ANNEXURE - 1

SUMMARY ON

ENVIRONMENTAL IMPACT ASSESSMENT REPORT

OF

TIRUMALA BALAJI ALLOYS PVT. LTD.

Expansion of Ferro Alloys unit

at

OP Jindal industrial Park , Sector -B, Punjipathra Village, Gharghoda Tehsil, Raigarh District, Chhattisgarh

Submitted to

CHHATTISGARH ENVIRONMENT CONSERVATION BOARD

Chhattisgarh

TIRUMALA BALAJI ALLOYS PVT. LTD. is operating a Ferro Alloy plant having 2 x 9 MVA Submerged Electric Arc Furnaces at **OP Jindal industrial Park, Sector -B, Punjipathra Village, Gharghoda Tehsil, Raigarh District, Chhattisgarh**. Now it is proposed to expand the plant capacity by installing another 1 x 9 MVA Submerged Electric Arc Furnace. Proposed expansion will be taken up in the existing plant of 15 acres (Plot Nos. 111,112,113 & 114 of SECTOR –B) for which Consent to Establish (CTE) & CTO (Consent to Operate) have been obtained from Chhattisgarh Environment Conservation Board to manufacture Ferro Manganese , Silico manganese & Ferro Chrome of 28,000 TPA capacity

As per the Ministry of Environment, Forest & Climate Change (MOEF&CC), New Delhi notification, dated 14th September, 2006 and its subsequent amendments, all the Ferro Alloy units are considered under Primary Metallurgical units and falls under Sl. No. 3 (a) & classified as Category 'A' project for the grant of Environmental Clearance at Central Level. MOEF&CC, New Delhi has accorded Terms of Reference (TOR) for the proposed expansion project vide letter no. J-11011/213/2016-IA.II(I) dated 18th November 2016. The EIA Report has been prepared considering the TOR issued by MOEF&CC.

Pioneer Enviro Laboratories & Consultants Private Limited, Hyderabad, which is accredited by NABET, Quality Council of India, vide certificate No. NABET/ EIA/ 1619/ RA 026, for preparing EIA report for Metallurgical Unit, have prepared Draft Environmental Impact Assessment (EIA) report for the proposed expansion project by incorporating the TOR approved by Ministry of Environment, Forests & Climate Change, New Delhi. The report contains detailed description of the following:

- Characterization of status of environment with in an area of 10 km radius from the plant for major environmental components including air, water, noise, soil, flora, fauna and socio-economic environment.
- Assessment of air emissions, liquid waste and solid waste from the proposed expansion project along with the noise level assessment.
- Environmental Management Plan comprising of emission control measures proposed to be adopted in the proposed expansion project, solid waste management, Greenbelt development.
- Post Project Environmental Monitoring & Budget for Environmental Protection Measures.

1.1 ENVIRONMENTAL SETTING WITHIN 10 Km. RADIUS OF THE PLANT SITE

The following is the environmental setting within the 10 Km. radius of the Plant site:

Salient Features / Environmental features	Distance w.r.t. site / Remarks		
Type of Land (for Expansion)	The plant is situated in Industrial Park developed by O.P.		
	JINDAL GROUP. The expansion project will be taken up in		
	the existing plant premises only.		
Type of Land (Study Area)	As per LULC the land use within 10 Km. is as follows: Settlements – 2.9 %; Industrial Area- 6.6 %; , Water Bodies – 8.8 %; Scrub Forest& Dense Forest area – 34.4 %; Single crop land –19.2 %; Double Crop Land – 5.2 %; Plantation-1.1 %; Land with scrub – 15.6 %; Land without scrub – 4.1 % & Gullied land – 2.1 %.		
National Park/ Wild life sanctuary /	There are no notified National Park/ Wild life sanctuary /		
Biosphere reserve / Tiger Reserve /	Biosphere reserve / Tiger Reserve/ migratory routes for		
Elephant Corridor / migratory routes	Birds with in 10 Km. radius of the plant.		
	Kms radius of the plant as per the secondary source		
	Conservation plan is being prepared.		
Historical places / Places of Tourist	Banjari temple is situated at a distance of 3.0 Kms. from		
importance / Archeological sites	the plant.		
Industrial areas / cluster (MoEF&CC office memorandum dated 13 th January	Nil		
2010)			
Defence Installations	Nil		
Nearest village	Punjipathara is the Nearest habitation - 0.15 Kms.		
No. of Villages in the Study Area	41		
Nearest Hospital	Within the Industrial Park		
Reserved forests	Taraimal RF (0.6 Kms.), Samaruna RF (2.9 Kms), Suhai RF (5.4 Kms.), Rabo RF (7.0 Kms), Urdana RF (6.7 Kms.) Punjipathra PF (0.5 Kms.), Pajhar PF (4.0 Kms.), Maghat P.F. (4.7) exist within 10 Km. radius of the plant site.		
Water body	Kelo river (5.6 Kms.), Kurket River(7.8 Kms.), Gerwani		
	Seasonal Nala (6.5 Kms.), Kosam Seasonal Nala (3.0 Kms.),		
	Rabo Dam project (1.5 Kms.)& Few seasonal nalas, ponds		
	existwithin 10 Km. Radius of the plant site.		
Crops in the Study Area	Major Crops - Paddy, Arhar, Mung, Groundnut		
	Minor crops - wheat, Maize, gram, Masur, Urad etc.		
	Rotato Mango Tomato Onion Cabbago Chilly Cingor		
	etc.		
Nearest Railway station	Nil (Bhupdeopur R.S. –12.5 Kms.)		
Nearest Port facility	Nil		
Nearest Airport	Nil (Jindal Air strip – 14 Kms.)		
Nearest Interstate Boundary	No interstate boundary within 10 Km radius of the plant		
	site.		

Salient Features / Environmental	Distance w.r.t. site / Remarks		
features			
Seismic zoneas per IS-1893	Seismic zone – II		
R & R	There is no rehabilitation and resettlement issue, as th proposed expansion will be taken up in the existin premises only.		
List of Industries / Mining activity	The following industries are situated in O.P. Jindal Industrial Park.		

S No	Name of the Industry	Туре
1	M/s Alok Ispat Put 1td	Steel Plant
2	M/s. Ganga Ispat Pvt. Ltd	Steel Plant
2.	M/s. G.D.Global India Dut. Ltd	Steel Plant
J. 1	M/s. O.F.Global India PVI. Etd.	Steel Plant
4. 5	M/s. Natifiaud fforf and steel Pvt. Ltd.	Steel Plant
<u>с</u>	M/s. Epic Alloys Steel PVI. Ltd.	Steel Plant
0.	M/s. Eureka Iron and Energy PVI. Liu	Steel Plant
7. o	M/s. Harsh Vinimay PVL LLC.	Steel Plant
0.	M/s. Jagdamba Sponge PVt. Ltd.	Steel Plant
9.	M/s. Maa banjari Ispat Pvt. Ltd.	Steel Plant
10.	M/s. Mamta Electrocasting Pvt. Ltd.	Steel Plant
11.	M/s. Sri Nirmalanand Steel Casting Pvt. Ltd.	Steel Plant
12.	M/s. R.S. Ispat Pvt. Ltd.	Steel Plant
13.	M/s. Radhe Govind Steel and Alloy	Steel Plant
14.	M/s. Raigarh Iron and industries	Steel Plant
15.	M/s. Rajat Ispat Pvt. Ltd.	Steel Plant
16.	M/s. Satguru Ispat Pvt. Ltd	Steel Plant
17.	M/s. Sai Ram Steel Pvt. Ltd	Steel Plant
18.	M/s. Shova Ispat Pvt. Ltd	Steel Plant
19.	M/s. Sri Banke Bihari Ispat Pvt. Ltd.	Steel Plant
20.	M/s. Shree Ram Hi Tech Steel and Power Pvt. Ltd.	Steel Plant
21.	M/s. Sri Balaji Ispat	Steel Plant
22.	M/s. Shree Consultant Pvt. Ltd.	Steel Plant
23.	M/s. Suryoday Steel Plant Pvt. Ltd.	Steel Plant
24.	M/s. Zeon Steel Pvt. Ltd.	Steel Plant
25.	M/s. Siddhi Vinayak Oxygen Pvt. Ltd	Oxygen Plant
26.	M/s. Orion Ferro Alloys	Ferro Alloys
27.	M/s. Vandana Energy Pvt. Ltd	Ferro Alloys
28.	M/s. V.A. Power Pvt. Ltd	Ferro Alloys
29.	M/s. Ajay Ingot Rolling mill s Pvt. Ltd.	Steel Plant
30	M/s Subh Project Brick Plant	Brick Plant

List of Industries with the Industrial Park[TOR # 4 (viii)]

1.2 Plant Configuration and Production Capacity

S. No	Particulars	Permitted capacities as per CTE obtained vide dated 30 th June 2004.	Proposed Expansion	After Expansion
	Submerged Electric Arc Furnace)			
1	Ferro Manganese (Fe-Mn)	28,000 TPA	20,000 TPA	48000 TPA
		(93.3 TPD)	(66.7 TPD)	(160 TPA)
			OR	
2	Silico manganese (Si-Mn)	28,000 TPA	14,000 TPA	42000 TPA
		(93.3 TPD)	(46.7 TPD)	(140 TPD)
			OR	
3	Ferro Chrome (Fe-Cr)	28,000 TPA	15,000 TPA	43000 TPA
		(93.3 TPD)	(50 TPD)	(143.3 TPD)
			OR	
4	Ferro Silicon (Fe-Si)	Nil	15,000 TPA	15000 TPA
			(50 TPD)	(50 TPD)

The proposed Steel Plant envisages manufacturing of the following products:

1.3 Raw Materials

The following will be the raw material requirement for the proposed expansion project:

S.No	RAW MATERIAL	QUANTITY (TPA)	SOURCE	MODE OF TRANSPORT
for Ma	anufacturing Fe-Si			
1.	Quartz	22000	Local	By Road (Covered Trucks)
2.	Pet coke	9000	Midnapur (WB)	By Road (Covered Trucks)
for Ma	anufacturing Si-Mn			
1.	Manganese Ore	24000	Balaghat (M.P.)	By Road (Covered Trucks)
			Import (south africa)	From Port By Road (Covered Trucks)
2.	Quartz	4000	Local	By Road (Covered Trucks)
3.	Mn. Slag	3500	Local	By Road (Covered Trucks)
4.	Pet coke	8500	Midnapur (WB)	By Road (Covered Trucks)
for Ma	anufacturing Fe-Cr			
1.	Chrome ore	35000	Sukinda (Odisha)	By Road (Covered Trucks)
			Import (Indonasia)	From Port By Road (Covered Trucks)
2.	Pet coke	14000	Midnapur (WB)	By Road (Covered Trucks)
for Ma	anufacturing Fe-Mn			
1.	Manganese Ore	26000	Balaghat (M.P.)	By Road (Covered Trucks)
			Import (south africa)	From Port By Road (Covered Trucks)
2.	Pet coke	9000	Midnapur (WB)	By Road (Covered Trucks)
3.	Dolomite / Limestone	2800	Local	By Road (Covered Trucks)



1.4 Manufacturing Process

Ferro manganese, silicon-manganese will be produced using manganese ore as main raw material, Ferro silicon will be produced using Quartz as main raw material & Ferro Chrome will be produced using Chrome Ore as main raw material in a sub-merged arc furnace using reducer (Coke) under high voltage.

1.5 Water Requirement

Water required for the proposed expansion project will be 25 KLD and same will be sourced from Ground water. Water drawl permission will be obtained from CGWA. Water requirement for the existing plant is 43.2 KLD. Total water requirement after expansion will be 68.2 KLD . The following is the break-up of the water requirement for proposed expansion project.

Description	Water Requirement (in KLD)
Make-up water for Ferro Alloys	24
For Domestic requirement	1
TOTAL	25

Break-up of Water requirement for Expansion

1.6 Waste Water Generation

There will be no effluent generation in the process of Ferro alloy manufacturing as closed circuit cooling system will be adopted. The sanitary wastewater (0.8 KLD) generated will be treated in Septic Tank followed by Subsurface dispersion. In the existing plant zero liquid effluent discharge system is maintained in the existing plant and similar practice will be continued after expansion also. The following are the Characteristics of Sanitary wastewater.

1.7 Wastewater Characteristics

PARAMETER	Sanitary waste water untreated
рН	7.0 - 8.5
BOD (mg/l)	200 – 250
COD (mg/l)	300 - 400
TDS (mg/l)	800 - 900

2.0 DESCRIPTION OF ENVIRONMENT

Base line data has been collected on ambient air quality, water quality, noise levels, soil quality, flora and fauna and socio economic details of people within 10 km radius of the plant.

2.1 Ambient air quality

Ambient air quality was monitored for $PM_{2.5}$, PM_{10} , SO_2 , NOx & CO at 8 stations including project site during October 2016 to December 2016. The following are the concentrations of various parameters at the monitoring stations:

Parameter		Concentration
PM _{2.5}	:	18.2 to 45.3 μg/m ³
PM ₁₀ *	:	32.5 to 78.5 μ g/m ³
SO ₂	:	6.5 to 22.6 μg/m ³
NO _X	:	7.0 to 29.5 μg/m ³
СО	:	445 to 1280 μg/m ³

2.2 Water Quality

2.2.1 Surface Water Quality

Kelo river (6.5 Kms.), Kurket River (7.8 Kms.), Gerwani Seasonal Nala (6.5 Kms.) & Kosam seasonal Nala (3.0 Kms.) are flowing within 10 Kms. radius of the plant site. Four (4) nos. of Surface water samples have been collected, one from upstream, one from downstream of Kelo river w.r.t the plant, one sample from Kurket River & one sample from Kosam Seasonal Nala to assess surface water quality. The analysis of samples shows that all the parameters are in accordance with BIS-2296 specifications.

2.2.2 Ground Water Quality

8 Nos. of ground water samples from open wells / bore wells have been collected from the nearby villages to assess ground water quality impacts and analyzed for various Physico-Chemical parameters. The analysis of samples shows that all the parameters are in accordance with BIS: 10500 specifications.

2.3 Noise Levels

Noise levels were measured at 8 locations during day time & Night time. The noise levels at the monitoring stations are ranging from **42.40 dBA to 62.35 dBA**.

3.0 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

3.1 Prediction of impacts on air quality

The likely emissions from the proposed expansion project are PM₁₀, NOx & CO. The predictions of Ground level concentrations have been carried out using Industrial Source Complex (ISC-3) model. Meteorological data such as wind direction, wind speed, max. and min. temperatures collected at the site have been used as input data to run the model.

A stack of 35 m height (minimum as per CPCB norms) for effective dispersion of emissions from 9 MVA Submerged Electric Arc Furnace .

The predicted max. Incremental PM_{10} concentrations (24 hourly) due to the proposed expansion project will be 0.24 µg/M³ at a distance of 500 m from the stack in the down wind direction over the baseline concentrations. The predicted incremental rise in Particulate Matter concentration due to the Vehicular emission will be 0.43 µg/m³. Hence the total predicted incremental rise in Particulate Matter concentration due to the vehicular emissions will be 0.24 µg/m³. Hence the total predicted incremental rise in Particulate Matter concentration due to the vehicular emissions will be 0.24 µg/m³ + 0.43 µg/m³ = 0.67 µg/m³.

There will not be any incremental SO_2 concentrations (24 hourly) due to the proposed expansion project.

The predicted max incremental NOx concentrations (24 hourly) due to the proposed expansion project will be 2.4 μ g/m³ at a distance of 500 m from the stack in the down wind direction over the baseline concentrations. The predicted incremental rise in NOx concentration due to the Vehicular emission will be 3.2 μ g/m³. Hence the total predicted incremental rise in NOx concentration due to the emission from expansion project and due the vehicular emission will be 2.4 μ g/m³ + 3.2 μ g/m³ = 5.6 μ g/m³

The predicted incremental rise in CO concentration due to the Vehicular emissions will be $2.0 \,\mu\text{g/m}^3$.

The net resultant concentrations (Maximum baseline conc. + predicted incremental rise in conc.) of PM, $NO_X \& CO$ are shown in Table below by considering the emissions from other industries in the area will be well within the National Ambient Air Quality Standards (NAAQS) when the expansion project commences the operation. Hence there will not be any adverse impact on air environment due to the proposed expansion.

Item	PM ₁₀	SO ₂	NOx	СО
	(~g/m³)	(~g/m³)	(~g/m³)	(~g/m³)
Maximum baseline conc. in the study area	78.5	22.6	29.5	1280
Maximum predicted incremental rise in	0.24	Nil	2.4	Nil
concentration due to proposed expansion project				
(Point Sources)				
Maximum predicted incremental rise in	0.43	Nil	3.2	2.0
concentration due to proposed expansion project				
(Vehicular emissions)				
Net resultant concentrations during operation of	78.17	22.6	35.1	1282
the expansion project				
National Ambient Air Quality Standards	100	80	80	2000

Net Resultant maximum concentrations due to the	proposed expansion proje	ect

3.2 Prediction of impacts on noise quality

The major noise generating sources are Furnace & DG set. Silencer has already been provided to the existing DG Set. The ambient noise levels will be within the standards prescribed by MoEF i.e. the noise levels will be less than 75 dBA during day time and less than 70 dBA during night time. 5 acres of extensive greenbelt has already been developed covering more than $1/3^{rd}$ of the total area helps in further attenuating the noise levels. Hence there will not be any adverse impact due to noise on population in surrounding areas due to the proposed expansion project.

3.3 Prediction of impacts on Water Environment

In the existing plant zero liquid effluent discharge system is being maintained. There will be no effluent generation from the process of manufacturing Ferro Alloys in expansion project as closed circuit cooling system will be adopted. Sanitary waste water will be treated in septic tank followed by sub-surface dispersion. Rain water harvesting helps in augmenting the water table. Hence there will not be any adverse impact on water environment due to the proposed expansion project.

3.4 Prediction of Impacts on Land Environment

Zero effluent discharge will be adopted. All the required air pollution control systems will be provided to comply with CPCB / CECB norms. All solid wastes will be disposed / utilized as per CPCB / SPCB norms. 5 Acres of greenbelt has already been developed as per guidelines. Hence there will not be any adverse impact on land environment due to the proposed expansion project.

3.5 Prediction of Impacts on Biological Environment

- There are no National Parks, Wild life Sanctuaries and Bird Sanctuaries within 10 Km. radius of the plant site. The area is known to have Elephant movement. Conservation plan under preparation.
- Taraimal RF (0.6 Kms.), Samaruna RF (2.9 Kms), Suhai RF (5.4 Kms.), Rabo RF (7.0 Kms), Urdana RF (6.7 Kms.) Punjipathra PF (0.5 Kms.), Pajhar PF (4.0 Kms.) exist within 10 Km. radius of the plant.
- All the required Air emissions control systems in the expansion project will be installed and operated to comply with MOEF/CPCB/CECB norms.
- Zero liquid effluent discharge is being maintained in the existing plant and similar practice will be maintained after expansion also.
- All solid waste disposal will be in accordance with the norms.
- Extensive Greenbelt of 5.0 acres has already been developed in the plant premises.

When all norms are complied and with proper implementation of Environment Management Plan, there will not be any adverse impact on flora & Fauna due to the proposed expansion .

3.6 Socio - Economic Environment

There will be lot of opportunities in employment to local people during construction as well as in operation phase. There will be further upliftment in Socio Economic status of the people in the area. 2.5% of the expansion project is allocated for CSR activities which will be implemented in the nearby villages. Hence there will be further development of the area due to the proposed expansion project.

4.0 ENVIRONMENTAL MONITORING PROGRAMME

Post project monitoring will be conducted as per the guidelines of CECB and MoEF&CC are tabulated below:

MONITORING SCHEDULE FOR ENVIRONMENTAL PARAMETERS

S.No.	Particulars	Frequency of	Duration of	Parameters required	
		Monitoring	sampling	to be monitored	
1. Wate	er & Waste water quality	У			
Α.	Water quality in the	Monitored on quarterly	Grab sampling	As per IS: 10500	
	area	basis.			
В.	Sanitary waste water	Once in a month	Grab sampling	As per EPA Rules1996	
2. Air (Quality				
Α.	Stack Monitoring	Once in a month		PM & NOx	
В.	Ambient Air quality	Once in a month	24 hours	PM _{2.5} , PM ₁₀ , SO ₂ , NOx	
			continuously	& CO	
С.	Fugitive emissions	Once in a Month	8 hours	PM	
3. Mete	eorological Data				
	Meteorological data	Daily	Continuous	Temperature, Relative	
	to be monitored at		monitoring	Humidity, rainfall,	
	the plant.			wind direction & wind	
				speed.	
4. Noise level monitoring					
	Ambient Noise levels	Twice in a year	Continuous for 24	Noise levels	
			hours with 1 hour		
			interval		

5.0 ADDITIONAL STUDIES

No rehabilitation and resettlement is required as proposed expansion will be taken up in the existing plant premises and the plant is located in OP Jindal Industrial Park.

6.0 **PROJECT BENEFITS**

With the establishment of the proposed expansion project employment potential will increase. Land prices in the area will increase. The economic status of the people in the area will improve due to the proposed project. Top priority will be given to locals in employment. 2.5% of the expansion project cost is earmarked for CSR activities to be taken up in the village. These activities will help in contributing to the development of villages in the nearby areas.

7.0 ENVIRONMENT MANAGEMENT PLAN

7.1 Air Environment

The following are air emission control systems proposed in the expansion project:

S.No.	Source	Control Equipment	Maximum Particulate emission at the outlet
1.	Submerged Electric Arc Furnace (SEAF)	Fume Extraction system with bag filters	50 mg/Nm ³

The following air pollution control systems/ measures are proposed in the expansion project:

- > All conveyors will be completely covered with G.I. sheets to control fugitive dust.
- All bins will be totally packed and covered so that there will not be any chance for dust leakage.
- All the dust prone points material handling systems will be connected with de-dusting system with bag filters.
- All discharge points and feed points, wherever the possibility of dust generation is there a de-dusting suction point will be provided to collect the dust.
- The Fugitive emissions from the Submerged Electric Arc Furnace will be sucked through hoods and will pass through a fume extraction system with bag filters and then the treated gases will be discharged into the atmosphere through a stack of 35 m height for effective dispersion of emissions from the Furnace. The outlet dust emission in the exhaust gases will be limited to 50 mg/Nm³. The dust will be pneumatically carried to covered bins.

7.2 Water Environment

There will be no effluent generation from the expansion project for manufacturing of Ferro Alloys as closed circuit cooling system will be adopted. Sanitary waste water will be treated in septic tank followed by sub-surface dispersion.

7.3 Noise Environment

The major sources of noise generation in the proposed expansion project will be Furnace & DG set, etc. Silencer is already provided to existing D.G. set. All the machinery will be manufactured in accordance with MoEF&CC norms on Noise levels. The employees working near the noise generating sources will be provided with earplugs. The extensive

greenbelt has already been developed within the plant premises and will help in attenuating the noise levels further.

7.4 Land Environment

There will be no effluent generation from the manufacturing process of Ferro Alloys as closed circuit cooling system will be adopted. Sanitary waste water will be treated in septic tank followed by sub-surface dispersion

Solid wastes will be disposed off as per norms. Extensive greenbelt is already been developed in the plant premises. Hence there will not be any impact due to the proposed expansion project.

Solid waste generation and disposal

SOLID WASTE QUANTITY **DISPOSAL METHOD** (TPA) Slag from Ferro Silicon Will be given to cast iron foundries. 250 Manufacturing Process Slag from Silico Manganese 11,000 Will be utilised in road construction Manufacturing Process Slag from Ferro Manganese Will be used in manufacture of Silico manganese 11,000 Manufacturing Process as it contains high MnO₂. Slag from Ferro Chrome Ferro chrome slag generated will be further 12,000 Manufacturing Process processed in Zigging plant for Chrome recovery the non chrome contents will be sent to common disposal yard within the Industrial Park. Dust from Bag filters of SEAF 0.05 It will be used in the existing Briquetting Plant. and during tapping

following will be the solid waste generation & proposed method of disposal.

TCLP test will be carried out for the slag generated during Ferro chrome production, if it is within the permissible concentrations, then it will be sent to common waste disposal yard of O.P. Jindal park. If the concentration exceeds, then secured landfill will be provided.

7.5 Greenbelt Development

Extensive Greenbelt of 5 acres has already been developed in the existing plant premises covering more than $1/3^{rd}$ of the total area.

Capital cost for environment protection for the total project is Rs. 2.0 Crores.
