RAPID ENVIRONMENTAL IMPACT ASSESSMENT FOR PROPOSED COAL BENEFICIATION PLANT AT BELTARA, BILASPUR (CG)

1.0 Introduction

M/s PHIL MINERALS BENEFICIATION & ENERGY PVT. Ltd, (PMBEPL) proposes to setup a 1.2 Million tonnes per annum Coal washery (Dry Process) plant in phase I and 1.2 Million tonnes per annum coal washery (Wet process) in phase II on 15 acres of land at village Beltara, Tahsil Ratnpur, Dist. Bilaspur. The raw coal will be supplied by SECL Dipka mine , which is about 50km away from PMBEPL

In order to assess the potential environmental impacts arising due to proposed activities M/s PMBEPL retained Anacon Laboratories Pvt. Ltd. Nagpur, to undertake Environmental Impact Assessment study incorporating baseline data on various components air, noise, water, land and socio-economic to prepare Environmental Management Plan.

2.0 Baseline Environmental Status and Identification of Impacts

2.1 Air Environment

The prime objectives of Ambient Air Quality (AAQ) monitoring within 10 Km. radial distance of PMBEPL was to establish existing regional background levels and baseline Air Pollution status.

Ambient Air quality Monitoring was carried out at 10 locations within the radial distance of 10 km. The locations have been identified keeping in view predominant wind direction prevailing during study period, sensitive area, and human settlement. The Status of ambient air quality within the study area monitored for Oct. 2006, Nov. 2006 and December 2006. The concentration of SPM, RPM, SO_2 and NO_X monitored during these three months were found to be less than NAAQS prescribed for rural & industrial area. (CPCB Std: SPM industrial

area 500µg/m^3, rural 200µg/m^3; SO$_2$ industrial area 120 µg/m^3, rural 80µg/m^3; NOx industrial 120µg/m^3, rural 80µg/m^3).

2.2 Noise Environment

Noise levels were monitored using sound level meter (Lutron SL – 4001) for the study area. It was observed that noise levels of study area vary in the range 42–51dB (A) in the day time and 30–36 dB (A) in the night time for residential area. These observations indicate that the ambient noise levels are within the impact zone comply with prescribed standards. (CPCB Std. Industrial area: Day – 75, Night – 70; Commercial area: Day – 65, Night – 55; Residential area: Day – 55, Night – 45; Silence area: Day – 50, Night – 40).

2.3 Water Environment

The water quality in the impact zone was assessed through physico-chemical analysis of ground and surface water samples. The samples were collected in October 2006. The status of ground water and surface water quality was assessed by identifying 6 ground water (Bore wells) samples in different villages and one surface water sample.

It was observed that all the physico chemical parameters and heavy metals from surface and ground water samples are below stipulated drinking water standards. The data indicate low mineral content in terms of chloride and sulphate. Bacteriological examination of surface water indicates the presence of Total Coliform, which may be due to human activities observed during the study period.

Water is drawn from bore wells within the plant premises to meet the requirement, which includes water spraying on conveyor transfer point, dust control measures and domestic use. The total water requirement for proposed project will be 33 m^3/day in phase I and 72 m^3/day in phase II. The wet coal washery requires process water. The process waste water generated will be recycled and used for dust suppression and green belt development. The domestic wastewater will be disposed through soak pit.

2.4   Land Environment

The proposed plant will be set up in an area of 15.0 acres, which is adequate for proposed project. Soil samples were collected from 5 locations within 10 km radius of proposed project. Physical characteristics of soil were characterizes through specific parameters viz. particle size distribution, bulk density, porosity, water holding capacity and texture.

The soils with low bulk density have favorable physical condition where as those with high bulk density exhibit poor physical conditions for agriculture crops. The bulk density of the soil in the study area ranged between 1.37 to 1.41 g/cm^3, which indicates favorable physical condition for plant growth.

Soil porosity is a measure of air filled pore spaces gives information about movement of gases, inherent moisture, development of root systems and strength of soil. The porosity and water holding capacity of the soils are in the range of 41 % to 47% and 30% to 33% respectively. The soil in the impact zone has silty clay structure with moderate water holding capacity.

pH is an important parameter indicative of alkaline or acidic nature of soil. It greatly affects the microbial population as well as solubility of metal ions and regulates nutrient availability. Variations in the pH of the soil in the study area was found to be neutral (6.92 to 7.98), thus conducive for growth of plant.

Electrical conductivity, a measure of soluble salt in the soil is in the range of 0.058 mmhos/cm to 0.212 mmhos/cm. The important cations in the soil are calcium and magnesium. It is observed that calcium and magnesium concentrations are in the ranges 0.0020 to 0.0065 % and 0.0008 to 0.0025 % respectively. Organic matter present in soil influences its physical and chemical properties of soil and is responsible for stability of soil aggregates. Organic matter of soil is found in the range 0.362% to 0.615% showed moderate to high fertility of the soil, which may be attributed to application of organic manure. The presence of organic matter enhances the metabolic activities of soil affecting the nitrogen and potash content of soil. The fertility status in respect of Nitrogen, P_2O_5 & K_2O shows moderate fertility.

Solid Waste

Solid waste as coal rejects, bag filter and coal dust will be stocked & recycled as fuel to power plant, agarbatti and brick/tiles manufacturers, where as stones will be disposed through filling of low lying areas.

Biological Environment

Terrestrial flora of the studied area has been distributed with number of herbs, shrubs and trees as well as grass lands. The study area has sparse vegetation, which includes fruit, ornamental trees, shrubs and grasses.

No national park or sanctuary exist in the study area, Wildlife is not found in the study area. Common mammals, birds and reptiles are found in study area.

2.5   Social Economic Environment

Study area encompasses villages, under Ratanpur block of Kota tehsil in Bilaspur district. Demographic data such as number of households, population, community structure, literacy and employment status of the villages surveyed. The significant features are as follows:

- The total population of surveyed villages is 11154.
- The ratio of female/male is 970/1000 for the study area as compared to national average of 929/1000.
- The percentage of Schedule Castes (SC) and Schedule Tribes (ST) population in the rural area is 20.51 and 19.46 respectively in the study area.
- The literacy rate in the study area is 53.47% respectively.
- The employment rate is 39%.

The significant observations on basic amenities are as follows:

- Educational facilities are available in the form of primary/secondary schools. For higher education & colleges the students have to go to the Ratanpur and Bilaspur.

- Medical facilities exist in villages, Beltara has primary health center catering services to nearby villages. Allopathic & Ayurvedic practiponers are also helping the people in getting medical aid during emergency.
- Wells, tanks, and tube wells are the main sources of drinking water in the region.
- Pucca road, post office and power supply facilities are available in the villages.
- Telecommunication facilities are available in few villages.
- State transport and private auto are the main transportation means.
- Electricity is available for both domestic as well as for agriculture.

The morbidity status in the study area collected from primary health center of Beltara village. Medical officers PHC are of opinion that the unsatisfactory sanitary conditions are the major cause behind diarrhea and fever.

- Malnutrition is a general feature of the poor people. The unhygienic food and lack of balanced diet is responsible for this.
- The people are not very conscious about their health status. The medicines or tablets given by the mobile parties or functionaries of health department, even for prevention of diseases like malaria are generally not consumed as the tribal have all sorts of reservation about using the modern drugs. Child and maternal mortality is quite high due to improper care at the time of child birth.

3.0 Prediction of Impact

3.1 Air Environment

The impacts on air quality from coal beneficiation plant depend on various factors viz. transportation of coal from mines, coal handling equipment, equipment envisaged in plant operation & maintenance.

- Stacks are not required in coal washery, hence impacts due to conventional air pollutants SO_2 and NO_X are not envisaged.

- During coal beneficiation process deposition of dust on leaves of vegetation may affect the photosynthetic activities of the plants. This may be avoided by maintaining proper schedule of sprinkling of water.

3.2 Water Environment

- The data collected from the dug wells in the study area reveals that depths of well water varies from 2 to 3 meter during post monsoon and 12 to 15 meter during premonsoon season. The wastewater generated from the process will be recycled while that from the domestic use will be disposed in soak pit, hence no adverse impact on water bodies.

3.3 Land Environment

- The dust generated during loading and unloading operations, vehicular movement constitute heavy particles that will settle down on a very small area within the premises. There will be no significant impact on the local plantation within the premises due to proper spraying of water at regular interval.

3.4 Socio-economic Environment

- There will not be rehabilitation due to proposed activity as no habited village land is being procured.
- The direct and indirect employment opportunities are likely to be generated due to proposed activities for local people, thus there will be positive impact.
- There will be positive impact on literacy which is due to increase in technical and non technical persons.
- The project is not going to influence the existing traditional agricultural practices significantly.
- There will be positive impact on economic aspects due to employment of persons of different skill and trades.

4.0   Environmental Management Plan

4.1   Air Environment

- An independent water spraying system has been established for coal handling and crushing facilities by PMBEPL. Water spraying system consists of water tanks and network of spray water pipeline and headers.

- The spray water pump is electrically coupled with truck dump hopper feeder in such a way that stoppage of pump automatically trips the feeder and thus stops raw coal feed to the circuit, which helps in arresting the dust particles.

- The coal received at plant from mines should have sufficient surface moisture to prevent the dust to become air born.

- Vehicular movements in the plant area will be regulated effectively to avoid traffic congestion and workers will be prevented from dust exposure.

- Emissions from the heavy duty vehicles operating in plant shall confirm the standard under Motor Vehicles Rules 1989.

4.2   Noise Environment

- Noise attenuation measures will be taken up by providing green belt around periphery of plant.

- Medical practitioner will be appointed to check the health of the worker on regular basis for noise inducing hearing loss.

- Ear plug will be provided to all workers working close to noise generating units.

- If required noise proof cabins will be provided to operators.

4.3   Water Environment

- PMBEPL will be adopt rainwater harvesting scheme to recharge ground water.

4.4   Land Environment

- Roads in and around plant shall be pucca (asphalted).
- Green belt plan will be done along the road side, coal handling area, office building and all around the boundary wall of proposed washery.
- Temporarily stocking of coal fines in earmarked area shall be provided with pucca road, construction of garland drain around the stock yard to prevent run off water during rainy season.

Green Belt Development

The prime considerations for recommending greenbelt plantation scheme are:

- a. Nature of Pollutants
- b. Emission levels
- c. Maximum impact zone

For making selection of plant species for greenbelt, the following criteria shall be followed:

- i. Fast growing
- ii. Thick canopy cover
- iii. Perennial and evergreen
- iv. Large leaf area index
- v. Preferably indigenous
- vi. Resistant to specific air pollutants
- vii. Should maintain regional ecological balance as well as soil and hydrological conditions of the region.

Greenbelt Development for Mitigation of Noise

Industrialization results in increase in transport activities due to movements of tankers, trucks and other vehicles. This would result in increase of noise levels in the region. Plantation along the roadsides in two staggering rows will help in reducing the noise levels. Within the plant itself, trees and shrubs should be planted wherever vacant land is available for reducing the noise levels in the washery. If trees and shrubs are planted in maximum density, a 30 m wide strip can reduce the noise levels by about 6-8 d(BA). Plant species suitable for noise attenuation are listed below:

Plant Species for Noise Prone Areas

Sr. No.	Biological Name	General Name
1.	*Azadirachta indica*	Neem
2.	*Aegle marmelos*	Bel
3.	*Syzygium cimunil*	Zaman
4.	*Dal Bengia sissoo*	Shisham
5.	*C.tora*	Wild Sena
6.	*B. variegata*	Kachnar
7.	*Albizia procera*	White Siris
8.	*A. lebbeck*	Siris
9.	*A. excelsa*	Maharukh
10.	*Thespesia populnea*	Tulip
11.	*Tectona grandis*	Teak
12.	*Shorea robusta*	Sal
13.	*Terminalia arjuna*	Arjuna
14.	*Polyathia longifolia*	Ashoka
15.	*Ficus religiosa*	Peepal
16.	*Mangifera indica*	Mango
17.	*Lagerstromia flosregeinal*	Jarul
18.	*Bauhinia purpuria*	Kachnar
19.	*Saraca indica*	Sita Ashoka
20.	*Ficus benghalensis*	Banyan