DRAFT

ENVIRONMENTAL IMPACT ASSESSMENT AND ENVIRONMENTAL MANAGEMENT PLAN FOR

EXPANSION OF INDUCTION FURNACE

AT

BANSKOPA, PO-BAMUNARA, DURGAPUR, DIST. PASCHIM BARDHAMAN, WEST BENGAL

Category – 'B', Sector and Schedule – Metallurgical Industries (Ferrous & Non-Ferrous) 3(a)

STUDY PERIOD – 1st October, 2021 TO 31st December, 2021

APPLICANT

M/s. VSP UDYOG PVT. LTD.

2021

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PREPARED BY	CHECKED BY	AUTHORIZED BY
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Abbreviation List

AAQM	Ambient Air Quality Monitoring
APHA	American Public Health Association
ASTM	American Society for Testing and Materials
BDL	Below Detectable Limit
CPCB	Central Pollution Control Board
CSR	Corporate Social Responsibility
EAC	Expert Appraisal Committee
EIA	Environmental Impact Assessment
EC	Environmental Clearance
EHS	Environment Health & Safety
EMP	Environment Management Plan
EMS	Environment Management System
EPA	Environmental Protection Act
ETP	Effluent Treatment Plant
DMP	Disaster Management Plan
GLC	Ground Level Concentration
GOI	Government of India
WBPCB	West Bengal Pollution Control Board
IMD	Indian Metrological Data
IS	Indian Standard
MoEF & CC	Ministry of Environment, Forest and Climate Change
MSL	Mean Sea Level
MSDS	Material Safety Data Sheets
NH	National Highway
NOC	No Objection Certificate
OSHA	Occupational Safety And Health Administration
PM	Particulate Matter
PPEs	Personal Protective Equipments
RA	Risk Assessment
TOR	Terms of Reference
TSDF	Treatment, Storage and Disposal Facility
TDS	Total Dissolved Solid

Compliance of TOR

TOR No.	TOR Points	Compliance Status
1.	**Executive Summary**	Complied
2.	**Introduction**	
	I. Details of the EIA Consultant including NABET accreditation	Chapter 12, Page 223
	II. Information about the Project Proponent	Chapter 1, Page 31
	III. Importance and benefits of the Project	Chapter 8, Page 187
3.	**Project Description**	
	I. Cost of project and time of completion	Chapter 2, Page 60
	II. Products with capacities for the Proposed project	Chapter 1, Page 48
	III. If expansion project, details of existing products with capacities and whether adequate land is available for expansion, reference of earlier EC if any	Chapter 1, Page 48
	IV. List of raw materials required and their source along with mode of transportation	Chapter 2, Page 52
	V. Other chemicals and materials required with quantities and storage capacities	NA
	VI. Details of emission, effluents, hazardous waste generation and their management	Chapter 2, Page 65
	VII. Requirement of water, power, with source of supply, status of approval, water balance diagram, man-power requirement (regular and contract)	Chapter 2, Page 54
	VIII. Process description along with major equipments and machineries, process flow sheet (quantative) from raw material to products to be provided.	Chapter 2, Page 49
	IX. Hazard identification and details of proposed safety systems	Chapter 7, Page 159
	X. Expansion / modernization proposals:	

	a. Copy of all the Environmental Clearance(s) including Amendments thereto obtained for the project from MOEF/SEIAA shall be attached as an Annexure. A certified copy of the latest Monitoring Report of the Regional Office of the Ministry of Environment and Forests as per circular dated 30th May 2012 on the status of compliance of conditions stipulated in all the existing environmental clearances including Amendments shall be provided. In addition, status of compliance of Consent to Operate for the ongoing / existing operation of the project from SPCB shall be attached with the EIA-EMP report.	Attached Consent to Operate as Annexure 13
	b. In case the existing project has not obtained environmental clearance, reasons for not taking EC under the provisions of the EIA Notification 1994 and/or EIA Notification 2006 shall be provided. Copies of Consent to Establish/ No Objection Certificate and Consent to Operate (in case of units operating prior to EIA Notification 2006, CTE and CTO of FY 2005-2006) obtained from the SPCB shall be submitted. Further, compliance report to the conditions of consents from the SPCB shall be submitted.	Attached Consent to Operate as Annexure 13
4.	**Site Details**	
	I. Location of the project site covering village, Taluka/ Tehsil, District and State, Justifications for selecting the site, whether other sites were considered.	Chapter 2, Page 44
	II. A toposheet of the study area of radius of 10km and site location on 1:50,000/ 1:25,000 scale on an A3/A2 sheet. (including all eco-sensitive areas and environmentally sensitive places)	Chapter 1, Page 35
	III. Details w.r.t. option analysis for selection of site	NA
	IV. Co-ordinates (lat- long) of all four corners of the site.	Chapter 2, Page 45
	V. Google map-Earth downloaded of the project site.	Chapter 2, Page 46
	VI. Layout maps indicating existing unit as well as proposed unit indicating storage area, plant area, greenbelt area, utilities etc. If located within an Industrial area/ Estate/ Complex, layout of Industrial Area indicating location of unit within the Industrial area/ Estate.	Chapter 2, Page 59
	VII. Photographs of the proposed and existing (if applicable) plant site. If existing, show photographs of plantation/ greenbelt, in particular.	Chapter 2, Page 47

	VIII.	Land use break-up of total land of the project site (identified and acquired), government/ private - agricultural, forest, wasteland, water bodies, settlements etc. shall be included (not required for industrial area)	Chapter 2, Page 57
	IX.	A list of major industries with name and type within study area (10km radius) shall be incorporated. Land use details of the study area.	Chapter 3, Page 112
	X.	Geological features and Geo-hydrological status of the study area shall be included.	Chapter 3, Page 95
	XI.	Details of Drainage of the project upto 5km radius of study area. If the site is within 1 km radius of any major river, peak and lean season river discharge as well as flood occurrence frequency based on peak rainfall data of the past 30 years. Details of Flood Level of the project site and maximum Flood Level of the river shall also be provided (mega green field projects).	Chapter 3, Page 99
	XII.	Status of acquisition of land. If acquisition is not complete, stage of the acquisition process and expected time of complete possession of the land.	Land is acquired.
	XIII.	R&R details in respect of land in line with state Government policy.	Not Applicable
5.	**Forest and Wildlife related issues (if applicable)**		
	I.	Permission and approval for the use of forest land (forestry clearance), if any, and recommendations of the State Forest department (if applicable)	Not Applicable
	II.	Landuse map based on High resolution satellite imagery (GPS) of the proposed site delineating the forestland (in case of projects involving forest land more than 40 ha)	Not Applicable
	III.	Status of application submitted for obtaining the stage I forestry clearance along with latest status shall be submitted.	Not Applicable
	IV.	The projects to be located within 10 km of the National Parks, Sanctuaries, Biosphere Reserves, Migratory Corridors of Wild Animals, the project proponent shall submit the map duly authenticated by Chief Wildlife Warden showing these features vis-à-vis the project location and the recommendations or comments of the Chief Wildlife Warden-thereon.	Not Applicable

	V. Wildlife Conservation plan duly authenticated by the Chief Wildlife warden of the State Government for conservation of Schedule I fauna, if any exists in the study area.	Not Applicable
	VI. Copy of application submitted for clearance under the Wildlife (protection) Act, 1972, to the standing committee of the National Board for Wildlife.	Not Applicable
6.	**Environmental Status**	
	I. Determination of atmospheric inversion level at the project site and site-specific micro-meteorological data using temperature, relative humidity, hourly wind speed and direction and rainfall.	Chapter 4, Page 131
	II. AAQ data (except monsoon) at 8 locations for PM10, PM2.5, SO_2, NOx, CO and other parameters relevant to the project shall be collected. The monitoring stations shall be based CPCB guidelines and take into account the pre- dominant wind direction, population zone and sensitive receptors including reserved forests.	Chapter 3, Page 73
	III. Raw data of all AAQ measurement for 12 weeks of all stations as per frequency given in the NAQQM Notification of Nov. 2009 along with min, max, average, and 98% values for each of the AAQ parameters from data of all AAQ stations should be provided as an annexure to the EIA report.	Chapter 3, Page 75
	IV. Surface water quality of nearby River (100m upstream and downstream of discharge points) and other surface drains at eight locations as per CPCB/ MoEF & CC guidelines.	Chapter 3, Page 85
	V. Whether the site falls near to polluted stretch of river identified by the CPCB/ MoEF & CC, if yes give details.	Not Applicable
	VI. Ground water monitoring at minimum at 8 locations shall be included.	Chapter 3, Page 83
	VII. Noise levels monitoring at 8 locations within the study area.	Chapter 3, Page 79
	VIII. Soil characteristic as per CPCB guidelines.	Chapter 3, Page 87

	IX.	Traffic study of the area, type of vehicles, frequency of vehicles for transportation of materials, additional traffic due to proposed project, parking arrangement etc.	Chapter 3, Page 89
	X.	Detailed description of flora and fauna (terrestrial and aquatic) existing in the study area shall be given with special reference to rare, endemic and endangered species. If Schedule - I fauna are found within the study area, a Wildlife Conservation Plan shall be prepared and furnished.	Chapter 3, Page 110
	XI.	Socio economic status of the study area.	Chapter 3, Page 101
7.	**Impact and Environment Management Plan**		
	I.	Assessment of ground level concentration of pollutants from the stack emission based on site-specific meteorological features. In case the project is located on a hilly terrain, the AQIP modeling shall be done using inputs of the specific terrain characteristics for determining the potential impacts of the project on the AAQ. Cumulative impact of all sources of emissions (including transportation) on the AAQ of the area shall be assessed. Details of the model used and the input data used for modeling shall also be provided. The air quality contours shall be plotted on a location map showing the location of project site, habitation nearby, sensitive receptors, if any.	Chapter 4, Page 131
	II.	Water Quality modeling – in case of discharge in water body.	Not Applicable
	III.	Impact of the transport of the raw materials and end products on the surrounding environment shall be assessed and provided. In this regard, options for transport of raw materials and finished products and wastes (large quantities) by rail or rail-cum road transport or conveyor-cum-rail transport shall be examined.	Chapter 4, Page 120
	IV.	A note on treatment of wastewater from different plant operations, extent recycled and reused for different purposes shall be included. Complete scheme of effluent treatment. Characteristics of untreated and treated effluent to meet the prescribed standards of discharge under E(P) rules.	Chapter 2, Page 65
	V.	Details of stack emission and action plan for control of emissions to meet standards.	Chapter 2, Page 62
	VI.	Measures for fugitive emission control	Chapter 2, Page 64

	VII.	Details of hazardous waste generation and their storage, utilization and management. Copies of MOU regarding utilization of solid and hazardous waste in cement plant shall also be included. EMP shall include the concept of waste- minimization, recycle/ reuse/ recover techniques, Energy conservation, and natural resource conservation.	Chapter 2, Page 65
	VIII.	Proper utilization of fly ash shall be ensured as per Fly Ash Notification, 2009. A detailed plan of action shall be provided.	NA
	IX.	Action plan for the green belt development plan in 33% area i.e., land with not less than 1500 trees per ha. Giving details of species, width of plantation, planning schedule etc. shall be included. The green belt shall be around the project boundary and a scheme for greening of the roads used for the project shall also be incorporated.	Chapter 10, Page 214
	X.	Action plan for rainwater harvesting measures at plant site shall be submitted to harvest rainwater from the roof tops and storm water drains to recharge the ground water and also to use for the various activities at the project site to conserve fresh water and reduce the water requirement from other sources.	Chapter 4, Page 146
	XI.	Total capital cost and recurring cost/ annum for environmental pollution control measures shall be included.	Chapter 10, Page 217
	XII.	Action plan for post-project environmental monitoring shall be submitted.	Chapter 6, Page 153
	XIII.	Onsite and Offsite Disaster (natural and Man-made) preparedness and Emergency Management Plan including Risk Assessment and damage control. Disaster management plan should be linked with District Disaster Management Plan.	Chapter 7, Page 166
8.	**Occupational health**		
	i.	Plan and fund allocation to ensure the occupational health & safety of all contract and casual Workers	Chapter 7, Page 175

	ii. Details of exposure specific health status evaluation of worker. If the workers' health is being evaluated by pre designed format, chest x rays, Audiometry, Spirometry, Vision testing (Far & Near vision, colour vision and other ocular defect), ECG, during pre placement and periodical examinations give the details of the same. Details regarding last month analyzed data of above mentioned parameters as per age, sex, duration of exposure and department wise.	Chapter 4, Page 141
	iii. Details of existing Occupation & Safety Hazards. What are the exposure levels of hazards and whether they are within Permissible Exposure level (PEL). If these are not within PEL, what measures the company has adopted to keep them within PEL, so that health of the workers can be preserved.	Chapter 4, Page 143
	iv. Annual report of health status of workers with special reference to Occupational Health and Safety.	Chapter 6, Page 156
9.	**Corporate Environment Policy**	
	I. Does the company have a well laid down Environment Policy approved by its Board of Directors? If so, it may be detailed in the EIA Report.	Chapter 10, Page 201
	II. Does the Environment Policy prescribe for standard operating process/ procedures to bring into focus any infringement/ deviation / violation of the environmental or forest norms/ conditions? If so, it may be detailed in the EIA.	Chapter 10, Page 202
	III. What is the hierarchical system or Administrative order of the company to deal with the environmental issues and for ensuring compliance with the environmental clearance conditions? Details of this system may be given.	Chapter 10, Page 202
	IV. Does the company have system of reporting of non compliances/ violations of environmental norms to the Board of Directors of the company and / or shareholders or stakeholders at large? This reporting mechanism shall be detailed in the EIA report.	Chapter 10, Page 201
10.	**Details regarding infrastructure facilities such as sanitation, fuel, restroom etc. to be provided to the labour force during construction as well as to the casual workers including truck drivers during operation phase.**	Chapter 10, Page 205
11.	**Enterprise Social Commitment (ESC)**	

	i. Adequate funds (at least 2.5% of the project cost) shall be earmarked towards the Enterprise Social Commitment based on Public hearing issues and item-wise details along with time bound action plan shall be included. Socio-economic development activities need to be elaborated upon.	NA
12.	**Any litigation pending against the project and / or any direction/ order passed by any Court of Law against the project, if so, details thereof shall also be included. Has the unit received any notice under the Section 5 of Environment (Protection) Act, 1986 or relevant Sections of Air and Water Acts? If so, details thereof and compliance/ATR to the notice(s) and present status of the case.**	NA
13.	**'A tabular chart with index for point wise compliance of above TORs.**	Page 18
B.	**SPECIFIC TERMS OF REFERENCE FOR EIA STUDIES FOR METALLURGICAL INDUSTRIES (FERROUS & NON FERROUS)**	
	1. Complete process flow diagram describing each unit, its processes and operations, along with material and energy inputs & outputs (material and energy balance).	Chapter 2, Page 54
	2. Details on blast furnace/ open hearth furnace/ basic oxygen furnace/ladle refining, casting and rolling plants etc.	Chapter 2, Page 48
	3. Details on installation/activation of opacity meters with recording with proper calibration system	NA
	4. Details on toxic metals including mercury, arsenic and fluoride emissions	NA
	5. Details on stack height requirement for integrated steel	Chapter 2, Page 62
	6. Details on ash disposal and management -Non-ferrous metal	Chapter 2, Page 65
	7. Complete process flow diagram describing production of lead/zinc/copper/ aluminium, etc.	NA
	8. Raw materials substitution or elimination	Chapter 2, Page 53

	9. Details on smelting, thermal refining, melting, slag fuming, and Waelz kiln operation	NA
	10. Details on Holding and de-gassing of molten metal from primary and secondary aluminum, materials pre-treatment, and from melting and smelting of secondary aluminium	NA
	11. Details on solvent recycling	NA
	12. Details on precious metals recovery	NA
	13. Details on composition, generation and utilization of waste/fuel gases from coke oven plant and their utilization.	NA
	14. Details on toxic metal content in the waste material and its composition and end use (particularly of slag).	Chapter 2, Page 65
	15. Trace metals Mercury, arsenic and fluoride emissions in the raw material.	NA
	16. Trace metals in waste material especially slag.	NA
	17. Plan for trace metal recovery	NA
	18. Trace metals in water	NA
C.	**ADDITIONAL TOR FOR INTEGRATED STEEL PLANT**	
	1. Iron ore/coal linkage documents along with the status of environmental clearance of iron ore and coal mines	NA
	2. Quantum of production of coal and iron ore from coal & iron ore mines and the projects they cater to. Mode of transportation to the plant and its impact	NA
	3. For Large ISPs, a 3-D view i.e. DEM (Digital Elevation Model) for the area in 10 km radius from the proposal site. MRL details of project site and RL of nearby sources of water shall be indicated.	NA

	4. Recent land-use map based on satellite imagery. High-resolution satellite image data having 1m-5m spatial resolution like quickbird, Ikonos, IRS P-6 pan sharpened etc. for the 10 Km radius area from proposed site. The same shall be used for land used/land-cover mapping of the area.	Chapter 3, Page 94
	5. Respirable Suspended particulate matter (RSPM) present in the ambient air must be analysed for source analysis - natural dust/RSPM generated from plant operations (trace elements). The RSPM shall also be analysed for presence of poly-aromatic hydrocarbons (PAH), i.e. Benzene soluble fraction, where applicable. Chemical characterization of RSPM and incorporating of RSPM data.	Chapter 3, Page 75
	6. All stock piles will have to be on top of a stable liner to avoid leaching of materials to ground water.	NA
	7. Plan for the implementation of the recommendations made for the steel plants in the CREP guidelines.	NA
	8. Plan for slag utilization	NA
	9. Plan for utilization of energy in off gases (coke oven, blast furnace)	NA
	10. System of coke quenching adopted with justification	NA

CHAPTER 1
INTRODUCTION

1. Chapter 1: Introduction

1.1 Introduction

VSP Udyog Pvt. Ltd. is one of the distinguished manufacturers who are engaged to manufacture Billet. Moreover, unit is entrusted to produce value in addition to customer by way of continuous up gradation of technology. Products manufactured by this company may comply with the international quality standards. These highly durable and corrosion resistant products are ideal for construction of Bridges, Reinforcement, High-rise Buildings, Dams, Industrial Structures, Thermal & Hydel Power Plants, Coastal Construction, Underground/Raised Platforms, and Concrete Reinforcement. The registered office of this company is situated at 238B, A.J.C. Bose Road, 3rd Floor, Kolkata - 700020. M/S. **VSP Udyog Pvt. Ltd.** has been taken over by M/s. Amit Metaliks Ltd. (AML), based on its Resolution plan submitted to NCLT, as Resolution Applicant (RA vide pursuant to approval of the Resolution Plan in the IRP by Adjudicating Authority by its Order dated 20th October, 2020).

The existing manufacturing unit is located at Banskopa, PO-Bamunara, Durgapur, Dist. Paschim Bardhaman, West Bengal, PIN 713212, JL No.65, Khatian No.3743, 3825, J.L.No.58, Khatian No.2374, 2885, 3085, 2884 on 21.7 acres (88098.62 sqm) Land. Therefore, realizing the demand of steel and allied products, the management has taken decision for installing 4 x 20 Tonnes Induction furnaces with Ladle Refining Furnace, CCM and expansion of Wire Rod/Rolling Mill capacity from 1,20,000 to 2,50,000 TPA.

Steel consumption in India has grown substantially since evolving of modern steel industry during nineteenth century. During the past two decade, steel consumption has grown at a faster pace driven by liberalization, decontrol of steel industry, growing population, infrastructure development and changing lifestyle of people.

The unit considers in sustainable development and is equally concern about environmental safeguard and control of pollution. Management of the company recommends sufficient Environmental Management System for meeting the desired norms of effluent discharge specifically Water, Air & Solid for their proposed project as per the statutory recruitments for the improvement of environment.

1.2 Purpose of the report

Developmental project may cause different types of impacts on its surrounding environment and on human beings. Therefore, there are some statutory obligations that any project proponent has to fulfill before proceeding with any developmental work. With this view to assess the impact and to ensure environmental quality, environmental impact assessment is a very necessary exercise.

In pursuance of Government of India National Environmental Policy as approved by the Union Cabinet on 18th May, 2006, new projects or expansion of any existing plant necessitates statutory prior environmental clearance in accordance with the MOEF&CC EIA Notification dated 14.09.06 and its amendment as on proposed Ferro Alloy manufacturing project is categorized as Category–"B", 3(a) Primary Metallurgical Industries. Which mandates obtaining prior Environmental Clearance from State Expert Appraisal Committee (SEAC), SEIAA by preparing Environmental Impact Assessment (EIA) report. In view of the above the EIA report has been prepared taking into consideration the requirement and guidelines of statutory bodies and also requirement of M/s. VSP Udyog Pvt. Ltd.

The objective of the EIA study report is to take stock of the prevailing quality of the environment, to assess the impacts of proposed industrial activity on environment and to plan appropriate environmental control measures to minimize the adverse impacts and to maximize beneficial impacts of proposed project. The following major objectives have been considered:

- Assess the existing status of environment.
- Assess the impacts due to the proposed project.
- Suggest pollution control and ameliorative measures to minimize impact.
- Prepare an action plan for implementation of suggested ameliorative measures.
- Suggest a monitoring programmed to assess the efficacy of the various adopted environmental control measures.
- Assess financial considerations for suggested environmental control plans.
- Clearances from statutory authorities.

1.3 Status of the report

As per the notification, prior Environmental Clearance (EC) from Ministry of Environment, Forest & Climate Change (MoEF&CC)/ SEIAA is mandatory for this industry. Hence, the industry has to follow due course of procedure to obtained Environmental Clearance. Accordingly, the project proponents have submitted prescribed application along with Pre-Feasibility Report to the SEIAA, West Bengal on dated 05.10.2021 vide proposal No. - **SIA/WB/IND/67416/2021** for seeking terms of references for conducting the EIA Study. The TOR has been granted on 23rd November 2021 vide file no. EN/T-II-1/159/2021.

1.4 Identification of Project and project proponent

In order to raise the production and also ensuring steady supply, as well as the significance of economy of scale, the management of **VSP Udyog Pvt. Ltd.** has taken decision has taken decision for increasing steel melting capacity by setting up Induction Furnace unit. Availability of Land, water & power along with other benefits prompted the promoters to set up the extension facility at Banskopa.

M/s. VSP Udyog Pvt. Ltd. has been promoted by directors Mr. Sri Amit Kumar Singh & Mrs. Arvind Kumar Singh. Details about the promoters are given in Table 1.1.

Table 1.1: Promoters & Their Background

Particulars
Name: Sri Amit Kumar Singh **Father's Name**: Sakal Deo Singh **Educational Qualification:** IIT, Graduate **Age:** 36 year **Address:** 238B, AJC Bose Road, 3rd Floor, Kolkata – 700020 **Experience:** He has got more than 13 years of experience in the Steel Industry.
Particulars
Name: Sri Arvind Kumar Singh **Age:** 41 year **Address:** MEAV-23, Urvashi Phase II, Bengal Ambuja Complex, City Centre, Durgapur-713216 **Experience:** He has got experience in managing steel rolling mill, electric furnace and induction furnace.

1.4.1 Address of the Project Proponent

VSP Udyog Pvt. Ltd.

Registered Office - 238B, A.J.C. Bose Road, 3rd Floor, Kolkata - 700020.

1.5 Brief description of nature, size, location of the project and its importance to the country and region

1.5.1 Nature and size of the project

The proposed project activity falls under the Category-B under project activity 3(a) Metallurgical industries (ferrous & non-ferrous) under EIA Notification 2006.

M/s. VSP Udyog Pvt. Ltd. has decided to expand its steel melting capacity. Now the company is operating a steel plant containing of 2 no. Induction furnaces of 8 T, 1 no. Induction furnace of 15 T, and 80,000 Tonnes/ Annum Rolling mill, 120,000 Tonnes/ Annum Wire Rod/ Rolling mill -2 & 1 No. 2 strand continuous caster for manufacturing TMT Bars and rounds.

They will install 4x20 Tonnes Induction furnaces along with Ladle Refining Furnace (25 Ton Capacity per Ladle), 3 Strand CCM and expansion of Wire Rod/Rolling Mill-2 capacity from 1,20,000 to 2,50,000 TPA.

The plant is located at Banskopa, PO-Bamunara, Durgapur, Dist. Paschim Bardhaman, West Bengal, PIN 713212, JL No.65, Khatian No.3743, 3825, J.L.No.58, Khatian No.2374, 2885, 3085, 2884 on 21.7 acres (88098.62 sqm) land to meet the industry demand after obtaining Environment Clearance for manufacturing of the same.

CTE & CTO for the proposed project shall be obtained from WBPCB.

Table 1.2: Detail of the Capacity

Particulars	Existing	Subsequent Modification/Addition	Total Production Capacity
Induction Furnace	2 no 8 T 1 no 15 T	4 no 20 T	-
M.S. Billets	90600 TPA	264000 TPA	354600 TPA
Rolling mill -1	80000 TPA	-	80000 TPA
Wire Rod/ Rolling mill -2	120000 TPA	130000 TPA	250000 TPA

Particulars	Existing	Subsequent Modification/Addition	Total Production Capacity
Ladle Refining Furnace	-	25 Ton Capacity per Ladle	25 Ton Capacity per Ladle
CCM	4/7 Mtrs 2 Strand	6/11 Mtr 3 Strand	

1.5.2 Location of the project

The expansion will be done within the existing plant area located in Banskopa, PO-Bamunara, Durgapur, Dist. Paschim Bardhaman, West Bengal, PIN 713212, JL No.65, Khatian No.3743, 3825, J.L.No.58, Khatian No.2374, 2885, 3085, 2884.

The Latitude and Longitude of the project site are given below:-

Latitude	Longitude
23°29'41"N	87° 22'30"E

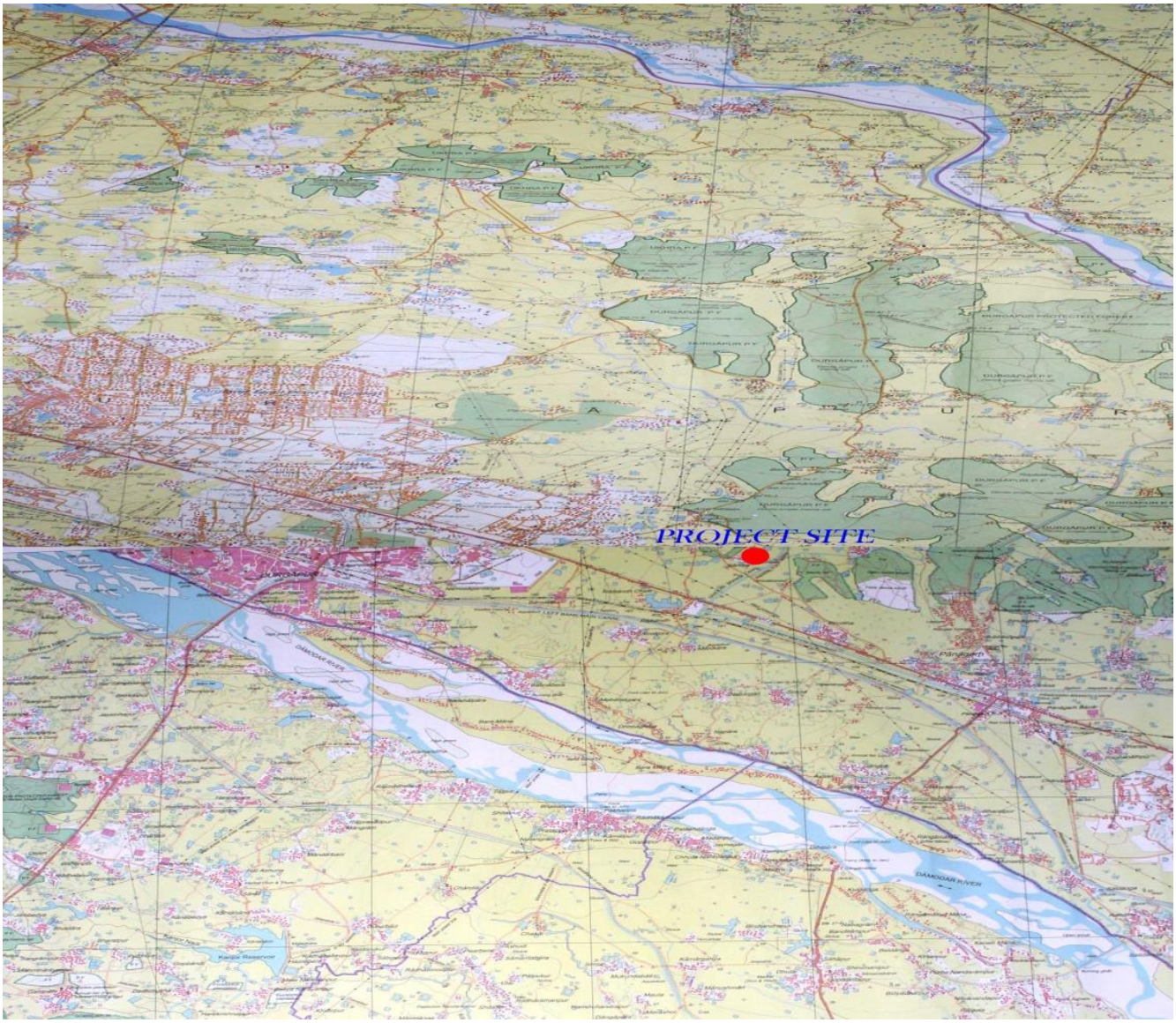
Source: - Google Earth

Table 1.3: Salient Features of the Project

1	Name of the Company	M/s. VSP Udyog Pvt. Ltd.
2	Registered Office Plant & Admin Office	**Plant:** JL No.65, Khatian No.3743, 3825, J.L.No.58, Khatian No.2374, 2885, 3085, 2884, Banskopa, PO-Bamunara, Durgapur, Dist. Paschim Bardhaman, West Bengal, PIN 713212. **Registered Office:** 238B, A.J.C. Bose Road, 3rd Floor, Kolkata - 700020
3	Name of the Directors	Sri Amit Kumar Singh & Sri Arvind Kumar Singh
4	Proposed Sector	Metallurgical Industries (Ferrous & Non-Ferrous)

<table>
<tr><td>5</td><td>Area of plant</td><td>21.7 acres (88098.62 sqm)</td></tr>
<tr><td>6</td><td>Topo Sheet No</td><td>73 M/6 and 73 M/7 (Project Site)</td></tr>
<tr><td>7</td><td>Project Site Co-ordinates</td><td><table><tr><td>Latitude</td><td>Longitude</td></tr><tr><td>23°29'41"N</td><td>87° 22'30"E</td></tr></table></td></tr>
<tr><td>8</td><td>Existing Units</td><td>2 no. Induction furnaces of 8 T, 1 no. Induction furnace of 15 T, production of 90600 TPA M.S. Billet and 80,000 Tonnes/ Annum Rolling mill, 120,000 Tonnes/ Annum Wire Rod/ Rolling mill -2 & 1 No. 2 strand continuous caster</td></tr>
<tr><td>9</td><td>Proposed Units</td><td>Additional: -
4x20 T Induction furnaces production of 264000 TPA M.S. Billet along with Ladle Refining Furnace (25 Ton Capacity per Ladle), 3 Strand CCM and expansion of Wire Rod/Rolling Mill capacity from 1,20,000 to 2,50,000 TPA</td></tr>
<tr><td>10</td><td>Cost of Project</td><td>Rs. 190.80 Crore</td></tr>
</table>

Figure 1.1: Location of Project Site



1.6 Importance of the project to the country and region

Steel is considered as the backbone of national economic development. India was the world's second-largest steel producer with production standing at 111.2 million tonnes (MT) in 2019. The growth in the Indian steel sector has been driven by domestic availability of raw materials

such as iron ore and cost-effective labour. Consequently, the steel sector has been a major contributor to India's manufacturing output.

The Indian steel industry is modern with state-of-the-art steel mills. It has always strived for continuous modernisation of older plants and up-gradation to higher energy efficiency levels.

Indian steel industry is classified into three categories - major producers, main producers and secondary producers.

Steel is used in different industries like energy, construction, automotive and transportation, infrastructure, packaging and machinery. It is also the key material used for delivering renewable energy such as thermal, solar and tidal power. Beside these, construction and housing sector is the biggest consumer of steel today, using around 50% of steel produced. Steel industry is in the front line in the liberalization of the industrial sector and has made fast steps since long. Per capita consumption of steel is one of the significant indexes for measurement of development of socioeconomic status and living standards of the people in any country.

Steel demand has outpaced supply over the last five years:

- In FY15, the consumption of finished steel grew to 76.99 MT although the CAGR increased to 5.74 per cent during FY08-15.
- It is expected that per capita consumption would rise supported by fast growth in the industrial sector, and rising infra expenditure projects in railways, roads & highways, etc.
- For FY15, per capita consumption of steel in India was 60 kg against the world average of 222 kg.
- Steel consumption is expected to reach 104 MT by 2017 due to rising infrastructure development and growing demand for automotives.
- India's finished steel consumption grew at a CAGR of 5.2% during FY16-FY20 to reach 100 MT. India's crude steel and finished steel production increased to 108.5 MT and 101.03 MT in FY20P, respectively.
- Between April 2020 and January 2021, India's cumulative production of crude steel stood at 87.21 MT and finished steel at 76.04 MT.
- Export and import of finished steel stood at 8.24 MT and 6.69 MT, respectively, in FY20P.
- Export and import of finished steel stood at 8.84 MT and 3.79 MT, respectively, between April 2020 and January 2021

*In CY 2019, the world crude steel production reached 1869 million tonnes (MT) and showed a growth of 3% over CY 2018.

*China remained world's largest crude steel producer in 2019 (996 MT) followed by India (111 MT), Japan (99 MT) and the USA (88 MT), based on rankings released by the World Steel Association.

* Per capita finished steel consumption in 2019 was 229.3 kg for world and 663 kg for China.

*The same for India was 74.3 kg in 2019 (Source: JPC). The per capita consumption of total finished steel in India during 2019-20 was 74.7 kg (Source: JPC).

The domestic steel industry faces new challenges. The domestic demand too has not improved to significant levels. The Indian steel industry is broadly categorised into public sector and private sector players. These players are either integrated producers or standalone producers of various steel products.

•Steel industry was de-licensed and de-controlled in 1991 & 1992 respectively.

• India was the 2nd largest producer of crude steel in the world in 2019.

• In 2019-20, production of total finished steel (alloy/stainless + non alloy) was 102.62 million tonnes (MT).

• Production of Pig Iron in 2019-20 was 5.42 MT, a decline of 15.5% over last year.

• India was the largest producer of Sponge Iron in the world in 2019. The coal□based route accounted for 82% of total Sponge Iron production (37.10 MT) in the country in 2019-20.

Table 1.4: Scenario of Indian steel industry

Indian steel industry : Production for Sale (in million tonnes)					
Category	2015-16	2016-17	2017-18	2018-19	2019-20
Pig Iron	10.24	10.34	5.73	6.41	5.42
Sponge Iron	22.43	28.76	30.51	34.71	37.1
Total Finished Steel	106.60	120.14	126.85	101.29	102.62
Source: Joint Plant Committee					

1.7 Market demand evaluation for the project

Demand - Availability Projection

• Industry dynamics including demand – availability of iron and steel in the country are largely determined by market forces and gaps in demand availability are met mostly through imports.

• Interface with consumers exists by way of meeting of the Steel Consumers' Council, which is conducted on regular basis.

• Interface helps in redressing availability problems, complaints related to quality.

Demand supply gap exists in the domestic steel market which can be attributed from the fact that imports have been always more than exports. Hence the excess demand has been met by imports.

The state and pattern of growth of the economy determine the steel requirement. The requirements of steel may be fulfilled either through indigenous production and/or through imports. It is not possible for a developing country to import huge quantities of steel because of foreign exchange constraints where as it is better for a country to be self-sufficient in its steel requirements.

Table 1.5: Import Scenario of Indian Steel Industry

Indian Steel Industry: Import of Total Finished Steel (in million Tons)					
Category	2015-16	2016-17	2017-18	2018-19	2019-20
Qty	11.71	7.23	7.48	7.83	6.77
Source: Joint Plant Committee (JPC)					

Table 1.6: Export Scenario of Indian Steel Industry

Indian Steel Industry: Exports of Total Finished Steel (in million Tons)					
Category	2015-16	2016-17	2017-18	2018-19	2019-20
Qty	4.08	8.24	9.62	6.36	8.36
Source: Joint Plant Committee (JPC)					

The state and pattern of growth of the economy determine the steel requirement. The requirements of steel may be fulfilled either through indigenous production and/or through imports. It is not possible for a developing country to import huge quantities of steel because of foreign exchange constraints where as it is better for a country to be self-sufficient in its steel requirements.

It is observed that, import has been in declining trend, while export is increasing. However, keeping in mind the above points and subsequently realizing the importance, the management has decided for additional installation of 4 x 20 Tonnes Induction furnaces with Ladle Refining

Furnace, CCM and expansion of Wire Rod/Rolling Mill capacity from 1,20,000 to 2,50,000 TPA.

1.8 Scope of the study- details of scoping (as per TOR)

The EIA/EMP study for additional installation of 4 x 20 Tonnes Induction furnaces with Ladle Refining Furnace, CCM and expansion of Wire Rod/Rolling Mill capacity from 1,20,000 to 2,50,000 TPA consists of the following elements: -

1. To generate (a) baseline information regarding status of environment by carrying out baseline survey of environmental parameters like air, water, noise and soil and (b) secondary data required for impact assessment from the available sources.
2. To identify set of activities which have a potential impact on the environment or the public and to provide the mitigation measures for the same, on the basis of the details of the project.
3. To carry out Land Use / Land Cover (LULC) pattern studies in project site and within 10 km radius study area to identify the impact on land due to the operation of the plant.
4. To predict pollution load/stress level in air, water, land and other environmental matrixes due to the sources identified.
5. To examine the availability and adequacy of the envisaged measures for control of pollution/sources of stress, so as to meet the statutory provisions, and propose mitigate measures, if needed.
6. To analyze the consequences of potential accidents and the steps adopted to avert accidents and the plans to mitigate consequences in the case of severe accidents.
7. To specify the environmental monitoring required in the operational phase of the plant to evaluate the effectiveness of the various environmental control measures adopted.
8. To assess the benefits arising from the project.
9. To delineate the administrative mechanisms warranted to oversee (a) the implementation of control / EMP mitigative measures during operation of the plant, (b) operation and maintenance of such systems subsequently, (c) compliance with monitoring programs and (d) provision of required budget.

The observations from the studies are concluded and compiled in the penultimate chapter i.e., in summary and conclusions.

1.8.1 Preparation of EIA

This EIA Report is prepared in accordance with the EIA Notification, 2006 and has been divided into twelve chapters (in addition to Executive Summary) as briefed here under:

CHAPTER 1 – INTRODUCTION

The chapter provides description of project background, site and surroundings, objectives, scope and organization of the study and format of this report.

CHAPTER 2 – PROJECT DESCRIPTION

This chapter provides information on project and capacity; need for the project; location; size or magnitude of operation; technology and process description; maps showing project layout, component of projects etc.

CHAPTER 3 – DESCRIPTION OF THE ENVIRONMENT

This chapter deals with the methodology and findings of field studies undertaken with respect to ambient air quality, meteorology, water quality, soils characteristics, noise levels and ecology to define the various existing environmental status in the area of the project.

CHAPTER 4 – ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

In this chapter, the potential impacts of the proposed new project, which could cause significant environmental concerns, are identified and discussed. This discussion will form the basis for environmental management activities.

CHAPTER 5 – ANALYSIS OF ALTERNATIVES (TECHNOLOGY AND SITE)

This chapter will include a comparison of alternatives in this chapter to determine the best method of achieving the project objectives with minimum environmental impacts or indicates the most environmentally friendly and cost effective options, if any.

CHAPTER 6 – ENVIRONMENTAL MONITORING PROGRAM

This chapter will include ascertaining the environmental impacts; state of pollution within the project area and in its vicinity; planning for predictive or corrective actions in respect of pollution to keep it within permissible limits.

CHAPTER 7 – ADDITIONAL STUDIES

This chapter will include outcomes of public consultation, Identification of hazards and risk assessment, social impact assessment, R&R action plan, biodiversity conservation plan, watershed management etc.

CHAPTER 8 – PROJECT BENEFITS

This chapter deals with improvements in the physical infrastructure, social infrastructure, employment potential and other tangible benefits due to proposed project activity.

CHAPTER 9 – ENVIRONMENTAL COST BENEFIT ANALYSIS

This chapter includes Project cost, Cost of Pollution Control facilities and Project Implementation Schedule. (Not in the scope of this EIA)

CHAPTER 10 – ENVIRONMENTAL MANAGEMENT PLAN

This chapter will include the description of administrative aspects of ensuring that the mitigation measures suggested are implemented and their effectiveness is monitored, after approval of the EIA.

CHAPTER 11 – SUMMARY& CONCLUSION

This will constitute the summary of the EIA Report. i.e., Overall justification for implementation of the project and Explanation of how, adverse effects have been mitigated.

CHAPTER 12 – DISCLOSURE OF CONSULTANT

This will includes the names of the consultants engaged in preparation of EIA and nature of consultancy rendered.

1.8.2 Laws applicable to this project

The Acts, Notifications, Rules and Amendments applicable for setting up a new Metallurgical industry of an industry and for its operation include the following:

Legal Channel	Responsible Ministries/ Bodies	Objective of Legislation
The Water (Prevention & Control of Pollution) Acts1974/ Rules1975	CPCB, SPCB	The prevention, control and abatement of air pollution
The Air (Prevention & Control of Pollution) Acts1981/ Rules1982	CPCB, SPCB	The prevention and control of water pollution and also maintaining or restoring the wholesomeness of water
The Environment (Protection) Acts1986/Rules 1986 The Environmental Impact Assessment (EIA) Notification, 2006	MoEF &CC, CPCB, SPCB	Protection and Improvement of the Environment
Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016	MoEF &CC, CPCB, SPCB, DGFT	Management & Handling of hazardous wastes in line with the Basel convention

Legal Channel	Responsible Ministries/ Bodies	Objective of Legislation
MoEF&CC notification S0 804 (E) dated 14/03/2018 and its subsequent amendments	MoEF &CC, SPCB	Damage Assessment, Remediation plan and Natural & Community Augmentation plan due to Violation of EIA notification 2006.
Factories Act, 1948 (as amended till 1987)	Ministry of Labour, DGFASLI and Directorate of Industrial Safety and Health/Factories Inspectorate	Control of workplace environment, and providing for good health and safety of workers
The Solid Waste Management Rules, 2016	CPCB, SPCB	To manage/ utilize the generated solid waste without damaging the environment and surroundings
E-Waste (Management) Rules, 2016	SPCB, CPCB and MoEF &CC	To recycle/manage the electronic waste from the industry
Noise Pollution (Regulation and Control) Rules, 2000 and its amendments	CPCB, SPCB, MoEF &CC	To maintain the noise levels with respect to the place/equipment/ industry

CHAPTER 2

PROJECT DESCRIPTION

2. Chapter 2: Project Description

2.1 The Project

To increase the production and meet the demand, as well as the importance of economy of scale, the management of **VSP Udyog Pvt. Ltd.** has taken a decision for expansion of Steel Plant. The company installed 2 no. Induction furnaces of 8 T, 1 no. Induction furnace of 15 T, 80,000 Tonnes/ Annum Rolling mill, 120,000 Tonnes/ Annum Wire Rod/ Rolling mill -2 & 1 No. 2 strand continuous caster. Necessary CTO is already obtained for operation.

They decided to expand its present billet production capacity from 90600 TPA to 354600 TPA. The proposed expansion will be made with the additional installation of 4x20 T Induction furnaces for production of 264000 TPA M.S. Billet along with Ladle Refining Furnace (25 Ton Capacity per Ladle), 3 Strand CCM and expansion of Wire Rod/Rolling Mill capacity from 1,20,000 to 2,50,000 TPA. The total land area required for proposed project is 21.7 acres (88098.62 sqm) which is already acquired by the proponent at Banskopa, PO-Bamunara. Durgapur, Dist. Paschim Bardhaman, West Bengal, PIN 713212, JL No.65, Khatian No.3743, 3825, J.L.No.58, Khatian No.2374, 2885, 3085, 2884. The total cost of the project is 190.80 Cr.

2.2 *Location of project (maps showing general location, specific locations, project boundary).*

The proposed site falls under the Survey of India Topo sheet 73 M/6 and 73 M/7. The Latitude and Longitude of the proposed site are shown in Table: -2.1 respectively. The location of the project site is at Banskopa, PO-Bamunara. Durgapur, Dist. Paschim Bardhaman, West Bengal, PIN 713212, JL No.65, Khatian No.3743, 3825, J.L.No.58, Khatian No.2374, 2885, 3085, 2884. Location of the project site is shown in Fig. 2.1. The site is not surrounded by heavily populated locations. Following forests and rivers are within 10 km radius of the site.

Durgapur Protected Forest – 2.0 KM – N

Damodar River - 6.60 KM- SW

Table 2.1: Project Coordinates

Latitude	Longitude
23°29'41"N	87° 22'30"E

Source: Google Earth

Figure 2.1: Map showing location of project site

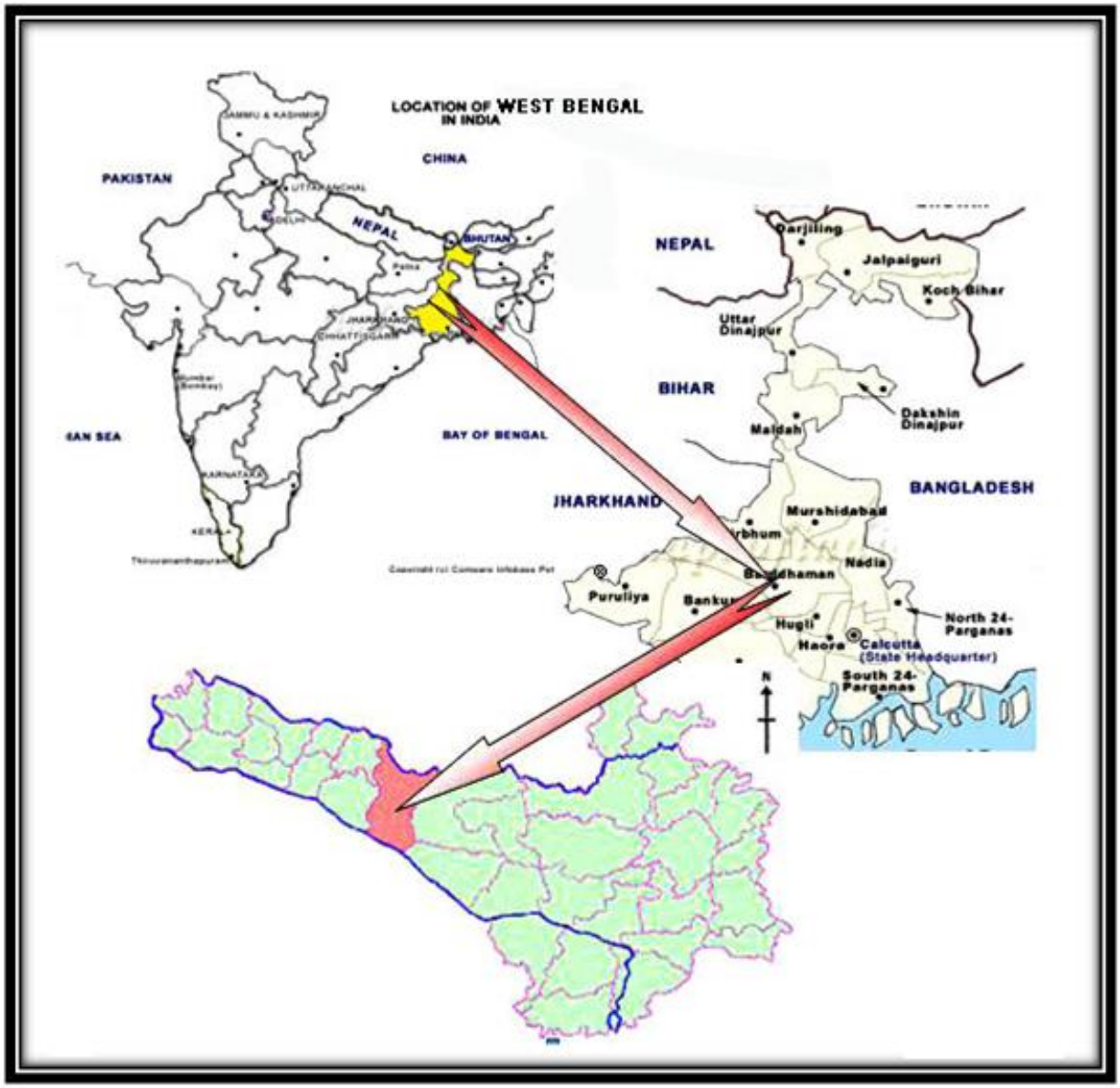
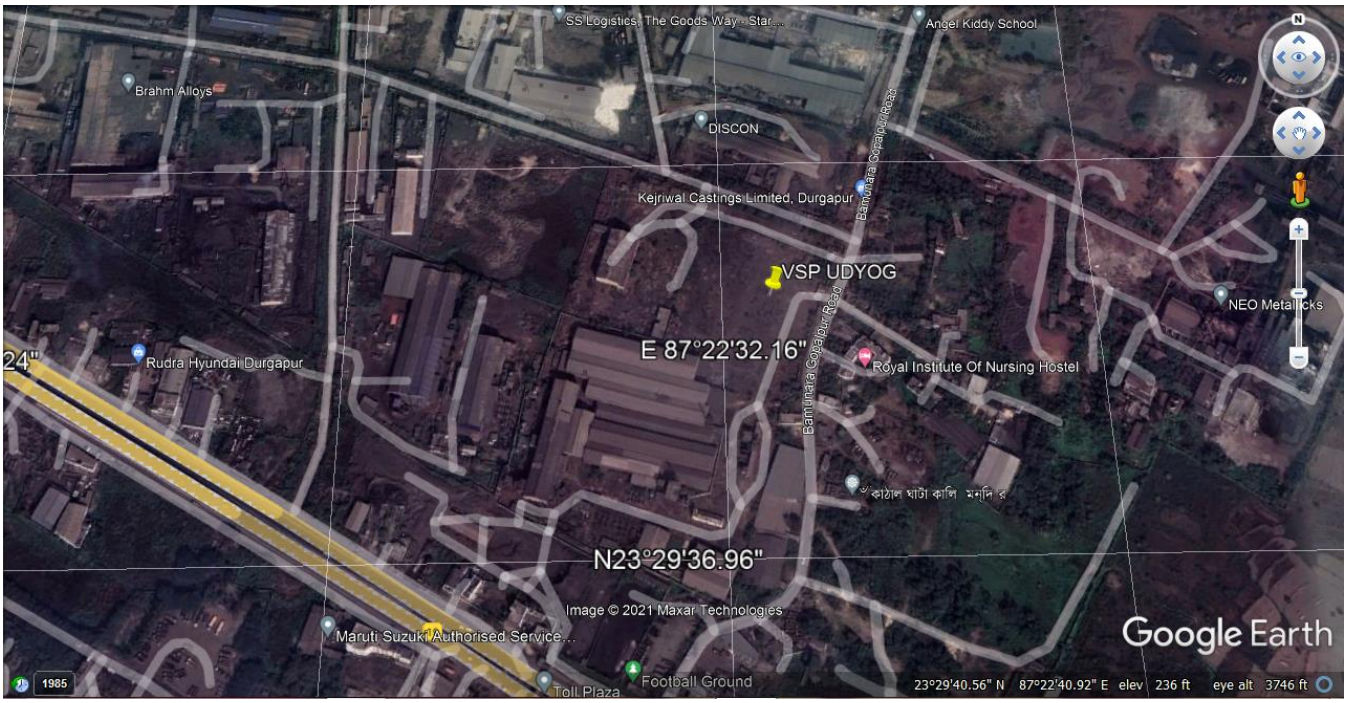


***Figure 2.2:* Co-ordinates of the site from Google map**

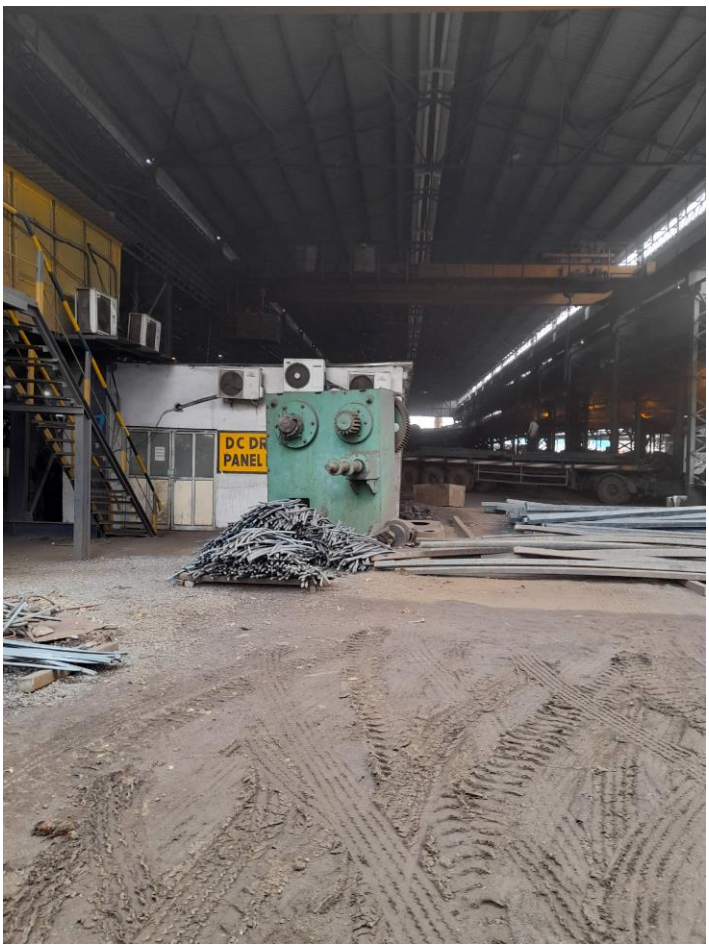


Source: - Google Earth

Figure 2.3: 10 km Buffer Map of project

10 KM RADIUS OF PROPOSED PROJECT SITE AT BAMUNARA INDUSTRIAL AREA, BAMUNARA, DURGAPUR, W.B.

Figure 2.4: Site Photographs



2.2.1 Site Connectivity

Total land requirement for project is 21.7 acres (88098.62 sqm) and it has good connectivity with the rail and road.

- **Road Connectivity:** The project site is well connected to G.T.Road which is at approx. 0.18 KM towards South direction.
- **Rail Connectivity:** The nearest railway station is Durgapur station at approx. 6.0 Km towards West direction from the proposed project site.
- **Airport:** Kazi Najrul Islam Airport is at distance of 20 Km towards NE direction from the project site. Netaji Subhas Chandra Bose International Airport is about 145 Km from the proposed project.

2.3 *Size* or magnitude of operation

VSP Udyog Pvt. Ltd. decided to expand its present billet production from 90,600 TPA to 354600 TPA. The proposed expansion will be made with the installation of 4 x 20 Tonnes Induction furnaces. They will also install Ladle Refining Furnace, CCM and made expansion of Wire Rod/Rolling Mill capacity from 1,20,000 to 2,50,000 TPA.

Particulars	**Existing**	**Subsequent Modification/Addition**	**Total Production Capacity**
Induction Furnace	2 no 8 T 1 no 15 T	4 no 20 T	-
M.S. Billets	90600 TPA	264000 TPA	354600 TPA
Rolling mill -1	80000 TPA	-	80000 TPA
Wire Rod/ Rolling mill -2	120000 TPA	130000 TPA	250000 TPA
Ladle Refining Furnace	-	25 Ton Capacity per Ladle	25 Ton Capacity per Ladle
CCM	4/7 Mtrs 2 Strand	6/11 Mtr 3 Strand	

ESTIMATION OF PROPOSED PLANT CAPACITY

No of Induction Furnace		4.00
No of Crucible		4
Capacity (T) of each Induction Furnace	T	20.00
Total Production (T) /heat	T/heat	80
No of Heats	Per day	10
Number of days available	Per annum	330
Total Liquid Metal Production	T	2,64,000
Actual Yield of Billets @ 99.5%	T	2,62,680

2.4 Proposed schedule for approval and implementation

The tentative project schedule is given below:

- 05.10.2021 → Submission of Form-1/PFR
- 23.11.2021 → TOR issued from SEIAA
- March, 2022 → Draft EIA submission for Public Hearing
- May, 2022 → Public Hearing
- July, 2022 → Submission of Final EIA to MOEF&CC for EC
- September, 2022 → Consideration of Project by EAC (Industry)

The implementation of the proposed part of the project will be taken up after receipt of Consent to establish from West Bengal State Pollution Control Board (WBPCB) and Environmental clearance from the SEIAA, Government of West Bengal.

2.5 Process details

The process of manufacturing ingot / billet from raw materials such as sponge iron, pig iron and scrap can be broadly classified as:

- Melting of Raw material in Induction Furnace.
- Transfer of molten metal into Ladle & put in CCM.
- Working up of the molten metal to the required grade & quality of steel.

Detail of manufacturing process is given below:

a) Selection of Raw-material:

The input materials for Induction Melting Furnace are sponge iron, pig iron, scraps and consumables like Ferro Silicon, Ferro Manganese.

b) Charging and loading of raw material into furnace:

The raw materials are stored right next to the furnace for easy of operation. They are weighed in the right proportion and charged into the furnace by using an electro magnet attached to an overhead crane. The crane used is called an E.O.T Crane.

c) Melting Process:

The furnace crucible is charged with the requisite quantity of scrap and sponge iron and the lid is put on. Power is introduced and the furnace gets hot and the steel starts to melt. Heating is continued till the entire metal mass melts to liquid state. At this stage, a little time is available for adding inclusions like ferroalloys and carbon, if necessary. The molten metal is now ready for pouring into the moulds. After completion of melting cycle, the homogeneous molten mass is poured into the ladle and carried away to CCM.

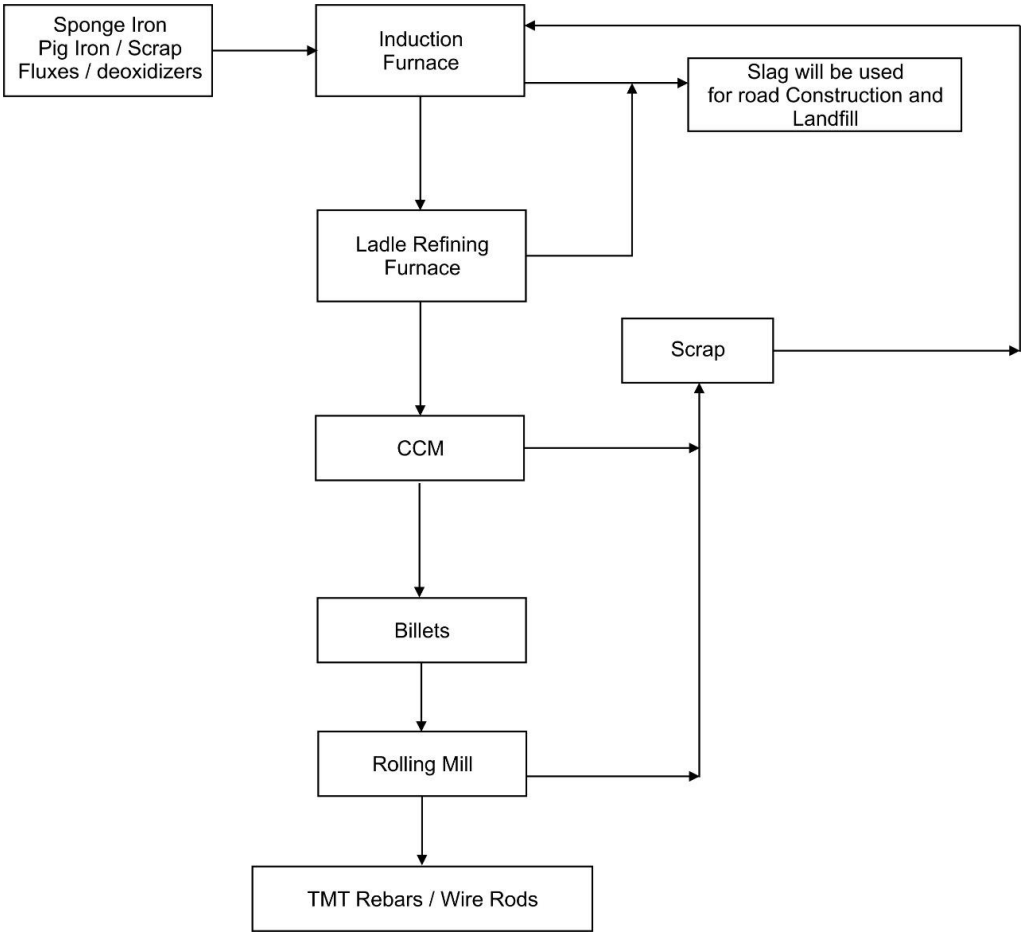
d) Ladle Refining Furnace (LRF)

Subsequent to the production of molten steel, the production of quality needs refining of the same. So, one Ladle Refining Furnace will be setup with electrodes arcing facility with complete provision to carry out de-sulphurization, and de-phosphorization if required. The liquid steel will be brought to LRF and after processing it will be transferred to CCM.

e) Casting by the Continuous Casting Machine (CCM)

The concept of continuous casting process is a continuous process. In continuous casting, the molten steel in the ladle is poured into an intermediate vessel (tundish). The continuous caster allows a cast strand to be withdrawn at high speed (1.5-2.8 m/min) from the mould in the form of a core of molten steel encased by a thin solidified shell. This high withdrawal speed ensures that casting productivity is matched to that of the converter. As the cast strand descends from the mould, its surface is cooled by a water spray or water mist, and the thickness of the shell increases progressively as the material solidifies. The continuous billet caster casts round or square strands of small cross-section, and the continuous bloom caster casts strands of large cross-section. Both are used to produce materials for long products such as wire rod, bars, shapes, and pipes.

Figure 2.5: Process Flow Chart



f) Rolled Products:

Subsequent to Billets (casting), further shaping operations are frequently desirable either to produce a new shape or to improve the properties of the metal. Shaping in the solid state may be divided into "non-cutting shaping" or "non-chipping shaping" such as forging, rolling, pressing, etc., and "cutting shaping" or "chipping shape giving" including the machining operations are various machine tools. Non-cutting shaping are referred to as mechanical working process.

After the hot, rolled bar leaves the finishing mill stand, it is rapidly quenched in TMT quench box by water spraying system. TMT bars or Thermo-Mechanically Treated bars are high-strength reinforcement bars having a tough outer core and a soft inner core. The rolled steel wires are therefore passed through the Tempcore water cooling system. While passing the wires through the water cooling system, the water pressure is optimised. The sudden quenching and drastic change in temperature toughen the outer layer of the steel bar, thus making it super tough

and durable. Once this process is over, the TMT bars are subject to atmospheric cooling. This is done in order to equalise the temperature difference between the soft inner core and the tough exterior. Once the TMT bar cools down, it slowly turns into a ferrite-pearlite mass. The inner core remains soft giving the TMT bar great tensile strength and elongation point. This design is unique to the TMT bars and gives superior ductility to the bars. Also, this unique manufacturing technique and the absence of Cold stress make this bar corrosion-resistant and boost its weldability.

2.6 Raw Material, Major equipment and Facilities

2.6.1 Raw Material

For **Induction Furnace:** Raw materials: - Sponge iron, Pig Iron, scrap, Ferro Silicon, Silicon Manganese are charged in induction furnace in a given ratio for the manufacture of mild steel.

Raw material for proposed unit to produce Steel Ingot, approximate per day requirement of above raw materials at 100% capacity utilization will be as below:

Raw Material Requirement at 100 % Capacity

Induction Furnace (Qtv. Required for 1 Ton Billet Production)		
Sponge lron made by Natural lron Ore	T	0.118
Sponge lron made by Pellet	T	0.793
Pig lon	T	0.021
Cast lron Boulder (205-1)	T	0.074
Mild Steel / Cast lron (70-250)	T	0.029
Scrap	T	0.084
Cast lron (2-15)	T	0.118

Adequate raw material storage capacity is available at the site.

Chemical composition of Ingot / Billet:

C	:	0.12-0.15%
Mn	:	0.50-0.60%
S	:	0.04-0.55%
Si	:	0.11-0.15%
P	:	0.55-0.65%

Sl. No.	Raw Materials	Finished Goods
1.	Sponge lron made by Natural lron Ore: 0.118 T	Steel Ingot/Billets : 1.000 T
2.	Sponge lron made by Pellet: 0.793 T	Slag : 0.080 T
3.	Pig lon 0.021 T	Others : 0.157 T
4.	Cast lron Boulder (205-1): 0.074 T	
5.	Mild Steel / Cast lron (70-250): 0.029 T	
6.	Scrap: 0.084 T	
7.	Cast lron (2-15): 0.118 T	
Total	Input : 1.237 T	Output : 1.237 T

2.6.2 Plant and Equipment

Sl. No.	**Particulars**
1.	Induction Furnace
	Static Frequency convertor
	DC Smoothing reactor
	Capacitor bank
	DM Water cooling system
	Operators Control panel
	Induction Furnace crucible
	Continuous Casting Machine
	Bus tube Assembly
	Hydraulic Power pack
	Water cool cables
	Transformer

Sl. No.	Particulars
2	Others
	Electricals
	EOT Care
	Lab Equipment
	Testing Equipment
	Refractories
	Mould
3.	Pollution Control System

2.7 Utilities

Water requirement: Water requirement in the plant is for cooling (make-up) and domestic & other purposes. The required water will be sourced from ground water.

Particulars	Required for Existing Plant (KLD)	Requirement for Proposed Plant (KLD)	Total (KLD)
Water for cooling (Make up)	57	97	154
Domestic Purpose & other uses	3	3	6
Total	60	100	160

Power and Fuel Requirement

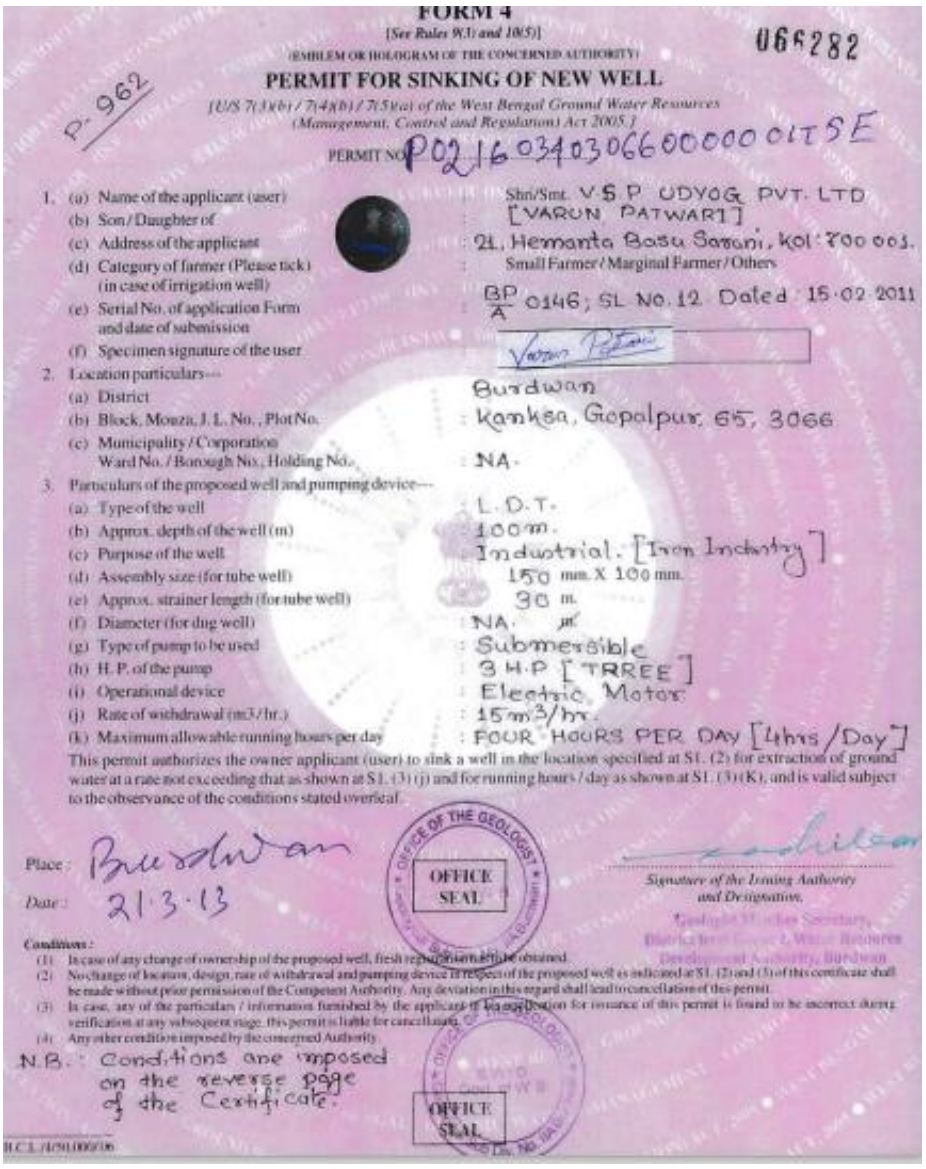
Power	Existing	Additional
Power from WBSEDCL	20 MVA	20 MVA
DG Set	1x125 KVA	NIL
	1X250 KVA	
	1X500 KVA	
	1X125 KVA	

Fuel (Diesel) required for Existing D.G. approx. 1000 KL per month.

Energy Balance:

Power consumption (proposed)	**KVA**	**Power Availability (proposed)**	**KVA**
Induction Furnace	22,000	From WBSEDCL	40,000
Rolling mill	14,000		
Allied services	4,000		
Total (KVA)	**40,000**	**Total (KVA)**	**40,000**

Figure 2.6: **Permission for water**



FORM 4

[See Rules 9(1) and 10(5)]

066282

(EMBLEM OR HOLOGRAM OF THE CONCERNED AUTHORITY)

PERMIT FOR SINKING OF NEW WELL

[U/S 7(3)(b) / 7(4)(b) / 7(5)(a) of the West Bengal Ground Water Resources (Management, Control and Regulation) Act 2005.]

P' 962

PERMIT NO. P02160340306600000 01T SE

1. (a) Name of the applicant (user) : Shri/Smt. V.S.P UDYOG PVT. LTD [VARUN PATWARI]
   (b) Son / Daughter of
   (c) Address of the applicant : 21, Hemanta Basu Sarani, Kol: 700 001.
   (d) Category of farmer (Please tick) (in case of irrigation well) : Small Farmer / Marginal Farmer / Others
   (e) Serial No. of application Form and date of submission : BP A 0146; SL No. 12 Dated 15.02.2011
   (f) Specimen signature of the user : Varun Patwari
2. Location particulars—
   (a) District : Burdwan
   (b) Block, Mouza, J. L. No., Plot No. : Kanksa, Gopalpur, 65, 3066
   (c) Municipality / Corporation Ward No. / Borough No., Holding No. : NA.
3. Particulars of the proposed well and pumping device—
   (a) Type of the well : L.D.T.
   (b) Approx. depth of the well (m) : 100 m.
   (c) Purpose of the well : Industrial. [Iron Industry]
   (d) Assembly size (for tube well) : 150 mm. X 100 mm.
   (e) Approx. strainer length (for tube well) : 30 m.
   (f) Diameter (for dug well) : NA. m.
   (g) Type of pump to be used : Submersible
   (h) H. P. of the pump : 3 H.P [TREE]
   (i) Operational device : Electric Motor
   (j) Rate of withdrawal (m3/hr.) : 15 m3/hr.
   (k) Maximum allowable running hours per day : FOUR HOURS PER DAY [4hrs/Day]

This permit authorizes the owner applicant (user) to sink a well in the location specified at Sl. (2) for extraction of ground water at a rate not exceeding that as shown at Sl. (3) (j) and for running hours / day as shown at Sl. (3) (K), and is valid subject to the observance of the conditions stated overleaf.

Place : Burdwan
Date : 21.3.13

OFFICE OF THE GEOLOGIST
OFFICE SEAL

Signature of the Issuing Authority and Designation.

Conditions :
(1) In case of any change of ownership of the proposed well, fresh registration will be obtained.
(2) No change of location, design, rate of withdrawal and pumping device in respect of the proposed well as indicated at Sl. (2) and (3) of this certificate shall be made without prior permission of the Competent Authority. Any deviation in this regard shall lead to cancellation of this permit.
(3) In case, any of the particulars / information furnished by the applicant in his application for issuance of this permit is found to be incorrect during verification at any subsequent stage, this permit is liable for cancellation.
(4) Any other condition imposed by the concerned Authority.

N.B. : Conditions are imposed on the reverse page of the Certificate.

OFFICE SEAL

Manpower

The manpower for expansion project is given as per the Table below.

Sr No.	Designation	No of Shift	Total
	Contract Manpower for Induction		
1	Furnace Operators (Highly Skilled)	2 Shift	24
2	Assistant Furnace Operators	2 Shift	08
3	Gas Cutter/Welder	2 Shift	08
4	Helper	2 Shift	20
5	Mechanical Fitter	2 Shift	16
6	Electrician	2 Shift	16
7	Helper	2 Shift	20
8	Pump/Compressor Attendant	2 shift	4
9	Bariman	2 Shift	32
10	Crane Operators	3 Shift	45
	Contract manpower for Concast and LRF		
11	Skilled Workmen	2 shift	54
12	SSK	2 Shift	13
TOTAL			**260**
	Permanent		
13	Store In charge	2 Shift	2
14	Store Assistants	2 Shift	2
15	Helper	2 Shift	4
16	QC in Charge	2 Shift	2
17	QC Assistant	2 Shift	4
18	Helper	2 Shift	4
19	Commercial Manager		1
20	Asst.Commercial Manager		1
21	Accounts Officer		2
22	Electrical Engineer	2 Shift	2
23	Assist. Electrical Engineer	2 Shift	2
24	Mechanical Engineer	2 Shift	2
25	Asst.Mechanical Engineer	2 Shift	2
26	Production in Charge-SMS	2 Shift	2
27	Production In Charge-Rolling	2 Shift	2
28	Raw Materials Handling- SMS	2 Shift	4
29	Despatch Handling-SMS & Rolling Mill	2 Shift	6
30	Rolling Mill Supervisor	2 Shift	2
31	Logistic In Charge	2 Shift	2
32	Logistic Assist.	2 Shift	2
TOTAL			**50**

Manpower	Existing Units	Proposed Expansion
Permanent	237	50
Contract	226	260
Total	**463**	**310**

2.8 Plant layout

The layout of the plant is developed taking into following considerations:

- The major utilities and service facilities are centrally located in respect to points of high Consumption.
- Sufficient space are provided for ease of operation and maintenance.
- Outward movements of materials from customers/suppliers is segregated from internal plant traffic.
- Sufficient space for storage of raw materials and finished products.
- Green belt is provided.
- Rainwater harvesting pond will be provided.
- Adequate area will earmark for solid waste disposal.

Table 2.2: Proposed Plant Area

Sl. No.	Category	Subcategory	Area (Sqm)	% Area
1	Air Pollution Control System		947.8	0.92%
2	Building	CMD Office		0.15%
		Main Office		0.18%
		Temp Office		0.04%
		General Store		0.42%
		Toilet		0.02%
		Security Room		0.01%
		Others	1031.61	0.38%
3	Road		6711.66	7.61%
4	Proposed Steel Melt Shop & Wire Rod Block Line	CCM 6/11 Stand		1.65%
		LRF	18414.12	1.8%

Sl. No.	Category	Subcategory	Area (Sqm)	% Area
		Billet Store Area		1.25%
		Wire Rod & TMT Storage Bay		2.9%
		Melting & Casting Bay		1.60%
		DRI Storage Area		1.2%
		Distribution Tower		2.82%
		Mill Bay		3.08%
		Others		4.6%
5	Existing Rolling mill and Finished product		18044.99	20.46
6	Substation	Proposed Substation		0.81
		Switch Yard	1430.05	0.81
7	Water Circulation System	Cooling Tower		0.86
		Pump House		0.86
		Water Tank		0.29
		Water Complex for SMS	2642.91	0.98
8	Transformer Room		1475.05	1.67
9	Vacant Land		6491.2	7.39
10	Green Belt		29913.23	33.95
11	Pave Road		996	1.13
	Total		**88098.62**	**100%**

Figure 2.7: Plant Layout

2.9 Cost estimate of the project

An indicative estimated capital cost of the proposed Plant is **Rs. 190.80 Cr.**

Sl. No.	Item	Cost (Rs. Cr)
1.	Land & Site Development	0.00
2.	Factory shed & structure	27.32
3.	Civil work	22.71
4.	Plant & machinery	89.25
5.	Aux. facilities equipments	6.10
6.	Electrical installation	16.30
8.	Equipment errection	5.58
9.	Misc assets	0.73
10.	Pre Operative Expenses	14.20
11.	Contingency /Escalation	8.60
	Total	**190.80**

2.10 Schedule for implementation of the project

It is envisaged that the project will be completed within a period of 3 months from `Go-ahead'. The external agencies such as consultant, machinery suppliers, contractors of civil construction and equipment will be selected carefully well in advance. An effective project team has been formulated with Director as its leader.

2.11 Description of mitigation measure incorporated in to the project to meet environmental standard, environmental operating conditions or other EIA requirements

The types of pollution, which affect the environment, emanating from the this plant can be classified as follows:

- Air Pollution
- Water Pollution
- Solid Waste
- Noise Pollution

2.11.1 Air Pollution:

The sources of air pollution from the plant activities are as follows:

a) The emission from Induction furnace during transfer of raw materials

b) Fumes from the Induction furnace

c) Fugitive emission during breaking of ferro-alloys and packing

Air in and over the plant area and beyond its boundaries gets polluted with gases, fumes and dust particles emanating from the processes, chimneys, transfer points of conveying and handling equipment. The air pollutions in the steel plant are mainly dust & gases like sulfur dioxide, carbon monoxide, nitrogen oxide, etc.

Existing and Proposed Air Pollution control devices: The performance of the existing APC has been discussed below.

Existing Stack No.	Stack Attached to	Stack height (m)	Dia of Stack (m)	Temp. (^{0}C)	Velocity (m/s)	PM (mg/Nm^3)	APC System & Air Volume As given in Test Report
1.	1 Nos. 8 T Induction Furnace	22.5	0.67	49	12.76	33.0	Spark Arrestor & Bag Filter Volume-14694 Nm^3/hr
	1 Nos. 8 T Induction Furnace	22.5	0.67	53	13.07	37.0	Spark Arrestor & Bag Filter Volume-14890 Nm^3/hr
	1 Nos. 15T Induction Furnace	22.5	0.67	71	14.62	33.0	Spark Arrestor & Bag Filter Volume-15792 Nm^3/hr
2.	Re-Heating Furnace	32	0.92	187	7.43	29.0	Nil
3.	1x125 KVA DG	3.0	0.1	162	13.84	<75	Nil
4.	1X250 KVA DG	3.0	0.1	162	13.84	<75	Nil
5.	1X500 KVA DG	3.0	0.1	162	13.84	<75	Nil

Existing Stack No.	Stack Attached to	Stack height (m)	Dia of Stack (m)	Temp. (^{0}C)	Velocity (m/s)	PM (mg/Nm^3)	APC System & Air Volume As given in Test Report
6.	1X125 KVA DG	3.0	0.1	162	13.84	<75	Nil

For proposed Induction furnace (4x20T), there will be installation of four nos. of APC system comprises of Bag filter, spark arrestor, ID Fan along with 30m high common chimney for disposal of clean gas.

Proposed Stack No.	Stack Attached to	Stack height(m)	Dia of Stack	Temp. (^{0}C)	Velocity (m/s)	PM (mg/Nm^3)	APC System & Air Volume As given in Test Report
1	1 Nos. 20 T Induction Furnace	30	Bottom 2800 mm Top 1800 mm	60-80	22	22	Bag Filter Volume- 75000 Nm³/hr Each
	1 Nos. 20 T Induction Furnace	30	Bottom 2800 mm Top 1800 mm	60-80	22	22	Bag Filter Volume- 75000 Nm³/hr Each
	1 Nos. 20 T Induction Furnace	30	Bottom 2800 mm Top 1800 mm	60-80	22	22	Bag Filter Volume- 75000 Nm³/hr Each
	1 Nos. 20 T Induction Furnace	30	Bottom 2800 mm Top 1800 mm	60-80	22	22	Bag Filter Volume- 75000 Nm³/hr Each

Technical Details of Proposed APC:

Gas volume for induction furnaces	:	4 nos x 75000 Nm³/hr each capacity

Gas volume for Ladle furnace	:	1 no x 20000 Nm^3/hr each capacity
Total Gas Volume	:	320 000 Nm^3/hr
ID Fan	:	4 nos x 80000 Nm^3/hr each capacity
Temperature	:	Exhaust gas temperature at tip of stack – 60 to 80°C
Static pressure at operating temp.	:	650mmWG
Speed	:	900RPM
Recommended motor rating	:	240KW each motor
Mode of construction	:	TISCO/SAIL

Bag Filter for Induction furnace	
Gas volume	320000 N m^3/hr
Air to Cloth ratio	1.4 m3/min/m2
Total filtering area	Net: 3597m2, Gross: 3997m2
No. of Filter Bag	2340Nos.
No. of Module	12 Nos
No. of Filter Bag in each module	195 Nos
Bag size (dia x long)	Ø158 mm,3660mm
Compressed air quantity	333.75 CFM
Pressure drop across the bag filter	600mmwg
Size and qty. of solenoid valve	40NB , 240 qty
Size of Rotary Air lock	250x250NB
Geared motor	3HP

Pulse duration	110 Milli seconds
Pulse Interval	10 - 300 second
Expected outlet Particulate Matter	outlet emission – 20 mg/Nm3.
Stack diameter (m)	Bottom dia 2800mm and top dia 1800 mm
Flue gas velocity (m/sec)	22

The dust concentration level in the chimney will be periodically monitored. Corrective steps will be taken, if the concentration is not as per the acceptable limits. The particulate concentration from the bag filters will remain within 50 mg/Nm^3.

Work zone emission control

All the raw material and finished product transfer points or conveyor chutes have dry fogging/misting system to restrain the fugitive dust from escaping in to surrounding area. The dry fogging system nozzles envisaged is self cleaning and low maintenance type. The dry fog systems is implemented, suited for suppressing all kind and level of dust including hydrophobic coal dust. The dry fog system envisaged controls all breathable fugitive dust. All dust at transfer point and handling system in spite of bag houses is further suppressed in semi-dry condition and moisture pick up is less than 0.1 % by weight of iron ore and coal being handled so that water consumption remains low.

The dust concentration level in the chimney is periodically monitored. Corrective steps is taken, if the concentration is not as per the acceptable limits. The particulate concentration from the bag filters is within 50 mg/Nm^3.

Raw material handling can cause dust generation at the point of storage and transportation. The fugitive dust can have adverse impact on air quality inside the plant and its immediate surrounding. This is prevented by spraying water at storage yard area.

Ambient air quality monitoring stations in and around the premises is done as per direction by West Bengal Pollution Control Board (WBPCB).

Other dust suppression measures:

*****All the conveyors and transfer points is totally enclosed with only self closing doors for entry for the purpose of maintenance.

*****All the existing internal roads, proposed roads and out side road leading to the plant is either asphalted or concreted.

***** It is proposed to install fixed sprinklers at all the iron ore, coal and char dump area, roads leading to these area near screens and ground hoppers.

*****One mobile water tanker fitted with water spraying arrangement is considered during the operation period for regular wetting of the ground within the premises.

2.11.2 Water Pollution:

At present there is no source of any industrial wastewater generation. Only domestic wastewater is generated. And, since the unit is going to continue its current practice of manufacturing after proposed expansion, so in this cases no wastewater generation. Actually, there will not be any process waste water (or) cooling water blow down from the SMS as closed circuit cooling system will be adopted. Closed circuit cooling system will be adopted in cooling of Billets and TMT Bars/Structural steel/MS Rounds/Strips. Therefore there will not be any waste water generation from process and cooling in the steel plant. Only domestic wastewater will be generated. Sanitary waste water (approx. 8.0 KLD) will be treated in septic tank followed by soak pit.

2.11.3 Solid waste:

Type of Solid Waste	Estimated Generation (T/Month)	Process of Disposal
Slag from SMS (new project)	320	Slag will be crushed and after recovery of iron by magnetic separator, the inert material will be used in road construction and remaining amount is planned to be dumped in an environmental friendly manner in a separate area.
Slag from LRF	15	Slag will be used for land fill.
Scrap	40	Re-melted in the process.
Dust from Air pollution control system	320	Land Filling, making of fly ash bricks.
Mill scale from rolling	30	Will be recycled in Induction furnace.

2.11.4 Noise Pollution:

Many operations in the produces objectionable level of noise which may not be practicable to eliminate entirely, by in most areas it can be brought down to the acceptable level. Various measures proposed to reduce the noise pollution includes reduction of noise at source, provision of acoustic lagging for the equipment and suction side silencers, selection for low noise equipment, isolation of noisy equipment from working personnel, etc.

Monitoring of Noise is carried out near the high noise generating areas inside the units. Beside this, necessary precaution is taken to minimize the noise generation.

Noise may be sourced from the following areas:

- Raw Material Handling Sections
- Charging operation, Product handling, Slag crushing
- Generator Area
- Compressor, Pumps, Fans
- Traffic Movement

Following mitigative measures is taken to minimize the noise.

- ✓ Appropriate specifications of Equipment / Machinery.
- ✓ Proper and timely oiling, lubrication and preventive maintenance is carried out for the machineries and equipments.
- ✓ Well lubrication of the rotating equipments.
- ✓ Provision of enclosures to reduce noise transmission.
- ✓ Provision of vibration Isolators to reduce vibration.
- ✓ To minimize the adverse effect on the health, ear muffs/ earplugs are provided to the workers working under high noise area.
- ✓ Provide acoustic enclosure for rotating equipment, silencer for DG set.
- ✓ Proper maintenance – reduction of noise at source.
- ✓ Vehicle will be periodically serviced and maintained
- ✓ Housing of Blowers / Compressors in sound proof buildings
- ✓ Green belt area will be developed to prevent the noise pollution outside the factory premises.

CHAPTER 3

BASELINE ENVIRONMENTAL STATUS

Chapter 3: Baseline Environmental Status

3.1 Introduction

This chapter illustrates the description of the existing environmental status of the study area with reference to the prominent environmental attributes. The existing environmental setting is considered to establish the baseline conditions which are described with respect to physical environment, air environment, noise environment, traffic pattern and density, water environment, land environment, biological environment, socio economic environment. An environmental baseline survey was also conducted for collection of primary and for generation of secondary data.

3.1.1 Establishment of study area

Before proceeding for baseline data generation, it is important to know the boundary limits and framework, so that the data generated can be effectively utilized for impact assessment. Baseline data of study area of 10 km radius around the project site is considered EIA study.

3.1.2 Study period

The TOR has been granted on 23rd November 2021 vide file no. EN/T-II-1/159/2021. Accordingly, the baseline environmental study has been done for the period **1st October, 2021 to 31st December, 2021,** as well as secondary data also collected from different sources. Baseline data has been collected out during the October, 2021 to December, 2021 by **M/s. Envirocheck**. The impact identification always commences with the collection of baseline data such as Ambient Air Quality, Micro-Meteorology, Ground and Surface Water Quality, Noise levels, Soil Quality, Land use pattern, Biological Environment and Socio-economic aspects, Solid and Hazardous waste, Risk Assessment, Geology and Hydrology within the study zone of 10 Km. radius.

3.2 Establishment of baseline for valued environmental components, as identified in the scope

3.2.1 Meteorological data

Assessment of the micro and macro meteorology is important from the standpoint of understanding the nature and extent of air pollution in the study area. Climate has an important role in the build-up of pollution levels. The metrological station was set-up at the project site and baseline data was collected which are reproduced as under:

3.2.2 Climatic condition

The meteorological data recorded during the monitoring period is very useful for proper interpretation of the baseline information as well as for input prediction models for air quality dispersion. A meteorological station equipped with continuous monitoring equipment was

installed on at project site, at a height 7.0 m above ground level to record wind speed, wind direction, relative humidity and temperature.

3.2.3 Regional meteorology

The district received an average rainfall of 1200 mm. Period from June to September is well known for monsoon. The monthly rainfall data shows that 75% of rainfall comes during monsoon period. The wind direction is predominantly from N, W, & NW during winter and S, E & SE during most of the other seasons.

The year broadly is divided into four seasons:-

- Winter Season: December to February
- Pre – Monsoon: March to May
- Monsoon Season: June to September
- Post – Monsoon: October to December

A. WIND

Regional meteorological scenario helps to understand the trends of the climatic factors. It also helps in determining the sampling stations and in predicting the post project environmental scenario. Meteorological scenario exerts a critical influence on Air Quality as the pollution arises from the interaction of atmospheric contaminants with adverse meteorological conditions such as temperature inversions, atmospheric stability and topographical features like hills, and valleys.

The critical weather elements that influence air pollution are wind speed, wind direction, temperature, which together determines atmosphere stability. Hence it is an indispensable part of any air pollution studies and required for interpretation of base line information. Wind speed and direction data recorded during the study period is useful in identifying the influence of meteorology on the air quality of the area.

B. WIND ROSE

The meteorological data was collected at the site by installing an automatic weather station during winter season 2021. Due care was taken in establishing the monitoring station to ensure free flow of winds without any obstructions.

Wind Speed, Wind Direction, Temperature and Relative Humidity were recorded for the total study period. The data on wind patterns are pictorially represented by means of wind rose diagrams for study period **1st October, 2021 to 31st December, 2021**. Wind rose is shown in **Figure 3.1.**

Figure 3.1: Windrose diagram

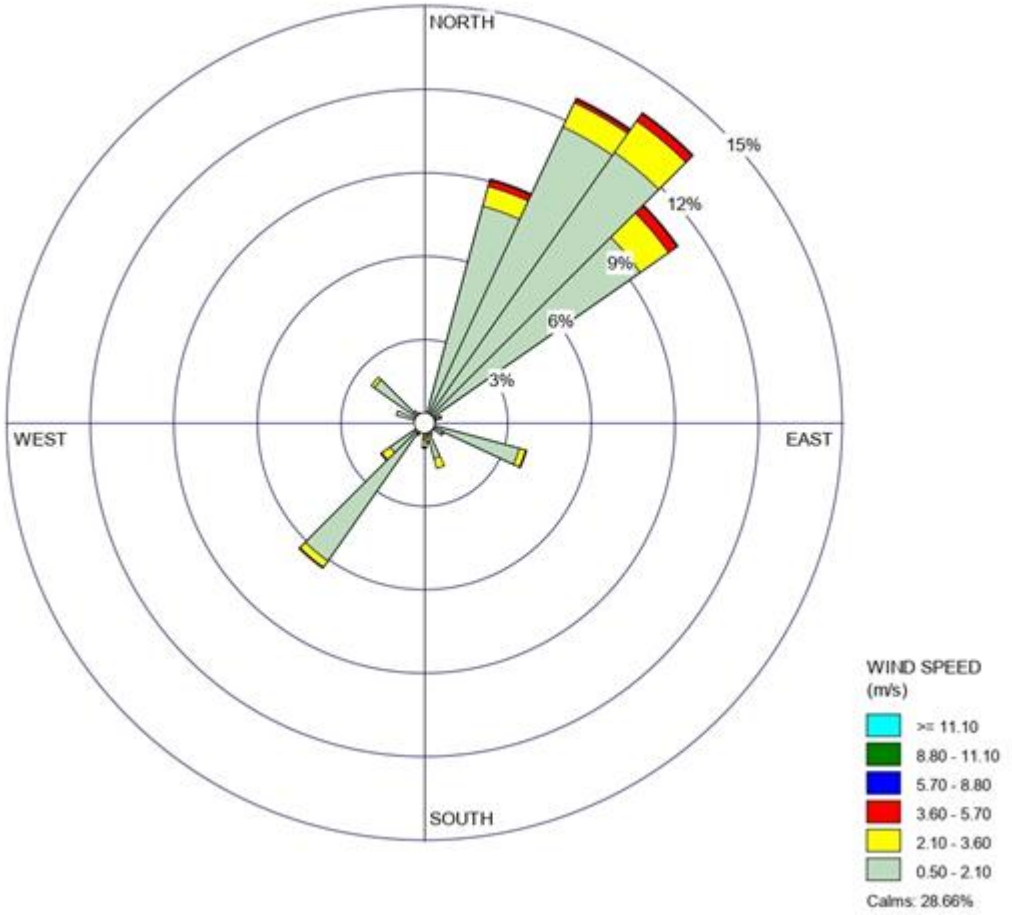
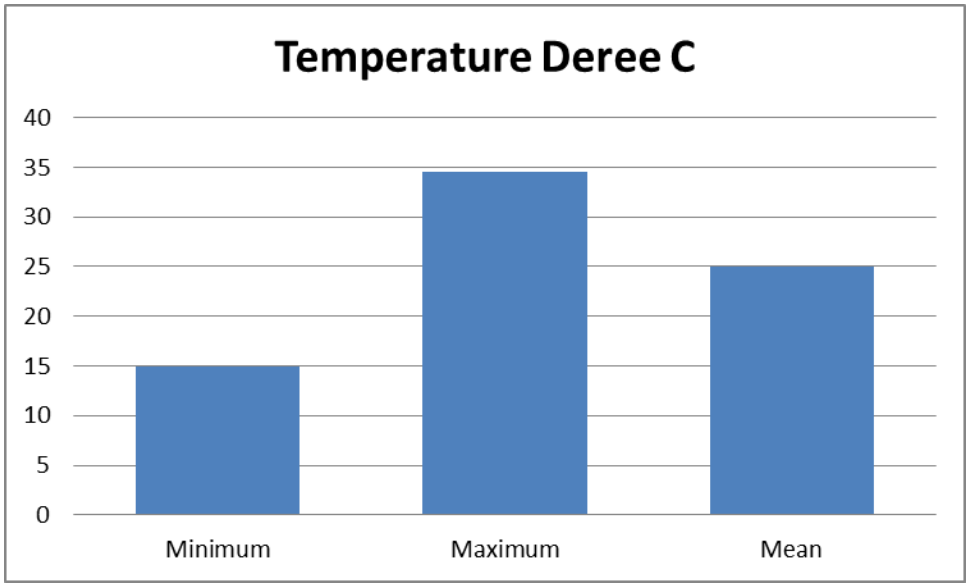
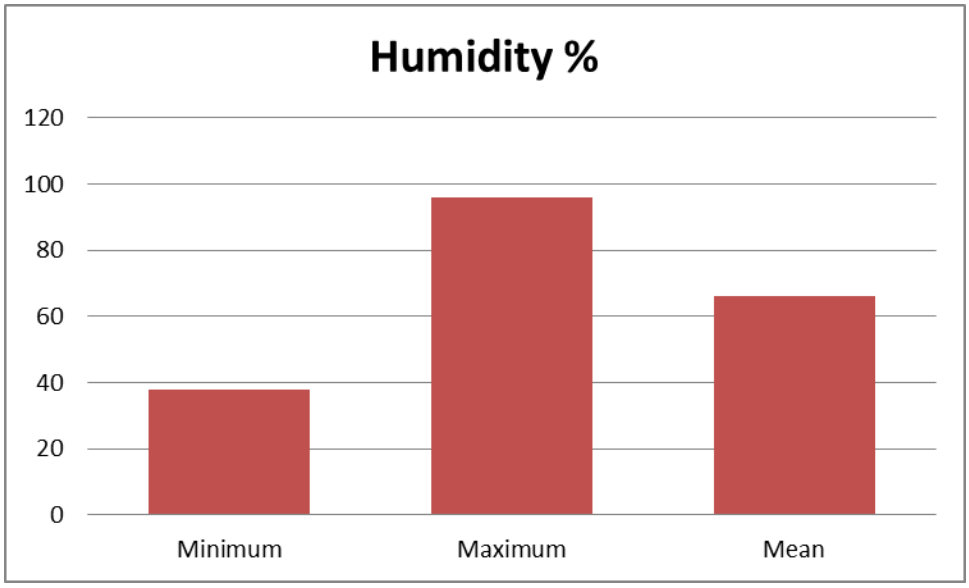


Table 3.1: Weather summary during study period

1	Predominant Wind direction	:	FROM NORTH EAST
2	Average Wind Speed	:	1.6 m/s
3	Minimum Temperature	:	15.0 ^{0}C
4	Maximum Temperature	:	34.5 ^{0}C
5	Mean Temperature	:	25.0 ^{0}C
6	Minimum Humidity	:	38%
7	Maximum Humidity	:	96%
8	Mean Humidity	:	66.0%
9	Total Rainfall	:	50.0 mm

Figure 3.2: Graphical presentation of Temperature and Humidity





3.3 Air Quality

3.3.1 Analytical techniques for air quality monitoring

Criteria pollutants like Fine Particulate Matter ($PM_{2.5}$), Respirable Suspended Particulate Matter (PM_{10}), Sulphur dioxide (SO_2), Nitrogen dioxide (NO_2) and Carbon Monoxide (CO) are monitored within the study area by following CPCB guidelines. Monitoring is carried out using Respirable & Fine Dust Sampler with attachment for gaseous sampling.

Selections of ambient air quality monitoring stations - Ambient air quality monitoring stations are selected within the impact zone by knowing the upwind and downwind direction (obtained from IMD, previous EIA reports, Coverage factor Analysis and screen modeling technique). Logistics for operating the instrument like accessibility, electricity connection, security and safety of instruments etc. is another main factor that is used to locate the station. Sampler is not operated using petrol/ diesel Generator Sets and not located on ground or along the road-side. The three broad criteria for selection of ambient air quality monitoring stations are given below.

- Sampling Height - Sampler should be located 3 m to 5 m height from ground level.
- Sampling Location - Sampler should be located > 500 m distance from the roads.
- Aerial Clearance - Minimum clearance satisfactory for sampling is 270°.There should be no high-rise structures above the sampler height, like tall trees, tall buildings, hordings or other high obstructions around the sampler (in a circle of 500 m radius).

Eight ambient air quality monitoring stations were located in the impact area during winter season 2021 (**1st October, 2021 to 31st December, 2021**). Standard procedures and frequency

prescribed by CPCB were used. The monitoring locations are shown below. The summary of AAQ results is shown in **Table 3.4.**

Table 3.2: *Techniques Used for Air Quality Monitoring*

Parameter	**PM10**	**PM2.5**	**SO_2**	**NOx**	**CO**
Method	IS: 5182 (Part 23), 2006	USEPA, (Part 50), 1997a, 40CFR , Appendix L	IS: 5182 (Part 2), 2001.	IS: 5182 (Part 6), 2006	IS: 5182 (Part 10), 1999 Reaffirmed 2003

3.3.2 Methodology adopted for the study

The baseline status of the ambient air has been established through a scientifically designed ambient air quality monitoring network. The following criteria were taken into account during selection of the sampling stations:

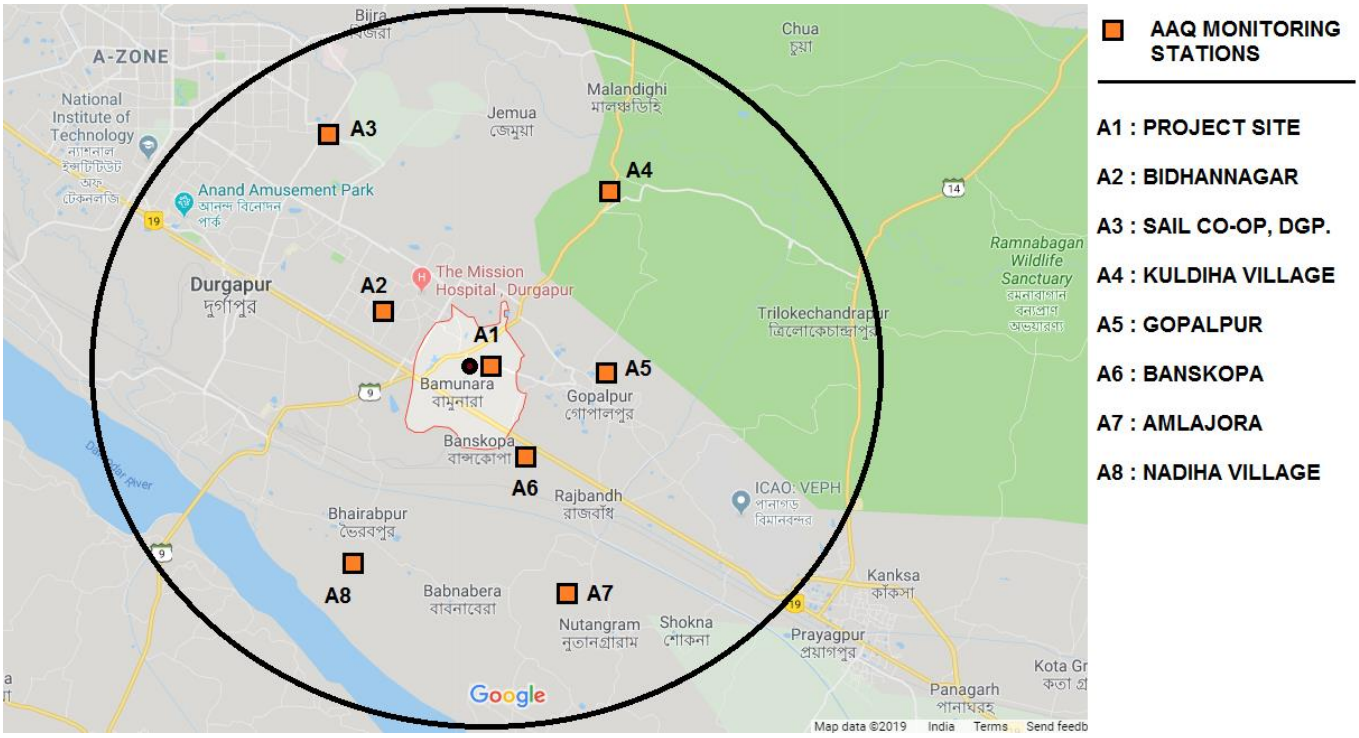
- Topography of the area.
- Human settlements within the study area.
- Safety, accessibility and non-interference with general routine of the people residing near the station.

Table 3.3: ***Ambient Air Sampling Stations***

Code	**Location**	**Description**	**Distance & Direction from Plant**
A1	Project Site	At Plant	0 km
A2	Bidhannagar	Upwind direction	3.0 km, NW
A3	Sail Cooperative, Durgapur	Upwind direction	5 km, NW
A4	Kuldiha Village	Upwind d direction	4 km, N
A5	Gopalpur	Crosswind direction	2 km, E

A6	Banskopa	Downwind direction	1.0 km, SE
A7	Amlajora Village	Downwind direction	4 km, S
A8	Nadiha Village	Downwind d direction	5.5 km, SW

Figure 3.3: Location of Ambient Air Quality Monitoring Station



3.3.3 Air quality of study area

Air quality at the project site ambient air quality analysis was conducted at the project site by-weekly for three months from October 2021 to December 2021. The analysis reports are appended below in the **Table-3.4 and attached as Annexure IV.**

Table 3.4: Summary of Ambient Air Quality Concentrations in the Study Area

STATIONS		PM10	PM2.5	SO2	NOX	CO
Project site [A1]	MIN	129.50	51.20	12.60	30.40	0.90
	MAX	149.40	69.90	19.20	45.20	1.50

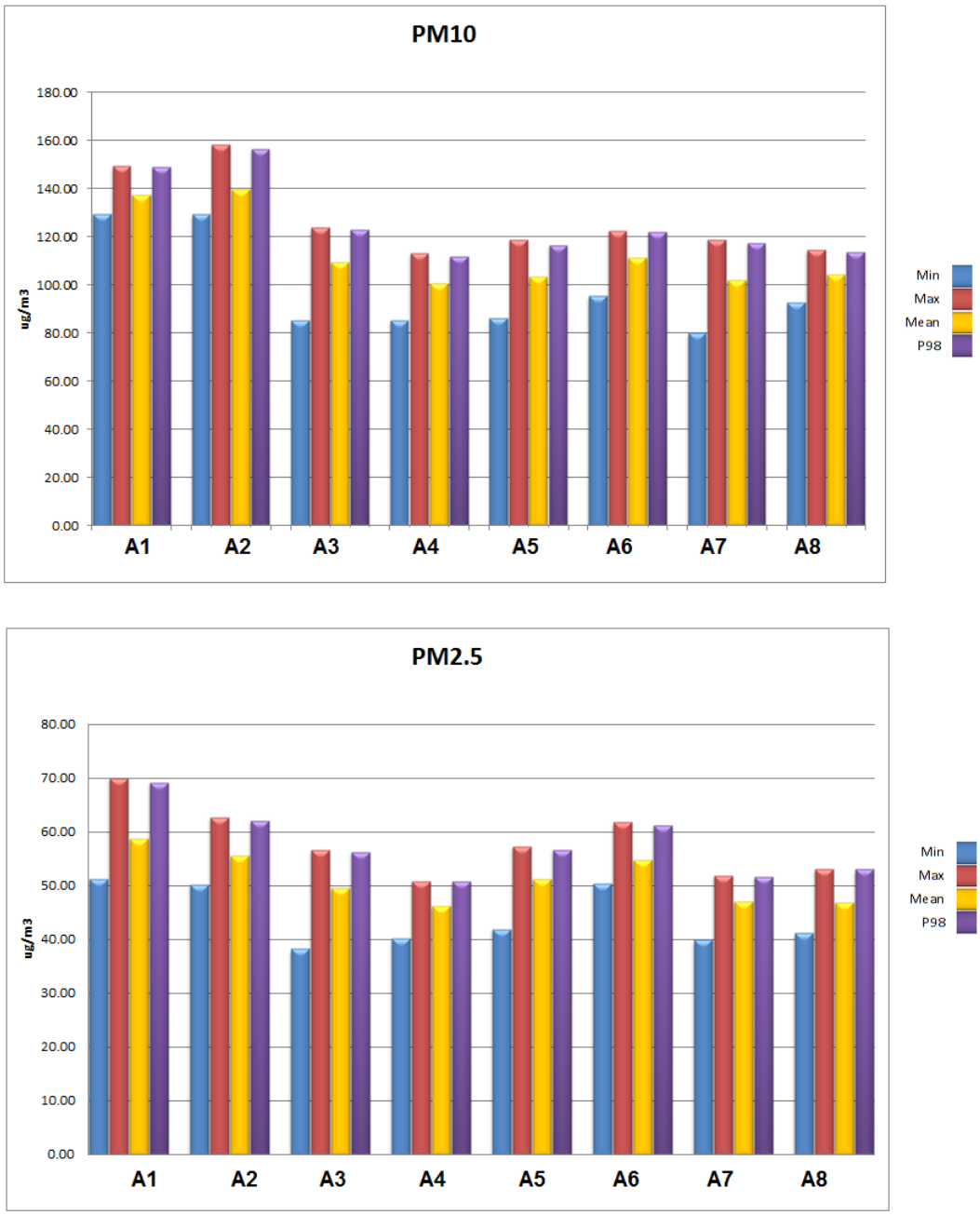
STATIONS		PM10	PM2.5	SO2	NOX	CO
	MEAN	137.56	58.71	15.59	36.07	1.14
	P98	149.03	69.12	18.88	43.91	1.44
Bidhannagar [A2]	MIN	129.40	50.10	11.30	29.60	0.56
	MAX	158.30	62.60	17.60	45.90	1.20
	MEAN	139.74	55.45	14.98	35.72	0.77
	P98	156.51	62.05	17.55	45.16	1.16
SAIL CO-OP. Durgapur [A3]	MIN	85.40	38.20	8.60	21.80	
	MAX	123.80	56.50	12.40	35.70	
	MEAN	109.33	49.43	10.50	27.14	BDL
	P98	123.16	56.13	12.22	33.68	
Kuldiha Village [A4]	MIN	85.40	40.10	7.60	24.20	
	MAX	113.20	50.80	9.80	31.40	
	MEAN	100.40	46.04	8.62	26.07	BDL
	P98	112.00	50.62	9.80	29.65	
Gopalpur [A5]	MIN	86.40	41.80	6.50	21.50	0.20
	MAX	118.60	57.20	12.50	32.00	0.50
	MEAN	103.27	51.18	9.58	27.29	0.39
	P98	116.62	56.56	12.18	31.63	0.50
Banskopa [A6]	MIN	95.30	50.40	7.10	26.00	0.40
	MAX	122.50	61.70	9.80	31.70	0.62
	MEAN	111.27	54.75	8.32	28.42	0.54
	P98	122.18	61.19	9.62	31.70	0.61
Amlajora village [A7]	MIN	80.10	39.80	5.00	18.50	0.28
	MAX	118.90	51.80	8.20	28.70	0.46
	MEAN	101.84	46.90	6.89	24.51	0.36
	P98	117.43	51.62	8.15	28.56	0.44
Nadiha village [A8]	MIN	92.50	41.10	8.20	21.30	0.20
	MAX	114.50	53.10	11.20	33.10	0.60
	MEAN	104.17	46.83	9.38	28.16	0.40
	P98	113.53	52.96	11.20	32.50	0.60

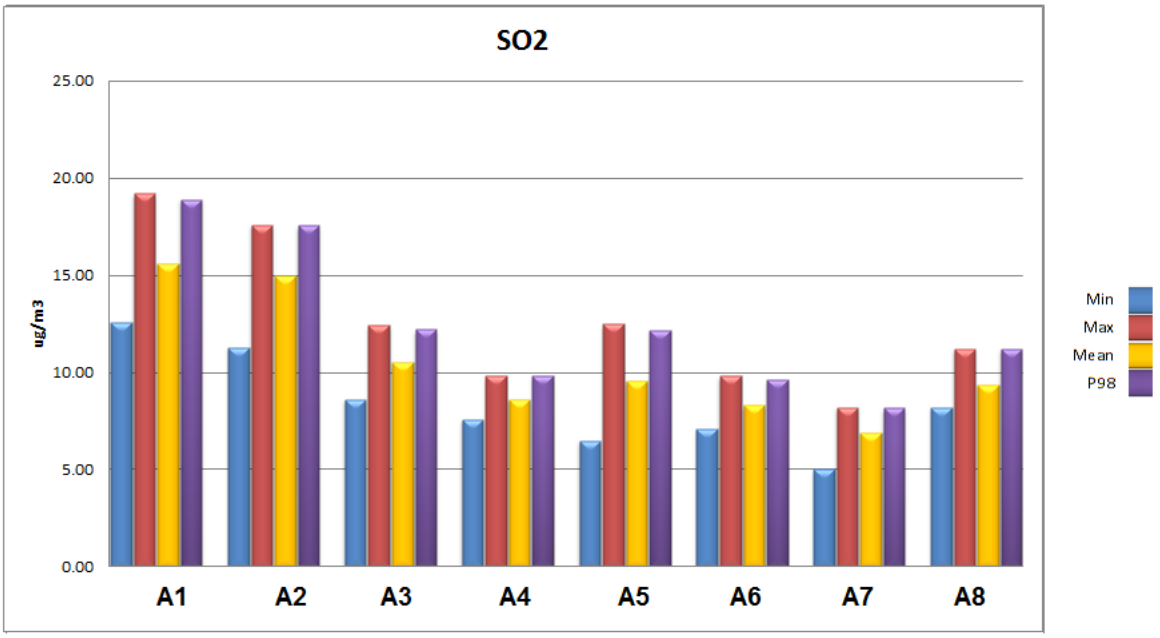
3.3.4 Observations

Ambient Air Quality Monitoring reveals that the minimum and maximum concentrations of PM_{10} for all the 08 AAQM stations were found to be 80.1 µg/m^3 and 158.3 µg/m^3 at A7 and A1 respectively, while for $PM_{2.5}$ it was of 38.2 µg/m^3 and 69.9 µg/m^3 at A3 and A1 respectively. As

far as the gaseous pollutants SO_2 and NO_2 are concerned, the prescribed CPCB limit of 80 $\mu g/m^3$ for residential, rural and industrial areas has never surpassed at any station. The minimum and maximum concentrations of SO_2 were found to be 5.0 $\mu g/m^3$ to 19.20 $\mu g/m^3$ respectively. The minimum and maximum concentrations of NO_2 were found to be 18.50 $\mu g/m^3$ to 45.9 $\mu g/m^3$ respectively. The Maximum and P98 levels for PM_{10} and $PM_{2.5}$ have remained below the ambient air quality standard. Graphical representations of pollutants are given below in **Figure: 3.4**

Figure 3.4: Statistical diagram for PM10, PM2.5, SO_2 and NO_x values

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20.00
15.00
10.00
5.00
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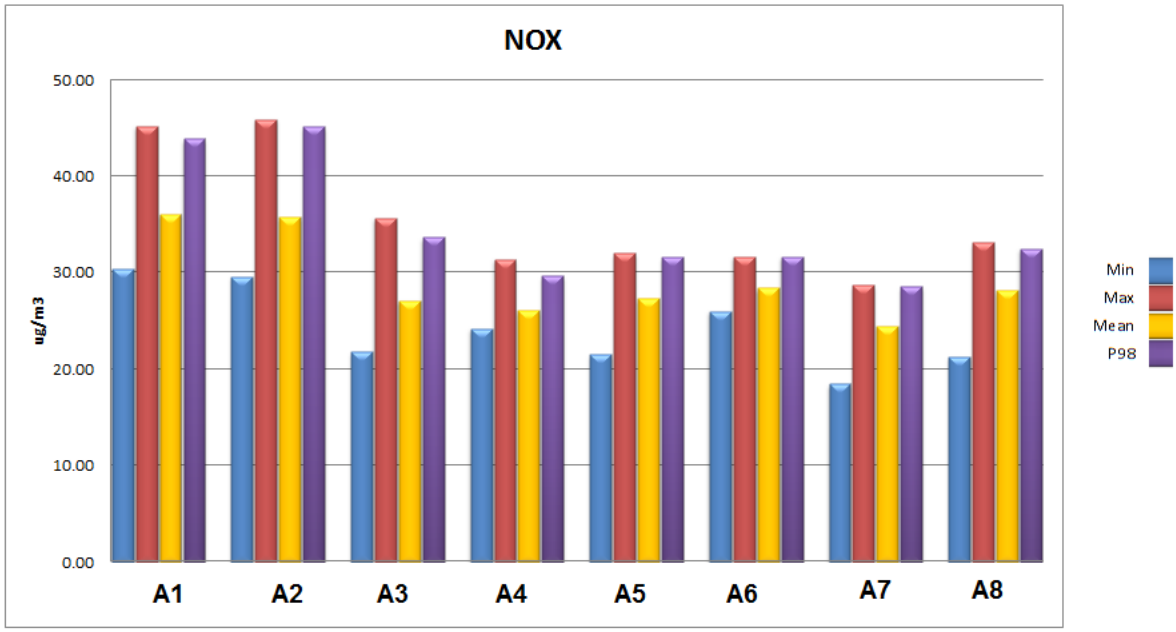
ug/m3
A1
A2
A3
A4
A5
A6
A7
A8
Min
Max
Mean
P98


NOX
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30.00
20.00
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0.00
ug/m3
A1
A2
A3
A4
A5
A6
A7
A8
Min
Max
Mean
P98

3.4 Noise Environment

The proposed project requires movement of raw materials, products, fuels, tools & tackles required for its manufacturing process and also transportation of finished products to its destination. The movement of personnel from their residence to industry would also result in a moderate increase in the traffic, which would not result in any drastic change in either the existing traffic pattern or noise levels of the area. Background noise levels were measured using integrated sound level meter in 8 locations.

Table 3.5: Monitoring Locations were Located within the Study Area

Code	Location
N1	Project Site
N2	Gopalpur (Residential)
N3	DSP Colony (Residential)
N4	Duragpur Station Market
N5	Muchipara
N6	City Center
N7	Durgapur Divisional Hospital
N8	DSP Hospital

3.4.1 Observations

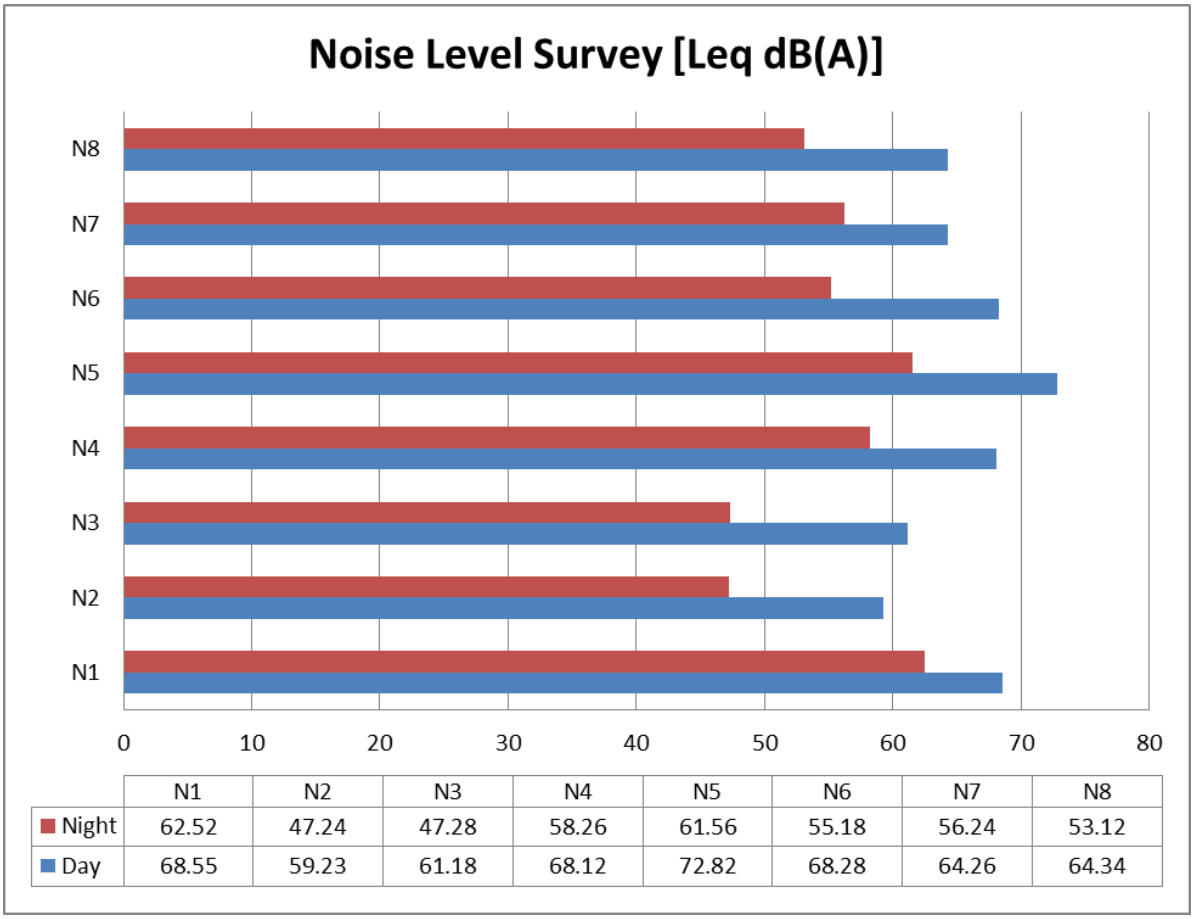
The values of noise observed in some of the rural areas are primarily owing to vehicular traffic and other anthropogenic activities. The baseline noise levels have been monitored at different locations as indicated in the Table 3.5 and graphical representation is given in Figure: 3.5. In rural areas wind blowing and chirping of birds would contribute to noise levels especially during the nights. Assessment of day noise levels around the study area are ranging between 59.23 to 72.82 dB (A) during study period. Whereas the night equivalents were in the range of 47.24 to 62.52 dB (A). Outside Ambient noise level during day time is expected to be within 55 dBA and during night time to be 45 dBA (EPA (GSR 1063(E), 1989). The noise results show that due to traffic and other noise sources, it cannot be maintained at a number of places.

From the results it can be seen that the Day equivalents and the Night equivalents were within the Ambient Noise standards of residential areas standards. Noise Report is attaches as **Annexure V.**

Table 3.6: Noise level survey

Date	Station code	Station location	Ambient Noise Level dB(A)	
			Day	Night
12.12.19	N1	Project Site	68.55	62.52
12.12.19	N2	Gopalpur (Residential)	59.23	47.24
12.12.19	N3	DSP Colony (Residential)	61.18	47.28
13.12.19	N4	Duragpur Station Market	68.12	58.26
13.12.19	N5	Muchipara	72.82	61.56
13.12.19	N6	City Center	68.28	55.18
14.12.19	N7	Durgapur Divisional Hospital	64.26	56.24
14.12.19	N8	DSP Hospital	64.34	53.12

Figure 3.5: The graphical presentation of Noise level survey



	N1	N2	N3	N4	N5	N6	N7	N8
Night	62.52	47.24	47.28	58.26	61.56	55.18	56.24	53.12
Day	68.55	59.23	61.18	68.12	72.82	68.28	64.26	64.34

3.5 Water Environment

3.5.1 Reconnaissance survey

The impact has been assessed on randomly selected surface and ground water sources falling within the impact zone. In order to assess the existing water quality, the water samples were collected from ten different locations within the study area and analyzed as per the procedure specified in standard methods for examination of water and wastewater published by American Public Health Association and Bureau of Indian Standards (APHA/BIS).

Selected water quality parameters for water resources of the study area have been used for describing the water environment and assessing the impacts on it. To assess the water quality impacts, water resources in the impact area have been grouped into 2 classes.

a. Ground water resources in the deeper strata of the ground

b. Surface water resources

About 8 ground water and 8 surface water samples were collected from the study area to assess the water quality during the study period. The ground water samples were drawn from the hand

pumps and open wells being used by the villagers for their domestic needs. Surface water sampling was carried out from River & khal within 10 Km of the proposed project site. The details of the locations are given in **Table 3.7 &** Lab reports are attached as **Annexure-VI & VII.**

Table 3.7: *Water Sampling Locations*

Code	Name of the Station	Remarks
GW1	Tubewell water near Rabindra Pathagar, Bamunara	Ground Water
GW2	Well water near Gopalpur	
GW3	Supply water, Kantapukur	
GW4	Tubewell water near Banskopa	
GW5	Tubewell Water Jawala Coke, Bamunara	
GW6	Tubewell Water Babanbera village	
GW7	Tubewell Water Rajbandh	
GW8	Tap Water Bamunara Industrial residence	
SW1	DVC canal outlet from Damodar River	Surface Water
SW2	Damodar river – 60 mt upstream of DVC canal outlet	
SW3	Damodar river – 60 mt downstream of DVC canal outlet	
SW4	Drain – Bamunara Industrial area	
SW5	Confluence of DVC Rajbandh choti canal and DVC Canal	
SW6	DVC Canal 60 mt upstream of DVC Rajbandh choti confluence	
SW7	DVC Canal 60 mt downstream of DVC Rajbandh choti confluence	
SW8	Pond near Bhairabpur	

Figure 3.6: Water quality monitoring locations

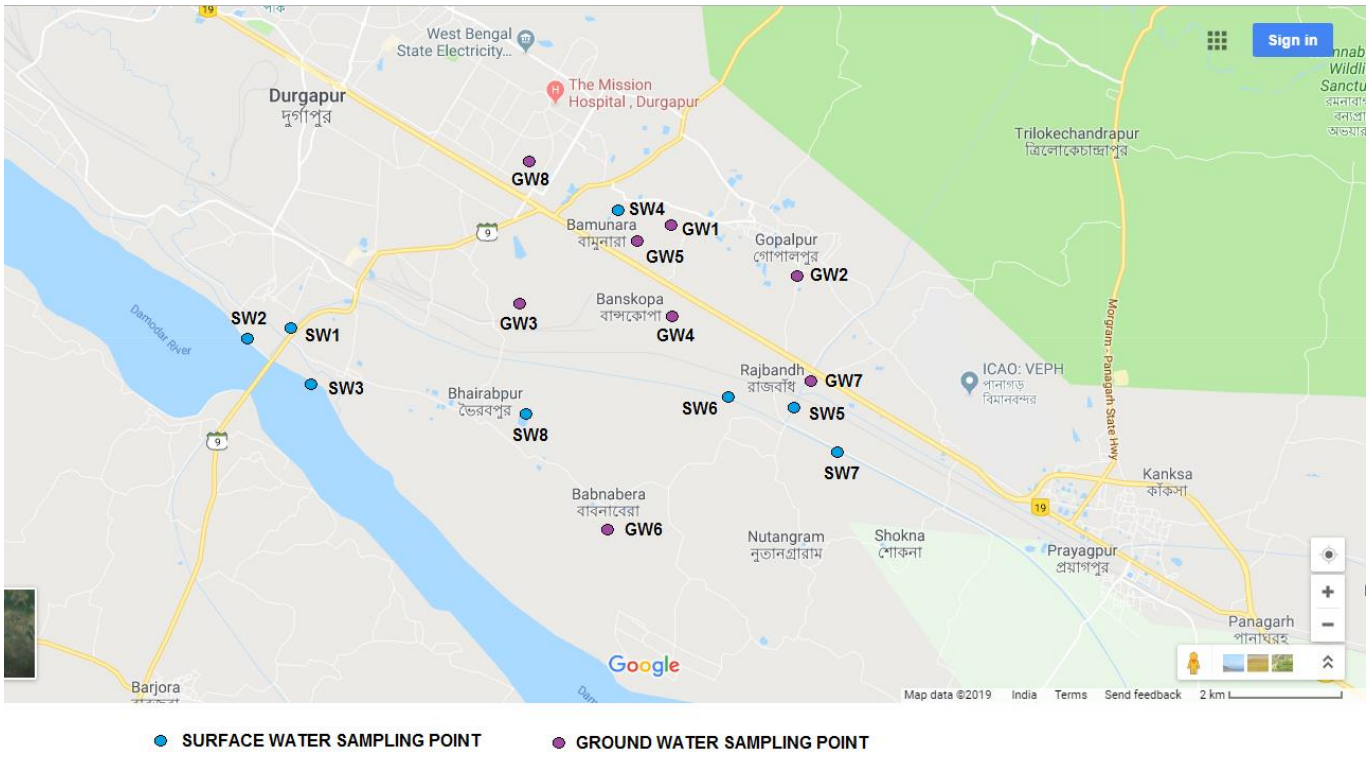


Table 3.8: Result of Ground water analysis

Sl. No.	Parameters	[GW1]	[GW2]	[GW3]	[GW4]
1	Odour (TON)	Odourless	Odourless	Odourless	Odourless
2	Colour (Hazen)	1	1	1	1
3	Taste	Acceptable	Acceptable	Acceptable	Acceptable
4	Temperature (^{0}C)	21.5	21.4	23.5	23.4
5	Turbidity (NTU)	1	1.2	<1	1.1
6	Total Dissolved Solid (mg/l)	654	693	312	612
7	pH	7.01	6.95	7.11	6.9
8	Alkalinity (mg/l)	81.7	77.9	65.55	58.9
9	Total Hardness (mg/l)	106.92	130.68	83.16	118.8
10	Residual Chlorine (mg/l)	<0.1	<0.1	<0.1	<0.1
11	Nitrate (mg/l)	3.8	4.92	3.14	4.22
12	Fluoride (mg/l)	<0.1	<0.1	<0.1	<0.1
13	Phenol (mg/l)	<0.001	<0.001	<0.001	<0.001
14	Total Nitrogen (mg/l)	5.81	12.34	3.55	6.43
15	Boron (mg/l)	<0.1	<0.1	<0.1	<0.1

Sl. No.	Parameters	[GW1]	[GW2]	[GW3]	[GW4]
16	Chloride (mg/l)	55.3	53.45	29.49	68.21
17	Sulphate (mg/l)	34	45.6	18	42
18	Bi-Carbonate (mg/l)	99.67	95.04	79.97	71.86
19	Cyanide (mg/l)	<0.01	<0.01	<0.01	<0.01
20	Calcium (mg/l)	26.98	33.33	19.05	26.98
21	Magnesium (mg/l)	9.5	11.4	8.55	12.36
22	Manganese (mg/l)	<0.05	<0.05	<0.05	<0.05
23	Zinc (mg/l)	0.7	0.44	0.21	0.28
24	Aluminium (mg/l)	<0.02	<0.02	<0.02	<0.02
25	Iron (mg/L)	0.82	0.51	0.55	0.66
26	Chromium (mg/l)	<0.06	<0.06	<0.06	<0.06
27	Copper (mg/l)	<0.04	<0.04	<0.04	<0.04
28	Mercury (mg/l)	<0.001	<0.001	<0.001	<0.001
29	Cadmium (mg/l)	<0.002	<0.002	<0.002	<0.002
30	Sodium (mg/l)	56.22	52.13	37.15	55.09
31	Arsenic (mg/l)	<0.01	<0.01	<0.01	<0.01
32	Lead (mg/l)	<0.005	<0.005	<0.005	<0.005
33	Total Coliform / 100 ml.	<1	7.8×10^2	<1	<1
34	Fecal Coliform /100 ml.	<1	3.1×10^2	<1	<1

<1 indicate No Colony developed.

Sl. No.	Parameters	[GW5]	[GW6]	[GW7]	[GW8]
1	Odour (TON)	Odourless	Odourless	Odourless	Odourless
2	Colour (Hazen)	1	1	1	1
3	Taste	Acceptable	Acceptable	Acceptable	Acceptable
4	Temperature (^{0}C)	22.8	24.1	23.1	24.2
5	Turbidity (NTU)	1	1.2	1	<1
6	Total Dissolved Solid (mg/l)	646	708	691	395
7	pH	6.88	6.85	7.11	7.14
8	Alkalinity (mg/l)	92.15	105.45	98.8	73.15
9	Total Hardness (mg/l)	110.88	95.04	87.12	79.2
10	Residual Chlorine (mg/l)	<0.1	<0.1	<0.1	<0.1
11	Nitrate (mg/l)	3.14	3.95	4.1	3.61
12	Fluoride (mg/l)	<0.1	<0.1	<0.1	<0.1
13	Phenol (mg/l)	<0.001	<0.001	<0.001	<0.001
14	Total Nitrogen (mg/l)	4.54	5.11	5.62	4.17
15	Boron (mg/l)	<0.1	<0.1	<0.1	<0.1
16	Chloride (mg/l)	62.68	68.21	73.74	66.36
17	Sulphate (mg/l)	33.6	32.4	37.2	30.4
18	Bi-Carbonate (mg/l)	112.42	128.65	120.54	89.14
19	Cyanide (mg/l)	<0.01	<0.01	<0.01	<0.01
20	Calcium (mg/l)	26.98	25.39	23.81	22.22
21	Magnesium (mg/l)	10.45	7.6	6.65	5.7

Sl. No.	Parameters	[GW5]	[GW6]	[GW7]	[GW8]
22	Manganese (mg/l)	<0.05	<0.05	<0.05	<0.05
23	Zinc (mg/l)	0.33	0.38	0.28	0.35
24	Aluminium (mg/l)	<0.02	<0.02	<0.02	<0.02
25	Iron (mg/L)	0.62	0.77	0.74	0.5
26	Chromium (mg/l)	<0.06	<0.06	<0.06	<0.06
27	Copper (mg/l)	<0.04	<0.04	<0.04	<0.04
28	Mercury (mg/l)	<0.001	<0.001	<0.001	<0.001
29	Cadmium (mg/l)	<0.002	<0.002	<0.002	<0.002
30	Sodium (mg/l)	57.0	32.0	49.0	38.0
31	Arsenic (mg/l)	<0.01	<0.01	<0.01	<0.01
32	Lead (mg/l)	<0.005	<0.005	<0.005	<0.005
33	Total Coliform / 100 ml.	<1	<1	<1	<1
34	Fecal Coliform /100 ml.	<1	<1	<1	<1

<1 indicate No Colony developed

Table 3.9: Result of Surface water analysis

Sl. No.	Parameters	[SW1]	[SW2]	[SW3]	[SW4]
1	Temperature (^{0}C)	24.6	24.2	24.3	25.5
2	pH	7.2	7.01	7.11	6.92
3	Total Dissolved Solid (mg./l)	312	247	282	984
4	Total Suspended Solid (mg./l)	22	33	41.7	88
5	Total Hardness (mg/l)	42.57	54.45	62.37	168.3
6	Dissolved Oxygen (mg/l)	6.1	6.4	6	4.6
7	BOD , 3 days at 27^{0}C (mg./l)	7	6	7	24
8	COD (mg./l)	28.56	23.8	28.56	95.2
11	Oil & Grease (mg./l)	<1.0	<1.0	<1.0	<1.0
12	Total Kjeldahl Nitrogen (mg/l)	3.21	3.04	4.81	9.15
14	Chloride (mg/l)	28.57	33.64	42.4	112.91
15	Sulphates as SO4 (mg/l)	45.6	22	30.8	105
16	Nitrate (mg/l)	4.41	5	5.2	7.12
17	Alkalinity (mg/l)	97.85	69.35	74.1	235.6
18	Bi-Carbonate (mg/l)	119.38	84.61	90.4	287.43
19	Phosphate (mg/l)	2.77	2.2	3.11	5.85
20	Calcium (mg/l)	10.32	12.3	14.28	37.3
21	Magnesium (mg/l)	4.04	5.7	6.42	18.06
22	Sodium (mg/l)	22.31	26.42	33.52	48.18
23	Manganese (mg/l)	<0.1	<0.1	<0.1	<0.1
24	Zinc (mg/l)	0.1	0.12	0.2	0.66
25	Iron (mg/l)	0.26	0.38	0.5	0.6

26	Chromium^{+6} (mg/l)	<0.1	<0.1	<0.1	<0.1
27	Chromium (Total) (mg/l)	<0.06	<0.06	<0.06	<0.06
28	Total Coliform (MPN/100 ml.)	1.2 x 10^3	1.6 x 10^3	2.1 x 10^3	2.8 x 10^3
29	Faecal Coliform (MPN/100 ml.)	4.4 x 10^2	7.2 x 10^2	7.5 x 10^2	1.7 x 10^3

Sl. No.	Parameters	[SW5]	[SW6]	[SW7]	[SW8]
1	Temperature (^{0}C)	25.4	24.8	24.8	25.5
2	pH	7.28	7.05	7.08	7.25
3	Total Dissolved Solid (mg./l)	265	288	315	294
4	Total Suspended Solid (mg./l)	24	28	33	22.4
5	Total Hardness (mg/l)	66.33	52.47	71.28	68.31
6	Dissolved Oxygen (mg/l)	6	6	5.8	6.4
7	BOD , 3 days at 27^{0}C (mg./l)	6	5	7	5
8	COD (mg./l)	23.8	19.04	28.56	23.8
11	Oil & Grease (mg./l)	<1.0	<1.0	<1.0	<1.0
12	Total Kjeldahl Nitrogen (mg/l)	2.64	2.22	4.63	3.85
14	Chloride (mg/l)	28.11	33.18	39.63	22.58
15	Sulphates as SO4 (mg/l)	24.6	28.8	33.4	20.6
16	Nitrate (mg/l)	4.44	3.2	5.6	3.26
17	Alkalinity (mg/l)	72.2	61.75	75.05	70.3
18	Bi-Carbonate (mg/l)	88.08	75.34	91.56	85.77
19	Phosphate (mg/l)	2.6	2.1	2.63	2.65
20	Calcium (mg/l)	17.46	13.09	18.65	17.06
21	Magnesium (mg/l)	5.46	4.75	5.94	6.18
22	Sodium (mg/l)	22.3	24.01	33.21	34.35
23	Manganese (mg/l)	<0.1	<0.1	<0.1	<0.1
24	Zinc (mg/l)	0.3	0.2	0.31	0.22
25	Iron (mg/l)	0.22	0.24	0.44	0.1
26	Chromium^{+6} (mg/l)	<0.1	<0.1	<0.1	<0.1
27	Chromium (Total) (mg/l)	<0.06	<0.06	<0.06	<0.06
28	Total Coliform (MPN/100 ml.)	2.2 x 10^3	8.2 x 10^2	8.8 x 10^2	2.0 x 10^3
29	Faecal Coliform (MPN/100 ml.)	1.1 x 10^3	3.2 x 10^2	3.6 x 10^2	1.1 x 10^3

3.5.2 Observations

Analysis results of ground water reveal the following;

- pH varies from to 6.85 to 7.14.
- Total Hardness varies from 79.2 to 130.68 mg/L.
- Total Dissolved Solids varies from 312 to 708 mg/L.

Analysis results of surface water reveal the following;

- pH varies from to 6.92 to 7.28.

- Dissolved Oxygen varies from 4.6 to 6.4 mg/L.
- Total Dissolved Solids varies from 247 to 984 mg/L.

A review of the above chemical analysis reveals that there is some variation in chemical composition of water tapped from different sources but the ground water from all sources remains suitable for drinking purposes as all the constituents are within the limits prescribed for drinking water standards promulgated by Indian Standards (IS: 10500).

No bacterial population of coliform group was found for tubewell water.

Iron concentration is mostly higher than desirable limit of 0.3mg/l but all within acceptable limit of 1mg/l.

From the result represented in Table 3.9 it may safely be concluded that the physico-chemical characteristics of the surface water samples had a good resemblance with respect to almost all the parameters and were well within the limits specified in Surface Water Standard IS: 2296. Lower level of COD, BOD values indicate that the pollutant level of different water bodies surrounding 10 km radius of project site are negligible.

3.6 Soil

3.6.1 Soil quality

The present study on soil quality establishes the baseline characteristics in the study area surrounding the project site. The study has been addressed with the following objectives.

- To determine the base line characteristics
- To determine the soil characteristics of proposed project site.
- To determine the impact of industrialization/urbanization on soil characteristics
- To determine the impacts on soils from agricultural productivity point of view.

3.6.2 Criteria adopted for selection of sampling locations

For studying the soil types and soil characteristics, 4 sampling locations were selected to assess the existing soil conditions representing various land use conditions and geological features.

3.6.3 Methodology and sampling

The homogenized soil samples collected at different locations were packed in a polyethylene plastic bag and sealed. The sealed samples were sent to laboratory for analysis. The important physical, chemical parameter concentrations were determined from all samples.

3.6.4 Soil sampling Locations

Details of the soil sampling locations are given in **Table 3.10.**

***Table 3.10:** Soil Sampling Locations*

Code	Name of the Station
S1	Inside Project Site
S2	Agricultural field at Banskopa
S3	Gopalpur, Near Portected forest

Table 3.11: Soil Characteristic of the project site

No.	Name of the soil sampling site	Project site [S1]	Agricultural field at Banskopa [S2]	Gopalpur, near Protected Forest [S3]
	Description of Soil	(Undisturbed soil)	(disturbed soil)	(Undisturbed soil)
	PARAMETERS			
	PHYSICAL			
	Colour	Slightly reddish	Grayish	Slightly reddish
	PH (1:2)	7.1	7.25	7.1
	Soil Texture (upto 60 cm depth)	Loamy sand	Sandy loam	Loamy sand
	Sand (%)	71	64	65
	Silt (%)	20	25	19
	Clay (%)	9	11	16
	CHEMICAL			
	Nitrogen (mg/Kg)	670	780	610
	Potassium (mg/Kg)	1020	1120	950
	Phosphorous(mg/Kg)	215	256	240
	Organic Carbon (gm/Kg)	4.2	6.6	5.9

3.6.5 Observations

Soil is the media for supplying the nutrients for plant growth. Nutrients are available to plants at certain pH and pH of soils can reflect by addition of pollutants in it either by air, or by water or by solid waste or by all of these. In order to establish the baseline status of soil characteristics, soil samples were collected at 3 sampling locations.

The analysis results show that soil is basic in nature as pH value ranges from 7.10 to 7.25. The concentration of Nitrogen, Phosphorus and Potassium has been found to be in good amount in the soil samples. Soil texture is Sandy Loam at project site. Soil for agricultural land is fertile and suitable for crop production.

The soil lab report is attached as **Annexure VIII.**

3.7 Traffic Density

Proposed road and transport plans for the area

Current transport model for the area

G.T.Road is adjacent to the site.

Accident data

There are no records of major accident along 2 Km stretch across the plant during last year.

Current information on the traffic and parking generation

There are space for parking truck and car inside the factory premises.

Table 3.12: Average Traffic density/hour data of project site

Bamunara Industrial area, Project site

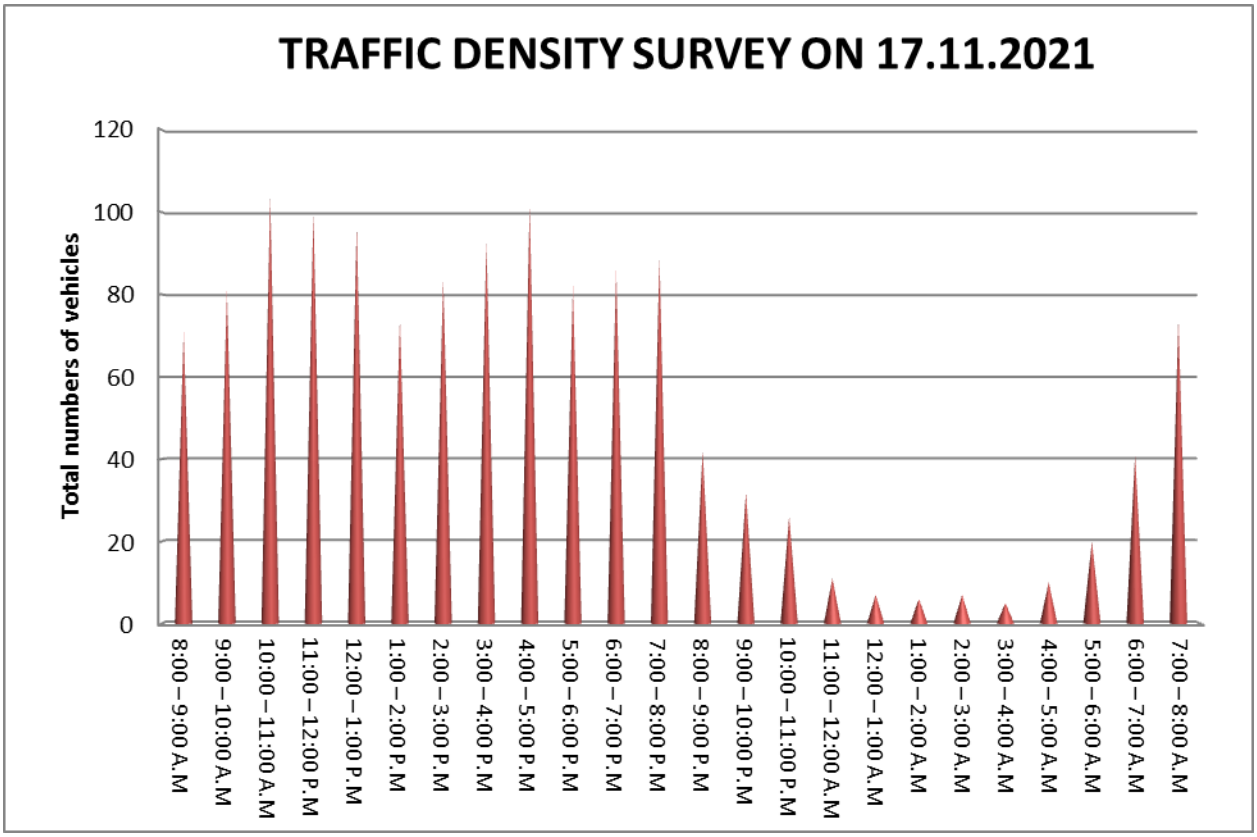
	Car & Jeep	Bus	Truck	Two Wheeler
Average traffic/hour	25	7	16	71
Recorded in peak time	57	9	24	156
Recorded in idle time	0	0	3	0

Bamunara Gopalpur road, Banskopa

	Car & Jeep	Bus	Truck	Two Wheeler
Average traffic/hour	9	2	21	30
Recorded in peak time	19	3	29	61
Recorded in idle time	0	0	8	0

The details report is given in ***Annexure – IX.***

Figure 3.7: Traffic Survey



3.8 Landuse pattern

Land use / land cover analysis

The geo-spatial database on "Land Use/ Land Cover on 1:50,000 scale" is prepared using three season Resourcesat-2 ortho rectified LISS-III data of 2019 and Resolution 24 meters. Interpretation of satellite imagery is done using visual interpretation technique and individual classes were interpreted using their visual characteristics. Output is in GIS vector file format, prepared using LCC projection and WGS-84 as datum.

Methodology

On screen visual interpretation was used in the current exercise wherein the GIS LU/LC vector layer created during the first cycle was overlaid on to the terrain corrected Resource sat 2 LISS

III imagery acquired during 2019. The methodology essentially is based on editing the above vector layer for the changed areas thereby creating the new LU/LC vector layer for 2019.

1. Acquision of Satellite DataDepends on inputs
2. Preparaion of base map From SOI topo sheet.
3. Data Analysis using VIP techniques
4. Ground truth Studies or field checks using GPS
5. Finalization of the Maps
6. Digitizationusing Head up Vectorisation methods
7. Topology construction in GIS
8. Area Calculation for Statistics Generation
9. Mosicing

Total project Area Covered 317 Sqkm. 100 percentage in the form of 10 sqkm radius.

Table 3.13: Land Use/ Land Cover Analysis

S.No	DESCR_1	DESCR_2	AREA (Sqkm)	Percentage
1	Builtup	Urban	73.72	23.26
2	Agriculture	Crop land	136.82	43.16
3	Forest	Deciduous	42.36	13.36
4	Wetland / Waterbodies	River / Stream / Canals	20.44	6.45
5	Grass / Grazing land	Grass / Grazing land	2.40	0.76
6	Barren / Unculturable wastelands	Sandy area	0.74	0.23
7	Forest	Forest Plantation	1.18	0.37
8	Barren / Unculturable wastelands	Scrub land	5.82	1.84
9	Builtup	Rural	27.93	8.81
10	Builtup	Mining	2.24	0.71
11	Wetland / Waterbodies	Waterbodies	2.14	0.68

S.No	DESCR_1	DESCR_2	AREA (Sqkm)	Percentage
12	Agriculture	Plantation	0.12	0.04
13	Wetland / Waterbodies	Inland wetland	0.78	0.25
14	Forest	Scrub Forest	0.49	0.15
Total area			**317**	**100**

Note: 1. Most of Area covered By Agriculture –Crop land that is 136.82 sqkm (43.16 %)

2. very Low area covered Forest Plantation 0.12 sqkm (0.04 %)

3. Deciduous Forest: 42.36 sqkm (13.36%)

4. Forest Scrub Forest 0.49 sqkm (0.15%)

5. Built up covered Urban Area:73.72 Sqkm (23.26%)

For more details visit field only cross check as per Maps extract above Data, for more information visit field, ground verification calculate features.

Findings

Deciduous: This applies to the phrenology of perennial plants that are leafless for a certain period of the year (Ford Robertson, 1971). The leaf shedding usually takes place simultaneously in connection with the unfavorable season. Total area covering in the study area 42.36 sqkm and percentage 13.36.

Cropland/ Agriculture**:** These are the areas with standing crop as on the date of Satellite overpass. Cropped areas appear in bright red to red in color with varying shape and size in a contiguous to non- contiguous pattern. They are widely distributed indifferent terrains; prominently appear in the irrigated areas irrespective of the source of irrigation. It includes kharif, rabi and zaid crop lands along with areas under double or triple crops. Total area covering in the study area 136.82Sq km and percentage 43.16.

Forest Plantation: These are the areas of three species of forestry importance, raised and managed especially in notified forest areas. Total area covering in the study area 1.18 sqkm and percentage 0.37.

Urban: Urban areas are non-linear built up areas covered by impervious structures adjacent to or connected by streets. This cover is related to centers of population. This class usually occurs in combination with, vegetated areas that are connected to buildings that show a regular pattern, such as vegetated areas, gardens etc. and industrial and/or other areas. (FAO, 2005).It includes residential areas, mixed built-up, recreational places, public / semi-public utilities,

communications, public utilizes/facility, commercial areas, reclaimed areas, vegetated areas, transportation, industrial areas and their dumps, and ash/cooling ponds. Total area covering in the study area 73.72 sqkm and percentage 23.26.

Rural: These are the lands used for human settlement of size comparatively less than the urban settlements of which the majority of population is involved in the primary activity of agriculture. These are the built-up areas, smaller in size, mainly associated with agriculture and allied sectors and non-commercial activities. They can be seen in clusters non- contiguous or scattered. Total area covering in the study area 27.93 sqkm and percentage 8.81.

Scrub Forest: These are the forest areas which are generally seen at the fringes of dense forest cover and settlements, where there is biotic and abiotic interference. Most times they are located closer to habitations. Forest blanks which are the openings amidst forest areas, devoid of tree cover, observed as openings of assorted size and shapes as manifested on the imagery are also included in this category. Total area covering in the study area 0.49 sqkm and percentage 0.15.

Scrub Land: These areas possess shallow and skeletal soils, at times chemically degraded extremes of slopes, severely eroded or subjected to excessive aridity with scrubs dominating the landscape. Total area covering in the study area 5.82 sqkm and percentage 1.84.

River /Stream / Canals: Rivers/streams are natural course of water flowing on the land surface along a definite channel/slope regularly or intermittently towards a DurgaPur urban area in most cases or in to a lake or an inland basin in desert areas or a marsh or another river Damodar River very near to Durgapur urban Area. Canals are artificial water course constructed for irrigation, navigation or to drain out excess water from agricultural lands. Total area covering in the study area 20.44 sqkm and percentage 6.45.

Water Bodies: This category comprises areas with surface water in the form of River ponds, lakes, tanks and reservoirs. Total area covering in the study area 2.14 sqkm and percentage 0.68.

Grass / Grazing land: They are the resultant of terrain deformation due to water erosion which occurs widely in all agro climatic zones. Gullies are formed as a result of localized surface run off affecting the unconsolidated material resulting in the formation of perceptible channels causing undulating terrain. They are mostly associated with stream courses, sloping grounds with good rainfall regions and foothill regions. These are the first stage of excessive land dissection followed by their networking which leads to the development of ravinous land. Ravines are basically extensive systems of gullies developed along river courses. Total area covering in the study area 2.40 sqkm and percentage 0.76.

Mining : Total area covering in the study area is 2.24 sqkm and percentage 0.71.

Impacts Predication & Mitigation measures:

1. **Not much impact this project most of area covered cropland/Agriculture Area.**

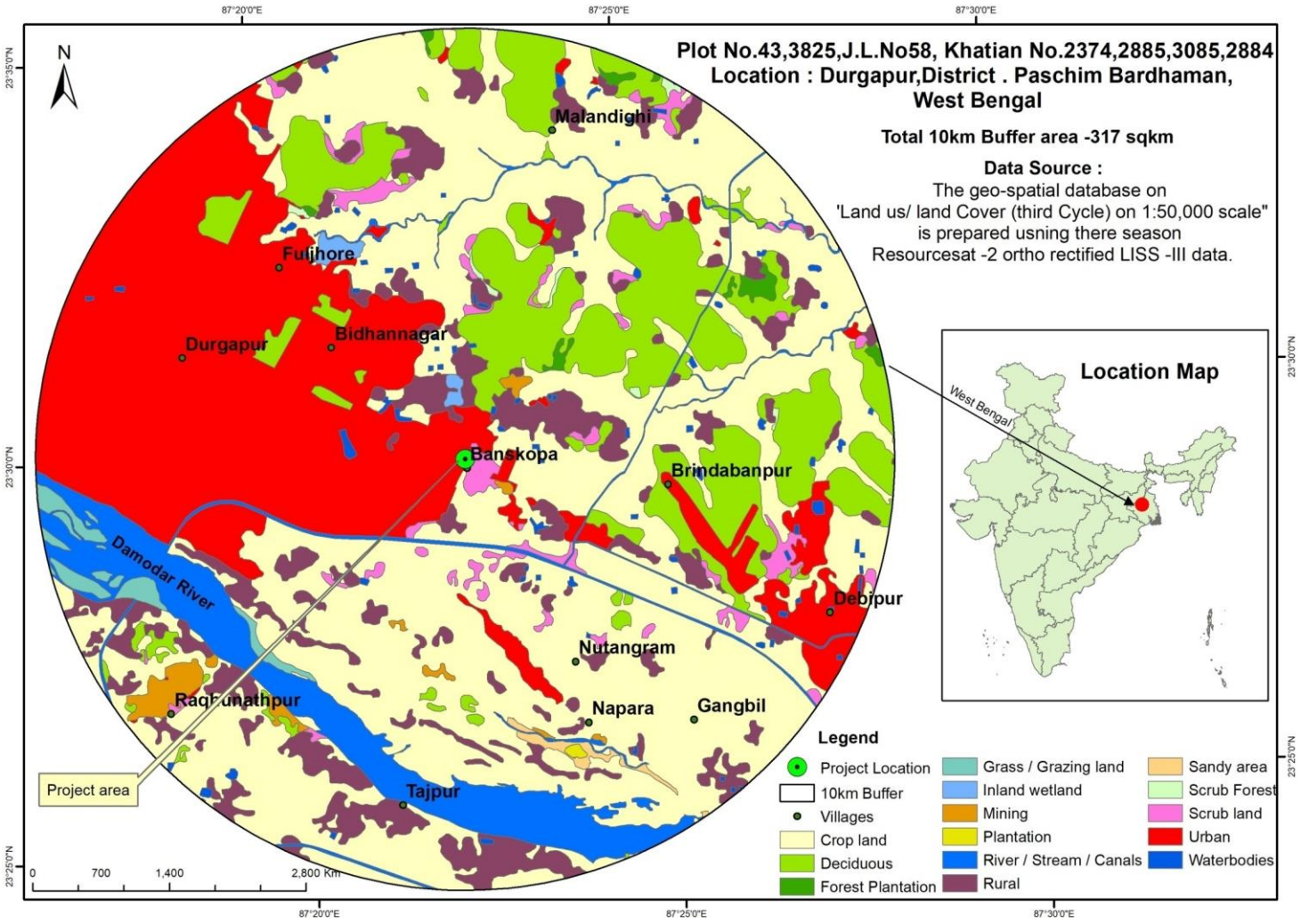
If required to Mitigation to develop Green belt along the River & Streams and urban/rural area

2. **Most to develop Mining Area develop Green belt along the Mine area.**

Project area Located to Banskopa, Durgapur Urban Area .

3. **Damodar, Tajpur awy from Project Area develop Green Belt if required to Depends on Project.**

Figure 3.8: Land use Map of Study Area



3.9 Physiography and Hydrology

Geology and Soil

The proposed project area is located in the Paschim Bardhaman district of West Bengal. The district is characterized by rocky undulating topography with laterite soil which is extension of the Chota Nagpur plateau. Previously, the area was heavily forested and infested with plunderers and marauders. The discovery of coal in the 18th century led to industrialisation. Majority of the forests in the coal-bearing areas have been cleared. The eastern part of the district gradually slopes down to the rice plains of the agriculturally rich Purba Bardhaman district.

Paschim Burdwan district is an extension of the Chota Nagpur Plateau. It is a transitional zone between the Chota Nagpur Plateau, which constitutes a portion of peninsular shield in the west, and Ganga-Brahamaputra alluvial plain in the north and east. The rocky undulating topography with laterite soil is found in the western part of the district, which extends to the western part of Durgapur subdivision; barren, rocky and rolling laterite soil rising into rocky hillocks, the highest being 227 m. The eastern part of the district gradually slopes down to the rice plains of Bengal. The district is a part of the Ajay Damodar Barakar tract with the Ajay on the north, the Damodar on the south and the Barakar on the west. The Ajoy-Damodar inter-stream tract is made up of several myriads of minor rivers and streams which criss-cross the district. The general slope is from north-west to south-east. Most of the streams of the region fall into the Damodar river which flows towards the south-east direction. The region is characterized by laterite soil. The land surface is generally covered with red loamy clay and sand.

Occurance of the Lateritic soil is found in the western part of the district. Local laterization process is responsible for the origin of such soils. The soil cover is thin (15cm-25cm) having texture varying from sandy loam to sandy clay loam. Soil colour varies from reddish yellow and yellow to brown and deep brown. It is poor in organic matter. It has low water holding capacity. Whereas, Alluvial soil is predominant in the eastern part of the district. Based on the nature of parent materials, alluvial soils are divided into two groups, viz., (i) Older alluvium or Vindhyan alluvium, and (ii) Younger alluvium or Ganga alluvium. (i) Older alluvium or Vindhyan alluvium is derived from the Chotanagpur plateau region. Alluvium is brought by the River Damodar, Ajoy and its tributaries. This aggradational soil is sandy and has a medium texture. It is brownish to greyish in colour. (ii) Younger alluvium or Ganga alluvium varies over its site and situation on a micro level from the river valley to the uplands or those occurring over the terraces. It is very deep and medium to fine in texture and is fertile.

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http://www.msmedikolkata.gov.in/201819/DIP/PASCHIM%20BARDHAMAN.pdf assessed on 08.09.2020.

Hydrogeology

The major portion of the Paschim Bardhaman district (covering Raniganj, Andal, Pandabeswar and Asansol region) possesses rock type of Fine grained sandstone, siltstone with coal seams aging from the period of Permo-Carboniferous to Triassic in Pediplain with scattered rock fragment constituting pebbles & gravels of quartz, feldspar & basic rocks. A portion of Asansol also has rock type of Clay with caliche concretion. Moderately thick & regionally extensive confined / unconfined aquifer is down to 150m. Again the Durgapur region possesses rock type of Laterite, Sand, silt and clay with caliche concretion aging from the period of Upper pleistocene to upper Holocene in Upper mature deltic plain & paradeltaic flood surface. Fairly thick & regionally extensive confined / unconfined aquifer is down to 300m. The Salanpur area possess rock type of Granite gneiss and migmatite aging from the period of Archean lies in the Pediplain with scattered rock, fragment constituting pebbles & gravels of quartz, feldspar & basic rocks. Groundwater restricted to weathered residuum and secondary porositie.

References

http://wbwridd.gov.in/swid/mapimages/BARDDHAMAN.pdf assessed on 08.09.2020.

https://shodhganga.inflibnet.ac.in/bitstream/10603/164812/8/08_chapter%203.pdf assessed on 08.09.2020.

Table 3.14: **General Hydrogeology**

General Hydrogeology	Lithology	Aquifer conditions
Gondowana sediment	Semi -consolidated sediments of arenaceous and argillaceous fecies associated with shale coal seam and basic intrusive.	Unconsolidated weathered friable sandstone. Aquifers are thin and discontinuous.

Source: SWID

Flood Hazard Zone

Damodar River running approx. 6.0 km south of the plant site is the major river in the study area. Damodar River is a river flowing across the Indian states of West Bengal and Jharkhand. Previously known as "Sorrow of Bengal" because of its ravaging floods in the plains of West Bengal, the Damodar and its tributaries have been to some extent controlled with the construction of several dams.

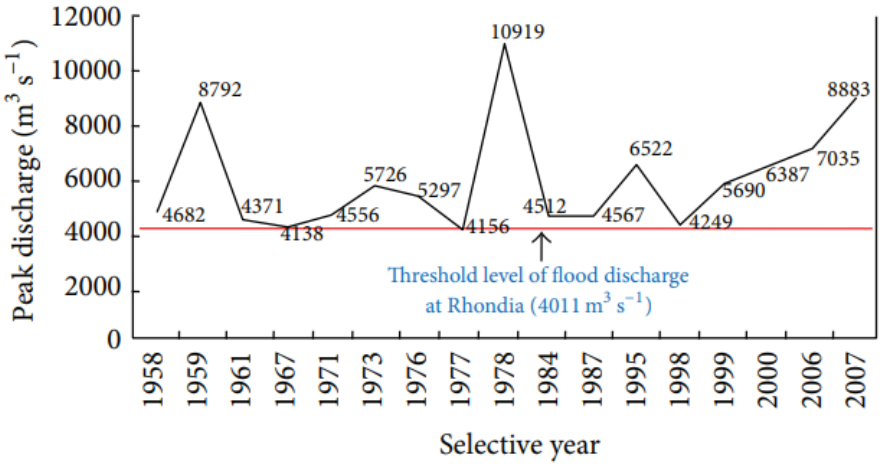
There is Barrage on Damodar River to control the excessive rain water & its management. In ancient period, overflow irrigation from the Damodar was considered beneficial for agriculture. The Flood history during the period 1857 to 1917 can be traced from the E.L. Glass repot submitted to the then Bengal Government as observed at Raniganj, a few Kms upstream of Durgapur (Sen, 1962). The flood history & its associated data is given below.

Table 3.15: Flood History of the Damodar river since 1857

Raniganj During 61 years (1857-1917)	
No. of extremely abnormal floods (above 12744 cumec)	1
No. of abnormal floods (above 8496 cumec)	12
No. of normal floods (between 5664-8496 cumec)	33
No. of subnormal floods (below 5664 cumec)	15
Rhondia During 25 years (1933-1957)	
No. of extremely abnormal floods (above 12744 cumec)	2
No of abnormal floods (above 8496 cumec)	7
No. of normal floods (between 5664-8496 cumec)	11
No. of subnormal floods (between 5664 cumec)	5
Rhondia During 39 years (1958 – 1996)	
No. of extremely abnormal floods (above 12744 cumec)	0
No. of abnormal floods (above 8496 cumec)	2
No. of normal floods (between 5664-8496 cumec)	2
No. of subnormal floods (below 5664 cumec)	35

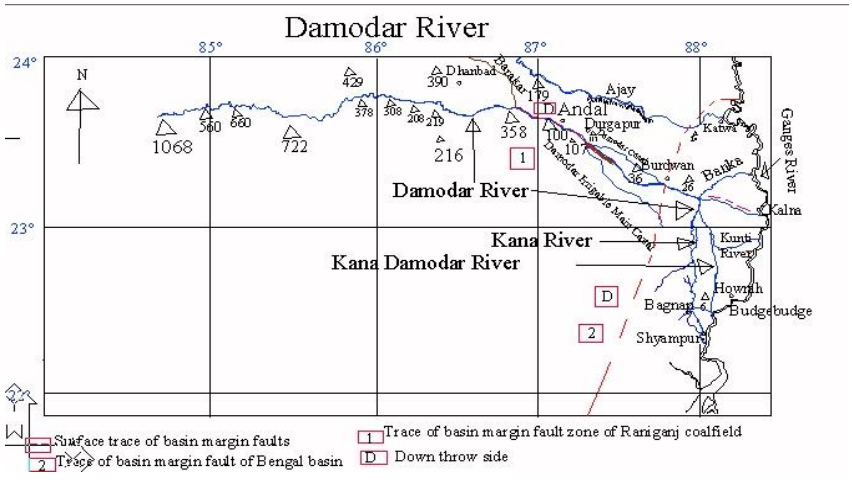
In the present century, the 1978 flood is regarded as the greatest disaster of the century in South-Bengal. Huge amount of sand deposited by the Damodar are still to be observed in the nearby villages near Gaitanpur, Panchpara etc. The riverine sand bars still exhibit sand heaps deposited during this flood. In no way, floods that have occurred after 1978 are comparable to the 1978 flood. The floods of 1995 is not so insignificant compared to many other floods that have occurred in the historical past, but in magnitude it cannot be compared with the 1978 flood.

Figure 3.9: *Post-dam trend of peak discharge at Rhondia above estimated threshold level of discharge (note: cumec: m^3 s −1)*



(Source: Ghoh and Mistri, *Geographic Concerns on Flood Climate and Flood Hydrology in Monsoon-Dominated Damodar River Basin, Eastern India, Geography Journal, 2015)*

Figure 3.10: Flood prone area of Damodar River



From the perception of flood climate, the recurrent floods of Damodar River is directly effected by rainstorms of 3- to 4-day duration, path of cyclone, extreme rainfall event of 3 to 6 hours, runoff yield, and discharging of excess water from the upstream dams and Durgapur barrage. To manage floods, it should be focused on the travel time of flood waves from Durgapur barrage to the downstream end and on the up-to-date accurate estimation of critical bankfull discharge at the ungauged sites of lower Damodar River.

3.10 Drainage Pattern

Damodar River running 7.0 km south of the plant site is the major steam in the area. The drainage in the study area is mainly Damodar river and its tributaries. Traditionally, Damodar basin was known to be a curse. The basin of River Damodar has a very particular shape and this controls its flood pattern. The river has about 70% of its basin just upstream of Durgapur town. These upper catchments of Jharkhand plateau, above Durgapur, makes heavy run-off during high rainfall and is carried to Durgapur in a short time. Starting here, this discharge moves through the river, bifurcating at Beguahana. One branch, the lower Damodar with very small capacity, reaches the Hoogly on the west bank.

Damodar enters flat alluvial plains after Dishergarh and runs eastwards upto Barsul in Burdwan and the flow of the river becomes very sluggish at this stage. Here, Damodar receives its last tributary, the Sali from the south. Afterwards the Damodar river takes a sharp turn towards south near the village Chachai, 24 km south east of Burdwan. Within its elbow several spill channels, locally known as hanans, are found. These hanas carry surplus water of the Damodar during monsoon months. Turning south, it has a distributary named the Kana Damodar which ultimately drains out water in the Hooghly. Traversing further south Damodar splits into important channels, the Mundeswari and the Damodar. The Damodar channel flows over the Arambagh sub division of Hooghly district and Uluberia sub-division of Howrah district to meet the Hooghly opposite Falta. At present 75% of the run off from the Damodar is carried by the Mundeswari channel through the Begor and the Mushir hanas and drains out water in the Rupnaranyan. This channel can not carry the total flood discharge of the Damodar and as a result the elbow area of the Damodar gets inundated occasionally notwithstanding the construction of barrage and dams over the Damodar in its upper reaches. Flood protection embankments have been constructed along the banks in the lower reaches of the Damodar, but are not sufficient to cope up with the steadily rising river bed due to silting.

So, Damodar river and its tributaries maintain the drainage system of the study area. It has a number of tributaries and sub-tributaries, such as Barakar, Konar, Bokaro, Haharo, Jamunia, Ghari, Guaia, Khadia and Bhera. The secondary tributaries are Talma, Choupai, Barajuri and and Barjor.

3.11 Seismic status

The Project site is located in an area which is falling in seismic Zone III (Source: IS 1893 (Part 1):2002). The details are given below. According to GSHAP data, the state of Jharkhand falls in a region of low to high seismic hazard. As per the 2002 Bureau of Indian Standards (BIS) map, this state also falls in Zones II, III & IV. Historically, parts of this state have experienced seismic activity in the M5.0 range.

Figure 3.11: Seismic map of India

3.12 Socio-Economics of the study area

Introduction

All infrastructure projects at any location usually are advantageous for the local residents by several means, like enhancing-i) easy obtain ability of the products, ii) employment prospect in the Project, iii) possibility for upgrading quality of life. However, the Project may also have some adverse social impacts involving losses like land acquisition, resettlement and rehabilitation (R&R) and certain other social implications relating to health and safety, gender issues, child labour, various social discrimination etc. An attempt to mitigate those undesirable impacts needs to be made by the Project authority. The present assessment, therefore, was undertaken in order to better comprehend the present situation and socioeconomic impact of the proposed Project. The information collected will serve as baseline data and will also be useful for prospective environmental monitoring and evaluations.

Socioeconomic Environment

Social Impact Assessment (SIA) is a process to assess the impact of any project on the residents around its project locations and also to predict the future socioeconomic conditions of the project area that might be expected to occur as an effect or consequence of implementing the project activities. SIA is an integral part of Environment Impact Assessment (EIA) and it includes the processes of analysing, planning for, managing and monitoring the positive and negative social impacts and consequences. Its primary purpose is to bring about a sustainable as well as equitable development.

Approach and Methodology

The approach and methodology that were involved in preparing this report included the followings:

i. Firstly a detailed desk review of all available secondary data related to the socioeconomic context of the Project were initially undertaken for assessing the prevalent situation. These included reports and documents like Primary Census Abstract, 2011 and socioeconomic context of the Project was undertaken to grasp the existing situation. The, District map, and other relevant websites were also consulted. The actual field study was carried out from 19th to 20th of January 2022.

ii. Secondly, based on the secondary data, locations within the radial coverage of 10 kilometers (aerial) from the proposed expansion Project area were identified. Three zones were demarcated- a) **Impact Zone** - within 10km radius from the proposed Project site, and b) **Core Zone**- within 2 km from the proposed site and c) **BufferZone**- beyond 10 km.

iii. Thirdly, a field study for carrying out baseline socioeconomic survey was conducted using an observation checklist and pre-coded questionnaire; and lastly public consultations were carried out in the defined Impact Zone.

Tools and Techniques

The tools used for this study were-an observation checklist, a semi-structured questionnaire and a focus group discussion guide for public consultation. Towards assessing the impact baseline socioeconomic data were collected within 10 km radius in the PIA. In depth probing helped in understanding the existing situation and assessing likely impact of the proposed project and also helped in identifying issues, people's attitude, apprehensions and expectations.

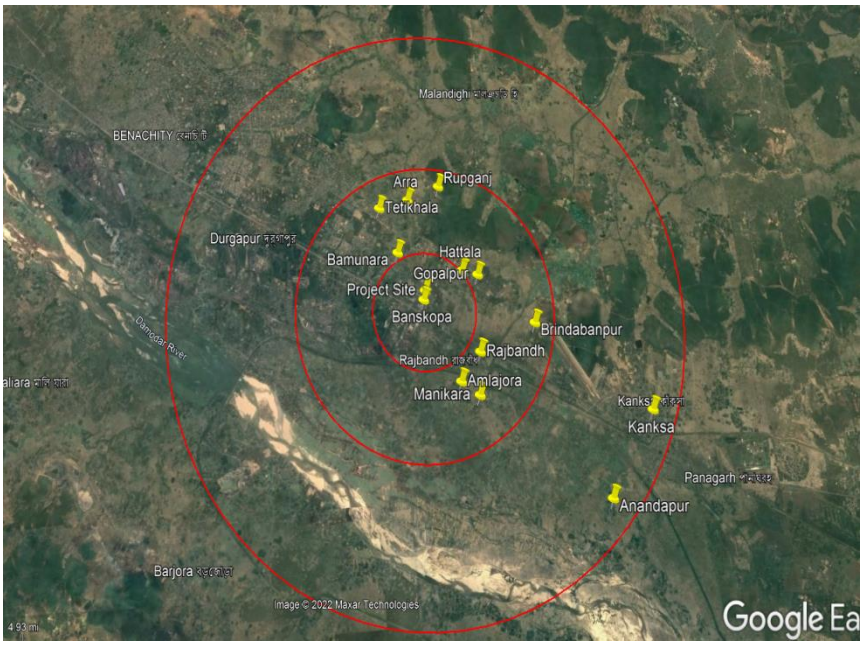
Sampling

Zone wise sampling was done in order to ensure effective representation and proportionate inclusion. All the villages of core zone were taken up for the study and selective villages from the buffer zone were included. It was experienced that while moving away from the Core Zone, the impact of the Project on the residents were fading away or it was impact of some other industry. So the focus of the study was more in the Core Zone and surrounding areas. A proportionate purposive sampling was drawn for selection from Impact Zone. The distribution of sampled locations is presented below:

Sampled Locations:

S No.	Locations
1.	Banskopa
2.	Bamunara
3.	Gopalpur
4.	Hattala
5.	Rajbandh
6.	Amlajora
7.	Manikara
8.	Rupganj
9.	Arra
10.	Tetikhala
11.	Brindabanpur
12.	Kanksa
13.	Anandapur

Figure 3.12: Visited Locations in the PIA



Data Management

The collected data, after scrutinising, have been computerized after checking for validity, processed and analysed. The qualitative data were quantified for analysis.

Constraints Faced

The consultant faced some inconveniences during data collection. Some of those were-

a) Current COVID situation posed a hindrance in interacting with people and collection of data.
b) Finding people for interview/discussion was somewhat difficult.

Profile of the Project Location

The population of West Bengal makes up 7.8% of India's total population. As per Census of India 2011,the concerned State- West Bengal has population of 9.13 crores, an increase from figure of 8.02 crore in 2001 census. As per projection, population of West Bengal in 2019 is 9.98 crore. The total population growth in this decade was 13.8% while in previous decade it was 17.8%. The population of West Bengal formed 7.5%of India in 2011. Sex ratio was 950, population density per square kilometre was 1028, and literacy rate was 76.3%- male literacy 81.7% and female literacy being 70.5%.

In 2019 the State's literacy rate is over 77%, falling well above the national rate of 74%. Nearly 20% of people in West Bengal live below poverty line, but this has declined from almost 32% just ten years ago. Over the last ten years, West Bengal's population grew by almost 14%. This is down from nearly 18% in the previous decade. Though growth of the State has slowed, there is no indication that it will significantly drop or stop, leaving the future clear for continued population growth.

Bardhaman District occupies 3rd position in terms of population and it ranks 4th in terms of child (0-6 years) population in the State. Bardhaman District occupies 3rd position in terms of scheduled castes population and 4th position in terms of scheduled tribes population in the State. The District ranks 15th in decadal population growth rate (11.9%) among the Districts. The density of population of the District is 1,099 per sq km which makes its rank 7th in the State. The sex ratio of the District is 945, which is lower than the State sex ratio (950). Literacy rate of the District is 76.2% (slightly lower than the State average of 76.3%). The Work Participation Rate (WPR) has improved from 35.5 (in 2001 Census) to 37.7 (in 2011 Census). Bardhaman District is following a decreasing trend in percentage of main workers to total workers from 77.6 in 2001 Census to 74.4 in 2011 Census similar to trend in the State where the percentage 78.1 in 2001 Census dips into 73.9 in 2011 Census. Cultivators and agricultural labourers constitute the major work force of the District. They are 11.8% and 33.4% of the total workers respectively.

According to the Census of 2011 Bardhaman District had a population of 7,717,563. Paschim Bardhaman District was formed on 7 April 2017 as 23rd district of West Bengal. It has its headquarters in Asansol. Total area of this District is 1603.17 km^2. Total population is 2882031 population, sex ratio is 922. Literacy rate is 73.86 per cent.

The concerned CD Block Kanksa had a population of 1,78,125 in 2011 of which 91,350 were males and 86,775 were females; hence the sex ratio was 918. SC and ST population were 34.99% and 10.24% respectively. Population density in 2011 was 640 per sq km.

List of Habitations in the Impact Zone is attached as Annexure IX.

The findings of desk review, socioeconomic survey and various consultations at community level are presented below:

The Impact Zone is characterized by several industries, educational institutions and medical centres. Major sources of livelihood in the Impact Zone are agriculture; work in factories as labourers, petty business and services. Of the participants more than 26% are farmer, 15% are worker, 42% are housemakers, 9% each are students and in business, more than 8% are unemployed and the rest in various employments. Child labour in any industry was no reported. But in one location the residents informed that the young workers work in the agriculture field as labourers. Land in the villages is mainly used for agriculture purpose and for residential use. Almost all have a cell phone for communication, many own two-wheelers.

Almost all locations have primary school, high schools; for secondary and higher secondary schooling students travel to other adjacent towns/cities. College education and various degree/diploma courses are accessed at Durgapur, Bardhaman and for university the students mostly travel to Bardhaman or Kolkata. Very few students go for higher education from the Impact Zone. There are technical institutes and English language training schools at Durgapur.

For water supply the residents depend mainly on hand pump, which exists in each village. In each village the concerned panchayat is accountable for providing potable water. In majority (70%) villages people have latrine at home. There is no solid waste management system in the Impact Zone. About 90% have electric supply; all villages enjoy the benefit of Public Distribution System (PDS). Only about 20% each of the surveyed locations are having the facility of community centre and library. Of all 50% of the villages have some playground available with them. Main mode of communication or daily activities is bus. Other modes are motorbike, toto, etc. Most of the locations have bus stops nearby. Almost every household is using mobile phone.

All the locations have access to some banks, though may not be in the same village. Each location has self help groups created by the women with support of anganwadi workers or under some government scheme. These are thrift and credit societies, but most of those groups are not yet confident to start any business till date. Probably they need more support and hand holding towards such initiative.

For advanced and critical health care, people visit Durgapur Sub Divisional Hospital and also a primary hospital is there. Of all 50% of the respondents communicated that people mainly suffer from allergy, skin disease, breathing problem, asthma, eye problem, etc due to pollution.

Summary of Public Consultation

Location	Date	Peoples' Views	Number of Participants
Banskopa Panchayat- Gopalpur Block- Kanksa	19/01/2022 10:00 AM	As per respondents, drinking water's quality is good and the sources of drinking water are pipeline and handpumps. But in summer time drinking water supply gets interrupted. Almost every household has electricity and sanitation; there is bin for solid waste. Villagers depend on bus, cycle and toto for transportation. It can be beneficial for villagers if they get job in plant. Those	5

Location	Date	Peoples' Views	Number of Participants
		who are working in plants, get ₹200-300 on daily basis. Literacy rate is low. There is no such prevalent illness due to pollution. Villagers have idea about industrial pollution. Nearest government hospital is at Durgapur.	
Hattala Panchayat-Gopalpur Block- Kanksa	19/01/2022 10:45 AM	It is a semi-urban area. Handpump is the main source of water. Water pipe has been installed but service yet to be started. Most of the households do not have electric connection and sanitation. No solid waste management system is there. Cycle, motorcycle and toto are main means of transportation. Bank and post office are at Gopalpur. Female wage earners work in agriculture field, earn ₹100-160 daily. Literacy rate here is high. Local people know less regarding this plant. A few people get job in local industries. Respondents know about air pollution which occurs from factory.	4
Gopalpur Panchayat-Gopalpur Block- Kanksa	19/01/2022 11:10 AM	This village also comes in the category of semi-urban area. Villagers depend on pipelineand handpump for drinking water. There is electric connection but not in every house also sanitation is not there in every house. Primary school is in the village. Respondents reported that they do not get any benefit from the nearby industries. They know less about concerned industry. People have idea about pollution which affects their health. Asthma and allergy are most common illness here.	6
Brindabanpur Panchayat-	19/01/2022 12:00 PM	Brindabanpur is semi-urban area where the sources of drinking water are handpump and pipeline. Electric	3

Location	Date	Peoples' Views	Number of Participants
Gopalpur Block- Kanksa		connection and sanitation are there.Other facilities like waste bin, ration shop, library, community centre and park/playground are there. Bus and toto are main means of transportation.ASHA operates here with AWW. There is a high school, though literacy is low here. Breathing problem is most common illness here.	
Rajbandh Block- Kanksa Durgapur Subdivision	19/01/2022 01:00 PM	Semi-urban settlement type. Maximum people do not have electric connection and sanitation. Other facilities like ration shop, solid waste management system are there. People depend on motorbike, cycle and bus for transportation. There is a health centre. Both primary and higher secondary schools are there in the village. Overall literacy rate is up to higher secondary. Female literacy rate is higher than male. Students get basic computer training from school. Here more people are attached with agriculture and mason. Some industrial labor reported that they get Rs. 220 per day for 8 hours work.	8
Amlajora Block – Kanksa Durgapur Subdivision	19/01/2022 01:30 PM	Amlajora, a semi-urban area where people get facilities like electricity, ration shop, library, financial institution etc. Despite that villagers complain sanitary latrines which were financed by government, are poorly constructed. Bus, toto, tracker are main transportation facilities. Anganwadi, ASHA services are available in the village. Health centre, primary and higher secondary school is in the village. However, literacy is low here. Most of villagers are dependant on agriculture. Children from poor family	4

Location	Date	Peoples' Views	Number of Participants
		work in agricultural field. A resident who works in one of the industries get ₹242/- per day if attendance is 24 per month, otherwise he gets₹207/- each day.	
Manikara Panchayat-Kanpur Block- Kanksa	19/01/2022 02:00 PM	Manikara is a rural area from Kanksa CD Block. Facilities like sanitation, electricity, ration shop, library community centre, park/playground etc are there. Villagers depend only on handpump for drinking water. There are AWW, ASHA workers and health workers available. Government hospital is at Durgapur. High school is at Amlajora. People are addicted to tobacco and alcohol mainly. People do not know about the plant. New industry can be beneficial for villagers if they get work. People know about industrial pollution. But there as such there is no effect of pollution on health.	3
Kanksa Block- Kanksa Durgapur Subdivision	19/01/2022 03:30 PM	Kanksa, a semi-urban area of Bardhaman District. Villagers get basic facilities like pipeline water supply, sanitation, electric connection, ration shop etc. Post office is there. One of the main problems here is that the road networks are not well developed. There is bus, toto services available. Higher secondary school is at block. Students get basic computer training from school. Agriculture is the main profession in this village. Women run swanirbhargoshti.	13
Anandapur Panchayat-Amlajora	19/01/2022 4:10 PM	This is a rural area from Kanksa Block. Handpump and piped water are main sources of drinking water. There is no solid waste management system. Ration shop is available in the village.	8

Location	Date	Peoples' Views	Number of Participants
Block- Kanksa		Transportation system is poor. AWW and ASHA work here effectively. Literacy rate is low. Main occupation is agriculture. Local people reported that due to pollution from industry children suffer more. Asthma and allergy are common. Women run swanirbhargosthi.	
Bamunara Block - Kanksa	20/01/2022 09:00 AM	This is an urban area. As per respondents drinking water quality is good and the sources of drinking water are pipeline. Almost every household has electricity and latrine, there is solid waste management. Respondents work in nearby industries, government office. Allergy and skin diseases are the common illnesses. Respondents have idea about industrial pollution. Nearest government hospital is at Durgapur. There is also some private hospitals available.	12
Rupganj Panchayat – Molandighi Block - Kanksa	20/01/2022 10:20 AM	Rupganj is under Molandighi Panchayat. Respondents depend on handpump and tube well for drinking water. Quality of drinking water is average. There is electric connection and sanitary latrines in every house. Respondents reported that they do not get any benefit from near by industries. People have idea about pollution which affects their health. Asthma is most common illness here. Hospital is at Durgapur.	9
Arra Block – Kanksa Durgapur Subdivision	20/01/2022 11:00 AM	In this village piped water supply and handpumps are sources of drinking water. Most of the households have electric connection but do not have latrine. Allergy is one of the common illnesses here. Agriculture is major	9

Location	Date	Peoples' Views	Number of Participants
		occupation. People do not get any benefit from plant. One of the respondents suggests that new industry is required but plants must control pollution strictly.	

Bibliography

https://www.census2011.co.in/census/state/west+bengal.html

http://worldpopulationreview.com/world-cities/west-bengal-population/

3.13 Ecology and biodiversity

Ecological survey aims to evaluate the relevance of an area for nature conservation. It is to support the estimation of the impact of a proposed development by providing assistance on how to describe the ecological features within the area affected, how to value them, and how to predict the value losses caused by the development. The estimation of the ecological consequence of an area can be undertaken from different perspectives and accordingly with different purposes. Therefore, this focuses on the conservation of biodiversity. The description of the actual ecological assessment provided by the ecological baseline study serves to set a reference for the consequent impact analysis. This information is naturally complemented by field visit, site surveys and sample collection.

General vegetation of the district

a) Flora

The most common natural tree species found within the study area are Sal (Shorea robusta), Radhachura (Peltophorum pterocarpum), Eucalyptus (Eucalyptus globules), Mahua (Madhuca indica), Devdaru (Polyalthia longifolia), Segun (Tectona grandis), etc.

There are also several natural species of shrubs, herbs and climbers observed within the study area**.**

Ecological study along with list of plant is given in ***Annexure*** **–**XI.

A full checklist of vascular plant species as recorded during the field survey has been made. The growth form of the plant species as categorized are big trees, medium trees, small trees, thorny trees, tall palm, herbs, small herbs, aquatic herbs, shrubs, small shrubs, under shrubs, climbing shrubs, lianas and climbers.

b) Rare and Endangered Plant Species

The International Union for Conservation of Nature and Natural Resources (IUCN) designated the term "rare" and 'endangered' plant species in the "Red Data Book". As per IUCN 's "Red Data Book", none of the taxa are found in this region could be marked as rare or endangered plant species.

c) Medicinal Plant Species

It was observed during the field survey of the study area, that the medicinal plant species occurred in a sporadic manner and only a few number of medicinal plant species could be identified and the list of the medicinal species are presented in ***Annexure –XI***

d) Agricultural Crops

The study area is under the sub region of fairly hot and moist climate with sandy loam and medium water holding capacity. The annual rainfall is 1400 mm and length of growing periods for crops is 150 – 180 days. Rice is the most important crop. Wheat, Oil seeds, pulses are the main commercial crop. Other main crops are sugarcane, potato, chillies, ginger etc.

Fruit trees are – Mango, Jackfruit, Tamarind, Banana, Kul, Bel, Nona, Ata etc. The garden vegetable are Alliums, Bet, Cucurbita, Tomato, beans, pea, potato etc.

e) Plan of Genetic and Economic Importance:

A large number of plant species of the study area have economic utility like timber, medicine, food, fuel wood. Such plant species may be used for afforestation programme under "social forestry". It was also observed during the sample survey that none of the species could be considered as unique to this place, whose germplasm needs to be conserved in the region under ex-situ condition.

Faunistic Status of the Study area

A faunistic checklist of the study is presented in ***Annexure*** –XII
Few wild animals like Fox, Jackal, monkey, Wild cat etc. could be seen in the study area occasionally.

The faunistic species as reported by the local people are mostly of V categories. A few species come under Schedule II category of Indian Wild Life Act are sometimes observed. The core area is free from any faunistic species.

Aquatic Status of the Study area

List of aquatic, semi aquatic, macrophytes along with list of fishes in Damodar river near project site are given in ***Annexure –XII***

Biodiversity Plan:

- Formulate an advisory and review panel.
- Collate issues related to Biodiversity Conservation and Management Plan.
- Review literature on threats to biodiversity.
- Organize workshops and conduct field surveys to assess threats to biodiversity.
- Formulate strategy and action plans for biodiversity conservation.

3.14 List of Industries

Many industries are located in its adjoining areas as well. The list of industries within 10 km of the proposed site is given below.

Table 3.16: List of Industry

Sl. No.	Name of The Industries	Type of industries
Bamunara Industrial Area		
1	Joy Venketes Concast Pvt. Ltd.	Induction Furnace
2	Braha Alloys Pvt. Ltd.	Induction Furnace
3	Ma Vashnavi Ispat Pvt. Ltd.	Induction Furnace
4	Bhaagaawanjee Ispat Pvt. Ltd.	Induction Furnace
5	V.S.P. Udyag Pvt.Ltd.	Ingot
6	Venky Hi – Tech Ispat	Induction Furnace
7	Jawala Coke Plant	Coke Plant
8	Navaraj Ispat Pvt. Ltd.	Ingot
9	Baahunbali Ferro Tech Power Pvt. Ltd	Iron & Steel
10	Neo Metalik Ltd.	Metaliks
11	Durgapur Iron & Steel Pvt.Ltd.	Induction Furnace
12	R.S. Metal Pvt.Ltd	Metal
13	Waresh Pree Iron & Steel Pvt .Ltd.	Ingot

Sl. No.	Name of The Industries	Type of industries
14	Maa Chandi Durga Cement Pvt.Ltd.	Cement
15	Krishna Sundharam Iron & Steel Pvt. Ltd	Induction Furnace &Rolling
16	Sabitri Ispat Pvt. Ltd.	Iron & Steel
17	Daudu Steel Pvt. Ltd.	Induction Furnace
Banskopa Industrial Area		
18	Ulltra- Tech Cement	Cement
19	Ram Rupai Balaji	Power
20	Jai Balaji	Rolling ,Ferro, Sponge
21	The Supreme Industries Ltd	Plastic
22	Ram Rupai Balaji	Sponge
Leading Company of **Durgapur**		
23	DSP	Steel & Power
24	TPS	Power
25	DPL	Power
26	DCL	Chemical
27	Durgapur Cement Ltd.	Cement
28	ASP	Steel
29	Alstom India (P) Ltd.	Engineering
30	PCBL	Power& Carbon Product
31	Graphite India Ltd.	Graphite

CHAPTER 4

ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION METHODS

Chapter 4: Anticipated Environmental Impacts and Mitigation Methods

4.1 Introduction

Environmental impact in the study area is any alteration of environmental conditions or creation of new set of environmental conditions, adverse or beneficial, caused or induced by the impacts of project. Prediction involving identification and assessment of potential impacts of the project on surrounding environment is a significant component of EIA studies. The likely Impacts of various activities of the proposed project on the environment were identified. These impacts were assessed for their significance based on the background environmental quality in the area and the magnitude of the impact. All components of the environment were considered and wherever possible impacts were evaluated in quantitative/qualitative terms. Several scientific methods are available to qualify and predict the impact of project on environmental factors such as water, air, noise, land, ecological and socio-economic. Such predictions are superimposed over baseline environmental status to derive post project scenario of the environmental conditions. The resultant (post-project) quality of environmental parameters is reviewed with respect to the permissible limits. Based on the impacts thus predicted preventive mitigation measures were formulated and incorporated in the environmental management plan to minimize adverse impacts on environmental quality during and after project execution.

The environmental impacts can be categorized as primary and secondary. Primary are those which are directly attributed to the project and secondary impacts are those which are indirectly induced due to primary impacts and include those associated with investment & socio-economic status. The project impact may be broadly divided into two phases.

- During construction phase: These may be regarded as temporary or short term and ceases with implementation of the project.
- During operation phase: These impacts are continuous warranting built in permanent measures for mitigation and monitoring.

Construction and operation phase of the project various activities comprises of, each of which will have an impact on some or other environmental parameters. Impacts on environmental parameters during construction and operational phase have been studied to estimate the impacts on environment. The impacts have been predicted for the proposed industrial project assuming that the pollution due to the existing activities has already been covered under baseline environmental monitoring.

4.2 Identification and characterisation of Impacts

The wastes and pollutants generated due to various activities of the project cause impacts on different environmental attributes. The major project activities and the anticipated environmental impacts of the proposed project are discussed below under the following categories:

- Impacts and mitigation measures due to project location
- Impacts and mitigation measures due to project design
- Impacts and mitigation measures during construction.
- Impacts and mitigation measures during operation.

4.2.1 Impacts and mitigation measures due to project location

The proposed installation of facilities shall be carried out within the premises. The total land required for the proposed project is 21.7 acres (88098.62 sqm) which is already acquired by project proponent. Also the project land use is industrial; hence no impact due to the project location is envisaged.

4.2.2 Impacts and mitigation measures due to project design

The impacts on air quality from any project depends on various factors like design capacity, configuration, process technology, raw material, fuel to be used, air pollution control measures, operation and maintenance. The proposed project plan envisaged state of art technology, presently available in the country and thus no anticipated impacts are envisaged due to project design.

- Considering the demand for billet, M/s. VSP Udyog Pvt. Ltd. has planned to streamline its operation and to diversify for the growth of the industry at home and also to cater to the International market by installation of facilities for production of billet. The new facilities will operate on the installation of 4 x 20 Tonnes Induction furnaces with Ladle Refining Furnace to manufacture M. S. Billet and expansion of Wire Rod/Rolling Mill capacity from 1,20,000 to 2,50,000 TPA, CCM.
- Existing State of air pollution control technologies have been considered to keep the impact due to the proposed project low.

4.2.3 Construction Phase

Construction activity includes installation of three preheaters. The major activities during construction phase are given below.

Project Activities

- Civil work
- Vehicular movement
- Loading and unloading civil items and equipment
- On-site storage of civil items &equipment
- Erection civil structures
- Power supply
- Maintenance of construction machinery
- Disposal of solid wastes

Particulate matter would be the predominant pollutant affecting the air quality during the construction phase. Dust is generated mainly during making foundation for installation of preheater. The plantation developed in the project area helps a long way to attenuate the dust in the area. The vehicular exhausts and other related activities causes air pollution. However, the incremental values are expected to be insignificant.

During construction phase of the proposed project, construction debris is stacked separately is used for filling of low laying area. Used oil is sold to CPCB authorized vendor.

4.2.4 Operation Phase

The operational phase involves storage & handling of various raw materials like Iron Ore Lumps, scrap etc. which may impact the environment through release of particulates, contamination of water body, run-off from waste storage area etc. During operational phase air, water and noise may be affected due to material usage, processing and associated activities in general. Associated activities e.g. transportation of materials, operations of workshop and garage, canteen etc., may also affect air, water and noise environment. Green belt development has a positive impact not only on flora and fauna but also on air quality, noise and soil characteristics. Positive impacts on socio-economic environment are expected due to employment, further infrastructure development and also due to socio-economic welfare developmental activities to be taken up. The major project activities and the affected environmental parameters are given below.

Project Activities

Operations of various plant units

Operation of D.G Set

Storage and handling of raw material and products

Transportation of raw materials, products and personnel

Water supply, storage and treatment

Solid wastes management

Wastewater management

Gaseous emission management

Pollution Sources

i. Fugitive emission from process, movement of vehicles and handling of raw material

ii. Noise from D.G. set, fans, and vehicular movement.

iii. Storage and handling of solid wastes.

Affected Environmental Parameters

i. Air quality

ii. Water resources & quality

iii. Noise level

iv. Soil quality

v. Biological

vi. Socio-economics

4.3 Impact Matrix

Environmental impacts could be positive or negative, direct or indirect, local or regional and also reversible or irreversible. The primary function of an environment impact assessment study is to predict and quantify the magnitude of these impacts, evaluate and assess the importance of the identified changes, present information and monitor actual changes. The activities of the proposed project are studied. The impacts of various activities of the proposed project are identified and presented as matrix in Table-4.1. Further the characteristics of these impacts have been evaluated and they are presented as matrix in Table- 4.2, 4.3.

Table 4.1: Impact Identification Matrix

No.	Activities	Environmental Attribute						
		Air	Noise	Water	Land & Soil	Ecology	Socio Eco	Aesthetics
Construction phase								
1.	Storage of Raw materials	√			√			√
2.	Ready-mix	√	√		√			

No.	Activities	Environmental Attribute						
		Air	Noise	Water	Land & Soil	Ecology	Socio Eco	Aesthetics
	concrete preparation							
3.	Transportation of materials and equipment	√	√					
4.	Foundation work	√	√		√	√		
5.	Erection of equipment	√	√		√	√		
Operational phase								
1.	Operation of Furnace	√						
2.	Handling & Charging of Raw materials	√	√	√	√			
3.	Operation of Domestic Utilities			√				√
4.	Operation of the DG Sets	√	√		√			
5.	Storage facilities for Raw material	√		√				
6.	Transportation of Raw material/products	√	√		√			
7.	Development of greenbelt					√	√	√
8.	Employment generation						√	

Table 4.2: **Characteristics of Environmental Impacts from Construction Phase**

Activity	Environmental attributes	Cause	Impact characteristics			
			Nature	Duration	Reversibility	Significance, Mitigative measures
Transportation of construction material	Air Pollution (Dust & Gases)	Transportation of construction material by trucks and exhaust emission from vehicles	Direct Negative	Short Term	Reversible	Medium, Regular emission checks shall be performed.
	Noise Pollution	Noise generated from loading /unloading and movement of vehicles	Direct Negative	Short Term	Reversible	Insignificant, Regular vehicle maintenance shall be done. PPE shall be provided.
Construction activities	Air Pollution (Dust & Gases)	Operation of construction machinery, welding & others	Direct Negative	Short Term	Reversible	Insignificant. PPE shall be provided to workers
	Noise Pollution	Generation from construction activities	Direct Negative	Short Term	Reversible	Significant. PPE shall be provided to workers
	Land use	Storage of spares, Refractory, Setting up of project	Direct Negative	Short Term	Reversible	Insignificant. Storage is temporary and during construction period only

Table 4.3: **Characteristics of Environmental Impacts *from Operational Phase***

Activity	Environmental attributes	Cause	Impact characteristics			
			Nature	**Duration**	**Reversibility**	**Significance, Mitigative measures**
Transportation of the Coal & other raw materials from the Mines/Suppliers to the Site						
Transportation of the Mineral ore and required material.	Air Pollution (Dust & Gases)	Haul road dust emission. Gaseous emissions due to Vehicle exhaust	Direct Negative	Short Term	Reversible	• Covered trucks/dumpers shall be used for transportation of the raw materials. • Water sprinkling shall be done on roads and unloading area. • Regular vehicle maintenance and pollution check shall be done. • Besides, the management will ensure proper usage of the personal protective equipment by the workers to avoid any exposure to dust.
	Noise Pollution	Noise pollution due to unloading of raw material and vehicle movement	Direct Negative	Short Term	Reversible	• Low, unloading will be done in covered area from low height. • PPE shall be provided to the workers working in the area.

Activity	Environmental attributes	Cause	Impact characteristics			
			Nature	Duration	Reversibility	Significance, Mitigative measures
Handling & Transportation of Raw material	Air Pollution (Dust Emission)	Transportation of Coal to the Site.	Direct	Short Term	Air Pollution (Dust Emission)	Transportation of Coal to the Site.
	Air Pollution (Dust Emission)	The raw material is emptied to the storage yard. So, dust emission during unloading of Raw material.	Direct Negative	Short Term	Reversible	Low, The unloading will be done in covered area. Also, there **water sprinkling** will be practiced to minimize dust emission. The management will also ensure proper usage of the personal protective equipment by the workers to avoid any exposure to dust.
	Land	Spillage of raw material on the land	Direct Negative	Short Term	Reversible	The raw material storage yard will be made of RCC. Hence no contamination of the land is envisaged.

Activity	Environmental attributes	Cause	Impact characteristics			
			Nature	Duration	Reversibility	Significance, Mitigative measures
Operation & Maintenance of Crusher	Air,	Crushing of the Iron Ore (Dust Emission & Noise Generation)	Direct Negative	Long Term	Reversible	The crusher will be entirely covered but a proper dust extraction system consisting Cyclone and Bag filter to be provided to ensure that no iron ore dust emission to the atmosphere take place. Moreover preventive maintenance will be done to ensure minimum noise. Besides, the management will also ensure proper usage of the personal protective equipments by the workers. viz. Dust Mask, Ear Plug , Goggle etc.
	Noise Pollution	Crushing	Direct Negative	Short Term	Irreversible	Preventive maintenance and suitable mountings shall be used to ensure minimum noise.
	Land Contamination	Land contamination due to dust	Direct Negative	Short Term	Irreversible	While crushing continuous water sprinkling will be done so as to ensure minimum dust emission. The crusher area will be made of RCC, hence no ground contamination will occur.

Activity	Environmental attributes	Cause	Impact characteristics			
			Nature	Duration	Reversibility	Significance, Mitigative measures
Operation of Induction furnace	Air Pollution	Dust emission from Stack, Fugitive emission	Direct Negative	Long Term	Reversible	Stack will be provided with suitable APC system. So, the impact will be insignificant. If no APC system is installed there will be high impact. If proper water sprinkling system is installed then the impact due to fugitive emission will be insignificant.
DG Set						
Operation of the DG Set	Air Pollution	Flue gas emission and Used oil generation	Direct Negative	Short Term	Reversible	The DG will be operated in case of power failure only. Green DG sets shall be installed (As Per CPCB & TOR Guidelines)
	Noise Pollution	Generation of noise during DG Set operation	Direct Negative	Short Term	Reversible	The DG Sets will have acoustic enclosure to minimize the noise.
Domestic Waste						
Operation and of Domestic utilities	Water Pollution	Operation of Washroom, toilets – Wastewater generation	Direct Negative	Long Term	Reversible	The sewage will be disposed into septic tank and soak pits. No discharge from Soaking Pits.
Greenbelt Development						

Activity	Environmental attributes	Cause	Impact characteristics			
			Nature	Duration	Reversibility	Significance, Mitigative measures
Development and maintenance of Greenbelt	Reduction in Air Pollution and Noise Pollution	Plantation of trees within premises to cover 33% of the area	Direct Positive	Long Term	Reversible	Positive Impact due to development of a proper greenbelt along the periphery of the premises. This will act as barrier for air emission and noise
Socio-economic Development						
Employment Generation			Direct Positive			Positive Impact due to direct employment of persons from the nearby area.
						Substantial benefits in the form of contracts to local agencies for different services.
						Employment generation in transport sector for transportation of raw material and finished goods.

4.4 Impacts during Construction Phase

4.4.1 Impact on land environment

The proposed expansion will be carried in the existing premises. The area of the plant is almost flat terrain and the land is already fully developed. There will be no change in land use or land cover as the project is in the company premises.

Very less **construction** work will be required for the installation of new/additional machineries. Therefore, during the construction, the impact is reversible, for short terms and insignificant.

4.4.2 Impact on water environment

As the proposed expansion will be in the existing premises, no major construction activities will be carried out. No disposal of construction waste outside the plant and no leaching are anticipated.

Construction activities for the proposed development can have minor impact on hydrology and ground water quality of the area if the construction waste leaches into the groundwater source. Potential sources of impacts on the hydrology and groundwater quality during the construction phase are as follows:

- Soil runoff from the site leading to off-site contamination (particularly during rainy season).
- Improper disposal of construction debris/refractories leading to off-site contamination of water resources.
- Spillage of oil and grease from the vehicles and wastewater generated on site activities such as vehicles washing, workshop etc.

Following precautions and preventive measure will be taken at the site during construction to avoid any ground and surface water contamination.

- Not allowing water to leave the construction site.
- Disposal of construction debris in approved areas.
- Immediately storm water drains will be made after starting construction activity. The drains will be properly aligned in conformity with the site drainage pattern. At suitable location, sedimentation pits will be made to trap the silt laden runoff water and avoid excessive silt from going outside.
- Construction of storm water diversion channels to divert storm runoff from flowing over the construction areas.

- Installing oil and grease traps in construction workshop and vehicle parking areas.
- Due to civil construction activities, during rainy season the surface run off may contain more of eroded soil and other loose matter. Construction activities will be avoided during rainy days to mitigate the small impacts on soil quality caused due to construction activity.
- With segregation of construction area and proper drainages provided prevents the contamination of water due to soil erosion.
- Septic tank and soak pit will be constructed during construction stage for disposal of domestic effluent from construction workers sheds.

4.4.3 Impact on air environment

The impact on the air quality during construction phase will be localized, temporary and reversible in nature. As the proposed activity will be in the same premises, there will be less impact due to Construction activities. Dust will be the main pollutant affecting the ambient air quality of the area during the construction phase. Dust will be generated during excavation, back filling. Fugitive dust emissions will be from digging, filling, material handling, transportation and use of construction machinery etc. The main source of emission during the construction phase is the movement of equipment and vehicles at site. Equipment deployed during the construction phase is also likely to result in marginal increase in the levels of SO_2, NO_X, and PM and fugitive emissions. The impact is reversible, marginal and temporary in nature. Further, concentration of NOx and CO may also slightly increase due to increased vehicular traffic. As most of the construction equipment will be mobile, the emissions are likely to be fugitive. Though, change in level of ambient concentrations of significant parameters in air will be insignificant and temporary.

The dust generation during construction will be suppressed through intensive water spraying. Proper maintenance of equipment and transport vehicles will reduce generation of gases. It will be ensured that all vehicles are properly maintained to comply with exhaust emission requirements.

Particulate matter would be the predominant pollutant affecting the air quality during the construction phase. Dust will be generated only during foundation activities. In this case, pollution emission sources are distributed throughout the project site and shall fall under the category of area source.

Concentration of SO_2, NO_X and CO may slightly increase due to increased vehicular traffic. The approach road shall be paved and vehicles will be kept in good order to minimize the pollution due to vehicular traffic. The impact of such activities would be temporary and restricted mostly within the construction site. Proper upkeep and

maintenance of vehicles, sprinkling of water on roads and construction site, providing sufficient plantation all-around are some of the measure that would greatly reduce the impacts during the construction phase.

4.4.4 Impact on Noise level

During the construction phase, some of the activities would temporarily enhance the ambient noise levels.

During construction phase, the impact on noise environment will be due to installation of new machineries and equipments, construction equipments like concrete mixer, cranes, generators, compressors, vibrators etc. The impact will be negligible and temporary in nature. The operation of these equipments will generate noise ranging between 70-85 dB (A). The noise produced during the construction will have significant impact on the existing ambient noise levels. The construction equipments will have high noise levels which can affect the personnel, operating the machines. Major construction work will be carried during the daytime. However, the exposure of construction labor and supervisors to this high noise levels will be for a short time only and hence will not pose any health hazards. Use of protective equipment like mufflers will reduce noise generated by such equipment. Personnel protective such as earplugs shall be used by the operators of these machineries.

The construction equipment will undergo preventive maintenance test at routine intervals. It will make minimize by taking appropriate mitigation measures as per Environment Management Plan. Enclosures are provided to those equipments which generate excessive noise. Noise generation will be confined within the surrounding areas of construction site.

Vehicular movements during construction phase and other transportation activity may also raise noise level. The transport contractor will be instructed to keep vehicle periodically serviced and maintain as per the requirement of latest trend in automobile industry.

4.4.5 Impact on biological environment

Since the proposed expansion will be in the existing premises, there will not be any cutting of natural vegetation. The entire land is flat having very less vegetation, no loss of flora & fauna is envisaged during construction. However, the adverse effect are reduced by shortening the construction phase period and development of greenery in the site. Further, there are no sensitive locations within the study area. Hence, no significant adverse impacts are expected on biological environment.

4.4.6 Impact on socio-economic status

The construction phase induces employment opportunities for the local people. Approx. 50 persons will be employed during peak construction phase. In addition to the opportunity of getting employment in construction work, the local population would also have employment opportunities in related activities like petty commercial establishments, small contracts and supply of construction materials etc. The dwelling of construction workers at the site may cause sanitation and other problems. As the villages are nearby and staying facilities are readily available in these villages, the construction and other workers will not be permitted to reside at the project site. Safety and health care of workers is also an important factor to be considered during construction phase. Hazards expected are electrocution, vehicular accident, fall of personnel from overhead works, high level noise due to construction machinery, centering failure and exposure of eyes to dust and welding rays. Constructional and occupational safety measures will be adopted during construction phase of the industry.

4.5 Impact during operational phase

During the operational phase, the following activities are considered significant.

- Raw material transportation and handling
- Water use and wastewater discharge
- Atmospheric emissions
- Noise generation
- Solid waste handling and disposal
- Employment generation
- Community development

During plant operation, dust generation due to raw material handling is controlled by using various dust suppression methods. Closed conveyor system also minimizes fugitive dust. Wherever installation of such devices is not feasible fugitive dust is controlled by using water sprinkling. The dust generated from the main furnace and cooler discharge is trapped in bagfilter.

4.5.1 Impact on air.

4.5.1.1 Emission from point source (stack emissions)

Dust and gaseous emission shall be from the Flue gases generated at plant. PM emission shall be 30 mg/Nm^3, SO_2 emission shall be less than 100 mg/Nm^3 and NOx emission shall be less than 150 mg/Nm^3.

4.5.2 Air pollution dispersion modeling studies

Gaseous Effluent and its control

The major sources of air pollution will be from the particulate emissions from the induction furnace. The emissions from these sources will be passed through bag filters and then will be disposed through 30 m high stacks. The pulse Jet type Bag filter system will be used. The particulate concentration from the bag filters will remain within 50 mg/Nm^3.

The details of the stack emission and stack data are given in below. All the stacks will have emission monitoring facilities.

Table 4.4: Stack Details & Stack Data

Existing Stack No.	Stack Attached to	Stack height (m)	Dia of Stack (m)	Temp. (^{0}C)	Velocity (m/s)	PM (mg/Nm^3)	APC System & Air Volume As given in Test Report
1.	1 Nos. 8 T Induction Furnace	22.5	0.67	49	12.76	33.0	Spark Arrestor & Bag Filter Volume-14694 Nm^3/hr
	1 Nos. 8 T Induction Furnace	22.5	0.67	53	13.07	37.0	Spark Arrestor & Bag Filter Volume-14890 Nm^3/hr
	1 Nos. 15 T Induction Furnace	22.5	0.67	71	14.62	33.0	Spark Arrestor & Bag Filter Volume-15792 Nm^3/hr
2.	Re-Heating Furnace	32	0.92	187	7.43	29.0	Nil
3.	1x125 KVA DG	3.0	0.1	162	13.84	<75	Nil
4.	1X250 KVA DG	3.0	0.1	162	13.84	<75	Nil
5.	1X500 KVA DG	3.0	0.1	162	13.84	<75	Nil

Existing Stack No.	Stack Attached to	Stack height (m)	Dia of Stack (m)	Temp. (^{0}C)	Velocity (m/s)	PM (mg/Nm^3)	APC System & Air Volume As given in Test Report
6.	1X125 KVA DG	3.0	0.1	162	13.84	<75	Nil

For proposed Induction furnace (4x20T), there will be installation of four nos. of APC system comprises of Bag filter, spark arrestor, ID Fan along with 30m high common chimney for disposal of clean gas.

Proposed Stack No.	Stack Attached to	Stack height(m)	Dia of Stack	Temp. (^{0}C)	Velocity (m/s)	PM (mg/Nm^3)	APC System & Air Volume As given in Test Report
1	1 Nos. 20 T Induction Furnace	30	Bottom 2800 mm Top 1800 mm	60-80	22	22	Bag Filter Volume-75000 Nm³/hr Each
	1 Nos. 20 T Induction Furnace	30	Bottom 2800 mm Top 1800 mm	60-80	22	22	Bag Filter Volume-75000 Nm³/hr Each
	1 Nos. 20 T Induction Furnace	30	Bottom 2800 mm Top 1800 mm	60-80	22	22	Bag Filter Volume-75000 Nm³/hr Each
	1 Nos. 20 T Induction Furnace	30	Bottom 2800 mm Top 1800 mm	60-80	22	22	Bag Filter Volume-75000 Nm³/hr Each

Dispersion of Gaseous Pollutants: The emissions from stationary sources are subjected to transport and diffusion process which is together termed as dispersion. The following processes govern the atmospheric dispersion of pollutants.

- an initial vertical rise called the plume rise due to initial thermal buoyancy and momentum of discharge

- Transport by wind in its direction.
- Diffusion by turbulence.
- A number of physico-chemical processes such as gravitational settling, dry and wet deposition which includes deposition on vegetation, chemical reactions, transformations and decomposition, adsorption on deposited vapors, coagulation of particles, etc.

The ground level concentration (GLC) of pollutants due to emissions from stationary elevated sources is computed using dispersion models, which are mathematical relations between the source strength and concentration and involves parameters related transport and diffusion. The empirical Gaussian model is the widely used model in practice. The equation is as follows:

$C(x,y,z) = (Q/(\pi.u.\sigma y.\sigma z)).\exp(-y2/2\sigma y2).\exp(-(z-H)2/2\sigma y2).\exp(-(z+H)2/2\sigma y2)$

where, C = Concentration of pollutant in g/cu m at a point (x,y,z)

Q = Source strength in g/s (rate of pollutant release)

u = Horizontal wind speed in m/s at the source level

σy & σz = horizontal crosswind and vertical distance in m from the plume centre line to the receptors respectively

H = The effective stack height which means the sum of stack height and plume rise above the stack.

Aermod 9.3 dispersion model of Lakes Environment is similar to CPCB's suggested model and has been used in the present study. It takes meteorological input for every hour and calculates concentration at each receptor for one hour average. The desired average e.g 24-hour average is obtained.

It should always be considered that Gaussian plume dispersion models provide approximate results because of number of assumptions and empirical equations being involved in the computation. The models would predict results which are mainly a guide for air quality decision.

Hourly meteorological data monitored have been used for the present computation.

Results and Discussions

Figure shows the isopleths for highest increase in 24 hour ground level concentrations (GLC) for Particulate matters for the future scenario. The summary of the findings is given below in Table.

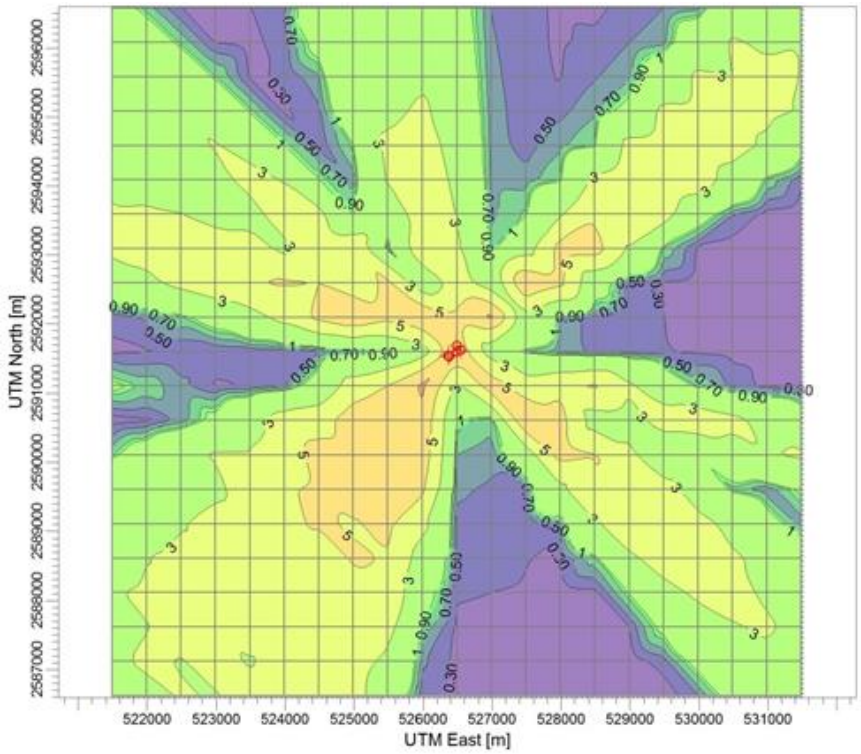
Table 4.5: Predicted Maximum Increase in 24 hour GLC of SPM Future Scenario

Pollutant	Max Increase in GLC in future (µg/m^3)	Distance from Stack
SPM	7.38	43 m

It shows that maximum increase in GLC of SPM is low, maximum increase to be only 7.38 µg/m^3. The maximum concentration remains very close to the industry.

With this, there will be no dust pollution outside. Thus no significant impact on air quality is expected.

Figure 4.1: GLC Concentration



Hence, there will not be any significant impact on air environment due to proposed unit.

4.5.3 Air pollution –Mitigative measures

The fugitive emissions in the industry will be controlled by following measures:

- Trucks carrying raw material will be covered with tarpaulin to prevent spreading of dust during transportation.
- Haulage roads will be sprinkled with water at regular intervals for which water tankers with sprinkler arrangement will be deployed.
- Greenbelt and greenery development around storage yards, around plants, either side of roads and around the periphery of the industry.
- Water spray and sprinkling will be practiced at unloading locations.
- The conveyors of fuel will be suitably covered with hood or enclosures to control fugitive emissions.
- All internal roads in the premise will be paved/ tarred.
- Speed limit of 10 km/h will be enforced for vehicles in the plant premises.
- Regular sweeping of roads will be practiced with vacuum sweeping machine.

4.6 Impact on water resources/water pollution

Potential impacts of withdrawal of water and wastewater discharges from the proposed industry on land or water body is an important factor in EIA Studies. The quantitative and qualitative information on water utilization and waste water generation in the proposed industry is presented in Chapter-2.

Total fresh water requirement of the proposed project is estimated to be **100 KLD** only for domestic purpose. Water requirement for the proposed plant will be sourced through Ground Water.

The domestic effluents from toilets within the plant premises will be treated in septic tank and will be disposed in soak pits. Canteen waste water will be treated & reused for gardening and sprinkling to minimize the use of water. Run off from various area such as dump and stock pile area are passed through settling tanks before discharging to outside.

Particulars	**Requirement for Existing Plant (KLD)**	**Requirement for Proposed Plant (KLD)**	**Total (KLD)**
Water for cooling (Make up)	57	97	154
Domestic purposes & other uses	3	3	6

Total	60	100	160

Table 4.6: Water Balance

Source of water	**KL/day**	**Total consumption**	**KL/day**
Water from Ground water	154.58	Water for Cooling (Make Up)	154.0
Rain water harvesting	5.42	Domestic Purpose & other uses	6.0
Total	**160.0**	**Total**	**160.0**

4.7 Impact on noise

During the operational phase, the main sources of noise will be from manufacturing activities, process plant, furnaces, hot rolling mills, material handling systems, transportation etc. Movement of vehicles along the road will create noise. Vehicular movements during operation phase for loading/unloading of raw and finished materials and other transportation activity may also increase noise level. The unit shall install latest technology based acoustic D.G. Sets.

Prediction of anticipated noise levels resulting from operation of the proposed plant has been computed using point source model. Basic phenomena of the model are the geometric attenuation of sound. Noise at a point generates spherical waves, which are propagated outward from the source through the air at a speed of 1,100 ft/sec, with the first wave making an ever-increasing sphere over an increasing surface area of the sphere.

The assumption of the model is based on point source relationship i.e. for every doubling of the distance the noise levels are decreased by 6 dB (A). Point source propagation is defined by the following equation

$$Lp2 = Lp1 - 20 \log r2 / r1$$

Where Lp1 & Lp2 are sound pressure levels at points located at distances r1 and r2 respectively, from the source.

Predictions are carried out without taking into consideration of any attenuation factors. Additional attenuation is expected, due to atmospheric effect or its interaction with objects in the transmission path.

Noise level at the plant boundary, calculated from the above equation is expected to be less than 65 dB (A) without considering any attenuation factors. It is proposed to develop a greenbelt along the periphery of the power plant, which will further reduce the noise levels. It is predicted that the high noise levels will be limited to work zone only and the noise levels gradually decreases further away from the source.

4.7.1 Mitigation Measures- Noise

The equipment will have inbuilt noise control devices and the measured noise produced by any equipment will not exceed 85 dB (A) at a distance of 1.0 m from its boundary in any direction under any load condition. The noise produced in valves and piping associated with handling compressible and incompressible fluids will be attenuated to 75 dB (A) at a distance of 1.0 m from the source by the use of low noise trims, baffle plate silencers/line silencers, acoustic lagging (insulation), thick-walled pipe work as and where necessary.

The general mitigation measures for the attenuation of noise are given below:

- Suitable padding is provided at required locations to avoid rattling due to vibration.
- Suitable noise control system will be provided to ensure that noise does not exceed the standard limit. Proper noise preventive measures will be taken for minimizing the noise pollution like ear plugs, efficient silencers to the vehicles, etc.
- Noise proof cabins are provided to operators wherever remote control for operating noise generating equipment is feasible.
- The generation of noise is mitigated by installing noise barriers/absorbers around stationery noise sources, viz. compressors, pumps and blowers etc. Sufficient noise control measures such as anti vibration pad for equipment with high vibration is provided. To reduce the noise generation, all the vibrating parts will be periodically checked and serviced.
- The equipments, which generate excessive noise, are provided with enclosures etc.
- The transport contractor will be instructed kept vehicle periodically serviced and maintain as per the requirement of latest trend in automobile industry. The transport contractor will be instructed to avoid unnecessary speeding of vehicles inside the premises.
- Design/installation precautions are taken as specified by the manufacturers with respect to noise control and will be strictly adhered.
- High noise generating sources are insulated adequately by providing suitable enclosures.

- Sound attenuation panels are installed wherever required around noise generating equipment.
- Noise control forms an integral part of the plant design.
- Other than the regular maintenance of various equipment's, ear plugs/muffs are provided to personnel working close to the noise generating units.
- Green belt acts as a barrier to the propagation of noise from the factory premises. Proposed greenbelt development will reduce the noise levels significantly and so there will not be any unpleasant impact occurred to the nearby present human settlement.
- All openings like covers and partitions are designed properly.
- Inlet and outlet mufflers are provided wherever required.
- All rotating equipment/parts are well lubricated and provided with enclosures as far as possible to reduce noise transmission.
- Noise monitoring will be carried out regularly at different parts of the plant as proposed in the monitoring program.

Therefore, impact on the environment during the operation phase will be long term but, insignificant quantity.

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4.8 Impact on Biological environment

4.8.1 Impact on Flora

Air emissions and increase in dust levels during the operational phase may result in restricted growth, less regeneration and degradation of sensitive vegetation. These emissions will be continuous and long term thus will have direct impact on the nearby vegetation. The increase in vehicular movement due to the project might increase the risk of introducing obnoxious or exotic species. This impact shall mostly remain insignificant as there is already a road network and existing traffic in the region. The increase in population may result in tree cutting, lopping and grazing in the nearby regions.

4.8.2 Impact on Fauna

The fauna might be impacted due to noise generated during the operational phase. The increase in human activity may also pose a threat due to illegal hunting and poaching in the nearby areas. The air emissions might reduce the abundance of sensitive species like butterflies and birds. The increased traffic may result in road kills of wildlife while crossing. The vehicular movement and road traffic may result in the introduction of unwanted species.

These alterations will have low impacts in the future course of proposed development, thus the impacts will be low from ecosystem functioning point of view.

4.8.3 Impact on Ecosystem

The proposed activity may result in degradation of surrounding habitat, introduction of weeds, increased road traffic, habitat fragmentation and wildlife poaching and forest fires. These activities may act at the larger level and reduce ecosystem resilience. Ecosystem resilience is the overall diversity of the habitat, which helps to resist the adverse conditions and or calamities that may seriously damage that particular habitat. The proposed project area may impose negative ecological attributes and might result in overall reduction in ecosystem resilience of the habitat if the activities are not managed properly.

4.9 Mitigation Measures

The fugitive dust generated during operation phases in the storage areas or parking area will be regularly sprinkled with water. Loss of any vegetation during construction will be compensated by greenbelt development. Tall trees with thick canopy will be planted along the boundary area to help reduce the fugitive dust emission from the plant and gaseous emission. Construction vehicles, machinery and equipment will remain confined within their designated areas of movement and the company staff will be strictly directed not to damage any vegetation such as trees, shrubs or bushes.

Thus, there will not be any significant impact on ecological environment due to proposed project.

4.10 Impact on socio-economic environment

Critically analysing the existing environmental status of the socio-economic profile and visualizing the scenario with the project, the impacts of the project would be varied and may generate both positive and negative impacts of the proposed project in the region that are stated below.

4.10.1 Positive Impacts

a. No Rehabilitation

As the project operations will not disturb or relocate any village or settlement, no adverse impact is anticipated on any human settlement.

b. Increase in Job Opportunities

The project will generate direct employment to 310 persons.

c. No burden in the existing Infrastructure Facilities

Local work force will be given first preference in the activity due to which influx of the outsiders is not envisaged or it will be very minimal. Thus, there will not be the necessity of provision of housing facility for the local workers and not stressing on the existing civic amenities of the area. If sufficient number of local workers will not be available, then workers from outside will be engaged. For the outside workers if any, housing arrangement and the facilities will be provided at the project site.

d. Improvement in Infrastructure

The activity will benefit the local people due to provision of more infrastructural facilities such as developments of approach routes within the village area, street light, health facilities etc.

4.10.2 Adverse Impacts

a. Impacts on Agriculture

Productivity of crops may be deteriorated affecting the agriculture-based livelihood due to the pollution arising out of the project activity, if proper mitigation measures will not implemented.

b. Impacts on Public Health and Safety

The discharge of air emissions from process operations may have potential impact on public safety and health. The impact from the discharge is not expected to be significant since, the adverse impacts on ambient air, water and soil quality are predicted to be low. It is predicted that the impacts on public safety will be low, due to the effective safety system and safety management which will beavailable in the plant.

Table 4.7: Qualitative Effects on Socio-economic Environment

Parameter	Local	Regional	Direct	Indirect	Reversible	Irreversible
Employment	+	•	+	+	•	+
Income	+	•	+	+	•	+
Transport	+	+	+	+	•	+
Education	+	•	+	•	•	+
Medical facilities	+	•	+	•	•	+
Communication	+	+	+	•	•	+
Sanitation	-	•	-	•	•	-

Housing	+	•	+	•	•	+
Health	-	•	-	-	•	-
Recreation	+	+	•	+	•	+
Agriculture	-	•	-	-	•	-
Cost of living	+	•	•	-	•	+
Business	+	+	+	•	•	+
Per Capita Income	+	+	+	•	•	+
Pollution	-	•	-	•	•	•

+: Positive; - : Negative; • : Insignificant

4.10.3 Mitigation measures of socio-economic environment

- Periodic health checkup camps, blood donation camps shall be organized by project authority for villagers, contract laborers, employees and their family in nearby villages.
- Workers will be provided with basic amenities like safe water supply, low cost sanitation facilities, first aid, required personal protective equipments, etc.; otherwise there could be an increase in diseases related to personal hygiene.
- Awareness programs shall be arranged on health, hygiene and sanitation.
- Apart from the normal health check-up, emphasis shall also be given to prevent specific diseases originating due to emission of different pollutants such as respiratory ailments, skin problems, water borne diseases, hearing abilities etc.
- Whenever necessary, collaboration between project authority and local bodies will be done on regular basis with an objective to build and maintain a good relationship which is necessary for smooth functioning of the project as well as progress and welfare of the people in the study area
- Awareness programs will be taken to make people aware about the environmental protection, need of water conservation etc.
- Job oriented training courses must be organized through industrial/technical training institutions for educated youth like electrical, tailoring, plumbing, type writing, shorthand and machine repairing, welding fabrication, and other skill developing trades.
- At the work place, first aid facilities shall be maintained at a readily accessible place with necessary appliances including sterilized cotton wool etc. Ambulance facility shall also be provided during emergency

- Sufficient supply of water fit for drinking shall be provided at suitable places.
- Sanitary facilities shall be provided at accessible place within the work zone and kept in a good condition.

4.11 Impact on Health

Exposure problems to noise, dust, heat and gases will be the major hazards from this plant. The employees working in dusty environment will be subjected to regular health check-ups as per norms. The workers will be diagnosed for respiratory functions at periodic intervals and lung function test, sputum test, X-ray test, etc. for specific complaints. Health Centre equipped with paramedical staff, medicines, vehicle and other medical equipment will be also available.

Plant personnel working in dust prone areas will wear protective equipment like air filters over their nose. Job rotation schemes will be practiced for over-exposed persons.

It is ensured that workers will not be exposed above the threshold noise limits prescribed by OSHA and Factories Act through suitable administrative controls. Personal Protective Equipment like earplugs and muffs will be provided. Periodic Auditory examinations by qualified doctors will be conducted.

The national ambient air quality standards prescribe level of air pollutants will protect public health and other adverse effect on environment. Exposure to PM, SO_2 and NO_2 is likely to affect public health if the ambient concentrations are above the stipulated criteria. Air quality dispersion modeling predicted that the ambient air quality would remain within the national standards. The factual position is validated by referring to the prescribed ambient air quality criteria (AAQC) developed by USEPA. AAQC are cause-effect relationships, observed experimentally, epidemiological, or in the field of exposure to various ambient levels of specific pollutants as shown below:-

Level in ppm	Level in $\mu g/m^3$	Exposure Time	Observed human symptoms
For Particulate Matter (Dust)			
-	2000	2 hour	Discomfort
-	1000	10 min	Direct respiratory mechanical changes
-	110	24 hour	Increased respiratory disease risk
For SO_2			
15	4000	1 hour	Decreased mucociliary activity

10	26200	10 min	Bronchospasm
5	13100	10 min	Increased airway resistance in healthy adults at rest
1	2620	10 min	Increased airway resistance in asthmatics at rest and in healthy adults at exercise
0.5	1310	1 hour	Visible injury to sensitive vegetation in humid regions
0.19	500	24 hours	Aggravation of chronic respiratory disease in adults
0.07	180	365 days	Aggravation of chronic respiratory disease in children
For NO_2			
5	9420	15 min	Impairment of normal transport of gases between blood and lungs in healthy adults
2.5	4710	2 hour	Increased airway resistance in healthy adults
2	3770	4 hour	Foliar injury to vegetation
1.0	1890	15 min	Increased airway resistance in bronchitis

The noise from the plant will be confined within the plant boundary. No toxic chemicals will be stored inside the plant premises. The PM, SO_2 and NO_2 levels in ambient air will be much below the above criteria; hence there will be no significant impact on the human health.

4.12 Impact on local infrastructure (transportation)

All the raw material as well as the finished product is transported through road. The nearest railway station is Durgapur Railway station at 6.0 Km towards West direction from the proposed project site.

Operational phase Traffic Assessment Study

The traffic assessment will be conducted to assess the impact of traffic with reference to road safety and carrying capacity of roads. This will help to in deciding the geometric design feature and traffic control for safe and efficient traffic movements.

Due to production activities after installation, there will be increase in the traffic to and from the site. Vehicles used for transportation of raw materials as well as finished product would be trucks and for supplying ground water tractors/trucks will be used. Other vehicles

used for various purposes would be Jeeps, cars and 2 wheelers. The site has good road connectivity. Traffic volume on nearby roads will increase due to movement of medium and heavy vehicles considering the overall size and nature of the Project.

Construction Phase

Construction activities in urban environments often have negative impacts on the communities surrounding the construction site, such as delays, negative environmental impacts, congested traffic conditions, safety hazards, and economic losses. These adverse impacts include:

- Delays and traffic congestion caused by the additional traffic volume of construction traffic.
- Loss of parking spaces
- Additional traffic conflict points at construction access and egress gates.
- Safety hazards associated with moving heavy equipment and oversized loads.

Although avoiding these impacts may not be practical or even possible, they must be mitigated for the construction activity of project to earn an acceptable rating both environmentally and socially.

Mitigation Measures

Traffic management will be implemented during construction period which can be followed as per following points.

- To organize the transport and delivery of construction materials, plant and equipment to the construction site and the removal of surplus items and waste materials from the site, minimizing and controlling the project's impact on road users, neighbors, the surrounding community, and the environment.
- To organize the movement of the construction workforce onto and off of the site on a daily basis, minimizing the impact on the available parking spaces on the roads around the site, minimizing the impact on traffic volumes and congestion, and encouraging the use of public transportation.
- To control construction vehicle movements on the site, maintaining both construction worker safety and road user safety by minimizing the interaction, wherever possible, between road user traffic and construction worker traffic and by segregating pedestrian routes and vehicle routes.
- To conduct a survey of the road network surrounding the construction site on foot. The purpose of this survey is to obtain sufficient detail on the network, including

load restrictions, height restrictions, road widths, parking availability, and their effects on current traffic flows, to make an informed decision on the selection of appropriate routes for construction traffic associated with the project.

Operation Phase

The transportation of material to and from industry will be enhanced. The materials from and to the site are transported mainly through trucks. The traffic density on this road is much less than its allowable limits. Traffic volume on nearby roads will increase due to movement of medium and heavy vehicles considering the overall size and nature of the Project, the increase in traffic will not have any significant effect.

Mitigation Measures

The increase in traffic will not have any significant effect. A traffic management plan for the area will be developed to ease the situation. The following arrangement would be made to ease the situation.

- Drivers of trucks / dumpers engaged in construction work will be instructed to give way to passenger buses, cars etc.
- Transport of construction materials and machineries will be carried out during lean traffic period of the day or during night.
- The roads will be strengthened, if required, for transportation of material, goods etc.
- All trucks are to be used for transportation will be covered with tarpaulin, maintained, optimally loaded and have PUC certificates.
- All vehicles and their exhausts would be well maintained and regularly tested for emission concentration.
- Advise traffic police about the activities.
- Truck/tippers shall be parked in designated parking area only.
- Minimize use of roads at any particular time by planning vehicles movements.
- Road crossings to be used will be well marked.

From above statements, it can be concluded that proposed project will have insignificant effect on the traffic and proper management plan will further reduce the negative impacts

4.13 Impact on demography and socio-economics

There is a positive impact on the overall socio-economic pattern of the area because of the 310 people will be employed. In addition to above, about 100-150 people have got indirect

benefit by this project for logistic reasons. Educational facilities, health centers, recreation centers, etc. have come up in the area.

No major occupational health hazards will be envisaged in plant after proper safety and environmental protection measures. However, the general hazards of plant industry will be there. The personnel will be trained to take sufficient precautionary measures for safety and hygiene. Project activities will not likely to cause changes in occurrence of disease or affect disease vector. Though, medical check-up of workers will be regularly done as per statute.

Also, the operating and maintenance personnel will be provided with all the necessary safety equipment such as hand gloves, gum boots, aprons, helmets, protective glasses, ear muffs etc. Workers training will focus on reduction of wastes, utilization of wastes and generally maintaining a clean and healthy environment.

4.14 Occupational health care

No major occupational health hazards will be envisaged in plant after proper safety and environmental protection measures. However, the general hazards of industry will be there. The personnel will be trained to take sufficient precautionary measures for safety and hygiene. Project activities are not likely to cause changes in occurrence of disease or affect disease vector. Though, medical check-up of workers will be regularly done as per statute.

Also, the operating and maintenance personnel will be provided with all the necessary safety equipment such as hand gloves, gum boots, aprons, helmets, protective glasses, ear muffs etc. Workers training will focus on reduction of wastes, utilization of wastes and generally maintaining a clean and healthy environment.

4.15 Greenbelt

The Greenbelt and plantation area will be developed in 29913.23 sqm of the total plant area i.e. 33.0 % so as to mitigate the effects of emissions from the plant. The main objective of the greenbelt is to provide a barrier between the plant and the surrounding areas. The treated wastewater from the plant will be utilized for the greenbelt development. Roads for vehicular movement will be paved and adequate mitigation measures will be provided to prevent fugitive emissions. The species selection will depend upon type of soil and local species with good survival rate will be selected. The Fruit bearing/ Medicinal plants and local species will be planted for greenbelt development. Tree density of 2000-2500 trees per hectare with local board leaf specification will be planted.

The plantation will be mixed i.e. all the species prescribed are to be planted intermingled and there will be no mono specific plantation or plantation of a single species in a patch. In the initial years of plantation irrigation will be done and in the later years canopy

management will be done to enable the shrub and herb species to colonize the floor of the greenbelt.

The following plant species has been selected for making greenbelt.

Arjun, Ashwatha, Akashmoni, Aam, Bot, Chatim, Debdaru, Ghoranim, Jhaun, Jarul, Karanj, Krishnachura, Neem, Pakur, Radhachura, Sisso, Sirish etc.

4.16 Rain water harvesting

Rainwater harvesting is the method by which rainwater falling within the plant premises are collected and reused. The quantum of rain water which is freely available for harvesting from the rooftop area is significant and keeping in view the shortage of drinking water, it is proposed to undertake a scheme of roof top rain water harvesting.

As per Environmental Management Plan this unit will have a Rain Water harvesting Plan. The average rainfall of the area considered for the design is 1200 mm/year. The total plant area is approximately **88098.62** m^2.The shed area considered for Rain water is approximately 38965.77 m^2 (44%) inclusive of the office building and the shed roof area.

Rain water yield (liters per year) = Roof Area (m^2) x Annual Rainfall (mm) x Run-Off coefficient of Friction x Filter Efficiency

Roof top area	38965.77 m^2 (approx)
Run Off coefficient of friction	0.85
Filter efficiency	90%

Rain water harvesting potential (38965.77 x 0.85 x 1200 x 0.90) = 35770576.86 lit= 35770.58 m^3 (approx)

Tank capacity:

Tank capacity to be constructed for water harvesting may be taken 20% of annual rainwater yield i.e. 5% of 35770.58 m^3 = 1788.53 m^3 (approx)

Three rectangular tanks will be constructed in the basement with dimensions of 14.0 m x 12.5m x 3.5 m = 612 m^3 each. This stored water in the tank can meet the basic water requirement for gardening purpose for the dry period and fire fighting.

5.42 KLD water will be available from Rain Water Harvesting (RWH) system.

CHAPTER 5
ANALYSIS OF ALTERNATIVES (TECHNOLOGY & SITE)

Chapter 5: ANALYSIS OF ALTERNATIVES (TECHNOLOGY & SITE)

5.1 Preamble

The proposed project is a green field project. Considering the ever rising demands for billets, M/s. VSP Udyog Pvt. Ltd. now desires to expand its present manufacturing capacity from 90,600 TPA to 354600 TPA. The proposed expansion will be made with the installation of 4 x 20 Tonnes Induction furnaces. They will also install Ladle Refining Furnace, CCM and made expansion of Wire Rod/Rolling Mill capacity from 1,20,000 to 2,50,000 TPA. The proposed expansion will be made in the existing unit at Bankskopa, PO-Bamunara. Durgapur, Dist. Paschim Bardhaman, West Bengal, JL No.65, Khatian No.3743, 3825, J.L.No.58, Khatian No.2374, 2885, 3085, 2884 on 21.7 acres (88098.62 sqm) Land & the estimation cost of project will be Rs. **190.80 Cr.** The project alternatives discussed here include the rational for the proposed project location, raw materials availability, production technology, etc. Prior to arriving at a conclusion regarding establishment of proposed new project, a number of alternatives were examined and reviewed. The options considered were:

- Project location
- Raw material availability
- Technology
- Environment management

5.2 Selection of Location

The manufacturing facilities and equipment of plant shall be set up within the plant premises of the plant area of 21.7 acres (88098.62 sqm). Therefore, no additional land shall be required for the project. Also, the site is well connected to the national and state highways.

The feasibility of installing the Plant has been studied from the point of view of availability of necessary infrastructural facilities like adequate land, water resource, facilities for transportation of plant and equipment and manpower availability.

INFRASTRUCTURE

The area is well connected with G.T.Road which is at approx. 0.18 Km towards South, Durgapur Purulia Raghunathpur Road is at approx. 2.56 Km towards West. The nearest major railway station is Durgapur railway station at 6.0 Km towards West direction from the proposed project site. Public conveyances and communication facilities are also available on the highway. The infrastructure facility is adequate in the proposed project site. The social infrastructure like school, college, temples and playground already exist in this area. The above infrastructure facilities need no further development for the project nor is any major change in the infrastructure envisaged due to the project. Furthermore, communication

facilities such as telephone, tele-fax and internet are available in industrial area near to the plant site.

ROAD CONNECTIVITY

The project site is well connected to G.T.Road which is at approx. 0.18 Km towards South.

RAIL CONNECTIVITY

The state has extensive and well developed railway system providing vital links to mining industry and with important cities and ports of the country. The nearest railway station is Durgapur at 6.0 Km towards West direction from the proposed project site.

AVAILABILITY OF RAW MATERIALS

The raw material viz., Cast Iron, Pig Iron, Scrap, Sponge Iron etc., will be received by trucks and stacked separately in stockyard. The material will be procured in required size range and quality and no further processing is required. These raw materials are stored on concreted yards.

PROXIMITY OF MARKET

The location is well connected to all the districts of West Bengal within reasonable distance. Moreover the items are High value and hence there is no factor of freight in the cost and hence the entire India is the suitable market. Since the raw material is indigenously available, our cost of production will be cheaper and can comfortably compete with overseas manufacturer.

AVAILABILITY OF ELECTRIC POWER

A total of 20MVA power will be required for the proposed project & the source of the power will be sourced from WBSEDCL.

WATER SOURCE AND SUPPLY

The total water requirement for the project will be estimated to be 100 KLD which will be sourced from Ground Water.

AVAILABILITY OF SKILLED & UNSKILLED WORK FORCE

Being surrounded by number of steel and allied plants in the area, skilled, semi-skilled and qualified manpower is available. The total requirement of manpower in the plant will be available without much difficulty as the area has industrial exposure in Iron & steel sector. It is also very near to the state's major industrial towns of West Bengal.

SITE CHARACTERISTICS

The land selected needs no clearance of vegetation and buildings as the proposed plant will be constructed on the vacant land. Construction of above ground buildings and structures for plant, roads etc. will be done inside the proposed site. There are no existing buildings on the proposed land and all the construction will be as per the approved plan.

ENVIRONMENTAL CONSIDERATION FOR SELECTING THE SITE

- Proximity to Raw materials sources,
- Non-presence of Eco-sensitive landmarks in the study areas,
- There is no wild life sanctuary/national park or any ecological sensitive zone within 10 km radius of the proposed site.
- Easy accessibility of rail and road infrastructure,
- Existing topography of land with slope and drainage in the area,
- Availability of land avoiding: Forest Land, Prime Agriculture land and Displacement and Rehabilitation or Scarce resources.
- The land selected needs no clearance of vegetation and buildings as the plant will be constructed in the open space available at the proposed site.
- Construction of above ground buildings and structures for plant, roads etc. will be done inside the proposed premises and all the construction for project will be as per the approved plan.
- Plant layout developed considering the placement of technological and services units so there is no interference and the movement of man/material is easy and minimum.

5.3 Selection of Technology

The technological facilities required at each processing step to achieve good quantity products are described briefly in the Chapter 2**.**

5.4 Environment Management

M/s. VSP Udyog Pvt. Ltd. is committed to use best technology available for controlling, treating and disposing of all type of waste to be generated during the operation of plant. The details of air emission, wastewater and solid wastes proposed to be generated and their disposal during operation phase are given in **Chapter-2** and **Chapter-4**. Environment sensitivities present in the study area of 10 km around the proposed project site are given in **Chapter 3**. The anticipated adverse impacts shall be less due to the following:

- All statutory requirements, guidelines and recommendations of WBPCB/CPCB/MOEF&CC shall be complied.
- No use of water in the manufacturing process. Domestic wastewater shall be treated and disposed of No wastewater shall be discharged outside the premises.

- Solid waste to be generated shall be utilized, sold to the registered recyclers or disposed of in environment friendly manner.
- Air emission shall be controlled by providing adequate pollution control equipment.
- Continuous efforts shall be made for improvement of the socio-economic status of the surrounding area.

CHAPTER 6

ENVIRONMENTAL MONITORING PROGRAM

Chapter 6: Environmental Monitoring Program

6.1. Introduction

The post project environmental monitoring program serves as the key tool to keep track on performance of mitigation measures implemented & pollution control technologies installed to prevent impacts associated with various operations of the project.

Environmental monitoring is the repetitive and methodical measurement of the characteristics of environmental components to test specific hypotheses of the effects of human activity on the environment. Environmental monitoring is undertaken primarily to determine the environmental effects of human activities, and secondarily to increase understanding of cause-effect relationships between human activity and environmental change.

Thus, environmental monitoring is the effective observation of site conditions and work activities; and identification of potential non-compliance situations and initiation of corrective or remedial actions. Monitoring is as important as that of control of pollution, since the efficiency of control measures can only be determined by monitoring.
To ensure the effective implementation of the proposed mitigation measures, the broad objectives of monitoring plan are:

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

A detailed monitoring of emissions and effluent sources for different environmental parameters will be carried out as per the present norms and any further notification/direction from West Bengal Pollution Control Board (WBPCB), Central Pollution Control Board (CPCB) and MoEF&CC. Monitoring methodologies will follow standard methods prescribed by CPCB, Bureau of Indian Standards (BIS), USEPA, AWWA etc.

6.2 Parameters to be monitored

- Ambient Air Quality,
- Stack Emission,
- Work zone Air quality,
- Surface water and Ground Water Quality,

- Noise Level

6.2.1 Ambient air Quality

It is necessary the monitor the air quality at the boundary of the sponge iron plant manufacturing units specifically with respect to particulate matters. Ambient air quality monitoring stations in and around the premises will be done as per direction by WBPCB. The parameters monitored include the parameters as per National Ambient Air Quality Standard, 2009.

Description	Number of Monitoring Stations	Frequency
Ambient Air Quality	2 (upwind and downwind direction inside the plant boundary	Weekly
Parameters – PM_{10}, $PM_{2.5}$, SO_2, NO_2		

6.2.2 Stack Emission

Periodical monitoring of stack for SPM, SO_2, NO_x in case of process stacks shall be done to assess the performance of pollution control facilities installed at the unit. Incase emissions are found to exceed the norms, the 'on duty' personnel shall check the relevant process parameters and take appropriate corrective action. Emissions from all the stacks shall be monitored once in a quarter using the manually operated stacks emissions monitoring equipment. However the frequency of monitoring may be increased if required in accordance with the stipulations of WBPCB or other statutory authorities.

Component	Location	Parameter	Monitoring & Analysis Method	Monitoring Frequency
Stack Emissions Monitoring	Port holes made on the stack (6 cm diameter, 2 Nos. at 90° to each other), provided with flange. Location of the port hole at 6 times the stack diameter. Platforms with railings be provided.	PM SO_2 NOx CO_2	SPM & SO_2 – CPCB Method NO_X – USEPA Method 7 O_2 – Orsat analysis CO_2 – Orsat Analysis Duration of sampling – Isokinetic method using stack monitoring kit Sample volume – 500 l of	Every week

			flue gas	

6.2.3 Fugitive Emission

Fugitive emissions shall be measured at 1 location at a distance of about 5-10 meters from the source of fugitive emissions (Raw material yard), once in a month.

6.2.4 Effluent Quality

There will be no effluent generation as the proposed plant has no use of water in manufacturing process. Domestic wastewater generated will be treated through septic tank in soak pit. No plant effluent will be discharged in to public water ways or drains.

6.2.5 Ground water Quality

Two samples shall be collected one from inside plant and second from nearby village and compared with IS: 10500: 2012 drinking water standards.

Component	Location	Parameter	Monitoring & Analysis Method	Monitoring Frequency
Groundwater Quality	Inside plant Nearby village	pH TDS TSS Total hardness Fluoride O&G	Standard Methods of APHA	Once during pre-monsoon and once during post monsoon

6.2.6 Noise Monitoring

Noise monitoring shall be carried at near to the high noise generating areas (furnace and disc) once in a month and shall be compared with as per the requirement of Occupational Safety and Health Administration (OSHA) Standards.

Monitoring of Ambient noise levels will be monitored once every quarter during day time (6 AM to 10 PM) and night time (10 PM to 6 AM) at plant boundary (nearest and furthest)

6.2.7 Plantation

Tree density of 2000-2500 trees per hectare with local broad leaf will be planted.

6.2.8 Occupational health & safety monitoring

Occupational health and safety monitoring programs shall verify the effectiveness of prevention and control strategies. The selected indicators shall be representative of the most

significant occupational, health, and safety hazards, and the implementation of prevention and control strategies. The performance and achievements of the OHSMS responsible for all management of all environments, Health & Safety aspects shall be reassessed on annual basis. The occupational health and safety monitoring program shall include:

Safety inspection, testing and calibration: They shall carryout inspection and testing of all safety features and hazard control measures for plant operation. This shall include regular inspection and testing of all safety features and hazard control measures focusing on engineering and personal protective features, work procedures, places of work, installations, equipment, and tools used. The inspection shall verify that issued personal protective equipment (PPE) continues to provide adequate protection and is being worn as required.

- All instruments installed or used for monitoring and recording of working environment parameters shall be regularly tested and calibrated, and the respective records maintained.
- Surveillance of the working environment shall be carried out.
- Surveillance of workers health: When extraordinary protective measures are required, workers shall be provided appropriate and relevant health surveillance prior to first exposure and at regular intervals thereafter. The company will provide appropriate and relevant health surveillance to workers with special emphasis to the dust prior to first exposure and at regular intervals thereafter.

6.2.9 Training

Training activities for employees and visitors shall be adequately monitored and documented (curriculum, duration, and participants). Emergency exercises, including fire drills, shall be documented adequately. Service providers and contractors shall be contractually required to submit the adequate training documentation before start of their assignment.

6.2.10 House keeping

There should be different stockyard for the raw materials, so that the shop floor area can be kept clean. Proper maintenance and cleaning of the Multi-cyclone, Bag houses and Inbuilt-Dust collector would be done as per requirement. Any solid waste generated will be kept in specific marked area and if possible, it would be reused in the process or sold.

6.2.11 Periodic preventive maintenance

A detailed maintenance schedule shall be drawn for all pollution control systems. The maintenance shall be done strictly as per schedule and guidelines furnished by plant manufacturer. All pollution control, monitoring and safety equipment shall be periodically checked and calibrated.

6.2.12 Socio-economic development

The setting up of the manufacturing units will improve the socio-economic conditions in the surrounding area. The proposed project will further improve the infrastructure; economic conditions thus further improve the socio-economic development. The communities, which are benefited by the manufacturing units, are thus one of the key stakeholders for the nearby steel plants. It is suggested that M/s VSP Udyog Pvt. Ltd. should have structured interactions with the community to disseminate the measures taken by billet manufacturing units and also to elicit suggestions for overall improvement for the development of the area.

6.2.13 Budget and procurement schedule

On regular basis, Environment Management Cell will inspect the necessity and availability of the materials, technologies, services and maintenance works. The Cell will make appropriate budget for the purpose. Regular record review for any change in financial requirement of environment management will be done and appropriate budgetary provisions will be made. Along with other budgets, Budget for environmental management will be prepared and revised regularly as per requirement. The budget will include provisions for:

- Environmental Monitoring Program
- Laboratory works for Environmental management activities
- Emergency Purchase of necessary material, equipment, tools, services
- Greenbelt development
- Social and Environmental Welfare and Awareness programs/training (CER)
- Annual Environmental Audit.

Table 6.1: Cost of Environmental Monitoring Program

S. No.	Item	Cost in Rs. Per year
1.	Cost of monitoring of environmental parameters for Air, Water and Noise	7,00,000
2.	Occupational Health & Safety	3,00,000
3.	Greenbelt Development	2,00,000
4	Cost on online CEMS, development of lab and cell for implementing the EMP	3,00,000
TOTAL		**15,00,000**

CHAPTER 7
ADDITIONAL STUDIES

7. Chapter 7: Additional studies

7.1. Introduction

In this chapter following issues are described and have been carried out by M/s. VSP Udyog Pvt. Ltd.

- Public consultation / Public Hearing.
- Hazard Identification and Risk Management

7.2. Public Consultation

The Company is located at Bankskopa, PO-Bamunara. Durgapur, Dist. Paschim Bardhaman, West Bengal, JL No.65, Khatian No.3743, 3825, J.L.No.58, Khatian No.2374, 2885, 3085, 2884. As per TOR, Public Hearing will be carried out for the expansion project.

7.3. Hazard identification and risk management

M/s. VSP Udyog Pvt. Ltd., decided to expand its present billet manufacturing capacity from 90,600 TPA to 354600 TPA. The proposed expansion will be made with the installation of 4 x 20 Tonnes Induction furnaces. They will also install Ladle Refining Furnace, CCM and made expansion of Wire Rod/Rolling Mill capacity from 1,20,000 to 2,50,000 TPA. at Bankskopa, PO-Bamunara. Durgapur, Dist. Paschim Bardhaman, West Bengal, JL No.65, Khatian No.3743, 3825, J.L.No.58, Khatian No.2374, 2885, 3085, 2884 & the land area required for the proposed project is 21.7 acres (88098.62 sqm) of land which is already acquired by project proponent & the estimation cost of project will be Rs.190.80 Crores.

'Hazard' has been defined as a source of potential harm to people, property or the environment. Alternatively, hazard is an agent (either chemical, biological, or physical) or it is a set of conditions that presents a source of risk. In any given situation hazards are fixed, they can vary in two ways-their intrinsic nature (e.g. high pressure / low pressure) and their scale (more or less).

In case of disaster the potential to cause serious injury or loss of life or property damage and other disruption increases. Although emergency situation may arise due to number of factors, normally fire and spill of toxic chemicals are the most credible form of disaster. Study of accident information provides an understanding of failure mode and mechanism of processes and control equipment. The major contributing factors for accident are human errors, faults in equipment design O & M deficiency an inherent material hazards. Common cause of accidents is poor housekeeping, improper use of tools, failure to follow prescribed safety rules and inexperienced staff. Coal storage and accident due to equipment failure or structural defects have no societal risk. It is therefore necessary to prepare an onsite

emergency plan to serve as a Guideline at the time of emergency and to manage the consequence of accidents as quickly as possible.

7.3.1 Approach to risk analysis study

The approach followed for Risk Analysis Study is in accordance with procedures prescribed by US-EPA. CPCB document titled "Environmental Risk Analysis due to Handling and Storage of Hazardous Chemicals" has been also referred. The approach comprises following steps:

- Hazard identification: Identification of events that could lead to hazards taking into account design / operating conditions, contaminants, ignition, etc. involving (i) study of process information; (ii) initial examination of plot plan and PI Diagram of the manufacturing process.
- Consequence analysis: Analysis of the consequences from accidental failure with respect to toxicity, injury, flammability, thermal radiation and explosion overpressure.
- Disaster Management Plan: Preparation of DMP with necessary mitigation measures required to contain and minimize the risk to human health and property.

7.3.2 Environmental and public receptors

Durgapur Protected Forest is present within 2.0 km of the plant site. No Public receptors like villages, schools, hospitals, jails, commercial complex, community center, etc. are present within 0.5 Km of the project site.

7.3.3 Hazard identification and consequence analysis

The following hazards were identified for this project.

a) Handling of hot metal and solid waste

b) Mechanical injury to body parts

a) **Handling of hot metal and solid waste:** Sudden breaks out of molten metal and slag have been known to take place during furnace operation. The spillage of hot metal or slag can cause severe burn injuries and fires. Explosions may also occur due to hot metal or slag falling in a pool of water resulting in injuries and fire due to flying hot splinters and splashing of hot metal or slag. Through regular check and proper upkeep of furnace refractory and cooling panels, such incidents can be avoided.

(b) Mechanical injury to body parts: In a steel plant, there are a number of places where workers are likely to be involved with accidents resulting in injury to body parts. The places are main plant, workshop, during construction work, during mechanical repair work in different units, road accidents due to vehicular movement, etc. Safety awareness workshop

for the plant personnel are arranged on regular basis. Workers are encouraged to wear and use suitable safety devices like gloves, helmets, aprons, boots, goggles and safety belts.
The hazards identified for the proposed project activities are presented in Table 7.1.

Table 7.1: Potential Hazard Identification

Group	Item	Nature of Hazard	Hazard Potential	Remarks
Induction Furnace	Hot metal & slag Handling	Heat	Major	Fire hazard
	Molten Metal Explosions	Fire	Major	Flammable, Burn
	Heat Stress	Heat	Moderate	Fire & personal injury
	Mechanical Hazards	Heat	Moderate	personal injury
	Recirculating cooling water coming in contact with the molten iron or slag, Leakage of water from the refractory walls	Heat	Major	Spurting of metal/slag. Explosion under extreme cases.
Rolling Mills	Gas firing	Fire	Major	Fire hazard
Electric Power supply	Short circuit	Fire	Major	Fire hazard
Hydraulic oil and lubricants	Accidental discharge of hydraulic oil under pressure	Fire & Toxic	Moderate	Fire & personal injury

7.3.3.1. Safety Measures for Transportation, Storage & Handling of Raw Material

- Flame proof electric motor is used during loading/unloading.
- NRV (Non-Return Valve) is provided on pump discharge line.
- Muffler on the silencer of the tanker during entering in factory premises.

- Safety permit system is followed for loading and unloading.
- Only authorized person is permitted in storage area.
- Caution note, hazardous identification board is provided.
- On-site detectors for fire based on heat &/or smoke detection with alarm system is provided as required.
- Water sprinkling system is provided to avoid dust.
- Storage area is declared as "NO SMOKE ZONE".
- Material handling is carried out by using all PPE with proper ventilation & under supervision.
- Fire extinguishers and fire hydrant system are provided as per requirement.
- First aids boxes are provided at different places wherever required.

7.3.3.2. Safety Measures for Process Units

- *Molten Metal Explosions:*

The explosions in an induction furnace can be due to steam entrapment or any other chemical material during heating process.

Steam Explosions: Causes of Steam explosions include:

a) During pouring of molten metal into refractories containing moisture.

b) Due to moisture present within the molten metal.

To minimize the risk, following safety measures will be taken.

❖ Use Moisture free raw material.

❖ Removal of possible sources of moisture that could come into contact with molten metal.

❖ Preheating of raw material before feeding into induction furnace.

❖ Preheating of refractories before pouring of molten mass.

❖ Keep the Equipment and tools free from rust, and preheated before use.

- *Mechanical Hazards:*

Machine and Equipment used may create mechanical hazards. Mechanical handling devices like cranes, hoists, forklifts and conveyors etc. used within Induction Furnaces may generate hazard.

To minimize the risk, following safety and control measures will be taken.

- Care should be taken for:

  a) Extreme vibration

  b) Machine lubricant contaminants

  c) Increase stress on fittings and components

  d) Excessive heat

  e) Airborne & machine lubricant contaminants

- To avoid undesirable Problems or accidents in the factory premises, Personal Protective Equipment (PPE) for the workers is necessity.

- Plant should be well maintained and regular inspection is necessary, so that it remains safe to use.

- Following Personal Protective Equipments during factory operations shall be provided:

  a) Insulation Gloves: During raw materials handling, gloves should be used by the workers.

  b) Rubber Gumboots: Workers working close to high temperatures should use to protect the skin from burns.

  c) Goggles: Goggles should be used by the workers who work on feeding the charge in the furnace or furnace related works.

  d) Face Shield Helmet: The person involved for welding work will be provided with face shield helmet.

  e) Medical Facilities: The Factory will provide the medical facilities to handle any emergency.

- Chemical Explosions:

During heating process, chemical explosions take place due to the presence of chemicals/substances in the molten metal which cause pressure buildup in the molten mass.

To minimize the risk, following safety and control measures will be taken.

  - Efficient raw material storage systems.
  - Labeling the Raw materials.

- *Heat Stress:*

Workers who are exposed to extreme heat or work in hot environments may be at risk of heat stress.

Effects of heal stress:

- ✓ Discomfort, heat cramps or heat rash to heat exhaustion or heat stroke can cause permanent injury or death.
- ✓ It affects concentration, perception and decision making.
- ✓ Heat stress can also affect behavior and judgment.

To minimize the risk, following safety and control measures will be taken.

- ➢ Installing spot coolers, blowers, fans or air-conditioning to relieve heat and circulation of air.
- ➢ Shielding radiant heat emissions from process plant.
- ➢ Using ventilation to draw in cooler air.
- ➢ Provide respite areas for workers.

- *Burns:* Burns are major source of injury in molten metal processes and are usually caused by touching hot surfaces, radiation or splashing of molten metal.

Following safety and control measures will be taken to minimize the risk.

- ➢ Manual handling of casting will be avoided.

- To minimize the risks, automating machinery will be used.
- Separating workers not directly involved in casting operation from the casting area.
- Control and Design the processes to prevent unpredicted reactions occurring.
- To prevent exposure to heat, protective barriers should be provided e.g. screens around the pouring station.
- Task-specific PPE should be provided in addition to other control measures.
- Always Safe distance should be maintained.

- *Using high currents*: Exposure to high current may be hazardous to people with heart pacemakers and cause burns.

To minimize the risk, following safety and control measures will be taken.

- Sources of electrical risk in the workplace should be removed.
- Tagging and testing should be done on all plant at least within the last 12 months.
- Effectively rated quick-response circuit breakers should be incorporated, supported by reliable, selective digital/microprocessor-based electro-magnetic protective relays in the electrical system design.
- Safety switches should be installed and test of switches should be done regularly.
- The workers should wear task-specific protective clothing in the industry.
- To identify electrical faults or hazards, thermal imaging or infrared scanning should be used.
- Damaged coils should be replaced before the operation of the furnace.
- Access to high-voltage areas should be restricted.

Some important critical safety measures are provided within the process technology/equipment itself for the safety in production area & continue efforts should be given for developing new technology/equipment.

7.3.3.3. Safety Measures for Preventive Maintenance

The safety measures in process & other plant area are as below:

- Keep appropriate and sufficient fire extinguisher in the vicinity of work area.
- Do not work on equipments without permission from plant head and maintenance head.
- Use proper PPE.
- Any employment will not be allowed without pre-medical check-up or without fitness checking.
- Make sure all process lines are disconnected.
- Work with any equipment must be conducted in presence of supervisor.
- Make checklist covering Do's & Don'ts of preventive maintenance,
- EHS are updated timely and made available to all concern department & personnel.

7.3.4 Disaster management plan

The main areas considered for management capability are as follows:

Compliance with existing Rules and Regulations: The following statutory provisions to be complied by PP:

The MSIHC Rules, 1989/2000 notified under the Environment Protection Act, 1986.

Rules on Emergency planning, Preparedness and Response for Chemical Accidents.

Factories Act, 1987 (Amended)

Public Liability Insurance Act, 1991

Air Act, 1981 and Water Act, 1974

Engineering Aspects: This includes the factory layout and following general features of the facility.

1. Demarcation with proper boundary wall
2. Green belt and buffer zone
3. Segregation of process and utility blocks
4. Access for emergency vehicle movement
5. Adequacy of exit and entry points
6. Ventilation of process area
7. Source of process know how and documentation

8. Use of codes and standards
9. Third party inspection

Process Aspects**:** This include the process safety angle like reaction characterization (is the reaction well characterized in terms of runaway potential, exotherms, heat of reaction, etc.), existence of high temperature pressure alarms, back up indicators, annunciate panel, etc. and existence of process control through PLC, single loop controls, interlocks, etc.

Emergency response: It includes the emergency preparedness of the installation like

1. Working on-site emergency plan
2. Fire protection system in terms of fire water storage, hydrant, sprinkler, foam, fire alarms, smoke detectors and gas detectors
3. Emergency power
4. First aid, emergency vehicle and medical provisions
5. Back-up communication
6. Training and mock drill
7. Personnel Protective Equipment and Self-Contained breathing apparatus

Management System**:** It includes the management commitment within the organization.

Existence of professionals in key factory positions

Safety, health and environment function

ISO 14000 and ISO 9000 certification, safety and environment policy

System for recording near miss and accident investigation

Workers awareness of hazards involved

Operation and Maintenance System: This includes existence of SOP for all critical operations Inerting systems used for reactors, tanks, pipelines, etc.

Earthing system

Preventive maintenance system

System for implementing plant modifications

- The aim of hazard control and disaster management is concerned with preventing accidents through standard design and efficient operation, preventive maintenance, inspection and proper usage of safety measures by which it is possible to reduce the risk of an accident. PP will coordinate with the District Administration and adopt all

measures to minimize the effect of disaster. The objective shall be to localize the emergency and, if possible, eliminate it and minimize the effects of the disaster on workforce and surrounding community. This EMP formulates a procedure for controlling disaster with minimum damage to men, material and machines, evacuating the victims to safer places, rescuing the victims and providing them medical treatment, rehabilitating the affected areas, delegating specific tasks to staff (avoid overlapping of activities within various groups) and preserving relevant records as evidence in any subsequent inquiry.

1. Elimination of hazards will require prompt action by operators and emergency staff and mobilizing fire-fighting equipment, emergency shut-off valves and water sprays. To minimize the effects of a disaster, prompt operation for providing rescue, first aid, evacuation, rehabilitation and right information to people living in nearby areas is necessary.
2. Emergency team leader is called site main controller (SMC) who shall be the plant manager. He shall lead the emergency response team. In his absence the senior most person available at plant shall act as emergency team leader. Besides the top officials described above, rest of the employees shall be divided into three action teams namely A, B, C. Action team A consists of staff of section in which accident has occurred. Action team B consists of staff of non-affected section and maintenance department. Action team C consists of supporting staff i.e. security supervisor, shift supervisor and ancillary people comprising of contractor, labour.
3. Team A will initiate action in case of an emergency. Team B will help team A by remaining in their respective sections and preparing to comply with specific instructions of SMC. Team C consisting of supporting staff will help Team A as and when required and receive direction from Team B to act. Team C will help in evacuating the affected personal to safer place, under the supervision of Team B. A multi-channel communication network will connect Site Emergency Control Room (SECR) to control rooms of various other departments and the nearest fire station, medical centre and district hospital.
4. The onsite emergency will in all probability commence with fire or burns and the victims shall be the members of operational staff on duty. In case a staff member on duty spots the emergency, he (as per site emergency procedure of which he is adequately briefed) shall go to nearest emergency (fire) alarm location. He shall try his best to inform the exact location and nature of emergency to the firefighting station. In accordance with work emergency procedure, the following key activities shall immediately take place to control the emergency.

5. On site crew shall arrive at the site of incident with fire extinguishers and necessary equipment.
6. Emergency security controller shall commence his role from main gate office.
7. Incident controller shall arrive at SECR with members of his advisory and communication team and assume absolute control of the site. He shall receive information continuously from incident controller and give decisions and directions to the following:

- Incident Controller
- Plant Control rooms
- Emergency security officer
- Site or shift medical officer

8. After all the key emergency personnel have taken up their respective positions, the incident controller shall use communication system to convey and receive the messages. At the site of incident the incident controller shall directly handle the emergency with the help of specific support group such as Team C and firefighting personnel. At the main gate, the Emergency Security Controller and Personnel Manager will contact external agencies. At the site medical center / first aid center, the Medical Officer will take control of medical support services. Site Main Controller shall direct and decide all issues and direct the following aspects:

- Whether the incident controller requires reinforcement of manpower and facilities.
- Whether the plant operation shall be shut down or kept in running condition.
- Whether the staff in other locations shall be kept indoors or evacuated and assembled at predefined safe areas.
- Whether the missing staff members shall be searched or rescued.
- Whether off-site emergency plan shall be activated and message to that effect shall be sent to the District Headquarter / Administration.
- Whether and when outside emergency services shall be called.
- Respond to any large size complaints from outside public and to assess an off-site impact arising out of the on-site emergency.

9. On receiving the message of Disaster from site main controller (SMC), fire control room attendant shall sound siren ‘wailing type’ for 5 minutes. Incident controller shall arrange to broadcast disaster message through public address system. On receiving the

message of 'Emergency Over' from incident controller the fire control room attendant shall sound alarm 'All Clear Signal' straight for two minutes. The features of alarm system shall be explained to one and all to avoid panic or misunderstanding during disaster.

10. On receiving the signal following actions shall be taken:

- All the members of advisory committee, personnel manager, security controller, etc. shall reach the SECR.
- The process unit persons will remain ready in their respective units for crash shutdown on the instruction from SECR.
- The persons from other sections will report to their respective officer.
- The concerned section will take immediate action to remove contractor's personnel outside the plant gate.

11. When the incident has eventually been brought under control as declared by the incident controller, the SMC will send two members of his advisory team as incident site for the following purpose:

- To conduct an on-the-spot assessment of total damage and prevalent condition with particular attention to possibility of recurrence of the emergency situation, which may be temporarily under control.
- To inspect other parts of site which might have been affected by impact of incident.
- To inspect the personnel collection centers and roll call centers, to check if all persons on duty have been accounted for.
- To inspect all the control rooms of the plant in order to assess and record the status of respective plants and to supervise any residual action that is deemed necessary.

12. Once the emergency situation comes under control, the advisory team shall return to SECR with their observations, report and submit the findings in writing to SMC. Based on the reports, SMC shall communicate further directives to all emergency management sub-centers and finally declare and communicate termination of emergency and authorize step by step restoration of normal operation of the affected plant. Emergency security controller and personnel manager shall deal with all the members of public and other local bodies from the main gate office. During the entire period of emergency, the site shall remain out of bounds to external visitors except for the following officials:

District fire personnel

District hospital ambulance staff

Civil/ Defense personnel

District administration

Factory Inspectorate Officers and Labour Commissioner

Officers of State Pollution Control Board

Insurance authorities.

13. Effective working of rescue team is essential during the disaster. In order to make the services of rescue team more effective following equipment shall be provided to the team.

- Chemical cartridge type gas mask (self-contained breathing apparatus)
- Self rescue type gas filters (with oxygen cylinder or compressed air)
- Mechanical filters
- Fire proximity suits, asbestos aprons or aluminized asbestos suits
- Safety helmets
- Face shields (Asbestos or PVC)
- Petromax lamp/Torche
- Axes/hand saw

14. In view of vulnerability to fire, effective measures have been considered to minimize fire hazard. Fire protection is envisaged through hydrant and sprinkler system, designed as per the standard recommendations.

15. For detection and protection of the plant against fire hazard, any one or a combination of the following systems will protect susceptible areas:

- Hydrant system
- Medium velocity spray system
- Portable fire extinguishers
- Fire alarm system

16. Fire hydrant points shall be provided at all necessary places. Medium velocity spray system shall be provided for protection of transformers, cable galleries and coal storage areas. Water for hydrant, spray and sprinkler systems shall be supplied from the fire-water pumps located in water pump house. The hydrant system shall be designed as an ordinary hazard class. Adequate number of portable and mobile

chemical fire extinguishers (Carbon dioxide, dry chemical powder, foam types) shall be provided at strategic locations throughout the plant. Fire detection, heat detection, hydrocarbon detection and alarm system shall be provided to detect fire/ heat/ smoke/ hydrocarbons in vulnerable areas of the plant.

7.3.5 Risk mitigation measures

- Appropriate storage facilities shall be provided for special requirements such as for substances that are flammable and incompatible by-product and waste types shall be kept separate.
- After constructing the plant and based on actual inventorization of hazardous chemicals that are stored inside the premises, their exact location and appointment of O&M staff, project management team shall carry out a detailed risk analysis. Based on the results of consequence analysis and end-point distances, On-site and Off-site Disaster Management Plan shall be prepared as per the guidelines of Factories Act. The Plan shall be prepared in consultation with the district administration and got approved by the Hazard Control Cell of the district. Name and contact numbers of plant personal, concerned government officials, police station, fire station, ambulance, district hospital staff shall be mentioned in the plan.
- Nitrogen / steam purging facilities shall be provided on critical equipment / system for driving out hydrocarbons.
- All hazardous storage systems shall be designed with safety features as appropriate and recommended to enhance the safety against design failure.
- Pumps of reliable quality shall be installed. Arrangements shall be made around the pumps so that leaks from glands, valves or joints can be contained locally.
- All lighting and electrical equipment in the unloading area and flammable chemicals storage area shall be suitable to the area classification approved by Competent Authority.
- Safety showers and eyewash fountains shall be provided in section where caustic soda, acid and other corrosive or reactive chemicals are handled.
- Pressure detectors shall be installed for gas transportation pipelines, the indication of which shall be seen in the control room. This would enable the control room to detect any leakage in the pipelines forwarding fuels / products.
- Minor leaks could occur in routine operations, like pump seal failure, flange leak, sample point valve left open or drain valve left open. These shall be checked regularly by a preventive maintenance program and rectified immediately.

- Corrosion protection methods for pipelines shall be done. All locations where the above ground pipelines are close to traffic movement, protection like crash guards shall be provided.

Table 7.2: Hazard Identification and Risk Assessment Matrix

S. No.	Operation process Equipment /areas	Possible Hazardous	Precautionary measures	Measures to be taken if any hazard occurs
1.	Electrical Panel	Electrical Shock possible due to short-circuit.	Earth leakage circuit breaker is installed.	In an event of electric leakage main supply should be immediately shut off.
2.	Welding Gas Oxygen LPG and /Acetylene cylinders	Fire hazards caused by flames and leakage	1. Emergency kit is kept readily available in store and working place. 2. Fire-fighting equipment's powder/Foam type extinguishers on vehicle and mounting on walls are kept readily available. 3. Hydrant system provided at conspicuous place. 4. Fire-fighting trained man is employed. 5. Cylinders are handled carefully without dropping or rolling. 6. Precaution to ensure that cylinders are not allowed to dash with	1. Installation of inert gas Nitrogen, Carbon dioxide. Equipment's to take care of fire hazards in the factory are being installed. 2. Hydrant point will be for gas cylinders stores and point where welding operation is done.

			each other. 7. Sand bed cushion available for the purpose of unloading cylinders. 8. Periodic inspection done to avoid accident of any kind.	
3.	Electrical transformer	Electrical power	Shock proof insulated PCC Platform.	Immediate Cut off the power supply, treat the injured for electrical shock
		Fire 1	Firefighting equipment: (i) Sand buckets. (ii) Fire extinguisher.	Immediately fight fire with available resources, summon outside help if necessary.
4.	Diesel Oil/ Transformer Oil etc. storage.	Fire hazard may be possible if directly comes in contact.	Fire proof system made available and fighting equipment like Foam, extinguishers and hydrant system, etc., are kept	Proper care is to be taken while storing and keeping the oil drums.
5.	Lab Chemicals	In case of	1. Proper care	Instruction Boards to be

	Storage area	bottle breakage, causes burns and damage to respirator systems due to inhalation	should be taken while handling the chemicals. 2. First Aid Box should be available at Site with all necessary and required medicines. 3. Firefighting equipment like Extinguishers, sand buckets should be available always.	displaced for knowledge of other workers to take care of the situation in the event of occurrence.

7.4 Occupational health and safety

Occupational health needs attention both during construction, erection, operation and maintenance phases. However, the problem varies both in magnitude and variety in the above phases. To control any occupational health and safety impact a detailed planning for mitigation measures has been done in the design stage of the project. Apart from the occupational exposure mitigation plans for various activities and work areas of hazards, following administrative control measures will be undertaken to ensure occupational health and safety of the employees:

- All employees will be trained for EHS policies and practices.
- Periodic health check-up for employees.
- All employees will be trained in first aid and emergency handling during fire breakout.
- Preparation and training of the employees in safety and emergency preparedness.
- Work permit system.
- Compliance to PPE use.
- Safety display sign board throughout the plant.

7.5 Safety Plan

Safety of both men and materials during construction and operation phases is of prime concern. The preparedness of an industry for the occurrence of possible disasters is known as emergency plan. Possibility of disaster in the proposed plant is due to leakage of fuels,

chemical hazard, collapse of structures and fire/explosion etc. Keeping in view the safety requirement during construction, operation and maintenance phases, and the plant shall formulate safety policy with the following regulations:

1. To allocate sufficient resources to maintain safe arid healthy conditions in working environment.
2. To ensure that all known safety factors are taken into account in the design, construction, operation and maintenance of plants, machine all equipment.
3. To ensure that adequate safety instructions are given to all employees.
4. To inform employees about materials, equipment or processes used in their work, which are known to be potentially hazardous to health/safety.
5. To keep all operations and methods of work under regular review for making necessary changes from the point of view of safety in the light of experience and up to date knowledge.
6. To provide wherever necessary protective equipment, safety appliances and clothing and to ensure their proper use
7. To provide appropriate facilities for first aid and prompt treatment of injuries and illness at work.
8. To provide appropriate instruction, training and supervision to employees in health and safety, first aid and to ensure that adequate publicity is given to these matters.
9. To ensure proper implementation of fire prevention methods and an appropriate fire-fighting service together with training facilities for personnel involved in this service.
10. To organize collection, analysis and presentation of data on accident, sickness and incident involving personal injury or injury to health with a view of taking corrective, remedial and preventive action.
11. To publish/notify regulations, instructions and notices in the local language of employees.
12. To prepare separate safety rules for each type of occupation/processes involved in the project.

7.6 Safety Organisation

Construction and erection phase

A qualified and experienced safety officer shall be appointed. The responsibilities of the safety officer include identification of the hazardous conditions and train/advice the workers

on preventive actions, conduct safety audit, organize training programs and provide professional expert advice on various issues related to occupational safety and health. He is also responsible to ensure compliance of safety rules/ statutory provisions

Operation and maintenance phase

When the construction is completed the posting of safety officers shall be in accordance with the requirement of Factories Act 1948 and their duties and responsibilities shall be as defined thereof.

7.7 Safety Circle

In order to fully develop the capabilities of the employees in identification of hazardous processes and improving safety and health, safety circles will be constituted in each area of work. The circle will consist of 5-6 employees from that area. The circle normally shall meet for about an hour every week.

7.8 Safety training

A full-fledged training center shall be set up at the plant. Safety training shall be provided by the Safety Officers with the assistance of faculty members called from Corporate Center, Professional Safety Institutions and Universities. In addition to regular employees, limited contractor labors shall also be provided safety training. To create safety awareness safety films shall be shown to workers.

7.9 Health and Safety Monitoring Plan

All the potential occupational hazardous work places such as fuel storage area, coal handling area shall be monitored regularly. The health of employees working in these areas shall be monitored once in six months for early detection of any ailment. A medical care center will be established with the following responsibilities:

- Examination of workers' health in relation to work.
- Surveillance of working environments.
- Identification and evaluation of environmental factors which may affect the workers' health.
- Assessment of conditions of occupational workers' health.
- Observance of safety norms and reduce/eliminate exposure to hazardous environment. Company will take up monitoring activities periodically to assess hazards due to gases, dusts, vibrations, radiations etc.

7.10 Fire Fighting Group

A small spark of fire may result in loss of machines, conveyors etc. This type of loss can be avoided by preventing and controlling the fire instantly for which fire-fighting group shall be established.

To deal with fires - other than carbonaceous fires (Class A), which can be extinguished with water, suitable fire extinguishers are required. Adequate numbers of fire stations within the plant are to be established with the following types of equipment and arrangements:

- CO_2 Extinguishers;
- Dry Powder Chemical Extinguishers;
- Foam Extinguishers;
- Fire Buckets; and
- 50-mm spray hoses up to 150-m length.

Appropriate types of fire extinguishers shall also be provided at chemical Storage area, crusher house, Admin rooms, in machines like stacker & declaimer, electrical yard, sub-station and other infrastructure facilities within the premises. In the transformer yard; automatic fire detecting and quenching system shall be provided for each transformer. This system comes into operation whenever the temperature of surrounding air exceeds 80°C and sprays water over the transformer to prevent spreading of fire and quenches the same. In order to avoid fire in cable galleries, all the power and control cables of FRLS type (Fire Resistant Low Smoke) shall be used. In addition, fire detecting and Fire Alarm Systems shall be installed in the cable galleries.

7.11 Emergency Facilities

EMERGENCY CONTROL CENTER (ECC)

For the time being Office Block is identified as Emergency Control Center. It will have external Telephone and Fax facility. The Site Controller/ Incident Controller Officers, Senior Personnel will be located here. Also, it will be an elevated place. The following information and equipment are to be provided at the Emergency Control Center (ECC).

1. Intercom, telephone.
2. P and T telephone.
3. Safe contained breathing apparatus.
4. Fire suit/gas tight goggles/gloves/helmets.
5. Hand tools, wind direction/velocities indications.
6. Public address megaphone, hand bell, telephone directories.

7. (Internal, P and T) factory layout and site plan.
8. Emergency lamp/torch light/batteries.
9. Plan indicating locations of hazard inventories, plant control room, sources of safety equipment, work road plan, assembly points, and rescue location vulnerable zones.
10. Escape routes.
11. Hazard chart.
12. Nominal roll of employees.
13. List of key personnel, list of essential employees, list of Emergency Co coordinators.
14. Duties of key personnel.
15. Address with telephone numbers and key personnel, emergency coordinator. Essential employees.
16. Important address and telephone numbers including Government agencies. Neighboring industries and sources of help, outside experts, chemical fact sheets population details around the factory.

FIRE FIGHTING FACILITIES

First Aid Fire-fighting equipment suitable for emergency shall be kept in each section in the plant. This will be as per statutory requirements as well as TAC Regulations. However, fire hydrant line covering major areas will be laid. It will be maintained as 6 kg/cm^2 pressure. Fire alarms will be located in the bulk storage areas. On the top of the Administration block, top of each production blocks, wind socks will be installed to indicate direction of wind for emergency escape.

EMERGENCY MEDICAL FACILITIES

Stretchers, gas masks and general first aid materials for dealing with chemical burns, fire burns etc. will be maintained in the medical center as well as in the emergency control room. Private medical practitioners help will be sought. Government hospital will be approached for emergency help. Breathing apparatus and other emergency medical equipment will be provided arid maintained. In this regard, help of nearby industrial managements will take on mutual support basis. An ambulance with driver availability in ails is arranged, emergency shift vehicle will be ensured and maintained to transport injured or affected persons. Number of persons will be trained in first aid so that, in every shift first aid personnel will be available.

7.12 Responsibilities of Key personnel

DEPARTMENT HEADS

The departmental heads will provide assistance as required by the workers. They will decide which members of their departments are required at the incident site.

CHIEF PERSONNEL MANAGER

- He will Report to Work Incident Controller.
- Receive reports from nominated persons from assembly points, and pass on the absence to information services.
- Keep liaison with other coordinators to meet the requirements of services such as materials, security management, transportation, medical, canteen facilities etc. as required during emergency.
- Be in constant touch with the Chief Incident Controller (CIC) and feed him correct information of the situation.
- Ensure that casualties receive adequate attention at medical center and arrange required additional help and inform relatives of the injured.
- Arrange to inform public on Radio and TV about evacuation etc.
- Arrange TV coverage on handling emergency.

IN CHARGE

On knowing about an emergency, he will report to CIC and assist him in all activities. He will also be in liaison with all teams.

MEDICAL OFFICER

Medical Officer will render medical treatment to the injured and if necessary, will shift the injured to nearby Hospitals. He will mobilize extra medical help from outside if necessary.

HEAD OF SAFETY

On hearing the emergency alarm, he will proceed to the site. He will

- Make sure that all safety equipment's are made available to the emergency teams.
- Participate in rescue operations.
- Co-ordinate to transfer the injured persons to medical center and arrange for first aid.
- Keep in contact with ECO and the WIC and advise them on the condition of injured persons.

SECURITY OFFICER

On hearing the Emergency alarm, he will proceed to main entrance/main gate.

- Arrange to control the traffic at the gate and the incident area
- Direct the security staff to the incident site to take part in emergency operations under his guidance and supervision
- Evacuate the persons in the plant or in the nearby areas as advised by WIC after arranging the transport through the Transport in-charge.
- Allow only those people inside who are associated with handling emergency.
- Maintain law and order in the area; if necessary, seek the help of police

TRANSPORT ENGINEER IN-CHARGE

On hearing the emergency alarm, he will immediately report to Work incident Controller (WIC). He will:

- Ensure availability of vehicles for evacuation or other duties, when asked for.
- Make all arrangements regarding transportation.

7.13 Assembly point

Assembly points depending upon the need and suitability will be identified wherein; employees who are not directly connected with the disaster management will be assembled for safety and rescue. Emergency breathing apparatus, minimum facilities like water etc. will be provided. Depending upon the location of hazard, the assembly points are to be used.

7.14 Emergency Power Supply

Plant facilities will be connected to emergency power supply and will be placed in auto mode. Thus, water pumps, plant lighting and emergency control center, administrative building and other auxiliary services will be connected to emergency power supply. In all the blocks flame proof type emergency lamps will be provided.

7.15 Off-site emergency management

The off-site emergency management plan is an integral part of any hazard control system. It is based on those accidents identified by the works management, which could affect people and the environment outside the works. Organizations involved their responsibilities and liaison arrangements between them.

7.16 City Fire Services

It is to combat fire and carry out other emergency operations as per the need. In case of fire, the fire brigade is the best help from outside. Even in a disaster not involving fire, the fire brigade could be of good help, inside the plant and outside, in view of their specialized equipment's and expertise in rescue and relief.

RESPONSIBILITIES:

- To reach the accident spot as soon as possible with all necessary equipment's to extinguish the fire.
- To provide all other necessary help depending on nature of emergency

7.17 Police

Police is required to manage and control the mob, violence, sabotage or outbreak, if any, cordoning of the area and help in fire-fighting and other emergency operations. In case of emergency the police department has a number of functions to perform.

RESPONSIBILITIES:

- Maintain law and order situation around the premises.
- To control the traffic to facilitate the victims to reach hospitals as early as possible.
- To restrict entry of any unauthorized persons
- To set up communication to assist in disaster management operation
- To take control of surrounding transport facilities and assist in disaster management operation by shifting injured persons and causalities to nearby hospitals
- Shifting injured persons and causalities to nearby hospitals
- To assist in fire-fighting and other emergency operations

7.18 Hospital

Hospitals are required to provide first aid, treatment, and also to arrange for removal of victims/casualties. Prompt and efficient medical aid is important in an emergency situation. The first centre inside the industrial premises, cannot cope up with all the treatment requirements. The right approach to this problem is to have arrangements with nearby hospitals so that in case of an emergency, services and facilities available with the nearby hospitals can be utilized.

RESPONSIBILITIES:

- To provide immediate medical relief to casualties
- Augmentation of equipment's, drugs and doctors
- To provide first aid on the spot to casualties
- Depute doctors and nurses to site with ambulance
- To take all out efforts on war-footing to save maximum lives
- To continue treatment to casualties till all of them are attended and properly shifted to medical centres.

7.19 District Administration

Civil administration is meant to provide overall supervision of all off-site emergency operations including order to evacuate off-site population. Local administration means those who are responsible for administration of the geographical area where the industrial facility is located.

RESPONSIBILITIES:

- To protect the citizens
- To assess the situation for overall control
- To monitor the functioning and need of various agencies in rescue operation at site
- To requisite and make available the services and facilities available in the area like additional fire tenders, hospitals, doctors, transport, police, fire brigade, requisition of army and so on
- To coordinate the activities outside the industrial facility in view of their authority and experience in coordinating rescue and relief operations.

7.20 Regional Transport Office

RTO services may be needed to clear all approach roads to and from accident area for free flow of vehicular traffic, which is engaged in combating the emergency, and demarcate parking area for vehicles to evacuate population.

7.20.1 Controller of explosives and factory inspectorate

These authorities are meant to provide expert advice and help in coordinating emergency operations with government agencies. The inspector of factories is expected to be friend and a guide to industrial establishments. His involvement is a matter of course since he would be officially connected with inquiries after the disaster.

RESPONSIBILITIES:

- To coordinate with local government body e.g., civil administration, civil hospital, police department, etc., as well as surrounding voluntary organizations
- To act as off-site emergency controlling authority
- To inform public for precautionary measures

7.21 Other industrial installation in the vicinity

Industrial installations present near the site should help to combat the emergency with the available equipment/infrastructure present in their locations.

RESPONSIBILITIES:

- To provide the strongest possible support and resources to the plant managers so that the best accident prevention and emergency preparedness procedures are in place in the industrial facility.
- To encourage their facility managers to commit themselves fully to the awareness and preparedness for emergencies at local level process

7.22 Personal protective equipment (PPE)

Personal Protective equipment kept onsite is made readily available to plant personnel. Table7.2 shows the lists of recommended Personal Protective equipment (PPE) onsite.

***Table 7.3:** Summary of Recommended Personal Protective Equipment According To Hazard*

	Workplace Hazards	Suggested PPE
Eye and face protection	Flying particles, molten metal, gases or vapors, light radiation	Safety glasses with side-shields, protective shades, etc.
Head protection	Falling objects, inadequate height clearance, and overhead power cords	Plastic helmets for top and side impact protection
Hearing protection	Noise	Hearing protectors (ear plugs or ear muffs)
Foot protection	Failing or rolling objects, points objects. Corrosive or hot liquids	Safety shoes and boots for protection against moving and failing objects, liquids and chemicals
Hand protection	Hazardous materials, cuts or lacerations, vibrations, extreme temperatures	Gloves made of rubber or synthetic material (Neoprene), leather, steel, insulation materials, etc.
Respiratory protection	Dust, fogs, fumes, mists, gases, smokes, vapors	➢ Facemasks with appropriate filters for dust removal and air purification (chemical, mists, vapors and gases). ➢ Single or multi-gas personal monitors, if available
	Oxygen deficiency	Portable or supplied air (fixed lines).

	Workplace Hazards	Suggested PPE
		Onsite rescue equipment
Body/leg protection	Extreme temperatures, hazardous materials, biological agents, cutting and laceration	Insulating clothing, body suits, aprons etc. of appropriate materials

7.23 Rehabilitation and resettlement (R&R) plan

The project land is already acquired which falls in the industrial area and there are no human habitation on the land. Thus, the project does not require any R&R plan.

CHAPTER 8

PROJECT BENEFITS

8. Chapter 8: Project Benefits

8.1 Introduction

The current expansion project will result in development of infrastructure as well upliftment of social structure in the area. The people residing in the nearby areas will be benefited directly and indirectly as well. There should be continued and intensive efforts of the project proponent to make the proposed project more beneficial for the residents in the PIA. Project Proponent's social responsibility towards the local community involves a defined agenda, timeline and participatory planning processes with the community. This incorporates identification and analysis of needs/issues, prioritising those and facilitates a needs-based participatory planning under Corporate Environment Responsibility (CER) aiming at improving the local area and quality of life of local people.

It is predicted that the proposed expansion will provide benefits for the locals public in two phases i.e., during construction phase as well as during operational phase of the plant.

It is anticipated that as a consequence of this expansion project there will be employment opportunity including skilled, semi-skilled, and unskilled wages. It has been assured alongside that the industry will bring improvement of physical infrastructure at local area like, building/strengthening of existing roads, providing drinking water, drainage system, power supply, transportation facility etc. With improved educational facilities and professional practices and by extending healthcare facilities it can be expected that the project will lead towards further development in literacy, economic status and standards of living. Thus, the basic requirement of the community needs will be strengthened by the proposed expansion project either by providing or by improving the existing facilities in the area, which will help in uplifting the quality of life of the local communities. Additionally, support in the areas of sports, recreation and environmental sanitation can also be undertaken to facilitate socioeconomic opportunities.

Details are given below:

8.2 Employment Potential

The project will create extra opportunities of direct and indirect employment for which skilled and unskilled manpower will be needed. Secondary jobs are also bound to be generated to provide day-to-day needs and services to the work force and industrial activity. This will also increase the demand for essential daily utilities in the local market.

8.2.1 Indirect Employment

Due to the proposed modernization project indirect employments will be generated. Indirect employments like; Primary requirements, Grocery Shops, Residential Requirements,

Garments Requirements, Transportation Facilities, Health Care Facilities, etc. Major maintenance and annual overall will be contracted out to manufactures or reputed agencies. Odd jobs, plant cleaning, hiring of vehicles, road and maintenance, plant security, gardening/green belt development etc. will be locally contracted out. These kinds of requirements will increase the prevailing scenario, which will generate the indirect employment.

8.2.2 Direct Employment

Direct Employment

About 50 people on daily wages basis will get employment during the construction stage. There are 463 persons permanently employed in the existing unit for the various job categories and in the proposed expansion project about 310 persons are expected to be employed during operational phase, for the skilled, semi-skilled and unskilled category. The preference will be given to local population for employment in the semi-skilled and unskilled category; this will increase the employment opportunity in the surrounding area. Local villagers of the project will get its benefits more by giving preference to them in relation to direct employment associated with the various project activities. Construction and operation phase of the proposed project will involve a certain number of laborers, contractors and construction workers. There is a possibility that local people will be engaged more for this purpose to the extent possible and hence it will improve the existing employment scenario of the region. Priority will be given to scheduled tribe families and women. This will enhance the present socio economic status of the local people. The employed people will be benefited financially. This financial gain will fulfill their monetary requirements, which in turn will increase their standard of living. The unit is aware of the obligations towards the society and to fulfill the social obligations. Unit will also try to generate maximum indirect employment in the nearby villages by appointing local contractors during construction phase as well as during operation phase.

8.3 Improvement Infrastructure

M/s. VSP Udyog Pvt. Ltd. intended to provide the following infrastructure in the study area of 10 km radius:

a) Road Transport: There will be improved road communication due to the proposed project and maintenance will also be done time to time.

b) Market for the product: Need for the proposed products are based on the demand and supply gap in the current market. With increasing utilization of the current products, in future, to cater the requirement of all the products, it is essential to have the proposed manufacturing unit.

c) Market for Consumer Goods: With the implementation of the project and development of the locality, existing demand pattern is likely to continue which indicates more importance on consumer goods and quality products. This will affect the local consumer goods market will grow, thus creating more income opportunities to the local people. The proposed project is going to have positive income effect and consequently, the multiplier effect is expected to lead to an overall increase in average consumption of the people of the study area.

d) Infrastructure: Creation of community assets (infrastructure) like Installation/Repair of Hand Pumps/Bore wells Gram Panchayat dug well de-siltation and deepening, as a part of corporate social responsibility.

e) Increasing other business opportunities for local people: There will be scope of hiring vehicle like tractors & trolleys, bulldozers, excavators during construction and operation phase of the project.

Physical infrastructure includes the necessary infrastructural facilities available in the locality for project operation. Proposed project is an expansion project which should include modernized commercial units and infrastructural facilities like transportation, power connections, communication facilities, water supply and drainage facilities, internal driveway cum parking facility, landscape, rain water harvesting, solid waste management and usage of solar energy etc. which will enhance the existing infrastructure and stimulate development in the locality.

8.4 Education

The local peoples' interest towards education will increase due to the expectation of getting jobs, especially from non-agricultural sources. The project is expected to increase such aspirations by bringing opportunities of some direct and indirect employment for the local people. The general awareness towards the importance of education is expected to increase as a result of the proposed project. The project will have positive impact on the level of education of the people.

8.5 Corporate Environment Responsibility (CER)

Corporate Environment Responsibility (CER) concerns the environmental aspects of Corporate Social Responsibility (CSR). It is commonly defined as the way in which organizations can incorporate environmental issues into their operations in order to eliminate waste and emissions, maximize the efficiency and productivity of its resources and minimize practices that badly affect the country's natural resources. Corporate Environmental Responsibility is about managing the use natural resources in the most effective and efficient manner in order to reduce environmental impacts and financial costs.

Areas of Focus:

- Energy Efficiency and Savings
- Waste Management
- Travel and Transportation
- Sustainable Procurement
- Sustainable Events
- Environmental Management Systems

Corporate Social Responsibility (CSR) and Corporate Environmental Responsibility (CER) are not two divergent concepts. In common parlance, corporate environmental responsibility is understood as a part and parcel of the broader concept of corporate social responsibility. A perusal of the some of the definitions of CSR will make the same evident. CER is understood as a part and parcel of the broader concept of CSR. Nevertheless, CER can be defined as the duty of the corporation to mitigate its impacts on the natural environment.

The aim and objectives of CER is

- Concentrate effort within the local rural society where business significantly interacts.
- To hold the company responsible for social activities and take care about customer, employees, suppliers, the local community, society and environment.
- Take activities those are important to and even expected by the Public and also contribute to business performance.
- Building a deeper understanding of benefits.
- Contribute to economic development while improving the quality of life of the workforce and their families as well as that of the local community and society.

Benefits of Corporate Environmental Responsibility

- Brand image: Standing out as a green corporate can improve organisation's reputation.
- Customer loyalty: People prefer brands who have environmental concerns and they are more inclined to buy from them in the future.
- Differentiation: Face to increasingly demanding customers and aware of environmental issues, gaining a green reputation can help one differentiate.

Some of the activities which can be carried out in CER, are infrastructure creation for drinking water supply, sanitation, health, education, skill development, roads, cross drains,

electrification including solar power, solid waste management facilities, scientific support and awareness to local farmers to increase yield of crop and fodder, rain water harvesting, soil moisture conservation works, avenue plantation in community areas etc.

The Industry intends to undertake CER activities in and around their Plant. A total amount of Rs. 1,43,10,000/- (Rs. One crore forty three lakh ten housand only) would be utilized for CER program over a period of 5 years. The said amount is 0.75% of the total project cost.

5 YEARS CER PLANNING							
	Project Cost	**Rs. 190,80,00,000.00**					
	Budget for CER (1%)	**Rs. 1,43,10,000.00**					
SL. No.	**CER DETAILS**	**5 YEAR CER PLANNING (RS.)**					**TOTAL (Rs.)**
		1ST YEAR	**2ND YEAR**	**3RD YEAR**	**4TH YEAR**	**5TH YEAR**	
1	Improvement and beautification of road and other infrastructure in vicinity	3,00,000	3,00,000	3,00,000	3,00,000	3,00,000	15,00,000.00
2	Help to Forest Department and local authority for tree plantation in the area	3,00,000	3,00,000	3,00,000	3,00,000	3,00,000	15,00,000.00
3	Donation to locality Schools for construction of Toilets, School Building and drinking water facility, gardening	3,00,000	3,00,000	3,00,000	3,00,000	3,00,000	15,00,000.00
4	Installation of solar street lights in local area	3,00,000	3,00,000	3,00,000	3,00,000	3,00,000	15,00,000.00
5	Health camp (Blood donation, eye checkup, child health etc.)for the local people	5,00,000	5,00,000	5,00,000	5,00,000	5,00,000	25,00,000.00
6	Slum community development	6,00,000	6,00,000	6,00,000	7,55,000	7,55,000	33,10,000.00

7	Contribution to WBPCB for Environmental and Social developmental programs	5,00,000	5,00,000	5,00,000	5,00,000	5,00,000	25,00,000.00
	TOTAL COMMITMENT (0.75% OF TOTAL BUDGET)						**1,43,10,000.00**

Details of various CER activities identified and planned are described below:

A. Infrastructure Development

- Undertake a feasibility study to install solar powered street light within the plant premises and surrounding area.
- Financial support and assistance for the development and maintenance of infrastructure facilities in the surrounding region.
- Promotion and development of water shed & rain water harvesting structure, solar street light and solar system.
- Gardening and beautification of the local area.

B. Water and Sanitation

- Provision of safe drinking water in village schools.
- Build water storage structures with the coordination of government.
- Cleaning of water storage tank in villages and school.
- Provision of sanitation facility in the villages by building common toilets.
- Provision of dustbin at various places like school, panchayat offices, public place in villages etc.
- Participate in Cleanliness Camp/drive of state government.

C. Health

- Promote awareness programs against social evils such as addictions, AIDS etc. and to spread the awareness of legal rights & responsibilities.
- Health awareness campaigns on serious/chronic diseases.
- Organize free medical check-up camp for the villagers.
- Offering specialized support services to the physically handicapped and mentally challenged people.
- Providing nutritional supplements to lactating mothers, children, adolescent girls and pregnant women.
- Provide scheduled vaccination program for children.

- Providing support for the development and maintenance of the health facilities.

D. Other Social Welfare Activities

- Development of Slum community.
- Plantation along the road side and development of garden/greenbelt.

8.6 Green Belt Development

The project officials need to maintain environment-friendly buildings with state-of the-art technology and hence it should have a well planned landscape to enhance the beauty and aesthetics of the project area.

Greenbelt will be developed over 33.0 % area of the total plant area. 29913.23 sqm will be developed as greenbelt. This greenbelt will serve as a buffer between the peripheries and the industry, thereby controlling the air emissions and noise levels. Tree density of 1500-2500 trees per hectare with local board leaf specification will be planted.

8.7 Other Tangible benefits

This plants by nature serve as the nuclei for development of small-scale industries in the areas around them. These small-scale units usually have input-output linkages with the plants. The demand for spares, assemblies and sub-assemblies by washery plants are generally met through the supply (of these items) from small-scale units located nearby.

The present project is likely to accelerate such industrialization through “Bubble Effects” in the study area. It is important to note that the small-scale units are usually labour-intensive and high-priority industries from social point of view. This is expected to play a major role in the future economic and social development of this area.

The proposed project is expected to serve as Centre of significant small-scale industrial economy around it complemented by the services sector. This is expected to play a major role in the future economic and social development of this area. Project will encourage industrial growth of this sector specifically in formulation units in the region;

- Project will encourage industrial growth of this sector specifically in formulation units in the region;
- The company will cater needs of the domestic market also.

8.8 Conclusions

On the basis of the overall results of the present impact assessment the following conclusions are drawn:

- The project is not going to cause any damage to the existing agricultural situation. Instead, it is likely to provide the farmers with on-farm income.
- The project has very strong positive employment and income effects, both direct as well as indirect.
- There is a possibility increase in industrialisation in the vicinity of project. This is likely to bring more skill diversification among local people.
- The project has positive impact on educational status of people of the study area.
- Community development activities are going to be increased due to the project.
- 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.
- 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.
- Overall people's perception on the project is good.

CHAPTER 9
ENVIRONMENTAL COST BENEFIT ANALYSIS

Chapter 9 Environmental Cost Benefit Analysis

Environmental Cost Benefit Analysis not recommended at scoping stage – thus no detailed analysis carried out separately in this EIA/EMP report.

CHAPTE 10
ENVIRONMENT MANAGEMENT PLAN

Chapter 10 Environment management Plan

10.1 Introduction

Any industrial development is associated with certain positive impacts as well as some negative impacts on the environment. The negative or adverse impacts cannot possibly rule out of scientific development. The environment management plan is prepared with a view to facilitate effective environmental management of the project, in general and implementation of the mitigation measures in particular. This plan helps in formulation, implementation and monitoring of the environmental parameters during and after commissioning of the project. The Environmental Management Plan describes in brief, the management plan for proper and adequate implementation of treatment and control system for air and liquid pollutants and for maintaining the environment. It also includes the development of green belt in and around the plant proper safety of the workers, noise control, fire protection systems and measures.

10.2 Purpose of Environment management Plan

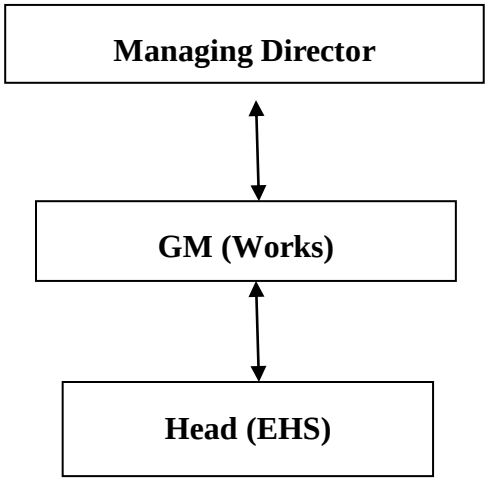
The EMP provides a delivery mechanism to address potential adverse impacts and to introduce standards of good practice to be adopted for all project works. For each stage of the program, the EMP lists all the requirements to ensure effective mitigation of every potential biophysical and socio-economic impact identified in the EIA. For each operation, which could otherwise give rise to impact. The Environmental Management Plan provided information for each impact or operation, which could otherwise give rise to impact. The EMP aims at following:

- Abatement treatment and disposal off all the pollutants viz. liquid, gaseous and solid waste so as to meet statutory requirements (Relevant Pollution Control Acts) with appropriate technology.
- To support and implement work to achieve environmental standards and to improve the methods of environmental management.
- To promote green-belt development.
- To encourage good working conditions for employees.
- To reduce fire and accident hazards.
- Budgeting and allocation of funds for environment management system.
- To adopt cleaner production technology and waste minimization program.

10.3 Environment Management Policy

The Company is very much oblivious of its responsibility in protecting the Environment. Thus various mitigation measures as given in the report shall be taken-up and effort will be made to minimize the effect, on the Environment, if any. Any action or effort remains incomplete, if it is not monitored properly at regular intervals and corrective measures taken, wherever necessary. Regular monitoring has thus, been provided. The Company has a well-defined policy to keep the Environment clean and green. The company has decided that all effective steps shall be taken to ensure that flow of information from working level to top level should flow in a smooth and coordinated manner, so that in case any deficiency is noted, it is brought to the notice of top management and preventive and corrective action is initiated in a systematic manner. The flow is given in **Figure 10.1.**

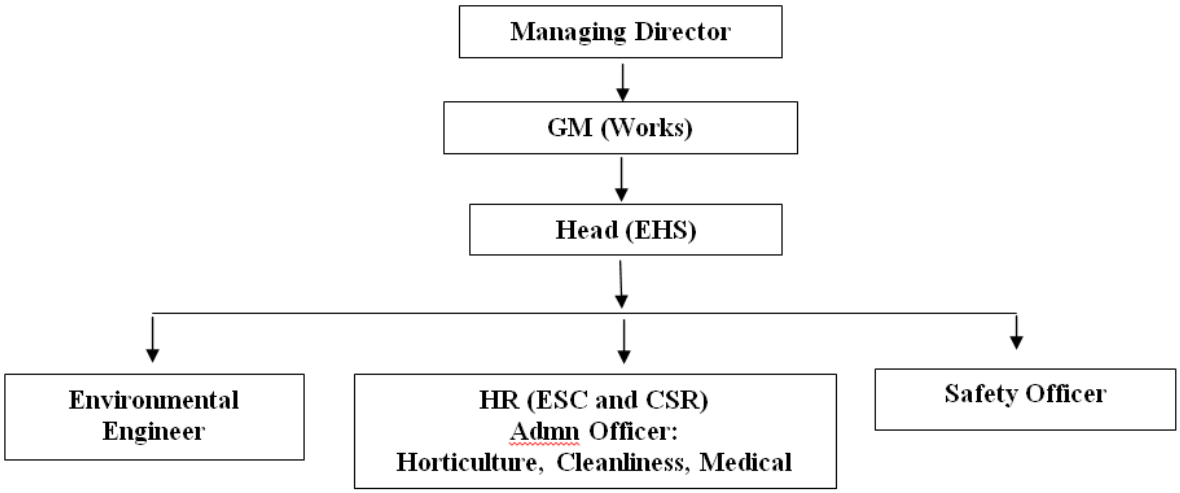
Figure 10.1: *Organization Chart on Environment Information*



10.4 Environment Management Cell

Company is responsible for implementation of all the mitigation and management measures suggested in Environmental Monitoring Program. A separate department "Environmental Management Cell" (EMC) shall be established to look after all environmental related matters of the plant. The EMC will supervise the reported activity from time to time for smooth implementation of Environmental Mitigation and Management measures and will take necessary actions if required. The cell will act to ensure the suitability, adequacy and effectiveness of the Environment Management Program. It will also ensure to meet all the Statutory Requirements

Figure 10.2: *Organization Chart of Environmental Monitoring Cell*



EMC will responsible for monitoring of the plant environment related requirements which include**:**

10.4.1 Interaction with the state pollution control board

EMC shall be in regular touch with WBPCB and shall send them environmental monitoring reports regularly in the prescribed format, as per the prevailing practice. Any new regulations considered by State/Central Pollution Control Board for the Industry shall be taken care of by EMC.

10.4.2 Proved Training

EMC would be responsible for the implementation of the EMP, needs to be trained on the effective implementation of the environmental issues. To ensure the success of the implementation set up proposed, there is a high requirement of training and skill up-gradation. For the proposed project, additional training facilities will be developed for environmental control. For proper implementation of the EMP, the officials responsible for EMP implementation will be trained accordingly.

To achieve the overall objective of pollution control it is essential not only to provide latest pollution control and monitoring systems but also to provide trained man power resources to operate and maintain the same. So far, the practice with many plants is to utilize the plant operations and maintenance crew for operation of systems. This has shown adverse results due to lack of specialized knowledge in addition to priority selection. Therefore apart from the ECD, specific training will be provided to personnel handling the operation and maintenance of different pollution control equipment.

In-plant training facilities will be developed for environmental control. Specialized courses at various Research / Educational institutes will be organized. The training will be given to employees to cover the following fields:

- Awareness of pollution control and environmental protection to all.
- Operation and maintenance of specialized pollution control equipment.
- Organize field monitoring, maintenance and calibration of pollution monitoring instruments.
- Laboratory testing of pollutants.
- Repair of pollution monitoring instruments.
- Occupational health/safety.
- Disaster management.
- Environmental management.
- Afforestation / plantation and post care of plants.
- Knowledge of norms, regulations and procedures.
- Risk assessment and Disaster Management.

10.4.3 Other Responsibilities of the cell will include:

WBPCB registered agency will be retained to generate the environment quality data in respect of air, water, noise, soil and meteorology and prepare the Environmental Report.

- Timely renewal of Consents & Authorization will be taken care of.
- Submitting environmental monitoring report to WBPCB. The cell will also take mitigative or corrective measures as required or suggested by the Board.
- Conduct and submit annual Environmental Statement to WBPCB.
- Prepare and submit six monthly report on the compliance with the conditions of the environmental clearance
- Keeping the management updated on regular basis about the findings / results of monitoring activities and proposes measures to improve environmental performance.

- Conducting regular safety drills and training programs to educate employees on safety practices. A qualified and experienced safety officer will be responsible for the issues related to occupational safety and health.
- Conducting safety and health audits to ensure that recommended safety and health measures are followed.

10.5 Other Responsibilities of the cell will include:

10.5.1 Land Environment

The installation will be within the existing unit, hence no levelling is required. Earth excavated during civil foundations will be reused for backfilling. Dust generated due to earthwork including excavation and transportation activities, especially during dry weather conditions, will be controlled by water sprinkling.

10.5.2 Air Environment

Dust will be generated at work site during the installation and vehicular movement. Providing suitable surface treatment to ease the traffic flow and regular sprinkling of water will reduce the dust generation. All internal and external roads will be asphalted and cleaned daily, so there will be less generation of re-suspended road dust.

10.5.3 Water Environment

Temporary drainage work will be maintained, removed and reinstated as required, and all other precautions will be taken for avoidance of damage by flooding and silt. Sedimentation pit of sufficient capacity will be constructed to trap silt-laden water during monsoon. The wastewater will be reused for dust suppression by adopting suitable mechanism. These will be cleaned on regular basis.

10.5.4 Noise Environment

The noise generated during the constructed phase will be due to the movement of vehicles and construction equipment. Construction equipment's and transport vehicles would be properly maintained so that noise generation is minimized. Regular maintenance schedule will be adopted for all construction equipment and vehicles.

10.5.5 Solid Waste Management

Careful design, planning and good site management would minimize waste of materials such as concrete, mortars and cement grouts. Construction waste will be segregated as much as possible at site itself to increase the feasibility of recycling concrete and masonry as filling material and steel pieces as saleable scrap.

Muck shall be generated from drains and sedimentation pits. The muck shall be collected daily and stored at earmarked place. It shall be finally disposed within the plant premises for plinth raising purpose. Litter disposal and collection points shall be established around the all construction work sites. Construction waste shall be segregated as much as possible at site itself to increase the feasibility of recycling concrete and masonry as filling material and steel pieces as saleable scrap.

10.5.6 Sanitation, welfare and safety measures of construction workers

Construction workers will be made aware of possible hazards and safety measures that need to be taken during construction activities through routine training. Personal Protective Equipment (PPEs) such as dust masks, goggles, earplugs/ earmuffs, safety gloves, safety belts, shoe with toe protection, gumboots will be made available at construction site. Construction workers and vehicle drivers will be provided with drinking water, canteen and toilet / washroom facility. Rest room facility for truck drivers will be provided.

10.6 EMP considered during operation phase

10.6.1 Air Pollution Management Plan

Point Source Emission:

For the proposed Induction Furnace system the following APC has been proposed.

Source	**APC System**	**Concentration of dust**	
		Inlet	Outlet
Induction furnace	Bag filter	1 - 2 gm/Nm^3	<50 mg/Nm^3
D.G	Proper stack with exhaust	-	<75 mg/Nm^3

Particulate Emission

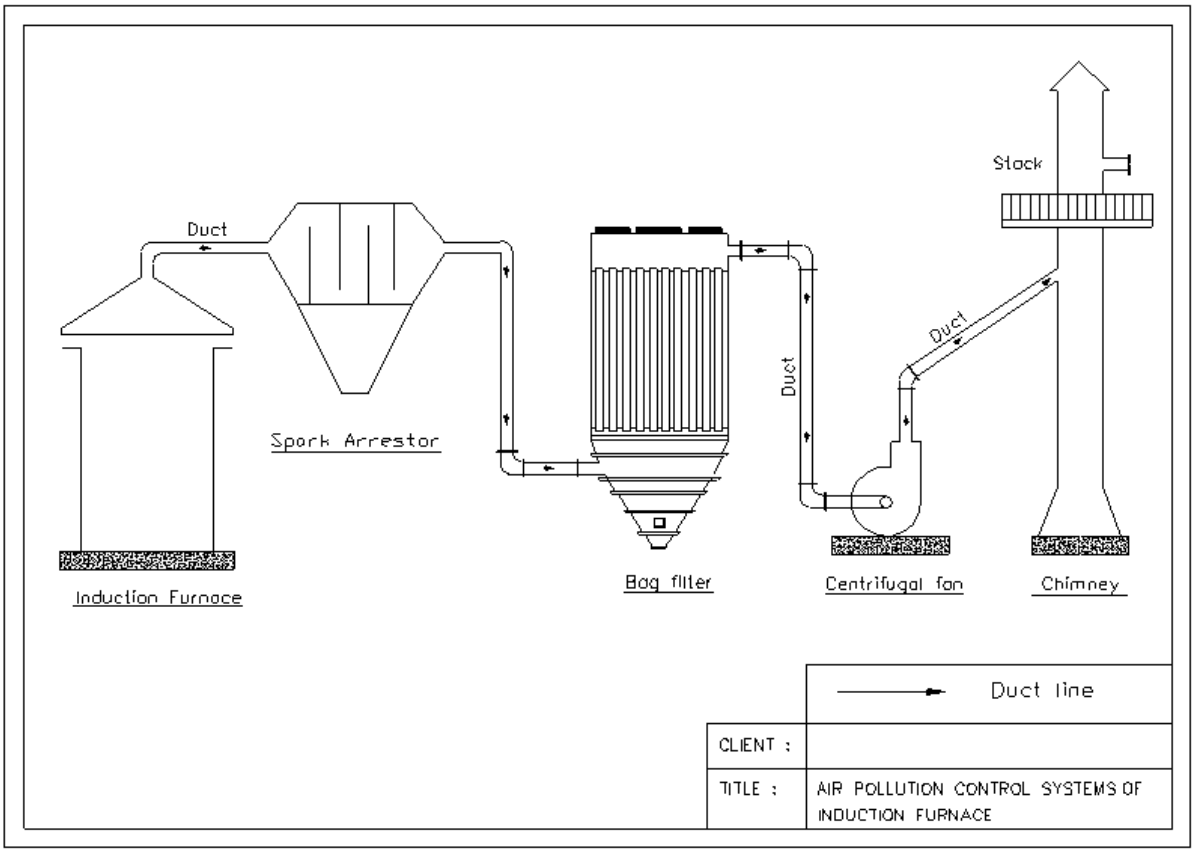
The sources of air pollution from the plant activities are as follows:

- Charging of Raw materials
- Fumes from Induction Furnace during Melting Operation

Control of emission from Induction Furnace:

Generated Fume from the Induction furnace is collected by swiveling type hood at the top of crucible, and passed through spark arrestor and bag filter before disposing through chimney. Installed APC system comprises of Bag Filter, spark arrestor, ID Fan along with 30m high common chimney for disposal of clean gas.

Figure 10.3: Air Pollution Control System



Dust concentration level of the chimney will be periodically monitored. Corrective steps will be taken, if the concentration is not as per the acceptable limits. The concentration of particulate from the bag filters will remain within 50 mg/Nm^3.

10.6.2 Fugitive dust emission control measures:

Fugitive emission shall be from valve and flanges, periodic maintenance of the pipeline and tanks. Record of same shall be maintained. Transportation will also cause fugitive emission. To minimize the increase of particulate matter due to transportation of final product, connecting roads from site to main roads should be concreted. Covered conveyor belt will be installed for raw materials transportation within the premises. To reduce the pollutant emission during transportation, the unit will adopt the practice of regular check up and maintenance of vehicular engines for complete combustion of the fuel. In order to reduce the effect of fugitive emissions, nose mask will be provided to workers.

All the raw material and finished product transfer points or conveyor chutes will have dry fogging/misting system to control the fugitive dust. The dry fogging system nozzles envisaged will be self cleaning and low maintenance type such that:

- All the conveyors and transfer points will be totally enclosed with only self closing doors for the purpose of maintenance.
- The dry fog systems to be implemented for suppressing all kind and level of dust.
- The dry fog system envisaged will control all breathable fugitive dust (1 to 10 microns).
- One mobile water tanker fitted with water spraying arrangement is considered during the operation period for keeping the connecting roads inside the Plant in wet condition.

Table 10.1: Fugitive Emission Sources

Sl. No.	Fugitive emission sources	Control Technique	Control Equipment
1.	Active Storage area	• Watering • Wind screens • Plantation	Water sprinkling on yard

Sl. No.	Fugitive emission sources	Control Technique	Control Equipment
2.	Raw Materials Handling	• Wind Screen	Water Sprinkling
3.	Loading & Unloading	• Wind Screen • Water sprays	Water sprinkling on yard
4.	Internal road transportation	• Water spray • Concrete / Bitumen road • Plantation	Dust suppression system

The following steps is also be practiced to prevent air pollution due to air borne dust:

- Dense greenbelt has to be developed around the dust generation points
- Trees should be planted on both sides of the roads used for transportation in order to arrest dust
- Afforestation around the industry will be act as barrier
- All the roads should be paved
- Proper maintenance of air pollution control equipment
- Regular maintenance of vehicles and machinery should be carried out in order to control emissions
- Dust masks should be provided to workers working in dusty atmosphere
- Good housekeeping and proper maintenance should be practiced in the industry, which is helping in controlling fugitive dust.

10.6.3 Noise pollution Management Plan

Different sources of Noise are mentioned below.

- Raw Material handling section.
- Induction Furnace
- Charging operation, Product handling, Slag crushing.

- Generator area.
- Compressors, Pumps, fans
- Traffic Movement

Most of these generate higher noise. The movement of vehicles may create noise level of 70-80 dB (A). The machinery and techniques used for manufacturing process would be such that there is minimal nuisance of noise in the surrounding region. However as a precautionary measure, enclosures will be provided where ever possible for all the major noise making mechanical units to arrest the sound waves travelling outside the plant area.

IMPACTS & MITIGATION MEASURES

Noise pollution on the surrounding community depends upon characteristics of noise source (instantaneous, intermittent, or continuous in nature), period and duration and the location of noise source with respect to noise sensitive receptor. The noise level due to project activity is limited to the project site only and little impact on surrounding area. The expected noise level from proposed project activities at project boundary would be less than the statutory requirement.

However, to minimize the noise pollution the unit proposes the following noise control measures:

● Noise generation due to friction from the machines shall be avoided by regular Proper maintenance,
● Reduction of noise at source and Well lubrication of the rotating equipments.
● Noise suppression measures such as enclosures, buffers and / or protective measures should be given, if required (wherever noise level is more than 90 dB (A)).
● The transportation contractor shall be informed to avoid unnecessary speeding of the vehicles inside the premises.
● All the vibrating parts will be checked periodically and serviced to reduce the noise generation. Provision of vibration Isolators to reduce vibration.
● Provide acoustic enclosure for rotating equipment, silencer for DG Set.
● Housing of Blowers / Compressors in sound proof buildings.
● To prevent the noise pollution in surrounding area, the green belt area will be developed within industrial premises and around the periphery.
● Employees should be provided with ear protection measures like earplugs or earmuffs.
● Develop proper awareness among workers by regular training session.

Table 10.2: Noise Mitigation Measures

Major Noise generating sources	Noise barrier for transmission losses
Induction Furnace	Dense concrete (100 mm thickness; density 244 mg/m^2)
ID fan	Light concrete (150 mm thickness; density 244 mg/m^2)
Bag Filters (ID Fans)	Light concrete (150 mm thickness; density 244 mg/m^3)
Machine/ grinding area	Aluminum Sheet (318 mm thick)

During proposed project, the major noise-generating source will be machinery and equipment. The proposed equipment of the proposed plant would be designed for noise levels not exceeding 75 dB (A) at plant boundary.

10.6.4 Water pollution Management Plan

The process does not include any industrial waste water generation. Only domestic waste water will be generated which will be deposed through soak pit through septic tank. The unit will adopt rain water harvesting system, which will ultimately reduce the fresh water requirement. Maximum use of harvested water will be for plant use.

Some of the measures, which are to be implemented, include:

- Minimization of water use
- Use of high-pressure hoses for cleaning the floor to reduce the amount of wastewater generated

There will be no treatment required in other processes as the plant will be based on zero discharge system. No Process Effluent Discharge from Plant, Complete recycle of water for horticulture & dust suppression will be carried out.

10.6.5 Pathway of pollutants (seepage into groundwater)

Raw materials stock pile, open dump yard shall be made inside the plant premises, which may have the potential to contaminate the groundwater level through seepage. Following mitigation measures are recommended to avoid any groundwater contamination:

1. Stockpiles of all raw materials is made on pucca platform (preferably concrete / clay compacted) and provided with garland drains and sedimentation pit.
2. Stockpiles should preferably be covered using tarpaulin, etc.
3. Wind breakers in the form of tin sheds should be installed around open stock yard.

10.7 Measures for improvement of ecology

Plantation programme is undertaken at several areas. They include plantation in the proposed plant premises, along the internal and external roads and along the administrative buildings and the stacking yards.

People are educated and trained in social forestry activities by local governmental and non-governmental organizations.

10.7.1 Plantation for aesthetics

Plantation in industrial areas is done along the narrow and broad internal road. This not only improves the flora in the region but also adds to the aesthetic of the region.

10.7.2 Greenbelt Development

Total area of the proposed Project site is 21.7 acres (88098.62 sqm). 33% of the total area i.e., 29913.23 sqm is proposed for greenbelt development i.e., afforestration program. The plantation is done in three rows along the earmarked area as per the suggested scheme given in figure 10.4. The plantation comprises of shed trees, big trees & lawn trees and based from detailed soil analysis report. Green belt is necessary to minimize the effect of pollution due to this unit in local area. The total planning will be done so that it does not affect the factory operation.

Table 10.3: List of Big Trees for Proposed Plantation

No.	Common name	Scientific name	Family
1	Jhaun	*Casuarina equisetifolia*	Casuarinaceae
2	Bot	*Ficus benghalensis*	Moraceae
3	Ashwatha	*Ficus religiosa*	Moraceae
4	Tantul, Tentuli	*Tamarindus indica*	Fabaceae
5	Krishnachura	*Caesalpinia pulcherrima*	Fabaceae
6	Nim	*Azadirachta indica*	*Meliaceae*
7	Ghoranim	*Melia azedarch*	*Meliaceae*
8	Akashmoni	*Acacia moniliformis*	Fabaceae
9	Aam	*Mangifera indica*	*Anacardiaceae*
10	Sisso	*Dalbergia sissoo*	Fabaceae
11	Pakur	*Ficus infectoria*	Moraceae
12	Sirish	*Albizia Lebbeck*	Fabaceae
13	Jarul	*Lagerstroemia speciosa*	Lythraceae
14	Jam	*Syzium cumini*	Myrtaceae
15	Debdaru	*Polyalthia longifolia*	Annonaceae

No.	Common name	Scientific name	Family
16	Radhachura	*Delonix regia*	Fabaceae
17	Arjun, Arjuna	*Terminalia arjuna*	Combretaceae
18	Chatim	*Alstonia scholaris*	Apocynaceae

The scenario of planting arrangement and size should be based on the optimum use of available land. Plants suitable to abate the pollution should be identified to be local plants.

Species selected fulfills the following specific requirements of the area:

- Tolerance to specific conditions or alternatively wide adaptability to ecophysiological conditions
- Fast growth
- Capacity to endure water stress and climate extremes after initial establishment
- Differences in height and growth habits
- Trees should be tall in peripheral curtain plantation, with large, spreading canopy in the primary and secondary attenuation zones.
- Pleasing appearances
- Providing shade

The general considerations involved while developing the green belt are:

- Planting of trees should be undertaken in appropriate encircling rows.
- The trees should be protected by plantation of non palatable shrub species to avoid browsing by animals.
- It should be tolerant to air pollutants present in the area mainly dust pollution.
- It should have possessed extensive foliar area to provide maximum impinging surface for continued efficient adsorption and absorption of pollutants.
- It should able to grow and thrive on soil of areas, be evergreen in habitat having minimum of leaf fall.
- It should maintain ecological, land and hydrological balance of the region.

10.7.3 Action plan for Greenbelt Development

Table 10.4: Action plan for Plantation Program

Propagation technique adopted perspective plants in on hector.			**Management & Cost estimation of plantation for 1st year plan**		
			Management	**Cost estimation for 1st year (Rs.)**	**Total cost for1st year (Rs.)**
Area (hector) for plantation	**No. of plants**	**Plantation procedure**			
2.991323	1500 per Hector Total plant **4486** approx.	2.0 mt. Spacing [line to line & plant to plant]	1. Plantation of single plant (Rs. 30/- per plant)	134580/-	4,24,880 approx.
			2. Watering, Manuring & Maintenance at seeding stage (Rs. 50/- per plant)	224300/-	
			3. Maintenance throughout the year by 1 gardening staff for weeding, cleaning, climber cutting, fire line cleaning etc. (Rs. 3000/- p.m)	36000/-	
			Other expenses	30,000/-	

(I) Plantation for Arresting Dust

Trees particularly having compact branching closely arranged leaves of simple elliptical and hairy structure, shiny or waxy leaves and twigs are efficient filters of dust. The following species are suggested to arrest the dust.

- Alstonia Scholaris (Chatim)
- Dalbergia sissoo (Sisoo)
- Delonix regia (Radhachura)
- Ficus religiosa (Aswatha)

- Tamarindus indica (Tentul)
- Azadirachta indica (Nim)

(II) Plantation For Absorb SO_2 Emissions

The following plants are suggested for plantation to absorb SO_2 in the air.

- Azadirachta indica (Nim)
- Albizia lebbeck (Shirish)
- Alstonia scholaris (Chatim)
- Lagerstroemia speciosa (Jarul)
- Poloyalthia longifloia (Debdaru)

(III) Plantation to Reduce Noise Pollution

Trees having thick and flushy leaves with petioles are suitable. Heavier branches and trunks of trees also deflect the sound waves. The following plant species are suggested to reduce noise pollution.

- Alstonia scholaris (Chatim)
- Azadirachta indica (Nim)
- Tamarindus indica (Tentul)

(IV) Plantation Along the Roads (Avenue Plantation)

- Alstonia scholaris (Chatim)
- Mimusops elangi (Bokul)
- Polyalthia longifolia (Debdaru)
- Lagerstroemia speciosa (Jarul)

Figure 10.4: Greenbelt Development

10.7.4 Rain water harvesting plan

Company will develop roof top rainwater harvesting system. Surface runoff from the plant area will be collected in drains inside the plant.

10.7.5 Greenhouse gas emissions reduction

Energy efficiency and greenhouse gas emissions are linked together. Consumption of more energy or energy guzzling manufacturing process generates more greenhouse gases that in turn contribute to climate change. Implementing energy efficiency programs in steel sector not only makes the steel production cost-effective but also reduces greenhouse gas emissions. The recommendations for reducing green house gas emission are given below:

- The proposed project has to be optimized in terms of energy consumption and utilization.
- The plant buildings shall be designed with 'Green Buildings' concept. Guidelines issued by the Bureau of Energy Efficiency and Energy Conservation Bureau Code 2007 shall be followed. LED lighting system, energy efficient refrigerators and air-conditioners, water-cooled screw type HVAC system, CFC and HCFC free refrigerants and chillers, solar water heaters on major buildings are some recommended energy saving devices that shall be considered in this project.
- Energy efficient building materials shall be considered for construction of structures. For external walls and boundary wall flyash bricks and blocks shall be considered. Ash, which is a waste, shall be mixed with cement to make concrete. Rat trap cavity brickwork using flyash bricks / blocks shall be considered.
- Energy efficient process and building structures shall achieve 20% reductions in energy consumption. It is recommended that the project authorities shall undertake yearly energy audit for their entire manufacturing process and ancillary facilities.

10.7.6 Budget for EMP

Table 10.5: Cost for EMP

SL No	ITEM DESCRIPTION	For Proposed	
		CAPITAL INVESTMENT (Rs. in Lakhs)	RECURRING COST PER YEAR (Rs. in Lakhs)
1	APC System	8.0	1.0

SL No	ITEM DESCRIPTION	For Proposed	
		CAPITAL INVESTMENT (Rs. in Lakhs)	RECURRING COST PER YEAR (Rs. in Lakhs)
2	Water sanitation	1.0	0.50
4	Green Belt Development	2.0	0.25
5	Rain Water Harvesting	2.0	0.25
6	Miscellaneous safety including fire fighting purpose	1.0	0.50
7	Environmental monitoring and Awareness campaign	2.0	0.50
	Total	**16.0**	**3.0**

CHAPTER 11
SUMMARY AND CONCLUSIONS

Chapter 11 Summary and Conclusion

M/s. VSP Udyog Pvt. Ltd. has taken an expansion project at its existing unit located at JL No.65, Khatian No.3743, 3825, J.L.No.58, Khatian No.2374, 2885, 3085, 2884, Banskopa, PO-Bamunara, Durgapur, Dist. Paschim Bardhaman, West Bengal.

The company installed 2 no. Induction furnaces of 8 T, 1 no. Induction furnace of 15 T, 80,000 Tonnes/ Annum Rolling mill, 120,000 Tonnes/ Annum Wire Rod/ Rolling mill -2 & 1 No. 2 strand continuous caster. Necessary CTO is already obtained for operation.

They decided to expand its present billet production capacity from 90600 TPA to 354600 TPA. The proposed expansion will be made with the additional installation of 4x20 T Induction furnaces for production of 264000 TPA M.S. Billet along with Ladle Refining Furnace (25 Ton Capacity per Ladle), 3 Strand CCM and expansion of Wire Rod/Rolling Mill capacity from 1,20,000 to 2,50,000 TPA.

The existing land area is 21.7 acres (88098.62 sqm) and is occupied with the existing facilities.

Salient Features of the Project

1	Name of Project	**VSP Udyog Pvt. Ltd.** is going to install of 4x20 Tonnes Induction furnaces for production of 264000 TPA M.S. Billet along with Ladle Refining Furnace (25 Ton Capacity per Ladle), 3 Strand CCM and expansion of Wire Rod/Rolling Mill capacity from 1,20,000 to 2,50,000 TPA at JL No.65, Khatian No.3743, 3825, J.L.No.58, Khatian No.2374, 2885, 3085, 2884, Banskopa, PO-Bamunara, Durgapur, Dist. Paschim Bardhaman, West Bengal.
2	Details of Applicant	Sri Amit Kumar Singh and Sri Arvind Kumar Singh
3	Year of Commissioning	2022
4	Capital Investment	190.80 Cr for the proposed Unit
5	Capital Investment &	16 Lakhs will be the capital investment on EMP with a

	Recurring Cost for EMP	recurring cost of Rs. 3 Lakh Per annum.
6	Employment Opportunity	Proposed 310
7	Green Belt Development	29913.23 sqm/ above 33% of total Area has been kept for Green Belt Development
8	Water Pollution Control	There will be no generation of effluent water from process. The Domestic waste water (8 KLD) will be treated as per PHE norms.
9	Air Pollution Control	For proposed Induction furnace (4x20T), there will be installation of four nos. of APC system comprises of Bag filter, spark arrestor, ID Fan along with 30m high common chimney for disposal of clean gas.
10	Solid Waste Management	320 Tonnes/month (approx) generated slag from induction furnace will be used in road construction. Approx 320 Tonnes /month dust will be generated from Air pollution control system which will be utilized in making the fly ash bricks. Approx. 15 Tonnes /month Slag from LRF will be used for land fill. Mill scale from rolling 30 Tonnes/month (approx) will be recycled in Induction furnace. 40 Tonnes/month (approx) will be re-melted in the process.
11	CSR Expenditure	Rs. **1,43,10,000**/- will be spent on CER Activities over a period of 5 Years

Conclusions

It can be concluded with a positive note that due to the sufficient provision and efficient operation of environmental management systems and after the execution of the proposed mitigation measures and environmental management plans, the project activities during the construction and operation phase would have manageable & largely have reversible impacts on the environment, and on balance the project would be beneficial to surrounding communities and the region. Thus the project is environmentally viable and sustainable.

CHAPTER 12
DISCLOSURE OF CONSULTANTS

12 Chapter 12: Disclosure of Consultants

12.1 Undertaking

Pacific Scientific Consultancy Pvt. Ltd. (PSCPL) hereby gives the undertaking that the prescribed TORs have been complied with and that the data submitted in this report is factually correct.

12.2 Details of Consultant

The EIA/EMP Report is based on the project report given by VSP Udyog Pvt. Ltd. In preparation of this report some experts and advisor were involved. All the instruction of TOR is complied as far as possible relevant to our project characteristics. The name of Consultants/Experts is given below.

- Dr. Mohit K. Ray
- Dr. Sumit Baran Chowdhury
- Mr. Dines Bhunia
- Dr. Ajoy Paul
- Mr. Biswajit Rakshit
- Dr. Paulomi Das
- Mr. Shubhradeep Moitra
- Mr. Upamannyu Banerjee
- Mr. Subhajit Pai
- Mr. S.Devi Prasad
- Mr. Shahbaz Malik

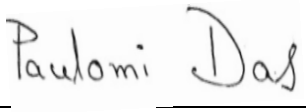
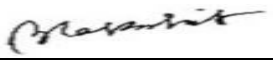
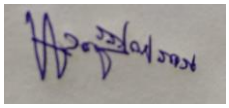
For monitoring report, we have taken the services of Environmental laboratory approved by W.B.P.C.B. The monitoring and analysis of Air, Water, Soil and Noise is done by M/s Envirocheck, Kolkata.

For Pacific Scientific Consultancy Pvt. Ltd.

Mr. B. Rakshit

(**EIA Coordinator**)

List of Experts along with field:

	Name of Experts		Area of Experts	Signature
1.	Ajoy Paul	:	SHW, WP	
2.	Mohit Kumar Roy	:	AP, AQ, SHW, RH	
3.	Subhajit Pal	:	NV	
4.	Upamannyu Banerjee	:	SE	
5.	Sumit Baran Chowdhury	:	AP, WP, SHW, AQ	
6.	Biswajit Rakshit	:	AP, WP, SHW, AQ	
7.	Shahbaz Malik	:	HG, GS	
8.	Dines Bhunia	:	AP, WP, SHW, AQ	
9.	Paulomi Das	:	EB, SHW, WP	
10.	Shubhradeep Moitra	:	AP, WP, SHW, AQ	
11.	S.Devi Prasad	:	LU	

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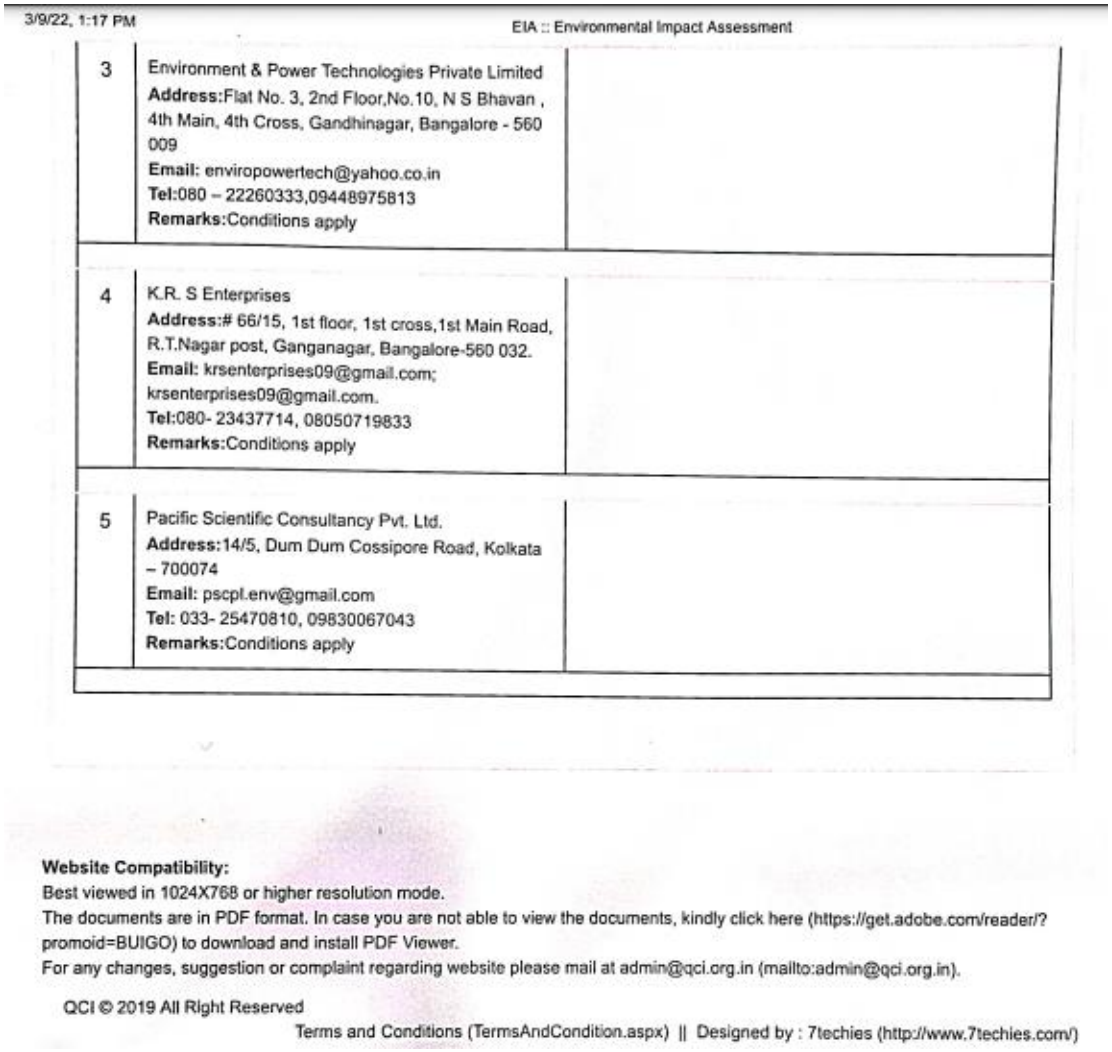
SL. No.	Name and Address EIA Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
1	Akshar Consultants **Address:**813, Sakar-5, Mithakhali Rly. Crossing, Off. Ashram Road, Ahmedabad – 380009 **Email:** akshar.consultants@vsnl.net **Tel:** 079 – 26583525,09825036435 **Remarks:**Conditions apply				
2	Environ India **Address:**UNS-75, Unnayan Commercial Complex, 1050/1, Survey Park, Kolkata – 700075 **Email:** info@environindia.org , environ.india@gmail.com **Tel:**033-65363212, 09831005864 **Remarks:**Conditions apply				



3/9/22, 1:17 PM EIA :: Environmental Impact Assessment

3	Environment & Power Technologies Private Limited **Address:**Flat No. 3, 2nd Floor,No.10, N S Bhavan , 4th Main, 4th Cross, Gandhinagar, Bangalore - 560 009 **Email:** enviropowertech@yahoo.co.in **Tel:**080 – 22260333,09448975813 **Remarks:**Conditions apply	
4	K.R. S Enterprises **Address:**# 66/15, 1st floor, 1st cross,1st Main Road, R.T.Nagar post, Ganganagar, Bangalore-560 032. **Email:** krsenterprises09@gmail.com; krsenterprises09@gmail.com. **Tel:**080- 23437714, 08050719833 **Remarks:**Conditions apply	
5	Pacific Scientific Consultancy Pvt. Ltd. **Address:**14/5, Dum Dum Cossipore Road, Kolkata – 700074 **Email:** pscpl.env@gmail.com **Tel:** 033- 25470810, 09830067043 **Remarks:**Conditions apply	

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----------THE END----------

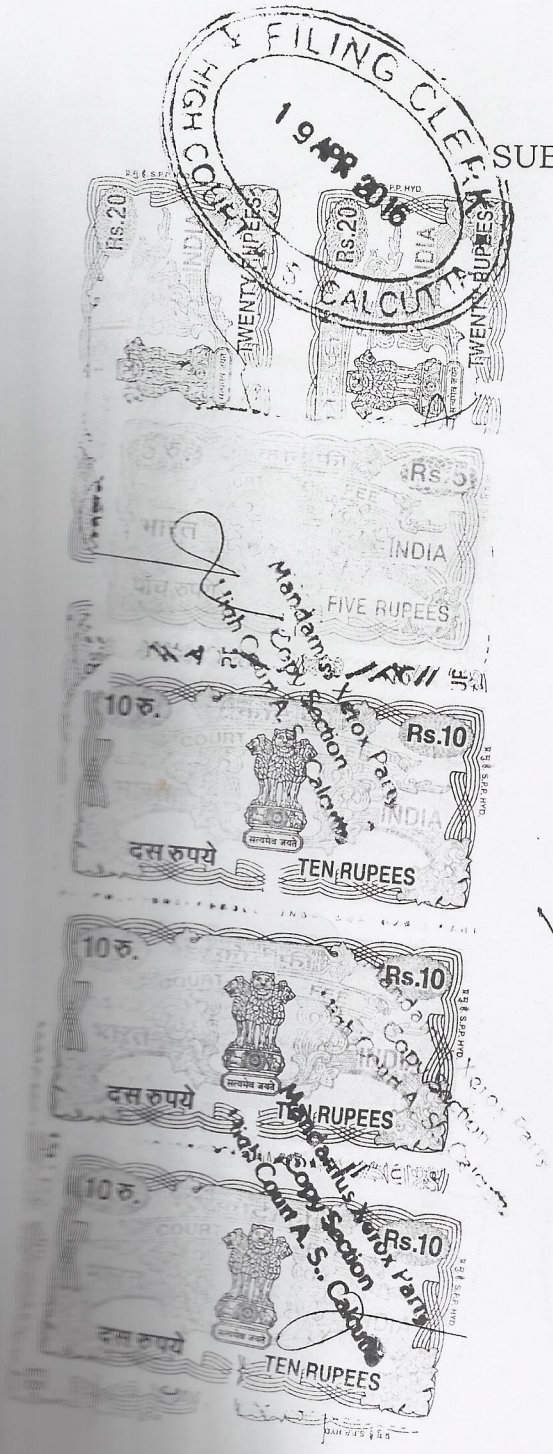
DISTRICT: NORTH 24 PARGANAS

IN THE HIGH COURT AT CALCUTTA

CONSTITUTIONAL WRIT JURISDICTION

APPELLATE SIDE

SUBJECT MATTER RELATING TO: RESIDUARY



W.P. No. 7365 (W) of 2016

19.04.2016

In the matter of:

An application under Article 226 of the Constitution of India;

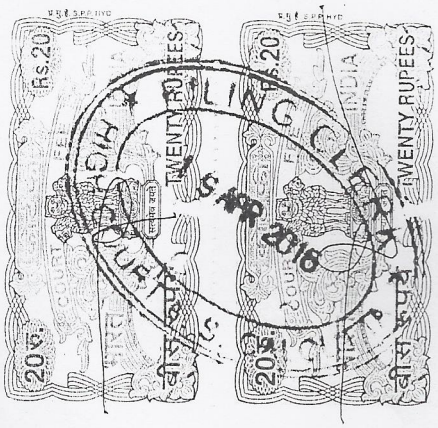
1414(1)

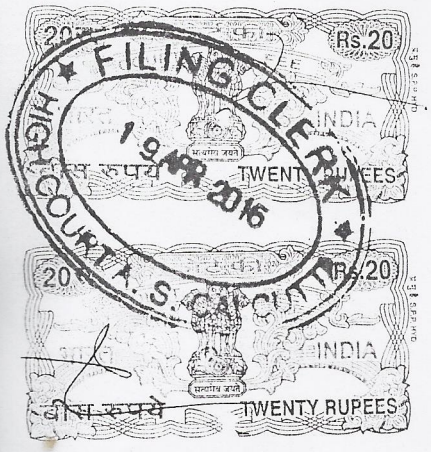
And

In the matter of:

An application for and/or in the nature of writ of Mandamus and/or Certiorari and/or any other appropriate writ or writs;

And





In the matter of:

An application for order or orders, direction or directions;

And

The Environment (Protection) Act, 1986;

And

In the matter of:

The Environment (Protection Rules, 1986;

And

In the matter of:

Notification dated 14th September, 2006 issued by the Joint Secretary to the Government of India, Ministry of Environment and Forest;

And

In the matter of:

Purported notification being no. S.O. 648(E) dated 03.03.2016 issued by the Secretary, Ministry of Environment, Forest and Climate Change, Government of India.

And

In the matter of:

1. Pacific Scientific Consultancy Private Limited, a company incorporated under the Companies Act, 1956 having its registered office at 14/5, Dum Dum Cossipore Road, Kolkata 700 074.

2. Dr. Sumit Baran Chowdhury, one of the Directors of Pacific Scientific Consultancy Private Limited, a company incorporated under the Companies Act, 1956

having his office at 14/5, Dum Dum Cossipore Road, Kolkata 700 074.

3. Biswajit Rakshit,

one of the Directors of Pacific Scientific Consultancy Private Limited, a company incorporated under the Companies Act, 1956 having his office at 14/5, Dum Dum Cossipore Road, Kolkata 700 074.

4. Dr. Mohit Kumar Ray,

Son of Late Mohini Mohan Ray,

One of the coordinators of Pacific Scientific Consultancy Private Limited, a company incorporated under the Companies Act, 1956, having his office at 14/5, Dum

Dum Cossipore Road, Kolkata 700 074.

...Petitioners.

-Versus-

1. Union of India,

service through the Secretary, Ministry of Environment and Forest, having office at Paryavaran Bhawan, C.G.O. Complex, Lodhi Road, New Delhi – 110 003 ;

2. State of West Bengal

service through the Secretary, Department of Environment, Government of West Bengal, having office at Poura Bhavan, 4th Floor, FD-415A, Sector-III, Salt Lake City, Kolkata-700 106.

... Respondents

17/05/16

M. 10

Noting by Office or Advocate	Serial No.	Date	Office notes. reports. Orders or proceedings with signature
	46 Pg	28.04.2016	**W.P.7365(W) of 2016** **(Pacific Scientific Consultancy Private Limited & Ors. vs. Union of India & Anr.)** Mr. Shakti Nath Mukherjee Mr. Durga Prosad Dutta Mr. Sumanta Ganguly.....for the petitioner Mr. Pranab Kr. Datta Ms. Suchitra Ray.....for the State Mr. Bhudeb Bhattacharya Ms. Sabita Roy.....for the Union of India This writ petition registers a challenge to a notification bearing no. S.O. 648(E) dated March 03, 2016 issued by the Secretary, Ministry of Environment, Forest and Climate Change, Government of India. Parties do not dispute that implementation of such notification has been deferred by reason of orders dated March 21, 2016 and April 05, 2016 passed by the Karnataka High Court and the Gujarat High Court respectively. Although the aforesaid orders do not specify the reasons for deferring implementation of the impugned notification with clarity, one cannot lose sight of the observation made by the Hon'ble Supreme Court in paragraph 22 of the decision reported in (2004) 6 SCC 254 : Kusum Ingots & Alloys Ltd. vs. Union of India to the effect that an order staying a parliamentary Act, whether interim or final, would have effect throughout the territory of India, subject of course to the applicability of the Act. DD.

17/05/16

Noting by Office or Advocate	Serial No.	Date	Office notes. reports. Orders or proceedings with signature

There is no reason to pass any further interim order on this writ petition. The notification, insofar as the petitioners are concerned, cannot be implemented in view of the order passed by the Gujarat High Court, which is in general terms and not restricted to the petitioners therein.

Let affidavits-in-opposition be filed by the respondents within two weeks after vacation; reply thereto, if any, may be filed within two weeks thereafter.

The writ petition shall be treated as ready for hearing on expiry of the period fixed above for exchange of affidavits and thereafter the parties shall be at liberty to mention it for consideration before the appropriate bench.

If, however, the interim order of the Gujarat High Court is vacated, the petitioners shall have the liberty to seek interim order on the self-same application.

Sd/- Dipankar Datta, J.

(DIPANKAR DATTA,J.)

17/05/16