कार्यालय
संचालनालय भौमिकी तथा खनिकर्म
मध्यप्रदेश
29–ए, ''खनिज भवन'' अरेरा हिल्स, भोपाल'
फोन एवं फैक्स : 0755–2551795

क्रमांक 16914 नस्ती क्रमांक03/एम.पी./सेल–4/2018, भोपाल, दिनांक 12/11/18

प्रति,

मेसर्स खजुराहो मिनरल्स प्रा0लि0
6 कि0मी0 सागररोड
ढढारी छतरपुर जिला–छतरपुर

विषय : **जिला टीकमगढ़ तहसील जतारा के ग्राम माचीगढ़ पर प्राप्त** सैद्वान्तिक **स्वीकृती खनिज पायरोफ्लाइट एवं डायस्पोर वनकक्ष क्रमांक पी–262 के रकबा 19.00 हेक्टेयर के मध्यप्रदेश गौण खनिज नियम, 1996 के नियम 42 के अधीन जमा किये गये माइनिंग प्लान का अनुमोदन।**

संदर्भ : **आपके द्वारा प्रस्तुत माइनिंग प्लान दिनाक 05.09.18**

---0---

उपरोक्त संदर्भ विषयांतर्गत मध्यप्रदेश गौण खनिज नियम, 1996 के नियम 42 के द्वारा प्रदत्त शक्तियों के अधीन तथा राज्य शासन के आदेश क्रमांक एफ 19–3/2016/12/1 दिनांक 04.04.2016 के अनुरूप एतद्द्वारा जिला टीकमगढ़ तहसील जतारा के ग्राम मांचीगढ़ पर स्वीकृत खनिज पायरोफ्लाइट एवं डायस्पोर वनकक्ष पी क्रमांक पी–**262 के** रकबा 19.00 हेक्टेयर क्षेत्र पर आवेदक **मेसर्स खजुराहो मिनरल्स** प्रा0लि0 के पक्ष में माइनिंग प्लान का अनुमोदन प्रदान किया जाता है। यह अनुमोदन सहायक,भौमिकीविद् संचालनालय,भौमिकी तथा खनिकर्म मुख्यालय भोपाल की टीप के अनुसार निम्नलिखित शर्तों के अधीन हैः–

1) इस माइनिंग प्लान का अनुमोदन केन्द्र सरकार, राज्य सरकार अथवा अन्य किसी प्राधिकारी द्वारा समय–समय पर लागू किये गये कानूनों पर किसी प्रकार का प्रतिकूल प्रभाव डाले बिना किया गया है।

2) यह भी स्पष्ट किया जाता है कि इस माइनिंग प्लान के अनुमोदन में खान एवं खनिज (विकास एवं विनियमन) संशोधन अधिनियम 2015 अथवा खनिज (परमाणु और हाईड्रोकार्बन ऊर्जा खनिजों से भिन्न) रियायत नियम, 2016 तथा वन (संरक्षण) अधिनियम, 1980 एवं वन (संरक्षण) नियमावली, 1981 सहित दूसरे अन्य कानूनों के किन्हीं अन्य प्रावधानों के लिए किसी भी प्रकार से सरकार का अनुमोदन समाविष्ट नहीं होता है।

3) इस माइनिंग प्लान का अनुमोदन किसी भी न्यायालय के सक्षम क्षेत्राधिकार के किसी अन्य आदेश या निर्देश पर प्रभाव डाले बिना किया गया है।

4) आपका ध्यान सर्वोच्च न्यायालय के अंतरिम आदेश क्रमांक डब्ल्यू.पी.(सी) क्रमांक 202/95, दिनांक 12.12.1996 की ओर अनुपालन हेतु आकर्षित किया जाता है। अतः इस माइनिंग प्लान का अनुमोदन न्यायालय द्वारा दिये गये दिशा निर्देश पर प्रभाव डाले बिना किया गया है।

5) a) Provisions of the Mines Act, 1952 and Rules and/Regulations made there under including submission of notice of opening, appointment of Manager and other statutory order as required by Mines Act, 1952 shall be complied with.

b) The execution of Scheme of Mining shall be subject to vacation of prohibitory orders/notices, if any.

c) If anythings is found to be concealed as required by the Mines Act in the contents of the mining shcme and the proposal for rectification has not been made the approval shall be deemed to have been withdrawn with immediate effect.

6) Yearly report as required under Rule-42 of Madhya Pradesh Minor Mineral Rule, 1996 setting forth the extent of protection and rehabilitation works carried out as envisaged in the approved progressive mine closure plan and if there any deviation reasons thereof shall be submitted before 1st July of every year to the concerned Collector and Directorate of Geology and Mining, Madhya Pradesh.

7) The Financial Assurance submitted by you as per earlier existing Rule (MCDR, 1988) with IBM is required to be transferred to concerned Collector for statutory compliance as per Rule, MPMMR 1996.

8) At any stage, if it is observed that the information furnished in the document are incorrect or misrepresent facts, the approval of the document shall be revoked with immediate effect.

9) The next scheme of mining will be due for submission on 120 days before the date of expiry of validity period of this Scheme.

10) The approval is given for the received proposals is applicable from this date.

11) मध्यप्रदेश गौण खनिज नियम, 1996 के नियम 42 के अनुसार खान में खनन कार्य अनुमोदित माइनिंग प्लान के अनुसार किया जाये इस हेतु खान मालिक माइनिंग प्लान की एक प्रति अपनी खान पर स्थित कार्यालय में अनिवार्य रूप से रखेगा साथ ही खान के खनन अभियंता, खान प्रबंधक या अन्य कोई जवाबदार व्यक्ति जो कि खान से संबंधित समस्त कार्यों का प्रभारी हो, को उसके दिन प्रतिदिन क्रियान्वयन हेतु उपलब्ध करायेगा, जिससे खनन कार्य अनुमोदित माइनिंग प्लान के अनुरूप किया जा सके।

12) As per Madhya Pradesh State Government's order dated 10/08/2011 if there is enhancement of production proposed from that in the approved mining plan. Under such circumstances additional stamp duty has to be paid by the lessee for the enhanced quantum of production and also a supplementary agreement has to be executed by the lessee.

13) a) A copy of Environment Impact Assessment-Environment Management Plan (EIA-EMP) as approved by MoEF (Ministry of Environment & Forests) as per notification dated 14.09.2006 shall be submitted to this office as well as office of the concerned Collector immediately after approval by MoEF alongwith a copy of their approval letter, before commencement of Mining operation.

b) A copy of consent/permission issued under above notification shall be submitted to this office as well as office of the concerned Collector immediately after approval by authority.

14) It is also made clear that the Georeferenced co-ordinates mentioned in mining Plan shall be corrobareted by the executing authority any mismatch or discrepancy of coordinates with the Bold demarcation/iease boundary shall hold lessee& RQp responsible & liable and accordingy action shll be taken against them.

15) उपरोक्तानुसार अनुमोदित माईनिंग प्लान की दो प्रतियाँ संलग्न कर निर्देशित किया जाता है, कि एक प्रति कलेक्टर कार्यालय में प्रस्तुत करें।

संलग्न :–अनुमोदित माइनिंग प्लान की तीन प्रतियाँ।

संचालक

पृ.क्रमांक नस्ती क्रमांक 03/एम.पी./सेल–4/2018 भोपाल, दिनांक

प्रतिलिपि :–

1. क्षेत्रीय नियंत्रक, भारतीय खान ब्यूरो, स्कीम नम्बर 11,कमला नेहरू नगर, जबलपुर (म.प्र.) की ओर अनुमोदित खनन प्लान की शर्त क्रमांक 7 के संबंध में आवश्यक कार्यवाही हेतु प्रेषित।
2. डायरेक्टर जनरल ऑफ माइन्स सेफ्टी,प्लाट नं.1936 से 1949 जेडीए स्कीम नं.5, जॉय स्कूल के पीछे,विजय नगर,जिला जबलपुर,म.प्र. पिनकोड –482002की ओर सूचनार्थ।
3. कलेक्टर (खनिज शाखा) जिला–टीकमगढ़ (म.प्र.) की ओर सूचनार्थ एवं आवश्यक कार्यवाही हेतु।
4. मान्यता प्राप्त व्यक्ति (आर.क्यू.पी.)**श्री रामचंद बंसल (आर.क्यू.पी) व्दारा मेसर्स बलराम सिंह एसोसिएट प्रा0लि0 चोपड़ा कालोनी पोस्ट ऑफिस मैहर, जिला– सतना (म0प्र0)** की ओर सूचनार्थ एवं आवश्यक कार्यवाही हेतु प्रेषित।

संचालक

Mining Plan

इस माइनिंग प्लान का अनुमोदन माइनिंग प्लान अनुमोदन पत्र क्र. 1691 दिनांक 12/11/18 में उल्लेखित शर्तों/प्रतिबन्धों के अधीन हुआ है।

MINING PLAN & PROGRESSIVE MINE CLOSURE PLAN OF

MACHIGARH PYROPHYLLITE AND DIASPORE DEPOSIT

Lease Period - 30 years

Applied M. L. Area – 19.0 ha.
M. L. Area in Forest if any - 19.0 ha.
Total M. L. Area - 19.0 ha.

Forest Block – Machigarh
Forest Compartment No. – 262
Forest Range – Jatara
Forest Division – Tikamgarh
State - Madhya Pradesh

For the Mineral - Pyrophyllite & Diaspore

APPROVED
Director
Geology & Mining
Madhya Pradesh

Applicant -
M/s. Khajuraho Minerals Pvt. Ltd.
6th km Sagar Road, Dhadari,
P.O. & District - Chhatarpur (M.P.)
Pin Code - 471001
Phone – 07682 – 248751, 241589
e-mail - khajurahomineral.sales@gmail.com

Submitted Under Rule 42 (A) (1) of of M.P. Minor Mineral Rules 1996 to Directorate of Geology and Mining, State Govt. of M.P.

Prepared by:
Ram Chandra Bansal
Regd. No.- RQP/DGMMP/53/2013, Valid upto – 04.06.2023
C/o. M/s. Balram Singh Associates Pvt. Ltd.
Chopra Colony, P.O.- Maihar
Distt.- Satna (M.P.) Pin : 485771
Phone No/Fax. : (07674) 232473
e-mail: bsapl.myr@gmail.com

RAM CHANDRA BANSAL
RQP/DGMMP/53/2013

INDEX

List of the Plans and Sections –

1.	KEY PLAN	Plate – 1
2.	LEASE MAP	Plate – 2
3.	LOCATION MAP	Plate – 3
4.	SURFACE PLAN	Plate – 4
5.	SURFACE GEOLOGICAL PLAN	Plate – 5
6.	SURFACE GEOLOGICAL SECTION	Plate – 6
7.	5 YEAR DEVELOPMENT/PRODUCTION PLAN & SECTION	Plate – 7
8.	ENVIRONMENT PLAN	Plate – 8
9.	CONCEPTUAL PLAN AND SECTION	Plate – 9
10.	PROGRESSIVE MINE CLOSURE PLAN	Plate – 10

List of documents Annexed:-

Annexure No.	Annexure Detail
1.	Pre Feasibility Report
2.	Copy of Letter of Intent for grant of Q.L.
3.	Certificate of Incorporation
4.	Power of Attorney
5.	P.L. Report
6.	Photographs
7.	RQP Certificate
8.	Copy of M.L. Application

अनुमोदित
APPROVED

RAM CHANDRA BANSAL
RQP/DGMMP/53/2013

CHAPTER – I

1.0 GENERAL

Introduction – The area under reference is Forest land and the state Government of M.P. vide their letter no.-. F2-135/2011/12/1 Bhopal Dated- 03.03.2012 sanctioned prospecting license over 199.0 ha. area. The prospecting license deed in form F was executed for two years period w.e.f. 16.04.2012 to 15.04.2014.

The PL area is forest land and approval Under Section-2 of Forest Conservation Act 1980 for drilling 3 bore holes of dia 4 inches has also been accorded by CCF (Land Management), Satpura Bhawan, Bhopal vide letter No.–F-1/603/2011/10-11 /1321 dated 10.05.2011 for 1 year period from date of execution of Prospecting license i.e. 15.4.2012. The applicant prospected the area and established the nature and occurrence of Pyrophyllite during the prospecting operations by giving 3 bore holes. The mineralized zone in PL area was demarcated based on the out crop, old pit and bore holes and two potential blocks were delineated. The prospecting report was prepared and submitted to the State Govt. as well as to IBM by the applicant.

The applicant applied for grant of M.L. as per rules on 26.10.2012 over the previously granted PL area in 19 ha. The applied area consists of 18.964 ha for mining and 0.036 ha for extraction path in the forest land. The State Govt. vide its letter no. F 3-25/2018/12/1 dated 04.07.2018 (Annex-2) has issued the LOI for grant of mining lease over an area of 19.0 ha under Rule 18(2) of M.P. Minor Mineral Rules 1996. This mining plan hence has been submitted under Rule 42(A) of M.P. Minor Mineral rules 1996 for grant of M.L. for 30 years period.

a) **NAME OF THE APPLICANT/LESSEE** : M/s. Khajuraho Minerals Pvt. Ltd.

Address	:	6th km Sagar Road, Dhadari
P.O. & District	:	Chhatarpur
State	:	Madhya Pradesh
Pin Code	:	471001
Phone No.	:	07682-248751, 241589
Fax No.	:	07682-243883
Mobile No.	:	9425140759
e-Mail	:	khajurahomineral.sales@gmail.com

अनुमोदित APPROVED

(b) **STATUS OF THE APPLICANT/LESSEE** : Private Limited Company

(c) **MINERAL(S) WHICH IS/ARE INCLUDED IN THE PROSPECT LICENSE** : NA

(d) **MINERAL(S) WHICH IS/ARE INCLUDED IN THE LETTER OF INTENT/ LEASE DEED** : Pyrophyllite and Diaspore

(e) **MINERAL(S) WHICH THE APPLICANT/LESSEE INTENDS TO MINE** : Pyrophyllite and Diaspore

(f) **NAME OF THE RECOGNISED QUALIFIED PERSON UNDER RULE 42 of M.P. MINOR MINERAL RULE 1996 PREPARING THE MINING PLAN :**

Ram Chandra Bansal
Registration Number : RQP/DGMMP/53/2013 Validity upto : 04.06.2023
Address : **C/o. M/s. Balram Singh Associates Pvt. Ltd.** Chopra Colony, P.O.- Maihar, District: Satna (M.P.) Pin-485771
e-mail : bsapl.myr@gmail.com

RAM CHANDRA BANSAL
RQP/DGMMP/53/2013

Chapter – II

2.0 LOCATION AND ACCESSIBILITY -

(a) LEASE DETAIL -

Name of Mine : **MACHIGARH PYROPHYLLITE AND DIASPORE DEPOSIT**

Latitude / Longitude of any boundary point -

Latitude : 24°55'43.9" to 24°56'10.6" N

Longitude : 78°57'17.8" to 78°57'34.1" E

Date of grant of lease : 04.07.2018

Period : 30 Years

Expiry Date : 30 years from date of registration of M.L.

Name of lease holder : M/s. Khajuraho Minerals Pvt. Ltd.

Postal Address : 6th km Sagar Road, Dhadari
P.O. and District - Chhatarpur (M.P.)

Pin Code : 471001

Phone/Fax No. : 07682-248751, 241589

Mobile No. : 9425140759

e-Mail : khajurahomineral.sales@gmail.com

(b) DETAILS OF APPLIED/LEASE AREA WITH LOCATION MAP (FRESH AREA/MINE)

Forest		Non-Forest	
Forest (specify)	Area (ha)	Nil	Area (ha)
Type - Protected Forest Compartment No.- 262 Forest Block - Machigarh Forest Range - Jatara Division & District- Tikamgarh	19.0 ha	(i) Waste land	NA
		(ii) Grazing land	Nil
		(ii) Agriculture land	Nil
		(iv) Others (specify)	Nil

Whether the area falls under Coastal Regulation Zone (CRZ)? If yes, details thereof : No.

Existence of public road/railway line, if any nearby and approximate distance :

The applied area can be approached from Tikamgarh. The applied area is 25 kms towards Jatara and then 4 kms upto Gumanganj. The nearest railway station is Tikamgarh at a distance of about 25 km. All the basic infrastructure is available at Tikamgarh.

Toposheet No. with latitude & longitude of all corner boundary point/pillar :

Toposheet No. – 54L/13

Pillar No.	Latitude	Longitude	Pillar No.	Latitude	Longitude
1	24°55'43.9"	78°57'28.6"	2	24°55'46.7"	78°57'17.8"
3	24°55'57.1"	78°57'21.0"	4	24°56'05.8"	78°57'23.7"
5	24°56'08.0"	78°57'27.0"	6	24°56'10.6"	78°57'30.0"
7	24°56'09.5"	78°57'34.1"	8	24°55'57.2"	78°57'28.8"
9	24°55'48.6"	78°57'30.1"			

अनुमोदित
APPROVED

RAM CHANDRA BANSAL
RQP/DGMMP/53/2013

(c) **ATTACH A GENERAL LOCATION MAP SHOWING AREA AND ACCESS ROUTES. IT IS PREFERRED THAT THE AREA BE MARKED ON A SURVEY OF INDIA TOPOGRAPHICAL MAP OR A CADASTRAL MAP OR FOREST MAP AS THE CASE MAY BE. HOWEVER, IF NONE OF THERE ARE AVAILABLE, THE AREA MAY BE SHOWN ON AN ADMINISTRATIVE MAP.**

A location map showing the QL area and access routes have been appended as plate -3. A Key Plan has been appended marked on the Survey of India Topo sheet No. 54 L/13 as Plate 1.

CHAPTER – III

3.0 DETAILS OF APPROVED MINING PLAN/MINING PLAN (if any)

3.1 DATE AND REFERENCE OF EARLIER APPROVED MINING PLAN/SCHEME OF MINING:

Sl. No.	Type of document & rule under which prepared	approval letter No & date	Lease area for Which approval given (ha)	Proposal from –to (period of years)
(a)	Nil	NA	NA	NA

Not applicable as this is a case of fresh grant of mining lease

3.2 DETAILS OF LAST MODIFICATION IF ANY (FOR THE PREVIOUS APPROVED PERIOD) OF APPROVED MINING PLAN/SCHEME OF MINING INDICATING DATE OF APPROVAL, REASON FOR MODIFICATION :

Not applicable as this is a case of fresh grant of mining lease.

3.3 GIVE REVIEW OF EARLIER APPROVED PROPOSAL (IF ANY) IN RESPECT OF EXPLORATION, EXCAVATION, RECLAMATION ETC.

Not applicable as this is a case of fresh grant of mining lease

3.4 GIVE STATUS OF COMPLIANCE OF VIOLATION POINTED OUT BY IBM:

No violation was pointed out. Not applicable as this is a case of fresh grant of mining lease.

3.5 INDICATE AND GIVE DETAILS OF ANY SUSPENSION/CLOSURE/PROHIBITORY ORDER ISSUED BY ANY GOVERNMENT AGENCY UNDER ANY RULES OR COURT OF LAW :

No suspension/closure/prohibitory order has been issued by any government agency under any rules or court of law.

3.6 IN CASE THE MINING PLAN IS SUBMITTED FOR APPROVAL OF MODIFICATION, SPECIFY REASON AND JUSTIFICATION FOR MODIFICATION UNDER RULES:

The Mining Plan is being submitted in compliance of the M.P. Minor Mineral Rules 1996 and no modification is being carried out.

अनुमोदित
APPROVED

RAM CHANDRA BANSAL
RQP/DGMMP/53/2013

PART – A

CHAPTER – I

1.0 GEOLOGY AND EXPLORATION :

a) BRIEFLY DESCRIBE THE TOPOGRAPHY, DRAINAGE PATTERN, VEGETATION, CLIMATE, RAINFALL DATA OF THE AREA APPLIED/MINING LEASE AREA.

(i) Topography - The lease area is hilly sloping towards south east and north west. The highest elevation is 370m RL towards north west while the lowest elevation is 270m RL towards south east.

(ii) Drainage Pattern :- There is no river or any perennial surface water source within the core zone. The general slope of the buffer zone is towards south east and seasonal water courses originating from east moving further towards south-east and merging in Jamnara Nala in SE at 0.75 km. distance. This discharges into Kirtwari nadi situated in south-east.

(iii) Vegetation –The core zone is devoid of any vegetation as is stony in nature. There are trees of Salai, Sagwan, Chirol, Mahua, Mango, Babool, Peepal, Bamboo, Kachnar, Palas, Khair, Tendu, Karanj, Gulmohar, Arjun, Sejha & Neem etc. in the buffer zone within 10km radius.

(iv) Climate & Rainfall data– For details refer Part A, Chapter-8.1(vi)

b) BRIEF DESCRIPTIONS OF REGIONAL GEOLOGY WITH REFERENCE TO LOCATION OF LEASE AREA:

The area is a part of Bundelkhand basement complex and the age of this rock has been determined to be 2500 million years (M. S. Krishnan, Page-118). The Bundelkhand mass is semicircular in outline and covers part of Madhya Pradesh and Uttar Pradesh. The outstanding feature of commercial importance in the geology of Bundelkhand area is occurrence of the minerals Pyrophyllite and Diaspore in an intimate relationship and Pyrophyllite. These minerals occur at the base of the Palar formation which display mineral assemblages resembling to that of green schist facies metamorphosis.

On the basis of the study of different rock types exposed in the area, following sequence of formation has been observed :-

Dolerite - Basic Dyke
Quartz reef
Granite (Fine grained)
Granite (coarse grained)

अनुमोदित
APPROVED

In general the Diaspore-Pyrophyllite deposit occur in direct contact with the (1) granite and gneissose (2) within phyllites or (3) encased within a host rock of Quartzites and Quartz-Pyrophyllite.

The weathered granites are invariably associated with this deposit. They are considered to be the source of the mineralisation of Diaspore and Pyrophyllite minerals. The weathered zone which contains clay along the inter granular margins after deformation resembles to mylonite. The common mode of occurrence of these minerals reflect coexistence of different mineral phases, heterogeneity of primary mineral phases and effect of the physical and chemical conditions during mineralization are as follows :-

(a) Fine grained Pyrophyllite
(b) Flaky Pyrophyllite
(c) Disseminated Diaspore in Pyrophyllite
(d) Nodular coarse crystalline Diaspore in Pyrophyllite

RAM CHANDRA BANSAL
RQP/DGMMP/53/2013

(e) Veins and irregular bodies of Diaspore in Pyrophyllite

(f) Diaspore occurring in bedded form zoning

The ore bodies may simply show a zonation from a central core of early Quartz with pure Pyrophyllite strikers parallel and oblique to the shear surface to an outer flank of relatively impure quartz-iron rich Pyrophyllite or distinctly zoned deposit with a core of Diaspore in Pyrophyllite with an outer well of serricite-muscovite kaolin. Such type of zoning is common in lens formed within the later milky crystalline Quartz which from the outermost rim of the deposit.

Granules of finely crystalline varieties of Diaspore are usually purer when compared with the coarse bladed types. All the samples are in fact admixtures of Diaspore and Pyrophyllite minerals. The finely crystalline varietiescontain less interstitial Pyrophyllite as compared to the coarsely crystalline varieties.

c) DETAILED DESCRIPTION OF GEOLOGY OF THE LEASE AREA SUCH AS SHAPE AND SIZE OF THE MINERAL/ORE DEPOSIT, DISPOSITION VARIOUS LITHO-UNITS INDICATING STRUCTURAL FEATURES IF ANY ETC. (APPLICABLE FOR MINING PLAN FOR GRANT & RENEWAL AND NOT FOR MINING PLAN/MODIFICATIONS IN THE APPROVED MINING PLAN/MINING PLAN):

GENERAL DESCRIPTION OF GEOLOGY OF THE LEASE AREA IS AS UNDER –

The Pyrophyllite and associated diaspore of the lease area belongs to Palar formation of Bundelkhand group having Pre-Cambrian age. The Pyrophyllite/Diaspore deposit of the lease area is encased in quartz/Phyllite. The geological sequence in the lease area is given below :-

Over Burden	-	0m to 5m
Pyrophyllite/Diaspore ore body	-	upto 30m

अनुमोदित
APPROVED

The strike of the ore body is north-east and south-west and dip is 70^0 and 80^0 due northwest. The Pyrophyllite ore body with the associated Diaspore is encircled by weathered granite at the immediate contact which forms the outer walls. The mineral Pyrophyllite and Diaspore occur in an intimate relationship. Pyrophyllite is dull pink, yellowish and green in colour. It has a typical greasy feel with and off white streak. It is massive, soapy, soft and compact in nature. Occasionally foliation is distinct. Embedded within Pyrophyllite are the nodules of Diaspore mineral which is usually medium to fine grained to bladed. Rossettas type of Diaspore in which blades are arranged in a radiating manner are not very common. The size of the nodules and chunks of Diaspore tend to increase in size along the depth. The wall rock which is comprised of quartzite rocks softens nearer to the contact. The recovery of Pyrophyllite is about 45% of the R.O.M. as most of it is highly ferruginous and or siliceous. Diaspore is found in the tune of about 15% of the ROM.

Bulk density of Pyrophyllite = 3 and that of Diaspore is 3.5.

The deposit in the area is massive with regular shape and grade-homogeneous to inhomogeneous. In view of above the Pyrophyllite deposit of the applied area may be placed under Category I as per UNFC i.e. Stratiform, Stratabound and Tabular Deposits of regular Habit.

RAM CHANDRA BANSAL
RQP/DGMMP/53/2013

Controls of mineralisation :-

(i) Genetic control :- The Pyrophyllite/Diaspore mineralisation represents the last phases of the hydrothermal actively connected with granite magma.

(ii) Lithological control :- The Pyrophyllite zone occur within the fine grained granites.

(iii) Structural control :- There are two sets of common fractures and joints, one running NNE-SSW direction and the other set in a NW-SE direction .

d) **(i) NAME OF PROSPECTING /EXPLORATION AGENCY :** The ML area was prospected by the lessee company itself under supervision of its own Mining Engineer & Geologist.

e) **DETAILS OF PROSPECTING/EXPLORATION ALREADY CARRIED OUT :**

i) Number of pits and trenches indicating dimensions, spacing etc along and across the strike/foliation with reference to geological plan.

The topographic plan of the applied area has been prepared on 1:1000 scale with contour interval of 5m. Up to date surface geological plan has been appended as plate-5 showing ultimate pit limit, exploration already carried out. There is one old pit in the applied area. The mineral is out cropping along the strike. The area being forest land, permission for drilling was only given and hence no pitting could be done.

ii) Number of boreholes indicating type (Core/RC/DTH), diameter, spacing, inclination, Collar level, depth etc with standard borehole logs duly marking on geological plan /sections.

Two bore hole has been given in the applied area as per the permission given by the forest department. The lithology and details of exploration carried out are given below.

Bore hole No.	Location	Depth (m)	Collar level	Inclination	O.B.	Pyrophyllite/ Diaspore (m)
BH-1	N 2759286, E 293805	30m	319.10	Vertical	-	0.0 – 30.0 – Pyrophyllite /Diaspore
BH-2	N 2758917, E 293645	30m	310.15	Vertical	0-0.5	0.5 – 30.0 – Pyrophyllite/ Diaspore

अनुमोदित
APPROVED

The percentage recovery on average was 45% of Pyrophyllite and 15% of Diaspore.

iii) Details of samples analysis indicating type of sample (surface/sub-surface from pits /trenches/borehole etc) complete chemical analysis for entire strata for all radicals may be undertaken for selected samples from a NABL accredited Laboratory or Government laboratory or equivalent. Entire mineralized area may be analyzed meter wise with 10% of check samples. (At least for 10% of total samples may be analyzed in accordance to BIS and reports from NABL accredited /other government laboratory) -

The Pyrophyllite sample was analysed with complete chemical analysis from a Govt recognised laboratory. The Pyrophyllite of the applied area is of mainly handicraft, Detergent, Soap, Pesticide & ceramic grade. The Diaspore is of Refractory grade.

iv) Expenditure incurred in various prospecting operations: Rs. 1,00,000 /-.

f) **THE SURFACE PLAN OF THE LEASE AREA MAY BE PREPARED ON A SCALE OF 1:1000 OR 1:2000 WITH CONTOUR INTERVAL OF MAXIMUM OF 10 M DEPENDING UPON THE TOPOGRAPHY AND SIZE OF THE AREA DULY MARKED BY GRID LINES SHOWING ALL FEATURES INDICATED UNDER RULE:**

RAM CHANDRA BANSAL
RQP/DGMMP/53/2013

The surface plan of the lease area has been prepared on a scale of 1:2000. The applied area is hilly and hence spot level along with contour at 5 m interval duly marked by grid lines showing all features indicated under Rule M.P. Minor Mineral Rules 1996 has been given.

g) FOR PREPARATION OF GEOLOGICAL PLAN, SURFACE PLAN PREPARED ON A SCALE OF 1: 1000 OR 1: 2000 SCALE SPECIFIED UNDER PARA 1.0 (F) OF PART A OF THE FORMAT MAY BE TAKEN AS THE BASE PLAN. THE DETAILS OF EXPLORATION ALREADY CARRIED OUT ALONG WITH SUPPORTING DATA FOR EXISTENCE OF MINERAL, LOCATIONS PROPOSED EXPLORATION, VARIOUS LITHO-UNITS ALONG WITH STRUCTURAL FEATURES, MINERALIZED/ORE ZONE WITH GRADE VARIATION IF ANY MAY BE MARKED ON THE GEOLOGICAL PLAN ALONG WITH OTHER FEATURES INDICATED UNDER RULE :

The geological plan (Plate -5) has been prepared based on the surface plan prepared on a scale of 1: 2000. The details of exploration already carried out along with various litho-units and structural features have been marked indicated under M.P. Minor Mineral Rules 1996. The Pyrophyllite of the applied area is of mainly handicraft, Detergent, Soap, Pesticide & ceramic grade. The Diaspore is of Refractory grade.

h) GEOLOGICAL SECTIONS MAY BE PREPARED ON NATURAL SCALE OF GEOLOGICAL PLAN AT SUITABLE INTERVAL ACROSS THE LEASE AREA FROM BOUNDARY TO BOUNDARY:

The Up-to-date geological sections have been appended on Plate-6.

i) BROADLY INDICATE THE FUTURE PROGRAMME OF EXPLORATION WITH DUE JUSTIFICATION(DULY MARKING ON GEOLOGICAL PLAN YEAR WISE LOCATION IN DIFFERENT COLOURS) TAKING INTO CONSIDERATION THE FUTURE TENTATIVE EXCAVATION PROGRAMME PLANNED IN NEXT FIVE YEARS AS IN TABLE BELOW: -

Exploration has been proposed as follows in order to establish depth persistence of the ore body and bring the reserve /resource under G1 level of the exploration.

Year	No. of boreholes (Core/RC/DTH)	Grid Interval	Total Meterage	No. of Pits, dimensions and volume	No. of Trenches, dimensions and volume
1st	2, DTH	100m	100	-	-
2nd	4, DTH	100m	200		
3rd	4, DTH	100m	200		

अनुमोदित
APPROVED

j) RESERVES AND RESOURCES AS PER UNFC WITH RESPECT TO THE THRESHOLD VALUE NOTIFIED BY IBM MAY BE FURNISHED IN A TABULAR FORM AS GIVEN BELOW: (AREA EXPLORED UNDER DIFFERENT LEVEL OF EXPLORATION MAY BE MARKED ON THE GEOLOGICAL PLAN AND UNFC CODE FOR AREA CONSIDERED FOR DIFFERENT CATEGORIES OF RESERVE/RESOURCES ESTIMATION MAY ALSO BE MARKED ON GEOLOGICAL CROSS SECTIONS). SUBMIT A FEASIBILITY/PRE-FEASIBILITY STUDY REPORT ALONG WITH FINANCIAL ANALYSIS FOR ECONOMIC VIABILITY OF THE DEPOSIT AS SPECIFIED UNDER THE UNFC FIELD GUIDELINES MAY BE INCORPORATED:

Reserves and Resources have been furnished in tabular form given below. The area explored under different level of exploration has been marked on the geological plan and UNFC code for area considered for different categories of reserve / resources estimation has also been marked on geological cross sections. A pre feasibility study report describing economic and feasibility axis along with financial analysis for economic viability of the deposit as specified under the UNFC field guidelines has been incorporated as Annexure-1.

RAM CHANDRA BANSAL
RQP/DGMMP/53/2013

Categorisation of total mineral resources and mineral reserve :-

The total mineral resources have been put under 332 category while the mineral reserve has been put under 122 category as per the UNF classification. The lease area is explored by way of one bore hole and a pit as permitted by the forest department during the course of prospecting license period. Hence the reserve/resource has been put under G2 level.

k) **FURNISH DETAILED CALCULATION OF RESERVES/RESOURCES SECTION WISE (WHEN THE MINE IS FULLY MECHANIZED AND DEPOSIT IS OF COMPLEX NATURE WITH VARIATION OF SIZE , SHAPE OF MINERALIZED ZONES, GRADE DUE TO INTRUSION WITHIN ORE ZONE ETC, AN ATTEMPT MAY BE MADE TO ESTIMATE RESERVES/RESOURCES BY SLICE PLAN METHOD). IN CASE OF DEPOSITS WHERE UNDERGROUND MINING IS PROPOSED, RESERVE/RESOURCES MAY BE ESTIMATED BY LEVEL PLAN METHOD, AS APPLICABLE, AS PER THE PROPOSED MINING PARAMETERS:**

Method of estimation of mineral resource & reserves:-

The total mineral resources have been calculated by surface area method. In this method the surface mineralised area is multiplied by the average thickness of the ore body to give the volume. This in turn has been multiplied by the incidence and bulk density to find out the tonnage. The mineral reserve thereafter has been calculated by depleting remaining resources from total mineral resources.

Mineral Resources:-

Indicated Mineral Resource (332)

Surface mineralised area		=	90,000 M2
Average thickness of ore body		=	30m
Recovery factor,	Pyrophyllite	=	45 %
	Diaspore	=	15%
Bulk Density,	Pyrophyllite	=	3.0
	Diaspore	=	3.5

अनुमोदित
APPROVED

Mineral Resource = Surface mineralised area x average thickness of ore body x Incidence x B.D.

Pyrophyllite	=	90,000 sqm x 30m x 0.45 x 3.0	=	36,45,000 t.
Diaspore	=	90,000 sqm x 30m x 0.15 x 3.5	=	14,17,500 t.

Mineral reserve and Remaining Resources:-

Mineral reserve = Total mineral resource - Remaining resources

Remaining Resources (Pre Feasibility Mineral Resource - 222)

The following are the Pre Feasibility Mineral Resource under UNFC classification 222 after deduction of all statutory barriers as per MMR 1961 and other applicable rules.

Deduction = Length x Width x Av. Thickness x % recovery x B.D.

Deduction	Pyrophyllite	Diaspore
Due to 7.5 m barrier as per MMR 1961	700m x 7.5m x 30m x 0.45 x 3 = 212625 t.	700m x 7.5m x 30m x 0.15 x 3.5 = 82688 t.
Due to Slope stability	670m x 30m x 30m x 0.45 x 3 = 814050 t.	670m x 30m x 30m x 0.15 x 3.5 = 316575 t.
Pre Feasibility Mineral Resource (222)	1026675 t.	399263 t.

RAM CHANDRA BANSAL
RQP/DGMMP/53/2013

Mineral reserve and Remaining Resources:-

Mineral reserve = Total mineral resource - Remaining resources

Mineral reserve and Remaining Resources	**Pyrophyllite**	**Diaspore**
Indicated Mineral Resource (332)	36,45,000 t.	14,17,500 t.
Pre Feasibility Mineral Resource (222)	1026675 t.	399263 t.
Probable Mineral reserve (122)	3645000 t. – 1026675 t. = 26,18,325 t.	1417500 t. – 399263 t. = 1018237 t.

I) **MINERAL RESERVES/RESOURCES:**

Mineral Resources: The Mineral resources have been estimated on the basis of level of exploration. The resources and Reserves within the lease has been arrived based on the results of the feasibility study and economic evaluation of deposit as elaborated in the feasibility report appended as Annexure -1 and based on various factors such as:

a) Mining method, Recovery factor, mining losses, processing loss etc.

b) Cut off grade, Ultimate pit depth proposed.

c) Mineral/ ore blocked dues to benches and 7.5m barrier.

Level of Exploration	Resources in tonne of Pyrophyllite	Resources in tonne of Diaspore
G1 - Detailed exploration	Nil	Nil
G2 - General Exploration	36,45,000 t.	14,17,500 t.
G3 – Prospecting	Nil	Nil
G4- Reconnaissance	Nil	Nil

UPDATED MINERAL RESERVE AS PER UNFC CLASSIFICATION:-

	UNFC Code	Pyrophyllite in tonne	Diaspore in tonne	Grade
A. Total Mineral Reserve				The Pyrophyllite of the applied area is of mainly handicraft, Detergent, Soap, Pesticide & ceramic grade. The Diaspore is of Refractory grade.
Probable Mineral Reserve	122	26,18,325	10,18,237	
B. Total Remaining Resources				
Pre Feasibility mineral Resource	222	1026675	399263	

APPROVED

Director
Geology & Mining
Madhya Pradesh

RAM CHANDRA BANSAL
RQP/DGMMP/53/2013

CHAPTER – II

2.0 MINING

A) OPEN CAST MINING:

a) BRIEFLY DESCRIBE THE EXISTING AS WELL AS PROPOSED METHOD FOR EXCAVATION WITH ALL DESIGN PARAMETERS INDICATING ON PLANS /SECTIONS.

(I) Existing Method of Excavation – Not applicable.

(II) Proposed Method of Excavation - Opencast semi mechanized method of mining will be adopted in the lease area in future. Development and loading of OB will be carried out by mechanical means. All operation of mining such as winning of ore and its loading will be carried out by mechanical means and at times by manual means. Drilling and blasting will be carried out of hole dia less than 100 mm and depth less than 3 m. While planning the proposal for the ensuing five years period, economic depth of the pit for minimum degradation of land has been considered. In order to prevent haphazard excavation of pits, the development has been proposed at one place from top down ward in the lease area.

The development will be done in OB where ever present in the QL area. It will be stripped off in 1st bench. The development in mineral has been proposed in benches of height and width equal to 6.0m. The recovery of Pyrophyllite from individual bench zone will depend on presence of extent of mineralization which is about 50%. No labour camp is proposed within the lease area. The transport of men is not applicable and they will come from nearby villages on their own. No tubs, haulage rope, conveyor or locomotive will be used.

1st Year - The development will be carried at the top of the mound. About 4200 sqm area will be developed. Benches of 339m and 333m will be worked. The height and width of the bench will be equal to 6m. The mineral is outcropping at the surface.

2nd Year - The development will be carried at the top of the mound. About 3580 sqm area will be deepened up to 327 m RL. The height and width of the bench will be equal to 6m.

3rd Year - The development will be carried at the top of the mound. About 4440 sqm area will be deepened up to 321 m RL. The height and width of the bench will be equal to 6m.

4th Year - The development will be carried at the top of the mound. About 4130 sqm area will be deepened up to 315 m RL. The height and width of the bench will be equal to 6m.

5th Year - The development will be carried at the top of the mound. The faces will be advance towards west. About 3250 sqm area will be developed towards west. The benches of 345m and 339m will be worked in OB while 333m, 327m, 321m and 315m will be worked in mineral. The height and width of the bench will be equal to 6m.

अनुमोदित
APPROVED

RAM CHANDRA BANSAL
ROP/DGMMP/53/2013

(III) Design parameters for wise development / production:-

Yr	Bench	B-1	B-2	B-3	B-4	B-5	B-6	OB/ Waste (cum)	Production (cum)	
									Pyrophylite	Diaspore
	Area Affected (sqm)	1500	2300							
	Av. Face Height (m)	3	3							
	Volume (cum)	4500	6900							
1st	Production of Pyrophyllite (cum)	0	3105					7260	3105	1035
	Production of Diaspore (cum)	0	1035							
	OB/waste (cum)	4500	2760							
	Av. Reduced level (m)	339	333							
	Area Affected (sqm)	3580								
	Av. Face Height (m)	4.5								
	Volume (cum)	16110								
2nd	Production of Pyrophyllite (cum)	7250						6444	7250	2416
	Production of Diaspore (cum)	2416								
	OB/waste (cum)	6444								
	Av. Reduced level (m)	327								
	Area Affected (sqm)	3580								
	Av. Face Height (m)	4.5								
	Volume (cum)	16110								
3rd	Production of Pyrophyllite (cum)	7250						6444	7250	2416
	Production of Diaspore (cum)	2416								
	OB/waste (cum)	6444								
	Av. Reduced level (m)	321								
	Area Affected (sqm)	4000								
	Av. Face Height (m)	4.5								
	Volume (cum)	18000								
4th	Production of Pyrophyllite (cum)	8100						7200	8100	2700
	Production of Diaspore (cum)	2700								
	OB/waste (cum)	7200								
	Av. Reduced level (m)	315								
	Area Affected (sqm)	2000	1800	1600	1400	1200	1000			
	Av. Face Height (m)	3	6	6	6	6	6			
	Volume (cum)	6000	10800	9600	8400	7200	6000			
5th	Production of Pyrophyllite (cum)	0	0	4320	3780	3240	2700	29280	14040	4680
	Production of Diaspore (cum)	0	0	1440	1260	1080	900			
	OB/waste (cum)	6000	10800	3840	3360	2880	2400			
	Av. Reduced level (m)	345	339	333	327	321	315			
	Total							56628	39745	13247

Recovery = 45 % of Pyrophyllite and 15% of Diaspore from ROM.

अनुमोदित
APPROVED

RAM CHANDRA BANSAL
RQP/DGMMP/53/2013

b) INDICATE YEAR-WISE TENTATIVE EXCAVATION IN CUBIC METERS INDICATING DEVELOPMENT, ROM, PIT WISE AS IN TABLE BELOW.

(I) Insitu Tentative Excavation

Year	Total tentative Excavation (Cum)	Top Soil (cum)	OB/SB/ IB (cum)	ROM (cum)			Production in tonnes of Pyrophyllite*	Production in tonnes of Diaspore*	ROM/ Waste ratio
				Ore (cum)		Mineral Reject			
				Pyrophyllite	Diaspore				
1st	11400	Nil	7260	3105	1035	Nil	9315	3622	1 : 1.75
2nd	16110	Nil	6444	7250	2416	Nil	21749	8458	1 : 0.67
3rd	16110	Nil	6444	7250	2416	Nil	21749	8458	1 : 0.67
4th	18000	Nil	7200	8100	2700	Nil	24300	9450	1 : 0.67
5th	48000	Nil	29280	14040	4680	Nil	42120	16380	1 : 1.56
Total	109620	Nil	56628	39745	13247	Nil	119233	46368	1 : 1.07

* Tentative tonnage of the ore has been taken as Pyrophyllite = 3.0 and Diaspore = 3.5m as these data are variable and may be established on time series.

APPROVED
Director
Geology & Mining
Madhya Pradesh

(II) Dump rehandling (for the purpose of recovery of mineral):

Estimated available material (Cum) – No mineralised dump is present in the QL area which will be re-handled for the purpose of recovery of mineral.

Dump identification/ no	Yearwise Handling (Cum)	Estimated recovery of saleable material (Cum) *	Reject (Cum)
Nil	NA	NA	NA

c) ENCLOSE INDIVIDUAL YEAR WISE DEVELOPMENT PLANS AND SECTIONS SHOWING PIT LAYOUTS, DUMPS, STACKS OF MINERAL REJECT, IF ANY, ETC IN CASE OF 'A' CATEGORY MINES. COMPOSITE DEVELOPMENT PLANS SHOWING PIT LAYOUTS, DUMPS, STACKS OF MINERAL REJECT, IF ANY, ETC. AND YEAR WISE SECTIONS IN CASE OF 'B' CATEGORY MINES.

Composite development plan and section has been appended as Plate No. 7.

d) DESCRIBE BRIEFLY GIVING SALIENT FEATURES OF THE PROPOSED METHOD OF WORKING INDICATING CATEGORY OF MINE.

(I) Opencast semi mechanized method of mining will be adopted in the lease area in future. Development and loading of waste will be carried out by mechanical means. All operation of mining such as winning of ore and its loading will be carried out by mechanical means and at times by manual means. Transport will be done by trucks & dumpers. Drilling and blasting will be carried out of dia less than 100 mm and depth less than 3.0m in mineral. Various mining activities such as drilling, blasting, loading and transportation will be so conducted as to ensure maximum mineral conservation and minimum environmental degradation. While planning, quality parameter of the deposit has been taken care of so as to have maximum blending ratio. Blasting will be carried out for heaving effect and fragmentation to the deposit. Blasted Ore will be loaded in to the dumpers by loaders/manual means and will be transported to the destination plant.

RAM CHANDRA BANSAL
RQP/DGMMP/53/2013

Secondary blasting will not be required. The over burden will be loaded by loaders and transported to the stacking site by dumpers.

Systematic working will be done by formation of benches as per M.M.R. 1961. All applicable Rules of MMR 1961, Mines Act-1952, M.P. Minor Mineral Rules, 1996 and relevant Act & Rules will be followed for safe, scientific & systematic working to follow the principles of safety & conservation of human health & mineral.

No labour camp is proposed within the lease area. The transport of men is not applicable. No tubs, haulage rope, conveyor or locomotive will be used.

(II) Drilling: - Drilling will be done as per parameters given below.

Spacing	2.40-2.50m	1.0m
Burden	2.0-2.20 m	0.80m
Depth of hole	2.80-2.90 m	1.5m
Dia of hole	80mm	33 mm

(III) Blasting:- The proposal for occasional blasting is given to meet any emergency during the time of big demand of minerals and shortage of labour Blasting will be done as per details here under: -

(i) Broad blasting parameter: -

Spacing	2.40-2.50m	1.0m
Burden	2.0-2.20 m	0.80m
Depth of hole	2.80-2.90 m	1.5m
Charge per hole	7.0 kg	0.45 kg
Powder Factor (t/kg)	5-6	6-7
Dia of hole	80mm	33 mm

(ii) Type of explosive to be used:-

(a) Power gel, Sun Prime, Nova Prime

(b) Ordinary detonator

(c) Detonating fuse and safety fuse

अनुमोदित
APPROVED

(iii) Storage of explosive - No storage of explosive will be done at mine site. The pre-calculated quantity of explosive will be taken from the authorised dealer and transported in permitted carrier on the scheduled day for blasting and will be used on the very same day. The storage of explosives will be done in accordance with the Indian Explosives Act. 1984 and the Rules made there under. The explosive will be supplied by the explosive van.

(iv) Precaution to be observed during drilling & blasting:-

(i) Preparation of charge and charging and stemming of holes will be done by a qualified blaster.

(ii) Before a shot is charged, stemmed or fired, sufficient warnings by signal is given over the entire area falling within the danger zone and ensure that all persons within such area have taken proper shelter.

(iii) During blasting, controlled blasting will be done to prevent flying fragments which may cause injury to local inhabitants within danger zone.

RAM CHANDRA BANSAL
RQP/DGMMP/53/2013

(iv) Proper inspection after shot firing will be done by the blaster.

(v) The number of shots which exploded shall be counted by the blaster to assess misfire.

(vi) All necessary precautions as enumerated under 106(2)(b) of MMR 1961 will be followed.

(IV) Extent of mechanization:-

Proposed Working days/annum = 275 days

Targeted production = 50,000 TPA or 182TPD

Total handling of OB & Waste = 65,000 TPA or 237 TPD

Hence Total handling = 1,15,000 TPA or 419 TPD

1. Drilling machines:

Type	Nos.	Dia of hole (mm.)	Size / capacity	Make	Motive Power
(i) Atlas Copco Compressor	2	32	210 CFM	Atlas Copco	Diesel
LM -100-D75	1	80	450 CFM		
(ii) Jack Hammer	2	32			

2. Loading equipment: -

All loading of OB/waste will be done mechanically by following machine. Requirement of loading equipment For arriving at the rate of production per hour in case of the mine under reference, following formula is applicable –

$$Q = \frac{C \times F \times T \times BD \times Bf}{Tc}$$

Q = Per hour handling of excavator cum loader in tones

C = Bucket in cubic meters = 0.90 cum.

F = Fill factor = 0.90

T = Time in second = 3600 secs.

Bf = Overall Efficiency = 0.60

B.D. = 1.4 (Blasted mass)

Tc = Time cycle per pass at 90^0 swing = 45 secs.

Thus $Q = \frac{0.90 \times 0.9 \times 3600 \times 1.4 \times 0.60}{45}$ = 54 t. per hour

अनुमोदित
APPROVED

Per excavator cum loader per day output

= hour capacity x effective hours in operational days

= 54 t. per hour x 8 hours = 432 t.

Therefore number of excavator cum loader required

= Total handling required = 419 t./day = say 1.
Handling by excavator cum loader 432 t.

RAM CHANDRA BANSAL
RQP/DGMMP/53/2013

Type	Nos.	Size / capacity	Make	Motive Power	H.P.
L & T PC- 200/ Hyd. Excavator	1	0.90 cum	L & T/ Tata	Diesel	210

3. Haulage and transport equipments:-

(a) Haulage Within the leasehold area:

Haulage of O.B. to the stacking site will be done mechanically by 10 t. dumpers. The distance is within 0.50 km. total distance.

Details of hauling/transport equipment:

(i) The effective time per dumper to dumping site/stacking considering up and down journey inclusive of positioning, loading time and backfilling is 30 minutes. Hence, per hour trip = 2

(ii) Heaped capacity of the dumpers= 10 tones

(iii) Corrected mass capacity and fill factor = 0.8

Hence hauling capacity of 1 dumper per day in 8 hrs. = 10 t. x 0.8 x 2 x 8 = 128 t.

Hence dumpers required = 237 t./128 t.= Say 3 No. considering 40% stand by.

Type	Nos.	Size / capacity	Make	Motive Power	H.P.
Dumpers	3	10 t.	Tata	Diesel	110

(b) Transport from mines head to the destination:-

Describe briefly the transport system (please specify)

- Ore transported by: - own trucks/hired trucks
- Main destination to which ore is transported (giving to and fro distance)

अनुमोदित
APPROVED

Details of hauling/transport equipment:

The mineral will be transported to the destination plant within 100 kms distance.

(i) The effective time per dumper to destination considering up and down journey inclusive of positioning, loading time and dumping is one day.

Hence no. of dumpers required = 182 t. / 25 t. = Say 8.

Type	Nos.	Size / capacity	Make	Motive Power	H.P.
Dumpers/Truck	8	25 t.	Tata	Diesel	210

4. Miscellaneous:- The following additional equipments/machineries will be required for allied operations related to the mining of the deposit not covered earlier. The mine equipment will be procured from the other mine as and when required.

Type	Nos.	Size/ Capacity	Make	Motive Power	H.P.
1. Water Tanker with water Sprinkler	1	5000 ltr.	Hindustan	Diesel	95
2. Jeeps	1			Diesel	

RAM CHANDRA BANSAL
RQP/DGMMP/53/2013

e) DESCRIBE BRIEFLY THE LAYOUT OF MINE WORKINGS, PIT ROAD LAYOUT, THE LAYOUT OF FACES AND SITES FOR DISPOSAL OF OVERBURDEN/WASTE ALONG WITH GROUND PREPARATION PRIOR TO DISPOSAL OF WASTE, REJECT ETC. A REFERENCE TO THE PLANS AND SECTIONS MAY BE GIVEN. UPL OR ULTIMATE SIZE OF THE PIT IS TO BE SHOWN FOR IDENTIFICATION OF THE SUITABLE DUMPING SITE.

Layout of the quarry faces :-

The layout of the mine working has been designed considering, the following aspects.

(a) The shape and size of the QL area.

(b) The quarry and present exposures within the lease area.

(c) Planning for earliest backfilling of the QL area.

In order to prevent haphazard excavation of pits, the development has been proposed at one place, from one end and top downwards. The site has been suitably selected as the working will be carried from one end of the QL area. The faces will be advanced along the sloping side of mound. The haul road will be made from north-west side of the QL area and leading to quarry bottom. Planning has been made to ensure proper blending of ore to have consistent grade. The layout of the quarry on year wise basis showing the present working, position of benches at the end of the year has been shown on plate 7 and disposal sites of OB and waste has been shown on plate 10.

Sites for disposal of overburden/waste:- The OB /waste generated will be stacked in south east side of the QL area.

f) CONCEPTUAL MINE PLANNING UPTO THE END OF LEASE PERIOD TAKING INTO CONSIDERATION THE PRESENT AVAILABLE RESERVES AND RESOURCES DESCRIBING THE EXCAVATION, RECOVERY OF ROM, DISPOSAL OF WASTE, BACKFILLING OF VOIDS, RECLAMATION & REHABILITATION SHOWING ON A PLAN WITH FEW RELEVANT SECTIONS.

(I) Conceptual Mine Development up to lease period:-

अनुमोदित
APPROVED

(i) The present available resources and reserves are as under –

	UNFC Code	Pyrophyllite in tonne	Diaspore in tonne
A. Total Mineral Reserve			
Probable Mineral Reserve	122	26,18,325	10,18,237
B. Total Remaining Resources			
Pre Feasibility mineral Resource	222	1026675	399263

(ii) The proposed excavation of OB & ore during the ensuing proposal period taking in to consideration the recovery is given below. In the present mine there is no mineral reject and hence the ROM is production/saleable ore.

RAM CHANDRA BANSAL
RQP/DGMMP/53/2013

Total tentative Excavation (Cum)	Top Soil (cum)	OB/SB/ IB (cum)	ROM (cum)			Production in tonnes of Pyrophyllite*	Production in tonnes of Diaspore*
			Ore (cum)		Mineral Reject		
			Pyrophyllite	Diaspore			
109620	Nil	56628	39745	13247	Nil	119233	46368

(iii) Life of the mine – The anticipated life of mine will be as follows –

Production during 1st 5 year = 165601 t.

Proposed production from 6th year onwards = 50,000 TPA

Hence Life of the mine, = 5 year + $\frac{(3636562 \text{ t} - 165601 \text{ t.})}{50{,}000 \text{ TPA}}$ = 74 Years

(iv) Excavation details – The proposed method of mining will be by open cast semi mechanised method confined within the ultimate pit limit. No drainage system (nalla, rivulet)/ infrastructure (road, building, plant, electric line, structure) will require diversion from mining area for safety of the working and Road.

The development and the ultimate pit limit has been designed keeping in view 7.5m barrier as per Rule 111 of MMR 1961 and mineral reserves/ mineable area established so far. The area to be developed i.e. ultimate mineable area will be 13.50 ha. The ultimate depth of mining will be 30 m from general ground level. The ultimate pit slope will be 45 degree. The stripping ratio will be 1:1.07 It is proposed to mine about 50,000 TPA of Pyrophyllite and diaspore beyond the 1st 5 years and for this 54,000 TPA of OB/mine waste will be generated beyond the 1st 5 years period till the conceptual period. The ultimate pit slope will be 45 degree.

अनुमोदित
APPROVED

(II) Conceptual Waste Dump Management upto lease period:

(i) **Built up of dump at the end of 5 year plan period –** Dumping has been proposed during the ensuing Mining Plan period towards SE. Dumping of OB and waste will be carried out during 5 years as per proposal given in chapter (IV)

(iii) Quantum of waste dumping at the end of 5 year plan period – During the ensuing Mining Plan period, 56628 cum of OB/waste will be generated. This will be partially utilised for preparation and maintenance of approach road to QL area and rest stacked for backfilling at end.

(iv) Built up of dump at the conceptual stage – No dumping has been proposed at the conceptual stage. No dump will remain at end.

(v) Quantum of waste dumping at the conceptual stage –40 Lakh t. of OB/Waste is proposed to be generated. No dumping will be carried out, instead simultaneous backfilling will be carried out.

(vi) Conceptual dump design – No external dump will remain.

(III) Conceptual reclamation and rehabilitation of the worked out area –

(i) **Backfilling of voids –**

At lease period end – Reclamation will be carried out after mineable depth is reached and established during conceptual stage. The present envisaged depth of mining is upto 30 m bgl.

RAM CHANDRA BANSAL
RQP/DGMMP/53/2013

About 13.50 ha area will be reclaimed during the conceptual period. The height of the backfilling will be around 10m to 15.0m following the topography of the bench. The soil to be brought from outside up to the thickness of 0.20m will spread at top, leveling will be done and rehabilitation by afforestation of native species such as Neem, Teak, Shisham, Karanj, Khamer, Mahua, Teak and Pipal etc. in consultation with the forest department will be carried out. Conceptual rehabilitation by plantation will be carried out in 13.50 ha. area. About 13500 number of trees will be planted in reclaimed area during conceptual period.

(IV) Conceptual land use –

QL area (ha.)	Mineable Area (ha.)	Green belt (ha.)	Rehabilitation (ha.)	Total Rehabilitation(ha.)
			Plantation on BF area	
19.0	13.50	5.50	Conceptual rehabilitation of the 13.50 ha reclaimed area will be done by way of growing native species in consultation with the forest department.	13.50

B) UNDERGROUND MINING - Not applicable because no underground mining is proposed.

अनुमोदित
APPROVED

CHAPTER – III

3.0 MINE DRAINAGE

a) Minimum and maximum depth of water table based on observations from nearby wells and water bodies.

The water table is about 40m bgl.

b) Indicate maximum and minimum depth of Workings.

The working is proposed above ground level at the end of proposal period.

c) Quantity and quality of water likely to be encountered, the pumping arrangements and places where the mine water is finally proposed to be discharged.

The quantity of water likely to encountered during rains will be 600cum with peak sudden rainfall on any day may be 5000 cum. No dewatering is proposed in view of working proposed much above ground water table and hilly terrain of the area overflows it.

d) Describe regional and local drainage pattern. Also indicate annual rain fall, catchments area, and likely quantity of rain water to flow through the lease area, arrangement for arresting solid wash off etc.

There is no river or any perennial surface water source within the core zone. The general slope of the buffer zone is towards south east and seasonal water courses originating from east moving further towards south-east and merging in Jamnara Nala in SE at 0.75 km. distance. This discharges into Kirtwari nadi situated in south-east.

The QL area is likely to receive about 60,000 cum of rain fall. The surface runoff will be about 20% of the total received rain fall. In order to arrest wash off from solid waste into the water courses, garland drain and bund has been proposed.

RAM CHANDRA BANSAL
RQP/DGMMP/53/2013

CHAPTER – IV

4.0 STACKING OF MINERAL REJECT/SUB GRADE MATERIAL & DISPOSAL OF WASTE :

a) Indicate briefly the nature and quantity of top soil, overburden / waste and Mineral Reject to be disposed off.

The mine waste is in the form of weathered granite etc. The quantity to be generated during proposal period is given below –

Year	Top Soil (cum)		OB/Mine waste		Mineral Rejects (cum)			
	Reuse/ spreading	Storage	Stacking	Backfilling	Backfilling	Storage	Blending	Beneficiation
1st	-	-	7260	-	-	-	-	-
2nd	-	-	6444	-	-	-	-	-
3rd	-	-	6444	-	-	-	-	-
4th	-	-	7200	-	-	-	-	-
5th	-	-	29280	-	-	-	-	-
Total	-	-	56628	-	-	-	-	-

b) The proposed dumping ground within the lease area be proved for presence or absence of mineral and be outside the UPL unless simultaneous backfilling is proposed or purely temporary dumping for a short period is proposed in mineralized area with technical constraints & justification.

Stacking of OB/waste will be done during the ensuing proposal period in SE direction. The site has been chosen such that will not interfere with mine workings in future. The land use of the area is barren land. The ground is impervious.

c) Attach a note indicating the manner of disposal of waste, configuration and sequence of year wise build up of dumps along with the proposals for protective measures.

As mentioned above, OB/mine waste will be stacked.

अनुमोदित
APPROVED

OB/waste Disposal

Year	OB/waste generation during the year	Old OB/waste dump handling	Total OB/waste Handled	Quantity Disposed of on (cum)
	(cum)	(cum)	(cum)	Stacking
1st	7260	-	7260	7260
2nd	6444	-	6444	6444
3rd	6444	-	6444	6444
4th	7200	-	7200	7200
5th	29280	-	29280	29280
Total	56628	-	56628	56628

RAM CHANDRA BANSAL
RQP/DGMMP/53/2013

Stacking configuration (OB/waste)

Year *	Size of Dump at the begining of the year			Effective Quantity	Cumulative Quantity	Size of Dump Portion at the end of the year		
	Bottom area (sqm)	Top area (sqm)	Avg. height / thickness (m)	Cum	cum	Bottom area (sqm)	Top area (sqm)	Avg. height/ thickness In mts
1st	-	-	-	7260	7260	2500	1200	4.0
2nd	2500	1200	4.0	6444	13704	3000	1600	6.0
3rd	3000	1600	6.0	6444	20148	4500	2300	6.0
4th	4500	2300	6.0	7200	27348	5000	2000	8.0
5th	5000	2000	8.0	29280	56628	9000	2400	10.0

The manner of loading at quarry bottom will be mechanical. The OB/ waste will be unloaded mechanically

Precautions for confinement of dumps to prevent pollution of surface water bodies/courses:-

The lease area is hilly with general slope towards SE. Garland drain and bund will be prepared towards the sloping side in east and west to prevent siltation of low lying areas and water course towards SE.

अनुमोदित
APPROVED

RAM CHANDRA BANSAL
ROP/DGMMP/53/2013

CHAPTER – V

5.0 USE OF MINERAL AND MINERAL REJECT

a) DESCRIBE BRIEFLY THE REQUIREMENT OF END-USE INDUSTRY SPECIFICALLY IN TERMS OF PHYSICAL AND CHEMICAL COMPOSITION.

The minerals are used in modern refractory, pesticides, rubber, paint, cosmetics, soap, detergents and handicraft industries. Diaspore is used for manufacture of high alumina bricks to curtail the imports. Ceramic being the basic ancillary to the steel industry, The requirement of various industries is given under sub Para (d).

b) GIVE BRIEF REQUIREMENT OF INTERMEDIATE INDUSTRIES INVOLVED IN UP-GRADATION OF MINERAL BEFORE ITS END-USE.

The mineral of the lease area is not intended for supply to any intermediate industry for up-gradation or any beneficiation.

c) GIVE DETAIL REQUIREMENTS FOR OTHER INDUSTRIES, CAPTIVE CONSUMPTION, EXPORT, ASSOCIATED INDUSTRIAL USE ETC.

The mineral is not intended to supply to any other industry, captive consumption, export or for any other associated industrial use.

d) INDICATE PRECISE PHYSICAL AND CHEMICAL SPECIFICATION STIPULATED BY BUYERS.

Physical and chemical specification of Pyrophyllite stipulated by buyers :-

Specification laid done for supply of Pyrophyllite to various industries is given below :-

Name of Industries		Specification		
(1) Refractory	Grade -1	(i) Al_2O_3	=	30%
		(ii) Fe_2O_3	=	-1%
		(iii) Lumps 15mm to 25mm		
		(iv) PCE for Pyro	=	28
(2) Cosmetics and Soap	Grade -1	(i) Al_2O_3	=	30%
		(ii) Fe_2O_3	=	-1%
		(iii) Power	=	200 mesh.
(3) Rubber, Paints	Grade - 2	(i) Al_2O_3	=	-30%
		(ii) Fe_2O_3	=	+1%
		(iii) Lumps 15mm to 25mm		
(4) Detergents -	Grade 2	(i) Al_2O_3	=	-30%
		(ii) Fe_2O_3	=	+1%

(5) Handicraft - Pyrophyllite used in handicrafts is of Grade - 2 in boulder form. The larger the size the better price it will fetch. This is harder then soap stone and convenient in cutting & polishing.

Specification laid done for supply of Diaspore to various industries is given below :-

Grade 1	(i) Al 2O3 = +50%	(ii) Fe 2O3 = -1%
	(iii) Lumps 15mm to 25mm	
Grade 2	(i) Al 2O3 = +35%	(ii) Fe 2O3 = -1%
	(iii) Chips (-) 15mm	

अनुमोदित
APPROVED

RAM CHANDRA BANSAL
RQP/DGMMP/53/2013

e) **GIVE DETAILS OF PROCESSES ADOPTED TO UPGRADE THE ROM TO SUIT THE USER REQUIREMENTS.**

No processing is proposed to be adopted to upgrade the ROM.

CHAPTER – VI

6.0 PROCESSING OF ROM AND MINERAL REJECT-

a) **IF PROCESSING / BENEFICIATION OF THE ROM OR MINERAL REJECT IS PLANNED TO BE CONDUCTED, BRIEFLY DESCRIBE NATURE OF PROCESSING /BENEFICIATION. THIS MAY INDICATE SIZE AND GRADE OF FEED MATERIAL AND CONCENTRATE (FINISHED MARKETABLE PRODUCT), RECOVERY ETC.**

No processing of mineral will be done in the mine. Only simple sizing and sorting will be done manually.

b) **GIVE A MATERIAL BALANCE CHART WITH A FLOW SHEET OR SCHEMATIC DIAGRAM OF THE PROCESSING PROCEDURE INDICATING FEED, PRODUCT, RECOVERY, AND ITS GRADEAT EACH STAGE OF PROCESSING.**

No processing of mineral will be done.

c) **EXPLAIN THE DISPOSAL METHOD FOR TAILINGS OR REJECT FROM THE PROCESSING PLANT.**

No processing of mineral will be done. No tailing or reject hence will be generated.

d) **QUANTITY AND QUALITY OF TAILINGS /REJECT PROPOSED TO BE DISPOSED, SIZE AND CAPACITY OF TAILING POND, TOXIC EFFECT OF SUCH TAILINGS, IF ANY, WITH PROCESS ADOPTED TO NEUTRALIZE ANY SUCH EFFECT BEFORE THEIR DISPOSAL AND DEALING OF EXCESS WATER FROM THE TAILINGS DAM.**

No processing of mineral will be done. No tailing or reject hence will be generated.

e) **SPECIFY QUANTITY AND TYPE OF CHEMICALS IF ANY TO BE USED IN THE PROCESSING PLANT.**

अनुमोदित
APPROVED

No processing is proposed. No chemical will be needed.

f) **SPECIFY QUANTITY AND TYPE OF CHEMICALS TO BE STORED ON SITE / PLANT.**

No processing is proposed. No chemical will be stored.

g) **INDICATE QUANTITY (CUM PER DAY) OF WATER REQUIRED FOR MINING AND PROCESSING AND SOURCES OF SUPPLY OF WATER, DISPOSAL OF WATER AND EXTENT OF RECYCLING. WATER BALANCE CHART MAY BE GIVEN.**

The Quantity of Daily water requirement with water balance chart is as under -

Activity	Water requirement, m^3/d	Source
Dust suppression	6.0	Sump
Green Belt	3 (additional 0.5 cum of domestic waste)	
Domestic	3(0.5 cum will be reused for green belt)	Ground water from dug wells/tube wells
Total	**12.00**	

No processing is proposed. No water will be disposed and it will be a zero discharge mine.

RAM CHANDRA BANSAL
RQP/DGMMP/53/2013

CHAPTER – VII

7.0 OTHER-

a) **SITE SERVICES** :

1. **Office and stores :-** Office and stores will be provided towards north-west outside the QL area.

2. **First Aid :-** Specified first Aid box will be maintained at the site office and the rest shelter as per Mines Act-1952. The mines manager is the qualified person to render first aid to the injured and will be the holder of a valid first aid certificate.

3. Various site services such as rest shelter, creche, drinking water facilities, Urinals, First Aid and office etc. will be provided as per provisions of Mines Act-1952 and Mines Rule-1955. No labour hutments is proposed because local labour will be employed.

(b) **EMPLOYMENT POTENTIAL:-**

Mining Engineer/Mines Manager	-	1
Geologist	-	1
Mines Foreman	-	1
Mining Mate cum blaster	-	1
Skilled	-	6
Semi Skilled	-	10
Unskilled	-	30

अनुमोदित
APPROVED

RAM CHANDRA BANSAL
RQP/DGMMP/53/2013

CHAPTER – VIII

8.0 PROGRESSIVE MINE CLOSURE PLAN UNDER RULE 42(J) OF M. P. MINOR MINERAL RULES 1996–

8.1 ENVIRONMENT BASE LINE INFORMATION:

(i) Existing land use pattern-

Degradation Type	Forest Land (Hects)	Agriculture Land (Hects)	Grassland (Hects)	Waste land (Hects)	other
Pits /Quarries	-	-	-	0.05	-
Dumps/Stack	-	-	-	Nil	-
Infrastructure inclusive of office	-	-	-	Nil	-
Area occupied by roads	-	-	-	Nil	-
Water bodies like tank /river/nalla	-	-	-	Nil	-
Town ship	-	-	-	Nil	-
Plantation	-	-	-	Nil	-
Processing plant	-	-	-	Nil	-
Others (Hutment etc.)	-	-	-	Nil	-
Workshop	-	-	-	Nil	-
Undisturbed	-	-	-	18.95	-
Total	-	-	-	19.0	-

अनुमोदित
APPROVED

(ii) Water regime – There is no river or any perennial surface water source within the core zone. The general slope of the buffer zone is towards south east and seasonal water courses originating from east moving further towards south-east and merging in Jamnara Nala in SE at 0.75 km. distance. This discharges into Kirtwari nadi situated in south- east.

(iii) Quality of air- The study area represents mostly rural environment. The source of air pollution in the core zone is fugitive dust emission due to excavation, drilling, blasting, loading, unloading and plying of vehicles. The source of air pollution in the buffer zone is domestic fuel burning and plying of vehicles. The ambient air quality is within permissible limits.

Suspended Particulate Matter (PM_{10})

Suspended particulate matter in general terms is the particulate matter in suspension in ambient air. It includes dust, smoke etc. In general some of the important sources of suspended particulate matter are mines. The following sources of suspended particulate matter in the study area are identified:

- Emission due to HEMM & vehicular movement
- Dust generation from ground or other mining operations

The 24 hourly average values of PM_{10} were compared with the National Ambient Air Quality

RAM CHANDRA BANSAL
RQP/DGMMP/[illegible]13

Standards (NAAQS) and found that recorded value is within the applicable limits i.e., 100 µg/m^3 for PM_{10} in rural areas.

Sulphur Dioxide (SO_2)

Sulphur dioxide gas is an inorganic gaseous pollutant. Sulphur dioxide emissions are expected to be emitted wherever combustion of any fuel containing Sulphur takes place. The Sulphur in the fuel will combine with oxygen to form Sulphur dioxide. The following sources of Sulphur dioxide in the study area are identified:

- Emissions from domestic/consumption of fuel (coal, diesel, etc)
- Emissions from DG sets used by mining activity and local residents

Sulphur dioxide in atmosphere is significant because of its toxicity; Sulphur dioxide is capable of producing illness and lung injury. Further it can combine with water in the air to form toxic acid aerosols that can corrode metal surfaces, fabrics and the leaves of plants. Sulphur dioxide is an irritant to the eyes and respiratory system. Excessive exposure to Sulphur dioxide causes bronchial asthma and other breathing related diseases as it affects the lungs.

The 24 hourly average values of SO_2 were compared with the National Ambient Air Quality Standards (NAAQS) and it was found that recorded values are below the applicable limits 80 µg/m^3 for rural areas.

Oxides of Nitrogen (NO_x)

The important sources of oxides of Nitrogen are from utilities and auto exhaust due to vehicular movement in mine lease area. The following sources of oxides of nitrogen in the study area are identified.

- Emissions from field burning of coal.
- Emissions from vehicular movements in the study area.

Oxides of Nitrogen in the presence of sunlight will undergo reactions with a number of organic compounds to produce all the effects associated with photochemical smog. NO_X has inherent ability to produce deleterious effects by themselves like toxicity. It causes asphyxiation when its concentration is great enough to reduce the normal oxygen supply from the air.

The 24 hourly average values of NO_2 were compared with the National Ambient Air Quality Standards (NAAQS) and it was found that all recorded values are below the applicable limits 80 µg/m^3 for rural areas.

Carbon monoxide (CO)

Carbon monoxide (CO) is a colorless, odorless and tasteless gas. It may temporarily accumulate at harmful levels, especially in calm weather during winter and early spring, when fuel combustion reaches a peak and carbon monoxide is chemically most stable due to the low temperatures.

The following source of carbon monoxide in the study area are identified are automobile emissions. Carbon monoxide enters the blood stream by combining with hemoglobin, the substance that carries oxygen to the cells. This combination occurs 200 times more readily with

carbon monoxide than with oxygen, reducing the amount of oxygen distributed throughout the body by the blood stream. Carbon monoxide adversely impacts health in many ways:

- It affects the central nervous system at relatively low concentrations.
- It weakens heart contractions, lowering the volume of blood distributed to various parts of the body.
- It significantly reduces a healthy person's ability to perform manual tasks, such as working, jogging and walking.

The 24 hourly average values of CO were compared with the National Ambient Air Quality Standards (NAAQS) and it was found that recorded value is below the applicable limits 4mg/m^3 for rural areas.

(iv) Ambient noise level- Noise is one of the most undesirable and unwanted by-products of our modern life style. It may not seem as insidious or harmful as air and water pollutants but it affects human health and well-being and can contribute to deterioration of human well-being in general and can cause neurological disturbances and physiological damage to the hearing mechanism in particular. It is therefore, necessary to measure both the quality as well as the quantity of noise in and around the proposed site.

SOURCE OF NOISE

The main sources of noise in the study area are domestic activities, mining activity and vehicular traffic. The main occupation of the villagers in the study area is mining, agriculture and business. There is no industrial activity within 5.0 kms buffer zone.

NOISE LEVEL IN THE STUDY AREA

The values of noise observed in some of the areas are primarily owing to vehicular traffic and other anthropogenic activities. Assessment of noise level within the study area reveals that at all places / activities, the noise levels are less than the 75 dB (A). It is observed that the noise values recorded were well within the prescribed Ambient Air Quality Standards by the MoEF.

(v) Flora – The lease area is forest land and hence amount for compensatory afforestation will be paid during approval under FCA 1980. The core zone is devoid of any vegetation as is stony in nature. There are trees of Salai, Sagwan, Chirol, Mahua, Mango, Babool, Peepal, Bamboo, Kachnar, Palas, Khair, Tendu, Karanj, Gulmohar, Arjun, Sejha & Neem etc. in the buffer zone within 10km radius.

It is proposed to develop green belt in the barrier zone.

(vi) Climatic Condition – Rainfall: The annual average total rainfall recorded in the region was found to be 1295.7 mm.

Temperature: The average maximum temperature was recorded in the month of May at 44.1°C and the minimum average temperature was 5.6°C in January.

Relative Humidity: The maximum Relative Humidity was found during the monsoon season with the month of August recording the highest average at 88%

Wind Speed and Direction: The maximum average wind speed was found to be 7.4 kmph in the month of June.

(vii) Human settlements – There is no human settlement in the core zone. In buffer zone Baidpur, Pathara, Marpura, Shivpura, Varpura, Chandpura and Ramgarh villages are within 5 Km radius.

(viii) Public buildings, places of worship and monuments - There is no public building, places of worship and monuments in the lease area or nearby buffer zone. The P.W.D. road is passing at 0.5 km distance from west of the QL area.

(ix) Indicate any sanctuary is located in the vicinity of leasehold – There is no sanctuary located in the vicinity of leasehold or within 10.0 kms of buffer zone.

8.2 IMPACT ASSESSMENT:

i) Land area indicating the area likely to be degraded due to quarrying, dumping, roads, workshop, processing plant, tailing pond/dam, township etc.

Cumulative land degradation:

Sr. No.	Heads	At present (ha)	At the end of 5 years-(ha.)
1.	Pits (broken area)	0.05	3.5
2.	Dumps/Ore Stack	0	0.90
3.	Road	0	0.05
4.	Green belt	0	2.0
5.	Infrastructure	0	0.01
TOTAL		0.05	6.46

Due to mining there will be changes as under.

Direct changes are in: Land degradation by mining and resultant external dumps which conflicts with land use for agriculture/forestry.

Destruction: Destruction of soil & vegetation, changes in geological structure and relief.

The landscape of this mine will be disturbed by the proposed mining and dumping in the area. The original topography will be characterized by excavated depressions/voids and elevated portions by dumping of OB/Waste. The mining will affect the core zone but would marginally affect the buffer zone or over all view of the area.

अनुमोदित
APPROVED

(ii) Air quality:-

The mining operations contribute towards air pollution in following ways :

Addition of gaseous pollutants to the atmosphere

Emission of particulates

The air borne particulate matter i.e. dust (SPM) will be the major air pollutant. Apart from fine sized solid particles resulting during blasting and surface mining, particulate matter will be carried in the atmosphere due to wind action over mineral and waste dumps. The movement of vehicles and transport of minerals by road will also add to the problem. It is also produced due to transport activities in surrounding area. Air pollution will lead to some respiratory problems to persons living in highly dust prone areas. Plants growth is also affected by dust deposition on leaf. Blasting generates NOx, but will be instantaneous and intermittent. Dumpers will have

RAM CHANDRA BANSAL
RQP/DGMMP/53/2013

negligible impact as the rate of emission of above pollutants in this is very less. Based on the predicted post project concentration of various pollutants, it is inferred that the area is unlikely to be affected significantly due to proposed working.

(iii) Water quality :-

The only source of water is ground water through dug wells and tube wells. There is no adverse effect on water quality since the over burden or ore has no toxic contamination. The water table will not be lowered due to mining above water table. Water available in the village is potable. No pumping of water will be done in any surface body directly. There is no toxic contamination in O.B. or ore.

(iv) Noise level:-

There may be noise pollution due to drilling, blasting, movement of trucks. The noise levels are dependent upon the deployment of mining machinery and heavy-duty vehicles in any mine. Exposures of noise level above thresh hold limit value has a detrimental effect on the health of the workers. The ill effect of high level noise are both psychological & biochemical. Continued exposure may result in annoyance, fatigue, temporary damage to hearing, permanent loss of hearing, hypertension and high blood cholesterol and other adverse biochemical effects. The noise level may exceed the permissible limit due to blasting but will be momentarily.

The anticipated noise level at QL boundary from nearest pit boundary will be less than 75 dB (A), which is less than the prescribed limits for industrial area. There will be no impact on the base line noise level at the nearest village. It is estimated that on the existing road, additional traffic load due to this project will have no impact as the road network is sufficient to transport the mineral. Hence the impact on total traffic load in future will be very less, on the existing road.

(v) Vibration level (due to blasting) :-

Ground vibration may occur due to the blasting operations. The other effects may be fly rocks, Air blast, Noise, dust and fumes. The blasting generates seismic waves in the ground which may cause significant damage to human and property in the area. When an explosive charge is fired in a hole, stress waves propagate radially in all directions and cause the rock particles to oscillate. This oscillation is felt as ground vibration. The ground vibration is measured as the peak particle velocity (PPV). To minimize the effect of blasting, controlled blasting with optimum charge and proper stemming of holes.

अनुमोदित
APPROVED

(vi) Water regime:-

(a) Surface Water :- There is no tank, water reservoir or any nalla in the core zone. There are seasonal water courses and rainwater catchment ponds in the vicinity of the mining area towards north. Hence, impacts on surface water drainage may be envisaged. The waste water generation in the mining process is not envisaged. The possibility of surface water contamination due to wash off of dumps is envisaged.

(b) Ground water :- There is no major ground water body in the core zone. The ground water table in the lease area varies from 40m to 45m. below general ground level. The mining will be done above ground water table. The rain water stored in mine pit will act as artificial ground

RAM CHANDRA BANSAL
RQP/DGMMP/53/2013

water source and full fill the need of use in mining and allied activities. This infers that no adverse impacts is there on the local ground water regime due to mining operations. The water requirement at the site, mainly for sprinkling on haul road will be met by the sump with in the pit. Water for drinking & service utilities will be met by bore well dug by the management.

vii) Acid mine drainage - Acid mine drainage is produced wherever a mine of any type, impermeable formations interacts with the water table , aquifer, perched water body or where surface water finds its way into a mine in terrains where sulphides(Particularly pyrites) are present in the ore or country rock. Among objectionable features of the acid mine drainage are low pit and high levels of sulphides, iron and total dissolved solid. These deplete the oxygen levels in water, increase the toxicity by rendering heavy metals soluble, and create corrosion problems. There is no sulphide in the country rock, hence problems of acid mine drainage is irrelevant in this mine.

viii) Surface subsidence – No underground mining is proposed and hence no surface subsidence is expected.

(ix) Socio-Economic:-

Human settlement - Since there are no villages and human settlement within the core-zone, therefore there would be no displacement of the human population. The traffic intensity will not have any appreciable impact within buffer zone as the activity will be restricted within the core zone. The primary census abstracts regarding population has been given in detail under human settlement. Socio-economic status of the buffer zone is rural with dominant agriculture economy. The area is thinly populated.

Sl. No.	Description	Numbers
Demographic Details within 10 Km radius		
1	Total Male Population	51.42%
2	Total Female Population	48.58%
3	Total SC Population	12.33%
4	Total ST Population	29.77%
5	Total Literate Population	46.41%

Within the nearby buffer zone, tribal population is dominant. The literacy rate is poor and the basic employment is through agricultural labours. Severe un-employment exists and the region is basically backward poor area. Standard of living is very poor. The mining operations substantially increase gross economic production and infrastructure facilities. Therefore, Socio-economic prospects are improve to some extent. Also mining operations result in direct and indirect employment and consequently the population in nearby villages. Thus this project has a positive impact.

Occupational health and safety :-

External hazard involves injuries to human cattle and plants, which could occur during mining operations. These injuries could be due to flying stones during blasting and also when ore transport vehicle lose control, internal hazards occur due to unhygienic work conditions or carelessness of the workers involved in mining operations. Internal hazards often show their affect after a long time. The mining operation is unlikely to cause any adverse impact due to the above factors in buffer zone.

RAM CHANDRA BANSAL
RQP/DGMMP/53/2013

The mine management will provide proper health care facilities near the mine area. This will be provided to the surrounding villages in case of emergencies. All measures to provide a safe environment will be taken by the management. Hence adverse impact on health & safety of the workers and local population is not expected. No accident or injury due to fly rock is expected in the mine or due to this mine.

(x) Historical monuments: - There are no places of worship and monuments in the applied area.

8.3 PROGRESSIVE RECLAMATION PLAN :

8.3.1. Mined-Out Land:

Mining effect environment in various ways including depletion of land cover, vegetation, removal of soil, change of landscape & deposition of the solid waste product thus causing imbalance in the landscape and increasing air, water and soil pollution. Land use in mining areas consists of mainly forestry, pasture and agriculture. No backfilling is proposed during PMCP period.

The mined out land when fully exhausted by virtue of excavation up to full depth of mineralisation will be simultaneously/progressively reclaimed by backfilling of OB & waste generated during the course of mining at conceptual stage. Reclamation will be carried out simultaneously during conceptual stage. The soil to be brought from outside to the thickness of 0.20m will spread at top, leveling will be done and afforestation of native species such as Neem, Gulmohar, Pipal, Karanj, Teak, Shisham and other fuel wood trees will be done.

8.3.2 Topsoil Management : There is no top soil in the QL area.

8.3.3 Tailings Dam Management : No Chemical/wet mineral processing will be carried out in the lease area. Hence no tailing will be created.

8.3.4 Acid mine drainage : There is no sulphide in the country rock, hence problems of acid drainage is irrelevant in this mine.

8.3.5 Surface subsidence : No underground mining is proposed and hence no surface subsidence is expected.

8.4 DISASTER MANAGEMENT AND RISK ASSESSMENT:-

अनुमोदित
APPROVED

Preliminary Risk assessment is based on the philosophy that **"Prevention is better than cure".** Mining operations may be carried to the utmost safety but there is always some element of danger or risk in it. No disaster is envisaged. Only minor accidents may take place. The applied area has gentle slope towards east and west. No perennial source of surface water is present. Blasting in OB & ore body has been proposed. The mining operations will be carried out under supervision of statutory personnel's as per provisions of M.P. Minor Mineral Rules 1996, Mines Rules 1955, Mines Act 1952 & strictly following safety aspects as per MMR 1961 monitored by Directorate General of Mines safety.

The lease area does not come under active seismic zone. Land slide, subsidence is not expected in view of opencast mining. No river is near the applied area and hence flood is not expected. Since opencast mining has been proposed, problems related with underground mines

RAM CHANDRA BANSAL
RQP/DGMMP/53/2013

are not applicable. In case of eventuality, first aid will be given by the competent authority initially to the injured person. The competent person / Mines manager or Mining Engineer will give notice of accident as per Rule-23 of Mines Act-1952.The persons / competent authorities named above will be responsible for co-ordinations between management and District authorities / DGMS etc. Regarding general safety as per Rule-181 of MMR 1961, "No person shall negligently or will fully do anything likely to endanger life or limb in the mine, or negligently or will fully omit to do anything necessary for the safety of the mine or of the persons employed there in". The workers will be provided with protective foot wear and safety helmets.

DISASTER MANAGEMENT CELL:-

In order to avert any danger to the mine site at the end of life of mine a disaster management cell headed by local authority District Collector will be constituted. Police department health authorities, including doctor, ambulances and so on will have a vital part to play following a disaster along with the mine management, and they will be an integral part of the disaster management plan.

8.5 CARE AND MAINTENANCE DURING TEMPORARY DISCONTINUANCE :-

If the mine will be discontinued temporarily for more than 120 days due to court order or due to statutory requirements or any other unforeseen circumstances expected to re-open in near future, notice will be given 30 days before the date of such discontinuance to the concerned authorities. During discontinuance period safety arrangement and fencing will be provided to avoid the entry of unauthorized persons and accessibility to the mine from the surface. The mine will be properly guarded by employing security guards.

8.6 Time scheduling for Reclamation & Rehabilitation:-

The reclamation will start from 10th year & rehabilitation will be started from 11th year onwards.

8.7 Financial Assurance:-

The Financial assurance will be submitted @ Rs. 15,000 per ha of 19.0 ha quarry lease area equal to Rs. 2,85,000/- as required under Rule 42(J)(6)(a) of M.P. Minor Mineral Rule 1996 in form specified under sub rule (6)(b).

अनुमोदित
APPROVED

RAM CHANDRA BANSAL
RQP/DGMMP/53/2013

PART – B

CHAPTER - IX

9.0 CERTIFICATES / UNDERTAKINGS/ CONSENTS

A. CONSENT LETTER/ UNDERTAKING/ CERTIFICATE FROM THE APPLICANT :

(1) The **Mining Plan** in respect of **Machigarh Pyrophyllite and Diaspore Deposit** over an area of **19.0 ha.**, in Comp. No.-262, Forest Block-Machigarh, Range-Jatara, Forest Division & District - **Tikamgarh,** P.O. **Baidpur**, **Madhya Pradesh**, under Rule 42 (A) (1) of M. P. Minor Mineral Rules 1996 has been prepared by **RQP** Ram Chandra Bansal RQP/DGMMP/53/2013. This is to request the Director, Directorate of Geology and Mining, Bhopal, to make any further correspondence regarding any correction of the **Mining Plan** with the said recognized person at their address below :-

Ram Chandra Bansal
C/o Balram Singh Associates Pvt. Ltd.
Chopra Colony, P.O.- Maihar
District : Satna (M.P.) Pin: 485771
e-mail-bsapl.myr@gmail.com

We hereby undertake that all modifications / updating as made in the said **Mining Plan** by the said recognized person be deemed to have been made with our knowledge and consent and shall be acceptable on us and binding in all respects.

(2) It is certified that the Progressive Mine Closure plan of **Machigarh Pyrophyllite and Diaspore Deposit** of **M/s. Khajuraho Minerals Pvt. Ltd.** over an area of **19.0 ha.** complies with all statutory Rules, Regulations, Orders made by the Central or State Government, Statutory organization, Court etc which have been taken into consideration and wherever any specific permission is required the lessee will approach the concerned authorities.

I also give an undertaking to the effect that all the measures proposed in Closure Plan will be implemented in time bound manner as proposed.

The information furnished in the **Progressive Mine Closure plan** is true and correct to the best of our knowledge and records.

(3) "The provisions of **Mines Act, Rules and Regulations** made there under have been observed in the **Mining Plan** over an area of **19.0 ha.** in **Tikamgarh** district in **M.P.** state belonging to **Machigarh Pyrophyllite and Diaspore Deposit** and where specific permissions are required, the applicant will approach the **D.G.M.S.** Further, standards prescribed by **D.G.M.S.** in respect of **miners' health** will be strictly implemented".

अनुमोदित

Place : Chhatarpur
Date : 29.09.2018

Signature of the Owner
M/S. KHAJURAHO MINERALS PVT. LTD.

AJAY PAL SINGH
(Attorney and Director)

CERTIFICATE FROM RQP

The provisions of the **M. P. Minor Mineral Rules 1996** have been observed in the preparation of the Mining Plan for **MACHIGARH PYROPHYLLITE AND DIASPORE DEPOSIT** over an area of **19.0 ha.**, of **M/s. Khajuraho Minerals Pvt. Ltd.,** in Comp. No.-262, Forest Block-Machigarh, Range-Jatara, Forest Division & District - **Tikamgarh,** P.O. **Baidpur**, **Madhya Pradesh** State and whenever specific permissions are required, the applicant will approach the concerned authorities of **DGM**, **State Government of M.P..** The information furnished in the Mining Plan is true and correct to the best of our knowledge.

Date: 29.09.2018

SIGNATURE OF RQP

R. C. Bansal
(Mining Engineer)
RQP/DGMMP/53/2013
M/s Balram Singh Associates Pvt. Ltd.

Annexure – I

Pre Feasibility Report

PRE FEASIBILITY REPORT

OF

MACHIGARH PYROPHYLLITE AND DIASPORE DEPOSIT

M. L. Area - *19.0 ha.*
M. L. Area in Forest if any – *19.0 ha*
Total M. L. Area - *19.0 ha.*

Forest Block – Machigarh
Forest Compartment No. – 262
Forest Range – Jatara
Forest Division – Tikamgarh
State - Madhya Pradesh

For the Mineral - Pyrophyllite & Diaspore

Applicant -
M/s. Khajuraho Minerals Pvt. Ltd.
6th km Sagar Road, Dhadari,
P.O. & District - Chhatarpur (M.P.)
Pin Code - 471001
Phone – 07682 – 248751, 241589
e-mail - khajurahomineral.sales@gmail.com

अनुमोदित
APPROVED

RAM CHANDRA BANSAL
RQP/DGMMP/53/2013

1.0 GEOLOGICAL STUDY REPORT

Sr. No.	Contents	Explanation
1.	Title & Ownership	(a) For Name & Address of lessee, Refer Chapter 2.0(a) of the Mining Plan. (b) The area has been sanctioned under quarry lease for 30 years period. The letter of intent for grant has been issued by the state govt. on 04.07.2018. (c) For details of exploration agency, Refer Part –A, 1.0 (e) of the Mining Plan.
2.	Details of the area	(a) For details of mining lease area, Refer chapter 2.0 (b) & (c) of the Mining Plan.
3.	Infrastructure & Environment	The applied area can be approached from Tikamgarh. The applied area is 25 kms towards Jatara and then 4 kms upto Gumanganj. The nearest railway station is Tikamgarh at a distance of about 25 km. All the basic infrastructure is available at Tikamgarh. No historical place exists within 500 m radius. The EIA/EMP is prepared & the environment clearance has been granted.
4.	Previous exploration	Refer Part –A, 1.0 (e) of the Mining Plan.
5.	Geology	Refer Part –A, 1.0 (b) & (c) of the Mining Plan. Geological Plan & Section has been appended as Plate 5 & 6.
6.	Aerial/Ground Geo physical/ Geo chemical data	No aerial/Ground Geo physical/ Geo chemical study or survey carried out.
7.	Technological investigation	Refer Part –A, 1.0 (e) of the Mining Plan. Only drilling carried out. The area is explored under G2 stage.
8.	Location of data points.	The survey was carried out by total-station.
9.	Sampling technique	Chip sampling from bore hole was carried out.
10.	Drilling technique and drill sampling employed.	DTH drilling was carried out. Vertical bore hole was drilled.
11.	Sub-sampling techniques and sample preparation.	Adequate measures were taken to ensure that sample is representative. The chip-sample was sampled.
12.	Quality of assay data and laboratory tests.	The chemical testing was done by a Govt recognized lab.
13.	Moisture	The tonnage was estimated on a dry basis.
14.	Bulk density	The bulk density has been assumed based on the results found a past.
15.	Resource estimation	The area is explored by drilling. There is sufficient data to

अनुमोदित
APPROVED

RAM CHANDRA BANSAL
RQP/DGMMP/53/2013

	technique	infer the resource. The Pyrophyllite & Diaspore is occurring upto 30 m BGL. The resource has been estimated by surface area method. The mineral resource has been classified under G2 stage. The recovery of saleable ore is 60%.
16.	Further work	No exploration is proposed.
17.	Annexure/ Enclosures to the report	The geological plan & section has been enclosed along with analysis report and photographs of the pit in the QL area.
18.	Any other Information	Nil.

(A) EXPLORATION - Pitting/Trenching/Drilling:- Up to date surface geological plan has been appended as plate-5 showing ultimate pit limit, exploration already carried out.

The details of exploration already carried out including the evidence of mineral existence have been shown on Geological plan and Section plate-5 & 6.

ii) Number of boreholes indicating type (Core/RC/DTH), diameter, spacing, inclination, Collar level, depth etc with standard borehole logs duly marking on geological plan/sections.

Two bore hole has been given in the applied area as per the permission given by the forest department. The lithology and details of exploration carried out are given below.

Bore hole No.	Location	Depth (m)	Collar level	Inclination	O.B.	Pyrophyllite/ Diaspore (m)
BH-1	N 2759286, E 293805	30m	319.10	Vertical	-	0.0 – 30.0 – Pyrophyllite /Diaspore
BH-2	N 2758917, E 293645	30m	310.15	Vertical	0-0.5	0.5 – 30.0 – Pyrophyllite/ Diaspore

The percentage recovery on average was 45% of Pyrophyllite and 15% of Diaspore.

अनुमोदित
APPROVED

(B) ENVIRONMENTAL FACTORS-

(i) EIA & EMP, Mine Closure and reclamation plan, sustainable development strategy etc.- The EIA EMP has been prepared. The progressive mine closure has been planned.

Backfilling of voids –

At lease period end – Reclamation will be carried out after mineable depth is reached and established during conceptual stage. The present envisaged depth of mining is 30m BGL. About 13.50 ha area will be reclaimed during the conceptual period. The height of the backfilling will be around 10-15m following the topography of the bench. The soil to be brought from outside upto the thickness of 0.20m will spread at top, leveling will be done and rehabilitation by afforestation of native species such as Neem, Teak, Shisham, Karanj, Khamer, Mahua, Teak and Pipal etc. in consultation with the forest department will be carried out. Conceptual rehabilitation by plantation will be carried out in 13.50 ha. area. About 13500 number of trees will be planted in reclaimed area during conceptual period.

RAM CHANDRA BANSAL
RQP/DGMMP/53/2013

Conceptual land use –

QL area (ha.)	Mineable Area (ha.)	Green belt (ha.)	Rehabilitation (ha.)	Total Rehabilitation (ha.)
			Plantation on BF area	
19.0	13.50	5.50	Conceptual rehabilitation of the 13.50 ha reclaimed area will be done by way of growing native species in consultation with the forest department.	13.50

2.0 CONTENTS OF PRE FEASIBILITY REPORT

(1) Mineral resource estimate for conversion to mineral reserve.

The mineral reserve has been converted from resource based on the statutory provisions of Rule 111 of MMR 1961 and slope stability. The whole mineral within mineable area leaving statutory barrier/restricted area will be mined out. The mineral resource is inclusive of the mineral reserve. Feasibility level of study was under taken to enable mineral resource to be converted to mineral reserve.

RESERVE ASSESSMENT -

(a) Categorisation of total mineral resources and mineral reserve:-

The total mineral resources have been put under 332 category while the mineral reserve has been put under 122 category as per the UNF classification. The lease area is explored by way of drilling within QL area. The mineralisation has been proved by way of drilling and a old pit. Hence the reserve/resource has been put under G2 level.

अनुमोदित
APPROVED

i) Economic Axis:-

E-1 - (i) Detailed exploration laterally as well as in depth by way of drilling.

(ii) Mining report/Mining Plan prepared under Rule 42 of MPMMR 1996.

(iii) Specific end use grade of reserve established. The reserves of Pyrophyllite in the lease area are of modern refractory, pesticides, rubber, paint, cosmetics, soap, detergents and handicraft industries. Diaspore is used for manufacture of high alumina bricks to curtail the imports. Ceramic being the basic ancillary to the steel industry.

(iv) Specific knowledge of forest and other land use data available. The lease area is forest land.

ii) Feasible Axis: - Pre Feasibility study carried out

F-2 - 1. Geology: Local geology, Mineralogy and Geometry of the Pyrophyllite deposit in the lease area established during propspecting operations. The identification of the ore body carried out and Pyrophyllite and diaspore was found to occur in the lease area.

2. Mining: The mine will be worked by semi mechanised method. Pre production & development plan prepared and appended. The estimate of man power has been carried out.

3. Environment : Base line data on environment such as AAQ data, soil analysis, surface & ground water sampling, noise level data and land use data etc. will be generated.

RAM CHANDRA BANSAL
RQP/DGMMP/53/2013

4. Processing: No processing is proposed.

5. Infrastructure: Infrastructure & services - Site services such as rest shelter, first aid room, drinking water facilities etc. will be provided in compliance of Mines Act 1952 and Mines Rules 1955.

6. Costing: Capital cost and operating cost has been evaluated based on comparable mining operations.

7. Marketing: The Pyrophyllite of the lease area is of Refractory, insecticide, pesticide, Ceramic, Soap, detergent, rubber, paint, cosmetics and handicraft industries. Diaspore is used for manufacture of high alumina bricks to curtail the imports. Ceramic being the basic ancillary to the steel industry

8. Economic Viability: The mine is economically viable.

9. Other factors: Statutory provisions relating to labour, mining and taxation etc. will be taken in to account during the course of mining.

iii) Geological Axis:-

G-2 - 1. (i) Geological survey: Mapping on a scale of 1:1000 with triangulation points & bench marks carried out and shown in surface geological plan. Prospecting has been done and the nature of deposition of ore has been shown on geological plan & section.

(ii) Linking of map with topo grid carried out and latitude and longitude of the corner points taken.

(iii) Assessment of lithology carried out based on the exposures in the pit, structure and surface mineralisation studied and mapped during the course of mining and given in the Mining Plan.

अनुमोदित
APPROVED

(iv) The Pyrophyllite of the lease area is of Refractory, insecticide, pesticide, Ceramic, Soap, detergent, rubber, paint, cosmetics and handicraft industries. Diaspore is used for manufacture of high alumina bricks to curtail the imports.

2. Geochemical survey: Detailed sampling of the quarry face. Chemical analysis report appended as Annexure.

3. Geophysical survey: Geophysical survey carried out. Pyrophyllite and Diaspore was found to occur in the lease area.

4. Technological: Drilling carried out through the lease area. 200m influence has been taken of bore hole. Pyrophyllite and Diaspore has been proved up to 30m BGL in bore holes and up to 30m in old pit, hence reserve up to 18m average depth has been taken under G2 axis.

(b) Method of estimation of mineral resource & reserves:-

The total mineral resources have been calculated by surface area method. In this method the surface mineralised area is multiplied by the average thickness of the ore body to give the volume. This in turn has been multiplied by the incidence and bulk density to find out the tonnage. The mineral reserve thereafter has been calculated by depleting remaining resources from total mineral resources.

RAM CHANDRA BANSAL
RQP/DGMMP/53/2013

Mineral Resources:-

Indicated Mineral Resource (332)

Surface mineralised area		=	90,000 M2
Average thickness of ore body		=	30m
Recovery factor,	Pyrophyllite	=	45 %
	Diaspore	=	15%
Bulk Density,	Pyrophyllite	=	3.0
	Diaspore	=	3.5

Mineral Resource = Surface mineralised area x average thickness of ore body x Incidence x B.D.

Pyrophyllite	=	90,000 sqm x 30m x 0.45 x 3.0	=	36,45,000 t.
Diaspore	=	90,000 sqm x 30m x 0.15 x 3.5	=	14,17,500 t.

Mineral reserve and Remaining Resources:-

Mineral reserve = Total mineral resource - Remaining resources

Remaining Resources (Pre Feasibility Mineral Resource - 222)

The following are the Pre Feasibility Mineral Resource under UNFC classification 222 after deduction of all statutory barriers as per MMR 1961 and other applicable rules.

Deduction = Length x Width x Av. Thickness x % recovery x B.D. Deduction

Deduction	Pyrophyllite	Diaspore
Due to 7.5 m barrier as per MMR 1961	700m x 7.5m x 30m x 0.45 x 3 = 212625 t.	700m x 7.5m x 30m x 0.15 x 3.5 = 82688 t.
Due to Slope stability	670m x 30m x 30m x 0.45 x 3 = 814050 t.	670m x 30m x 30m x 0.15 x 3.5 = 316575 t.
Pre Feasibility Mineral Resource (222)	1026675 t.	399263 t.

अनुमोदित
APPROVED

Mineral reserve and Remaining Resources:-

Mineral reserve = Total mineral resource - Remaining resources

Mineral reserve and Remaining Resources	Pyrophyllite	Diaspore
Indicated Mineral Resource (332)	36,45,000 t.	14,17,500 t.
Pre Feasibility Mineral Resource (222)	1026675 t.	399263 t.
Probable Mineral reserve (122)	3645000 t. – 1026675 t. = 26,18,325 t.	1417500 t. – 399263 t. = 1018237 t.

The resources and Reserves within the lease has been arrived based on the results of the feasibility study and economic evaluation of deposit and based on various factors such as:

a) Mining method, Recovery factor, mining losses, processing loss etc.

b) Cut off grade, Ultimate pit depth proposed.

c) Mineral/ ore blocked dues to benches and 7.5m barrier.

RAM CHANDRA BANSAL
RQP/DGMMP/53/2013

Level of Exploration	Resources in tonne of Pyrophyllite	Resources in tonne of Diaspore
G1 - Detailed exploration	Nil	Nil
G2 - General Exploration	36,45,000 t.	14,17,500 t.
G3 – Prospecting	Nil	Nil
G4- Reconnaissance	Nil	Nil

UPDATED MINERAL RESERVE AS PER UNFC CLASSIFICATION:-

	UNFC Code	Pyrophyllite in tonne	Diaspore in tonne	Grade
A. Total Mineral Reserve				The Pyrophyllite of the applied area is of mainly handicraft, Detergent, Soap, Pesticide & ceramic grade. The Diaspore is of Refractory grade.
Probable Mineral Reserve	122	26,18,325	10,18,237	
B. Total Remaining Resources				
Pre Feasibility mineral Resource	222	1026675	399263	

(2) **Cut off Parameters –** The cut off has been taken as Alumina –28% (Min) and Silica – 50% (Max.) for Pyrophylllite and Alumina 40% (Min) for Diaspore.

(3) **Mining factors or assumptions –** The method and assumptions used to convert the mineral resource to a mineral reserve is by detailed design supported with conceptual plan for mining. The anticipated ore to OB ratio is 1: 1.07. The recovery is 60% within ore zone taking into consideration the dilution factor. The mining will be done by open cast semi mechanised method. HEMM will be deployed for removal & loading of OB and transport of OB and ore. For winning of ore, excavator cum loader will be deployed. Other details including design parameter of mining has been given in Part –A, Chapter 2.0 of the Mining Plan.

Bench dimension (W x H) – 6.0m x 6.0 m in OB and in ore body.

Slope angle - 45^0

अनुमोदित
APPROVED

Drilling - Drilling will be done as per parameters given below.

Spacing	2.40-2.50m	1.0m
Burden	2.0-2.20 m	0.80m
Depth of hole	2.80-2.90 m	1.5m
Dia of hole	80mm	33 mm

(4) **Metallurgical factor or assumptions –** No metallurgical process or test is proposed in view of very small area and Pyrophyllite having potential market of the grade found in the QL area.

Crushing/Manual dressing, Sorting, Sizing & Washing - Sizing of ore will be done by manual means.

RAM CHANDRA BANSAL
RQP/DGMMP/53/2013

(5) **Cost and revenue factors** – The projected capital and operating cost is as under –

Capital Investment	
Area of investment	**Expenses (in Million Rs.)**
i Land (NPV, CA)	**35.00**
ii. Mining	**10.00**
iii. Environmental Protection	**0.050**
iv. Occupational Health & Safety	**0.050**
Total Capital Investment	**45.10**

Operating/ Recurring Cost

	Area of investment	Cost per ton (in Rs.)
a	Exploration	**1.0 /-**
b	Interest & Depreciation	**50.00/-**
c	Taxes & Rent	**25.00 /-**
d	Mining Expenses	**250.00 /-**
e	Royalty on Mineral	**150.00 /-**
f	Over head	**20.00 /-**
g	Miscellaneous Exp	**5.00 /-**
ii	**Socioeconomic Development**	**6.00 /-**
iii	**Occupational Health and Safety**	**2.00 /-**
iv	**Environment Management**	**10.00/-**
	Total Recurring Expenditure	**519 /-**

(6) **Market assessment** – The demand supply relation is adequate for supply. The project is economically viable based on preliminary study of cash flow forecast. The operating cost is 519 /- PMT and the PMV is 750/- PMT. Hence the margin of profit will be around 25%.

(7) **Other modifying factors** – No other modifying factor are expected. The QL area is granted for 30 years period. The Environment Clearance will be taken after approval of mining plan.

(8) **Classification** – The mineral reserve has been classified under G2 stage of confidence level based on the structural disposition, lithological exposures, local geology and past experience of mining.

CONCLUSION

Based on the feasibility study carried out, the project is considered to be viable.

अनुमोदित
APPROVED

RAM CHANDRA BANSAL
RQP/DGMMP/53/2013

PREDOMINANT WIND DIRECTION

KEY PLAN

PLATE-1

TOPOSHEET NO.- 54 L/13
SCALE- 1:50000

MACHIGARH DIASPORE / PYROPHYLLITE DEPOSIT
AREA:- 19.00 HECTS.
M/S KHAJURAHO MINERALS PVT. LTD.

LEASE AREA :-

Prepared By:-

Certified to be correct & up to date

अनुमोदित
APPROVED

R. C. BANSAL
RQP / DGMMP / 53 / 2013
BALRAM SINGH ASSOCIATES PVT. LTD.

PRODUCED BY AN AUTODESK EDUCATIONAL PRODUCT

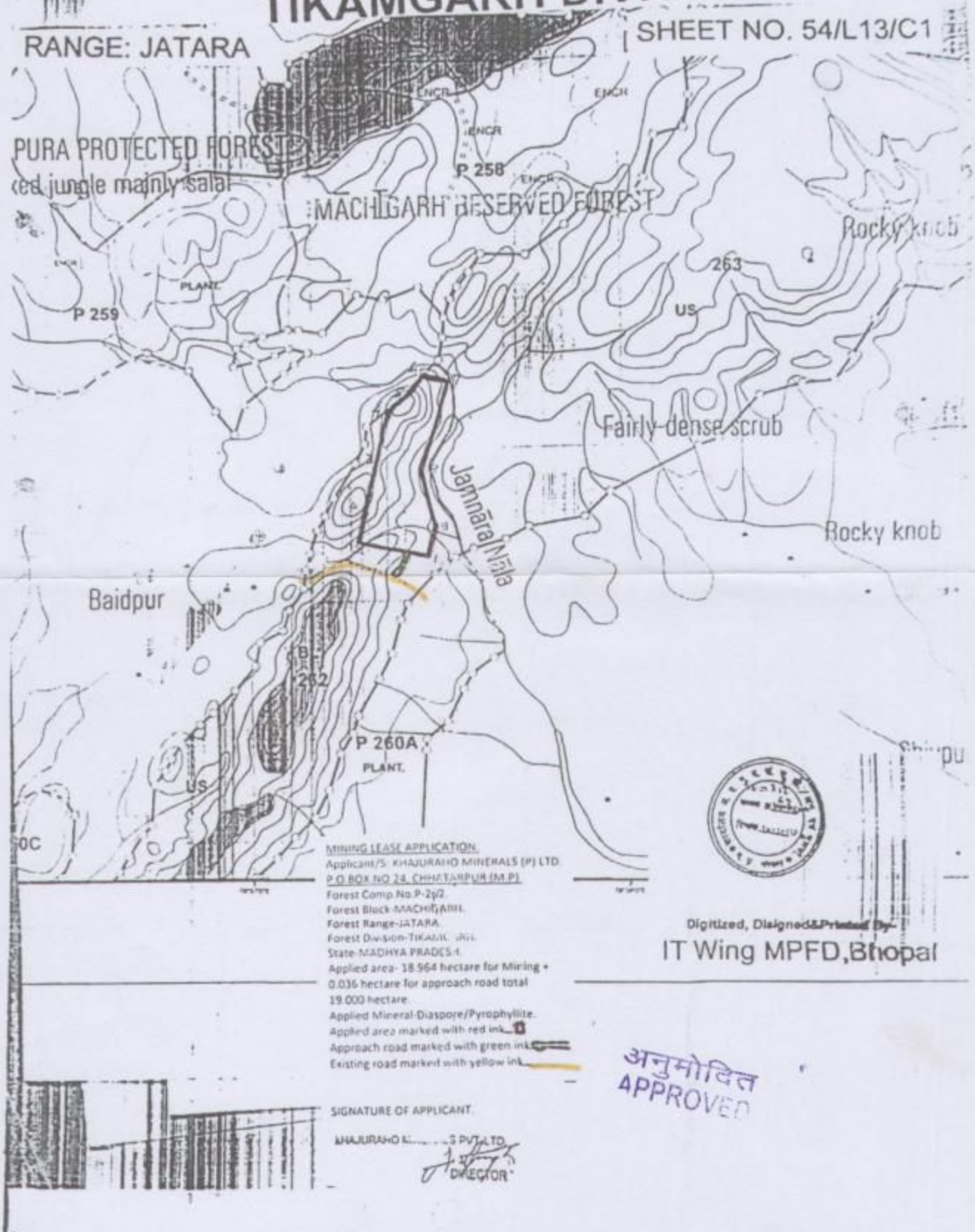
PRODUCED BY AN AUTODESK EDUCATIONAL PRODUCT

PLATE-2

MADHYA PRADESH FOREST DEPARTMENT
TIKAMGARH DIVISION

RANGE: JATARA

SHEET NO. 54/L13/C1



MINING LEASE APPLICATION.
Applicant/S- KHAJURAHO MINERALS (P) LTD.
P.O.BOX NO 24, CHHATARPUR (M.P.)
Forest Comp.No.P-2g/2.
Forest Block-MACHIGARH.
Forest Range-JATARA.
Forest Division-TIKAMGARH.
State-MADHYA PRADESH.
Applied area- 18.964 hectare for Mining + 0.036 hectare for approach road total 19.000 hectare.
Applied Mineral-Diaspore/Pyrophyllite.
Applied area marked with red ink.
Approach road marked with green ink.
Existing road marked with yellow ink.

Digitized, Designed & Printed By-
IT Wing MPFD,Bhopal

अनुमोदित
APPROVED

SIGNATURE OF APPLICANT.

KHAJURAHO M[illegible] PVT. LTD.
DIRECTOR

PLATE - 3

LOCATION MAP

MACHIGARH PYROPHYLLITE & DIASPORE DEPOSIT

AREA : - 19.0 Ha.

M/s. Khajuraho Minerals Pvt. Ltd.

QL Area- ●

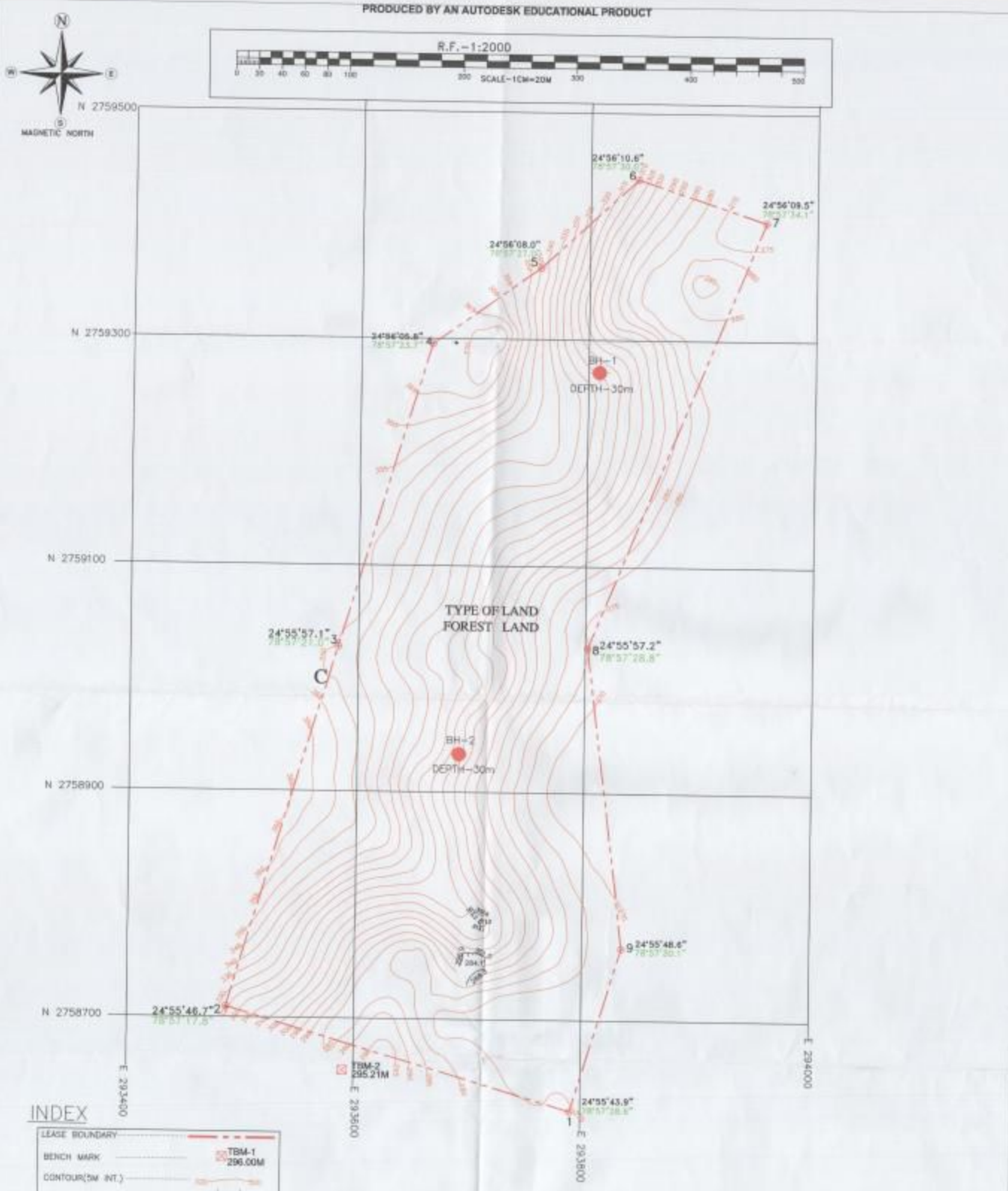
Prepared by :-

अनुमोदित
APPROVED

R.C.Bansal

RQP/DGMMP/53/2013

Balram Singh Associates Pvt. Ltd



INDEX

- LEASE BOUNDARY
- BENCH MARK — TBM-1 296.00M
- CONTOUR(5M INT.)
- GRID
- BORE HOLE — BH-1
- OLD PIT
- NATIONAL CO-ORDINATE — 24°55'43.9" 78°57'28.6"

PLATE -4

SURFACE PLAN

MACHIGARH DIASPORE / PYROPHYLLITE DEPOSIT
AREA:-19.00 HECTS)
M/S KHAJURAHO MINERALS PVT.LTD.

Certified that "The plans and sections are prepared based on the lease map authenticated by state government" and is correct & upto date.

APPROVED

Surveyed by :-

Prepared By:-

R.C. BANSAL
RQP/DGMMP/53/2015
BALRAM SINGH ASSOCIATES PVT. LTD.

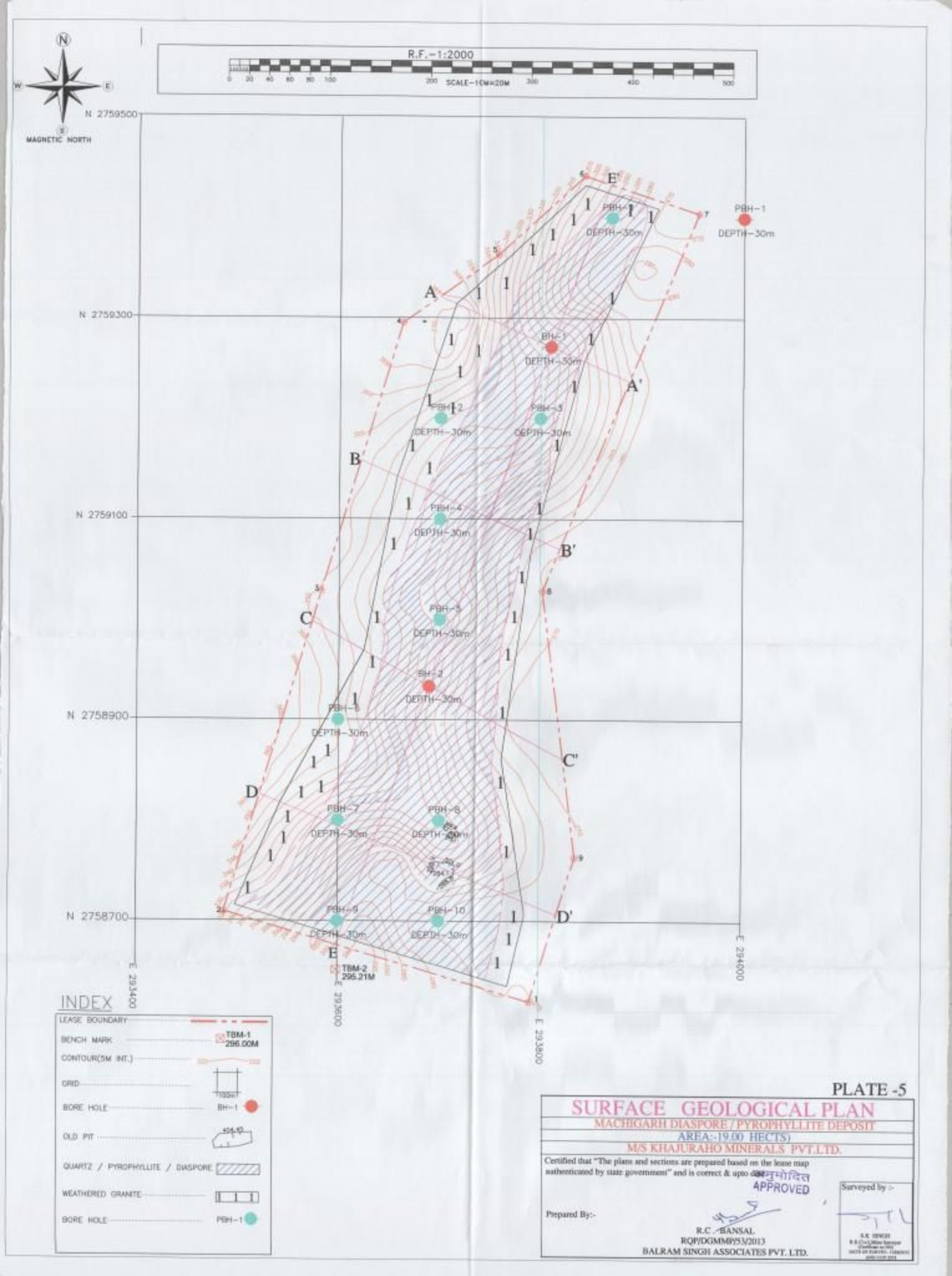


PLATE -5

SURFACE GEOLOGICAL PLAN

MACHIGARH DIASPORE / PYROPHYLLITE DEPOSIT

AREA:-19.00 HECTS)

M/S KHAJURAHO MINERALS PVT.LTD.

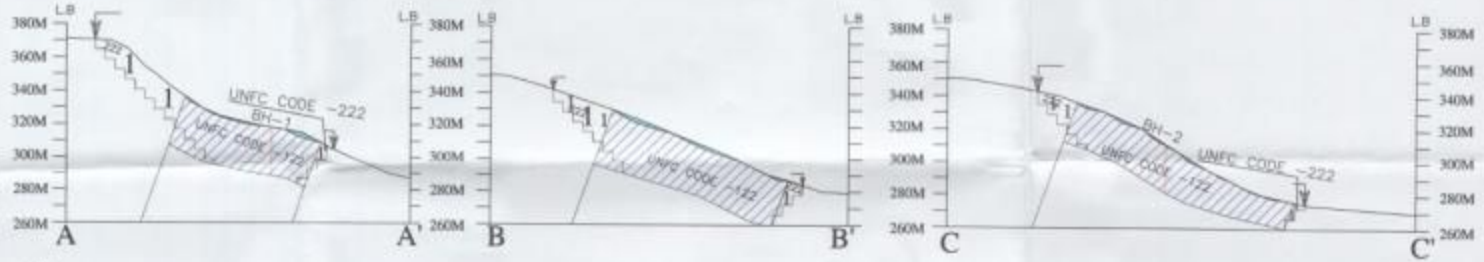
Certified that "The plans and sections are prepared based on the lease map authenticated by state government" and is correct & upto date

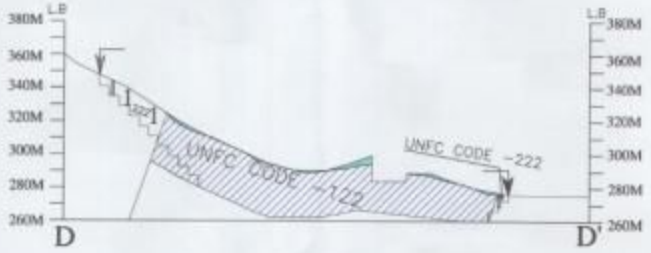
अनुमोदित
APPROVED

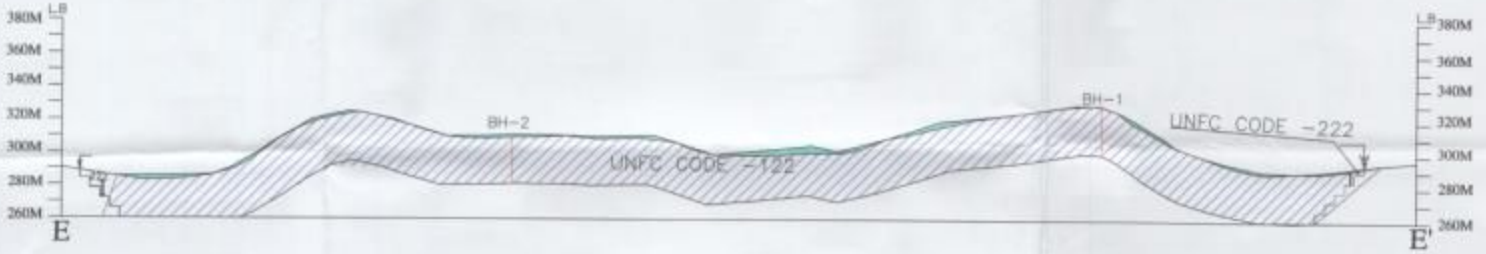
Prepared By:-

R.C. BANSAL
RQP/DGMMP/53/2013
BALRAM SINGH ASSOCIATES PVT. LTD.

Surveyed by :-







INDEX

LEASE BOUNDARY	LB
BORE HOLE	BH
PIT LIMIT	
QUARTZ PYROPHYLLITE / DIASPORE	
WEATHERED GRANITE	

PLATE -6

SURFACE GEOLOGICAL SECTION

MACHIGARH DIASPORE / PYROPHYLLITE DEPOSIT
AREA:-19.00 HECTS)
M/S KHAJURAHO MINERALS PVT.LTD.

Certified that "The plans and sections are prepared based on the lease map authenticated by state government" and is correct & upto date.

अनुमोदित
APPROVED

Prepared By:-

R.C. BANSAL
RQP/DCIMMP/53/2013
BALRAM SINGH ASSOCIATES PVT. LTD.

INDEX

- LEASE BOUNDARY
- BENCH MARK — TBM-1 296.00M
- CONTOUR(5M INT.)
- GRID
- BORE HOLE — BH-1
- OLD PIT
- QUARTZ PYROPHYLLITE / DIASPORE
- WEATHERED GRANITE
- 1st YEAR
- 2nd YEAR
- 3rd YEAR
- 4th YEAR
- 5th YEAR

PLATE -7

5 YEAR DEVELOPMENT PLAN & SECTION

MACHIGARH DIASPORE / PYROPHYLLITE DEPOSIT
AREA:-19.00 HECTS)
M/S KHAJURAHO MINERALS PVT.LTD.

Certified that "The plans and sections are prepared based on the lease map authenticated by state government" and is correct & upto date.

APPROVED

Director
Geology & Mining
Madhya Pradesh

Prepared By:-

R.C. BANSAL
RQP/GOMMP/53/2013
BALRAM SINGH ASSOCIATES PVT. LTD.

PRODUCED BY AN AUTODESK EDUCATIONAL PRODUCT

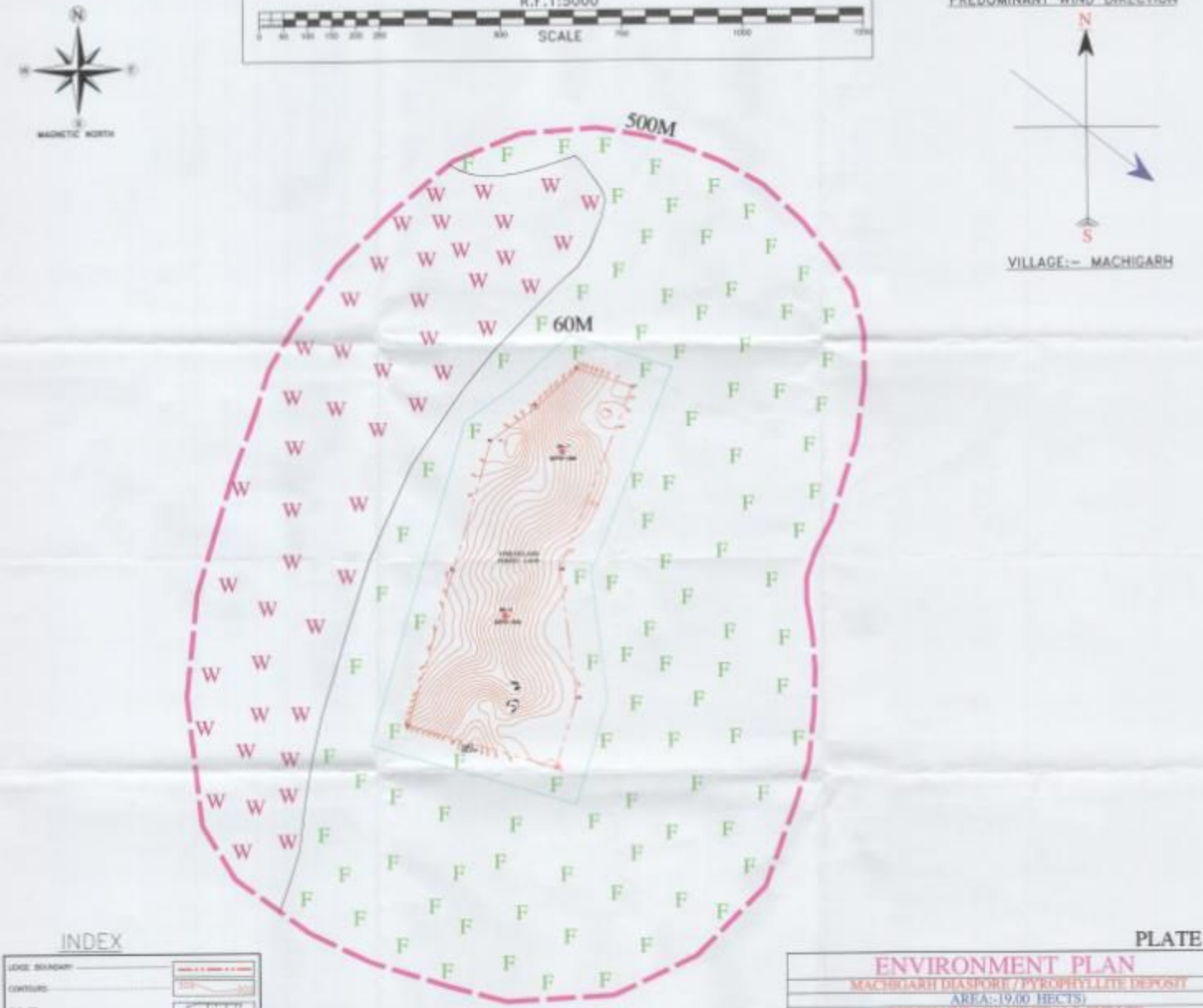


PLATE -8

ENVIRONMENT PLAN

MACHIGARH DIASPORE / PYROPHYLLITE DEPOSIT

AREA:-19.00 HECTS)

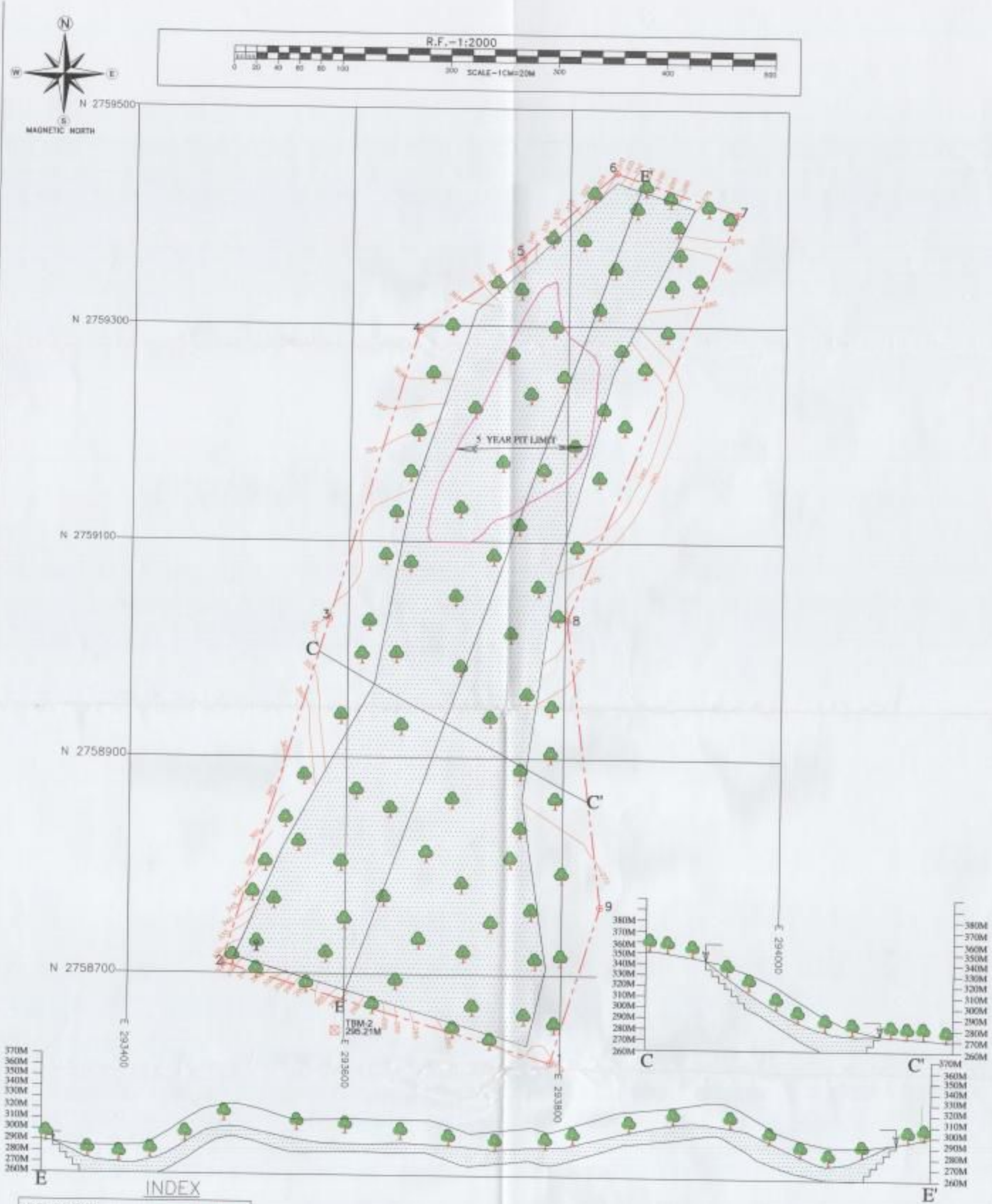
M/S KHAJURAHO MINERALS PVT.LTD.

Certified that "The plans and sections are prepared based on the lease map authenticated by state government" and is correct & upto date.

APPROVED

Prepared By:-

R.C. BANSAL
RQP/DGM(MP)/53/2013
BALRAM SINGH ASSOCIATES PVT. LTD.



INDEX

- LEASE BOUNDARY
- BENCH MARK — TBM-1 296.00M
- CONTOUR(5M INT.)
- GRID — T10SW
- BACKFILLING
- PLANTATION
- 5 YEAR PIT LIMIT

PLATE -9

CONCEPTUAL PLAN & SECTION

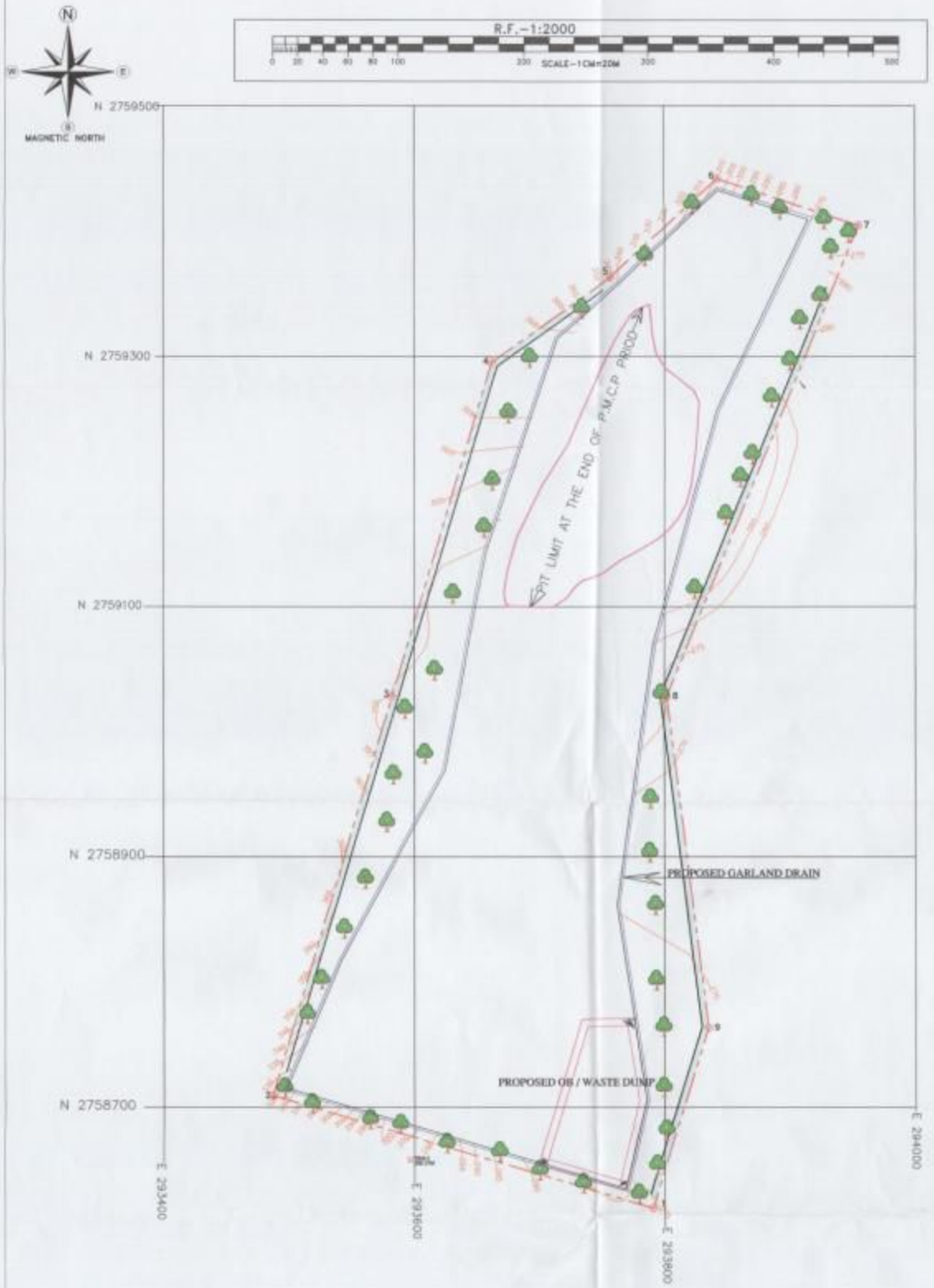
MACHIGARH DIASPORE / PYROPHYLLITE DEPOSIT
AREA:-(19.00 HECTS)
M/S KHAJURAHO MINERALS PVT.LTD.

Certified that "The plans and sections are prepared based on the lease map authenticated by state government" and is correct & upto date.

अनुमोदित
APPROVED

Prepared By:-

R.C. BANSAL
RQP/DGMMP/53/2013
BALRAM SINGH ASSOCIATES PVT. LTD.



INDEX

- LEASE BOUNDARY
- BENCH MARK — TBM-1 296.00M
- CONTOUR(5M INT.)
- GRID
- BACKFILLING
- PLANTATION
- 5 YEAR PIT LIMIT

PLATE - 10

PROGRESSIVE MINE CLOSURE PLAN

MACHIGARH DIASPORE / PYROPHYLLITE DEPOSIT
AREA:-19.00 HECTS
M/S KHAJURAHO MINERALS PVT.LTD.

Certified that "The plans and sections are prepared based on the lease map authenticated by state government" and is correct & upto date.

APPROVED

Prepared By:-

R.C. BANSAL
RQP/DGMMP/53/2013
BALRAM SINGH ASSOCIATES PVT. LTD.