SUMMARY
OF
EIA OF BAGDEWA UNDERGROUND PROJECT
(0.76 MTY)
FOR
PUBLIC HEARING

I. PROJECT DESCRIPTION

The project is a part of Bagdewa Geolgical Block located in Korba Area of SECL in Korba District of Chhattisgarh State. The Block, which lies in between $22^0$22'34"-$22^0$23'47" North latitude and $82^0$30'37"-$82^0$33'35" East longitude , shown in the survey of India toposheet No. 64-J/11 The block is located at an approximate distance of 1.5 kms. East of Bilaspur-Katghora State Highway . The approach road to mine is existing . The mine is also approachable from Sutara by Sutara-Bagdewa road. The nearest rail head is Gevra road of SEC Railway on the Champa-Korba branch line at a distance of 20 kms.

The nearest meteorological observatory is at Bilaspur. The climate of this area is sub-tropical one with three main seasons. Season during April to June is the summer with temperature rising to maximum 44.7°C in the month of May. July to September is the monsoon season with an average rainfall of 1516 mm. Winter is short and temperature during this season dips to 5°C in the month of December. Relative humidity during winter ranges from 33 % to 95 %.

The brief description of geology is as under :

Name of the seam being worked	:Seam G-II, G-III(bot), G-III(top)
Seam thickness range (m)	: 0.90m 3.00m
Grade of coal	: Grade B
Balance minable reserves (as on 01.04.2007)	:11.26 Mt
Target production	: 0.76 Mty
Balance life of mine	: 19 Years

Mine Entries : The brief details of the present mine entries is as under:-

Incline – Two – size 4.2m x2.5m, 165m length - Intake
Airshaft - Two – size 5.0m dia x58m depth one intake, other return

Mine boundaries :North: Fault F9F9, 15m Hard cover line
South: Kholar Nala & Fault F7F7 & F10F10
East : Fault F8F8, F10F10, workable seam thickness line
West : 15m Hard cover line of G-II seam & 40m against road

Method of mining :

Bord and Pillar method of working with development is being done by Side Discharge

Loaders & Load Haul Dumpers in mine, coal face drilled & blasted and loaded by SDL & LHD on belt conveyors.

Major mining / other equipment deployed :

SDL with belt conveyor in SDL panels ; LHD with belt conveyor in LHD panels and Bunker & Tippers on surface

II. DESCRIPTION OF THE ENVIRONMENT

SOCIO-ECONOMIC ASPECTS

The socio-economic profile within the study area of the project is based on 2001-census data. The land use pattern, basic and civic amenities details are also based on available 2001-census data collected.

Out of 56933 persons, 50.66% are male and 49.34% are female. The Scheduled castes account for 9.5 % of total population and the scheduled tribes for 39.47 %. About 49.7 % population is literate.

The data reveals that 30.00% of the population are main workers and 13.78% are marginal workers, the rest 56.22% are non-workers. .

LAND

A. REQUIREMENT

The land use pattern, as per the present scenario is as given in the Table given below

Sl. No.	Type of Land	Area in Ha.
1	Government Land	76.81
2	Tenancy Land	143.51
3	Forest Land	282.28
4	**Total Land**	**502.60**

B LAND USE

Buffer Zone of the project is the area of 10 kms. radius from the periphery of the project area . The entire area of core & buffer zone is called study area for environmental impact. Total area thereof is around **31615.00**Ha.

The summarised details are as follows:-

Sl.No.	Landuse	Area (in ha.)	% of total area
A	Forest land	10527.00	33.30
B	Irrigated agricultural land	457.00	1.45
C	Unirrigated agricultural land	15183.00	48.02
D	Cultivable Waste land	3152.00	9.97
E	Area not available for cultivation	2296.00	7.26
	TOTAL	**31615.00**	**100.00**

The data reveals that, out of total study area of **31615.00** Ha. around 33.30 % is forest land, 49.47 % is agricultural land, 9.97 % is cultivable waste land and 7.26 % is not available for cultivation.

HYDROGEOLOGY

Year-wise static water levels, as inferred from the ground water level study of last 17 years (1990 - 2007) at Hydrograph Stations during pre and post-monsoon as recorded by Ground Water Survey Unit, Bilaspur District, 6.07 m(pre-monsoon average). and 3.26 m(post-monsoon average). The average fluctuation in GWL observed from the data of permanent observation wells is about 2.81 metres.

Rainfall is the principal source of recharge of the block. The calculation of the ground water recharge is based on the GEC norms for rainfall infiltration index as 11.5 %. Based on the rainfall infiltration method the recharge works out to **42.20 M.Cum.** Discharge of the area works out to **11.19 M.Cum,** and the surplus water available in the area is **31.01 M.Cum**.

ENVIRONMENTAL QUALITY

A AMBIENT AIR QUALITY

Ambient air quality data at the project site shows maximum concentration of SPM, RPM, NOx, SO_x in October,07 to December,07 as 276, 112, 22 & 23 µg/cum respectively, and which is within the permissible limits.

B WATER QUALITY

Water samples were collected and analysed from different locations representing surface sources and adjoining mine discharge. The analytical result shows that the physical and chemical parameters are within prescribed limits of IS:10500 for drinking water. The effluent quality of the UG mines is regularly monitored and their quality are well within the limit prescribed by MOEF/CPCB standard.

C NOISE LEVEL

The ranges of day time and night time equivalent noise levels recorded in the area are 45.5 to 74.3 dB(A) & 35.6 to 64.2 dB(A) respectively. These are well within the limits prescribed as per standards of MOEF (vide no G.S.R 742 (E) dated 25.09.2000).

The main sources of noise pollution are Coal Bunker, workshop and mine fans. Green belt development and other control measures are recommended to keep the noise levels within permissible limits.

COMPOSITION OF FLORA AND FAUNA.

In the study area, the forest cover is 10527.00 ha, which is only 33.30 %.The flora and fauna presented is based on the field survey and discussions held with the local forest officials up to grass root level regarding availability of flora and fauna in buffer zone of the proposed project.

III. ANTICIPATED ENVIRONMENTAL IMPACT & MITIGATION MEASURES

SOCIO ECONOMIC IMPACT

The project will have on the whole a positive impact on socio-economic profile of the area due to increase in employment opportunities, trade and business, community development, improved communication link etc.

IMPACT ON LAND USE

Important surface features within core zone will not be affected since, no depillaring operation will be undertaken, and developed pillars will be left standing after isolating them. Crop compensation would be paid during the period when depillaring of panels damage tenancy land at surface due to subsidence.

Subsided land and cracks would be filled with soil to maintain the original topography of the area.

IMPACT ON ENVIRONMENT

Air environment:- Air quality in respect of SPM, RPM, SO2 & NOx within and around the project area are found to be within the prescribed limits of MOEF. These parameters may increase their values if proper mitigative measures are not taken care of may cause pulmonary infections like neumoconiosis , silicosis etc, irritation of eyes , poor visibility etc.

Water environment : - Untreated mine water , Workshop & Domestic effluent water could cause pollution to surface & ground water courses with excess of Suspended solids , Oil & Grease , COD and BOD, Dissolved solids , Sulphates , Chlorides , Bacterial contamination leading to serious problems to aquatic life & human health hazard.

Lowering of ground water table are the likely impacts on surface & ground water courses leading to water scarcity in the area..

Noise environment :- The impact of continued exposure of higher noise levels on humans and fauna are as follows:

* Annoyance and irritation
* Mental and Physical fatigue
* Interference in normal activities.
* Health hazards resulting from impaired hearing
* In extreme cases, cardio-vascular diseases etc.
* Task interference.
* Interference with communication i.e masking.
* Hypertension and higher blood cholesterol.

FLORA & FAUNA :-

There will not be any adverse effect on the existing habitat due to underground mining operations at greater depth. However, some indirect impact due to developmental activity and population growth is expected which will be controlled by adopting strict protective measures by area authorities.

HYDROGEOLOGICAL ASPECT : - As mentioned earlier, because of the low permeability of aquifers, the impact of mining on local water regime will be marginal and the radius of influence will be limited to a small distance (577 m). So also, due to stratification, the individual permeable beds develop individual drawdown cones and the impact is usually limited to few hundred meters.

IV ENVIRONMENTAL MONITORING PROGRAM

The implementation and monitoring of pollution control measures and for overall environmental management, environmental cell at the area and Corporate level will take all necessary care. It will look after the following aspects of environmental management.

* Generation of environmental data bank.

* Evolving micro environmental management plan for the project in collaboration with other agencies and consultants.

* Monitoring project implementation along with environmental control measures.

* Co-ordinate with other project activities to ensure timely implementation of the project.

* Co-ordination with Ministry of Environment & Forest, Central/State Pollution Control Board for prevention and control of water and air pollution.

V ADDITIONAL STUDIES

PUBLIC CONSULTATION

To ascertain the concern of local affected and others who have a plausible stake in environmental impacts of the project / activity public consultation will be done at project site or close proximity for local affected persons.

RISK ASSESSMENT

Assessment of risk and its management is essential to guard against and mitigate the consequences of major accidents. The term, " major accident" means an unexpected and sudden occurrence of event from abnormal developments in course of one's industrial activity leading to a serious danger to public or environment, whether immediate or delayed, inside or outside the installation involving one or more hazardous substances.

VI PROJECT BENEFITS

IMPROVEMENT IN THE SOCIAL INTRASTRUCTURES:

a) Literacy Drive :

An action plan for achieving 100% literacy among workers in the SECL, was launched in the year 1992. Under the same scheme, workers of Bagdewa UG project will be covered to achieve 100% literacy level.

b) Socio-Economic Development

1) Infrastructure Development in nearby villages .
c) Community Development works in nearby villages .

d) Vocational Training Programme for the village provided by Bagdewa UG project

EMPLOYMENT POTENTIAL:-

a) In the project

There will be direct employment opportunities of 1064 manpower of different categories of persons .

b) Secondary Employment opportunities

There will be spontaneous economic stimulus in the area with the commencement of the mine. Traders and private enterprises will grow in the area with this economic growth. Besides, the State exchequer will derive financial revenues through levy of royalty, sales tax etc. and Central Government will also be benefited by way of Central Sales Tax, Income Tax, Cess's etc.

VII ENVIRONMENTAL MANAGEMENT PLAN

COMPENSATION

Important surface features within core zone will not be affected since, no depillaring operation will be undertaken, and developed pillars will be left standing after isolating them. Crop compensation would be paid during the period when depillaring of panels damage tenancy land at surface due to subsidence.

RECLAMATION

Subsided land and cracks would be filled with soil to maintain the original topography of the area.

AIR QUALITY CONTRON MEASURES

Considering anticipated effect on air quality due to mining operations, following control measures have been Envisaged for the project.

- Mist sprinkling arrangements would be installed in surface coal bunkers for dust suppression.
- Project envisages road sale of coal and all coal transport is through tarpoulin covered trucks.
- Black topping of approach roads already completed.
- Green belt around colony, industrial complex and other service centre.
- Sapling of fruit bearing trees, medicinal trees, timber value trees and ornamental trees have been planted.

WATER QUALITY CONTROL MEASURES

The analytical result shows that the physical and chemical parameters are within prescribed limits of IS:10500 for drinking water. The effluent quality of the UG mines is regularly monitored and their quality are well within the limit prescribed by MOEF/CPCB standard.

i) However, 82000 gallon capacity mine sump to arrest suspended solids from mine water has already been provided.
ii) Settled mine effluent is being used for domestic and industrial consumption.
iii) 2 settling tanks of 88000 & 62000 gallons capacity to treat mine water have been commissioned.
iv) Oil & Grease trap will be commissioned for workshop effluent treatment..
v) Monitoring of surface water quality & ground water levels will be done throughout life of the project.

CONTROL MEASURE FOR NOISE LEVEL

Green belt development and other control measures are recommended to keep the noise levels within permissible limits.

To minimise anticipated noise pollution, following control measures are envisaged.

- Provision of earplugs, earmuffs as and when required.
- Routine maintenance of equipment.
- Location of colony at sufficient distance from mine.
- Green belt around colony and industrial complex.

FLORA & FAUNA

It is presumed that there will not be any adverse effect on the existing habitat due to underground mining operations at greater depth. However, some indirect impact due to developmental activity and population growth is expected which will be controlled by adopting strict protective measures by area authorities.

ENVIRONMENTAL ECONOMICS

(in Rs. Lakh)

	Capital		Revenue	
	Existing	Proposed	Existing	Proposed
A. ENV. cost				
1. Pollution control i) Mine & industrial area ii) Township	 13.58 4.14	 -	 -	
2. Pollution monitoring i) EMP preparation ii) Peizometer construction iii)Flora & fauna study iv)Monitoring	 - - - -	 10.00 5.00 - -	 - - - -	 - - 0.40(One time) 4.25
3. Greeen belt	15.00	-	-	18.75(One time)

4. Subsidence management	-	-	-	2.50
5. Final mine closure	-	-	-	1.00 (One time)
Sub total A	**32.72**	**15.00**	**-**	**26.90**
B. Social cost				
1. Occupational health	-	-	-	-
2. Community development work in villages	8.36	-	-	-
Sub total B	**8.36**	-	-	-
Total cost A+B	**41.08**	**15.00**	**-**	**26.90**

MINE CLOSURE PLANNING

Although, the mining activities may last a few decades, but they are liable to leave a long lasting impacts on the landscape, ecology and on local inhabitants. If not properly managed, effects can be detrimental for general welfare of most of the stake holders. Thus, any mining venture must have adequate closure plan, aimed at rehabilitation of disturbed area, which should be acceptable to local community as well as regulatory authority. Mine closure cost will be around Rs 49.39 Lakhs

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