Executive Summary
Draft Environmental Impact Assessment & Management Plan Report

(English & Hindi)

Project Proposal

Tiwarta Coal Washery Plant

Proposal : 0.96 MTPA of Coal Washery; Area 19.93 Acres
Limha Village, Post Beltara, District Bilaspur , Chhattisgarh

Project Proponent

M/s Tiwarta Coal Beneficiation Ltd

Tiwarta Bus Stand, Pali Road, Tiwarta Dipka
Dist Korba 495449, Chhattisgarh

Environmental Consultant
M/s Bhagavathi Ana Labs Pvt Ltd., Hyderabad

Executive Summary - English

EXECUTIVE SUMMARY OF THE PROJECT

INTRODUCTION

M/s Tiwarta Coal Beneficiation Pvt. Ltd. is well known company in Korba Coalfields of SECL in the field of trading and transport of coal since last 20 years. Realizing the need for washed coal company now has decided to enter in the field of coal washing through Coal Washeries

M/s Tiwarta Coal Beneficiation Ltd has submitted its proposal of 0.96 million tonnes / annum coal washery to State Environmental Impact Assessment Authority & State Environmental Appraisal Committee, Chhattisgarh on 14.01.2016 vide proposal number SIA/CG/CMIN/8898/2016.

The proposal was considered in the SEAC meeting held on 2nd May 2016 and the clarifications regarding issues discussed during presentation were submitted vide letter No. TCBL/BSP/15/005 Dtd. 07.05.2016. The Proposal was rejected vide letter No. SEIAA/CG/EC/Coal Washery/Bilaspur/311 dtd. 05.07.2016. Application for reconsideration was submitted vide letter No. TCBL/BSP/IC/059 dtd. 02.09.2016 accordingly the project was further considered on 19.10.2016, wherein the Honourable Committee after through scrutiny of the proposal has accorded Terms of Reference for undertaking detailed EIA Studies vide Lr No 1208/SEIAA/EC/COAL/BILASPUR/311 NEW RAIPUR dated 22nd December 2016 in accordance with the provisions of Environmental Impact Assessment Notification dated 14-11-2006

Salient Features of the Project:

Details of the Area	
District & State	Bilaspur & Chhattisgarh
Tehsil	Bilaspur
Villages	Limha , PO Beltara
Area	19.93 Acres
Survey Nos	74, 76, 38/1, 78, 47/1, 47/2, 49/1, 50, 52, 53, 54, 55, 56/1, 56/2, 56/3 K, 56/3 KHA, 56/4, 56/5, 57, 58, 59, 60, 61/3, 63, 62, 65, 66/1, 66/2, 67, 68, 69, 70/2, 71, 72, 77, 87, 37/2, 38/2, 42/1, 42/2, 44/1, 49/3, 73/1, 73/2, 75, 79, 51, 37/4, 37/8
Details of the Proposed Project	
Category	B
Proposal	0.96 million tonnes / annum of Coal Washery
Average rainfall **(1992 – 2011)**	1082mm **(Central Ground Water Brochure - Bilaspur District)**
Topography & soil condition	309 Meters above seal level. 'CI' soil bearing capacity
Details of Study area	
Nearest water bodies	Sagri nala, 1.4 km NE Goknal nala, 8.4 km NE Ganjar nala, 5.9 km N Tati nala, 7.6 km NNW

	Kurung nadi, 7.9 km W Kurung tank, 4.5 km W Kurung left bank canal, 7.3 km W Kurung right bank canal, 8.6 km W Khalari reservoir, 13.3 km E
Approach to site (Air distance) a) Nearest Town b) Nearest Railway Station c) Nearest Airport d) Nearest Seaport	Bilaspur Bilaspur (29.18 km) Raipur Airport (135 km) Viashakhapatnam 515 Kms.
Names and distance of the national park, sanctuary Biosphere reserve, Tiger Reserve, Elephant reserve, Forest (RF/PF/Unclassified	Bitkuli RF, 1.5km SE Chhinpani PF, 1.7 km NE Donganala PF, 2.6 km N Bhijwatkhar PF, 7.6 km NE Burbur PF, 6.1 km N Pali PF, 8.1 km NNE Kartala PF, 8.6 km NE Dhaurabhata PF, 11.6 km NE Shivpur PF, 10.8 km NW RF near Nangrahipara village, 3.1 km S

PROJECT DESCRIPTION

Name of the project	:	Tiwarta Coal Washery Plant
Project Area	:	19.93
Project Proposal	:	0.96 million tonnes / annum of coal washery
Location	:	Village Limha, Post Beltara, District Bilaspur, Chhattisgarh

Project Requirements

0.96 Million Tones Per Annum (MTPA) of raw coal will be required for washing through this washery. It will be stored in raw material yard on pucca platform within plant premises.

Tiwarta Coal Beneficiation Ltd. proposes to lift, transport and wash raw coal (ROM coal) of Dipka, Gevra and Kusmumda mines/areas of SECL on behalf of the consumers having linkage from mines of SECL and offer Tiwarta Coal Beneficiation Ltd.to lift and wash their coal.

Clean coal will be dispatched to these consumers having linkage from mines of SECL and reject coal will be sold/ dispatched to M/s Salasar Steel & Power Limited. Some of the reject coal may be sold to local bricks kiln and other small consumers. Raw coal will be transported for washing by road. Clean and reject coal will be transported to the consumers by road and by road and rail both as the case may be.

0.96 Million Tones Per Annum (MTPA) raw coal will be washed to yield 0.77 MTPA clean coal and 0.19 MTPA Reject Coal. Clean coal will be dispatched to the linked consumers as above where as reject coal will be sold/ dispatched to M/s Salasar Steel & Power Limited. Some of the reject coal may be sold to local bricks kiln and other small consumers.

Process Details

Considering the screen analysis, washing characteristics of available coal and customer requirement, M/s Tiwarta Coal Beneficiation Ltd has decided to incorporate latest design and equipment with most modern and efficient washing technology i.e. Heavy Media Cyclone System

Transport of raw coal from mines to the ground hopper site of the proposed coal washery of the company will be done by road through Rear Dump Trucks.

From the ground hopper, the raw coal will be fed to a Rotary then screening unit sized to -50 mm. This sized coal shall be taken to a storage bunker to get +10-15mm sized coal

Rotary Breaker rejects will be received by a Conveyor and carried to Rotary Breaker Reject Dumps

Coal from Surge Bunker will be carried to Sieve Bend and disclaiming Screen at washery Building where dust (fines) coal particles will be washed by spray of water received from Magnetic Separator and fresh water reservoir.

This coal without fine coal dust will be delivered to Heavy Media Tank having Heavy Media of required specific gravity (mixture of Magnetite and water). A mixture of Heavy Media & Coal will be pumped from Heavy Media Tank to Heavy Media Cyclone

The overflow of Heavy Media Cyclone (clean coal) will be delivered to a set-of Sieve Bend and D&R Screen and further delivered to the Clean Coal Conveyor.

The underflow of Heavy Media Cyclone (reject coal) will be delivered to another set-of Sieve Bend and D&R Screen and further delivered to reject coal conveyor.

The drained Magnetic Slurry flows back to the heavy media sump.

In the second section of the D&R screens (rinse sections) water jets are used to wash the magnetite sticking to the body of clean/reject coal. The rinse water being of a lower specific gravity has to be processed through a Wet Drum Magnetic Separator where magnetite from the rinse water is concentrated and sent back to the Heavy Media Sump for make-up.

The tailing (mostly water with fine coal dust) from Wet Magnetic Separator is directed to mix with fresh water supply and is spread over from feed coal received from surge bunker over sieve bend de-slimming screen.

After removing fine coal dust from body of (+10 -50) mm coal the fine coal slurry (affluent) is collected in fine coal slurry tank.

The fine coal slurry from fine coal slurry tank is pumped to Hydro Classifying cyclone.

The underflow of Hydro Classifying cyclone containing fine solid particles of coal dust are directed to High Frequency Screen.

The solid fine coal from top of High Frequency Screen is directed to clean coal belt to get mixed with clean coal.

The rinse water of High Frequency Screen is directed to fine coal slurry tank.

The overflow of Hydro Classifying cyclone having very fine coal dust is directed to affluent treatment plant.

The effluent treatment plant consists of one Hi-Rate Thickener and its associated with Flocculent Dosing System, underflow sludge carrying pump and a Multiroll Belt Press or settling tank (optional)

The effluent from the plant which reports to the hi-rate thickener is collected in the thickener tank. This tank is dosed with suitable amounts of flocculent which aids faster suspension of solids and helps to give a clearer overflow.

The settled solids are collected at the bottom cone of the thickener tank by rotating rake arms the height of which can be adjusted if the amount of solids in the effluents varies. The solids which are collected in the bottom of the thickener flows to the settling pond/settling tank for reclamation of water. The dewatered solid are blended with the reject coal.

The overflow of the thickener which is clear water is pumped back for recirculation to the plant.

The proposed plant is a zero effluent plant and the process selected ensures minimum generation of dust.

DESCRIPTION OF THE ENVIRONMENT

The baseline data had been collected within 10 km radial distance around the proposed project area. The study area is divided into:

a. **Core Zone,** i.e. Proposed plant area (directly impacted area due to project activities) and
b. **Study Area / Buffer Zone** i.e. 10 km radius area around the proposed project area (impact areas due to project & project related activities).

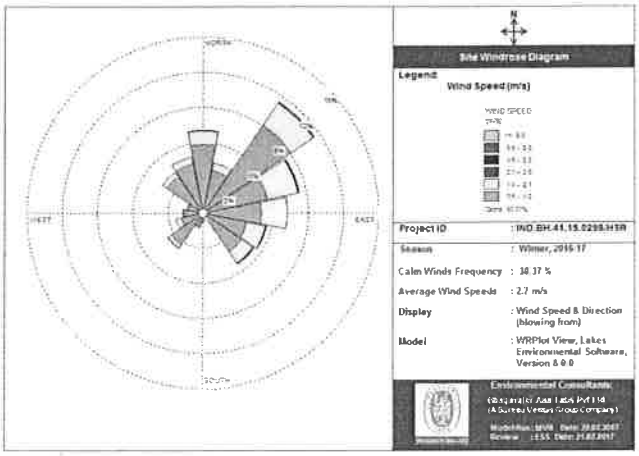
Study Period

This EIA/EMP report is prepared based on the primary baseline environment data collected during winter season 2016 - 17 (Dec 2016 – Feb 2017)

Meteorology (winter season 2016 - 2017)

The predominant wind direction during study period is blowing from northeast sector

Wind Rose Diagram



Study Area:

The Environmental studies are carried out in an area of 10 km radius around the plant area.

Ambient Air Quality

The scenario of the existing Ambient Air Quality in the study region has been assessed through a network of 8 Ambient Air Quality locations. The summary of Ambient Air Quality monitoring results are given below.

Summary of Ambient Air Quality (Units: µg/m^3)

LOCATION	PM_{10}	$PM_{2.5}$	SO_2	NO_x
Project Site	51.8	15.5	7.6	9.5
Limha Village	53.3	16.1	8.0	9.5
Belpara Village	50.3	15.1	9.0	12.0
Haranmuri Village	51.4	15.5	8.1	10.4
Tikripara Village	51.2	15.1	7.6	11.8
Barbhanta Village	47.3	14.3	7.0	11.4
Nawapara Village	49.9	14.8	7.3	13.8
Andhiyaripara Village	49.8	14.9	8.4	11.4
Standard (Core & Buffer Zone)	**100**	**60**	**80**	**80**

Source: Primary Data collected by Bhagavathi Ana Labs Pvt Ltd.

The baseline ambient air quality monitored during the study period was observed to be within the prescribed National Ambient Air Quality Standards

Noise Level

A preliminary survey was undertaken at 11 locations during study period, to identify the major noise generating sources in the area. Summary of noise level data of different locations are given below.

Summary of Noise Levels during Study Period [Units:dB(A)]

Code	Location name	Ld	Ln
N1	Plant site	46.3	45.5
N2	Limha	47.9	40.4
N3	Belpara	55.5	43.5
N4	Haranmuri	47.3	40.0
N5	Tikripara	47.8	40.1
N6	Barbhanta	48.0	40.0
N7	Nawapara	51.3	42.2
N8	Andhiyaripara	45.0	43.2
N9	Beltara	52.0	42.7
N10	Baksahi	47.3	39.7
N11	Hardipara	42.9	41.6

Water Quality

Four surface water and eight ground water samples were collected from the study area and tested to know the water quality of study area. Summary of the water quality test results are given below.

Summary of Surface Water Quality

- pH of the surface water quality is varying between 6.97 to 7.49
- Total hardness is in the range of 80mg/l at Kurang tank and 160mg /l at Sagri nala
- TDS in the samples is varying between 138mg/l at Kurang tank to 270 mg/l at Nehara nala
- Fluorides are in the range of 0.2 – 0.4 mg/l

Summary of Ground Water Quality

- pH of the ground water quality is varying between 6.56 to 7.16
- Total hardness is in the range of 165mg/l at Limha and 905mg /l at Barbhanta
- TDS in the samples are varying between 358mg/l at Limha and 1210mg /l at Barbhanta
- Fluorides are in the range of 0.2 mg/l to 0.8mg/l

Land Environment

Soil Sampling was carried out at 8 locations and the analysis results shows that the soil quality is moderately fertile in nature.

The proposed Coal Washery Plant Area is spread over 19.93 acres. On the name of Tiwarta Coal Beneficiation Limited.

Land Use Pattern

S. No	Purpose	Area in acres	Percentage, %
1	Washery Plant	4	20
2	Raw Coal Stock yard	3.5	17.5
3	Clean coal, middling & rejects		
4	Other facilities (internal roads, WTP, Staff quarters etc)	2	10
5	Plantation area	9.5	47.5
6	Vacant land	0.93*	5
	Total	**19.93**	**100**

Biological Environment

A primary field study was conducted in core as well as buffer area. The consolidated list of flora and fauna was prepared based on primary field visit and information form published literature and working plan of forest department.

There was few forest area observed within 10 km radial Distance from the project site. As per Champion & Seth, the area could be grouped as Tropical Dry Deciduous Forest.

The forests present in the study area include: Bitkuli RF, 1.5km SE, Chhinpani PF, 1.7 km NE, Donganala PF, 2.6 km N, Bhijwatkhar PF, 7.6 km NE, Burbur PF, 6.1 km N, Pali PF, 8.1 km NNE, Kartala PF, 8.6 km NE, Dhaurabhata PF, 11.6 km NE, Shivpur PF, 10.8 km NW, RF near Nangrahipara village, 3.1 km S

There are few schedule – II species within the study area

Socio-Economic Environment

The administrative details indicate two districts and 6 tehsil areas comprising in the study area. There were 34 villages from Bilaspur district and 26 villages from Korba district.

Total households were 18918, total population was 82,750. Total male population was 41,852 and female population was 40,898, 0-6 child population was 12,477(15%), SC population was 10,989 (13.27%) and ST population was 32,259(39%).sex ratio was 977 female to 1000 male

ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Air Environment

M/s Tiwarta Coal Beneficiation Ltd., proposes to adopt wet washery process. Hence, dust emissions during the process of washing are not envisaged.

The major sources of air pollution are:

- Raw Coal Handling System
- Washed Coal Handling System
- Coal Rejects Handling System

To assess the impact due to these activities on air environment, predictions have been carried out using ISCST-3 Model.

The maximum predicted value of increase in PM due to proposed plant operations would be about 0.03 $\mu g/m^3$. This concentration will be observed within the core zone where plant operations will be carried out. The SO_2 concentrations will be 0.5$\mu g/m^3$ and NO_x concentration are 0.04$\mu g/m^3$. These concentrations will be negligible beyond the plant boundary.

Air Pollution Control Measures

Regular water sprinkling for dust suppression will be provided in the raw material storage area. The sprinkler system will comprise of pumps, feed water tank, and spray system, associated pipe work, electrical and instrumentation system.

- Dust extraction system will be provided at transfer points and at the crushing and screening station
- Regulation of the speed of trucks / dumpers plying on unpaved roads
- Common Bag filters of 20000 m^3 capacity for Rotary Breaker and Screening units and exhaust pipe connection and other transfer points of the coal.
- All conveyors covered with proper canopy for internal transport of coal in the plant.
- Regular maintenance of trucks
- Transportation through trucks covered with tarpaulins.

Noise Level

Impact on Noise Levels

During operation, the major noise generating sources are Rotary Breaker, Screening Unit, pumps and electric motors etc. These sources will be located at distance from each other and installed on rubber padding. Under any circumstances the noise level from these sources will not exceed 90 dB (A).

Noise level at the plant boundary, calculated, is expected to be less than 42 dB (A) without considering any attenuation factors. It is proposed to develop 47.5 % area under greenbelt including the area along the periphery of the plant, which will act as a barrier and further reduce the noise levels.

Control Measure of Noise Pollution

- All design / installation precautions will be strictly adhered to specification of the manufacturer
- Provision of enclosures to conveyors belts
- Provision of sound proof cabins at HEMM's
- Noise control system as integral part of the plant
- Period maintenance of machinery and equipment including replacement / tightening of loose parts, padding for rattling parts, lubrication etc
- Provision of PPE's like earmuffs and plugs to workers exposed to high noise generating areas
- Job rotation for workers
- Development of green belt around the plant boundary

Water Environment

Impact on Water Environment

There are no surface water sources within the proposed project area. At present the surface runoff from the proposed coal washery area flows along the natural slope of the area. After the proposed washery construction and operation the surface runoff will be drained through separate storm water drains and will be collected into the settling tanks. This collected storm water will be utilized for dust suppression, coal washing in order to reduce the fresh water demand.

The water requirement for the proposed project will be 350 KLD

Water Conservation Measures

M/s Tiwarta Coal Beneficiation Ltd proposed to recover process water through high speed thickener coupled with settling tank (belt press optional) for maximum recovery (92-93%) and recirculate the recovered water in to the process thus only 8% i.e 350 KLD is used as make up water in the process.

It is proposed to operate the coal washery plant on "Zero Effluent Discharge" principal. Thus the effluent generated will be properly treated, recycled back into the system within the plant premises.

- ☞ Regular monitoring and identification of water requirement at unit operation will be carried out with a view to desire remedial measure for reduction of fresh water consumption.
- ☞ All fresh water tap for domestic purpose will be provided with 3mm orifice to reduce the flow rate.
- ☞ Periodic maintenance of septic tank & soak pits will be carried out.
- ☞ Preventive maintenance of water distribution system will be undertaken as a remedial feature.
- ☞ All the pipelines/tap will be properly maintained

Land Environment

Impact on Land use and it's Management

The proposed project will be located in 19.93 Acres area. The total land is already in the possession of M/s Tiwarta Coal Beneficiation Ltd. The existing land will be permanently converted into industrial area.

M/s Tiwarta Coal Beneficiation Ltd has proposed to develop green belt and plantation over an area of 9.5 acres (47.5%) within the plant premises. This will not only control soil erosion but also aid in improving the visual scenario in the area.

- Material stacking will be carried out in designated areas only
- Regular and periodic maintenance of internal & public roads used for transportation
- Boundary wall of 5mt height will be constructed all along the plant premises. Above the boundary wall atleast 5 mtr. heigh Screen (wind break) will be installed to prevent the fugitive dust.
- Tiwarta Coal Beneficiation Ltd., propose to develop a green belt plantation of broad leave species upto 15 mtr. in general and 25 mtr. wide strip around the boundary wall facing Bilaspur-Korba Road as suggested/directed by the Hon'ble Committee around the boundary facing of the said Bilaspur-Korba road upto 25 meters wide strip. Thus about 47.5% of total area will be covered by Green Belt as against 33%.earlier proposed.

Biological Environment

There is no forest land within the project area. There are no Schedule – I species of animals observed during the survey or reported by the local villagers. There are few schedule – II species of Mammals and reptiles in the study area.

The present project involved transportation of raw coal, coal rejects and washed coal through trucks. Even though major quantity will be transported through covered trucks, there is a possibility of coal dust spreading over the transport route and thus depositing on the plantation on the sides of the road. Apart from that the fugitive dust generation in the proposed plant area will also contribute to dust pollution in the surrounding area.

During the construction activities also the clearance of grasses and shrubs land will impact the habitat of invertebrate fauna in the project area.

There are vegetable crops which are generally grown in the surrounding areas like Brinjal, Potato, Cabbage, Cauliflower, Tomato and Mustard. There will be marginal impact on these vegetable crops if proper care in dust suppression is not carried out.

M/s Tiwarta Coal Beneficiation Ltd has proposed to develop green belt and plantation over an area of 9.5 acres within the plant premises. It is proposed to develop 15m wide green belt all along the boundary and 25m wide towards Bilaspur-Korba road which also acts as a habitat for various fauna.

Regular water sprinkling will be carried out to control fugitive dust emission

In order to have an addition protective measure it is proposed to provide green nets along the agriculture farm boundaries facing the plant.

Socio- Economic environment

- Increase in employment opportunities and Reduction in migrants to outside for employment.
- Increase in literacy rate.
- Growth in service sectors.
- Increase in consumer prices of indigenous produce and services, land prices, house rent rates and Labour wages.
- Improvement in socio cultural environment of the study area.
- Improvement in transport, communication, health and educational services.
- Increase in secondary employment due to increased business, trade commerce and service sector.

The overall impact on the socio economic environment will be beneficial

Occupational Health and Safety

Occupational safety of the workers will be achieved by the following:

- Pre-employment examinations for all the employees will be carried out
- Educating & provision of training regarding risks & hazards will be given prime importance
- Implementing safety and health management system and assessing the effectiveness through periodic monitoring
- Control of Dust pollution at source by water sprinkling / dust arresting systems etc
- Limiting the exposure of worker to dust prone areas
- Training programs to utilize Personal Protective Equipment's for protection from dust, noise and vibrations and associated problems.
- Conducting regular performance reviews
- Establishing and maintaining a system of medical surveillance for employees
- Ensuring employees at all levels receive appropriate training and are competent to carry out their duties and responsibilities.

ENVIRONMENTAL MONITORING PROGRAMME

Monitoring of ambient air quality, ambient noise levels, surface and ground water quality, soil quality, plantation and green belt in the plant area, etc. will be carried out as per the applicable guidelines and the reports will be submitted to the corresponding regulating authorities. An Environment Management Cell will be formed for implementation of the monitoring programme and the environmental management plan.

BUDGET FOR ENVIRONMENTAL PROTECTION

A budgetary provision has been made for implementation of all the environmental protection measures in a time bound manner.

Rs: Lakhs

Sr. No.	Description of Item	Capital Cost	Recurring Expenditure /annum
1	Environmental Pollution Control Measures	75.00	30.00
2	Environmental Monitoring	10.00	5.00
3	Occupational Safety and Health	15.00	7.50
4	Socio economic development activities	25.00	20.00
5	Green belt & Plantation	10.00	5.00
7	Miscellaneous	7.50	5.00
	Total	**142.5**	**72.5**

CONCLUSION

The proposed project activities will lead to the sustainable development of the nearby areas. There will be development of educational, medical and infrastructural facilities in the area. The project and allied activities will provide direct and secondary employment opportunities for local people. This will lead to the improvement of economic status of the nearby villages..

During the active operation of the washery, the pollution will be controlled within permissible limits by way of adopting various control and mitigation measures discussed in the report.