1.1 INTRODUCTION

Godawari Power & Ispat Limited (GPIL) has an existing Iron Ore Crushing plant of 12,00,000 MTPA capacity at Gidhali, Village Kusumkasa, Tehsil - Balod, District - Durg (Chhattisgarh) and now proposes to setup an Iron Ore Washery & Pelletizing Plant in the existing plant premises. The present EIA Report addresses the environmental impacts of the proposed power plant and proposes the mitigation measures for the same.

1.2 SCREENING CATEGORY

The proposed Iron Ore Washery & Pelletizing Plant falls under 'Category A' with project or activity type number 3 (a) as per Environment Impact Assessment (EIA) Notification dated 14th September 2006 which requires preparation of EIA Report to get Environmental Clearance (EC) from the Ministry of Environment and Forests (MoEF), New Delhi.

1.3 SCOPE OF THE REPORT

The scope of the EIA report is based on the Terms of Reference (TOR) approved by MoEF, Vide F. No. J-11011/230/2011-IA-II (I) dated 10th June, 2011 and based on baseline data collected during Post Monsoon Season, 2011. **M/s. J.M. EnviroNet Private Limited, Gurgaon** – a NABET accredited consultancy organization has been retained by M/s. Godawari Power & Ispat Ltd. (GPIL) to carry out and prepare the EIA report as per MoEF guidelines.

1.4 ENVIRONMENTAL SETTING

The environmental setting of the proposed plant site is as follows:

- > The proposed project site is covered in Toposheet No. 64-H/2
- > The project site is located at an elevation of 378 m above Mean Sea Level (MSL);
- The geographical co-ordinates of the proposed power plant fall between 20°40'18.33" to 20°41'12.424" N latitudes and 81°05'22.41" to 81°04'50.088"E longitudes.
- > Present land use at the proposed plant site is largely fallow and scrub land;
- > N.H. 6 is 50 km away from the proposed plant boundary;
- The nearest railway station is Kusumkasa railway station at a distance of 4 km in N direction;
- > The nearest airport is Raipur airport (140 km from project site);
- The nearest town is Dalli Rajahara at a distance of 12 km in SSE direction from the proposed project site;

- The Keshala or Jhujhara Nallah, which shall be the source of water for the project is at a distance of 2 km in SW direction from the project site;
- > Daihan Reserved Forest at a distance of 5.5 km in ENE direction;
- There is no Eco sensitive zone viz. National Park, Wild life sanctuary, Biosphere Reserve, Wild Life corridors within 10 km radius of the project site;
- > There is no Historical and Archeological site within 10 Km.
- > The project area falls under Seismic Zone II as per Indian Standards, IS:1893-2000.

1.5 PROJECT DETAILS

- The proposed project at Gidhali, Village Kusumkasa, Tehsil Balod, in district Durg of Chhattisgarh will include the following facilities:-
 - Iron Ore Washery of capacity 2.00 MTPA
 - Pelletization plant of capacity 1.20 MTPA
- Water will be sourced from Keshala (Jhujhara) nallah (at a distance of 2 km).
- The main raw materials required for the project such as iron ore fines, will be sourced from Captive mines and local market. The raw materials required for Pelletizing Plant are Iron ore fines (12,24,000 MT), Bentonite (18,000 MT), Coke (15,600MT) & Flux – Dolomite (19,200 MT) which will be sourced from Captive Mines/Local Market, Gujarat, imported & M.P. respectively.

2.0 DETAILS OF PROCESS

2.1 PROCESS DESCRIPTION

2.1.1 PELLETIZATION PLANT

Pelletizing is the process of converting Iron Ore Fines into "Uniformed Sized Iron Ore Pellets" that can be charged into the blast furnaces or for Production of Direct Reduced Iron (DRI) kiln.

- Iron ore washing is done in fine mesh (- 200 mesh) form, which cannot be used in this form for steel making. Hence concentrate ore from Washing is converted into pellets (6– 16mm balls) to make it suitable for different steel making processes.
- Major Units and Process Steps:
- Raw material handling and storage of iron ore fines and crushing plant
- Iron Ore Washing plant
- Storage of washed fines and transportation facilities
- Waste water treatment
- Pelletization plant.

TECHNOLOGICAL FEATURES:

- > Disc Pelletizers for making green pellets.
- Circular furnace based on Grate kiln Technology for induration:

Such type of furnace is suited for Magnetite and Hematite ores. Drying, pre heating, induration are carried out in a single furnace. The advantages are as follows:

- a) There is no ring formation/ accretion.
- b) Longer refractory life.
- c) Low dust emission in the gas system.
- d) Low capital cost as compared straight grate technology.



Pelletization Plant - Process flow Diagram

2.1.2 IRON ORE WASHING PLANT

The proposed iron ore washing plant will have a capacity of 2.00 MTPA. Different stages of Iron Ore washing are as follows:

- Stage1: Feeding Circuit
- Stage2: Screening Circuit
- Stage3: Fines Washing Circuit
- Stage4: Water Recovery Circuit
- Stage5: Crushing Plant

2.2 **RESOURCE REQUIREMENT**

2.2.1 Raw Material Requirement

ANNUAL REQUIREMENT OF RAW MATERIALS

S.	Name of Raw	Quantity per	Source	Mode of	Distance of
No.	materials	Annum		Tansportation	Source
	For Iron Ore Washery-				
1.	Iron Ore	20,00,000 TPA	Captive mines	Rail/Road	34 km (Ari Dongri /
					Boria Tibu Mines)
	For Pelletizing Plant				
1.	Iron Ore /	12,24,000 MT	Captive	Rail/ Road	34 km (Ari Dongri /
	Fines		Mines/ Local		Boria Tibu Mines)
			Market		
2.	Coke	15,600	Imported	Road	
3.	Flux- Dolomite	19,200	M.P.	Road	200 km
4.	Bentonite	18,000	Local Market/	Road	50- 200 km
			Gujarat		
5.	Fuel Requirement				
i.	Furnace oil	100KL/D	Nearby Petrol	Road	20 km
			Pumps		

2.2.2 Land Requirement

The Project is proposed within the existing Iron Ore crushing plant site and no additional land is required for the proposed project. The existing premises of Iron Ore Crushing unit is spread in 26.12 ha (64.543 acres) out of which the Built up area for existing crushing unit is 1.385 Ha only. The area required for proposed Washery & Pellet Plant is 6.070 Ha. Green belt will be developed in 8.610 Ha and the remaining 10.05 Ha land is an open area.

2.2.3 <u>Power Requirement and Supply</u>

The power requirement for the proposed Iron Ore Washery will be 4 MW & Pelletizing Plant will be 8 MW, hence total requirement will be 12 MW which will be sourced from State electricity Board through a double circuit 11 kV line.

2.2.4 <u>Water Requirement and Supply</u>

The total water requirement for the proposed plant is 1210 KLD. Out of this 1010 KLD is required for the pelletization process & 200 KLD for the washery unit. The water demand for the proposed plant will be met from Keshala Nallah (Jhujhara Nallah) at a distance of 2 km from project site. Application for sanction of 1 MCM of water per year has already been submitted.

2.2.5 <u>Manpower Requirement</u>

The total direct manpower requirement for the project is 210 persons. Out of the total, manpower for beneficiation and Pelletization will be 60 and 150 respectively.

3.0 BASELINE ENVIRONMENTAL STATUS

Baseline environmental studies have been carried out during study period i.e. Post Monsoon Season, 2011. Studies have been carried out in 10-km radius from project as centre for Soil quality, ambient air quality, water quality, noise level, flora and fauna studies and demography.

3.1 METEOROLOGICAL DATA GENERATED AT SITE

The meteorological parameters like wind speed, wind direction (from 0 to 360 degrees), temperature, relative humidity, atmospheric pressure, rainfall and cloud cover were recorded on hourly basis during the study period (Post Monsoon season 2011) at proposed plant site. The data shows that the

•	Temperature	Min: 11.5°C and Max: 32.8°C
•	Relative Humidity	Min: 70% and Max: 93% at 8:30 hrs
		Min: 73% and Max: 92% at 17:30 hrs
•	Predominant Wind Direction	North East

3.2 AMBIENT AIR QUALITY

The ambient air quality was monitored at 8 locations the data shows:

- ➢ PM₁₀: 50.20 µg/m³ to 75.30µg/m³
- ➢ PM_{2.5}:22.27 µg/m³ to 33.20µg/m³
- ➢ SO₂:6.54µg/m³ to8.22 µg/m³
- ▶ NOx: 13.24µg/m³ to 18.20 µg/m³
- Ozone: 1.20µg/m³ to 3.50µg/m³

The results of the monitored data indicate that the ambient air quality of the region in general is in conformity with respect to norms of the National Ambient Air Quality (NAAQ) Standards

3.3 WATER QUALITY

The baseline groundwater quality status in the region is established by analyzing 8 samples. The pH varies from 7.19 to 7.46. Calcium and Magnesium content varies between 54.50mg/l to 123.44 mg/l and 10.56mg/l to 59.52 respectively. Total hardness and alkalinity expressed as $CaCO_3$ ranges between 180.00 to 520.00 mg/l and 163.8 to 428.40 mg/l respectively. The physico-chemical and biological analysis revealed that most of the parameters of groundwater are within the permissible limits as per IS: 10500.

Five surface water sample was taken for analysis. The pH varies from 7.56 to 7.97. The COD was found to be 11.5 to 16.19 mg/l. BOD was found to be 3.12 to 5.08 mg/l. The heavy metal contents are found to be well within the limit. Total coliform was found to be <2 MPN/100 ml. The physico-chemical and biological analysis revealed that all the parameters are well within the prescribed limits

3.4 SOIL CHARACTERISTICS

The soil samples were tested at 8 locations covering various land uses. It was observed that the soil in the study area is predominantly of silty clay type. The pH of the soil samples ranged from 7.12 to 7.78. The Conductivity of the soil samples varied from 0.05 to 0.11 mS/cm. The phosphorus values ranged between 28.70 kg/ha to 41.86 kg/ha. The nitrogen values ranged between 228.9 kg/ha to 285.40 kg/ha. The potassium values ranged between 49.00 kg/ha to 98.99 kg/ha. The soil data indicate soil has less organic matter, good nitrogen and more phosphorous, but less of potassium.

3.5 NOISE LEVEL SURVEY

The noise monitoring has been conducted at 8 locations in the study area. The Day time and Night time Noise Levels in the study area ranged between 45.95 Leq dB (A) to 51.45 Leq dB (A) and 39.60 Leq dB (A) to 44.20 Leq dB (A)respectively. The noise levels in general found mostly within the acceptable levels as per standards notified under E(P) Act.

3.6 FLORA AND FAUNA STUDIES

Detailed ecological studies were conducted during study to identify the floristic composition in and around proposed project site and surrounding villages. Plant species and animals observed/recorded through primary survey and with interaction local

people and forest officials of the area. The study area has varied patches of forest separated by habitation & agriculture lands.

3.7 SOCIO-ECONOMIC DETAILS

The population as per 2001 Census records is 52,144 (for 10 km radius buffer zone). Scheduled Caste fraction of the population of the study area (10 km) is 3641(6.98%) and Scheduled Tribe 29,156(55.91%). Percentage of literacy is 77.16% and that of workers those actually engaged in occupation is 49.07% including, 81.87% of Main workers & 18.13% of marginal workers. Rest 50.93% of the total population, are considered as non-workers

4.0 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

4.1 AIR ENVIRONMENT

The following air pollution control systems are proposed to be installed in this project to reduce the anticipated adverse impacts:

- Installation of ESPs of 99.99% efficiency to limit the PM concentrations below 50 mg/Nm³;
- > Provision of 85 m high stack for wider dispersion of gaseous emissions;
- All the conveyors will be covered & provided with hoods to control fugitive emissions.
- High efficiency reverse air jet type Bag Filters will be installed to control emissions at transfer points
- > The material will be kept moist by sprinkling water while unloading from trucks.
- > All the roads inside the plant will be black topped to reduce fugitive emission.
- The sprinkling of water will be done along the haul roads in the plant premises to control the dust arising due to the movement of vehicular traffic.
- Thick green belt will be developed along the periphery of the plant premises & around raw material stockyard to arrest the fugitive emissions.
- Ventilation and air-conditioning systems will be provided with adequate measures for safety and fire fighting for fire hazardous areas and will be of flame proof/explosion proof construction.

4.2 WATER ENVIRONMENT

The project will not extract groundwater and hence there will be no impact on ground water. There would be no effluent generated in the Iron Ore Pelletization Plant. The plant would be designed and equipment will be selected accordingly. Thus, the plant is designed as "ZERO EFFLUENT DISCHARGE". In the grinding system the water will be completely recovered and re-circulated. Cooling Towers will be fitted with efficient

filtering system thus no bleeding is required. Water Reservoir will be created inside the project area during the construction stage where rainwater and surface water runoff will be collected and stored. Drainage network will be constructed to drain off all surface water from the work site into the reservoir. Wastewater arising from site offices, canteens and other washing facilities will be collected in a pit and reused for dust suppression.

4.3 SOLID WASTE GENERATION

The various waste materials arising out of the technological processes would be reutilized. Solid waste from Iron Ore washery plant will be sold to brick manufacturers.

4.4 NOISE ENVIRONMENT

Various measures proposed to reduce noise pollution include reduction of noise at source, provision of acoustic lagging for the equipment and suction side silencers, selection of low noise equipment. The operations will be confined within a covered shed with skirt boards, which will control noise at desired levels. The green belt will help in reducing noise levels in the campus as a result of attenuation of noise generated due to plant operations, and transportation.

4.5 **GREENBELT DEVELOPMENT**

Godawari Power & Ispat Ltd. is proposing for development of green belt in more than 33% of the total project area. Green belt will be developed in about 8.610 ha area.

5.0 ENVIRONMENTAL MANAGEMNT PLAN

The project will have robust post project monitoring facilities within the company to check the efficacy of the environmental mitigation measures undertaken and it will have a full time environmental management cell with adequately qualified environmental engineers and scientists. The sampling and analysis of the environmental attributes will be as per the guidelines of CPCB. The source emissions will be monitored by establishing monitoring facilities. A rainwater harvesting system to utilize the collected rain water for plant use will be in place.

5.1 COST PROVISION FOR ENVIRONMENTAL MEASURES

The total cost of the project is Rs. 352 crores. Capital cost for EMP is Rs. 15 Crore and the recurring cost Rs. 1.5 Crore.

6.0 ADDITIONAL STUDIES

6.1 RISK ASSESSMENT AND DISASTER MANAGEMENT STUDIES

The risks associated with the proposed project like spontaneous ignition of coal and Hazard analysis involves the identification and quantification of the various hazards (unsafe conditions) that exist in the proposed plant. On the other hand, risk analysis deals with the recognition and computation of risks, the equipment in the plant and personnel are prone to, due to accidents resulting from the hazards present in the plant. This requires a thorough knowledge of failure probability, credible accident scenario, vulnerability of population etc. Much of this information is difficult to get or generate. Consequently, the risk analysis is often confined to maximum credible accident studies and these details discussed in details in EIA report.

6.2 GEOLOGICAL & HYDROGEOLOGICAL STUDIES

The site is situated within Chhattisgarh Supergroup of Meso-Neo-Proterozoic. It is covered with Quaternary Soil/Alluvium and they are underlain by rocks of Chhattisgarh Supergroup.

The study area has hard rock aquifer. Hard rock aquifer sandstone as main aquifer. Ground water generally occurs in unconfining to confining conditions in this aquifer. The sand stone has moderate hydraulic conductivity. In this rock occurrence of groundwater is restricted only along the bedding planes. The lower unit of this formation is consist of arkosic sand forms potential aquifer. The contact between Chandrapur and Archean formation also forms good aquifer due to presence of conglomeratic bed.

Water level in the area ranges from 2 m to 7 m below ground level in the post monsoon period while during pre-monsoon it ranges from 5 to 12 m. Seasonal fluctuation in the area is about 2 to 4m.

The ground water in the district is mainly developed by dug wells and dug cum bore wells for irrigation. These structures tap groundwater down to a depth of 30 mbgl. The borewells generally range in depth 45 to 80 mbgl. Bore wells fitted with hand pumps are used for the rural drinking supply requirements of the village community. The discharge of borewells varies from 100 to 200 KLD.

Ground water storage of the area will be augmented by practicing rain water harvesting. Total recharge from built-up & open land of plant area will be 83864 cum. To accommodate that amount of water seven new tube wells/ DCB / Open well with silting & filter pits have been proposed.

6.3 **PROJECT BENEFITS**

The proposed project by Godawari Power & Ispat Limited would not only reduce the demand supply gap of electricity for domestic and commercial purposes. Further, the

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proposed plant will result in improvement of infrastructure as well upliftment of social structure in the area. It is anticipated that the proposed plant will provide employment benefits for the locals in two phases i.e. during construction phase as well as during operational stage. It will also invoke supplementary support growth of industry and entrepreneurship in the area.

6.4 CSR ACTIVITIES

GPIL will be spending about 5% of the total project cost on different social activities leading to the upliftment of people. Also GPIL will be organizing Schools, regular medical camps and other facilities for local residents. GPIL is planning for a Corporate Social Responsibility Cell (CSR Cell) in this project area. This CSR Cell will plan various activities to improve social status of the locals.

7.0 CONCLUSION

The proposed Ire Ore Washery and Pelletizing Plant will have fewer adverse impacts on the environment .These impacts are only marginal on the local and global environment. The pollution control facilities proposed to be installed as a part of project and the comprehensive CSR activities planned to be implemented by GPIL will contribute to the overall development of environment and social fabric of the area. The direct and indirect employment opportunities likely to emerge due to the power project will improve the social and economic well being of the society around.