

JAIPRAKASH ASSOCIATES LTD.
(CEMENT DIVISION)

EXECUTIVE SUMMARY
FOR
CHORMARI - DEGARHAT LIMESTONE DEPOSIT
AT
VILLAGES CHORMARI AND DEGARHAT
DISTRICT SATNA, MADHYA PRADESH
(EXTENT: 102.983 Ha)

APRIL, 2008

Prepared by:



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**EXECUTIVE SUMMARY OF EIA REPORT
FOR
PROPOSED CHORMARI-DEGARHAT LIMESTONE MINE
(102.983 HA)
VILLAGE CHORMARI-DEGARHAT,
TEHSIL RAMPUR-BAGHELAN, DISTRICT SATNA,
MADHYA PRADESH**

1.0 INTRODUCTION

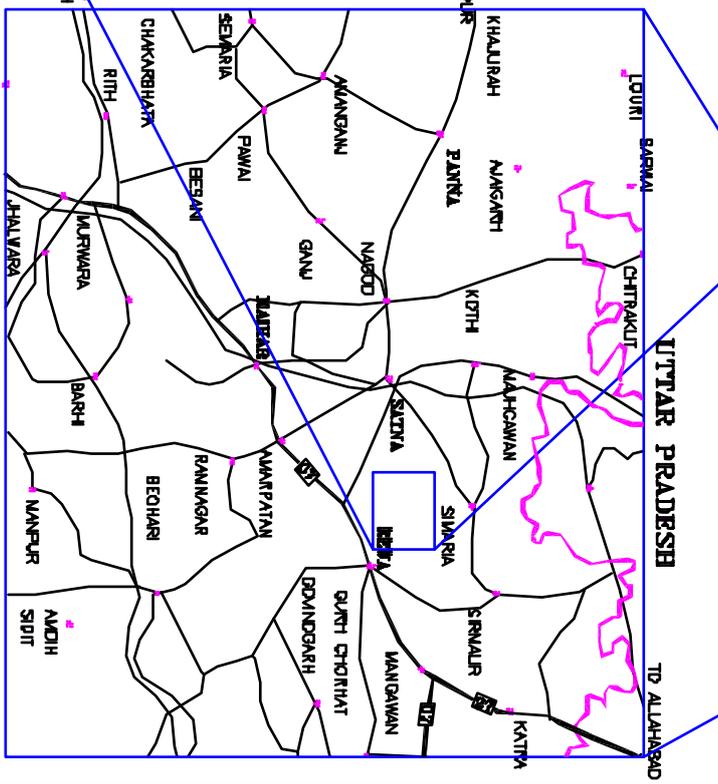
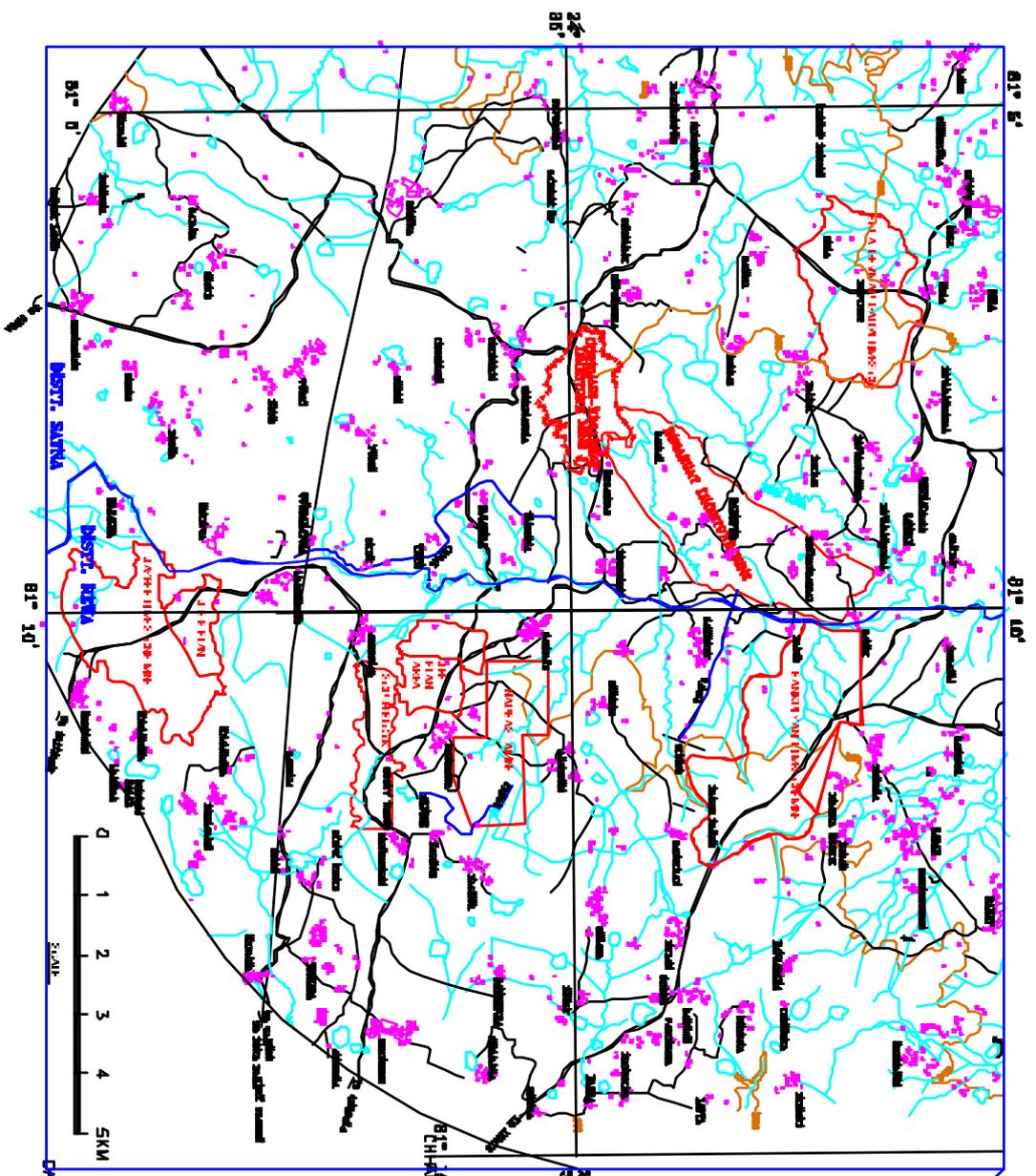
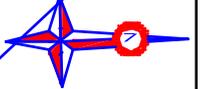
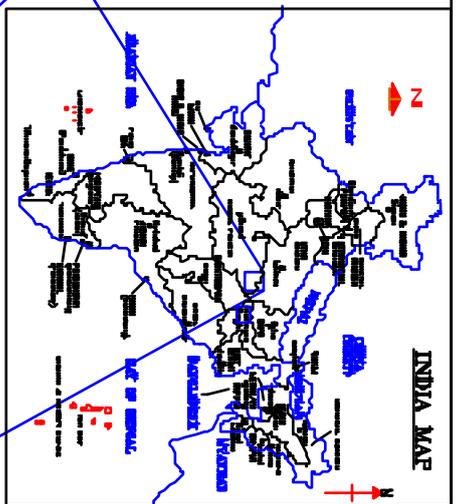
1.1 General background

Jaiprakash Associates Limited (JAL) is a leading industrial house for civil construction and hydropower projects. M/s JAL has entered into cement sector during 1986 for diversification. Presently, the group owns two cement plants having annual production of 3.5 and 2.5 million tonnes, which are located in Rewa district, M.P. The limestone from proposed Chormari Degarhat limestone mine (102.983 Ha) falls in village Chormari-Degarhat, Tehsil Rampur-Baghelan in District Satna of Madhya Pradesh. In first five years of mining 3 to 5 lakh tonne per year will be the production from this ML area, which will cater part of requirement of Jaypee Rewa plant. The ultimate production of 0.5 MTPA is envisaged from this mine. The mining lease has been granted for 30 years from the date of mining lease agreement.

1.2 Location and communication

The Mining lease area is located 20 km NW of Rewa town and 40 km NE of Satna town. The area is 5 km NW of Jaypee Rewa plant. The study area falls in survey of India toposheet No. 63 H/2 and is bounded between Latitude 24° 34' 47" - 24° 35' 39" N and Longitude 81° 07' 09" - 81° 08' 36" E (**Fig 1**).

The M.L area may be approached through metal topped road from Satna via Janardanpur-Karmau-Sajjanpur (45 km) or from J.P. Nagar via Garhwa (6 km) or Sagauni-Chormari (10 km) by fair weather Road. The nearest Railway Station "Turki Road" is situated on Satna-Rewa Broad gauge line at a distance of 10 km from the ML area. The Rewa Railway Station is situated at a distance of 20 km from the ML area and Satna railway station is situated at 45 km on Allahabad – Katni/Mumbai main line of central railway. The Company's siding at Turki Railway Station is only 5 km away from J.P. Nagar. Allahabad and Khajuraho are the two main nearest airports situated at a distance of 130 km and 200 km respectively from the mining lease area.



LEGEND

PROJECT SITE

RIVER / DRAINAGE

STATE BOUNDARY

DISTRICT BOUNDARY

NATIONAL HIGHWAY

STATE HIGHWAY

OTHER ROAD

VILLAGE LOCATION

SURFACE CONTOUR

RAILWAY LINE



0 10 20 30 40 50 KM

SCALE

MVA

MVA JRC CONSULTANCY PVT. LTD.

FOR THE STATE ROAD DEVELOPMENT CORPORATION

AT 80, 81A, 81B, 81C, 81D, 81E, 81F, 81G, 81H, 81I, 81J, 81K, 81L, 81M, 81N, 81O, 81P, 81Q, 81R, 81S, 81T, 81U, 81V, 81W, 81X, 81Y, 81Z

PROJECT: STATE ROAD DEVELOPMENT CORPORATION

TITLE: ROAD DEVELOPMENT PROJECT

CLIENT: STATE ROAD DEVELOPMENT CORPORATION

DATE: 17-01-2007

SCALE: 1:1

2.0 PROJECT DESCRIPTION

2.1 Geology

The Mining Lease area is generally a flat area. The topographic elevation in the leasehold varies from 301 to 313 meters above Mean Sea Level. It forms a part of the Bhandar series of the upper Vindhyan system of the Indian stratigraphy. The limestone deposit of the area is mainly of Stromatolite type with a nodular look and belongs to the Nagod limestone formation of Bhandar series, sandwiched between the underlain Simrawal/Ganurgarh shales overlain by Sirbu Shales. The limestone bands of interest quality usually occur in two main horizons, namely upper grey limestone and lower grey limestone with a thick shale band in between.

The formations encountered in the area comprise of Soil, Upper Grey Limestone (UGL), and Middle shale, NDS, Lower Grey Limestone (LGL), Cherty Limestone and Magnesium Limestone. Out of these formations only UGL formation has been considered under the category of reserves at this stage. The mining shall be limited upto UGL. Each of the rock formation encountered in the area is described below in order of superimposition.

Upper grey limestone

The upper grey limestone is mainly of nodular type in appearance with shaly intercalations with dark gray to gray colour and thickness of limestone band varies from 6.45 to 16.00 m. The formation is very high in silica, alumina and magnesia content.

Soil

Soil cover in the area comprises of weathered shales and laterite is generally present in the major parts of the leasehold, which is sticky in nature. The thickness of the soil cover in the area ranges from 0.70 to 3.00 m.

Structure

The general strike of the formation is ENE-WSW. The formations are horizontal to sub-horizontal and the dip is varying 2° to 4° towards south.

Middle shale

The middle shale is about 0.5 to 14.50 m thick and separates the lower grey limestone from the upper grey limestone band.

Quality

The quality and the chemical characteristics of the limestone and associated formations of Chormari-Degarhat limestone deposit were derived from the analytical results of borehole samples. A total of 447

borehole samples from 14 Nos. of boreholes (435.75 meters total drilling) were analysed for CaO, MgO, SiO₂, Al₂O₃, Fe₂O₃, LSF, SM, AM, Na₂O, Cl and K₂O. In addition to this, three no. of surface samples were also analysed as given in **Table 1**.

TABLE 1
ANALYTICAL DATA OF UPPER GREY LIMESTONE

Constituents	Maximum	Minimum
CaO	45.71	39.98
MgO	5.64	1.51
SiO ₂	13.52	9.12
Al ₂ O ₃	3.41	2.56
Fe ₂ O ₃	1.56	0.98
Na ₂ O	0.56	0.12
Cl	0.0092	0.0010
K ₂ O	0.58	0.10
LSF	161.34	87.33
SM	3.31	2.33
AM	2.39	1.93

The average quality of UGL is quite suitable for cement manufacturing grade.

2.2 Limestone reserves

The deposit of the area is horizontal and bedded and the thickness of ore columns encountered in boreholes is consistent. The geological reserves of Limestone and OBS/Rejects have been calculated by Block Method taking area of influence of individual boreholes. The category wise reserves are given in **Table 2**.

TABLE 2
CATEGORY WISE GEOLOGICAL RESERVES

Sl. No.	Category	Reserve (CUM)
1	Proved	7071945.40
2	Probable	530392.00
Total		7602337.40

The upper Grey Limestone (UGL) formation is considered as usable category and other formations like soil/ lateritic soil, Upper Magnesian Shale are considered as overburden/rejects. Out of 7071945 cum of proved geological reserves about 3228993 cum reserves have been considered towards losses on account of various barriers, mining losses etc. Balance of proved mineable reserve after deducting losses is 3842952.00 cum.

The mineable reserve works out as 9.60 M.T. after deducting 10% mining losses. For mining 9.60 M.T. the life of mine will be about 21 years at the average rate of 0.5 MTPA production from 3rd year stage onwards.

2.3 Mining

Mining Methodology

The method of mining will be open cast working with formation of benches by fully mechanized means. The formations encountered in the area comprise of Soil, UGL, and Middle shale, NDS, Lower Grey Limestone, Cherty Limestone and Magnesium Limestone. Out of these formations only UGL formation has been considered under the category of reserves at this stage. The mining shall be limited upto UGL. The overlying formations such as Upper Magnesian Shale and Soil have been treated under the category of overburden. It is planned to operate each formation separately as an independent unit and accordingly the mine planning have been done for first five years of mining operations.

Production and Development

The year wise production of overburden waste and limestone for the first five years as per approved mining plan is as shown in **Table 3**.

**TABLE 3
CALENDAR PROGRAM OVERBURDEN AND LIMESTONE
PRODUCTION**

Year	Over-burden handling (in CuM)		Total OB (in MT)	Limestone production (in MT)	Limestone to Overburden Ratio (T:CUM)
	OBS	UMS			
I	30000	150000	411500	Nil	-
II	22500	135000	364500	300000	1 : 0.53
III	22500	135000	364500	500000	1 : 0.32
IV	22500	146250	392625	500000	1 : 0.34
v	22500	135000	364500	500000	1 : 0.32
Total	120000	701250	1897625	1800000	1 : 0.46

Drilling, Blasting, Loading and Hauling

The drilling will be done with the help of 100 mm/153 mm dia blast hole drill of Atlas Copco / Ingersollrand or any other suitable drill machine. An average spacing of 4.0 meters with 3.0 meters burden will be kept in 6.0 meters deep holes. The slurry explosives or ANFO mixture will be used for blasting.

The blasted mass will be loaded into dumpers with the help of hydraulic excavators. The limestone loaded by excavators will then be transported to

crusher, stock yard through well maintained haul roads. Other development activities include the maintenance of roads, site clearance for drilling, making of quarry roads, levelling at dump yard/stock yard, heaping of scattered material etc.

Equipment

The equipment required for mining loading transportation and other related activities are drill machine, Dumper, Shovel Water Tanker, Explosive Van etc.

Life of mine

The total available mineable reserves is 9.60 Mio Tonnes which will cater for about 21 years to feed the cement plant at the average rate of 0.5 MTPA production from 3rd year stage onwards.

2.4 Stacking of mineral rejects and disposal of waste

The proposed working area is covered by soil and hard overburden. Soil is generally soft in nature and will not require any drilling & blasting. It will be excavated with the help of Excavator and transported by dumper to the proposed dump/ backfilling area.

During the first year top soil will be utilized at external dump yard while 2nd year onwards the top soil will be utilized on top of the matured dump yard. The height of dump shall be gradually increased to 10 m. and terraced. Thus a dump shall be build up with natural angle of repose which is about 38°. From 3rd year onwards the overburden will be dumped on mined out area as a backfilling.

2.5 Mine drainage

In general the area is having flat topography. The general ground level varies from 313.0 to 301.0 meter above MSL. One seasonal small stream is passing through ML area and joins the Karihari seasonal stream at eastern side of ML. All these streams remain dry except in the rainy season. Based on observations made in the area, the water table in the area is around 30 to 35 m below the general ground level i.e. 271 m MSL. It is proposed to carry out mining operations up to a level of 293 m above MSL in the mining scheme. The ultimate vertical consideration is upto 275 meters which is 4 meter above the water table.

Sub-surface/ground water shall not be encountered in the present mine plan period. There would be a small quantity of water accumulated in the mining pits after heavy rains, which will be pumped out as and when, required. The pumped out water shall be used for industrial purpose, dust suppression, plantation as well as supply to nearby agriculturists for irrigation.

2.6 Facilities

A well-planned mines office will be provided at a suitable site having sufficient space to accommodate mine executives and staff. It will be equipped with telephones and wireless facilities connected with mine and cement plant.

Total water requirement of 96 cum/day is estimated (91 cum/day for industrial use and 5 cum/day for drinking). The water required for sprinkling will be drawn from Naubasta water reservoir while for drinking ground water will be used.

A diesel tanker with 12 KL capacity will be used for diesel filling in track mounted equipment. A store, first aid station, ANFO mining shed, Rest shelter, canteen, urinals etc will also be provided.

2.7 Manpower

The mine is planned to be worked in two to three shift and total of 52 persons would be required at the site.

3.0 PRESENT ENVIRONMENTAL SCENARIO

3.1 Topography and drainage

The core zone forms a part of Tamasa (Toms) river sub basin with a general northerly slope. The land is flat and mildly undulating. The ground elevation varies from 313 AMSL to 301 m. AMSL. The area represents cultivated land with thin soil cover and rocky ground. The drainage in the core zone is through couple of drains of 1st order. These drains finally join Karihari Nala flowing northerly. The nala finally joins Tamasa River at a distance of 12 kms.

The study area (Buffer zone) occupies a part of Toms or Tamasa river sub basin. The physiography of the area is largely controlled by sub surface lithology, which is made of flatly lying thick sediments of shale, limestone and dolomite. The master drainage of the area is Tamasa River flowing easterly in the northern parts of Buffer zone. The entire drainage network of Karihari Nala drains out surplus of rain water to Tamasa River. These drainages mostly flow towards north.

3.2 Climate

The climate of this region may be considered as tropical. The coldest month is January (average temperature as low as 8.75°C) and the hottest being May (average temperature as high as 42.85°C). The average annual rainfall is 1243.0 mm. For the monitoring period, the predominant wind direction is north and the wind speed is found in the range between calm and 17 kmph. Winds were found usually below 10 KMPH. The micrometeorological data is given in **Table 4**.

TABLE 4
MICROMETEOROLOGICAL DATA (DEC 06 - FEB 07)

Particulars	Maximum	Minimum	Average
Temperature (°C)	33.00	9.70	18.60
Relative humidity	76.80	32.40	56.05
Wind speed (km/hr)	17.10	0.00	2.67
Predominant wind direction	N (47.59 % Readings)		

3.3 Ambient air quality, noise levels and traffic density

Ambient air quality was studied at five locations including one in core zone. The SPM (suspended particulate matter) was found to be between 97 and 134 $\mu\text{g}/\text{m}^3$ while RPM, (Respirable particulate matter) varied from 37 $\mu\text{g}/\text{m}^3$ to 55 $\mu\text{g}/\text{m}^3$ in the core zone. The concentration of SO_2 and NO_x were found to be within standard limits.

The noise level recorded within core zone and buffer zone are in the range of 43.3 to 51.1 dB(A) and 37.7 to 54.3 dB(A) respectively.

The traffic density monitored on Janardhanpur-Degarhat road near Rupolatola. It is observed that traffic density on the road is low. The number of Two/Three wheeler is the maximum, and is followed by cycles and light motor vehicles.

3.4 Water environment

Tamasa is only perennial stream in the study area. The drainage network existing are mainly ephemeral in nature and carry surplus runoff only during monsoon season over flooding the bank. The ground water occurs under unconfined state within the secondary porosity of the limestone / shales, which constitutes the only aquifer in the area. The water level in the study area is deep ranging between 30-40 m from ground levels.

3.5 Quality of water

Ground Water quality in the study area is fresh and potable. 16 ground water and 4 surface water samples were collected and analysed. Concentration of various elements present in water indicate that the groundwater as well as surface water of the area is safe and fresh for human consumption only after primary treatment at domestic level.

3.6 Landuse pattern and soil quality

Out of 102.983 Ha core zone land, Agricultural land is 26.098 Ha. and waste land 76.885 Ha. There is no forest land.

As far as buffer zone area is concerned 52.74% of total area is unirrigated agricultural land followed by irrigated agricultural land (23.89), culturable waste (11.90%) area not available for cultivation (10.58%) and forest within revenue land (0.89%).

Soil quality is mildly alkaline and exhibits normal conductivity. The organic contents are low. It is mostly clayey loam with low fertility.

3.7 Ecology

There is no forest within the ML area. The trees on the mining site are naturally occurring but are less in number. However, the tree density is good in the green belt in the vicinity of the mines. The faunal variety in the core area is rather poor. Mammalian fauna is almost restricted to domestic species like cattle, dogs, cats etc. Bird species also do not exhibit much diversity. Widely spread farmlands showing lush green vegetation were seen during the study period. The water bodies (mines reservoirs) are healthy and are frequented by a variety of water birds at other mines of the company.

Ecologically the area is sound and not much effect of the plant or mining activities are seen beyond a distance of 2-3 km radius

3.8 Socio-economic condition

There is no major habitation within the core zone, except for few hutments. In the buffer zone there are 93 inhabited revenue villages. 51 villages fall in 2 tehsil of Satna district while remaining fall in two tehsil of Rewa district. 53.14% of total population is literate. The composition of SC and ST in the study area is 16.83% and 11.80% respectively. The average family size is 5.4 persons / family. 59.72% of the total populations are non-workers while main workers are 30.61% and Marginal workers are 9.67%.

3.9 Industries and sensitive targets

There are two cement plant of the Company present within the study area. Besides there are 3 limestone mines belonging to the Company – Naubasta mine, Jaypee mine and Bankuiyan mine. No specific place of touristic / historical importance or monument falls in the study area.

4.0 ENVIRONMENTAL IMPACT ASSESSMENT AND MITIGATION MEASURES

4.1 Air quality

The mining activity is bound to increase the pollutant level in the air. The SO₂, NO_x and CO level will remain below the national ambient air quality standard prescribed by central pollution control board.

For air pollution control effective spraying will be used for dust suppression. Transport vehicles shall be maintained leak proof. The roads shall be black topped. Drilling shall be wet or dust extractors shall be used.

4.2 Water resources

No impact on existing surface water resources is expected as the mining activity is confined to limited area occupying flat mound. No change in drainage pattern will take place due to mining as no major nala will be cut.

Since it is open cast mining the quarry pit will receive accumulation of rain water as direct precipitation. The water table in the area rest at 271 m a.m.s.l. while during the mining depth will be confined to 275 m. a.m.s.l. Therefore the water table will not be cut and no loss of ground water is anticipated

4.3 Water quality

There is no generation of effluent from mining or allied activities. However, the dewatering process may involve discharging excess water to the natural water courses in rainy season in case of heavy rains. Discharge from septic tank at mine site will be much limited for a meagre strength of less than 52 personnel. Hence, no deterioration of ground water or surface water is anticipated. Control measures for water pollution are as follows:

- To prevent water pollution by oil/grease leak proof containers shall be used for storage and transportation of oil/grease.
- During dewatering operations, the water pumped out will be used for fulfilling the needs of mine and plant related activities.
- Check dam (Protection Bund) shall be provided across the drainage system to protect soil erosion due to rain.

4.4 Land degradation

It is envisaged that about 102.983 Ha area will be disturbed by mining activity during entire life.

The backfilling of excavated area will be the regular practice from second year of mining and a continuous process of backfilling will be carried to cover the maximum mined out area and followed by tree plantation. The overburden is planned to be used for backfilling in the mined out area. During first five years about 7.00 Ha will be backfilled and out of that about 5.00 Ha will be covered with plantation.

At the end of mining operations, total 65.0 Ha area will be reclaimed by backfilling and plantation while 14.0 Ha area will be rehabilitated by developing the water reservoir with a storage capacity of 0.84 Mil. Cum, the depth of water reservoir varies from 6 to 8 meters.

4.5 Flora and Fauna

The core zone is agricultural land. The land acquired will need due compensation to owners as mitigation measure. As there is no forest in the ML area, no danger to the wild life and flora due to the project is expected.

4.6 Noise level, ground vibration and traffic

The application of drilling, blasting, haulage/transportation is expected to raise noise level in ML area. The observed noise level will be well within the prescribed limits for surrounding population due to control measures proposed in management plan.

The traffic density will marginally increase as the entire production will be consumed by company's plant located close to mine. A dedicated road from Degarhat mine to Jaypee Rewa Cement Plant is proposed for plying the production handling traffic from both Degarhat and Bela Devmaudaldal mines. The traffic for handling the production from Chormari Degarhat mine will also ply from this road. Till the road is constructed, the traffic will ply on existing PWD road.

The ground vibration due to blasting will need mitigation plan and shall require study when operation begins.

4.7 Socio-economic conditions

Mining will result in loss of mainly agricultural land. The mining activity will improve the socio-economic conditions of the area. The local people will get direct or indirect job opportunity. The educational and medical facilities will be developed by the company which will be available to local villages as well. A 24 bed Hospital has already been provided at Jaypee Nagar. Free medical facilities are provided to employees and villagers. The land looser will get compensation as well as direct or indirect job.

Communication, education facilities, health facilities and recreational facilities will be improved due to mining activity.

5.0 SITE ALTERNATIVES

Mining industry is very much site specific and a mineral has to be mined at the place where it exists in economically feasible quality and quantity. So, no site alternatives can be chosen.

6.0 ENVIRONMENTAL CONTROL AND MONITORING ORGANIZATION

An appropriate team has been proposed to take care of pollution monitoring aspects and implementation of control measures. A schedule has been spelt out for periodical monitoring. The capital investment on environmental improvement works is envisaged as Rs 49.40 Lakhs and recurring expenditure during the stage of production is Rs 33.55 Lakhs per year. The specific cost therefore, comes to Rs 9.88/ tonne of limestone mined, the recurring cost comes to Rs 6.71/ tonne, the annual output of clean limestone being 5 lakh tonne/year.

7.0 DISASTER MANAGEMENT PLAN

There is only a small seasonal nala originating from the western part of the ML area. There is no other perennial or artificial drainage system in the ML area. During mine working the water table will not touch as floor level will be 275 MRL while ground water table is at 271 MRL. In order to control the in-rush of water into the quarry in rainy season from the surface, sufficient garland drains will be made around the opencast excavations. Besides, pumps of required capacity will be installed to pump out rain water, if required. A diesel generator will be provided for un-interrupted supply of power.

Sufficient number of fire extinguishers and water hydrants will be made available for fire protection.

The storage of explosive will be done at safe place away from mine working and residential area. Due precaution as per safety rule will be taken to avoid any danger/ mishap. The storage of explosive will be done in accordance with the Indian Explosives Act, 1884. Hence, there is no danger anticipated from this activity.