerned State Government. **Plan in support of Annexure - II**	
Plates	Printed copy of the KML file superimposed in the recent (not older than one year from the base date) dated satellite Image duly certified by Accredited Agency should also be attached. Note: The soft copy of the KML file shall also be part of the Soft copy of the mining Plan.	
Plates	Cadastral plan showing approved block boundary vis-à-vis proposed/existing mining lease & Mine boundary superimposed over it in distinct color, showing land use and infrastructure etc..	
Plates	Geological plan showing all the boreholes drilled and proposed to be drilled showing allotted block boundary and required lease area	
Plates	Representative Graphic Litholog	
Plates	Surface Plan showing drainage system, Contour, preferably at 3m interval, location of BH (borehole)	
Plates	Conceptual plan showing infrastructure facilities including colony, boundary of mining area, mine entries, roads including road diversion alignment etc.	
Plates	Tentative land use plan showing land type (Govt., forest and tenancy land) with its data source	
Plates	Floor contour plan and seam folio plan, iso-grade plan	
Plates	Cross-section showing coal/lignite seam(s)	
Plates	Plan showing existing and proposed surface layout(s)	
Plates	Plan showing total coal thickness and overburden thickness and stripping ratio (in case of opencast (OC) Mines)	
Plates	Final stage quarry plan showing haul road alignment (in case of OC Mines)	

Details		(✔ / ✖)
Plates	Plan showing mode and location of entries and surface layouts (in case of underground (UG) Mines)	
Plates	Layout of the panel for each system (like Longwall, Continuous Miner, Bord& Pillar, road header etc.) should be given (in case of UG Mines)	
Plates	Layout of pillar extraction (in case of UG Mines)	
Plates	Support system (in case of UG Mines)	
Plates	Haulage and transport system (in case of UG Mines)	
Plates	Post mining land use plan	
Plates	Progressive mine closure plan/ stage plans	
Plates	Reclamation plan	

	Parameters	*Details*
1.1	**INTRODUCTION**	
1.1.1	Name of Coal / Lignite Block	
1.1.2	Name of the Coalfield/ Lignite Field	
1.1.3	Base date of Mining Plan/ Mine Closure Plan	
1.1.4	Linked End Use Plant	
1.1.5	Distance of End use plant from the pit head of the project in "km"	
1.1.6	Mode of Coal Transport	

1.2 LOCATION, TOPOGRAPHY AND & COMMUNICATION

1.2.1	Location of coal deposit (District and State)	
1.2.2	Communication: PWD roads, railway lines, Air	
1.2.3	Availability of power supply, water etc.	
1.2.4	Prominent physiographic features, drainage pattern, natural water courses, rainfall data, highest flood level	
1.2.5	Important surface features within the project area and major diversion or shifting involved	

1.3 DETAILS OF THE ALLOTTMENT AGREEMENT

1.3.1	Name the Allottee	
1.3.2	Details of allotment/vesting order	
1.3.3	Name and address of the applicant	
1.3.4	Name of the Previous allottee of the Block	
1.3.5	Starting Date of the Mine as per CMDPA	
1.3.6	Rated Capacity as per CMDPA	
1.3.7	Production Schedule as per opening permission (meeting provisions of CMDPA if any)	
1.3.8	End Use of Coal/Lignite as	

	Parameters	*Details*
	per allotment order if any	
1.3.9	Cardinal Points co-ordinates of the Block boundary	

ID	Latitude	Longitude
1	° ' " N	° ' " E
2	° ' " N	° ' " E
	° ' " N	° ' " E
	° ' " N	° ' " E

1.4 DETAILS OF THE PREVIOUS APPROVAL OF MINING PLAN

1.4.1	Date of Approval	
1.4.2	Conditions, if any	
1.4.3	Scheduled year of start of production	
1.4.4	Proposed year of achieving the targeted production	
1.4.5	Date of actual commencement of mining operations, if operations already started	
1.4.6	Likely date of mining operations, if operations not yet started & reasons for non-commencement of operations	
1.4.7	**Planned production and actual levels achieved in last 3 years (Coal in Mte, OB in MM^3, SR in MM^3/te)**	
1.4.8	**Statutory obligations vis-à-vis compliance status in a tabular form**	
1.4.9	Reasons for difference between the planned and actual production levels	

Year	Coal "**Mte**"		OB **MM^3**	**SR "MM^3/te"**
	UG	OC		

1.5 PARAMETERS OF APPROVED MINING PLAN VIS-À-VIS PROPOSED MINING PLAN

		Approved Mining Plan	**Proposed Mining Plan**
1.5.1	Block Area in "Ha"		
1.5.2	Block Area Projectised "Ha"		
1.5.3	Lease area "Ha"		
1.5.4	Project Area "Ha"		
1.5.5	Life of the Project "Yrs"		
1.5.6	Minimum and Maximum Depth of working "m"		

	Parameters	*Details*	
1.5.7	Net Geological Block "Ha"		
1.5.8	Production Target "MTPA"		
1.5.9	Seams Available "As per GR"		
1.5.10	Seams not considered for Mining with Reasons		
1.5.11	Gross Geological Reserve "Mt"		
1.5.12	Net Geological Reserve "Mt"		
1.5.13	Blocked Reserve "Mt"		
1.5.14	Minable Reserve "Mt"		
1.5.15	Extractable Reserves "Mt"		
1.5.16	% of Extraction/ recovery		
1.5.17	Reserve Depleted (till the base date) Reserves " Mt"		
1.5.18	Balance Extractable reserve "Mt"		
1.5.19	Average Grade		
1.5.20	OB in MM3		
1.5.21	SR MM3/te		
1.5.22	Mining Technology		
1.5.23	Coal Beneficiation envisaged		
1.5.24	Handling of Rejects		
1.5.25	Land use pattern " Ha"		
1	Excavation Area		
2	Top Soil Dump		
3	External Dump		
4	Safety Zone		
5	Other Use		
6	Infrastructure area		
7	Green Belt		
8	Undisturbed Area		
	Total		
1.5.26	**Reasons for revision**		

<table>
<tr><th></th><th>Parameters</th><th colspan="2">Details</th></tr>
<tr><td>2.1</td><td colspan="3">DETAILS OF THE BLOCK</td></tr>
<tr><td>2.1.1</td><td>Particulars of adjacent blocks: North, South, East, West</td><td>North :
South:</td><td>East:
West:</td></tr>
<tr><td>2.1.2</td><td>Location of the Block
District / State</td><td colspan="2"></td></tr>
<tr><td>2.1.3</td><td>Area of the Block "Ha"</td><td colspan="2"></td></tr>
<tr><td>2.1.4</td><td>Area of the geological block projectized "in Ha" (Area of the geological block considered for liquidation of coal reserve)</td><td colspan="2"></td></tr>
<tr><td>2.1.5</td><td>Balance area yet to be projectized "Ha"</td><td colspan="2"></td></tr>
<tr><td>2.1.6</td><td>Likely Reserve in the area yet to be projectized "Mte"</td><td colspan="2"></td></tr>
<tr><td>2.1.7</td><td>Cardinal Point Co-ordinates of the non-coal/lignite bearing area/existing mining lease outside the allotted Geological Coal/Lignite block

(Duly certified in line with para 1.9 of the Guideline, if fresh inning lease required)</td><td colspan="2">Cardinal Points Co-ordinates of the Proposed area outside the non-coal/lignite bearing area outside the allotted Geological Coal/Lignite block
<table>
<tr><th>ID</th><th>Latitude</th><th>Longitude</th></tr>
<tr><td>1</td><td>° ' "N</td><td>° ' "E</td></tr>
<tr><td>2</td><td>° ' "N</td><td>° ' "E</td></tr>
<tr><td></td><td>° ' "N</td><td>° ' "E</td></tr>
<tr><td></td><td>° ' "N</td><td>° ' "E</td></tr>
<tr><td></td><td></td><td></td></tr>
</table></td></tr>
<tr><td>2.1.8</td><td>Certificate of Qualified person/ Accredited Mining Plan preparing agency (MPPA)if the project area is confined within the vested/allotted block boundary/existing mining lease and

Where the project area extends beyond the block boundary, a certificate of Qualified person/ Accredited Mining Plan preparing agency (MPPA)should be supported with a certificate of State Government mines and Geology department must be attached, which should specify (a) intent of the state government for grant of lease beyond the vested geological boundary; (b) non-existence of Coal/ Lignite in the area beyond the vested/allotted geological block boundary/existing mining lease to rule out the issue of encroachment and use of coal bearing area (beyond the vested/allotted block boundary/existing mining lease) in the mining plan

The Project area, Lease area and geological block area in "Ha" shall also be envisaged.</td><td colspan="2">Cardinal Points Co-ordinates of the Proposed LeaseArea considered in the Mining Plan
<table>
<tr><th>ID</th><th>Latitude</th><th>Longitude</th></tr>
<tr><td>1</td><td>° ' "N</td><td>° ' "E</td></tr>
<tr><td>2</td><td>° ' "N</td><td>° ' "E</td></tr>
<tr><td></td><td>° ' "N</td><td>° ' "E</td></tr>
<tr><td></td><td>° ' "N</td><td>° ' "E</td></tr>
<tr><td></td><td></td><td></td></tr>
</table>
Note: Certificate should be given on conceptual plan envisaged in the proposed mining plan depicting OB area, infrastructure locations and cardinal point co-ordinates of the lease area, block area, project area;

In case the project boundary extends beyond the allotted geological block boundary/existing mining lease certificate of non-occurrence of coal should be clearly shown.

Certificate should envisage that the Geo-reference Co-ordinates considered for preparation of Mining plan is in line with Vesting/allotment order and does not encroach</td></tr>
</table>

	Parameters	*Details*
		any other adjacent block, and non-coal bearing certificate of the area in case any proposed infrastructure or OB dump is outside the block area;
2.1.9	KML file of the Proposed lease area, Project Area and geological block.	**Note:** Printed copy of the KML file superimposed in the recent (not older than one year from the base date) dated satellite Image duly certified by Accredited Agency should also be attached. Note: The soft copy of the KML file shall also be part of the Soft copy of the mining Plan.
2.1.10	Whether the proposed project area is confined within the allotted block boundary/**existing mining lease**, if not, the reason for deviation from allotted block boundary, may be given.	
2.1.11	If the project area extends outside the allotted block boundary/**existing mining lease**, confirmation about non-occurrence of coal/lignite in the area under reference needs to be furnished	
2.1.12	Type of the Project (Operating / under Implementation) and year of Starting.	
2.2	**EXPLORATION, GEOLOGY AND ASSESSMENT OF RESERVE**	
2.2.1	Regional geological set up of the area, local geology, structure, stratigraphic sequence, characteristics of the litho-logical units (coal seams /partings/overburden).	(In Maximum 500 Words)
2.2.2	Local geology, Structure, Stratigraphic sequence, Characteristics of the litho-logical units (coal seams /partings/overburden).	(In Maximum 500 Words)
2.2.3	Geological Block Area " Ha"	
2.2.4	Status of Exploration of the block	
2.2.5	Area covered by 'detailed' exploration within the block (sq. km)	
2.2.6	Whether entire lease area has been covered by 'detailed' exploration.	
2.2.7	No. of boreholes drilled within the block	
2.2.8	Whether any further exploration/study is required or suggested and time frame in which it is to be completed	
2.2.9	Year wise future programme of exploration	
2.2.10	Overall borehole density within the block (no./ sq. km) approx	
2.2.11	No of Seams available as per GR (Geological Report)	
2.2.12	Seams not considered for Mining with Reasons	
2.2.13	Dip of the Seam	
2.2.14	Seam wise thickness, depth and reserve	

	Parameters	Details
	 Note : Break-up of the geological reserve for the block, considered in the proposed mining plan, to be projected later and that likely to be sterilized to be given seam wise along with the relevant plans.	
2.2.15	Methodology of reserves estimation (also mention if any software package has been used).	(In Maximum 500 Words)
2.2.16	Average GCV "KCal/kg"	
2.2.17	Gross Geological Reserve of the block "Mte"	
2.2.18	Net Geological Reserve of the block "Mte"	
2.2.19	Minable Reserve of the block "Mte"	
2.2.20	Blocked Reserve "Mte	
2.2.21	Corresponding extractable reserve of the block "Mte"	
2.2.22	Percentage of Extraction	
2.2.23	Reserve already depleted (Base date of Mining Plan)	
2.2.24	Balance Reserve (as on Base Date)	

	Parameters	*Details*
3.1	**MINING METHOD**	
3.1.1	Existing method of mining if the mine is under operation	
3.1.2	Proposed method of mining with justification on suitability of method of mining	• Seams to be worked, Choice of Mining Method and justification for Optimization of targeted capacity, sequence of mining, production scheduling, equipment configuration etc. • Behavior of coal roof & floor and support system for strata control including, Geo-technical investigations, rock mechanics study carried out already, if any, Scheme of mine development in tandem with production, transport and winding system in underground for coal and rock (if required) and personnel; Sources of stowing material (if applicable) • Brief description of all operation e.g. winning, transport, blasting, overburden removal and disposal, Life of the mine furnishing the assumptions made and the detailed computations • **Location of Mine Opening:** In case of opencast mines location of Access trench & reason for selection of site thereof the mining system (geometry and bench parameters and its sequence of development, along with a drawing) and quarry parameters (surface area, floor area), thickness range of each seam and parting, minimum and maximum depth. Quarry stage plans including OB dumps for 1st year, 3rd year, 5th year, year of achieving rated capacity of the mine, Final year (i.e. at the end of mine life) and post closure subsequently, also indicating the volume of excavation for coal and OB, area of excavation volume of internal and external dump and the area, in hectare, for internal and external dumps and height. Seam wise calendar programme of excavation, timeframe for commencement of Backfilling & justification therefor. • In case of underground mining, number and location, length & depth of shafts, inclines, and other mode of entries to be shown in the plan, e.g. Shaft 1, Shaft -2 etc.), HFL of the area, gassiness of the seams, Technology tie-ups if any. • Seams to be worked, method of working, optimization of coal roof & floor and support system for strata control including, Geo-technical investigations, rock mechanics study carried out already, if any, Scheme of mine development in tandem with production, extent of working for 1st year, 3rd year, 5th year, year of achieving rated capacity of the mine, Final year (i.e. at the end of mine life) and post closure, (all stages may be marked in distinct color in the working plan of each seam), transport and winding system in underground for coal and rock (if required) and personnel; Sources of stowing material (if applicable). • Adequacy of ventilation system taking into account the

<table>
<tr><td></td><td>Parameters</td><td>Details</td></tr>
<tr><td></td><td></td><td>development works with supporting calculations, specifications of Main Mechanical Ventilator, blasting requirements and requirement of explosives, pumping requirements and standby arrangements.
(In Maximum 2000 Words)</td></tr>
<tr><td>3.1.3</td><td>Coal production capacity proposed "Mtpa"</td><td></td></tr>
<tr><td>3.1.4</td><td>Justification for optimization Coal production capacity</td><td>(In Maximum 500 Words)</td></tr>
<tr><td>3.1.5</td><td>Calendar year from which the production will start</td><td></td></tr>
<tr><td>3.1.6</td><td>Year of Achieving rated production</td><td></td></tr>
<tr><td>3.1.7</td><td colspan="2">Tentative Coal production Plan "MT"
<table>
<tr><th colspan="2">Year</th><th colspan="3">Coal Production Schedule</th><th rowspan="2">OB "MM3"</th><th rowspan="2">SR</th></tr>
<tr><th>Year of Operation</th><th>Calendar Year</th><th>UG</th><th>OC</th><th>Total</th></tr>
<tr><td colspan="2">Up to 31.03.2019</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Y-1</td><td>2019-20</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Y-2</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Y-3</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Y-4</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Y-5</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
</table>
Note: Calendar Plan / Production Plan for the entire life of the mine.</td></tr>
<tr><td>3.1.8</td><td>Rated Capacity "Mtpa"</td><td></td></tr>
<tr><td></td><td>- By OC</td><td></td></tr>
<tr><td></td><td>- By UG</td><td></td></tr>
<tr><td></td><td>- Overall</td><td></td></tr>
<tr><td>3.1.9</td><td>Life of the mine: "Years"</td><td></td></tr>
<tr><td></td><td>- By OC</td><td></td></tr>
<tr><td></td><td>- By UG</td><td></td></tr>
<tr><td></td><td>- Overall</td><td></td></tr>
<tr><td>3.1.10</td><td>Whether the proposed external OB dump site is coal/ lignite bearing: If so, whether coal/lignite below waste disposal area is extractable.</td><td></td></tr>
<tr><td>3.1.11</td><td>Whether negative proving for coal / lignite in the proposed site for OB dump/ infrastructure has been done.</td><td></td></tr>
<tr><td>3.1.12</td><td>Results of any investigation carried out for scientific mining, conservation of minerals and protection of</td><td></td></tr>
</table>

	Parameters	*Details*
	environment; future proposals.	
3.1.13	Type of Equipment/ HEMM proposed	

	Parameters	*Details*
4.1	**Safety Management**	
4.1.1	**Important safety aspects:** Major Risks and uncertainties to the project viz. Proximity to river, adjacent working, geo-mining disturbances, slope stability and remedial measures suggested. It should also include proposed overall slope of the quarry and OB dump, dump height, strata control, fire and spontaneous heating, gas monitoring, disaster management, danger from inrush of water etc.	(In Max 500 Words)
4.1.2	A Commitment from the Company Board that entire mining operation will be carried out as per the Statutory provision given under Mines Act 1952, Coal Mine Regulation 2017 and & wherever specific permission will be required the company will approach the concerned authorities.	(To be furnished as a Part of Annexure)

Chapter 5 : Infrastructure Facilities

	Parameters	*Details*
5.1	Mine infrastructure required e.g. Equipment maintenance planning, Office buildings, Workshop, Power supply arrangement, Water supply etc.	**(Tabular Form)** ***(Location to be shown in Conceptual Plan/Plates)***
5.2.	Power supply & illumination.	***(Max 500 Words)*** ***(Location to be shown in Plates)***
5.3	Drainage & Pumping : Assessment of Volume of Water for Pumping, Pumping Capacity and Pump Selection	***(Max 500 Words)*** ***(Location to be shown in Plates)***
5.4	Coal Handling Arrangement: Brief detail of the CHP/ Mode of Dispatch, Coal quality and Coal staking and handling arrangement	***(Max 500 Words)*** ***(Location to be shown in Plates)***
5.5	Coal washing and the proposed handling/ disposal of rejects.	***(Max 500 Words)*** ***(Location to be shown in Plates)*** Annual Raw coal Feed plan and product with reduction in ash% from feed to product must be furnished in a tabular form

	Parameters	*Details*
6.1	**LAND REQUIREMENT**	
6.1.1	Total Land requirement for the mine in "Ha"	***Break up of pre-mining land type*** (indicative) ***and source of data.***

Land Type		Area
Tenancy	Agricultural	
	Township	
	Grazing	
	Barren	
	Water Bodies	
	Road	
	Community/other use	
Govt Non Forest	Agricultural	
	Township	
	Grazing	
	Barren/other use	
Forest	Reserve	
	Protected	
FreeHold		
Total		

6.1.2 During mining Land use details:

Type	Land use (Proposed)	Land Use (End of Life)	Land Use (Post Closure)						
			Agricultural land	Plantation	Water Body	Public/ Company Use	Forest Land (Returned)	Undisturbed	Total
Excavation Area									
Backfilled Area									
Excavated Void									
Without plantation									
Top Soil Dump									
External Dump									
Safety Zone									
Haul Road between quarries									
Road diversion									
Diversion/ below River/Nala/canal									
Settling pond									
Road & Infrastructure area									
Rationalization area									
Garland drains									
Embankment									

	Parameters	Details
	Green Belt	
	Water Reservoir near pit	
	UG entry	
	Undisturbed/ Mining right for UG	
	Resettlement	
	Pit head power plant	
	Water harvesting	
	Agricultural land	
	Total	
6.1.3	Surface features over the block area	
6.1.4	No. of villages/Houses to be shifted	
6.1.5	Population to be affected by the project	
6.1.6	Proposed Rehabilitation programme	
6.2	**DETAILS OF LEASE**	
6.2.1	Status of Lease	
6.2.2	Existing Lease Area "Ha"	
6.2.3	Period for which Mining Lease has been granted/is to be renewed/ is to be applied for.	
6.2.4	Date of expiry of earlier Mining Lease, if any	
6.2.5	Whether the lease boundary/ required boundary is same as mentioned in the allotment order	
6.2.6	Lease Area (applied/ required) as per the Mining Plan under consideration (Ha)	
6.2.7	Whether the applied lease area falls within the allotted block	
6.2.8	Area (Ha) of lease which falls outside the delineated Block Boundary/Existing Mining Lease	
6.2.9	**Details of outside area:**	
	□ Whether forms part of any other coal block	
	□ Whether it contains any coal/lignite reserves	
	□ Purpose for which it is	

	Parameters	*Details*
	required, e.g. roads/ OB dumps/ service buildings/ colony/ safety zone/ others (specify)	
6.2.10	**Whether some part(s) of the allotted block has not been applied for mining lease.**	
	- Total area in Ha of such part(s).	
	- Total reserves in such part(s). (Mt)	
	- Brief reasoning for leaving such part(s)	

	Parameters	*Details*
7	**ENVIRONMENTAL MANANGEMENT**	
7.1	**Commitment from the project proponent that the company will comply Environment and Forest Condition stipulated in the respective clearances**	

	Parameters	Details
8.1	*Land Degradation and restoration Schedule*	

8.1.1 Tentative Land Degradation and Technical Reclamation (Commutative Area "Ha")

Year/Stage (Life of the mine plus post closure period)		Land Degraded				Technically Reclaimed Area			
		Excav	Dump (Extn + Top Soil)	Infra/ others	Total	Backfill	Dump (Extn + Top Soil)	Others	Total
Up to Base year *									
Y-1	19-20								
Y-3	21-22								
Y-5	23-24								
Y-10	28-29								
Y-15	33-34								
Y-20									
Y-25									
Y-30									
Y-33*									
Post Closure									
Y-36									

* - Considering Base year i.e. 2018-19 and life of 33 years in this case

Note: For the purpose of preparation of Stage plan and action plan for restoration and assessment of life of mine and escrow account, the year in which any activity over the proposed land is envisaged, should be considered as 1st year **i.e First year of development.**

Stages of reclamation and restoration of land should be given for 1st, 3rd, 5th and subsequently every five year for the entire life of the project and for 3 years post closure.

8.1.2 Tentative Biological Reclamation (Cumulative in "Ha")

Year/Stage (Life of the mine plus post closure period)		Biologically Reclaimed Area					Forest land (Return)	Un Disturbed/ To be left for Public/com Use	Total
		Agriculture	Plantation	Water Body	Public/ Company Use	Total			
Up to Base year *									
Y-1	19-20								
Y-3	21-22								
Y-5	23-24								
Y-10	28-29								
Y-15	33-34								
Y-20									

	Parameters	Details

Y-25										
Y-30										
Y-33*										
Post Closure										
Y-36										

Stages of reclamation and restoration of land should be given for 1st, 3rd, 5th and subsequently every five year for the entire life of the project and for 3 years post closure.

8.2	**Post Closure Water Quality management:**	**(Max 200 Words)** (Existing water bodies available in the lease hold area; Measures to be taken for protection of the same including control of erosion, sedimentation, siltation, water treatment, diversion of water course if any; Measures for protection of contamination of ground water from leaching etc;)
8.3	**Post Closure Air Quality management**	**(Max 200 Words)**

8.4 **Waste Management** (Figures in MM3) (Tentative)

Year/Stage (Life of the mine plus post closure period)		OB Removal (Cumulative)			External Dump (Cumulative)		Internal Backfilling (Cumulative)		Embankment (Cumulative)	
		Top Soil	OB	Total	Top Soil	OB	Top Soil	OB	Top Soil	OB
Up to Base year *										
Y-1	19-20									
Y-3	21-22									
Y-5	23-24									
Y-10	28-29									
Y-15	33-34									
Y-20										
Y-25										
Y-30										
Y-33*										
Post Closure										
Y-36										

* - Considering Base year i.e. 2018-19 and life of 33 years in this case

Stages at 1st, 3rd, 5th and subsequently every five year for the entire life of the project and for 3 years post closure

	Parameters	*Details*
8.5	**Top Soil Management – (Including Action plan for Top Soil management) (Tentative)**	

(All Figures are Cumulative and in MM3)

Year/Stage (Life of the mine plus post closure period)		Top Soil Removal Plan	Top Soil Used				
			Spreading Over Embankment	Spreading over Backfill area	Spreading over External OB Dump area	Used in Green Belt area	Total Utilised
Up to Base year *							
Y-1	19-20						
Y-3	21-22						
Y-5	23-24						
Y-10	28-29						
Y-15	33-34						
Y-20							
Y-25							
Y-30							
Y-33*							
Post Closure							
Y-36							

Stages at 1st, 3rd, 5th and subsequently every five year for the entire life of the project and for 3 years post closure

8.6	**Management of Coal Rejects.**	**(Max 150 Words)** **Proposal regarding future maintenance and dismantling of structures, slurry pond and rejects**
8.7	**Restoration of Land used for Infrastructure**	(Infrastructure to be retained and to be dismantled are to be presented in a tabular form envisaging measures to be taken for their physical stability and maintenance for the retained infrastructure facilities)
8.8	**Disposal of Mining Machinery**	
8.9	**Safety & Security**	**Measures to be implemented to prevent access to surface opening for underground working, excavation etc**
8.10	**Abandonment Cost and Financial Assurance**	
8.10.1	**Abandonment Cost: Cost of Activities to be taken up for closure of the mine**	

Parameters	Details

Head		Unit	Quantity	Rate Rs/ Unit	Amount *Rs. Cr*
Progressive closure	Water quality management	LS			
	Air quality management	LS			
	Waste Management	M Cum			
	Barbed wire fencing around dump	m			
	Barbed wire fencing around the Pit	m			
	Filling of Void - Rehanding of Crown Dump	MM3			
	Top Soil management	MM3			
	Technical and Biological Reclamation of Mined out of land and OB Dump	Ha.			
	Plantation over virgin area including green belt	Ha			
	Manpower Cost and supervision				
	Toe Wall around the dump	m			
	Garland drain	m			
	Garland Drain around the dump	m			
	Any other Activity				
Dismentaling of Infrastructure & Disposal rehabilitation of Mining machinery	Dismentaling of workshop	LS			
	Rehabilitation of the dismentaled Facilities	LS			
	Dismentaling of pumps and Pipes/ other facilities	LS			
	Dismentaling of stowing bunker, provisioning of pumps for borewell pumping arrangement				
	Dismentaling of UG equipment				
	Rearranging water pipeline to dump top park/ Agricultural land	LS			
	Dismentaling of Power lines				
Safety and security	Barbed wire fencing around dump				
	Barbed wire fencing around the Pit	m			
	Barbed wire fencing with masonary pillars				
	Concrete wall with Masonalry pillars around the pit	m			
	Securing air shaft and installation of borewell pump				
	Securing of incline				
	Concrete wall fencing around the water body				
	Boundary wall around the water body				
	Stabilisation(viz benching, pitching etc) of side walls of the water body				
	Toe Wall around the dump				
	Garland drain				
	Garland Drain around the dump				
	Drainage Channel from main Ob dump				
Technical and Biological Reclamation of Mined out of land and OB Dump	Filling of Void	Ha			
	Top Soil management	MM3			
	OB Rehandling for backfilling	MM3			
	Terracing, blanketing with soil and vegetation of External OB Dump	Ha			
	Paripheral road, gates, view point, cemented steps on bank				
	Expenditure on development of Agricultural land				
	Landscaping and Plantation	LS			
Post Closure management and supervision	Power Cost	LS			
	Post Mining Water quality management	LS			
	Post Mining Air quality management	LS			
	Subsidence monitoring for 5 years	LS			
	Waste Management	LS			
	Manpower Cost and supervision	LS			
Others	Enterprenuership development (vocational/skill development training for sustainable income of affected people				
	Golden Handshake / Retrenchment benefits to 100 employees of OC				
	Golden Handshake / Retrenchment benefits to 200 employees of UG				
	Onetime financial grant to societies / institutions /organisations which is dependent upon the project				
	Provide jobs in other mines of the company				
	Continuation of other services like running of schools etc				
Total					

	Parameters	Details
8.10.2	**Financial Assurance : Amount to be deposited in Escrow account as a security against the mine activities to be carried out for the closure of the mine**	

WPI as on	Apr-19	121.10
WPI as on base date *	Apr-19	121.10
Escalation rate of Closure cost		1.00

	UG	OC
Base Rate of Closure Cost "Rs. Crs./Ha"	0.015	0.09
Closure Cost "Rs. Crs/Ha"	0.015	0.09
Project Area	1000.00	885.53
Amount to be depostied into Escrow Account "Rs. in Crs"	15.00	79.70

Amount already deposited into Escrow Account "Rs. in Crs"	5.00	8.87
Net Amount to be depostied into Escrow Account "Rs. in Crs"	10.00	70.83

Rate of componding of Annual Closure Cost		5.00%
Balance Life of the project "in Yrs"	10	33
Annual Closure Cost	1.000	2.146
in Crs		184.42

* - Base date considered in the example is 01.04.2019 and the life of theOC mine considered is 33 years and UG mine considered is 10 years. Rs. 8.87 and RS 5.0 crs have been deposited in escrow account for OC and UG mine respctively.

Amount to be deposited into Escrow

Year	OC	Year	UG	Total
1	2.146	1	1.000	3.146
2	2.254	2	1.050	3.304
3	2.366	3	1.103	3.469
4	2.485	4	1.158	3.642
5	2.609	5	1.216	3.824
6	2.739	6	1.276	4.016
7	2.876	7	1.340	4.216
8	3.020	8	1.407	4.427
9	3.171	9	1.477	4.648
10	3.330	10	1.551	4.881
11	3.496			3.496
12	3.671			3.671
13	3.854			3.854
14	4.047			4.047
15	4.249			4.249
16	4.462			4.462
17	4.685			4.685
18	4.919			4.919
19	5.165			5.165
20	5.424			5.424
21	5.695			5.695
22	5.979			5.979
23	6.278			6.278
24	6.592			6.592
25	6.922			6.922
26	7.268			7.268
27	7.631			7.631
28	8.013			8.013
29	8.414			8.414
30	8.834			8.834
31	9.276			9.276
32	9.740			9.740
33	10.227			10.227
Total	171.839		12.578	184.417

ANNEXURES

	Parameters	*Details*	
I	Copy of allotment order /Vesting order.	**Mandatory Document**	**Annexure - I**
II	Certificate of **Qualified person (QP) / Accredited Mining Plan preparing agency (MPPA)**if the project area is confined within the vested/allotted block boundary **/existing mining lease area** Where the project area extends beyond the block boundary, a certificate of **Qualified person (QP)/ Accredited Mining Plan preparing agency (MPPA)**should be supported with a certificate of State Government mines and Geology department must be attached, which should specify (a) intent of the state government for grant of lease beyond the vested geological boundary; (b) non-existence of Coal/ Lignite in the area beyond the vested/allotted geological block boundary/**existing mining lease** to rule out the issue of encroachment and use of coal bearing area (beyond the vested/allotted block boundary/**existing mining lease**) in the mining plan	**Mandatory Document** **Note:** Certificate should be given on conceptual plan envisaged in the proposed mining plan depicting OB area, infrastructure locations and geo-reference co-ordinates of the lease area, block area, project area; In case the project boundary extends beyond the allotted geological block boundary certificate of non-occurrence of coal should be clearly shown. Certificate should envisage that the Cardinal Point Co-ordinates considered for preparation of Mining plan is in line with Vesting/allotment order and does not encroach any other adjacent block, and non-coal bearing certificate of the area in case any proposed infrastructure or OB dump is outside the block area; The Project area, Lease area and geological block area in "Ha" shall also be envisaged.	**Annexure - II**
III	**Approval of the Company Board Approval**: ,	**Mandatory Document** **Board approval must Specify:** • Approvals of Mining Plan form the Board of the company giving undertaking for correctness of data used in preparation of Mining Plan; • Details of the **Qualified person (QP)/ Accredited Mining Plan preparing agency (MPPA)** with certification that the eligibility of Qualified person/	**Annexure - III**

	Parameters	Details	
		Accredited Mining Plan preparing agency has been verified. • Acceptance of the Mining Plan by the company board with recommendation for approval; • Undertaking that the mine will be developed as per the approval of the mining plan from Ministry of coal and all other approvals, as required will be obtained from relevant authorities • Commitment that entire mining operation will be carried out as per the Statutory provision given under Mines Act 1952, Coal Mine Regulation 2017, EP Act 1986 and FC Act 1980 and & wherever specific permission will be required the company will approach the concerned authorities. • Financial Assurance for implementation • Undertaking that the reclamation & rehabilitation work shall be carried out in accordance with the approved Mine Closure Plan and any modification /amendments which may be made in the mine Closure Plan by Ministry of Coal, from time to time. • Undertaking that the protective measures contained in the mine closure plan including reclamation and rehabilitation works will be carried out in accordance with the approved mine closure plan and final mine closure plan and undertake to submit a yearly report before 1st July of every year to the Coal Controller setting forth the extent of protective and rehabilitative works carried cut as envisaged in the approved mine closure plans (Progressive and Final Closure; • Undertaking that they will obtain a mine closure certificate from Coal Controller to the effect that the protective, reclamation and rehabilitation works carried out in accordance with the approved mine	

	Parameters	*Details*	
		closure plan/final mine closure plan and will surrender the reclaimed land to the State Government concerned.	
IV	Copy of earlier approval of mining plan.	**Mandatory Document**	**Annexure - IV**
V	Plan / chart showing schedule of Implementation of Mine closure activities (progressive and final closure) with duration of important activities	**Mandatory Document**	**Annexure - V**
VI	Non-refundable Application Fee	**Proof of the payment**	**Annexure - VI**
VII	Expert-Review Report	**Carried out by Accredited Mining Plan Preparing Agency (MPPA)**	**Annexure - VII**
VIII	Other document (if any)		**Annexure - ...**

PLANS/ PLATES

I	Location plan	
II	Plan certified by **Qualified person (QP) / Accredited Mining Plan preparing agency (MPPA)**if the project area is confined within the vested/allotted block boundary and Where the project area extends beyond the block boundary, a Plan certified by **Qualified person (QP) / Accredited Mining Plan preparing agency (MPPA)**should be supported with a plan with cardinal point co-ordinates duly certified by the State Government mines and Geology department. **Plan in support of Annexure - II**	**Plan in support of Annexure - II** **Note:** Certificate should be given on conceptual plan envisaged in the proposed mining plan depicting OB area, infrastructure locations and cardinal Point co-ordinates of the lease area, block area, project area; In case the project boundary extends beyond the allotted geological block boundary certificate of non-occurrence of coal should be clearly shown. Certificate should envisage that the cardinal point Co-ordinates considered for preparation of Mining plan is in line with Vesting/allotment order and does not encroach any other adjacent block, and non-coal bearing certificate of the area in case any proposed infrastructure or OB dump is outside the block area;
III	KML file of the Proposed lease area, Project Area and geological block.	**Note:** A printed copy of the KML file superimposed in the recent (not older than one year from the base date) dated satellite Image duly certified by Accredited Agency should also be attached. The soft copy of the KML file shall also be part of the Soft copy of the mining Plan.
IV	Cadastral plan showing approved block boundary vis-à-vis proposed/existing mining lease & Mine boundary superimposed over it in distinct color, showing land use and infrastructure etc.	
V	Geological plan showing all the boreholes drilled and proposed to be drilled showing allotted block boundary and required lease area	
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CLOSURE PLAN

XX	Post mining land use plan	
XXI	Progressive mine closure plan/ stage plan indicating stages at 1st,3rd, 5th, year of achieving rated capacity of the mine and end of life (showing area, volume, dump height etc. for OC and seam-wise layout projects and ventilation system in UG)	Year / Plate No: 1st; 3rd; 5th; PRC; End of Life
XXII	Reclamation plan	

APPLICANT
NEYVELI UTTAR PRADESH POWER LIMITED
6/42, Vipul Khand.Gomti Nagar, Lucknow-226010, Uttar Pradesh.
Tele-Fax: 0522-4951065, CIN: U40300UP2012GOI053569.

Mining Plan and Mine Closure Plan
For
Pachwara South Coal Block

Project area 714.8553 ha(≈715 ha)
Rajmahal Coalfield, Dumka District, Jharkhand

Targeted Capacity 9.00 MTPA

Peak Rated Capacity – 13.50 MTPA

November, 2023

Prepared by
United Exploration India Private Limited
Unit-402, 4th Floor, Axis Mall, Block-C
Action Area-I,Newtown-700056
Kolkata, West Bengal

SUJIT DAS
Chief General Manager/Project Head
Pachwara South Coal Mine Project
NUPPL

LIST OF ABBREVIATIONS USED

AMSL	Above Mean Sea Level
AMC	Annual Maintenance Contract
ANFO	Ammonium Nitrate; Fuel Oil
Avg.	Average
BCM	Bank Cubic Meter
CBA Act	Coal Bearing Areas (Acquisition and Development) Act
CCO	Coal Controller Office
CJBJ	Chota Jungle Bara Jungle
CGWA	Central Ground Water Authority
Cum	Cubic Meter
Cum/hr	Cubic Meter per Hour
CHP	Coal handling Plant
CPCB	Central Pollution Control Board
CSR	Corporate social responsibility
DGPS	Differential Global Positioning System
DGMS	Directorate General Of Mines Safety
DMP	Disaster Management Plan
EC	Environment Clearance
EDM	Electronic Distance Measurement
ET	Effective Thickness
EUP	End Use Plant
EOT	Electric overhead traveling
ETP	Effluent Treatment Plant
FEL-RDT	Front End Loader- Rear Dump Trucks.
ISP	Indian Standard Procedure
Govt.	Government
GOI	Government of India
GCV	Gross Calorific Value
GSI	Geological Survey of India
ha	Hectare
HT	High tension
HEMM	Heavy Earth-Moving Machinery
HFL	Highest Flood Level
hz	hertz
Hp	horsepower

Kcal	kilocalorie
Kg	Kilogram
Kwhr	kilowatt hour
KV	Kilovolt
KL	Kiloliter
KML	Keyhole Markup Language
LMV	Light Motor Vehicle
Lr.	Lower
LS	Lumsum
LAN	local area network
MBCM	Million Bench Cubic Meter
MDO	Mine developer-cum-operator
MOC	Ministry of Coal
MOEF & CC	Ministry of Environment, Forests and Climate Change
MVA	Mega Volt Ampere
MW	megawatt
MTPA	Metric tonnes per annum
m	Meter
mm	Millimeter
Ma	Million Years
Min	Minimum
Max	Maximum
Mt	Million tons
MMDR	Mines and Minerals Development and Regulation Act
MM^3	Million Cubic Meter
MLD	millions of liter per day
M^3	Meter Cube
MIS	Management Information System
MSR	Mine Slope Stability Radar
NAAQStandards	National Ambient Air Quality Standards
NRSC	National Remote Sensing Centre
NUPPL	Neyveli Uttar Pradesh Power Limited
OMS	Output Per Man-Shift
ONGC	Oil and Natural Gas Corporation
OB	Over Burden
OC	Open caste
PAF	Project affected families

PAP	Project Affected Person
PMT	Physico-Mechanical Test
PRC	Peak Rated Capacity
QTY	Quantity
RD	Relative Density
RDT	Rear Dump Trucks
RLS	Rapid Loading System
RPM	Respirable Particulate Matter
ROM	Run Of Mine
RQP	Recognised Qualified Person
RL	Reduced Level
SH	State Highway
SIA	Social Impact Assessment
SPM	Suspended Particulate Matter
SPCB	State Pollution Control Board
Sq. Km.	Square kilometer
SSR	Slope Stability Report
TDS	Total dissolved solids
TPH	Tonnes per Hour
Up.	Upper
UG	Under Ground
UNFC	United Nations Framework Classification
VT Center	Vocational Training Center
WAN	Wide Area Network
WTP	Water Treatment Plant

MAIN TEXT

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Chapter-1: Project Information

1.1 Introduction

	Parameters	Details
1.1.1	Name of the Coal/Lignite Block	Pachwara South Coal Block.
1.1.2	Name of the Coalfield/ Lignite Field.	Rajmahal Coalfield, Dumka District, Jharkhand.
1.1.3	Base date of Mining Plan/ Mine Closure Plan.	April, 2020.
1.1.4	Linked End Use Plant.	Coal from this project is linked to Ghatampur Thermal Power Plant (1980 MW). M/s Neyveli Uttar Pradesh Power Ltd (NUPPL), is a joint venture of NLC India Ltd (Govt. of India Enterprise) and Uttar Pradesh RajyaVidyutUtpadan Nigam Ltd (Government of Uttar Pradesh) is setting up this Coal based Thermal Power Plant with a capacity of 1980 MW (3 X 660 MW) at Ghatampur Tehsil in Kanpur Nagar District, Uttar Pradesh. **Table No. 1.1:** Detail configuration and Plant Capacities of the thermal power station.
1.1.5	Distance of End Use Plant from the pit head of the project in "km".	Rail distance of Ghatampur Thermal Power Plant from the Mine Site is around 1050 km.
1.1.6	Mode of Coal Transport;	Coal transportation from mine site to Pachwara Railway Siding will be done through conveyor system. However, in the initial few years, till the conveyor laying is completed, coal will be transported through road.

S.L. No.	Name of Specified End Use Plants	Address	Capacity	Existing or Proposed
1	Ghatampur TPP.	6/42, Vipul Khand, Gomti Nagar, Lucknow Uttar Pradesh-226010.	3 x 660 MW = 1980 MW	Under Implement ation

1.2 Location, Topography & Communication:

1.2.1	Location of coal deposit (District and State)	Pachwara South block is the southernmost part of the Pachwara Coalfield in Dumka District, Jharkhand. Pachwara-Chirudih Sector lies in the western part of Pachwara basin. The limiting Co-ordinates of the block are, lies on Toposheet number G 45 V6 & G 45 V7andareas given below: **Latitude:** 24° 29' 57.404" N-24° 31' 46.956" N (WGS84 45 R 2709584.08 N - 2712965.123 N). **Longitude:**87° 27' 22.010" E-87° 29' 56.150" E (WGS84 45 R 546208.62 E - 550540.973 E). A location Map is depicted in **Figure 1.1**.
1.2.2	Communication: PWD roads, railway lines Air.	The Block is well connected with Dumka, one of the district town of Jharkhand State at a distance of around 52 km. Amrapara is the nearest semi-urban area near the site and well connected with both Dumka and Pakur (district headquarter) through black topped Dumka-Shahibganj Road and Amrapara-Maheshpur-Pakur road respectively. The nearest railhead is Murarai and is situated at a distance of around38km from the Block and falls in between the block and district headquarter Pakur. The nearest public airport is situated at a distance of around201 km from the block at Andal (Kazi Nazrul Islam Airport). Birsa Munda Airport at state Capital Ranchi is situated at a distance of around 330 km while Netaji Subhash Chandra Bose International Airport at Kolkata is situated at a distance of around 283 km from the project site. A transportation map showing the roads and prominent transfer points are shown in **Figure 1.2**.
1.2.3	Availability of power supply, water etc.	Power will be provided from the nearest substation of Jharkhand Electricity Board. Initially water will be drawn from the Bansloi river after taking the necessary permissions from the state Government afterwards the mine water generated will be used.

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1.2.4	Prominent physiographic features, drainage pattern, natural water courses, rainfall data, highest flood level.	The terrain in general, portrays a gently undulating topography with few isolated hillocks in the South central and South western part. The main coal bearing area with subdued topography is skirted on the northern and southern sides by hills of basic volcanic rocks. The general elevation of the low ground straddles from about 82 m (above MSL) towards northeast to about 188 m (above MSL) towards south central with general ground slope from south to north towards Bansloi river and which is also supported by the detailed topographical survey of the area. Highest elevation within the block area is 188.96 m. Bansloi, the main surface run-off flowing from west to east, the central part of the area with a few ephemeral streamlets descending from the catchment area of the Bansloi River forming the drainage system of the area. The area experiences a typical dry tropical climate with hot summer and cold winter. The annual rainfall which is mostly confined to monsoon months is around 1300 mm. The area in general is sparsely vegetated with shrubs and herbs, although at some places, particularly along the higher contours open forest with luxurious growth of Mahua, Palash and Bamboo are found. Mango and Jack fruit and Bamboo are commonly found around villages. The area experiences humid to sub-humid climate with hot summer and cold winter. Winter starts from the middle of November and continues till the end of February. The district experiences great heat from March to May, when the maximum temperature reaches up to 40°c. December is the coldest month when the minimum temperatures fall down up to 4°c. Rainy season mainly started from June to end to September. The normal average rainfall in the project area which falls in the Gopikandar block is 926 mm. The highest rainfall noted in the year 2008 whereas 2018 recorded very less rainfall than average. July is the month of highest rainfall recorded in the year. A drainage plan of the block area with respect to the nearby prominent water bodies are depicted in **Figure no. 1.3.** Please refer to **Plate No. VII** for present Surface condition of Pachwara South Coal Block.

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Chief General Manager/Project Head
Pachwara South Coal Mine Project
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1.2.5	Important surface features within the project area and major diversion or shifting involved.	The east central, central and north western part of the block is characterized by three villages with approximate 2000 number of persons. A village road connecting Chirudih, Kundapahari and Mahuldabar village also passing across the block through the central part. A high tension electrical line also passing through the central part of the block. The block is also characterized by few ponds, first order seasonal streams, a Church and a School. Southern part of the block characterizes with some hillocks. The seasonal nalas will be utilized to channelize storm water in the initial years, while a garland drain of sufficient capacity has been planned along the southern boundary to channelize the storm water preventing from mine inundation. The project involves around 1806 number of project affected persons which is distributed over 314 numbers of families. About 76 number of families need to be rehabilitated from Mahuldabar, 124 number of families need to shift from Kundapahari while Chirudih involves 114 number of families for Rehabilitation. At present, detailed SIA study is ongoing under the guidance of District Administration. More precise numbers of PAF's and PAP's along with detailed plan of rehabilitation and resettlement will be prepared for implementation. A metalled village road, situated in central part of the block, connecting eastern and western part of the block joining Chirudih and Mahuldabar villages, need to be diverted. An approximate route for diversion has been suggested in this Mining Plan however, final route will be finalized in consultation with the district administration. The high tension electric line (11 KV, single pole) passing through the block also needs to shift before commencement of mining operation. The same will be undertaken with Jharkhand Bijli Vitran Nigam Limited.

1.3 Details of the Allotment Agreement:

1.3.1	Name of the Allottee	Neyveli Uttar Pradesh Power Ltd.
1.3.2	Details of allotment/ vesting Order.	Pachwara South Coal Block was allotted to NUPPL, vide, allotment order no 13016/26/2004-CA-I/CA-III(Pt) (Vol.II), Dated 03.10.2016 FROM MoC, GOI.
1.3.3	Name and address of the Applicant	**Registered Office:** Neyveli Uttar Pradesh Power Ltd (NUPPL) 6/42, Vipul Khand. Gomti Nagar, Lucknow-226010. Uttar Pradesh. Tele-Fax: 0522-4951065 CIN: U40300UP2012GOI053569.

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		Local Office: Office of the General Manager. Pachwara South Coal Mine Project. Neyveli Uttar Pradesh Power limited. Shanta Bhavan, Behind SBI. LIC Colony, Dumka-814 101, Jharkhand.
1.3.4	Name of the previous Allottee of the Block.	Neyveli Uttar Pradesh Power Ltd (NUPPL) is the primary and current allottee.
1.3.5	Starting date of the Mine as per CMDPA/CBDPA	August, 2022.
1.3.6	Rated capacity as per CMDPA/CBDPA	Not Applicable.
1.3.7	Production Schedule as per opening permission (meeting provisions of CMDPA if any).	Not Applicable. Opening permission shall be obtained on receipt of all requisite statutory clearances.
1.3.8	End Use of Coal/ Lignite as per allotment order if any	Thermal Power Generation.
1.3.9	Cardinal points co-ordinates of the Block Boundary	**Table No. 1.2** Georeferenced Coordinates of Pachwara South Coal Block.

Boundary Points	Longitude	Latitude	Easting (X)	Northing (Y)
1	87° 29' 7.879" E	24° 30' 45.384" N	549185.77	2711067.601
2	87° 29' 7.822" E	24° 30' 45.371" N	549184.168	2711067.196
3	87° 29' 7.773" E	24° 30' 45.361" N	549182.79	2711066.883
4	87° 29' 7.725" E	24° 30' 45.351" N	549181.44	2711066.571
5	87° 29' 7.694" E	24 ° 30' 45.344" N	549180.568	2711066.353
6	87° 29' 7.647" E	24° 30' 45.334" N	549179.247	2711066.041
7	87° 29' 7.588" E	24° 30' 45.321" N	549177.588	2711065.635
8	87° 29' 7.114" E	24 ° 30' 45.218" N	549164.26	2711062.42
9	87° 29' 4.731" E	24" 30' 44.704" N	549097.257	2711046.376
10	87° 28' 59.367" E	24° 30' 43.545" N	548946.434	2711010.2
11	87° 28' 58.692" E	24° 30' 43.400" N	548927.455	2711005.674
12	87° 28' 19.283" E	24° 30' 34.887" N	547819.349	2710740.008
13	87° 28' 18.697" E	24° 30' 34.208" N	547802.929	2710719.068
14	87° 28' 16.915" E	24° 30' 32.142" N	547752.998	2710655.353
15	87° 28' 15.988" E	24° 30' 31.067" N	547727.024	2710622.201
16	87° 28' 15.573" E	24° 30' 30.586" N	547715.396	2710607.367

SUBAJIT DAS
Chief General Manager/Project Head
Pachwara South Coal Mine Project
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		17	87° 28' 14.942" E	24° 30' 29.853" N	547697.715	2710584.762
		18	87° 28' 12.958" E	24° 30' 27.553" N	547642.123	2710513.832
		19	87° 28' 5.776" E	24° 30' 19.227" N	547440.877	2710257.066
		20	87° 28' 1.586" E	24° 30' 14.367" N	547323.466	2710107.189
		21	87° 28' 0.519" E	24° 30' 13.131" N	547293.567	2710069.073
		22	87° 27' 57.507" E	24° 30' 9.638" N	547209.163	2709961.354
		23	87° 27' 48.459" E	24° 29' 59.146" N	546955.609	2709637.8
		24	87° 27' 46.957" E	24° 29' 57.404" N	546913.517	2709584.08
		25	87° 27' 45.373" E	24° 29' 59.155" N	546868.758	2709637.785
		26	87° 27' 35.825" E	24° 30' 9.704" N	546598.963	2709961.339
		27	87° 27' 33.779" E	24° 30' 11.965" N	546541.152	2710030.688
		28	87° 27' 33.670" E	24° 30' 12.085" N	546538.072	2710034.369
		29	87° 27' 32.647" E	24° 30' 13.216" N	546509.166	2710069.059
		30	87° 27' 32.401" E	24° 30' 13.488" N	546502.215	2710077.401
		31	87° 27' 32.118" E	24° 30' 13.800" N	546494.219	2710086.971
		32	87° 27' 31.752" E	24° 30' 14.204" N	546483.878	2710099.362
		33	87° 27' 22.010" E	24° 30' 24.967" N	546208.62	2710429.487
		34	87° 27' 23.843" E	24° 30' 28.000" N	546259.896	2710522.942
		35	87° 27' 24.863" E	24° 30' 30.373" N	546288.359	2710596.022
		36	87° 27' 26.269" E	24° 30' 34.231" N	546327.533	2710714.812
		37	87° 27' 26.642" E	24° 30' 35.401" N	546337.91	2710750.832
		38	87° 27' 27.503" E	24° 30' 38.105" N	546361.864	2710834.078
		39	87° 27' 28.889" E	24° 30' 41.980" N	546400.473	2710953.389
		40	87° 27' 29.162" E	24° 30'43.101" N	546408.041	2710987.893
		41	87° 27' 29.769" E	24° 30' 45.591" N	546424.868	2711064.534
		42	87° 27' 30.131" E	24° 30' 47.076" N	546434.903	2711110.241
		43	87° 27' 30.156" E	24° 30' 47.263" N	546435.588	2711115.995
		44	87° 27' 30.450" E	24° 30' 49.473" N	546443.635	2711183.994
		45	87° 27' 30.731" E	24° 30' 51.574" N	546451.328	2711248.64
		46	87° 27' 31.260" E	24° 31' 0.288" N	546465.324	2711516.703
		47	87° 27' 31.323" E	24° 31' 1.312" N	546466.992	2711548.203
		48	87° 27' 31.344" E	24° 31' 1.667" N	546467.547	2711559.124
		49	87° 27' 31.507" E	24° 31' 4.342" N	546471.86	2711641.413
		50	87° 27' 31.536" E	24° 31' 4.830" N	546472.627	2711656.425
		51	87° 27' 31.544" E	24° 31' 4.958" N	546472.839	2711660.362
		52	87° 27' 31.577" E	24° 31' 7.944" N	546473.462	2711752.205
		53	87° 27' 31.577" E	24° 31' 7.990" N	546473.457	2711753.62

SURAJIT DAS
Chief General Manager/Project Head
Pachwara South Coal Mine Project
NUPPL, Dumka (Jharkhand)

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54	87° 27' 31.591" E	24° 31' 9.258" N	546473.722	2711792.62
55	87° 27' 31.607" E	24° 31' 10.745" N	546474.02	2711838.357
56	87° 27' 31.622" E	24° 31' 12.082" N	546474.305	2711879.48
57	87° 27' 31.633" E	24° 31' 13.138" N	546474.507	2711911.96
58	87° 27' 31.634" E	24° 31' 13.229" N	546474.526	2711914.759
59	87° 27' 31.621" E	24° 31' 13.492" N	546474.133	2711922.847
60	87° 27' 31.815" E	24° 31' 13.685" N	546479.572	2711928.801
61	87° 27' 31.932" E	24° 31' 13.881" N	546482.845	2711934.84
62	87° 27' 32.837" E	24° 31' 14.625" N	546508.234	2711957.808
63	87° 27' 33.244" E	24° 31' 14.919" N	546519.657	2711966.888
64	87° 27' 32.919" E	24° 31' 15.224" N	546510.48	2711976.238
65	87° 27' 33.418" E	24° 31' 15.845" N	546524.458	2711995.385
66	87° 27' 33.535" E	24° 31' 15.995" N	546527.735	2712000.009
67	87° 27' 33.938" E	24° 31' 16.510" N	546539.022	2712015.887
68	87° 27' 34.449" E	24° 31' 16.741" N	546553.377	2712023.04
69	87° 27' 36.565" E	24°31' 18.152" N	546612.774	2712066.635
70	87° 27' 38.644" E	24° 31' 19.540" N	546671.132	2712109.521
71	87° 27' 38.476" E	24° 31' 19.608" N	546666.398	2712111.596
72	87° 27' 39.815" E	24° 31' 20.469" N	546703.987	2712138.204
73	87° 27' 39.803" E	24° 31' 20.501" N	546703.646	2712139.187
74	87° 27' 40.120" E	24° 31' 20.702" N	546712.545	2712145.399
75	87° 27' 41.037" E	24° 31' 21.128" N	546738.304	2712158.587
76	87° 27' 42.151" E	24° 31' 21.468" N	546769.615	2712169.149
77	87° 27' 42.450" E	24° 31' 21.523" N	546778.023	2712170.869
78	87° 27' 43.590" E	24° 31' 21.815" N	546810.071	2712179.957
79	87° 27' 43.970" E	24° 31' 21.906" N	546820.754	2712182.792
80	87° 27' 44.336" E	24° 31' 21.994" N	546831.043	2712185.533
81	87° 27' 45.885" E	24° 31' 22.745" N	546874.552	2712208.777
82	87° 27' 46.890" E	24° 31' 23.172" N	546902.787	2712222.005
83	87° 27' 47.900" E	24° 31' 23.485" N	546931.175	2712231.727
84	87° 27' 48.647" E	24° 31' 23.496" N	546952.193	2712232.136
85	87° 27' 48.648" E	24° 31' 23.496" N	546952.221	2712232.136
86	87° 27' 48.649" E	24° 31' 23.496" N	546952.249	2712232.137
87	87° 27' 49.313" E	24° 31' 23.431" N	546970.94	2712230.2
88	87° 27' 50.345" E	24° 31' 23.308" N	546999.991	2712226.515
89	87° 27' 50.931" E	24° 31' 23.238" N	547016.487	2712224.417
90	87° 27' 51.904" E	24°31' 23.183" N	547043.872	2712222.818

SURAJIT DAS
Chief General Manager/Project Head
Pachwara South Coal Mine Project
NUPPL, Dumka (Jharkhand)

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		91	87° 27' 53.353" E	24°31' 23.197" N	547084.643	2712223.385
		92	87° 27' 53.994" E	24° 31' 23.265" N	547102.672	2712225.538
		93	87° 27' 54.149" E	24° 31' 23.245" N	547107.036	2712224.937
		94	87' 27' 55.305" E	24° 31' 23.093" N	547139.579	2712220.372
		95	87° 27' 55.317" E	24° 31' 23.057" N	547139.921	2712219.266
		96	87° 27' 56.960" E	24° 31' 23.385" N	547186.118	2712229.51
		97	87° 27' 56.915" E	24° 31' 23.308" N	547184.86	2712227.137
		98	87° 27' 57.945" E	24° 31' 23.416" N	547213.831	2712230.557
		99	87° 27' 59.061" E	24° 31' 23.820" N	547245.191	2712243.089
		100	87° 28' 1.218" E	24° 31' 23.798" N	547305.888	2712242.617
		101	87°28' 1.854" E	24° 31' 23.696" N	547323.795	2712239.54
		102	87° 28' 2.521" E	24° 31' 23.681" N	547342.564	2712239.143
		103	87° 28' 3.385" E	24° 31' 23.785" N	547366.865	2712242.424
		104	87° 28' 4.066" E	24° 31' 23.866" N	547386.019	2712244.98
		105	87° 28' 4.956" E	24' 31' 23.931" N	547411.055	2712247.064
		106	87° 28' 5.446" E	24° 31' 23.978" N	547424.838	2712248.556
		107	87° 28' 6.111" E	24"31'24.113"N	547443.536	2712252.772
		108	87° 28' 6.741" E	24° 31' 24.034" N	547461.271	2712250.402
		109	87° 28' 7.775" E	24° 31' 24.105" N	547490.359	2712252.685
		110	87° 28' 8.715" E	24' 31' 24.060" N	547516.813	2712251.391
		111	87" 28' 9.756" E	24° 31' 24.156" N	547546.095	2712254.443
		112	87° 28' '9.862" E	24° 31' 23.901" N	547549.104	2712246.61
		113	87° 28' 10.006" E	24° 31' 23.683" N	547553.179	2712239.919
		114	87° 28' 10.436" E	24° 31' 23.922" N	547565.254	2712247.311
		115	87° 28' 10.350" E	24° 31' 24.085" N	547562.817	2712252.316
		116	87° 28' 10.626" E	24° 31' 24.255" N	547570.565	2712257.571
		117	87° 28' 10.989" E	24° 31' 24.314" N	547580.773	2712259.42
		118	87° 28' 11.204" E	24° 31' 24.361" N	547586.818	2712260.887
		119	87° 28' 11.578" E	24° 31' 24.269" N	547597.351	2712258.093
		120	87° 28' 12.362" E	24° 31' 24.138" N	547619.425	2712254.139
		121	87° 28' 12.869" E	24° 31' 24.149" N	547633.69	2712254.526
		122	87° 28' 13.548" E	24° 31' 24.103" N	547652.801	2712253.176
		123	87° 28' 13.761" E	24° 31' 24.068" N	547658.798	2712252.12
		124	87° 28' 14.174" E	24° 31' 24.055" N	547670.421	2712251.76
		125	87° 28' 14.738" E	24° 31' 24.143" N	547686.281	2712254.52
		126	87° 28' 15.405" E	24° 31' 24.270" N	547705.036	2712258.49
		127	87° 28' 16.197" E	24° 31' 24.486" N	547727.299	2712265.21

SUBAJIT DAS
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UNITED EXPLORATION
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128	87° 28' 16.672" E	24° 31' 24.560" N	547740.657	2712267.532
129	87° 28' 17.139" E	24° 31' 24.684" N	547753.785	2712271.39
130	87° 28' 17.941" E	24° 31' 24.760" N	547776.343	2712273.805
131	87° 28' 18.201" E	24° 31' 24.779" N	547783.657	2712274.414
132	87° 28' 18.321" E	24° 31' 24.787" N	547787.033	2712274.672
133	87° 28' 18.666" E	24° 31' 24.775" N	547796.742	2712274.336
134	87° 28' 19.032" E	24' 31' 24.932" N	547807.024	2712279.2
135	87° 28' 19.516" E	24° 31' 24.814" N	547820.655	2712275.617
136	87° 28' 20.048" E	24° 31' 24.423" N	547835.666	2712263.643
137	87° 28' 20.518" E	24° 31' 24.229" N	547848.911	2712257.721
138	87° 28' 20.994" E	24° 31' 24.174" N	547862.311	2712256.075
139	87° 28' 20.993" E	24° 31' 24.173" N	547862.283	2712256.044
140	87° 28' 21.631" E	24° 31' 23.676" N	547880.288	2712240.82
141	87° 28' 22.188" E	24° 31' 23.565" N	547895.972	2712237.46
142	87° 28' 22.944" E	24° 31' 23.253" N	547917.278	2712227.936
143	87° 28' 23.361" E	24° 31' 23.080" N	547929.03	2712222.656
144	87° 28' 23.885" E	24° 31' 23.120" N	547943.77	2712223.936
145	87° 28' 23.956" E	24° 31' 23.053" N	547945.775	2712221.883
146	87° 28' 24.773" E	24° 31' 22.281" N	547968.845	2712198.217
147	87°28' 25.255" E	24° 31' 21.964" N	547982.442	2712188.514
148	87°28' 25.800" E	24° 31' 21.756" N	547997.799	2712182.169
149	87°28' 26.532" E	24° 31' 21.698" N	548018.402	2712180.456
150	87°28' 27.047" E	24° 31' 21.867" N	548032.876	2712185.704
151	87°28' 28.134" E	24° 31' 21.729" N	548063.477	2712181.564
152	87°28' 28.786" E	24° 31' 21.691" N	548081.827	2712180.459
153	87°28' 29.577" E	24° 31' 21.626" N	548104.091	2712178.536
154	87°28' 29.909" E	24° 31' 21.708" N	548113.425	2712181.09
155	87°28' 30.386" E	24° 31' 21.826" N	548126.834	2712184.766
156	87°28' 30.515" E	24° 31' 21.794" N	548130.468	2712183.794
157	87°28' 31.399" E	24° 31' 21.850" N	548155.336	2712185.602
158	87°28' 32.359" E	24° 31' 22.086" N	548182.324	2712192.954
159	87°28' 33.187" E	24° 31' 22.235" N	548205.607	2712197.617
160	87°28' 33.528" E	24° 31' 22.789" N	548215.143	2712214.689
161	87°28' 34.379" E	24° 31' 23.183" N	548239.047	2712226.89
162	87°28' 34.930" E	24° 31' 23.188" N	548254.551	2712227.097
163	87°28' 35.227" E	24° 31' 22.578" N	548262.973	2712208.364
164	87°28' 36.637" E	24° 31' 22.952" N	548302.608	2712220.004

SUBAJIT DAS
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		165	87° 28' 37.616" E	24° 31' 23.725" N	548330.073	2712243.874
		166	87° 28' 37.837" E	24° 31' 23.857" N	548336.278	2712247.956
		167	87° 28' 38.716" E	24° 31' 24.385" N	548360.955	2712264.281
		168	87° 28' 38.995" E	24° 31' 24.685" N	548368.774	2712273.535
		169	87° 28' 39.267" E	24° 31' 24.978" N	548376.396	2712282.573
		170	87° 28' 39.492" E	24° 31' 25.315" N	548382.691	2712292.96
		171	87° 28' 39.816" E	24° 31' 25.639" N	548391.774	2712302.957
		172	87° 28' 40.130" E	24° 31' 25.953"N	548400.576	2712312.645
		173	87° 28' 40.415" E	24° 31' 26.238" N	548408.565	2712321.438
		174	87° 28' 40.692" E	24° 31' 26.602" N	548416.32	2712332.661
		175	87° 28' 41.010" E	24° 31' 27.093" N	548425.216	2712347.793
		176	87° 28' 41.294" E	24° 31' 27.742" N	548433.138	2712367.782
		177	87° 28' 42.022" E	24° 31' 28.531" N	548453.538	2712392.12
		178	87° 28' 42.357" E	24° 31' 28.866" N	548462.929	2712402.456
		179	87° 28' 42.820" E	24° 31' 29.761" N	548475.861	2712430.029
		180	87° 28' 43.026" E	24° 31' 30.670" N	548481.561	2712458.007
		181	87° 28' 43.167" E	24° 31' 31.432" N	548485.447	2712481.457
		182	87° 28' 43.404" E	24° 31' 31.991" N	548492.056	2712498.673
		183	87° 28' 43.697" E	24° 31' 32.795" N	548500.215	2712523.43
		184	87° 28' 44.181" E	24° 31' 33.441" N	548513.764	2712543.346
		185	87° 28' 44.316" E	24° 31' 33.811" N	548517.523	2712554.739
		186	87° 28' 44.637" E	24° 31' 34.469" N	548526.485	2712575.009
		187	87° 28' 44.961" E	24° 31' 35.018" N	548535.543	2712591.926
		188	87° 28' 44.846" E	24° 31' 35.730" N	548532.232	2712613.813
		189	87° 28' 45.164" E	24° 31' 36.476" N	548541.1	2712636.789
		190	87° 28' 45.339" E	24° 31' 37.407" N	548545.924	2712665.44
		191	87° 28' 45.538" E	24° 31' 38.311" N	548551.427	2712693.264
		192	87° 28' 45.672" E	24° 31' 38.726" N	548555.153	2712706.041
		193	87° 28' 45.671" E	24° 31' 39.043" N	548555.091	2712715.791
		194	87° 28' 45.770" E	24° 31' 39.444" N	548557.834	2712728.134
		195	87° 28'46.036" E	24° 31' 39.811" N	548565.279	2712739.448
		196	87° 28' 46.248" E	24° 31' 40.412" N	548571.18	2712757.953
		197	87° 28' 46.549" E	24° 31' 40.874" N	548579.6	2712772.192
		198	87° 28' 46.801" E	24°31' 41.344" N	548586.64	2712786.672
		199	87° 28' 47.057" E	24°31' 41.489" N	548593.828	2712791.157
		200	87° 28' 47.619" E	24°31' 42.309" N	548609.553	2712816.433
		201	87° 28' 48.154" E	24°31' 42.668" N	548624.568	2712827.527

SURAJIT DAS
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		202	87° 28' 48.531" E	24°31' 42.792" N	548635.163	2712831.377
		203	87° 28' 49.515" E	24°31' 43.233" N	548662.803	2712845.037
		204	87° 28' 50.036" E	24°31' 43.524" N	548677.431	2712854.039
		205	87° 28' 50.409" E	24°31' 43.628" N	548687.915	2712857.274
		206	87° 28' 50.462" E	24° 31' 43.743" N	548689.394	2712860.816
		207	87° 28' 51.130" E	24° 31' 43.606" N	548708.204	2712856.668
		208	87° 28' 51.711" E	24° 31' 43.462" N	548724.567	2712852.296
		209	87° 28' 52.261" E	24° 31' 43.141" N	548740.077	2712842.477
		210	87° 28' 53.130" E	24° 31' 43.021" N	548764.541	2712838.871
		211	87° 28' 53.415" E	24° 31' 42.860" N	548772.577	2712833.948
		212	87° 28' 53.650" E	24° 31' 42.729" N	548779.204	2712829.942
		213	87° 28' 53.967" E	24° 31' 42.552" N	548788.142	2712824.529
		214	87° 28' 54.408" E	24° 31' 42.303" N	548800.577	2712816.914
		215	87° 28' 55.247" E	24° 31' 42.512" N	548824.162	2712823.424
		216	87° 28' 55.871 " E	24° 31' 42.828" N	548841.686	2712833.205
		217	87° 28' 56.950" E	24° 31' 42.783" N	548872.05	2712831.927
		218	87° 28' 57.279" E	24° 31' 42.904" N	548881.295	2712835.681
		219	87° 28' 58.026" E	24° 31' 42.647" N	548902.341	2712827.85
		220	87° 28' 58.218" E	24° 31' 42.752" N	548907.732	2712831.098
		221	87° 28' 58.809" E	24° 31' 42.950" N	548924.339	2712837.246
		222	87° 28' 59.101" E	24° 31' 42.593" N	548932.594	2712826.295
		223	87° 29' 0.404" E	24° 31' 42.500" N	548969.267	2712823.563
		224	87°29'0.988" E	24° 31' 42.770" N	548985.67	2712831.925
		225	87° 29' 1.497" E	24° 31' 42.792" N	548999.989	2712832.651
		226	87° 29' 1.512" E	24° 31' 42.792" N	549000.411	2712832.653
		227	87° 29' 2.236" E	24° 31' 42.694" N	549020.793	2712829.71
		228	87° 29' 2.978" E	24° 31' 42.552" N	549041.686	2712825.416
		229	87° 29' 3.181" E	24° 31' 42.513" N	549047.402	2712824.236
		230	87° 29' 3.633" E	24° 31' 42.091" N	549060.166	2712811.302
		231	87° 29' 4.074" E	24° 31' 42.118" N	549072.571	2712812.176
		232	87° 29' 5.039" E	24° 31' 42.177" N	549099.717	2712814.086
		233	87° 29' 5.699" E	24° 31' 42.330" N	549118.271	2712818.857
		234	87° 29' 6.441" E	24° 31' 42.576" N	549139.122	2712826.496
		235	87° 29' 8.332" E	24° 31' 42.544" N	549192.333	2712825.699
		236	87° 29' 9.143" E	24° 31' 42.380" N	549215.17	2712820.735
		237	87° 29' 9.824" E	24° 31' 42.438" N	549234.325	2712822.587
		238	87° 29' 9.853" E	24° 31' 42.467" N	549235.138	2712823.482

SURAJIT DAS
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		239	87° 29' 10.975" E	24° 31' 42.388" N	549266.717	2712821.163
		240	87° 29' 11.031" E	24° 31' 42.538" N	549268.276	2712825.782
		241	87° 29' 12.150" E	24° 31' 42.986" N	549299.713	2712839.672
		242	87° 29' 12.812" E	24° 31' 42.969" N	549318.342	2712839.215
		243	87° 29' 12.872" E	24° 31' 42.979" N	549320.029	2712839.528
		244	87° 29' 13.211" E	24° 31' 43.036" N	549329.561	2712841.315
		245	87° 29' 14.184" E	24° 31' 42.984" N	549356.944	2712839.812
		246	87° 29' 14.751" E	24° 31' 43.135" N	549372.882	2712844.513
		247	87° 29' 15.411" E	24° 31' 43.226" N	549391.442	2712847.378
		248	87° 29' 16.302" E	24° 31' 43.071" N	549416.529	2712842.699
		249	87° 29' 16.809" E	24° 31' 43.044" N	549430.798	2712841.919
		250	87° 29' 17.371" E	24° 31' 42.974" N	549446.618	2712839.822
		251	87° 29' 17.732" E	24° 31' 43.015" N	549456.771	2712841.119
		252	87° 29' 18.201" E	24° 31' 42.902" N	549469.98	2712837.69
		253	87° 29' 18.231" E	24° 31' 42.754" N	549470.84	2712833.141
		254	87° 29' 18.460" E	24° 31' 42.771" N	549477.282	2712833.687
		255	87° 29' 18.503" E	24° 31' 42.850" N	549478.483	2712836.121
		256	87° 29' 18.510" E	24° 31' 42.885" N	549478.676	2712837.198
		257	87° 29' 19.477" E	24° 31' 42.733" N	549505.902	2712832.619
		258	87° 29' 20.106" E	24° 31' 42.572" N	549523.617	2712827.73
		259	87° 29' 19.848" E	24° 31' 42.220" N	549516.396	2712816.878
		260	87° 29' 20.310" E	24° 31' 41.749" N	549529.447	2712802.438
		261	87° 29' 20.481" E	24° 31' 41.818" N	549534.251	2712804.577
		262	87° 29' 20.832" E	24° 31' 42.517" N	549544.051	2712826.111
		263	87° 29' 21.400" E	24°31' 42.433" N	549560.042	2712823.584
		264	87° 29' 22.235" E	24° 31' 42.056" N	549583.578	2712812.072
		265	87° 29' 22.471" E	24° 31' 42.293" N	549590.192	2712819.385
		266	87° 29'23.029" E	24° 31' 42.245" N	549605.898	2712817.964
		267	87° 29' 23.185" E	24° 31' 42.037" N	549610.31	2712811.582
		268	87° 29' 23.422" E	24° 31' 41.722" N	549617.013	2712801.918
		269	87° 29' 23.692" E	24° 31' 41.553" N	549624.629	2712796.747
		270	87° 29' 24.137" E	24° 31' 41.743" N	549637.129	2712802.635
		271	87° 29' 24.656" E	24° 31' 41.798" N	549651.726	2712804.378
		272	87° 29' 24.925" E	24° 31' 41.632" N	549659.313	2712799.3
		273	87° 29' 25.899" E	24° 31' 41.323" N	549686.753	2712789.893
		274	87° 29' 25.813" E	24° 31' 41.000" N	549684.368	2712779.95
		275	87° 29' 26.746" E	24° 31' 40.727" N	549710.65	2712771.647

SURAJIT DAS
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		276	87° 29' 28.083" E	24° 31' 40.451" N	549748.3	2712763.292
		277	87° 29' 28.946" E	24° 31' 40.135" N	549772.617	2712753.659
		278	87° 29' 29.527" E	24° 31' 39.901" N	549788.99	2712746.52
		279	87° 29' 30.379" E	24° 31' 39.507" N	549813.006	2712734.488
		280	87° 29' 31.126" E	24° 31' 38.835" N	549834.099	2712713.894
		281	87° 29' 31.343" E	24° 31' 38.842" N	549840.204	2712714.131
		282	87° 29' 31.606" E	24° 31' 38.850" N	549847.603	2712714.403
		283	87° 29' 31.692" E	24° 31' 38.853" N	549850.023	2712714.504
		284	87° 29' 31.930" E	24° 31' 38.762" N	549856.729	2712711.729
		285	87° 29' 32.803" E	24° 31' 38.427" N	549881.33	2712701.513
		286	87° 29' 32.808" E	24° 31' 38.427" N	549881.471	2712701.514
		287	87° 29' 33.504" E	24° 31' 38.375" N	549901.06	2712699.985
		288	87° 29' 33.909" E	24° 31' 38.345" N	549912.459	2712699.102
		289	87° 29' 34.912" E	24° 31' 38.326" N	549940.683	2712698.619
		290	87° 29' 35.828" E	24° 31' 38.483" N	549966.44	2712703.54
		291	87° 29' 35.836" E	24° 31' 38.483" N	549966.665	2712703.541
		292	87° 29' 37.128" E	24° 31' 38.496" N	550003.017	2712704.07
		293	87° 29' 37.698" E	24° 31' 38.502" N	550019.055	2712704.312
		294	87° 29' 37.982" E	24° 31' 38.504" N	550027.045	2712704.402
		295	87° 29' 39.127" E	24° 31' 39.419" N	550059.162	2712732.66
		296	87°29' 39.244" E	24° 31' 39.451" N	550062.45	2712733.656
		297	87° 29' 40.277" E	24° 31' 39.734" N	550091.485	2712742.464
		298	87° 29' 40.864" E	24° 31' 39.835" N	550107.991	2712745.63
		299	87° 29' 41.432" E	24° 31' 39.848" N	550123.971	2712746.087
		300	87° 29' 41.551" E	24° 31' 39.899" N	550127.314	2712747.668
		301	87° 29' 41.725" E	24° 31' 39.974" N	550132.202	2712749.992
		302	87° 29' 41.758" E	24° 31' 39.898" N	550133.139	2712747.658
		303	87°29' 41.795" E	24° 31' 39.811" N	550134.189	2712744.986
		304	87° 29' 41.971" E	24° 31' 39.388" N	550139.188	2712731.994
		305	87° 29' 42.439" E	24°31' 38.997" N	550152.4	2712720.015
		306	87° 29' 42.844" E	24° 31' 38.995" N	550163.795	2712719.994
		307	87° 29' 43.093" E	24° 31' 38.929" N	550170.809	2712717.989
		308	87° 29' 43.150" E	24° 31' 39.092" N	550172.395	2712723.009
		309	87°29' 43.690" E	24° 31' 39.057" N	550187.593	2712721.987
		310	87° 29' 44.331" E	24° 31' 39.123" N	550205.622	2712724.081
		311	87° 29' 44.284" E	24° 31' 39.218" N	550204.289	2712726.998
		312	87° 29' 44.253" E	24° 31' 39.348" N	550203.402	2712730.994

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		313	87°29' 44.169" E	24° 31' 39.576" N	550201.013	2712737.998
		314	87° 29' 44.105" E	24° 31' 39.674" N	550199.202	2712741.005
		315	87° 29' 44.067" E	24°31' 39.869"' N	550198.111	2712746.999
		316	87° 29' 44.063" E	24° 31' 39.891" N	550197.996	2712747.675
		317	87° 29' 44.032" E	24° 31' 40.064" N	550197.105	2712752.993
		318	87° 29' 44.020" E	24° 31' 40.079" N	550196.765	2712753.453
		319	87° 29' 44.179" E	24°31' 40.545" N	550201.188	2712767.802
		320	87° 29' 44.262" E	24°31' 41.067" N	550203.465	2712783.865
		321	87° 29' 44.197" E	24° 31' 41.569" N	550201.581	2712799.299
		322	87° 29' 44.362" E	24° 31' 42.039" N	550206.172	2712813.771
		323	87°29' 44.362" E	24° 31' 42.092" N	550206.166	2712815.401
		324	87°29' 44.362" E	24° 31' 42.254" N	550206.148	2712820.384
		325	87° 29' 44.467" E	24" 31' 42.690" N	550209.054	2712833.804
		326	87° 29' 44.422" E	24°31' 43.265" N	550207.725	2712851.485
		327	87° 29' 44.438" E	24° 31' 43.841" N	550208.111	2712869.203
		328	87° 29' 44.427" E	24° 31' 44.060" N	550207.777	2712875.937
		329	87°29' 44.559" E	24° 31' 44.583" N	550211.434	2712892.036
		330	87°29' 44.500" E	24°31' 44.879" N	550209.741	2712901.134
		331	87° 29' 44.489" E	24° 31' 44.935" N	550209.425	2712902.856
		332	87° 29' 44.511" E	24° 31' 45.039" N	550210.033	2712906.056
		333	87° 29' 44.875" E	24° 31' 45.150" N	550220.262	2712909.507
		334	87° 29' 45.133" E	24° 31' 45.328" N	550227.502	2712915.008
		335	87° 29' 45.213" E	24° 31' 45.508" N	550229.733	2712920.552
		336	87° 29' 45.679" E	24° 31' 45.754" N	550242.818	2712928.166
		337	87° 29' 45.618" E	24° 31'46.084" N	550241.065	2712938.309
		338	87° 29' 45.520" E	24° 31' 46.333" N	550238.28	2712945.958
		339	87° 29' 45.458" E	24°31' 46.719" N	550236.493	2712957.824
		340	87° 29' 45.559" E	24° 31' 46.956" N	550239.309	2712965.123
		341	87° 29' 45.772" E	24° 31' 46.825" N	550245.316	2712961.116
		342	87° 29' 46.271" E	24° 31' 46.314" N	550259.413	2712945.449
		343	87° 29' 46.588" E	24° 31' 46.242" N	550268.34	2712943.267
		344	87° 29' 48.191" E	24°31' 44.780" N	550313.606	2712898.463
		345	87°29' 48.750" E	24° 31' 44.329" N	550329.384	2712884.648
		346	87° 29' 49.191" E	24 ° 31' 43.935" N	550341.836	2712872.575
		347	87° 29' 49.840" E	24°31' 43.435" N	550360.153	2712857.262
		348	87°29' 50.073" E	24° 31' 43.246" N	550366.73	2712851.473
		349	87°29' 50.158" E	24° 31' 42.879" N	550369.162	2712840.193

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Chief General Manager/Project Head
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		350	87° 29' 50.330" E	24° 31' 42.816" N	550374.009	2712838.273
		351	87° 29' 50.575" E	24° 31' 42.456" N	550380.942	2712827.226
		352	87° 29' 50.988" E	24° 31' 41.737" N	550392.643	2712805.153
		353	87° 29' 51.221" E	24° 31' 41.335" N	550399.243	2712792.813
		354	87° 29' 51.661" E	24°31' 40.596" N	550411.705	2712770.128
		355	87° 29' 51.971" E	24° 31' 40.333" N	550420.457	2712762.071
		356	87° 29' 52.547" E	24° 31' 40.178" N	550436.681	2712757.362
		357	87° 29' 52.767" E	24° 31' 39.889" N	550442.904	2712748.495
		358	87° 29' 52.957" E	24° 31' 39.133" N	550448.334	2712725.263
		359	87° 29' 53.185" E	24°31' 38.522" N	550454.817	2712706.493
		360	87° 29' 53.596" E	24° 31' 38.106" N	550466.428	2712693.74
		361	87° 29' 53.961" E	24° 31' 37.624" N	550476.751	2712678.953
		362	87° 29' 54.137" E	24° 31' 37.305" N	550481.739	2712669.159
		363	87° 29' 54.174" E	24° 31' 37.031" N	550482.81	2712660.736
		364	87° 29' 54.249" E	24° 31' 36.473" N	550484.983	2712643.581
		365	87° 29' 54.521" E	24° 31' 36.020" N	550492.687	2712629.676
		366	87° 29' 54.989" E	24° 31' 35.149" N	550505.952	2712602.934
		367	87°29' 55.759" E	24° 31' 33.563" N	550527.794	2712554.232
		368	87° 29' 55.790" E	24° 31' 32.077" N	550528.831	2712508.531
		369	87° 29' 55.810" E	24° 31' 31.081" N	550529.505	2712477.899
		370	87° 29' 55.831" E	24° 31' 30.012" N	550530.215	2712445.022
		371	87° 29' 55.871" E	24° 31' 28.028" N	550531.561	2712384.005
		372	87° 29' 56.036" E	24° 31' 19.716" N	550537.127	2712128.372
		373	87° 29' 56.144" E	24° 31' 14.320" N	550540.766	2711962.419
		374	87° 29' 56.150" E	24° 31' 13.977" N	550540.973	2711951.87
		375	87° 29' 56.150" E	24° 31' 13.977" N	550540.973	2711951.87
		376	87° 29' 54.749" E	24° 31' 11.025" N	550501.878	2711860.934
		377	87° 29' 50.246" E	24° 31' 1.535" N	550376.219	2711568.596
		378	87° 29' 43.316" E	24° 30' 58.893" N	550181.502	2711486.635
		379	87° 29' 36.954" E	24° 30' 56.468" N	550002.743	2711411.409
		380	87° 29' 30.435" E	24° 30' 53.982" N	549819.57	2711334.293
		381	87° 29' 14.390" E	24° 30' 47.864" N	549368.725	2711144.523
		382	87° 29' 9.206" E	24° 30' 45.887" N	549223.058	2711083.203
		383	87° 29' 8.674" E	24 ° 30' 45.684" N	549208.11	2711076.907
		384	87° 29' 8.131" E	24° 30' 45.477" N	549192.852	2711070.487
		385	87° 29' 8.050" E	24 ° 30' 45.446" N	549190.576	2711069.525
		386	87° 29' 7.890" E	24° 30' 45.385" N	549186.08	2711067.633

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		387	87° 29' 7.890" E	24° 30' 45.386" N	549186.079	2711067.664

1.4 Details of the Previous Approval of Mining Plan:

1.4.1	Date of approval	N/A
1.4.2	Conditions if any	N/A
1.4.3	Scheduled year of start of production.	N/A
1.4.4	Proposed year of achieving the targeted production.	N/A
1.4.5	Date of actual commencement of mining operations, if operations already started.	N/A
1.4.6	Likely date of mining operations, if operations not yet started & reasons for non-commencement of operations.	N/A
1.4.7	Planned production and actual levels achieved in last 3 years (Coal in Mte, OB in MM^3, SR in M^3/te).	N/A
1.4.8	Statutory obligations vis-à-vis compliance status in a tabular form.	N/A
1.4.9	Reasons for difference between the planned and actual production levels.	N/A

1.5 Parameters of Approved Mining Plan vis-à-vis Proposed Mining Plan:

		Approved Mining Plan	Proposed Mining Plan
1.5.1	Block area in " ha"	N/A	714.8553 ha (≈715 ha)
1.5.2	Block area projectised "ha"	N/A	714.8553 ha (≈715 ha)
1.5.3	Lease area "ha"	N/A	714.8553 ha (≈715 ha)
1.5.4	Project area "ha"	N/A	714.8553 ha (≈715 ha)

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		Approved Mining Plan	Proposed Mining Plan
1.5.5	Life of the project " yrs"	N/A	38 years.
1.5.6	Minimum and Maximum Depth of working "m".	N/A	45 meter and 320 meter respectively.
1.5.7	Geological Block "ha".	N/A	714.8553 ha (≈715 ha)
1.5.8	Production Target " MTPA"	N/A	9.00MTPA (Rated); 13.50 MTPA (Peak Rated Capacity).
1.5.9	Seams available "As per GR".	N/A	IX, VIIIT, VIIIM, VIIIB, VIIC, VIIB, VIIA, VII, L6, L5, VIT, VIB, VT, VB, V, L4, IVT, IVB, L3, IIIT, IIIB, III, L2, IITT, IITB, IIT, IIB, II, L1, IT, IM, IB.
1.5.10	Seams not considered for Mining with reasons.	N/A	Seam L2 has not been considered for mining because of its limited intersections (only 3 intersections).
1.5.11	Gross Geological Reserve "MT".	N/A	415.02 MT (Gross Geological reserve has been estimated with a cutoff thickness of 0.5 m)
1.5.12	Net Geological Reserve "MT".	N/A	373.52 MT (Net Geological reserve has been estimated with a cutoff thickness of 0.5 m)
1.5.13	Blocked Reserve "Mt"	N/A	103.94 MT (This includes reserve blocked under embankment, barriers & batter slopes. This also includes about 2.57 MT of Coal below the planned depth of 320 m).
1.5.14	Mineable Reserve 'Mt"	N/A	269.58MT
1.5.15	Extractable Reserve "MT"	N/A	262.84 MT
1.5.16	% of Extraction/ Recovery.	N/A	70.37%
1.5.17	Reserves depleted (till base date)- Reserves Mt	N/A	Nil.
1.5. 18	Balance Extractable reserves " Mt"	N/A	262.84 MT
1.5.19	Average Grade	N/A	G10
1.5.20	OB in MM^3	N/A	854.98Mcum
1.5.21	SR in MM^3/te	N/A	3.25Cum/Te

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		Approved Mining Plan	Proposed Mining Plan
1.5.22	Mining Technology	N/A	Drilling and blasting is proposed for OB production. Blast free surface miner with FEL-RDT combination is proposed for coal removal. Shovel-Dumper combination is proposed for OB excavation. Coal will be transported through steep angle mine face conveyor system.
1.5.23	Coal Beneficiation envisaged.	N/A	Not envisaged.
1.5.24	Handling of Rejects	N/A	Not envisaged.
1.5.25	**Landuse Pattern "Ha"**		
1	Excavation area	N/A	643.76
2	Top Soil Dump	N/A	6.53
3	External Dump	N/A	-
4	Safety Zone	N/A	10.84
5	Other Use	N/A	38.10
6	Infrastructure area	N/A	9.30
7	Green Belt	N/A	3.06
8	Undisturbed area	N/A	3.2653
	Total	N/A	714.8553
1.5.26	**Reasons for Revision**	Not Applicable	

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Chief General Manager/Project Head
Pachwara South Coal Mine Project
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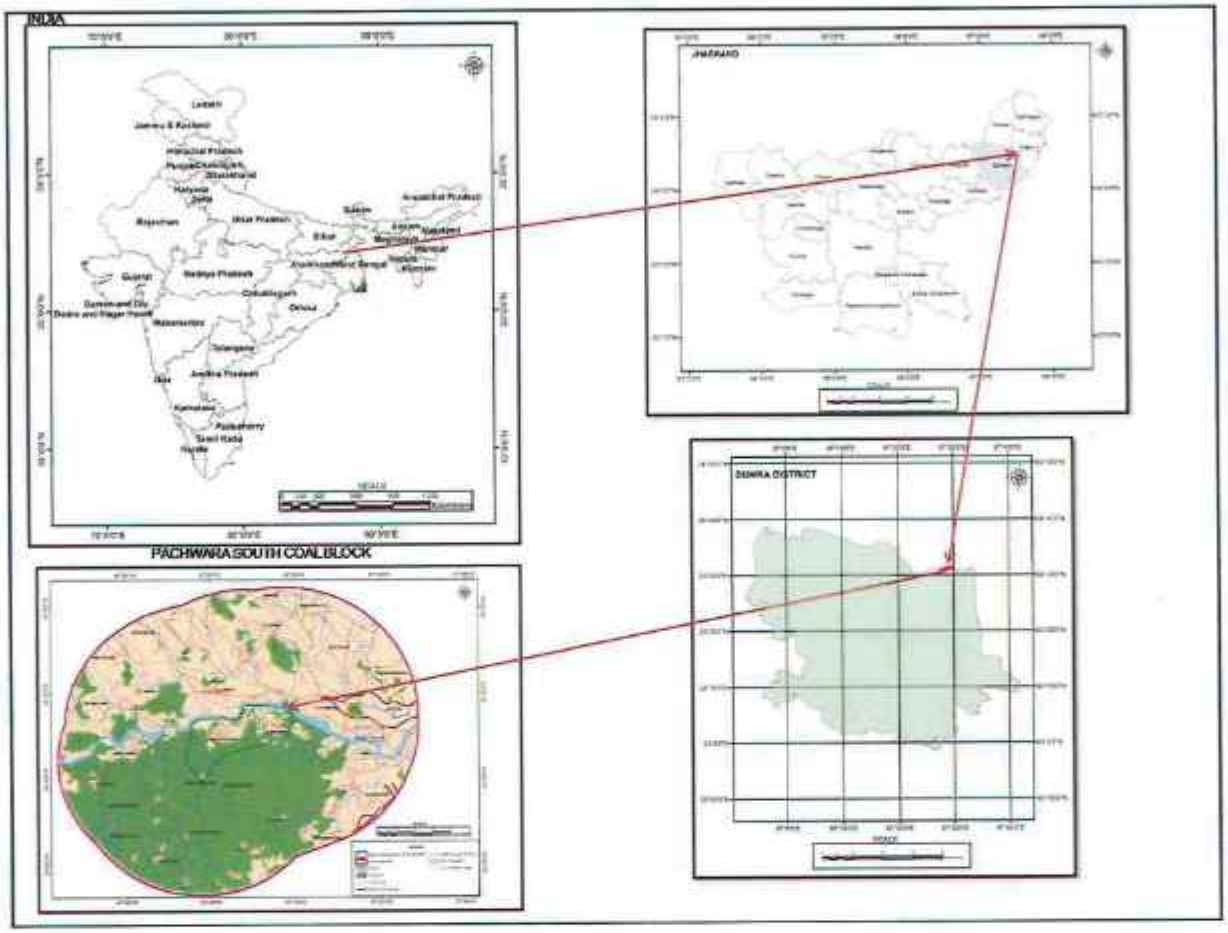

Figure No 1.1: Plan showing the location of Pachwara South Coal Block, Dumka District, Jharkhand.

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Chief General Manager/Project Head
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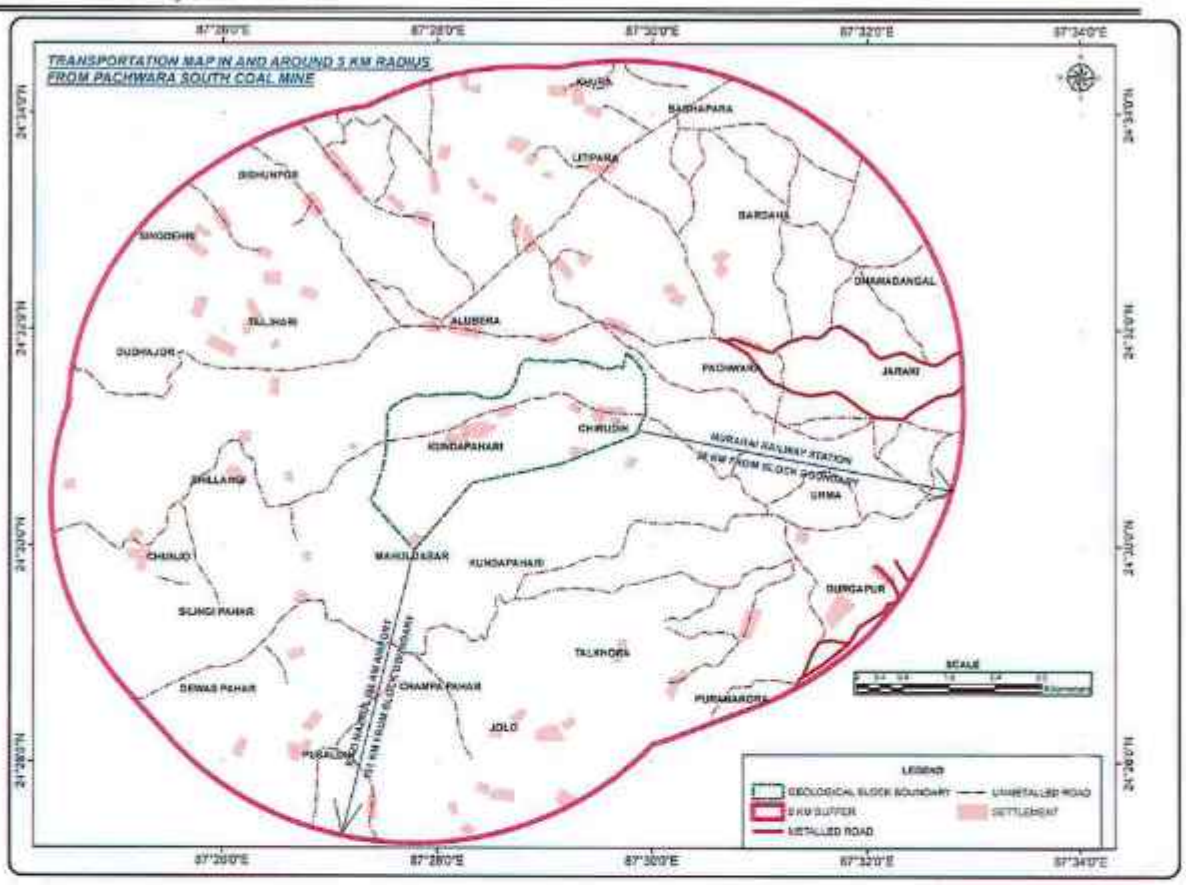

Figure No 1.2: Plan showing various options of Transportation with respect to Pachwara South Coal Block.

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Chief General Manager/Project Head
Pachwara South Coal Mine Project
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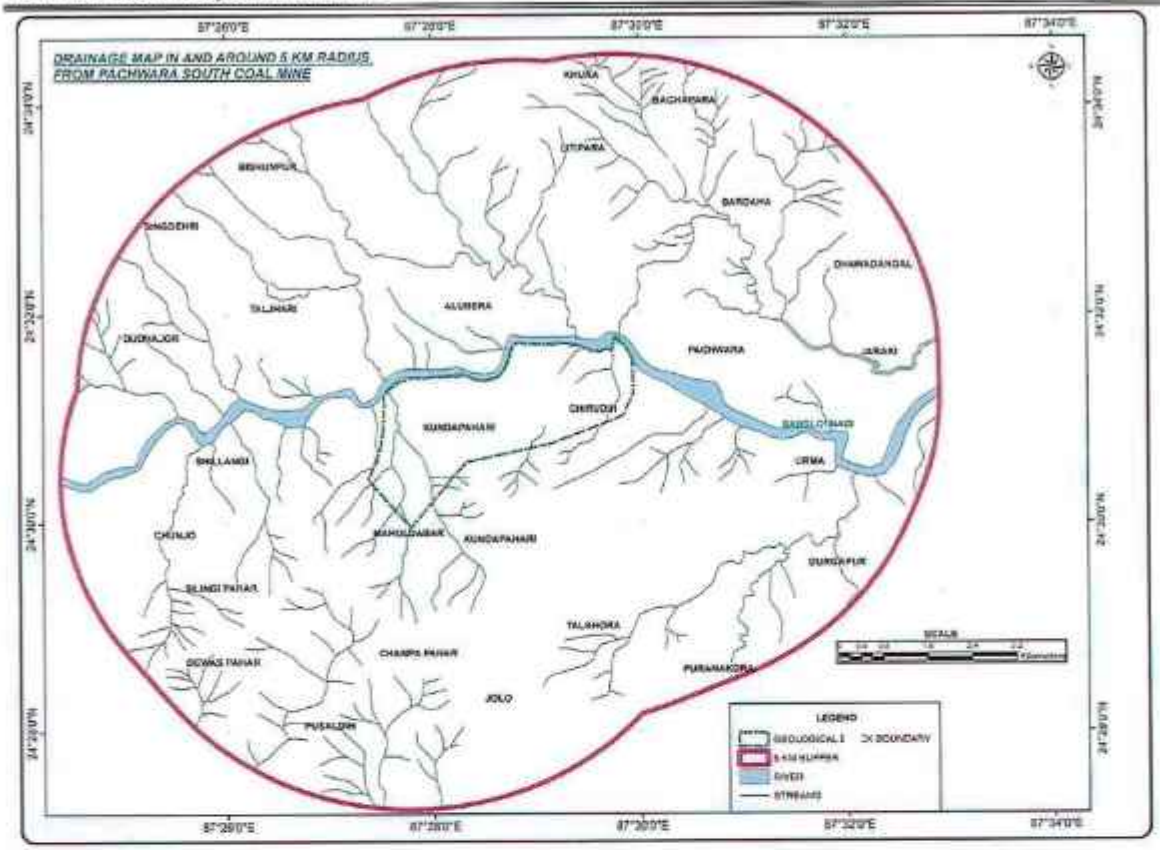

Figure No 1.3: Plan showing the drainage pattern of Pachwara South Coal Block.

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Chief General Manager/Project Head
Pachwara South Coal Mine Project
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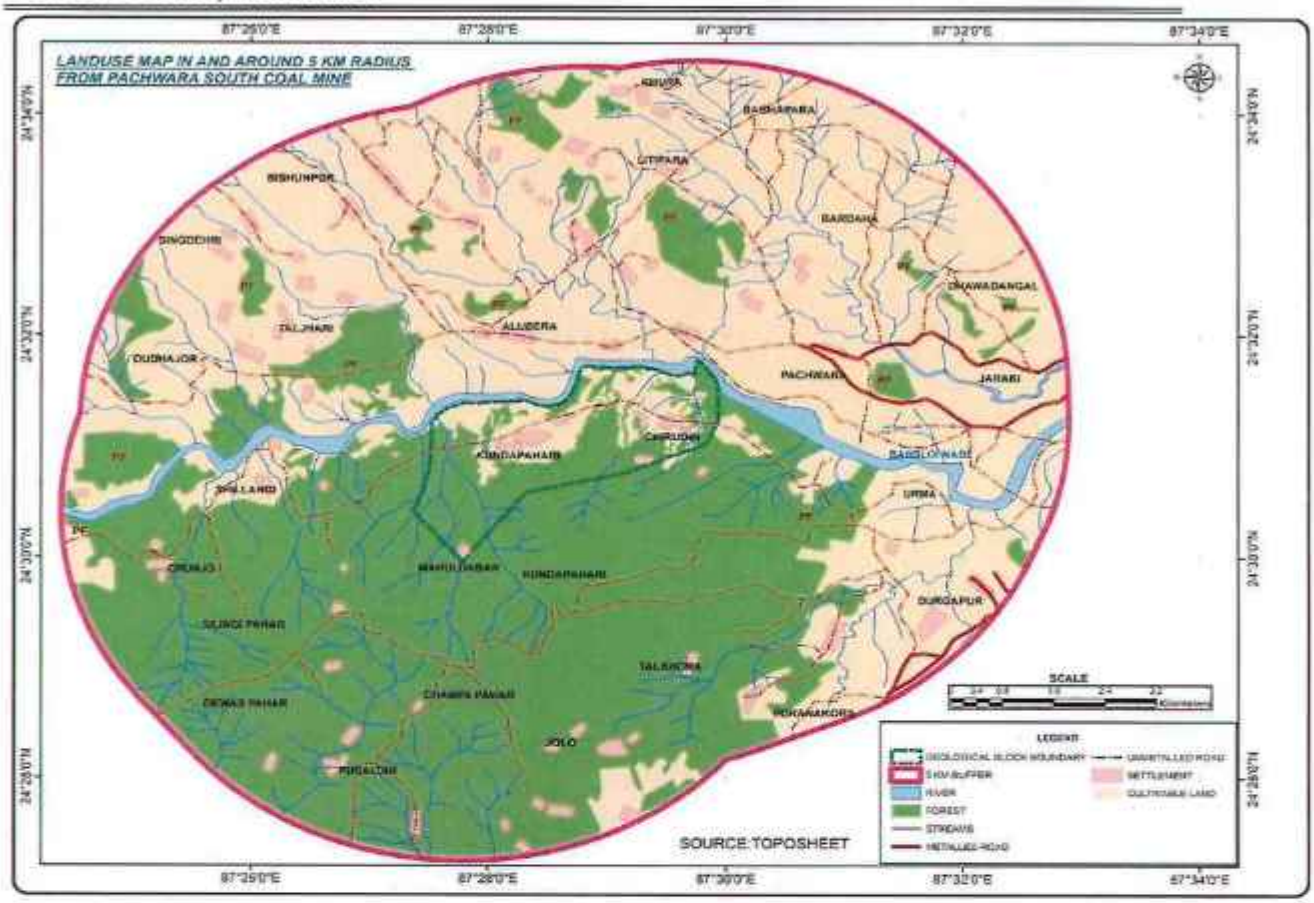

Figure No 1.4: Plan showing the landuse pattern of Pachwara South Coal Block.

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Chief General Manager/Project Head
Pachwara South Coal Mine Project
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Chapter-2: Exploration, Geology, Seam Sequence, Coal Quality and Reserve.

2.1 Details of the Block

	Parameters	Details	
2.1.1	Particulars of adjacent blocks: North, South, East, West.	**North:** Pachwara Central Coal Block separated by the Bansloi river.	**East:** Western boundary of the Urma Paharitola Coal Block.
		South: No Block.	**West:** No Block.
2.1.2	Location of the Block (District/State)	Pachwara South block is located in the southernmost part of the Pachwara Coalfield in Dumka District, Jharkhand. The limiting Co-ordinates of the block are, lies on Toposheet number G45V6 & G45V7andareas given below: **Latitude:** 24° 29' 57.404" N-24° 31' 46.956" N (WGS84 45 R 2709584.08 N - 2712965.123 N). **Longitude:**87° 27' 22.010" E-87° 29' 56.150" E (WGS84 45 R 546208.62 E - 550540.973 E).	
2.1.3	Area of the Block "Ha"	714.8553 ha (≈715 ha)	
2.1.4	Area of the geological block projectised"in Ha" (Area of the geological block consideredfor liquidation of coal/lignite reserve).	714.8553 ha (≈715 ha)	
2.1.5	Balance area yet to be projectised "Ha".	NA	
2.1.6	Likely Reserve in the area yet to be projectized "Mte"	NA	
2.1.7	Cardinal Point Co-ordinates of the non-coal/lignite bearing area/existing mining lease outside the allotted geological Coal/Lignite Block (Duly certified in line with para 1.9 of the	The Geo-reference Coordinates of the Block Boundary post DGPS Survey as certified by the CMPDIL is furnished below in Table No. 2.1. Please refer to the **Plate No. II** for the certified block boundary.	

SURAJIT DAS
Chief General Manager/Project Head
Pachwara South Coal Mine Project
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Guideline, if fresh inning lease required)

Table No. 2.1

Geo-referenced Coordinates of Pachwara South Coal Block.

Boundary Points	Longitude	Latitude	Easting (X)	Northing (Y)
1	87° 29' 7.879" E	24° 30' 45.384" N	549185.77	2711067.601
2	87° 29' 7.822" E	24° 30' 45.371" N	549184.168	2711067.196
3	87° 29' 7.773" E	24° 30' 45.361" N	549182.79	2711066.883
4	87° 29' 7.725" E	24° 30' 45.351" N	549181.44	2711066.571
5	87° 29' 7.694" E	24 ° 30' 45.344" N	549180.568	2711066.353
6	87° 29' 7.647" E	24° 30' 45.334" N	549179.247	2711066.041
7	87° 29' 7.588" E	24° 30' 45.321" N	549177.588	2711065.635
8	87° 29' 7.114" E	24 ° 30' 45.218" N	549164.26	2711062.42
9	87° 29' 4.731" E	24° 30' 44.704" N	549097.257	2711046.376
10	87° 28' 59.367" E	24° 30' 43.545" N	548946.434	2711010.2
11	87° 28' 58.692" E	24° 30' 43.400" N	548927.455	2711005.674
12	87° 28' 19.283" E	24° 30' 34.887" N	547819.349	2710740.008
13	87° 28' 18.697" E	24° 30' 34.208" N	547802.929	2710719.068
14	87° 28' 16.915" E	24° 30' 32.142" N	547752.998	2710655.353
15	87° 28' 15.988" E	24° 30' 31.067" N	547727.024	2710622.201
16	87° 28' 15.573" E	24° 30' 30.586" N	547715.396	2710607.367
17	87° 28' 14.942" E	24° 30' 29.853" N	547697.715	2710584.762
18	87° 28' 12.958" E	24° 30' 27.553" N	547642.123	2710513.832
19	87° 28' 5.776" E	24° 30' 19.227" N	547440.877	2710257.066
20	87° 28' 1.586" E	24° 30' 14.367" N	547323.466	2710107.189
21	87° 28' 0.519" E	24° 30' 13.131" N	547293.567	2710069.073
22	87° 27' 57.507" E	24° 30' 9.638" N	547209.163	2709961.354
23	87° 27' 48.459" E	24° 29' 59.146" N	546955.609	2709637.8
24	87° 27' 46.957" E	24° 29' 57.404" N	546913.517	2709584.08
25	87° 27' 45.373" E	24° 29' 59.155" N	546868.758	2709637.785
26	87° 27' 35.825" E	24° 30' 9.704" N	546598.963	2709961.339

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Chief General Manager/Project Head
Pachwara South Coal Mine Project
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		27	87° 27' 33.779" E	24° 30' 11.965" N	546541.152	2710030.688
		28	87° 27' 33.670" E	24° 30' 12.085" N	546538.072	2710034.369
		29	87° 27' 32.647" E	24° 30' 13.216" N	546509.166	2710069.059
		30	87° 27' 32.401" E	24° 30' 13.488" N	546502.215	2710077.401
		31	87° 27' 32.118" E	24° 30' 13.800" N	546494.219	2710086.971
		32	87° 27' 31.752" E	24° 30' 14.204" N	546483.878	2710099.362
		33	87° 27' 22.010" E	24° 30' 24.967" N	546208.62	2710429.487
		34	87° 27' 23.843" E	24° 30' 28.000" N	546259.896	2710522.942
		35	87° 27' 24.863" E	24° 30' 30.373" N	546288.359	2710596.022
		36	87° 27' 26.269" E	24° 30' 34.231" N	546327.533	2710714.812
		37	87° 27' 26.642" E	24° 30' 35.401" N	546337.91	2710750.832
		38	87° 27' 27.503" E	24° 30' 38.105" N	546361.864	2710834.078
		39	87° 27' 28.889" E	24° 30' 41.980" N	546400.473	2710953.389
		40	87° 27' 29.162" E	24° 30'43.101" N	546408.041	2710987.893
		41	87° 27' 29.769" E	24° 30' 45.591" N	546424.868	2711064.534
		42	87° 27' 30.131" E	24° 30' 47.076" N	546434.903	2711110.241
		43	87° 27' 30.156" E	24° 30' 47.263" N	546435.588	2711115.995
		44	87° 27' 30.450" E	24° 30' 49.473" N	546443.635	2711183.994
		45	87° 27' 30.731" E	24° 30' 51.574" N	546451.328	2711248.64
		46	87° 27' 31.260" E	24° 31' 0.288" N	546465.324	2711516.703
		47	87° 27' 31.323" E	24° 31' 1.312" N	546466.992	2711548.203
		48	87° 27' 31.344" E	24° 31' 1.667" N	546467.547	2711559.124
		49	87° 27' 31.507" E	24° 31' 4.342" N	546471.86	2711641.413
		50	87° 27' 31.536" E	24° 31' 4.830" N	546472.627	2711656.425
		51	87° 27' 31.544" E	24° 31' 4.958" N	546472.839	2711660.362
		52	87° 27' 31.577" E	24° 31' 7.944" N	546473.462	2711752.205
		53	87° 27' 31.577" E	24° 31' 7.990" N	546473.457	2711753.62
		54	87° 27' 31.591" E	24° 31' 9.258" N	546473.722	2711792.62
		55	87° 27' 31.607" E	24° 31' 10.745" N	546474.02	2711838.357
		56	87° 27' 31.622" E	24° 31' 12.082" N	546474.305	2711879.48

SUBAJIT DAS
Chief General Manager/Project Head
Pachwara South Coal Mine Project
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		57	87° 27' 31.633" E	24° 31' 13.138" N	546474.507	2711911.96
		58	87° 27' 31.634" E	24° 31' 13.229" N	546474.526	2711914.759
		59	87° 27' 31.621" E	24° 31' 13.492" N	546474.133	2711922.847
		60	87° 27' 31.815" E	24° 31' 13.685" N	546479.572	2711928.801
		61	87° 27' 31.932" E	24° 31' 13.881" N	546482.845	2711934.84
		62	87° 27' 32.837" E	24° 31' 14.625" N	546508.234	2711957.808
		63	87° 27' 33.244" E	24° 31' 14.919" N	546519.657	2711966.888
		64	87° 27' 32.919" E	24° 31' 15.224" N	546510.48	2711976.238
		65	87° 27' 33.418" E	24° 31' 15.845" N	546524.458	2711995.385
		66	87° 27' 33.535" E	24° 31' 15.995" N	546527.735	2712000.009
		67	87° 27' 33.938" E	24° 31' 16.510" N	546539.022	2712015.887
		68	87° 27' 34.449" E	24° 31' 16.741" N	546553.377	2712023.04
		69	87° 27' 36.565" E	24°31' 18.152" N	546612.774	2712066.635
		70	87° 27' 38.644" E	24° 31' 19.540" N	546671.132	2712109.521
		71	87° 27' 38.476" E	24° 31' 19.608" N	546666.398	2712111.596
		72	87° 27' 39.815" E	24° 31' 20.469" N	546703.987	2712138.204
		73	87° 27' 39.803" E	24° 31' 20.501" N	546703.646	2712139.187
		74	87° 27' 40.120" E	24° 31' 20.702" N	546712.545	2712145.399
		75	87° 27' 41.037" E	24° 31' 21.128" N	546738.304	2712158.587
		76	87° 27' 42.151" E	24° 31' 21.468" N	546769.615	2712169.149
		77	87° 27' 42.450" E	24° 31' 21.523" N	546778.023	2712170.869
		78	87° 27' 43.590" E	24° 31' 21.815" N	546810.071	2712179.957
		79	87° 27' 43.970" E	24° 31' 21.906" N	546820.754	2712182.792
		80	87° 27' 44.336" E	24° 31' 21.994" N	546831.043	2712185.533
		81	87° 27' 45.885" E	24° 31' 22.745" N	546874.552	2712208.777
		82	87° 27' 46.890" E	24° 31' 23.172" N	546902.787	2712222.005
		83	87° 27' 47.900" E	24° 31' 23.485" N	546931.175	2712231.727
		84	87° 27' 48.647" E	24° 31' 23.496" N	546952.193	2712232.136
		85	87° 27' 48.648" E	24° 31' 23.496" N	546952.221	2712232.136
		86	87° 27' 48.649" E	24° 31' 23.496" N	546952.249	2712232.137

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		87	87° 27' 49.313" E	24° 31' 23.431" N	546970.94	2712230.2
		88	87° 27' 50.345" E	24° 31' 23.308" N	546999.991	2712226.515
		89	87° 27' 50.931" E	24° 31' 23.238" N	547016.487	2712224.417
		90	87° 27' 51.904" E	24°31' 23.183" N	547043.872	2712222.818
		91	87° 27' 53.353" E	24°31' 23.197" N	547084.643	2712223.385
		92	87° 27' 53.994" E	24° 31' 23.265" N	547102.672	2712225.538
		93	87° 27' 54.149" E	24° 31' 23.245" N	547107.036	2712224.937
		94	87' 27' 55.305" E	24" 31' 23.093" N	547139.579	2712220.372
		95	87° 27' 55.317" E	24° 31' 23.057" N	547139.921	2712219.266
		96	87° 27' 56.960" E	24° 31' 23.385" N	547186.118	2712229.51
		97	87° 27' 56.915" E	24° 31' 23.308" N	547184.86	2712227.137
		98	87° 27' 57.945" E	24° 31' 23.416" N	547213.831	2712230.557
		99	87° 27' 59.061" E	24° 31' 23.820" N	547245.191	2712243.089
		100	87° 28' 1.218" E	24° 31' 23.798" N	547305.888	2712242.617
		101	87°28' 1.854" E	24° 31' 23.696" N	547323.795	2712239.54
		102	87° 28' 2.521" E	24° 31' 23.681" N	547342.564	2712239.143
		103	87° 28' 3.385" E	24° 31' 23.785" N	547366.865	2712242.424
		104	87" 28' 4.066" E	24" 31' 23.866" N	547386.019	2712244.98
		105	87° 28' 4.956" E	24' 31' 23.931" N	547411.055	2712247.064
		106	87° 28' 5.446" E	24° 31' 23.978" N	547424.838	2712248.556
		107	87° 28' 6.111" E	24"31'24.113"N	547443.536	2712252.772
		108	87° 28' 6.741" E	24° 31' 24.034" N	547461.271	2712250.402
		109	87° 28' 7.775" E	24° 31' 24.105" N	547490.359	2712252.685
		110	87° 28' 8.715" E	24' 31' 24.060" N	547516.813	2712251.391
		111	87" 28' 9.756" E	24° 31' 24.156" N	547546.095	2712254.443
		112	87° 28' '9.862" E	24° 31' 23.901" N	547549.104	2712246.61
		113	87° 28' 10.006" E	24° 31' 23.683" N	547553.179	2712239.919
		114	87° 28' 10.436" E	24° 31' 23.922" N	547565.254	2712247.311
		115	87° 28' 10.350" E	24° 31' 24.085" N	547562.817	2712252.316
		116	87° 28' 10.626" E	24° 31' 24.255" N	547570.565	2712257.571

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		117	87° 28' 10.989" E	24° 31' 24.314" N	547580.773	2712259.42
		118	87° 28' 11.204" E	24° 31' 24.361" N	547586.818	2712260.887
		119	87° 28' 11.578" E	24° 31' 24.269" N	547597.351	2712258.093
		120	87° 28' 12.362" E	24° 31' 24.138" N	547619.425	2712254.139
		121	87° 28' 12.869" E	24° 31' 24.149" N	547633.69	2712254.526
		122	87° 28' 13.548" E	24° 31' 24.103" N	547652.801	2712253.176
		123	87° 28' 13.761" E	24° 31' 24.068" N	547658.798	2712252.12
		124	87° 28' 14.174" E	24° 31' 24.055" N	547670.421	2712251.76
		125	87° 28' 14.738" E	24° 31' 24.143" N	547686.281	2712254.52
		126	87° 28' 15.405" E	24° 31' 24.270" N	547705.036	2712258.49
		127	87° 28' 16.197" E	24° 31' 24.486" N	547727.299	2712265.21
		128	87° 28' 16.672" E	24° 31' 24.560" N	547740.657	2712267.532
		129	87° 28' 17.139" E	24° 31' 24.684" N	547753.785	2712271.39
		130	87° 28' 17.941" E	24° 31' 24.760" N	547776.343	2712273.805
		131	87° 28' 18.201" E	24° 31' 24.779" N	547783.657	2712274.414
		132	87° 28' 18.321" E	24° 31' 24.787" N	547787.033	2712274.672
		133	87° 28' 18.666" E	24° 31' 24.775" N	547796.742	2712274.336
		134	87° 28' 19.032" E	24' 31' 24.932" N	547807.024	2712279.2
		135	87° 28' 19.516" E	24° 31' 24.814" N	547820.655	2712275.617
		136	87° 28' 20.048" E	24° 31' 24.423" N	547835.666	2712263.643
		137	87° 28' 20.518" E	24° 31' 24.229" N	547848.911	2712257.721
		138	87° 28' 20.994" E	24° 31' 24.174" N	547862.311	2712256.075
		139	87° 28' 20.993" E	24° 31' 24.173" N	547862.283	2712256.044
		140	87° 28' 21.631" E	24° 31' 23.676" N	547880.288	2712240.82
		141	87° 28' 22.188" E	24° 31' 23.565" N	547895.972	2712237.46
		142	87° 28' 22.944" E	24° 31' 23.253" N	547917.278	2712227.936
		143	87° 28' 23.361" E	24° 31' 23.080" N	547929.03	2712222.656
		144	87° 28' 23.885" E	24° 31' 23.120" N	547943.77	2712223.936
		145	87° 28' 23.956" E	24° 31' 23.053" N	547945.775	2712221.883
		146	87° 28' 24.773" E	24° 31' 22.281" N	547968.845	2712198.217

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		147	87°28' 25.255" E	24° 31' 21.964" N	547982.442	2712188.514
		148	87°28' 25.800" E	24° 31' 21.756" N	547997.799	2712182.169
		149	87°28' 26.532" E	24° 31' 21.698" N	548018.402	2712180.456
		150	87°28' 27.047" E	24° 31' 21.867" N	548032.876	2712185.704
		151	87°28' 28.134" E	24° 31' 21.729" N	548063.477	2712181.564
		152	87°28' 28.786" E	24° 31' 21.691" N	548081.827	2712180.459
		153	87°28' 29.577" E	24° 31' 21.626" N	548104.091	2712178.536
		154	87°28' 29.909" E	24° 31' 21.708" N	548113.425	2712181.09
		155	87°28' 30.386" E	24° 31' 21.826" N	548126.834	2712184.766
		156	87°28' 30.515" E	24° 31' 21.794" N	548130.468	2712183.794
		157	87°28' 31.399" E	24° 31' 21.850" N	548155.336	2712185.602
		158	87°28' 32.359" E	24° 31' 22.086" N	548182.324	2712192.954
		159	87°28' 33.187" E	24° 31' 22.235" N	548205.607	2712197.617
		160	87°28' 33.528" E	24° 31' 22.789" N	548215.143	2712214.689
		161	87°28' 34.379" E	24° 31' 23.183" N	548239.047	2712226.89
		162	87°28' 34.930" E	24° 31' 23.188" N	548254.551	2712227.097
		163	87°28' 35.227" E	24° 31' 22.578" N	548262.973	2712208.364
		164	87°28' 36.637" E	24° 31' 22.952" N	548302.608	2712220.004
		165	87° 28' 37.616" E	24° 31' 23.725" N	548330.073	2712243.874
		166	87° 28' 37.837" E	24° 31' 23.857" N	548336.278	2712247.956
		167	87° 28' 38.716" E	24° 31' 24.385" N	548360.955	2712264.281
		168	87° 28' 38.995" E	24° 31' 24.685" N	548368.774	2712273.535
		169	87° 28' 39.267" E	24° 31' 24.978" N	548376.396	2712282.573
		170	87° 28' 39.492" E	24° 31' 25.315" N	548382.691	2712292.96
		171	87° 28' 39.816" E	24° 31' 25.639" N	548391.774	2712302.957
		172	87° 28' 40.130" E	24° 31' 25.953"N	548400.576	2712312.645
		173	87° 28' 40.415" E	24° 31' 26.238" N	548408.565	2712321.438
		174	87° 28' 40.692" E	24° 31' 26.602" N	548416.32	2712332.661
		175	87° 28' 41.010" E	24° 31' 27.093" N	548425.216	2712347.793
		176	87° 28' 41.294" E	24° 31' 27.742" N	548433.138	2712367.782

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		177	87° 28' 42.022" E	24° 31' 28.531" N	548453.538	2712392.12
		178	87° 28' 42.357" E	24° 31' 28.866" N	548462.929	2712402.456
		179	87° 28' 42.820" E	24° 31' 29.761" N	548475.861	2712430.029
		180	87° 28' 43.026" E	24° 31' 30.670" N	548481.561	2712458.007
		181	87° 28' 43.167" E	24° 31' 31.432" N	548485.447	2712481.457
		182	87° 28' 43.404" E	24° 31' 31.991" N	548492.056	2712498.673
		183	87° 28' 43.697" E	24° 31' 32.795" N	548500.215	2712523.43
		184	87° 28' 44.181" E	24° 31' 33.441" N	548513.764	2712543.346
		185	87° 28' 44.316" E	24° 31' 33.811" N	548517.523	2712554.739
		186	87° 28' 44.637" E	24° 31' 34.469" N	548526.485	2712575.009
		187	87° 28' 44.961" E	24° 31' 35.018" N	548535.543	2712591.926
		188	87° 28' 44.846" E	24° 31' 35.730" N	548532.232	2712613.813
		189	87° 28' 45.164" E	24° 31' 36.476" N	548541.1	2712636.789
		190	87° 28' 45.339" E	24° 31' 37.407" N	548545.924	2712665.44
		191	87° 28' 45.538" E	24° 31' 38.311" N	548551.427	2712693.264
		192	87° 28' 45.672" E	24° 31' 38.726" N	548555.153	2712706.041
		193	87° 28' 45.671" E	24° 31' 39.043" N	548555.091	2712715.791
		194	87° 28' 45.770" E	24° 31' 39.444" N	548557.834	2712728.134
		195	87° 28'46.036" E	24° 31' 39.811" N	548565.279	2712739.448
		196	87° 28' 46.248" E	24° 31' 40.412" N	548571.18	2712757.953
		197	87° 28' 46.549" E	24° 31' 40.874" N	548579.6	2712772.192
		198	87° 28' 46.801" E	24°31' 41.344" N	548586.64	2712786.672
		199	87° 28' 47.057" E	24°31' 41.489" N	548593.828	2712791.157
		200	87° 28' 47.619" E	24°31' 42.309" N	548609.553	2712816.433
		201	87° 28' 48.154" E	24°31' 42.668" N	548624.568	2712827.527
		202	87° 28' 48.531" E	24°31' 42.792" N	548635.163	2712831.377
		203	87° 28' 49.515" E	24°31' 43.233" N	548662.803	2712845.037
		204	87° 28' 50.036" E	24°31' 43.524" N	548677.431	2712854.039
		205	87° 28' 50.409" E	24°31' 43.628" N	548687.915	2712857.274
		206	87° 28' 50.462" E	24° 31' 43.743" N	548689.394	2712860.816

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		207	87° 28' 51.130" E	24° 31' 43.606" N	548708.204	2712856.668
		208	87° 28' 51.711" E	24° 31' 43.462" N	548724.567	2712852.296
		209	87° 28' 52.261" E	24° 31' 43.141" N	548740.077	2712842.477
		210	87° 28' 53.130" E	24° 31' 43.021" N	548764.541	2712838.871
		211	87° 28' 53.415" E	24° 31' 42.860" N	548772.577	2712833.948
		212	87° 28' 53.650" E	24° 31' 42.729" N	548779.204	2712829.942
		213	87° 28' 53.967" E	24° 31' 42.552" N	548788.142	2712824.529
		214	87° 28' 54.408" E	24° 31' 42.303" N	548800.577	2712816.914
		215	87° 28' 55.247" E	24° 31' 42.512" N	548824.162	2712823.424
		216	87° 28' 55.871 " E	24° 31' 42.828" N	548841.686	2712833.205
		217	87° 28' 56.950" E	24° 31' 42.783" N	548872.05	2712831.927
		218	87° 28' 57.279" E	24° 31' 42.904" N	548881.295	2712835.681
		219	87° 28' 58.026" E	24° 31' 42.647" N	548902.341	2712827.85
		220	87° 28' 58.218" E	24° 31' 42.752" N	548907.732	2712831.098
		221	87° 28' 58.809" E	24° 31' 42.950" N	548924.339	2712837.246
		222	87° 28' 59.101" E	24° 31' 42.593" N	548932.594	2712826.295
		223	87° 29' 0.404" E	24° 31' 42.500" N	548969.267	2712823.563
		224	87°29'0.988" E	24° 31' 42.770" N	548985.67	2712831.925
		225	87° 29' 1.497" E	24° 31' 42.792" N	548999.989	2712832.651
		226	87° 29' 1.512" E	24° 31' 42.792" N	549000.411	2712832.653
		227	87° 29' 2.236" E	24° 31' 42.694" N	549020.793	2712829.71
		228	87° 29' 2.978" E	24° 31' 42.552" N	549041.686	2712825.416
		229	87° 29' 3.181" E	24° 31' 42.513" N	549047.402	2712824.236
		230	87° 29' 3.633" E	24° 31' 42.091" N	549060.166	2712811.302
		231	87° 29' 4.074" E	24° 31' 42.118" N	549072.571	2712812.176
		232	87° 29' 5.039" E	24° 31' 42.177" N	549099.717	2712814.086
		233	87° 29' 5.699" E	24° 31' 42.330" N	549118.271	2712818.857
		234	87° 29' 6.441" E	24° 31' 42.576" N	549139.122	2712826.496
		235	87° 29' 8.332" E	24° 31' 42.544" N	549192.333	2712825.699
		236	87° 29' 9.143" E	24° 31' 42.380" N	549215.17	2712820.735

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		237	87° 29' 9.824" E	24° 31' 42.438" N	549234.325	2712822.587
		238	87° 29' 9.853" E	24° 31' 42.467" N	549235.138	2712823.482
		239	87° 29' 10.975" E	24° 31' 42.388" N	549266.717	2712821.163
		240	87° 29' 11.031" E	24° 31' 42.538" N	549268.276	2712825.782
		241	87° 29' 12.150" E	24° 31' 42.986" N	549299.713	2712839.672
		242	87° 29' 12.812" E	24° 31' 42.969" N	549318.342	2712839.215
		243	87° 29' 12.872" E	24° 31' 42.979" N	549320.029	2712839.528
		244	87° 29' 13.211" E	24° 31' 43.036" N	549329.561	2712841.315
		245	87° 29' 14.184" E	24° 31' 42.984" N	549356.944	2712839.812
		246	87° 29' 14.751" E	24° 31' 43.135" N	549372.882	2712844.513
		247	87° 29' 15.411" E	24° 31' 43.226" N	549391.442	2712847.378
		248	87° 29' 16.302" E	24° 31' 43.071" N	549416.529	2712842.699
		249	87° 29' 16.809" E	24° 31' 43.044" N	549430.798	2712841.919
		250	87° 29' 17.371" E	24° 31' 42.974" N	549446.618	2712839.822
		251	87° 29' 17.732" E	24° 31' 43.015" N	549456.771	2712841.119
		252	87° 29' 18.201" E	24° 31' 42.902" N	549469.98	2712837.69
		253	87° 29' 18.231" E	24° 31' 42.754" N	549470.84	2712833.141
		254	87° 29' 18.460" E	24° 31' 42.771" N	549477.282	2712833.687
		255	87° 29' 18.503" E	24° 31' 42.850" N	549478.483	2712836.121
		256	87° 29' 18.510" E	24° 31' 42.885" N	549478.676	2712837.198
		257	87° 29' 19.477" E	24° 31' 42.733" N	549505.902	2712832.619
		258	87° 29' 20.106" E	24° 31' 42.572" N	549523.617	2712827.73
		259	87° 29' 19.848" E	24° 31' 42.220" N	549516.396	2712816.878
		260	87° 29' 20.310" E	24° 31' 41.749" N	549529.447	2712802.438
		261	87° 29' 20.481" E	24° 31' 41.818" N	549534.251	2712804.577
		262	87° 29' 20.832" E	24° 31' 42.517" N	549544.051	2712826.111
		263	87° 29' 21.400" E	24°31' 42.433" N	549560.042	2712823.584
		264	87° 29' 22.235" E	24° 31' 42.056" N	549583.578	2712812.072
		265	87° 29' 22.471" E	24° 31' 42.293" N	549590.192	2712819.385
		266	87° 29'23.029" E	24° 31' 42.245" N	549605.898	2712817.964

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		267	87° 29' 23.185" E	24° 31' 42.037" N	549610.31	2712811.582
		268	87° 29' 23.422" E	24° 31' 41.722" N	549617.013	2712801.918
		269	87° 29' 23.692" E	24° 31' 41.553" N	549624.629	2712796.747
		270	87° 29' 24.137" E	24° 31' 41.743" N	549637.129	2712802.635
		271	87° 29' 24.656" E	24° 31' 41.798" N	549651.726	2712804.378
		272	87° 29' 24.925" E	24° 31' 41.632" N	549659.313	2712799.3
		273	87° 29' 25.899" E	24° 31' 41.323" N	549686.753	2712789.893
		274	87° 29' 25.813" E	24° 31' 41.000" N	549684.368	2712779.95
		275	87° 29' 26.746" E	24° 31' 40.727" N	549710.65	2712771.647
		276	87° 29' 28.083" E	24° 31' 40.451" N	549748.3	2712763.292
		277	87° 29' 28.946" E	24° 31' 40.135" N	549772.617	2712753.659
		278	87° 29' 29.527" E	24° 31' 39.901" N	549788.99	2712746.52
		279	87° 29' 30.379" E	24° 31' 39.507" N	549813.006	2712734.488
		280	87° 29' 31.126" E	24° 31' 38.835" N	549834.099	2712713.894
		281	87° 29' 31.343" E	24° 31' 38.842" N	549840.204	2712714.131
		282	87° 29' 31.606" E	24° 31' 38.850" N	549847.603	2712714.403
		283	87° 29' 31.692" E	24° 31' 38.853" N	549850.023	2712714.504
		284	87° 29' 31.930" E	24° 31' 38.762" N	549856.729	2712711.729
		285	87° 29' 32.803" E	24° 31' 38.427" N	549881.33	2712701.513
		286	87° 29' 32.808" E	24° 31' 38.427" N	549881.471	2712701.514
		287	87° 29' 33.504" E	24° 31' 38.375" N	549901.06	2712699.985
		288	87° 29' 33.909" E	24° 31' 38.345" N	549912.459	2712699.102
		289	87° 29' 34.912" E	24° 31' 38.326" N	549940.683	2712698.619
		290	87° 29' 35.828" E	24° 31' 38.483" N	549966.44	2712703.54
		291	87° 29' 35.836" E	24° 31' 38.483" N	549966.665	2712703.541
		292	87° 29' 37.128" E	24° 31' 38.496" N	550003.017	2712704.07
		293	87° 29' 37.698" E	24° 31' 38.502" N	550019.055	2712704.312
		294	87° 29' 37.982" E	24° 31' 38.504" N	550027.045	2712704.402
		295	87° 29' 39.127" E	24° 31' 39.419" N	550059.162	2712732.66
		296	87° 29' 39.244" E	24° 31' 39.451" N	550062.45	2712733.656

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		297	87° 29' 40.277" E	24° 31' 39.734" N	550091.485	2712742.464
		298	87° 29' 40.864" E	24° 31' 39.835" N	550107.991	2712745.63
		299	87° 29' 41.432" E	24° 31' 39.848" N	550123.971	2712746.087
		300	87° 29' 41.551" E	24° 31' 39.899" N	550127.314	2712747.668
		301	87° 29' 41.725" E	24° 31' 39.974" N	550132.202	2712749.992
		302	87° 29' 41.758" E	24° 31' 39.898" N	550133.139	2712747.658
		303	87°29' 41.795" E	24° 31' 39.811" N	550134.189	2712744.986
		304	87° 29' 41.971" E	24° 31' 39.388" N	550139.188	2712731.994
		305	87° 29' 42.439" E	24°31' 38.997" N	550152.4	2712720.015
		306	87° 29' 42.844" E	24° 31' 38.995" N	550163.795	2712719.994
		307	87° 29' 43.093" E	24° 31' 38.929" N	550170.809	2712717.989
		308	87° 29' 43.150" E	24° 31' 39.092" N	550172.395	2712723.009
		309	87°29' 43.690" E	24° 31' 39.057" N	550187.593	2712721.987
		310	87° 29' 44.331" E	24° 31' 39.123" N	550205.622	2712724.081
		311	87° 29' 44.284" E	24° 31' 39.218" N	550204.289	2712726.998
		312	87° 29' 44.253" E	24° 31' 39.348" N	550203.402	2712730.994
		313	87°29' 44.169" E	24° 31' 39.576" N	550201.013	2712737.998
		314	87° 29' 44.105" E	24° 31' 39.674" N	550199.202	2712741.005
		315	87° 29' 44.067" E	24°31' 39.869"' N	550198.111	2712746.999
		316	87° 29' 44.063" E	24° 31' 39.891" N	550197.996	2712747.675
		317	87° 29' 44.032" E	24° 31' 40.064" N	550197.105	2712752.993
		318	87° 29' 44.020" E	24° 31' 40.079" N	550196.765	2712753.453
		319	87° 29' 44.179" E	24°31' 40.545" N	550201.188	2712767.802
		320	87° 29' 44.262" E	24°31' 41.067" N	550203.465	2712783.865
		321	87° 29' 44.197" E	24° 31' 41.569" N	550201.581	2712799.299
		322	87° 29' 44.362" E	24° 31' 42.039" N	550206.172	2712813.771
		323	87°29' 44.362" E	24° 31' 42.092" N	550206.166	2712815.401
		324	87°29' 44.362" E	24° 31' 42.254" N	550206.148	2712820.384
		325	87° 29' 44.467" E	24° 31' 42.690" N	550209.054	2712833.804
		326	87° 29' 44.422" E	24°31' 43.265" N	550207.725	2712851.485

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Chief General Manager/Project Head
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		327	87° 29' 44.438" E	24° 31' 43.841" N	550208.111	2712869.203
		328	87° 29' 44.427" E	24° 31' 44.060" N	550207.777	2712875.937
		329	87°29' 44.559" E	24° 31' 44.583" N	550211.434	2712892.036
		330	87°29' 44.500" E	24°31' 44.879" N	550209.741	2712901.134
		331	87° 29' 44.489" E	24° 31' 44.935" N	550209.425	2712902.856
		332	87° 29' 44.511" E	24° 31' 45.039" N	550210.033	2712906.056
		333	87° 29' 44.875" E	24° 31' 45.150" N	550220.262	2712909.507
		334	87° 29' 45.133" E	24° 31' 45.328" N	550227.502	2712915.008
		335	87° 29' 45.213" E	24° 31' 45.508" N	550229.733	2712920.552
		336	87° 29' 45.679" E	24° 31' 45.754" N	550242.818	2712928.166
		337	87° 29' 45.618" E	24° 31'46.084" N	550241.065	2712938.309
		338	87° 29' 45.520" E	24° 31' 46.333" N	550238.28	2712945.958
		339	87° 29' 45.458" E	24°31' 46.719" N	550236.493	2712957.824
		340	87° 29' 45.559" E	24° 31' 46.956" N	550239.309	2712965.123
		341	87° 29' 45.772" E	24° 31' 46.825" N	550245.316	2712961.116
		342	87° 29' 46.271" E	24° 31' 46.314" N	550259.413	2712945.449
		343	87° 29' 46.588" E	24° 31' 46.242" N	550268.34	2712943.267
		344	87° 29' 48.191" E	24°31' 44.780" N	550313.606	2712898.463
		345	87°29' 48.750" E	24° 31' 44.329" N	550329.384	2712884.648
		346	87° 29' 49.191" E	24 ° 31' 43.935" N	550341.836	2712872.575
		347	87° 29' 49.840" E	24°31' 43.435" N	550360.153	2712857.262
		348	87°29' 50.073" E	24° 31' 43.246" N	550366.73	2712851.473
		349	87°29' 50.158" E	24° 31' 42.879" N	550369.162	2712840.193
		350	87° 29' 50.330" E	24° 31' 42.816" N	550374.009	2712838.273
		351	87° 29' 50.575" E	24° 31' 42.456" N	550380.942	2712827.226
		352	87° 29' 50.988" E	24° 31' 41.737" N	550392.643	2712805.153
		353	87° 29' 51.221" E	24° 31' 41.335" N	550399.243	2712792.813
		354	87° 29' 51.661" E	24°31' 40.596" N	550411.705	2712770.128
		355	87° 29' 51.971" E	24° 31' 40.333" N	550420.457	2712762.071
		356	87° 29' 52.547" E	24° 31' 40.178" N	550436.681	2712757.362

SUBRAJIT DAS
Chief General Manager/Project Head
Pachwara South Coal Mine Project
NUPPL, Dumka (Jharkhand)

		357	87° 29' 52.767" E	24° 31' 39.889" N	550442.904	2712748.495
		358	87° 29' 52.957" E	24° 31' 39.133" N	550448.334	2712725.263
		359	87° 29' 53.185" E	24°31' 38.522" N	550454.817	2712706.493
		360	87° 29' 53.596" E	24° 31' 38.106" N	550466.428	2712693.74
		361	87° 29' 53.961" E	24° 31' 37.624" N	550476.751	2712678.953
		362	87° 29' 54.137" E	24° 31' 37.305" N	550481.739	2712669.159
		363	87° 29' 54.174" E	24° 31' 37.031" N	550482.81	2712660.736
		364	87° 29' 54.249" E	24° 31' 36.473" N	550484.983	2712643.581
		365	87° 29' 54.521" E	24° 31' 36.020" N	550492.687	2712629.676
		366	87° 29' 54.989" E	24° 31' 35.149" N	550505.952	2712602.934
		367	87°29' 55.759" E	24° 31' 33.563" N	550527.794	2712554.232
		368	87° 29' 55.790" E	24° 31' 32.077" N	550528.831	2712508.531
		369	87° 29' 55.810" E	24° 31' 31.081" N	550529.505	2712477.899
		370	87° 29' 55.831" E	24° 31' 30.012" N	550530.215	2712445.022
		371	87° 29' 55.871" E	24° 31' 28.028" N	550531.561	2712384.005
		372	87° 29' 56.036" E	24° 31' 19.716" N	550537.127	2712128.372
		373	87° 29' 56.144" E	24° 31' 14.320" N	550540.766	2711962.419
		374	87° 29' 56.150" E	24° 31' 13.977" N	550540.973	2711951.87
		375	87° 29' 56.150" E	24° 31' 13.977" N	550540.973	2711951.87
		376	87° 29' 54.749" E	24° 31' 11.025" N	550501.878	2711860.934
		377	87° 29' 50.246" E	24° 31' 1.535" N	550376.219	2711568.596
		378	87° 29' 43.316" E	24° 30' 58.893" N	550181.502	2711486.635
		379	87° 29' 36.954" E	24° 30' 56.468" N	550002.743	2711411.409
		380	87° 29' 30.435" E	24° 30' 53.982" N	549819.57	2711334.293
		381	87° 29' 14.390" E	24° 30' 47.864" N	549368.725	2711144.523
		382	87° 29' 9.206" E	24° 30' 45.887" N	549223.058	2711083.203
		383	87° 29' 8.674" E	24 ° 30' 45.684" N	549208.11	2711076.907
		384	87° 29' 8.131" E	24° 30' 45.477" N	549192.852	2711070.487
		385	87° 29' 8.050" E	24 ° 30' 45.446" N	549190.576	2711069.525
		386	87° 29' 7.890" E	24° 30' 45.385" N	549186.08	2711067.633

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		387	87° 29' 7.890" E	24° 30' 45.386" N	549186.079	2711067.664
2.1.8	Certificate of qualified person/accredited mining Plan preparing agency (MPPA) if the project area is confined within the vested/allotted block boundary/existing mining lease andWhere the project area extends beyond the block boundary, a certificate of qualified person/accredited mining Plan preparing agency (MPPA) should be supported with a certificate of State Government mines and Geology department must be attached, which should specify (a) intent of the state government for grant of lease beyond the vested geological boundary; (b) non-existence of Coal/ Lignite in the area beyond the vested/ allotted geological block boundary /existing mining leaseto rule out the issue of encroachment and use of coal bearing area (beyond the vested/allotted block boundary/existing mining lease) in the	The Geological Block area and the Project area are same. Project area doesn't contain any area outside the Block area. A certificate from QP in this regard has been furnished in **Annexure-IIB.** The Conceptual Plan of Pachwara South Coal Project showing the Block Boundary, Project Boundary and extent of the Block has been certified by Qualified Person and is furnished in **Plate II.**				

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	mining plan. The Project area, Lease area and geological block area in " Ha" shall also be envisaged.	
2.1.9	KML file of the Proposed lease area and geological block.	A KML file is being prepared and superimposed in satellite Imagery and it is furnished in **Plate No. III.**
2.1.10	Whether the proposed project area is confined within the allotted block boundary/existing mining lease, if not, the reason for deviation from allotted block boundary may be given.	Yes. The proposed project area is confined within the allotted block boundary.
2.1.11	If the project area extends outside the allotted block boundary/existing mining lease, confirmation about non- occurrence of coal/lignite in the area underreference needs to be furnished.	Not applicable.
2.1.12	Type of the Project (operating / under implementation) and year of starting.	This project is under implementation. At present the project is obtaining necessary Statutory clearances. The first two year (2020-2022) of the planned period has been envisaged to obtain the statutory Clearances including Notice of Opening and establishment of the Site Infrastructures. Production is planned from the year 2022-23.

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2.2 EXPLORATION, GEOLOGY AND ASSESSMENT OF RESERVE

<table>
<tr><td>2.2.1</td><td>Regional geological set up of the area, local geology, structure, stratigraphic sequence, characteristics of the litho-logical units (CoalSeams/partings/overburden).</td><td>The Pachwara South Coal Block is located in the southern most part of the Northern extension of Rajmahal Coal field, Dumka District, Jharkhand, India. The Block comprises an area of about 7.15 sq. km.
The Pachwara basin occupies central part of N-S trending Rajmahal basin and is sandwiched between Chuppervita in the north northwest and Mahuagarhi in the southwest. Northern, southern and eastern part of this basin is concealed by younger units comprising Dubrajpur and Rajmahal Formations that stand out as hill ranges and plateau. The western margin of the basin is defined by the contact of Precambrian basement with coal bearing Barakar Formation that rests unconformably over basement. Pachwara south block lies in the southern part of Pachwara basin. The General Stratigraphic sequence is furnished in Appendix-2.1 at the end of this chapter.</td></tr>
<tr><td>2.2.2</td><td>Local geology, Structure, Stratigraphic sequence, Characteristics of the litho-logical
units (coal seams /partings/ overburden).</td><td>The generalized stratigraphic sequence based on the data generated from boreholes drilled within the block is furnished in Table 2.2.
<u>Table No. 2.2</u>
Geological Succession of the Block.
<table>
<tr><th>Formation</th><th>Lithology</th></tr>
<tr><td>Surficial deposits/Alluvium</td><td>Alluvial and residual soil</td></tr>
<tr><td>Rajmahal</td><td>Traps (Basic volcanic rocks) and intertrappean beds are represented by fine grained sandstone, cream coloured shale and oolitic ironstone (very occasional).</td></tr>
<tr><td>Barakar</td><td>Fine to coarse grained feldspathic sandstone and grey coloured shale, with coal seams.</td></tr>
<tr><td>Archaean</td><td>Granite gneiss</td></tr>
</table>
The structural interpretation of Pachwara South Coal Block is mostly based on the subsurface of</td></tr>
</table>

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		exploration. The data available from the adjoining areas have also been utilized. Coal-bearing Barakar Formation covers nearly the entire stretch of the sector with N-S to NNW-SSE trending strike with generally rolling easterly dip of low magnitude (about 4°-6°). From the study of the available data, it seems that the Geology of the block is consistent throughout with intersection of few faults. The block is traversed by total 9 number of faults, amongst which 6 number of faults are continuing from Pachwara Central coal block, designated from west to east as F9-F9, F5-F5, F4-F4, F3-F3, F8-F8 & F7-F7, however fault F1-F1,F2-F2 & F6-F6 is restricted within the block. The general trends of the faults are NW-SE and N-S and are mostly strike parallel, except fault F6 is trending NE-SW. Throw of the faults ranges between 10 m to 110 m. The faults are tentatively linear to curvilinear in nature. The dip of the faults has been considered between 65°-75° for geological modeling. All faults are oblique type, normal and having variable throw. Occurrence of 9 nos. of faults has been interpreted from the sub surface information and is depicted in **Appendix-2.2** at the end of this chapter. The sequence of coal seam along with their thickness range and depth of occurrence is shown in **Appendix-2.3** at the end of this chapter.
2.2.3	Geological Block Area " Ha"	714.8553 ha (≈715 ha)
2.2.4	Status of Exploration of the block	Detail exploration in the block has been carried out since 1987. Altogether 69 numbers of coring boreholes were drilled and considered for preparation of the Geological Report. Drillhole spacing found to be around 400m x 400 m. Total meterage considered for preparation of Geological Reportis14506.70 m. All boreholes drilled in the Block are cored. Geophysical Logging has been carried out in 54

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<table>
<tr><td></td><td></td><td>Number of boreholes drilled in the last phase of Exploration carried out by NUPPL. All core samples were analysed band by band and Overall Composite analysis has been carried out on 100% basis. Special tests, PMT and Geotechnical analysis were also done in the last phase of exploration.
Details of the drilling was performed in the Block are given below in table No. 2.3.
<u>Table No. 2.3</u>
Quantum of drilling in Pachwara South Coal Block.
<table><tr><th>Name of the Agencies</th><th>Total Number Of Borehole</th><th>Drilling Meterage (m)</th><th>Time Period</th></tr><tr><td>Coring Borehole done by NUPPL</td><td>54</td><td>11510.00</td><td>April-November 2019</td></tr><tr><td>Coring Borehole done by GSI</td><td>15</td><td>2996.70</td><td>1987-88 to 1995-96</td></tr><tr><td>Total</td><td>69</td><td>14506.70</td><td></td></tr></table></td></tr>
<tr><td>2.2.5</td><td>Area covered by 'detailed' exploration within the block.</td><td>714.8553 ha (≈715 ha)</td></tr>
<tr><td>2.2.6</td><td>Whether entire lease area has been covered by 'detailed' exploration.</td><td>Yes. The entire proposed project area has been explored.</td></tr>
<tr><td>2.2.7</td><td>No. of boreholes drilled within the block</td><td>69 boreholes.</td></tr>
<tr><td>2.2.8</td><td>Whether any further exploration/study is required or suggested and time frame which it is to be completed.</td><td>Further exploration is not envisaged/required. As recommended in the Geological Report, parts of the reserves estimated are of Indicated category. This may be converted into proved reserve at later phase by increasing the borehole density.</td></tr>
<tr><td>2.2.9</td><td>Year wise future programme of exploration</td><td>Not applicable.</td></tr>
<tr><td>2.2.10</td><td>Overall borehole density within the block (no./ sq.</td><td>9.65 BH/Sq. km.</td></tr>
</table>

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	km) approx.	
2.2.11	No of Seams available as per GR (Geological Report).	As per the Geological Report, there are nine Major Coal Seams – Seam-I to Seam-IX occurring in this block. However, including Splits and Local Coal Seams, total number of coal seams are 31 (Reserve estimation done).
2.2.12	Seams not considered for Mining with Reasons.	Seam L2 is not considered for mining for its limited intersection (3 no. of intersection) throughout the block.
2.2.13	Dip of the Seam	Coal-bearing Barakar Formation covers nearly the entire stretch of the sector with N-S to NNW-SSE trending strike with generally rolling easterly dip of low magnitude (about 4°-6°).
2.2.14	Seam wise, thickness, depth and reserve: Depth wise – Seam wise Reserve of Pachwara South Block is furnished below in Table No. 2.4& 2.5 and Thickness wise Reserve of Pachwara South Block is furnished as Table No. 2.6 & 2.7.	

Table No. 2.4

Seam Wise Depth Wise Net Insitu Proved Coal Reserve of Pachwara South Coal Block, Dumka District, Jharkhand.(All figures are in Million Tons)

DEPTH	0-50M	50-100M	100-150M	150-200M	200-250M	250-300M	300-350M	TOTAL (Million Tons)
IX	4.30	0.02	0.00	0.00	0.00	0.00	0.00	**4.35**
VIIIT	1.55	0.05	0.00	0.00	0.00	0.00	0.00	**1.60**
VIIIM	0.36	0.00	0.00	0.00	0.00	0.00	0.00	**0.36**
VIIIB	1.08	0.13	0.00	0.00	0.00	0.00	0.00	**1.23**
VIIC	0.22	0.08	0.00	0.00	0.00	0.00	0.00	**0.30**
VIIB	0.69	0.56	0.00	0.00	0.00	0.00	0.00	**1.25**
VIIA	0.07	0.04	0.00	0.00	0.00	0.00	0.00	**0.11**
VII	9.20	12.11	0.00	0.00	0.00	0.00	0.00	**21.31**
L6	0.00	0.01	0.00	0.00	0.00	0.00	0.00	**0.01**
L5	0.07	0.29	0.00	0.00	0.00	0.00	0.00	**0.36**
VIT	0.00	0.24	0.06	0.00	0.00	0.00	0.00	**0.30**
VIB	1.14	1.18	2.41	0.00	0.00	0.00	0.00	**4.73**
VT	6.80	1.22	0.03	0.00	0.00	0.00	0.00	**8.04**
VB	0.45	0.13	0.00	0.00	0.00	0.00	0.00	**0.58**
V	1.75	0.85	9.39	0.77	0.00	0.00	0.00	**12.76**
L4	0.78	0.01	0.03	0.05	0.00	0.00	0.00	**0.88**

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Chief General Manager/Project Head
Pachwara South Coal Mine Project
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IVT	6.81	2.81	0.75	1.46	0.00	0.00	0.00	**11.84**
IVB	4.59	2.61	0.13	1.60	0.02	0.00	0.00	**8.95**
L3	0.27	0.00	0.00	0.35	0.04	0.00	0.00	**0.65**
IIIT	1.67	4.71	0.93	2.18	1.72	0.00	0.00	**11.21**
IIIB	1.73	7.09	4.08	2.24	8.75	0.00	0.00	**23.89**
III	0.36	3.96	0.02	0.00	0.00	0.00	0.00	**4.35**
IITT	0.00	0.00	0.00	0.02	5.81	1.45	0.00	**7.28**
IITB	0.00	0.00	0.00	0.00	0.37	0.31	0.00	**0.69**
IIT	0.16	5.36	5.76	1.47	5.89	0.35	0.00	**18.98**
IIB	0.12	3.58	4.46	0.78	2.88	8.43	0.02	**20.28**
II	0.86	9.10	23.37	3.64	0.00	0.00	0.00	**36.97**
L1	0.06	0.29	1.67	0.29	0.46	0.52	0.00	**3.29**
IT	0.74	1.74	10.50	6.51	0.70	4.39	1.06	**25.64**
IM	0.13	0.35	2.35	2.53	0.35	1.32	0.91	**7.96**
IB	0.19	0.32	2.39	3.25	0.24	0.34	0.18	**6.90**
TOTAL (Million Tons)	**46.16**	**58.85**	**68.35**	**27.17**	**27.23**	**17.10**	**2.16**	**247.04**

Table No. 2.5

Seam Wise Depth Wise Indicated Coal Reserve of Pachwara South Coal Block, Dumka District, Jharkhand.

(All figures are in Million Tons)

DEPTH	0-50M	50-100M	100-150M	150-200M	200-250M	250-300M	300-350M	TOTAL (Million Tons)
IX	2.89	0.08	0.00	0.00	0.00	0.00	0.00	**2.96**
VIIIT	0.33	0.08	0.00	0.00	0.00	0.00	0.00	**0.41**
VIIIM	0.34	0.07	0.00	0.00	0.00	0.00	0.00	**0.41**
VIIIB	0.95	0.10	0.00	0.00	0.00	0.00	0.00	**1.04**
VIIC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.01**
VIIB	0.14	0.29	0.00	0.00	0.00	0.00	0.00	**0.43**
VIIA	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**
VII	4.81	5.76	0.01	0.00	0.00	0.00	0.00	**10.59**
L6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**
L5	0.02	0.09	0.00	0.00	0.00	0.00	0.00	**0.10**
VIT	0.19	0.12	0.07	0.00	0.00	0.00	0.00	**0.38**
VIB	0.35	1.41	1.29	0.01	0.00	0.00	0.00	**3.06**
VT	0.78	0.54	0.18	0.00	0.00	0.00	0.00	**1.50**
VB	0.11	0.01	0.01	0.00	0.00	0.00	0.00	**0.12**
V	0.59	1.31	3.51	0.62	0.00	0.00	0.00	**6.03**
L4	0.08	0.02	0.00	0.00	0.00	0.00	0.01	**0.10**

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Chief General Manager/Project Head
Pachwara South Coal Mine Project
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IVT	1.15	0.63	0.71	0.52	0.01	0.00	0.00	**3.03**
IVB	0.89	0.89	0.20	1.33	0.01	0.00	0.00	**3.31**
L3	0.02	0.00	0.00	0.22	0.12	0.00	0.00	**0.36**
IIIT	0.54	0.94	0.48	1.33	0.82	0.00	0.00	**4.10**
IIIB	0.39	2.85	1.14	2.54	4.24	0.03	0.00	**11.17**
III	0.18	0.68	0.07	0.00	0.00	0.00	0.00	**0.93**
IITT	0.00	0.00	0.00	0.03	2.37	1.14	0.00	**3.54**
IITB	0.00	0.00	0.00	0.00	0.17	0.10	0.00	**0.27**
IIT	0.22	2.09	2.71	1.41	3.77	0.42	0.00	**10.63**
IIB	0.27	1.12	2.46	1.11	2.39	3.81	0.00	**11.16**
II	0.63	2.29	1.61	0.09	0.00	0.00	0.00	**4.62**
L1	0.06	0.02	0.11	0.01	0.19	0.11	0.00	**0.49**
IT	0.54	0.36	2.34	1.03	0.81	3.07	2.14	**10.30**
IM	0.16	0.14	0.73	0.33	0.18	1.21	1.66	**4.39**
IB	0.26	0.46	0.60	0.61	0.21	0.25	0.18	**2.55**
TOTAL (Million Tons)	**16.87**	**22.35**	**18.24**	**11.18**	**15.28**	**10.12**	**3.98**	**98.01**

Table No. 2.6

Thickness Wise Proved Coal Reserve of Pachwara South Coal Block, Dumka District, Jharkhand.

(All figures are in Million Tons)

THICKNESS-WISE, DEPTH-WISE MEASURED GEOLOGICAL RESERVE OF PACHWARA SOUTH COAL BLOCK									
THICKNESS RANGE	**Thickness Range (m)**	**0-50M**	**50-100M**	**100-150M**	**150-200M**	**200-250M**	**250-300 M**	**300-350 M**	**TOTAL (Million Tons)**
T1	**1.0 - 1.2**	2.29	1.62	1.82	2.05	0.41	0.31	0.08	**8.59**
T2	**1.2 - 3.0**	14.64	10.95	12.20	10.53	3.74	2.78	1.74	**56.57**
T3	**3.0 - 6.0**	19.47	19.04	21.62	8.54	12.41	11.59	0.35	**93.04**
T4	**6.0 - 9.0**	4.87	13.01	10.18	2.25	8.06	2.42	0.00	**40.79**
T5	**>9.0**	4.89	14.23	22.53	3.79	2.62	0.00	0.00	**48.05**
TOTAL (Million Tons)		**46.16**	**58.85**	**68.35**	**27.17**	**27.23**	**17.10**	**2.16**	**247.04**

SURAJIT DAS
Chief General Manager/Project Head
Pachwara South Coal Mine Project
NUPPL, Dumka (Jharkhand)

Table No. 2.7

Thickness Wise Indicated Coal Reserve of Pachwara South Coal Block, Dumka District, Jharkhand.

(All figures are in Million Tons)

THICKNESS-WISE, DEPTH-WISE INDICATED GEOLOGICAL RESERVE OF PACHWARA SOUTH COAL BLOCK									
THICKNESS RANGE	**Thickness Range (m)**	**0-50M**	**50-100 M**	**100-150M**	**150-200 M**	**200-250M**	**250-300 M**	**300-350 M**	**TOTAL (Million Tons)**
T1	**1.0 - 1.2**	0.85	0.76	0.63	0.92	0.39	0.32	0.17	**4.03**
T2	**1.2 - 3.0**	5.15	4.69	4.92	4.29	1.77	1.81	3.19	**25.82**
T3	**3.0 - 6.0**	4.72	6.88	8.77	4.51	6.57	6.26	0.62	**38.33**
T4	**6.0 - 9.0**	4.46	7.19	2.31	1.37	4.53	1.74	0.00	**21.60**
T5	**>9.0**	1.69	2.83	1.60	0.09	2.02	0.00	0.00	**8.22**
TOTAL (Million Tons)		**16.86**	**22.35**	**18.24**	**11.18**	**15.28**	**10.12**	**3.98**	**98.01**

Estimation of Blocked Geological Reserves and Extractable Reserves are depicted in **Appendix-2.4** and **Appendix-2.5** respectively.

2.2.15	Methodology of reserves estimation (also mention if any software package has been used).	Basic assumptions/ considerations followed for estimation of Coal Reserve of Pachwara South Coal Block are as follows: I. Estimation of reserves is restricted up to the workable limits of the seams. The workable limits of the thickness have been taken as 0.50 m as the property is being considered as opencast for the seams under this exploration program. II. **28.47 million Tone of** reserve has been estimated separately for the seam thickness between 0.50 to 1.00m. III. Reserve has been estimated only in block area of 7.15 sq.km. IV. Shaly coal and Carbonaceous shale Low (having ash and moisture more than 40% and up to 65%) occurring at the roof and/or floor of a coal seam has been considered as part of the seam while arriving at the effective thickness for estimating

SUBAJIT DAS
Chief General Manager/Project Head
Pachwara South Coal Mine Project
NUPPL, Dumka (Jharkhand)

the Reserve.

V. Reserves have been calculated based on the in-band thickness (I-100) of seams. In-band (I-100) thickness of seam has been delineated including combustible bands (Ash +Moisture >65% to <75%) up to 100 cm.

VI. The areas of heave zones of faults have been excluded from the estimation of Reserve.

VII. The lower seams were found to be of extensively splitting nature. To limiting the number of split seams for interpretation and modeling purpose, in seam band in some special cases were considered more than 1 meter in this model.

VIII. Depth line: Depth wise reserves are estimated in every 50 m interval from the surface upto a depth of 350 m.

IX. Reserve estimation has been carried out based on the effective thickness of 68 boreholes which includes 14 number of boreholes drilled by GSI. However, GCV of 64 boreholes only considered for Quality grid generation. Geovia Minex Software 6.3 version have been utilized for resource estimation purpose.

X. Specific Gravity has been considered as given in the Table No. 2.8 below as per ISP.

Table No. 2.8

GCV Range and RD values with respect to different Grade of Non Coking Coal (Ref.: ISP 2017)

Grade Based on GCV	Range of GCV(kcal/kg)	Average Relative density (RD)
G1	>7000	1.36
G2	>6700 to ≤7000	1.40
G3	> 6400 to ≤6700	1.43
G4	>6100 to≤ 6400	1.44
G5	>5800 to≤ 6100	1.47

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Chief General Manager/Project Head
Pachwara South Coal Mine Project
NUPPL, Dumka (Jharkhand)

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		G6	>5500 to≤ 5800	1.50
		G7	>5200 to ≤5500	1.53
		G8	>4900to ≤5200	1.56
		G9	>4600 to ≤4900	1.58
		G10	>4300 to ≤4600	1.61
		G11	>4000 to ≤4300	1.65
		G12	>3700 to ≤4000	1.69
		G13	>3400 to ≤3700	1.73
		G14	>3100 to ≤3400	1.78
		G15	>2800 to ≤3100	1.81
		G16	>2500 to ≤ 2800	1.84
		G17	>2200 to ≤2500	1.87
		Ungraded	≤2200	1.90

2.2.16 Average GCV in Kcal/Kg

Seam Wise Average GCV in Kcal/Kg is furnished below in Table No. 2.9.

Table 2.9

Seam Wise Average GCV (in Kcal/Kg) of Pachwara South Coal Block.

SEAM NAME	GCV	GRADE	AVG GCV OF THE BLOCK
IX	4681	G9	4443 (G10)
VIIIT	3548	G13	
VIIIM	2979	G15	
VIIIB	3278	G14	
VIIC	3076	G15	
VIIB	3398	G14	
VIIA	3682	G13	
VII	3731	G12	
L6	2996	G15	
L5	3912	G12	
VIT	3180	G14	
VIB	3479	G13	
VT	4651	G9	
VB	3574	G13	
V	4523	G10	
L4	3848	G12	
IVT	4417	G10	
IVB	4632	G9	

SURAJIT DAS
Chief General Manager/Project Head
Pachwara South Coal Mine Project
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			L3	5040	G8	
			IIIT	5486	G7	
			IIIB	5179	G8	
			III	4674	G9	
			IITT	4347	G10	
			IITB	4199	G11	
			IIT	4617	G9	
			IIB	4711	G9	
			II	4638	G9	
			L1	3930	G12	
			IT	4165	G11	
			IM	3431	G13	
			IB	3758	G12	
2.2.17	Gross Geological Reserve of the block "Mte"	415.02 MT (Gross Geological reserve has been estimated with a cutoff thickness of 0.5 m)				
2.2.18	Net Geological Reserve of the block "Mte"	373.52 MT (Net Geological reserve has been estimated with a cutoff thickness of 0.5 m)				
2.2.19	Mineable Reserve of the block "Mte"	269.58 MT				
2.2.20	Blocked Reserve "Mte	103.94 MT (This includes reserve blocked under embankment, barriers & batter slopes. This also includes about 2.57 MT of Coal below the planned depth of 320 m).				
2.2.21	Corresponding extractable Reserve of the block "Mte"	262.84 MT				
2.2.22	Percentage of Extraction	70.37 %				
2.2.23	Reserve already depleted (Base date of Mining Plan)	Nil.				
2.2.24	Balance Reserve (as on Base Date)	262.84 MT				

SURAJIT DAS
Chief General Manager/Project Head
Pachwara South Coal Mine Project
NUPPL, Dumka (Jharkhand)

Appendix –2.1

The general stratigraphic sequence of Rajmahal Coalfield after Geological Survey of India.

Age	Group	Formation	Lithotype	Maximum thickness (m)
Recent/ Quaternary		Soil/ Alluvium	Sandy loams, silt and clay	15
Early Cretaceous	Upper Gondwana	Rajmahal Formation	Basic volcanics with sedimentary itertrappeans	30
---------- Unconformity ------				
Late Triassic to Jurassic	Upper Gondwana	DubrajpurFormation	Coarse to pebbly sandstone, medium to coarse grained ferruginous sand-stone, grey siltstone and mottled shale.	35 m
---------- Disconformity -------				
Early Permian	Lower Gondwana	Barakar Formation	Coarse to pebbly sandstone, (often with shale and coal clasts), medium to fine grained (often felspathic) sandstone, sandy shale, grey shale, carbonaceous shale, alternation of grey shale and very fine grained sand-stone and coal seams.	387 m
Late Carboni-ferous to Early Permian	Lower Gondwana	Talcher Formation	Pebbly sandstone, fine grained, greenish to mottled sandstone, greenish and chocolate shale.	16 m +
---------- unconformity -------				
Precambrian		Chhota-Nagpur gneissic complex	Granite gneiss, pegmatites, vein quartz.	

SURAJIT DAS
Chief General Manager/Project Head
Pachwara South Coal Mine Project
NUPPL, Dumka (Jharkhand)

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Appendix-2.2

Details of the Faults Interpreted in Pachwara South Coal Block.

Fault No.	Location of fault	Type of fault	Trend	Throw		Evidences
				Direction	Amount	
F9	The fault is located at western part of the block and located in the East of, PSD45, RJP17 & this fault is continuing from Pachwara Central block.	Oblique fault	N-S	Easterly	50m	Based on the level difference of floor contour values.
F5	The fault is located almost central part of the block and located near PSD 41, PSD 42. This fault is continuing from Pachwara Central block.	Oblique fault	N-S	Westerly	20m	Based on the level difference of floor contour values.
F6	The fault is located at central part of the block and located on the western side of PSD36 & this fault is branching out from relationship from F5 fault and this fault is continuing southward.	Oblique fault	N-S	Westerly	15m	Based on the level difference of floor contour values. Seam IIB is faulted in borehole PSD36.
F4	The fault is located at central part of the block and located in the east of PSD48 & this fault is continuing from Pachwara Central block	Oblique fault	N-S	Westerly	30m	Based on the level difference of floor contour values.
F1	The fault is located at central part of the block and located in the east of PSD39	Oblique fault	N-S	Westerly	20m	Based on the level difference of floor contour values.
F3	The fault is located almost part of the block and located near PSD03,32 &	Oblique fault	N-S	Easterly	100-110m	Based on the level difference of

SURAJIT DAS
Chief General Manager/Project Head
Pachwara South Coal Mine Project
NUPPL, Dumka (Jharkhand)

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Fault No.	Location of fault	Type of fault	Trend	Throw		Evidences
				Direction	Amount	
	37. This fault is continuing from Pachwara Central block					floor contour values VIT to IIIB is faulted in borehole PSD03,32.
F8	The fault is continuing from Pachwara Central block & and located in the eastern part of the block near RJP46,49 & PSD 05.	Oblique fault	NE-SW	Westerly	0-20m	Based on the level difference of floor contour values. Seam IIIT is faulted in borehole RJP49.
F7	The fault is continuing from Pachwara Central block located at the eastern side of the block & located near RJP15, NP01.	Oblique fault	N-S	Westerly	0-10M	Based on the level difference of floor contour values.
F2	The fault is located at the eastern side of the block & located on the west of the near PSD21.	Oblique fault	N-S	Westerly	0-10M	Based on the level difference of floor contour values. Seam IIIT is faulted in borehole PSD21.

SURAJIT DAS
Chief General Manager/Project Head
Pachwara South Coal Mine Project
NUPPL. Dumka (Jharkhand)

Appendix-2.3

Sequence of Coal seams along with their thickness range and depth of occurrence.

Seam Name	Thickness Range (m)				Generalized Thickness Range (m)	NO OF HOLE INTER.
	MIN.	BH NAME	MAX.	BH NAME		
IX	1.00	GT03	5.80	PSD29	3.00m-6.00m	11
Seam parting between IX & VIIIT	9.25	PSD21	14.60	RJP15		
VIIIT	0.26	PSD11	5.63	PSD02	0.50m-3.00m	19
Seam parting between VIIIT & VIIIM	0.60	PSD01	4.19	PSD02		
VIIIM	0.75	NP01	1.64	PSD01	0.50m-3.00m	5
Seam parting between VIIIM & VIIIB	1.03	PSD01	3.48	PSD21		
VIIIB	0.23	PSD38	4.34	PSD27	0.50m-1.00m	20
Seam parting between VIIIB & VIIC	1.55	NP02	15.36	PSD21		
VIIC	0.27	PSD29	1.31	PSD38	0.50m-1.00m	18
Seam parting between VIIC & VIIB	1.30	PSD04	3.80	PSD05		
VIIB	0.10	PSD11	2.30	RJP46	0.50m-1.20m	19
Seam parting between VIIB & VIIA	0.65	PSD05	3.87	NP01		
VIIA	0.18	PSD05	1.35	PSD01	0.50m-1.00m	14
Seam parting between VIIA & VII	1.62	RJP49	9.09	PSD32		
VII	1.40	PSD32	11.45	NP01	6.00m->9.00m	22
Seam parting between VII & L6	2.75	PSD29	9.36	PSD03		
L6	0.28	PSD03	1.38	PSD38	0.50m-1.00m	21

SUBRAJIT DAS
Chief General Manager/Project Head
Pachwara South Coal Mine Project
NUPPL, Dumka (Jharkhand)

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Seam Name	Thickness Range (m)				Generalized Thickness Range (m)	NO OF HOLE INTER.
	MIN.	BH NAME	MAX.	BH NAME		
Seam parting between L6 & L5	6.35	NP02	28.08	PSD32		
L5	0.10	GT04	1.68	PSD32	0.50m-1.00m	18
Seam parting between L5 & VIT	11.61	PSD02	22.07	PSD29		
VIT	0.20	PSD01	1.70	PSD11	0.50m-1.00m	19
SEAM PARTING VIT & VIB	4.06	PSD11	17.72	RJP46		
VIB	0.55	PSD37	2.70	PSD01	1.20m-3.00m	29
Seam parting between VIB & VT	8.90	PSD44	20.51	PSD36		
VT	0.42	PSD23	6.01	PSD31	3.00m-6.00m	18
Seam parting between VT & VB	1.10	RJP10	11.21	PSD23		
VB	0.24	PSD26	2.54	PSD09	0.50m-1.00m	20
Parting	-	-	-	-	-	-
V	0.62	PSD22	7.10	NP02	1.20m-9.00m	31
Seam parting between V & L4	5.40	PSD39	25.05	RJP15		
L4	0.10	PSD36	2.20	PSD18	0.50m-3.00m	13
Seam parting between L4 & IVT	1.19	PSD43	17.40	PSD06		
IVT	0.23	PSD38	6.00	PSD33	1.20m-6.00m	52
Seam parting between IVT & IVB	6.47	PSD43	39.20	PSD05		
IVB	0.25	PSD11	4.16	RJP44	1.20m-3.00m	58

SURAJIT DAS
Chief General Manager/Project Head
Pachwara South Coal Mine Project
NUPPL, Dumka (Jharkhand)

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Seam Name	Thickness Range (m)				Generalized Thickness Range (m)	NO OF HOLE INTER.
	MIN.	BH NAME	MAX.	BH NAME		
Seam parting between IVB & L3	4.10	RJP46	18.82	PSD14		
L3	0.13	NP04	1.85	RJP07	<0.50m-1.00m	28
Seam parting between L3 & IIIT	5.83	NP04	17.68	PSD48		
IIIT	0.56	GT01	3.33	PSD14	1.20m-3.00m	53
Seam parting between IIIT & IIIB	1.79	GT01	19.10	RJPC01		
IIIB	0.80	RJP31	6.90	NP02	3.00m-6.00m	54
Parting	-	-	-	-	-	-
III	2.40	RJP43	6.45	PSD33	3.00m-6.00m	8
Seam parting between III & L2	No common intersection					
L2	0.30	RJP07	2.25	PSD25	<0.50m-3.00m	3
Seam parting between L2 & IITT	No common intersection					
IITT	3.65	PSD01	9.20	RJP49	3.00m-9.00m	11
Seam parting between IITT & IITB	1.45	RJP49	12.52	PSD40		
IITB	0.53	PSD40	2.40	PSD05	0.50m-1.00m	10
Parting	-	-	-	-	-	-
IIT	2.86	PSD30	11.26	RJPC01	3.00m-9.00m	24
Seam parting between IIT& IIB	1.10	PSD22	23.80	PSD37		
IIB	0.84	GT01	8.00	PSD22	3.00m-9.00m	34
Parting	-	-	-	-	-	-
II	8.75	RJP44	19.43	PSD16	>9.00m	28
Seam parting between II & L1	1.88	PSD48	12.62	PSD13		

SUBAJIT DAS
Chief General Manager/Project Head
Pachwara South Coal Mine Project
NUPPL, Dumka (Jharkhand)

Seam Name	Thickness Range (m)				Generalized Thickness Range (m)	NO OF HOLE INTER.
	MIN.	BH NAME	MAX.	BH NAME		
L1	0.18	PSD13	2.03	PSD48	0.50m-3.00m	57
Seam parting between L1 & IT	2.45	PSD32	23.85	RJP43		
IT	0.50	PSD19	8.50	PSD20	1.20m-6.00m	60
Seam parting between IT & IM	0.67	PSD18	9.62	PSD12		
IM	0.27	PSD17	3.95	PSD43	1.20m-3.00m	55
Seam parting between IM & IB	1.01	GT01	13.90	PSD11		
IB	0.25	GT01	3.40	NP03	0.50m-3.00m	57

SURAJIT DAS
Chief General Manager/Project Head
Pachwara South Coal Mine Project
NUPPL, Dumka (Jharkhand)

Appendix-2.4

Estimation of Blocked Geological Reserves and Extractable Reserves.

	Thickness Range (m)				Blocked Reserve Below (in Million Tons)					Mineable Reserve "Mte"		
Seam name	Min. Thickness (m)	Max. Thickness (m)	Depth Range (m)	Net Insitu	Highwall / batter	Nala / River Road/ Embankment	Barrier	Uneconomic	Total Blocked	UG	OC	Mining Losses
IX	1	5.8	12.00-35.45	7.37	1.62	0.22	0.21		2.05		5.32	0.13
Seam parting between IX & VIIIT	9.25	14.6							0.00		0.00	
VIIIT	0.26	5.63	8.45-47.36	2.60	0.57	0.08	0.07		0.72		1.88	0.05
Seam parting between VIIIT & VIIIM	0.6	4.19							0.00		0.00	
VIIIM	0.75	1.64	32.94-45.70	1.22	0.27	0.04	0.03		0.34		0.88	0.02
Seam parting between VIIIM & VIIIB	1.03	3.48							0.00		0.00	
VIIIB	0.23	4.34	11.00-53.20	3.85	0.85	0.12	0.11		1.07		2.78	0.07
Seam parting between VIIIB & VIIC	1.55	15.36							0.00		0.00	
VIIC	0.27	1.31	7.70-63.38	1.86	0.41	0.06	0.05		0.52		1.35	0.03
Seam parting between VIIC & VIIB	1.3	3.8							0.00		0.00	
VIIB	0.1	2.3	10.50-67.58	2.92	0.64	0.09	0.08		0.81		2.11	0.05

	Thickness Range (m)				Blocked Reserve Below (in Million Tons)					Mineable Reserve "Mte"		
Seam name	**Min. Thickness (m)**	**Max. Thickness (m)**	**Depth Range (m)**	**Net Insitu**	**Highwall / batter**	**Nala / River Road/ Embankment**	**Barrier**	**Uneconomic**	**Total Blocked**	**UG**	**OC**	**Mining Losses**
Seam parting between VIIB & VIIA	0.65	3.87							0.00		0.00	
VIIA	0.18	1.35	11.77-69.41	1.60	**0.35**	**0.05**	**0.04**		0.44		1.16	0.03
Seam parting between VIIA & VII	1.62	9.09							0.00		0.00	
VII	1.4	11.45	22.26-83.3	31.90	**7.02**	**0.96**	**0.89**		8.87		23.03	0.58
Seam parting between VII & L6	2.75	9.36							0.00		0.00	
L6	0.28	1.38	30.42-90.21	1.80	**0.40**	**0.05**	**0.05**		0.50		1.30	0.03
Seam parting between L6 & L5	6.35	28.08							0.00		0.00	
L5	0.1	1.68	52.20-97.64	1.93	**0.43**	**0.06**	**0.05**		0.54		1.40	0.03
Seam parting between L5 & VIT	11.61	22.07							0.00		0.00	
VIT	0.2	1.7	57.85-114.97	2.74	**0.60**	**0.08**	**0.08**		0.76		1.98	0.05
SEAM PARTING VIT & VIB	4.06	17.72							0.00		0.00	
VIB	0.55	2.7	10.20-131.42	8.47	**1.86**	**0.25**	**0.24**		2.36		6.12	0.15

	Thickness Range (m)				Blocked Reserve Below (in Million Tons)					Mineable Reserve "Mte"		
Seam name	**Min. Thickness (m)**	**Max. Thickness (m)**	**Depth Range (m)**	**Net Insitu**	**Highwall / batter**	**Nala / River Road/ Embankment**	**Barrier**	**Uneconomic**	**Total Blocked**	**UG**	**OC**	**Mining Losses**
Seam parting between VIB & VT	8.9	20.51							0.00		0.00	
VT	0.42	6.01	15.48-65.38	9.55	**2.10**	**0.29**	**0.27**		2.65		6.89	0.17
Seam parting between VT & VB	1.1	11.21							0.00		0.00	
VB	0.24	2.54	11.00-68.04	2.01	**0.44**	**0.06**	**0.06**		0.56		1.45	0.04
Parting	-	-	-						0.00		0.00	
V	0.62	7.1	7.95-159.13	18.79	**4.13**	**0.56**	**0.53**		5.22		13.56	0.34
Seam parting between V & L4	5.4	25.05							0.00		0.00	
L4	0.1	2.2	15.40-174.25	1.29	**0.28**	**0.04**	**0.04**		0.36		0.93	0.02
Seam parting between L4 & IVT	1.19	17.4							0.00		0.00	
IVT	0.23	6	22.40-184.55	15.88	**3.49**	**0.48**	**0.44**		4.41		11.46	0.29
Seam parting between IVT & IVB	6.47	39.2							0.00		0.00	
IVB	0.25	4.16	7.05-200.07	14.21	**3.13**	**0.43**	**0.40**		3.95		10.26	0.26
Seam parting between IVB & L3	4.1	18.82							0.00		0.00	
L3	0.13	1.85	16.77-196.60	2.13	**0.47**	**0.06**	**0.06**		0.59		1.54	0.04

	Thickness Range (m)				Blocked Reserve Below (in Million Tons)					Mineable Reserve "Mte"		
Seam name	Min. Thickness (m)	Max. Thickness (m)	Depth Range (m)	Net Insitu	Highwall / batter	Nala / River Road/ Embankment	Barrier	Uneconomic	Total Blocked	UG	OC	Mining Losses
Seam parting between L3 & IIIT	5.83	17.68							0.00		0.00	
IIIT	0.56	3.33	14.97-215.31	15.77	3.47	0.47	0.44		4.38		11.39	0.28
Seam parting between IIIT & IIIB	1.79	19.1				0.00	0.00		0.00		0.00	
IIIB	0.8	6.9	21.02-236.10	35.08	7.72	1.05	0.98		9.75		25.33	0.63
Parting	-	-	-						0.00		0.00	
III	2.4	6.45	25.80-97.8	5.28	1.16	0.16	0.15		1.47		3.81	0.10
-									0.00		0.00	
IITT	3.65	9.2	231.60-256.60	10.81	2.38	0.32	0.30		3.01		7.81	0.20
Seam parting between IITT & IITB	1.45	12.52							0.00		0.00	
IITB	0.53	2.4	233.83-267.35	1.69	0.37	0.05	0.05		0.47		1.22	0.03
Parting	-	-	-						0.00		0.00	
IIT	2.86	11.26	64.90-247.73	29.61	6.51	0.89	0.83		8.23		21.38	0.53
Seam parting between IIT& IIB	1.1	23.8							0.00		0.00	
IIB	0.84	8	74.67-285.90	31.45	6.92	0.94	0.88		8.74		22.71	0.57
Parting	-	-	-						0.00		0.00	
II	8.75	19.43	61.20-159.50	41.59	9.15	1.25	1.16		11.56		30.03	0.75

	Thickness Range (m)				Blocked Reserve Below (in Million Tons)					Mineable Reserve "Mte"		
Seam name	**Min. Thickness (m)**	**Max. Thickness (m)**	**Depth Range (m)**	**Net Insitu**	**Highwall / batter**	**Nala / River Road/ Embankment**	**Barrier**	**Uneconomic**	**Total Blocked**	**UG**	**OC**	**Mining Losses**
Seam parting between II & L1	1.88	12.62							0.00		0.00	
L1	0.18	2.03	16.72-294	7.79	**1.71**	**0.23**	**0.22**		2.16		5.62	0.14
Seam parting between L1 & IT	2.45	23.85							0.00		0.00	
IT	0.5	8.5	12.65-316.45	36.00	**7.92**	**1.08**	**1.01**		10.01		25.99	0.65
Seam parting between IT & IM	0.67	9.62							0.00		0.00	
IM	0.27	3.95	19.15-320.50	14.20	**3.12**	**0.53**	**0.40**		4.05		10.15	0.25
Seam parting between IM & IB	1.01	13.9							0.00		0.00	
IB	0.25	3.4	28.15-324.55	12.12	**2.67**	**0.36**	**0.34**		3.37		8.75	0.22
				373.52	**82.17**	**11.31**	**10.46**	**0.00**	**103.94**	**0.00**	**269.58**	**6.74**

Appendix-2.5

Estimation of depleted reserve.

Seam	EXT Res "Mte"			As on Base date "Mte" Depletion of reserve			Balance Reserve			Total	Reason Not considered for mining
	UG	OC	Highwall	UG	OC	Highwall	UG	OC	Highwall		
IX		5.19						5.19		5.19	
VIIIT		1.83						1.83		1.83	
VIIIM		0.86						0.86		0.86	
VIIIB		2.71						2.71		2.71	
VIIC	-	1.31						1.31		1.31	Total reserve is Less Than 1.5 Mte.
VIIB		2.05						2.05		2.05	
VIIA		1.13						1.13		1.13	Total reserve is Less Than 1.5 Mte.
VII		22.45						22.45		22.45	
L6		1.27						1.27		1.27	Total reserve is Less Than 1.5 Mte.
L5		1.36						1.36		1.36	
VIT		1.93						1.93		1.93	
VIB		5.96						5.96		5.96	
VT		6.72						6.72		6.72	
VB		1.42						1.42		1.42	
V		13.23						13.23		13.23	
L4		0.91						0.91		0.91	Total reserve is Less Than 1.5 Mte.
IVT		11.18						11.18		11.18	
IVB		10.00						10.00		10.00	
L3		1.50						1.50		1.50	Total reserve is Less Than 1.5 Mte.

Seam	EXT Res "Mte"			As on Base date "Mte" Depletion of reserve			Balance Reserve			Total	Reason Not considered for mining
	UG	OC	Highwall	UG	OC	Highwall	UG	OC	Highwall		
IIIT		**11.10**						11.10		11.10	
IIIB		**24.69**						24.69		24.69	
III		**3.72**						3.72		3.72	
IITT		**7.61**						7.61		7.61	
IITB		**1.19**						1.19		1.19	
IIT		**20.84**						20.84		20.84	
IIB		**22.14**						22.14		22.14	
II		**29.28**						29.28		29.28	
L1		**5.48**						5.48		5.48	
IT		**25.34**						25.34		25.34	
IM		**9.89**						9.89		9.89	
IB		**8.53**						8.53		8.53	
		262.84						**262.84**		**262.84**	

NO CHANGE IN THIS CHAPTER

Chapter-3: Mining

3.1 Mining Method:

	Parameters	***Details***
3.1.1	Existing method of mining if the mine is under operation.	The block is virgin and shall commence its production on receipt of all requisite Statutory Permits/clearances.
3.1.2	Proposed method of mining with justification on suitability of method of mining.	The occurrence of Coal seams has been established upto a depth of 350 meter through detail exploration of the Block with a borehole density of 9.65 BH/Sq. Km. The depth of occurrence of the Coal seam itself has decided the opencast nature of the deposit. Mining upto a depth range of 320 meter has been planned. Year wise and seam wise Calendar schedule is furnished below in **Appendix-3.1.** Key planning considerations for winning of coal from Pachwara South Coal Block are described below: 1. All coal reserves of more than 0.5 meter thickness has been considered for mining; 2. Seam L-2, having only three intersections have been excluded from mineable reserve estimation and not considered for mining; 3. Floor of seam-IB is being considered as the base of Mine Pit Floor. 4. A safety zone of 60 meter has been considered along the northern boundary against Bansloi River from the southern bank of the river; thus depending upon the proximity of the river bank that to Block boundary, a variable safety zone has been considered all along the northern boundary. Safety zone all along the southern and eastern boundary has been considered as 15 meter to accommodate the garland drain. Safety zone of 7.5 meter is reflected along the part of the western boundary. 5. A village road passing through the central part of the Block joining Chirudih-Kundapahari need to be diverted. 6. An embankment has been planned to construct all along the safety zone against the Bansloi River. Height of the embankment shall be maintained more than 3 meter of the HFL of Bansloi River. HFL of Bansloi River in this part is 97 meter AMSL as per information obtained from the local public works department. 7. Top of the embankment will have more than 30 meter width and shall be utilized for dedicated Coal Corridor, village road diversion, service road and garland drain.

SUBAJIT DAS
Chief General Manager/Project Head
Pachwara South Coal Mine Project
NUPPL, Dumka (Jharkhand)

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		8. A box cut has been planned from the western boundary of the block, from Incrop zone of Seam IIB. Influence zones of boreholes RJP-32and RJP-43 are considered for initial planning. 9. Initial box cut also has been planned with minimum interference of private land in the first two years of mining operation. 10. Bench height of 10 meter has been planned. Working bench widths are planned to be 30 meter. Individual bench slopes are planned to 70°. Bench widths in the highwall are planned to 3 meter each and in every 4 benches, bench width of 10 meter has been planned. Bench width of 20 meter has been planned in every eighth bench for stability and also to accommodate the haul road for coal and OB transportation. 11. Dumping for the initial 6 years (the year of achieving PRC from the commencement of production year) has been planned in the eastern side of fault-F4. About 80.63 MBCM of Overburden will be dumped temporarily within the coal bearing area of the block. 12. Dumping of Overburden and stacking of top soil in the very first year of operation has been planned in the government land to avoid local issues. Land Acquisition will be done prior to dumping in this area. Necessary clearances from the concerned department will be obtained prior to the mining operation. 13. Top soil dump in the first year has been planned in the government land to avoid local issues. 14. Concurrent backfilling will commence from 9th year . 15. Re-handling of the temporary surface Dump will commence from 9th year. Re-handling will continue for 13 years with capping of re-handling volume to 8.4 Mcum/Year. 16. A swell factor of 1.20 has been considered for In-situ to loose volume calculation. Re-handling schedule has been prepared based on lose volume of OB. **Choice of Opencast Mining:** Before selection of Mining technology, following methods of Opencast Mining were compared. i. Bucket Wheel Mining. ii. Dragline Mining. iii. Shovel Dumper Combination; and, iv. Continuous Surface Mining. Out of the four methods mentioned above, Overburden removal has been planned with **Shovel-Dumper** Combination due to its operational flexibility. Considering 24 number of coal seams to be worked, multi seam working is inevitable at Pachwara south Coal Mine. Shovel/Excavators of varying sizes are thus considered

SUPRAJIT DAS
Chief General Manager/Project Head
Pachwara South Coal Mine Project
NUPPL, Dumka (Jharkhand)

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		commensurate with the parting variations. Selections of size of equipment were based on the thickness range of parting. It has been observed that, about 82% of the partings are lying in a range of 0-15 meter thickness range, about 11% partings are lying in a thickness range of 15 meter to 20 meter, about 5.3% lying in a thickness range of 20 meter to 30 meter and about 1.70% of the total parting volume constituted by more than 30 meter thickness. Based on the wide variation of parting thickness range, shovels of varying size – 3.1 cum bucket capacity to 10 cum bucket capacity has been proposed in this mining plan. Combination of 35 – 100 T RDT also considered for obtaining the optimum productivity of the excavators. Considering the wide variation of the seam thickness starting from 0.1 meter to 19.43 meter, **Surface Miners** have been selected for winning of coal. The seams are relatively flatter (around 4° dip) and both strike length (around 1.2 Km) and Dip-Rise length (> 4.0 KM) are also feasible for surface miner operation. The product coal from surface miner is usually (-) 100 mm which eliminates the primary crushing unit at mine end. **Access Trench and Initial Box Cut:** Selection of Box Cut location has been done based on the following considerations: i. Commencement of coal production at the shallowest depth. ii. Restriction of Initial mining operation at Government Lands. iii. Creation of sufficient voids for backfilling in the minimum time period; iv. Reaching targeted capacity in optimum period; Based on the above criteria, two options were analysed and finally the area demarcated in the 1st year stage plan (refer Plate No. XXIA) has been proposed. **Excavation of Overburden:** The top soil will be scrapped through smaller size excavators and shall be transported through 35-40 T RDT to store in designated stack yard and will maintain a height within 10 meter. Conventional Drilling and Blasting will be adopted for excavation of Hard OB. Maximum hole depth will be 10 meter each. Considering varying thickness of partings (3.48 meter to 39.20

SURAJIT DAS
Chief General Manager/Project Head
Pachwara South Coal Mine Project
NUPPL, Dumka (Jharkhand)

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		meter with an average thickness of 17.56 meter), blast hole depth needs to be optimized. Spacing and burden proposed to be around 6 meter and 7 meter respectively, however, a separate blasting study will be done during the initial phase of mining to optimize the suitable blasting technology and pattern in Pachwara South Coal Mine. Drilling will be performed through crawler mounted pneumatically operated down the hole drill rigs of 250 mm diameter. For smaller partings, RBH drill rigs of 160 mm diameter will be deployed. Heavy ANFO type/Slurry emulsions are proposed to be used as explosives. However, more suitable explosives can be planned during operational phase considering the geo-mining conditions of the mine. Considering the sensitivity of the area, magazines are not planned. Authorized agencies will be deployed for supplying and managing explosives at site. The blasted OB will be removed through Shovel Dumper combination. **Coal Winning:** Coal winning will be performed through deployment of Surface Miners of two capacities. For thinner seam 2200 series with drum width 2.2 meter shall be deployed while for thicker coal seams 3800 series surface miner with 3.8 meter drum width will be deployed. Wherever edges will be left out, ripper dozers shall be deployed for coal extraction. Front end loader-dumper combination shall be deployed for Coal transportation from coal face to temporary coal stock yard for shallow depth (up to 150 m depth). Steep angle conveyors will be installed for coal transportation from Mine face (beyond 150 meter depth) to temporary coal stock yard. Coal will be transported through conveyor from temporary coal stock yard up to the main stock yard from 6th year of mine operations. The mine will achieve its targeted production capacity in the 6th year of mining operation. **Transportation:** Overburden will be transported to the designated OB dump areas as shown in the Stage Plans (Please refer to Plate No. **XXIA-XXIE)** through 100/40 T RDT's. Coal transportation from coal face to temporary stack yard will be done through 35-40 T RDT. As the mine goes to depth, a steep angle conveyor system will be installed from mine face to temporary coal stock yard. It has been conceptualized that, steep angle conveyor system will be implemented beyond 150 meter depth.

SURAJIT DAS
Chief General Manager/Project Head
Pachwara South Coal Mine Project
NUPPL, Dumka (Jharkhand)

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Top soil Storage:

Top soil will be scrapped and stored in the designated place as shown in the respective stage plans. Year wise top soil generation is furnished in below table No. 3.1. Top Soil will be utilized in the Embankment in the initial years, however, will be spread over the reclaimed area in later phases during the progressive and final closure of the mine.

Waste Management:

The overburden generated in the initial 6 years shall be dumped in the eastern part of the Block beyond Fault F4. Height of the dump will remain 60 meter on average with 30 meter height in each tier. Concurrent backfilling will commence from the 7th year from production commencement. Re-handling of the surface dump of the eastern part will commence from 7th year of the production commencement and proposed to be completed by 19th year from commencement of production.

Stage wise Waste management schedule is furnished below in **Appendix-3.2.**

Year wise OB and top soil generation is furnished below in Table No. 3.1.

Table No. 3.1

Year wise Tentative cumulative Top soil and OB generation.

Year of operation	Calender Year	Top Soil "MM3"	OB "MM3"	Total OB "MM3"
Year-1	2020-21	-		
Year-2	2021-22	-		
Year-3	2022-23	0.01	5.27	5.28
Year-4	2023-24	0.02	13.76	13.78
Year-5	2024-25	0.03	23.75	23.78
Year-6	2025-26	0.06	37.22	37.28
Year-7	2026-27	0.09	55.69	55.78
Year-8	2027-28	0.15	80.63	80.78
Year-9	2028-29	0.21	109.57	109.78
Year-10	2029-30	0.27	138.51	138.78
Year-11	2030-31	0.33	167.45	167.78
Year-12	2031-32	0.39	196.39	196.78
Year-13	2032-33	0.45	225.33	225.78
Year-14	2033-34	0.51	254.27	254.78

SURAJIT DAS
Chief General Manager/Project Head
Pachwara South Coal Mine Project
NUPPL, Dumka (Jharkhand)

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Year-15	2034-35	0.57	283.21	283.78
Year-16	2035-36	0.63	312.15	312.78
Year-17	2036-37	0.69	341.09	341.78
Year-18	2037-38	0.75	370.03	370.78
Year-19	2038-39	0.81	398.97	399.78
Year-20	2039-40	0.87	427.91	428.78
Year-21	2040-41	0.93	456.85	457.78
Year-22	2041-42	0.99	485.79	486.78
Year-23	2042-43	1.05	514.73	515.78
Year-24	2043-44	1.11	543.67	544.78
Year-25	2044-45	1.17	572.61	573.78
Year-26	2045-46	1.29	601.49	602.78
Year-27	2046-47	1.38	630.40	631.78
Year-28	2047-48	1.46	659.32	660.78
Year-29	2048-49	1.57	688.21	689.78
Year-30	2049-50	1.71	714.07	715.78
Year-31	2050-51	1.71	740.07	741.78
Year-32	2051-52	1.71	766.07	767.78
Year-33	2052-53	1.71	792.07	793.78
Year-34	2053-54	1.71	816.07	817.78
Year-35	2054-55	1.71	836.07	837.78
Year-36	2055-56	1.71	844.57	846.28
Year-37	2056-57	1.71	849.57	851.28
Year-38	2057-58	1.71	853.27	854.98
POST CLOSURE				
Year-39	2058-59	-		
Year-40	2059-60	-		
Year-41	2060-61	-		

The Geo-mining parameters are listed below in **Table No. 3.2.**

Table No. 3.2

Geo-mining Parameters of Pachwara South Coal Mines.

Geological reserve	Net Geological Reserve of the block is 373.52 million tons considering 0.5 m cut off thickness.
Mineable Reserve	Mineable Reserve as estimated is 269.58 Million Tons (converted from net insitu coal reserve with 0.5 meter cut off thickness).

SUBRAJIT DAS
Chief General Manager/Project Head
Pachwara South Coal Mine Project
NUPPL, Dumka (Jharkhand)

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Extractable Reserve	Considering 2.5% Mining Losses, extractable reserve comes to about 262.84 Million Tons.
Mine Capacity	9 MTPA (Rated) 13.50 MTPA (Peak rated)
Ultimate Pit Depth (m)	320 meter from the average ground level.
Dip-Rise length (m)	Strike Length – 1250 meter (average); dip to rise length – 4500 meter (average)
Excavation area (Ha)	643.76 ha
Length of embankment (Km)	4.85 km
Total Overburden	854.98Mcum
Average Stripping Ratio (Cum:te)	1: 3.25
Quarry Benches	Height – 10 meter, 30 meter for working benches, 3 meter width in sterile benches and 10 meter width in every fourth sterile benches. 20 meter width in every eighth bench for accommodating haul road and affirming bench stability.
Dumping Profiles	The external duping will be followed with 30 meter tier with a maximum height of 60 meter in the northern side, with an overall slope of 32°. Internal dumping will follow the quarry floor and will maintain a height of maximum upto 60 meter from the average ground height in the norther part, while same ground height as in the southern part. overall slope along towards the mined out void will be 28 degree, while above the ground level it will be 32 degree. Each tier will be of 30 meter height both below and above ground levels.

Year wise re-handling Schedule is furnished below in table no. 3.3.

SURAJIT DAS
Chief General Manager/Project Head
Pachwara South Coal Mine Project
NUPPL, Dumka (Jharkhand)

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Table No. 3.3
Re-handling schedule

S.L. Year	Calendar Year	Re-handling Quantity in Mcum
Year-9	2028-29	3.6
Year-10	2029-30	5.4
Year-11	2030-31	5.4
Year-12	2031-32	8.4
Year-13	2032-33	8.4
Year-14	2033-34	8.4
Year-15	2034-35	8.4
Year-16	2035-36	8.4
Year-17	2036-37	5.4
Year-18	2037-38	5.4
Year-19	2038-39	5.4
Year-20	2039-40	5.4
Year-21	2040-41	2.63
Total Re-handling Volume		**80.63**

Re-handling of the surface dump is planned from 7th year of production commencement or 9th year from the base year. This will continue for 13 years and shall be completed by 21st year from the base year or 19th year from production commencement. Separate set of equipment has been planned for re-handling of the surface dump.

Coal Evacuation:

The coal evacuation activities in Pachwara South Coal Mine can be subdivided into two parts- i. Mine face to Coal Stock Yard and, ii. Main stock yard to RLS at Railway siding. The first activity will be restricted to the mine area only while the second activity involves transboundary movement. The mine face to coal stock yard movement will takes place in two modes – the coal produced from the upper benches (less than 150 meter depth from the average ground level) will be taken to the temporary coal stock yard through dumpers. While the coal produced from the deeper benches will be transported through steep angle conveyor system

SURAJIT DAS
Chief General Manager/Project Head
Pachwara South Coal Mine Project
NUPPL, Dumka (Jharkhand)

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		from coal face to temporary coal stock yard. From the temporary stock yard coal will be transported through conveyor to the main stock yard located in the north eastern corner of the block. The activity two involves the second set of conveyor system to be installed from mine site to Pachwara Railway Siding where RLS and Bunkers will be installed for coal loading onto wagons.
3.1.3	Coal production capacity proposed "Mtpa";	Targeted Capacity – 9 MTPA (Rated). Peak Rated Capacity – 13.50 MTPA.
3.1.4	Justification for Optimization Coal production capacity.	The targeted capacity of the mine has been firmed based on 85% PLF of 1980 MW power plant. As per the grade of coal (G10), the coal requirement comes to about 8.88 MTPA of say 9 MTPA. Thus normative capacity of this mine has been kept as **9 MTPA.** Thus the peak rated capacity of this mine is considered as **13.50 MTPA** as per the provision of MoC's guideline for preparation of Mining Plan dated, 29.05.2020.
3.1.5	Calendar year from which the production will start;	2022-2023.
3.1.6	Year of Achieving rated production;	8th Year, 2027-2028.

3.1.7 **Tentative Coal production Plan "MT"**

The first two year of the planned period has been envisaged to obtain the statutory Clearances including Notice of Opening and establishment of the Site Infrastructures. Mine production is planned from the year 2022-23. Year wise production schedule is given below in **Table no. 3.4.**

Table No. 3.4
Production Calendar of Pachwara South Coal Mine.

Coal Production Plan " MT"						
Year of operation	**Calendar Year**	**Coal Production**			**OB "MM3"**	**SR**
		UG	**OC**	**Total**		
Period for Obtaining Forest Clearance and Other Requisite Statutory Clearances						
Year-1	2020-21	-				
Year-2	2021-22	-				
Production Calendar						
Year-3	2022-23	-	-	-	5.28	-
Year-4	2023-24	-	1.68	1.68	8.50	5.06
Year-5	2024-25	-	2.00	2.00	10.00	5.00
Year-6	2025-26	-	4.11	4.11	13.50	3.28
Year-7	2026-27	-	6.50	6.50	18.50	2.85

SURAJIT DAS
Chief General Manager/Project Head
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Year-8	2027-28	-	9.00	9.00	25.00	2.78
Year-9	2028-29	-	9.00	9.00	29.00	3.22
Year-10	2029-30	-	9.00	9.00	29.00	3.22
Year-11	2030-31	-	9.00	9.00	29.00	3.22
Year-12	2031-32	-	9.00	9.00	29.00	3.22
Year-13	2032-33	-	9.00	9.00	29.00	3.22
Year-14	2033-34	-	9.00	9.00	29.00	3.22
Year-15	2034-35	-	9.00	9.00	29.00	3.22
Year-16	2035-36	-	9.00	9.00	29.00	3.22
Year-17	2036-37	-	9.00	9.00	29.00	3.22
Year-18	2037-38	-	9.00	9.00	29.00	3.22
Year-19	2038-39	-	9.00	9.00	29.00	3.22
Year-20	2039-40	-	9.00	9.00	29.00	3.22
Year-21	2040-41	-	9.00	9.00	29.00	3.22
Year-22	2041-42	-	9.00	9.00	29.00	3.22
Year-23	2042-43	-	9.00	9.00	29.00	3.22
Year-24	2043-44	-	9.00	9.00	29.00	3.22
Year-25	2044-45	-	9.00	9.00	29.00	3.22
Year-26	2045-46	-	9.00	9.00	29.00	3.22
Year-27	2046-47	-	9.00	9.00	29.00	3.22
Year-28	2047-48	-	9.00	9.00	29.00	3.22
Year-29	2048-49	-	9.00	9.00	29.00	3.22
Year-30	2049-50	-	9.00	9.00	26.00	2.89
Year-31	2050-51	-	9.00	9.00	26.00	2.89
Year-32	2051-52	-	9.00	9.00	26.00	2.89
Year-33	2052-53	-	7.00	7.00	26.00	3.71
Year-34	2053-54	-	5.50	5.50	24.00	4.36
Year-35	2054-55	-	5.50	5.50	20.00	3.64
Year-36	2055-56	-	2.50	2.50	8.50	3.40
Year-37	2056-57	-	1.55	1.55	5.00	3.23
Year-38	2057-58		1.50	1.50	3.70	2.47
Total			262.84	262.84	854.98	3.25
POST CLOSURE						
Year-39	2058-59	-				
Year-40	2059-60	-				
Year-41	2060-61	-				

Note: Calendar Plan/ Production Plan for the entire life of the mine.

SURAJIT DAS
Chief General Manager/Project Head
Pachwara South Coal Mine Project
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3.1.8	**Peak/Rated Capacity**	
	- By OC	9.00 MTPA (Rated); 13.50 MTPA (Peak rated)
	- By UG	Nil
	- Overall	9.00 MTPA (Rated); 13.50 MTPA (Peak rated)
3.1.9	**Life of the mine:**	
	- By OC	38 years.
	- By UG	Not applicable.
	- Overall	38 years.
3.1.10	Whether the proposed external OB dump site is coal/ lignite bearing: If so, whether coal/lignite below waste disposal area is extractable.	Initial OB dumping will involve coal bearing areas within the eastern part of the block. The same will be re-handled from 7th Year of production commencement and shall be completed within 19th Year of production commencement. At the end of the mine life, there will be no external dump.
3.1.11	Whether negative proving for coal / lignite in the proposed site for OB dump/infrastructure has been done.	Not Applicable.
3.1.12	Result of any investigation carried out for scientific mining, conservation of minerals and protection of environment; future proposals.	The Geological Report and slope stability report are in place.
3.1.13	Type of Equipment/ HEMM proposed	Selection of equipment has been largely guided by the volume and type of rocks including their physical characters. Planned HEMM configuration for production of OB, Coal, Re-handling of OB and reclamation including common pool are given below in table nos. 3.5 to 3.8. The equipment mentioned in the common pool will be extended for the closure activities.

Table No. 3.5

HEMM Configuration of Pachwara South Mine for OB handling.

Likely List of HEMM & Other Equipment For OB Handling			
Specification	**Unit**	**Capacity**	**Maximum Numbers**
DIESEL/ Electrical HYD. SHOVEL	Cum	10	2

SURAJIT DAS
Chief General Manager/Project Head
Pachwara South Coal Mine Project
NUPPL, Dumka (Jharkhand)

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DIESEL/ Electrical HYD. SHOVEL	Cum	5.5 - 6.0	3
DIESEL/ Electrical HYD. SHOVEL	Cum	4.5	5
DIESEL/ Electrical HYD. SHOVEL	Cum	3.1-3.5	6
REAR DUMPER	Tons	100	10
REAR DUMPER	Tons	50-60	34
REAR DUMPER	Tons	35-40	32
Diesel Drill	mm	250	7
Diesel Drill	mm	160	6
DOZER	HP	320	8
Ripper Dozer	HP	460	3
Wheel Dozer	HP	400	2
GRADER 145HP	HP	145	6
WATER SPRINKLER with Fog Canon Systems.	KL	20	5
FUEL TRUCK	KL	-	6
FIRE TRUCK	-	-	2
MAINTENANCE VAN	-	-	4
Light Motor Vehicle	-	-	15
VIBRATOR COMPACTOR	HP	145	2

Table No. 3.6
HEMM Configuration for Coal Production.

For Coal Production			
Specification	**Unit**	**Capacity**	**Maximum Numbers**
Surface Miner	mm	2200	2
Surface Miner	mm	3800	2
Front End Loader	Cum	5	3
Front End Loader	Cum	2.5	2
Dump Trucks	T	35-40	32
Dozer with Ripper	HP	460	1
DIESEL/ Electrical HYD.SHOVEL	Cum	3.1-3.5	2
Dozer	HP	320	2
Grader	HP	145	2
Fuel Truck	-	2	2
Fire Truck	-	2	2
Maintenance VAN	-	2	2
Water Sprinkler with Fog Canon systems.	KL	20	3

Table No. 3.7

HEMM (Common PooL and Closure Activities) for Pachwara South Coal Mine.

For Common Services & Closure Activities			
Specification	**Unit**	**Capacity**	**Maximum Numbers**
Drill	mm	160mm	1
Dozer	hp	165 & 320 hp	4
Grader	hp	120 - 150 hp	1
Crane	T	20T- 40T	2
Crane	T	8-10T	1
Diesel Backhoe	Cum	1 cum	1
FE loader	Cum	4-6 cum	2
Dozer	hp	165 hp	1
Ripper Dozer	HP	300 - 450 HP	1
Fuel Truck			2
Fire tender			1
Boom truck			2
Heavy duty toe truck			1
Fork lift truck	T	5T	1
Tipping truck			5
Vibratory Compactor			1
Water Sprinkler with Fog canon systems.	KL	12 KL	5
Ambulance	-	-	1

Table No. 3.8

HEMM Configuration for Re-handling of Overburden.

Specification	Unit	Capacity	Maximum Numbers
DIESEL/ Electrical HYD. SHOVEL	Cum	3.1-3.5	7
REAR DUMPER	Tons	35-40	37
Dozer	HP	320	2
GRADER 145HP	HP	145	2
Water Sprinkler with Fog canon systems.	KL	12 KL	2

Man power requirements are assessed on the basic design criteria for a production of 9.0 MTPA of Coal and come to about 1288. Break-up of total manpower requirement for Pachwara South Coal Mine is given in below table no. 3.9.

SURAJIT DAS
Chief General Manager/Project Head
Pachwara South Coal Mine Project
NUPPL, Dumka (Jharkhand)

UNITED EXPLORATION INDIA PVT LTD

Table No. 3.9
Manpower details of Pachwara South Coal Mine

Category	Nos.
Management Staff	32
Mine Operations	1075
Maintenance	80
Environmental	4
Safety	26
Training	3
Support	68
Total =	**1288**

The overall OMS as envisaged comes to about 23.29.

SUBAJIT DAS
Chief General Manager/Project Head
Pachwara South Coal Mine Project
NUPPL, Dumka (Jharkhand)

Appendix-3.1

Seam wise Calendar Schedule

Year	Extractable Reserve (MT)	Seam Name (All figures in MT)																												
		IX	VIIIT	VIIIM	VIIIB	VIIC	VIIB	VIIA	VII	L6	L5	VIT	VIB	VI	VB	V	L4	IVT	IVB	L3	IIIT	IIIB	III	IIIT	IIIB	IIT	IIB	II	L2	IT	IM	IB
Year-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Year-4	1.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.10	0.12	0.13	0.73	0.42	0.00
Year-5	2.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.16	0.21	0.18	0.36	0.16	0.19
Year-6	4.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.42	0.17	0.46	0.15	0.28	0.11	0.39
Year-7	6.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.59	0.45	0.00	0.00	0.59	0.32	0.53
Year-8	9.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.89	0.71	0.00	0.00	0.63	0.53	0.69
Year-9	9.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Year-10	9.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Year-11	9.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Year-12	9.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Year-13	9.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Year-14	9.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Year-15	9.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Year-16	9.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Year-17	9.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Year-18	9.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Year-19	9.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Year-20	9.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Year-21	9.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Year-22	9.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Year-23	9.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Year-24	9.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Year-25	9.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Year-26	9.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Year-27	9.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Year-28	9.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Year-29	9.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Year-30	9.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Year-31	9.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Year-32	9.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Year-33	7.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Year-34	5.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Year-35	5.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Year-36	2.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Year-37	1.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Year-38	1.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	262.84	3.19	1.89	0.86	2.71	1.31	8.05	1.13	22.45	1.27	4.36	1.03	5.06	6.72	1.42	13.83	0.01	11.18	10.00	1.39	11.10	24.69	3.72	7.61	2.39	29.84	22.14	29.28	5.48	25.34	9.89	8.33

Prepared by
United Exploration India Pvt. Ltd.

SURAJIT DAS
Chief General Manager/Project Head
Pachwara South Coal Mine Project
NUPPL, Dumka (Jharkhand)

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Appendix-3.2

Year wise Waste Management Schedule

Year of operation	Calendar Year	TOP SOIL "MM3"	Ext. OB "MM3"	Int. OB "MM3"	TOTAL OB "MM3"	Re-handling Quantity inMcum
Year-1	2020-21	-				
Year-2	2021-22	-				
Year-3	2022-23	0.01	5.27		5.27	
Year-4	2023-24	0.01	8.49		8.49	
Year-5	2024-25	0.01	9.99		9.99	
Year-6	2025-26	0.03	13.47		13.47	
Year-7	2026-27	0.03	18.47		18.47	
Year-8	2027-28	0.06	24.94		24.94	
Year-9	2028-29	0.06		28.94	28.94	3.6
Year-10	2029-30	0.06		28.94	28.94	5.4
Year-11	2030-31	0.06		28.94	28.94	5.4
Year-12	2031-32	0.06		28.94	28.94	8.4
Year-13	2032-33	0.06		28.94	28.94	8.4
Year-14	2033-34	0.06		28.94	28.94	8.4
Year-15	2034-35	0.06		28.94	28.94	8.4
Year-16	2035-36	0.06		28.94	28.94	8.4
Year-17	2036-37	0.06		28.94	28.94	5.4
Year-18	2037-38	0.06		28.94	28.94	5.4
Year-19	2038-39	0.06		28.94	28.94	5.4
Year-20	2039-40	0.06		28.94	28.94	5.4
Year-21	2040-41	0.06		28.94	28.94	2.63
Year-22	2041-42	0.06		28.94	28.94	
Year-23	2042-43	0.06		28.94	28.94	
Year-24	2043-44	0.06		28.94	28.94	
Year-25	2044-45	0.06		28.94	28.94	
Year-26	2045-46	0.12		28.88	28.88	
Year-27	2046-47	0.09		28.91	28.91	
Year-28	2047-48	0.08		28.92	28.92	
Year-29	2048-49	0.11		28.89	28.89	
Year-30	2049-50	0.14		25.86	25.86	
Year-31	2050-51			26	26	
Year-32	2051-52			26	26	
Year-33	2052-53			26	26	

SUBAJIT DAS
Chief General Manager/Project Head
Pachwara South Coal Mine Project
NUPPL, Dumka (Jharkhand)

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Year of operation	Calendar Year	TOP SOIL "MM3"	Ext. OB "MM3"	Int. OB "MM3"	TOTAL OB "MM3"	Re-handling Quantity inMcum
Year-34	**2053-54**			24	24	
Year-35	**2054-55**			20	20	
Year-36	**2055-56**			8.5	8.5	
Year-37	**2056-57**			5	5	
Year-38	**2057-58**			3.7	3.7	
Total		**1.71**	**80.63**	**772.64**	**853.27**	**80.63**

SURAJIT DAS
Chief General Manager/Project Head
Pachwara South Coal Mine Project
NUPPL, Dumka (Jharkhand)

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Appendix-3.3

Cumulative Waste Management Schedule

Stage/ Year			Cumulative OB Removal (Figures in MM3)			Surface Dump (Cumulative) (MM3)		Internal Backfilling (Cumulative) (MM3)			Embankment (MM3)	
			Top Soil(BCM)	OB(BCM)	Total (BCM)	OB(BCM)	Top Soil(BCM)	RE-HANDLED OB(BCM)	OB(BCM)	Top Soil(BCM)	OB(BCM)	Top Soil(BCM)
upto year 2019-2020			-									
Year 1	Development Period	2020-21	-									
Year 2		2021-22	-									
Year 3	Y-1	2022-23	0.01	5.27	5.28	5.27	0.00	-	-	-	-	0.01
Year 5	Y-3	2024-25	0.03	23.75	23.78	23.75	0.00	-	-	-	-	0.03
Year 7	Y-5	2026-27	0.09	55.69	55.78	55.69	0.06	-	-	-	-	0.03
Year 8	Y-6	2027-28	0.15	80.63	80.78	80.63	0.12	-	-	-	-	0.03
Year 12	Y-10	2031-32	0.39	196.39	196.78	57.83	0.36	22.80	115.76	-	-	0.03
Year 17	Y-15	2036-37	0.69	341.09	341.78	18.83	0.66	61.80	260.46	-	-	0.03
Year 22	Y-20	2041-42	0.99	485.79	486.78	-	-	-	485.79	0.96	-	0.03
Year 27	Y-25	2046-47	1.38	630.40	631.78	-	-	-	630.40	1.35	-	0.03
Year 32	Y-30	2051-52	1.71	766.07	767.78	-	-	-	766.07	1.68	-	0.03
Year 38	Y-36	2057-58	1.71	853.27	854.98	-	-	-	853.27	1.68	-	0.03
Post Closure												
Year 41	Y-39	2060-61	1.71	853.27	854.98	-	-	-	853.27	1.68	-	0.03

NO CHANGE IN THIS CHAPTER

Chapter-4: Safety Management

<table>
<tr><th></th><th>Parameters</th><th>Details</th></tr>
<tr><td>4.1</td><td colspan="2">Safety Management</td></tr>
<tr><td>4.1.1</td><td>Important safety aspects:
Major Risks and uncertainties to the project viz. Proximity to river, adjacent working, geo-mining disturbances, slope stability and remedial measures suggested.
It should also include proposed overall slope of the quarry and OB dump, dump height, strata control, fire and spontaneous heating, gas monitoring, disaster management, danger from inrush of water etc.</td><td>The major areas of risks along with their remedial measures as envisaged in this project are discussed herewith.
<table>
<tr><th>Areas of concern</th><th>Remedial measures.</th></tr>
<tr><td>Failure of Benches of OB and Coal.</td><td>The benches in the overburden rocks are proposed upto10 meter height 30 meter width for the operational zones. On these 30meter horizontal benches, regular movement of dumpers and shovels shall take place. Any sudden failures of the vertical face would cause dangerous situations to the top horizontal bench and would move large quantity of debris to the lower horizontal benches, thereby causing serious mishap to the equipment and persons deployed at both the horizontal bench. In order to prevent such incidents, a comprehensive slope monitoring system will be implemented under the safety management program of the mines. Implementation of Real time Slope Monitoring system such as SSR or MSR will be evaluated during operational stage besides manual monitoring through EDM, crackmeters etc. Any chances of slope failure identified by the monitoring system will be attended with highest priority and appropriate measures based on the type of failure will be followed. Based on nature of failure, grouting, ground anchoring, retaining walls, wire netting etc. methods shall be adopted. Fault zones and other weak zones will be monitored with added frequency.</td></tr>
</table></td></tr>
</table>

SURAJIT DAS
Chief General Manager/Project Head
Pachwara South Coal Mine Project
NUPPL, Dumka (Jharkhand)

	Parameters	Details	
			A pre-monsoon audit will takes place at least one month prior to the onset of monsoon. Based on the audit report, a monsoon planning will be prepared and implemented.
		Failure of Dump Slopes	The surface dump has been benched at 30 meter height. Although individual OB bench slopes at its natural angle of repose i.e.- 37° the overall slope has been reduced to 27° by leaving a 30 meter wide berm between two successive benches. This reduces the chances of OB slope failure and subsequent damages. At any point of time, reverse sloping on the top of the dumps will be followed. Toe drains and weep holes will be provided to drain out the water from the loose overburdens. Terracing will be done as much as possible in the dump slopes before plantation/ slopes will be covered through grass turfing. In few strategic areas, covering through Geotextiles will be evaluated and if found suitable shall be implemented. Guard wall and retention walls of appropriate size shall be provided in the toe of the dump. Backfilled dumps once stabilized shall be technically and biologically reclaimed. Dump heights above the average ground level will be limited to 30 meter. Thus failure of backfilled dumps in post closure phase is not envisaged, except otherwise near the left out void area. The exposed dump surface facing towards the water body will be covered through wire netting, and proper terracing will be done to prevent such failure. Regular dump

	Parameters	Details	
			slope monitoring will be done through real time slope monitoring system and appropriate preventive measures will be taken if such chances of failures are identified.
		Flooding of the Mine	The mining operation will be restricted to 320 m depth from the surface level. Ground water accumulated during mining will be pumped and stored for plantation, workshop and sprinkling usage. As a river is flowing parallel to the northern boundary of the block, so, a proposal has been made for construction of an embankment parallel to the Bansloi River. A separate technical study will be conducted for construction of embankment. However, in general the Embankment slope walls will be stone pitched in the outer surface and grass turfing will be done in the inner surface. Sloples in the outer surface will be maintained to 1:1 while inner surface slope will be maintained to 1:2. Periodical monitoring will be done to identify any damages of this embankment. Necessary pumping arrangements need to be done considering the worst-case scenario of the rainfall on a single day basis and ground water assessment through detail hydrogeological study. Since the southern part of the Block is elevated compare to the other part of the block, a berm of 3 meter all along the pit crest is planned to prevent entry of storm water within the pit. These water will be channeliesd along the pit which will then follow the natural course to join Bansloi

SURAJIT DAS
Chief General Manager/Project Head
Pachwara South Coal Mine Project
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	Parameters	Details	
			river. A garland drain of 5-7 meter width has been planned along the lease boundary to channelize the storm water from the catchment area. In the initial years, this garland drain will connect the natural drainage through the central part of the block. Pumping arrangement on year to year basis will be followed as per Monsoon Planning to drain put the storm water.
		Blasting in Opencast Mines.	In general drilling and blasting has been envisaged as a mining process. Necessary study will be conducted when the mine moves to more than 200 meter depth. Vibrations due to blasting may cause damage to the nearby structures if appropriate control measures are not adopted. Flyrock is another possible damage causing outcome of blasting. There are many factors which influence flyrocks. These are like long explosive columns with inadequate stemming column, improper burden, loose material or pebbles near holes and long water columns in the holes. The following control measures have been envisaged to reduce ground vibration within statutory limits: a.The peak particle velocity (PPV) of ground vibration will be kept below 10mm/s for 8-25 hz frequency range through optimally controlled blasting techniques, after necessary field trials. b. Drilling and charging pattern will be formulated, with less explosives charge etc, after field trials. c. Use of suitable initiating sequence and millisecond detonators. d. Reduction of amount of explosives charged per day optimally. e. To contain fly rocks, stemming

SURAJIT DAS
Chief General Manager/Project Head
Pachwara South Coal Mine Project
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	Parameters	Details	
			column will not be less than burden of the hole. Blasting area will also be muffled, if necessary, to stop fly rocks propagation. f. Blasting will not be carried out when strong winds are blowing towards habitation areas. Blasting will be done during midday time and never at night. g. Surrounding villages within 1 km radius of blasting will be regularly inspected for any visual cracks on walls and feedbacks will be gathered to investigate the reasons for these and for reassessing the charge per delay from time to time. h. Vibration study will also be carried out at appropriate times to firm up most ideal and optimal blasting parameters. i. Controlled blasting to avoid tension cracks which may endanger the stability of bench slopes in the mine. j. Short delay detonators to be used in preference to detonating fuse. k. In case of using detonating fuse, it should be covered with 750 mm thick cover of sand or drill cuttings. l. Proper care and supervision during blasting by a competent and experienced person.
		Fire in Coal Benches/Coal Stack Yard	Spontaneous heating of Coal may cause fire in its Coal benches, Coal yards etc. Extraction of coals will made maximum possible from the coal benches and spillage coals will be removed before moving to another bench. This will reduce the chances of fire. Never the less, if any Coal benches are to remain idle for a period more than 15 days, the same shall be properly dressed and cleaned from loose Coal or fines at the time of stoppage. Heights of coal stack yard will be less than 10 meters to avoid spontaneous combustion at the stack yard. Fixed type sprinkler and fire fighting arrangements will be installed at the coal stock yards.

SURAJIT DAS
Chief General Manager/Project Head
Pachwara South Coal Mine Project
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	Parameters	Details	
		Accidents due to lack of proper space in movement in Mine.	Workers around shovel, dumper, dozer, drill and cranes must be warned to keep out of blind area so that operator may be able to see them clearly. Audiovisual alarms are used for pre warning person around this machine. To overcome shortage of space, strict discipline will have to be inculcated in workmen and supervisors. Haul roads are planned with sufficient widths to prevent accidents in the mines. CC TV camera's will be installed in the strategic location of the mine to supervise the mine activities more closely and for operational improvement to increase safety levels.
		Disaster management Plan.	The mine will prepare a DMP as per guideline. This plan is to be vetted by DGMS and is governed by the provision of the mine act 1952. This is to be prepared and submitted for approval to DGMS just after opening a mine. It is to be stated that, in case of any disaster, DGMS is the organization which is first to be informed. The emergency plan for disaster management is executed under guidance of best grade of the industry and senior officers of the regulator, the Directorate General of Mines Safety, GOI.
		Breaching of Embankment	Since the top of the embankment proposed to used for Coal Transportation Corridor and village road diversion, monitoring of this embankment will be very critical aspect for running of this mine. Plying of heavy vehicles on continuous basis may cause occasional cracks and breaching of some part of the embankment. Monitoring on fortnight basis will be followed.

SURAJIT DAS
Chief General Manager/Project Head
Pachwara South Coal Mine Project
NUPPL, Dumka (Jharkhand)

	Parameters	***Details***
4.1.2	A Commitment from the Company Board that entire mining operation will be carried out as per the Statutory provision given under Mines Act 1952, Coal Mine Regulation 2017 and &wherever specific permission will be required the company will approach the concerned authorities.	A commitment from the Board of Director has been furnished in **Annexure-III.**

SUJAJIT DAS
Chief General Manager/Project Head
Pachwara South Coal Mine Project
NUPPL, Dumka (Jharkhand)

NO CHANGE IN THIS CHAPTER

Chapter-5 : Infrastructure Facilities

	Parameters	***Details***
5.1	Mine infrastructure required e.g. Equipment maintenance planning, Office buildings, Workshop, Power supply arrangement, Water supply etc.	Following Mine Infrastructures have been planned to be located within the Mining Lease area: 1. E & M Workshop 2. Excavation Workshop 3. Conveyor from Mine Face to Main Stack Yard. 4. Conveyor connecting to Railway Siding. 5. Coal Yard including Feeder-Hopper. 6. Mine Office, VT Centers and Common Facilities. 7. HEMM Parking yard; 8. Security office; 9. Car parking areas for staffs and officers. List of Infrastructures to be retained and to be dismantled at the end of mine life are furnished below in Table No 5.1.

Table No. 5.1
List of Infrastructures to be dismantled.

S. L. No.	Mine Infrastructure to be Constructed	Mine Infrastructure to be retained in post closure period	Mine Infrastructure to be dismantled at the end of Mine Life
1	E & M Workshop	No	Yes
2	Excavation Workshop	No	Yes
3	Conveyor from Mine Face to Main Stock Yard	No	Yes
4	Conveyor - Mine Stackyard to Railway Siding	No	Yes
5	Coal Yard including Feeder-Hopper.	No	Yes
6	Mine Office, VT Centers and Common Facilities.	Yes	No.
7	HEMM Parking yard;	No	Yes
8	Security office;	No	Yes
9	Car parking areas for staffs and officers;	No	Yes

SUBAJIT DAS
Chief General Manager/Project Head
Pachwara South Coal Mine Project
NUPPL, Dumka (Jharkhand)

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A tentative area for each of the facilities is provided in below table no. 5.2.

Table No. 5.2

Layout dimensions of Excavation workshop, E&M workshop cum project Store and Mine Office.

Particular	Size (m x m)	Area (m^2)
A. Excavation workshop- including open area, Washing Bay's etc.	200 x 75	15000
B. E&M Workshop cum project store.	150 x 50	7500
C. Mine office and common Facilities.	75 x 75	5625
D. Conveyor from Mine Face to Main Coal stack Yard.	About 2450 meter.	-

Location of the office and other infrastructures are shown in respective Stage Plans and Conceptual Plan.

The Scope of Excavation workshop is listed below:

- Preventive maintenance.
  a) Daily maintenance, routine lubrication and bi-weekly washing of equipment.
  b) Technical inspection and running repair of transport equipment and checking of tyres.
  c) Daily and fast filling of diesel at fuel delivery station for transport equipment and at site for field equipment.
  d) Dismantling, opening and refitting of tyres.
  e) Incidental minor repairs of assemblies and sub-assemblies of mining and mechanical equipment, i.e dumper, dozer, shovel, drill etc.
- Scheduled Maintenance.
- Medium repair and replacement of assemblies and sub-assemblies.
- Mobile repair team with crew and facilities to cater the maintenance of minor repair needs of field equipment at site.

The Scope of E & M Workshop are listed below:

- Minor repair, medium repair and replacement of components, assemblies and sub-assemblies of pumps and electrical equipment.

SURAJIT DAS
Chief General Manager/Project Head
Pachwara South Coal Mine Project
NUPPL, Dumka (Jharkhand)

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		• Bi-weekly washing of LMVs and washing of equipment assemblies and sub-assemblies as and when required. • Periodical lubrication. • Repairs and replacement of components/ assemblies for LMV. • Minor and medium repair of switchgears, motors, self-starters and other electrical equipment. • Battery charges facilities and re-conditioning of batteries. Following facilities have been provided in the excavation workshop and E & M workshop for maintenance and repair of equipment as envisaged in the scope of work: • Mechanized washing on specially constructed platform for dumpers and dozers. • Daily maintenance bays for dumpers and dozers. • Schedule inspection and lubrication bays for dumpers and dozers. • Schedule maintenance, medium repair and minor repair facilities for dumpers and dozers. • Minor repair and replacement of sub-assemblies and assemblies of shovels, drills and other field equipment at site by mobile repair team. • Medium repair of overhauling of sub-assemblies and assemblies of field equipment. • Machining section. • Electrical and auto repair section. • Engine section. • Repair of hydraulics especially Surface miner. • Radiator repair section. • Welding and structural section. • Tyre section. • Condition monitoring section. • Shovel repair section. • Drill repair section. • Dozer repair shop. • Pavements for dumper and dozer parking. • Overhead and u/g water reservoirs. • Supporting facilities like computer room, electronics room, charge stores, tool room, offices, pump room, cycle stand, canteen, security post, fire fighting facilities, ventilation system etc.

SURAJIT DAS
Chief General Manager/Project Head
Pachwara South Coal Mine Project
NUPPL, Dumka (Jharkhand)

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		• Material handling facilities • Machine tools, general and special purpose tools, diagnostic tools, master tool kits etc. • Refueling station with pump and other necessary accessories. • Mobile repair and servicing unit.
5.2	Power supply illumination.	Necessary power connection will be drawn from the nearby substation of Jharkhand Bijli Vitran Nigam Limited. The details of sub-station capacities, distribution network, system of power supply and power factor improvement are as follows: **Distribution and Utilisation Voltages:** • Incoming power supply for the project - 11 kV • Pumps 265 kW & 180 KW - 3.3 kV • Pumps 94 kW, 30 KW & Face pumps - 415 V • Workshop/Colony water supply equipment - 415 V • Lighting - 230 V ➢ 2 nos. of 33/3.3 kV, 1.6 MVA Capacity Transformers feed power to various loads. The sub-station will be established near the entry of the quarry. ➢ From the Sub-station, 3.3 kV overhead transmission line will be laid along the edge of the quarry to feed power to equipment inside the quarry. The surface loads of workshop, Office, stores etc., will be fed by distribution transformers. ➢ The system of power supply at all the voltages in the project i.e., 3.3 KV, 415 V and 230 V will be by earthing neutral as per statutory regulations. ➢ Due to inductive loads of pumps etc., it is proposed to improve overall power factor of the system above 0.9 by manually operated capacitor banks. No automatic power factor correction is proposed as the connected loads are less. ➢ The working areas of the quarry and haul road etc. will be illuminated with energy efficient Sodium Vapour lamps mounted on 15 meter high towers, installed along the edge of the quarry. 2 Nos of 50 KVA transformers are provided for meeting the lighting loads of the quarry. ➢ The power for lighting loads of roads, stores, workshop, Office etc., will be drawn from 315 KVA, 3.3 KV/440 V transformers installed at the Sub-station.

SURAJIT DAS
Chief General Manager/Project Head
Pachwara South Coal Mine Project
NUPPL, Dumka (Jharkhand)

5.3	Drainage &Pumping Assessment of volume of Water for Pumping, Pumping Capacity and Pump Selection.	The planning of de-watering of the mine has been done in such a way that as far as possible the working faces and haul roads remain dry. The layout of the quarry provides suitable gradient along the quarry floors and the benches to facilitate self-drainage of water to the lowest level of the quarry towards the eastern side. Sump will be planned in the lowermost part of the mining face at any given point of time. The eastern section of the quarry face is proposed to act as the mine sump at any given point of time. The rain water inflow into the quarry workings will gravitate into this sump by natural drainage. The quantity of water inflow during a day of peak rainfall in monsoon in excess of sump capacity will be handled by the main pumps. Although there is a fair variation from year to year, the average annual rainfall is around 1317 mm per annum as per data collected from Dumka district HQ, Jharkhand. Basic Consideration on Pumping Capacity derivations are as follows: The following considerations have been made for calculating the pumping requirement and selection of pump for this interim period. • Excavated mine area and its depth (Maximum). • Geographical location of the project. • General climatic conditions, surface features of the terrain beyond the boundary of the mine. • Calendar plan of excavation of quarry. • Geological characteristics of OB and coal seams. • Meteorological data of nearest rain-gauge stations. • Catchment areas, mined out areas beyond excavation, spoil dump area etc., maximum depth of the quarry during this interim period. • Water garland drains shall be developed in advance for each stage of mine working so that rain water is collected by the garland drains and get diverted to the adjoining nallah. • Desired location at surface where quarry water can be discharged after due settlement and considering the surface drainage system. • The heaviest rainfall in 24 hours experienced was 300.8 mm on the 27th day of month of September in 1978. This figure has been considered for estimation of water accumulation in mine pit. • Pumping requirement has been assessed on the basis that the make of water on the day of maximum rainfall will be pumped out in following fifteen days.

SUBRAJIT DAS
Chief General Manager/Project Head
Pachwara South Coal Mine Project
NUPPL, Dumka (Jharkhand)

- Within the quarry, the faces shall be so laid that water from the working areas shall flow into the sump by gravity. From the sump, the water would be pumped out to the surface and will flow into the surface drainage system.
- Concurrent backfilling will be done in the de-coaled areas of the quarries. Effective water accumulation areas are thus calculated accordingly.
- For the purpose of pumping calculation, effective pumping hours per day has been adopted as 18.
- Adequate reserve pumping capacity shall be provided.

Assessment of Volume of water for Pumping:

The average rainfall in Pachwara South area is about 1317 mm of which 85% precipitation is during rainy season from June to September. The average annual rainfall limits to 1317 mm over a period of 30 years. Maximum rainfall in day found to be 300.80 mmon27th September, 1978(Data Source: IMD, Dumka). The volume of rain water entering to the mine and accumulating in the quarry has been estimated on the basis of direct catchment area, maximum daily precipitation and the run-off coefficient.

Volume of rain water entering to the mine and accumulating in the quarry (make of water) has been assessed on the basis of the following formula:

$$Q = A \times H \times \partial \ m^3/day;$$

Where, A - Catchment area in m^2;

H - Maximum daily precipitation in mm;

∂ - Run-off co-efficient;

The run-off co-efficient (∂) has been considered as below:

For mined out area	:	0.60
For area beyond excavation	:	0.15
For internal dumped area	:	0.10

The maximum broken area within the planned period is envisaged in the 6th year of operation and estimation for make of water done on the quarry parameters for sixth year only.

Following parameters were considered:

Maximum broken area:	143.49 ha;
Backfilled area:	0 ha;
Other catchment area:	Nil.

SURAJIT DAS
Chief General Manager/Project Head
Pachwara South Coal Mine Project
NUPPL, Dumka (Jharkhand)

Net area calculated for make of water in pit – 143.49 ha –0.00 ha

= 143.49 ha;

Make of water within pit = 143.49 x 10000 x 0.300 x 0.60= **258282.00 m³**

However, for estimation of pumping requirement, 15% of the Surface Water accumulation has been considered as ground water accumulation in the pit which needs to be pumped out. Such volume comes to, 38742.30 m³.

Thus the total volume of water accumulation estimated for Pumping is,

= 258282.00+38742.30 m³

= 297024.30 m³.

The pumping capacity has been designed in such a way that the maximum water can be pumped out in 15 days with 18 hours of pumping per day. As estimated per hour pumping requirement will be 1100.09m³. The estimation of number of Pumps are furnished in Table No. 5.3.

Table No. 5.3

Details of Pumps requirement in Pachwara South Coal Mine.

Year	Total required pumping capacity (cum/hr)	Depth of excavation from surface (m)	Specification of Pump	Basic Strength (No.)
Upto 41 th year (Including Closure Period	1100.09	300	300 cum/hr cap. 150 m head stage pumps, around 350 – 400 HP diesel operated pumps will be fitted.	4

The above assessed numbers and capacities are indicative only. the above specifications & strength (no. of pumps) will be revisited on completion of hydro geological investigation. Accordingly, the specification of pumps and requirement of pumps will be modified.

The mines during operation phase will have requirement of Pumps for various purposes and strengths. Requirement of pumps and accessories will be assessed by the mine management during operational planning.

5.4	Coal Handling Arrangement: Brief	The total coal production has been proposed to be done by Surface Miner. Requirement of primary crusher is thus ruled out. Coal will be evacuated by

SURAJIT DAS
Chief General Manager/Project Head
Pachwara South Coal Mine Project
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	detail of the CHP/ Mode of Despatch, Coal quality and Coal stacking and handling arrangement.	road for the initial five years from production commencement. Sixth year onward, coal evacuation from Pachwara South is planned through conveyor. When the mine working is within 150m depth, coal from the mine face will be transported to temporary coal stock through dumpers. For depths beyond 150m, from mine face, High angle conveyor system will be implemented to transfer coal up to the temporary coal stock at pit surface where Feeder-Hopper arrangement is proposed. Both Dumpers and high angle conveyor will deliver the coal at temporary coal stock/Feeder-hopper. From the temporary coal stock/ Feeder-hopper, from the 6th year of mining operation, coal will be transported through another belt conveyor of 2000 TPH capacity upto the Main coal stock located at the North-East corner of the coal block for further evacuation of coal. Necessary safety arrangements and dust control arrangements will be implemented in the conveyor arrangements. In the initial years, till the dedicated railway siding is constructed, coal will be dispatched to Pakur Railway Siding through trucks. Thereafter coal will be transferred to the RLS of dedicated Pachwara Railway Siding through conveyor system. Conveyor lay out is shown in the successive stage plans.
5.5	Coal washing and the proposed handling/ disposal of rejects.	Washing of Coal has not been envisaged in this project.

SURAJIT DAS
Chief General Manager/Project Head
Pachwara South Coal Mine Project
NUPPL, Dumka (Jharkhand)

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Chapter-6: Land Requirement

6.1 Land Requirement:

<table>
<tr><th></th><th>Parameters</th><th>Details</th></tr>
<tr><td>6.1.1</td><td>Total Land requirement for the mine in "Ha"</td><td>The Project area consists of 714.8553 ha(≈715 ha). The land distribution as per the Land records Obtained from the State Government both from revenue department and Forest department are furnished in Table No. 6.1 below.
<u>Table No. 6.1</u>
Pre-Mining Land Distribution of Pachwara South Coal Deposit.

<table>
<tr><th></th><th colspan="2">Pre Mining
Land Use "ha"</th></tr>
<tr><td rowspan="8">Tenancy</td><td>Agricultural</td><td>122.7345</td></tr>
<tr><td>Township</td><td>134.06</td></tr>
<tr><td>Grazing</td><td>2.27</td></tr>
<tr><td>Barren</td><td>-</td></tr>
<tr><td>Water Bodies</td><td>0.68</td></tr>
<tr><td>Road</td><td>-</td></tr>
<tr><td>Community</td><td>-</td></tr>
<tr><td>Others</td><td>-</td></tr>
<tr><td rowspan="5">Govt. Non Forest</td><td>Agricultural</td><td>-</td></tr>
<tr><td>Township</td><td>-</td></tr>
<tr><td>Grazing</td><td>-</td></tr>
<tr><td>Barren</td><td>-</td></tr>
<tr><td>Water Bodies</td><td>-</td></tr>
<tr><td>Road</td><td>-</td></tr>
<tr><td>Forest</td><td>Notified Forest</td><td>455.1108</td></tr>
<tr><td>Free Hold</td><td></td><td>-</td></tr>
<tr><td>Total =</td><td></td><td>714.8553</td></tr>
</table>

* Break up of Notified forest as per notifications is furnished in Table No.1.1 below</td></tr>
</table>

Table No. 6.1.1

Break up of Notified forest as per notifications

Forest	Notified Forest as per notification No. 2014-VIF-27R Dated – 16.05.1944 & 9316-VIF-81 R Dated – 30.11.1945	324.045 ha
	Notified forest according to section – 4 of IFA (as per notification No. 2014-VIF-27R Dated – 16.05.1944 & 9316-VIF-81 R Dated – 30.11.1945) Forest Land	96.4134 ha
	Notified forest according to section – 4 of IFA (as per notification No. 2014-VIF-27R Dated – 16.05.1944 & 9316-VIF-81 R Dated – 30.11.1945) Waste Land	34.6524 ha
Total		455.1108 ha

6.1.2 **During mining Land use details:**

Land use pattern during mining, end of mining and post closure are given below in table No. 6.3.

Table No. 6.2

Land Use Pattern of Pachwara South in proposed and end of life.

Type	Land Use (proposed)	land use (End of Life)	Land Use (Post Closure)						
			Agricultural Land Land	Plantation	Water Body	Public/ Company Use	Forest Land (Returned)	Undisturbed	Total
Excavation Area	643.76								0.00
Backfilled Area		523.62	51.16	100.70			371.76		523.62
Excavated Void		120.14			44.5692		75.5708		120.14
Without Plantation									0.00
Top Soil Dump.	6.53	6.53		6.53					6.53
External Dump /surface dump									0.00

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Chief General Manager/Project Head
Pachwara South Coal Mine Project
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	Safety Zone	10.84	10.84		3.06			7.78		10.84
	Haul road between quarries	17.13	17.13		17.13					17.13
	Road Diversion.	3.31	3.31				3.31			3.31
	Diversion/ Below River / Nala / Canal.									0.00
	Settling Pond	0.04	0.04				0.04			0.04
	Road & Infrastructure area.	18.47	18.47		17.84		0.63			18.47
	Rationalisation Area.									0.00
	Garland Drains.	4.89	4.89				4.89			4.89
	Embankment.	3.56	3.56				3.56			3.56
	Green Belt.	3.06	3.06		3.06					3.06
	Water Reservoir Near Pit									0.00
	UG Entry.									0.00
	Undisturbed / Mining Rights for UG.	3.2653	3.2653						3.2653	3.2653
	Resettlement.									0.00
	Pit Head Power Plant									0.00
	Water Harvesting									0.00
	Agricultural Land									0.00
	Total	**714.8553**	**714.8553**	**51.16**	**148.32**	**44.5692**	**12.43**	**455.1108**	**3.2653**	**714.8553**

6.1.3 Surface features over the block area

The project site covering an area of 714.8553 ha (≈715 ha) is dominated by forest land covering about 64% (455.1108 ha) of the project site. The present landuse pattern of the Project area is given below in Table No. 6.4 below.

Table No. 6.3

Present Land Use Pattern of Pachwara South Coal Block.

Classification	Area In Ha
Forest	455.1108
Settlement	134.06
Agricultural Land	122.7345
Grazing Land	2.27
Waterbodies	0.68
Total	714.8553

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Chief General Manager/Project Head
Pachwara South Coal Mine Project
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6.1.4	No. of villages/Houses to be shifted.	About 314 number of families to be shifted from three number of villages.
6.1.5	Population to be affected by the project.	Shifting of about 1806 number of Project Affected Persons is involved in Pachwara South Coal Project.
6.1.6	Proposed Rehabilitation Programme.	At present detail SIA is ongoing under the guidance of the District Administration. Based on the outcome of the survey, a detail R & R plan will be prepared and implemented after duly vetted by the State Government of Jharkhand.

6.2 Details of the Lease:

6.2.1	Status of Lease	The Development of this Block comes under CBA, 1957. Request for notification under section-11 (1) has already been published by Ministry of Coal vide Gazette Notification S.O 343 dated 21st May,2021.
6.2.2	Existing Lease Area "Ha"	Nil.
6.2.3	Period for which Mining Lease has been granted/is to be renewed/ is to be applied for.	The area will be vested as per CBA Act.
6.2.4	Date of expiry of earlier Mining Lease, if any	NA
6.2.5	Whether the lease boundary/required boundary is same as mentioned in the allotment order.	The applied project area is same as the Allotted Block.
6.2.6	Lease Area (applied/ required) as per the Mining Plan under consideration (Ha).	714.8553 ha(≈715 ha)
6.2.7	Whether the applied lease area falls within the allotted block.	Yes. The applied project area falls well within the allotted block boundary.
6.2.8	Area (Ha) of lease which falls outside the delineated block/sub-block	Nil.
6.2.9	**Details of outside area:**	Not applicable.

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	☐ Whether forms part of any other coal block	NA
	☐ Whether it contains any coal/lignite reserves	NA
	☐ Purpose for which it is required, e.g. roads/ OB dumps / service buildings/ colony/ safety zone/ others (specify)	NA
6.2.10	**Whether some part(s) of the allotted block has not been applied for mining lease.**	Not applicable.
	- Total area in Ha of such part(s).	NA
	- Total reserves in such part(s). (Mt)	NA
	- Brief reasoning leaving for such part(s)	NA

Chapter-7: Environmental Management

7. Environmental Management:

	Parameters	Details
7.1	Commitment from the project proponent that the company will comply Environment and Forest Condition stipulated in the respective clearances.	A commitment from the Board of Director regarding compliance of the Conditions as will be stipulated in the Forest Clearance as per FC Act, 1980 and Environmental Clearance as per EP Act, 1986 or any other permission related to Environment is furnished in **Annexure-III.**

NO CHANGE IN THIS CHAPTER.

SURAJIT DAS
Chief General Manager/Project Head
Pachwara South Coal Mine Project
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Chapter-8: Progressive & Final Mine Closure Plan

	Parameters	*Details*
8.1	**Land Degradation and restoration Schedule**	
8.1.1	**Tentative Land Degradation and Technical Reclamation (Commutative Area "Ha"):** Stage wise Land degradation and technical reclamation details are furnished in table no. 8.1 below.	

Table No. 8.1

Stage Wise Details of Tentative Land Degradation and Technical Reclamation in ha

Stage/ Year			Land Degraded (ha) - Cumulative				Technically Reclaimed Area (ha) - Cumulative			
			Excavation	Dump (Surface+ Top Soil)	Infra/ Others	Total	Backfill	Dump (Surface+ Top Soil)	Others	Total
upto year 2019-2020			-							
Yr 1	Development Period	2020-21	-							
Yr 2		2021-22	-							
Yr 3	Y-1	2022-23	30.44	31.37	58.24	120.05	-	-	-	-
Yr 5	Y-3	2024-25	48.74	167.77	58.24	274.75	-	-	-	-
Yr 7	Y-5	2026-27	102.31	198.12	58.24	358.67	-	-	-	-
Yr 8	Y-6	2027-28	146.87	204.32	58.24	409.43	-	-	-	-
Yr 12	Y-10	2031-32	217.45	168.25	58.24	443.94	75.58	-	-	75.58
Yr 17	Y-15	2036-37	287.33	97.29	58.24	442.86	140.56	-	-	140.56
Yr 22	Y-20	2041-42	398.98	6.53	58.24	463.75	289.2	-	-	289.20
Yr 27	Y-25	2046-47	489.78	6.53	58.24	554.55	345.01	-	-	345.01
Yr 32	Y-30	2051-52	569.48	6.53	58.24	634.25	489.73	-	-	489.73
Yr 38	Y-36	2057-58	643.76	6.53	58.24	708.53	523.62	-	-	523.62
Post Closure										
Yr 41	Y-39	2060-61	643.76	6.53	58.24	708.53	523.62	6.53	178.38	708.53

SUBAJIT DAS
Chief General Manager/Project Head
Pachwara South Coal Mine Project
NUPPL, Dumka (Jharkhand)

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8.1.2	**Tentative Biological Reclamation (Cumulative in "Ha")** Stage wise details of Biological Reclamation are furnished in table no. 8.2 below.

Table No. 8.2

Stage wise details of Tentative Biological Reclamation.

Stage/ Year			Biologically Reclaimed Area (ha) - Cumulative					Forest Land (Return)	Undisturbed/ To be left for Public/ Community Use	Total
			Agriculture	Plantation	Water Body	Public/ Company Use	Total			
upto year 2019-2020			-							
Yr 1	Development Period	2020-21	-							
Yr 2		2021-22	-							
Yr 3	Y-1	2022-23	-	-	-	-	-	-	-	-
Yr 5	Y-3	2024-25	-	-	-	-	-	-	-	-
Yr 7	Y-5	2026-27	-	-	-	-	-	-	-	-
Yr 8	Y-6	2027-28	-	-	-	-	-	-	-	-
Yr 12	Y-10	2031-32	-	35.45	-	-	-	-	-	-
Yr 17	Y-15	2036-37	-	76.29	-	-	-	-	-	-
Yr 22	Y-20	2041-42	-	102.34	-	-	-	-	-	-
Yr 27	Y-25	2046-47	-	132.87	-	-	-	-	-	-
Yr 32	Y-30	2051-52	-	145.12	-	-	-	-	-	-
Yr 38	Y-36	2057-58	-	161.05	-	-	-	-	-	-
Post Closure										
Yr 41	Y-39	2060-61	51.16	145.26	44.5692	12.43	253.4192	455.1108	6.3253	714.8553

The total forest land in this project is about 455.1108 Ha and is to be returned to the concerned Government authority at the end of the mine life. The distribution of the forest lands are as follows:

1. 371.76 ha – Backfilled dump and shall be covered under Plantation.
2. 7.78 ha - the part of the safety zone- shall be utilized for plantation.
3. 75.5708 ha – as a part of the last phase of mine and shall be utilized for water body creation.

At the end of the closure period, total 708.53 ha of land will be biologically reclaimed.

SURAJIT DAS
Chief General Manager/Project Head
Pachwara South Coal Mine Project
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8.2	**Post Closure Water Quality management:**	The proposed mining area is not dissecting any natural streams. The storm water and ground water intersected during the mining operation will be the source of water accumulation within the active mining pit. Accumulated mine pit water during the active mining period will be pumped while post mining operation, there will be accumulated water in the left out voids. An area of about 120.14 ha of land will be converted to water body at the end of mine life. This area can't not backfilled, however out of this 45.5692 ha will technically reclaimed by converting into water body and 75.5708 ha area will be returned to the forest land. In post closure phase the water accumulated in the lagoon shall be quarterly sampled and analysed to monitor development of any acidity or toxicity in the accumulated water. As post mine period, most of the broken areas will be backfilled and left out water bodies will be much less, development of toxic water is not anticipated. The accumulated water will be utilised for the local community for agriculture and other usage. Regular monitoring of the water quality will be carried out as per the CPCB norms. Once the mine is closed, outside water shall be prevented to enter into the mined out pits which in turn will reduce the TDS and other solvents. The pit water will be utilized for agricultural use, supply as drinking water after treatment, and for pisciculture. Water quality analysis shall be carried out as per CPCB guidelines 2009.
8.3	**Post Closure Air Quality Management:**	The post closure activities will be restricted to limited operation only in the following areas: 1. Dismantling of temporary infrastructures. 2. Dismantling of conveyor systems. 3. Dismantling of electrical infrastructures. 4. Regular maintenance works in the dumping ground. 5. Regular maintenance job in the embankment. 6. Post plantation care. 7. Maintenance of the main haul road. 8. Cleaning of suture drains and garland drains. Most of the activities does not involve any regular dust generation,

SURAJIT DAS
Chief General Manager/Project Head
Pachwara South Coal Mine Project
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		except the dismantling works which will be restricted to a limited zones compared to the whole project area. Water sprinkling will be continued before the vehicle movement. Occasionally dust may be generated from the uncovered areas of the dump. Regular sprinkling arrangements will be done till the areas are stabilized. Quarterly Air Quality Monitoring will be done as per NAAQ standard (CPCB guidelines, 2009).

8.4 **Tentative Waste Management** (Figures in MM3):
Tentative waste management schedule including top soil is furnished below in table no. 8.3.

Table No. 8.3
Details of Waste Management.

Waste Management (Figures in MM3)											
Stage/ Year			Cumulative OB Removal			Surface Dump (Cumulative)		Internal Backfilling (Cumulative)		Embankment	
			Top Soil	OB	Total	OB	Top Soil	OB	Top Soil	OB	Top Soil
Upto year 2019-2020			-								
Yr 1	Development Period	2020-21	-								
Yr 2		2021-22	-								
Yr 3	Y-1	2022-23	0.01	5.27	5.28	5.27	0	-	-	-	0.01
Yr 5	Y-3	2024-25	0.03	23.75	23.78	23.75	0	-	-	-	0.03
Yr 7	Y-5	2026-27	0.09	55.69	55.78	55.69	0.06	-	-	-	0.03
Yr 8	Y-6	2027-28	0.15	80.63	80.78	80.63	0.12	-	-	-	0.03
Yr 12	Y-10	2031-32	0.39	196.39	196.78	57.83	0.14	138.56	0.22	-	0.03
Yr 17	Y-15	2036-37	0.69	341.09	341.78	18.83	0.33	322.26	0.33	-	0.03
Yr 22	Y-20	2041-42	0.99	485.79	486.78	-	0.38	485.79	0.58	-	0.03
Yr 27	Y-25	2046-47	1.38	630.40	631.78	-	0.30	630.40	1.05	-	0.03
Yr 32	Y-30	2051-52	1.71	766.07	767.78	-	0.43	766.07	1.25	-	0.03
Yr 38	Y-36	2057-58	1.71	853.27	854.98	-	0	853.27	1.68	-	0.03
Post Closure											
Yr 41	Y-39	2060-61	1.71	853.27	854.98	-	0	853.27	1.68	-	0.03

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Chief General Manager/Project Head
Pachwara South Coal Mine Project
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8.5 Tentative Top Soil Management - (Including Action plan for Top Soil management)

Table No. 8.4

Details of Top Soil Management

Top Soil Management-(Including Action Plan for Top Soil Management) (All figures are Cumulative and in MM3)								
Stage/ Year			Top Soil removal plan "MM3"	Top Soil Used "MM3"				
				Spreading over Embankment	Spreading over the Back fill Area	Spreading over the OB Dump Area	Used in Green Belt Area	Total Utilised
upto year 2019-2020			-					
Yr 1	Development Period	2020-21	-					
Yr 2		2021-22	-					
Yr 3	Y-1	2022-23	0.01	0.01	-	-	-	0.01
Yr 5	Y-3	2024-25	0.03	0.03	-	-	-	0.03
Yr 7	Y-5	2026-27	0.09	0.03	-	-	-	0.03
Yr 8	Y-6	2027-28	0.15	0.03	-	-	-	0.03
Yr 12	Y-10	2031-32	0.39	0.03	0.22	-	-	0.25
Yr 17	Y-15	2036-37	0.69	0.03	0.33	-	-	0.36
Yr 22	Y-20	2041-42	0.99	0.03	0.58	-	-	0.61
Yr 27	Y-25	2046-47	1.38	0.03	1.05	-	-	1.08
Yr 32	Y-30	2051-52	1.71	0.03	1.25	-	-	1.28
Yr 38	Y-36	2057-58	1.71	0.03	1.68	-	-	1.71
POST CLOSURE								
Yr 41	Y-39	2060-61	1.71	0.03	1.68	-	-	1.71

8.6	**Management of Coal Rejects.**	Since the project doesn't envisage any washery, generation of rejects are not associated.
8.7	**Restoration of Land used for Infrastructure**	All infrastructures will be dismantled excluding the office, VT Center and Canteen which will be handed over to the state government. The details of the infrastructure to be retained and to be dismantled are furnished in Table No. 5.1.

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Chief General Manager/Project Head
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8.8	**Disposal of Mining Machinery**	Mining machineries are to be deployed by MDO. They will be taking out the machineries at the end of mine life and will utilized in their other projects. Scrapped machinery's will be auctioned to the authorized agencies.
8.9	**Safety & Security**	• Thorough inspection of the mine and OB dump areas for assessing the left over closure jobs of already reclaimed internal dump areas. • Inspection of infrastructure and water body areas for their safe reclamation and abatement of any leftover dangers. • Action required making drainage and any fire areas safe for future period. • Making 2 meter high fencing wall against excavated void area to prevent inadvertent entry as per requirement. • Making safe approach road from surface to left out pit bottom for future uses, as void becomes a water body. • Completing the survey of total reclaimed areas like mined areas, internal dumps, mine faces, quarry fencing and other areas to complete and update the Mine Plans under Coal Mine Regulation.
8.10	**Abandonment Cost and Financial Assurance**	
8.10.1	**Abandonment Cost: Cost of Activities to be taken up for closure of the mine:**	

Table No. 8.5

Estimated Fund Requirement for Closure Activities
(Without Escalation- Base Year- 1st of April, 2020)

Head	Activities	Unit	Qty	Rate Rs. (Lakhs) /	Amount Rs. In Lakhs
Progressive Closure	Water Quality Management	Year	36	1.25	45
	Air Quality Management	Year	36	15.5	558
	Waste Management	MM3	-	-	
	Ditch and Plant Fencing around dump	KM	5.75	1.75	10.0625
	Biological fencing around the Lease Area	KM	8.5	6.5	55.25
	Filling of voids.	MM3	-	-	
	Top Soil management.	MM3	-	-	
	Technical and Biological Reclamation of mined out of land and OB dump.	ha	-	-	-

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Chief General Manager/Project Head
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		Plantation over virgin area including green belt.	ha	10.84	4	43.36
		Manpower cost and supervision.	PM	60	0.75	45
		Toe wall around the dump.	M	4850	0.15	727.5
		Garland Drain.	M	7550	0.1	755
		Garland Drain around the dump.	M	4850	0.04	194
		Any Other Activities. (WTP)	LS	1	1050	1050
		AMC- WTP	PM	39	37.5	1462.5
		Pit & Dump Slope Monitoring	PM	35	6	210
	A.	**Sub-Total =**				**5155.6725**
	Dismantling of Infrastructure & Disposal or rehabilitation of Mining Machinery	Dismantling and Shifting of Workshop, Crusher, Conveyor.	LS	2	1000	2000
		Rehabilitation of the dismantled facility.	LS	1	650	650
		Dismantling of pumps and pipes / Other Facilities	LS	1	450	450
		Dismantling of Stowing bunkers/ provisioning of pumps for borewell pumping arrangement.	LS			0
		Dismantling of UG equipment				0
		Rearranging water pipeline to dump top park / Agricultural land	LS			0
		Dismantling of power lines.	LS	1	475	475
	B.	**Sub-Total =**				**3575**
	Safety & Security	Net fencing around dumps	M	3000	0.03	90
		Biological fencing around the pit.	M	2000	0.01	20
		Net fencing with masonary pillars	M	1250	0.25	312.5
		Concrete wall with masonary pillar around the Water Harvesting area.	M	1500	0.35	525
		Securing air shaft and installation of borewell pump				0
		Securing of Incline				0
		Concrete wall fencing around the water body	m	3100	0.1	310
		Boundary wall around the water body	M	1875	0.05	93.75
		Stablisation (Viz. Benching, Pitching) of side walls of the water body.	LS	-	-	
		Toe wall around the dump.	M	-	-	
		Nala Diversion/ Road Diversion	KM	5.35	90	481.5
		Garland drain around the dump.	M	-	-	
		Drainage channel from main OB dump.	M	2250	0.15	337.5

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Chief General Manager/Project Head
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		Construction of Embankment along Bansloi River	Km	4.85	250	1212.5
	C.	**Sub-Total =**				**3382.75**
	Technical & Biological Reclamation of Mined out of land and OB Dump	Filling of void.	Ha	65.5	18	1179
		Top Soil management	MM3	1.11	450	499.5
		OB rehandling for backfilling.	MM3	-	-	-
		Terracing, Blanketing with soil, and vegetation of External OB dump	Ha			
		Peripheral road, gates, view point, cemented steps on bank.	LS			
		Expenditure on development of agricultural land.	Ha	55.35	1.5	83.03
		Landscaping and plantation.	Ls			0
	D.	**Sub-Total =**				**1761.525**
	Post Closure Management and Supervision	Power Cost	Year	3	25	75
		Post mining water quality management	Year	3	3.5	10.5
		Post mining air quality management	Year	3	6	18
		Pit & dump slope /Subsidence monitoring for five years.	Year	3	6	18
		Waste Management	LS	10	25	250
		Manpower cost and supervision.	Year	3	125	375
	E.	**Sub-Total =**				**746.5**
	Others	Enterprenuershipdevelopment (Vocational/Skill development/training for sustainable income of affected people)	Year	25	10	250
		Golden Handshake / Retrenchment benefits to OC employees.	Nos.	500	5	2500
		Golden Handshake / Retrenchment benefits to UG employees.	Nos.	-	-	0
		One time financial grant to societies / Institutions/ Organisations which is dependent upon the project.	LS	35	20	700
		Provide Jobs in other mine of the company.	-	-	-	0
		Continuation of other services like running of schools etc.	Year	39	4.5	175.5
	F.	**Sub-Total =**				**3625.5**
	Total Mine Closure Cost in Rs. Lakhs. (A+B+C+D+E+F)					**18246.9475**

SURAJIT DAS
Chief General Manager/Project Head
Pachwara South Coal Mine Project
NUPPL, Dumka (Jharkhand)

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S. L. No	Closure Head	Amount in Cr.
A	Progressive Closure	51.56
B	Dismantling of Infrastructure & Disposal or rehabilitation of Mining Machinery	35.75
C	Safety & Security	**33.83**
D	Technical & Biological Reclamation of Mined out of land and OB Dump	17.62
E	Post Closure Management and Supervision	7.47
F	Others	36.26
	Total =	**182.47**

SURAJIT DAS
Chief General Manager/Project Head
Pachwara South Coal Mine Project
NUPPL, Dumka (Jharkhand)

8.10.2 Financial Assurance: Amount to be deposited in Escrow account as a security against the mine activities to be carried out for the closure of the mine:

Table No. 8.6

Calculation for ESCROW account.

Amount to Be deposited in ESCROW Amount as a security against the mine activities to be carried out for the closure of the mine			
WPI As on	April_19		121.1
WPI as on base date	1/4/2020	119.2	
Escalation rate of closure cost			1
		UG	OC
Base rate of closure cost "Rs. Crs./Ha"			0.09
Closure Cost "Rs. Crs/ Ha"			0.09
Project Area			715
Amount to be deposited in ESCROW account "Rs. in Crs"			64.35
Amount already deposited into ESCROW account "Rs. in Crs"			0.000
Net amout to be deposited into ESCROW account "Rs. in Crs."			64.350
Rate of compounding of Annual Closure Cost			5%
Balance life of the project "in yrs"			38
Annual Closure Cost			1.69
Amount to be deposited into Escrow Account after compounding@ of 5% "Rs in Crs"			182.40

Table No. 8.7

Year wise ESCROW Account. (Rs. In Crores)

	Year	OC	Year	UG	Total
Year-1	2020-21	1.69	2020-21	-	1.69
Year-2	2021-22	1.78	2021-22	-	1.78
Year-3	2022-23	1.87	2022-23	-	1.87
Year-4	2023-24	1.96	2023-24	-	1.96
Year-5	2024-25	2.06	2024-25	-	2.06
Year-6	2025-26	2.16	2025-26	-	2.16
Year-7	2026-27	2.27	2026-27	-	2.27
Year-8	2027-28	2.38	2027-28	-	2.38
Year-9	2028-29	2.50	2028-29	-	2.50

SURAJIT DAS
Chief General Manager/Project Head
Pachwara South Coal Mine Project

		Year-10	2029-30	2.63	2029-30	-	2.63
		Year-11	2030-31	2.76	2030-31	-	2.76
		Year-12	2031-32	2.90	2031-32	-	2.90
		Year-13	2032-33	3.04	2032-33	-	3.04
		Year-14	2033-34	3.19	2033-34	-	3.19
		Year-15	2034-35	3.35	2034-35	-	3.35
		Year-16	2035-36	3.52	2035-36	-	3.52
		Year-17	2036-37	3.70	2036-37	-	3.70
		Year-18	2037-38	3.88	2037-38	-	3.88
		Year-19	2038-39	4.08	2038-39	-	4.08
		Year-20	2039-40	4.28	2039-40	-	4.28
		Year-21	2040-41	4.49	2040-41	-	4.49
		Year-22	2041-42	4.72	2041-42	-	4.72
		Year-23	2042-43	4.95	2042-43	-	4.95
		Year-24	2043-44	5.20	2043-44	-	5.20
		Year-25	2044-45	5.46	2044-45	-	5.46
		Year-26	2045-46	5.73	2045-46	-	5.73
		Year-27	2046-47	6.02	2046-47	-	6.02
		Year-28	2047-48	6.32	2047-48	-	6.32
		Year-29	2048-49	6.64	2048-49	-	6.64
		Year-30	2049-50	6.97	2049-50	-	6.97
		Year-31	2050-51	7.32	2050-51	-	7.32
		Year-32	2051-52	7.68	2051-52	-	7.68
		Year-33	2052-53	8.07	2052-53	-	8.07
		Year-34	2053-54	8.47	2053-54	-	8.47
		Year-35	2054-55	8.90	2054-55	-	8.90
		Year-36	2055-56	9.34	2055-56	-	9.34
		Year-37	2056-57	9.81	2056-57	-	9.81
		Year-38	2057-58	10.30	2057-58	-	10.30
			Total =	182.40			182.40

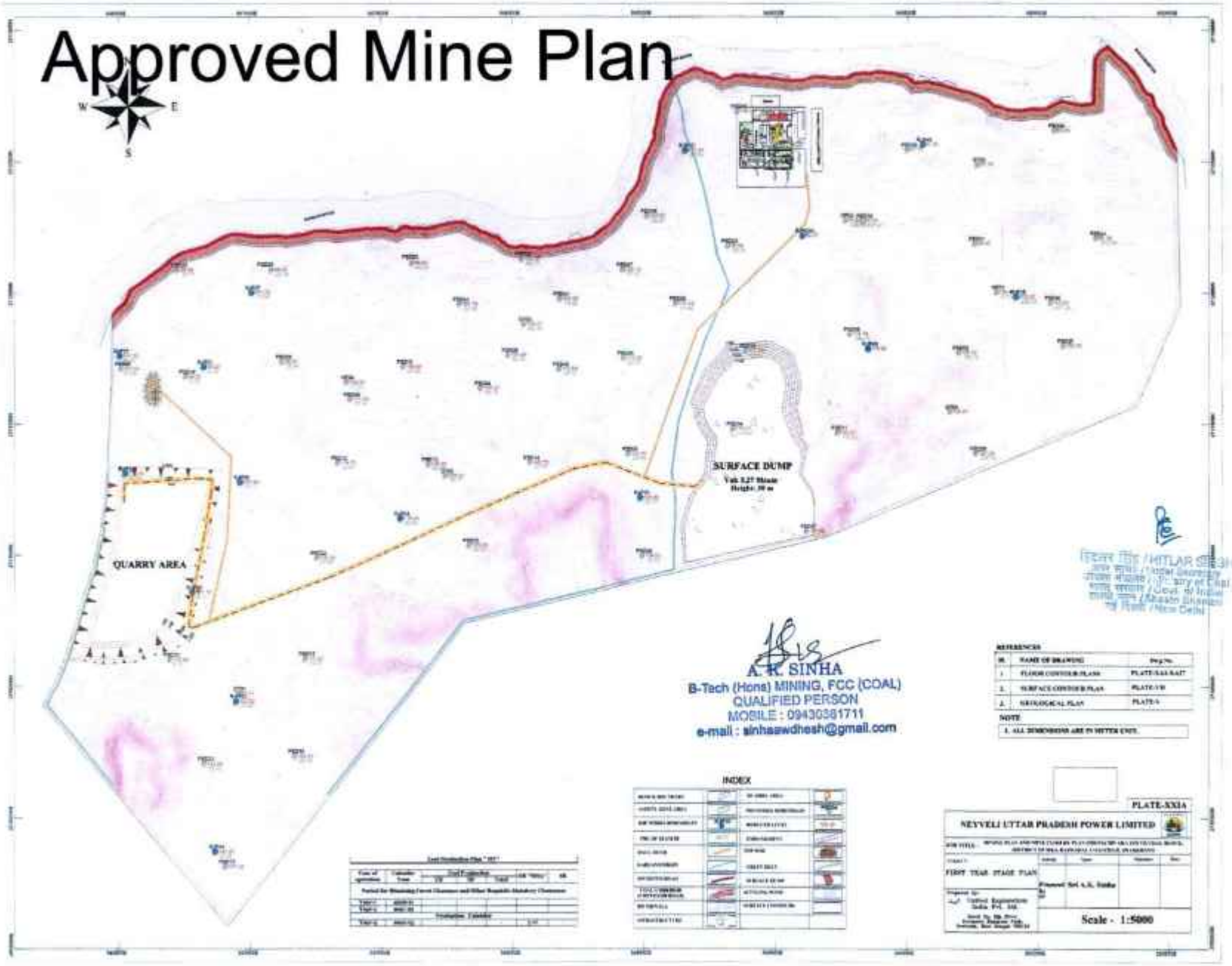
M/S Neyeveli Uttar Pradesh Power Limited shall open an ESCROW account immediately after the receipt the Approval of this Mining Plan including Mine Closure Plan of Pachwara South Coal Project. Amount will be deposited in the account as shown in Table No. 8.7.

*** Calculation of final Escrow amount and annual closure cost will be done on the date of signing of the Escrow Agreement.*

SUKANT DAS
Chief General Manager/Project Head
Pachwara South Coal Mine Project
NUPPL, Dumka (Jharkhand)

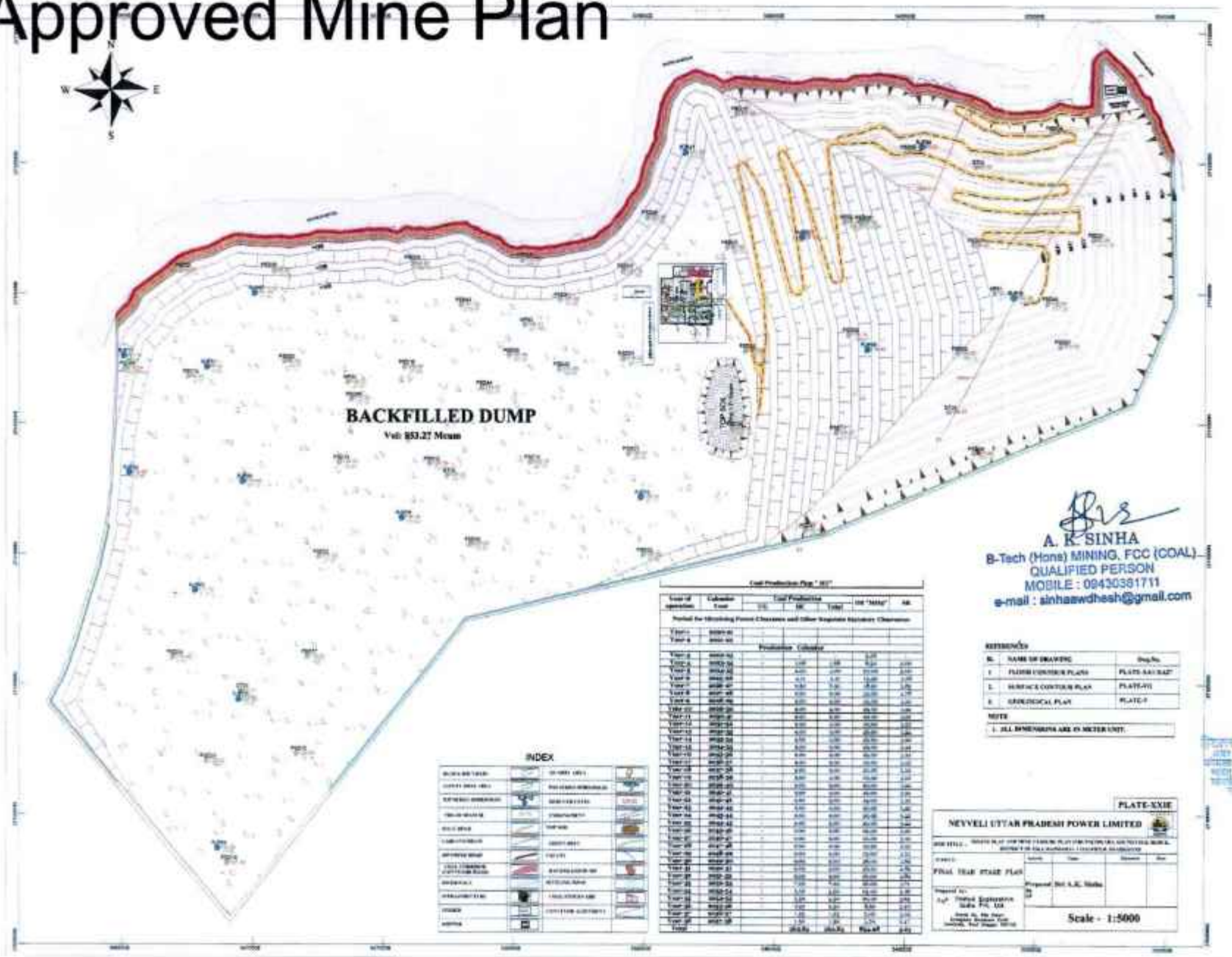
UNITED EXPLORATION
INDIA PVT LTD

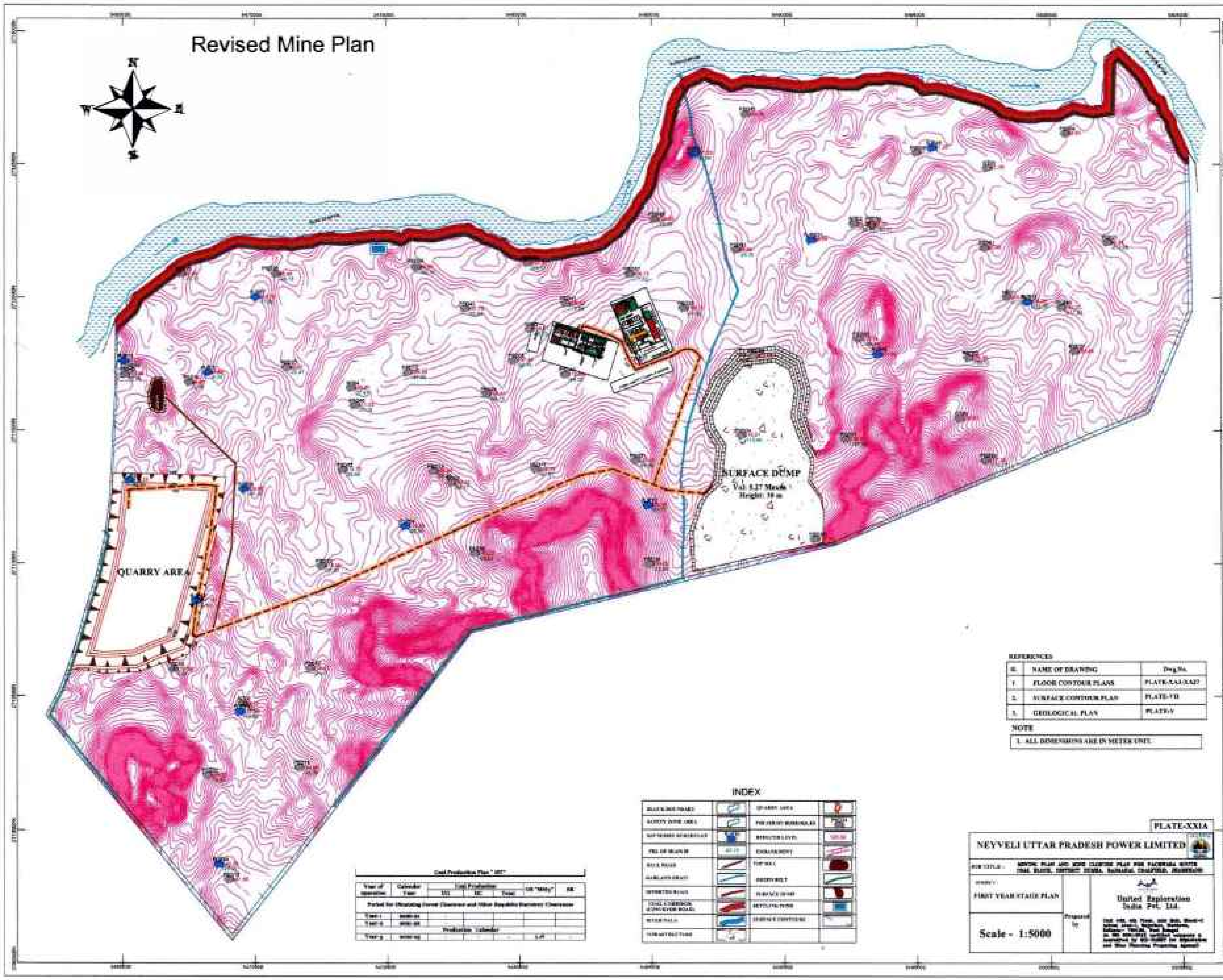
Approved Mine Plan



ANNEXURE-II

Approved Mine Plan





Revised Mine Plan
N
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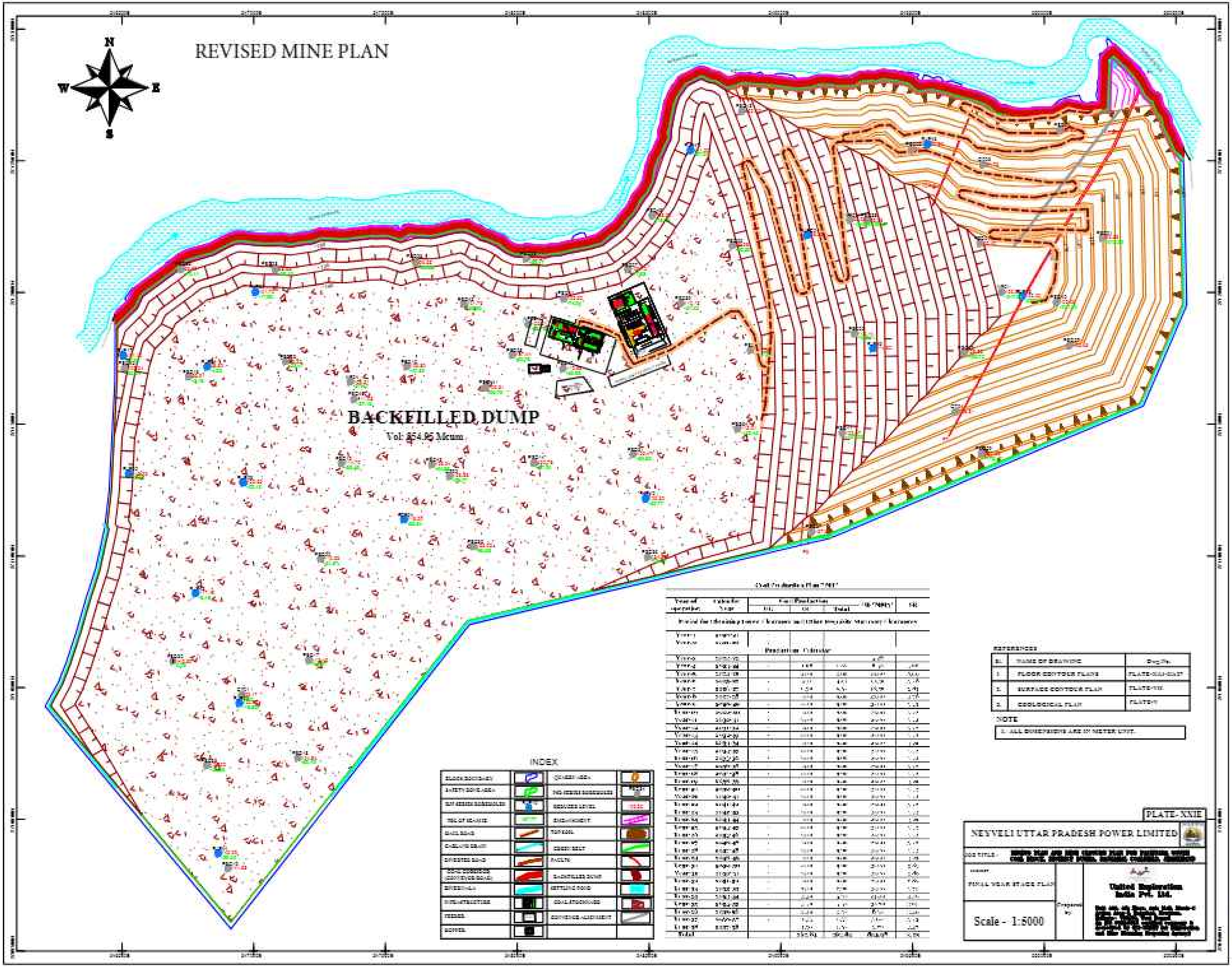
SURFACE DUMP
QUARRY AREA
REFERENCES
NAME OF DRAWING
FLOOR CONTOUR PLANS
SURFACE CONTOUR PLAN
PLATE-VII
GEOLOGICAL PLAN
PLATE-V
NOTE
1. ALL DIMENSIONS ARE IN METER UNIT.
INDEX
PLATE-XXIA
NEYVELI UTTAR PRADESH POWER LIMITED
FIRST YEAR STAGE PLAN
Scale - 1:5000
Prepared by
United Exploration India Pvt. Ltd.



REVISED MINE PLAN
N
S
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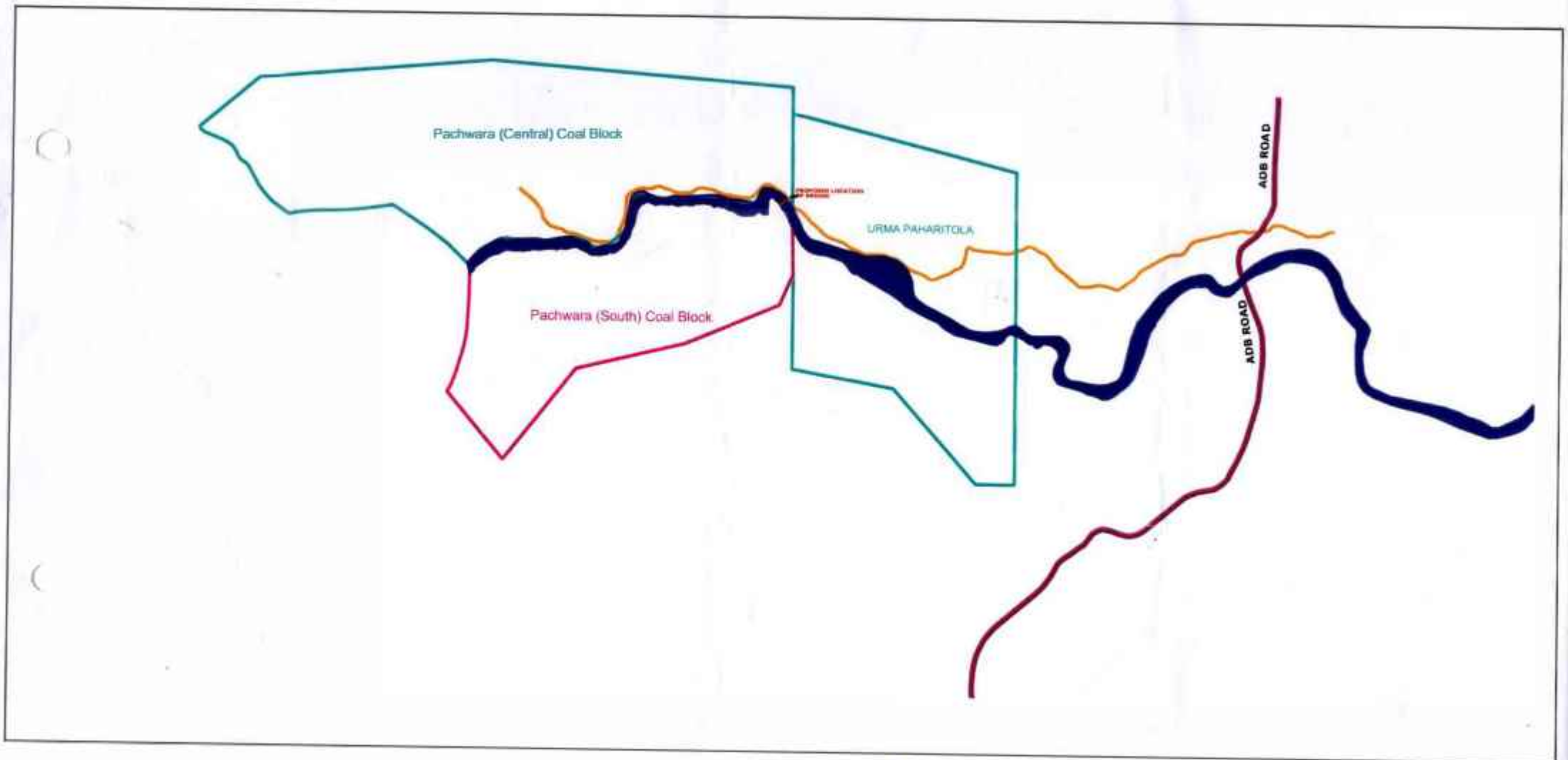
W
BACKFILLED DUMP
Vol: 254.95 Mcum
INDEX
REFERENCES
NOTE
1. ALL DIMENSIONS ARE IN METER UNIT.
PLATE- XXIE
NEYVELI UTTAR PRADESH POWER LIMITED
FINAL YEAR STAGE PLAN
United Exploration India Pvt. Ltd.
Scale - 1:5000

ANNEXURE-III



SURAJIT DAS
Chief General Manager/Project Head
Pachwara South Coal Mine Project
NUPPL, Dumka (Jharkhand)