

GOVERNMENT OF WEST BENGAL
Office of the Chief Mining Officer
COURT ROAD, P.O. ASANSOL, 713304,
DISTT. - PASCHIM BARDHAMAN.

Tele Fax: 0341-2252407
e-mail : cmo.dmm-wb@nic.in

Memo. No. 379/CMO/ XVI/91(189)

Dated:- Asansol, the 23rd October, 2019.

To

The Director, Patel Nagar Minerals & Industries Pvt. Ltd.,
Vill. Patelnagar, P.O. Md. Bazar (Ts.),
P.S. Md. Bazar, Dist. Birbhum, W.B.

Subject- Approval of "Scheme of Mining", for mining of "China Clay" in respect of "Kharia China Clay Mine", of "M/s. Patel Nagar Minerals & Industries Pvt. Ltd.", in Mouza Kharia, J.L. No. 145, Plot No.s 136-192 etc., over an area of 130 Acres (52.60 Hectares) under P.S. Md. Bazar, in Distt. Birbhum, W.B.

Ref :-

- i) Your Submission letter No. nil, dated 26.09.2019.
- ii) Your Submission letter No. nil, dated 02.02.2019.
- iii) This Office Memo. No. 351/CMO, dated 12.09.2019.

Sir,

In terms of Rule 19 of the West Bengal Minor Minerals Concession Rules, 2016, I hereby approve the above mentioned "Scheme of Mining" for "China Clay" in mouza "Kharia", Plot No.s 136-192 etc., J.L. No. 145, Under P.S. Md. Bazar, in Distt. Birbhum, State of West Bengal, over an area of 130 Acres (52.60 Hectares) subject to the following conditions:-

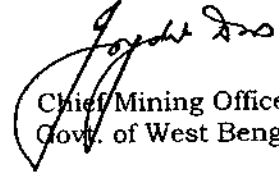
- 1) This "Scheme of Mining" is approved without prejudice to any other laws applicable to the mine/area from time to time whether made by the Central Government, State Government or any other authority.
- 2) This "Scheme of Mining" is approved without prejudice to any order or directions from any court of competent jurisdiction.
- 3) The approval of mining operations and associated activities is restricted to the mining lease only.
- 4) This "Scheme of Mining" is valid for remaining period of scheme of mining i.e., up to 31.03.2020. **The Final Mine Closure Plan (FMCP) must be submitted on or before 31.03.2020.**
- 5) The execution of "Scheme of Mining" shall be subjected to vacations of prohibitory orders/notices, if any.
- 6) This approval of the "Scheme of Mining" does not in any way imply the approval of the Government in terms of any other provisions of the Mines & Minerals (Regulation & Development) Act, 1957 or the Mineral Concession Rules, 1960, Mineral Conservation & Development Rules, 1988 and any other laws including the Forest Conservation Act, 1980 and rules made there under as well as other relevant statutes, orders, guidelines as may be applicable to the lease area from time to time.

Contd.....2/-

- 7) At any stage, if it is observed that the information furnished in the documents are incorrect or misleading or wrong the approval of the documents shall be revoked with immediate effect.
- 8) A copy of Environmental Clearance shall be submitted to this office when the same will be issued by the **SEIAA, West Bengal / MoEF & CC, New Delhi.**

Encl: Two copies of approved "**Scheme of Mining**" are enclosed herewith for information and necessary action.

Yours faithfully,


Chief Mining Officer
Govt. of West Bengal

Memo. No. 379/1(1234)/CMO/XVI/91(189)

Dated:- Asansol the 23rd October, 2019.

Copy along with a copy of approved "**Scheme of Mining**" forwarded for information & necessary action to:-

1. The Director, Directorate of Mines & Minerals, Government of West Bengal, Shilpa Sadan, 4, Abanindranath Tagore Sarani (2nd Floor), Kolkata 700 016, West Bengal.
2. The District Magistrate, Birbhum, West Bengal.
3. The Dy. Director General of Mines Safety, Eastern Zone, P.O. Sitarampur, Distt. Paschim Bardhaman, West Bengal.
4. The Mining Officer In-Charge of Suri Zone, Distt. Birbhum, West Bengal.

Chief Mining Officer
Govt. of West Bengal

Memo. No. 379/CMO/2(1)/XVI/91(189)

Dated:- Asansol the 23rd October, 2019.

Copy of the approval letter forwarded for information & necessary action to:-

1. Shri Ajit Prasad Chatterjee, RQP. (Consultant Geologist), 68, B.B.D. Sarani, SAIL Co-operative Colony, City Centre, Durgapur, Distt. Paschim Bardhaman, West Bengal.

Chief Mining Officer
Govt. of West Bengal

FINAL

SCHEME OF MINING

KHARIA CHINA CLAY MINE

VILL. KHARIA, MOUZA. KHARIA J.L. NO. 145
P.O. MD. BAZAR (T.S.), P.S. MD. BAZAR
DIST. BIRBHUM, WEST BENGAL

OVER AN AREA OF 130 ACRES (52.60 HECTARES)
NON-FOREST LAND

LESSEE – M/S. PATELNAGAR MINERALS & INDUSTRIES PVT. LTD.
P.O. MD. BAZAR (T.S.), P.S. MD. BAZAR, DIST – BIRBHUM
PIN – 731132, WEST BENGAL

FOR MINING OF CHINA CLAY

SUBMITTED UNDER

WEST BENGAL MINOR MINERALS CONCESSION RULES, 2016



:- Prepared by :-

Shri Ajit Prasad Chatterjee,
RQP (Consultant Geologist),
Regn. No. RQP/KOL/355/2008/A,
Sail Co-Operative Colony, 68, B.B.D. Sarani,
City Centre, Durgapur,
Dist – Paschim Bardhaman, West Bengal.



:- Approved by :-

APPROVED

Joydeb Das
(Joydeb Das) 23/10/19
Chief Mining Officer
Govt. of West Bengal

SCHEME OF MINING

KHARIA CHINA CLAY MINE
OF M/S. PATEL NAGAR MINERALS & INDUSTRIES PRIVATE LIMITED,
MOUZA-KHARIA, P.S.- MD. BAZAR,
DISTT.- BIRBHUM, WEST BENGAL

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Ajit Prasad Chatterjee
AJIT PRASAD CHATTERJEE
RQP/KOL/355/2008/A

SCHEME OF MINING

KHARIA CHINA CLAY MINE
OF M/S. PATEL NAGAR MINERALS & INDUSTRIES PRIVATE LIMITED,
MOUZA-KHARIA, P.S.- MD. BAZAR,
DISTT.- BIRBHUM, WEST BENGAL

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Ajit Prasad Chatterjee
AJIT PRASAD CHATTERJEE
RQP/KOL/355/2008/A

SCHEME OF MINING

KHARIA CHINA CLAY MINE
OF M/S. PATEL NAGAR MINERALS & INDUSTRIES PRIVATE LIMITED,
MOUZA-KHARIA, P.S.- MD. BAZAR,
DISTT.- BIRBHUM, WEST BENGAL

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Ajit Prasad Chatterjee
AJIT PRASAD CHATTERJEE
RQP/KOL/355/2008/A

ANNEXURE - I

CONSENT LETTER

The Scheme of Mining in respect of Kharia China Clay Mine in Mouza Kharia, J.L. No. 145 over an area of 130 acres (52.60 Ha.) under P.S. Md. Bazar, in Distt. Birbhum in the State of West Bengal of M/S. Patelnagar Minerals & Industries Pvt.Ltd. has been prepared by Shri Ajit Prasad Chatterjee, RQP. of Durgapur, West Bengal.

I request to Chief Mining Officer, Govt. of West Bengal to make further correspondence regarding rectification of the Scheme of Mining if any, with the said recognized person to his following address:

Shri Ajit Prasad Chatterjee (RQP),
Sail Co-Operative Colony, 68, BBD Sarani, City Center
Durgapur - 713216
Distt. Paschim Bardhaman, West Bengal.



I do hereby undertake that all the plans and information furnished in the mining plan by recognized person be deemed to have been made with my knowledge and consent and shall be acceptable to me in all respect.

Signature of the R.Q.P.
(Ajit Prasad chatterjee)
(RQP/KOL/355/208/A)

Swapan Kanti Ghosh
Signature of Director
(Swapan Kanti Ghosh)

Ajit Prasad Chatterjee
AJIT PRASAD CHATTERJEE
RQP/KOL/355/2008/A

ANNEXURE – II

CERTIFICATE OF DECLARATION

I certified that the preparation of Scheme of Mining including Environmental Management Plans in respect of the Scheme of Mining in respect of Kharia China Clay Mine in Mouza Kharia, J.L. No. 145 under P.S. Md. Bazar, in Distt. Birbhum in the State of West Bengal over an area of 130 Acres (52.60 Ha.) of Patelnagar Minerals & Industries Pvt. Ltd. is under Rule 12(2) under MCDR'88 and WBMCR' 2016.

The provision of mines Act, Rules, Regulation & orders made there under have been observed in the modified plans & sections when ever any specific permission, the applicant will approach the Director General of Mines Safety in this behalf.

Further standard prescribed by DGMS in respect of Miners health must be implemented by the applicant.

Signature of Director

Swapan Kanti Ghosh
(Swapan Kanti Ghosh)



(Ajit Prasad chatterjee)
(RQP/KOL/355/208/A)

Ajit Prasad Chatterjee
AJIT PRASAD CHATTERJEE
RQP/KOL/355/208/A

APPENDIX - II

(A) CERTIFICATE OF DECLARATION



Kharia China Clay Mine in Mouza Kharia, J.L. No. 145 under P.S. Md. Bazar, in Distt. Birbhum in the State of West Bengal over an area of 130 Acres (52.60 Ha.) of M/s. Patelnagar Minerals & Industries Pvt. Ltd.

The Provisions of the Mines Act, Rules, Regulations & orders made there under have been observed in the Mining Scheme & whenever any specific permission is required, the applicant will approach the Director General of Mines Safety in this behalf.

Further, the standard prescribed by **DGMS** in respect of Miner's health must be implemented by the applicant.

Swapan Kanti Ghosh
Signature of Director
(Swapan Kanti Ghosh)

Ajit Prasad Chatterjee
(Ajit Prasad Chatterjee)

AJIT PRASAD CHATTERJEE
RQP/KOL/355/2008/A

APPENDIX - III

(B) CERTIFICATE OF DECLARATION



Certified that in the preparation of the Scheme of Mining under Rule -- WBMMCR' 2016, in respect of Kharia China Clay Mine in Mouza Kharia, J.L. No. 145 under P.S. Md. Bazar, in Distt. Birbhum in the State of West Bengal over an area of 130 Acres (52.60 Ha.) of M/S. Patelnagar Minerals & Industries Pvt. Ltd. the provisions of WBMMCR' 2016 shall be observed. In particular, the Miner's Safety shall be strictly observed. If necessary the applicant shall approach the **Chief Mining Officer (CMO)**, Government of West Bengal, authority for the purpose.

Swapankanti Ghosh
Signature of Director
(Swapankanti Ghosh)

Signature of the R.Q.P.
(Ajit Prasad Chatterjee)

Ajit Prasad Chatterjee
AJIT PRASAD CHATTERJEE
RQP/KOL/355/2008/A

CONSULTANT SHRI A. P. Chatterjee (RQP)	KHARIA CHINA CLAY MINE VILL- KHARIA MOUZA – KHARIA J.L. NO - 145 P.S. - MD. BAZAR, DISTT. BIRBHUM, STATE: WEST BENGAL	LESSEE PATELNAGAR MINERALS & INDUSTRIES PVT LTD
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CHAPTER - NIL Introduction.

0.0 Introductory notes

Birbhum District of West Bengal is known to have a number of potential quantities of clay deposits, besides other mineral resources, particularly around the Md. Bazar P.S. area. M/S. Patelnagar Minerals & Industries Pvt. Ltd. has been holding four Mining Leases for Clay Minerals at Mouza Kharia & Komopur P.S. MD. Bazar, Dist. Birbhum as detailed below.

Kharia China Clay Mine, Lease No-2 of 52.6092 Hectares or 130 Acares is under representation/consideration



Brief details of the Leasehold (as per Lease Deeds, copies enclosed):

a) The original Mining Lease was executed by the "Lease" i.e., Patelnagar Minerals & Industries Private Limited on 19.8.1963 "for a term of 20 years with option for renewal of the said lease for a further period of "twenty years" (copy of three pages of Lease Deed enclosed). Date of expiry of the above lease was scheduled to have expired on 18.08.1983.

b) Renewed on 16.02.1985 for 20 years

c) Expiry of mining lease on 31.03.2020 (as per MMDR Amendment Act, 2012.)

**Table 0-1
Lease Details**

Area in (Hect.)	Mouza	Minerals	Lease Period	Expiry	Status
11.80	Kharia Mine Lease. 1	China Clay	20 Years w.e.f 20/09/1978	19/09/1998	FMCP submitted on 27.03.2018
52.6092	Kharia Mine Lease No. 2	China Clay	20 Years w.e.f 16/02/1983	15/02/2003	Presently not Working
14.78	Komopur Mine Lease No. 3	China Clay	20 Years w.e.f 23/09/1977	22/09/1997	Working
13.07	Kharia Mine Lease No. 4	Fire Clay & China Clay (Kaolin)	20 Years w.e.f 19/10/1984	18/10/2004	Working

All the above leasehold areas are contiguous and the company has opened up a number of pits to exploit them. In Plate No. 5 (Environment Plan, Scale 1:5000) the other Mining Lease areas around the existing MLA has been shown within the 500 Mtrs. radius lease boundary line with the same name of the mine and the same lessee. Also in Plate No. 5 population of the villages within 5 Km radius for the leasehold have been properly marked under the name of village.

The present Mining Plan in respect of Kharia Mine Lease No. 2, Area 52.6092 Hect. is being submitted, and is supported by Tables, Drawings and Appendices whenever it necessary.

In Plate No. 1, the population of the villages within 5KM radius of the lease hold have been properly marked under names of the villages (Refer: Appendix – 5, Demographic Profile). Predominant wind direction has been marked in Plate No. 1 & 5. Also Topo sheet No. has been giving in Plate No. 1 with clear notation given in the Index. The approach to the MLA from a known place has been clearly marked with distance specified.

CONSULTANT SHRI A. P. Chatterjee (RQP)	KHARIA CHINA CLAY MINE VILL- KHARIA MOUZA – KHARIA J.L. NO - 145 P.S. - MD. BAZAR, DISTT. BIRBHUM, STATE: WEST BENGAL	LESSEE PATELNAGAR MINERALS & INDUSTRIES PVT LTD
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In the Surface Plan, Plate No. 3 of this MLA, name of the Surveyor has been inscribed over it. Notations used in the Index covering all the items as depicted in the Plan area shown clearly. Top & bottom RLs of the Quarry has been shown. Village road or mine road have been spelt correctly.

The Geological Plan & Sections, Quarries Development Plan & Section, Conceptual Plan and EMP all have been drawn as per IBM Guidelines & Circulars laid down in this behalf.

0.2 Review of Compliance Position of Salient Features of the Approved SOM

Table No. – 02

Sl. no.	Salient Features	Period	Proposal	Achievement	Remarks
1	Exploration	2013-19 (31.03.2019)	Nil	Nil	The development was made in already proved area
2	Mine development	-Do-	Nil	51,851 MT	From 31.03.2017 to 31.03.2019, Production has been stopped due to non-availability of E.C.
3	Over Burden / Waste Management	-Do-	Nil	8,710 M ³	Used as back filling
4	Afforestation	-Do-	Nil	150 No.s	Survival rate - 60%
5	Top Soil Management	-Do-	Nil	726 M ³ Top Soil	Top Soil has been spread over the Back filled area
6	Environment Monitoring	-Do-	-Do-	Environment i.e. Air, Water & Noise monitoring	Monitoring done at regular intervals



Ajit Prasad Chatterjee
AJIT PRASAD CHATTERJEE
 RQP/KOL/355/2008/A

CONSULTANT SHRI A. P. Chatterjee (RQP)	KHARIA CHINA CLAY MINE VILL- KHARIA MOUZA – KHARIA J.L. NO - 145 P.S. - MD. BAZAR, DISTT. BIRBHUM, STATE: WEST BENGAL	LESSEE PATELNAGAR MINERALS & INDUSTRIES PVT LTD
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CHAPTER I

1.1. General

a) Name of applicant: M/S. Patelnagar Minerals & Industries (Pvt.) Ltd.

Address : Patel Nagar, P.O. Md. Bazar (T.S.), P.S. Md. Bazar,
Dist : Birbhum
State : West Bengal, PIN: 731132.



b) Status of the Applicant: Board of Directors:

(i) Shri A.K. Ghosh – Managing Director, Abdul Hamid St. (First Floor), Kolkata – 700 069, Ph. No (off.) 033 – 224 – 34661/84726

(ii) Shri Swapan Kanti Ghosh – Director, Abdul Hamid St. (First Floor), Kolkata – 700 069

(iii) Shri Tapan Kanti Ghosh – Director & Others

This is a Pvt. Ltd. Company. They are both mining and trading China Clay and Fire Clay. The Company have been holding mining leases for clay minerals at Mouza – Kharia and Komorpur, P.S. Md. Bazar, Dist – Birbhum. As such they have a thorough knowledge of & are conversant with the relevant technology & commercial aspects, gained over the years, while conducting with utmost competence the mining operations & activities of their various clay mines in the vicinity.

c) Mineral/s which the Applicant intends to mine:

The Applicant intends to mine China Clay, as available from the M.L.A., which are covered in the subsisting lease dated 16.02.1985

(d) Period for which the mining lease granted is granted / renewed / proposed to be applied:

The said lease, dated 16.02.1985, granted for 20 years has expired. There is sufficient reserve of minerals of fair grades as estimated in various Blocks, which is expected to prolong the life of the mine to a further period of 20 years. Renewal for 20 years submitted in “J” Form,

Application Ref. dated 01.02.04, addressed to Secretary, C & I Dept., Mines Br., Writers’ Building, Calcutta – 700 001 forwarded through The Mining officer, Suri Zone, Birbhum, Govt. of W.B. Applied for Renewal of 20 years. As per gazette notification by The Government of India. The said mining lease will be expired on 31.03.2020. *The last and final mining plan was approved by the I.B.M. Nagpur, vide no. CAL/BRM/MP-233, dated 23.09.2008.*

(e) Name & Address of the R.Q.P., preparing Mining Scheme:

Shri Ajit Prasad Chatterjee, RQP (Consultant Geologist), Regn. No. RQP/KOL/355/2008/A, Sail Co-Operative Colony, 68, B.B.D. Sarani, City Centre, Durgapur, Distt. Paschim Bardhaman, West Bengal.

(f) Name & Address of prospecting Agency:

Karunakaran & Rao of G.S.I. (1964 – 65) had thoroughly prospected the area and suggested that there was workable deposit of clay in the lease hold areas. They have encountered various types of clay during drilling operations during 1964 – 65.

CONSULTANT SHRI A. P. Chatterjee (RQP)	KHARIA CHINA CLAY MINE VILL- KHARIA MOUZA – KHARIA J.L. NO - 145 P.S. - MD. BAZAR, DISTT. BIRBHUM, STATE: WEST BENGAL	LESSEE PATELNAGAR MINERALS & INDUSTRIES PVT LTD
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CHAPTER 2

LOCATION & ACCESSIBILITY

2.1 Location and Accessibility

(i) Details of the area with location Map:

The subsisting mining lease map vide Plate No. 2 is prepared from Mouza which is covered under lease dasted 16.02.1985. A brief description of the area is presented in the Table No. 2-1 below.

Table 2-1 Description of the area

Dist, Taluk & State	Village J.L. No.	Area Ha. /Acres	Ownership/Occupancy
1	2	3	4
Birbhum West Bengal	P.S. Md. Bazar, Mouza, Kharia J.L. No. 145	52.6092/Ha 130 Acres	10.0 Ha. Owned by Lessee & Rest by Villagers. (As per Approved Mining Plan)

2.2 Classification of Land: There is no grazing land, forest land waste land in the said area. Details of the land classifications are given in Table 2 - 2

Remarks: All these R.S. Plots for which NOC's have been taken from the villagers as required have been covered under various Blocks, namely from Block - 1 to Block - VIII. Presently, the Block No - III in the West side & Block No. IV have been explored, and shall be worked to end of the lease periods.

(ii) Existence of public Road/Railway line, if any nearby and approximate distance:

The area is located in P.S. Md. Bazar, Dist. Birbhum, West Bengal, and is very close to Patelnagar Township. The area is approachable by Road. Nearest Railheads are Sainthia and Suri which are about 12 kms. And 14 kms. From Patelnagar Township, the area can be approached by Jeep, car or foot, and is about 1/2 km. from Suri - Sainthia Road via Patel Nagar.

(iii) Facilities:

The area situated at a distance of 2kms. From Md. Bazar where all types of commodities are available. There is also a small market at Patelnagar. At Patelnagar there is a Health Centre where medical facilities are available. The Post office, BDO office, Police Station and other Govt. departments are situated in Patelnagar and Md. Bazar.

(iii) Power:

Power is available in the area.

(iv) Water:

The requirement of water is met from old Quarry, dug wells and Tube Wells.

(v) Topo sheet No. with Latitude & Longitude:

Topo sheet no. - 73M/9; Latitude - 23° 59' 09.733" North, and Longitude - 87° 35' 18.87" East

(vi) Land use Pattern:


Mouza - Kharia, J.L. No. 145. There is no grazing land, forest land, waste land in the said M.L.A. Details of the land classifications are given.



CONSULTANT SHRI A. P. Chatterjee (RQP)	KHARIA CHINA CLAY MINE VILL- KHARIA MOUZA – KHARIA J.L. NO - 145 P.S. - MD. BAZAR, DISTT. BIRBHUM, STATE: WEST BENGAL	LESSEE PATELNAGAR MINERALS & INDUSTRIES PVT LTD
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TABLE 2 – 2

SUMMARY OF LAND USE PATTERN OF MOUZA – KHARIA; J.L. NO. 145

SL. NO.	CLASSIFICATION	TOTAL AREA (ACRES) & HA.
1	BAID	 130 ACRES OR 52.6092 HA.
2	JOLE	
3	NALA	
4	TANK	
5	BAID / MINES	
6	PUKUR PARH	
7	MINES	
8	CHHUT	
9	DOBA	
10	DANGA	
11	KHAMAR	
12	BARJ	
13	VITI	
14	MANDIR	
15	PATH	
16	KHAMAR BARI	
17	DEBASTHAN	
18	DOBA (SAR)	
19	VITIBARI	
20	GOPATH	
21	DEBALAY	
22	RASTHA	
23	GOCHAR	
TOTAL AREA = 130.00 ACRES OR 52.6092 HA.		

(vii) Key plan / Location map (Plate No. 1)

1: 63000 is enclosed. Topo sheet No. marked as 73 M/9. Predominant wind direction, population of villages within 5KM radius for the lease hold have been property marked under the names of the villages within 1/2 KM. Refer: Demographic Profile Appendix – V. Notation used in the Index are clearly made to differentiate each item and the approach road to the MLA has been marked on the Plate with the distance from the known place, namely P.S. Md. Bazar.

REMARKS: There is no grazing land, forest land waste land in the said lease hold area.

Regarding Serial No 4 “Tank” as mentioned in the Land use pattern shown in the lease hold area (Plate 2) occupied by the lease as early as in 1963 mostly comprises of shallow (3 to 4 mtr.) depth & water – filled (during Rainy season) cannot be categorize as public utility service type ponds warranting there by statutory barriers to be kept for the purpose except however 6 No of tanks falling under Residential area which may be used public utility purpose.

Therefore the Company has been approaching to the District Authority (BL & LRO, DL & LRO) for allowing most of the tank-ponds to be included for the purpose of mining whenever required.

CONSULTANT SHRI A. P. Chatterjee (RQP)	KHARIA CHINA CLAY MINE VILL- KHARIA MOUZA – KHARIA J.L. NO - 145 P.S. - MD. BAZAR, DISTT. BIRBHUM, STATE: WEST BENGAL	LESSEE PATELNAGAR MINERALS & INDUSTRIES PVT LTD
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CHAPTER 3 GEOLOGY & EXPLORATION

3.0 Geology and Exploration

i) Topography of General and local Geology of the area

This area is included in the Survey of India Topo sheet No. M-397 and its Easting is $23^{\circ} 59' 37.870''$ North (Latitude ranging between $23^{\circ} 59' 09.733''$ North and $23^{\circ} 59' 13.118''$ North) and Longitude $87^{\circ} 35' 24.879''$ East, (Longitude ranging between $87^{\circ} 35' 18.873''$ East and $87^{\circ} 35' 20.968''$ East) is administratively controlled by Mohammed Bazar Police Station, District Birbhum, (Boundary point co-ordinate enclosed).

ii) Physiography and Drainage

The area is having a gently undulating topography with occasional high grounds. The general slope of the area is, however, gently sloping towards North – East and 61.780 Mtrs. above Mean Sea Level. The river is within 1 Km. of the lease hold area. A feeder canal is located near the lease hold area which is finally terminates in the paddy field.

iii) Regional Geology

Almost the entire area of this belt is covered on the surface by Trap rock of upper Gondwana age or by still younger Tertiary rocks and Laterites. These rocks rest upon the Precambrians as seen in the West of the area. There are several prospecting Pits for locating China Clay at shallow depths beneath the lateritic cover. The lower Gondwana sequence of rocks occur in the Southernmost part of the area, west of Khayrasol Village, and also in flying part with sporadic exposures of sub-trappean sedimentary rocks of Barakar and Talchir formation (as reported by GSI in 1987).

iv) Geological setting of the lease hold area

Laterites and the associated rocks containing clay horizons of the area form the cap rock and rests either directly upon Precambrians metamorphics or upon the trap rocks of upper Gondwana age. These associated surficial deposits containing Fire clay and China clay horizons belong to tertiary rocks.

It is seen from the quarries, pits and bore holes that within a single clay horizon there are different types of clay such as Yellowish, Redish and Buff colored clays.

The sequence of cap rocks and the associated clay beds observed from quarry faces, pits and boreholes etc. are given in Table 3 – 1 in the next page.




AJIT PRASAD CHATTERJEE
 RQP/KOL/355/2008/A

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Lithological Units

Table 3 - 1 The succession of strata is mentioned as observed in working / boreholes.

Strata (In order of succession)	Av. Thickness (m) (As per Borehole Data)
1. Alluvium	5.5-6m
2. Sandy Clay	2.8-3m
3. Yellow Clay	2.6-1.5m
4. Rejection	3.7-4
5. China Clay	4.3-4.5m
6. Rejection (Dirty Ferruginous Red Clay)	1.8-1.5m
7. China Clay	3.1-2m
8. Hard Sand Continued	



Total = 23.8m section; Total Mineral = 9.9m; Clay = 2.8; Rejections = 5.5m; Alluvium = 5.5m.

(v) **Structural Features of the Clay deposits:**

The disposition of clay in this area is in bedded from associated with very low dipping almost sub-horizontal beds. The pinching and swelling of the clay beds are common features. The strike of the deposit is NW – SE dipping with very low angles (4° to 5°) towards N – E.

3.1 Physical and chemical characteristics of clay deposits:

A few samples collected from the pits, bore hole and quarries within the area have been analyzed and indicated the following characteristics:

3.2 Physical characteristics:-

The colour of the clay is Buff to White. The inferior grade clay is slightly yellowish white in colour, whereas the superior grade china clay variety is white in colour.

The clay is easily dispersible in water, but insoluble in acids. It can be powdered to extreme fineness. It has high water retaining capacity. It is plastic when wet and is soft, and it can break as lumps. When fired at 1250° C its pale cream with 17% - 19% shrinkage and light verification.

3.3 Chemical characteristics:-

The Ultimate Analysis (in percent) of the few samples collected from the Quarry and Boreholes are given in Table 3 – 2 below:

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Table 3 - 2 (Clay analysis)

SiO ₂	Al ₂	Fe ₂ O ₃	TiO ₂	CaO	MgO	K ₂ O	Na ₂ O
45.70	36.60	1.21	2.50	0.08	0.09	0.12	0.22

Loss on Ignition = 13.28%
Undetermined = 0.20%
Retainable on 250 mesh = 0.01% Through 250 mesh = 99.9%
Bulk Density = 0.4695 gm/cc; pH Value = 7.0 to 7.5
Proximate Analysis (in percent):
Water of Plasticity - 28%
Dry Shrinkage - 1%



Table 3 - 3 (Clay analysis)

Clay Substance	Spar	Quartz	Fe ₂ O ₃	TiO ₂	CaCO ₃	MgCO ₃	Remarks
86.81	3.66	0.99	2.30	3.84	1.14	0.23	Slightly high in iron & Titania

3.4 SUMMARY OF GEOLOGICAL/MINEABLE RESERVE

REF: NET MINEABLE RESERVE AS PER EARLIER APPROVED MINING PLAN PAGE NO. 9 OF 10 TABLE NO. 3-8.

- i) Net mineable mineral reserve $601171 \times 0.855 \times 1.3 = 668202$ M.T. = 51400m³ (Proved), UNFC Code = 111. (As per approved Mining Plan)

Balance Net Mineable Reserve as on 31.03.2019 = 668202 MT - 206162 MT = 462040 MT

3.5 UNFC CODIFICATION

Justification for classification of various Codes under UNFC for reserve estimate of Lease NO. 2 is as follows:- Admittedly there is no Code '112' under UNFC. Deposit of China Clary and Fire Clay in PMI are strati form, strata bound and tabular deposits of mostly regular habits.

1) The proved reserve of Minerals in the above Leasehold may be assigned with Code 111 as in 'C' Pit West of Block III and as in 'G' Pit of Block IV as they are economically mineable part of measured mineral resource having satisfied in 3 A X ES 'EEG' with highest confidence. Thus it includes materials and allowances for losses which may occur when the material is mined.

2) Probable Mineable Reserve may be assigned with Code 121 + 122 which are economically mineable part of an indicated and in some circumstances measured mineral resource. It included materials and allowances for losses which may occur when the material is mined. (Ref. Plate 4 Geological Plan where Proved, Probable & Possible areas have been clearly delineated.

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3) Regarding remaining resources in the Leasehold i.e. about 50% of the total area occupied by agricultural land on the Western side and by residential area on the south east and other part may be assigned with Code 222 i.e. demonstrated to be potentially economic by a pre-feasibility study usually carried out in area of general exploration.

4) Also they can be assigned with Codes 332/333 i.e. indicated & inferred mineral resources i.e. those part of the mineral resources of which tonnage, densities, shape, physical characteristic, grade and mineral content could be estimated with a reasonable level of confidence i.e. based on exploration, sampling, testing, pits too widely spaced and where future exploration is yet to be done.

Summary of UNFC Code is on Reserve as follows:-

i) Geological Proved area:-
Mineable area (Recovery)

Saleable	Non Saleable (Sub Grade)	Non Mineable
111	211	1. 7.5m Safety Barrier and other Statutory barrier 2. Pit Slope (211)

ii) Geological Probable:-

Mineable area (Recovery)

Saleable
(122)

Non Saleable (Sub Grade)
(222)

Non Mineable
1. 7.5 m Safety Barrier and other statutory barrier
2. Pit slope (222)

iii) Geological Possible: 333

5) **THE SAFETY BARRIER FOR GREENARY**

It is considered as Un-Mineable due to 7.5 m. Solid barrier to be kept along the lease boundary for Plantation.

Total Considerable perimeter = 3880 m. of the Leasehold

Width of the barrier = 7.5 m.

Area = 2.91 Hect. = 29100 m²

Mineral Losses = 29100 x 15m = 4, 36, 500 m³



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6) **YEAR-WISE DEPLETION OF RESERVE (2008-09 to 2018-19), PIT 'C'**

Data collected from monthly return submitted to MOIC Suri Zone

Year	O.B.(M ³)	China Clay (M.T)
08-09	5350	35582
09-10	5203	41062
10-11	4000	28713
11-12	4627	25941
12-13	4779	23013
13-14	5200	34208
14-15	2260	12330
15-16	1250	3478
16-17	NIL	1835
17-18	NIL	NIL
18-19	NIL	NIL
TOTAL	32669	206162



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CHAPTER 4

4.0 METHOD OF MINING

Mining will be done by opencast method. Mining and Transportation of mineral and OB will be carried out partly by Excavator cum Loader for top four benches and the bottom portion will be worked manually. Mining operation will be carried out by cutting, digging, storing disposal, dewatering and backfilling.

Entire mining operations are classified as:

- a) Removal of over burden
- b) Dewatering and Drainage
- c) Removal of different types of Clays and storing them separately for dispatch by truck.
- d) Backfilling

The proposed area is being worked by 16 Nos. of benches having following specifications and excavation proceeds towards western side.

Details of working Benches

Table 4- 1

Name of Bench	Thickness (m)	Number of Benches	Bench Height (m)	Bench Width (m)
Alluvium	6	4	1.5 1.5 1.5 1.5	1.5 1.5 1.5 1.5
Sandy Clay	3	2	1.5	1.5 Each
Fire Clay	1.5	1	1.5	1.5 Each
Rejects	4.5	3	1.5	1.5 Each
China Clay	4.5	3	1.5	1.5 Each
Rejects	1.5	1	1.5	1.5 Each
China Clay	3	2	1.5	1.5 Each
Total	24 m Approx Thick section	16		



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4.1 **QUANTUM OF DEVELOPMENT PROGRAMME FOR THE YEAR OF 2019-20**

Table 4-2

Year	Pit Area in M ²	O.B (M ³)	Sandy Clay (MT)	Yellow Clay 1.5 MT	Reject (50%) MT	China Clay MT	Reject/(50%) MT	China Clay
2019 - 20	120.5 x 15 = 1807.50	120.5 x 15 x 6 = 10845	111.5 x 15 x 3 x 0.855 x 1.3 = 5577	107 x 15 x 1.5 x 0.855 x 1.3 = 2676	101 x 15 x 4.5 x 0.855 x 1.3 x 1/2 = 3788	92 x 15 x 4.5 x 0.855 x 1.3 = 6902	86 x 15 x 1.5 x 0.855 x 1.3 x 1/2 = 1075	76.5 x 15 x 3 x 0.855 x 1.3 = 3826
Total	1,807.50	10,845	5,577	2,676	3,788	6,902	1,075	3,826

- Note:**
- Sandy Clay is treated as Saleable mineral.
 - Total Rejects (Waste) generated per Year = 10845+1894+537.5 = 13276.5 m³ or say 13277 m³
 - Top soil = 0.5 m / 6 x 10845 = 903 m³ per year
 - Total China clay / year = (5577 + 2676 + 6902 + 3826 + 1894 + 537.5) MT= 21412.5 MT or say 21413 MT
 - Extraction factor, deducting Geological/Mining Loss= 0.855
 - Conversion factor = 1.3 MT/m³.
 - Balance mineable reserve = (4, 62,040 – 21,413) = 4, 40,627 MT



- 4.2 **Underground mines:** Not Applicable.
- 4.3 **Extent of Mechanization:** The whole operation of mining is done manually semi-mechanized method.
- Drilling machineries:** Not used as the entire mine working is manual without any drilling/blasting, and the Excavator on the Top Benches. Extraction work is done by means of hand tools like, iron picks, spades, crowbars and baskets and partly by JCB
 - Loading Equipment:** No equipment is used for this purpose. The extracted mineral is carried out on head load by baskets through footpath, which is 1 in 16 gradient in the working pit, and brought to the mine head. One JCB Excavator cum Loader is being used to work the Top Benches from Top to Dirty Clay Level and then china clay Beds are manually worked out along the road through the Mine gradient 1 in 16 (Ref. Page 1 A OF 8)
- 4.4 **Haulage and Transport Equipment:**
- Transport of minerals from the mine head to drying platform and pulverizes is carried out by 10 Nos. of Dumpers of 4 tonne capacity owned by the Lessee.
 - One JCB Loader cum Excavator is used for reloading dumped OB to dumpers for reclamation as required from time to time.

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4.5 Miscellaneous (machineries related to mining):

- (a) Pump 5 H.P.: 2 Nos. (Diesel)
- (b) Pump 10 H. P.: 2 Nos. (Electric).

APPENDIX - I A

Extent of Mechanization

LIST OF MINING EQUIPMENTS

Table 4-3



Sl.No.	Item	Quantity	Remarks
1.	Dumpers	10	4-tonne capacity
2.	Auger Drill	1	
3.	Car	1	
4.	Wheel mounted Water tank	1	
5.	Crowbar, shade, cane basket etc.	As per requirements	
6.	Hand Scrapper	As per requirements	
7.	Miner's Protective equipment e.g., safety boot, helmet etc.	As per requirements	Approved Type by DGMS
8.	JCB Excavator/Loader	One	72 H.P.
9.	Diesel Pump	2	5 H.P. (For dewatering mine water)
10.	Electric Pump	2	10 H.P. (For dewatering mine water)

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CHAPTER 5

5.1 Blasting

As the overburden and minerals are soft enough to be mined directly by manual method with the help of Picks, Crowbars, Spades etc. no mechanical drilling and blasting with explosives are required to be done. Hence no explosives are required to be used for breaking overburden or minerals. Therefore, Blasting Parameters with regards to 5 (a) to (e) are not applicable.

Manual implements like Crowbars, Picks, and Baskets are being used for mining both overburden and minerals.



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CHAPTER 6

6.0 Mine Drainage

- (a) The area is bounded by a garland drain. This become dry during summer, in addition, a number of tanks/ponds and dug wells exist in the area.

Water Table :

- (a) Maximum depth of the Quarry is 23.80 m. Excavation and pumping operation continue simultaneously. At the floor of the bottom-most bench adequate pumping arrangement with 2 Nos. 5 H.P. Diesel Pumps and 2 Nos. 10 HP electric Pumps has been made dewatering mine water. The mine water thus enhances the surface water resources.
- (b) The Suspended Solids are removed by Settling and floatation method. The quarry water is discharged to the garland drain and then diverted to the settling tank. Water is allowed to settle down and thereby the slime is settled to a considerable extent. The overflow water from the settling tank is diverted to the adjoining tank through a drain.

The overflow water of this tank is apparently clear and the same is diverted to the low-lying land where the same is being used for cultivation purpose. The water of clay bearing areas is non-injurious to cultivation. The retaining capacity of the settling tank = 50,000 litres.



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CHAPTER 7

7.0 STACKING OF MINERAL REJECTS & DISPOSAL OF WASTE

Stacking of Mineral Rejects and Disposal of Waste

(As per Calendar Pattern in Table 4-3 Mining Chapter)

- (a) Nature and quantity of top soil, overburden/waste and mineral rejects likely to be generated during the year 2019 - 20

Current year Over Burden generation

Table No. 7-1

Year	Top soil (0.5 m) (cum)	Total Overburden (Sub – soil +Rejects) Rejects & Waste (cum)	Remarks
2019 - 20	$0.5/6 \times 10845 \text{ m}^3 = 903 \text{ m}^3$	$9942 + 1457 + 413 = 11,812 \text{ m}^3$	1) Top soil = 0.5 m out of 6 m 2. OB / Sub-soil 5.5 m out of 6 m 3) $3788 / 2 + 1075 / 2 = 1894 + 537.5$ MT = $2431.5 / 1.3 = 1870 \text{ m}^3$

- (b) (i) Land chosen for disposal of waste with proposed justification:

In Pit No. 'C' production and reclamation of worked out void is being done simultaneously, after ensuring that there is no further mineral deposits by putting bore holes at the bottom to a depth of 10 meters. There exists dumps for (i) overburden/Waste and (ii) temporary topsoil and (iii) mineral, Refer Plate No. 7 & No. 9, where year – wise dump has been proposed. The maximum slope is 37° from the horizontal.

Land chosen is in proximity to the development areas in order that reclamation may be done simultaneously. Reclaimed area resulting out of back filling of voids created out of the development of presently working pit 'C' of Block III is being used for dumping of roads and some portion shall be converted into block plantation.



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CHAPTER 8 USE OF MINERAL

8.0 Use of Mineral

(a) The end use of minerals:

The mineral is indigenously consumed in the industries e.g., ceramics, textile and fertilizer. China clay also finds its use in foundry, asbestos cement, cosmetics, electrode, chemical, electrical and abrasive. New uses of China clay are also being developed.

China clay is used in ceramic industry where it is treated at a high temperature. In non-ceramic industry unburnt China clay is used. China clay available in the area under consideration is suitable for rubber and few other minor industries.

(b) Physical and Chemical specifications stipulated by the buyer:

At present north Indian consumers consume china Clay from nearby Rajasthan Mines in preference to Patel Nagar China Clay Mines. Snow white China Clay requires to be produced by processing raw China Clay through washing system adopted by Levitation channel. But now-a-days in view of its less demand the company desires to avoid such costly washing system. Rather, the consumers consuming china clay for rubber industries, and Fire Clay for refractories where compositions of minerals is not that importance are preferred.

Physical and Chemical specifications stipulated by buyers.

(i) Physical characteristics :

The colour of the clay is buff to white. The clay is easily dispersible in water but insoluble in acids. It can be powdered to extreme fineness. It has high water retaining capacity, and has high plasticity when wet, soft and breaks as lump. When fired at 1250 C its colour is pale - Cream with 17 - 19 percent shrinkage and slight verifications.

(ii) Chemical characteristics:-

Ultimate analysis of Clay Samples

Table 8 - I

SiO	AlO	FeO	TiO	CaO	MgO	KO	NaO
45.70%	36.60%	1.21%	2.50%	0.08%	0.09%	0.12%	0.22%

Loss on ignition = 13.28%

Undermined = 0.20%

Retainable on 250 Mesh = 0.01%, Bulk Density = 0.4695 gm/cc

Through 250 Mesh = 99.9%, pH = 7.0 to 7.5

Blending of different grades of ores: -

No blending is done. Also there are no sub-grade minerals, and as such no such problem for their disposal.



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CHAPTER 9 OTHERS

9. Others

(a) Site Services:-

(i) STORE:

For storing oil, Grease, picks, crow-bars, baskets, bags and other Items to be used in the store.

(ii) WORKSHOP:

For day to day maintenance and repair of the equipment associated with the mine operation.

(iii) OFFICE:

For accommodation of staff like Manager, Surveyor, Clerks, Typists, preservation of relevant plans and record room.

(iv) FIRST – AID ROOM:

With necessary arrangement as per Mine Regulations.

(v) CANTEEN AND REST SHELTER:

For taking rest and food & refreshment for the personnel.

(vi) POWER:

Power is available at the mine site.

(vii) WATER:

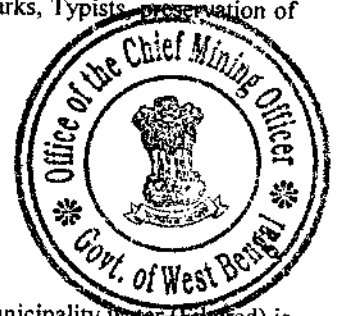
For drinking purpose Tube wells have been dug. Also Municipality water (Filtered) is also available at convenient points.

(viii) ABLUTION BLOCK:

Latrines and Urinal were constructed separately for male and female, and the numbers provided were in accordance with the Mines Rules.

(ix) COLONY:

No labour colony or staff colony shall be built as local labourers and staff shall be employed. But some quarters have already been built for essential staff.



(b) Employment Potential:

(i) Organization:-

The mine is headed by a Mine Manager-cum-Mining Engineer reporting to the Director. Thus one Mining Engineer with B.E. Mining Certificate also with First Class Metalliferous Mining Manager Certificate under MMR, 1961 has been employed. The same Mine Manager is responsible for control, direction and management of the mine and is assisted by one assistant Manager, four Mining Mates and one Foreman and office staff.

(ii) Qualification & experience of competent persons:-

Mine Manager is holder of valid 1st Class Certificate and has adequate experience.

(iii) Geologist: Part time

(iv) Mining Mate:-

The Mining Mates are holders of valid Mining Mate's Certificates.

They have at least 5 years working experience in mines.

(v) Asst. Manager (Foreman):-

The Asst. Manager is the holder of foreman's Certificate and has adequate experience.

(vi) The details of employment potential are summarized below:

Employment potential of leasehold area (Prov.):-

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(vii) Manpower estimate: -

Table 9 - 1

Designation	Category	Per day	Total on pay roll	Remarks
Mine Manager	Managerial	1	1	Full Time
Medical Staff	Supervisory	1	1	---Do---
Foreman	---Do---	1	1	---Do---
Mine Surveyor	---Do---	1	1	---Do---
Geologist	Managerial	1	1	---Do---
Office Staff	---Do---	2	2	---Do---
Typist	Office	1	1	---Do---
Accountant	---Do---	1	1	---Do---
Mining Mate	Supervisory	4	4	---Do---
Truck Driver Incl. Dumper & Loader	Skilled	2	2	---Do---
Truck Helper	Semi-skilled	2	2	---Do---
Miners	Unskilled	60	60	---Do---
Designation	Category	Per day	Total on pay roll	Remarks
Others (Car Driver)	Skilled	1	1	Full time
Mazdoor (water supply)	Unskilled	1	2	---Do---
Sweeper	---Do---	1	1	---Do---
Gardener	---Do---	1	1	---Do---
Chowkidar	---Do---		2	---Do---



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CHAPTER 10 MINERAL PROCESSING

10.0 Mineral Processing

- (a) Nature of Processing/beneficiation, size and grade of feed material and concentrate (finished material product), recovery ratio:

The Clay is processed before dispatch by sorting and hand dressing to remove external impurities. The clay is then processed by pouring it through pulverisor. Some quantity of china clay is passed through disintegrator and washed to recover super fine clay. Since there is a levitation system for washing the clay, a brief description is given hereunder:-

The levitation system here involves breaking the lump clay to 10 cm size to feed into the grinder, where clay mixes with water at a pressure. The mixture of clay and water passes through levitation channel and finally falls into a settling tank. From here finest clay mixed with water is pumped to reservoir and allowed to settle there. The excess water from the reservoir is decanted and the clay-water mixture is allowed to sundry. The viscous matter is brought up from reservoir to drying platform where the mixture is poured in the form of balls which is sun dried. When dried it is packed in bags or sometimes it is pulverized according to the needs.

The processing of crude clay is being done as per flow sheet appended herewith.

Recovery Ratio: 67%: 33%

Snow - White Clay = 67% and 22% Sub-grade mineral and 10-11% sand rejects.

- (b) Disposal method for tailings or waste from the Processing Plant:

There is a tank adjacent to the processing plant where rejects are settled down. All these rejects are loaded on the dumpers and transported to the mine for back filling.



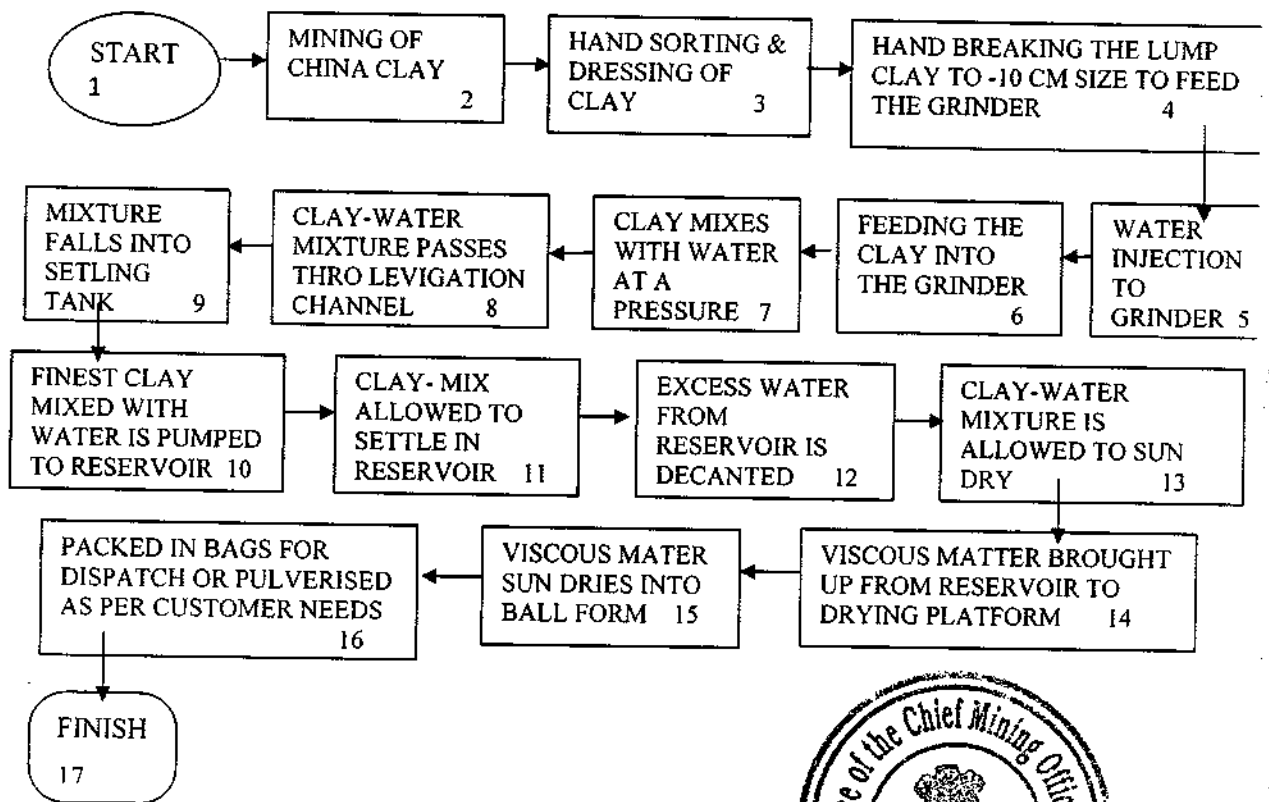
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CHINA CLAY FLOW CHART

(c) (PROCESSING PROCEDURE)



- (d) Quantity and type of chemicals used in the Processing Plant:
No chemical is used.
- (e) Quantity/ Type of chemicals stored on site/Plant:
Not applicable.



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CHAPTER 11 ENVIRONMENTAL MANAGEMENT PLAN

11.0 Environmental Management Plan

i) Introduction

Exploration of China Clay deposit by semi-mechanized and by manual method without blasting is yet bound to create some sort of imbalance in the environment. In order to seek some remedial measures in the environmental management relevant features like type of soil and rock, Topography, Agriculture and Vegetation, Forest, Hydrology, Meteorological conditions, flora and Fauna, Industries, methods of working, Beneficiation of minerals and Reclamation of land etc., required to be studied and examined properly.

(a) Base line information Status

(i) Existing land use pattern:

TABLE 11 - 1 EXISTING LAND USE PATTERN

Sl. No.	Use of Land	Area in Hect.
i)	Area under Mining	14.072
ii)	Reclaimed Area (With OB & Fly Ash)	9.500
iii)	Reservoir (B+C+F Pits)	4.8685
iv)	Area under present Development (C Pit & G Pit Part)	0.180
v)	Area for OB/Waste Dump (Out of 53, 000m ³ OB/Rejection (50% generated out of Dirty Clay is used for backfilling, dump height kept at 7.5m)	0.5000
vi)	Temporary Storage for Top Soil (10%)	0.066
vii)	Temporary Storage for Mineral (5m Ht.)	0.20
viii)	Roads	5.434
ix)	Greenery along Boundary & Block Plantation)	2.9687
x)	Area for Site Services	0.02
xi)	Township / Railways	NIL
xii)	Forest Area	NIL
xiii)	Structure like Residential area Village, school Temples & Infrastructure including usable road & pond	14.80
Total Area		52.6092 Hect.

(ii) Water Regime

- (a) **Surface drainage:** The area is traversed by a number of streamlets/nallas. These become dry during summer. In addition, a number of tanks/ponds and dug wells exist in the area.
- (b) **Sub-surface water source:** The water level (1990), Post Monsoon 3.15 m, Pre-monsoon 4.25 m. (Information collected from Hydrological Dept. Govt. of W.B., Suri, Birbhum). The pumped out water from the mine enhances the surface water bodies.
- (c) **Water Reservoir:** There are 19 pond & reservoirs existing in the lease area. Accumulation of water during rainy season is 10, 00,000 m³ and in dry season is 5, 00,000 m³.
- (d) **Flora and fauna**
- i) **Flora:-** Arjuna, Pakur, Sishu, Tamarind, , Mango, Eucalyptus hybrid situated at a distance of 2 to 10m from one another. There are 100 such plants.
- ii) **Fauna: -** Wild animals have never been noticed in this area. Domestic animals like cow, goat, and sheep are found near grazing ground outside the mining area. Domestic birds like duck and hen are seen in the nearby villages.

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(iii) Ambient Air Quality

TABLE 11 - 2

Results in ug / m³

Ref. appendix - 10 As per approved Mining Plan	Location	SPM	O ₂	NO _x	CO
	PIT - "C" quarry area		460.3	DL	19.2
Near Processing Plant		408-502.7	Do-	12.7-19-30-50-65	-Do-

Analyzed by "CENTRE FOR STUDIES MAN AND ENVIRONMENT" Salt Lake City, Kolkata

Wind Direction: Predominant wind direction during winter and spring is from West and North - West, but in summer and monsoon from East and South - East.

(iv) Ambient sound / noise level

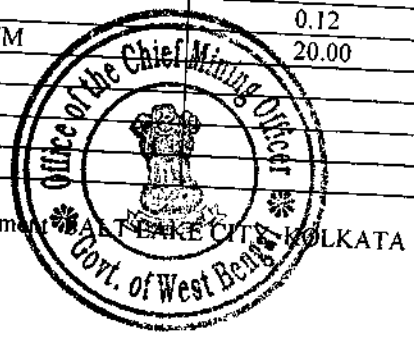
The mine is manual-cum-semi-mechanized with JCB Machine & Dumpers and no drilling and blasting are carried out. Therefore the ambient noise level is within normal limit of 60-65 dBA. However, disintegrator in the adjoining Lease Area, Grinding Mills (inside & outside), and the results vary from 70 - 86 dBA in all directions (Ref. Appendix 11 as approved Mining Plan).

(v) Water Quality (Pit - C)

Average Yearly rainfall is 1100 mm. Pumped out water from the mine is decanted in setting tank to become to be fit for agriculture use. Relevant analysis report reveals no harmful effect, and as such there is a great demand by the cultivation of adjoining paddy land.

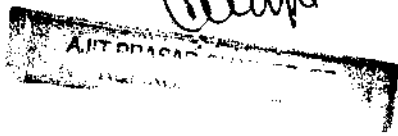
Table 11 - 3
Waster Analysis Report (Waste water collected from Mine Water)

Name of the Tests		Results (mg/L), except pH	
pH	8.20	SULPHATE	18.00
TDS	250.00	NITRATE	0.03
ACIDITY	NIL	FLUORIDE	BDL
ALKALINITY (M)	120.00	COPPER	0.04
TOTAL HARDNESS	80.00	NICKEL	BDL
CALCIUM	70 - 150	CHROMIUM	BDL
CHLORIDE	28.10	IRON	0.12
TSS	28.40	SODIUM	20.00
DO	50.36		
B.O.D.	6.30		
C.O.D	0.20		
	6.40		



Analyzed by 'Centre for Studies Man & Environment' SALT LAKE CITY, KOLKATA

Signature



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Table 11 - 4

Recommendation Max Limit (mg/L) as per BIS Standard for Drinking Water:

Name of the Tests		Results (mg/L), except pH	
pH	6.5 - 8.5	SULPHATE	200
TDS	1000 - 1500	NITRATE	20
ACIDITY	NIL	FLUORIDE	1.0
ALKALINITY (M)	500	COPPER	1.0
TOTAL	200 - 250	NICKEL	---
HARDNESS	75 - 250	CHROMIUM	0.1
CALCIUM	75	IRON	0.1
CHLORIDE	250	SODIUM	---
TSS	<30		
DO	5 - 10		
B.O.D.	<30		
C.O.D	---		



(vi) **Climatic conditions**

* Tropical climate

* Temp. : In Summer 20° to 43° & in Winter: 10° to 20° Ref: Appendix - II

* Relative Humidity - Ref: Appendix - III

* Rainfall - The yearly rainfall in the area is very poor except in the monsoon. The average rainfall is 1100mm. Ref: Appendix - IV.

(vii) **Human Settlements**

Social and demographic profile (Refer Appendix - V) shows that the inhabitants in the villages around and within 1 / 2 to 4 kms. of PMI office vary as 480, 800, 1000; 1200, 1500 and 2000 in number, and they are mostly Hindus, Muslims and Scheduled Caste / Tribes. They are engaged in Cultivation / Working under PMI.

(viii) **Public buildings, places of worship and monuments**

There is no national park, wild life sanctuary, national monuments or places of worship or any tourist interest in the area. However, there are places of worship in Kharia, Angargeria and Maldiha villages,

Refer: Environmental Management Plan, Plate No, 7

(ix) **Plans showing the locations of sampling stations**

Refer: Surface Plan, Plate No. 3

The locations of sampling stations of water test for mines percolated water, for air and noise test have been established and shown on the Surface Plan 7 Environment Plan,

(x) **Area (partly or fully) falling under notified area under (Water Prevention & Control of Pollution Act 1974)**

(i) Mouza - (i) Kharia is not falling under Notified Area, (ii) There is no perennial river or Dam in the proximity of Mauza Kharia. (iii) The area does not fall under water contravening provision of Pollution Act, 1974

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ENCLOSURE - I
ENVIRONMENTAL IMPACT ASSESSMENT STATEMENT
REFER: EMP, CHAPTER 11 (B)



Sl. No.	Environmental Components	Impact of Mining		Assessment Statement
		Degradation	Up gradation/ Beneficiation	
	Land Environment a) Landscape	Yes	Yes	Quarries will degrade the land, but simultaneous development of roads etc. will have a positive impact
	b) Aesthetic Environment	Yes	Yes	Plantation along the lease boundary & roads will have a positive impact
	c) Soil & land use pattern i) Agricultural	No	No	Undisturbed, as the area is totally barren
	ii) Forest	No	No	Mining is not done in Forest area
	Water Environment a) Surface water	No	No	Undisturbed
	b) Ground water	No	No	Undisturbed
	c) Water Quality	No	No	Undisturbed
	Air Environment a) Air	No	No	No contamination by air pollutants, as there is no drilling / blasting is not carried out. The mine is free from smoke & exhaust gases because of non-use of HEMM. Scanty Qty. of dust generated due to plying of a few trucks, carrying minerals, shall be suppressed by using water tanker fitted with sprinkling device.
	b) Noise	No	No	Noise level is not affected at all as the mine is fully manual, using Pick axes, Crowbars, Baskets etc. The ambient noise level is within 60 dB.
	c) Climatic condition	No.	No	Undisturbed
	Vibration Level (due to blasting)	No	No	Undisturbed, as no drilling/blasting is carried out.
	Socio - economic Environment s) Social - economic	No	Yes	Due to manual operation and non-use of explosives the habit will not be affected. The mining project will not only proved employment to the local villagers who may primarily depend upon mining activities for their livelihood, but will also improve their standard of living to a considerable extent. Thus the project has favourable socio - economic impact.
	Historical Monuments	No	No	There is no Historical Monuments built up in the vicinity of mine.

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Ref: Details of Environmental Management Plan

Afforestation Programme from 2013-14 to 2018-19

Table 11 - 5.1

YEAR	LENGTH	BREADTH	ACHIVEMENT	TYPE OF PLANTS	LOCATION
2013-14	50 M	6.5 M	75 No.s	Sishu, Eucalyptus	Pit 'C'
2014-15	-- do --	-- do --	55 No.s	-- do --	-- do --
2015-16	-- do --	-- do --	60 No.s	-- do --	-- do --
2016-17	-- do --	-- do --	45 No.s	-- do --	-- do --
2017-18	-- do --	-- do --	50 No.s	-- do --	-- do --
2018-19	-- do --	-- do --	65 No.s	-- do --	-- do --
Total	1,950 sq. m.		350	-- do --	DO

Table 11 - 5.2

Afforestation Programme for 2019-20

YEAR	LENGTH IN M	BREADTH IN M	AREA IN SQM	TARGET IN NO.S	TYPE OF PLANTS	LOCATION
2019-20	50	6.5	325	80	Sishu, Eucalyptus	Pit 'C'



Ajit Prasad Chatterjee
AJIT PRASAD CHATTERJEE
RQP/KOLKATA

CONSULTANT SHRI A. P. Chatterjee (RQP)	KHARIA CHINA CLAY MINE VILL- KHARIA MOUZA - KHARIA J.L. NO - 145 P.S. - MD. BAZAR, DISTT. BIRBHUM, STATE: WEST BENGAL	LESSEE PATELNAGAR MINERALS & INDUSTRIES PVT LTD
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CHAPTER 12 CONCLUSION

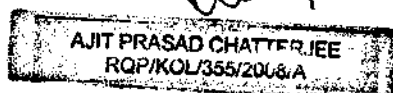
During the years gone by our country has witnessed in several states including West Bengal, Rajasthan, Karnataka etc. various acute problems – Social, Cultural, Legal and mainly Environmental, arising out of mushroom growth of very small Metal Mines and a lot of publicity was given showing the evils of the same in various publications of the country. Consequently, our Government has taken very wise decision by framing out the relevant laws to control over them, Planned, Scientific and Law-full Development and Exploitation of Minerals is the supreme need of the home with a view to achieve the country's goal with due regard to safety, conservation and maximum extraction with scrupulous observance of the existing environmental laws, as which is highlighted during the preparation of the Mining Scheme.

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APPROVED

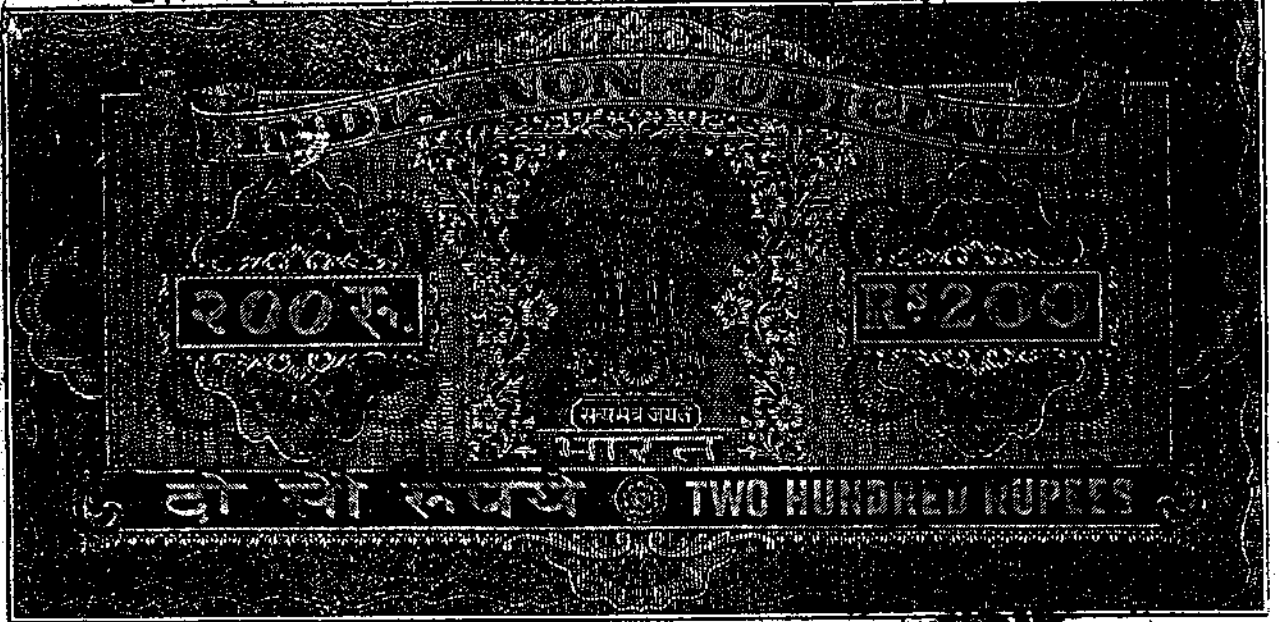
Joydeb Das
 (Joydeb Das)
 Chief Mining Officer
 Govt. of West Bengal
 23/10/19



EST. RENEWAL LEASE DEED
 No. 2 D.T. 16/02/85

P. 1703

21343 200Rs



Establishment under Departmental rule No. 150 of 1954...
 also under section... of
 the... Act, 1956...
 Section 35A(10).

Handwritten notes:
 3/10/85
 29/1/85
 21-5/85

अनुमोदित
 APPROVED

26-2-1985

THIS INDENTURE made this Sixteenth day
 of February One thousand Nine hundred and
 eighty five between the Governor of the State of West Bengal
 hereinafter referred to as the "Governor" (which expression
 shall include his successors in office and assigns) of the
 One Part and Patelnagar Minerals & Industries Private Limited,
 a Company Registered under the Companies Act, 1956 and having
 its registered Office at No. 2, Church Lane, in the town of
 Calcutta hereinafter referred to as the "Lessee". (which expression
 shall where the context so admits be deemed to include its
 successors and permitted assigns) of the Other Part.

WHEREAS the Lessee had applied to the Government of
 West Bengal (hereinafter referred to as the "State Government")

Handwritten signature: Mohal
 ANYAL B.Sc. A.I.S. M. (MINA)
 L/210/94/A



- 2 -

for renewal of mining lease for Chinaclay, in Revisional
survey Plots No. 676 to 680, 680/5239, 736, 740 to 757,
759 to 784, 784/1711, 785 to 815, 815/5247, 816 to 822,
822/5314, 823 to 843, 843/5244, 844 to 869, 901 to 909, 912
to 919, 919/5174, 920 to 1082, 1082/1712, 1083 to 1103,
1103/1702, 1104 to 1107, 1107/5248, 1108 to 1122, 1122/5175,
1123, 1124, 1125, 1125/5176, 1126 to 1155, 1159 to 1192, 1192/5231
1193 to 1202, 1202/5249, 1203 to 1236, 1237/5231, 1237/5231,
1237/5232, 1238 to 1264, 1264/5250, 1266, 1267, 1267/5233,
1267/5312, 1268, 1268/1715, 1268/1720, 1268/1721, 1268/5177,
1268/5253, 1269, 1269/5252, 1270, 1271, 1271/5251, 1272 to 1285,
1285/5331, 1286 to 1307, 1307/1713, 1308, 1309, 1309/5245, 1310,
1311, 1311/5246, 1312 to 1326, 1326/1714, 1327 to 1333, 1335,
1335/5310, 1335/5311, 1335/5313, 1336 to 1348, 1348/1716, 1349,
1349/1703, 1350 to 1358, 1358/1704, 1359 to 1363, 1363/5317, 1364,
1563, 1563/5256, 1563/5317, 1564, 1564/5255, 1565 to 1595,
1595/5333, 1596 to 1623, 1623/5259, 1624, 1625 to 1652, 1652/525

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1/210/94/A

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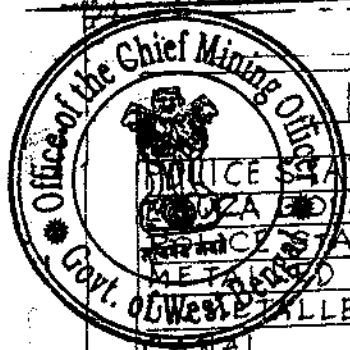
- 3 -

1653 to 1658, 1658/5309, 1659, 1660, 1660/5308, 1661, 1664, 1667 to 1670, 1673 to 1679, 4830 to 4836, 4836/5298, 4837, 1236/5226, 1236/5227, 1237/5228, 1237/5229, 1237/5230 IN FULL AND 714, 716, 717, 718, 719, 733, 735, 737/5224, 739, 758, 870, 900, 910, 911, 1681/5203, 1681/5260 IN PART of Mouza - Kharis, J.L.No.145, Police Station - Md.Bazar, in the Registration District of Birbhum, Sub-District Suri (Sadar) comprising an area of 130 Acres (One hundred Thirty acres) or 52.6092 Hectares (Fifty two and point six zero nine two) or thereabouts and whereas the Lessee deposited with the State Government the sum of Rs.1,000/- (Rupees one thousand only) as security and the sum of Rs.500/- (Rupees five hundred only) for meeting the preliminary expenses for Original Mining Lease dated 19.8.63 and whereas the Governor in consideration of the rents and royalties agreed to be paid and covenants and agreement agreed to be observed between

M. S. Sanyal
 SANYAL B.Sc. A.I.S. M.(MINE)
 CAL/210/94/A

LONG. 87°35'49"E

TOPO SHEET NO. A1



INDEX

POLICE STATION BOUNDARY	—
BOUZA BOUNDARY	—
POLICE STATION	—
METalled ROAD	—
UNMETALLED ROAD	—
CANAL	—
CART TRACK	—
RIVER	—
WIND DIRECTION	—
CONTOUR	—
POPULATION	—

KEY PLAN

KHARIA CHINA CLAY MINES
P.S. - MD. BAZAR, DIST. - BIRBHUM
LESSEE - M/S PATELNAGAR MINERALS
& INDUSTRIES (P) LTD.
P.O. - PATELNAGAR (S), BIRBHUM.

SCALE - 1:63060

DRG No. 1

Amu
ABAN CHATTERJEE
 FORKOU 552008/A

KEY PLAN - PLAT