(IBM Reg. No. IBM/8287/2011) CATEGORY "A" MINE: OPEN CAST

REVIEW AND UPDATION OF MINING PLAN AND PROGRESSIVE MINE CLOSURE PLAN

(Submitted under Rule 17(1) of Minerals (other than atomic and hydrocarbons energy Minerals) concession rule 2016) & RULE 23 OF MCDR 2017

For

Gunas Nar Bajarnar Limestone Mine (44 HECTARES)

Khasra No's 3973/3002/1

VILLAGE: Wuyan TEHSIL: PAMPORE

DISTRICT: PULWAMA STATE: JAMMU AND KASHMIR

TOTAL LEASE AREA: 44Hectares. (NON-FOREST)(Govt. Land) (Govt. land) Stony topography

LEASE PERIOD FROM 22-09-1998 TO 21/09/2028.

Upto 21-09-2048 (As per Amended MMDR Act' 2015) Section 8, new section 8A, sub section 3 (under process).

PERIOD OF PROPOSAL FROM JANUARY 2019 TO 2022-23.

Date of approval

LESSEE: Mushtaq Ahmad Trumboo. Residence: (Former) Barzulla Srinagar, Present: Guptganga Ishbar Nishat Srinagar 190004.

C/O: Javadian Building 156-C Near post office Rajbagh Srinagar (J & K) 190008

PHONE NO. 01942312057, 09906694124.

E-mail- Trumboo@hotmail.com

Prepared By:

G.N. CHOWDRY (M.Sc GEOLOGY)

FORMERLY DY. DIRECTOR GEOLOGY AND MINING DEPT. J&K GOVT.

Cell No.:- 09419086373, e-mail-gnchowdry@yahoo.com

17-Iqbal Colony, Chanapora, Srinagar (J & K)

यह खनन योजना / स्कीम अनुमोदित पत्र सं. (14(2) MP-B-178/2018-Ddm/ Date - 8/2/19 की शर्तों / उपबंधों के अनुसार अनुमोदित की गई है।

उप खान नियंत्रक
Deputy Controller of Mines
भारतीय खान ब्यूरो
Indian Bureau of Mines

CONTENT

LIST OF PLATES

S.No.	List of Plates	Plate No.
1	Location Plan	1
2	Key Plan	2
3	Surface Plan	3
4	Geological Plan	4
5	Geological Section & Composite 5 year plan	5,5A & 5C
6	Pit Position & section at the end of I Year	6
7	Pit Position & section at the end of II Year	7
8	Pit Position & section at the end of III Year	8
9	Pit Position & section at the end of IV Year	9
10	Pit Position & section at the end of V Year	10
11	Environment Plan	11
12	Conceptual Plan	12
13	Reclamation Plan	13
14	Financial Area Assurance Plan	14

LIST OF ANNEXURE

S.No.	Title	Annexure No.
1	Copy of Lease Grant Order	1A
2	Copy of Lease Deed	1B
3	Copy of Intikhab Girdawari & NOC from tehsildar	2,2A,2B.
4	English translation of Jamabandi	2C
5	Copy of approval of scheme of mining of 2016	3A
6	Chemical Analysis of samples from NABL LAB	4
7	Chemical analysis of lowgrade bore holes	5
8	Copy of letter requesting extension of lease	6
9	Air quality report	7
10	Water quality report	8
11	Noise quality report	9
12	Feasibility Report	10
13	Bank Guarantee	11
14	Photo identity of lessee	12
15	Gunas Nar Bajnar limestone mine kml file	13
16	Photographs of the lease area	14
17	CSR Expenditure	15
18	Authenticated Geo referenced coordinates of state Govt.	16
19	Undertaking for authenticay of CD	17

A. CONSENT LETTER/UNDERTAKING /CERTIFICATE FROM THE APPLICANT

01. The Review and Updation of Mining Plan/Progressive Mine Closure Plan in respect of (Gunas nar Bajnar limestone Mine) over an area of (44.00 hectare), in (Gunas nar Bajanar wuyan), P.O (Pampora) District (Pulwama), (J&K) under rule 17 (1) of MCR 2016 & 23B of MCDR 1988 has been prepared by G.N Chowdry.
This is to request the Regional Controller of Mines, Indian Bureau of Mines , Dehradun, to make any further correspondence regarding any correction of the Review And Updation of Mining Plan/Progressive Mine Closure Plan with the said recognized person at his address below:-

(G.N. Chowdry)
M.SC. GEOLOGY
17- Iqbal Colony ,Chanapora , Srinagar (J&K)
Phone No.9596205752,9419086373,9149604929

We hereby undertake that all modifications /updating as made in this said review and Updation Of Mining Plan / Progressive Mine Closure 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.

02. It is certified that the CCOM Circular No -2/2010 will be and complied with when an authorized agency is approved by the state govt.
03. It is certified that the Progressive Mine Closure Plan of (Gunas nar Bajnar limestone Mine) Mine of (Mr. Mushtaq Ahmad Trumboo) over an area of (44.00 hectares) complies with all statutory rules, Regulations, Orders Made By the Central or State Govt.,Statutory Organtisation, Court etc.which have been taken into consideration and wherever any specific permission is required the lessee will approach the concerned authorities

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

04. "The provisions of Mines Act , Rules and Regulations made there under have been observed in The Review And Updation Of Mining Plan / Progressive Mine closure plan over an area of 44.00 hectares in pulwama district in J&K state belonging to (Gunas nar Bajanar limestone Mine)_ of Mr.Mushtaq Ahmad Trumboo , and where specific permissions are required , the applicant will approach D.G.M.S. Further , standards prescribed by D.G.M.S. in respect of Miners health will be strictly implemented"

Dated :- 17/10/2018

Mr. Mushtaq Ahmad Trumboo

Lessee

CERTIFICATE

The provisions of Mineral Conservation & Development Rules 2017 have been observed for preparation of Review and up-dation of Mining Plan and Progressive Mine closure plan for, ***Gunas Nar Bajarnar Wuyan Limestone Mine,*** *over an area of 44 hectares of Mushtaq Ahmad Trumboo. In village* ***Wuyan,*** Post-Office ***Wuyan,*** District ***Pulwama, Jammu & Kashmir,*** under *Rule 17(1) of Minerals (other than atomic and hydrocarbons energy minerals) concession rule 2016 and 23 of MCDR 2017* has been prepared by me and whenever specific permissions are required the lessee will approach the concerned authorities of IBM.

The information furnished in the above plan is true and correct to the best of my knowledge.

Place: Srinagar

Dated: 04-01-2019

G.N. Chowdry
M.Sc GEOLOGY
17, Iqbal Colony, Chanapora,
Srinagar (J & K).

No topsoil shall be generated incidental to mining of benches, if any inter-burden soil is generated, that will be stacked separately but not in near future or during this plan period. The retaining wall will be made along the periphery of stacks. The stacks will be temporary in nature and soil will be spread over for the purpose of plantation.

iv). **Proper training on the use of equipment's:**

Proper training on use of compressor and Jack hammer shall be imparted to operators.

v). **Development of Green belt:**

The green belt development program will help in:

- Prevention of dust (leaves acting as a sink) and screening noise.
- Maintaining ecological balance.
- Increasing aesthetic value. Plantation will be under taken towards the southwestern flank, earmarked as green belt covering an area of 0.4124 hectares where by 3770 trees shall be planted on the year wise basis.

4.1 **Care and maintenance during temporary discontinuance:**

An emergency plan for the situation of temporary discontinuance due to court order or due to statutory requirements or any other unforeseen circumstances may indicate measures of care, maintenance and monitoring of status of discontinued mining operations expected to re-open in near future.

At the time of temporary discontinuance of mine notice (as per rule 24 of MCDR, 1988 & Reg. 6 of MMR 1961) shall be sent to IBM and Mines Safety authorities. Notice shall be accompanied as per rule 24 of MCDR, 1988, vide Form No. D-1. All the precautionary steps shall be taken into account in the respect of care & maintenance.

In the event of temporary discontinuance of mining operations or incomplete program due to a Court order or due to statutory requirements or any other unforeseen circumstances, it would be necessary to take appropriate measures for care, maintenance and monitoring status of unplanned discontinued mining operations expected to reopen in near future.

With the objective in mind that the mining operations can start immediately after the causes as above have been removed it would be necessary to carry out maintenance and monitoring of the mines as detailed below:

Monitoring:

- Carry out mine inspections daily by qualified staff to ensure that the workings remain safe for restarting work.
- Monitor the quality of Air & Water as per CPCB guide lines or as per IBM guide lines.

MAINTENANCE:

Carry out maintenance of the following in such a way as would have been done as if the mines were operating:

Retaining walls, haul roads, Fencings around the mine excavations, checking and maintenance of machines and equipment's, Drinking water arrangements, mine office, first aid stations etc.

To carry out the above functions necessary staff shall continue to be employed at the mines under intimation to the authority under whose orders the mining operations were closed temporarily.

Caution:

It is worth mention here that all the above proposals become inoperative because in most of the cases and in particulars the court orders the lessees are prohibited from entering the mining areas even for carrying out functions necessary for safety of maintenance personnel or even the neighboring habitat.

4.2 **Financial Assurance:** (Rule 27(1) of Mineral Conservation and Development Rules, (2017)

The area considered for financial assurance during the proposal period of 'Review of Mining Plan' is calculated based on the Financial Area Assurance Plan (Plate No. 14) and the same is given in following table.

The table indicate that the total **5.00** hect. area out of 44 hectare will be put in use for the period during year January-19 to 2022-23 of mining. The detailed calculation for amount of financial assurance is as under:

1	Area considered for calculation	5.00 9ha
2	Financial assurance amount	Rs. 3,00,000/ Ha (Rule 27 of MCDR, 2017, Subject to minimum of Rs. Ten lakhs
3	Total amount for Financial assurance	(5.0*300000) =**Rs 1500000/-**

INTRODUCTORY NOTES

This Review and updation of Mining Plan with Progressive Mine Closure Plan for the 'Gunas Nar Bajnar Limestone Mine' (S. No. 3973/3002/1) over an area of 44 Hect. Gunas Nar Bajnar Wuyan, In Village: Tehsil- Pampore, District - Pulwama, Jammu & Kashmir belonging to Mushtaq Ahmad Trumboo (Lessee) is submitted under Rule 17 (1) of Minerals (Other than Atomic and Hydro Carbons Energy Minerals) Concession Rules 2016 and Rule 23 of MCDR' 2017. The current proposal document is submitted for the five years period (i.e. January-19 to 2022-23).

Sequence of events regarding grant of lease are given as under:

- The lease was granted vide Govt. order no 289-IND of 1998 dated 05-08-1998 read with Govt. Order No. 403-IND of 1998 Dated 29-10-1998 in favour Mushtaq Ahmad Trumboo Village: Gunas Nar Bajnar, Village Wuyan, Tehsil: Pampore, District: Pulwama, State: Jammu & Kashmir for 30 years. (copy enclosed as **Annexure No:1,1A**)

- A copy of land revenue records (Intikhab Jama-bandi, Khasra and sajra map is given in Annexure No. 2,2A,2B.
- The Review and updation of mining plan for the period 2016-17 and 2017-18 was approved under MCDR 1988 by Regional Controller of Mines, Indian Bureau of Mines, Dehradun vide letter No. 614(2)/MP-B-178/08-DDN dated- 07-10-2016.

Since the previous mining plan was approved in October 2016 for two years and it was presumed that the present mining plan is valid for October 2018 also. Further due to local disturbance and truckers strike it was not possible to conduct the survey in the area and consequently the work on the mining plan got delayed. Now it has been started and accordingly the plan is being prepared for the period from January-19 to 2022-23.

Further a letter 31-10-2018 was received from IBM where under violations regarding non submission of returns and mining plan have been pointed out and which are being replied suitably.

Lessee is already registered with IBM under rule 45 of MCDR 2017. Under No: **IBM/8287/2011**.(Where in address for correspondence is C-156 Javadian building near Post office Rajbagh).

This Review and updation of Mining Plan has been prepared as per the proposed universal format for Review and updation of Mining Plan with PMCP under "IBM manual on Appraisal of scheme of Mining 2013" downloaded from the IBM's website.

The lessee is always committed to abide by the statutory provisions.

This Review and updation of Mining Plan with Progressive Mine Closure Plan for five years period (i.e. January-19 to 2022-23) is therefore submitted under rule 17 (1) of Minerals (Other than Atomic and Hydro Carbons Energy Minerals) Concession Rules 2016 and rule 23 of MCDR 2017, for competent approval.

यह संशोधित योजना पत्र सं. 614(2)/MP-B-178/2008-DDN dtd- 8/2/19 की शर्तों/उपबंधों के अनुसार अनुमोदित की गई है।

1.0 GENERAL

a)	Name of lessee	Mushtaq Ahmad Trumboo
	Rule 45 registration No.	IBM/8287/2011.
	Address	(Former)Resident of Barzulla Srinagar Present Residence Guptganga, Ishbar Nishat Srinagar. Address for correspondence C/O, Javidan Building 156-C near post office Rajbagh Srinagar. 190008 (J&K).
	District	Srinagar
	State	J & K
	Pin code	190008
	Phone	01942312057,
	Fax	-
	Mobile No	09906694124
	Email id:	trumboo@hotmail.com
b)	Status of lessee	Private Individual
c)	Mineral(s) which is / are included in the prospecting license (For Fresh grant)	Not Applicable
d)	Mineral(s) which is / are included in the letter of Intent /Lease deed	Limestone
e)	Mineral(s) which is the applicant / lessee intends to mine	Limestone
f)	Name of Person under rule 15 of Minerals (OAMHEM) Concession Rules 2016 or a Person employed under clause (c) of Sub rule (1) of rule 55 of MCDR, 2017 preparing Review of Mining Plan:	G.N. Chowdry M.Sc.(Geology), Formerly Dy. Director, Geology and Mining Department, J&K Govt.
	Address	17- Iqbal Colony, Chanapora, Srinagar (Jammu & Kashmir)
	Phone	+91-9419086373
	Fax	-------
	Email	gnchowdry@yahoo.com
	Mobile No.	09419086373, 09149604929

08/02/19
खान नियंत्रक
Deputy Controller of Mines
भारतीय खान ब्यूरो
Indian Bureau of Mines

2.0 LOCATION AND ACCESSIBILITY

a) Lease Details (Existing Mine)

I	Name of mine	Gunas Nar Bajarnar Limestone Mine
ii	Lat/long of any boundary point	34°02'25.82"N, 74°58'57.95"E. (Lease Pillar No. JT)
iii	Date of grant of lease	Date of grant of lease 05-08-1998 and execution 22-09-1998. (Ann. No. 1B)
iv	Period/Expiry Date	21-09-2048 (As per new MMDR Amendment Act, 2015)section 8, and new section 8A, sub section 3
v	Name of lease holder	Mushtaq Ahmad Trumboo
vi	Postal Address	Address for correspondence C/O, Javidan Building 156-C near post office Rajbagh Srinagar. 190008 (J&K)
vii	Telephone	01942312057,
viii	Fax	-
ix	email id	trumboo@hotmail.com
x	Mobile No	09906694124

b) Details of lease area with location map (Existing mine)

The lease area is 44Hect.Under Survey no. 3973/3002/1).

Details of Lease area (Forest & Non-Forest)

Forest (specify)	Area (ha)	Non-forest	Area(ha)
N.A	NIL	(i) Barren land, (Govt)	44
		(ii) Grazing land,	—
		(iii) Agriculture land,	—
		(iv) Others	—

Total Lease area	:	44 Hectare
District & State	:	Pulwama, Jammu & Kashmir
Taluka	:	Wuyan
Village	:	Gunas Nar Bajnar Wuyan

Whether the area falls under Coastal Regulation Zone(CRZ)?if yes, details thereof:	**Not Applicable. The Lease area does not fall under Coastal Regulation Zone.**
Existence of public road/railway line, if any nearby and approximate distance:	**Road:** 1.5 Km **Railway line:** Nearest railway line is 15 km away in south west direction from the lease area. This railway line is part of Srinagar- Banihal section of railway.

Topo-sheet No. with latitude & longitude of all corner boundary point/pillar: The geo referenced coordinates of lease area authenticated by state Govt. are **annexed at 16.**

Topo sheet No	43N/4 & 43J/16.
Latitude & longitude of all corner boundary point/pillar	**Table: Coordinates of lease boundary pillars**

Lease Pillar No.	Latitude	Longitude
CT	34°02'39.60" N	74° 58' 22.68" E
DT	34°02'38.95" N	74°58'30.95" E
ET	34°02'37.70" N	74°58'35.68" E
FT	34°02'38.32" N	74°58'40.03" E
JT	34°02'25.82" N	74°58'57.95" E
KT	34°02'35.78" N	74°59'08.02" E
LT	34°02'44.91" N	74°59'02.24" E
NT	34°02'47.17" N	74°58'39.67" E
HT	34°02'40.51" N	74°58'17.70" E
GT	34°02'35.30" N	74°58'25.18" E

Format of Lat& Long is; degree°minute'seconds", seconds are in decimals. These are derived from DGPS Survey.

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 these are available, the area may be shown on an administrative map.

Lease area with access route is marked on route map of J&K, attached as Plate No. 1

3.0 DETAILS OF APPROVED MINING PLAN / SCHEME

3.1 Date and reference of earlier approved MP/SOM:

Table: Summary of earlier approved MP/SOM

SOM	Date of Approval	Approval Letter No.*
Review and updation of the mining plan.	07/10/2016 (2016-2018) Plan period	614(2)/MP-B-178/08-DDN

*The copy of above approval letter is attached as **Annexure no. 3**

3.2 Details of last modifications if any (for the previous approved period) of approved MP/SOM, indicating date of approval, reason for modification:

Not Applicable. No modification of scheme of mining was done during the previous approval period.

3.3 Give review of earlier approved proposal (if any) in respect of exploration, excavation, reclamation etc.

<table>
<tr><th>Proposal made in Mining plan</th><th>Extent of implementation</th><th>Reasons for deviation</th><th>Corrective action to be initiated</th></tr>
<tr><td>Exploration:
<table>
<tr><th>Year</th><th>Proposal no. of drill holes</th><th>Total meterage</th></tr>
<tr><td>I year</td><td>-</td><td>-</td></tr>
<tr><td>II year</td><td>-</td><td>-</td></tr>
<tr><td>III year</td><td>-</td><td>-</td></tr>
<tr><td>IV year</td><td>4</td><td>40</td></tr>
<tr><td>V year</td><td>4</td><td>40</td></tr>
</table></td>
<td><table>
<tr><th>Year</th><th>Achieved</th><th>Total meterage</th></tr>
<tr><td>I yr.</td><td>The samples from pits were regularly analysed at deptt. lab.</td><td>Not applicable</td></tr>
<tr><td>II yr.</td><td>The samples from pits were regularly analysed at deptt. lab.</td><td>Not applicable</td></tr>
<tr><td>III yr.</td><td>The samples from pits were regularly analysed at deptt. lab.</td><td>Not applicable</td></tr>
<tr><td>IV yr.</td><td>5</td><td>125</td></tr>
<tr><td>V yr.</td><td>5</td><td>125</td></tr>
</table></td>
<td>As a matter of trial we have been able to put here holes beyond the depth of 10m upto 25m.</td>
<td>Similar efforts shall be done in future also to drill exploratory bore holes</td></tr>
<tr><td>Mine Development:
<table>
<tr><th>Year</th><th>Job</th><th>Quantum of work</th></tr>
<tr><td>I year</td><td>-</td><td>-</td></tr>
<tr><td>II year</td><td>-</td><td>-</td></tr>
</table></td>
<td>1. Check dams 6 no's
2. Road constructed for 535m.</td>
<td>Due to lack of adequate infrastructur</td>
<td>In future efforts as far as possible</td></tr>
</table>

	-	-			
III year	-	-			
	-	-			
IV year	Road	2.2km			
	Check dams	-			
V year	Maintenance	Earlier check dams		e and disturbed conditions only part of the road could be constructed.	shall be done for the completion of developmental activities.

Exploitation:

0.551 million tonnes of limestone was proposed to be extracted as under:

Year	Proposal
2016-17 (IV Yr)	288639
2017-18 (V Yr)-	322560
Total	611160

Year	Achievement
2016-2017	53200
2017-2018	110010

Due to disturbed conditions the target couldnot be achieved

Efforts shall be made to achieve the target in future

Afforestation:

In the approved plan the afforestation was proposed as under:-

Year	Mined out benches	7.5 barrier PPL
2013-14 (I Yr)	-	-
2014-15 (II Yr)	-	-
2015-16 (III Yr)	-	-
2016-17 (IV Yr)	0.01	100
2017-18 (V Yr)-	0.01	100

200 trees have been planted towards south western side of the lease area at the base.

Nil

It shall be ensured to do a better job by planting more trees on the ear marked places. It is also proposed to create a green belt at the western tail end of the mine over an area of 0.4124 hectares whereby 3770 trees shall be planted.

Environmental Protection aspect:

The monitoring work for mensurement of Air, Water, Soil and Noise quality.

The monitoring in respect of Air, Water, Noise etc is being done as per the norms put forth by MoEF.

Nil

The Environmental effect will be regularly checked. Vibration level due to blasting shall be monitored on regular basis.

Reclamation/ Rehabilitation

No proposal of bench rehabilitation was given in the approved plan.

No bench reached the ultimate pit limit

Mining was carried out in south west portion of the area and no bench reached the ultimate pit limit.

No bench has reached the ultimate pit limit.

3.4 Give status of compliance of violations pointed out by IBM

It was communicated that Monthly returns and Mining plan has not been submitted till 31-10-2018. While as the returns have already been submitted and this mining plan is being submitted from January-19 to 2023(March) as it was thought that previous mining plan being approved in October would hold valid up to Oct 2018.

Sr no	Date of inspection	Violation date	Rule violated	Compliance status
1	---	Letter dated 31-10-2018	11(1),11(4),26(2), 27(2),33, 45(5)(b), 45(5)(c).	Already communicated and now mining plan is submitted.

3.5 *Indicate and give details of any suspension /closure/ prohibitory order issued by any Government agency under any rule or Court of law*:

In light of letter dated 31-10-2018 from IBM, the mine has been put under suspension.

3.6 *In case the MP/SOM is submitted under rules 9 and 10 of the MCDR'88 or under rule 22(6) of the MCR'1960 for approval of modification, specify reason and justification for modification under these rules*:

Not Applicable.

PART – A

1.0 GEOLOGY AND EXPLORATION:

a) Briefly describe the topography, drainage pattern, vegetation, climate, rainfall data of the area applied/mining lease area.

Topography:

The topography of the area forming the hills of Pir Panjal range is mountainous and rugged one. It is characterized by deep ravines having steep to moderate slopes and is dissected by numerous snow fed Nallas.

The topography of the area is rough & rugged representing the typical scenario of mountainous region. The general slope of the area is towards from south west direction. All the rainy water flows through the slopes and meet the Nala which flows south west to north east The highest level is 2216m asl where as the lowest RL is 1692m asl.

Drainage Pattern:

Drainage of the area is of dendritic pattern with small dry Nallas coming from top joining the main Dun valley & ultimately joining river Jhelum at distance of 12 Kms.

Vegetation:

The hillocks towards North western side are densely forested & the plains are covered with almond, apple, orchards.

The village gullies are planted with willow, white willow, Kikar, & Walnut trees. The areas where water is available is cultivated with paddy fields.

Climate:

The climate of the area is pleasant in summer with temperature upto 30° C but winters are cold & frosty when temperature some time goes below 0°C.

b) Brief descriptions of Regional Geology with reference to location of lease/applied area.

Regional Geology:

The Main Geological formation of lease area is Triassic comprising of limestone shale's etc. at Guryul Ravine Khummoh 3.00 Km away we have following formation in order of:

Formation	Age
6. Upper triassic in saman, sekinar	Triassics
5. Middle Triassics in Shivdakri	
4. Lower Triassics Guryul	
3. Black Shales, Limestone (Fossiliferous) Protoretepora Ampla.	Permians (Zewan Series)
2. Novocullite bands & Gangamopteris beds	Lower Gondwana
1. Panjal Trap	Permo carboniferous

The triassics mostly limestone & shales continue their exposures along Sangria, Khrew, Trall & Anantnag ridges as per as Jawahar Tunnel of Verinag.

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 Scheme of Mining/Modifications in the approved mining plan/scheme of Mining).

Geology of the Area:

The main geological formation is upper Triassic rocks comprising of various grades of limestone interbedded with few siliceous and argillaceous bands. A lithological section of the area from top to bottom i.e, NE-SW is as follows:

Bed No.	Lithological Description	Ar. Thickness (in metres)
B4	Dirty grey to earthy coloured limestone with siliceous and argillaceous partings and patches	60
B3	Bluish grey limestone fine to medium grained	250
B2	Off white grey to dirty grey magnesium limestone	95
B1	Bluish grey limestone fine to medium grained	35
B0	Low grade limestone	120

Bed B4:

A thick pile of dirty grey to earth colour limestone frequently inter bedding with argillaceous beddings intruded with siliceous materials at places occur in the western part of the' area (Gunasnar Side). The strike of bed is 310° to 338° N, amount of dip varies 42° N to 48° & dip direction varies 30°N to 61° N. The average thickness of the bed is 60 meters.

Bed B3:

Bluish grey to blackish grey limestone with moderate bedding planes, well jointed which have resulted in leaching of calcareous materials at places. This bed shows wide distribution in the area. The bed thrown into folds on a large, scale. It outcrops at South Western Corner of Gunas Nar and crosses over to Bhajar Nar in N.E. side and ultimately forms top most part of the. ridges in Bhajar Nar Area. The limestone is of very good grade for cement manufacture. Due to its involvement in. folding, the bed shows various changes in 'the strike and dip. The average thickness of the bed is 250 metres. This bed is, quarried for supply of road metal in the Gunas Nar area. The strike of bed is 298° N to 325° N, amount of dip varies 38° N to 42° N & dip direction varies 25°N to 43° N.

Bed B2:

Off white magnesium limestone, massive in nature. It is also involved in folding. A small outcrop in the South Western corner of the Gunas Nar side grows into a large outcrop with changing strike and dip on the Eastern side in Bajnar Nar. The average thickness of this bed is 95 meters. The strike of bed is 313° N to 330° N, amount of dip varies 40° N to 50° N & dip direction varies 41° N to 63° N.

Bed B1:

Bluish grey limestone well jointed and thinly bedded. The limestone is of a very good quality but the extent is not as wide as that of bed B3. This bed is also involved into folding in Eastern side (i.e. Bajnar Nar). A small outcrop of this bed is found is South Western corner just above valley floor which is extensively quarried by locals for supply of road metal. The strike or bed is 330° N to 340° N, amount of dip varies 48°N to 50° N & dip direction varies 50° N to 63° N.

Bed BO:

Low grade limestone outcropping in the Bhajar Nar side forming core of the folded limestone. The average thickness of the bed is 120 meters. The strike of bed is 325° N to 343° N, amount of dip varies 45°N to 50° N & dip direction varies 52° N to 68° N.

(i) Name of prospecting / exploration agency.

Geology & Mining Department J& K Govt. Srinagar.

(ii) Address

a) (ii) Address 4th floor Sanat Ghar Bemina Srinagar, J&K 190018.

b) (iii) E mail: dgmjak@gmail.com

c) Contact detail: 01942493588.

d) <u>Details of prospecting/exploration already carried out:-</u>

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

8 No. of sampling channels have been drawn to ascertain the quality of the deposit. The channels are shown on the surface geological plan plate 4.

Details of exploration carried out:

Detailed topographic and geological mapping with a contour interval of 6m was carried out and where in various litho units have been mapped coupled with channel sampling. Details are given in plate no. (3). The sampling channels were aligned across the strike of the formations and channels were drawn along the thickness of the beds. The channel samples were collected from bottom to top of the beds & samples were collected at irregular intervals depending upon the topography of the area. Over all 8 composite samples were prepared detailed as under.

Name of Channel	Length of Channel (m)	No. of Samples Collected
GB/SL-I	99	9
GB/SL-II	86	8
GB/SL-III	174	17
GB/SL-IV	138	14
GB/SL-V	111	11
GB/SL-VI	66	9
GB/SL-VII	121	12
GB/SL-VIII	81	8

Ten composite samples were prepared out of above samples and channel wise details of the chemical analysis of these samples indicates that the range in calcium oxide as 48.67 to 51.93 and SiO2 between 2.12 to 3.89 with MgO within 2.5. The ingredients suggest that limestone is by and large cement grade and can be utilized in making value added cement.

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/section.

Ten boreholes of 102mm dia for 25m depth each were drilled vertically by wagon drill (ROC).

for ascertaining the behavior of litho logical and chemical control in depth and across.

The chemical analysis of these samples indicates that by and large the limestone of Bed (B3) is cement grade.

The details of the bore is given as under:

S.NO	Location	Borehole no.	Dia	Depth Vertical	Lithology
1	E359,N407	BH1	102mm	25m	Bluish grey limestone with argillaceous and siliceous patches.
2	E452,N336	BH2	102mm	25m	Bluish grey limestone with more argillaceous and siliceous patches.
3	E345,N449	BH3	102mm	25m	Bluish grey limestone with calcite vein lets.
4	E363,N347	BH4	102mm	25m	Bluish grey to blackish limestone massive hard with arenaceous concentration
5	E291,N491	BH5	102mm	25m	Bluish grey limestone fine to medium grained with more aluminum and silica.
6	E188,N561	BH6	102mm	25m	Bluish grey to light grey limestone fine to medium grained with argillaceous patches.
7	E567,N522	BH7	102mm	25m	Ash grey limestone with argillaceous and siliceous patches.
8	E253,N564	BH8	102mm	25m	Ash grey limestone with argillaceous and siliceous patches.
9	E685,N555	BH9	102mm	25m	Light grey to bluish grey limestone with more argillaceous and siliceous patches
10	E656,N628	BH10	102mm	25m	Light grey to bluish grey limestone with more argillaceous and siliceous patches.

Details of samples analysis indicating type of sample (Surface/sub-surface from pits/trances/borehole etc) complete chemical analysis for entire strata for all radicals may be undertaken for selected samples form a NABL accredited Laboratory or Government laboratory or equivalent. Entire mineralized area may be analyzed meter wise with 10% of check samples.

8 Channel sample lines have been drawn to collect 87 samples and 8 composite samples were collected and chemically analyzed. The chemical analysis of composite samples and borehole samples is given as under:-

3 bore hole samples in lowgrade and magnesium bands of BED B0, B2 and B4 have been analyzed and the details of which reflects that the limestone is of higher silica, low calcium and high magnesium in nature and has been as such denoted as non mineralized zone because the chemical analysis reflects that it is below thresh hold value. The details are given as under at annexure "5A"

Table showing chemical analysis of Bore Hole

Lowgrade samples

SAMPLE NO.	BED	CaO	MgO	SiO2	Al2O3	Fe2O3	LOI
LG BH-I	BO	17.56	6.90	28.82	12.44	7.42	26.52
LG BH-2	B2	28.62	17.42	16.53	8.44	6.52	22.01
LG BH-3	B4	38.02	4.52	19.22	7.52	3.42	27.10

DETAILS OF CHANNEL SAMPLES

Channel No.	Samples No's	Total Samples	Average Grade (%)					
			CaO	MgO	SiO_2	Fe_2O_3	Al_2O_3	L.O.I.
SL-I	GB/SL-I to GB/SL-9 Composite.	1	52.74	0.91	1.91	0.78	0.83	42.12
SL-II	GB/SL-10 to GB/SL-18 Composite.	2	52.97	0.88	1.89	0.39	0.80	42.52
SL-III	GB/SL-19 to GB/SL-35 Composite.	3	52.89	0.87	1.99	0.41	0.86	42.58
SL-IV	GB/SL-36 to GB/SL-49 Composite.	4	52.47	1.05	2.32	0.34	1.09	42.09
SL-V	GB/SL-50 to GB/SL-60 Composite.	5	52.47	1.10	2.15	0.63	0.98	42.14
SL-VI	GB/SL-61 to GB/SL-68 Composite.	6	51.52	0.85	2.12	0.65	0.92	42.16
SL-VII	GB/SL-69 to GB/SL-74 Composite.	7	51.45	0.85	3.15	0.62	1.01	42.62
SL-VIII	GB/SL-75 to GB/SL-82 Composite.	8	51.90	0.94	2.23	0.69	0.96	42.75

iii) (At least for 10% of total samples may be analyzed in accordance to BIS and reports from NABL accredited/other government laboratory).

Chemical analysis of borehole samples was done from NABL accredited lab EKO PRO ENGINEERS PVT. LTD. Ghaziabad detailed at **Annexure No. (5).**

iv)Expenditure incurred in various prospecting operations.

Rupees 4.30 Lac have been spent on prospecting.

e) 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 10m depending upon the topography and size of the area duly marked by grid lines showing all features indicated under Rule 28 (1) (a) of MCDR 1988.

Surface Plan on scale of 1:2000 has been prepared - Plate No. 3.

f) 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 28 (1) (b) of MCDR 1988.

Surface Geological Plan has been prepared on scale of 1:2000 & is given in Plate No. 4.

g) Geological sections may be prepared on natural scale of geological plan at suitable interval across the lease area from boundary to boundary.

Geological Section have been prepared to delineate different litho units on scale of 1:2000 and are given in plate no. 5.

h) Future Programme of Exploration:

1. The quantum of exploration carried out by Geology & Mining department is considered adequate for sustenance of the existing requirement. However, the sampling is done from time to time from the existing working pits, which are chemically analyzed at the departmental lab installed in the cement plant. The level of exploration already done including drilling of bore holes and analysis of data thus derived suggests that 9.8106 hectares is covered under UNFC G1 axis and does not warrant any future exploration. However for purpose of collection of more relevant data to gain more confidence. The exploration is proposed in accordance with rule 12 of MCDR 2017 where under prospecting in the form of drilling of bore holes with the help of wagon drill 102mm dia bore holes for 25m depth each have been proposed keeping in view the lateral distance between each bore hole. Preferably vertical bore holes in the

mineralized zone to obtain drill cuttings for ascertaining the grade of deposit and persistence in strike and depth, so that systematic development of mineral deposit, conservation of mineral and protection of environment in ensured. Further the exploration is proposed keeping in mind the (Evidence of Mineral Content Rule 2015). Since it is a continued exploration and exploitation going on for more than a decade, the qualitative and quantitative extension of the deposit in strike and down dip is being done. The placement of the deposit across the contour of the ridge from lower level of RL 1818m to RL 1998m in the centre, RL 1900 TO RL 2070m, RL 2070 to RL2214m in the east, its continuity and assessment of the cement grade limestone is confirmed. However for ascertaining the grade of the deposit in case of bed numbers B0,B2&B4 some bore holes are proposed so as to confirm the lowgrade nature of these beds (below thresh hold value) accordingly it is proposed to give additional seven bore holes with the help of wagon drill for a dia of 102mm and depth upto 25m. so that the whole lease area comes under G1 level of exploration by the year 2022. the year wise proposal is given as under:-

S.NO	Year	Bore hole No.	Depth of each hole	Location
1	Ist year(2018-19)	PBH1	25m	E449,N327
2	II Year (2019-20)	PBH2 PBH3 PBH4	25m 25m 25m	E626,N680 E790,N678 E810,N570
3	III Year(2020-21)	PBH5 PBH6 PBH7	25m 25m 25m	E939,N615 E947,N431 E1190,N590
4	IV Year(2021-22)	PBH8 PBH9	25m 25m	E1110,N410 E1380,N480
5	V Year(2022-23)	PBH10 PBH11 PBH12	25m 25m 25m	E1360,N480 E1287,N545 E1280,N646

i) **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).**

The thresh hold value prescribed by IBM indicates limestone with less than 34% CaO and more than 12% silica is to be treated as low grade as it does not satisfy LSF. In case of this deposit, the chemical composition of limestone derived from the chemical analysis indicates that this limestone has CaO% more than 48% and silica less than

12% and as such could be termed as cement grade. The lime stone available in this part of deposit has already been explored and exploited coupled with collection of channel samples, drilling and production pits can be classified under UNFC classification to have been explored to the level of G1 up to depth of 25m. Further the lateral extension of limestone in strike exposed towards upper side of hill is having identical litho logical behavior and chemical composition as that in lower altitude for more than 200m and thus the level of exploration could be safely considered for 25m depth as measured mineral resource. Besides in terms of Rule 9 of Minerals (Evidence of mineral contents) Rules 2015 which reads "the majority of the inferred mineral resource could be upgraded to indicated mineral resources with continued exploration as G2 axis." In the case of this mine as has already been described continued exploration has already been proposed. As such we could safely take the Resources i.e 331 measured mineral resource up to 25m depth and beyond that up to base as 333 indicated mineral resource on which we could safely bank up on.

For purpose of breakup of mineral resource the deposit of limestone from surface upto 25m could be termed as measured mineral resources (331) beyond which as indicated mineral resources (333).

S.NO	LEVEL OF EXPLORATION UNDER UNFC	Depth	AREA Hectares.
1	(G1 Axis)	25m	9.8106
2	(G2 Axis)	Up to base	2.7457

Non mineralized Zone and non feasible Area = 31.4437 Hectares

Total lease area = 44 hectares.

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.

Assessment of the deposit has been carried out based on the followings: -

1. Core BH data comprising of topographical data, assay data etc.
2. Working pits available in the area
3. Exposures of mineral in the area

Accordingly based on above feasibility report of the deposit has been prepared and it is placed at **annexure 10.**

Estimation of Resources/ Reserves

Method adopted for Resources/ Reserves estimation

Estimation of resources and reserves has been carried out by cross sectional area method.

i) Area and Depth Considered for Resources/ Reserves estimation

For estimation of geological resources, the depth considered is based on data as encountered in drill cutting upto 25m which shall be termed as measured mineral resource and beyond which as indicated mineral resource upto base. Similarly the reserves upto 25m from surface are designated as proved (111 UNFC) and beyond which upto base as probable reserves (122 UNFC).

Category wise/ Bench wise mineral reserves Under UNFC Code are given in tables below:

Section wise Mineable reserves

111(UNFC) FOR BED (B3)

Section	Sectional area (sqm)	Average face length (m)	Volume (cum)	Reserves in tonnes
1-1'	1166	68	79288	198220
2-2'	352	90	31680	79200
3-3'	1013	90	91170	227925
4-4'	2029	70	142030	355075
5-5'	2779	90	250110	625275
6-6'	5522	100	552200	1380500
TOTAL				2866195

Section	Sectional area (sqm)	Average face length (m)	Volume (cum)	Reserves in tonnes
6-6'	2425	100	242500	606250

111 (UNFC) = 2866195 Tonnes.

122 (UNFC) = 606250 Tonnes.

Total = 3472445 Tonnes

Table showing bench wise / section wise reserves of limestone section 5-5'

RL. MTRS	BENCH	SECTIONAL AREA	FACE LENGTH	VOLUME	RESERVES
1896-90	M1	8	90	720	1800
1890-84	M2	41	90	3690	9225
1884-78	M3	82	90	7380	18450
1878-72	M4	126	90	11340	28350
1872-66	M5	156	90	14040	35100
1866-60	M6	170	90	15300	38250
1860-54	M7	190	90	17100	42750
1854-48	M8	257	90	23130	57825
1848-42	M9	313	90	28170	70425
1842-36	M10	350	90	31500	78750
1836-30	M11	363	90	32670	81675
1830-24	M12	383	90	34470	86175
1824-18	M13	340	90	30600	76500
TOTAL					625275

ii) Usable Limestone

The entire limestone of Bed (B1 & B3) has been considered as usable limestone for manufacture of Cement. Thus, the cut off limit has been set as prescribed by CCOM Circular No. 03/2010 dated 14.07.2010 (>34% CaO and <4% ofMgO) during estimation of limestone resources/reserves. Although the CaO contents in both the grades is higher side. The cement grade limestone is being only produced at the mine in focus for captive use only as the lessee has a cement plant in the vicinity as TCI CEMENT PLANT. The entire mineral produced irrespective of size is utilized very smartly. This is all for conservation of valuable mineral.

iii) Ultimate Pit Limit in the Mining Area

The ultimate pit limit has been marked on the basis of the extent of mineralization of cement grade limestone observed within the area of ML. Laterally the boundary barrier within the lease area forms the limit of mining while at depth the ultimate pit bottom shall be restricted 2214mRl upto 1812mRL forming northern eastern part. The rest of the area which exposes the siliceous and MgO limestone is considered as non mineralized zone comprising Bed No. B0, B2 & B4 which shall not be exploited for the time being

iv) Tonnage Factor

An overall tonnage factor of 2.5 has been considered for limestone for this area.

vi) Recovery

Based on past experience, the recovery of limestone is considered 100% because whatever limestone is mined, the whole quantity finds its use in cement manufacturing.

Resources/ Reserves Categories under UNFC.

The resources and reserves of the area have been categorized under different geological axis as per the followings: -

The exploitation and available data suggest that the G1 level of exploration has been done in the south western and north eastern area forming the lower portion of the lease area below RL 2214m upto 1812m of 9.8106 hectares and where under the reserves for limestone B1 & B3, have been estimated from RL 2214 to RL 1812m where upon it is expected to obtain more than 3.47 million tonnes of limestone. As per the proposal for mining the benches up to M13 RL 1896 to RL 1818m shall be worked out which shall yield about 625275 tonnes and rest of about more than 2.84 million tonnes could be exploited in future programme till then further exploration has already been proposed for rest of the area on the upper side of the lease area towards north north west. The details of different resources therefore is given as under:

For purpose of breakup of mineral resource, the deposit of limestone from surface upto 25m could be termed as measured mineral resources (331) beyond which upto base as inferred mineral resources (332).

S.NO	LEVEL OF EXPLORATION UNDER UNFC	Depth	AREA Hectares.
1	(G1 Axis)	25m	9.8106
2	(G2 Axis)	Up to base	2.7457

Non mineralized Zone and non feasible Area = 31.4437 Hectares
Total lease area = 44 hectares.

The detailed Feasibility Study Report is enclosed as Annexure No.10.

j) Furnish detailed calculation of reserves/resources section wise furnished (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).

Table showing the Geological resources along section line (7-7')

Geological resources	Sectional area (sqm)	Inter distance (m)	Volume (cum)	Bulk density	Tonnes
Inferred mineral resources(332)	4268	80	341440	2.5	853600
Total					853600

Table showing the Geological resources along section line (8-8')

Geological resources	Sectional area (sqm)	Inter distance (m)	Volume (cum)	Bulk density	Tonnes
Inferred mineral resources(333)	1599	60	95940	2.5	239850
Total					239850

Category wise UNFC Mineral reserves

111 (UNFC) = 2866195 Tonnes.
121(UNFC) = 0 Tonnes.
122(UNFC) = 606250 Ttonnes
Total = 3472445 Tonnes.
332(UNFC) Resource= 853600 Tonnes.
333(UNFC) Resource= 239850 Tonnes.
Total Resources = 1093450 Tonnes.

k) Mineral Reserves/Resources Review and updated as on 31-12-2018.

Mineral Resources: (Mineral resources may be estimated purely based on level of exploration, with reference to the threshold value of minerals declared by IBM)

Level of Exploration	Resources in tonnes	Grade
G1 - Detailed exploration	0	0
G2 - General Exploration	853600	Cement Grade
G3 - Prospecting	239850	Cement Grade

Table: Updated UNFC Resources/ Reserves as on 31-12-2018.

	UNFC Code	Limestone (in tonnes)	Remark
A. Total Mineral Reserve			
Proved Mineral Reserve	111	2866195	Cement Grade
Probable mineral Reserve	121 & 122	606250	
B. Total Remaining Resources		0	
Feasibility mineral Resource	211	0	
Prefeasibility mineral resource	221 & 222	0	
Measured mineral resource	331	0	Cement Grade
Indicated mineral resource	332	853600	0
Inferred mineral resource	333	239850	Cement Grade
Reconnaissance mineral resource	334	0	
Total Resources		1093450	

Life of Mine:

Total mineable reserves	3472445	Tonnes
Rate of production average	125000 approx.	Tonne/Year
Total mine life	27.77 say 28 years	Years

Total resources – 1093450 tonnes, Say 1.09 million tonnes.

*The resources and reserves in previous scheme of mining have been estimated taking resource to surface exploration and where by resource upto 25m have been shown under 331 category, below that upto 10m depth as 332 category and below that upto further 10m depth as 333 category . Thus geological resource thus estimated under different categories is given as under

CATEGORY	LEVEL OF EXPLORATION	RESERVES/RESOURCES IN MILLION TONNES	GRADE
G1	Detailed Exploration	26.66/27.13	Cement
G2	General Exploration	9.60/9.82	Cement

Accordingly the proved reserves under different category are given by subtracting mineral blocked due to 7.5 m statuary barrier from geological resource and thus the proved reserves of 111 have been given as 27.13 – 0.47 = 26.66 million tonnes
Probable reserve 122= 9.82 – 0.22 = 9.60 million tonnes against G2 level of exploration.

While in the present estimation of resource and reserves as per directives of IBM the drilling factor has been incorporated as essential part for estimation of resource under G1 Exploration and beyond, therefore the resource in current plan are 1.09 million tonnes, and reserves 3.47 million tonnes. But this approach is scientifically correct, and with the exploration proposed during next five years it is expected that figure of the proved reserves under G1 category level of exploration shall increase considerably.

The depletion of the reserves has already been taken into account while accessing the quantity of resources and reserves upto date.

R&R Shown in million tonnes

UNFC Category	R&R As On 2016 (A)**	Depletion upto November. 2018. (B)	Book Balance of R&R (C=A-B)	Up-dation effect * (D-C)	Re-estimated / updated by sectional method (D)	Remarks
111	26.66	0.51	26.15	-23.29	2.86	* Up-dation using sectional method Bore holes
121	0	0	0	0	0	
122	9.6	0	9.6	-9.0	0.60	
211	0	0	0	0	0	
221	0	0	0	0	0	
222	0	0	0	0	0	
331	27.13	0	0	-27.13	0	*
332	9.82	0	0	-8.96	0.85	
333	0	0	0	0.23	0.23	*
334	0	0	0	0	0	

**** as per last approved scheme of mining.**

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.***

Existing and proposed method of Mining: The existing method of mining is Open cast. The category of mine is *'A' Open Pit Mine (OTFM).* Details as follows-

i) Mining will be open cast mechanized.

ii) It is being proposed to start the mining from RL 1896 m to RL 1818m which shall yield about 625275 tonnes. Further exploration is being proposed for rest of the area on the northern and nort eastern side. Mining benches will be opened in bed B3 from RL 1896 downwards. The primary drilling with 102mm dia size wagon drill shall be under taken. Blasting will be undertaken with suitable slurry explosives. Only cement grade limestone has been considered to be extracted while as the adjoining magnesium / siliceous limestone is not being proposed to be mined. The maximum height and minimum width of the benches shall remain 6 meter and 6 meter respectively.

iii) Existing 535m long road having width 6m & gradient 1:16 to 1:20 shall be carried further up from boundary pillar FT towards top to reach the working bench at RL 1896 for a length of 682m.

iv) The slope of the mining faces will be kept 75^{0}to 80^0.

v) Large boulders of limestone will be broken manually with the help of hammer or by using rock breaker.

vi) Limestone shall be loaded into tippers by poclain/loader shovel.

vii) The recovery of limestone has been considered 100% of the total excavation. The area consists of high grade limestone having no soil cover. Negligible part of MgO/Siliceous limestone may be generated incidental to actual mining of limestone. This MgO / Siliceous limestone thus generated shall be utilized in development works / road development.

viii) The area consists of high grade limestone having no soil cover. In the present plan period no benches shall be formed in the overburden and all the benches shall be formed in limestone band. Only part of the road may be taken in the non mineralized zone.

ix) Since the mine is located on a hill slope and as such proper benching from top have been proposed. Further in the five year development plan proposals have been made for erection of retaining walls, check dams, parapet walls to ensure stability of the slopes and safe mining. Besides suitable and adequate proposals for controlled blasting techniques are also proposed in the relevant chapters pertaining to blasting.

x) Mining is proposed in limestone from M1 to M13. No sub-grade mineral or mineral reject shall be generated during this plan period. About 1.41 hectares area shall be covered by mining faces which shall include the development of

haulage road. Previously around 3.269 hectares area was covered by mining including haulage road & channels etc. The plantation shall be carried out in the earmarked green belt in south western part.

The bench will be opened through a box cut and advanced towards NNE direction. This will facilitate environmentally safe mining as rolling of boulders and debris will be avoided. The ultimate bench heights will be 6m which will be advanced through sub benches of 3m each.

The pit layout, temporary dump yard and pit sections showing yearly advancement is shown on Plate No. 6 to 10.

b) Extent of Mechanization:

The quantum and type of equipment to be provided for the various mining operations is given below:

Drilling Machines

Table - Drilling Equipment & Compressors.

S.No	Type	No's	Dia of hole (mm)	Size/ capacity	Make	Motive Power	H.P.
1	DTH drills with water mist system	2	102 mm	24m	Atlas Copco	Compressed air	N.A
2	Air compressor	2	NA	600 cfm	Atlas Copco XA-280	Diesel	180

2. Loading Equipment

Table – Loading Equipment

S. No	Type	No's	Bucket capacity	Make	Motive Power	H.P.
1	Hydraulic excavators	1	0.9m³	Kobelco	Diesel	107-125

3. Haulage and Transportation Equipment

Table – Haulage and Transportation Equipment

S. No	Type	No's	Size/ capacity	Make	Motive Power	H.P.
1	Tipper	20	10 M.T.	Tata	Diesel	31.5
2.	Water Tanker (Tipper mounted)	1	5000 liters	Tata	Diesel	31.5

4. Miscellaneous Equipment

In addition to above, equipment should be provided for dozing, construction & maintenance of haul roads, cleaning of faces and haul road, dust suppression along haul roads by water spraying, transportation of men and material, through pick up vans.

The Dozing equipment to be provided at this mine is indicated in Table below:

S.no	Type	Nos	Size/ capacity	Make	Motive Power	H.P.
1	Dozer D-155A-1	1		BEML	Diesel	320
2	Hydraulic Rock Breaker	1		Kobelco	Diesel	107-125

5. Proposal for controlled blasting,Ground Vibrations, Air over pressure standards.

The blasting shall be carried out using Delay detonators, proper stemming and charging of holes. The nearest population and building structures are about 2km away from the lease area, even then it is expected that there will be not significant ground vibrations due to controlled blasting as it is hard rock and permissible limits of vibrations here are 100mm/s as per DGMS prescribed norms besides the air over pressure standards and limit shall be taken into account and it is expected that permissible limit 0.0145psi (134db) as per bureau of mines recommendations for surface mine blasting shall be taken into account and efforts shall be made not to exceed the permissible limits. Besides for monitoring the vibration effects, on daily basis, vibration measuring equipment shall be procured, there by monitoring daily vibrations due to blasting. The other procedures are given in detail as under.

a) Blasting Pattern:

The pattern of initiation adopted affects the standard of fragmentation, muck profile after the blast, ground vibrations are caused, noise generated besides fly rock and air blast. Some of the blasting patterns are indicated below in brief:

It will be preferable to use millisecond delay sequence and use of in hole delays. It permits to divide the shot into smaller charges which are detonated in predetermined millisecond sequence at specific time interval. It shall reduce the ground vibrations and air blast to a greater extend besides checking of the fly rocks. All other measures shall be kept in place to ensure reduction of ground vibration.

The pattern at case no 2 below shall be adopted for the purpose.

Single Row

Case 1 Simultaneous firing,

0----------0----------0----------0----------0----------0----------0

It gives spread out muck pile

Case 2 Using short delays, single hole per delay

0----------0----------0----------0----------0----------0----

Zero 1 2 3 4 5

It gives minimum vibrations

Case 3 Using short delays, in pair (s)

0----------0----------0----------0----------0----------0----------0

3 2 1 Zero 1 2 3

It gives better fragmentation.

Charge per delay

1. Total material required per day	678 Tonnes
2. Charge per day	85 Kg producing 678 tonnes
3. Charge per delay per hole	10kg to obtain 80 tonnes @ 8 tonnes per kg
4. No. of holes to be blasted	678/80= 9 holes of 6m depth with short delay

single hole per delay technique as in case 2 above.

b) Maximum number of holes blasted in a round

The number of holes to be blasted in a round shall be kept at 9 holes each in 6 days. These shall be covered by 6 delays each with 1 holes per delay. Each round shall yield about 9x80=678 tonnes. In six days a week, the yield would be 678*6= 4068 tonnes. This quantity is adequate to feed the crusher for about 7 days.

Manner and sequence of firing

Two-row drilling and blasting pattern (square grid V pattern) with sequence of drilling as discussed under (viii) above shall be adopted as per the existing practice.

Distribution of charge and decking

Considering the nature of strata/ deposit and height of the bench, no decking is considered necessary. However use of wooden spacers as decks may in future be resorted to with a view to improve the powder factor and blasting efficiency. The explosive charge shall be kept at the bottom of the hole

c) Type of explosive to be used:

Nitrate mixture slurry explosive (class 2) based on Ammonium nitrate viz. power gel aquadyne etc. shall be used for blasting purpose. Use of ANFO explosive with slurry based primary explosive is not advisable due to security reasons.

d) Storage for Explosive: The explosive magazine of 1800kgs capacity has been installed as per the requirement of department of Explosive by the lessee.

e) Precaution during blasting:

Following precautions will be undertaken:

1. Stemming should be strong and of adequate length and not less than 3:7 of burden to check the blow outs.
2. Over confinement and consequent vertical catering will be avoided by adhering to designed burden & spacing & firing sequence with appropriate delays.
3. Blasting should be avoided in early morning and late evening hours to avoid temperature inversion conditions.
4. Blasting may be avoided at the time when strong surface winds are blowing towards inhabited area.
5. The burden at any point in the charge length should not be less than optimal.

6. The wind direction at the time of blasting should not be towards the structure to be protected, especially if wind speed is high.
7. Blasting should be done during day time when there is heavy background noise.
8. Before electric firing, the circuit will be tested by an approved tester/blaster.
9. Flags erection and siren signaling systems will also be provided during time of blasting. For further safety, the blasting time will also be fixed during the lunch time 1:30pm of the shift so that all the workers leave the danger zone.

f) Indicate year-wise tentative Excavation in Cubic Meters indicating development, ROM, pit wise as in table below.

The proposed excavation year-wise plan is given for five years; starting from January 2019 to 31st March'2023.

The likely position of the benches & roads etc. in this mine at the end of first to five year is shown in the plate no. 7,8,9,10&11.

I.In-situ Tentative Excavation in m^3

Year	Total tentative Excavation (m^3)	Top Soil (m^3)	OB (Cum)	ROM (Limestone) (Tonnes)		Mineral reject (Tonnes)	ROM/ Waste Ratio
				Limestone (Tonnes)	Mining losses (Tonnes)		
1	2	3	4	5	6	7	8
I year (From January-19 to March 2019)	11790	-	-	29475	-	-	1:0
II year(2019-20)	50940	-	-	127350	-	-	1:0
III year (2020-21)	58140	-	-	145350	-	-	1:0
IV year(2021-22)	64170	-	-	160425	-	-	1:0
V year(2022-23)	65070	-	-	162675	-	-	1:0
Total	250110			*625275			

Tentative tonnage of the ore may be arrived by computing approximate bulk density of 2.50 tonnes per cum. *(Values put in round figure to avoid decimals fractions in reserve)

II. Dump re-handling (for the purpose of recovery of mineral): Nil.

Estimated available material from the existing lease area (Cum)

Mineral dump position as on 30-11-2018

Particular	Area (sqm)	Height (m)
—	—	—

Year	Dump identification/ no	Year-wise handling (Cum)	Estimated recovery of saleable material (Cum) *	Reject (Cum)
2018-19	Nil	Nil	Nil	Nil
2019-20	Nil	Nil	Nil	Nil
2020-21	Nil	Nil	Nil	Nil
2021-22	Nil	Nil	Nil	Nil
2022-23	Nil	Nil	Nil	Nil

** Tentative tonnage of the saleable material may be arrived by computing approximate bulk density and recovery factor as these data are variable and may be established on time series.*

g) 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 five-year development plan and sections for year January-19 to 2022-23 workings showing pit layouts attached as Plate No. 6 to 10 at the scale of 1:2000 respectively.

h) Describe briefly giving salient features of the proposed method of working indicating Category of mine.

Salient feature of proposed method of working

Following design parameters are set for casting the mining proposal for ensuring next five years-

Category of Mine	Category A
Method of mining	Opencast (With adoption of drilling and blasting)
Production Target	The average annual production target of mineral limestone is proposed around **125000** tonnes per year
Bench Height and Width	Max. Height: **6m.** Width: Minimum width of bench shall be 6m
First bench -	Maximum 6m from surface

Limestone	
Drilling & Blasting	Occasional adoption of drilling and blasting
pit slope	The edge of excavation shall be adequately sloped and secured so as to prevent danger of sliding as per the Regulation 106 of the Metalliferous Mines Regulation, 1961. The face slope will be at 75 degree and overall bench slope will maintain at 33 degree.
Excavation and loading	Hydraulic excavator - 1.3 cum bucket capacity
Transportation within mine	Dumpers / Trucks
Transportation outside mine	Contractual trucks/dumpers

UTILITIES AND SITE SERVICES

- An office cum store with maintenance shed is near mine site. A first aid box with necessary medical facility is available and maintained at the mine office.
- Maintenance of all the machineries are done at lease area
- Power supply: The mine will work in one shift only in day time, so no electric power supply is required for mining operations. However the mine office is connected with eclectic supply.
- Water supply: there is no source of drinking water within the lease area. Drinking water & water for other purpose is brought from TCI tube well situated outside lease area. Drinking water stored in clean and hygienic water purifiers is provided to workers.
- Latrine and Urinal: latrine and urinal is provided as per rule.
- First-Aid Room: A first-aid room with all necessary medical facilities is provided as per mines act and mines rules.

f) 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.

Five year development and production proposal for the period January-19 to 2022-23

I year: (January 19- 31st March 219.)

DEVELOPMENT

Road leading to local quarries outside lease area near boundary pillar FT shall be connected at RL 1878m extended towards north in the lease area for making approach road to mining benches proposed at RL 1926m for a length of 682m on a gradient of 1:16 to 1: 20. The lower pit near boundary pillar HT at southern base of the hillock shall be reclaimed by spreading soil to make it suitable for plantation where by 670 trees shall be planted over an area of 670sqm. Barbed wire fancying for about 500m from boundary HT towards NT shall be undertaken.

Production:-

During this year excavation is proposed from January-19 by opening Bench M1 RL 1896m and downwards upto bench M3 RL 1878 m shall be opened from the west to east and taking a swing in the center towards northeast, whereby we could extract 29475 tonnes for a total face length of 270m, maintaining a face slope of 75° and pit slope of 33°.The maximum height of the benches shall be 6m and minimum width of the benches shall be 6m.

The production is shown in table below:

RL. MTRS	BENCH	Section 5-5' Reserves
1896-90	M1	1800
1890-84	M2	9225
1884-78	M3	18450
Total		29475

The pit position, plantation, road development and other developmental activities are shown in plate no. 6.

II Year: (2019-20)

DEVELOPMENT

During this year already developed haulage road shall be metalled. One checkdam shall be erected and safety bern having width of 1m* height of 2m for a length of 45m along boundary pillar HT shall be constructed by using dry masonary stones. Bardeb wire for 500m length shall extended along boundary pillar NT. Plantation for an area of 1100sqm shall be done where upon 1000 trees shall be planted.

Production:

During this year new BenchesM4 RL 1878m downwards to RL 1854m (M7) shall be opened in the west towards east taking a swing towards north east in the middle and finally moving towards south east for a face length of 324 m to obtain a total limestone of 127350 tonnes, maintaining the face slope of 75°and pit slope of 33°. The maximum height shall be 6m and minimum width shall be 6m.

The production is shown in table below.

RL. MTRS	BENCH	Section 5-5' Reserves
1878-72	M4	28350
1872-66	M5	35100
1866-60	M6	38250
1860-54 (54m face length only)	M7	25650
Total		127350

The pit position, plantation, road development and other developmental activities are shown in plate no.7.

III Year: (2020-21)

DEVELOPMENT

During this year safety bern wall having width of 1m and height of 2m for a length of 47m shall be carried further along boundary pillar HT towards GT also one check dam shall be erected in the central portion of excavation zone along boundary pillar ET, further barbed wire fancying for another 500m shall be continued on the northern side of the hillock from Boundary pillar NT on wards. The 1100 trees shall be planted over an area of 1163 sqm earmarked on the plan.

Production:

During this year the work on the bench M7 shall be continued for 36m to obtain 17100 tonnes of limestone, further another bench M8 RL 1854-48 and M9 RL 1848-42m shall be advanced from west to east for face length 216m to obtain 128350 tonnes of limestone. Totaling the production of 145350 tonnes of limestone. Maintaining a face slope of 75° and pit slope of 43°. The maximum height of the bench shall be 6m and minimum width shall be 6m.

The production is shown in table below.

RL. MTRS	BENCH	Section 5-5' Reserves
1860-54(for a length of 36m)	M7	17100
1854-48	M8	57825
1848-42	M9	70425
Total		145350

The pit position, plantation, road development and other developmental activities are shown in plate 8.

IV Year: (2021-22)

DEVELOPMENT

During this year the parapet wall for a length of 30m shall be erected near boundary pillar FT. Besides construction of one check dam shall be done. The. Further 500 trees shall be planted on 596 sqm near boundary pillar CT. The Barbed wire fencing around lease area for 500m shall be undertaken.

Production

During this year the production of limestone will be achieved by opening new Bench M10 RL (1842-36) for a face length of another 90m to obtain 78750 tonnes of limestone. Another bench M11 RL (1836-30) shall be opened in the west and continued towards north-north east for a face length of 90m to obtain 81675 tonnes of limestone there by a total of 160425 tonnes of limestone shall be extracted during this year for total face length of 180m, maintaining the face slope of 75° and pit slope of 33°. The maximum height of the bench shall be 6m and minimum width of the bench shall be 6m.

The production is shown in table below:

RL. MTRS	BENCH	Section 1-1' Reserves
1842-36	M10	78750
1836-30	M11	81675
Total		160425

The pit position, plantation, road development and other developmental activities are shown in plate 19.

V Year: (2122-23)

DEVELOPMENT

During this year parapet wall on the haulage road for a length of 35m near boundary pillar FT shall be constructed and maintaining the width of 0.75m and height of 1m for safe guard. One check dam shall be constructed for the safe guard of slope besides maintenance of other already constructed check dams shall be done. The plantation shall be done near boundary pillar HT for an area of 595 sqm planting 500 trees. Barbed wire fencing around lease area for 500m shall be undertaken.

Production

During this year the production of limestone will be achieved by opening a new bench M12 RL (1830-24) for a face length of 90m towards north-north east to obtain 86175 tonnes of limestone. Another bench M13 RL 1824-18 for a face length of 90m to obtain 76500 tonnes of limestone. Totaling 162675 tonnes of limestone. Maintaining the face slope of 75^0 and pit slope of 33^o, the maximum height of the bench shall be 6m and minimum width shall be 6m.

The production is shown in table below:

RL. MTRS	BENCH	Section 1-1' Reserves
1830-24	M12	86175
1824-18	M13	76500
Total		162675

The pit position, plantation, road development and other developmental activities are shown in plate 10.

The development works during the five year period is given below in tabular form.

Activity	I year January-19-2019	II year 2019-2020	Iii Year 2020-2021	IV Year 2021-2022	V Year 2022-2023
Already developed Haulage road	100m road to be Metaled	30m road to be metaled	30m road to be metaled	Maintenance	Maintenance
Check Dam		01 Check dam	01 Check dam	01 Check dam	01 Check dam
Parapet wall along southern side of the road				30m parapet wall	35m parapet wall
Retaining wall		45m safety bern	47m safety bern		
Barbed wire	500m	500m	500m	500m	500m

PRODUCTION DURING FIVE YEARS PERIOD IS GIVEN BELOW

Year	Bench with RL	Tonnes
I Year from January 2019 – to March 2019	M1 TO M3RL(1996-87)	29475
II Year (2019-20)	M4 to M7 RL(1887-54)	127350
III Year (2020-21)	M7 to M9 RL(1860-42)	145350
IV Year (2021-22)	M10, M11 RL(1842-30)	160425
V Year (2122-23)	M11 to M13 (1830-18)	162675
Total		625275

Extent of Mechanization

The operations in this mine will include drilling and blasting of limestone & transport to cement plant. The system for carrying out these operations and selection of machinery for the same are intimately inter-connected and therefore both have been discussed together.

Drilling:

Drilling of Horizontal/Vertical holes 102mm dia through wagon drill is proposed for mining of limestone. To control the problem of toes, a provision of 10% sub-grade drilling has been made. In case toes still tend to appear, these may be tackled by drilling and blasting of some toe periodically, depending upon the situation.

However if needed rock breaker shall be used from time to time for sizing the boulders. The length of holes is generally governed by the bench height. The larger the length of the hole, the more will be the burden and spacing, which in turn will

yield bigger size boulders in the blasted mass. If the shovel size is already fixed, as is the case in this area, and the boulders are too big for the shovel to load, secondary drilling and blasting for reducing the size of such boulder will have to be increased. On the contrary, the smaller the hole length, lesser would be the burden and spacing of holes which means more meter age of drilling for the same excavation. Accordingly for the 6m high benches adopted for this mine, the diameter of blast holes is proposed 102 mm.

The requirement of drills has been calculated as follows:

1	The maximum level of annual Production planned	162675 tonnes per year
2	Daily production required assuming 240 working days	678 tonnes
3	Requirement of Wagon Drills	
4	Yield per hole with a burden and spacing of3.0m x 2.5m, bench height 10m and specific gravity of limestone as 2.5.	3mx2.5mx10mx2.5= 80 tonnes per hole
5	Daily production required	678 tonnes
6	Number of holes to be drilled per shift.	8 nos.
7	Length of each hole with a sub-grade drilling of 10%	3.3m
8	Therefore meterage required to be drilled per shift	3.3x8= say 26 m
9	Expected performance of drills in proposed mine site per wagon drill in effective 5 hours per shift	30m
10	Therefore number of drills required for limestone production	26/30= 0.86 no's say 1 number

Breaking of big boulders:

The secondary blasting is detrimental to ecology and as such has been discarded. The production of limestone requires manual sorting. The manual sorting of big boulders involves their breaking. Therefore, for some time manual labour shall be involved to break the boulders into desired size of 400mm. after some time rock breaker shall be hired to break large size of boulders if any.

Transport of Limestone

The requirement of dumpers for the transport of limestone from the mine to the cement plant out as follow.

i) To and fro journey time :	
To and fro journey of 2.5 km mine road @ 15 km/hr From mine site to stack yard. , Cycle time of dumpers	30 min
Spotting and waiting	5 min
Loading (machine loading) 0.75cu mts bucket capacity	5 min
Turning and unloading	15min
Therefore total cycle time	60 min
ii) Requirement of dumpers :	
Limestone required to be transported per day	678 tonnes
Cycle time of dumpers	60 minute
Average load carried per trip	10 tonnes
Therefore round trips per dumper per hour	60/60=1
Taking 6 effective hours of utilization per shift	6 x 1 = 6, Say 6 trips
Average load carried per round trip	10 tonnes
Therefore average carrying capacity per dumper per shift:	6x 10 = 60
Therefore number of dumpers required	678/60 = 11.3, say 12 no's.
Stand by dumper @ 25%	1
Therefore total requirement of tippers	10 no's

After execution of lease deed the lessee has procured few dumpers on behalf on company side & as well as engaging dumpers on contract for the purpose of transporting limestone to the factory. The transport on contract basis works out to be slightly cheaper than the departmental transport possible because of the lower overhead expenses of the contractors. Therefore, it is recommended that this mixed system of transport shall be continued so that while complete dependence on outside agencies is avoided, some economy is also achieved in the operation.

No overburden shall be generated during course of mining, therefore requirement of dumpers for overburden disposal is not applicable in this mine.

B. General Services:

The opencast mining operations basically consist of drilling, blasting, loading and transport. But certain ancillary facilities are necessary for the efficient utilization of the machinery used in these operations. Thus facilities for supplying explosives for blasting at site, creating properly-shaped heaped of debris for efficient operation of loading units, water sprinkling on the transport roads for dust suppression, supplying fuel to diesel operated machinery working on the benches, routine maintenance of loading units at the face itself and provision of accessories for blasting such as exploders, ohm-meters, sirens, etc. are essentially required.

The requirement of excavator will be basically for cleaning the drilling area for loading and dozing of the scattered debris after blasting for creating properly –shaped heaps of debris for efficient loading operation. The excavator will also be helpful in the construction and repair of roads. Besides these regular jobs, excavator will also take care of miscellaneous jobs such as towing of other machines.

A diesel-driven truck-mounted water tanker of about 5000 liter capacity has been engaged for water sprinkling.

It is proposed to install a diesel pump within the proposed cement plant, it shall cater to the diesel requirement of machinery in cement plant and mine.

g) 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 and rehabilitation showing on a plan with few relevant sections.

The lease area is presently having mineable reserve of approx. 3.051 million tonnes of limestone expected from an area of about 9.81 hectares, which is fully prospected under G1 exploration. The rest of the lease area out of 44 hectares remains 34 hectares has already been covered through channel sampling which indicates the presence of limestone and thus can be classified as to have been covered through G3 level of exploration. It is further proposed to drill additional 12 drill holes of 25m each depth and whereby it is expected to cover at least the rest of the area under G1 exploration after confirming the quality and quantity besides extension of litho logical control. The production target in the first year has been kept from January-19 to March 2019 to obtain 29475 tonnes of limestone.

From second year production target of limestone is kept around 127350 to 162675 tonnes per annum to fulfill the current requirement. At this production rate the life of mine for current estimated mineable reserves will be around 24years. Once more reserves are proved by further exploration in years to come it is expected that life of the mine shall increase many fold. But at the same time the life of the mine then would also be dependent on the quantum of production envisaged at that point of time. At present it would be too early to conceptualize that situation. Overall the mining activity is expected to be carried out in 4 pits. The topographic and geological sequence from the surface Geological plan under section 1,2 and 3, reflects that bed B4 which is magnesium in nature and non mineralized overlies part of Bed B3. So while mining of the limestone care has to be taken

that no such limestone is envisaged to be mined out which has more than 1:1 ore to over burden ration which also shall become uneconomical. Besides the deposit of limestone and its reserves are too adequate that we can avoid working on more than 1:1 over burden ratio. Hence the ultimate pit (UPL) in that case has been taken as the line dividing the Bed B3 and B4.

Given the stratrigraphical and litho logical position of the lease area where by only two bands B1 & B3 are chemically suitable for cement manufacture. The other bands B0,B2 &B4 are siliceous, argillaceous and MgO limestone and as such are not suitable for cement manufacture. However Bed B0 and part of B2 having high silica could at one time be considered for blending with high grade limestone of other bands to make a suitable raw mix design, but at this stage it would be too early to envisage its utility. The present mining planning is confined to bed B3 only. The bed B1 having a thickness of about 20m is sandwiched between B2 & B3 could also not be considered for mining at present in future Bed B3 have chances of exploitation depending upon the need.

A conceptual plan showing pit position at the end of the life of the mine which at present is 28 years and end of the lease period which is 2048 i.e 30 years, hereafter, have been given with relevant sections showing the position of lease with due reclamation and rehabilitation and is attached as **plate no.13.**

Life of the mine based on present mineable reserves, proposed production during five year plan period is given in following table.

Total mineable reserves	3472445	Tonne
Average Rate of production	125000	Tonne/Year
Total mine life	28	Years

The phased restoration of the mined out benches shall be under taken in the following manner. The envisaged mining benches from top RL 2214m to RL 2070m in the eastern sector and RL 2004m to RL 1818m in the central portion shall be restored in the phased manner five yearly plans and plantation, check dams , retaining walls, parapet walls etc shall be developed as per the need at that point of time. Presently the plantation has been depicted on the envisaged benches in the conceptual plan of the lease area.

Time Frame of Completion of Exploration:

S.NO	Year	Bore hole No.	Depth of each hole	Location
1	Ist year(2018-19)	PBH1	25m	E449,N327
2	II Year (2019-20)	PBH2 PBH3 PBH4	25m 25m 25m	E626,N680 E790,N678 E810,N570
3	III Year(2020-21)	PBH5 PBH6 PBH7	25m 25m 25m	E939,N615 E947,N431 E1190,N590
4	IV Year(2021-22)	PBH8 PBH9	25m 25m	E1110,N410 E1380,N480
5	V Year(2022-23)	PBH10 PBH11 PBH12	25m 25m 25m	E1380,N480 E1287,N545 E1280,N646

With the help of above exploration, almost 100% of the area shall come under G1 axis by the year 2022.

The Shape & size of approximately 4 mining pits at the end of lease period is given below:

Year	Area (Ha.) Trapezium	Shape
2048	1.4150	By & large Shape of lease area

Sites for Disposal of Waste Rock and Sub grade Mineral:

The lease hold consists of limestone. It is proposed that only limestone will be

extracted during this plan period.

Infrastructure facilities: About 0.006 hectare area will be occupied by check dams, retaining walls, parapet walls and further parapet walls discussed in development chapter shall be erected.

Road: 535m long road is already occupied by development of haul roads.

Afforestation: The plantation shall be mostly done in south eastern corner of the lease area near boundary pillar A.Year wise details of plantation are given as under.

Year	Area (Ha.)	No. of sapling proposed to be planted
January-19	0.0670	670
2019-20	0.11	1000
2020-21	0.1163	1100
2021-22	0.0596	500
2022-23	0.0595	500
TOTAL	0.9479	3770

Rehabilitation of benches:

By the end of lease period, top benches from RL 2214m downwards are proposed to reach the ultimate pit limit therefore plantation shall be carried out over the benches.

Ultimate Pit Limit:

An ultimate pit limit has been marked after leaving a non-mineable barrier zone of 7.5m on all sides measuring 2.5 hectares, 12.5632 is mineralized and rest of the area measuring 31.43 hectares is proposed to be covered for future exploration to identify the deposit suitable for exploitation.

The shape of this deposit is by and large a polygon. Mining shall be done through mechanized open cast method. The haulage road of 535 meters shall be used for opening of faces and transportation of mineral. The alignment of mining faces shall be by and large west to east direction. During the present plan period the benches from RL 1896m downwards to RL 1818m shall be developed and worked out in phased manner in the future planning beyond this plan period.

After conducting further exploration in the form of drilling etc. on the upper slopes preferably from RL 2214m down wards to RL 2070m. It would be advisable to block of the area covering Bed B0,B2&B4 it further exploration and its value added use as a silica supplement in raw mix design is worked out. The height and width of the benches shall always be kept as maximum 6m and width minimum 6m with angle of mining faces to be kept around 75° to 80° degrees maintaining ultimate pit slope of 33°. The alignment of the mining faces shall be by and large north north-east to south south-west towards the end of life of the lease the worked out benches would have to be covered with 0.4m soil to make them worth plantation. The terraced hillock shall be

planted in such a manner to give it ecofriendly look besides erection of check dams and retaining walls around the lease area for stability of the slope. At the bottom of the ultimate pit limit mass plantation shall be carried out.

STACKING OF MINERAL REJECT AND DISPOSAL OF WASTEEND OF LIFE OF MINE

The area consists of high grade limestone having no top soil cover therefore no top soil sub grade mineral or mineral reject shall be generated. Negligible quantity of siliceous limestone may be generated incidental to operation of benches in the cement grade limestone. And this quantity shall be utilized in the road making etc.

Table: Calculation of Mineral Rejects

Year	Top Soil (cum)		Mineral Rejects (cum)			
	Reuse/ Spreading	Storage	Backfilling	Storage*	Blending	Beneficiation
2018-19	Nil	Nil	Nil	Nil	Nil	Nil
2019-20	Nil	Nil	Nil	Nil	Nil	Nil
2020-21	Nil	Nil	Nil	Nil	Nil	Nil
2021-22	Nil	Nil	Nil	Nil	Nil	Nil
2022-23	Nil	Nil	Nil	Nil	Nil	Nil
Total	Nil	Nil	Nil	Nil	Nil	Nil

Backfilling of Void: As there is no OB lying inside the lease area, so there will be no backfilling material available to backfill the void, thus the void generated if any will be converted into the water-reservoir for storing surface run off.

Reclamation and Rehabilitation: No proposal for backfilling of pits or works out area is made in this review of mining plan. At the end of mining worked out area will be leveled and used for plantation.

As the conceptual planning, green belt of suitable width shall be developed along south western part of the lease area earmarked for plantation. The row of plants facing mine shall be of smaller species and those facing outside shall be of taller species. The post plantation care is proposed to maintain the growth of plantation. Plantation will reduce the land erosion possibility in the surrounding area.

The void formed at the base of worked out area will be left to be recharged by rain water (in leve ground). This front portion at the base of hill lock about 1 hectare shall be rendered plain where mass plantation shall be made as shown on 'Conceptual Plan' attached as Plate 13.

FENCING AROUND LEASE AREA

Barbed wire fencing around lease area shall be done on year wise basis as shown in

Table 8.3. as well as plate 13,14 & 15.

B. UNDERGROUND MINING - Not Applicable

3.0 MINE DRAINAGE

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

The average depth (m) of the water table based on observations from nearby village tube wells is given below:

Max. Water Table	Min. Water Table
180 m	170 m

b) Indicate maximum and minimum depth of Workings.

Proposed Maximum and minimum working depth during ensuing five years will be 78m and 6m from surface. Proposed working area will be in between RL 1896m to RL 1818m along hill slope.

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 mine excavation activity in the next five-year period will be above the ground water table. Hence, mining will not have any impact on ground water in the area. All the rain water flows down to lower side in the lease area. There it is allowed to pass through settlers to arrest any silt in the water. Clean water is allowed in the natural drainage system. Limestone is non-toxic and hence no chemical treatment of mine water is required. Periodical quality monitoring will be carried out and reports submitted to concerned authorities. The ground water analysis report shows drinkable water in **Annexure no 9B.**

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.

The area is dry hilly with dendritic type of drainage in the form of dry nallahs dissecting the main hillocks. Three dry nallahs (DATRIPATRI, BAJNAR, GUNSNAR) drain rainy water down in to main Dune valley which ultimately recharge the groundwater.

The mine is situated at higher altitude from surrounding level so during rainy season, water will drain out from nearby areas into nallah. Within lease area no mine out limestone is left behind on slopes so the possibility of rolling of stone during rainy season does not arises.

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4.0 STACKING OF MINERAL REJECT /SUB GRADE MATERIAL AND DISPOSAL OF WASTE - NA

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

The lease area is devoid of overburden. Limestone is exposed on the surface itself. Very thin layer of soil exists at places and this gets mixed up with limestone which is disposed of for cement making. The siliceous and MgO limestone which forms part of the lease area in east and west shall not be mined at present so, no waste or mineral reject is expected.

Table: Year-wise quantity of Top soil, OB/waste and Mineral Rejects

Year	Top Soil (cum)		Mineral Rejects (cum)			
	Reuse/ Spreading	Storage	Backfilling	Storage*	Blending	Beneficiation
2018-19	Nil	Nil	Nil	Nil	Nil	Nil
2019-20	Nil	Nil	Nil	Nil	Nil	Nil
2020-21	Nil	Nil	Nil	Nil	Nil	Nil
2021-22	Nil	Nil	Nil	Nil	Nil	Nil
2022-23	Nil	Nil	Nil	Nil	Nil	Nil
Total	Nil	Nil	Nil	Nil	Nil	Nil

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.**

There is chance of generation of siliceous material incidental to mining which is negligible and shall be utilized in road making etc. Therefore no proposal for dumping is given.

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

Not Applicable. As the area is devoid of OB/ waste thus no permanent dump for disposal of waste is required. The talus, Scree, Quarry cuttings of limestone shall find it use in cement industry.

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5.0 USE OF MINERAL AND MINERAL REJECT

The following are to be furnished in the interest of mineral conservation.

a) Describe briefly the requirement of end-use industry specifically in terms of physical and chemical composition.

The Limestone should be such, to satisfy LSF. Generally, Cao should be + 44%, with Mgo< 2.5%, SiO_2< 12.5% for making cement & lime. Other additions are low grade limestone with higher silica, clay, iron ore/blue dust as per raw mix design. The limestone of the lease area is suitable for crushing through jaw crushers, the crushing strength of limestone is 58 N/m3. Chemically it satisfies LSF (Lime saturation factor) and as such is fed to 400 TPD cement plant (TCI CEMENT PLANT) installed 2.5km away from the lease area. The cement thus manufactured is sold in market. The end use of this limestone is making of cement.

Table: Typical Chemical analysis of Cement Gr. Limestone

CaO (%)	MgO (%)	Fe2O3 (%)	Al2O3 (%)	SiO2 (%)	LOI
52.0	<2.5	0.81	1.46	2.42	42

No changes are proposed in the use of mineral. Limestone produced at this mine is sent to crusher attached with cement plant and in future also the same will continue.

Cement Manufacture:

Chemical composition	Acceptable range for OPC %	Limiting value for other type of cement, scope of beneficiation and blending %
CaO	44 – 52 %	40
MgO	Max 3.5 %	Max 3.5
SiO_2	To satisfy LSF, Silica & Alumina Modulii of raw mix	
Al_2O_3		
Fe_2O_3		
Mn_2O_3	<0.5	<3.0
R_2O	<0.6	<1.0
Total S as SO_3	<0.6	<0.8
P_2O_5	<0.6	<1.0
Cl	<0.05	<0.1

b) Give brief requirement of intermediate industries involved in upgradation of mineral before its end-use.

No intermediate industry is required for up-gradation.

c) Give detail requirements for other industries, captive consumption, export, associated industrial use etc.

Not applicable, as this mineral is only for captive use.

d) Indicate precise physical and chemical specification stipulated by buyers

As the ROM is being used for the Captive consumption and specifications are already mentioned in above 5.0 a) section.

e) Give details of processes adopted to upgrade the ROM to suit the user requirements.

No up-gradation of ROM is needed.

The useable mineral recovered from ROM may not be directly used in any industry and may need intermediate process to suit the user industry in terms of physical and chemical compositions. The limestone needs crushing to 25mm size for further processing in cement technology. The limestone crusher and cement plant is located about 2.5km from lease area.

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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 beneficiation of ROM is needed as it suits the requirement of industry, only crushing is involved.

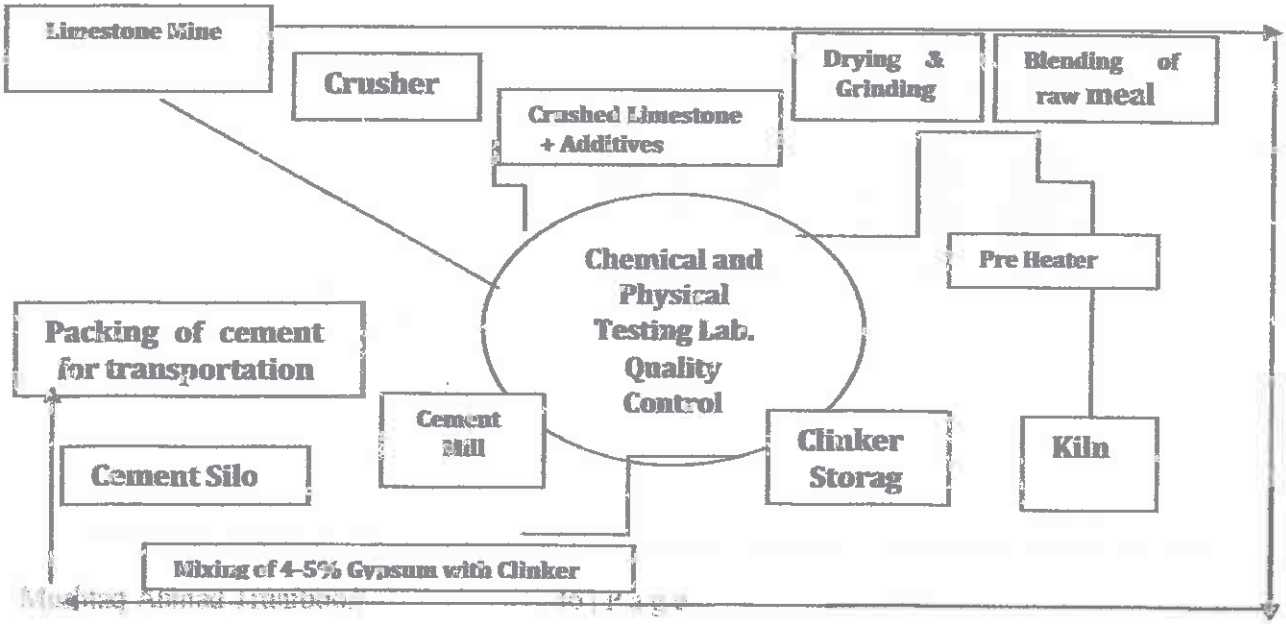
b) **Give a material balance chart with a flow sheet or schematic diagram of the processing procedure indicating feed, product, recovery, and its grade at each stage of processing.**

The cement plant under the name and style of Trumboo Cement Industries is located 2km away from lease area.

Flow sheet of Material Balance Chart:

Material balance chart.

Mining of limestone, sizing upto 600mm size and transportation in tippers and feeding to crusher. 20mm size crushed material is mixed with other additives like silica, alumina and iron to make raw mix as per chemical proportion. The crushed material raw meal is fed to raw mill for further grinding, then this raw mix is fed to pre-heater from where the pre calcinisedmaterial is fed to kiln for burning whereby clinker is formed. After cooling the clinker, it is mixed with 4 to 5% gypsum and fed to cement mill for further crushing. The cement is air lifted to cement silo and packed in bags of 50kg for marketing. The role of chemical and physical testing lab of quality control deptt. is defined at right from mining of suitable material, preparing raw mix design and clinker formation, testing of cement for strength.



c) **Explain the disposal method for tailings or reject from the processing plant.**

Not Applicable. No tailings or reject shall 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.**

Not Applicable

e) **Specify quantity and type of chemicals if any to be used in the processing plant.**

Not Applicable

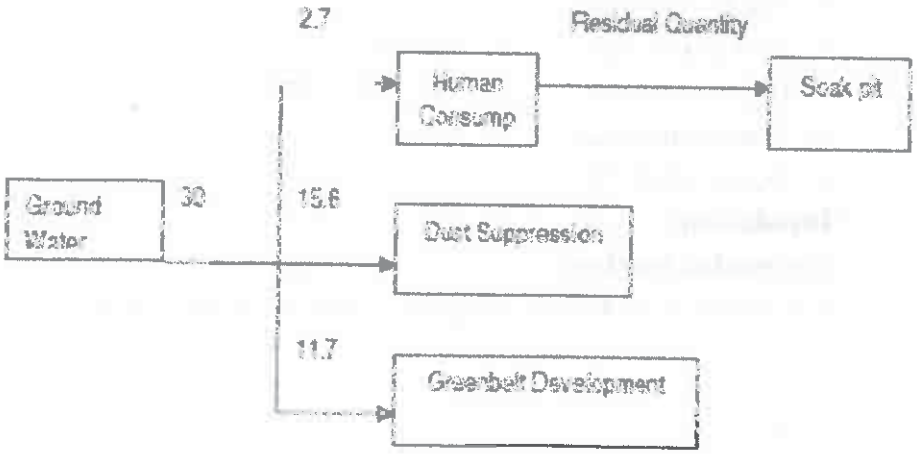
f) **Specify quantity and type of chemicals to be stored on site / plant.**

Not Applicable

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 mining doesn't need water, except 3000 liters for sprinkling on roads and wet drilling for dust suppression and shall be brought from company tube well per day for such purpose. The limestone broken to 400mm size in the form of soling is despatched to cement plant.

The projected water requirements for the mine site are likely to be in the range of 60 KLD. It is to be noted that due to mechanical nature of mining in this lease the water requirement for the dust suppression will be optimal. Water balance diagram is given below:



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7.0 OTHER

Describe briefly the following:

a) **Site services:**

Office cum rest shelter for mining staff & labour has been erected at bottom of hillocks where toilet, drinking water & first aid is provided.

As regards to other specific mine site service requirements, the position is as follows:

Rest Shelter: Rest shelter along with first-aid station complying with all the provisions of Mines Rules is constructed out side of the company private land itself.

Water Supply: There is a deep tube well adjacent to cement plant from which water will be supplied for drinking and toilet purpose as well as for dust suppression measures.

Power Supply: The mine will work in one shift (i.e. general shift) only, so no lighting arrangement will be required. At present there is no electric supply.

Workshop & stores: These are situated with our cement establishment and will be serving to the machineries deployed at this mine.

All other facility like regular medical check-ups and other benefits to be provided to the mine workers regarding their health as per Mines Act 1952 are already provided.

b. Employment potential :

1. Manager Mines	-	1
2. Mining Geologist	-	1
3. Mining Engineer	-	1
4. Mine Mate/Blasters	-	2
5. Machinery Operators	-	2
6. Extractors, Labours for breaking of limestone to size	-	10
7. Office Clerks	-	2
8. Shovel Operators	-	2
9. Compressor Operators	-	2

Un-skilled:

Piece rated workers - 15

The services of following persons/agencies have been retained on part time basis.

i) Geo-technical consultant

ii) Mines surveyor

8.0 PROGRESSIVE MINE CLOSURE PLAN UNDER RULE 23 OF MCDR'2017

8.1 Environment Base line information:

I. Existing Land Use Pattern:

The lease area is a government barren land and part of Survey No. 3973/3002/1 min which falls under survey of india topos sheet no. 43J/16

The highest R.L. in the block is 2214m MSL near Boundary Pillar (LT) and lowest RL is 11692m MSL near boundary pillar "HT". No prominent drainage pattern exist within the lease area, water follows down the slope and is generally flowing towards low lying fields which carry water only during rainy season, otherwise remain dry for most of the year.

The whole are area is govt. / Shamliat deh/ Kacharie.

Existing land use pattern is given as below:

TABLE – 8.1 Existing land use pattern

Sl. No.	Head	Area put on use at start of Mining Plan (ha)
1.	Area under mining (old pit, Prop. Pit & trench)	4.679
2.	Storage for top soil	0.0000
3.	Waste dump site	0.0000
4.	Mineral storage	0.0000
5.	Infrastructure - workshop, administrative building etc.	0.0000
6.	Roads	0.321
7.	Green belt/rehabilated	00000
8.	Tailing pond	0
9.	Effluent Treatment Plant	0
10.	Crusher	0.000
11.	Forested land	0000
12.	Others(channel retaining wall)	0.00
13	Grand Total	5.00
14.	Remaining Lease area	39
15	Grand Total (Lease area)	44

II. Water Regime, quality of air and ambient noise level, flora, climatic conditions

The base line data is tabulated below.

S.NO	Regime	Value	Remarks
1.	**Landform:** Undulated, hilly rugged terrain with steep to moderate slope.	Higest RL 2214m near boundary pillar LT, Lowest RL 1692m near boundary pillar HT. General drainage from north to south merging into dune valley.	
2.	Ground water/ Surface water	No surface water is available in the lease area. The ground water table is about 300mts. Below surface. Small fresh water springs are emanating from limestone caves in wuyan village 2km. south west from lease area.	
3.	Hydro geological studies	Water table aquifer is unconfined. Its flow is controlled by porosity and karstic topography. One tubewell has been drilled for 100mts one km away from lease area along wuyan check road. The water is fresh and portable.	
4.	Water balance chart.	Water in mining is required from dust suppression on roads and wet drilling, besides domestic consumption. Total $3m^3$ of water are got from TCI Tubewell in the truck mounted tanker and consumed in full to get ultimately soaked in the earth.	
4.	Flora & Fauna	The lease area is dry hilly with few thorny bushes on stony topography. Coniferous forest lies on the upper side of the lease area in dathripather outside the lease area. The wiid animals including stray jackals, snakes are present.	
5.	Climate	The winters are frosty and cold from December to march and summers are warm and pleasant. Average summer temperature is 28 to 30^{o} C and winter 5 to -6^{o} C	

AIR Monitoring	Station	PM10	PM2.5	SO2	NO2	CO	Lead
	Mine area	88.4	53.7	15.2	32.6	< 1.15	< 0.1
	Khonmoh	87.6	53.8	16.3	34.8	< 1.15	< 0.1

The Air quality report is at **annexure 7.**

Noise Monitoring	Station	Value	dB(A)
	Mine Pit	Leg 60.1	
	Near Haul road	Leg 61.2	
	Mine Office	Leg 59.8	

The Air quality report is at **annexure 9.**

Water quality: The water of the tube well of TCI is portable and safe for drinking purposes the water analysis report is at **annexure 8.**

ix) Human Settlement:

There is no village and hutments within the lease. Farming is the main job of the people of Bathyn and nearby villages.

TABLE-8.2

S.No.	Name of Village	Total area of village (Ha.)	Total Population
1	Khonmoh	196	8630
2	Sangar	150	584
3	Chak	70	357
4	Wuyan	1156	5874
5	Zawoora	60	880
6	Namblan	59	332
7	Khrew	80	15230
8	Bathyan	551.1	862
9	Sharshali	655.6	6178
10	Mandakpal	230.20	1256
11	Zantrag	187.40	616
12	Nagender	167.90	351
13	Satapokrin	332.70	1342
14	Lodou	904.90	4604

The locals are farmers, quarry holders and transporters. Paddy, Maize, Saffron cultivation is main profession. During winter the labour class

migrates to Jammu, Punjab and other valuables districts to earn their livelihood.

III. Public Building, Place of Worship and Monuments:

Juwalamukhi Temple at Khrew is of historical importance located at distance of 6.0 Km from mine.

IV. Indicate any Sanctuary located in the vicinity of the leasehold:

Dachigam wildlife sanctuary exists in the vicinity of lease hold at a distance of 6Km from lease area.

8.2 Environment Impact Assessment:

(i) Land area usage:

At the end of five year plan period, the damage to the landscape in the form of pit & road, about 4.679 hect will be degraded. The area influence of mining at the end of year is given below:

TABLE – 8.3 Existing vs at the end of Plan period land use pattern

S.No.	Head	Area put on use at start of the plan (in hectare) A	Additional required during plan period (in hectare) B	Total area (in hectare) C=(A+B)
1	Area under mining (old pit, Prop. Pit & trench) including road	3.59	1.41	5.000
2	Storage for top soil	0.0000	0.0000	0.0000
3	Waste dump site	0.0000	0	0.0000
4	Mineral storage	0	0.000	0.000
5	Infrastructure - workshop, administrative building etc.	0.000	0.0000	0.0000
6	Green belt / Forested area including	00000	0.000	000000
7	proposed plantation	0.00	0.4124	00000
8	Reclaimed area	0	0	0
9	Mineral Separation Plant	0.000	0.000	0.000
10	Township area	0	0	0
11	Others(channel, retaining wall)	0.002	0.000	0.000
12	Grand Total	3.592	1.822	5.00
13	Remaining Area	40.408		39
14	Lease Area	44		44

(ii) Air Quality:

In mining activity main pollutant of air is suspended particulate matter (SPM). Dust will be generated from drilling, blasting, transportation and sizing

Table: Air pollution monitoring and control measures

Potential Impact	Action	Parameters for Monitoring	Timing
Air Emissions	All equipments are operated within specified design parameters.	Random checks of equipment logs/ manuals	During site clearing
	Vehicle trips to be minimized to the extent possible	Vehicle logs / increase the capacity of vehicle	During site clearing, transportation of minerals
	Topsoil (if any) must be removed from the entire area to be mined and stored from where it can be recovered and utilized immediately in other areas.	Absence of stockpiles	During site clearing
	Use proper drills bits for drilling holes and wet drilling method.	Random check of equipment used for drilling	During blast hole drilling
	Regular water spraying shall be done	Quantity of water requirement shall be monitored	During site clearing, transportation etc.
	Ambient air quality within the premises of the proposed unit to be monitored.	The ambient air quality will conform to the standards for SPM, SO_2 and NO_2	As per CPCB requirement. The air quality shall be monitored at monitoring station 'A' earmarked on the plan.

(iii) Water Quality:

The lease area does not contain any prominent features. The deposit does not contain any harmful contents such as sulfur, potash etc, so it is not going to affect the quality of water in surrounding area. The depth of ultimate pit in the lease area will be much above the level of ground water table.

Table: Water quality monitoring and control measures

Potential Impact	Action	Parameters for Monitoring	Timing
Water Quality	During extraction of mineral proper care should be taken such that it does not disturb the ground water table. The water shall be regularly tested for qualitative analysis.	No discharge of waste water from mining operation	During mining operation
	After extraction of mineral, rainwater will be stored in void generated.	Quantity of water used for green belt development	During mining operation.

(iv) Noise Levels:

Noise pollution in mining is due to operation of drilling, blasting and HEMM equipment. Occasional plying trucks on the road will also cause impact on ambient noise quality.

It will not cause any problem to the inhabitants of this area because there is no human settlement in the close proximity to the lease area. The nearest village is far away to be affected by noise pollution. However noise level monitored at the monitoring station 'N' ear marked on the plan.

Table 6-5: Noise quality monitoring and control measures

Potential Impact	Action	Parameters for Monitoring	Timing
Noise	List of all noise generating machinery onsite along with age to be prepared. Equipment to be maintained in good working order.	Equipment logs, noise reading	During mining operation.
	Generation of vehicular noise	Maintenance records of vehicles	During transportation.
	Implement good working practices (equipment selection and sitting) to minimize noise and also reduce its impacts on human health (ear muffs, safe distances and enclosures). Adopt good blasting practices to reduce impact on flora and fauna. Muffling will be done at the time of blasting	Site working practices records, noise reading	During blasting
Noise	Noise to be monitored in arabient air near blasting shelter and at the lease boundaries.	Noise reading	As per GPCB requirement or quarterly whichever is earlier.
	The Noise level should not exceed the permissible limit both during day and night time.		
	All equipment operated within specified design parameters.	Random checks of equipment logs/ manuals	During mining operation
	Vehicle trips to be minimized to the extent possible	Vehicle logs	During mining operation
	Plantation of dense hedges on the boundary of lease area, these will reduce dust and noise in the vicinity area.	Adhere to mine closure plan	

(v) Vibration Levels (Due to Blasting):

During blasting, all the necessary measures will be taken for minimizing noise and vibration, like optimum charge per delay, various controlled blasting techniques etc. However there will be little impact in and around 500 mts of this area which is un populated as well. it is proposed to conduct regular monitoring of the vibration levels with the help of Seismograph.

Potential Impact	Action	Parameters for Monitoring	Timing
Ground Vibrations due to Blasting	Good blasting layout must be adopted Adopting less number of holes per delay	Vibrations due to blasting shall be monitored daily. With the help of portable (Seismograph) which is being procurred shortly.	At the time of blasting or based on the blasting data

(vi) Water Regime:

Surface water: There is no surface water accumulation within the area of mining, and hence there will not be any impact on surface water.

Ground Water: The mining excavation will not go deeper down the ground level, because limestone deposit is an elevated one, above the ground level, excavation of which will never touch the ground water table. Hence no question of ground water pollution arises.

(vii) Acid Mine Drainage:

The deposit does not contain any harmful contents such as sulfur, potash etc, so it is not going to affect the quality of water in surrounding area. Also no dumps are to be maintained lease area to cause any AMD issue.

(viii) Surface Subsidence:

Not Applicable as this is an Open pit Mining however the mined out pit will not be deep down in the ground so no risk of Surface subsidence involves with this project.

(ix) Socio Economics:

Mining in this lease will give more job opportunity directly and indirectly to the local people. This will reduce in the migration of jobless labourers from native places to other distant places.

The project will not generate hazardous dust and also human settlement is about 1kms away from mining area. Thus, mining will not have any adverse impact on the village human settlement.

(x) Historical Monuments:

There is no monuments related to historical importance found in the core as well as buffer zone area. Except one temple known as Jawalamukhi Temple situated on the hillock near khrew village is of some historic importance.

Monitoring Schedule of Environment data:

S.N.	Activity	Schedule
	Air Pollution Monitoring	
1.	Ambient air monitoring of parameters specified by CPCB in their air consents from time to time within the TCL's mining lease	Once in every season except monsoon
2.	Ambient air monitoring of parameters specified by GPCB in their air consents from time to time at stations outside TCL mining lease	Once in every season except monsoon
	Water Quality Monitoring	
3.	Monitoring water quality from rain water collected in mine pit area. Rain water will be used for plantation purpose.	During Monsoon
4.	Monitoring of one sample of tube well and open well at mine / nearby location. Parameters are essential parameters as per IS: 10500:1991.	Once in every season except monsoon
5.	Monitoring of water spray requirements	Log-sheet of water spray will be maintained on daily basis
	Noise Quality Monitoring	
6.	Noise in the ambient atmosphere in other mining leases.	Once in every season except monsoon
	Greenbelt Maintenance	
7.	Monitor schedule for Greenbelt development as per approved mining plan	Yearly
	Soil Quality Monitoring	
8.	Soil at two locations	Once in every year
	Ground Vibration monitoring	
9.	Close to human settlement or other structure or at 300m from blasting side.	Daily

8.3 Progressive reclamation Plan:

To mitigate the impacts and ameliorate the condition, describe year wise steps proposed for phased restoration, reclamation of lands already/to be degraded in respect of following items separately for 5 years period.

8.3.1 Mined-Out Land: Describe the proposals to be implemented for reclamation and rehabilitation of mined-out land including the manner in which the actual site of the pit will be restored for future use.

A. Sustainable Mining.

Due to repeated persuasion by IBM authorities and some NGOS, the mine owners have waken up to the call and have started to develop plans bearing in mind local conditions and mines life cycle – main focus on safe and healthy atmosphere, economic, social environmental issues to reduce negative effects on communities, vegetation, wildlife, water, land and air. Following steps are needed to be taken/have been taken by the lessee in this regard for Sustainable mining in this area. Accordingly year wise development proposals for the coming plan period is given in brief in tabulated form as under.

Year	Activity	Proposed jobs	Expenditure in Rs.
2018-2019	Barbed wire fancying along lease boundary.	500m.	Rs/ 400000.00
	Plantation and maintenance	670 trees	Rs/ 77000.00
	Monitoring of Air, Water, Noise and ground vibrations due to blasting including cost of vibration sensor seismograph.	Seasonal	Rs/ 470000.00

Year	Activity	Proposed jobs	Expenditure in Rs.
2019-2020	Barbed wire fancying along lease boundary.	500m.	Rs/ 400000.00
	Plantation and maintenance	1000 trees	Rs/ 110000.00
	Monitoring of Air, Water, Noise and ground vibrations due to blasting	Seasonal	Rs/ 220000.00

Year	Activity	Proposed jobs	Expenditure in Rs.
2020-2021	Barbed wire fancying along lease boundary.	500m.	Rs/ 400000.00
	Plantation and maintenance	1100 trees	Rs/ 120000.00
	Monitoring of Air, Water, Noise and ground vibrations due to blasting	Seasonal	Rs/ 220000.00

Year	Activity	Proposed jobs	Expenditure in Rs.
2021-2022	Barbed wire fancying along lease boundary.	500m.	Rs/ 400000.00
	Plantation and maintenance	596 trees	Rs/ 69600.00
	Monitoring of Air, Water, Noise and ground vibrations due to blasting	Seasonal	Rs/ 220000.00

Year	Activity	Proposed jobs	Expenditure in Rs.
2022-2023	Barbed wire fancying along lease boundary.	500m.	Rs/ 400000.00
	Plantation and maintenance	595 trees	Rs/ 69500.00
	Monitoring of Air, Water, Noise and ground vibrations due to blasting	Seasonal	Rs/ 220000.00

a. All the necessary measure have already been suggested to conduct safe, healthy working atmosphere including minimizing ground vibrations and Air Over Pressure, celebration of SAWACHHTA PAKHWADA from 16 Oct to 31 Oct 2018 Annexure 16. The techniques and safety measures are already in place viz, development of the mine taking safety measures and minimizing risk factors.

b. The mine workers are given suitable wages, allowances besides soap, oil, gud on monthly basis and cement on concessional rates.

c. Towards local welfare necessary funds to the tune of approximately 5.7 lacs have being spent from Oct. 17 to march 2018 towards Corporate Social Responsibility (CSR) Annexure 15. by providing cement on concessional rates, widow fund, funds for school, mosque, play ground, roads besides a Tubewell to

augment the water supply for locals of Village Wuyan and around. Besides about 30 workers have been appointed from the adjacent locality.

d.The limestone mine is already covered with EC where under the stipulations and conditions imposed by MOEF and SPCB are taken due care by monitoring Air, Water, Noise quarterly submitting the report to the concerned besides taking preventive measures for reducing the adverse impact of mining on the environment. Water spraying on the roads through companies' water tanker, use of air plugs and other protective equipments for the mine workers lubrication of machinery, development of green belt towards southeastern side of the lease.

e. The wild life sanctuary is 6 Km away from the lease area there is no appreciable species of wild life in the lease area except few jackals, snakes (non venomous). However the lease area is already covered by NOC from Wild life and in future if any protective measures are suggested those will be taken care of.

f. Water regime, quality of air, ambient noise level, flora and fauna, climatic conditions have already been discussed in the environment chapters and all the precautions are taken to make this mining an ecofriendly activity so that the fruits of sustainable mine development are reaped.

B. Reclamation Plan.

The following measures have been taken to mitigate the effects of mining and reclamation thereof.

The mining shall be done forming benches of maximum 6m height and minimum 6m width with face slope of 75° and pit slope of 33°. The chances of destabilization of slopes and vegetated areas shall be reduced to minimum. The following measures shall be under taken to safe guard the mined out land .

1. The parameters and design of mining faces shall be maintained.
2. The boulders on the edges of the benches shall be removed and not allowed to be rolled down instead shall be broken on spot and removed.
3. The area is hard rock country with very little soil as over burden. Protective engineering measures such as erection of Retaining Walls, Checkdams, Parapet Walls, Dressing of worked out benches shall be resorted to.
4. No bench at present shall reach to the ultimate pit limit and as such the plantation shall be restricted in the lower part of the lease area earmarked as green belt near boundary pillar A. About 30cm of the soil shall be spread over this portion for making it ready for plantation.
5. There is no surface water or under ground water available in the lease area which shall need conservation or treatment. The rain water in the form of surface runoff shall get discharged through natural drainage down below in the main valley floor.
6. In order that the lease area will be free from other encumbrances and entry of stranger human being, stray cattle etc. it is advisable that the whole lease area

is properly fenced with six parallel line barbed wire 2m height with 1.75m poles intervals.

The details with respect to protective engineering measures have already been discussed in the relevant chapters viz, Development of mine etc. the other measures for the ecofriendly mining and handling of the mined out land is given as under:-

i) **Aesthetics:**

Mining operations open ugly sights of dug out slopes and fuming debris which in the hills are visible from long distances. It is desirable to screen away such sights so that inevitable unpleasantness of operations is not exposed to the public eye. Well planned plantation of ornamental trees improves the aesthetic value of land.

ii) **Production:**

Trees and shrubs produce timber, fodder, fuel, fruits, fibers etc. for direct use of village community.

Programme of Afforestation:

Based on the above consideration, the following afforestation programme has been worked out:

a) **Mining area:**

The mine faces will be rehabilitated in the following manner:

i) After completion of mining bench, it will be left exposed for about one month for weathering and for soil working.

ii) The soil working will consist of waste & soil. Smaller pieces of waste rock should first be laid for about 200mm and about 300mm, soil layer will be spread over it. If more soil is easily available it will be advantageous to have this layer even thicker.

iii) 500mm high dry-stone wall should be constructed along the bench edge. The bench filling should be kept slightly sloping say 1 in 200, inward to facilitate drainage.

iv) On the outer 1/3 rdwidth of the bench, grasses and shrubs will be planted at 1m x 1m spacing.

v) Tree species should be planted in the inner two third width at 1.5m x 1.5m spacing in pits prepared in advance.

vi) The species recommended for planting are:

Grasses & Hedges:	Local grass, Pudina, ivory hedges
Shrubs & Herbs:	Zeera, Ven, rose
Trees:	Kikar, Walnut, white willow, Handoon

Various methods adopted for reclamation and afforestation of mining benches are as below: