

EXECUTIVE SUMMARY
0.1 Preamble

M/S Kalyani Gerdau Steels Limited, formerly known as *SJK Steel Plant Limited* (hereinafter referred to as '**KGSL**') is operating a steel plant near Tadipatri in Anantpur district of Andhra Pradesh. (*M/s SJK Steel Plant Limited has been renamed as M/s Kalyani Gerdau Steels Limited on October 8, 2008.*)

KGSL proposes to expand its designed annual steel production capacity to 1.0 million TPA as per the details given below:

S.N	Particulars	Designed Production Capacity	
		Pre Expansion	Post Expansion
Finished Products			
1.	Rebar Steel	-	0.52 MTPA
2.	SBQ Steel	-	0.4 MTPA
3.	Cold Pig Iron	-	0.078 MTPA
Intermediate Products			
1.	Pig Iron	0.3 MTPA	1.0 MTPA
2.	Steel Billets	0.3 MTPA	0.922 MTPA
Coke Oven			
1.	Coke	-	0.6 MTPA
Power			
1.	Waste Heat Recovery Boiler (WHRB)	-	2x25 MW & 1x9MW

The proposed expansion is designated to be developed under the Environmental Impact Assessment (EIA) Notification and amendments under Environment (Protection) Act, 1986. Proposed project falls under "Category A" as per the notification issued on 14th September 2006 by Ministry of Environment & Forests (MOEF), hence requires clearance from MOEF.

M/s. SGS India Pvt. Ltd., (hereinafter referred as **SGS**), Gurgaon has been engaged by **KGSL** to carry out Rapid Environment Impact Assessment (EIA) study and to prepare Environment Management Plan (EMP) for the proposed expansion for getting the environment clearance.

The study has been carried out as per the Terms of Reference (TOR), prescribed by MOEF vide letter no J-11011/3222/2008-IA II(I) dated October 16, 2008.

❑ Location and Accessibility

The proposed expansion is envisaged within the premises of existing plant. Existing plant is located near village Jambulapadu which is about 6 km away from Tadpatri town in Anantpur district of Andhra Pradesh and has latitude as 14° 52' 32" E and longitude as 78° 03' 24" N (as per Topo sheet (no 57J/1) of Survey of India). The mean elevation of plant site is 222.5 m above MSL.

The nearest highway SH30, connecting Tadpatri to Cuddapah district is passing adjacent to the plant boundary in north direction. The Mumbai Chennai South Central Railway mainline is passing adjacent to plant boundary in the south direction.

The nearest railway station is at Challavaripalli which is 0.5 km from the plant site. The nearest airport is at Bangalore (about 270 km) while nearest port is at Krishnapatnam (about 300 km) and Chennai (about 350 km). The district head quarters i.e Anantpur is about 70 km from the project Site.

0.2 Project Details

❑ Land Requirement

The proposed expansion is planned within the existing plant area of 887.42 acres (359.27 hect). No further land acquisition is envisaged for the proposed expansion.

❑ Raw Material

The details of raw materials requirement for the existing and proposed expanded plant and their respective sources are as per given below:

Raw Materials	Quantity (TPA)		Source	Mode of Transport
	Pre Expansion	Post Expansion		
Iron Ore Lump	595200	360,300	Bellary, Hospet, Kurnool & Kaddapa	Rail/Road
Iron Ore Fines	-	1,198,300	Bellary, Hospet, Kurnool & Kaddapa	Rail/Road
Non-Coking Coal for CDI	-	95,400	Imported	Rail/Road
Lime Stone (BF Grade)	42300	81,500	Gooty & Tadipatri	Rail/Road
Dolomite (BF Grade)	43000	84,000	Tadpatri	Rail/Road
Limestone (SMS Grade)	-	158,500	Rajasthan, MP	Rail/Road
Dolomite (SMS)	-	63,400	Tadpatri	Rail/Road

Grade)				
Quartzite	6300	23,500	Kurnool	Rail/Road
Coal	-	834000	Imported/domestic	Rail/Road
Purchased Coke	220800	-	Imported/domestic	Rail/Road
Purchased DRI	-	67,200	Local	Rail/Road
Purchased Scrap	-	16,200	Local	Rail/Road
Fe-Cr (HC)	-	3,708	Local	Rail/Road
Fe-Mo	-	1,016	Local	Rail/Road
Nickel Plates	-	1,475	Local	Rail/Road
Fe-Si	600	3,190	Local	Rail/Road
Fe-Mn (HC)	1800	10,000	Local	Rail/Road
Lime & calcined dolo (sms grade)	34500	-	Local	Rail/Road

❑ Equipment/Machinery

The details for major equipments/machinery which are in operation and envisaged for the proposed expansion are as per given below:

S.N	Particulars	Capacity		
		Pre-Expansion	Expansion	Post-Expansion
1	Raw Material Handling System			
	Wagon Tippler	1000 T/h Iron Ore 583 T/h Coke	Nil	1000 T/hr Iron Ore 583 T/hr Coke
	Conveyor	500 T/h IO 283 T/h Coke	Nil	500 T/hr IO 283 T/hr Coke
2	Sintering Plant Facilities	Nil	1 x 50 m ² + 1 x 82 m ²	132m ²
3	Blast Furnace	1 x 350 m ³	1 x 750m ³	1100 m ³
4	Basic Oxygen Furnace (BOF)	2 x 25/30 T	1 x 50 T	2 x 25/30 T 1 X 50 T
5	LRF/VD	30 T LRF	2 X 30T LRF 1 X 35 T VD 1 X 50T VD	3X30T LRF 35T VD 1 X 50T VD
6	Caster	5,00,000 TPA Billet Caster	5,00,000 TPA Bloom Caster	10,00,000 TPA
7	Lime Plant a. Calcination Plant b. Dolomite Calcination Plant	Nil	300 TPD 100 TPD	300 TPD 100 TPD
8	Oxygen Plant a. Oxygen b. Nitrogen	60 + 25 = 85 TPD 76 TPD	180 + 65 TPD 70 TPD	330TPD 146 TPD
9	Power Plant	Nil	2 x 25 M W 1 x 9 MW	59 MW
10	Air Compressor Plant	3 x 30 m ³ /min	3 X 30m ³ /min	180m ³ /min
11	Coke Oven Plant	Nil	0.6 MTPA	0.6 MTPA
12	Rebar Mill	-	5,20,000 TPA	5,20,000 TPA
13	SBQ Mill	-	2,00,000 TPA + 2,00,000 TPA	4,00,000 TPA

❑ Water Requirement

Average water requirement of the existing plant is 1446 m³/day. After commissioning of proposed expansion the same will be 21, 446 m³/day. Water requirement for the existing plant is abstracted via infiltration bore wells (18 nos.) on the bed of Pennar river at a distance of 5 km from plant. While for the proposed expansion, additional water requirements will be met from the Gandikota reservoir via pipeline which is about 22 km

from plant site. Approval @ 2.5 MGD from Pennar river for existing operation and additional @ 5 MGD for proposed expansion have been obtained.

❑ Power Requirement

Power requirement for the existing plant is 15.48 MW which is met through 132 KV transmission line from Tadpatri. For the proposed expansion, additional requirement of 60 MW power have been sanctioned by AP Electricity Board (APEB) through new 220 KV transmission line from Thimmapuram (23 km from the Plant Site). Withdrawal of power from grid will be regulated as per the proposed in-house power generation.

❑ Project Cost

Capital cost of the project is Rs. 1924 Crores.

0.3 Existing Environment

The details of environment settings of the study area covering an area of 10 km radius around the project site are given below:

Sn	Areas	Name/ Identity	Aerial distance (within 10 km from Proposed project location boundary)
1	Areas which are important or sensitive for ecological reasons - Wetlands, watercourses or other water bodies, coastal zone, biospheres, mountains, forests	<u>Rivers:</u> • River Pennar <u>Mountains:</u> • Penna/Muchukota Hills	• 3 km • 8 km
2	Routes or facilities used by the public for access to recreation or other tourist, pilgrim areas	• SH 30 • South Central Main Railway Line	• Adjacent to Plant Boundary • Adjacent to Plant Boundary
3	Areas containing important, high quality or scarce resources (<i>ground water resources, surface resources, forestry, agriculture, fisheries, tourism, minerals</i>)	Cement grade Limestone mines, Road metal, Building Stones	• 8 km, N
4	Industries within 25 Km radius	• Penna Cement (Talaricherevu) • Ultra Tech Cement (Kaverisammudram) • Limestone & Shale Mines • Cuddapah Slab & granite polishing units (In and around Tadipatri) • Ganga Bhavani Metal Crusher • Sindhu Industries (pulversing unit) • Vinayaka Industries (cement grinding) • Sai Sindhu sponge Iron Pvt Ltd	• North 9 km • North west 11 km • North 15 km • North West 6-8 km • West – 11 km • NW – 6 km • NW-7 km • NW-7km • NW-11km

In order to assess the baseline environmental of the study area, a primary data collection programme was undertaken in an area of 10 km radius surrounding the project site during the following periods:

1. April to July-08 for three months before getting TOR from MOEF (referred as summer season); and
2. February-09 to March-09 for one month for complying the conditions stipulated in TOR issued by MOEF (referred as winter season).

The existing environment of the study area is described hereunder:

- ☐ Area covered by double cropped agricultural land and single cropped agricultural land contribute 48.10% and 21.43 % of the total study area respectively. Area covered by open forest and dense forest is 2.41 & 0.241% respectively. Human settlements contribute 2.805 % of the study area;
- ☐ During the summer season, the temperature varied from 21.7 °C to 43.4°C, relative humidity varied from 9.5% to 97.9 % and the wind speed varied from 0.0 to 7.6 m/sec. Predominant wind directions were blowing from north and north east. While during the winter season, temperature varied from 18.7 °C to 42.5 °C, relative humidity varied from 16.5 % to 82.0% and wind speed varied from 0.4 to 4.3 m/sec. Predominant wind direction was blowing from north and north east;
- ☐ The existing ambient air quality, in terms of Suspended Particulate Matter (SPM), Respirable Suspended Particulate Matter (RSPM), Sulphur dioxide (SO₂), Oxides of Nitrogen (NO_x) and Carbon monoxide (CO) has been monitored. The ambient air quality in the study area was found well within the standard prescribed by CPCB/APPCB for rural and mixed area during summer and winter season.
- ☐ Noise level in the study area was found well within the standard prescribed by CPCB/APPCB for residential area during summer and winter season.

0.4 Anticipated Environment Impact and mitigation Measures

☐ Air Quality

The main sources of the pollution from the operation of proposed expansion are:

- Combustion of Iron ore, coal and other additives;
- Handling of raw materials; and
- Handling of solid waste to be generated.

Anticipated pollutants are particulate matter, sulphur dioxide (SO₂), oxides of Nitrogen (NO_x) and carbon monoxide (CO). Oxides of Nitrogen will be controlled by optimizing core flame temperature while Carbon monoxide will be controlled by ensuring complete

combustion. Dust and SO₂ have been considered as critical pollutants for dispersion modelling

Prediction of Incremental Ground Level Concentrations (GLCs) of particulate matter and SO₂ is carried out by using Industrial Source Complex Short Term Model Version-3 (ISCST 3) software developed by US Environmental Protection Agency (USEPA). The predicted air quality after operation of proposed expansion is summarized as per given hereunder:

Sn	Pollutants	Maximum Concentration (µg/m ³)			
		Predicted incremental Value due to Operation of proposed expansion (Average(maximum))	Existing ambient Air Quality in the study area (Average(98 percentile))	Resultant ambient Air Quality in the study area (Average(98 percentile))	CPCB norms
1	SPM	2.06(14.7)	116.2 (155.9)	118.26 (170.6)	200
2	SO ₂	0.94(5.34)	11.24 (14.25)	12.18 (19.59)	80

Mitigation Measures

a) **Stack Emissions Management**

- Suitably designed ESPs / Bag filters will be placed downstream of the stacks which will separate out the incoming dust in flue gas and limit the dust concentration at its designed outlet concentration of 50 to 150 mg/Nm³;
- In the event of failure of any pollution control equipment, automatic tripping in the control system, will be provided;
- For ESP operations, interlocking will be provided with supply to electrode, which means that any disturbance in the power supply to electrode will switch the whole unit off;
- SO₂ emission will be controlled by providing adequate stack height as per formula; $H=14Q^{0.3}$ where H is in meter and Q is the SO₂ emission rate in Kg/hr. Attempt shall be made to use low sulphur coal to the possible extent; and
- Stack emissions will be regularly monitored by **KGSL**/ APPCB/ external agencies on periodic basis as per statutory requirements.

b) **Fugitive Emission Management**

- Jet Pulse bag filters at all dry material conveying and transfer points;
- Dust suppression system by water sprinkler at dump hopper of raw materials and on roads;

- Open areas within the plant premises and along with boundaries of the plant premises will be covered under green belt/plantation; and
- Raw Materials will be fully covered during transportation to/ from the plant site by road/ rail.

❑ Water Quality

The details of wastewater generated during the operation of the proposed project are as per given hereunder:

Particulars	Existing	Expansion	Treatment & Disposal
Plant process water			
Plant operation	15.0	80.0	Will be used for slag quenching /cooling
Water treatment Plant (DM or Softener)	0.0	140.0	After primary treatment as per details given below, treated water will be sent to coke oven plant for coke quenching
Cooling tower/Blow down	25.0	140.0	Will be used for slag quenching /cooling
Total	40.0	360.0	
Domestic water			
Domestic (from plant)	80.0	200.0	Will be treated in STP and treated waste water will be used for dust suppression (dust pollution control) & for green belt development.
Domestic (from Township)	0.0	300.0	
	80.0	500.0	
Total	980.0		
Quantity of water recycled			
(in %)	95 %		
(in cum/day)	930		

It is evident from the above table that no waste water will be discharged outside the plant premises.

❑ Solid Waste

The details of main solid waste generation and management are summarized as per given below:

Nature of Waste	Composition	Quantity TPD		
		Pre Expansion	Post Expansion	Mode of Disposal/Recycling
Granulated Blast Furnace Slag	Oxides of Calcium, Magnesium, Silicon, Aluminum, Iron etc.	345	1150	Is/shall be sold to Cement Plants
Cast House Scrap	Pig Iron scrap	1	3	Is/shall be Sent to BOF
BOF Scrap	Steel scrap	12	40	Is/ shall be used in Steel Making
Sinter Plant Dust (ESP, Multi-cyclone)		0	193	Shall be recycled to Sinter Plant
Flue dust from the BF	Oxides of Iron, Si, Al, Mn, Ca, Mg	13	43	Shall be recycled to Sinter Plant
Coke fines from the Stock House	Coke fines	25	83	Shall be recycled to Sinter Plant
Scale from rolling mills & Continuous casting	Oxides of Iron	6	20	Shall be recycled to Sinter Plant
Steel Scrap	Scrap	20	67	Is/ shall be recycled to BOF
Lime Plant Dust	Lime	0	67	Shall be recycled to Sinter Plant
Steel Making Slag	Oxides of Iron, Ca, Si,	115	383	Partially it will be used as flux in

Nature of Waste	Composition	Quantity TPD		
		Pre Expansion	Post Expansion	Mode of Disposal/Recycling
	Al			Blast Furnace & rest will be used for selected land filling.
Converter Gas Cleaning Sludge	Oxides of Iron, Ca, Mg, Si, Al, Mn	18	60	Shall be recycled to Sinter Plant
BF Gas Cleaning Sludge	Oxides of Iron, Ca, Mg, Si, Al, Mn	5	17	Shall be recycled to Sinter Plant
Used Lead Acid Batteries	-	10	15	Shall be sold to selected parties.
Spent/Used Oil	-	3.7 m ³	10 m ³	To be sold to selected parties
Process dust	-	4	10	will be used in Sinter Plant
Sludge from Sewage treatment	-	-	3.5	will be used as manure
Sludge from primary treatment plant	-	-	2.0	will be used for land filling after ensuring its status for hazardous waste.
Sludge from coke plant desulphurization units	Gypsum	-	10	will be used for selective land filling.

It is proposed to deposit Steel Making slag about 250T/day in the low lying areas in the plant. An area of 4000 m² will be ear marked for primary dumping of slag & salvaging of scrap.

❑ Socio-economic

Establishment or expansion of any industrial activities, results in industrial growth, which in turn would generate direct and indirect opportunities of employment and business in the region. As per estimate, total additional manpower required for proposed expansion will be 940. In addition to above, significant number of casual labour will be required and indirect employment will also be generated on local and regional basis.

There will be an increase (directly and indirectly) in the payment of royalty, excise duty and sales tax to Government due to the proposed expansion. Proposed township will also contribute in terms of employment and business opportunities for locals.

KGSL is committed to contribute to improve the socio-economic conditions of the area and contributing to the welfare of the local habitants to the maximum possible extent. **KGSL** will keep continuing to participate in implementation of Government schemes for the welfare of the society of the study area up to extent possible in addition to the direct and indirect employment generation and payment of taxes and royalty.

Mitigation Measures

- Preference will be given to locals for direct and indirect employment;
- Local suppliers for machinery and materials will be given preference; and
- Local transporters will be preferred for transportation of man/machinery/materials.

❑ **Cost of Environment Management Plan**

The details of estimated capital and recurring cost of the proposed environmental management plan are as per given below.

S.N	Particulars	Capital Investment (Rs. in lacs)			Recurring Investment per annum (Rs. in lacs)		
		Existing	Expansion	Total	Existing	Expansion	Total
1	Air Pollution Control	1460.0	3900.0	5360.0	175.0	610.0	785.0
2	Water Pollution Control	175.0	440.0	615.0	53.0	160.0	213.0
3	Noise Pollution Control	45.0	132.0	177.0	5.0	14.0	19.0
4	Environment Monitoring & Management	90.0	350.0	440.0	9.0	20.0	29.0
5	Occupational Health	90.0	175.0	265.0	26.0	45.0	71.0
6	Green Belt	180.0	1050.0	1230.0	53.0	120.0	173.0
Total		2040.0	6047.0	8087.0	321.0	969.0	1290.0

