

CHAPTER – XI

SUMMARY AND CONCLUSION

11.1 INTRODUCTION :

11.1.1 Purpose

A Project Report for Dipka Expansion Opencast Project of SECL for a targeted capacity of 20Mty coal was prepared by CMPDI, R.I.V and was sanctioned by the Government on 12th July 2005 for capital investment of Rs **1268.53** crores (December,2007) .

Working group/X Plan document had indicated the demand of non-coking coal for XI Plan as 580 Mt and indigenous supply of non-coking coal from CIL as 445 Mt. The updated production of May 2005 have indicated the demand of non coking coal for the XI plan as 622 Mt and indigenous supply of non coking coal from CIL as 508 Mt. Projection of total indigenous supply of non coking coal as 562.32 Mt. leaves a gap of 59.68 Mt for which Emergency Coal Production Plan of CIL has been formulated. Dipka Opencast has been identified as one of the project in the **Emergency Coal Production Plan of CIL**.

This project named Dipka OCP (20 to 25 Mty) has been conceived with an additional capital investment of **Rs. 574.95 crores**(December,2007). The project will produce coal of Power Grade.

11.1.2 Location

Dipka OCP Expansion, a part of Dipka and Hardi Blocks, is located in the south-central part of Korba Coalfield in Korba district of Chhattisgarh. These blocks cover an area of **12.42** sq.km. and are bounded by latitudes **22°18'59"** and **22°19'43"** North and longitudes **82°30'47"** to **82°33'34"** East (ref. **Plate No. I**) and included in Survey of India Toposheet No. 64J/11.

The blocks are well connected by rail and road. 'Gevra Road' and 'Korba Railway Stations' on Champa-Gevra Road branch line of S.E. Railway are at a distance of **19** km and **25** km respectively. Railway Siding which exists upto Gevra OCP is being extended upto Dipka. At present, Coal from Dipka OCP is being despatched through the existing Rly Sidings at Junadih and Gevra Road. SECL headquarters, Bilaspur, is at a distance of about **90** km by road.

11.1.3 Source of data & scope

On the basis of detailed drilling, G.R. was prepared . A total **91** boreholes were drilled in the mine take area of **10.02** sq.km.

Baseline environmental data in respect of micro-meteorological data, air, water, soil quality data, noise level data have been generated by CMPDIL.

Meteorological data has been collected from Indian Meteorological Department at Bilaspur and rainfall data from Katghora.

Socio economic data in respect of population statistics, economic profile, work force pattern, land use pattern, civic amenities etc. have been collected from Janganna Bhawan, Bhopal, M.P.

Data collected from Survey Department of the area and incorporated in the PR.

Ground water data has been collected from Ground Water Survey Unit of Bilaspur District for Banki village and Hardibazar village .

Environmental and forestry clearance is a pre-requisite for the approval of coal mining and other projects. In accordance with the above requirement, the Environmental Impact Assessment (EIA) for Dipka Opencast project of 25 MTY has been prepared. Details have been given in CHAPTER I.

11.2 PROJECT DESCRIPTION:

The area of Dipka mining block is **10.02** sq.km. The entire area is under consideration for mining of Dipka Opencast Expansion Project (**25 Mty**).

Occurrence of 3 nos. of coal seams have been proved in the block. These seams in descending orders are 'E' & 'F', Upper Kusmunda and Lower Kusmunda. Lower Kusmunda Seam occurs as composite seam in the northern part of the block. However, it splits up in two sections, namely, Lower Kusmunda (Top Section) and Lower Kusmunda (Bottom Section) in southern part of the block. The average grade of the coal is 'E'

The mine-able reserves & volume of OBR considered in this report have been **617.00** M Tes and **615.00** Mcum . The life of the mine is **25** years.

Considering the geo-mining parameters of the quarry, shovel-dumper mining system has been adopted to excavate OB, while extraction of coal will be done through **Surface Miner**.

The expansion project has provisions for pumping & drainage of mine water , coal handling , workshop, power supply , township with water supply & sewerage system and land area. Details have been given in CHAPTER II.

11.3 DESCRIPTION OF THE ENVIRONMENT

11.3.1 Study Area, Period, Components & Methodology

Study area is considered area within **10** km radius from the periphery of the project as all the base line data have already been studied and assessed within this definition of ambit of the study area.

11.3.1.1 Study Area

The study area as described in **Table-3.1** of which study has been carried out.

11.3.1.2 Period

The period has been mentioned in Table-3.2.

11.3.1.3 Components

As mentioned herein before as in 11.3.1 and 3.1.1 .

11.3.1.4 Methodology

Methodologies have been discussed in para 3.1.4 in CHAPTER III.

11.3.2 Establishment of baseline for valued environmental components as identified in the scopea). **Socio-economic aspects**

A study of socio-economic profile in buffer zone including core zone (based on available census data) reveals that the total population of the area consists of about **137895** persons, of which **50.66%** are male and **49.34%** are female. Scheduled castes account for **11.85%** of total population and Scheduled tribes **40.42%**, whereas **49.60%** population is literate. The data reveals that **29.04%** of the population are main workers and **13.93%** are marginal workers, the rest **57.03%** are non-workers.

b). **Land requirement****Core Zone Area**

It is estimated that **2000.963** Ha. of land will be required for Dipka Opencast Project Expn. including land for quarry, external dumps, industrial and residential complex, road diversion, safety zone and rehabilitation colonies. This also includes **1894.479**Ha . land already acquired for existing Dipka OCP . The break-up of land use is given below in **Table-3.8 a**.

Table-3.8 A

Activity	Forest	Tenancy	Govt.	Total area in Ha.
Quarry area	424.522	512.483	65.048	1002.053
External OB dump	0	170.336	35.664	206.00
Infrastructures	0	453.809	8.78	462.589
Land for road diversion	0	4.00	0	4.00
Rehabilitation	0	40	0	40
Safety zone	0	225.735	60.265	286.00
Total land for the project	424.522	1406.363	169.757	2000.642
% of total land	21.22	70.30	8.49	100.00

Study Area

The detailed land use map is prepared based on topo-sheets and then supplemented by information collected from Forest Department, revenue department and mouza maps of the neighbouring villages as shown in **Plate-II**.

Census data of 2001 have been collected and utilised for knowing the landuse pattern. Village wise landuse pattern is given in **Annexure -V** and shown in **Figure 4b** Summarised details are in **Table-3.8 B**:

Table-3.8 B

PARTICULARS	AREA	% OF TOTAL AREA
Total area	48799	100
Forest area	18600	38.12
Irrigated Agril. Land	545	1.12
Un irrigated Agril. Land	20912	42.85
Culturable waste land	5084	10.42
Area not available for cultivation	3658	7.50

c). Meteorological Trend

The meteorological data with respect Temperature for 1984 to 2003 are available so far from the nearest Bilaspur Meteorological Observatory, which is situated approximately 90 km. from the project. The temperature varies from **5⁰C to 44.7⁰C** . The average rainfall as per as per raingauge station at Katghora for 1954 to 2007 is **1516 mm**.

d) Micro-meteorological Study

Micrometeorological and microclimatic parameters were collected and recorded by installing station at Sirki village that represents micrometeorological aspects of the study area. During Summer 2006 (01.4.2006 to 30.6.2006), hourly reading of wind velocity, wind direction, temperatures, humidity, cloud cover, etc., were recorded and collected. Location is shown in **Figure -5**.

Meteorological data collected during the study reveal the following as briefly described in **Table- 3.10 b**:

Table-3.10 b

Parameters	Observations
Wind direction	Predominant from South West(SW).
Wind Velocity	Ranging from 0.40 kmph to13.0 kmph.
Temperature	Ranging from 20.0 °C to 42.5° C.

Relative Humidity(Mean)	Ranging from 22 - 86%.
Cloud Cover	Mostly clear sky during study period.
Rainfall	A total rainfall of 46.0 mm during study period.

e). Ambient air quality

Ambient air quality data in & around Dipka project area shows maximum concentration. of SPM, RPM, NO_x, SO₂ in summer as **370, 98, 12.0 & 7.6** µg/cum respectively which is within the permissible limits.

f). Water quality

Water samples were collected and analysed from different locations representing surface water sources , ground water sources and adjoining mine discharge. The analytical result shows that the physical and chemical parameters are within prescribed limits of GSR : 422(E) and IS:10500 except for coliforms organisms which may be due to human/animal waste. Provision of settling tanks to arrest suspended solids from mine water, workshop water, surface run off have been made. Domestic Effluent Treatment Plant (DETP) has already been commissioned.

g). Noise level

The maximum noise level data recorded at Dipka mine site was **54.6** dB(A) which is within the prescribed limit value of 75 dB(A).

h). Forest flora & fauna

1) Flora.

There is about **424.522** Ha of forest land in mining area most of which has already been acquired. The forest cover in buffer zone is about 18175.48 ha.(18600 in the study area) In the absence of scientific management in the past, these forests have suffered from heavy fellings. Biotic pressure put exerted by human beings and domestic animals of surrounding areas is also tremendous. In order to confirm the survey status of flora and fauna, the Intensive Forest Management Plan for Katghora Division of Forest Department in Chhattisgarh , was consulted. Forest area is open, unclassified and not covered under any working plan.

2) Fauna

Fauna are identified by forest officials adopting four methods viz., signs of faecal droppings, siting, appearance of pug marks on water holes/prints and signs of grazing/browsing. The migration of wild life from adjoining forest areas is not noticed as the area is open and disturbed by biotic factors already existing. Inventory of animals and birds is made in compartment history on the prescribed format of forest department. The details of existing environmental scenario have been given in CHAPTER III.

i) Hydrogeology

Yearwise static water levels from Hardibazar and Banki Hydrograph Stations during pre and post-monsoon as recorded by Ground Water Survey Unit, Irrigation Department have been collected. The average fluctuation in GWL observed from the data of permanent observation wells is about 3.79 metres.

Rainfall is the principal source of recharge. The calculation of the ground water recharge has been done based on the GEC norms for rainfall infiltration index as 11.5% and for water level fluctuation method assuming specified yield as 8% for hard rocks. Based on the rainfall infiltration method the recharge works out to 61.45 M.cu.m. Discharge of the area works out to 24.27 M.cu.m. From this it is seen that the surplus water available in the area is 37.67 M.cu.m. The details are given in CHAPTER - III .

11.4 ANTICIPATED ENVIRONMENTAL IMPACT & MITIGATION MEASURES

11.4.1 Environmental Impact Assessment

1). 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. There will be creation of direct and indirect new employment opportunities in the long term as the life of the mine is **25** yrs.

The approximate no. of affected land oustees involved in the project is **3427** . The no. of families involved in the project is **3350** including approximately **1660** families in additional minetake area . **365**families have already been rehabilitated. The remaining **2985** families are to be rehabilitated. Around **1445** land oustees have been given employment out of **3427** land oustees involved.

Chattisgarh Government will be benefited through financial revenues in crores of rupees by way of royalty, sales tax etc. from the direct and indirect operations in the project area. Central exchequer is also getting financial revenues by way of Income tax, Central Sales Tax etc.

2). Impact on land use

The premining land use of the project is as follows.

Forest land	:	424.522Ha.
Govt. land	:	169.757Ha.
Tenancy land	:	1406.363Ha.
/ Agricultural land	:	
Total land area	:	2000.642 Ha.

The land area would be utilized by the project for quarrying (**1002.053Ha.**), External OB dumping (**206.00 Ha.**) , infrastructures & rehabilitation area (**502.589 Ha.**), road

diversion (4.00 Ha.) and safety zone & others (286.00 Ha..). These activities will cause change in premining land use pattern by degrading 424.522Ha of forest, agricultural and Govt. land affecting existing flora & fauna , existing surface drainage pattern , displacement of population.

3). **Impact on environment**

Air environment:- Air quality in respect of SPM, RPM, SO₂ & NO_x 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 pneumoconiosis , 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.

Diversion of surface water courses and 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 are following identified impacts on flora & fauna .

- a) Removal of vegetation (424.522Ha Ha of forest, for which provision of compensatory afforestation has been made) due to mining activities.
- b) Pollution of surrounding water bodies due to leaching from overburden dump and pollutants from other activities. This affects the aquatic fauna . Plantation on dump surface and provision of foot & catch drains have been made to control this phenomena.
- c) Dust in atmosphere , contributed by mining and associated activities, when deposited on leaves of the plants in the surrounding areas may retard their growth. Provision of dust suppression system on haul roads , CHP etc have been made.

4). **Impact on meteorology** : - Meteorological data for the last few decades have been collected from nearest IMD station at Bilaspur. The average annual rainfall recorded is about 1516 mm.(at Katghora) Maximum rainfall is received during monsoon

months of June to September. Looking into general trend of rainfall, differences are within normal cyclic pattern and cannot be attributed to mining activity in the area.

5) **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. So also, due to stratification, the individual permeable beds develop individual drawdown cones and the impact is usually limited to few hundred meters.

6). **Hazard assessment** :-

a) Impact of Ground Vibration

The main impacts due to ground vibration may be :

1. Development of cracks in the houses located in the neighbouring areas.
2. During blasting rock fragments fly upto a distance of about 150 m.

The habitat nearby opencast mine would be rehabilitated and hence no such hazard is anticipated.

b) Coal fire

No incident of coal fire is reported in adjoining mines of Dipka area.

The details of environmental impact assessment have been given in CHAPTER V.

11.4.2 Environmental Control Measures

a). **Socio Economic Measures :**

The approximate no. of affected land oustees involved in the project is **3427** . The no. of families involved in the project is **3350** including approximately **1660** families in additional minetake area . **365**families have already been rehabilitated. The remaining **2985** families are to be rehabilitated. Around **1445** land oustees have been given employment out of **3427** land oustees involved.

1) Secondary Employment opportunities

There will be spontaneous economic stimulus in the area with the commencement of opencast patch. Some 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, Cesses etc.

2) Educational Facilities

There are several educational institutions of various standards managed by both public and private sectors/bodies in the area due to SECL, NTPC, BALCO, CGSEB etc.

Educational facilities provided are by Central School in Kusmunda by SECL and NTPC, Korba, Delhi Public School (Upto Class XIIth) by NTPC and DAV School in Kusmunda & Gevra Area by SECL. Total 106 villages falling in study area have primary school facility. There are 38 middle schools and 17 secondary school in study area.

3) Medical Facilities

There are well equipped Hospitals at Gevra , Korba and Kusmunda area of SECL. In addition there are 15 dispensaries, 6 primary health centres within study area.

4) Preventive measures:-

The SECL authorities have adopted following measures to prevent occupational diseases and health hazards.

- * Pre-employment, pre-placement and periodic medical examination of employees.
- * Regular monitoring of working environment and implementation of safety and control measures, to prevent hazards.
- * Use of protective equipments, clothing, helmets, Gas mask, shoes, etc.
- * Periodical medical examination of every worker is done once in five years to detect preventable and curable diseases at an early stage.
- * Cases suspected having Pneumoconiosis are examined by a Special Board constituted by the Chief Medical Officer. Established cases are suitably compensated and their job is changed if required.

5) 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 Dipka OC project will be covered to achieve 100% literacy level.

b). Solid waste management & land reclamation:

The total volume of OBR is estimated as **615** Mcum including **260.19** Mcum from west section and **354.81** Mcum from east section. Out of this, **81.00** Mcum of OB would be placed as external dumps. The balance OB of **534.00** Mcum would be placed as internal dumps. There will be final void of **529.54** Ha. which will be used as water reservoir if no further expansion of the mine at the dip side takes place.

The volume of external dumps is about 13.17% of the total volume of OBR. Three locations have been identified for the same.

3 locations, namely A, B & C have been identified for internal dumps. Internal dump 'A' would have a capacity of 10.00 Mcum.

A location for the top soil dumping and preservation has also been identified beyond the western quarry limit.

The external dumps have been merged with internal dumps in order to reduce the area of the external dumps. The top R.L. of this dump would be + 370 m which is 50 m above the general topography.

1) Reclamation

Technical reclamation involves backfilling of excavated area with overburden in a systematic manner, after levelling and grading, the dump slope and top. Then the top soil would be laid over dump surfaces. In the initial stage emphasis will be given on growing legumes and grasses, which can provide quick soil enrichment and green cover and hasten soil stabilisation and thus reduce erosion. In later stage, various local species will be tried keeping in view the experience in the existing & nearby mines.

2) Compensatory afforestation

About **424.522** Ha of forest land is involved within mine lease area of project. Compensatory afforestation is involved and will be carried out.

c). **Air pollution control measures :**

Considering anticipated affect on air quality due to advance in mining operations, following control measures will be implemented.

1. Water spraying by water Sprinkler (5 nos. of 28 KL and additional 1 to 3 nos. of 10 KL) are being done regularly on approach roads, coal transportation roads and within the mining area to minimise the dust generation.
2. 4.25 line kilometers of fixed water sprinklers already commissioned.
3. Surface miner to be deployed for coal mining to reduce dust levels.
4. Conveyor belts for movement of total coal mined from mine pit to surface will be installed to reduce dust generation due to transportation.
5. Mine plans, to dispatch total coal mined to consumers by rail to reduce dust levels.
6. About 10.26 lakh saplings planted in project area for dust suppression.
7. Adequate dust suppression system commissioned in Silo, Coal Bunkers, coal stockyards etc. to reduce dust levels.
8. Black topping of roads undertaken.
9. Drills have been fitted with dust extractors.
10. Conveyor belts provided with covers.
11. In-pit crushing of coal is at present being undertaken which will be discontinued after deployed of surface miner, thus generation of dust will be reduced.

d). Water pollution control measures :

1) Management of surface water drainage:-

Garland drains will be made around the periphery of the quarry. These garland drains will be connected to the local nalla which is not likely to be disturbed by mining operation. In the workings, heavy duty pumps will be deployed in rainy season which will throw the accumulated water from the working face into these garland drains. As the extraction of the quarry advances, the position of garland drain will also advance. Thus these garland drains will drain off the rain water away from the workings.

2) Mine Water Discharge & Industrial Effluent

1. Mine sump of 0.95 to 2.35 Mcum capacity will be established.
2. Settled mine effluent is being used for domestic & industrial consumption.
3. Settling tank to treat mine water has been commissioned.
4. Oil & grease trap for workshop effluent treatment has been commissioned.
5. Mine sumps will act as a water recharge structure.

3) Domestic Effluent Treatment:-

3.0 MGD capacity domestic effluent treatment plant for colony already commissioned to treat colony waste water of Gevra & Dipka projects.

4) Water Conservation:-

The waste water recycling after due treatment for the purpose mentioned above will enable conservation of water. Storage of conserved water in mine pits will be given due emphasis to provide water round the year and quality of water will be maintained before and after storage.

d). Noise pollution control measures :

To minimise anticipated noise pollution, following control measures will be implemented.

The following measures are adopted and will be continued :

1. About 10.26 lakh saplings already planted for noise attenuation.
2. High capacity machines to be deployed in mine. This will ensure reduced number of vehicular trips, thereby reducing noise levels.
3. Reduced quantity of blasting will result in lower noise levels.
4. Lined chutes in Silo to reduce noise.
5. Surface miner deployed to eliminate coal crushing will reduce noise.

6. Provision of ear muffs/ear plugs to workers subjected to noise level above recommended limits.
7. Regular monitoring of noise level of project area.
8. Routine maintenance schedules for HEMM and other machineries to eliminate noise as far as possible.

e). Blasting Vibration Control Plan

The following factors will be given special attention to minimise effects of blasting:

- * Charge per delay
- * Charge per round
- * Over charging will be avoided
- * Distance from the structures (Scaled distance)
- * Type of initiation & sequence of delay
- * Stemming material used will be moist.
- * Blasting time (safety aspect)
The blasting will be done at a fixed time as far as possible.

- * Warning

Before blasting is carried out , warning sound will be given so that people can move to safe place.

1) Vibration control

- * As mentioned above, the mitigation measures will be implemented during blasting and it is expected that vibration will not cause damage to any structure or annoyance to the people in the colony area or neighbouring villages.
- * Controlled blasting techniques will be implemented near the builtup structure in the vicinity of active face.
- * A safe blasting zone as per DGMS norms would be kept around the periphery of the quarry.

f) Green Belt Development

Green belt around mine , Sides of haul Roads & all other roads , around infrastructures , colony are already in existence & will be augmented further..

The details of environmental control measures have been given in CHAPTER IV.

g) Final decommissioning or rehabilitation of completed project

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. CHAPTER – IV described the details about the mine closure planning.

11.4.3 Irreversible & Irretrievable components of environmental components

a) Land use :

There will be change in the surface topography from the original premining status (298-326 m above mean sea level) to the scenario in post mining which gives external as well as backfilled dumps with 50 m high above ground and left out mine void as given in **table 2. 4 & 4.12 d A** . The details have been discussed in para 4.5.1.

b) Rehabilitation & resettlement of project affected families & persons:

Although the project affected families & persons will be benefited with the facilities provided at the new locality but their original cultural heritage may not be restored back.

There are many educational , medical facilities and other civic amenities in the area have been developed for the benefits of the project employees as well as for the people residing around the project considered to be permanent & positive impacts.

Refer para **4.4.1** and table **4.11** for details discussion on R&R .

11.4.4 Assessment of significance of impacts:

Comparison of the impact on the socio-economic attributes and environmental factors by undertaking the mining scheme with and without remedial measures are taken up.

To understand the significance for such comparison, some of the important aspects for comparison are given in para **4.6**. Though this method is considered subjective, still it will indicate a measure for assessment.

11.4.5 Mitigation measures :

Implementation of aforesaid mitigation measures in para **4.4** will improve the environmental conditions. The negative effects will get mitigated, while positive impacts may get absorbed on environmental measures. A statement showing the environmental matrix and various parameters with protective measures are furnished in table thereof.

11.5 ANALYSIS OF ALTERNATIVES

The project has been planned with a high degree of mechanisation, in line with the present and forthcoming changes in neighbouring mines as well as in other parts of the country. The techno-economics have been worked out based on the prevalent norms of productivity, operating cost, spare consumption etc.

For meeting increasing demand of power grade coal in X Five Year Plan for upcoming thermal power houses, it is essential to approve and implement this project.

11.6 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.

Details have been discussed in CHAPTER VI

11.7 ADDITIONAL STUDIES

11.7.1 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 with the following activities .

- i) The process in which public would be directly involved or participate and indirect responses would be received through different modes of communications.
- ii) District Magistrate will preside over the Public Hearing process to get public concerns incorporated in the EIA report.
- iii) Videography of proceedings would be done and would be enclosed with the application for Expert Committee .
- iv) The proceedings will be signed by DM/ADM in the same day of hearing.
- v) The proceedings will be displayed in web site and other Govt. offices.

11.7.2 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.

Keeping in view the three basic principles i.e. prevention, preparedness (both pro-active and reactive) and mitigation of effect through rescue, recovery, relief and rehabilitation; a comprehensive blue print of risk assessment and management plan has been prepared for Dipka OCP incorporating the following :

- * Identification and assessment of risks
- * Recommendation of measures to prevent damage to life and property against such risks.

11.7.3 Social impact assessment

Dipka Opencast Project of Dipka Area is situated in Korba District of Chhattisgarh, in the western part of Korba coalfields, the nearest railhead being Gevra Road station, Champa Gevra Road branch of South Eastern Railway. This project is captive to Sipat Super Thermal Power Station of National Thermal Power Corporation (NTPC).

The approximate no. of affected land oustees involved in the project is **3427**. The no. of families involved in the project is **3350** including approximately **1660** families in additional minetake area. **365** families have already been rehabilitated. The remaining **2985** families are to be rehabilitated. Around **1445** land oustees have been given employment out of **3427** land oustees involved. Details are enumerated in CHAPTER VII.

11.8 PROJECT BENEFITS

11.8.1 Improvement of physical infrastructures:

a) Rehabilitation & resettlement

The following facilities would be provided in R&R site

1. Road
2. Street light
3. School
4. Health Centre
5. Drinking Water Facilities.
6. Recreation
7. Ponds/Well

- 8. Playground/park
- 9. Shopping centre

- b) Educational Facilities
- c) Medical Facilities

11.8.2 Improvement in the social infrastructures:

- 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 Dipka OC project will be covered to achieve 100% literacy level.

- b) Socio-Economic Development

- 1) Infrastructure Development in existing rehabilitation village of Vivekanand Nagar, Gandhi Nagar, Nehru Nagar and Chainpur Nagar.

- c) Community Development works in nearby village i.e. Jhabar, Ratiza and Renki provided by project.

- d) Vocational Training Programme for the village provided by Dipka OC project

11.8.3 Employment potential

- a) In the project

There will be direct employment opportunities of 2594 manpower of different categories of persons .

- b) Secondary Employment opportunities

There will be spontaneous economic stimulus in the area with the commencement of expansion of opencast 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.

Following parameters that require of environmental mitigation and control measures against environmental pollution owing to project activities including ecological and socioeconomic uplift / betterment of the project area and its vicinity will be considered into Environmental Cost Benefit Analysis.

- i) Socio Economic
- ii) Restoration-R & R Implementation
- iii) Anti Pollution Measures in Mine, industrial and residential areas

11.9 ENVIRONMENTAL COST BENEFIT ANALYSIS:

MOEF while issuing TOR has not specifically indicated for carrying out ‘ Cost Benefit analysis ‘ , hence the same has not been carried out.

11.10 ENVIRONMENTAL MANAGEMENT PLAN:

a). Socio Economic Measures :

The approximate no. of affected land oustees involved in the project is **3427** . The no. of families involved in the project is **3350** including approximately **1660** families in additional minetake area . **365**families have already been rehabilitated. The remaining **2985** families are to be rehabilitated. Around **1445** land oustees have been given employment out of **3427** land oustees involved. The project affected families & persons will be benefited with the facilities provided at the new locality but their original cultural heritage may not be restored back.

1) Secondary Employment opportunities

There will be spontaneous economic stimulus in the area with the commencement of expansion of opencast 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.

2) Educational Facilities

Total 106 villages falling in study area have primary school facility. There are 38 middle schools and 17 secondary school in study area.

3) Medical Facilities

There are well equipped Hospitals at Gevra , Korba and Kusmunda area of SECL. In addition there are 15 dispensaries, 6 primary health centres within study area.

5) 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 Dipka OC project will be covered to achieve 100% literacy level.

b). Solid waste management & land reclamation:

Out of total volume of **615** Mcum OB to be removed , only **81** Mcum will be dumped as external dump and the balance of **534** Mcum will be dumped in the decoaled area as internal dump.

81 Mcum OB will be externally dumped for which 206 Ha of land will be required. External dump has been made in the rise side boundary of the mine after following considerations:

1) Reclamation

Technical reclamation involves backfilling of excavated area with overburden in a systematic manner, after levelling and grading, the dump slope and top. Then the top soil would be laid over dump surfaces. Then plantation will be done on dump surface.

2) Compensatory afforestation

About 424.522Ha of forest land is involved within mine lease area of project. Compensatory afforestation is involved and will be carried out.

c). **Air pollution control measures :**

Considering anticipated affect on air quality due to advance in mining operations, following control measures are being implemented.

1. Water spraying by water Sprinkler (5 nos. of 28 KL and additional 1 to 3 nos. of 10 Kl) are being done regularly on approach roads, coal transportation roads and within the mining area to minimise the dust generation.
2. 4.25 line kilometers of fixed water sprinklers already commissioned.
3. Surface miner to be deployed for coal mining to reduce dust levels.
4. Conveyor belts for movement of total coal mined from mine pit to surface will be installed to reduce dust generation due to transportation.
5. Mine plans, to dispatch total coal mined to consumers by rail to reduce dust levels.
6. About 10.26 lakh saplings planted in project area for dust suppression.
7. Adequate dust suppression system commissioned in Silo, Coal Bunkers, coal stockyards etc. to reduce dust levels.
8. Black topping of roads undertaken.
9. Drills have been fitted with dust extractors.
10. Conveyor belts provided with covers.
11. In-pit crushing of coal is at present being undertaken which will be discontinued after deployed of surface miner, thus generation of dust will be reduced.

d). **Water pollution control measures :**

1) Management of surface water drainage:-

Garland drains will be made around the periphery of the quarry. These garland drains will be connected to the local nalla which is not likely to be disturbed by mining operation. In the workings, heavy duty pumps will be deployed in rainy season which will throw the accumulated water from the working face into these garland drains. As the extraction of the quarry advances, the position of garland drain will also advance. Thus these garland drains will drain off the rain water away from the workings.

2) Mine Water Discharge & Industrial Effluent

- (i) Mine sump of 0.95 to 2.35 Mcum capacity will be established.
- (ii) Settled mine effluent is being used for domestic & industrial consumption.
- (iii) Settling tank to treat mine water has been commissioned.
- (iv) Oil & grease trap for workshop effluent treatment has been commissioned.
- (v) Mine sumps will act as a water recharge structure.

3) Domestic Effluent Treatment:-

3.0 MGD capacity domestic effluent treatment plant for colony already commissioned to treat colony waste water of Gevra & Dipka projects.

4) Water Conservation:-

The waste water recycling after due treatment for the purpose mentioned above will enable conservation of water. Storage of conserved water in mine pits will be given due emphasis to provide water round the year and quality of water will be maintained before and after storage.

d). **Noise pollution control measures :**

The following measures are adopted and will be continued :

1. About 10.26 lakh saplings already planted for noise attenuation.
2. High capacity machines to be deployed in mine. This will ensure reduced number of vehicular trips, there by reducing noise levels.
3. Reduced quantity of blasting will result in lower noise levels.
4. Lined chutes in Silo to reduce noise.
5. Surface miner deployed to eliminate coal crushing will reduce noise.
6. Provision of ear muffs/ear plugs to workers subjected to noise level above recommended limits.
7. Regular monitoring of noise level of project area.
8. Routine maintenance schedules for HEMM and other machineries to eliminate noise as far as possible.

e) **Final decommissioning or rehabilitation of completed project**

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. CHAPTER – IV described the details about the mine closure planning.

11.11 DISCLOSURE OF CONSULTANTS ENGAGED:

Central Mine Planning & Design Institute Limited. Briefly, it is generally called as CMPDI. It is an ISO 9001 Company and one of the subsidiary companies of Coal India Ltd..(CIL)

Its registered Corporate office is situated at Gondwana Place, Kanke Road, Ranchi-834 008, a capital city of Jharkhand state. It operates through seven strategically located Regional Institutes over six states territories of India. These Regional Institutes are engaged in exploration , planning & design works of other subsidiary companies of CIL, namely , ECL, BCCL, CCL,MCL, NCL, WCL,SECL and NECL.

The company was formerly known as Coal Mines Authority Limited. And, the Central Mine Planning & Design Institute Limited (herein after called as CMPDI) is a planning & design division of Coal India Limited (hereinafter called as CIL) as per Memorandum of Association of the company. The CIL is a holding company since November 01, 1975, and the CMPDIL is one of its subsidiaries since then. It is under Ministry of Coal, Government of India.
