EXECUTIVE SUMMARY

1 PURPOSE OF THE REPORT

M/s. Sarita Steel & Power Ltd. (SSPL) is situated in Kolkata city in West Bengal. The company is keen on the installation of Ferro Alloys & Sinter Plant at Mahroomkala village in Rajnandgaon district of Chhattisgarh state. The company plans to initially establish 4x9 / 2x18 MVA Ferro Alloy furnaces and 3 x 300 TPD Manganese ore Sinter plant.

The demand for Ferro Alloys as a raw material has been increasing enormously due to the significant growth of steel and stainless steel industries. Furthermore, riding on strong growth for steel demand, the steel manufacturing facilities were in constant need of raw materials like Ferro Alloys. In order to cater the demand of Ferro Alloys, both from steel and stainless steel industries, SSPL is proposing to install 4x9 / 2x18 MVA capacity of Submerged Arc Furnace.

As per EIA notification Serial No. 1533, issued on 14th September, 2006 and its subsequent amendments the proposed project is falling under Project / Activity 3(a) – Metallurgical Industries (Ferrous & Non Ferrous) and Category A – Primary metallurgical industry - all projects, and require Environmental Clearance from Expert Appraisal Committee (EAC), MOEF, New Delhi. Sarita Steels and Power Ltd. have submitted Form 1 application for obtaining Terms of Reference (TOR) from EAC.

The proposal was considered by the Expert Appraisal Committee in its 25th Meeting of the Expert Appraisal Committee (Industry-1) held during 29th & 30th June 2011 for determination of the Terms of Reference for undertaking detailed EIA Study in accordance with the provisions of the EIA notification dated September 14, 2006. The EAC has given Terms of Reference vide its Letter No. J-11011/190/2011-IA-II (I) dated: 21st July, 2011.

2 IDENTIFICATION OF PROJECT

2.1 Project

The proposed Ferro Alloys manufacturing plant consists of 4x9 / 2x18 MVA Submerged Arc Furnace and 3 x 300 TPD Manganese ore Sinter plant. The details of the proposed project are given in **Table 2.1 (A).**

Table 2.1 (A)

Details of the proposed project

S. No	Type of the product	Capacity TPA
1	**Ferro Alloys - 4x9 / 2x18 MVA Submerged Arc Furnace**	
	Ferro Manganese-FeMn, &)	58,320
	Silicon Manganese-SiMn	81,230
	Ferro Silicon-FeSi	25,272
Total		**1,64,822**
2	**3 x 300 TPD Manganese ore Sinter Plant**	**2,97,000**

Table 2.1 (B)

Salient Features of the Proposed Site

S. No	Particulars	Details
1	Location	Mahuroomkala Village, Rajnandgaon District, Chhattisgarh State
2	Geographical Positions	Longitude - 81°02'53.3"E to 81°03'11.1"E Latitude - 21°14'23.3"N to 21°14'38.4"N
3	Elevation	340 m
4	Land required for the Activity	40.0 Acres (16.15 Ha)
5	Present Land use	Private Land
6	Nature of Terrain	Flat
7	Major Crops	Paddy
8	Predominant Wind direction	West
9	Nearest Highway	NH 6 – 17 km, South
10	Nearest Major railway station	Rajnandgaon R.S 17 km, South East
11	Nearest Airport	Mana (Raipur) 80 km, East
12	Nearest Port	Vishakhapatnam (~488 km) South South East
13	Nearest Village	Mahuroomkala Village – 0.5 km, North
14	Nearest Town/City	Rajnandgaon 20 km, South East
15	Nearest River	Aurda Nadi – 5.7 km North East Bhiha Nadi – 6.5 km North West
16	Nearest Water Body	Tilai – 4km W
17	Monuments	Nil
18	Archaeologically important	None

	places	
19	National Parks	None
20	Forests	None
21	Seismicity	Zone II
22	Rehabilitation & Resettlement	None

Table 2.1 (C)

Technical Details of Power Plant

S.No	Equipment	Description
1	Name of the plant	Sarita Steels and Power Ltd.
2	Project Capacity	a) 1,64,822 TPA (Ferro Manganese, Silicon Manganese, & Ferro Silicon) b) 2,97,000 TPA (Manganese Ore Sinter)
3	Main Plant	4x9 / 2x18 MVA – Submerged Arc Furnace 3x300 TPD Sinter plant
4	Power Required	60 MW
5	Water Required	580 KLD
6	Effluent Quantity	23 KLD
7	Total Project cost	Rs. 29754 Lakhs
8	EMP Cost	Rs. 2975 Lakhs (Recurring Cost : Rs 297 Lakhs)

3 BASIC REQUIREMENTS

3.1 Land

The land required for the proposed project was identified at Mahroomkala Village, Khairagarh Thasil, Rajnandgaon District, Chhattisgarh State. The proposed land is completely private land; the total land is 40.0 acres.

3.2 Raw Material

The proponent is proposing to produce Ferro Alloy products and Manganese ore Sinter with production capacities of 1,64,822 TPA and 2,97,000 TPA respectively. The production capacity of the combined Ferro Alloy products or one product will not exceed 1,64,822 TPA. The details and amount of raw materials required for the production of 1,64,822 TPA and 2,97,000 TPA of Ferro Alloy Products and Manganese Ore Sinter are given in **Table 3.2 (A)**.

Table 3.2 (A)

Details of Raw Materials Required for Ferro Alloy Production

S.No	Raw Material Required	Quantity Required		
		Ferro-Manganese	Silicon-Manganese	Ferro-Silicon
1	Manganese Ore	153900	84564	-
2	Quartz	59850	10496	45500
3	Ferro Manganese Slag	21375	59390	-
4	Coke Breeze	29925	36450	20200
5	Iron Ore	25650	6416	8550
6	Dolomite	8550	1700	-
7	Electrode Paste	1710	1284	-
8	Carbon Paste			1800
Total		**300960**	**200300**	**76050**

Table 3.2 (B)

Details of Raw Materials Required for Manganese ore Sinter

S.No.	Raw Material	Quantity
1	Manganese Ore Fines	1100 MT/day
2	Coke Fines	132 MT/day
3	Fuel-LDO/FO	15 kg/T

3.3 Water

The total water required from the project will be taken from the ground water (borewell) within the plant premises, necessary permission obtained from the Central Ground Water Board. The detailed breakup of the water required for various activities are given in **Table 3.3 (A).**

Table 3.3 (A)

Water Requirement (KLD)

S. No	Description	KLD	Source
1	Cooling Purpose	432	Bore well
2	Domestic Purpose	36	
3	Gardening Purpose	112	
	Total	**580**	

3.4 Power Evacuation

The total power required for the proposed plant is 60 MW, which will be supplied by Chhattisgarh State Power Distribution Company Limited.

4 BASELINE ENVIRONMENTAL STATUS

4.1 Meteorology

On site monitoring was undertaken during summer season the winds were predominantly recorded from West to East; closely followed by South West during this time period. Calm conditions prevailed for 11.19% of the total time. Averaged wind speed for the study period that is March 2011 – May 2011 is 2.08 m/sec.

4.2 Ambient Air Quality

Ambient Air Quality Monitoring (AAQM) was carried out at 10 locations within 10 km peripheral of the project site. AAQ locations were selected in downwind, cross wind and upwind directions of the proposed plant location. AAQ levels recorded are given below **Table: 4.2 (A)**.

Table: 4.2(A)

Ambient Air Quality levels in the study area- µg/m^3

S.No	Parameter		Min	Max	CPCB, Limits
1	RPM	$PM_{2.5\mu}$	11	42	60
2		$PM_{10\mu}$	20	70	100
3	SO_2		4.4	17.9	80
4	NO_x		8.8	27.1	80
5	Benzene		BDL	BDL	05

4.3 Noise levels in the study area

Baseline noise levels are monitored at 10 locations in the study area and found that noise levels are within the Residential prescribed limits.

4.4 Water Quality

Ground water samples at 10 locations and surface water samples at 2 locations were collected in the study area and analyzed to assess the water quality.

Ground Water Quality – Observations

- The pH of water samples varied from 7.29 to 7.91
- The Total Dissolved Solids are in the range of 292 mg/l to 402 mg/l.
- The chloride values are in the ranges of 63 mg/l to 82 mg/l.
- The fluoride values are in the rage of 0.42 mg/l to 0.71 mg/l.

Surface Water Quality – Observations

- The pH of the surface water is in the range of 7.5 to 7.6
- The Total Dissolved Solids are in the range of 241 mg/l to 269 mg/l
- The Fluoride values are in the range of 0.13 mg/l to 0.16 mg/l
- The Total Hardness is in the order of 138 mg/l to 149 mg/l
- The total chlorides are in the order of 58 mg/l to 62 mg/l

4.5 Soil Quality

Soil quality studies are performed around the project site. Soil samples were collected from 10 locations at various depths and physico-chemical characteristics of the collected samples were analyzed.

4.5.1 Soil Quality – Observations

- The soil quality analysis indicates the soils are predominantly in Balkish brown.
- The pH of soil indicates normal to saline nature (7.25 to 7.83)

4.6 Environmental sensitive areas

Study was carried out to identify environmental sensitive areas with in 15 Km peripheral of the project site and found that there are no Sanctuary, Elephant/Tiger reserve (existing as well as proposed), migratory roots within 15 Km of the project site.

S. No.	Features	Existence with in 15 Km of the project site
1	Sanctuary	Nil
2	Elephant/Tiger reserve	Nil
3	Migratory routes	Nil

5 ENVIRONMENTAL IMPACTS OF THE PROPOSED PROJECT

The proposed power plant may cause impact on the environment in two phases.

- During construction phase
- During Operation phase

5.1 Impact during Construction Phase

Increase in SPM, RPM (PM_{10} & $PM_{2.5}$), SO_2, NO_X & CO levels due to construction activities and movement of vehicles. The impact of these activities would be temporary and will be confined within the project boundary.

The impact on water environment during construction phase is likely to be short term and insignificant. The impact of noise due to construction activities is insignificant, reversible and localized in nature. No significant adverse impacts on the soil in the surrounding area are anticipated. No major impacts on the flora and fauna in the region are anticipated during the construction phase. Overall, there will not be any adverse impact on the surroundings during the construction period.

5.2 Impacts during Operation Phase

5.2.1 Impact on Air Quality

The main raw materials required for the proposed project are Manganese ore, Iron ore, Carbon reducer, Dolomite, Quartz and Carbon electrode paste. Particulate Matter (PM10), Sulphur dioxide (SO_2), and Oxides of Nitrogen (NO_X) are the major air pollutants generated from the plant. The Stack and Emission Details of Proposed Units are provided in **Table: 5.2.1 (A)**

Table 5.2.1 (A)

Stack and Emission Details of Proposed Units

Details	Units	Ferro Alloys	Sinter Plant	DG Set
Plant capacity		4x9 / 2x18 MVA	3x300 TPD	500 KVA
Fuel Consumption	TPD	-	-	60 LPH
Height of the stack	M	30	40	10
Dia. of stack	M	2.0	2	0.5
Temp of flue gas	^{o} C	150	136	135
Velocity of flue gas	m/s	18	6.2	15
SPM Emissions	g/s	2.1	0.9	Nil
SO_2 Emissions	g/s	Nil	0.6	0.15
NO_x Emissions	g/s	Nil	14.5	0.08

Using the above emission data and meteorological data, incremental concentrations of the pollutants were predicted. For prediction of incremental GLCs, USEPA approved ISCST3 model has been used and post project scenario has been assessed as given in **Table 5.2.1 (B)**

Table: 5.2.1 (B)

Post Project Scenario-*Units:* μg/m^3

Particulars	Particulate Matter (PM_{10})	Sulphur Dioxide (SO_2)	Oxides of Nitrogen (NO_X)
Baseline Scenario (Max)	70	17.9	27.1
Predicted GLC (Max)	4.6	2.9	10.2
Overall Scenario (Worst Case)	**74.6**	**20.8**	**37.3**
MOEF / CPCB Standards	**100**	**80**	**80**

The predicted ground level concentrations are superimposed on the baseline levels. The post project pollution levels are found to be within the CPCB limits.

5.2.2 Impact on Water Quality

The main source of water for the proposed plant is ground water. 106 m^3/day of wastewater will be generated from the proposed plant. 100% effluent will be treated and reused for greenbelt development and slag cooling.

5.2.3 Slag Generation and its Impact

The slag generated from all the units is 162098 TPA which will be used for bricks manufacturing, designer tiles, load bearing tiles, and construction of roads.

5.2.4 Impact on Soil Quality

As the proposed project does not discharge any treated water outside the premises, hence there will be no impact envisaged due to the proposed project on soil quality. The wastewater from domestic and plant services are treated and reused within plant premises for cooling system makeup, greenbelt development, dust suppression, etc., hence the impact on soil quality will be minimum due to the proposed project

5.2.5 Impact on Ecology

The impact of the project on flora and fauna would be negligible.

5.2.6 Demography and Socio-Economics

The impacts of the proposed plant during operation of plant on demography and socio economic conditions would be both positive and negative some of them are as follows.

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

The overall impact on the socio economic environment will be beneficial.

5.2.7 Impact on Health

Adequate air, water and noise pollution control measures will be provided in the proposed project to conform to regulatory standards. The environmental management and emergency preparedness plans are proposed to ensure that the probability of undesired events and consequences are greatly reduced, and adequate mitigation is provided in case of an emergency. The overall impact on Human health would be negligible during operation of plant.

6 ENVIRONMENT MANAGEMENT PLAN

6.1 Air Quality Management

The particulate emissions, Sulphur dioxide (SO_2), and Oxides of Nitrogen (NO_X) are the major air pollutants generated from the proposed plant. To control and limit the particulate matter to 50 mg/Nm3 from the plant, cyclone, ESP, and bag filters are proposed for each kiln, and for the proper dispersion of SO_2 and NO_X emissions, sufficient stack height is proposed.

6.2 Water Quality Management

The source of water for the proposed plant is ground water from borewell with in the site and the necessary permission has been obtained from Central Ground Water Authority of Chhattisgarh region. The major Part of this water will be used for cooling purpose and the minor part of this water is for domestic requirement.

The wastewater generation from the proposed plant is from cooling system blow down,

domestic wastewater, and floor washings etc. the cooling system blow down will be reused for slag cooling. The domestic wastewater will be treated in sewage treatment plant (STP). The treated water from STP will be used for greenbelt development. Details of wastewater generation and Water balance are given in **Table 6.2(A)**.

Table 6.2 (A)
Water Balance – m^3/day

Particulars	Raw Water Required	Wastewater Generated	Loss	Discharge
Cooling Purpose	432	86	346	Reused for Slag Cooling
Domestic Purpose	36	20	16	Reused for GB
Gardening	112	-	112	-
Total	**580**	**106**	**474**	

6.3 Solid Waste Utilization plan

The details of the solid waste (slag) generated from proposed unit and its management measures are given in **Table 6.3 (A).**

Table 6.3 (A)
Details of the Solid Waste Generation and its Management Measures

Description	Quantity MTPA	Remarks
Si-Mn	56450	Used for brick manufacturing, designer tiles, load bearing tiles, construction of roads
Fe-Mn	75108	
Fe-Si	30540	
Total	**162098**	

6.4 Noise Level Management

Equipment will be designed to 85 dB(A) to meet ambient noise levels as per the OSHA regulations.

6.5 Storm water Management

Proper drainage system will be provided to ensure smooth draining of storm water without water logging problems.

7 Environmental Monitoring

7.1 Stack Gas Monitoring

The emissions from the stack will be monitored continuously using stack monitoring equipment.

7.2 Ambient Air Quality Monitoring

The ambient air quality will be monitored for SPM, RPM (PM_{10} & $PM_{2.5}$), SO_2, NOx, as per the direction of the state pollution control board.

7.3 Monitoring of other parameters

Ground and surface water quality, effluent quality, noise levels monitoring etc will be regularly monitored and reported to local PCB and also MoEF, GOI.

8 BUDGETARY PROVISIONS FOR EMP

In order to comply with the environmental protection measures as suggested in the above sections, the management has made a budgetary provision for Environmental Protection and Safety measures. The estimated cost of the overall project, amount allocated to Environmental Management Cost towards Environmental Mitigation Measures both capital and recurring are given in **Table 8 (A).**

Table 8 (A)

Cost towards Environmental Mitigation Measures

S.No	Particulars	Capital Cost (Rs. in Lakhs)	Recurring Cost (Rs. In Lakhs)
1	Ferro Alloys unit – Bag filter and dust suppression units	**2975**	**297**
2	Sinter Plant – Bag filter		
3	STP, Rainwater harvesting, storm water drains, etc		
4	Greenbelt development, Environmental Lab miscellaneous		
Capital cost of the project Rs.29754 Lakhs **CSR Activities (5% of the Capital Cost) – 1500 Lakhs**			

9 ORGANIZATIONAL SET UP FOR ENVIRONMENTAL MANAGEMENT

Environment Division headed by an experienced Executive Engineer is directing responsible for Environmental Management of the existing station. The Executive Engineer reports to the Superintending Engineer (Environment) and Chief Engineer (O&M). The environment division has Environmental Engineering and Environmental Chemistry group. The existing Environmental management team will discharge the responsibilities of the proposed unit.