

1.0 EXECUTIVE SUMMARY

M/s. Bhatia Energy & Minerals Pvt Ltd (BEMPL) is a well-established name in coal handling, washing & transportation. BEMPL is operating a coal washery (Rajan Coal Washery) with a production capacity of 0.96 MTPA located at village Chhote Dumarपाली, tehsil Kharsia, district Raigarh, state Chhattisgarh. Environmental clearance has been accorded by State Level Environmental Impact Assessment Authority, Raipur, Chhattisgarh vide letter no: 140/SEIAA-CG/EC/Coal Wash/RGH/225/10 Raipur, dated: 28/08/2012. Now BEMPL proposed capacity enhancement of coal washery from 0.96 MTPA to 5.0 MTPA with increase in land area from 8.10 ha to 14.5 ha within existing plant premises.

1.1 Purpose of the Report

As per the Environment Impact Assessment (EIA) Notification dated 14th September, 2006 and its subsequent amendments dated 1st December 2009, new projects or activities, or the expansion or modernization of existing projects proposed in any part of India would need prior environmental clearance from Ministry of Environment, Forest and Climate Change (MoEF&CC).

The proposed expansion of coal washery project falls under “**Category-A**” of activity type-2(a) as per the EIA Notification dated 14th September 2006 issued by the Ministry of Environment, Forest and Climate Change (MoEF&CC). Accordingly, TOR application was filed with MoEF&CC vide its proposal no. IA/CG/CMIN/121489/2019 dated 14.10.2019. TOR meeting was held on 05.12.2019 for determining the Terms of Reference (TOR) for the preparation of EIA-EMP report. After detailed deliberations MoEF&CC granted TOR vide its letter no: No. J-11015/71/2019-IA-II (M) dated 08.01.2020.

Vimta Labs Limited, Hyderabad, has been assigned to undertake an Environmental Impact Assessment (EIA) study and preparation of Environment Management Plan (EMP) for various environmental components, which may be affected due to the impacts arising out of the expansion project.

1.2 Identification of the Project and Project Proponent

1.2.1 Project Proponent

M/s. Bhatia Energy & Minerals Pvt Ltd (BEMPL) is a well-established name in coal handling, washing & transportation through rail and road. M/s. BEMPL is certified for ISO 9001: 2015, ISO 14001: 2015 & ISO 18001:2007.

1.2.2 Identification of the Project

M/s. Bhatia Energy & Minerals Pvt Ltd (BEMPL) proposes for capacity enhancement of coal washery from 0.96 MTPA to 5.0 MTPA with increase in land area from 8.10 ha to 14.5 ha within existing plant premises at Chhote Dumarपाली village, Kharsia tehsil, Raigarh district, Chhattisgarh State. The proposed enhancement is for 4.04 MTPA.

1.3 Environmental Setting

This site is located at Chhote Dumarपाली village, Kharsia tehsil, Raigarh district, Chhattisgarh State.

- General slope of the site is towards south-east and the average contour elevation near to the site is 240 m MSL;
- Geographical coordinates lies between 22° 00' 26.53" N to 22° 09' 9.59" N and 83° 09' 36.63" E to 83° 10' 0.46" E;
- Nearest town is Kharsia and is 6.0 km in SW direction;
- Nearest highway: NH-200, which is at a distance of 26 km in SE direction;
- Nearest railway station is Robertson railway station at a distance of 2.0 km in SE direction;
- Major water bodies: Mand river (2.3 km, E) and Dantar nala (0.7 km, E);
- 7 reserve forests exist within 10 km i.e Burhapahar PF (2.4 km, SW), Rabo R.F (4.5 km, NE), Bargarh R.F (4.5 km, NW), Basnajhar R.F (5.0 km, SW), Endu R.F (7.8 km, NNW), Paranga PF (7.0 km, SW) and Lotan RF (9.8 km, NNE).
- No national parks, wildlife sanctuaries and biosphere reserves within 15 km;
- Seismic zone-II (As per IS 1893 Part 1:2016)

The study area of the project is shown in **Figure-1.1**.

1.4 Size of the Project

The existing plant was constructed to wash about 0.96 MTPA. Now, the present proposal is to enhance the production capacity of coal washery from 0.96 MTPA to 5.0 MTPA. The estimated cost of the proposed expansion project is about 70 crores. The cost of existing project is about 40 crores. Total cost after expansion will be about Rs. 110 crores.

1.5 Resource Requirement

- **Land Requirement**

The existing unit of 0.96 MTPA was installed in an area of 8.10 ha. The land requirement for proposed 4.04 ha is about 6.40 ha. The total area after expansion will be about 14.50 ha. The entire land is under possession of M/s. BEMPL. There will not be any additional land acquisition for the proposed expansion project.

Out of proposed capacity enhancement, 1.4 MTPA will be within the existing plant premises. 2.64 MTPA will be on extra land which is appurtenant to existing plant premises. No additional land acquisition involved.

- **Water Requirement**

Water requirement of operating unit is about 240 KLD. The source of water is Dantar nala which is a tributary of Mand river. Water allocation for the existing unit of 0.96 MTPA has been obtained from State Water Resource Department vide letter no.575/F 4-209/S-2/31/OJF/12 dated 12.02.2019. The proposed water requirement is 960 KLD. The source of water is Dantar nala tributary of Mand river. The total water requirement after expansion is about 1200 KLD.

- **Power Requirement**

The existing power demand is 1500 KVA supplied by CSPDCL. The proposed enhancement of power requirement is 3500 KVA. The total power requirement after expansion is 5000 KVA. Power requirement for the existing plant met from Chhattisgarh State Power Distribution Company Limited (CSPDCL).

- **Coal Requirement**

Annual Throughput of Coal

The proposed coal washery will have an installed capacity to wash 5 MTPA of coal (RoM). The annual throughput of the washed coal will be 3.6 MTPA. Remaining 1.4 MTPA will be rejects.

Sources and Transport of Raw Coal

Existing Source of Coal: The coal washery's source of raw material (coal) met from Chhal mines (at a distance of 16 km) or the Baroud mines (50 km) of SECL in Raigarh.

Proposed Source of Coal: Raw coal will be sourced from Raigarh & Korba mines of SECL and neighbouring mines of MCL (approx.25-100 km).

Transportation of raw coal from mines to washery site will be by tipping trucks (Chhal-16 km, Baroud mine (50 km) via existing SECL/MCL coal transportation through road/rail. Washed coal will be transported through private railway siding at about 0.70 km from near Robertson station.

- **Manpower Requirement**

The existing manpower is about 110 persons. The proposed manpower is about 1270 persons. The total manpower after expansion is about 1380 persons.

1.6 Process Technology

The operating coal washery of 0.96 MTPA is operating with heavy media bath technology. The proposed enhancement of capacity will be with a throughput of 4.04 MTPA and proposed to be operated on two phases with two different operating technologies.

- ✓ Phase-I: 1.4 MTPA with heavy media bath coal processing unit will be attached with existing washery of 0.96 MTPA; and
- ✓ Phase-II: 2.64 MTPA with heavy media cyclone based coal processing unit.

1.7 Description of the Environment

The baseline data was monitored for three months from 1st December 2019 to 29th February 2020 representing winter season. Secondary data was collected from various Government and Semi-Government organizations.

1.7.1 Soil Characteristics

Eight locations within 10 km radius of the proposed expansion project site were selected for soil sampling. The pH of the soil ranges from 5.32 to 6.42. The electrical conductivity was recorded as 94.6-219.5 $\mu\text{S}/\text{cm}$. The organic carbon content in the study area observed as 1.10 % to 2.12 %. Available potassium was observed as 209.6 kg/ha to 382.6 kg/ha in the study region. Available nitrogen was observed as 94.5 kg/ha to 192.0 kg/ha. Available phosphorous was observed as 74.8 kg/ha to 118.6 kg/ha in the study region.

1.7.2 Climatology and Meteorology

The recorded temperature at site during study period ranges between 8.0 °C to 34.0 °C and relative humidity ranges in between 35 % to 67 %. Predominant winds from NE and NW directions were observed during the study period.

1.7.3 Ambient Air Quality

Ambient Air Quality Monitoring (AAQM) stations were set up at **nine** locations. The minimum and maximum concentrations for PM₁₀ were recorded as 30.6 $\mu\text{g}/\text{m}^3$ and 69.1 $\mu\text{g}/\text{m}^3$ respectively. The minimum and maximum concentrations for PM_{2.5} were recorded as 18.6 $\mu\text{g}/\text{m}^3$ and 34.9 $\mu\text{g}/\text{m}^3$ respectively. The minimum and maximum SO₂ concentrations were recorded as 10.3 $\mu\text{g}/\text{m}^3$ and 19.3 $\mu\text{g}/\text{m}^3$ respectively. The minimum and maximum NO₂ concentrations were recorded as 12.1 $\mu\text{g}/\text{m}^3$ and 23.6 $\mu\text{g}/\text{m}^3$ respectively.

The concentrations of PM_{2.5}, PM₁₀, SO₂, NO₂, O₃, CO, NH₃, Pb, BaP, As, Ni and C₆H₆ are observed to be well within the NAAQ standards prescribed by Central Pollution Control Board (CPCB) for industrial and rural /residential zone.

1.7.4 Water Quality

Two surface water and eight ground water sources in the study area were examined for physico-chemical, heavy metals and bacteriological parameters in order to assess the effect of industrial activities and other activities on surface and ground water.

Ground Water Quality

The pH and conductivity vary from 6.69 to 7.8 and 576 µS/cm to 1449 µS/cm respectively. Total dissolved solids range between 302 to 782 mg/l. Calcium and magnesium content vary between 41.3 to 123.5 mg/l and 23.8 to 56.5 mg/l respectively. Total hardness expressed as CaCO₃ and alkalinity range between 211.9 to 541.3 mg/l and 145 to 298 mg/l respectively. Chlorides and Sulphates are in the range of 76.3 to 225.3 mg/l and 31.8 to 198 mg/l respectively. Nitrates and fluorides vary from 1.8 to 9.3 mg/l and 0.3 to 0.8 mg/l respectively.

The heavy metal contents were found to be well within the limit. The physico-chemical and biological analysis revealed that most of the parameters are well within the prescribed limits of IS: 10500.

Surface Water Quality

The pH and conductivity vary from 6.91 to 7.21 and 150 to 168 µS/cm respectively. The dissolved oxygen levels range from 5.4 to 5.6 mg/l and the total dissolved solids range from 81 to 89 mg/l. Calcium and magnesium contents vary between 11.9 to 12.2 mg/l and 6.5 to 8.4 mg/l. Chlorides and Sulphates are in the range of 22.6 to 24.7 mg/l and 9.7 to 10.8 mg/l respectively. Nitrates and fluorides are in the range of 0.7 to 0.9 mg/l and 0.2 to 0.3 mg/l.

The heavy metal contents were found to be well within the limit. The physico-chemical and biological analysis revealed that all the parameters are well within the prescribed limits of IS: 10500 limits.

1.7.5 Noise Level Survey

The noise monitoring was conducted for determination of noise levels at eight locations in the study area. The day time (L_{day}) noise levels at all the locations are observed to be in the range of 40.6 dB (A) to 49.3 dB (A). It is observed that the day time noise levels are in accordance to the prescribed limit of 55 dB (A) for residential areas.

The night time (L_{night}) noise levels at all the locations were observed to be in the range of 37.5 dB (A) to 46.1 dB (A). It has been found that the night time noise levels are in accordance with prescribed limit of 45 dB (A) for residential areas.

1.7.6 Flora and Fauna

There are no wildlife sanctuaries or national parks or biosphere reserves or migratory corridors of wildlife or Ramsar Wetlands.

There are tropical dry deciduous forests and also protected forests of Sal, Teak, Bamboo in the buffer zone. There shall be no net loss of biodiversity on account of the proposed expansion.

There are no RET fauna in the study area. Peacock (*Pavo cristatus*) and Common Indian Monitor (*Varanus bengalensis*) are the two schedule I species reported from the buffer zone of the study area. Though both Peacock and Common Indian Monitor belong to the least concern (LC) category of the IUCN, conservation for both the schedule I species.

1.7.7 Demography and Socio Economics

The configuration of male and female indicates that the males constitute to about 50.07% and females to 49.93% of the total population as per 2011 census records. In the study area, as per 2011 census, 15.55% of the population belong to Scheduled Castes (SC) and 23.10% to Scheduled Tribes (ST). The data of study area reveals that literacy rate of 77.05 % as per 2011 census.

As per 2011 census total work participation in the project study areas is 40.83% and the non-workers constitute 59.17 % of the total population.

1.8 Anticipated Environmental Impacts and Mitigation Measures

1.8.1 Impact on Land Use

The land required for the proposed expansion activity is about 6.4 ha. The additional land required for the proposed expansion is already in possession of M/s. BEMPL. The land is already under industrial land use category. The topography of the site is fairly flat and requires minimum filling. No filling material from outside is envisaged for the plant construction. The drainage pattern in the buffer zone is dendritic to sub-parallel. Cutting of trees will be not be done except removing grasses, herbs etc. Hence, there will be no major impact.

1.8.2 Impact on Soil

The construction activities will result in loss of vegetation cover and topsoil to some extent in the plant area. Apart from localized construction impacts at the plant site, no adverse impact on soil in the surrounding area is anticipated.

1.8.3 Impact on Air Quality

The source of emissions from the operations will be from proposed expansion of washery and its activities covering stock pile, crushing, screening, unloading / loading, and vehicles movement. The emissions are mainly Particulate Matter (PM).

Prediction of impacts on air environment has been carried out employing mathematical model based on a steady state Gaussian plume dispersion model. The resultant concentrations after the implementation of the proposed expansion project are observed to be within the permissible limits.

The following are the mitigation measures being adopted in the existing plant and the same will be implemented after the proposed expansion also

- Dry fog dust suppression system in crusher and screening area;
- Bag filter attached to the coal crusher;
- Regular water sprinkling through nozzles during loading and unloading of coal on conveyors;
- Covered belt conveyors at the top and sides to prevent dust particles from becoming airborne;
- Regular water sprinkling on roads;
- Pucca internal roads;
- Coal stock pile-Intermittent water spraying. Stock yards will be housed in closed sheds. Provision of suitable wind barriers will be examined;
- Installation of rainguns in coal stock yards;
- Greenbelt development; and
- Good maintenance of CHP area.

1.8.4 Water Environment

The existing water requirement is 240 KLD. The proposed water requirement is 960 KLD. The total water requirement after expansion is about 1200 KLD. The source of water is Dantar nala which is a tributary of Mand river.

Washery will operate on closed water circuit, therefore, only make-up water is required. Requirement of water for pollution control measures like dust suppression, floor washing and plantation will be 180 KLD. The process water [make-up] requirement of the washing circuit will be 180 KLD. Plant will have close circuit water circulation system so that no effluent is discharged in the open outside the plant boundary. The run-off water from the roof of the structures and paved areas will be collected through storm water drainage system and led to rainwater harvesting ponds.

1.8.5 Noise Environment

The most common noise generating sources are screens, crushers and vehicular movement. These noise sources are generating noise continuously as well as intermittently. Workers near such sources could be exposed to sound pressure level exceeding permissible limit.

1.8.6 Impact on Soil vis-à-vis Solid Waste

Final rejects (consisting of coal fines mixed with shales etc.) will be the main solid waste generated from coal washery. Shales and Stones etc. will be utilized for road formation and levelling of low lying areas while the reject coal shall be gainfully utilized by the nearby Power Plants and FBC Boilers. Spent oil and

lubricants will be collected in leak proof drums and stored in earmarked area, which will be sold to authorised vendors.

Solid waste in the form of sludge is generated from existing septic tank/ soak pits. This waste will be used as manure for greenbelt development.

1.8.7 Greenbelt development

Greenbelt is developed in the area of 2.67 ha within the existing premises and further will be strengthened for the proposed expansion also. Dedicated greenbelt area marked for development wherein each year plantation is being carried out

1.8.8 Impacts on Socio-Economics

The requirement of skilled, unskilled and semi-skilled manpower will be met from nearby villages during construction phase. The project will also help in generation of the indirect employment apart from direct employment. This will be a positive socio-economic development for the region. There will be a general upliftment of standard of living in the region.

1.9 Environmental Monitoring Program

Post project environmental monitoring is important in terms of evaluating the performance of pollution control equipment installed in the project. The sampling and analysis of the environmental attributes will be as per the guidelines of CPCB/ Chattisgarh State Pollution Control Board (CSPCB). The frequency of air, noise, surface water and ground water sampling and location of sampling being as per the directives of CSPCB.

1.10 Environmental Cost

M/s. BEMPL proposed a capital investment of Rs. 47 lakhs and a recurring cost of Rs. 10 lakhs per annum for environmental protection measures.

1.11 Risk Assessment and Disaster Management Plan

Risk assessment has been carried out to quantify the extent of damage and suggest recommendations for safety improvement for the proposed expansion project. Risk mitigation measures based on consequence analysis and engineering judgments are incorporated in order to improve overall system safety and mitigate the effects of major accidents.

An effective Disaster Management Plan (DMP) to mitigate the risks involved is in place for proposed expansion of project. This plan defines the responsibilities and resources available to respond to the different types of emergencies envisaged. Training exercises will be held to ensure that all personnel are familiar with their responsibilities and that communication links are functioning effectively.

1.12 Project Benefits

The beneficial impact of proposed expansion project on the civic amenities will be substantial after the commencement of project activities. The basic requirement of the community needs will be strengthened by extending healthcare, educational facilities to the community, building/strengthening of existing roads in the area. The proposed CER budget up break on total project cost for 2020-21 to 22-2023 is about Rs. 37 lakhs.

1.13 Conclusions

The proposed expansion project will have marginal impacts on the local environment with proper mitigation measures and effective implementation of the environment management measures as suggested in the EIA/EMP report and as may be recommended by MoEF&CC and the State Pollution Control Board. The negative impacts will be minimized to a great extent. However, development of this project has beneficial impact/effects in terms of growth in regional economy, transform the region's economy from predominantly agricultural to significantly industrial, increase government earnings and revenues and accelerate the pace of industrial development in the region.

The proposed expansion project will provide direct employment to a large number of personnel. This project will also generate indirect employment to a considerable number of families, who will render their services for the employees of the project.

The project will also encourage ancillary industries in the region, which will not only increase the employment potential but also the economic base of the region will be further strengthened.

Beneficiation of non-coking coal is an important area both from the economic and the environment point of view. Thus, in view of considerable benefits from the project, the proposed expansion project is most advantageous to the region as well as to the nation.