M/S MURLI AGRO PRODUCTS LIMITED
(Cement Unit)

**

CHEDVAI LIMESTONE LEASE

M.L. Area - 695.72 ha
(Forest Area - 527.48 ha)
District Chandrapur, Maharashtra

**

MINING PLAN

(Submitted under Rule 22
of
Mineral Concession Rules - 1960)

**

VOLUME ONE: TEXT & FIGURES
**

Prepared by
MINENVIRON SYSTEMS PVT LTD
NAGPUR

SEPTEMBER, 2007

MINENVIRON SYSTEMS PVT. LTD. NAGPUR

10/10/07

GOVERNMENT OF INDIA
MINISTRYT OF MINES
INDIAN BUREAU OF MINES
MCCM CENTRAL ZONE

314(3)/2007-MCCM(C)/MP-20/1419

Dated: 26/10/07
29-10-07
01/11/07

To
M/s Murali Agro Products Ltd.,
(Cement Unit)
101, Jai Bhavani Society,
Central Avenue, Wardhaman Nagar,
Nagpur - 440008

Subject:- Approval of mining Plan of Chedvai Limestone Deposit, over an area of 695.72 ha. in Chandrapur district of Maharastra State, submitted by M/s Murali Agro Products Ltd., under Rule 22 of MCR 1960 for grant of mining lease.

Ref: 1) Your RQP's letter No. Nil dated 01.08.07
2) This office letter of even no. dated 14.09.2007
3) Your RQP's letter No. MES/09-07/2007-08 dated 03.10.07
4) This office letter of even no. dated 17.10.2007
5) Your RQP's Letter No. MES/09-07/2007-08 dated 18.10.2007.

Sir,

In exercise of the powers conferred by Clause (b) of Sub-Section (2) of Section 5 of Mines & Minerals (Development & Regulation) Act, 1957 read with Government of India Order No. S.O.445(E) dated 26.4.1987, I hereby approve the above said mining plan. This approval is subject to the following conditions :-

i) This mining plan is approved without prejudice to any other laws applicable to the mine/area from time to time whether made by the Central Government, State Government or any other authority.

ii) It is clarified that this approval of mining plan does not, in any way, imply the approval of the Government in terms of any other provisions of the Mines & Minerals (Development & Regulation) Act, 1957 or the Mineral Concession Rules, 1960 and any other laws including the Forest Conservation Act, 1980.

iii) It is further clarified that this approval of mining plan under Rule 22 of MCR 1960 is subject to the provisions of Forest (Conservation) Act, 1980, Forest Conservation Rules, 1981, and other relevant statues orders and guidelines as may be applicable to the lease area from time to time.

iv) The provisions of Mines Act, 1952 and Rules and Regulations made there under including submission of notice of opening, appointment of Manager and other statutory officials as required by the Mines Act, 1952 shall be complied with.

v) The mining plan is approved without prejudice to any other order or direction from the court of competent jurisdiction.

6th Floor, 'D" Block, Indira Bhawan, Civil Lines, Nagpur – 440001
Email : com_cz@ibm.mah.nic.in ; Fax : (0712) 2565603 Telephone : (0712) 2565603

vi) Your attention is invited to the Supreme Court interim order in W.P.(C) No.202 dated 12-12-96 for compliance. The approval of mining plan is, therefore, issued without prejudice to and is subject to the said directions of the Supreme Court as applicable.

vii) The details of grant of the lease by the State Government, whenever such an order is passed, may be intimated to the Regional Controller of Mines, Indian Bureau of Mines Nagpur.

viii) This approval for mining operations and associated activities is restricted to the mining lease area only.

ix) A copy of Environment Impact Assessment – Environment Management Plan (EIA-EMP) as approved by MOEF (Ministry of Environment & Forest) shall be submitted to IBM within a month of approval alongwith a copy of their approval letter.

x) If anything is found to be concealed as required by the Mines Act in the content of the mining plan and the proposals for rectification has not been made, the approval shall be deemed to have been withdrawn with immediate effect.

xi) The department does not undertake any responsibility regarding correctness of the boundaries of the lease area shown on the ground with reference to lease map & other plans furnished by the applicant/lessee.

xii) Yearly report as require under rule23E(2) of MCDR'88 setting forth the extent of protection and rehabilitation works carried out as envisaged in the approved progressive mine closure plan and if there is any deviations, reasons thereof shall be submitted before 1st July of every year.

xiii) The lessee should submit the financial assurance to the Regional Controller of Mines (NR), Indian Bureau of Mines, Nagpur before executing the mining lease deed as per rule 23(F)(3) of Mineral Conservation & Development Rules, 1988.

xiv) The Environmental Monitoring Cell shall be established by the company. This Environmental Monitoring Cell of the company, shall continue monitoring ambient air quality, dust-fall rate, water quality, soil sample analysis and noise level measurements at various stations established for the purpose both in the core zone and buffer zone as per requirement of Environment Guidelines and keeping in view IBM's circular No. 3/92 & 2/93 season-wise every year or by engaging the services of an Environmental Laboratory approved by MOEF/CPCB. The data so generated shall be maintained in a bound paged register kept for the purpose and the same shall be made available to the inspecting officer, on demand.

Yours faithfully,

26/x/07

(Ranjan Sahai)
Controller of Mines (CZ)

Encl. : Two copies of approved mining plan

Copy for information to :

1. The Director, Directorate of Geology & Mining, Govt. of Maharashtra, Old Secretariate Building, Civil Lines, Nagpur (M.S.).

2. The Director, Directorate of Mines Safety, Nagpur Region, CGO Complex, Seminary Hills, Nagpur- 440 006 along with a copy of approved Mining Plan.It is requested to advise the applicant/lessee to submit the financial assurance to the Regional Controller of Mines(NR), Indian Bureau of Mines, Nagpur to comply with the provisions of rule 23(F) of the Mineral Conservation & Development Rules, 1988 before executing the mining lease deed. The lease deed shall be executed only after receiving a confirmation letter from The Regional Controller of Mines (NR), Indian Bureau of Mines, Nagpur.

3. M/s Minenviron Systems Pvt. Ltd., 49, Bhausaheb Surve Nagar, Jayatala Road, Nagpur - 440 022.

(Ranjan Sahai)
Controller of Mines (CZ)

M/S MURLI AGRO PRODUCTS LIMITED

(Cement Unit)

**

CHEDVAI LIMESTONE LEASE

M.L. Area - 695.72 ha

(Forest Area - 527.48 ha)

District Chandrapur, Maharashtra

अनुमोदित
APPROVED

खान नियंत्रक (मध्यांचल)
Controller of Mines (Central Zone)
भारतीय खान ब्यूरो
Indian Bureau of Mines

MINING PLAN

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Prepared by
MINENVIRON SYSTEMS PVT LTD
NAGPUR

SEPTEMBER, 2007

॥ श्री ॥

MURLI AGRO PRODUCTS LTD.

(CEMENT UNIT)

CONSENT LETTER

The Mining Plan in respect of Chedvai Limestone lease of M/s Murli Agro Products Ltd. (Cement Unit) for 695.72 ha. At Village Chedvai, Tehsil Rajura, Dist. Chandrapur, Maharashtra State, has been prepared by M/s. MINENVIRON SYSTEM PVT. LTD. Nagpur, Registration No. RQP/NGP/246/2001/B, dated 12/01/2001.

I request the Regional Controller of Mines, Nagpur Region / Controller of Mines, Central Zone, Indian Bureau of Mines, to make further correspondence regarding modifications of this Mining Plan with the said Recognized Qualified Person at the following address.

MINENVIRON SYSTEM PVT. LTD.
49, Bhausaheb Serve Nagar,
Jaytala Road,
Nagpur – 440022.

Phone : (0712) 2237015
2237055
Fax No. : (0712) 2244528
E-mail : minenviron@sancharnet.in

I hereby undertake that all the modifications so made in this Mining Plan by the Recognised Qualified Person be deemed to have been made with my knowledge and consent and shall be acceptable to me and binding on me in all respects.

अनुमोदित
APPROVED

Place : Nagpur

Date : 29/11/2006

[N. L. MALOO]

Designation : Managing Director
Organisation : Murli Agro Products Ltd.
(Cement Unit)

CERTIFICATE BY RQP

1. CERTIFIED THAT THE PROVISIONS OF THE MINERAL CONCESSION RULES, 1960 HAVE BEEN OBSERVED IN THIS MINING PLAN AND WHEREVER SPECIFIC PERMISSIONS ARE REQUIRED, THE APPLICANT WILL APPROACH THE CONCERNED AUTHORITIES OF IBM FOR GRANTING PERMISSION.

2. THE INFORMATION FURNISHED IN THIS MINING PLAN IS TRUE AND CORRECT TO THE BEST OF OUR KNOWLEDGE.

MINENVIRON SYSTEMS PVT LTD NAGPUR

10/10/07

MINENVIRON SYSTEMS PVT LTD

Registration No. RQP/NGP/246/2001/B,
Dated 12.01.2001
Renewed upto 11.01.2011

Place : Nagpur
Date : 4 . 6 .2007

CERTIFICATE BY RQP

1. THE PROVISIONS OF MINES 'ACT, RULES AND REGULATIONS MADE THEREUNDER HAVE BEEN OBSERVED IN THE MINING PLAN OF CHEDVAI SIMESTONE LEASE BELONGING TO M/S MURLI AGRO PRODUCTS LIMITED (CEMENT UNIT) AND WHEREVER SPECIFIC PERMISSIONS ARE REQUIRED, THE APPLICANT WILL APPROACH THE D.G.M.S.

2. THE INFORMATION FURNISHED IN THIS MINING PLAN IS TRUE AND CORRECT TO THE BEST OF OUR KNOWLEDGE.

MINENVIRON SYSTEMS PVT LTD. NAGPUR

MINENVIRON SYSTEMS PVT LTD

Registration No. RQP/NGP/246/2001/B,
Dated 12.01.2001
Renewed upto 11.01.2011

Place : Nagpur
Date : 4. 6.2007

MURLI AGRO PRODUCTS LTD.

(CEMENT UNIT)

CERTIFICATE

It is certified that while preparing the Progressive Mine Closure Plan of Chedvai Lime Stone Lease, all statutory provision including Regulations, Rules, Orders passed by the Central and State Government, Statutory Organizations, Courts etc.. have been taken into consideration. These have been complied with or implemented to the extent possible in the present stage of mining plan. Any balance measures etc. would be implemented at an appropriate time.

An undertaking is also given that all the measures proposed in this Progressive Mine Closure Plan will be implemented in a time bound manner as proposed.

Place : Nagpur

Date : 29/11/2006

[N. L. MALOO]

Designation : Managing Director
Organisation : Murli Agro Products Ltd.
(Cement Unit)

॥ श्री ॥

MURLI AGRO PRODUCTS LTD.

(CEMENT UNIT)

EXTRACT OF THE MINUTS OF THE MEETING OF THE BOARD OF DIRECTORS OF M/S MURLI AGRO PRODUCTS LIMITED HELD ON 07th of July, 2005 AT THE REGISTERD OFFICE OF THE COMPANY , SITUATED AT 101, JAI BHAWANI SOCIETY, WARDHMAN NAGAR , CENTRAL AVENUE, NAGPUR 440 008.

RESOLVED that **Mr. Murli Maloo,** Executive of the company, be and hereby authorized of making application to the respective Ministries and other concerned authorities for mining and other related activities in respect on chedvai Limestone Lease at Chedvai Village , Tehsil Rajura , Dist. Chandrapur , Maharashtra State , and to sign all related papers , documents deeds including submission of mining Plan and Mine Closure Plan as they may deem necessary for implementation of the above and to do all such acts, deeds things as may be required in this behalf.

[N. L. MALOO]

For **MURLI AGRO PRODUCTS LTD.**

(Cement Unit)

CORPORATE OFFICE: 239, EAST WARDHAMAN NAGAR, NAGPUR-440008. MAHARASHTRA, INDIA
PHONE : 2683000 - FAX NO. : 0712-2684422 • e.mail : maloo@murliagro.com murli@murliagro.com

CHEDVAI LIMESTONE LEASE
MINING PLAN

Prepared under Rule 22 of
MINERAL CONCESSION RULES, 1960

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MINENVIRON SYSTEMS PVT. LTD. NAGPUR

CHEDVAI LIMESTONE LEASE
MINING PLAN

Prepared under Rule, 22
of
Mineral Concession Rules, 1960

0.0 INTRODUCTION

0.1 M/s Murli Agro Products Limited, Nagpur, have taken a decision to enter into cement manufacturing by establishing a cement plant of capacity 3.0 Mt per annum of Puzzolona Cement, near Naronda Village, near Sangoda deposit of the company, Tehsil Korpana, Dist-Chandrapur, Maharashtra. In this connection, they have applied for grant of mining leases for captive mining of limestone, in Chandrapur and nearby districts. The Govt. of Maharashtra has allotted two leases namely Nandgaon Ekodi and Sangoda. Mining plan documents for both have been duly approved.

0.2 The reserves base of cement grade lime-stone at these two leases are only adequate for about 10 years, to meet annual demand of 3 Mt of limestone for the plant. Hence, they have applied for additional leases. The Chedwai lease, in Rajura Taluka of Chandrapur district, on border with state of Andhra Pradesh, has recently been allotted to them. After allotment of this lease, the company proposes to establish, additional capacity of 3.0 Mt. of Puzzolona Cement per year, in the neighbourhood of Chedvai deposit, thus, raising the capacity to 6.0 Mt. per annum of Puzzolona Cement.

0.3 This Mining Plan has been prepared for grant of mining lease over an area of 695.72 ha in village Chedvai, Tehsil Rajura, Dist-Chandrapur, under Rule 22 of Mineral Concession Rules, 1960. The mine is proposed to be named after village Chedvai, which lies almost in the middle of the proposed lease area.

0.4 The Mining Plan document will cover five year period from the grant of mining lease by the Govt. of Maharashtra with yearly rated production capacity of 2.0 lakh tonnes of cement grade limestone.

अनुमोदित
APPROVED

26/X/07

खान नियंत्रक (मध्यांचल)
Controller of Mines (Central Zone)
भारतीय खान ब्यूरो
Indian Bureau of Mines

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MINENVIRON SYSTEMS (P) LTD. NAGPUR

10/10/07

1.0 GENERAL INFORMATION

1.1 Name and address of Applicant

M/s Murli Agro Products Limited (Cement Unit)
101, Jai Bhawani Society, Wardhaman Nagar,
Central Avnue, Nagpur-440008.
Maharashtra, India.

Tel: 0712-2769849,
2769876,
2765526
Fax(0712)-2761145
E-mail-maloongp@sancharnet.in

1.1.1 The site office of the proposed mine is yet to be established. The address and other details of the same will be intimated in due course, but certainly when notice to start mine is sent.

1.2 Status of Applicant

1.2.1 The applicant is a Public Limited Company. The list of members of the Board of Directors of M/s Murli Agro Products Ltd. is given at **Annexure IA.**

1.2.2 The company will nominate owner of the mine, under the Mines Act, 1952, when the mine is started.

1.3 Minerals to be Mined :- Limestone

1.4 Period for which the mining lease is to be granted: 30 years.

1.5 Name of the RQP who prepared this mining plan:

Minenviorn Systems Pvt. Ltd.
49, Bhausaheb Survey Nagar,
Jaitala Road, Nagpur-440 022.

Tel: (0712)-2237015/2237055
Fax: (0712)-2244528
E-mail-minenviron@sancharnet.in

Registration No.: RQP/NGP/246/2001/B Dated 12.01.2001 valid upto 11.01.2011
A copy of RQP Certificate is enclosed at **Annexure IB.**

List of Key Persons:

i) Shri U.W. Datey (Mining Engineer)
ii) Shri N.M. Sangode (Mining Engineer)

1.6 Prospecting Agency

Directorate of Geology and Mining (DGM), Government of Maharashtra, Nagpur.

1.7 Reference and Date of Consent Letter from the State Government

MMN 1004/CR 696/Udyog-9 dated 28.02.2006. The letter is placed at **Annexure IIA.**

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2.0 LOCATION AND ACCESSIBILITY

2.1 Details of the Area

2.1.1 The proposed Chedvai limestone lease area is in the southernmost part of Rajura Tehsil extending up to the interstate border between states of Maharashtra and Andhra Pradesh. The location details are as follows:

District	:	Chandrapur
State	:	Maharashtra
Tehsil	:	Rajura
Village	:	Chedvai

2.1.2 **Figure 1** shows location of the proposed lease area. **Plate I**, Key Plan, shows lease, area along with 10 Km radius buffer zone on 1:50,000 scale.

2.2 Extent and Location of Lease Area in Forest

The major part of approved lease area, 527.48 ha. out of total 695.72 ha proposed lease is part of Manikgarh Reserved Forest. The forest survey numbers are marked by green colour on the **Plate II** Map showing Survey Nos. in the lease area. Out of remaining 168.24 ha, the agricultural land accounts for 167.84 ha. Balance 0.4 ha. is Govt. Land.

2.3 Lease Area : 695.72 ha

2.4 Forest Land : 527.48 ha

2.5 Ownership / Occupancy

2.5.1 The 527.48 ha. forest land is under the State Forest Department. For 167.84 ha. agricultural land, surface rights belong to individual land owners. The company proposes to acquire this land following due process of law. Necessary consent letters will be obtained from these land owners before signing the lease agreement. The detailed list of survey numbers of the lease area is placed at **Annexure II B**.

2.6 Approach

2.6.1 The area is not readily approachable from Maharashtra side, the toposheet only shows cart track road from Manikgarh Village about 27 km. away. This road is all weather motorable roads via Bari (Bhari). However, approach through Andhra Pradesh is easier at present. The state high way No. 264, Jam-Chandrapur-Ballarpur continues upto Rajura in Maharashtra and Asifabad in Andhra Pradesh. After entering Andhra Pradesh the road is SH No. 1 of Andhra Pradesh and a diversion to right to Indhani Village is about 7 Km. before Asifabad. This road is metalled road upto Indhani village near Maharashtra border. From Indhani there is jeepable road upto Chedvai. This road is now all season roads as a bridge has been constructed on river Bapur Vegu on border of Maharashtra. The distance from SH No.1 to Indhani about 8 Km and from there Chedvai village is about 7 Km.

There are not, even many cart tracks, leave aside roads, within the lease area. Hence, it is not easy to travel within lease.

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2.6.2 The nearest railway station is Manikgarh, on Ballarshah-Kazipeth section of South Central Railway. Nearest railway junction is Ballarshah about 65 Km from the proposed lease area. Both Ballarshah and Manikgarh are located on Delhi-Chennai broad gauge Grand Trunk Railway Line.

2.6.3 The nearest airport is at Nagpur, approximately 240 Km away from Chedvai village. Nagpur is directly connected by air to Mumbai, Delhi, Hyderabad, Kolkata etc.

2.7 SOI Toposheet No. 56 M/3

The latitude and longitude as given in DGM in their report are as under:

Latitude : 19^0-27'-30" to 19^0-31'-00" North

Longitude : 79^0-06'-00" to 79^0-12'-00" East

2.8 Premining Landuse

The premining land use of major part, 527.48 ha out of 695.72 ha lease area, is Reserved Forest. Out of the balance, 167.84 ha. is Private Agricultural land, while 0.4 ha. is Government Land.

2.9 Location

Location Map at Figure 1, shows general location of proposed lease area, while Plate I is Key Plan (1:50,000 scale) showing the lease area along with 10 Km radius buffer zone.

Contd...

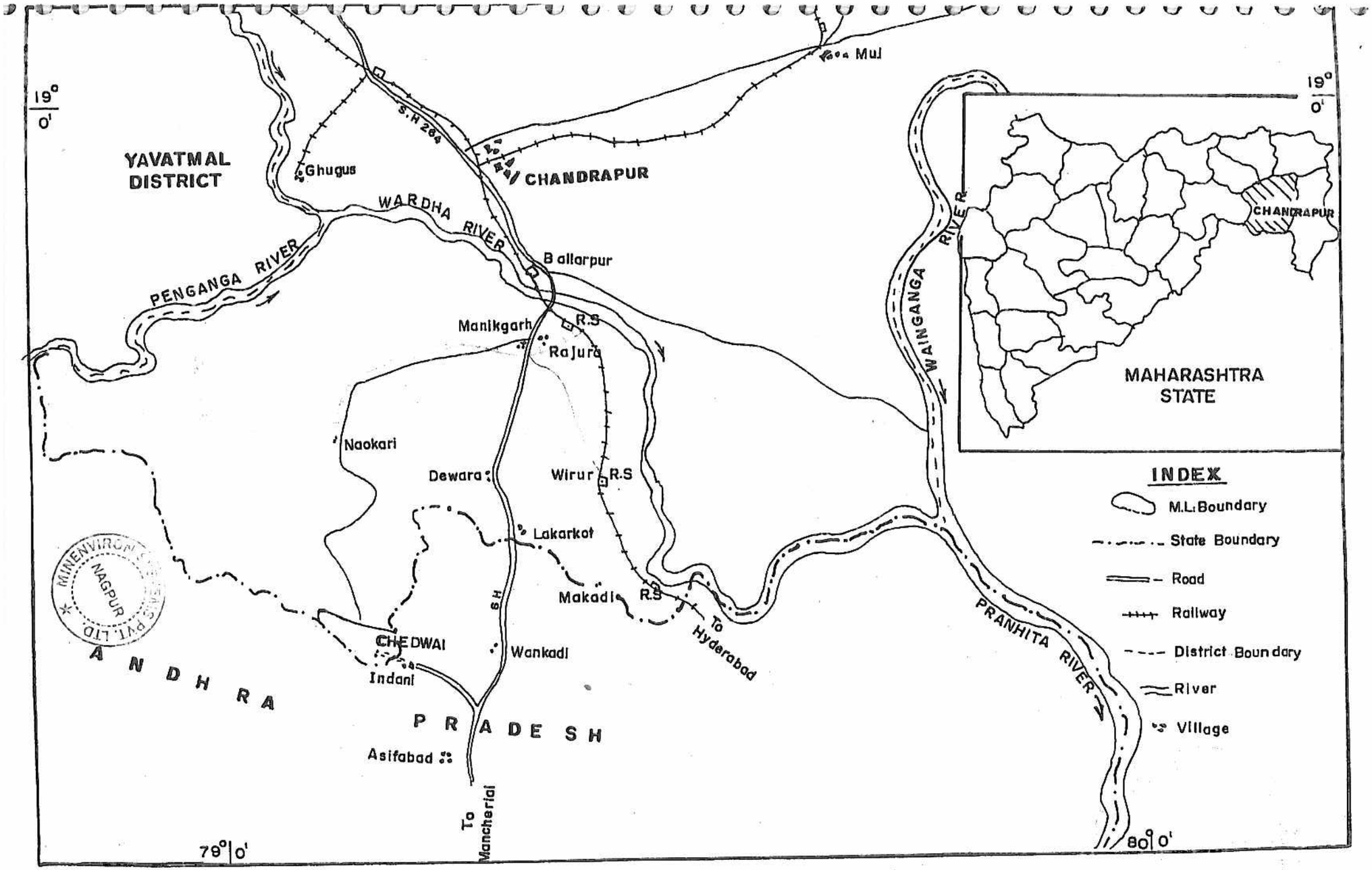

Fig 1 : LOCATION MAP

PART – A

3.0 GEOLOGY AND EXPLORATION

3.1 Physiography

The Chedvai Limestone deposit is located in a plateau like terrain near Andhra Pradesh Border. The terrain is dissected by numerous valleys giving rise to isolated hilly patches in the plateau. The over all ground level is about 70 m on basis of assumed datum. The plateau and hills rise 50m to 100m above ground level. The hilly terrain, in general, has a trend of NW-SE with south westernly slope. The valleys are generally broad with steep flanks. The valleys are mostly covered/filled with alluvium and detrital mantle of variable thickness.

3.2 Drainage

The rainfall in the area is fairly heavy, about 1500 mm per annum, mostly during rainy season from June to September. A network of small seasonal nallahs flowing to the Southern direction, constitute the drainage system of chedvai area. The southernly flowing Bapur nallah in the east and the easterly flowing Perennial river, Pedda vagu, in Andhra Pradesh, constitute the main drainage system of the area.

3.3 General Geology

3.3.1

The Chedvai area in Chandrapur district is in the south eastern part of the Vindhyan limestone belt of Yavatmal and Chandrapur districts of Maharashtra.

The Proterozoic sedimentary suites of Vindhyan system, constituting mainly of Purple shales, sandstone and limestone, are locally, known as Penganga Series.

3.3.2

The general strategraphic sequence of the area is as follows:

Formation	Age	Lithotypes
Alluvium	Recent to sub recent	Soil, Kankar and Detrital mantle
Deccan Trap	Cretaceous - Eocene	Basaltic Lava with inter- trapean beds.
——————Unconfermity——————		
Lametas	Cretaceous	Calcareous,Argillaceous And cherty sandstone
——————Unconfirmity——————		
Penganga group (Vindhyan system)	(Precambrian)	Limestone,Shale,Sandstone
——————Unconfirmity——————		
Basement	Archean	Granite, gneiss and schists.

Contd...

3.4 Local Geology

3.4.1 At Chedvai, the Penganga suites of rocks are exposed in higher ground while alluvium occupies the valley regions. The other lithological exposures are of Deccan trap, in the western and northern part, underlain by purple shale, argillaceous and low grade unclassified calcareous rocks. Cement grade limestone occupies the major part of the lease area, covered with alluvium in the valleys. The Archean formations (Granite) constitutes the basement of the Vindhyan basin.

3.4.2 The lithotypes of the area may be generalized as described below:

i) Granite: - Granite (Archean) is exposed in the eastern part of the area forming NNW-SSE trending narrow ridges. Granite represents the basement Archean formation in the area.

ii) Dolerite: - Intrusive dolerite outcrops are observed in the north eastern part of the area at isolated places.

The Penganga group of sedimentary suites of rocks of the area consist of the following major lithotypes.

iii) Purple shale:- This is the oldest unit of the Penganga group. It is thinly bedded, purple coloured and calcareous. The shale outcrops are observed in nallah cuttings and low lying areas, mostly adjacent, but out of Chedvai area.

iv) Sandstone :- Impersistent exposure of sandstone are seen in low lying hillocks and ridges. At some places the younger limestone has overlapped the sandstone to rest directly over the Purple shale.

v) Limestones :- Limestone is the youngest unit of the Penganga group and is well exposed in about seven sq.km area, around Chedvai and Bari (Bhari) villages, on slopes of hills and plateaus.

The valley separating these hills are mostly covered with the detrital material ranging in thickness from about 2 m to 30 m. Geological Plan, **Plate IIIA**

vi) Deccan trap (Basalt)

The traps lie unconfirmally above the Penganga group of rocks (limestone, purple shale). The Basalt is mostly exposed in hilly terrain, north and North West of Chedvai area.

Contd...

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3.5 Exploration:-

3.5.1 The Chedvai area was taken up for geological investigation by Directorate of Geology and Mining (DGM) Maharashtra State, since early seventies. The area was contour Surveyed and geologically mapped. Surface samples from limestone outcrops were collected and analyzed to demarcate the zones of various qualities of limestone of which cement grade limestone was the target. The surface lay of cement grade limestone as shown on the geological plan was tentatively drawn on the basis of surface sample analysis data and later firmed up by subsurface data obtained through exploration. The modified geological plan has been presented in Plate IIIA and surface plan at **Plate IIIB**

3.5.2 For convenience of surveying DGM(MS) established 3 Bench Marks on the block as follows on the basis of assumed datum. As per survey of India toposheets level of area ranges from 260 m to 320 m above MSL.

BM – 1(RL 76.29) In the south eastern part, near borehole CV – 53.

BM- 2(RL 101.29) Located in the east central part of the block, between boreholes CV- 63 and CV 134.

BM – 3(RL – 96.84) – located in the north central part between borehole CV-68 and CV-103.
The Bench Mark locations have been shown in the geological plan.

3.5.3 The Pontential cement grade limestone bearing areas of the Chedvai block were covered by systematic drilling. Boreholes were located on a square grid of 200m, to establish the geometric shape and size of the cement grade limestone bed. However, not whole of present lease area is covered by drilling. Only about 20 boreholes were drilled in the area covered by alluvium. Similarly, only a few holes were drilled in the two hill areas on eastern side of the lease. Thus, area covered by core drilling in present lease area is about 400 ha. Core recovery was about 85%.

3.5.4 On the basis of the Geological map and drilling data, the Chedvai block was originally divided into four Blocks for assessment of Potentiality by DGM. The summarized exploration data have been furnish in the following table:

Block	Area where Cement Grade Limestone was found (sq. km.)	No. of Boreholes drilled Grid 200mx200m	Total drilling (m)	No. of samples collected	No. of Samples subjected to	
					Partial Analysis	Full Analysis
I	0.14	14	474.80	413	413	43
II	0.64	42	2803.45	2039	2039	440
III	1.70	37	2507.25	2387	1179	1279
IV	1.00	53	4281.50	3974	3874	1251
	3.48	146				

3.5.5 The present Mining Plan has been prepared on the basis of exploration data presented in three reports prepared by DGM (MS), for Block I & II, Block III and Block IV respectively. A letter of consent from DGM, Maharashtra regarding use of Geological data from these reports is placed at **Annexure IIIA/1**. An abstract from last volume is attached at **Annexure IIIA/2.**

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3.5.6 The demarcation of different Blocks as also location of boreholes in each Block has been marked in the Geological Plan (Plate IIIA). The strike length covered by core drilling varies from Sector to Sector from 125 m to 1000 m. The total are as of all these four Blocks is not covered by present lease. A list of borehole drilled, which fall in the present lease area is placed at **Annexure IIIB.**

3.5.7 The core samples collected were subjected to partial chemical analysis for some samples and full analysis for others, the later being selected on the basis of results of the former. The analysis results of those boreholes where Cement Grade limestone was found are placed at **Annexure IIIC.**

3.6 Limestone Deposit

3.6.1 The outcrops of limestone are generally marked on top and slopes of the plateaus. The strike of the limestone varies from NW-SE to N-S with westerly dip of 2^0 to 5^0 .

The upper part of the deposit is in generally consists of Cement Grade limestone. Medium grade limestone with variable bands, of low grade and cement grade limestone composes the lower mass of the carbonate horizon.

3.6.2 In Chedvai area, the limestone are predominantly of two types.

a) Flaggy argillaceous limestone is gray black coloured, thinly bedded and poor in quality.

b) Massive Limestone is in various shades of colours ranging from pinkish to light gray. However, predominantly occurring type is of light ash gray to white coloured. Cement grade limestone is part of massive type, with stratigraphic, thickness of 85m to 90m, with interbands of variable thickness of low and medium grade limestone.

3.6.3 However, cement grade limestone beds are interlayered with lowgrade limestone at various horizons. Facies change of limestone from cement grade to lowgrade has been present both laterally and vertically. (Sections and cross sections at **Plates IVA, IVB and IVC.)**

3.6.4 The average grade of cement grade limestone in Chedvai area, as established by DGM through analysis of core samples of boreholes drilled in the area have been presented in the following table.

Sr.No.	Components	Percentage Range
1.	Lime (CaO)	43.94 -50.0
2.	Magnesia (MgO)	0.4-2.4
3.	Silica (SiO_2)	7.0-15.0
4.	Alumina (Al_2O_3)	0.8-2.5
5.	Ironoxide (Fe_2O_3)	0.4-1.5

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3.6.5 The low content of MgO, Fe_2O_3 and Al_2O_3 in limestone of the area makes it suitable for cement industry. However, a substantial Part of Chedvai Limestone contain high SiO_2 and low CaO. The details of analytical results of core samples have indicated three different grades viz. cement grade, marginal cement grade and low grade. The limestone, having silica content above 15% and lime between 40% and 43% have been included in marginal grade whereas the limestone with still higher silica and lower lime content has been considered as low grade limestone.

3.6.6 This low to marginal grade limestone along with thicker cement grade limestone make a substantial thickness of the deposit suitable for cement manufacture.

3.6.7 Chedvai limestone deposit is a thick composite carbonate horizon with interbanding of Cement grade and inferior grade limestone, making the exploitability of full thickness difficult.

3.6.8 The top beds of cement grade limestone are amenable to opencast mining and studied in details.

3.6.9 In view of low magnesia and iron, Content of low grade limestone, a part may be utilized as "Blendable Material" where lime is not less than 40% and silica is not more than 15%.

3.7 Reserves

3.7.1 The generalized subsurface configuration of the limestone reserves has been deciphered by systematic drilling. The cross sections prepared on the basis of borehole data brought out interbanding of cement grade limestone and low grade limestone as presented in a few selected cross sections from each Blocks (Plates IVA, IVB, IVC.). The top bands of cement grade limestone presents opencast mining possibilities.

3.7.2 The reserve (resources) of total cement grade limestone beds in the carbonate horizons as estimated by DGM (MS) by "Cross-Section" Method. For the Chedvai block have been presented below:

Block – I	-	7.33 MT
Block – II	-	67.27 MT
Block – III	-	53.52 MT
Block – IV	-	32.27 MT
	Total	**160.39 MT**

3.7.3 However, according to United Nations frame work classification (UNFC), these 160.39 MT of limestone reserves can only be graded as "Resources" as the mineability of the deposit was not studied properly.

3.7.4 The exploitable reserves of cement grade limestone in all four Sector of the lease area have been re-estimated utilizing raw exploration data provided in the following geological reports prepared by the Directorate of Geology and Mining, Government of Maharashtra.

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1. Report on prospecting of limestone in Block-I and II of Chedvai area, Rajura Tahesil. (Field season 1976-77 to 1979-80)

2. Report on Prospecting of Limestone in Block-III Chedvai Area of Rajura Tahesil. (F.S. 1976-77 to 1983-84)

3. Report on Prospecting of Limestone in Block-IV, Chedvai Area. (F.S. 1981-82 to 1984-85)

However, on the basis of positive boreholes, the Sectors have been redefined, keeping the mining feasibility in view.

3.7.5 Method of reserve estimation

i) In the present study "Block Method" of estimation has been followed. Gridlines (200m apart) are drawn keeping the borehole in the centre and grid lines are 100m away on either side of the borehole. Thus square blocks are produced with the borehole at central position.

For peripheral boreholes, the influence zone has been taken as proportionate distance from the borehole in that square.

ii) The thickness of cement grade limestone along with contiguous blendable limestone as per quality data available for the borehole, (data provided in the geological report), have been considered as thickness for the area of the square, at centre, of which the hole is located.

iii) The volume of the square block multiplied by specific gravity of limestone (2:6) of the area provides the gross reserves in tonnes.

iv) Gross reserves when reduced by 30% for unknown geological factors and cavities in limestone beds, produce the "Net Reserves". The estimated reserves will be of "Net Proved" category.

v) Thus following formula has been utilized for estimation of reserves in the block method.
Net Proved Reserve (T) = Area (m^2) of the block x Thickness of limestone (m) x sp.gr. (2.6) x 0.7

vi) As the reserves are mostly from exposed limestone bed, there will not be overburden in most places. However, where borehole data provided any O.B., on top of the limestone, volume of such OB has been estimated.

vii) The limestone reserves are generally characterized by low MgO (1.5%-2.5%), moderate SiO_2 (7%-15%) and moderate to high CaO (43%-50%) making it suitable for cement industry.

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viii) The details of re-estimation of limestone reserves for Block-I, Block -II, Block -III and Block -IV have been furnished in **Annexure IV** in four parts.

Blockwise summarised reserves of cement grade limestone in Chedvai area are presented below:

Block	Area (Hector)	Volume of OB (Mm^3)	Net Proved reserve of limestone (million T)
Block – I	17.00	NIL	10.11
Block – II	82.25	1.77	75.46
Block – III	77.80	1.34	58.98
Block – IV	37.80	0.34	28.83
Total	**214.85**	**3.45**	**173.38**

ix) The quality parameter of the mined limestone may be established more accurately to suit the raw material requirement of the cement plant by systematic sampling and analysis. To adjust any high silica (SiO_2) / Low Lime (CaO) material, an appropriate quantity of "Sweetner" (Higher grade limestone) may have to be added, if required.

x) In Chedvai leasehold a positive area of 214.85 hectors contains 173.38 Mt of limestone suitable for cement manufacture. The deposit contains 3.45 million m^3 overburden and waste. However, a thin layer of top soil present in the area have to be scrapped and stored, for future use.

3.8 United Nation Frame Work Classification (UNFC)

According to UNFC, the Chedvai limestone deposit falls under "Stratiform, strata bound and tabular deposit regular habit".

i) Geological Study
The area was properly explored by core drilling in a grid pattern as the basis of surface and Geological plan prepared by systematic field investigation.
The axis value will be G-I

ii) Feasibility Study
On the basis of exploration data, the area is identified for opencast mining of limestone. Mine planning and required EIA studies indicate the area is highly promising.
The feasibility axis value will be F-I

iii) Economic axis
The proposed limestone mine will be treated as captive mine for predesignated cement plant whose economic viability has already been thoroughly studied and established.
The economic axis value will be E-I

iv) The triaxial value as per UNFC for the Chedvai Limestone deposit of the leasehold area will be (III)

Hence the estimated reserves as furnished in the mining plan of Chedvai leasehold will be "Proved Mineral Reserves" as per United Nation Framework Classification.

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iv) The triaxial value as per UNFC for the Chedvai Limestone deposit of the leasehold area will be (III)

Hence the estimated reserves as furnished in the mining plan of Chedvai leasehold will be "Proved Mineral Reserves" as per United Nation Framework Classification. Other resources will be estimated, after obtaining forest clearance for the entire lease area applied from the MoEF. The status of these reserves is shown in the table given below as not estimated advised by the Indian Bureau of Mines in recent circulars.

UNFC Classification of Reserves and Resources Estimation

	Classification	Code	Quantity (Mill. tonne)	Grade
a)	**For Potential 214.85 ha Lease Area in Blocks I, II,III & IV (Forest Area)**			
	Total Mineral Resources			
A.	Mineral Reserves			
	a. Proved Mineral Reserves	111	173.38 *	Cement Grade CaO –43.94-50.0% SiO_2 - 7.0 – 15.0% mgo – 0.4-2.4%
	b. Probable Mineral Reserves	121 & 122	Not Estimated	N.A.
B.	Remaining Resources			
	a. Feasibility Mineral Resources	211	Not Estimated	N.A.
	b. Pre-feasibility Mineral Resources	221 & 222	Not Estimated	N.A.
	c. Measured Mineral Resources	331	Not Estimated	N.A.
	d. Indicated Mineral Resources	332	Not Estimated	N.A.
	e. Inferred Mineral Resources	333	Not Estimated	N.A.
	f. Reconnaissance Mineral Resources	334	Not Estimated	N.A.
b)	**For remaining Forest Area of 312.63 ha**			
A.	Proved and Probable Mineral Reserves	111 & 121 & 122	Not Estimated	N.A.
B.	Remaining Resources	-	Not Estimated	N.A.
c)	**For Non Forest area of 168.24 ha.**			
A.	Proved and Probable Reserves	111 & 121 & 122	Not Estimated	N.A.
B.	Remaining Resources	-	Not Estimated	N.A.

* These are net proved reserves by reducing 30% quantity for unknown geological factors and mud cavities in the area explored by DGM, Maharashtra and cover mostly exposed limestone beds.

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4.0 MINING

4.1 Past Development and Production

The Chedvai is virgin area covered by hilly terrain, intersected by valleys, which are agricultural fields. M/s Murli Agro Products Ltd. have applied for grant of Mining lease over an area of 695.72 ha. There has been no mining lease granted over the area. Hence, there is no question of any past development or production.

4.2 Current Situation

4.2.1 After receipt of letter of intent of proposed grant of ML over the precise area of 695.72 ha, from the Government of Maharashtra; the company has obtained village survey number plan of Chedvai village and prepared the plan for lease area. The surface and Geological plans are prepared by transferring lease boundary on the plan available in DGM report. The company has taken steps to prepare other statutory documents to obtain consents to establish from the Maharashtra Pollution Control Board and also to get Environmental Clearance. The forest diversion proposal is also being prepared.

4.2.2 The present Mining Plan is the first document which is required for getting Environmental Clearance as well as for preparation of forest diversion proposal.

4.3 Factors Governing Mine Design and Mining Strategies.

4.3.1 The limestone deposit belongs to Vindhyan formations. The occurrence of cement grade limestone is not continuous both vertically as well as horizontally. Hence, cement grade limestone and low grade limestone will have to be separately mined. The marginal grade limestone has not been separately delineated in the geological report prepared by DGM (M.S.) Hence, before planning mining operation these will have to be examined for their suitability for blending.

4.3.2 The mine will be developed as mechanised opencast mine where blasted overburden / waste as well as limestone will be removed by shovel-tipper combination. The mine will be developed for annual production of 2.00 lakh tonnes of ROM limestone to supply desired blend of limestone to cement plant located near Naronda Village, where a plant of capacity 3.0 Mt per annum is being constructed. Further capacity of 3.0 Mt. per annum will be created near Chedvai at later date.

4.3.3 The desired blend of limestone from the mine to be received at the plant and as stipulated by the cement consultant is as given below: (figures in %)

CaO	SiO_2	Al_2O_3	Fe_2O_3	Magnesia	K_2O	Na_2O	Total Sulphate as SO_3	LOI
44.0 to 45.0	13.0 Mxm.	1.83 Mxm.	0.75 Mxm.	0.67	0.20	0.23	0.45	36.84

The above analysis of limestone blend will be kept in view while loading limestone from the mine pits, for transportation to cement plant.

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4.3.4 There is neither much soil nor overburden occurring in the ML area, except at hill tops. In fact there is not much of overburden on limestone, except thick alluvium in the valleys. However, a substantial quantity of low grade limestone will have to be removed and dumped as waste.

4.3.5 Although there is a all weather motorable road to proposed lease area, it will have to be upgraded to transport ore, by constructing a good road for trucks carrying limestone.

4.3.6 The intervening valleys are privately owned agricultural lands and there is no Govt. waste land or privately owned lands on the hilly terrain of the lease. Hence, selecting areas for overburden and waste dumps will need considerable effort.

4.3.7 The mine will be worked for one shift in a day.

4.4 Method of Work

4.4.1 Selection of Working Blocks

The Geological report has already divided the mineralized area in four blocks. For the approach road from Maharashtra, a fair weather road is already available from NW side. Hence, Block II becomes appropriate choice for starting mining operations from western side of the lease area.

4.4.2 The Block II has largest quantum of reserves and average quality is best among the four Blocks. These limestones can be readily used as sweetening material. Hence, it is proposed to start mining operations from Block II. Additionally this will also allow starting from higher levels of the area and not valley part.

4.4.3 There are no villages or Gudas/ Wadis except Chedvai village which has three Gudas or Bastis. Some houses are spread here and there in agricultural lands. The starting of Mining Operations from Western end of Blocks II allows operations away from the Chedvai village. The operations also start at top of highest hill ranges in the area.

4.4.4 Choice of Mining Method

The area is free of any human settlement except Chedvai village, hence drilling and blasting can be carried out without much restrictions. Hence, loading by hired hydraulic shovels and transport by hired tippers is obvious choice for working the deposit. Since, the limestone has to be ground fine for cement manufacturing, 100 mm dia blast holes will be drilled for this small production capacity of two lakh tonnes of limestone. Since the terrain is hilly, 0.9 m^3 capacity hydraulic Shovel and 10 tonnes tippers will be hired. In addition, one front end loader of 2.6 – 3.6 m^3 bucket capacity will also be engaged sothat production of limestone continues un-interrupted, even if hydraulic shovel goes under breakdown.

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4.4.5 Mining by Shovel-tipper combination

It is proposed to use 0.9 m^3 hydraulic Shovels coupled with 10 tonne tippers to achieve this production of nearly 700 tonnes per day. Since for initial 15 years, workings are going to be started from top of the hills and since dip of the deposit is very low, it is proposed to mine by top slicing. This will mean that all benches will follow the level of floor in both strike and dip direction.

After 100 mm dia blast holes are drilled and blasted, the blasted material will be loaded by 0.9 m^3 hydraulic Shovels into 10 tonne tippers and taken to crushing plant of 250 tph capacity located within the lease. The benches will initially vary in height as hill top is undulating.

After first bench advances about 170 m, the second bench will be started, six m. below the level of first bench. A minimum bench width of 15 m will be maintained. Thus one to two benches will be operated in Block II.

4.5 Production Planning for First five years

4.5.1 The mine will start production as soon as all clearances are received and road to evacuate limestone is available. It is proposed to produce 1.5 lakhs of limestone during the first year itself. The production will be raised to 2.0 lakh tonnes per year from second year onwards.

Year	Limestone (lakh tonnes) Cément Grade	Soil (cu.m.)	Overburden including low grade limestone '000 cu.m.
I	1.5	200	4.0
II	2.0	100	5.0
III	2.0	100	5.0
IV	2.0	100	7.0
V	2.0	--	7.0
TOTAL	**9.5**	**500**	**28.0**

4.5.2 The yearwise, benchwise production is given at **Annexure VA.** The ROM Limestone will be taken to primary crusher of 250 tph capacity, located within the lease (Plate IIIA and IIIB) and crushed to (-) 150 mm size for despatch to Cement Plant.

4.5.3 The yearwise advances and section are shown at **Plates VA to VE** for five year period.

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4.6 Life of Mine

4.6.1 The proved reserves at the mine are 173.38 Mt. Assuming 5% mining and handling losses, these reserves will be sufficient for production for 41 years assuming production of 9.5 lakh tonnes during the first five years and 4.5 Mt per year during subsequent years.

4.6.2 However, there are reserves in the two hill ranges on the eastern side of the property and it is expected that they will add another 100 Mt. of limestone reserves when properly explored and analysed, there by increasing life of the mine by further 21 years. Thus, total life will exceed 62 years, once eastern side reserves are proved and mining feasibility and economic viability of such reserves established.

4.6.3 However, the above life is for reserves upto floor of the valley i.e. 70 mRL (assumed datum). There are reserves below this level too. But these reserves are mixture of Cement Grade (CGL), Medium Grade (MGL) blendable limestone and Low Grade (LGL) limestone. These will also be evaluated for economic viability. This may further increase the life of the mine.

4.6.4 In all probability life of the mine will be about 75-80 years, when all potential areas within leasehold is explored and analysed as per requirement.

4.7 Conceptual Mining Plan

4.7.1 The limestone deposit has been explored by drilling holes upto 30m to exceeding 100 m depth, on 200 m x 200 m grid and has proved mineable reserves of 173.38 Mt. Besides the reserves proved in four blocks, there is a large area, as part of two hills on the eastern side of the lease, where available drilling data is inadequate so as to evaluate quality and quantity of limestone.

4.7.2 Exploration

a) The proved mineable reserves in the area are sufficient for 41 years at the proposed rate of production of 9.5 lakh tonnes during the first five years and later at the rate of 4.5 Mt. per annum. Hence it is not necessary to carry out further exploration in the lease area during, initial 20/25 years lease period. However, after 20/25 years, the exploration in the two hills on the eastern side will be taken up. Thick limestone is clearly visible on slopes of the hill. So the exploration will aim at finding quality parameters of the limestone.

b) The proposed boreholes numbering 61 are shown of Geological Plan Plate IIIA.

4.7.3 Production and Development

a) The Rate of annual production will continue to be same for the first five years of operation. In case of initial 30 years lease period, the reserves in Blocks II and III will be sufficient for 21 years at the proposed rate of production of 4.5 Mt / year after the first five years. By that time reserves in the eastern Block will be taken up for exploration.

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b) The Cement Grade reserves in Blocks II and III are present in hilly part upto a depth of 20 m to 50 m on the hill tops. The deposit below 70 m level of assumed datum will not be mined initially, as this is the general level of valleys which are covered by thick alluvium. The deposit here is at greater depth with considerable overburden.

c) When blocks II and III are fully extracted, upto 70 mRL or near general level of valley, the eastern part of Block IV will be taken up for development. Similarly the proved Block IV will be taken up subsequently or simultaneously depending on quality of limestone and blending requirement.

d) The presently proved reserves in two hills of western side will be sufficient to last 41 years for 3.0 Mt/yr Cement Plant.

4.7.4 Waste Disposal

The waste disposal has been separately dealt in Chapter 7.0 in this document. The thickness of overburden and soil on top of hills is meagre. The main quantity of waste to be removed and dumped is low grade limestone which cannot be used even for blending. During the 30 year lease period quantity of overburden to be handled is estimated as under: Soil 30,000 m^3, other stony material and low grade limestone 2.45 Mm^3.

4.7.5 Reclamation of Mined out areas and dumps

During first five year period of mining, no land or dump will be available for reclamation. The reserves of Block II, upto 70 m datum are expected to last nearly 21 years. Even then, there are proved reserves of cement grade limestone at greater depth with intervening 10 m to 40 m of low grade limestone. Hence, it will not be desirable to reclaim these areas. The economics of winning these ores is not favourable today but after 20 years, this may be economical, as there are no proved cement grade limestone deposits currently available in Chandrapur district.

4.7.6 Plantation

The major part of lease area, 527.48 ha out of 695.72, or nearly 76% is Reserved Forest. The area is part of Manikgarh Reserved Forest which is spread over large part of border areas between state of Maharashtra and state of Andhra Pradesh. The remaining part of area is agricultural land. Thus, there will not be much land available for plantation. However, the company will approach the forest department, for permission to plant saplings within the forest area with permission of Forest department. The company will also encourage villagers to plant fruit bearings trees, on boundary of their agricultural lands, if they are not acquired.

4.7.7 The conceptual mining plan and sections are depicted at **Plate VI.**

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4.7.8 Slope stability

The mine will work above ground level during the lease period of 30 years. The slopes will be left at 45° angles on both sides of the opencast pits where the pits cannot be extended further upto hill slopes due to low grade limestone.

4.8 Extent of Mechanisation

4.8.1 The mine will be developed as initially as a mechanized opencast mine designed to handle 2.0 lakh tons of ROM limestone per annum, the mechanization will be low as described in para 4.4.4.

4.8.2 Later, after five years, a cement plant of 3.0 million tonne per annum capacity is proposed to be set up. Then, the mine will be developed as a fully mechanized mine to raise ROM limestone @ 4.5 Mt. per annum. For this purpose, it is proposed to use 4.6 cu.m. diesel hydraulic shovels along with 30/35 tonne capacity dumpers. The latter are chosen for easy maneuverability in the hilly terrain.

4.8.3 150 mm dia high capacity drilling machines are proposed, for high production, nearly 1700-2000 m of drilling will be required per month, working two shifts/day.

4.8.4 A detailed list of equipment for initial five years is given at **Annexure V B.**

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5.0 BLASTING

5.1 General

The drilling and blasting is essential part of mining at this proposed mine. In order to facilitate limited limestone production proposed, use of 100-110 mm Halco drills is envisaged. The limestone deposit is massive in nature but there are several joint planes in both directions.

5.2 Blasting Parameters

The mine will have 6 m high benches with minimum width of 15 m. For the limited ROM production planned at 2.0 lakhs tonnes. per annum, it is proposed to use following blasting parameters, initially. Subsequently after sufficient experience at the site, these may be modified.

Burden : 3.0 m Spacing : 3.5 m

However, after a few trial blast, the blasting parameters will be established for different benches, if required.

5.3 Explosive to be used

The company proposes to use cartridged slurry or emulsion explosive as column charge with cast boosters as primary charge. Although there is not much overburden above the limestone, 65-75 t of explosive is likely to be consumed every year. The company will explore possibility, if any contractor near Ghugus is willing to supply the quantity of catridged ANFO / emulsion explosive.

5.4 Drilling and Blasting

The blast holes will be drilled to a depth of 6.5 m with 9% subgrade drilling. The holes will be charged with explosive and detonating fuse will be used to connect holes in the same row and between the rows.

5.5 Powder Factor

The average powder factor is expected to be about 7.0 tonnes per kg of explosive with charge per hole varying from 15-20 kg. About 30-35 holes will be blasted at a time with use of electric delay detonators or cord relays to achieve better fragmentation. Blasting will be carried out three times a week.

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5.6 Secondary Blasting

All efforts will be made for properly designed blasts so that minimum large boulders, which cannot be handled by loading machines, are generated. These will need secondary blasting. For secondary blasting slurry explosive in cartridge form will be used. One or two cartridges are placed on oversize boulder and covered with wet mud. These are then blasted resulting in breaking of large boulders. Alternatively, hydraulic rock breakers will be used, particularly if site mixed explosive is used.

5.7 Storage of Explosives

After setting up a cement plant near Chedvai deposit it is proposed to construct one magazine of capacity of 1500 kg. cartridged explosives. The magazine will also store cast boosters, detonating fuse and detonators. Necessary approval will be obtained from competent authority.

Since magazine of major suppliers of explosives are located within 50 Km to 70 Km, an explosive van will be hired for transport of explosives from its Nandgaon Ekodi Limestone mine.

6.0 Mine Drainage

6.1 Since the mining operations will be located on hill tops with steep slope at places, there is unlikely to be accumulation of rain water in any part of the mine.

6.2 Since, the limestone is fairly well jointed, with vertical or sub-vertical joint planes, there is unlikely to be any percolation of water into the mine till workings are extended below ground / valley level of 70 m datum.

6.3 Hence, no pumping will be required at this mine, till workings reach level below the level of the valleys which is not likely during initial 30 years.

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7.0 Stacking of Top Soil, Mineral Rejects and Disposal of Waste

7.1 General

As can be seen from borehole data, there is topsoil present occasionally for upto 0.30 m only on plateau portion of hills. The hill slopes are generally barren with limestone cliffs. Hence, the quantity of topsoil expected to be removed is quite small. The overburden is also found at places, with limestone outcropping at most of the sites. But in Block II nearly 51% of overburden shown in Para 3.7.5 (viii) or 1.77 Mm^3 will have to be removed. The quantum of low grade ore, where CaO is less than 35% constitutes waste.

7.2 Top Soil

This will be scrapped or dozed and collected at a suitable place before being loaded by wheeled loaders into tippers for stacking at soil dump site near the Western part of the area as shown on geological plan **Plate IIIA**. The total soil during initial five years is estimated at 500 m^3. Hence a small area of 10 m x 40 m is marked and soil dump height will be less than about two meters.

7.3 Overburden

The amount of overburden estimated is about 0.728 mm^3 in initial 15 years. The overburden will be dumped on the relatively flat area on Western side of Block-II where argillaceous limestone is outcropping. The area of the dump will be 2.4 ha. considering 10 m dump height near the lease boundary. The dump is shown on Geological Plan Plate IIIA.

7.4 Low Grade Limestone

There will be substantial production of low grade limestone containing less than 35% CaO and more than 16 % SIO_2. This will have to be stacked at suitable place within the mine itself as there is only agricultural land in valley, which will mean displacement of people from livelihood, which company wishes to keep to a minimum. Hence, it will be stacked during initial five years towards North of soil dump.

7.5 Biological Reclamation of Dump

The dump will be mainly lowgrade limestone. There is not much soil available in the area of mining. Hence, biological reclamation of dump will not be possible for initial 10 years. During this period, some special methods will be investigated so that these dumps can be reclaimed with minimum of soil.

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8.0 USE OF MINERALS

8.1 As stated earlier, this will be captive mine for a proposed cement plant near Chedvai Village about 5-10 km. away. As such entire production will be sent to the proposed plant after crushing at mine site.

8.2 The limestone crushed will be transported and mechanically stacked at the cement plant before blending so as to get desired chemical analysis of the mix.

8.3 The expected chemical analysis of raw mix to be fed to cement kilns, as stipulated by plant consultants, is as given below:

(Value in %)

CaO	SiO_2	Al_2O_3	Fe_2O_3	MgO	LOI at 900°C
44.8	12.8	2.1	2.7	0.9	36.76

This will be achieved by blending additives like bauxite to limestone.

8.4 The limestone raised from Chedvai Limestone Mine will be initially transported by existing road from Maharashtra side, after strengthening the same. However, the company will be examining options like aerial ropeway, after the location of the plant is finalized. Till then, limestone will be transported to the plant under construction at Naronda.

9.0 OTHERS ASPECTS

9.1 Site Services

9.1.1 The Chedvai site of the mine is about 60 Km away from proposed cement plant near Naronda village. Hence, it will be necessary to create all site services at this proposed mine. The area selected for site services is shown on both surface and Geological plans Plate IV and Plate IIIA. The proposed site services include:

- Mine office
- Workshop / Repair shop
- Stores
- HSD Outlet
- Water supply
- Canteen
- Ore sampling facilities

A brief description of each of these proposed facilities is given below:

9.1.2 Mine Office

A small mine office with 3-4 rooms will be provided which will accommodate offices of Mines Manager, Geologist, Safety / Environment Officer. They will be provided with cell phones to have contacts with plant at Naronda, office in Chandrapur and company's Head Quarter at Nagpur.

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9.1.3 Repair shop / Workshop

A small Repair shop / workshop will need to be provided at site by the contractor as facilities at cement plant are far away. The workshop will have capability, facilities, equipment and tools and will tackle all minor repair work of heavy earth moving machinery, trucks, light motor vehicles except major overhaul of engines and transmission assemblies. The workshop will be provided with a drilling machine, electrical and gas welding equipments and all tools to tackle preventive maintenance as well as minor breakdown maintenance work. It will also have a service station for washing of vehicle. It will be manned by trained qualified staff of the contractor.

9.1.4 Stores

The mine will have a small size stores set up by the contractor. The store will stock all necessary spares for preventive maintenance as well as for break down maintenance. It will have a separate area for storing of greases and lubricants.

9.1.5 HSD Out Let

Since, the mine is out of way; it is proposed that the contractor should have storage license for a 15 kl storage tank of HSD and he will arrange to install the same.

9.1.6 Electric Substation

Although the equipment at mine will be operated by diesel, electric power will be required to operate crusher, workshop equipment, water pumps, and lighting. It is proposed to draw a 33 KV transmission line from nearest substation of Maharashtra Power Distribution Co. Ltd. when construction of Cement Plant near Chedvai will start. The transformer capacity will depend on power requirement of crusher.

Till then, it is proposed to have 2x50 KVA DG sets, for lighting, pumping and workshop equipment.

9.1.7 Water Supply

It is proposed to have two or more tube wells with submersible pumps for meeting requirement of water for drinking, civilian use and industrial use like haul road and other spraying. The requirement of water is estimated at 10 m^3 per day for all purposes. Adequate storage capacity will be created at mine office to store about 20m^3 of water.

9.1.8 Canteen

Since, the area is quite far away from towns, it is proposed to provide canteen which will have a good kitchen with gas stoves, steam cookers and store room. The canteen made refreshment items will be supplied to workers at site.

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9.1.9 Ore Sampling Facilities

A full fledged room for collection, preparation and storing of limestone samples from mine will be provided at the mine. A small crusher will be installed so that samples can be prepared for sending them to cement plant for analysis.

9.1.10 Magazines

When the mine production is enhanced to 4.5 Mt/yr, Magazines for explosive storage will be constructed in the eastern part of the lease area. Till then an explosive van will also be provided or taken on loan from Nandgaon –Ekodi Mine for carrying out blasting twice in a week.

9.2 Statutory Facilities

Rest shelters, blasting shelters and first aid boxes to all field supervisory staff will be provided as per statutory requirement.

9.3 Residential Colony

A small temporary residential colony with 5-6 houses for staff and supervisors will be provided at mine site. The colony will provide bachelor accommodation initially. The location of colony will be decided after necessary acquisition of non forest land.

9.4 Dispensary

A dispensary with paramedical staff will be provided at company's Naronda Cement Plant. It will be stocked with necessary medicines to meet emergencies. The doctor employed by the company at cement plant will visit the Mine site once a week. An ambulance will be kept available round the clock at the mine.

9.5 Employment

The manpower proposed to be employed at Chedvai for mining and related operations is as under:

Officers	:	4
Supervisors	:	4
Skilled operators & maintenance personnel	:	4
Monthly Rated	:	5
Other workers	:	15
Total		**32**

9.6 Mine Management

9.6.1 The mine will be headed by a First Class Mine Manager who will have full charge of all departments located at site. He will be assisted by a Maintenance Engineers, a Geologist, Safety and Environment Officer.

9.6.2 The proposed organization chart is depicted at **Figure 2.**

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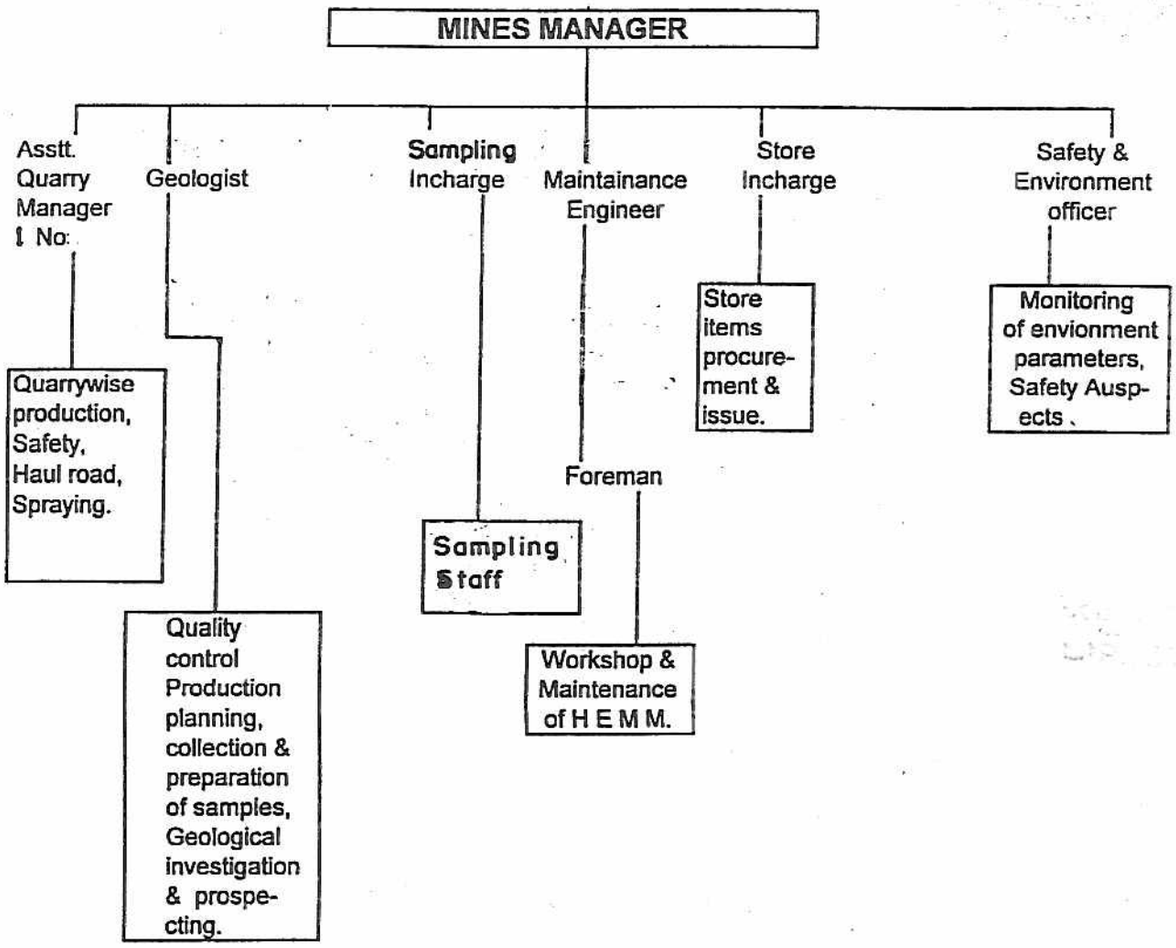

Fig -2 : Organisation Chart
Chedwai Limestone Lease.

10.0 MINERAL PROCESSING

10.1 Since the mine will win limestone by drilling and heavy blasting, there may be oversize pieces which cannot be readily transported to cement plant initially nearly 60 km. away. It is, therefore, proposed to have a primary crusher of adequate capacity say 250 tph capacity at the mine site, so that all limestone produced, is crushed to (-) 80 mm size for direct feeding to grinding mills at the plant. The crusher house will receive the limestone in a bunker. The maximum size to crusher feed will be 300 mm.

10.2 The crushed limestone will be transported to proposed cement plant about 60 km away by the available road on Maharashtra side. This road will be first strengthened for plying of 20/30 t dumpers. If 10 t tippers are proposed, it will involve 65-70 trips of loaded tippers and 65-70 trips of empty tippers per day.

The road is marked on toposheet and is a public road and not a forest road. However, if necessary, permission from the State Forest Department will be obtained.

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PART - B

11.0 ENVIRONMENT MANAGEMENT PLAN

11.1 Baseline Information

11.1.1 Landuse Pattern

The existing land use of the area, which is also premining landuse is as under:

i)	Forest Land	.....	527.48 ha.
ii)	Agricultural Land	.....	167.84 ha.
iii)	Govt. land.	.....	0.40 ha.
		Total	**695.72 ha.**

The major part of lease area is Forest Land which is part of Manikgarh Reserved Forest. There is only one village not included the lease area, namely Chedvai spread over 2.76 ha of land. The village is divided into three parts namely Sarpanch Guda, Patil Guda and Up Sarpanch Guda with intervening agricultural fields. Besides a few of the land owners have their own houses in their lands which are part of the lease.

11.1.2 Water Regime

a. There are no perennial water courses in the area. The water falling on hilly terrain flows down to the valley and through the seasonal water courses, flowing mainly to south and southeast eventually meet easterly flowing Pedda Vagu (River) in the Southern part of buffer zone.

b. The main drainage of the area is controlled by southerly flowing Bapur Nallah in the state of Maharashtra and easterly flowing perennial river Pedda Vagu in state of Andhra Pradesh. The seasonal drainage from Chedvai area generally flows south eventually into Pedda Vagu (River).

c. There are no tanks in the lease area or buffer zone. A few springs are located in the hills mostly near contacts of limestone with that of overlying Deccan Trap basalt.

d. The thick alluvium of the valleys yields good quantities of water in the wells of the area. As per information collected from villagers, water levels are very near to surface-upto 0.5 m maximum in wells during monsoon and post monsoon. The water level goes upto 15 m below ground during summer.

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11.1.3 Flora and Fauna

a. The hilly part of lease and surrounding area have thin cover of mixed forest. The forest is deciduous forest comprising mainly Tendu, Palas, Behada and lot of bamboo. There is no list of climbers available but many are seen in the field.

b. The wild animals although present in the area, are rarely seen. They include sambars, Chitals and bears etc. A sizeable population of birds is visible in the area.

c. The valley areas are cultivated, with Jawar, Tur, Chilly and Cotton are main crops.

11.1.4 Ambient Air Quality

a. The ambient air quality data is being collected. But ambient air quality will be excellent as there are no industries within 10 km buffer zone nor there are roads on which vehicles travels. Only transports seen in the area are three wheelers and jeeps and their numbers too does not touch double digit. The area have unpolluted air which is felt when one moves in the area.

b. The SPM values are unlikely to exceed 100$\mu g/m^3$ while RPM values will not touch even 50 $\mu g/m^3$. Sulphur dioxide are unlikely to exceed lowest detectable levels of 6.5 $\mu g/m^3$. The oxides of nitrogen will also be low.

c. The dust fall rate in the area is expected to be less than 5 t per sq. km. per month.

11.1.5 Ambient Noise Levels

There being no industry, no roads, no vehicles moving, the ambient noise levels are very low. Day time noise levels in valley areas as measured on October 2006 were usually less than 45 d B(A) at all stations, where noise levels were measured, during visit to the area. Only near the village noise levels were higher upto 50 d B(A).

The noise levels on hill tops were upto 50 d B (A) due to wind on the hill tops.

11.1.6 Water Quality

Data is being collected.

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11.1.7 Climate Conditions

The area has extreme climate as reported by DGM. Summer temperatures are high going upto 46^0C. The winter temperatures are quite low going down to 6^0C. The rainfall, temperature or humidity records are not available for any nearby town.

The nearest meteorological station is at Chandrapur, the district place, about 65 Km towards north of the area. The following data is summarized from data obtained from Meteorological Department.

a. Rainfall

The average rainfall during 12-year period 1992-2003 was 1,234.3 mm. Only during three years rainfall had gone below 1,000 mm. The maximum rainfall was 1,521.8 m during 1998 while minimum was 808.4 mm during 1996. The monthwise rainfall data is given in **Annexure VIII** while annual rainfall is graphically shown at **Figure 3.**

The precipitation is spread mainly over five month period of June to October each year but about 70% precipitation takes place during three month period of July, August and September. Months of November, December and February are comparatively dry months. The data regarding maximum rainfall in 24-hr period was not available.

b. Temperature

The summers are usually hot and dry in the area. Chandrapur is considered hottest district of Maharashtra. The mean daily maximum temperature during May is 43 °C while mean daily minimum temperature is between 29°C-30 °C. Winters are usually mild with minimum temperature rarely going below 18 °C.

c. Humidity

The humidity is usually high during monsoon but from months of November till April maximum humidity often touches 30% while minimum touches as low as 15%.

d. Wind Velocities and Wind Direction

The wind velocity and wind direction data collected from Chandrapur Meteorological Station, gives monthwise windrose diagram at 0830 hrs and 1730 hrs. 24-hour data is not available. During four months of January to April the predominant wind direction is from SE, and E and the wind velocity are usually below 11 kmph. Calm period range from 6% to 14%. The wind direction start changing in April itself and predominant wind direction from June to September is from W, NW and WSW. The wind velocity often goes up to 12 kmph to 19 kmph with calm periods reducing to between 1% and 9%. From October to December predominant wind direction is from N, NE and E. The wind velocities rarely exceed 5 kmph while calm period range from 10% to 20%. The monthwise windrose diagram for Chandrapur Station is depicted at **Figure 4A and Figure 4B.**

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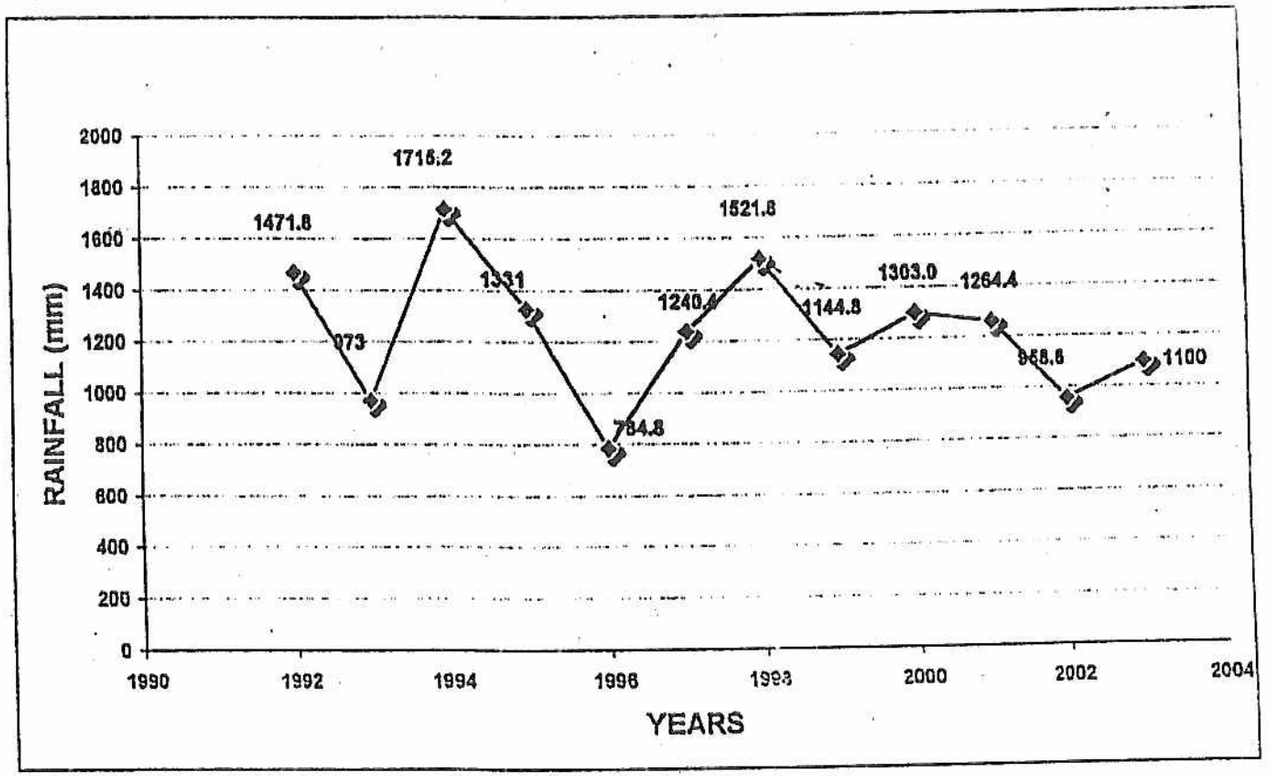

FIG.3 : YEARLY RAINFALL DATA 1992 -2003
CHEDWAI LIMESTONE LEASE

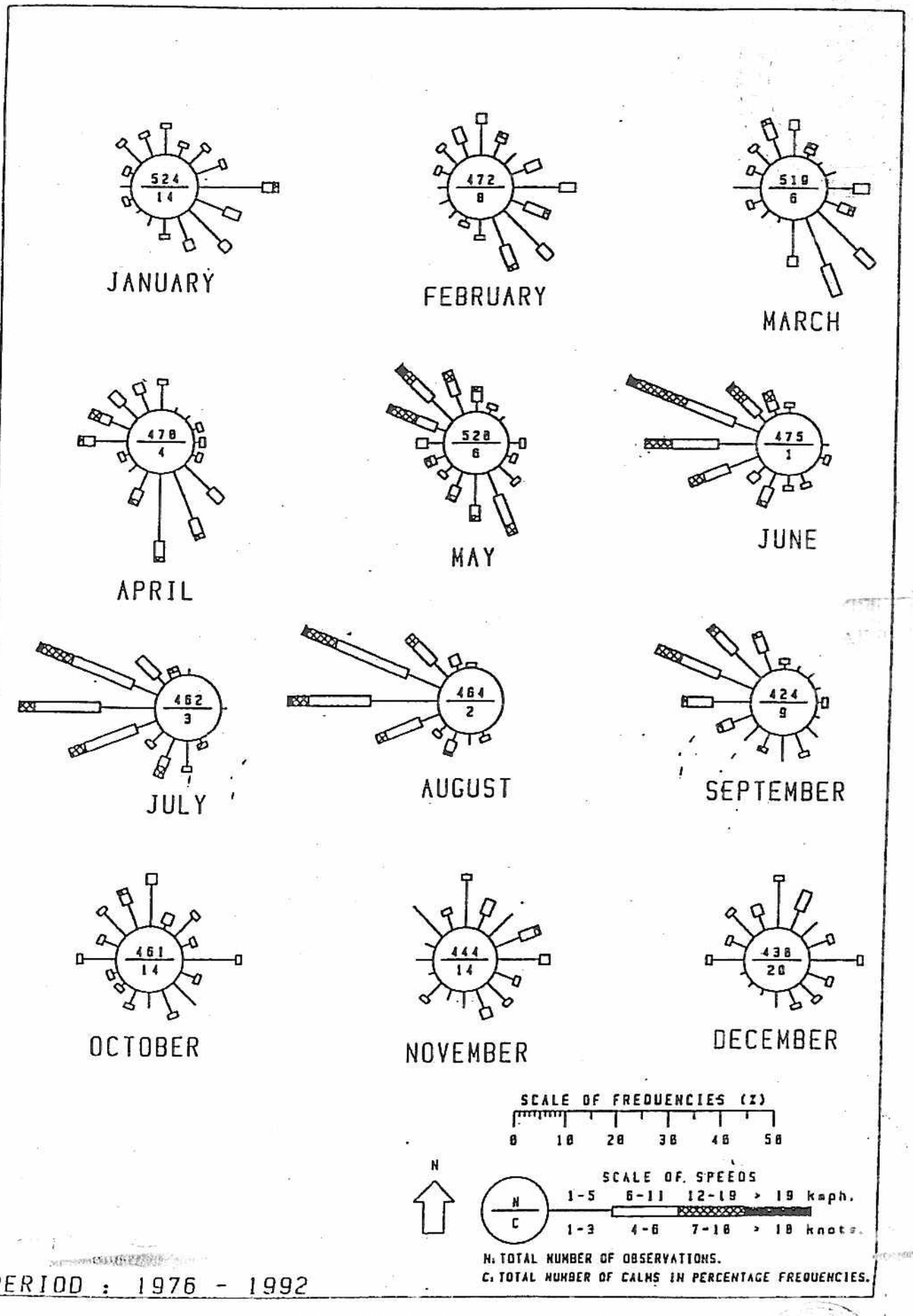

Fig 4A : WINDROSE CHANDRAPUR STATION 8·30 HRS

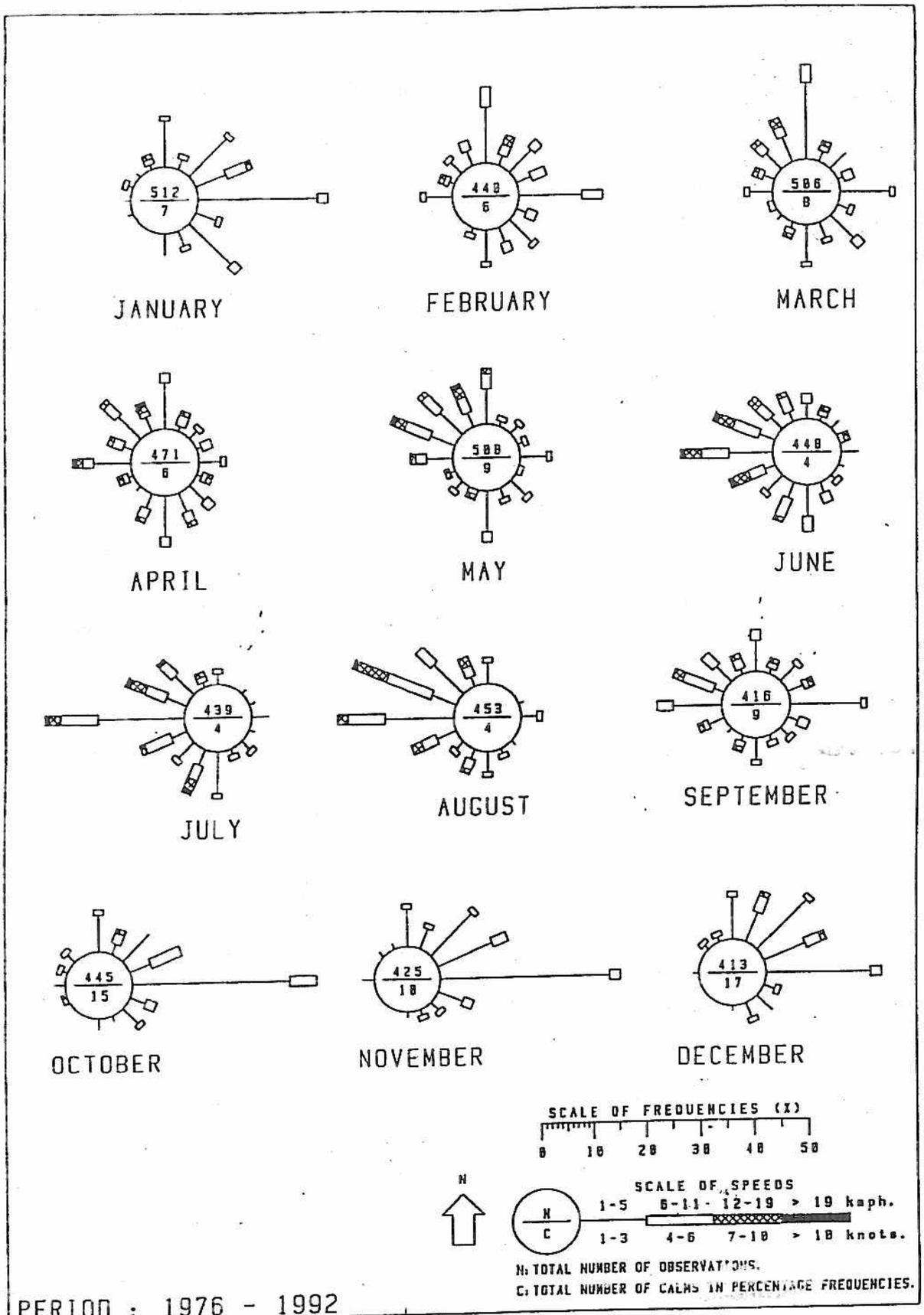

Fig 4 B : WINDROSE CHANDRAPUR STATION 17-30 HRS.

11.1.8 Human Settlements and Demography

a) The 2001 census data is now available on compact discs and the following data is extracted from the same. The villagewise demographic data is presented in **Annexure IX A**. The data is analysed below:

i) There are total number 32 villages in the 10 km. radius buffer zone area, 10 in the Rajura Tehsil Chandrapur District of State of Maharashtra and 22 in the Kenameri and Wankdi Tehsil of Adilabad district of State of Andhra Pradesh. Thus the Andhra Pradesh part of buffer zone area is better populated.

ii) The population of 10 villages of Maharashtra totals 6,326 consisting of 3286 males and 3040 females. The population and 22 villages of Andhra Pradesh is almost twice at 12,534 consisting of 6276 males and 6258 females.

iii) The number of females per 1000 males is 925, a comparatively poor ratio, for 10 villages of Maharashtra. For 22 villages in the state of Andhra Pradesh the ratio is 997, a very high ratio.

iv) The percentage of scheduled Cast and Scheduled Tribes in the population is as under:

	Percentage of		**Total**
	Scheduled Castes	**Scheduled Tribes**	
10 villages (Maharashtra)	8.9	33.6	37.5
22 villages (Andhra Pradesh)	10.2	34.2	44.4

The percentage of Scheduled Castes in the villages of Maharashtra is low as compared to villages of State of Andhra Pradesh. On the other hand percentage of scheduled tribes in almost same in the villages of both sides of the interstate border.

b. Literacy

	% of Literacy		
	Total	**Male**	**Female**
10 villages (Maharashtra)	36.08	44.95	26.41
22 villages (Andhra Pradesh)	26.56	35.91	17.18

The overall Literacy rate in the villages of both sides of interstate border is poor, the situation is comparatively poorer in the State of Andhra Pradesh. The female literacy rate is extremely poor, nearly 54 years after independence.

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c) Vocational Data

i) The vocational data for the 32 villages is presented below as percentage of total population, separately for 10 villages of Maharashtra and 22 villages of Andhra Pradesh. The villagewise data is presented in **Annexure IX B.**

	% of Total Population	
	10 villages (Maharashtra)	22 villages (Andhra Pradesh)
Cultivators	23.84	33.47
Agricultural Labourors	10.02	06.75
Household Industries	00.43	00.68
Other workers	04.00	03.67
Total Main Workers	38.29	44.57
Marginal Workers	10.60	07.76
Non Workers	51.11	47.67

ii) An analysis of above data is presented below.

iii) The percentage of total main workers in the villages Andhra Pradesh is almost 17% more than the villages of Maharashtra. The percentage cultivators are more in the villages of Andhra Pradesh than the villages of Maharastra. On the other hand the position agricultural labourers is just opposite. Obliviously land holdings are better distributed in the villages of Andhra Pradesh than Maharashtra.

iv) The percentage Marginal workers are almost 25% of total main workers in the villages of Maharashtra as against just 15% in villages of Andhra Pradesh. Obviously there are better job opportunities in Andhra Pradesh than in Maharashtra villages.

v) Perhaps, due to non availability of the employment the percentages of non workers in villages of Maharashtra are higher than that in villages of Andhra Pradesh.

11.1.9 Public Building, Places of Worship and Monument.

There are no archaeological monuments or public buildings or places of tourist interest within 10 Km radius buffer zone. There are also no temples of local importance in the area.

11.1.10 Application of Water Act

The water (Prevention and Control of Pollution) Act, 1974, is applicable to the area. The mine will obtain necessary consent under the Act after the lease is granted.

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11.2 Environmental Impact Assessment

11.2.1 General

The opencast mining activity at Chedvai will be new to the area, although mining activity will not be new to Chandrapur district. However, there are no mining or industrial activities within 10 Km radius buffer zone of the proposed lease. The mine will have life of more than 45 years on the basis of the present proved reserves. If cement grade limestone is found in unexplored eastern hills in the lease area, the life may extend further by at least a decade. The environmental impacts of the Mining Operation are to be assessed in the following general context.

a. The mining of ore, including removal of overburden and waste will be by semi-mechanized mining method. The shovel tipper combination along with the drilling and blasting will be used.

b. The annual production will be built up initially to capacity of 2.0 lakhs tonnes per annum over a period of first five years. Later, when Cement Plant of 3.0 Mt. per annum capacity is set up in the vicinity of the mine, the production capacity of the mine will be enhanced to 4.5 Mt/yr.

c. The major part of lease area is in 50 m to 100 m high hills which are covered by thin deciduous forest.

d. The limestone deposits are mainly in hills, with steep slopes, which rise 50 m to 100 m above ground level of the valley.

e. A thin soil cover is present on hill top plateaus but steep hill slopes are generally barren with limestone cliffs.

f. The limestone is not of uniform quality both vertically and horizontally. Hence, a large quantum of waste will have to be handled in certain parts of ore bearing area.

g. The mining operation initially during the first five years will be spreads over 5.6 ha. area and no backfilling will be possible till the ore extraction from hill reaches ground level of the valley. Even after that, if there are deposits of cement grade limestone below thick intervening low grade limestone. At that time, 30 years from today, it may be economical to mine these reserves.

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11.2.2 Landuse

The Limestone ore is in the hills which are forest land. In the valleys there are thick alluvium deposits below which there are limestone deposits which are not fully investigated. However, it is expected that during initial lease period of 30 years limestone will be mined from Block II and III. Based on this premise, the land utilized will be as under:

(Fig. in ha)

Type of Land use		At the end of first five years	At the end of 30 yrs. lease period
i)	Area broken due to Mining/ pits	5.60	120.50
ii)	Area covered by dumps a) Top Soil	0.04	1.00
	b) Waste & OB	2.40	15.00
iii)	Area utilized for : a) Infrastructure	1.00	2.06
	b) Roads	3.28	4.60
iv)	Crusher	0.25	0.25
v)	Green Belt	1.35	5.00
Total		**13.92**	**148.41**

11.2.3 Impact on Air Quality

a. The major part of the lased area as well as surrounding area falls within Forest leave aside any industries, there is no good approach road to the area. Hence, current air quality parameters are even lower than average rural areas.

b. The limestone is hard and compact and generally generates less dust than other ore mines.

c. The mining operations, although concentrated at one or two Blocks at any one time, are unlikely to generate so much of dust as to affect the SPM and RPM in the air beyond limits prescribed for rural and residential areas. Even in work zone areas values are unlikely to exceed limits prescribed by the Indian Bureau of Mines for such areas.

d. The other pollutants like sulphur dioxide, oxides of Nitrogen and Carbon monoxide are expected to be well below prescribed limits, even for rural / residential area as the sources for their generation will be limited to blasting of explosives and diesel consumed by the heavy earth moving equipments.

e. The lead, now a day, is generally found absent in the ambient air, as diesel, petroleum and other fuels used today are free of lead compounds.

f. Overall, the impacts on air quality, although expected, are unlikely to be of an extent, where the air quality parameters are affected beyond permissible limits for rural / residential areas.

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11.2.4 Impact on Water Quality

a. The area does not have any perennial surface water courses. The seasonal water courses carrying rainfall water down the hills and through the valleys, do carry rain wash off / scree to day. These are likely to increase due exposed areas due to mining operations. The management will take appropriate steps like construction of bunds and with waste material to arrest them.

b. The soil and waste dumps are likely other sources of water pollution. All the dumps will have garland drains surrounding them, at toes of the dump, so that material flowing with rain water will be arrested.

c. The mine will use water for wet drilling, pre and post blast spraying, spraying of haulroads and dust suppression at crushing and screening plant. Only limited quantities will be used for this purpose and hence will not cause water pollution.

d. A small quantity of water used for washing of tippers and other equipment is likely to be contaminated with oil and grease. The used water will be collected in a oil separating arrangement and overflow water will be used for plantation.

11.2.5 Noise Levels

a. Permissible exposure durations for different noise levels prescribed by DGMS is as under:

Noise Level d B(A)	90	93	96	99	102	105	108
Maximum Exposure Levels hours per day	08	04	02	01	0.5	0.25	0.125

b. The existing noise levels in the area are very low, even less than normal rural areas. The mining operations are expected to generate lot of noise particularly due to drilling, blasting, loading, plying of tippers and crushing plant.

c. However, since the mining operations will be located on hill tops, the noise is unlikely to affect, the only village Chedvai, located in the valley.

d. The noise levels are unlikely to exceed 70 dB(A) near lease boundary.

11.2.6 Impact of Blasting Vibrations

There is only one village – Chedvai – within lease area. The mining operations will be on hill top while the village is located in the valley. There are no other villages within 3 km of the lease boundary. Even then, when the mine starts, the company intends to carry out trial blasting to determine parameters so that effects of blasting are minimized. The blasting will be restricted to three times in a week.

Hence, there will not be any impacts due to blasting.

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11.2.7 Water Regime

a. The depth of ground water table in the wells located in the valley part is 0.5 m post monsoon and upto 15.0 m during summer. Since the mining operations are to be located on hill top, 50 m to 100 m above valley level, they will not affect the ground water table.

b. The water regime may be impacted to a limited extent due to requirement of water for industrial and civilian use of the mine, as requirement is not very large.

c. The mine will require about 10 m^3 of water per day initially and later upto 250 m^3/day which will be obtained by open dugwell / drilling tubewells. The management intends to take necessary permission from the appropriate authority for withdrawal of ground water.

11.2.8 Impact on Socio Economics

There are neither industries nor there are any means of communication to Chedvai village through all weather road. Even during months other than monsoon, the people are dependent on adjoining areas of Andhra Pradesh. The starting of mine is expected to change all this.

The mine will not only have good approach road built to the area, it will also have tele-communications. This will benefit the people of Chedvai Village.

The starting of mine will result in several job opportunities for the villagers, directly and indirectly. This can only have positive impact on socio-economic of the area.

11.2.9 Historical Monuments etc.

There are no historical or archaeological monuments within 10km of the lease area nor even any public buildings or any places of tourist interest. Thus there will not be any impacts on them.

11.3 Environment Management Plan

11.3.1 General

The group is entering, the field of mining for the first time. The major part of Chedvai lease is forest land. Although forest is thin, the hill top plateaus have fair amount of tree cover. The company would therefore, endeavor to incorporate best environmental protection measures in operation of the mine. The principal measures proposed to be adopted will include:

a. Selection of proper sites for dumping of overburden and waste will b[illegible]nsured.

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b. During process of building dumps, stone walls will be erected at the toe of the dumps. The garland drains will be made outside these walls so that silt from rainwash can be arrested. The garland drains will be cleaned before start of every monsoon and during monsoon, when necessary.

c. Regular spraying of mine roads will be undertaken so that air borne dust will be reduced to minimum.

d. The rain water flowing down the hill slopes will be properly guided through channels. Earthen bunds will be constructed so that fines flowing with water will be arrested.

e. Environment Plan is Placed at **Plate VII.**

11.3.2 Temporary storage of Top Soil

There is soil only on hill top plateaus and in valleys. The area of valleys will not be mined as it has thick alluvium cover. The thickness of soil on hill tops is maximum of 0.5 m. However, quantity of soil required to be removed is not large.

The soil will be stored in dump with area of 0.4 ha. The height of the dump will be restricted to about two m. In order to preserve nutrients available in the soil, leguminous plants and grasses will be grown on top and slope of dumps. However, every effort will be made to use the soil for plantation during every monsoon.

The location of soil dump is shown on Geological Plan, Plate IIIA. In order to arrest wash off from the soil dump, garland drains will be provided all round the dump. The drains will be 2 m wide and 1.0 m deep so that soil run off settles into the drains. The drains will be cleaned every year prior to monsoon and if required, during monsoons too.

11.3.3 Yearwise Reclamation Proposal

a. Life of the mine is more than current lease period of 30 years, on the basis of presently proved reserves. The major parts of reserves are in Blocks II and III. The Block II reserves itself will last more than 20 years. Hence, there will not be area available for reclamation during first 10 years. Backfilling will not be possible for atleast 20 years.

b. The only possibility of reclamation will be in case of dumps. However, even in the case of dumps, reclamation will not be possible for initial 12-15 years.

c. The slopes of the dumps will be reclaimed through plantation after digging one m deep pits of size 0.6 m x 0.6 m, in the low grade lime stone. These pits will be filled with soil and cow dung fertilizer, before planting saplings.

d. The reclamation of land in Block II can be started only after 20 years, provided there no reserves below 70 m level (assumed datum). The reclamation of land will be postponed if reserves of Cement Grade and blendable limestone are found below valley level. This can only be explored after workings have reached this level. If there are no economically workable reserves, then these areas can be reclaimed.

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e. Reclamation will follow the same procedure outlined in para c) above. About 1600 saplings will be planted per ha.

f. The east side areas, if worked after exploration, extraction of the reserves will not be even started during initial period of 20 years. The reclamation of these areas will be taken up only after decision regarding renewal of lease beyond 30 years is taken

11.3.4 Abandoned pits as Water Reservoirs

Since the mining will be restricted to above ground level, there is no possibility of abandoned pits, as reservoirs during first lease period of 30 years.

11.3.5 Programme for Afforestation

The major part of lease area is Reserved Forest Land and most of the balance lands are agricultural lands. Hence, during initial years of plantation will only be possible along boundaries of the pits, by the side of haul roads and in open forest areas if permitted by Forest Department. It is, therefore, proposed to plant 2000 saplings per year during first five years increasing it to 3000 to 5000 saplings per year thereafter, depending on availability of space for plantation.

11.3.6 Stabilization and Vegetation of Waste Dumps

a. There will be two or three dumps, each of 20 m height during current lease period of 30 years. The dumps will mainly consist of low grade limestone which have very high Silica (+18%) and low Calcium Oxide (less than 40%). The dumps will be reclaimed as per procedure described in para 11.3.3 (c) above.

b. The saplings will looked after for three to five years, depending on their growth. Watering of saplings during non monsoon months and application of fertilizers will be main steps involved.

c. The soil dump will be single stage with 1.5 to 2 m height. The soil will be used as and when required for plantation. The dump will be planted with grasses and legumes suitable for fixing nitrogen in the soil so that soil quality is preserved.

11.3.7 Measures to control Water Pollution and Sedimentation

a. There are no perennial water courses within the area. There are a number of seasonal water courses on the hills and the valleys. The mining being mainly restricted above level of valleys around 70m level (assumed level), most of these will not be disturbed.

b. All the dumps, whether soil or overburden / waste, will be surrounded by garland drains one meter depth and two meters wide. Most of the sediments will settle in these drains.

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c. The water from garland drains will be coursed so that it flows out of the working areas, down the slopes. On the slopes small earthen dams will be constructed to arrest balance sediments.

d. The garland drains will be cleaned before every monsoon as well as and when required. The material consisting fine sediments will be utilized for plantation. The soil available in hilly part of lease area is not sufficient. The sediments will be analysed and appropriate fertilizer additions will be made.

11.3.8 Treatment and Disposal of Water from the mine

The water from mine will be mainly rainwater falling on the area. Hence no treatment, except removal of sediments is required. The handling and treatment of rain water is described in para 11.3.7 above.

11.3.9 Measures to Minimize Adverse Impacts on Water Regime

a. Since the working will be located on hill tops, there will not be any impact on ground water table below in the valley due to mining operation. All the water will continue to flow to alluvium in the valley. The earthen bunds constructed will help in accumulation and absorption of water in the ground.

b. If necessary, water harvesting structures will be constructed in the valley so that maximum rainfall percolates down.

11.3.10 Protective Measures against ground vibrations, fly rocks and Air Blasts Caused by Blasting

a. Since the mining operations are mainly located on hills tops the impact of blasting vibrations and fly rocks will be negligible. No Air Blasts are expected as limestone beds, although massive, are well jointed.

b. The nearest and only village, Chedvai, in the lease area will be about 1.5 km away when the mining operations are started. The mining will advance towards the village and at end, the village will be about 450 m away.

c. There are no villages outside within 1.5 km. of the lease area. Hence, there will not be any problem arising out of blasting, affecting any other village.

d. As soon as mining operations are started, trials will be carried out to design suitable blasting parameters like number of holes to be blasted per blast, explosives per hole as well as maximum charge to be blasted per delay. The delay detonators and / or cord relays will be used to control vibrations and for better fragmentation.

e. Thus, there will be no danger from blasting vibrations, air blasts and / or fly rocks due to blasting operations at the mine.

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11.3.11 Measures to Protect Monuments etc.

Since there are no monuments, temples or places of tourist interest within 10 km radium buffer zone no steps are called for.

11.3.12 Socio Economic Benefits

There are no industries in the area including 10 km. radius buffer zone. The mine expected to create over 32 jobs directly and over 50 indirect jobs opportunities. This will have positive impact on socio-economics of this backward out of the way area.

11.3.13 Organisation of work of Environment Management

a) The work of Environment Management at Chedvai Mine will be looked after by the officer designated as "Assistant Manager (Safety and Environment)". He will be a post graduate Geology / Environment, who has been given special training in environment management in mining area. He will be directly reporting to the Mines Manager.

b) The Officer will look after all the local pollution control activities except those coming under perview of Line Managers, like sprinkling of haul roads within mining area. All the plantation work in Chedvai Mine will also be under his control.

c) He will also be responsible for monitoring all environmental parameters like air quality, water quality, noise etc. and keeping upto date records, in a bound paged Register/File.

11.4 Monitoring Schedule

a) As stated above in 11.3.13 (c) the monitoring of various environmental parameters would be the responsibility of the Incharge of Environment i.e. 'Environment Officer'. These will include the following:

i) Monitoring ambient air quality by monitoring SPM, once in three months for eight hours at one station.

ii) Monitoring of water quality once a month during monsoon at seasonal nallah and / or earthen bund constructed on seasonal water courses.

iii) Monitoring of noise levels once a months at four to six stations.

iv) Maintaining all the above records in a bound paged Register/ File.

b) In addition to above, the Environment Officer will also be responsible for planning of plantation activity each year as well as getting garland drains around the dumps cleaned as and when required, positively before onset of monsoon every year.

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12.0 PROGRESSIVE MINE CLOSURE PLAN

12.1 Introduction

12.1.1 M/s Murli Agro Products have proposed to establish a cement plant of 3 Mt. per annum of Pozzolona Cement at Naronda Village. With granting of Chedvai deposit it is proposed to establish another cement plant in the vicinity of Chedvai village of 3.0 Mt. per annum capacity. To supply, the main raw material, i.e. limestone to this new unit, Chedvai Mine is proposed to be developed to produce about 4.5 Mt. of limestone per annum.

12.1.2 A large part of the 695.72 ha. lease area is covered by Reserved Forest which accounts for 527.48 ha. of the lease.

12.1.3 Reasons for Closure

Not Applicable

12.1.4 Statutory Obligations

After receiving the letter of intent from the State Government, regarding granting of Chedvai lease, the company has initiated action to obtain necessary statutory clearances, which include preparation of the Mining Plan. The other steps like preparation of EIA / EMP, obtaining consent to establish and Environmental Clearance have also been initiated. An application for grant of Mining lease is also being made to the State Govt.

12.1.5 Closure Plan Preparation

Not Applicable. This is a separate chapter on 'Progressive Mine Closure Plan' and is part of the Mining Plan document for a mine yet to start operations.

12.2 Mine Description

12.2.1 Geology

The limestone occurrence at Chedvai is part of Vindhyan System. The limestone outcrops are visible over a large area exceeding 7 sq.km. The Penganga suites of limestone are exposed on higher grounds, in the form of hillocks. The valleys are covered by alluvium. The limestone deposit is of variable quality and thickness of the cement grade limestone is also variable. The detailed geology is described in paras 3.3, 3.4 and 3.6 of this document.

12.2.2 Reserves

The details of reserve estimation is given in para 3.7 of this document. In the earlier para 3.5 the exploration carried out by Directorate of Geology and Mining, Govt. of Maharashtra has been described. The method of calculation of the reserves is described in details in sub para 3.7.5 of this Mining Plan document.

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12.2.3 Mining Method

The method of mining proposed for this mine is mechanized opencast, using Shovel-Tipper combination. The proposal has been described in para 4.4. The mine will be using combination 0.9 m^3 hydraulic Shovels and 10 tonnes tippers. The mine will be worked with six m high benches.

There is not much soil at hill top where mining operations will be started. However, where ever soil is present, it will be removed carefully by dozer, loaded by Shovels and transported by tippers for stacking separately.

12.2.4 Mineral Beneficiation

No beneficiation, wet or dry has been proposed. Only blending will be undertaken by mining Cement Grade and Medium Grade limestone separately in the desired proportion. A crushing plant is proposed. The low grade limestone having silica in excess of 16% and CaO less than 40% will be stacked as waste.

12.3 Review of the Implementation of Mining Plan / Scheme of Mining Including five year progressive mine closure plan upto the Final Mine Closure Plan.

Since this is first mining plan for grant of lease of a virgin area, this is not applicable.

12.4 Closure Plan

12.4.1 Mined out Land

The Block II, where mining operations will be started have reserves which will last for nearly 24 years. Even, then the mining would have reached only upto valley level. Hence, no mined out land will be available for reclamation during first 30 years of life of mine.

12.4.2 Water Quality

This is a medium rainfall area and water level is 0.5 m to 15m below ground level of valley depending on the season. The mine working will be 20 m to 40 m above on hills. Hence only parameter of water quality likely to be affected will be suspended solid in rain water flowing down the hills. Management proposes to guide this water through existing water courses and construct earthen bunds to arrest the rain wash off. The quality of water is described in para 11.1.6 in the mining plan.

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12.4.3 Air Quality Management

The results of generation of Ambient Air Quality data are described in para 11.1.4 above. However the premining ambient air quality in the area will be better than other / normal rural areas, as there are no industries or roads in the area. The management proposes to undertake water spraying during working of mine. Mined out lands will be available for reclamation after about 30 years.

12.4.4 Waste Management

Waste generated during mining of limestone is low grade lime stone with SiO_2 more than 16% and CaO less than 40%. The quantity of overburden is small compared to reserves of limestone. The management of the overburden is described in Chapter 7.0 of this Mining Plan. Measures like construction of retaining walls and garland drains around the dumps will be taken up, to arrest pollution of water. It will not be possible to reclaim dumps during initial 10 years of mining.

12.4.5 Top Soil Management

There is not much of top soil available in the hill tops where limestone deposits are available and will be mined. The valley have thick deposit of alluvium, where no mining is proposed during current lease period. The top soil, whenever available, will be carefully removed and temporarily stacked in soil dump. This soil will be used for plantation in the same year. Details are given at para 7.2 of the document.

12.4.6 Tailing Pond Management

Not applicable

12.4.7 Infrastructure

Presently no infrastructure, except all weather good motorable public road, is available in the area from Maharashtra side. The management strengthen this road with prior permission of the Government of Maharashtra. This will benefit the population of the area. The other infrastructure like electric supply, office, workshop, water supply etc. will be created after and will be used beyond the present lease period.

12.4.8 Disposal of Mining Machinery

Not Applicable.

12.4.9 Safety and Security

Before starting of Mining operations, the mine authorities will make safety and security arrangement. Hence, no additional safety and security will be required.

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12.4.10 Disaster Management

There is unlikely to be any disaster at this mine. However, an action plan will be drawn as a contingency measure after the mining operations are started.

12.4.11 Care and Maintenance During Temporary Discontinuance

The following protective measures would be taken up to deal with the unforeseen circumstances that may arise due to temporary discontinuance of the mine.

i) All heavy earthmoving machinery from the quarry would be withdrawn and brought to the safe place so that these do not get submerged in pits during heavy rains, during the period of discontinuance.

ii) The entries to the quarry would be fenced with Notice Boards at the fences prohibiting entry into the quarry by unauthorized persons.

iii) The boundaries of the quarry will be fenced off to prevent cattles from the neighbouring village entering the quarry.

iv) At the entrances and strategic points, sentries/watchmen will be posted to guard the mine areas, oil depots, stores etc. if any. They will be provided with mobile phones / walky-talkies to contact the mine authorities / police/ fire authorities for help during emergency.

v) The mine area will be kept illuminated during night time, after the electric power supply is provided from the MSEB Grid.

vi) Audible warning sirens will be established at the mine office to be used during emergency so that prompt help can be received from proper sources.

vii) Managerial, supervisory and competent persons of the mine would be engaged for supervising machinery maintenance and house-keeping of the mine areas, as per needs.

12.5 Economic Repercussions of closure of Mine and Manpower Retrenchment

Not applicable.

12.6 Time Scheduling for Abandonment.

Not applicable.

12.7 Abandonment Costs

Not applicable.

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12.8 Financial Assurance

Out 695.72 ha. of the area applied for Mining lease, 16.19 ha. will be utilized during the first five years for opencast mine, soil and overburden dumps and for infrastructure and site services to be established, including roads. The area utilized upto the end of 5th year is depicted at **Plate VIII,** Progressive Mine Closure Plan. The details are also given at **Annexure X.** Therefore, financial assurance in the form of Bank guarantee for the proposed broken area of 16.19 ha. @ Rs. 25,000/- per hector comes to Rs.4,04,750/- (Rupees Four lakh four thousand seven hundred and fifty only). The bank guarantee will be submitted at the time of execution of the lease agreement.

12.9 Certificate

This being a progressive mine closure plan, the prescribed certificate; duly signed by the lessee, is enclosed.

12.10 Plans and Section etc.

The required plans and sections are enclosed in the Mining Plan.

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अनुमोदित
APPROVED

26/X/07

खान नियंत्रक (मध्यांचल)
Controller of Mines (Central Zone)
भारतीय खान ब्यूरो
Indian Bureau of Mines

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10/10/07