

# **Prefeasibility Report**

**For the proposed  
Capacity Expansion from  
6.3 MTPA to 7.3 MTPA by  
revamping and augmentation of existing facilities  
Gajuvaka,  
Visakhapatnam, Andhra Pradesh**

**Project Proponent**



**Rashtriya Ispat Nigam Limited  
Visakhapatnam Steel Plant  
Visakhapatnam**



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## 1. EXECUTIVE SUMMARY

**M/s Visakhapatnam Steel Plant (VSP)** is the first shore-based integrated steel plant in India owned by M/s. Rashtriya Ispat Nigam Limited (RINL), Visakhapatnam, a Navratna PSE under Ministry of Steel, Government of India.

It is located in Village Gajuwaka, District Visakhapatnam, State Andhra Pradesh was received Environmental clearance for expansion of Hot metal from 4.0 to 6.5 MTPA by Ministry of Environment, Forest and climate change (MoEFCC) vide their letter no. J-11011/196/2005-IA II (I) dated 11-08-2005.

The said EC was for increase in hot metal production from 4.0 to 6.5 MTPA, liquid steel production from 3.5 to 6.3 MTPA, saleable steel from 3.17 to 5.72 MTPA, coal chemicals from 0.18 to 0.23 MTPA and power generation from 235 MW to 384 MW. Now RINL intends to expand its capacity of liquid steel production from 6.3 to 7.3 MTPA.

The total land area in possession with the company is 8827 ha of which the plant area is 3240 ha. No additional land will be required for this capacity augmentation project.

### Process Description

The process steps for steel production in sequence are as follows:

- Coal Carbonization in coke ovens with recovery of coke oven gas (COG)
- Agglomeration of iron ore fines by sintering
- Hot Metal making in BF by reduction of sintered and lump iron ore with coke in presence of additive materials
- Oxidation of carbon present in the hot metal by oxygen blowing in presence of lime in BOF for producing liquid steel.
- Refining of liquid carbon steel by addition of micro- alloys to get the desired chemistry of liquid carbon steel for casting
- Continuous casting of refined liquid carbon steel to blooms and slab.

The existing plant lies between  $17^{\circ} 34' 29''$  to  $17^{\circ} 38' 49''$  N Latitude and  $83^{\circ} 09' 23''$  to  $83^{\circ} 14' 12''$  E Longitude in Survey of India topo sheet No. 65 O/2, at an elevation of 10 m AMSL.

The plant water requirement is 1,36,350 m<sup>3</sup>/day (30 MGD) and for township and others it is estimated at 36,360 m<sup>3</sup>/day (8 MGD) for 6.3 MTPA stage. The additional water required for the proposed augmentation would be 31,815 m<sup>3</sup>/day (7 MGD) of which 27,270 m<sup>3</sup>/day (6 MGD) would be required for the operation of plant and 4,545 m<sup>3</sup>/day (1 MGD) for the township and others. The water will be sourced from existing Yeleru Reservoir. RINL has accorded permission for withdrawal of 45 MGD from Visakhapatnam Industrial Water Supply Company Limited (VIWSCO).

The power requirement for operating the steel plant including township at 6.3 MTPA stage is 470 MW of which in plant generation is 384 MW and the balance 86 MW is drawn from APTRANSCO. The additional power required for the proposed expansion is 76 MW, which will be sourced from the APTRANSCO.

Since the capacity augmentation project will be taken up within the existing land boundary of RINL/VSP and therefore this project is not envisaged any R&R issue.



The solid waste generated at 6.3 MTPA stage will be approx 11,700 TPD which includes granulated BF slag, SMS slag, mill scales, sludges, ESP/Bag filter dust etc. In addition, about 2000 TPD of coal ash will be generated at 6.3 MTPA stage. There would be additional generation of approx 1,700 TPD of solid waste. It is estimated that 100% of the granulated BF slag would be sold to the cement making industries for manufacturing of slag cement. Other waste such as mill scale, sludges, dust etc would be 100% recycled into the sinter plant. 60% of the SMS slag would also be used within the steel plant and the balance would be stored for further processing for secondary use.

Tar sludge/solid sludge generated in by-product plant will be transported to coal yard for mixing with coal. Alternatively, mechanized handling system will be explored to facilitate charging into ovens.

#### Liquid Effluent

WWTP will Consists of bowl rake classifier/spiral classifier, thickener, thickener under flow pumps sludge dewatering units etc. A HRT will be provided to further reduce the sludge loading on the sludge filtration equipment. HRT under flow pumps, Separate sludge tanks will be provided to collect the sludge from the HRT and pump the same to vertical filter press (1 W +1S) of 12T/hr capacity. Working hours for same shall be 12 hrs max. The sludge tank will be provided with mechanical agitator including air agitation to maintain consistency of the sludge. For emergency handling of the sludge, sludge pumps along with pipeline will be provided at the sludge tank for pumping the sludge to the waste water treatment plant of the SMS-1.

Most part of the treated wastewater will be recycled within the plant. A small part (about 8%) of the treated effluent may get discharged to sea, maintaining the statutory norms. No untreated waste-water will be disposed of.

Out of total acquired land of 8827 ha, greenbelt has been done in 1969 ha within the plant area. On the whole about 38% of the land is afforested with the planting of 5.16 million trees. This will help to attenuate the noise levels and trap the dust generated due to operation of plant/project development activities.

The capital cost of the expansion project is estimated at around Rs 9439.53 crores .



## 2. INTRODUCTION OF THE PROJECT/ BACKGROUND INFORMATION

### Identification of project and project proponent

Visakhapatnam Steel Plant, popularly known as Vizag Steel is an integrated steel producer in Visakhapatnam, India built using German and Soviet technology. Its products have been rated the best in the world market. Vizag Steel Plant was conferred Navratna status on 17 November 2010. Founded in 1971, the company focuses on producing value-added steel, with 214,000 tonnes produced in August 2010, out of 252,000 tonnes total of salable steel produced. It is the largest single site plant in India and Asia minor.

Since inception of VSP, it was planned to provide provision for future expansion within the plant boundary so that the production capacity of hot metal can be achieved up to 12 MT per annum without much difficulty.

VSP received an Environmental clearance for increase in hot metal production from 4.0 to 6.5 MTPA, liquid steel production from 3.5 to 6.3 MTPA, saleable steel from 3.17 to 5.72 MTPA, coal chemicals from 0.18 to 0.23 MTPA and power generation from 235 MW to 384 MW by Ministry of Environment, Forest and climate change (MoEFCC) vide their letter no.J-11011/196/2005-IA II (I) dated 11.08.2005. During commissioning and revamping of the equipment of 6.3 MTPA expansion programme, RINL adopted the 'Best Available Technologies (BAT)' which help in reduction of pollution and increase in productivity. After reviewing the detailed design and technology options, it was seen that the plant can achieve 7.3 MTPA of liquid.

### Brief description of nature of the project

The proposal would be primarily based on revamping of Blast furnace 1&2, Sinter plant 1&2, Steel Melting Shop-1 and installation of convertor-3 (1 X 150 T capacity ) & caster-4(1 x 5-strand combi-caster) The production of hot metal and liquid steel will be around 7.5 MTPA and 7.3 MTPA respectively after the above expansion and modernisation schemes are executed.

The plant is located in Village Gajuwaka, District Visakhapatnam, State Andhra Pradesh The plant lies between 17034'29" to 17038'49" N Latitude and 83009'23" to 83014'12" E Longitude in Survey of India topo sheet No. 65 O/2, at an elevation of 10 m AMSL. The total land area in possession with RINL is 8827 ha of which the plant area is 3240 ha. Since the capacity augmentation will be taken up within the existing plant boundary, therefore, no additional land will be required for this capacity augmentation project. Also due to adoption of BAT, the net pollution load after 7.3 MTPA augmentation will also come down from the existing pollution load at 6.3 MTPA stage.

The major production facilities :

- Coke oven battery -5 of 0.8 MTPA capacity. Out of the 5 batteries, out of which only 4 batteries will be operating at a time owing to capital repairs to be carried out in battery Nos. 1, 2 & 3 in phases.(Existing)
- Sinter plant 1&2 of 2.85 MTPA capacity each will produce 3.64 MTPA each after revamping
- Blast furnaces 1&2 will produce additional 1 MTPA of hot metal after revamping
- SMS -1 after revamping and - SMS-2 after addition of 150T convertor-3 & one additional 1 x 5-strand combi caster-4 will produce additional 1 MTPA of liquid steel
- Re bar Mill of 0.6 mtpa capacity for conversion of part of surplus billet in SMS-2 into value added product of 8 mm to 16 mm rebar, is planned in lieu of the Seamless Tube mill considered under 6.3 MTPA.

UTILITIES:

- LPG/Propane storage installation comprising of 3 nos of horizontal, cylindrical, mounded storage vessel each of capacity 75 tons inclusive of LPG/propane unloading storage evaporation and distribution system complete with all auxiliary facilities.
- One no. 200 m<sup>3</sup> , 40 kscg, Nitrogen Buffer Vessel with associated pipework including valves.

### 3. PROJECT DESCRIPTION

#### Type of project including interlinked and interdependent projects, if any.

Visakhapatnam Steel Plant (VSP) is the first shore-based integrated steel plant in India owned by Rashtriya Ispat Nigam Limited (RINL), Visakhapatnam, A.P, India. It is currently operating SMS -1 complex, which is capable of producing 3.5 MTPA (Million Tons per Annum) liquid steel. The SMS-1 complex was fully commissioned and dedicated to the nation on 2nd August 1992.

RINL, Visakhapatnam, has recently commissioned SMS-2 complex facilities to increase the plant capacity to 6.3 MTPA liquid steel. The envisaged production capacity of SMS -2 complex is 2.8 MTPA liquid steel. Provision was also kept for installation of one more Converter and one more Caster and associated facilities in the existing layout of SMS-2 complex. RINL is now installing one more LD Converter (BOF#3) and one more 5-strand Bloom cum Round Caster (CCM#4) alongwith associated auxiliary facilities in SMS-2 Complex to take care of the additional Hot Metal production from existing Blast Furnaces after Category- I Capital Repairs, in order to increase production capacity of SMS-2 complex from 2.8 MTPA to 3.8 MTPA liquid steel. CCM#4 is envisaged to handle 1.0 MTPA liquid steel produced from BOF#3 in order to produce Billets of cross-section 200x200 mm in 6.0 to 12.0 meters length and Rounds of cross-section 410 mm, 450 mm diameter in 4.0 to 6.5 meters length. With installation of the above facilities in SMS-2 complex, overall plant capacity of VSP will reach to 7.3 MTPA liquid steel.

The facilities and revamping envisaged for the proposed project are given **Table 1** below:

S.No	Facility
1	Revamping of Sinter Plant 1 &2
2	Revamping of SMS-1
3	Installation of Conv.3 & Caster4 (SMS -2)
4	Installation of LPG storage facility
5	Installation of Nitrogen Plant
6	Installation of Twin Ladle Heating furnace in SMS 2
7	Revamping of Blast Furnace 1
8	Revamping of Blast Furnace 2
9	Installation of Re bar mill
10	Installation of Coke Oven Battery -5
11	Revamping and Modernization of Continuous Casting Department
12	Revamping and upgradation of Walking beam type reheating Furnaces of the light and medium merchant mill (LMMM)
13	Rebuilding of Coke Oven Battery No. 1
	OTHERS
14	Revamping & Upgradation of Electrostatic Precipitators of Two Boilers in Thermal Power Plant (TPP)
15	Guard Pond
16	Turbo Blower -5
17	Kanthi Balancing Reservoir

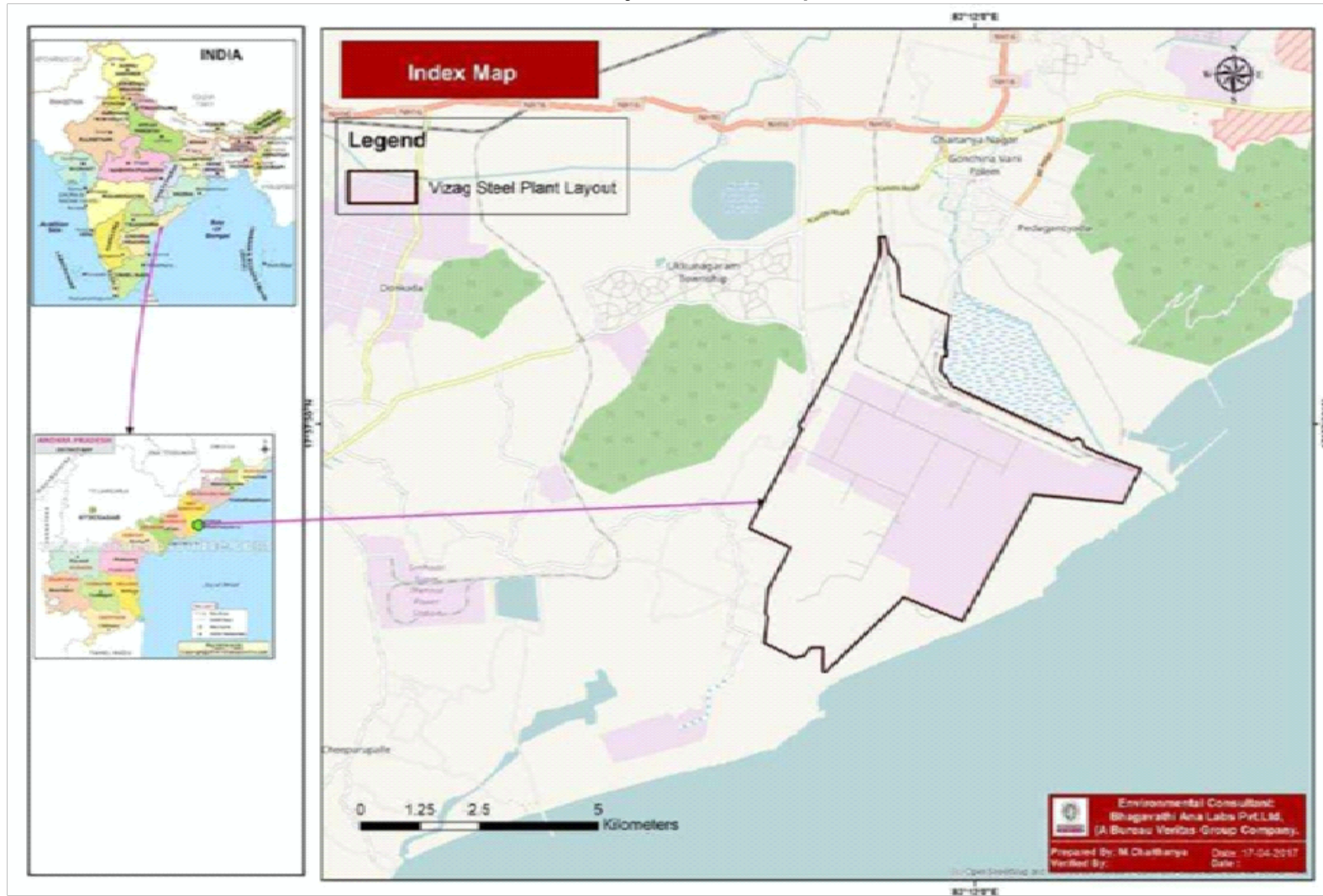
#### Location (map showing general location, specific location, and project boundary & project site layout)

The plant is located in Village Gajuvaka, District Visakhapatnam, State Andhra Pradesh. The plant lies between 17034'29" to 17038'49" N Latitude and 83009'23" to 83014'12" E Longitude in Survey of India topo sheet No. 65 O/2, at an elevation of 10 m AMSL. The total land area in possession with RINL is 8827 ha of which the plant area is 3240 ha. Since the capacity augmentation will be taken up within the existing plant boundary, therefore, no additional land will be required for this capacity augmentation project.



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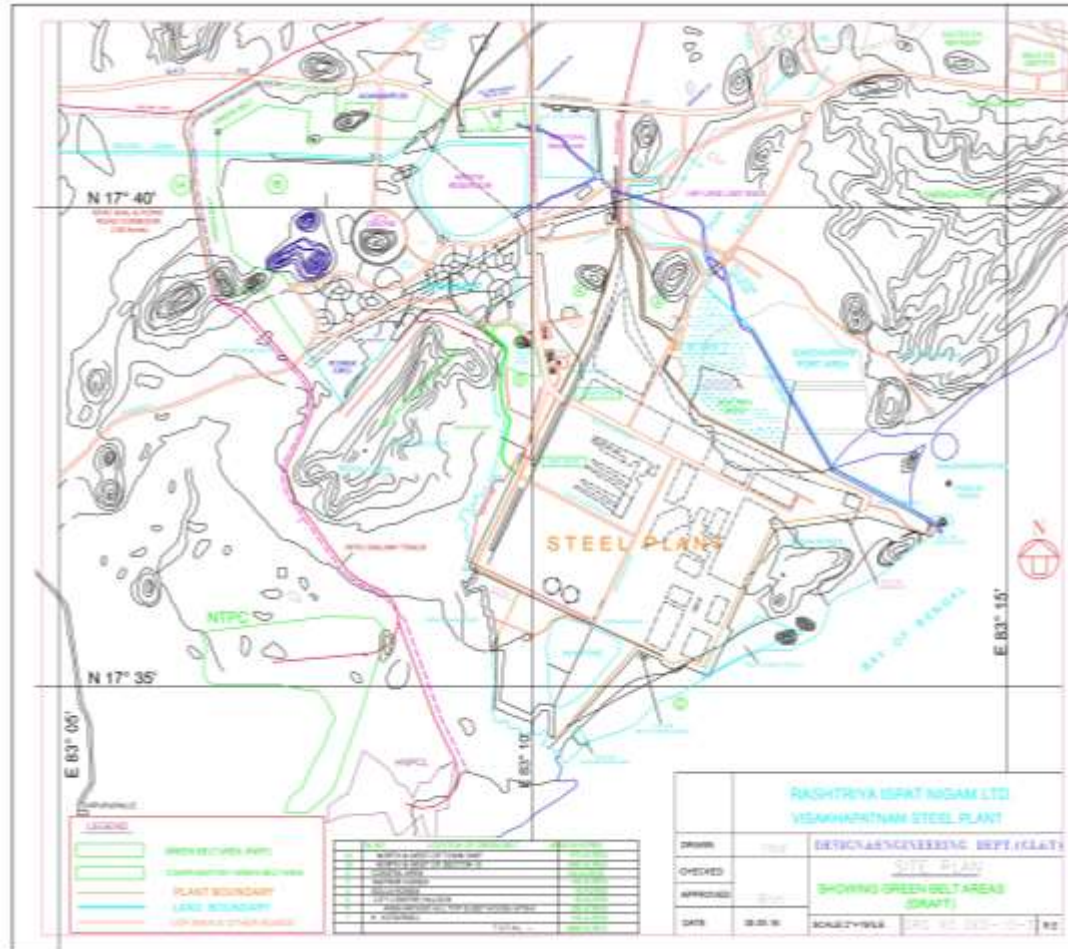
### Project Location Map





Pre Feasibility Report for the proposed Capacity Expansion from 6.3 MTPA to 7.3 MTPA by revamping and augmentation of existing facilities Gajuvaka, Visakhapatnam, Andhra Pradesh

### Layout of the Project



Details of alternate sites considered and the basis of selecting the proposed site

The proposed project is Capacity Expansion from 6.3 MTPA to 7.3 MTPA by revamping and augmentation of existing facilities Gajuvaka, Visakhapatnam, Andhra Pradesh. Hence, no alternative sites are considered.

#### Raw material required along with estimated quantity & Storage details.

For the proposed capacity augmentation from 6.3 MTPA to 7.3 MTPA liquid steel, it is estimated that nearly 3.065 MTPA minerals would be required additionally. The additional requirements of the minerals is presented in Table 2.

**TABLE 2 - RAW MATERIAL REQUIREMENT**

Sl. No.	Minerals	Quantity, MTPA
1	Sized Iron Ore	0.33
2	Iron Ore (fine)	1.06
3	PCI Coal	0.11
4	Limestone	0.20
5	Dolomite	0.15
6	Quartzite	0.015
7	Coal	1.2
	<b>Total</b>	<b>3.065</b>

Piles of about 8500, Concrete of about 0.45 million cum, Structural steel of about 11300 MT  
Sheeting & cladding materials about 0.4 million sq m

#### Availability of Water

The plant water requirement is 1,36,350 m<sup>3</sup>/day (30 MGD) and for township and others it is estimated at 36,360 m<sup>3</sup>/day (8 MGD) for 6.3 MTPA stage. The additional water required for the proposed augmentation would be 31,815 m<sup>3</sup>/day (7 MGD) of which 27,270 m<sup>3</sup>/day (6 MGD) would be required for the operation of plant and 4,545 m<sup>3</sup>/day (1 MGD) for the township and others. The water will be sourced from existing Yeleru Reservoir. RINL has accorded permission for withdrawal of 45 MGD from Visakhapatnam Industrial Water Supply Company Limited (VIWSCO) and the copy of the permission is appended in **Appendix-1**.

#### Power Requirement

The power requirement for operating the steel plant including township at 6.3 MTPA stage is 470 MW of which in plant generation is 384 MW and the balance 86 MW is drawn from APTRANCO. The additional power required for the proposed augmentation is 76 MW, which will be sourced from the APTRANCO.

#### Manufacturing Process

##### Process Route

Existing conventional Blast Furnace-Basic Oxygen Furnace (BF-BOF)–Continuous Caster Route and Rolling Mills for production of long products.

##### Process Description

The process comprises five (5) steps of operation, namely,

- i) coke making in by-product recovery type coke ovens,
- ii) sintering of iron ore fines, limestone/dolo fines, coke fines etc to produce sinter as one of the burden materials of Blast Furnaces,
- iii) iron making in Blast Furnaces by charging iron ore, sinter, coke and fluxes,

- iv) conversion of molten iron to liquid steel followed by casting of liquid steel to blooms, billets and rounds as semis in continuous casting machines and finally
- v) reheating of semis for rolling in different types of rolling mills to produce finished steel products.

The supporting production facilities are calcination of limestone and dolomite, production of oxygen, nitrogen and argon in air separation plant and captive power generation.

Following description gives a brief outline of the principal process steps stated above.

#### Coke making

Metallurgical coke is required for reduction of iron ore to produce hot metal. Metallurgical coke is produced by carbonising the coking coal at a temperature of around 10000C under reduced atmosphere in closed door multiple ovens. The coke ovens produce metallurgical coke and by-product coke oven gas which after separation of ammonia, tar, naphthalene etc is used for plant fuel purpose. The run-of-oven coke after dry quenching with nitrogen is screened to separate out the sized coke and coke breeze. This coke dry quenching (CDQ) facility provides power.

#### Sintering

Sintering is a high temperature (1200-13000C) process for sintering of iron ore fines, with coke breeze and other recycled minerals like limestone, lime fines, metallurgical process wastes, LD slag, BF flue dusts etc. Sinter plant in fact is a waste utilisation plant for the solid wastes like fines and sludges produced in the steel plant.

#### Iron making

Sized iron ore, coke, sinter along with other fluxing agents are charged to the tall vertical blast furnace for production of hot metal in presence of hot blast air. The operational temperature is around 16000C. The gangue minerals present in the iron ore are converted to slag known as BF Slag. Fe content of the ore gets converted to hot metal due to reduction of oxide ore by carbon of the coke. The hot metal after desulphurisation is ready for conversion to steel in LD converters. The BF gas after cleaning in the Wet Gas Cleaning Plant is used for fuel purpose in the plant.

#### Steelmaking

In LD converters, the desulphurised hot metal along with burnt lime, limestone and other fluxing minerals is reacted with Oxygen to oxidise the excess carbon present in the hot metal. The operational temperature of LD converter is around 17500C. The crude liquid steel so produced gets further refined by vacuum degassing and chemistry is adjusted with the addition of ferro alloys in ladle furnaces. The desired quality of steel in molten state is continuously cast in a special machine to produce semis in the form of blooms and billets respectively.

#### Rolling of semis

The billets are reheated to a temperature of around 12000C in the furnace for rolling in different types of long product mills to produce long merchant products like bars, rods, sections, tubes etc. Rolling Mills are of proprietary designs, which give the finished shape of reheated semis to the desired forms like bars, rods, angles, channels etc of commercial quality.

#### Lime calcination

Burnt lime and dolomite are required for steel making. Limestone and Dolomite are burnt in the kilns at a temperature of around 10500C to produce burnt lime and dolo, which after screening are fed to the LD Shops.

#### Air separation

Steel making in the LD Converters requires Oxygen of high purity. Air separation plant produces liquid Oxygen, Nitrogen and Argon. Oxygen lancing is required in LD Converters for converting hot metal to liquid steel of desired carbon level. Argon is required for rinsing the molten bath and Nitrogen is used by the process at various steps of operation.



## Utilities

LPG/Propane storage installation comprising of 3 nos of horizontal, cylindrical, mounded storage vessel each of capacity 75 tons inclusive of LPG/propane unloading storage evaporation and distribution system complete with all auxiliary facilities. The storage facility of LPG will be about 15.07 Cum

Nitrogen Buffer Vessel with associated pipework including valves of capacity 3.5 Cum

## **Quantity of wastes to be generated (liquid and solid) and scheme for their Management/disposal.**

The solid waste generated at 6.3 MTPA stage will be approx 11,700 TPD which includes granulated BF slag, SMS slag, mill scales, sludges, ESP/Bag filter dust etc. In addition, about 2000 TPD of coal ash will be generated at 6.3 MTPA stage. There would be additional generation of approx 1,700 TPD of solid waste. It is estimated that 100% of the granulated BF slag would be sold to the cement making industries for manufacturing of slag cement. Other waste such as mill scale, sludges, dust etc would be 100% recycled into the sinter plant. 60% of the SMS slag would also be used within the steel plant and the balance would be stored for further processing for secondary use.

Tar sludge/solid sludge generated in by-product plant will be transported to coal yard for mixing with coal. Alternatively, mechanized handling system will be explored to facilitate charging into ovens.

## Liquid Effluent

WWTP will Consists of bowl rake classifier/spiral classifier, thickener, thickener under flow pumps sludge dewatering units etc. A HRT will be provided to further reduce the sludge loading on the sludge filtration equipment. HRT under flow pumps, Separate sludge tanks will be provided to collect the sludge from the HRT and pump the same to vertical filter press (1 W +1S) of 12T/hr capacity. Working hours for same shall be 12 hrs max. The sludge tank will be provided with mechanical agitator including air agitation to maintain consistency of the sludge. For emergency handling of the sludge, sludge pumps along with pipeline will be provided at the sludge tank for pumping the sludge to the waste water treatment plant of the SMS-1.

Most part of the treated wastewater will be recycled within the plant. A small part (about 8%) of the treated effluent may get discharged to sea, maintaining the statutory norms. No untreated waste-water will be disposed of.



#### 4. SITE ANALYSIS

##### Connectivity

**Road:** Site is approachable from Gajuwaka on NH 5 connecting Howrah and Chennai. Approach to site is possible through the road network within the VSP premises.. Transportation of heavy equipment from manufacturer's works to site shall be by road and by railway network.

**Rail:** The nearest railway station is Duvvada which is about 10 km from project site. The rail line will be used for transportation of heavy equipment to the site in consultation with Indian Railways for permissible weight & height of consignments during construction period and subsequently for transportation of coal & fuel oil during operation & maintenance.

**Air:** Visakhapatnam Airport is at a distance of 12.5 km

**Port:** Gannavarm port is about 10 km from the project site.

The total land area in possession with RINL is 8827 ha of which the plant area is 3240 ha. Since the capacity augmentation will be taken up within the existing plant boundary, therefore, no additional land will be required for this capacity augmentation project. Topography (along with map)

The elevation of the contours of the site varies between 72m to 93m accounting to a level difference of 13m.

**Existing land use pattern (agriculture, non-agriculture, forest, water bodies (including area under CRZ)), shortest distances from the periphery of the project to periphery of the forests, national park, wild life sanctuary, eco sensitive areas, water bodies (distance from the HFL of the river), CRZ. In case of notified industrial area, a copy of the Gazette notification should be given.**

There is no National park, wild life sanctuary, eco sensitive areas within 10 km radius of study area.

##### Existing Infrastructure

**Location:** The plant is located in Village Gajuwaka, District Visakhapatnam, State Andhra Pradesh. The plant lies between 17034'29" to 17038'49" N Latitude and 83009'23" to 83014'12" E Longitude in Survey of India topo sheet No. 65 O/2, at an elevation of 10 m AMSL

**Industry:** Production facilities at VSP

Sl. No.	Production Unit	Facilities at 6.3 MTPA stage	Production at 6.3 MTPA stage, MT	Facilities at 7.3 MTPA stage	Production at 7.3 MTPA stage, MT
1	Coke Ovens and By-products Recovery Plant (COBP) of capacity 0.8 MTPA each	COB-1 2 COB-3 COB-4	0.695 0.695 0.695 0.695	COB-1 2 COB-3 COB-4	0.775 0.775 0.775 0.775
2	Sinter Plant	SP-1 SP-2 SP-3	2.85 2.85 3.25	SP-1 SP-2 SP-3	3.64 3.64 3.25
3	Blast Furnace	BF-1 BF-2 BF-3	2.0 2.0 2.5	BF-1 BF-2 BF-3	2.5 2.5 2.5

Sl. No.	Production Unit	Facilities at 6.3 MTPA stage	Production at 6.3 MTPA stage, MT	Facilities at 7.3 MTPA stage	Production at 7.3 MTPA stage, MT
4	Lime/dolo Plant	Kiln#1-5 Kiln#6&7	0.425 0.365	Kiln#1-5 Kiln#6&7	0.425 0.365
5	LD Shop	SMS-1 SMS-2	3.5 2.8	SMS-1 SMS-2	3.5 3.8
6	Rolling Mill	Wire Rod Mill	1.65	Wire Rod Mill	1.78
		Special Bar Mill	1.65	Special Bar Mill	1.77
		Structural Mill	1.75	Structural Mill	1.91
		Rebar	-	Rebar	0.6
		Semis (Bloom/Rounds/Billets)	1.25	Semis (Bloom/Rounds/Billets)	1.24
7	Captive Power	Coal Based Waste Gas Gas Based Nedo Sinter cooler	315 MW 69 MW 120 MW 20.6 MW	Coal Based Waste Gas Gas Based Nedo Sinter cooler	315 MW 69 MW 120 MW 20.6 MW

#### Climatic data from secondary sources.

Visakhapatnam has a tropical wet and dry/ savanna climate (Köppen-Geiger classification ) with a pronounced dry season in the low-sun months , no cold season, wet season is in the high-sun months. According to the Holdridge life zones system of bioclimatic classification Visakhapatnam is situated in or near the subtropical dry forest biome.

#### Temperature

The annual average temperature is 28.4 degrees Celsius (83.1 degrees Fahrenheit). Average monthly temperatures vary by 8.4 °C (15.1°F). This indicates that the continentally type is hyperoceanic, subtype barely hyperoceanic..

#### Rainfall

Total annual Precipitation averages 955 mm (37.6 inches).

## 5. PLANNING IN BRIEF

### (i) Planning Concept (type of industries, facilities, transportation etc) Town and Country Planning / Development authority Classification.

The major phases of the project during its implementation are as follows:

- 1) Planning & Contract Packaging
- 2) Design, Engineering, Tendering & Contract award
- 3) Manufacturing, Inspection & Expediting
- 4) Construction, Erection & Commissioning
- 5) Operation & Maintenance and Manpower Training & Placement.

During construction phase, a team of engineers headed by General Manager (Projects) of VSP supported by Implementation Consultant's Site Construction Manager & Construction supervision Engineers will supervise the activities of the EPC Contractor.

### (ii) Population Projection

The area surrounding the plant site is having many villages in 10-km radius. There would be negligible influx of population with project associated activities in the project nearby area.

### (iii) Land use planning (breakup along with green belt etc).

The proposed revamping and additional facilities are proposed in the existing project site of VSP. The land requirement for the new facilities proposed are

1. COB 5 – 112 acres
2. Kanthi Balancing Reservoir - 225 acres
3. Twin Laddle Furnace - 10 acres
4. Cast 4 - 5 acres

### (iv) Assessment of Infrastructure Demand (Physical & Social).

On Assessment of Infrastructure Demand near the project area, following are the few requirements for the nearby villages of project area.

- Colleges with ITI / Vocational Training institutions, (nearby available).
- Hospitals / Primary Healthcare centers with Ambulance facility, (-- do-)
- Fire stations, (Own as well as nearby available)
- Community halls etc., (--do--)
- Amenities/Facilities. (--do--)



## 6. PROPOSED INFRASTRUCTURE

### Industrial Area (Processing Area)

The existing area will be used for construction and development of project.

### Residential Area (Non Processing Area)

Considering all the factors and on the ground of economy, accommodation is proposed for personnel for the power Station operation and maintenance staff, staff employed in finance, administration, accounts, welfare and purchase, and staff for schools, bank, post office, hospital, park, township maintenance, for the security and firefighting staff. Guesthouse & bachelor hostels will also be provided.

### Green Belt

Out of total acquired land of 8827 ha ( 21811.99 Acres ), greenbelt has been done in 1969 ha (4866 Acres) within the plant area. On the whole about 38% of the land is afforested with the planting of 5.16 million trees. This will help to attenuate the noise levels and trap the dust generated due to operation of plant/project development activities.

The detail breakup of the greenbelt location in the project site is given below

SI.No	Location of Greenbelt	Area in Acres
1A	North and West of Township	975
1B	North and West of Sector – 12	1980
2	Coastal Area	745
3	Kappari Konda	100
4	Golla Konda	50
5	City Center Hillock	60
6	Area Around Hill Top Guest House (HTGH)	256
7	K.Kotapadu	700
	Total	4866

### Social Infrastructure

In association with the neighbouring industrial community as a corporate responsibility social infrastructure will be developed in the project study area. This development will be in association with the local bodies and village people.

On Assessment of Infrastructure Demand near the project area, following are the few requirements for nearby villages of project area.

- Schools/training institutions
- Hospitals / Primary Healthcare centers with Ambulance facility,
- Fire stations,
- Community halls etc.,

### (v) Connectivity (Traffic and Transportation Road/ Rail/Metro/Water ways etc)

#### Connectivity

**Road:** Site is approachable from Gajuvaka on NH 5 connecting Howrah and Chennai. Approach to site is possible through the road network within the VSP premises.. Transportation of heavy equipment from manufacturer's works to site shall be by road and by railway network.

**Rail:** The nearest railway station is Duvvada which is about 10 km from project site. The rail line will be used for transportation of heavy equipment to the site in consultation with Indian Railways for permissible weight & height of consignments during construction period and subsequently for transportation of coal & fuel oil during operation & maintenance.

**Air:** Visakhapatnam Airport is at a distance of 12.5 km

**Port:** Gannavarm port is about 10 km from the project site.

#### (vi) **Drinking Water Management (Source & Supply of water)**

The water will be sourced from existing Yeleru Reservoir. RINL has accorded permission for withdrawal of 45 MGD from Visakhapatnam Industrial Water Supply Company Limited (VIWSCO).

#### **Industrial Waste Management.**

##### **Solid Wastes Generation & Disposal**

The solid waste generated at 6.3 MTPA stage will be approx 11,700 TPD which includes granulated BF slag, SMS slag, mill scales, sludges, ESP/Bag filter dust etc. In addition, about 2000 TPD of coal ash will be generated at 6.3 MTPA stage. There would be additional generation of approx 1,700 TPD of solid waste. It is estimated that 100% of the granulated BF slag would be sold to the cement making industries for manufacturing of slag cement. Other waste such as mill scale, sludges, dust etc would be 100% recycled into the sinter plant. 60% of the SMS slag would also be used within the steel plant and the balance would be stored for further processing for secondary use.

Tar sludge/solid sludge generated in by-product plant will be transported to coal yard for mixing with coal. Alternatively, mechanized handling system will be explored to facilitate charging into ovens.

##### **Liquid Effluent**

WWTP will Consists of bowl rake classifier/spiral classifier, thickener, thickener under flow pumps sludge dewatering units etc. A HRT will be provided to further reduce the sludge loading on the sludge filtration equipment. HRT under flow pumps, Separate sludge tanks will be provided to collect the sludge from the HRT and pump the same to vertical filter press (1 W +1S) of 12T/hr capacity. Working hours for same shall be 12 hrs max. The sludge tank will be provided with mechanical agitator including air agitation to maintain consistency of the sludge. For emergency handling of the sludge, sludge pumps along with pipeline will be provided at the sludge tank for pumping the sludge to the waste water treatment plant of the SMS-1.

Most part of the treated wastewater will be recycled within the plant. A small part (about 8%) of the treated effluent may get discharged to sea, maintaining the statutory norms. No untreated wastewater will be disposed of.

#### **Power Evacuation & Supply / source.**

The power requirement for operating the steel plant including township at 6.3 MTPA stage is 470 MW of which in plant generation is 384 MW and the balance 86 MW is drawn from APTRANCO. The additional power required for the proposed augmentation is 76 MW, which will be sourced from the APTRANCO.



## 7. REHABILITATION AND RESETTLEMENT (R&R) PLAN

**Policy to be adopted (Central/State) in respect of the project affected persons including home outstees, land outstees; and landless labourers (a brief outline to be given)**

The proposed project is an expansion project. Hence, no Rehabilitation and Resettlement Plan is involved.

## 8. PROJECT SCHEDULE & COST ESTIMATES

Likely date of start of construction and likely date of completion (Time schedule for the project to be given).

### 8.1 Project Implementation

For implementing this project within the desired time and cost schedules, it is essential to undertake meticulous planning, right from the conceptual stages. Following aspects of the project implementation will be crucial:

- Effecting timely project development activities, including securing various approvals / NoC's / permissions for each component of the integrated project.
- Selection of a prospective developer simultaneously along with approvals.
- Finalization of mode of project implementation (EPC mode and O&M contracts for individual project components), along with experienced owner engineering / consultancy team for effective monitoring of the implementation / commissioning of each component as per the schedule, is recommended. VSP proposes to appoint experienced project engineering management consultancy firm, as well as experienced in-house project team for the purpose.
- Manpower and resource mobilization at required time and effectively

### 8.2 Project Schedule

Completion schedule is 60 months from the date of obtaining all clearances and Go-Ahead date.

The major activities to be carried out after the financial closure will include

- i. Detailed design engineering and specifications
- ii. Preparation of EPC / package bid cum, bidding, bid evaluation, recommendations and contracting for civil, mechanical, electrical and instrumentation components as well as Kick off meetings with individual vendors / contractors.
- iii. Vendor drawing review and approvals, inspection and expediting and delivery at site
- iv. Engineering services for wrap around of all packages.
- v. Site supervision for erection, testing & commissioning
- vi. Bidding, contracting and signing of O&M contracts
- vii. Plant stabilization and development of MIS

### 8.3 Estimated project cost along with analysis in terms of economic viability of the project.

#### Estimate Of Project Cost

The total cost of the project is estimated to be about

S.No	Facility	Cost in Rs. Crores
1	Revamping of Sinter Plant 1 &2	489
2	Revamping of SMS-1	354
3	Installation of Conv.3 & Caster4 (SMS -2)	975
4	Installation of LPG storage facility	15.07
5	Installation of Nitrogen Plant	3.5
6	Installation of Twin Ladle Heating furnace in SMS 2	106
7	Revamping of Blast Furnace 1	656
8	Revamping of Blast Furnace 2	943
9	Installation of Re bar mill	431
10	Installation of Coke Oven Battery -5	2857.66
11	Revamping and Modernization of Continuous Casting Department	633.1
12	Revamping and upgradation of Walking beam type reheating Furnaces of the light and medium merchant mill (LMMM)	203
13	Rebuilding of coke oven battery no. 1	944.42



Pre Feasibility Report for the proposed Capacity Expansion from 6.3 MTPA to 7.3 MTPA by revamping and augmentation of existing facilities Gajuvaka, Visakhapatnam, Andhra Pradesh

S.No	Facility	Cost in Rs. Crores
<b>OTHERS</b>		
14	Revamping & Upgradation of Electrostatic Precipitators of Two Boilers in Thermal Power Plant (TPP)	70.38
15	Guard Pond	12.55
16	Turbo Blower -5	280
17	Kanthi Balancing Reservoir	465.85
	<b>Total</b>	<b>9439.53</b>





## 9. ANALYSIS OF PROPOSAL (FINAL RECOMMENDATIONS)

### 9.1 Financial and social benefits with special emphasis on the benefit to the local people including tribal population if any, in the area:

The expansion would create new employment opportunities to local people directly and indirectly. Hence, scope for development of the local population economically is envisaged.



**Appendix - I  
(Water With Drawl Permission)**

**CERTIFIED COPY OF MINUTES OF AGENDA ITEM NO. 43/7 OF 43<sup>RD</sup> MEETING OF THE BOARD OF DIRECTORS HELD ON 24<sup>TH</sup> DECEMBER 2009 AT HYDERABAD.**

**AGENDA ITEM NO.43/7**

**ADDITIONAL RAW WATER REQUIREMENT BEYOND 127 MLD FOR VSP**

RINL vide its letter No. GM(W)/284/D-54 Dated 28<sup>th</sup> October 2008 address to VIWSCO informed that keeping the completion schedule of erection and commissioning of expansion units in view and further continuous operation of the same the total water requirement for VSP is as below:

- From April 2009 – May 2010 - 150 MLD to 163 MLD
- June 2010 – Dec 2010 - 163 MLD to 204 MLD
- Dec 2010 onwards - 204 MLD

2. Further RINL vide its letter No. VSP/D(O)/T-34/D-071 dated 24-04-2009 addressed to Secretary, Irrigation, GoAP, Hyderabad notified following additional requirement pursuant to provisions of Clause-5.1 (C) of the BWSA

- From June 2010 – Dec 2010 - 163 MLD to 204 MLD
- Dec 2010 onward - 204 MLD

3. RINL vide its letter No. W(K)/D(O)/T-34/D-102 dated 13<sup>th</sup> July 2009 forwarded a draft supplementary Agreement to BWSA for requirement of additional water beyond 127 MLD from June 2010.

4. In various recently held meetings RINL had been insisting for written commitment from VIWSCO for supply of additional quantities required by them as projected in the Cash Flow statement for rehabilitation. Quantities projected by them are 28 MGD, 40 MGD and 45 MGD for 2009-10, 2010-2011 and 2011-12 and thereafter respectively. The above quantities work out approximately to 127 MLD, 182 MLD and 205 MLD respectively.

5. The provisions in Bulk Water Supply Agreement with RINL with regard to supply period, quantities during respective supply periods, procedure for demanding additional quantities, interest, rates, special rates, prevailing water supply position, feasibility to supply the required quantities subject to availability, necessity to increase the rate etc., were submitted to the Board for its consideration and decision.

6. After some discussions the Board decided to issue letter to RINL confirming supply as scheduled below:

SNo	year	Quantity	
		MGD	MLD
1	2009-10	28	127
2	2010-11	30	136
3	2011-12	32	145
4	2012-13	35	159
5	2013-14	40	182
6	2014-15	45	205

subject to availability of required water in Godavari River and Yeleru Reservoir and subject to enhanced rate which will be negotiated and settled mutually. The Board authorized CMD to issue the letter accordingly.

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for Visakhapatnam, India  
Water Supply Company Ltd.

*[Handwritten Signature]*

**DIRECTOR**

