EXECUTIVE SUMMARY
FOR

EXPANSION OF STEEL PLANT FROM 1.0 MTPA TO 2.0 MTPA

AT

WARDHA, MAHARASHTRA

11.S2.2015.EE2184 **February, 2015**

Project Proponent

Uttam Value Steels Limited

Environmental Consultant

मेकॉन लिमिटेड
भारत सरकार का संस्थान
MECON LIMITED
(A Govt. of India Enterprise)

EXECUTIVE SUMMARY

1.0 INTRODUCTION

Uttam Value Steels Limited (UVSL) intends to enhance the steel manufacturing capacity from 1.0 MTPA to 2.0 MTPA at Village Barbadi, Bhugaon and Selukata, Bhugaon Link Road, District Wardha, Maharashtra and produce Hot rolled coils/sheet/plates, Long products (Bar & Rods), Cold Rolled coils & sheets and Galvanized coils & sheets, Colour Coating Product and Pipes to meet the requirements of the customers. The expansion facilities will be built within the existing facilities.

UVSL has submitted Form-I on 8th October, 2012 to The Ministry of Environment, Forest and Climate Change for prescribing Terms of Reference (TOR) for expansion of Steel Plant from 1.0 MTPA to 2.0 MTPA within the existing plant premises at the above mentioned location at Wardha, Maharashtra. The following TOR has been finalised during the 8th Reconstituted Expert Appraisal Committee (Industry) of Ministry of Environment & Forest held on 16th to 17th May, 2013 for preparation of EIA/EMP report for the expansion project.

EIA/EMP report has been prepared based on the approved TOR and contains all the information as per the generic structure of EIA.

M/s Uttam Galva Steels Limited (UGSL) is the first company promoted by Miglani family which has its registered and corporate office located at Uttam House, 69, P.D'Mello Road, Mumbai – 400009, India. M/s UGSL is a producer of cold rolled steel (CR), galvanized products comprising galvanized plain (GP), galvanized corrugated (GC) coils and sheets and colour coated products. The company is in the business of procuring hot rolled steel (HR) and processing it into CR and further into GPs. The one million tonne plant is at Khopoli on Mumbai-Pune road. Its facilities are mainly in thinner gauge materials.

The proposed site is located at Bhugaon- Barbadi- Selukate in Wardha district of Maharastra state between latitude 20°42'12" N and longitude 78°38'15" E. The State highway No. SH-243 joining Wardha and Vaygaon passes about 2 km away from site on the West side. The site is approximately 5 km South of Wardha Town. The Wardha railway station of central railway is located 7 km from the site. The site is at an elevation varying from 270 to 280 m above MSL.

The proposed plant falls under Category 'A' (Sl.No. 3 (a) of Schedule : "Primary and Secondary Ferrous Metallurgical Industries") and intends to produce Hot rolled coils/sheet/plates, Long products (Bar & Rods), Cold Rolled coils & sheets and Galvanized coils & sheets, Colur Coating Product and Pipes based on DRI-SCRAP-EAF-CCM-B&R mill Route of steel making.

2.0 PROJECT DESCRIPTION

Uttam Value Steels Limited (UVSL) intends to enhance the steel manufacturing capacity from 1.0 MTPA to 2.0 MTPA at Village Barbadi, Bhugaon and Selukata, Bhugaon Link

Road, District Wardha, Maharashtra and produce Hot rolled coils/sheet/plates, Long products (Bar & Rods), Cold Rolled coils & sheets and Galvanized coils & sheets, Colur Coating Product and Pipes to meet the requirements of the customers. The expansion facilities will be built within the existing facilities. for Techno-Commercial viability of entire steel complex. The existing and proposed capacities are presented below.

The existing and proposed capacities of the project

Sr No.	Name of the Product	Existing (MTPA)	Proposed (MTPA)	Total Capacity (MTPA)
01	Hot Rolled Coils / Sheets/Plates	1.000	0.500	1.500
02	Long Product (Bar & Rods)	-	0.500	0.500
	Total	-	1.000	2.000
	Further Processing for Value addition			
A	Cold Rolled Coils & Sheets	0.225	0.375	0.600
B	Galvanized Coil & Sheets	0.225	0.375	0.600
	Finishing Line			
A	Colour Coating Product	-	0.300	0.300
B	Pipes	-	0.250	0.250

3.0 Land Use Pattern in the Study Area

Existing land use in the study area has been studied through Satellite image processing (Resource at LISS III, January,2008) with Satellite data of 23.5 m resolution. Existing land use of the study area radius of 10 kms are given below.

Approximate land Use in the Study Area

Sr. No.	Land Feature	Area in Sq.Km	Area in Hectres	Percentage
1	Agriculture	231.280	23128.023	73.859
2	Barren Land	28.370	2836.997	9.060
3	Dual Road	2.613	261.279	0.834
4	Fallow_Land	5.824	582.378	1.860
5	Habitation	29.673	2967.329	9.476
6	Canal	0.519	51.874	0.166
7	Industrial Area	3.131	313.067	1.000
8	Layout	5.853	585.293	1.869
9	Marshy Land	0.164	16.440	0.053
10	Mining Area	0.163	16.253	0.052
11	Nala	0.781	78.110	0.249
12	Plantation	1.641	164.118	0.524
13	Pond	0.910	90.982	0.291
14	Quarry	0.866	86.648	0.277

15	Railway	0.283	28.272	0.090
16	Railway Property	0.568	56.786	0.181
17	River	0.501	50.098	0.160
Total		313.139	31313.948	100.000

Land use for the Expansion Project does not involve any Resettlement & Rehabilitation issues.

3.1 Biological Environment

The project site lies within the existing plant premises of UVSL. The land on which the proposed project is coming, most of which is barren with occasional shrubs and on the periphery is planted with greenbelt.

The study area covers 10km radius around the project site. The area exhibits plain topography. The study area falls under **Tropical Wet and Dry** climate region and the agro-climate is characterised by **hot, dry, and subhumid** bioclimate with dry summers and mild winters. The area is plain and predominantly with agro-ecosystem and poor irrigation facilities. There is no forest area, wildlife and bird sanctuary within the study area. The soil in the area has low to medium fertility with reference to its agricultural production potential. In the study area, no rare, threatened or endangered plant species have been encountered.

4.0 DESCRIPTION OF THE ENVIRONMENT

4.1 Introduction

The study area was taken as 10 km radius from centre of the plant around the project site. The baseline environmental data were generated and compiled during in 2013 (Continuously for 13 weeks) for meteorology, air quality, water quality, noise levels and soil characteristics by setting up a number of monitoring stations. Further, existing ecological, geological, hydrological and socio-economic features were also studied. The collected data were analysed for identifying, predicting and evaluating environmental impacts. The maximum anticipated impacts were assessed and based on which an environmental management plan has been drawn.

4.2 Meteorology

A meteorological station was set up at project site. The predominant wind directions were W (21.6%), NW (14.5%) and SW (12.9%). Calm conditions prevailed for 9.0% of the time. The wind velocity was mostly between 1.0 to 5.0 km/hr. Ground based inversions and mixing height were also collected from IMD (Indian Meteorological Department) publications for Nagpur.

4.3 Ambient Air Quality (AAQ)

Nine AAQ monitoring stations were monitored. During the monitoring period, 24 hourly samples were collected twice a week for PM 10, PM 2.5, SO_2 and NO_x whereas for

CO three one hourly samples were taken on each monitoring day. It was observed that the average value for PM 10 and all the values of PM 2.5, SO2, NOx and CO during the monitoring period are well within the norms for Industrial, Residential, Rural and other area.

Summarised Results of AAQ Monitoring During Summer around Wardha

Parameters		Results (µg/m^3)								
		Plant Gate **(A1)**	China Colony **(A2)**	Bapukuti Sewagram Area **(A3)**	Mandavgarh Village **(A4)**	Bhugaon Village **(A5)**	Kurjhadi Village **(A6)**	Salod Village **(A7)**	Borgaon Village **(A8)**	Wardha (Anand Nagar) **(A9)**
PM -10	Max	70.3	63.8	62.6	63.8	66.3	53.4	62.8	69.2	77.2
	Min.	59.8	50.2	40.5	51.8	53.5	44.5	48.8	58.6	58.4
	C_{98}	70.3	63.2	62.1	63.2	66.2	53.1	62.2	69.1	77.1
	Avg.	65.1	57.0	50.5	59.4	59.9	49.1	56.1	63.3	68.6
PM -2.5	Max	42.6	43.7	22.4	24.6	34.5	21.4	26.4	33.4	38.9
	Min.	32.6	36.9	14.6	18.1	26.5	16.5	17.6	24.9	26.5
	C_{98}	42.4	43.1	22.2	24.3	34.2	21.1	26.1	33.3	38.7
	Avg.	38.3	40.6	18.4	21.5	30.3	18.6	21.4	28.0	32.5
SO_2	Max	19.6	16.7	13.1	10.4	17.6	11.8	11.3	13.8	18.6
	Min.	15.4	13.2	8.6	7.2	13.6	8.9	8.6	10.2	14.8
	C_{98}	19.4	16.5	13.1	10.2	17.5	11.6	11.2	13.6	18.4
	Avg.	17.2	15.1	11.2	8.7	15.8	10.1	10.0	12.1	16.5
NO_X	Max	35.4	26.4	28.0	22.4	33.9	23.3	21.3	30.1	36.9
	Min.	18.3	15.9	11.6	10.4	18.4	11.0	10.9	13.4	17.4
	C_{98}	35.2	26.2	28.0	22.1	33.6	23.1	21.1	30.1	36.5
	Avg.	23.6	19.7	18.7	15.1	24.8	15.9	14.8	19.3	26.3
CO	Max	2162	1362	1264	1518	1432	1358	1643	1431	1649
	Min.	1352	896	892	627	856	862	762	852	984
	C_{98}	1375	942	934	729	862	924	943	857	1062
	Avg.	1696	1087	1071	993	1123	1053	1183	1138	1238
O_3	Max	41.0	40.0	43.2	53.2	41.5	42.3	42.8	40.9	41.3
	Min.	27.2	27.4	29.7	29.9	28.5	28.2	28.4	26.7	28.0
	C_{98}	40.0	39.0	43.1	53.0	41.3	42.1	42.7	40.8	41.2
	Avg.	34.1	33.7	36.4	41.5	35.0	35.2	35.6	33.8	34.6
NH_3	Max	12.6	11.8	12	11.4	11.2	9.2	10.7	10.8	13.4
	Min.	6.5	4.2	3.9	3.4	5.6	1.4	2.6	4.7	6.5
	C_{98}	12.4	11.6	12	11.3	11.1	9.1	10.5	10.6	13.2
	Avg.	8.9	7.7	7.8	6.7	8.1	4.8	6.0	7.1	9.3
Pb	Max	0.046	0.032	BDL	BDL	0.03	BDL	BDL	0.031	0.052
	Min.	0.016	0.014	BDL	BDL	0.014	BDL	BDL	0.014	0.016
	C_{98}	0.046	0.032	BDL	BDL	0.03	BDL	BDL	0.031	0.052
	Avg.	0.028	0.002	BDL	BDL	0.020	BDL	BDL	0.021	0.033
As ng/m^3	Max	1.24	1.09	BDL	BDL	1.2	BDL	BDL	1.21	1.64
	Min.	0.43	0.36	BDL	BDL	0.38	BDL	BDL	0.45	0.48
	C_{98}	1.24	1.09	BDL	BDL	1.2	BDL	BDL	1.21	1.64

Parameters		Results (µg/m^3)								
		Plant Gate **(A1)**	China Colony **(A2)**	Bapukuti Sewagram Area **(A3)**	Mandavgarh Village **(A4)**	Bhugaon Village **(A5)**	Kurjhadi Village **(A6)**	Salod Village **(A7)**	Borgaon Village **(A8)**	Wardha (Anand Nagar) **(A9)**
	Avg.	0.82	0.69	BDL	BDL	0.76	BDL	BDL	0.78	0.98
Ni ng/m^3	Max	2.56	2.13	BDL	BDL	1.8	BDL	BDL	1.64	2.69
	Min.	0.96	0.53	BDL	BDL	0.69	BDL	BDL	0.59	0.98
	C_{98}	2.53	2.11	BDL	BDL	1.7	BDL	BDL	1.62	2.67
	Avg.	1.7	1.2	BDL	BDL	1.0	BDL	BDL	1.02	1.6
BaP	Max	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Min.	ND	ND	ND	ND	ND	ND	ND	ND	ND
	C_{98}	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Avg.	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	Max	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Min.	ND	ND	ND	ND	ND	ND	ND	ND	ND
	C_{98}	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Avg.	ND	ND	ND	ND	ND	ND	ND	ND	ND

BDL = Below detection limit

ND = Not Detected

4.4 Water Environment

A total of sixteen water-sampling locations were selected for the present study (8 surface water & 8 ground water). The water sampling locations were selected up gradient and down gradient of the project site.

The surface water quality was compared with CPCB norm for surface water. The surface water quality is not within the norms for Classes A, B, C, D, and E. The results indicate that surface water is not fit for drinking purposes.

Results of ground water analysis were compared with IS: 10500 (IS: 10500; 1991, amendment no.1, 1993 - norms for drinking water). All the parameters at the eight locations are well within the permissible limit of the norm (IS: 10500, 1991).

4.5 Soil

Five samples of top soil were collected and were analysed. The analysis results indicate that soils in the region are more or less of alkaline pH. Availability of Nitrogen & Phosphorus was medium to high in all the samples. Potassium was medium to high. Organic carbon content is medium to high in all the samples. Overall, the soil fertility in the area is good for plant growth.

4.6 Ambient Noise

The noise monitoring was done at nine locations. The values are well below the respective statutory norms as applicable.

4.7 Ecological Features

There is no suitable habitat for occurrence of ecologically important fauna in the area. Most of the avifauna that is found is associated with agriculture and human habitation and dominated by granivores, insectivores and omnivores. Since there are no forests around, the trees and shrubs on field bunds and roadsides provide important resting, breeding and perching sites. The trees Ficus and Neem provide important feeding and resting sites for birds especially when no food is available elsewhere in summer.

No endangered species have been reported in the study area. The mammalian fauna is limited and does not show much diversity. They mainly constitute domesticated animals and rodents. The area harbours granivores avian fauna because agricultural grains in the field provide food for such birds.

Due to lack of any forest area and biotic interference the only animals found in the study area are few rodents, reptiles and birds. Due to human interference, in general the availability of animals in the study area is low.

5.0 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

5.1 Impact during Construction

The proposed expansion plant will come up in the existing plant premises. Large-scale excavation, soil erosion, loss of topsoil is expected. Moreover, Wardha is already a fairly well developed area with all sorts of infrastructure available. Therefore influx of construction labour is not expected to change present land use pattern. Further this land use change if any, during construction is only temporary and will persist during construction phase only.

5.2 Operational Phase Impact

During operation of the plant, environmental releases in the form of air emissions, wastewater discharges, solid waste & noise may affect air, water, land and ecological environment directly. In addition to the above primary impact, some indirect impact on the surrounding socio-economic environment may also take place. Impacts & mitigation measures envisaged are mentioned below in brief.

I. Air Environment

In this report, the dust content of flue gas is taken as 50 mg/Nm^3. Accordingly, sources and emitted pollutants are a straightforward addition, which can be directly used as source data input in the ISCST-3 model to assess the additional contribution from the expansion plant to the background concentrations.

The following mitigation measures are envisaged in the design stage of the expansion plant.

Sl. No	Area of operations	Air pollution control measures proposed to be adopted	Design limits
1.	**Raw material handling**		
	Fugitive emissions in material handling	• Dust suppression systems (chemical and dry fog type) • Water sprinklers • DE systems with bag filters in case of conveyors, lime handling	As per Norms
2.	**SMS Shop**		
	EAF	• Secondary fume extraction system	Stack: 50 mg/Nm^3
3.	**Bar & Rod Mill**	• Low NOx burner	Stack: 50 mg/Nm^3
4.	**Lime & Dolo Plant**	• Bag Filter	Stack: 50 mg/Nm^3

All the emissions from different stacks will be kept within the norm. Stack emission details are based on the consumption, gas balance, prevailing emission factors as available in literature, suppliers, from other steel plants and different statutory regulations prevailing in the country.

Meteorological data used as input data of the model during computation were generated during the monitoring period. Spatial distribution of hourly mixing depth over Indian region published by CPCB (Central Pollution Control Board) has been used for mixing height.

The predicted GLC (Ground Level Concentrations) values are given below.

Prediction of GLC's at 2.0 MTPA

Sl. No	Description	Pollutants*		
		PM	SO_2	NO_x
1	Predicted Maximum ground level concentrations	3.12 (10,9)	16.97 (10.5, 10)	2.60 (10,9)
2	Fugitive emission concentration	0.43 (10.2,9.5)	-	-
3	Monitored maximum Average background concentrations	77.2	19.6	36.9
4	Total maximum concentrations	80.75	36.57	39.50

	Norms 1. Industrial, Residential, Rural and other areas	100	80	80

**Concentrations are in µg/m3 and of 24hours averaging time*
Values in the parenthesis indicate the coordinates of the grid points in Km in the direction of occurrence from the plant stacks. Plant location at (10, 10)

It is clear from the above that after expansion, the net change in RPM, SO2 and NOx will not be appreciable and the final concentrations will be well within the MOE&F norm for residential and rural areas. Thus it can be clearly concluded that there will not be any adverse changes in AAQ in the study area.

II. Impact on Water Environment

Effect of Water drawal & Water Usage

The proposed plant draws its requirement of raw water from balancing reservoir which in turn receives water from the pumping station on river Dham. Water is supplied to the plant for different activities from the balancing reservoir directly. In addition to this, water is also supplied to the plant from the reservoir after treating it in a water treatment plant.

Surface Water Pollution

During the design phase, all efforts have been made to adopt latest state of art technology and to install adequate effluent treatment facilities for different units expected to generate water pollutants, details of which are given in brief below:

- Re-circulating water in the process whereby discharged volume is minimum.
- Clarifier and sludge pond for removal of suspended solids.
- Neutralisation of acidic water by lime.
- Removal of oil and grease from the contaminated water by means of oil traps , skimming devices, etc.

The effluent quality will be kept within the permissible limits of MPCB/MoEF.

Ground Water Pollution

The proposed plant does not envisage any ground water drawal and hence no impact on ground water availability around the plant is anticipated. In addition, rain water harvesting measures are envisaged in the proposed project to re-charge/re-use the water to keep the water drawal at minimum.

III. Impact of Solid Waste Disposal

It is expected that about 94 t/day SMS slag will be produced from the proposed steel plant. Flue dust from the SMS plant will be around 11t/day and Mill scale will be around 4.31 t/day. SMS slag shall be dumped in the area ear marked for solid waste management site within the plant, which will have suitable monitoring system to monitor the groundwater contamination if any. Mill scale will be sold in the open market.

UVSL is also proposing to install a slag granulation plant and make briquettes or pellets to be used in road laying / paving of areas, which is in practice in some of the east Asian countries.

All the solid/hazardous wastes will be utilized/disposed as per statutory guidelines.

IV. Impacts on Noise Levels

During plant operations, noise generated will be close to the compressors and blowers and as a result, will be confined within respective area of the units, thus will not have any impact out of the plant boundary. The incremental noise at the boundary because of proposed plant will be negligible and the ambient noise will be within the norms.

V. Impact on Ecological Features

The project site is within existing plant premises, thus change in land-use pattern will not be there and will not cause any significant loss of habitat. The project site comprises shrubby vegetation on some of the plateau and big trees in patches in plain areas, all care will be taken to avoid cutting of these vegetation. Efforts shall be made to have minimum damage to the existing vegetation and to amalgamate the existing vegetation with the green belt / cover plan.

The proposed project is designed for maximum re-circulation. The project and domestic waste water will be treated and after treatment the same will be used for gardening purpose. A small amount of effluent after treatment will be discharged from the proposed plant thus there will be no impact on the ecological components of surface water bodies in the area.

6.0 ENVIRONMENTAL MONITORING PROGRAMME

A detailed Environmental monitoring programme has been envisaged with the following objectives to ensure proper & effective implementation of the proposed mitigation measures.

- To evaluate the performance of mitigation measures proposed.
- To evaluate the adequacy of Environmental Impact Assessment.
- To suggest improvements in environmental management plan, if required.
- To enhance environmental quality.
- To implement and manage the mitigative measures defined in EMP.

Environmental aspects like Meteorological data, Stack emission monitoring, solid/hazardous wastes generation/utilisation, Green belt development, House keeping, Work zone air quality, Work zone noise, Ambient Air Quality, Ambient Noise, Effluent quality, Ground water quality etc. will be monitored as per the details worked out in the Environmental Monitoring Programme. The Monitoring plan specifies the parameters to be monitored, Location of the monitoring sites, Frequency and duration of monitoring, Applicable standards & Institutional responsibilities for implementation and supervision.

7.0 ADDITIONAL STUDIES

The present expansion project is of crucial importance for making it economically viable. At the same time viable project will help long-term development of the region and the state. Public consultation, Risk Assessment and Socio-economic assessment were carried out. Overall the project is going to improve the socio-economic condition of the area with negligible risk.

8.0 PROJECT BENEFITS

The following impacts are anticipated in the study area:

- The project is not going to cause any damage to the existing agricultural situation. Instead, it is likely to provide the farmers with non-farm income.
- The project is going to foster the change in pattern of demand among people of the study area by way of shift from food items to non-food items.
- There will be a positive employment and income effects, both direct as well as indirect.
- The project has strong positive effect on average consumption in the study area, which is likely to lead to increase average income through multiplier effect.
- There is a possibility increase in industrialisation in the vicinity of the project area. This is likely to bring more skill diversification among local people.
- Overall peoples' perception on the project is good.
- Community development activities are going to be implemented due to the proposed project.
- The project has positive impact on educational status of people of the study area.

9.0 ENVIRONMENTAL MANAGEMENT PLAN (EMP)

9.1 Management Policy

Management has adopted a two-pronged strategy to abate pollution, as follows:

- Installation of new state of art pollution control equipment at the design stage itself.
- By developing a very strong monitoring/analysis and inspection setup for compliance.

9.2 Mitigation measures in the Proposed Project

Mitigative measures for air, water & noise pollution control, solid /hazardous waste management have already been envisaged in the proposed project. Environmental mitigation measures are also a part of equipment and will be commissioned along with the main equipment. Also, critical emission parameters have been covered under the performance guarantee clause so that to ensure compliance.

For proper implementation of the above, an organizational set-up, Laboratory set-up, functioning of the above, training, co-ordination with internal/external agencies have already been planned.

9.3 Air Pollution : Mitigation Measures

The expansion plant is taking a number of measures to control air pollution. The remedial and control measures planned to be adopted are discussed briefly in the following sections.

Fugitive Dust Emission Control

Raw Materials Handling (RMHS) Section

To control the fugitive dust emissions at the stock piles on the ground, conveyor transfer points, vibrating screens, etc which would be major source of fugitive dusts, both water sprinkling and dry fogging (DFDS) would be adopted for dust suppression. The DFDS system generates a layer of fine water droplets (fog) that a dust particle cannot pass through without colliding with water droplet. It does not use any chemicals as dust suppressant agent. DF requires only compressed air and water pressure for atomization through specially designed nozzles. DF is applicable for coal dusts, coke dust, ore dust etc which are non-reactive with water – if the material is not hot.

For lime dust abatement, conventional dust extraction (DE) would be adopted. The Dust Extraction system will comprise of pulse jet type bag filter, centrifugal fan with motor and other accessories, suction hood, duct work, stack, etc. will be provided. The pollution Control Facility at RHMS can be summarized as:

- Stock Pile & Wagon Tripler – Plain water spray
- Rest all transfer point – DFDS
- All crusher House – Bag Filter based Dust Extraction.
- DE system with bagfilters in case of crusher house of lime/dolo handling plant.

SMS

Material Handling Operations

The SMS would be one of the prime sources of fugitive dust emissions during material handling operations, charging / tapping / blowing, argon rinsing, steel pouring, de-slagging etc. Air pollution control system comprising of suction hood, duct and bag filters

are provided in the SMS for bulk material charging system, mixer, desulphurization and LF.

Point Source Dust Emission Control

Wherever there is fuel gas fired combustion systems like reheating furnace where cleaned fuel gases are used as fuel, no dust emission control devices are proposed.

Process Dust Emission Control

All bag filters shall have bags with non-adhesive coating to avoid blinding of bags and no air infiltration into bag house including ducting shall be ensured. However, the suitability of non-adhesive coating for specific application will be examined during detailed engineering. Pug mills shall be provided below dust silos to prevent secondary pollution / fugitive emission during unloading of dust. The collected dust from bag filters shall be transported to near by material handling system. In case this is not feasible, the same will be transported by trucks to consumer points.

Gas Cleaning System

A dry gas cleaning plant will be installed.

EAF – Convertors / LF

EAF Gas Cleaning System

The dust cleaning (of primary gases) system will be of venturi scrubber type.

Secondary Refining

During secondary refining process, the gases generated during mixing and de-sulphurisation process will be contaminated with dust. A centralised secondary dust and fume extraction system for Converters and LFs will comprise of Bag Filter suction hood, ducts and stacks.

Gaseous Emission Control

SO_2 Emission Control

The main sources of sulphur dioxides from the proposed expansion in the steel plant will from the L.D.O. used in SMS- Ladle drier & Tundish preheating and furnace oil in BAR & Rod MILL - Reheating furnace.

NO_X Emission Control

The source of NO_X will mainly be thermal NO_X during combustion of fuels. It is therefore proposed to have combustion control devices by adopting waste gas recirculation and

introducing secondary air in the combustion process. For this using low NOx burners so as to minimize the formation of NO_X will be installed to limit combustion temperature in different units as feasible.

9.3.1 Water: Mitigation Measures

Water used and discharged from these plants are mainly from indirect cooling circuit which are not normally contaminated with any major pollutants. However occasional discharges are made as bleed off when there is built up of dissolved solids in the circulating water due to repeated circulation. The dissolved solids are mainly different salt constituents of calcium and magnesium already present in water. Thus major portion of water will be re-circulated after necessary physical treatment e.g settling, cooling etc. except for the bleed off portion, which is required to be discharged for the reasons, explained above. Some of the measures taken to reuse the wastewater generated in the plant will be:

- The wastewater generated from SMS gas cleaning plant, containing mainly suspended solids, will be treated in scale pit and after physical treatment will be reused in the system.
- The wastewater generated from Billet & Bloom caster recirculation circuit, containing mainly Suspended Solids and Oil & Grease, will be treated in scale pit and after physical treatment will be reused in the system.
- The wastewater generated from Bar & Rod Mill recirculation circuit, containing mainly Suspended Solids and Oil & Grease, will be treated in scale pit and after physical treatment will be reused in the system.

Blow down from the above units will be collected in a settling tank and will be used for dust suppression & Green Belt Development within the plant premises.

Rain water harvesting: While developing the Plant General Layout, it will be ensured that rain water is harvested. There are two methods in the field of rainwater harvesting, viz. rainwater recharging and rainwater collection & reuse.

Recharge may be defined as the process of augmenting the groundwater table by providing artificial infiltration techniques which will reduce the excess surface run off and increase the storitivity of the soil. Other is the process of utilizing the rainwater by means of its collection. Collected water can be utilized for industrial and domestic purposes.

Run-off water from the administrative building roof will be collected and stored for future use.

Sanitary wastewater treatment: A sewage treatment plant will be provided for the expansion plant and treated waste water will be utilised for afforestation.

9.3.2 Solid Waste: Mitigation Measures

The source of solid waste generation along with their re-use, re-cycle, utilization and disposal methodology are presented below.

Solid Waste Generation their Re-Use, Re-Cycle, Utilization and Disposal

SN	Type of Solid Waste	Re-Utilisation		
		Recycle	Re-use	
			Within Plant	To be Sold
1	EAF Slag		Will be used for making briquettes or pellets to be used in road laying / paving of areas	- Will be sold to parties for building roads (aggregate for road making), civil engineering works, etc. - Rail track ballast - Scientific dumping for residual slag
2	Mill scale		Sent to UGML-Sinter Plant	
3	Flue Dust From Pollution Control facility		Sent to UGML-Sinter Plant	

- Recycle of waste means utilization of waste in the same process from which it has been generated
- Re-use of waste means utilization of the waste in any process other than the process from which the waste has been generated. The process utilizing the waste may be within the plant or out side the plant. In case of utilization outside plant, the waste is sold to firm utilizing the waste
- Disposal means dumping of waste in designated areas.

Hazardous waste disposal from the expansion plant and their utilization is given below.

Hazardous waste generation & Utilisation

Sl. No.	Hazardous waste Generated	Quantity t / KL Per month	Mode of utilisation
1.	Used oil/ waste oil (Category 5.1)	11.4 t	Reused and balance sold to authorised party approved by CPCB & MSPCB
2.	ETP Sludge	24.75 t	Will be sold to registered recyclers.

Sl. No.	Hazardous waste Generated	Quantity t / KL Per month	Mode of utilisation
3.	Zinc Dross	190 kg	Sold

9.4 Additional Measures

Also, as an additional environmental protection measures, the following have been planned.

- Rain water harvesting for the expansion project.
- Various energy conservation measures to reduce CO2 emissions also.
- Community development measures like Social infrastructure development under CSR (Corporate Social Responsibility), Medical welfare, Sports etc are being planned to further strengthened the overall development.

10.0 COST CONSIDERATIONS

- The total project cost for the expansion project has been estimated to be Rs. 3325.90 crores.
- The capital outlay for environmental control measures alone is estimated to be Rs. 290.35 crores.

The environmental impacts identified by the study are manageable. The implementation of environmental mitigation measures recommended in the report will bring the anticipated impacts to minimum. Site specific and practically suitable mitigation measures are recommended to mitigate the impacts.