



EXECUTIVE SUMMARY OF 0.30 MILLION TONNE PER ANNUM BUDGAWANA EXTENSION LIMESTONE MINE, IN AN AREA OF 87.992 HECTARE, NEAR BAGHWAR & GORHATOLA VILLAGES, TEHSIL RAMPUR NAIKIN, DISTRICT SIDHI, (M.P.) OF JAIPRAKASH ASSOCIATES LIMITED



1.0 INTRODUCTION

Jaiprakash Associates Limited (JAL) is one of the leading companies in India engaged in the field of Civil Construction, Hydropower, Thermal Power, Information Technology and Cement Manufacturing.

As part of the group's expansion proposals, it has been planned to develop a Greenfield cement plant complex, including captive power plant and captive limestone mines near Majhgawan village of Sidhi district in Madhya Pradesh. The proposed cement plant will have a capacity of 1.5 MTPA. To meet the requirements of the raw material, JAL has been granted with six limestone mining leases and the details of these leases are presented below:

Sr. No.	Name of Villages	Name of Mining Lease	Mine Lease Area (Ha)	Tehsil and District
1	Baghwar, Burhgawana Gorhatola	Budgawana ML Area	68.910	Rampur Naikin, Sidhi
2	Majhgawan, Patna, Sarda, Kariyajhar etc	Majhgawan ML Area	430.952	Rampur Naikin, Sidhi
3	Hinauti, Dengraha, Biharganj, Jurmani	Hinauti ML Area	378.261	Ramnagar, Satna
4	Baghwar and Gorhatola	Budgawana Extension ML Area	87.992	Rampur Naikin, Sidhi
5	Sarda and Majhgawan	Majhgawan Extension ML Area	54.825	Rampur Naikin, Sidhi
6	Hinauti, Dengraha, Biharganj and Jurmani	Hinauti ML Extension Area	258.867	Ramnagar, Satna

The present EIA report has been prepared for the proposed limestone mining of Budgawana Extension mine lease area.

The Budgawana Extension ML area is spread over 87.992-ha in villages Baghwar and Gorhatola in Rampur Naikin Tehsil of Sidhi District. The lease has been granted to the company for 30 years by Govt. of MP. The mining plan of the lease has been approved by Indian Bureau of Mines (IBM).

1.1 Description of Environment

The details of environmental setting of Budgawana Extension limestone mining lease area are given below.

Sr. No.	Particulars	Details
1	Location	
(a)	Villages	Baghwar and Gorhatola
(b)	Tehsil	Rampur Naikin
(c)	District	Sidhi
2	Latitude	24°20'22" to 24°21'14" North
3	Longitude	81°21'03" to 81°22'04" East
4	General Elevation	320-m to 381-m above MSL
5	Current status of land	Forest land (Compartment no. 1119 and Churhat range) and waste barren land



Sr. No.	Particulars	Details
6	Climatic conditions	As per IMD, Sidhi Annual Mean Max. Temp : 42.0 °C Annual Mean Min. Temp : 8.1 °C Annual average rainfall : 1234.6-mm
7	Nearest Highway	National Highway-7 (24-km,NW) National Highway-75 (0.2-km,E)
8	Nearest Railway Station	Rewa (24-km NW)
9	Nearest Airport	Khajuraho (150-km)
10	Defense Installations	Nil in 10-km radius
11	Archaeological Important Places	Nil in 10-km radius
12	Wildlife Sanctuaries	Nil in 10-km radius
13	Reserved/Protected Forests	Major portion of the core zone falls under Govindgarh Reserved forest
14	Industries in 10-km radius	No Industries in 10-km radius
15	Nearest major city	Rewa (24-km on NW)
16	Villages within 1-km radius surrounding the mine lease	Budgawana, Baghwar, Gorhatola and Majhgawan
17	Rivers 10-km radius	Son River (8.5-km, SE)
18	Nearest Lake/Ponds	Govindgarh Lake (6.2-km, NW)
19	Hill Ranges	Govindgarh hillock (325-680 MSL)
20	Socio-economic factors	No homestead oustees for the project

2.0 PROJECT DESCRIPTION

2.1 Salient Features of Mine Lease

The salient features of mine lease are given below:

Sr. No.	Parameter	Description
1	Method of mining	Opencast mining
2	Proposed Limestone production from the mine lease	0.3 MTPA
3	Soil / Overburden removal	A total of about 0.59 MT in first five years of operations
4	Total ML area	87.992-ha
5	Mineable Reserves	10.15-Million Tonnes
6	Extent of mechanization	100%
7	Type of Blasting	Deep hole blasting with delay detonators
8	Type of drilling	Down the hole drilling
9	Source of Power	From captive cement plant
10	Water requirement (including Budgawana Lease)	90 m ³ /day (Peak)
11	Water source	Canal water or bore water during initial five years and later mine sump water
12	Wastewater Treatment	
(a)	Sanitary waste	Treated in septic tanks and disposed using soak pits
(b)	Workshop	Routed through oil-water separator



Sr. No.	Parameter	Description
13	Noise Levels	Maintenance of HEMM to keep the noise levels <95 dB(A)
14	Ground vibration	Within the safe limits
15	Stripping ratio (tonnage of ore : overburden in m ³)	1:0.6

2.1 Mineral Reserves

The geological and mineable reserves of the lease are 14.50-MT and 10.15-MT respectively.

2.2 Conceptual Production Plan

The details of proposed production, development (removal of soil) for the first five years of operation of the mine are given below.

Year	Overburden incl. topsoil (m ³)	Topsoil (Tonne)	Overburden excluding topsoil (Tonne)	Overburden incl. topsoil (Tonne)	Limestone Production (Tonne)
1 st	50000	17000	83000	100000	200000
2 nd	50000	17000	83000	100000	200000
3 rd	50000	17000	83000	100000	300000
4 th	70000	23800	116200	140000	300000
5 th	75000	25500	124500	150000	300000
Total	295000	100300	489700	590000	1300000

2.3 Method of Mining

100% mechanized opencast method of mining will be practiced. The mechanised method will consist of the following operations:

- Dozing of surface soil by Dozer;
- Drilling and blasting using DTH Drills;
- Excavation and loading by excavator; and
- Haulage by dumpers upto crusher.

2.4 Reclamation and Afforestation Programme

Reclamation and rehabilitation work will be taken up along with mining. Topsoil would be utilised for intensive plantation and greenbelt development in the non-mineral bearing areas, along haul roads, ultimate limit of benches and all along the lease periphery. The details of plantation and number of saplings to be planted are given below.

Sr. No.	Details	Area (ha)	Number of Plants	Budgetary Estimation (Million Rs)
1	Undisturbed area	31.0	62000	18.6
2	Mine Lease periphery	8.0	16000	4.9
3	Backfilled area	32.0	64000	19.2
	Total	71.0	142000	42.7



2.5 Land use Pattern

100% of the lease area is under forest area. The details of the post mining land use and area proposed for reclamation are given below:

Post Mining Land Use Pattern		
Sr. No.	Activities	Area in ha
1	Area to be excavated	48.0
2	Dump Yard	8.0
3	Infrastructures	1.0
4	Safety barrier / constraints / undisturbed area	20.992
5	Undisturbed area with green belt.	10.0
	Total	87.992
Proposal for Reclamation and Rehabilitation		
1	By backfilling and afforestation / agriculture	32.0
2	Convert into the water reservoir	16.0

3.0 BASELINE ENVIRONMENTAL STATUS

3.1 Soil Quality

Eight soil samples were collected in and around the mine lease area to assess the present soil quality of the region. The pH of the soil indicates that the soil is slightly to moderately alkaline in nature. The nitrogen, phosphorous, potassium concentrations were observed to be in the range of 'very less' to 'better' category. Based on the results, it is evident that the soils are not contaminated by any pollution sources.

3.2 Meteorology

Meteorological data at the site was monitored during first week of March to first week of June 2006 representing pre-monsoon season. It was observed that the during study period, temperature ranged from 17°C to 45°C. During the same period of observations, the relative humidity recorded was ranged from 28% to 62%. A total of 12.0-mm rainfall was recorded during the study period.

3.3 Ambient Air Quality

Ambient Air Quality Monitoring (AAQM) has been carried out at Fifteen locations with a frequency of two days per week during pre-monsoon season of 2006 and pre-monsoon season of 2008. The results thus obtained indicate that the concentrations of SPM, RPM, SO₂, NO_x and CO in the ambient air are well within the National Ambient Air Quality (NAAQ) standards for Residential and Rural areas.

3.4 Water Quality

To assess the physical and chemical properties of water in the region, water samples from twelve locations were collected from various water sources around the project site. The results indicate groundwater is generally in conformity with



the drinking water standards (IS:10500) and surface water is in conformity with IS-2296 standards.

3.5 Noise Levels

Ambient noise levels were measured at ten locations around the proposed mine site. The daytime and nighttime noise levels in all the residential locations were observed to be within the permissible limits.

3.6 Ecological Environment

Based on the field studies and review of published literature, it is observed that there are no endangered and protected flora and fauna in the core zone or buffer zone. There are no wildlife sanctuaries and National Parks within the study area of 10-km radius.

3.7 Social Environment

The study area (10-km radius) area has a total population of 49898 according to 2001 census. Total male population is about 52% and total female population is around 48%. The average literacy rate (30.4%) is less in the region.

4.0 ANTICIPATED ENVIRONMENTAL IMPACTS

4.1 Impact on Air Quality

The air pollution impact of limestone mines depends on the intensity of ore extraction operations and mode of transport. All proposed mining operations are mechanized and operated on diesel. The incremental ground level concentrations of dust (SPM) due to all mining operations of JAL in the region are estimated through computer aided software approved models (FDM techniques) and found to be about $10.6\text{-}\mu\text{g}/\text{m}^3$ at the boundary of the Budgawana lease area with effective implementation of Environment Management Plan.

4.2 Impact on Surface Water Hydrology

The mining lease area does not have any major stream channel or nalah, except few streams of 1st and 2nd order having very small catchment area, coming from north and passing through the lease area. The drainage map of the lease area indicates three streams passing through the lease area which require diversion. A plan of these streams is prepared. These streams will divert along the barrier and will be connected to stream in the south of the lease area. The streamlets originating within the lease area will disappear due to mining and its rain water will be collected in the water reservoir.

It is therefore apparent that there will be insignificant impact of mining on the surface water regime.



4.2 Impact on Ground Water Resources

The water requirement for the mining operations will be initially sourced from either canal water or bore well water. Insignificant impact is envisaged on the groundwater resources, as the drawl from groundwater is meagre (200- m³/d).

The likely depth of water table in the area is around 300 to 320 MRL. It is proposed to carryout mining operations up to a depth of about 45-m, i.e., 295-m MRL. The mining operations will intersect the water table.

Detailed Hydro-Geological survey of the area has been carried out and it is found that the inflow of ground water during conceptual mine plan stage will be 22,000 m³ (0.022 mcm) per year.

The present status of ground water development in the area is 13% and during conceptual mine plan period, this will be 34% and will remain within the **safe** category. Hence, no significant impact on the ground water resources is envisaged.

4.4 Impact on Water Quality

The wastewater generation in the mining process is not envisaged. The sanitary wastewater will be treated in septic tanks and soak pits combination. The run-off during monsoon season will be routed through sedimentation tanks and no siltation is envisaged in the natural nallahs.

Similarly, groundwater pollution also not envisaged as there will not be any discharges to the groundwater also.

4.5 Impact on Noise Levels and Ground Vibrations

With the mining operations, due to the deployment of machinery, drilling and blasting for mine development, excavation and transportation of limestone and men, it is imperative that noise levels would increase. It is estimated that the incremental noise levels due to the proposed mining operations will be about 35.0 dB(A). It is also observed that these incremental noise levels will not significantly affect the existing ambient noise levels.

With the adoption of controlled blasting techniques, the ground vibrations will be minimised and hence, no impact due to ground vibrations are envisaged.

4.6 Impact on Soil

The environmental impacts of the mining activities on topsoil are based on the quantity of removal of topsoil and its dumping. In the present project as it is proposed to temporarily store the topsoil and use it for plantation schemes, no impact of dozing of topsoil is envisaged.

The soil erosion from overburden dumps is not envisaged in the present project, as sufficient measures as detailed in the EMP would be undertaken. Also



concurrent backfilling will be practiced from second year of operations. No permanent dump will be made.

In major part of the lease area, limestone is exposed on the surface but on the lower slopes, there is thick overburden comprising loamy soil, intercalations of shales through which streams have developed water courses in which formations are exposed. Rainfall intensity of the area is not more than 80 mm/day and with stabilized soil mantle, soil erosion is not a major problem and there are very remote chances of developing any ravines. However, gullies in the soil profile may be developed along the streamlets and streams.

These streams are proposed to be diverted along the ML boundary to main stream outside the lease area. Also unstable gullies will be strengthened by stone curbing. Hence, soil erosion from ML area will be insignificant.

4.7 Impact on Flora and Fauna

Major portion of ML area is under forest area. Compensatory afforestation measures are planned in a large scale.

About 70-80% area of excavations are proposed to be backfilled and rehabilitated with plantations. Remaining area will be converted into water reservoir. Extensive green belt and green cover is planned.

It is proposed to include *Azadirachta indica*, *Ficus religiosa*, *Pongamia glabra* and *Ficus recinosa* in the plantation program as they serve as sinks for gaseous emissions. Extensive plantation comprising of pollutant resistant trees will be undertaken, which will serve not only as pollution sink but also as a noise barrier.

The incremental dust generations due to the mining operations, at the boundary of the mine lease are insignificant and it is also expected that with the adoption of mitigatory measures as suggested in EMP, the impact due to operation of the mine will be minimal on the terrestrial ecosystem and also on the adjacent forest area.

The impact on the fauna due to the mining activity will be marginal. The proposed progressive plantation over a period of time will reduce the impact, if any, on the fauna. A detailed Wildlife Conservation Plan is prepared in consultation with State Forest Department, which will be implemented to nullify the impact on fauna, if any.

4.8 Impact on Land Use Pattern

As it is proposed to backfill and rehabilitate most of the voids created during the mining operations, no major impact is anticipated to the land use of the core zone. No adverse impact is anticipated in land use of buffer zone, as all the mining activities will be restricted to core zone only.



4.9 Impact on Socio - Economic Aspects

The proposed cement plant complex including mining operations and CPP obviously improve the socio-economic levels in the study area.

No human settlements exist in the ML area. All of the mine operating personnel will be accommodated in the township, which is in the jurisdiction of the captive cement plant. Hence, there will not be any impact of the population growth on near by surroundings.

The literacy rate of the study area is 'less' to 'moderate'. However, the socio-economic benefits from the mining and industrial activities may increase the literacy and educational facilities in the buffer zone.

The civic amenities of the region will be developed due to cement complex activities. The health care facilities of the area will also be improved.

The employment potential of the cement plant complex will ameliorate economic conditions of the surrounding population directly and indirectly. The socio-economic conditions of the area will be improved significantly.

5.0 ENVIRONMENTAL MONITORING PROGRAM

Regular monitoring of important and crucial environmental parameters is of immense importance to assess the status of environment during mining operations. The post-project monitoring will be common for all ML areas of JAL operating in the region.

5.1 Air Pollution and Meteorological Aspects

Both ambient air quality and meteorology will be monitored regularly. The ambient air will be monitored twice in a week [in line with the guidelines of Central Pollution Control Board] at about five locations around the mine lease area.

Meteorological parameters like wind speed, wind direction, temperature, relative humidity and rainfall will be recorded continuously at mine lease area using automatic weather stations.

5.2 Water Levels and Quality

The water to be used in the project will be monitored on a daily basis for important parameters. The storm water will be analyzed during the rainy season. The comprehensive ground water quality will be monitored on a seasonal basis. The water depths will be monitored in the wells of surrounding villages in every season.

5.3 Noise Levels

Noise levels in the work zone environment such as crusher, excavators, rock breakers, pumps and compressors will be monitored regularly on a fortnightly



basis. The ground vibrations will be recorded at the time of blasting. The frequency of noise monitoring will be twice in a month in the work zone.

The ambient noise levels in the surrounding villages will be monitored once in six months.

5.4 Soil Sampling and Analysis

Soil samples will be tested before plantation/vegetation of the area.

5.5 Environmental Monitoring Cell

The environmental monitoring cell will co-ordinate all monitoring programs at site and data thus generated will be regularly furnished to the State regulatory agencies. Environment Management Cell will be headed by Chief in-charge of mine and will constitute Manager (Environment), Manager (Mines), Manager (Civil), Horticulturist, Geologist and Chemists.

6.0 OCCUPATIONAL SAFETY AND HEALTH

Occupational Safety and Health is very closely related to productivity and good employer-employee relationship. The main factors of occupational health in limestone mine are fugitive dust and noise. Safety of employee during blasting operation and maintenance of mining equipment and handling of explosive materials will be taken care of as per mine regulations. PPEs such as Dust masks, ear plugs/earmuffs will be provided to workmen. Hence, no significant impact on health of workmen is envisaged.

7.0 PROJECT BENEFITS

The envisaged JAL cement manufacturing project comprising captive power plant and captive mines is proposed to be established in one of the backward districts of Madhya Pradesh.

The proposed cement manufacturing project apart from producing 1.5-MTPA cement would be self dependent on power requirements. The project would be beneficial to the construction industry of the state as well as surrounding states. The availability of cement, which is the major building material, in the market will boost the constructional activities and thereby boost the economy of the state. The royalty generated from the mining will be additional advantageous to the local government.

The proposed project also benefits in improving the physical infrastructure of the state. The social infrastructure of the area will also be developed.

The project also benefits the employment potential of the area by providing employment to vast number of population (directly and indirectly) during constructional as well as operational phases of the project.



8.0 ENVIRONMENT MANAGEMENT PLAN

8.1 Air Pollution Control Management

The following management techniques are proposed for the effective control of air pollution:

- Dust generation will be reduced by using sharp teeth of shovels;
- Dust suppression system (atomized water spraying) on haul roads, which are used for transportation and plying of vehicles;
- Wet drilling will be carried out to contain the dust;
- Water sprinkler will be provided in the crusher to avoid dust generation during material unloading into crusher;
- Controlled blasting techniques will be adopted;
- Charge per hole and charge per round will be optimized;
- Dense plantation will be carried in and around the proposed mine will also help in combating air pollution;
- Afforestation of completely mined out area will be planned with minimum gap between excavation and afforestation to fix the dust and prevent it from getting airborne;
- Dust control systems like bag filters will be installed in the crushing system;
- Provision of applicable enclosures with ventilation system will be provided with local exhaust ventilation system at crushing plant;
- Regular maintenance of vehicles and machinery will be carried out in order to control emissions;
- Cabins for shovel and dumpers and dust masks to workmen will be provided;
- Advantage of wind direction and meteorology will be considered while planning, so that pollutants, which cannot be fully suppressed by engineering technique, will be prevented from reaching the residential areas; and
- A good housekeeping and proper maintenance will be practiced which will help in controlling pollution.

8.2 Water Pollution Control Management

The following management techniques are proposed for the effective control of water pollution:

- Suitable drainage system will be provided to prevent surface water from entering into mines directly, to reduce soil wash off;
- Sufficient number of retaining walls/Check walls will be provided to OB dump and other areas in order to avoid the soil wash out;
- The storm water will be regularly tested in rainy season for presence of any undesirable elements and appropriate measures will be taken in case any element is found exceeding the limits prescribed by CPCB.

8.3 Noise Pollution Control Management

The following management techniques are proposed for the effective control of noise pollution:

- Secondary blasting and pop shooting will be totally avoided;



- Rock breakers will be used for sizing;
- Controlled blasting with proper spacing, burden and stemming will be maintained;
- The prime movers/diesel engines will be of proper design and will be properly maintained;
- The operator's chamber will be safe guarded with proper enclosures to reduce the noise levels;
- A thick tree belt will be provided in phased manner around the periphery of the mine to attenuate noise; and
- Trees will be planted on both sides of haul roads.

9.0 CONCLUSIONS

- The mining operations will meet the compliance requirements of MPPCB/MoEF;
- Community impacts will be beneficial, as the project will generate significant economic benefits for the region;
- Adoption of Best Available Technology and Best Management Practices with more environmental friendly process; and
- With the effective implementation of the Environment Management Plan (EMP) during the mining activities, the proposed project can proceed without any significant negative impact on environment.