DRAFT

ENVIRONMENTAL IMPACT ASSESSMENT REPORT

For

EXPANSION OF GREY AND DUCTILE IRON CASTINGS MANUFACTURING

Of

M/s. DANBLOCK BRAKES INDIA PVT. LTD.

Located at S No. 270 Part, 256 Part,
Pappankuppam Village,
Gummidipoondi Taluk, Tiruvallur District.

3(a) Metallurgical Industries
(Ferrous & Non Ferrous)

Category: B

File No: SEIAA-TN/F.No.9176/2022

Environmental Consultant

M/s. Pollucare Engineers India Pvt. Ltd.,
NABET Accreditation -
NABET/EIA/2225/RA 0268
Ayapakkam,
Chennai - 77

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Chapter 1 INTRODUCTION

1.1 Purpose of the Project

M/s Sanmar Ferrotech Ltd, was obtained Environmental Clearance for Ductile iron Foundry unit (25,000 TPA) vide EC F.No.J-11011/783/2007-IA II (I), Dated 23.01.2008 same copy is enclosed as **Annexure 2.**

M/s. JKM Ferrotech Limited, acquired the facility in the year of 2012, the unit name was changed from M/s Sunmar Ferrotech Ltd to M/s.JKM Ferrotech Limited. M/s. Danblock Brakes India Pvt Ltd acquired the facility in the year of 2021, the unit name was changed from M/s.JKM Ferrotech Limited to M/s. Danblock Brakes India Pvt Ltd. Consent copies is enclosed as **Annexure 3.**

Now the unit is applying Environmental Clearance for propose 70,000 T/Annum Grey and Ductile Iron castings manufacture. The existing manufacturing capacity of the unit is 25,000 T/Annum, After Expansion the total quantities of products will be 95,000 T/Annum. The EC Copy is enclosed as **Annexure 2**. The CTEs/CTOs copy is enclosed as **Annexure 3**. The current CTO was valid upto 31.03.2023.

The Existing and proposed Project site is located in the Gummudipondi Industrial area, Project termed under Schedule 3 (a), Metallurgical Industries (Ferrous & Non Ferrous). The project is under Category B, as per EIA notification dated 14th September 2006. The Interstate boundary is located 8km from the project site. Hence the project is not attracting the general condition. The facility requires obtaining prior Environmental Clearance from TNSEIAA as per the above said notification before commencing the above activities. The Pulicat bird sanctuary is located 8.5 Km from the project site. The company has implemented Zero Liquid Discharge (ZLD) system and comply all the environmental laws.

1.2 Brief Description of Project & Project Proponent

1.2.1 About Project

M/s. Danblock Brakes India Pvt Ltd has facility located at S No. 270 part, 256 part, Pappankuppam Village, Gummidipoondi Taluk and Tiruvallur District. M/s Sanmar Ferrotech Ltd has acquired the facility in 2008 and currently M/s. Danblock Brakes India Pvt Ltd is being operating from 2021. The unit have Induction Furnace (6T/H) - 2Nos with 2 Crucibles each with total electrical panel capacity of 4500 KWA and Induction Furnace (1T/H) - 3 Nos. with 2 Crucibles each with total electrical panel capacity of 2250 KWA (Tritrack) - to manufacture Grey and Ductile Iron castings 25,000 T/Annum.

1.2.2 Project Components

M/s Sanmar Ferrotech Ltd., Environmental Clearance was obtained for Ductile iron Foundry unit (25,000 TPA) vide EC F.No. J-11011/783/2007-IA II (I), Dated 23.01.2008 same copy is enclosed as **Annexure 2.**

M/s. JKM Ferrotech Limited, acquired the facility in the year of 2012, the unit name was changed from M/s Sunmar Ferrotech Ltd to M/s.JKM Ferrotech Limited.

M/s. Danblock Brakes India Pvt Ltd acquired the facility in the year of 2021, the unit name was changed from M/s.JKM Ferrotech Limited to M/s. Danblock Brakes India Pvt Ltd. Consent copies is enclosed as **Annexure 3.**

1.3 Need of the Project

Iron and steel are the world's most important engineering and construction material. It is used in almost every aspect of our lives and is an environment friendly material as it can be recycled infinite times without loss of property. It possesses great durability with strength as compared to other materials. Consumption of iron and steel is taken to be an indispensable indicator of economic development of any region. Iron and steel continue to have a stronghold in traditional sectors such as construction, housing, infrastructure, shipping, railways, automobiles, engineering goods, and packaging.

1.4 Justification of the Project

In 2020, iron casting accounted for over 80% market share in iron & steel casting market. Iron is further subcategorized into white iron, ductile iron, and grey iron. Grey iron is the most commonly used cast iron and contains graphite microstructure with small fractures.

When grey cast iron is produced, the fractures reveal the graphite underneath the surface. It has high thermal conductivity, superior vibration damping capability, and acceptable tensile strength. Additionally, this type of cast iron is cost-efficient and has an excellent ability to withstand thermal cycling. It is used in hydraulic components, pumps, linkages, gears, automotive suspension components, steering knuckles, tractor parts, wind turbine housings, machinery bases, and truck suspension components. The machinery used is indigenously manufactured and will be purchased.

Export Possibility

The product shall be exported in the nearby region depending on the market demand

Domestic/Export Markets

The end products will be sold depending on the market demand & shall be exported or maybe sold in domestic market.

1.5 Nature & Description of Project

The Existing and proposed Project site is located in the Gummudipondi Industrial area, Project termed under Schedule 3 (a), Metallurgical Industries (Ferrous & Non Ferrous). The project is under Category B, as per EIA notification dated 14th September 2006. The Interstate boundary is located 8km from the project site. Hence the project is not attracting the general condition. This facility requires obtaining prior Environmental Clearance from TNSEIAA as per the above said notification before commencing the above activities. The Pulicat bird sanctuary is located 8.5 Km from the project site. The company has implemented Zero Liquid Discharge (ZLD) system and comply all the environmental laws. Comparison statement of existing and proposed project detail provided in **Table 1.1** and chronological matrix is given in Table 1.2.

Table 1. 1 Comparison Statement of Existing and proposed Product

S. No	Description		Existing	Proposed	After expansion
1	Quantity (T/A)		25,000	70,000	95,000
2	Project land (Acres)		15.54	Nil	15.54
3	Land coverage area (Acres)		4.49	1.74	6.23
4	Total Water consumption (KLD)		426	379	805
5	Recycled water consumption (KLD)		48	14	62
6	Fresh water requirement (KLD)		378	365	743
7	Hazardous waste	Used/spent oil (T/Annum)	0.5	0.5	1.0
		Discarded containers / barrels / liners contaminated with hazardous wastes/ chemicals (T/Annum)	2.5	12.5	15.0
		Wastes or residues containing oil	3.0	1.0	5.0
8	Sewage generation (KLD)		20.5	4	24.5
9	STP Capacity (KLD)		25	-	Install new STP 40
10	Cooling tower Blow town water in KLD		30	10	40
11	Power Requirement in KW		10,250	2500	12,750
12	DG Set (kVA)		500	Nil	500
13	Induction Furnace		(6T/H) - 2Nos with 2 Crucibles each(1T/H) 3 Nos. with 3 Crucibles each	(10T/H) – 1 Nos with Dual track 2 Crucibles each	(6T/H) - 2Nos with 2 Crucibles each(1T/H) 3 Nos. with 3 Crucibles each(10T/H) – 1 Nos with Dual track 2 Crucibles each
14	Diesel Requirement (KLD)		1	KLD	1
15	Manpower (Nos)		480	100	580

Table 1. 2 Chronology matrix of the project

S. N	Unit Name	Acquired Date	EC	CTE	CTO		Production Capacity as per EC 2008	Remarks
1	M/s Sanmar Ferrotech Ltd	15.06.2007 To 24.10.2012	EC F.No.J-11011/783/2007-IA II (I), Dated 23.01.2008	-	-		**25,000 T/A**	• As per EIA notification 2006, All other nontoxic secondary metallurgical processing industries is required Environmental Clearance for >5000 Tons/Annum. • The unit was located at SIPCOT Industrial complex, Gummidipoondi. The unit is located within 10 km radius of Interstate boundary. As per EIA notification general condition was attracted. Henceo the unit has obtained Environmental Clearance from MoEF&CC, Vide letter **J-11011/783/2007 – IA II (I). Dated 23.01.2008.**
2	M/s. JKM Ferrotech Limited	25.10.2012 To 04.07.2021	-	-	2016-17	**Air**: Consent Order No. 160526103722 Dated: 05/10/2016.	25,000 T/A	• M/s. JKM Ferrotech Limited, was acquired in the year of 2012, the unit name was changed from

						Water: Consent Order No. 160516103722 Dated: 05/10/2016 **Valid Upto: 31.03.2017**		M/s Sanmar Ferrotech Ltd to M/s.JKM Ferrotech Limited. • The unit has maintained same production capacity as per EC2008 (25000 T/A).
					2017-18	**Air:** Consent Order No. 170828171639 Dated: 04/07/2017. **Water**: Consent Order No. 170818171639 Dated: 04/07/2017. **Valid Upto: 31.03.2018**		
					2018-20	**Air**: Consent Order No. 1808212088794 Dated: 25/10/2018. Water: Consent Order No. 1808112088794 Dated: 25/10/2018. **Valid Upto: 31.03.2020**		

					2020-24	Air Consent Order No. 2008233264338 Dated: 03/12/2020. Water: Consent Order No. 2008133264338 Dated: 03/12/2020. **Valid Upto: 31.03.2024**		
3	M/s. Danblock Brakes India Pvt Ltd	05.07.2021 to Till date		-	Air-Consent Order No. 2105240210103 Dated: 20/11/2021. Water: Consent Order No. 2105140210103 Dated: 20/11/2021. **Valid Upto: 31.03.2023**		**25,000 T/A**	• **M/s. Danblock Brakes India Pvt Ltd** acquired the facility in the year of **2021**, the unit name was changed from M/s.JKM Ferrotech Limited to M/s. Danblock Brakes India Pvt Ltd. • As per MoEF&CC S.O 3067(E) Dated: 01.12.2009. Secondary metallurgical processing industrial units, those projects involving operation of furnaces only such as induction and electric arc furnace, submerged arc furnace, and cupola with capacity

							more than 30,000 tonnes per annum (TPA) would require environmental clearance. MoEF&CC S.O 3067(E) is enclosed as **Annexure 2.** • Since the unit capacity is 25,000 T/A as per MoEF&CC S.O 3067(E) Date: 01.12.2009, Environmental Clearance is not required. So the unit was not applied for the name transfer. • Now Danblock have applied for the EC Expansion for 25,000 T/A to 95,000 T/A and interstate boundary is 8.0 km from the project site. Hence we have applied for Environmental Clearance in SEIAA, Tamil Nadu.

1.6 Location of Project

M/s. Danblock Brakes India Pvt Ltd has located at S No. 270 part, 256 part, Pappankuppam Village, Gummidipoondi Taluk and Tiruvallur District.

1.6.1 List of Industries in 10 Km Radius

S. No	Description	Distance (~km)	Direction
1	Birla Carbon India Private Limited	0.25	NNE
2	Galada Petrochemicals Pvt Ltd	0.4	NE
3	TALCO Aluminium Company	0.25	SSW
4	Qute Extrusions	0.45	NE
5	Tamil Nadu Waste Management Limited	0.95	NE
6	SGR 777 Foods Pvt Ltd	0.27	ESE
7	Kantaflex India Pvt Ltd factory	0.45	SSE
8	Abref Private Limited	0.55	SSE
9	CRP India Pvt Ltd	0.6	SE
10	SAC Engine Components Pvt Ltd	0.56	ESE
11	Jain FGL metal Industries	0.99	ESE
12	Gupta Power Infrastructure limited	0.94	SE
13	Aditya Birla Group	1.10	SE
14	TVS Sundram Fasteners Ltd	1.10	SE
15	ARS Steels & Alloys International Pvt Ltd	1.05	NNE
16	Arun Vyapar Udyog Ltd	1.22	ENE
17	MCR Tmt Bars	1.60	ESE
18	Govindaraja Mudaliar Sons Pvt Ltd	1.90	SE
19	Unico Insudtries	2.20	SSW
20	Tulsyan NEC Limited (Steel Plant)	0.28	SSW
21	Kamachi Power Plant	1.63	WNW
22	Green Signal Bio Pharma Private Limited	0.60	WNW
23	Jain Metals And Rolling Mills Pvt. Ltd	1.40	WNW
24	Flocon Systems	1.40	WSW
25	Kamatchi steel factory	2.20	NW
26	Hima Aqua Minerals	1.20	NNW
27	VIROGREEN India Private Limited	2.00	NNE
28	OPG Power Generation Pvt Ltd	2.90	NNW
29	Winwall Technology India Private Limited	1.90	NE
30	Emerald Resilient Tyre Manufacturers Pvt. Ltd.	1.20	NNE
31	Tamil Nadu Coke and Power pvt ltd	4.00	SSE
32	TCP Limited Power Plant	3.60	SE
33	Suryadev Alloy And Power Pvt Ltd	3.25	SSE

S. No	Description	Distance (~km)	Direction
34	Blendsteel Engineering Private Limited	4.22	SE
35	AACHI MASALA FOODS PVT LTD,	4.90	SSE

1.7 Project Cost

Proposed cost for the expansion project is Rs.60 Crore. The proposed expansion will be completed within one year after obtaining the Environment Clearance.

1.8 Scoping of EIA Study

The scope of the study has been based on EIA notification 2006, generic Structure of Environmental Impact Assessment document. Work mentioned includes an assessment study of propose 70,000 T/Annum Grey and Ductile Iron castings manufacture. The existing manufacturing capacity of the unit is 25,000 T/Annum, After Expansion the total quantities of products will 95,000 T/Annum. This study puts forward the most effective ways to protect the environment from increasing pollution caused by the burgeoning industrial development and recommendations for environmental-friendly development initiatives in the region. An Environmental Impact Assessment (EIA) is an assessment of the possible impact, whether positive or negative, that a proposed project may have on the environment, together consisting of the natural, social and economic aspects, i.e., aiming at "Sustainable Development" due to the project activities.

This EIA report presents the existing baseline scenario and the assessment and evaluation of the environmental impacts that may rise during operational phases of the project. This report also highlights the Environmental Monitoring Program during the construction and operation phases of the project and the post project monitoring program. In terms of the EIA Notification of the MoEF&CC dated 14th September 2006 and subsequent amendments the generic structure of the EIA document will be as under.

1.9 Environmental sensitivities & significant impacts of the project considered

The proposed expansion site is located at SIPCOT Industrial Complex. The existing site has undulate topography with minimal elevation differences. The average elevation of the proposed site is 17 m. Geomorphologically, study area has been classified into the units of

denudation origin. Some Large and medium size lakes are situated along the topographic gradients, and most of which are connected by small ephemeral nallahs. Other than these many small ponds and lakes are situated around the study area. These lakes receive seasonal flows, otherwise mostly remain dry.

Interstate boundary of Tamil Nadu and Andhra Pradesh is at distance of 8.00 km in the direction of North.

The location is in rural and urban back ground with a total population of 2,84,764 (2011 Census) in 46 villages covering 2 districts.

The Key Environmental Impacts considered are Air Pollution from Induction Furnaces, fugitive dust from material handling and slag handling facilities. Water to be taken from ground water resources. Impact of Process emissions on the surrounding environment, disposal of slag and other solid wastes generated from the project and resource uses are key environmental impacts considered

These key impacts are discussed in detail and mitigation measures are addressed in Environmental Management Plan.

1.10 Policy, legal and administrative frame work

This Section presents a review of the existing regulations and legislations relevant to this project, at the National and the State Levels. Regulations concerning procedures and requirements that may directly concern the project.

1.10.1 Institutional Setting for the Project

The proposed expansion project is located at at S No. 270 part, 256 part Pappankuppam Village, Gummidipoondi Taluk and Tiruvallur District.

1.10.2 Institutional Setting in the Environmental Context

The environmental regulations, legislation policy guidelines and control that may impact this project, are the responsibility of a variety of government agencies. In all, as discussed

in the subsequent sections, the following agencies would play important roles in this project.

1.10.3 Ministry of Environment, Forests & Climate Change (MoEF&CC)

The primary responsibility for administration and implementation of the Government of India's policy with respect to environmental management, conservation, ecologically sustainable development and pollution control rests with the Ministry of Environment and Forests (MoEF&CC). MoEF & CC is the agency primarily responsible for the review and approval of EIAs pursuant to G.O.I Notification in September, 2006 and subsequent amendments.

1.10.4 MoEF & CC Regional Offices

The Ministry of Environment and Forests Regional office in Chennai is responsible for collection and furnishing of information relating to compliance to conditions of Environmental Clearance of projects, pollution control measures, methodology and status, legal and environment measures and environmental protection in special conservation areas such as wetlands, mangroves and biological reserves.

1.10.5 State Pollution Control Board (SPCB)

The Tamil Nadu Pollution Control Board plays the role of environmental management at the state level, which emphasizes on air and water qualities. The project needs to obtain Consent to Establishment (CTE) & Consent to Operation (CTO) before construction and during operational phase of project. It enforces the waste water and air emission standards compliance and other conditions of EC and CTE/CTO granted. It is also responsible for granting of authorization under Hazardous Waste Management, Transboundary movement Rules 1998.

1.10.6 Departments of Environment and Forests (DOEF)

The department of Environment, Forests, Science and Technology performs the functions similar to the MoEF & CC at the state level in Tamil Nadu.

1.11 Other Statutory Licenses/Permission

1.11.1 Director of Factories & Boilers

Under Factories Act, 1948 as amended, the unit is required to obtain clearance for expansion activities and for construction of new production block and other utilities.

1.11.2 Permissions from Wildlife Department

The proposed expansion project needs to obtain NBWL clearance from wildlife department. The proponent to get the EC certified compliance report from, MOEF&CC Chennai.

1.12 Required Statutory Licenses at A Glance

The table gives the requirement & status of various applicable clearances for the project and its current status is given in the **Table 1.3** below

Table 1. 3 Applicable Acts and Rules

S. No	Act and Rules applicable	Purpose	Objective	Applicability
1	EIA Notification 2006 and its amendments.	New projects, Expansion modernization, change in product mix of the existing project	Protection and Improvement of the Environment	The production quantity and expansion of plant facilities scheduled under category 3(a), attracts EIA notification 2006. Environmental clearance from SEIAA, Tamilnadu is applicable.
2	The Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989 and its amendments	Handling of Hazardous Chemicals	Regulate the manufacture, storage and import of Hazardous Chemicals	Preparation/ update of On-site Emergency Preparedness Plan and submission to Factory inspectorate. Preparation/ update of Safety Report and submit to Factory inspectorate.
3	The Water (Prevention and Control of Pollution) Act, 1974 and its amendments.	New projects, Expansion modernization, change of product mix of the existing project, Existing plants	Prevention, control and abatement of water pollution	Consent to Establish and Consent to Operate from State Pollution Control Board to be obtained for expansion activity.
4	The Air (Prevention and Control of Pollution) Act, 1981 and its amendments.	New projects, Expansion /modernization, change of product mix of the existing project, Existing industries	Prevention, control and abatement of air pollution	Consent to Establish and Consent to Operate from State Pollution Control Board to be obtained for expansion activity.

S. No	Act and Rules applicable	Purpose	Objective	Applicability
5	The Hazardous and other waste (Management, Handling and Transboundary Movement Rules) 2016 and its amendments.	Management, Handling and Transboundary Movement of Hazardous waste	Prevention, Control and abatement of pollution	Hazardous waste Authorization from State Pollution Control Board to be obtained.
6	The solid Waste Management Rules, 2016	Management of solid (non-hazardous) waste as per the provisions of the Rule	Prevention control and resource conservation	Solid waste authorization from SPCB. Proper collection, segregation and disposal as per Rules.
7	The Environmental (Protection)Act,1986 and its Amendments	New projects, Expansion/modernization change of product mix of the existing project, Existing industries	Protection and Improvement of the Environment	Environmental Standards as specified are to be complied. Submission of Environmental Statement on yearly basis to PCB.
8	The Noise Pollution (Regulation and Control) Rules, 2000	New projects, Expansion/modernization change of product mix of the existing project, Existing industries	To protect the workers and public from noise related problems	Noise control measures. Comply with Noise standards and submission of monthly report to PCB.

S. No	Act and Rules applicable	Purpose	Objective	Applicability
9	The Factories Act 1948 and its amendments.	New projects, Expansion/modernization change of product mix of the existing project, Existing industries	Control of workplace environment, and providing for good health and safety of workers	Factory License from Factory inspectorate.
10	The Central Motor Vehicle Act, 1988	New projects, Expansion/modernization change of product mix of the existing project, Existing industries	Check the pollution load of vehicles inside the plant	Adequate environmental measures are put in place to check the vehicular emissions.

1.13 Structure of the EIA report

The report is organized in 12 chapters as follows

Chapter 1 is introduction chapter which highlights briefly about the project, introduction to project proponents, nature & size of the project and its importance & scope of study & regulatory frame work applicable to the project under Environment

Chapter 2 Outlines project description provides the complete description of the expansion project of M/s. Danblock Brakes Private Limited. The details are presented from the environmental perspective along with the salient features such as land use, process adopted, water consumption and waste water discharges, Air emissions, solid wastes generation, resource requirement for the project and current compliance levels of the unit visà-vis previous clearances from Pollution Control Board.

Chapter 3 Discuss the study area, period of study, components & methodology adopted, base line data established and environmental components.

Chapter 4 Discuss the details of investigated environmental impacts due to project at various stages of development and operations. Also the chapter outlines the measures for minimizing or off-setting adverse impacts identified and mitigation measures.

Chapter 5 Discuss the details of alternative sites & technologies considered if any. **Chapter 6** Discuss the details of environmental monitoring program, frequencies & costs during implementation and operation.

Chapter 7 Discuss the potential hazards and risks associated with project & risk mitigation measures proposed and out lines disaster management plan.

Chapter 8 Discuss the benefits from the project to various stake holders.

Chapter 9 Discuss the Environmental Cost Benefit Analysis (Not specified in TOR in this case).

Chapter 10 Discuss the detailed Environmental Management Plan which addresses the measures to be adopted for effective environmental conservation. It also gives estimated

budget for implementation of EMP, both capital investment and recurring costs & Outline the commitment from project proponents on Corporate Environmental responsibility and budget

Chapter 11 Gives the Summary & Conclusion of the EIA and justification of implementation of project.

Chapter 12 Gives the credentials of M/s.Pollucare Engineers India Pvt. Ltd., their accreditation details and team which conducted the EIA studies.

1.14 Compliance of Terms of Reference (ToR)

The EIA study has been conducted in-line with the approved TOR by MOEF and taking into consideration the structure of the report given in the EIA Notification 2006 and amendments thereafter. Compliance of the TOR has been provided in **Table 1.4**

Table 1.4 Compliance of Terms of Reference

S. N	Terms of Reference	Compliance Status
1	**Executive Summary**	M/s Danblock Brakes India Private Limited is located at SIPCOT Industrial Estate, Gummidipoondi, Tiruvallur District, Tamil Nadu. The project falls under Category B, Sector 3(a) of Material Production and the activity is Secondary Metallurgical Processes Industry.
2	**Introduction**	
i	Details of the EIA Consultant including NABET accreditation	**Name of the Consultant:** M/s Pollucare Engineers India Private limited, Ayapakkam, Chennai - 77 **Certificate No**. NABET/EIA/2225/RA 0268 Valid up to 05.09.2025. NABET Certificate is enclosed in **Annexure 26.**
ii	Information about the project proponent.	M/s. Danblock Brakes India Pvt Ltd is located S No. 270 part, 256 part, Pappankuppam Village, Gummidipoondi Taluk and Tiruvallur District.
iii	Importance and benefits of the project	The proposed expansion will result in the following benefits: • Employment to the local population • Infrastructure development of surroundings area. • Economic and social upliftment of suppressed class.

<table>
<tr><td></td><td></td><td>• Environmental activities in the surrounding villages.
• Revenue to State & Central exchequers.
• Narrowing down the demand supply gap.</td></tr>
<tr><td>3</td><td colspan="2">Project Description</td></tr>
<tr><td>i</td><td>Cost of project and time of completion.</td><td>Cost of the Project:
Proposed project cost: 60 Crore
The proposed expansion will be completed within one year after obtaining of Environment Clearance.</td></tr>
<tr><td>ii</td><td>Products with capacities for the proposed project.</td><td>
<table>
<tr><th>S.N</th><th>Description</th><th>Exiting</th><th>Proposed</th><th>After Expansion</th></tr>
<tr><td>1</td><td>Grey and Ductile Iron castings</td><td>25,000 T/Annum</td><td>70,000 T/Annum</td><td>95,000 T/Annum</td></tr>
</table>
</td></tr>
<tr><td>iii</td><td>If expansion project, details of existing products with capacities and whether adequate land is available for expansion,
reference of earlier EC if any.</td><td>
<table>
<tr><th>S.N</th><th>Description</th><th>Exiting</th><th>Proposed</th><th>After Expansion</th></tr>
<tr><td>1</td><td>Grey and Ductile Iron castings</td><td>25,000 T/Annum</td><td>70,000 T/Annum</td><td>95,000 T/Annum</td></tr>
</table>
This is an expansion project. Expansion activity will be proposed within the existing site. Adequate land is available for expansion activity.

EC was obtained existing project. EC copy is enclosed as Annexure 2.
</td></tr>
<tr><td>iv</td><td>List of raw materials required and their source along with mode of transportation.</td><td>
<table>
<tr><th>S.No</th><th>Name of the Product</th><th>Existing TPA</th><th>Proposed TPA</th><th>After Expansion TPA</th><th>Source</th><th>Mode of transport</th></tr>
<tr><td>1</td><td>Steel Scrap</td><td>15696</td><td>35472</td><td>51168</td><td>Tamil Nadu/ Andhra Pradesh</td><td>Road</td></tr>
<tr><td>2</td><td>Pig Iron</td><td>3768</td><td>10888</td><td>14656</td><td>Tamil Nadu</td><td>Road</td></tr>
<tr><td>3</td><td>Ferro Alloys</td><td>1212</td><td>3514</td><td>4726</td><td>Tamil Nadu</td><td>Road</td></tr>
<tr><td>4</td><td>CI Boring</td><td>-</td><td>29280</td><td>29280</td><td>Tamil Nadu</td><td>Road</td></tr>
<tr><td>5</td><td>Sand</td><td>6000</td><td>33600</td><td>39600</td><td>Tamil</td><td>Road</td></tr>
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						Nadu	
		6	Additives	300	900	1200	Tamil Nadu	Road
		7	Resin	58	600	658	Tamil Nadu	Road
		8	Returns	19824	31316	51140	Tamil Nadu	Road
v	Other chemicals and materials required with quantities and storage capacities	No other chemicals and materials are used.						

vi Details of Emission, effluents, hazardous waste generation and their management.

S. No	Description	Existing Quantity (KLD)	Proposed Quantity (KLD)	After Expansion (KLD)	Final Disposal Points
1	Sewage	20.5	4	24.5	Sewage is being treated in the STP. Treated Sewage is being used for Green Belt. Sludge will be used as manure for Green Belt.
2	Cooing tower bleed off	30	10	40	Cooling Tower Bleed off is collected from the Collection cum Re - circulation tank and the treated water will be used in cooling tower.

Waste details	Schedule	Unit	Existing Quantity,	Proposed Quantity	After expansion Quantity	Disposal method
Used/spent oil	5.1	T/Annum	0.5	0.5	1.0	Recover and Reuse – TNPCB Authorized recyclers
Wastes or residues containing oil	5.2	T/Annum	3.0	1.0	4.0	Recover and Reuse – TNPCB Authorized recyclers
Discarded containers / barrels / liners contaminated with hazardous wastes/ chemicals	33.3	T/Annum	2.5	12.5	15.0	Recover and Reuse – TNPCB Authorized recyclers

S.No.	Sources of emission	Control Measures Proposed	Stack Height from GL(m)	Stack top dimension (in Meters)
Existing				
1	Induction Furnace (6T/H) - 2Nos with 2 Crucibles each	Common fumes extraction system, Cartridge bag filter with stack	30.0	1.0
2	Induction Furnace (1T/H) 3 Nos. with 3 Crucibles each	Common fumes extraction system, wet scrubber with stack	15.0	0.8
3	Sand Shake out plant (1)	Individual Cartridge Bag Filter with stack	30.0	1.2
4	Sand Plant (2)	Individual	30.0	1.2

				Cartridge Bag Filter with stack		
		5	Cool Drum	Cartridge Bag Filter with stack	30.0	1.45
		6	DISA Shot Blasting	Cartridge Bag Filter with stack	8.0	0.3
		7	Online Shot Blast	Cartridge Bag Filter with stack	13.0	0.6
		8	tumb Shot Blast Finishing 1T	Cartridge Bag Filter with stack	7.0	0.2
		9	Span Core Shooter	Wet scrubber with stack	4.0	0.45
		10	Laempe Core Shooter	Wet scrubber with stack	4.6	0.40
		11	Core Shop	Cartridge Bag Filter with stack	9.3	0.40
		12	Fettling Shop	Cartridge Bag Filter with stack	7.5	0.40
		13	500 KVA DG Set	Acoustic enclosures with stack.	9.8	0.23
		Proposed				
		1	Induction Furnace (10T/H) – 1 Nos with Dual track 2 Crucibles each	Common fumes extraction system, Cartridge bag filter with stack	30.0	1.0
		2	Sand plant (1)	Individual Cartridge Bag Filter with stack	30.0	1.2
		3	Cool Drum	Cartridge Bag Filter with stack	30.0	1.45
		4	Online Shot Blast	Cartridge Bag Filter with stack	13.0	0.6
		5	Grinding Machine	Cartridge Bag Filter with stack	13.0	0.6
vii	Requirement of water, power, with source of supply, status of approval, water balance diagram, man-power requirement (regular and	The following are the required details: **Water requirement Details:** Total Water Requirement: 805 KLD Source of water: SIPCOT Water Water requirement details is given in Chapter 2, Table 2.12 Water Balance diagram given in Figure 2.8 & Figure 2.9. **Power requirement details:** Existing Demand = 10,250 KW				

<table>
<tr><td></td><td>contract)</td><td>Additional Demand = 12,750 KW
Source = TNEB
Manpower Requirement details:
<table>
<tr><th>Description</th><th>Contract workers In Nos</th><th>Permanent workers In Nos</th><th>Total (In Nos)</th></tr>
<tr><td>Construction Phase</td><td>45</td><td>5</td><td>50</td></tr>
<tr><td colspan="4">Operation Phase (Nos)</td></tr>
<tr><td>Existing</td><td>180</td><td>300</td><td>480</td></tr>
<tr><td>Proposed</td><td>70</td><td>30</td><td>100</td></tr>
<tr><td>Total</td><td>250</td><td>330</td><td>580</td></tr>
</table></td></tr>
<tr><td>vii i</td><td>The project proponent shall furnish the requisite documents from the competent authority in support of drawl of ground water and surface water and supply of electricity.</td><td>No ground water will be withdrawal. The source water is SIPCOT water.</td></tr>
<tr><td>ix</td><td>Process description along with major equipments and machineries, process flow sheet (quantitate) from raw material to products to be provided</td><td>Detailed project description, major equipments and machineries, process flow sheet and given in Chapter 2, Section 2.6</td></tr>
<tr><td>X</td><td>Hazard identification and details of proposed safety systems.</td><td>Hazard identification and details of safety system is included in Chapter 7.</td></tr>
<tr><td>xi</td><td>Expansion/modernization proposals:</td><td></td></tr>
<tr><td>a</td><td>Copy of all the Environmental Clearance(s)</td><td>Copy of Environmental clearance is enclosed as Annexure 2.
Copy of certified EC Compliance report from MoEF & CC is enclosed as Annexure 4.</td></tr>
</table>

	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 on-going I existing operation of the project from SPCB shall be attached with the EIA-EMP report.	
b	In case the existing project has not obtained environmental	Not Applicable. The unit was obtained Environmental Clearance from MoEF&CC. The EC Certified compliance was obtained from MoEF&CC Regional office, Chennai.

	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.	
4.	**Site Details**	
i	Location of the project site covering village, Taluka/Tehsil, District and State, Justification for selecting the site, whether other sites were considered.	The project site is located at SIPCOT Industrial Estate, Pappankuppam Village, Gummidipoondi, Thiruvallur, Tamil Nadu. The proposed expansion will be carried out in the existing unit where all the infrastructure facilities are available. Alternative sites are therefore not considered.
ii	A toposheet of the study area of radius	The project site covered under Toposheet No. 66C/2 & 66C/3 scale 1:5000 covering 10 km covered the site has been attached

<table>
<tr><td></td><td>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)</td><td>as Figure 2.2.</td></tr>
<tr><td>iii</td><td>Details w.r.t. option analysis for selection of site</td><td>The proposed project will be carried out in existing project site only. No any alternative site was examined.</td></tr>
<tr><td>iv</td><td>Co-ordinates (lat-long) of all four corners of the site.</td><td>
<table>
<tr><th>S.N</th><th>Point</th><th>Latitude and Longitude</th></tr>
<tr><td>1</td><td>A</td><td>13°24'57.76"N, 80°6'2.69"E</td></tr>
<tr><td>2</td><td>B</td><td>13°24'56.32"N, 80°6'11.66"E</td></tr>
<tr><td>3</td><td>C</td><td>13°24'49.36"N, 80°6'10.26"E</td></tr>
<tr><td>4</td><td>D</td><td>13°24'51.63"N, 80°6'1.11"E</td></tr>
</table>
</td></tr>
<tr><td>v</td><td>Google map-Earth downloaded of the project site.</td><td>Google map showing 10Km radius and Site marked in Google earth is given in Chapter 2, Figure 2.3 & Figure 2.4.</td></tr>
<tr><td>vi</td><td>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.</td><td>The Project is located within the SIPCOT Industrial Complex. Detailed Layout plan of existing and proposed components is given in Chapter 2, Figure 2.5.
<table>
<tr><th rowspan="2">S. No</th><th rowspan="2">Description</th><th colspan="3">Area in Acres</th><th rowspan="2">%</th></tr>
<tr><th>Existing</th><th>Proposed</th><th>After expansion</th></tr>
<tr><td>1</td><td>Plot area</td><td>4.49</td><td>1.74</td><td>6.23</td><td>40</td></tr>
<tr><td>2</td><td>Green Belt Area</td><td>5.13.2</td><td>-</td><td>5.12</td><td>33</td></tr>
<tr><td>3</td><td>Road</td><td>2.20</td><td>-</td><td>2.20</td><td>14</td></tr>
<tr><td>4</td><td>Parking</td><td>0.1</td><td>-</td><td>0.1</td><td>1</td></tr>
<tr><td>5</td><td>Other Utilities</td><td>0.2</td><td>-</td><td>0.2</td><td>1</td></tr>
<tr><td>4</td><td>Vacant Land</td><td>3.43</td><td>-1.74</td><td>1.69</td><td>11</td></tr>
<tr><td></td><td>Total</td><td>15.54</td><td>-</td><td>15.54</td><td>100</td></tr>
</table>
</td></tr>
<tr><td>vii</td><td>Photographs of the</td><td>Photographs of Existing site are enclosed in Chapter 2, Figure</td></tr>
</table>

<table>
<tr><td></td><td>proposed and existing (if applicable) plant site. If existing, show photographs of plantation/greenbelt, in particular.</td><td>2.6.</td></tr>
<tr><td>viii</td><td>Landuse 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)</td><td>The Land use pattern of the project site industrial land, the project site is located Gummidipoondi SIPCOT Industrial area.
<table>
<tr><th rowspan="2">S. No</th><th rowspan="2">Description</th><th colspan="3">Area in Acres</th><th rowspan="2">%</th></tr>
<tr><th>Existing</th><th>Proposed</th><th>After expansion</th></tr>
<tr><td>1</td><td>Plot area</td><td>4.49</td><td>1.74</td><td>6.23</td><td>40</td></tr>
<tr><td>2</td><td>Green Belt Area</td><td>5.13.2</td><td>-</td><td>5.12</td><td>33</td></tr>
<tr><td>3</td><td>Road</td><td>2.20</td><td>-</td><td>2.20</td><td>14</td></tr>
<tr><td>4</td><td>Parking</td><td>0.1</td><td>-</td><td>0.1</td><td>1</td></tr>
<tr><td>5</td><td>Other Utilities</td><td>0.2</td><td>-</td><td>0.2</td><td>1</td></tr>
<tr><td>4</td><td>Vacant Land</td><td>3.43</td><td>-1.74</td><td>1.69</td><td>11</td></tr>
<tr><td></td><td>Total</td><td>15.54</td><td>-</td><td>15.54</td><td>100</td></tr>
</table></td></tr>
<tr><td>ix</td><td>A list of major industries with name and type within study area (10km radius) shall be incorporated. Land use details of the study area</td><td>A list of Major industries is given in Chapter 1, Section 1.6.1. Land use details of study area is given in Chapter 3, Section 3.4, Table 3.2.</td></tr>
<tr><td>x</td><td>Geological features and Geo-hydrological status of the study area shall be included.</td><td>• Sub surface geological formation comprises of fine to Red Soil, Alluvial Soil, Colluvial soil.
• The major part is covered by sandy & clay loam type.
• Ground water generally occurs under phreatic conditions in the weathered mantle and under semi-confined conditions in the fissured and fractured zones at deeper levels.
• The depth to water level in the district varied between 2.38 – 7.36 m bgl during pre-monsoon (May 2006) and 0.79 – 5.30 m bgl during post monsoon (Jan 2007).</td></tr>
</table>

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)	No river is run within 1km radius of project site. Details of water bodies within 10km radius are given in Chapter 3, Table 3.6 Rain fall data of past 30 years is given in Chapter 3, Table 3.10.
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.	The project has 15.54 Acre of own land. No additional land will be required for expansion activity.
xiii	R&R details in respect of land in line with state Government policy	The project doesn't involve any displacement of population and subsequent Rehabilitation & Resettlement.
5	**Forest and wildlife related issues**	
i	Permission and approval for the use of forest land (forestry clearance),	No forest land is involved hence no forest clearance required.

	if any, and recommendations of the State Forest Department. (if applicable)	
ii	Land use 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)	Land use map is given in chapter 3 section 3.4. Figure 3.5. The forest land is not involved in this project.
iii	Status of Application submitted for obtaining the stage I forestry clearance along with latest status shall be submitted.	The forest land is not involved in this project. 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	Pulicat lake is located 8.5km from the project site. Hence the unit is under processing of NBWL Clearance. The Acknowledgement copy is enclosed as **Annexure 18**.

	location and the recommendations or comments of the Chief Wildlife Warden-thereon	
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	Pulicat lake is located 8.5km from the project site. Hence the unit is under processing of NBWL Clearance. The Acknowledgement copy is enclosed as **Annexure 18.**
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.	The Baseline Meteorological data was generated from 15th June 2022 to 15th September 2022. Detailed Meteorological data Given in Chapter 3 of EIA Report, Section 3.8.1 to 3.8.5.
ii	AAQ data (except	The below table showing locations of air monitoring stations

<table>
<tr>
<td></td>
<td>monsoon) at 8 locations for PM10, PM2.5, SO2, 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.</td>
<td>
<table>
<tr><th>S.No.</th><th>Location Code</th><th>Location Name</th><th>Wind Direction</th><th>Distance</th><th>Direction</th></tr>
<tr><td>1</td><td>AAQ1</td><td>Project site</td><td></td><td colspan="2">Within Site</td></tr>
<tr><td>2</td><td>AAQ 2</td><td>Billakuppam</td><td>u/w</td><td>2.10</td><td>WNW</td></tr>
<tr><td>3</td><td>AAQ 3</td><td>Gummidipoondi</td><td>d/w</td><td>2.8</td><td>E</td></tr>
<tr><td>4</td><td>AAQ 4</td><td>Rajapalayam</td><td>d/w</td><td>6.10</td><td>NE</td></tr>
<tr><td>5</td><td>AAQ 5</td><td>Peria Soliampakkam</td><td>d/w</td><td>5.0</td><td>ENE</td></tr>
<tr><td>6</td><td>AAQ 6</td><td>Thandalacheri</td><td>c/w</td><td>3.8</td><td>S</td></tr>
<tr><td>7</td><td>AAQ 7</td><td>Papankuppam</td><td>c/w</td><td>0.9</td><td>NNW</td></tr>
<tr><td>8</td><td>AAQ 8</td><td>Chinna Obulapuram</td><td>c/w</td><td>4.0</td><td>NE</td></tr>
</table>
Topo sheet showing the locations of monitoring stations is provided at Figure 3.14.
Abstract of the air monitoring is given in Table 3.14
</td>
</tr>
<tr>
<td>iii</td>
<td>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.</td>
<td>Raw data of all AAQ measurement is provided as Annexure-17.
The minimum., maximum., average and 98% values for each of the AAQ parameters from data of all AAQ stations is provided chapter 3 section 3.9</td>
</tr>
<tr>
<td>iv</td>
<td>Surface water quality of nearby</td>
<td>Topo sheet showing the location of monitoring stations is provided at Chapter 3, Figure 3.11</td>
</tr>
</table>

<table>
<tr>
<td></td>
<td>River (100m upstream and downstream of discharge point) and other surface drains at eight locations as per CPCB/MoEF&CC guidelines.</td>
<td>The below table showing location of surface water monitoring station.
<table>
<tr><th>S.No</th><th>Location</th><th>Location Code</th><th>Distance (km)</th><th>Direction</th></tr>
<tr><td>1</td><td>Lake near Nagaraja Kandigai</td><td>SW1</td><td>4.3</td><td>NNW</td></tr>
<tr><td>2</td><td>Chitoornatham Lake</td><td>SW2</td><td>4.8</td><td>W</td></tr>
<tr><td>3</td><td>Karumbukuppam Lake</td><td>SW3</td><td>2.40</td><td>SE</td></tr>
<tr><td>4</td><td>Pulicat Lake</td><td>SW4</td><td>8.5</td><td>NNE</td></tr>
<tr><td>5</td><td>Thandalacheri Lake</td><td>SW5</td><td>3.8</td><td>S</td></tr>
<tr><td>6</td><td>Therauli Lake</td><td>SW6</td><td>4.3</td><td>NE</td></tr>
</table>
Results of the surface water monitoring is given in Table 3.7</td>
</tr>
<tr>
<td>v</td>
<td>Whether the site falls near to polluted stretch of river identified by the CPCB/MoEF&CC, if yes give details.</td>
<td>No, the site does not fall near the polluted stretch of any river identified by the CPCB/ MoEF&CC.</td>
</tr>
<tr>
<td>vi</td>
<td>Ground water monitoring at minimum at 8 locations shall be included.</td>
<td>Toposheet showing the locations of monitoring stations is provided at Chapter 3, Figure 3.10
The below table showing locations of ground water monitoring stations.
<table>
<tr><th>S.No.</th><th>Location Code</th><th>Location Name</th><th>Distance</th><th>Direction</th></tr>
<tr><td>1</td><td>GW 1</td><td>Project site</td><td colspan="2">Within Site</td></tr>
<tr><td>2</td><td>GW2</td><td>Billakuppam</td><td>2.10</td><td>WNW</td></tr>
<tr><td>3</td><td>GW3</td><td>Gummidipoondi</td><td>2.8</td><td>E</td></tr>
<tr><td>4</td><td>GW4</td><td>Rajapalayam</td><td>6.10</td><td>NE</td></tr>
<tr><td>5</td><td>GW5</td><td>Peria Soliampakkam</td><td>5.0</td><td>ENE</td></tr>
<tr><td>6</td><td>GW6</td><td>Thandalacheri</td><td>3.8</td><td>S</td></tr>
<tr><td>7</td><td>GW7</td><td>Papankuppam</td><td>0.9</td><td>NNW</td></tr>
<tr><td>8</td><td>GW8</td><td>Chinna Obulapuram</td><td>4.0</td><td>NE</td></tr>
</table>
Results of the ground water monitoring is given in Table 3.5</td>
</tr>
</table>

<table>
<tr><td>vii</td><td>Noise levels monitoring at 8 locations within the study area.</td><td>Toposheet showing the locations of monitoring stations is provided at Chapter 3, Figure 3.15.
The table showing locations of noise monitoring stations
<table>
<tr><th>S.No.</th><th>Location Code</th><th>Location Name</th><th>Distance in KM</th><th>Direction</th></tr>
<tr><td>1</td><td>N1</td><td>Project site</td><td colspan="2">Within Site</td></tr>
<tr><td>2</td><td>N2</td><td>Billakuppam</td><td>2.10</td><td>WNW</td></tr>
<tr><td>3</td><td>N3</td><td>Gummidipoondi</td><td>2.8</td><td>E</td></tr>
<tr><td>4</td><td>N4</td><td>Rajapalayam</td><td>6.10</td><td>NE</td></tr>
<tr><td>5</td><td>N5</td><td>Peria Soliampakkam</td><td>5.0</td><td>ENE</td></tr>
<tr><td>6</td><td>N6</td><td>Thandalacheri</td><td>3.8</td><td>S</td></tr>
<tr><td>7</td><td>N7</td><td>Papankuppam</td><td>0.9</td><td>NNW</td></tr>
<tr><td>8</td><td>N8</td><td>Chinna Obulapuram</td><td>4.0</td><td>NE</td></tr>
</table>
Results of the noise monitoring is given in Table 3.8
Highest level of 65.0 dB (A) was observed which may be due to on-going industrial operations.</td></tr>
<tr><td>vii i</td><td>Soil Characteristic as per CPCB guidelines.</td><td>Toposheet showing the locations of monitoring stations is provided at Chapter 3, Figure 3.12.
The below table showing locations of soil monitoring stations.
<table>
<tr><th>S.No.</th><th>Location Code</th><th>Location Name</th><th>Distance in km</th><th>Direction</th></tr>
<tr><td>1</td><td>S1</td><td>Project site</td><td colspan="2">Within Site</td></tr>
<tr><td>2</td><td>S2</td><td>Billakuppam</td><td>2.10</td><td>WNW</td></tr>
<tr><td>3</td><td>S3</td><td>Gummidipoondi</td><td>2.8</td><td>E</td></tr>
<tr><td>4</td><td>S4</td><td>Rajapalayam</td><td>6.10</td><td>NE</td></tr>
<tr><td>5</td><td>S5</td><td>Peria Soliampakkam</td><td>5.0</td><td>ENE</td></tr>
<tr><td>6</td><td>S6</td><td>Thandalacheri</td><td>3.8</td><td>S</td></tr>
<tr><td>7</td><td>S7</td><td>Papankuppam</td><td>0.9</td><td>NNW</td></tr>
<tr><td>8</td><td>S8</td><td>Chinna Obulapuram</td><td>4.0</td><td>NE</td></tr>
</table>
Results of the soil monitoring is given in Table 3.9</td></tr>
<tr><td>ix</td><td>Traffic study of the area, type of vehicles, frequency of vehicles for transportation of materials,</td><td>The traffic study is conducted on Gummidipoondi to Kallur Road access road. The volume of traffic on access road which is double lane road is 1495 PCU/Day
Traffic data is Included in Chapter 3 of EIA Report, Section 3.12, page no 3- 149.Table:3.23.</td></tr>
</table>

	additional traffic due to proposed project, parking arrangement etc.	
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.	Detailed description of flora and fauna (terrestrial and aquatic) existing in the study area is given in Chapter 3 of EIA Report, Section 3.13.
xi	Socio-economic status of the study area	The geographical coverage for Socio economic survey of the project extends over the area falling within the 10 km radius from the project site and comprises as many as 46 villages and habitations spread across Gummidipoondi Sub- districts. Socio economic status of the study area is Included in Chapter 3 of EIA Report, Section 3.11.
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	Assessment of ground level concentration of pollutants from the stack emission based on site-specific meteorological features in Chapter 4 of EIA Report. Air Quality Modelling report Attached as **Annexure 27**.

	AQIP Modelling 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 modelling 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.	
ii	Water Quality modelling - in case of discharge in water body	Since, no process related effluent is generated & discharged, this requirement is not applicable. Sewage is being treated in STP.
iii	Impact of the transport of the raw materials and end products on the surrounding environment shall	The traffic study is conducted on Gummidipoondi to Kallur Road access road. The volume of traffic on access road which is double lane road is 1495 PCU/Day Traffic data is Included in Chapter 3 of EIA Report, Section 3.12, page no 3- 149.Table:3.23.

	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 conveyorcum-rail transport shall be examined.	
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.	The treatment of process water is given in Chapter 2 of EIA Report, Section 2.9.1.
v	Details of stack emission and action plan for control of emissions to meet standards.	The details provided in the Chapter 2 of EIA Report, Table 2.13.
vi	Measures for fugitive emission	The fugitive emission control measures given in chapter 10 section 10.4.2.1.

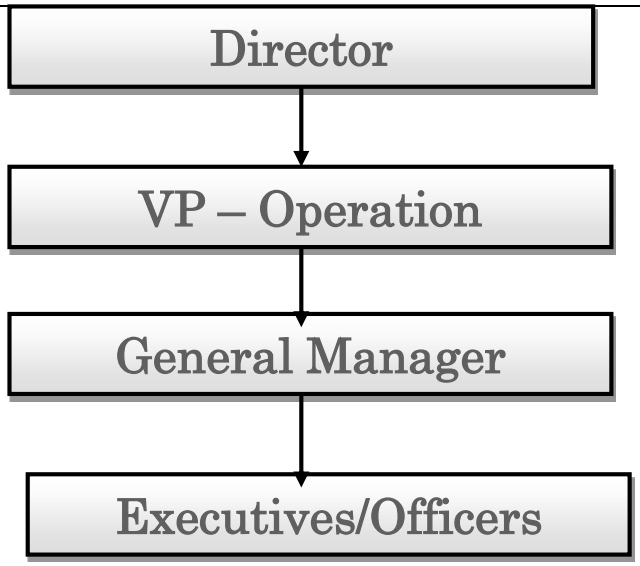
<table>
<tr><td></td><td>control</td><td></td></tr>
<tr><td>vii</td><td>Details of hazardous waste generation and their storage, utilization and management.
Copies of MOU regarding utilization of solid and hazardous waste in cement plant shall also be included. EMP shall include the concept of waste-minimization, recycle/reuse/recover techniques, Energy conservation, and natural resource conservation.</td><td>
<table>
<tr><th>Waste details</th><th>Schedule</th><th>Unit</th><th>Existing Quantity,</th><th>Proposed Quantity</th><th>After expansion Quantity</th><th>Disposal method</th></tr>
<tr><td>Used/spent oil</td><td>5.1</td><td>T/Annum</td><td>0.5</td><td>0.5</td><td>1.0</td><td>Recover and Reuse – TNPCB Authorized recyclers</td></tr>
<tr><td>Wastes or residues containing oil</td><td>5.2</td><td>T/Annum</td><td>3.0</td><td>1.0</td><td>4.0</td><td>Recover and Reuse – TNPCB Authorized recyclers</td></tr>
<tr><td>Discarded containers / barrels / liners contaminated with hazardous wastes/ chemicals</td><td>33.3</td><td>T/Annum</td><td>2.5</td><td>12.5</td><td>15.0</td><td>Recover and Reuse – TNPCB Authorized recyclers</td></tr>
</table>
Hazardous waste Agreement Copy is enclosed as Annexure 15 & 16.
</td></tr>
<tr><td>viii</td><td>Proper utilization of fly ash shall be ensured as per Fly Ash Notification, 2009. A detailed plan of action shall be provided.</td><td>No fly ash is either generated in the unit existing and after expansion. However, during construction, wherever required fly ash based cement and other products such as blocks, pavers, bricks & tiles will be used.</td></tr>
<tr><td>ix</td><td>Action plan for the green belt development plan in 33 % area i.e. land with not less</td><td>The Total Green Belt Area: 2.07 Hectare. (As per MOEF&CC norms 1500 trees to planted per Hectare). Hence 3000 trees to be planted in 2.07 Ha.</td></tr>
</table>

<table>
<tr><td></td><td>than 1,500 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.</td><td>Existing 1368 trees are planted in project site, hence remaining 1700 tress to be planted in project site area.</td></tr>
<tr><td>x</td><td>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.</td><td>Detailed rain water harvesting methods is Included in Chapter 10 of EIA Report, Section 10.5.</td></tr>
<tr><td>xi</td><td>Total capital cost and recurring cost/annum for environmental</td><td><table>
<tr><th>S.No.</th><th>Particulars</th><th>Capital cost In Lakhs</th><th>Recurring cost in Lakhs</th></tr>
<tr><td>1.</td><td>Air Pollution Control measures</td><td>40.0</td><td>5.0</td></tr>
</table></td></tr>
</table>

<table>
<tr><td></td><td>pollution control measures shall be included.</td><td>
<table>
<tr><td>2.</td><td>Sewage treatment Plant</td><td>35.0</td><td>3.0</td></tr>
<tr><td>3.</td><td>Solid Waste Management & dust prevention measure</td><td>10.0</td><td>2.0</td></tr>
<tr><td>4.</td><td>Solar lighting in open areas</td><td>30.0</td><td>3.0</td></tr>
<tr><td>5.</td><td>Noise Pollution Control</td><td>10.0</td><td>3.0</td></tr>
<tr><td>6.</td><td>Environmental Monitoring & Management</td><td>-</td><td>5.0</td></tr>
<tr><td>7.</td><td>Green belt & open area development*</td><td>15.0</td><td>2.0</td></tr>
<tr><td>8.</td><td>Rainwater harvesting pits</td><td>15.0</td><td>2.0</td></tr>
<tr><td colspan="2">Total</td><td>155.0</td><td>25.0</td></tr>
</table>
</td></tr>
<tr><td>xii</td><td>Action plan for post-project environmental monitoring shall be submitted.</td><td>Action plan for post-project environmental monitoring is given in Chapter 6 of EIA Report, Table 6.4.</td></tr>
<tr><td>xiii</td><td>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.</td><td>Onsite emergency plan is drawn for handling emergencies that may be manmade or natural within shortest possible time with the available resources. The existing set up will be further strengthened to meet any eventually. The highlights of plan are:
➢ The clock securely setup.
➢ Making ‘First Aid’ available & contact with nearly hospitals, police stations and industries.
➢ Deputing a responsible person to be contacted in case of emergency.
➢ Free access to areas where emergency is to be attended.
➢ Assembly points for workers/contact labour & the visitors.
➢ Proper coding of equipments & their locations for attending the emergency.</td></tr>
<tr><td>8</td><td>Occupational health</td><td></td></tr>
<tr><td>i</td><td>Plan and fund allocation to ensure the occupational health & safety of all contract and casual workers</td><td>The total cost of 15 Lakhs/Annum is allocated for Action plan for Occupational Health & Safety of workers and recurring cost is 5 Lakhs/Annum.
Plan and fund allocation to ensure the occupational health & safety of all contract and casual workers are detailed in the Chapter 10.</td></tr>
<tr><td>ii</td><td>Details of exposure</td><td>Periodic medical health check-up of worker is being/shall be</td></tr>
</table>

<table>
<tr><td></td><td>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 any other ocular defect) ECG, during pre-placement and periodical examinations give the details of the same. Details regarding last month analysed data of above mentioned parameters as per age, sex, duration of exposure and department wise.</td><td>done based on their age and the records maintained.
The age specific frequency of examination is:
➢ For new entrants & employees below 30 years, once in 5 years
➢ Between 31-40, once in 4 years
➢ Between 41-50, once in 2 years
➢ Above 50 years, every year</td></tr>
<tr><td>iii</td><td>Details of existing Occupational & Safety Hazards. And whether they are within Permissible Exposure level (PEL). If these are not within PEL, what measures the company has</td><td>M/s. Danblock Breaks India Pvt Ltd, provides a safe and healthy work environment to its employees by conducting annual medical check-ups for all the employees. The unit medical surveillance program includes following major elements; Medical report is enclosed as Annexure 19.
<table>
<tr><th>S.No</th><th>Solvent</th><th colspan="2">Permissible Exposure level</th></tr>
<tr><td rowspan="3">1</td><td rowspan="3">Diesel</td><td>Carbon Monoxide</td><td>50 PPM</td></tr>
<tr><td>NO (Nitric oxide)</td><td>25 PPM</td></tr>
<tr><td>NO_2 (Nitrogen Dioxide)</td><td>5 PPM</td></tr>
</table></td></tr>
</table>

	adopted to keep them within PEL so that health of the workers can be preserved,	
iv	Annual report of health status of workers with special reference to Occupational Health and Safety.	Periodic medical examination is the same as the pre-employment screening and may be modified according to current conditions, such as changes in the employee's symptoms, site hazards or exposures Medical report is enclosed as **Annexure 19.**
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.	Yes. Environmental Policy is appended in Chapter 10, Section 10.19. The training Plan to employee along with photograph of training details are enclosed in **Annexure 23.**
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.	The SOP is applicable to the Danblock Breaks India Pvt Ltd. The policies and regulation which apply to the site and the Environmental Management system is in place to ensure compliance. The plan outlines the environmental monitoring requirement, sampling methods, frequency and reporting requirement for air quality monitoring and control measures, bag filter system and preventive measure, water quality monitoring, Noise quality monitoring and mitigation measure. The Environment Policy prescribes for standard operating process/procedures to bring into focus any infringement/ deviation/ violation of the environment is given in SOP.

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.	
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	The reporting system non-compliances/ violations of environmental norms to the Board of Directors of the company details is given in SOP
10	Details regarding infrastructure facilities such as sanitation, fuel, restroom etc. to be provided to the labour force during	The layout indicating sanitation, restroom, manafacturing area, admin block etc. is appended in Chapter 2, Figures 2.5 and site layout is enclosed as **Annexure-7.**

	construction as well as to the casual workers including truck drivers during operation phase.	
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.	The management of company has earmarked Rs. 15 lakhs towards CER. The amount will be spent in the surrounding villages on such social activities as providing Government school renovation and construction work, greenbelt development, smart board etc. Details of CER activities is given in **Table 10.10**
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,	No such litigation pending against the project.

	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.	
Additional TORs For Metallurgical Industry (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).	Details given in EIA report Chapter 2 section 2.6 Figure 2.7
2	Emission from sulphuric acid plant and sulphur muck management.	Not applicable. As no sulphuric acid manufacturing is involved.
3	Details on installation of Continuous Emission monitoring System with recording with proper calibration system.	The continuous emission monitoring system has installed in the project site. The online monitoring results shall be linked to SPCB & CPCB portals. The online monitoring photograph is enclosed in **Annexure 21**.
4	Details on toxic metals including fluoride emissions.	Not Applicable. As no toxic metals and other toxic materials will be used and manufactured.

5	Details on stack height.	**S.No.**	**Sources of emission**	**Control Measures Proposed**	**Stack Height from GL(m)**	**Stack top dimension (in Meters)**
		Existing				
		1	Induction Furnace (6T/H) - 2Nos with 2 Crucibles each	Common fumes extraction system, Cartridge bag filter with stack	30.0	1.0
		2	Induction Furnace (1T/H) 3 Nos. with 3 Crucibles each	Common fumes extraction system, wet scrubber with stack	15.0	0.8
		3	Sand Shake out plant (1)	Individual Cartridge Bag Filter with stack	30.0	1.2
		4	Sand Plant (2)	Individual Cartridge Bag Filter with stack	30.0	1.2
		5	Cool Drum	Cartridge Bag Filter with stack	30.0	1.45
		6	DISA Shot Blasting	Cartridge Bag Filter with stack	8.0	0.3
		7	Online Shot Blast	Cartridge Bag Filter with stack	13.0	0.6
		8	tumb Shot Blast Finishing 1T	Cartridge Bag Filter with stack	7.0	0.2
		9	Span Core Shooter	Wet scrubber with stack	4.0	0.45
		10	Laempe Core Shooter	Wet scrubber with stack	4.6	0.40
		11	Core Shop	Cartridge Bag Filter with stack	9.3	0.40
		12	Fettling Shop	Cartridge Bag Filter with stack	7.5	0.40
		13	500 KVA DG Set	Acoustic enclosures with stack.	9.8	0.23
		Proposed				
		1	Induction Furnace (10T/H) – 1	Common fumes extraction system, Cartridge bag filter	30.0	1.0

			Nos with Dual track 2 Crucibles each	with stack		
		2	Sand plant (1)	Individual Cartridge Bag Filter with stack	30.0	1.2
		3	Cool Drum	Cartridge Bag Filter with stack	30.0	1.45
		4	Online Shot Blast	Cartridge Bag Filter with stack	13.0	0.6
		5	Grinding Machine	Cartridge Bag Filter with stack	13.0	0.6
6	Details on ash disposal and management.	Not Applicable. The process does not involve the use of fossil fuels and biomass.				
7	Complete process flow diagram describing process of lead/zinc/copper/aluminum etc.	Not Applicable. As the process is based on simple secondary metallurgy using iron scrap and induction furnace. No ore is processed.				
8	Details on smelting, thermal refining, melting, slag fuming and Waelz kiln operation	Not Applicable. The process doesn't involve any of the designated operations.				
9	Details on Holding and de-gassing of molten metal from primary and secondary aluminum, materials pre-treatment and from melting and smelting of secondary aluminum.	Not Applicable. As no such operations are involved.				
10	Details on toxic metal content in the waste material and	Slag will be generated from the process and it will be stored and disposed to TNPCB authorized vendors. The agreement copy is enclosed as **Annexure 16.**				

	its composition and end use (particularly of slag).	
11	Trace metals in waste material especially slag.	Slag will be generated from the process and it will be stored and disposed to TNPCB authorized vendors. The agreement copy is enclosed as **Annexure 16.**
12	Plan for trace metal recovery	Metal recovery details given in **Annexure 22.**
13	Trace metals in water.	Not Applicable. As the process doesn't involve the use of water in the process thereby no process related waste water requiring subsequent disposal

1.2. Specific and Additional Condition

S.N	Terms and Condition	Compliance Status
1	The PP shall obtain NBWL Clearance since the Pulicat Eco- sensitive Zone is located within 10 km from the project site	The unit has Obtained NBWL Clearance from Government of Tamil Nadu Same copy is enclosed as **Annexure 18.**
2	The proponent shall furnish the production detail submitted to the commercial tax department for the last 5 years.	Danblock acquired this facility from JKM on 2021. The last 16 months' production details are given below:

Month	Gross Production (MT)	Net Production (MT)
Jun-21	1,308.90	1,253.24
Jul-21	571.90	529.67
Aug-21	846.30	804.02
Sep-21	650.00	595.38
Oct-21	1,028.60	947.20
Nov-21	1,167.60	1,048.17
Dec-21	1,351.00	1,226.44
Jan-22	1,301.87	1,167.47
Feb-22	1,641.37	1,468.27
Mar-22	1,870.64	1,698.63

<table>
<tr><td></td><td></td><td></td><td>
<table>
<tr><td>Apr-22</td><td>1,736.11</td><td>1,580.57</td></tr>
<tr><td>May-22</td><td>1,839.09</td><td>1,728.30</td></tr>
<tr><td>Jun-22</td><td>1,929.01</td><td>1,845.42</td></tr>
<tr><td>Jul-22</td><td>2,389.32</td><td>2,269.40</td></tr>
<tr><td>Aug-22</td><td>2,249.04</td><td>2,139.83</td></tr>
<tr><td>Sep-22</td><td>2,139.76</td><td>2,026.34</td></tr>
</table>
</td></tr>
<tr><td>3</td><td>The proponent shall submit the copy of the consent to operate and the latest renewal consent order issued by the TNPCB</td><td colspan="2">The CTE and CTOs copy is enclosed as Annexure 3.
The current CTO copy is valid upto 31.03.2023 the same copy is enclosed as Annexure 3.</td></tr>
<tr><td>4</td><td>The project proponent shall furnish the detailed comparison statement of existing and expansion project details in the EIA report.</td><td colspan="2">The existing and expansion project details have given in EIA report in Chapter 2. Section 2.3.</td></tr>
<tr><td>5</td><td>The proponent shall submit the compliance report from TNPCB for the conditions imposed in the consent order issued by the TNPCB and Environmental clearance.</td><td colspan="2">The latest compliance report from MoEF & CC is enclosed as Annexure 4.
The copy of Environmental Clearance is enclosed as Annexure 2.</td></tr>
<tr><td>6</td><td>The proponent shall implement the cleaner technology for the expansion activity and the detail should be included in the EIA report.</td><td colspan="2">The cleaner technology details given in chapter 4 section</td></tr>
</table>

7	The Environmental pollution control measures proposed to deal with increased air pollution, effluent generation and slag generation should be detailed.	**S. No.**	**Sources of emission**	**Control Measures Proposed**	**Stack Height from GL(m)**	**Stack top dimension (in Meters)**
		Existing				
		1	Induction Furnace (6T/H) - 2Nos with 2 Crucibles each	Common fumes extraction system, Cartridge bag filter with stack	30.0	1.0
		2	Induction Furnace (1T/H) 3 Nos. with 3 Crucibles each	Common fumes extraction system, wet scrubber with stack	15.0	0.8
		3	Sand Shake out plant (1)	Individual Cartridge Bag Filter with stack	30.0	1.2
		4	Sand Plant (2)	Individual Cartridge Bag Filter with stack	30.0	1.2
		5	Cool Drum	Cartridge Bag Filter with stack	30.0	1.45
		6	DISA Shot Blasting	Cartridge Bag Filter with stack	8.0	0.3
		7	Online Shot Blast	Cartridge Bag Filter with stack	13.0	0.6
		8	tumb Shot Blast Finishing 1T	Cartridge Bag Filter with stack	7.0	0.2
		9	Span Core Shooter	Wet scrubber with stack	4.0	0.45
		10	Laempe Core Shooter	Wet scrubber with stack	4.6	0.40
		11	Core Shop	Cartridge Bag Filter with stack	9.3	0.40
		12	Fettling Shop	Cartridge Bag Filter with stack	7.5	0.40
		13	500 KVA DG Set	Acoustic enclosures with stack.	9.8	0.23
		Proposed				
		1	Induction Furnace (10T/H) – 1 Nos with Dual track 2 Crucibles each	Common fumes extraction system, Cartridge bag filter with stack	30.0	1.0
		2	Sand plant (1)	Individual	30.0	1.2

			Cartridge Bag Filter with stack		
		3	Cool Drum	Cartridge Bag Filter with stack	30.0	1.45
		4	Online Shot Blast	Cartridge Bag Filter with stack	13.0	0.6
		5	Grinding Machine	Cartridge Bag Filter with stack	13.0	0.6

S. No	Description	Existing Quantity (KLD)	Proposed Quantity (KLD)	After Expansion (KLD)	Final Disposal Points
1	Sewage	20.5	4	24.5	Sewage is being treated in the STP. Treated Sewage is being used for Green Belt. Sludge will be used as manure for Green Belt.
2	Cooing tower bleed off	30	10	40	Cooling Tower Bleed off is collected from the Collection cum Re - circulation tank and the treated water will be used in cooling tower.

8	The project proponent has to strengthen the air pollution control	The Draft Adequacy report is enclosed as **Annexure 14**.

	measures of the existing system and furnish an adequacy report on the revamped system from a reputed institution like Anna university or IIT Madres along with the EIA report. The revamping of the existing air pollution control measures should include the interlinking of the position of the hood system and furnace to ensure that the emission from the furnace shall be treated and routed through wet scrubber and stack	
9	The proponent shall obtain prior permission from the central ground water authority for withdrawal of ground water	Not Applicable, the unit source water is SIPCOT, Gummidipoondi.
10	Material balance and water balance shall be furnished in accordance with MOEF&CC guidelines.	Material balance is enclosed as **Annexure 10.** Water balance is furnished in Chapter 2 of EIA report section. Figure 2.8 & Figure 2.9
11	A detailed report on solid waste	The Solid waste management and Hazardous waste management report is furnished in Chapter 4 of EIA report

	management, hazardous waste shall be furnished.	Section.
12	Report on AAQ survey and proposed Air pollution prevention and control measures shall be furnished in the EIA Report.	Report of AAQ survey is enclosed as Chapter 3 of EIA report Table. Air pollution prevention and control measures has furnished in the EIA Report Chapter 4 Section 4.3.
13	The project proponent shall do the stoichiometric analysis of all the involved reactions of assess the possible emission of air pollutants in addition to the criteria pollutants from the proposed project.	Not Applicable
14	Adequacy report for ETP & STP for the proposed project obtained from any reputed Government institution such as IIT, Anna university, NIT shall be furnished	Adequacy report has obtained from Anna University. The copy is enclosed as **Annexure 14**.
15	Land use classification shall be obtained from DTCP for the survey numbers of this project. Further, the project proponent	Land use classification and Planning Permission are under process.

	shall submit the planning permission obtained from the DTCP, if any	
16	The proponent shall conduct the EIA study and submit the EIA report for the entire campus along with layout and necessary documents such as "A" register and village map.	The "A" register and village map is enclosed in **Annexure 20.**
17	Public hearing points raised and commitments of the project proponent on the same along with time bound action plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP. Report of the project and to be submitted to SEIAA/SEAC with regard to the office memorandum of MOEF&CC accordingly.	Condition Noted and it will comply after Public Hearing.
18	The public hearing advertisement shall be published in one major National daily and one most	Condition Noted and it will comply after submission of EIA report in TNPCB.

<table>
<tr><td></td><td>circulated vernacular daily.</td><td></td></tr>
<tr><td>19</td><td>The PP shall produce/display the EIA report. Executive summery and other related information with respect to public hearing in Tamil Language also.</td><td>Executive summery and other related information with respect to public hearing in Tamil Language will be submitted along with the Draft EIA report.</td></tr>
<tr><td>20</td><td>The project proponent shall obtain forest under the provision of forest (conservation) Act, 1986, in case of the diversion of forest land for non-forest purpose involved in the project.</td><td>Not applicable</td></tr>
<tr><td>21</td><td>The project proponent shall obtain clearance from the National Board for wildlife, if applicable</td><td>Pulicat lake is located 8.5km from the project site. Hence the unit is under processing of NBWL Clearance. The copy is enclosed as Annexure 18.</td></tr>
<tr><td>22</td><td>The project proponent shall explore the possibilities of treating and utilizing the trade effluent and sewage within the premises to achieve zero liquid discharge.</td><td>
<table>
<tr><th>S. No</th><th>Description</th><th>Existing Quantity (KLD)</th><th>Proposed Quantity (KLD)</th><th>After Expansion (KLD)</th><th>Final Disposal Points</th></tr>
<tr><td>1</td><td>Sewage</td><td>20.5</td><td>4</td><td>24.5</td><td>Sewage is being treated in the STP. Treated Sewage is being used for Green Belt. Sludge will be used as manure for Green</td></tr>
</table>
</td></tr>
</table>

							Belt.
		2	Cooing tower bleed off	30	10	40	Cooling Tower Bleed off is collected from the Collection cum Re - circulation tank and the treated water will be used in cooling tower.
23	The layout plan shall be furnished for the greenbelt area earmarked with GPS coordinates by the project proponent on the periphery of the site and the same shall be submitted for CMDA/DTCP approval. The green belt width should be a least 3m wide all along the boundaries of the project site. The green belt area should be not less than 15% of the total, land area of the project.	The Greenbelt layout and GPS coordinates are enclosed in **Annexure 9**. The same layout has submitted to DTCP. The greenbelt is given 3m wide along the boundaries. The Total Green Belt Area: 2.07 Hectare (33%). (As per MOEF&CC norms 1500 trees to planted per **Hectare).** Hence 3000 trees to be planted in 2.07 Ha. Existing 1368 trees are planted in project site, hence 1700 tress to be planted in project site area. The greenbelt layout is enclosed in **Annexure 9.**					
24	As the plant operation involves the sensitive processing, the medical officer and supporting staff involved in the health centre activates shall be trained in occupational health	The well trained medical officer and supporting staff involved in the health centre activates.					

	surveillance (OHS) aspect through the outsourced training from the expert available in the field of OHS for ensuring the health standards of persons employed.	
25	The proposal for Roof Top solar panel shall be included in the EIA Report.	The roof top solar panel will be provided. The details is given in the chapter 10 section
26	As per the MoEF&CC office memorandum F.N 22-65/2017-IA.III dated 30.06.2020 and 20.10.2020 the proponent shall furnish the detailed EMP	The detailed EMP Report is enclosed in Chapter 10.

Condition of SEIAA

S.N	Terms and Condition	Compliance Status
1	Proposal for the APC measures provided for the furnace	Condition Complied. The detailed APC measures given in Chapter 2 of EIA report, Table 2.13
2	Proposal for the online monitoring system for APC measure provided by the proponent	Online monitoring system has installed in the unit. The photographs of Online monitoring system are enclosed in **Annexure 21**.
3	As per the MoEF& CC office memorandum F.No. 22-65/2017-IA III dated: 30.09.2020 and 20.10.2020 the proponent shall address the concerns raised during the Public consultation and all the activities proposed shall be part of	Condition will be complied after Public Hearing.

	the Environment Management Plan'	
4	The Environmental impact Assessment shall study in detail the carbon emission and also Suggest the measures to mitigate carbon emission including development of carbon sinks and temperature reduction including control of other emission and climate mitigation activities'	Carbon emission is not generated from the process.
5	The Environmental Impact Assessment should study the biodiversity' the natural ecosystem' the soil micro flora' fauna and soil seed banks and suggest measures to maintain the natural Ecosystem-	The detailed study of Biodiversity is given in Chapter 3 of EIA report Section 3.13.
6	The Terms of Reference should specifically study impact on soil health, soil erosion, the soil physical, chemical components and microbial components	The Soil details are given in chapter 3 of EIA report. Section 3.7
7	The Environmental Impact Assessment should study impact on standing trees and trees should be numbered	The Total Green Belt Area: 2.07 Hectare (33%). (As per MOEF&CC norms 1500 trees to planted per **Hectare).** Hence 3000 trees to be planted in 2.07 Ha. Existing 1368 trees are planted in the project site, hence remaining 1700 tress to be planted in project site area.
8	The Environmental Impact Assessment should study on wetlands, water bodies, rivers streams, lakes and hydrological cycles.	The Environmental Impact Assessment studied on wetlands, water bodies, rivers streams, lakes and hydrological cycles.
9	The Environmental Impact Assessment should study impact on climate change, GHG emission, temperature rise, pollution and above soil & below soil carbon stock.	The impact and mitigation details is give in chapter 4 and consider for the climate change, GHG emission, temperature rise, pollution
10	The Environmental Impact Assessment should study impact on protected areas, Reserve Forests, National Parks,	The impact and mitigation measures of the project are given in Chapter 4.

	Corridors and Wildlife pathway.	
11	The project proponent shall furnish the details of trees in the project site with all trees numbered and protected.	The Total Green Belt Area: 2.07 Hectare (33%). (As per MOEF&CC norms 1500 trees to planted per **Hectare).** Hence 3000 trees to be planted in 2.07 Ha. Existing 1368 trees are planted in the project site, hence remaining 1700 tress to be planted in project site area. The list of trees with there is given in chapter 10 and table
12	The project proponent shall furnish a detailed study on the impact of proposed activity with mitigation measures on the nearby environmental fragile area.	The proposed activity mitigation measures are given in Chapter 4. And consider for the environmental fragile area
13	The project proponent shall furnish the detailed study on health with regard to respiratory distress due to allergens on workers and nearby villagers.	No any respiratory distress in surrounding village. The project is located Gummidipoondi SIPCOT area. The nearest village located 1.5 KM from the project site.
14	The project proponent shall furnish the impact on dust pollution on the nearby habitation and livelihoods.	The baseline monitoring was conducted on the nearby habitation and livelihoods and within 10 km radius. The baseline monitoring data is given in Chapter 3.
15	The project proponent shall furnish the Risk Assessment plan, EMP and Disaster management plan which should be prepared after thorough study	The detailed Risk Assessment plan, EMP and Disaster management plan is given in Chapter 7 of EIA report.
16	GPS coordinates for all along the boundaries of the project site.	The details of Greenbelt along with Green Belt Coordinate are enclosed as **Annexure 9**.
17	The GPS coordinates for the boundaries at the green belt of 33% of proposed project site shall be furnished separately.	The details of 33% Green Belt Coordinate are enclosed as **Annexure 9.**

Chapter 2 PROJECT DESCRIPTION

2.1 Brief Description of Project

M/s. Danblock Brakes India Pvt Ltd is located at S No. 270 part, 256 part, Pappankuppam Village, Gummidipoondi Taluk and Tiruvallur District. M/s Sanmar Ferrotech Ltd has established in 2008 and currently M/s. Danblock Brakes India Pvt Ltd is being operating from 2021. The unit have Induction Furnace (6T) - 2Nos with 2 Crucibles each with total electrical panel capacity of 4500 KWA and Induction Furnace (1T) - 3 Nos. with 2 Crucibles each with total electrical panel capacity of 2250 KWA (Tritrack) - to manufacture Grey and Ductile Iron castings 25,000 T/Annum.

M/s Sanmar Ferrotech Ltd., Environmental Clearance was obtained for Ductile iron Foundry unit (25,000 TPA) vides EC F.No. J-11011/783/2007-IA II (I), Dated 23.01.2008 same copy is enclosed as Annexure 2.

M/s. JKM Ferrotech Limited, was acquired in the year of 2011, the unit name was changed from M/s Sunmar Ferrotech Ltd to M/s.JKM Ferrotech Limited. M/s. Danblock Brakes India Pvt Ltd was acquired in the year of 2021, the unit name was changed from M/s.JKM Ferrotech Limited to M/s. Danblock Brakes India Pvt Ltd. Consent copies is enclosed as Annexure 3.

Now the unit is applying Environmental Clearance for propose 70,000 T/Annum Grey and Ductile Iron castings manufacture. The existing manufacturing capacity of the unit is 25000 T/Annum; After Expansion the total quantities of products will 95,000 T/Annum. The EC Copy is enclosed as Annexure 2. The CTEs/CTOs copy is enclosed as Annexure 4. The current CTO valid is upto 31.03.2023.

The details of proposed installations and products with production capacity are given in **Table 2.1.**

Table 2. 1 Production capacity - Current & Proposed

S.N	Description	Exiting	Proposed	After Expansion
1	Grey and Ductile Iron castings	25,000 T/Annum	70,000 T/Annum	95,000 T/Annum

The salient features of the project are given in the **Table 2.2.**

Table 2. 2 SALIENT FEATURES OF THE PROJECT

S. No	Description		Existing	Proposed	After expansion
1	Quantity (T/A)		25,000	70,000	95,000
2	Project land (Acres)		15.54	Nil	15.54
3	Land coverage area (Acres)		4.49	1.74	6.23
4	Total Water consumption (KLD)		426	379	805
5	Recycled water consumption (KLD)		48	14	62
6	Fresh water requirement (KLD)		378	365	743
7	Hazardous waste	Used/spent oil (T/Annum)	0.5	0.5	1.0
		Discarded containers / barrels / liners contaminated with hazardous wastes/ chemicals (T/Annum)	2.5	12.5	15.0
		Wastes or residues containing oil	3.0	1.0	5.0
8	Sewage generation (KLD)		20.5	4	24.5
9	STP Capacity (KLD)		25	-	Install new STP 40
10	Cooling tower Blow town water in KLD		30	10	40
11	Power Requirement in KW		10,250	2500	12,750
12	DG Set (kVA)		500	Nil	500
13	Induction Furnace		(6T/H) - 2Nos with 2 Crucibles each(1T/H) 3 Nos. with 3 Crucibles each	(10T/H) – 1 Nos with Dual track 2 Crucibles each	(6T/H) - 2Nos with 2 Crucibles each(1T/H) 3 Nos. with 3 Crucibles each(10T/H) – 1 Nos with Dual track 2 Crucibles each
14	Diesel Requirement (KLD)		1	KLD	1
15	Manpower (Nos)		480	100	580

2.2 Need for the Project

Iron and steel are the world's most important engineering and construction material. It is used in almost every aspect of our lives and is an environment friendly material as it can be recycled infinite times without loss of property. It possesses great durability with strength as compared to other materials. Consumption of iron and steel is taken to be an indispensable indicator of economic development of any region. Iron and steel continue to have a stronghold in traditional sectors such as construction, housing, infrastructure, shipping, railways, automobiles, engineering goods, and packaging.

2.3 Location

The existing facility has located at S No. 270 part, 256 part, Pappankuppam Village, Gummidipoondi Taluk and Tiruvallur District. The project site is located in Survey of India Topo Sheet No. 66C/2 & 66C/3 and is lying in following Geo co-ordinates.

S.N	Point	Latitude and Longitude
1	A	13°24'57.76"N, 80°6'2.69"E
2	B	13°24'56.32"N, 80°6'11.66"E
3	C	13°24'49.36"N, 80°6'10.26"E
4	D	13°24'51.63"N, 80°6'1.11"E

2.4 Site Sensitivity

- The Nearest human settlement is Gummidipoondi 2.30 kms from the project site in South East direction.
- The key demographics of the study area comprising 46 villages and Towns. The total population of the study area is 2,84,764.
- Nearest town is Gummidipoondi at a distance of 2.3 Kms from the site.
- The nearest water body is Karumbukuppam Lake (1.80 km) (SSE)
- There Periya Puliur Reserved forest is located at 5.30km from the site.
- The access road to the Project site is Gummidipoondi –Kallur which is connected to Chennai - Kolkata National Highway.
- The Gummidpoondi Railway station is located at 2.30 Km from the site in the direction of South East.

- Interstate boundary of Tamil Nadu and Andhra Pradesh is at distance of 8.00 km in the direction of North.
- No archaeological monuments and heritage precincts are observed to be present in the project impact area.

Location Map of the Project is given at **Figure 2.1**

The Topo sheet of the area is given at **Figure 2.2**

The 10 km Google Imaginary of the study area is given at **Figure 2.3**

The Google Map of the area is given at **Figure 2.4**

Plant Layout for Existing and Proposed is given at **Figure 2.5**

Photographs of the existing plant are given at **Figure 2.6**

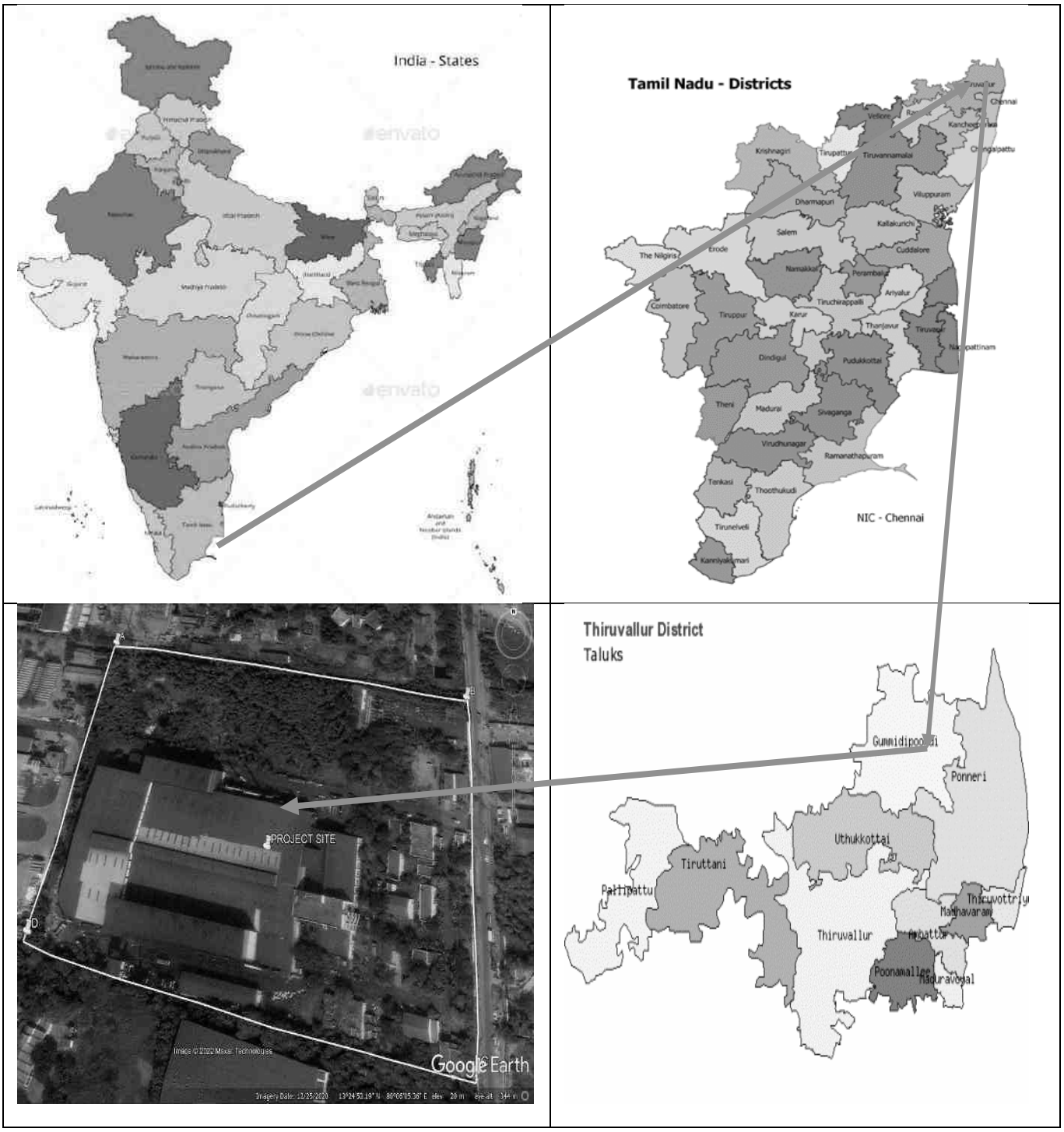


Figure 2. 1 Location Map of the Project Site

Figure 2. 2 Topo Map of Project Site & Study Area

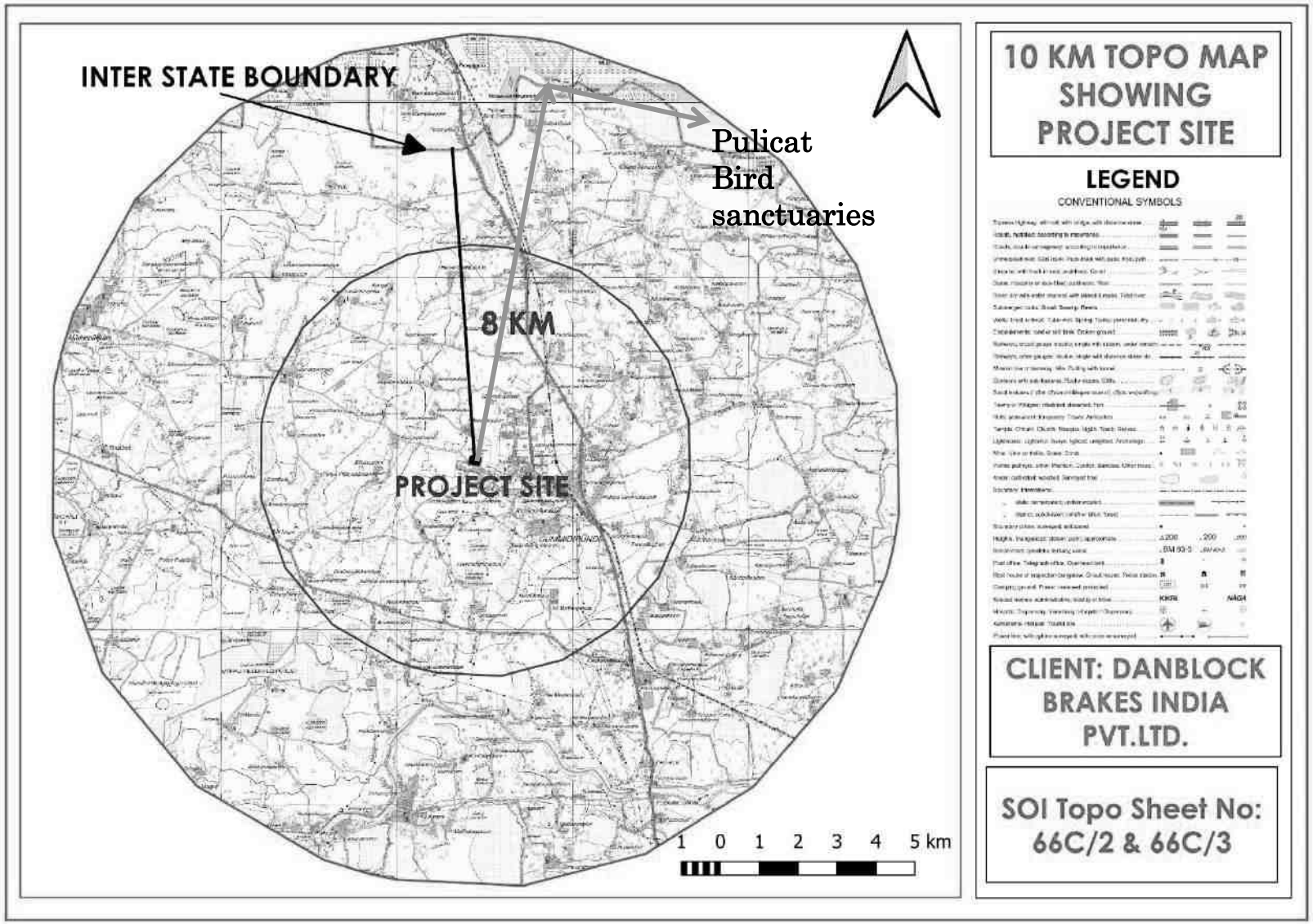


Figure 2. 3 The Google Imagery of the Project site at 10 km radius

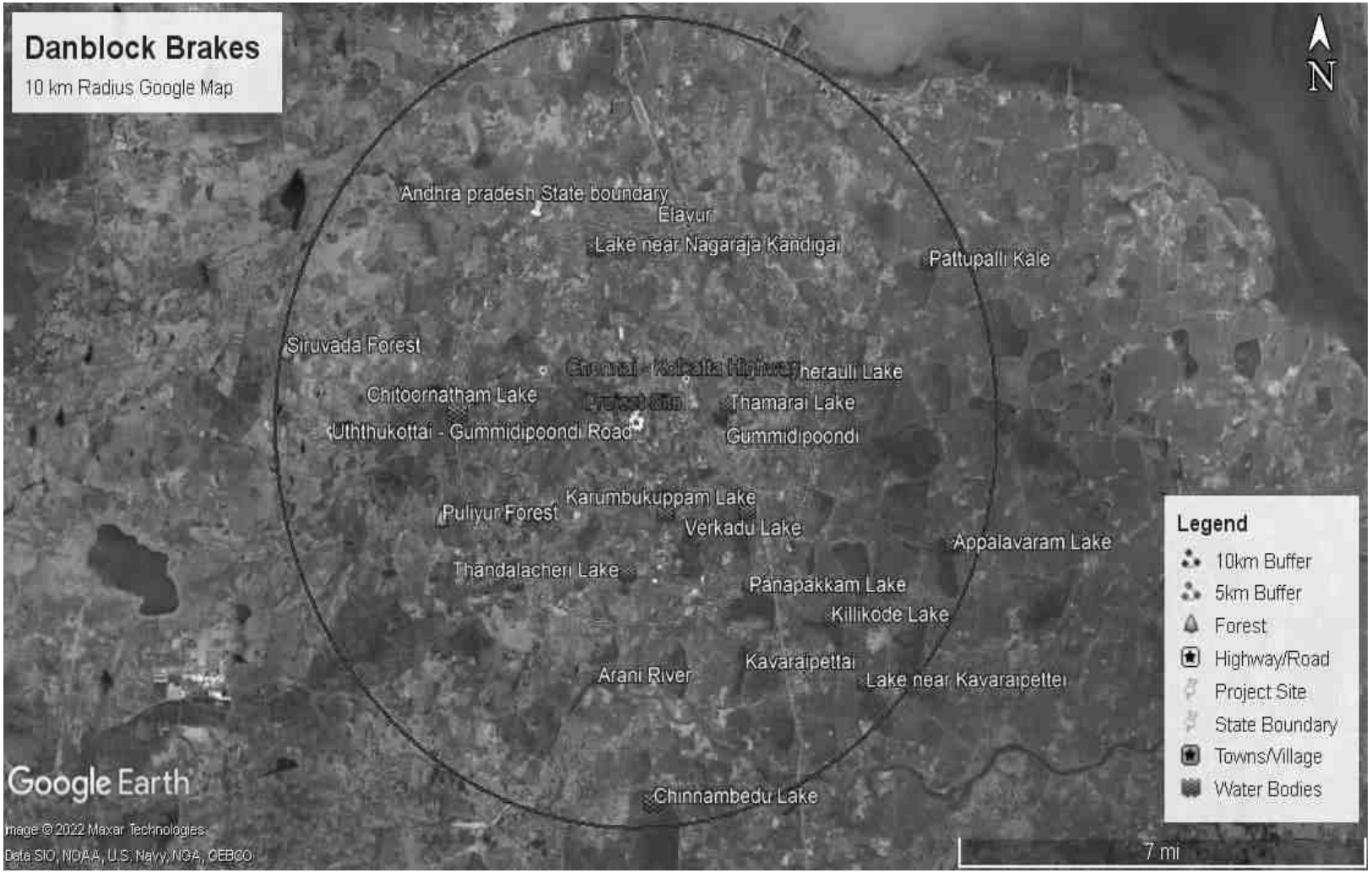


Figure 2. 4 Google Map of the Site

Figure 2. 5 Plant Layout for Existing and Proposed

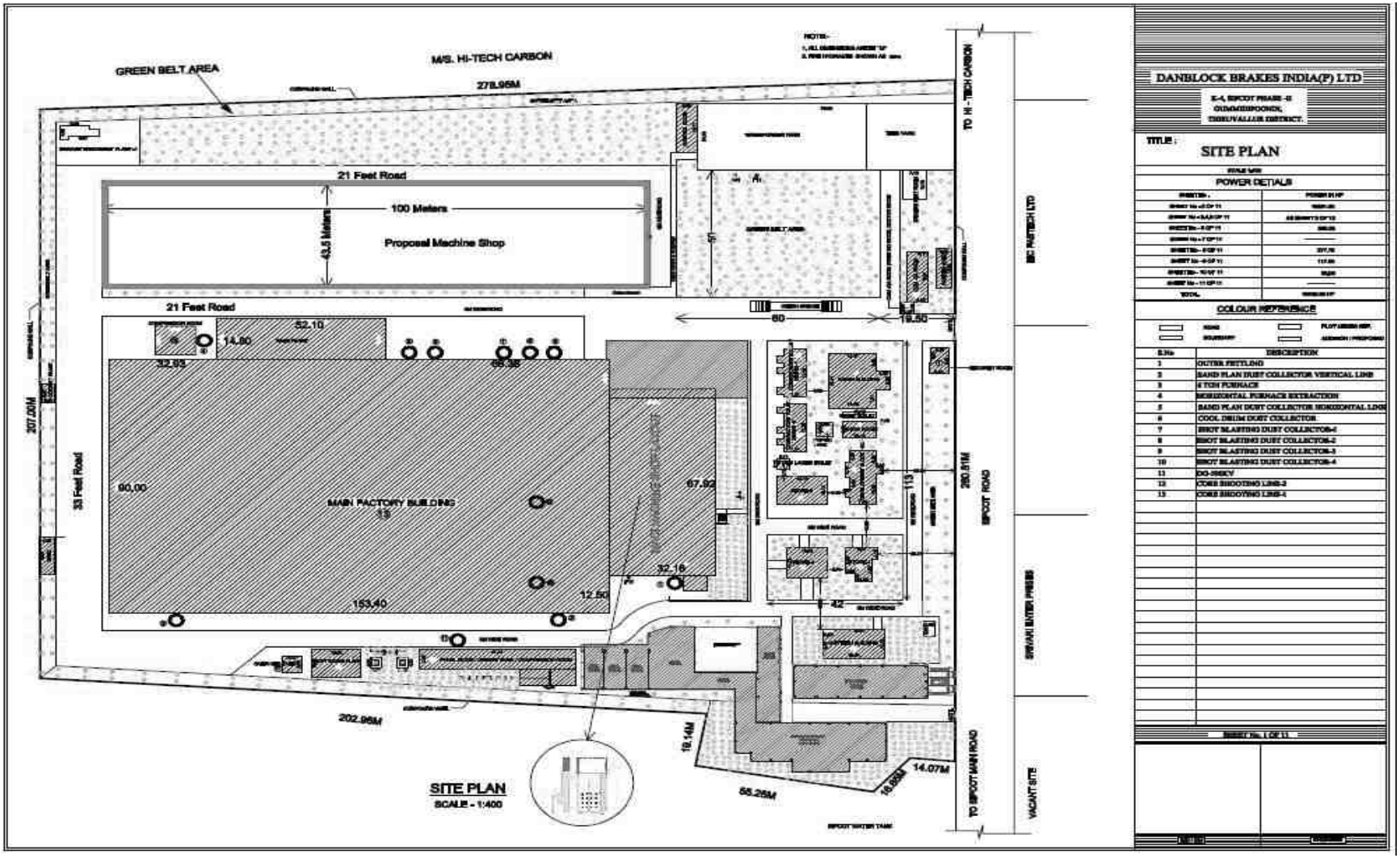


Figure 2. 6 PHOTOGRAPHS OF THE PLANT

2.5 Size & Magnitude of Operation

The Plant facilities are spread over 15.54 Acres Land which is completely fortified and protected on all sides by boundary walls. The Existing and Proposed Capacity detail given in **Table 2.3.**

Table 2. 3 Table Existing & Proposed Capacity

S.N	Product	Unit	Existing	Proposed	After Expansion
1	Grey and Ductile Iron castings	T/Annum	25,000	70,000	95,000

Table 2. 4 Capital investment on the project

S.No	Description	Cost (Crores)
1	Land	Nil
2	Building construction	20
3	Machineries and fixed assets	39.50
4	Environmental Management Cost	0.50
	Total	**60**

2.5.1 Proposed Schedule for Approval and Implementation

In the process of obtaining Environmental Clearance to the proposed project as per the EIA Notification, 2006, Danblock Brakes India Pvt. Ltd. obtained TOR from SEAC, SEIAA Tamil Nadu.

The EIA study has been carried out and the Draft EIA Report has been prepared as per standard terms of reference and special TOR conditions prescribed for submission to Tamil Nadu Pollution Control Board for conducting public hearing.

The project proposed to complete the expansion activity within 6 months' time once all statutory permissions are obtained.

2.6 Project description with process details

2.6.1 Project Description

The manufacturing process involves different step in induction furnace section manufacturing process of induction furnace involving following steps: Manufacturing process flow Diagram is given in **Figure 2.7**

1. Furnace Charging
2. Heating
3. Slag removal
4. Alloying
5. Moulding
6. Pouring
7. Cooling
8. Storage

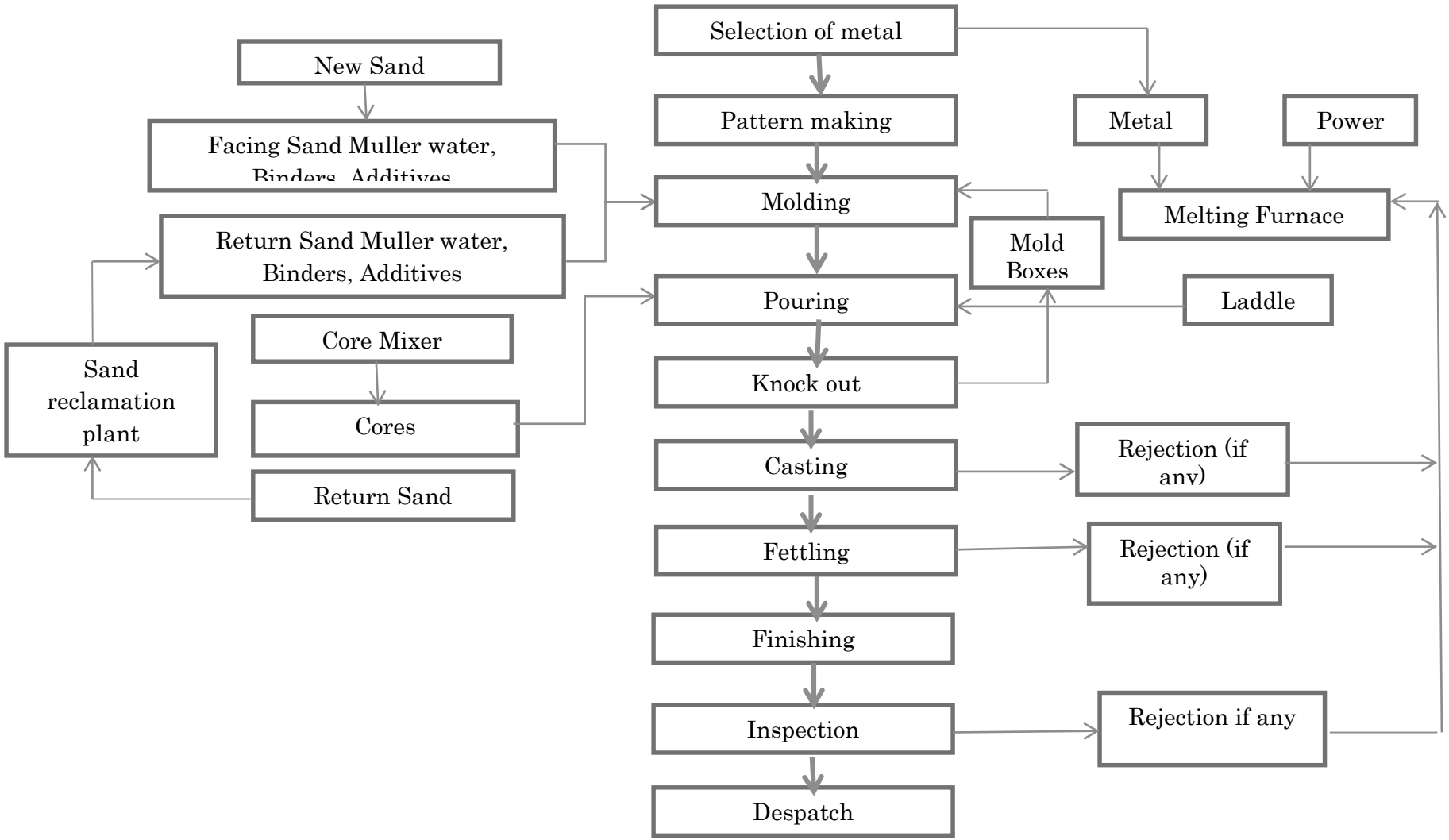


Figure 2. 7 Manufacturing process flow Diagram

2.7 Resource requirement for the project

2.7.1 Raw material requirement

The list of raw materials required for the manufacturing of proposed products is given in **Table 2.5.**

Table 2. 5 Raw Materials Details

S.No	Name of the Product	Existing TPA	Proposed TPA	After Expansion TPA	Source	Mode of transport
1	Steel Scrap	15696	35472	51168	Tamil Nadu/ Andhra Pradesh	Road
2	Pig Iron	3768	10888	14656	Tamil Nadu	Road
3	Ferro Alloys	1212	3514	4726	Tamil Nadu	Road
4	CI Boring	-	29280	29280	Tamil Nadu	Road
5	Sand	6000	33600	39600	Tamil Nadu	Road
6	Additives	300	900	1200	Tamil Nadu	Road
7	Resin	58	600	658	Tamil Nadu	Road
8	Returns	19824	31316	51140	Tamil Nadu	Road

Note: Existing 50% was raw material returned and Proposed 30% is raw material returned.

2.7.1.1 Storage facility for raw materials and products

Adequate storage facilities with optimum inventories are provided for the raw materials and products. The raw materials, product and others storage facilities required are detailed in the **Table 2.6.** The chemical composition for raw material is given in **Table 2.7**

Table 2. 6 . Details of Storage Quantities

S. No	Description	Units	Capacity		
			Existing	Proposed	After Expansion
1	Raw Materials	Tons	1000	1000	2000
2	Final Product	Tons	800	2200	3000

Table 2. 7 Chemical Composition for Raw Material

Specification	C%	Si%	Mn%	P%	S%	Cu%	Mg%
Minimum	3.4	2.4	0.10	0.015	0.005	0.45	0.03
Maximum	3.8	2.80	0.35	0.050	0.015	0.6	0.06
Actual	3.60	2.59	0.337	0.027	0.014	0.462	0.040

2.7.2 Power Requirement

The power requirement for the project is being sourced from TNEB. DG sets will act as the standby facilities and will be utilized in case of power failures. The details of power requirement and power backup details (existing and proposed) are given in **Table 2.8.**

Table 2. 8 Power and Energy Requirement (Existing and Proposed)

Description	Unit	Existing	Proposed	After Expansion	Source
Power requirement	KVA	10250	12750	23000	TNEB Connection.
DG Set	KVA	1*500	Nil	1*500	
Diesel Requirements	KLD	1.0	Nil	1.0	Local outlets

2.7.3 Man Power Requirement

The total manpower of existing facility is 480 nos. The additional manpower requirement due to proposed expansion will be 100 nos. Thus, the total manpower requirement after expansion will be 580 nos. The manpower requirement details are shown in **Table 2.9**.

Table 2. 9 Man Power Requirement

Description	Contract workers In Nos	Permanent workers In Nos	Total (In Nos)
Construction Phase	45	5	**50**
Operation Phase (Nos)			
Existing	180	300	**480**
Proposed	70	30	**100**
Total	**250**	**330**	**580**

2.7.4 Water Requirement

a. Existing

Total water requirement of the existing facility is 426 KLD (from SIPCOT),

Sewage Generation is 20.5 KLD.

The trade effluent generation is 30 KLD

STP Capacity -25 KLD

b. Proposed

Total water requirement of the proposed facility is 379 KLD (from SIPCOT),

Sewage Generation is 4 KLD.

The trade effluent generation is 10 KLD

c. After proposal

Total water requirement of the proposed facility is 805 KLD (from SIPCOT),

Sewage Generation is 24.5 KLD.

The trade effluent generation is 40 KLD.

STP Capacity -40 KLD

Existing and proposed water consumption details are given in Table 2.12

Water balance diagram of existing and proposed is given in **Figure 2.8** and **Figure 2.9.**

2.7.5 Land Requirement

Total Project area: 15.54 Acres (62,888Sq.m). The M/s.Danblock Brakes India Pvt Ltd., have own land. The Land document for the project site is enclosed as Annexure-1. The area breakup details of the project site are given in **Table 2.10**. Detailed land area break-up (Existing and Proposed) is given in **Table 2.11**. Proposed project site layout is attached as an **Annexure-7**.

Table 2. 10 Area Breakup for Proposed Site

S. No	Description	Area in Acres			%
		Existing	Proposed	After expansion	
1	Plot area	4.49	1.74	6.23	40
2	Green Belt Area	5.13.2	-	5.12	33
3	Road	2.20	-	2.20	14
4	Parking	0.1	-	0.1	1
5	Other Utilities	0.2	-	0.2	1
4	Vacant Land	3.43	-1.74	1.69	11
	Total	15.54	-	15.54	100

Table 2. 11 Detailed land area break-up (Existing and Proposed)

Sl No	Description	Sq.M	Constructed Year
Existing Area			
1	Security Room	53.5	1998
2	Admin Building	318.4	1998
3	Staff Toilet	24.9	2014
4	Show Room	60.0	1998
5	Development Block	171.5	1998
6	Store - 1	96.4	1998
7	Store - 2	134.1	1998
8	Store - 3	153.1	1998
9	Staff Ladies Toilet	13.8	1998
10	Contractor Toilet - Dining - 1	133.8	1998
11	Contractor Toilet - Dining - 2	133.8	1998
12	Septic Tank	27	1998
13	Main Factory Building Phase - 1	10390	2008
14	Main Factory Building Phase - 2	5440	2012
15	Compressor Room	128.6	2008
16	Cooling Plant	23.8	2012
17	Shed	60.7	2012
18	Overhead Water Tank	36	2008
19	Soft Water Plant	150	2008
20	Cooling Plant Furnace	28	2008
21	Panel Room/ Genset/ Compressor Room	337	2008
22	Main Raw Water Sump&Pump Room	465.2	1998
23	Canteen Building	198	2008

Sl No	Description	Sq.M	Constructed Year
24	Store - 4	190	1998
25	Raw Water Sump (Sidco)	24	1998
26	Weigh Bridge	43	2008
27	First And, Doctor Room, Cmm-Qa Room	90	2008
28	Two Wheelar Parking	73	2008
29	Drivers Rest Room	76.6	2008
30	Control Room	120.9	2008
31	STP	58.6	2008
32	FIRST FLOOR, SENCOND FLOOR, THIRD FLOOR,840x3=2520	2520	1998
33	Control Room Near Sandplant	25.0	2008
34	Stack And Dust Collector Foundation	72	2008
35	Switch Yard Oil Collection Pit	16.2	2008
36	Conveyor Pits	83	2008
37	Cooling Tower Foundation	36	2008
38	Furnace Pit And Fume Trench Area	110	2008
39	Helipad	360	2008
40	Scrap Collection Pit	195	2008
41	Foundation For Online Shotblasting	127	2008
42	Foundation For Shotblasting Machine	36	2008
43	Sand Lab	28	2008
44	Spectrolab	48	2008
45	Visipour	6.5	2008
46	Conveyor Pitt Of BC 02 AND BC 05	116	2008
47	Sand Plant Conveyor Structure	771	2012
48	Horizontal Sandplant Conveyor Pits	392	2012
49	Horizontal Sandplantcontrol Room	58	2012
50	1 Ton Tritrack Furnace &Scrap Collection Pit	340	2012
51	Horizontal Sandplant Dust collectors Foundation	413	2012
52	6 Ton Furnace And Fumes Collector Foundation	676	2008
53	ABC Area	532.88	2022
54	Production Storage Area	1045.3	2022
55	Finished Goods Storage Area	619	2022
	Total	**27879.6**	
Proposed area			
1	Proposed - STP		
2	Proposed Shed - 1		
3	Proposed Shed - 2		

2.8 Environmental aspects from different processes

Raw material handling

The Induction Furnace Units consumes Steel Scrap, Sponge Iron, Pig Iron and other Ferro Alloys as needed. Dust generation during transport and storage is expected.

Induction Furnace

The emissions from Induction Furnace include suspended particulate matter, Oxides of Sulphur, Oxides of Nitrogen and CO2.

Slag Handling

Slag generated from the Induction Furnace needs to be disposed off. Slag is crushed in slag crusher and iron is removed using magnets. Rest of the crushed slag is used as land fill material and brick manufacturing.

Fly Ash Handling

The ash handling from re-heating furnace will create fugitive dust emissions.

2.9 Environmental Impacts & Control Systems

2.9.1 Water & Waste Water

Steel making is an energy intensive process wherein a considerable quantity of cooling water is required for control of metallurgical process. Water is mainly needed for cooling various furnace components, domestic consumption and other uses.

Water is not used in manufacture process. Water is used only for cooling purpose. Water circulation systems are planned to facilitate recycling and reuse of 40 KLD of return water, after cooling in cooling towers. There is no generation of waste water in the manufacturing process.

The daily total fresh water requirement for the plant after expansion will be 743 KLD which would be taken from SIPCOT Gummidipoondi. Fresh water will be utilized for cooling water make up, Domestic use & Green Belt development. The total water balance is given in **Table 2.12.**

Table 2. 12 The water requirement for existing and after expansion.

S.No	Description	Existing in KLD			Proposed in KLD			After Expansion in KLD		
		Fresh water	Reuse Water	Total	Fresh water	Reuse Water	Total	Fresh water	Reuse Water	Total
1	Domestic	23	0	23	4	0	4	27	0	27
2	Process	71	0	71	237	0	237	308	0	308
3	Cooling Tower	284	30	314	76	10	86	360	40	400
4	Green Belt	0	18	18	48	4	52	48	22	70
Total		**378**	**48**	**426**	**365**	**14**	**379**	**743**	**62**	**805**

Currently the domestic waste water is let into septic tank followed by soak pit. As a part of expansion, it is proposed to establish STP which can cater to both units of Danblock Brakes India Pvt. Ltd. Also it is proposed to provide primary treatment plant for Cooling Tower Unit for treating and recycling the cooling water to remove oil & grease and suspended solids.

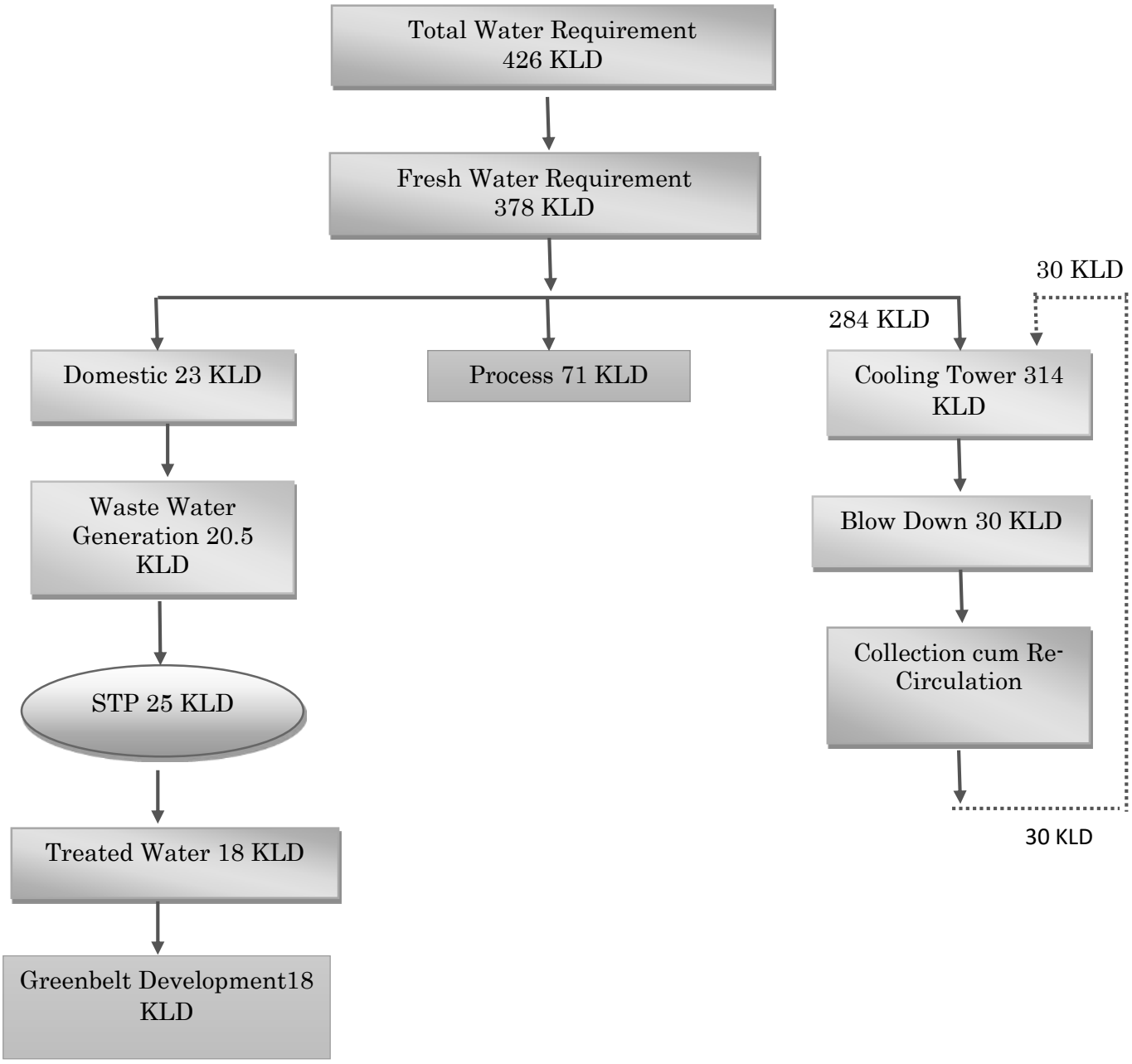


Figure 2. 8 Water Balance Diagram (Existing)

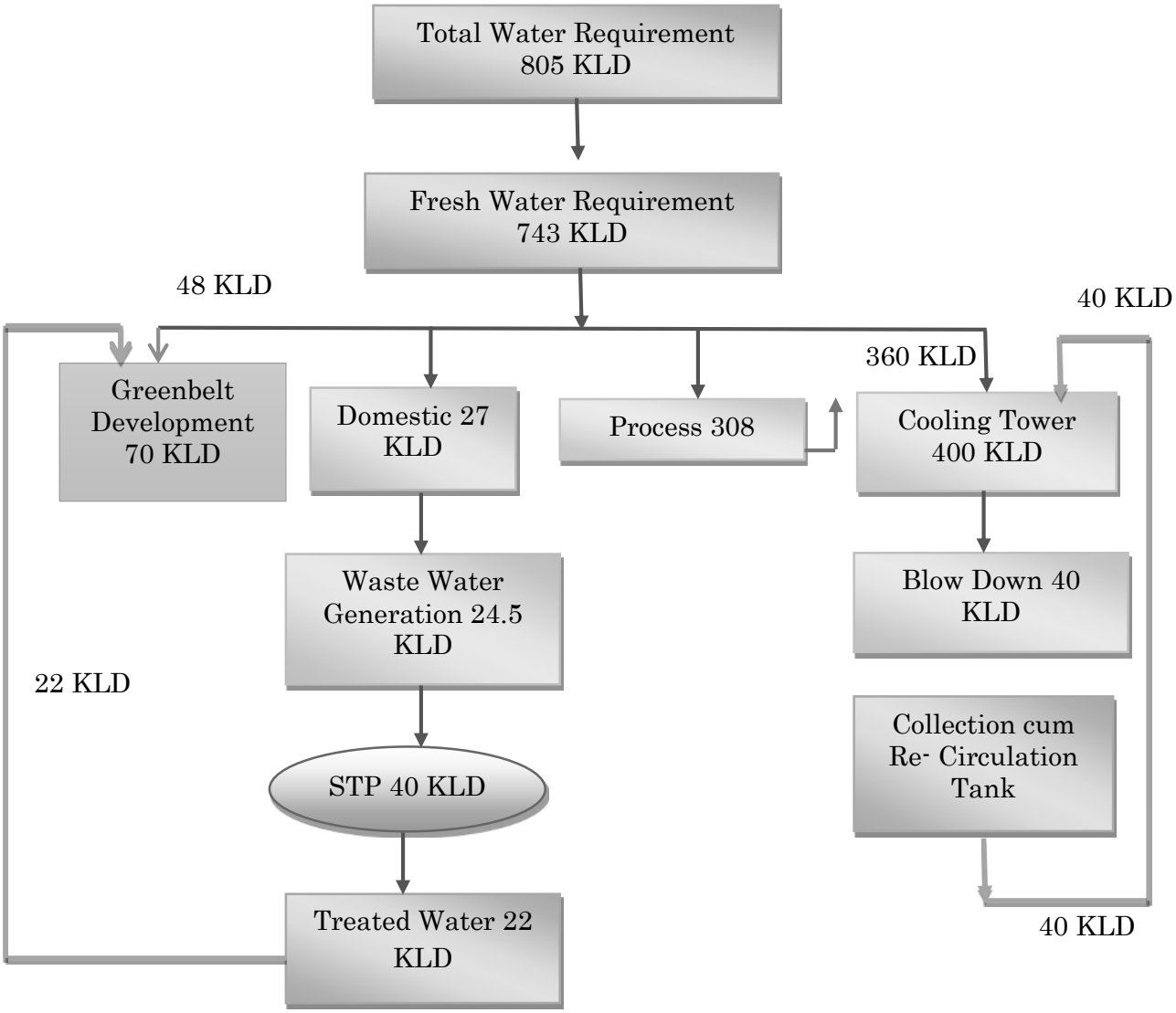


Figure 2. 9 Water Balance Diagram (After Expansion)

2.9.2 Air Emission Sources & Control

The details of emission sources and their control measures after expansion are given in **Table 2.13**

Table 2. 13 Air Emission Sources & Control

S.No.	Sources of emission	Control Measures Proposed	Stack Height from GL(m)	Stack top dimension (in Meters)
Existing				
1	Induction Furnace (6T/H) - 2Nos with 2 Crucibles each	Common fumes extraction system, Cartridge bag filter with stack	30.0	1.0
2	Induction Furnace (1T/H) 3 Nos. with 3 Crucibles each	Common fumes extraction system, wet scrubber with stack	15.0	0.8
3	Sand Shake out plant (1)	Individual Cartridge Bag Filter with stack	30.0	1.2
4	Sand Plant (2)	Individual Cartridge Bag Filter with stack	30.0	1.2
5	Cool Drum	Cartridge Bag Filter with stack	30.0	1.45
6	DISA Shot Blasting	Cartridge Bag Filter with stack	8.0	0.3
7	Online Shot Blast	Cartridge Bag Filter with stack	13.0	0.6
8	tumb Shot Blast Finishing 1T	Cartridge Bag Filter with stack	7.0	0.2
9	Span Core Shooter	Wet scrubber with stack	4.0	0.45
10	Laempe Core Shooter	Wet scrubber with stack	4.6	0.40
11	Core Shop	Cartridge Bag Filter with stack	9.3	0.40
12	Fettling Shop	Cartridge Bag Filter with stack	7.5	0.40
13	500 KVA DG Set	Acoustic enclosures with stack.	9.8	0.23
Proposed				
1	Induction Furnace (10T/H) – 1 Nos with Dual track 2 Crucibles each	Common fumes extraction system, Cartridge bag filter with stack	30.0	1.0
2	Sand plant (1)	Individual Cartridge Bag Filter with stack	30.0	1.2
3	Cool Drum	Cartridge Bag Filter with stack	30.0	1.45
4	Online Shot Blast	Cartridge Bag Filter with stack	13.0	0.6

S.No.	Sources of emission	Control Measures Proposed	Stack Height from GL(m)	Stack top dimension (in Meters)
5	Grinding Machine	Cartridge Bag Filter with stack	13.0	0.6

2.9.3 Fugitive Dust Suppression

- Fugitive dust is generated from the roads during transportation of raw materials and finished products within the plant.
- Slag generated from the plant is crushed in slag crusher and Iron is removed. Bag filter with fume extraction system is proposed for slag crusher.
- Fugitive emissions may also likely to be generated during coal and ash handling system. Coal Pulveriser is enclosed and fume extractions are cleaned in bag filter (Combined bag filter for re-heating furnace and coal pulveriser).
- Cement roads are laid within the plant area. Dust generation is observed in FG Stock yard. Currently Tractor mounted water tanker is deployed for sprinkling water in the areas within the plant premises and along the approach roads regularly. It is proposed to establish water sprinklers wherever dust generation is anticipated.

2.9.4 Hazardous & Solid Waste Generation and Handling:

2.10.5.1 Solid Waste Management

Construction Phase: During Construction phase, the approximate solid waste generation is 22.5 Kg/day. The details are given in **Table 2.14**.

Table 2. 14 Solid waste Generation and Management during Construction phase

S. No	Description	Proposed Quantity (Kg/day)	Method of Disposal
Construction phase: 50 Nos			
1	Organic	13.5	Disposed through local Panchayat collection system.
2	Inorganic	9.0	Send to TNPCB authorized vendors
Total		**22.5**	

Operation Phase: During operation phase, the approximate solid waste generation existing 216 kg/day, Proposed 45 kg/day and after expansion 261 kg/day. The details are given in **Table 2.15**.

Table 2. 15 Solid waste Generation and Management during Operation phase

S. No	Description	Existing quantity (Kg/day)	Proposed Quantity (Kg/day)	After quantity (Kg/day)	Method of Disposal
Operation Phase – Existing 480 Nos & Proposed – 100 Nos					
1	Organic	129.6	27	156.6	Disposed through local Panchayat collection system.
2	Inorganic	86.4	18	104.4	Send to TNPCB authorized vendors
Total		216	45	261	

(As per CPHEEO Guidelines -0.45 kg/capita/day)

Table 2. 16 Solid waste from process (Non-Hazardous)

Description	Unit	Existing	Proposed	After proposal	Disposal methods
Metal Scrap	MT/Year	80	30	110	Reused for Melting
Furnace Slag	MT/Year	810	2209	3019	Sold Out to Sri Balaji Enterprises
Cotton	Kg/Year	100	120	220	Tamil Nadu Waste Management
Wood	Kg/Year	50	55	105	Tamil Nadu Waste Management
Paper	Kg/Year	300	400	700	Tamil Nadu Waste Management

2.10.5.2 Hazardous waste Generation and Management

The solid wastes and hazardous wastes will be packed in double lined PP bags and stored in an isolated room, exclusively ear marked for the purpose. As and when sufficient stock is accumulated, Organic Waste will be handover to Municipal Authority and Inorganic will be sent to TSDF for further treatment and safe land fill. Industry will be entered into an agreement with concerned Hazardous Waste Management unit. Hazardous waste will be stored and disposed as per the Hazardous and Other Wastes (Management and Trans boundary Movement) Amendment Rules, 2016. The Hazardous waste authorization NOC is enclosed as Annexure 15 & 16. The Hazardous waste generation and management detail is given in **Table 2.17**. E-waste and Battery waste generation from project site is given in **Table 2.18.**

Table 2. 17 Hazardous waste Generation and Management

Waste details	Schedule	Unit	Existing Quantity,	Proposed Quantity	After expansion Quantity	Disposal method
Used/spent oil	5.1	T/Annum	0.5	0.5	1.0	Recover and Reuse – TNPCB Authorized recyclers
Wastes or residues containing oil	5.2	T/Annum	3.0	1.0	4.0	Recover and Reuse – TNPCB Authorized recyclers
Discarded containers / barrels / liners contaminated with hazardous wastes/ chemicals	33.3	T/Annum	2.5	12.5	15.0	Recover and Reuse – TNPCB Authorized recyclers

Table 2. 18 E-waste and Battery waste generation from project site

Waste details	Unit	Existing Quantity,	Proposed Quantity,	After expansion Quantity	Disposal method
E-waste and Battery waste	T/ Annum	0.07	0.05	0.12	Send to TNPCB Authorized recyclers

2.9.5 Noise Pollution

Noise is anticipated from Furnace, and DG sets. The DG sets will be kept in separate rooms with acoustic enclosures. The employees working in noise generating areas will be provided with earmuffs.

The employees will be trained in the mitigation measures and personal protection measures to be taken to avoid noise related health impacts.

2.10 Current Environmental Control Mechanisms & Gaps

As this is brown field project and going for expansion activity. It is essential to assess the current scenario of environmental impacts from the current operations and controls and to assess the adequacy of current Environmental Management practices.

Chapter 3 DESCRIPTION OF ENVIRONMENT

3.1 Introduction

This chapter basically describes the existing environmental conditions in and around the proposed expansion project with reference to the prominent environmental attributes. The baseline assessment is important for the assessment of impacts if any due to the proposed project on the surroundings. The proposed expansion is to be commissioned in the existing plant located at SIPCOT Industrial Estate, Gummidipoondi, Thiruvallur district. The study involves the assessment of the prevailing environmental and socioeconomic conditions. The primary baseline monitoring was conducted during the month of 15th June 2022 to 15th September 2022. Secondary data was collected from government and semi-government organization. The primary baseline data has been generated by M/s. Pollucare Engineers India Pvt. Ltd., Chennai, and a MoEF&CC approved & NABL Certified Environmental Testing Laboratory for the following Terrestrial environmental components.

- **Meteorology:** Temperature, Relative Humidity, Rainfall, Wind Speed & Direction.
- **Ambient Air Quality:** Particulate matter <10-micron size (PM_{10}), Particulate matter <2.5-micron size ($PM_{2.5}$), Sulphur Dioxide (SO_2), Nitrogen Dioxide (NO_2), Carbon Monoxide (CO), Lead (Pb), Ozone (O_3), Benzene (C_6H_6), Benzo (a) pyrene (C20H12), Arsenic (As), Nickel (Ni), Ammonia (NH_3)
- **Ambient Noise Levels:** Day equivalent noise levels, Night equivalent noise levels
- **Water Quality:** Groundwater Quality & Surface Water Quality.
- **Soil Quality**
- **Eco-biodiversity**
- **Socio economic status**
- **Traffic Studies**

3.2 Methodology of Base line data collection

3.2.1 Scoping

The scope of the assessment for this study was determined by the Terms of Reference, the statutory requirements for the area of influence required by the Ministry of Environment, Forests & climate change and in consultation with experts. An initial discussion with the project authorities and other stakeholders was conducted in the study area to that the focus would be on valued ecosystem components (VECs) they considered important.

3.2.2 Reconnaissance Surveys

The study team visited the project area and data was collected, information on various aspects like availability of infrastructure, physiological condition of the project site, surroundings of the site such as road connectivity, nearby population, nearby water bodies & neighboring industrial activity etc. The information collated has been used for identifying the valued eco components to be chosen for specific consideration in the study.

3.2.3 Analysis of Data

The data from field surveys is supplemented by information collected from Survey of India topo sheets, census handbooks, published flora and fauna data etc. Standard statistical techniques were used for analysis of the socioeconomic data, etc. Qualitative analysis was done for more descriptive data.

3.2.4 Documentation of Baseline Conditions

The documentation of the baseline conditions was completed for a 10 km radius circle from the site Project influence Area (PIA) as per the MoEF & CC guidelines. Primary surveys were carried out for determination of ambient air quality, water quality, noise quality socio economic conditions of nearby residents etc. A detailed ecology survey was also conducted.

3.2.5 Assessment of Alternatives

Alternatives of the project site are not assessed in this case as this project is expansion in existing unit.

3.2.6 Assessment of Potential Impacts

The design and decision – making process integrated environmental and social issues and prompted the early identification of appropriate actions. Such actions included, for example, optimizing the layout and Floor Area Ratio (FAR), measures for water conservation, measures for solid waste management etc.

3.2.7 Integration of Environmental Impacts in the Design Process: Environmental Component

The design and decision – making process integrated environmental and social issues and prompted the early identification of appropriate actions. Such actions included, for example, optimizing the layout and Floor Area Ratio (FAR), measures for water conservation, measures for solid waste management etc.

3.3 Land Environment

Land and soil constitute the basic components of the physical environment. The location of an industrial project may cause changes in land, land use, soil and denudation processes in different intensities contingent on spatial proximity of the activity and receptors. Land and soil may get altered within the vicinity of 5 km radius and to a lesser extent upto 10 km radial distance due to the development of present industrial project.

3.3.1 Physiography

The existing facility has located at S No. 270 part, 256 part, Pappankuppam Village, Gummidipoondi Taluk and Tiruvallur District. The project site is located in Survey of India Topo sheet No. 66C/2 & 66C/3 and is lying in following Geo co-ordinates.

S.N	Point	Latitude and Longitude
1	A	13°24'57.76"N, 80°6'2.69"E
2	B	13°24'56.32"N, 80°6'11.66"E
3	C	13°24'49.36"N, 80°6'10.26"E
4	D	13°24'51.63"N, 80°6'1.11"E

The Nearest human settlement is Gummidipoondi 2.30 kms from the project site in South East direction. The key demographics of the study area comprising 46 villages and Towns. The total population of the study area is 2,84,764. Nearest town is Gummidipoondi at a

distance of 2.3 Kms from the site The nearest waterbody major waterbody is Karumbukuppam Lake (1.80 km) (SSE). There Periya Puliur Reserved forest is located at 5.30km from the site. The access road to the Project site is Gummidipoondi –Kallur which is connected to Chennai - Kolkata National Highway. The Gummidpoondi Railway station is located at 2.30 Km from the site in the direction of South East. Interstate boundary of Tamil Nadu and Andhra Pradesh is at distance of 8.00 km in the direction of North. No archaeological monuments and heritage precincts are observed to be present in the project impact area.

The Project Site Neighborhood as interpreted from the Google Map is shown in the **Figure-3.1**

Figure 3. 1 The Google Imagery of the Project site at 1 km radius

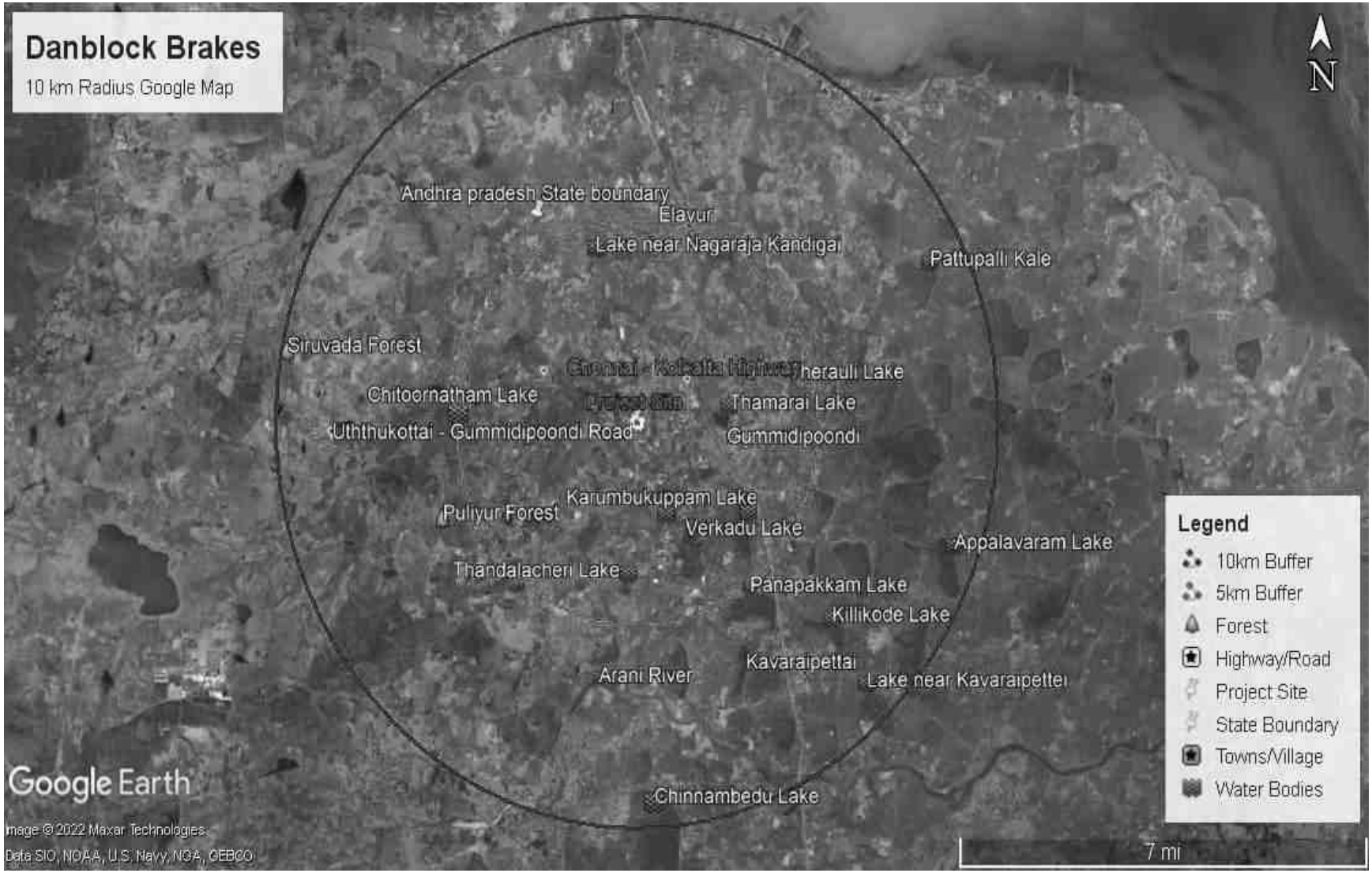


Figure 3. 2 The Google Imagery of the Project site at 10 km radius

3.3.2 Topography

The proposed expansion site is located at SIPCOT Industrial Complex, Gummidipoondi. The site is located within the Gummudipondi Industrial estate. Interstate boundary of Tamil Nadu and Andhra Pradesh is at distance of 8.00 km in the direction of North. It is as well shown in the Toposheet No. 66C/2 & 66C/3 of the Survey of India.

The existing site has undulate topography with minimal elevation differences. The average elevation of the proposed site is 17 m. Geomorphologically, study area has been classified into the units of denudation origin. The geomorphic units encountered in the study area are pediments and alluvial plains. Apart from these plains there are fractures system occurs in and around the project site. Pediments are rock outcrops located with close proximity to the hills with thin veneer of soil. Alluvial soils occur along the river courses and eastern part of the coastal areas. The soil type in study area is lateritic soil of red sandy/clay loam.

3.3.3 Drainage

There are no major or perennial rivers flowing in this district. However, certain rivers with seasonal flow of water are found in this district. One of them is the Arni River of Ariyanadi. It rises in Andhra Pradesh and flows along the boundaries between Tiruvallur and Ponneri taluks before entering to the sea near Pulicat. Another river of the district, the Kosasthalaiyar(also known as Kortalaiyar), has its source from the surplus water of the Kaveripakkam tank in Vellore district. The river also receives water from the tanks in Walajapet taluk. Two jungle streams viz. Mahendranadi and Tappur also join the river. During its traverse towards north easterly direction, it passes through Tiruvallur and Ponneri taluks where it joins with two tributaries viz., Tiruttani and Nagari Rivers. The anaicut at Velur Tambarambakkam helps the river water to be supplied to the Cholavaram and Red Hills Tanks from where Chennai city gets water supply. It enters Ennore backwater after filling a number of tanks on its further course. The drainage pattern of the project study area is given in **Figure 3.3.**

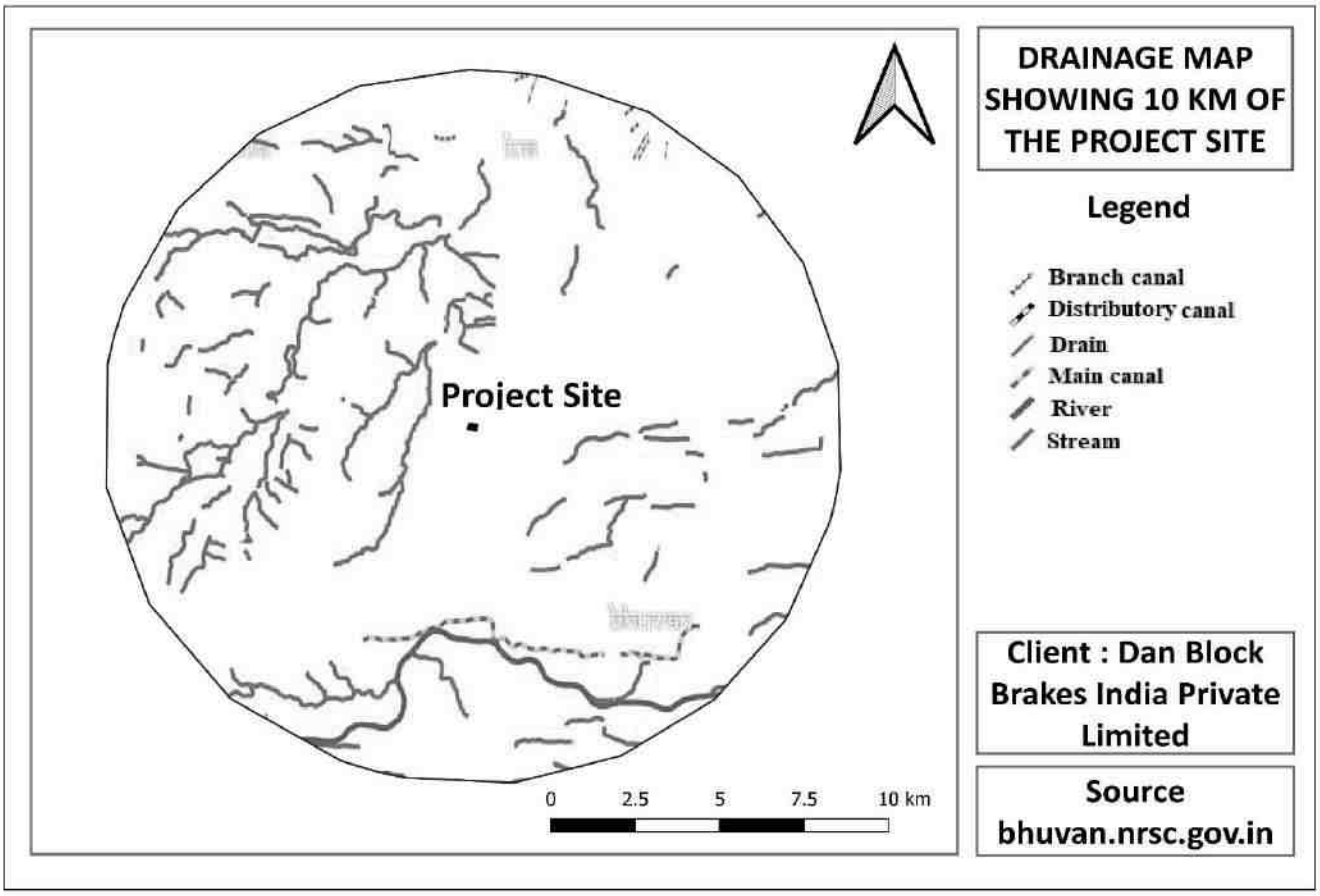


Figure 3. 3 Drainage pattern of the project study area

3.4 Land use Pattern

Total geographical area of Thriuvallur district is 171 Sq. Km. Built-up area, Urban is 157.39 Sq. Km. and Built-up area, Rural 0.02 Sq. Km. Details of district land use/land cover statistics for Tiruvallur district is given in **Table 3.1** and Land use pattern in the PIA of district given in Figure 3.4. Land Use/Land Cover Statistics for Study Area is given in **Table 3.2**. Land use Pattern of the Study Area is given in Figure 3.5.

Table 3.1 District Land Use/Land Cover Statistics for Thiruvallur District

S.No	Division of Land Use/Land Cover	Area in Sq.Km	Area in Acres	Area in Ha	Total Area %
1.	Builtup,Urban	295.16	72935.5118	29515.95444	8.62
2.	Builtup,Rural	272.76	67400.3598	27275.95789	7.97
3.	Builtup,Mining	7.54	1863.1717	753.9988361	0.22
4.	Agriculture,Crop land	1834.25	453252.3463	183424.7168	53.59
5.	Agriculture,Plantation	87.77	21688.40585	8776.986451	2.56
6.	Agriculture,Fallow	115.92	28644.4116	11591.98211	3.39

7.	Forest,Evergreen/ Semi evergreen	18.22	4502.2531	1821.997187	0.53
8.	Forest,Deciduous	68.13	16835.26365	6812.989483	1.99
9.	Forest,Forest Plantation	10.57	2611.89985	1056.998368	0.31
10.	Forest,Scrub Forest	0.03	7.41315	2.999995369	0.00
11.	Forest,Swamp/ Mangroves	3.03	748.72815	302.9995323	0.09
12.	Barren/unculturable/ Wastelands, Salt Affected land	7.42	1833.5191	741.9988546	0.22
13.	Barren/unculturable/ Wastelands, Gullied/Ravinous Land	0.11	27.18155	10.99998302	0.00
14.	Barren/unculturable/ Wastelands, Scrub land	190.58	47093.2709	19057.97058	5.57
15.	Barren/unculturable/ Wastelands, Sandy area	12.83	3170.35715	1282.998019	0.37
16.	Barren/unculturable/ Wastelands, Barren rocky	2.39	590.58095	238.9996311	0.07
17.	Wetlands/Water Bodies, Inland Wetland	0.65	160.61825	64.99989966	0.02
18.	Wetlands/Water Bodies, CoastalWetland	86.74	21433.8877	8673.98661	2.53
19.	Wetlands/Water Bodies, Reservoir/Lakes/Ponds	341.57	84403.65485	34156.94727	9.98
20.	Wetlands/Water Bodies, River/Stream/canals	67.33	16637.57965	6732.989606	1.97
Total		3423	845840.4	342299.5	100

Source: https://bhuvan-app1.nrsc.gov.in/thematic/thematic/index.php

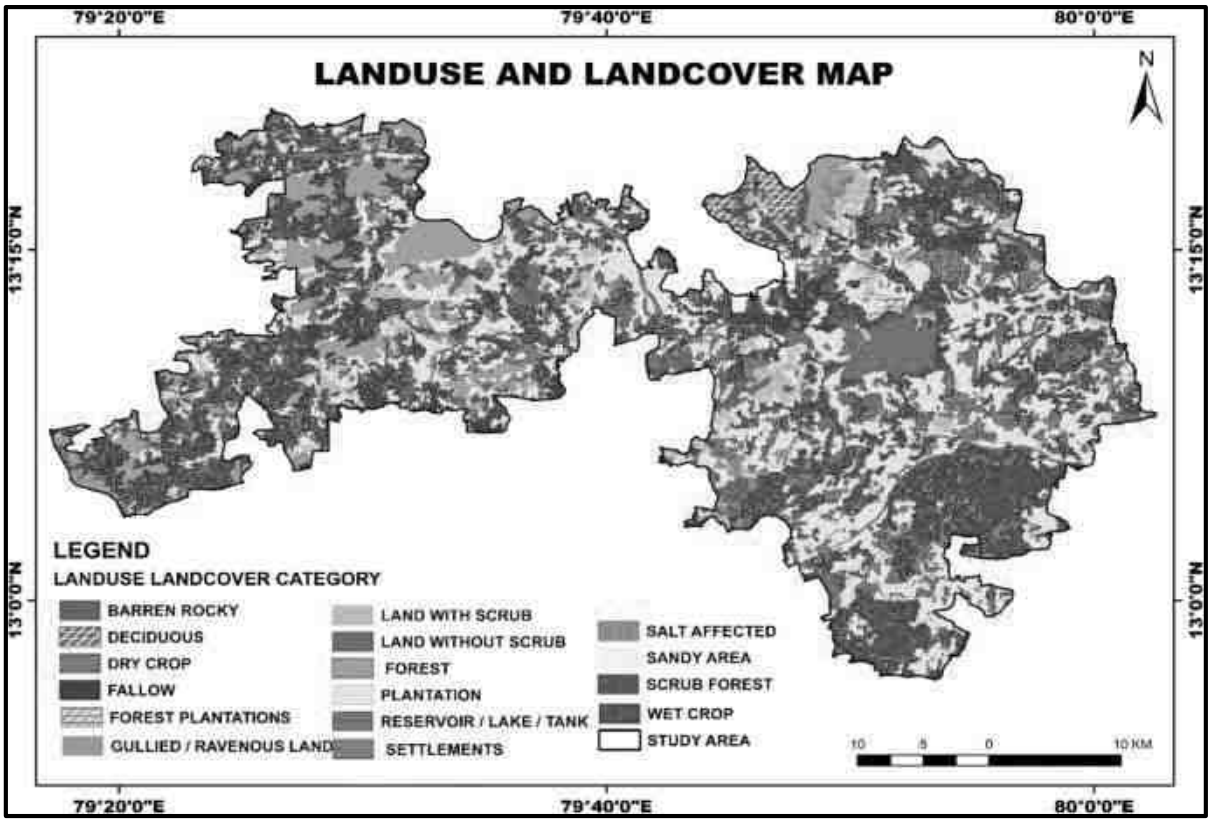


Figure 3.4 Land use Pattern of the PIA District

Table 3.2 Land Use/Land Cover Statistics for Study Area

LULC Class	Sq.km	Hectare	Acre	Percentage
Coastal wetland	3.41	341	842.61	0.69
Crop land	305.21	30521	75417.39	61.37
Deciduous	11.62	1162	2871.30	2.34
Evergreen / Semi Evergreen	0.12	12	29.65	0.02
Fallow	15.64	1564	3864.64	3.14
Forest Plantation	3.69	369	911.80	0.74
Gullied / Ravinous	0.11	11	27.18	0.02
Plantation	8.08	808	1996.57	1.62
River / Stream / Canals	7.18	718	1774.18	1.44
Rural	44.45	4445	10983.60	8.94
Salt affected land	0.37	37	91.43	0.07
Sandy area	0.41	41	101.31	0.08
Scrub land	21.81	2181	5389.25	4.39
Urban	21.29	2129	5260.76	4.28
Water bodies	53.91	5391	13321.16	10.84
Total	**497.3**	**49730**	**122883**	**100**

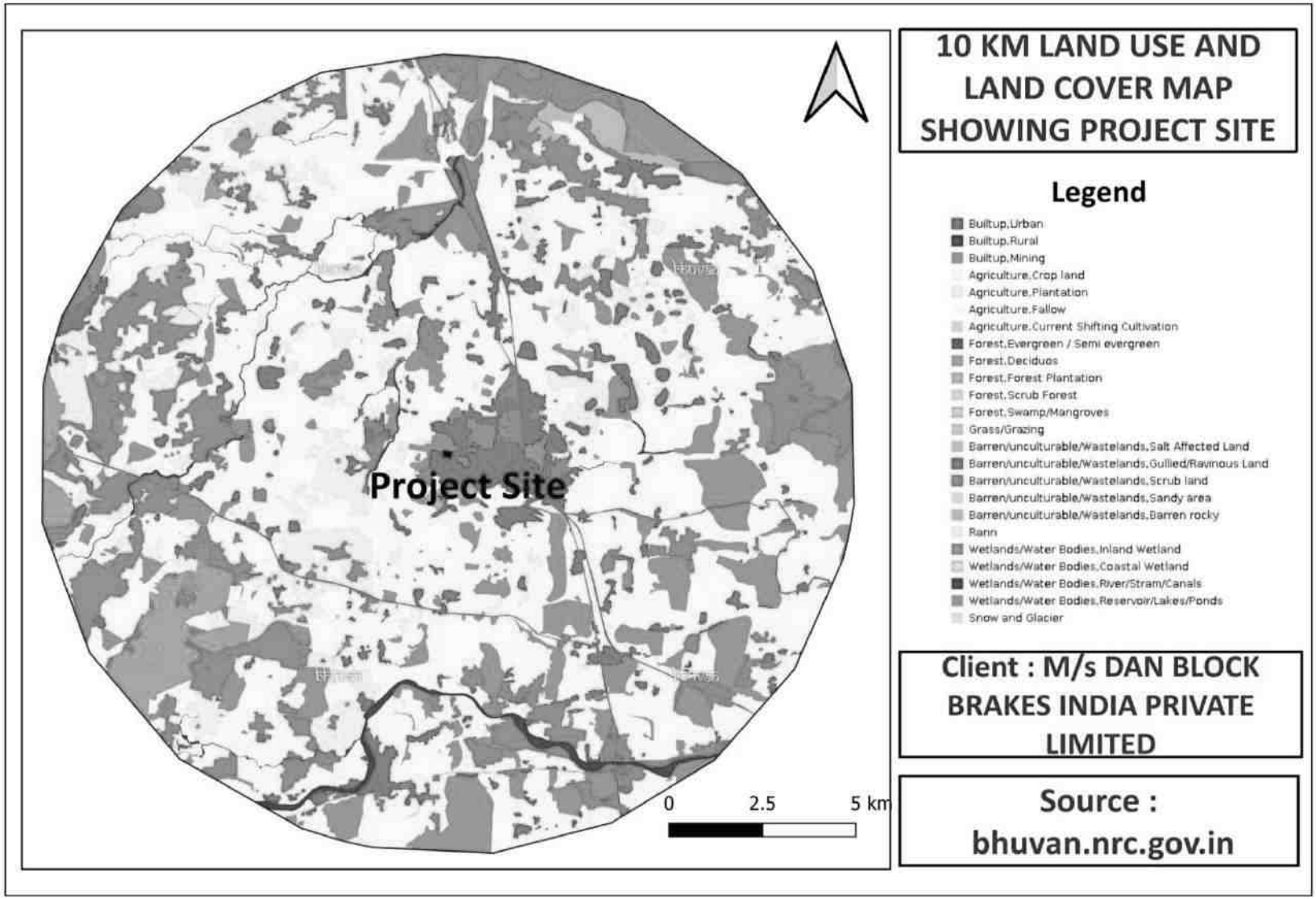


Figure 3.5 Land use Pattern of the Study Area

3.5 Geology

The Thiruvallur district can be geologically classified into hard rock and sedimentary (alluvial) formation. This district is principally made up of Archaean, upper Gondwana, and the tertiary formations. These are overlaidy laterites and alluvium. The oldest of the crystalline rocks of Archaean age are of Biotite and Hornblende Gneiss, Charnockite, and granite. These are intruded by Amphibole dykes, and occasionally with veins of quartz and pegmatites. Granites and gneisses of Archaean 4 age are mainly seen in Tiruthanitaluk. These crystalline rocks have undundergoneathering to a variable extent. Geology map of thiruvallur district isgiven in **Figure 3.6.**

Source: http://nwm.gov.in/sites/default/files/Notes%20on%20Thiruvallur%20District.pdf

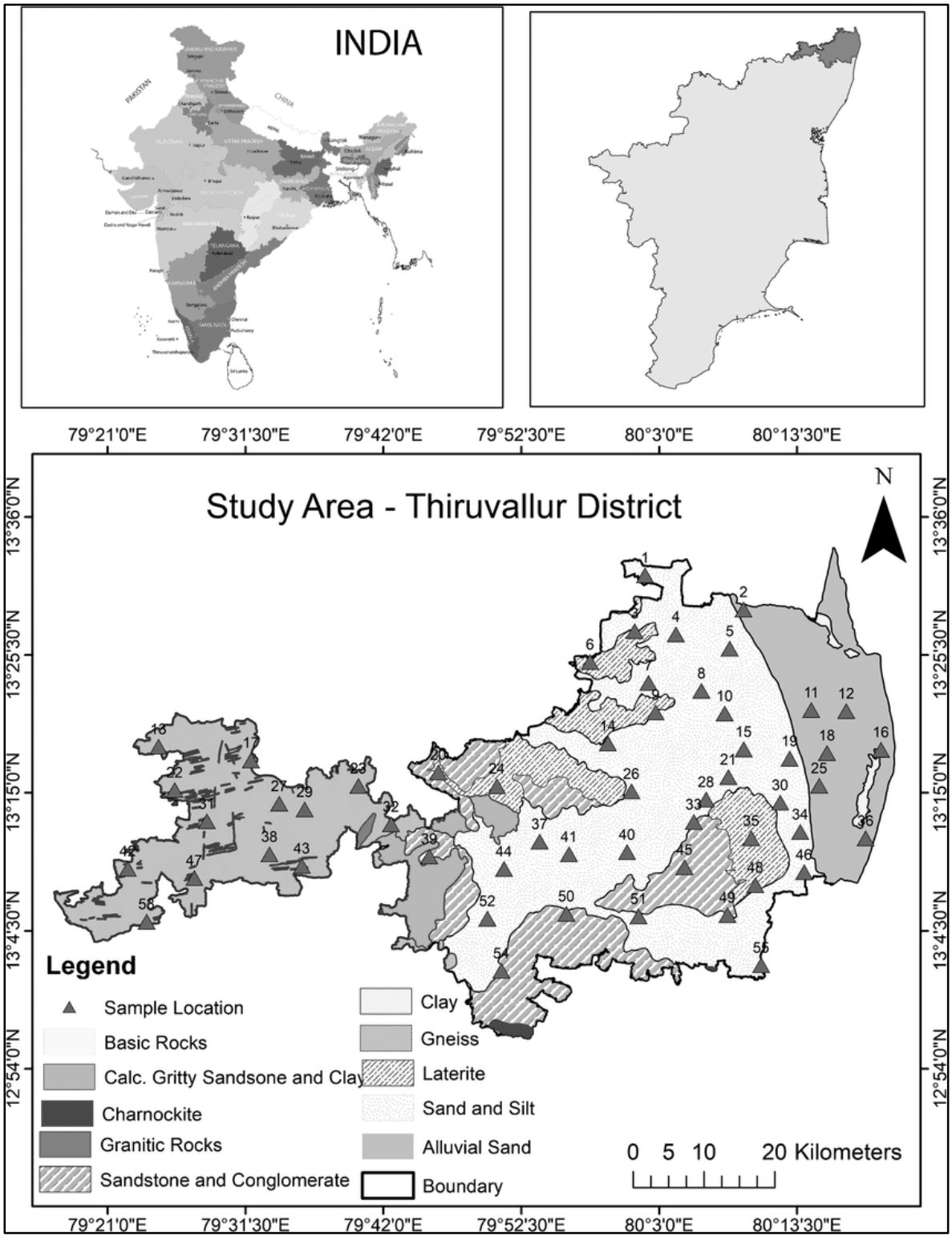


Figure 3.6 Geology Map of Study Area

3.6 Water Environment

The industrial development of any region is contingent on the availability of sufficient water resources, as most of the process industries would require water for process or cooling purposes. The potential for exploitation of ground water resources increases as development of new projects increases in industrial and agricultural areas. With the increasing industrialization and urbanization, the possibilities of contamination of surface water and ground water sources are rapidly increasing. The water resources in the area broadly fall into following categories:

1. Surface Water resources: Streams and ponds, etc.
2. Ground Water resources: Accumulation in deeper strata of ground

3.6.1 Ground Water Conditions

The ground condition in the study area is in semi-critical condition. Ground water generally occurs under phreatic conditions in the weathered mantle and under semi-confined conditions in the fractured zones at deeper levels. Ground water generally occurs under phreatic conditions in the weathered mantle and under semi-confined conditions in the fissured and fractured zones at deeper levels. The thickness of weathered zone in the district is in the range of 2 to 12 m. The depth of the wells ranged from 8.00 to 15.00 m bgl.

The yield of large diameter wells tapping the weathered mantle of crystalline rocks ranges from 100 to 500 lpm and are able to sustain pumping for 2 to 6 hours per day. Hydrogeological Map of Tiruvallur District is given in **Figure 3.7.**

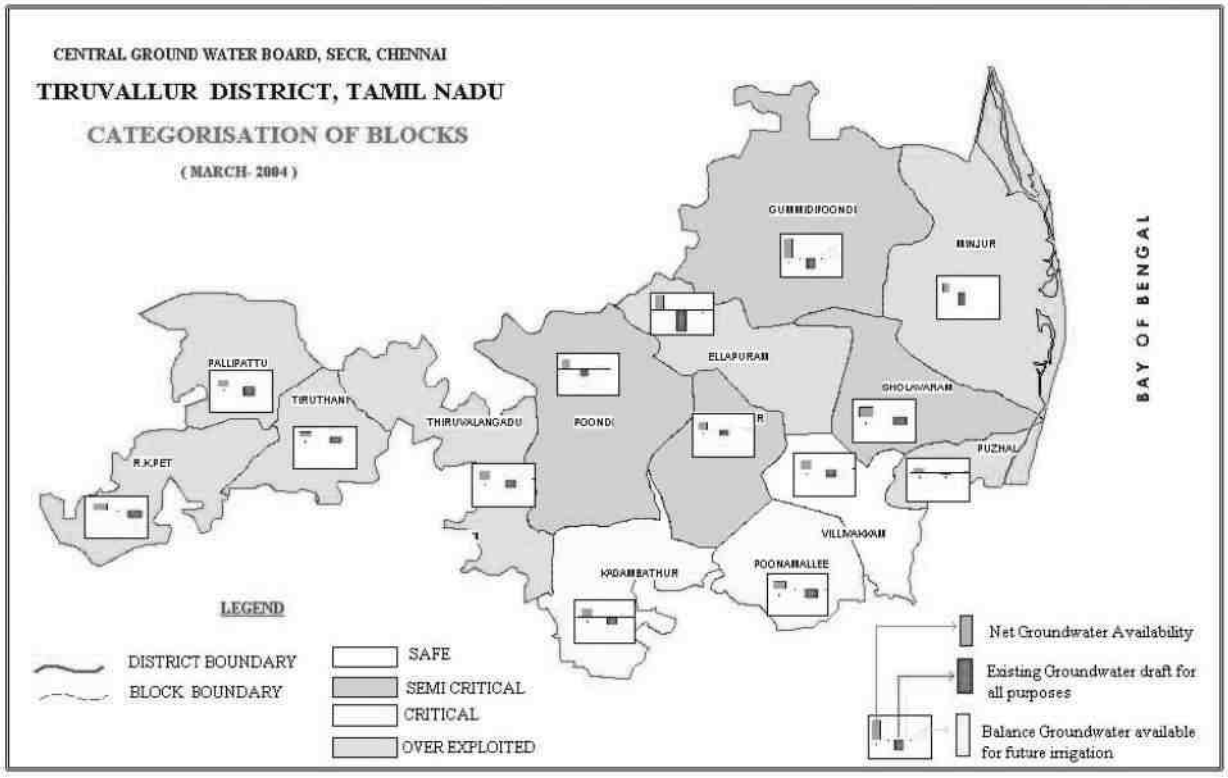


Figure 3.7 Hydrogeological Map of Tiruvallur District

3.6.2 Ground Water Levels

The depth to water level in the district varied between 2.38 – 7.36 m bgl during pre-monsoon (May 2006) and 0.79 – 5.30 m bgl during post monsoon (Jan 2007). The seasonal fluctuation shows a rise between 0.28 and 4.80 m bgl. The piezometric head varied between 2.20 to 10.30 m bgl (May 2006) during pre-monsoon and 2.72 to 8.55 m bgl during post-monsoon.

The yield of bore wells drilled down to a depth of 50 to 60 m ranges from 20 to 400 lpm. The yield of successful bore wells drilled down to a depth of 150 m bgl during the ground water exploration programme of Central Ground Water Board ranged from 1.2 to 7.6 lpm. Annual Average Depth to Water Levels in Thiruvallur District Pre-monsoon and post monsoon Figure 3.8 & Figure 3.9. Ground water Potential in Tiruvallur District is given in **Table 3.3.**

Source: http://cgwb.gov.in/District_Profile/TamilNadu/TIRUVALLUR.pdf

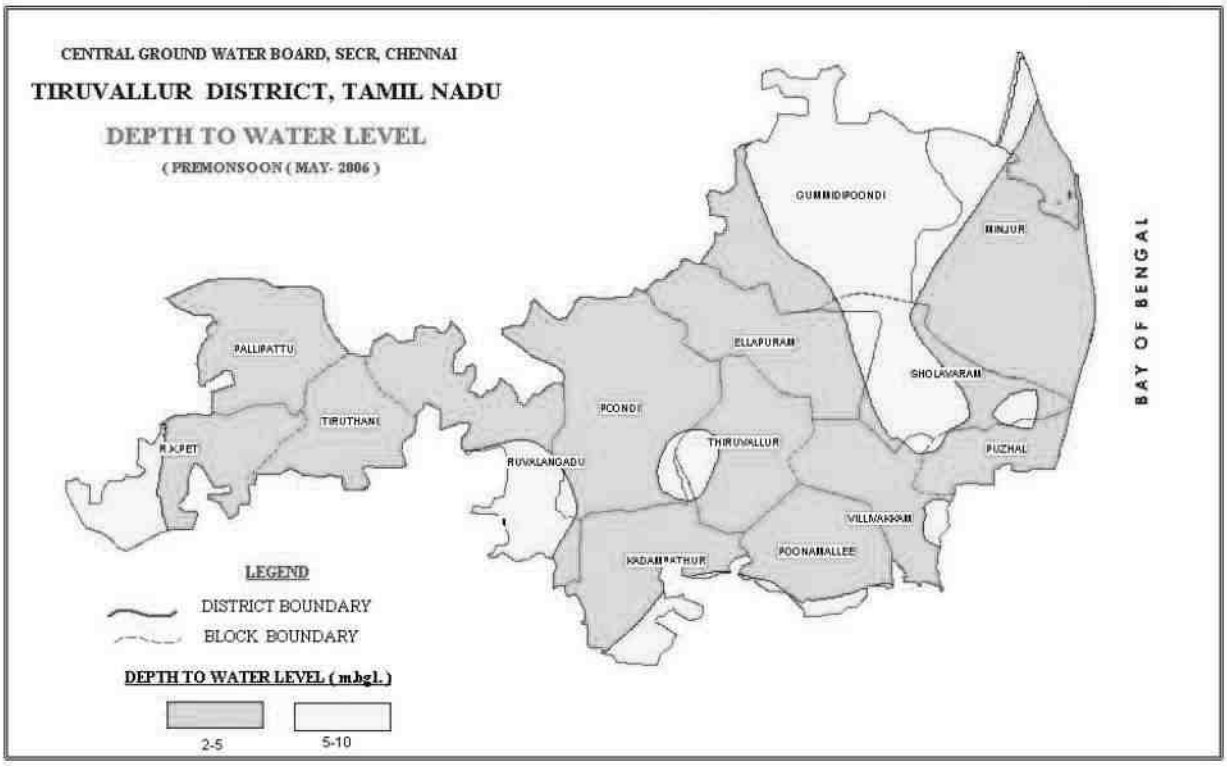


Figure 3.8 Annual Average of Pre-monsoon Depth to Water Levels in Thiruvallur District

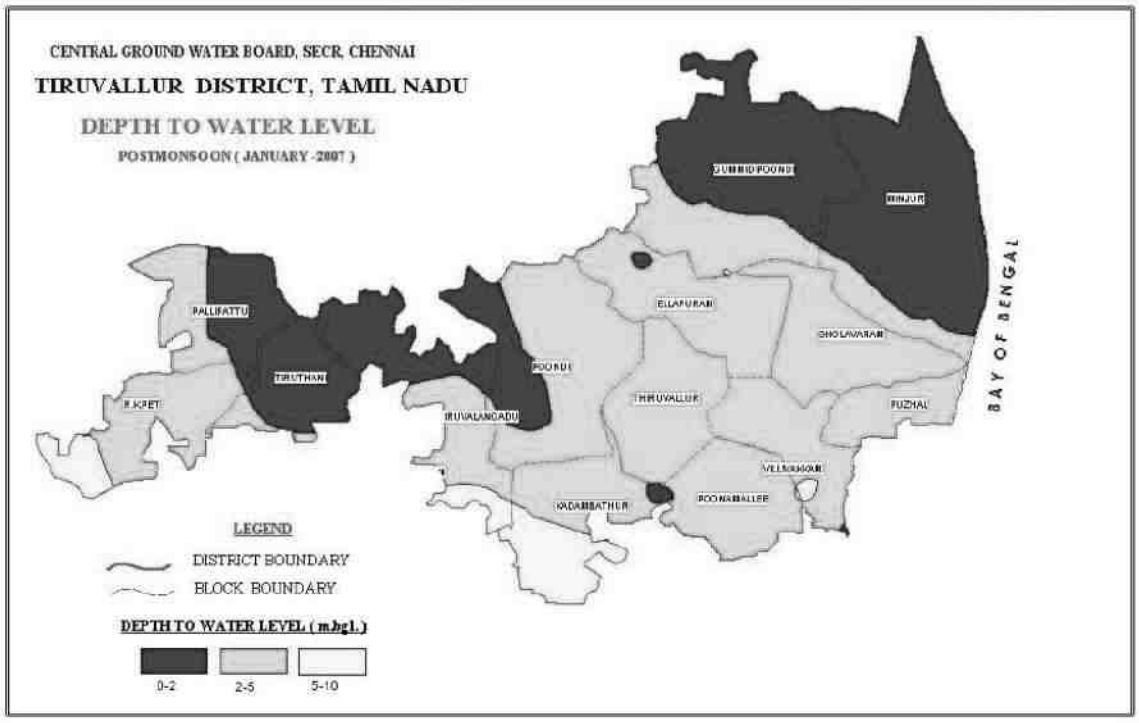


Figure 3.9 Annual Average of Post-monsoon Depth to Water Levels in Thiruvallur District

Table 3.3 Ground water Potential in Tiruvallur District

Attributes	Potential/Quantity
i. Number of Exploratory wells	46
ii. Number of Observation wells	6
iii. Number of Piezometers under Hydrology Project.	3
iv. Depth range(m bgl)	18 – 790.50
v. Discharge(lps)	0.5 – 39.0
vi. Storativity (S)	2.29×10^{-2}
vii. Transmissivity(m2/day)	1 – 4200

3.6.3 Ground Water Resources Estimation

In collaboration with the state departments, Central Ground Water Board (CGWB) carried out ground water resource estimation and categorization studies for the Gummidipoondi Taluk of Thiruvallur District for the year 2008-09. The CGWB has categorized the area as 'Semi Critical', indicating little scope for ground water development. These details are applicable to the study area also, as it is part of this Taluk. The plant's water requirement met from SIPCOT water.

3.6.4 Ground Water Quality

The ground water in the study area occurs under moderate and deep water level conditions, and quality-wise is generally suitable for domestic, irrigation, and industrial purposes.

Ground water samples were collected from the dug and boreholes located in the area and are shown in Figure 3.10. The samples were analyzed in the Pollucare Laboratory, Chennai the results are summarized in **Table 3.5**.

Table 3.4 Ground Water Sampling Locations

S.No.	Location Code	Location Name	Distance in km	Direction
1	GW1	Project site	Within Site	
2	GW2	Billakuppam	2.10	WNW
3	GW3	Gummidipoondi	2.8	E
4	GW4	Rajapalayam	6.10	NE
5	GW5	Peria Soliampakkam	5.0	ENE
6	GW6	Thandalacheri	3.8	S
7	GW7	Papankuppam	0.9	NNW
8	GW8	Chinna Obulapuram	4.0	NE

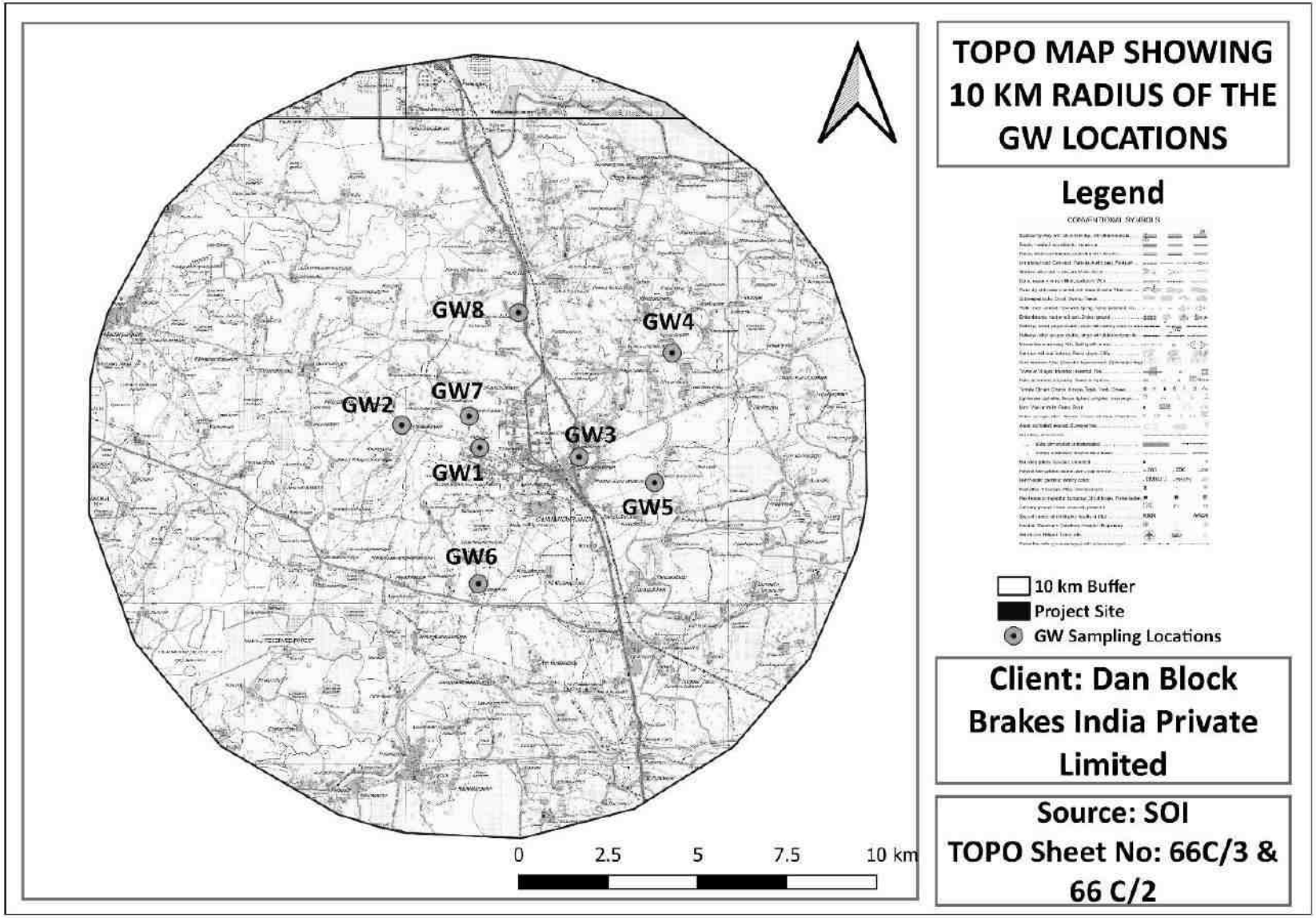


Figure 3.10 Location of ground water samples in the study area

Table 3.5 Ground Water Samples analysis report

S. No	Parameters	Units	GW1	GW2	GW3	GW4	GW5	GW6	GW7	GW8
1	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
2	Turbidity	NTU	BDL(DL: 0.1)	1.3	18.5	0.9	7.4	0.4	6.2	10.9
3	pH Value @ 25 oC	-	6.36	6.18	7.36	6.47	6.23	6.99	6.37	6.48
4	Electrical Conductivity @ 25oC	µS/cm	310	432	1104	848	510	929	715	758
5	Total Dissolved Solids @ 180ºC	mg/l	200	280	710	556	328	604	464	493
6	Nitrate (as NO3)	mg/l	7.89	3.01	32.8	4.90	15.1	10.2	12.5	22.1
7	Calcium (as Ca)	mg/l	20.4	19.5	110	111	52.3	108	56.9	78.0
8	Chlorides (as Cl)	mg/l	37.9	25.3	159	222	75.6	145	66	113
9	Sulphate (as SO4)	mg/l	9.1	9.4	36.4	6.9	17.4	82.3	81.6	25.7
10	Total Hardness (as CaCO3)	mg/l	50.9	48.8	345	410	164	367	206	244
11	Total Alkalinity (as CaCO3)	mg/l	61.6	90.2	319	99.0	152	260	169	224
12	Fluoride (as F)	mg/l	BDL(DL: 0.1)	BDL(DL: 0.1)	BDL(DL: 0.1)	BDL(DL: 0.1)	BDL(DL: 0.1)	BDL(DL: 0.1)	BDL(DL: 0.1)	BDL(DL: 0.1)
13	Dissolved phosphate (as PO4)	mg/l	BDL(DL: 0.1)	BDL(DL: 0.1)	BDL(DL: 0.1)	BDL(DL: 0.1)	BDL(DL: 0.1)	BDL(DL: 0.1)	BDL(DL: 0.1)	BDL(DL: 0.1)
14	Magnesium (as Mg)	mg/l	BDL(DL: 0.24)	BDL(DL: 0.24)	17.0	32.4	7.99	23.7	15.5	12.0
15	Sodium (as Na)	mg/l	23.4	13.9	94.8	42.8	44.8	67.6	46.7	66.0

16	Potassium (as K)	mg/l	BDL(DL: 0.5)	BDL(DL: 0.5)	BDL(DL: 0.5)	2.20	BDL(DL: 0.5)	BDL(DL: 0.5)	1.53	BDL(DL: 0.5)
17	Lead (as Pb)	mg/l	BDL(DL: 0.01)	BDL(DL: 0.01)	BDL(DL: 0.01)	BDL(DL: 0.01)	BDL(DL: 0.01)	BDL(DL: 0.01)	0.02	BDL(DL: 0.01)
18	Boron (as B)	mg/l	BDL(DL: 0.05)	BDL(DL: 0.05)	BDL(DL: 0.05)	BDL(DL: 0.05)	BDL(DL: 0.05)	BDL(DL: 0.05)	BDL(DL: 0.05)	BDL(DL: 0.05)
19	Copper (as Cu)	mg/l	BDL(DL: 0.01)	BDL(DL: 0.01)	BDL(DL: 0.01)	BDL(DL: 0.01)	BDL(DL: 0.01)	BDL(DL: 0.01)	BDL(DL: 0.01)	BDL(DL: 0.01)
20	Arsenic (as As)	mg/l	BDL(DL: 0.001)	BDL(DL: 0.001)	BDL(DL: 0.001)	BDL(DL: 0.001)	BDL(DL: 0.001)	BDL(DL: 0.001)	BDL(DL: 0.001)	BDL(DL: 0.001)
21	Cadmium (as Cd)	mg/l	BDL(DL: 0.001)	BDL(DL: 0.001)	BDL(DL: 0.001)	BDL(DL: 0.001)	BDL(DL: 0.001)	BDL(DL: 0.001)	BDL(DL: 0.001)	BDL(DL: 0.001)
22	Total Chromium	mg/l	BDL(DL: 0.01)	BDL(DL: 0.01)	BDL(DL: 0.01)	BDL(DL: 0.01)	BDL(DL: 0.01)	BDL(DL: 0.01)	BDL(DL: 0.01)	BDL(DL: 0.01)
23	Zinc (as Zn)	mg/l	0.06	BDL(DL: 0.01)	0.18	BDL(DL: 0.01)	BDL(DL: 0.01)	BDL(DL: 0.01)	BDL(DL: 0.01)	0.02

The ground water results reflect the nature of the area. The details of analysis of results are discussed below

- The pH concentration of the water samples collected from the study area varies from 6.18 to 7.36, and is within acceptable limits.
- The total dissolved solids (TDS) ranges from 200 to 710 mg/l, and is within permissible limits of 2000 mg/l indicating it's suitable for drinking, domestic, and industrial use. Highest is reported at Gummidipoondi.
- Chloride concentrations are within the permissible limits (1000 mg/l) of 25.3 to 222 mg/l. Highest is reported at Rajapalayam village.
- Sulphates concentrations vary from 6.90 to 82.30 mg/l which is within the acceptable limit.
- The hardness of samples collected in the area varies 48.80 to 410 mg/l.

3.6.5 Surface Water Quality

To establish the baseline status of water environment, the existing representative sampling locations for surface water within a radial distance of 10 Km from project site have been selected as per CPCB guidelines of Water Quality Monitoring through an adequate survey of the project area. Surface water samples were collected from the lake, and ponds located in the area and are shown in **Figure 3.11** The results of the analysis of surface water sources in the vicinity are presented in the **Table 3.7**.

Table 3.6 Surface Water Sampling Location

S.No	Location	Location Code	Distance (km)	Direction
1	Lake near Nagaraja Kandigai	SW1	4.3	NNW
2	Chitoornatham Lake	SW2	4.8	W
3	Karumbukuppam Lake	SW3	2.40	SE
4	Pulicat Lake	SW4	8.5	NNE
5	Thandalacheri Lake	SW5	3.8	S
6	Therauli Lake	SW6	4.3	NE

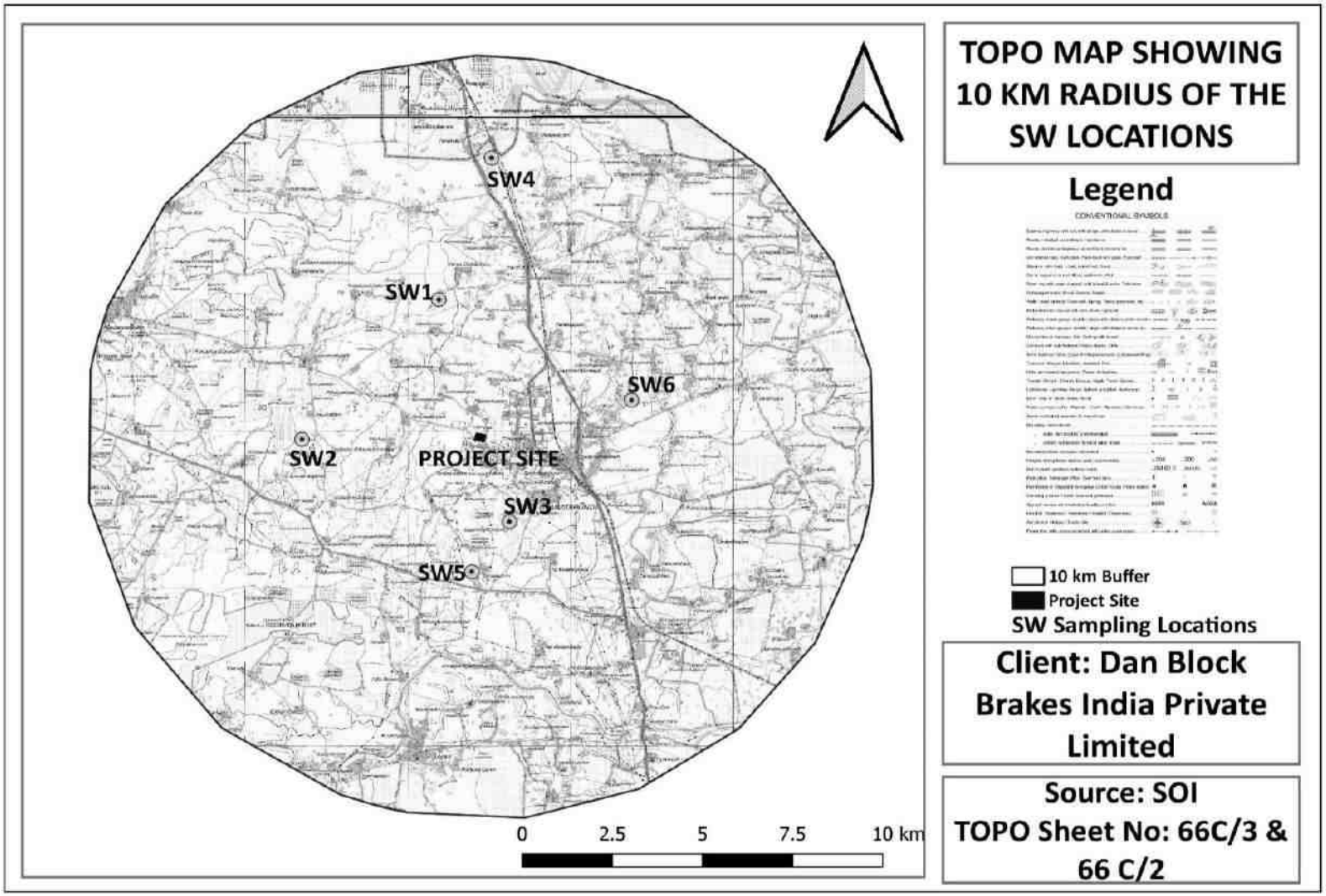


Figure 3.11 Surface Water Sampling Locations

Table 3.7 Surface Water Samples analysis report

S. No	Parameters	Units	SW1	SW2	SW3	SW4	SW5	SW6
1	Colour	Hazen	90	20	40	BDL (DL:1.0)	20	10
2	Odour	-	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable
3	Turbidity	NTU	18.2	11.8	3.3	6.3	BDL(DL:0.5)	20.6
4	pH Value @ 25 oC	-	5.99	9.02	8.17	8.44	7.75	8.15
5	Electical Conductivity @25oC	µS/cm	82.9	438	1227	262	1556	738
6	Total Dissolved Solids @ 180ºC	mg/l	58.0	285	800	166	1023	474
7	Total Suspended Solids @ 105oC	mg/l	28.2	36.0	22.0	20.7	28.4	60.8
8	Bio chemical Oxygen Demand (27ºC for 3 days)	mg/l	5.32	27.5	3.48	13.4	BDL(DL:2.0)	48.2
9	Chemical Oxygen Demand (COD)	mg/l	29.5	142	27.4	80.5	BDL(DL:4.0)	236
10	Dissolved Oxygen (DO)	mg/l	2.6	4.8	4.4	6.2	3.9	5.7
11	Calcium (as Ca)	mg/l	BDL (DL:0.4)	25.3	105	14.4	133	41.9
12	Chlorides (as Cl)	mg/l	17.5	4.86	160	2.83	243	8.13
13	Copper (as Cu)	mg/l	BDL (DL:0.01)	0.03	BDL (DL:0.01)	BDL (DL:0.01)	BDL (DL:0.01)	0.09
14	Iron (as Fe)	mg/l	4.29	BDL (DL:0.075)	0.83	BDL (DL:0.075)	0.17	BDL (DL:0.075)
15	Magnesium (as Mg)	mg/l	BDL (DL:0.24)	17.9	66.4	10.1	84.3	29.6
16	Nitrate (as NO3)	mg/l	6.22	2.92	13.3	1.68	15.0	4.91
17	Dissolved Phosphate (as PO4)	mg/l	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)

S. No	Parameters	Units	SW1	SW2	SW3	SW4	SW5	SW6
18	Sodium (as Na)	mg/l	12.4	61.3	98.4	34.7	124	104
19	Potassium (as K)	mg/l	BDL (DL:0.5)	3.92	6.17	2.26	9.57	7.85
20	Sulphates (as SO4-2)	mg/l	1.90	4.28	115	2.43	162	7.16
21	Total Alkalinity (as CaCO3)	mg/l	15.4	103	292	60.4	305	175
22	Total Hardness (as CaCO3)	mg/l	BDL(DL:1.0)	137	535	77.6	678	227
23	Fluoride (as F)	mg/l	BDL(DL:0.1)	BDL(DL:0.1)	BDL(DL:0.1)	BDL(DL:0.1)	BDL(DL:0.1)	BDL(DL:0.1)
24	Zinc (as Zn)	mg/l	0.05	0.09	0.04	0.05	0.03	0.19
25	Cadmium (as Cd)	mg/l	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)
26	Boron (as B)	mg/l	0.19	BDL(DL:0.05)	0.58	BDL(DL:0.05)	0.51	BDL(DL:0.05)
27	Total Arsenic (as As)	mg/l	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)
28	Total Chromium (as Cr)	mg/l	0.04	0.54	BDL(DL:0.01)	0.34	BDL(DL:0.01)	0.86

A summary of analytical results is presented below:

- In the surface water the pH varies between 6.0-9.0, which are meeting the IS 10500:2012 for Drinking Water.
- The Total Dissolved Solids range varies between 58 mg/l – 1023 mg/l for the surface water. The TDS value of a few samples exceed the acceptable limit of IS 10500:2012
- The desirable limit of the chloride content is 250mg/l and permissible limit is 1000 mg/l. The chloride content in the surface water for study area is ranges between 3 mg/l – 43 mg/l.
- The desirable limit of the Sulphate content is 200mg/l and permissible limit is 400mg/l. The Sulphate content of the surface water of the study area varies between 2 mg/l – 162 mg/l meeting the desirable limit of the IS 10500: 2012.
- The Total hardness ranges is between 78 mg/l - 678 mg/l, for few samples acceptable limit of IS 10500: 2012 exceeds.
- COD ranges between 27 – 236 mg/l.
- BOD ranges between 3 – 48 mg/l.

Overall, the surface water quality in the region comes in the Class “C” & Class “D” norms of IS 2296:1982.

3.7 Soil

Soils have been classified into Blacksoil, mixedsoil, red loamy soil, gravelly and sandy soils. Red soil, Black Soil, Alluvial Soil, Coluvial Soil are majorly found in the district.

The Soil characteristics include both physical and chemical parameters. M/s. Pollucare field team carried out soil survey to assess the soil characteristics of the study area. Representative soil sampling was done at important locations and these locations are shown in **Figure 3.12**. Analytical data of soil samples is presented in **Table 3.9**.

Table 3.8 Soil Sampling Location

S.No.	Location Code	Location Name	Distance in km	Direction
1	S1	Project site	Within Site	
2	S2	Billakuppam	2.10	WNW
3	S3	Gummidipoondi	2.8	E
4	S4	Rajapalayam	6.10	NE
5	S5	Peria Soliampakkam	5.0	ENE
6	S6	Thandalacheri	3.8	S
7	S7	Papankuppam	0.9	NNW
8	S8	Chinna Obulapuram	4.0	NE

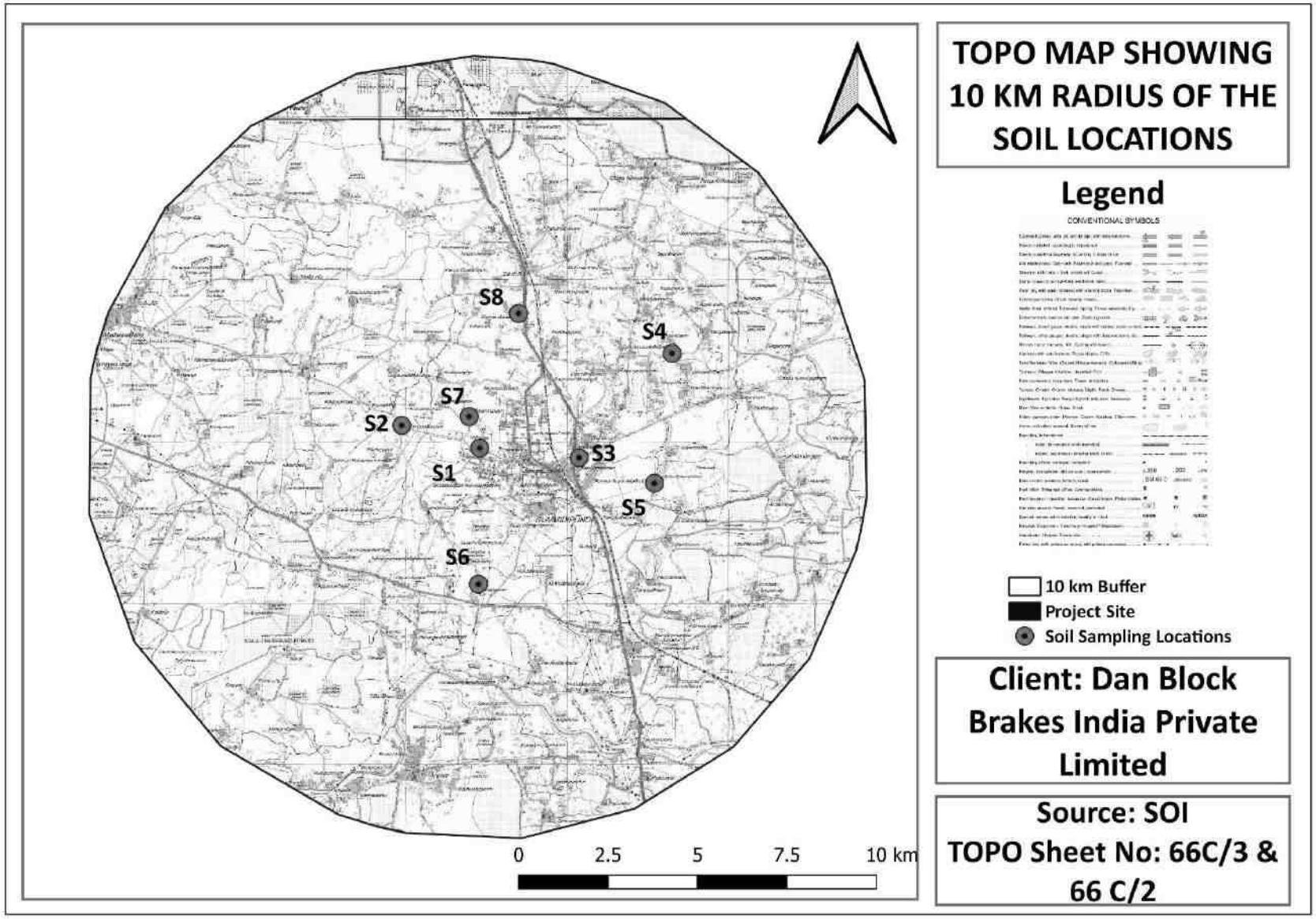


Figure 3.12 Soil Sampling Locations

Table 3.9 Soil Analysis Data

S. N	Parameters	Units	S1	S2	S3	S4	S5	S6	S7	S8
1	Color*	-	Blackish brown	Blackish brown	Light Brown				Light Brown	
2	pH value @ 25°C	-	5.62	6.27	6.61	6.83	7.22	8.36	8.04	6.33
3	Electrical Conductivity @ 25oC	µS/cm	89.5	431	58.7	220	713	1144	1603	65
4	Organic Carbon	%	1.98	2.62	1.52	5.71	18.4	28.6	0.44	1.72
5	Available Phosphorous (as P)	µg/g	49.4	66.2	55.4	204	658	1032	51.6	60.4
6	Soluble Calcium (as Ca)	meq/L	BDL(DL:0.2)	6	BDL(DL:0.2)	3.03	9.73	15.4	BDL(DL:0.2)	0.87
7	Total Nitrogen (as N)	%	0.79	1.07	0.56	2.31	8.23	7.15	0.24	0.57
8	Bulk Density	g/cc	BDL(DL:0.5)	0.54	0.51	BDL(DL:0.5)	0.88	1.46	0.51	1.07
9	Soil Texture	%	Sandy loam	Sandy Loam	Sandy Loam	Sandy loam	Sandy loam	Sandy loam	Sandy loam	Sandy loam
10	Soluble Magnesium (as Mg)	meq/L	BDL(DL:0.2)	1.5	BDL(DL:0.2)	0.77	2.5	3.98	BDL(DL:0.2)	0.24
11	Sodium (as Na)*	µg/g	1.14	29.2	0.38	14.9	48	74.2	25.5	4.53
12	Available Potassium (as K)*	µg/g	5.2	1	9.02	0.56	1.81	2.66	99.1	0.18

The test results of soil samples collected in the impact area are interpreted referring to the book; "Interpreting soil test results". The reference tables are presented in **Table 3.10.** The pH of soil samples ranges from Moderately acidic to Strongly alkaline. The cation exchange capacity of the soils is Low to Very high. The level of nitrogen of the samples very less and the potassium levels are medium to Very high. Bulk density of soil of impact varies from 0.51 – 1.46 g/cc. Soil texture is predominantly Sandy loam.

Table 3.10 Soil Test Results – Reference Tables

General interpretation of pH measured		
pH	**Range**	**Classification**
	<4.5	Extremely Acidic
	4.51 -5.0	Very Strong Acidic
	5.1-5.5	Strong Acid
	5.6- 6.0	Moderately Acid
	6.1-6.5	Slightly acid
	6.6-7.3	Neutral
	7.4-7.8	Mildily Alkaline
	7.9 -8.4	Moderately Alkaline
	8.5-9.0	Strongly Alkaline
	>9.0	Very Strongly Alkaline
Source: Bruce and Rayment (1982).		

Rating for Cation exchange Capacity	
	CEC (Cmol)+)/kg
Very low	<6 *
Low	6-12
Moderate	12-25
High	25-40
Very High	>40
Source: Metson (1961)	
* Soils with CEC less than three are often low in fertility and susceptible to soil acidification.	

Ca/mg Ratio	
	Description
<1	Ca Deficient
1-4	Ca (Low)
4-6	Balanced
6-10	Mg (Low)
>10	Mg deficient
Source: Eckert (1987)	

Base Saturation as a criterion of leaching	
Range (%BS)	**Rating**
70-100	Very Weakly Leached
50-70	Weakly Leached
30-50	Moderately Leached
15-30	Strongly Leached
0-15	Very Strongly Leached
Source: Metson (1961)	

Rating of Total Nitrogen	
Rating (% by W)	**Description**
<0.05	Very low

Extractable Potassium (K)	
	K
low	<150 ppm* (< 0.4 meq/100 g soil)

0.05-0.15	Low		mediu m	150–250 ppm (0.4–0.6 meq/100 g soil)
0.15-0.25	Medium		high	250–800 ppm (0.6–2.0 meq/100 g soil)
0.25-0.50	High		excessi ve	>800 ppm (>2.0 meq/100 g soil)
>0.5	Very High		**Source: Abbott (1989)**	
Source: Bruce and Rayment (1982)				

3.8 Air Environment

Baseline ambient air quality assessment gives the status in the vicinity of the site and is an indispensable part of environmental impact assessment studies. Significant changes, in predominant winds and weather conditions, are observed in winter, summer and post-monsoon seasons apart from the local topographic influences. The baseline status of the air environment in the study area is assessed through a systematic air quality surveillance program.

3.8.1 Meteorological Conditions

The regional air quality is influenced by the meteorology of that region. The principal weather parameters that influence the concentration of the air pollutants in the surroundings are wind speed, wind direction, and temperature. The meteorological data is useful for proper interpretation of the baseline data. It is used as input for air quality dispersion models for predicting the post-project environmental scenario

3.8.2 Meteorological Data Collection

Available secondary data pertaining to the meteorological parameters were obtained from the IMD Climatological tables. In addition, baseline meteorological data (primary data) was generated for 15th June 2022 to 15th September 2022. The methodology adopted for monitoring surface observations is as per the standard norms laid down by the Bureau of Indian Standards (BIS) i.e., IS:8829 and the Indian Meteorological Department (IMD).

3.8.3 General Meteorological Scenario based on IMD Data

The nearest Indian Meteorological Department (IMD) station located to project site is Minampakkam. The Climatological data for Chennai (Minambakkam) (13°00' N and

80°11' E), published by the IMD, Pune based on daily observations at 08:30 and 17:30 hour IST for a 30-year period, is presented in the following sections on the meteorological conditions of the region. The monthly variations of the relevant meteorological parameters are reproduced in **Table 3.11**.

Table 3.11 Climatological Summary – Chennai (Minambakkam) Region (1981-2010)

Month	Temp (°C)		Rainfall (mm)		Relative Humidity (%)		Station Level Pressure hPa		Mean Wind Speed (m/s)	Predominant Wind Directions (From)*
	Daily Min.	Daily Max.	Total	No. of days	Min	Max	Min	Max		
Jan	20.8	29.5	31.5	1.5	64	83	22.4	24.2	5.2	E
Feb	21.8	31.4	4.6	0.5	62	81	23.8	25.6	6.3	E
Mar	23.8	33.7	4.8	0.4	63	76	26.6	28.2	7.7	SE
Apr	26.2	35.7	14.2	0.9	67	72	30.5	31	9.3	SE
May	27.7	38.2	52.9	1.8	62	64	29.6	30.7	10	SE
Jun	**27.4**	**37.5**	**63.5**	**4.2**	**57**	**60**	**26.6**	**28.2**	**10.2**	**W**
Jul	**26.3**	**35.6**	**107.8**	**6.7**	**60**	**66**	**27**	**28.1**	**8.9**	**W**
Aug	**25.8**	**34.8**	**137.2**	**8.6**	**63**	**71**	**27.7**	**28.9**	**8.5**	**W**
Sep	25.4	34.3	145.8	7.7	69	75	29.1	29.6	7.1	W
Oct	24.5	32.2	298.1	10.6	74	81	29.3	29.8	5.4	E
Nov	23	30	373	10.9	75	83	26.7	27.8	5.1	NE
Dec	21.6	29	166	5.8	69	83	23.6	25.4	5.3	E
Max.	20.8	29	4.6	0.4	57	60	22.4	24.2	5.1	West
Min.	27.7	38.2	373	10.9	75	83	30.5	31	10.2	
Avg /Total.	24.5	33.5	116.6	5.0	65.4	74.6	26.9	28.1	7.4	

As per Table 3.10, Climatological data provided observations drawn for the study period are the following:

- The daily maximum temperature during the study period is 37.5°C and the daily minimum temperature is 25.8°C were recorded in the months of June and August respectively
- Maximum and minimum relative humidity of 57 % and 71 % were recorded in the months of June and August respectively.
- Total rainfall recorded during study period is 308.5 mm

- Wind speed range is 8.5 m/s – 10.2 m/s. Annual Wind predominant are mostly from West direction.

3.8.4 Meteorological Scenario during Study Period

Meteorological scenario in and around the project site is an essential requirement during study period for proper interpretation of baseline air quality status. Meteorological data was collected for the period of 15th June 2022 to 15th September 2022.The wind rose of the study period is given in **Figure 3.13.**

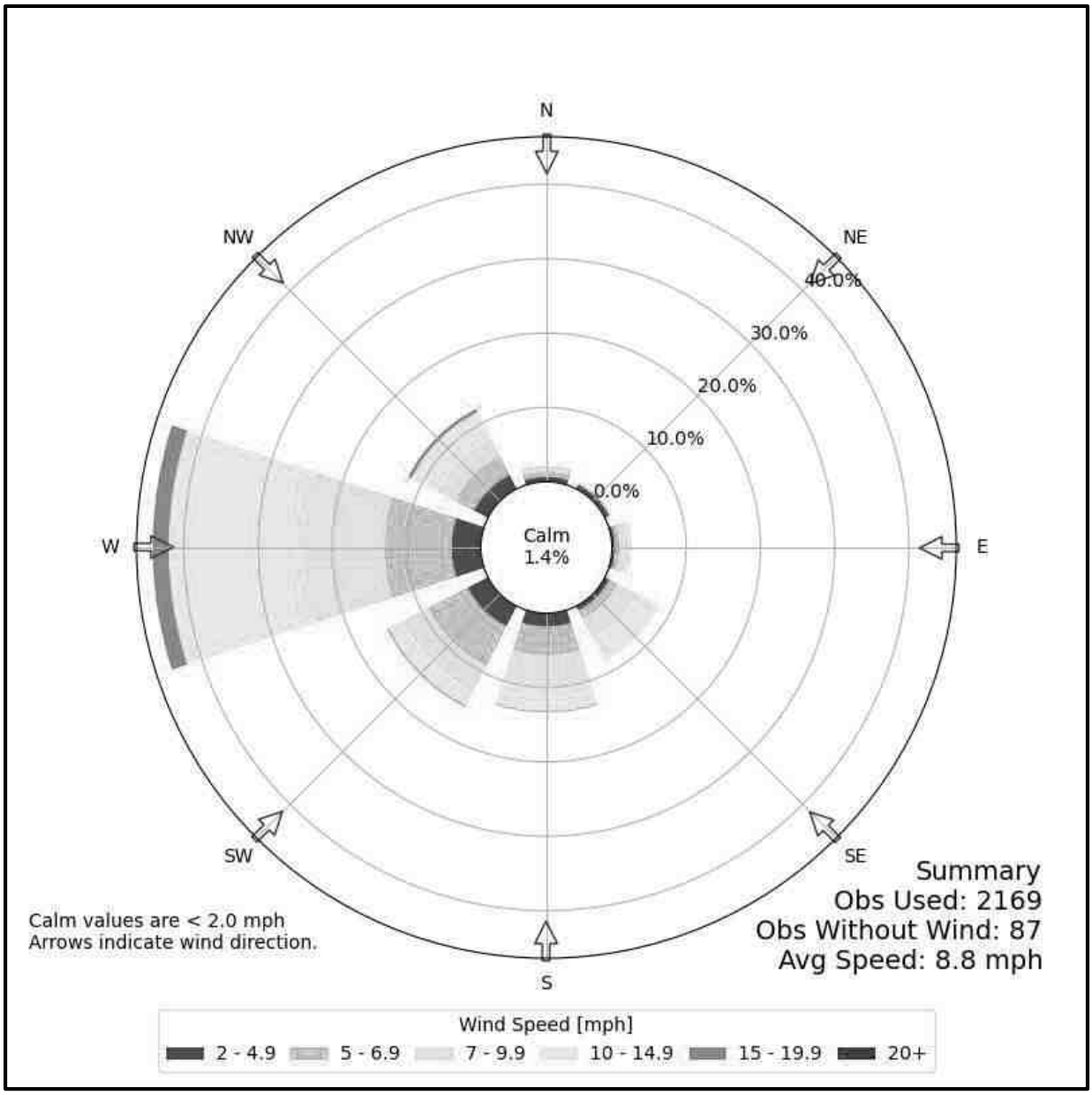


Figure 3.13 Specific Wind Rose for the Study Period

3.8.5 Meteorological data during Study Period

The meteorological data of study period was used for interpretation of baseline status. Meteorology Data for the Study Period (15th June 2022 to 15th September 2022) is given in **Table 3.12.**

Table 3.12 Meteorology Data for the Study Period

(15th June 2022 to 15th September 2022)

S.No	Parameter	Observation
1.	Temperature	• Min Temperature: 23°C • Max Temperature: 37°C • Avg Temperature: 30°C
2.	Relative Humidity	79%
3.	Average Wind Speed	8.29 m/h
4.	Predominant Wind Direction	West to East
5.	Total Rainfall	443.18 mm

3.9 Ambient Air Quality

Air pollution means the presence in the outdoor atmosphere of one or more contaminants or combinations thereof in such quantities and of such duration as are or may tend to be injurious to human, plant or animal life or property. Air pollutants include smoke, vapors, soot, fumes, gases, mist, odors, particulate matter, radioactive material or noxious chemicals. With upcoming industrial activity, a range of different pollutants are released into the atmosphere that are dispersed and have a significant impact on neighborhood air environment. Thus collection of base line data of air environment occupies a predominant role in the impact assessment statement. The ambient air quality status across the study zone forms basis for prediction of the impacts due to the project.

The data required for assessing air quality impacts in and around neighborhood is achieved by selecting monitoring stations reflecting down wind, up wind and cross wind directions.

3.9.1 Ambient air quality monitoring station network

An intensive ambient air quality monitoring of the study area was done consisting of 10 km radius of the plant site. The ambient air quality was monitored at eight locations

spread over entire study area including plant site. **Figure 3.14** presents the locations of ambient air quality-monitoring stations.

The location of ambient air quality stations is contingent on the meteorological status of the area, Residential and sensitive areas within the study area and nearby industrial activity **Table 3.13** presents the ambient air quality locations and their distances and directions from the plant site.

Table 3.13 Locations of Ambient Air Quality Monitoring Stations

S.No.	Location Code	Location Name	Wind Direction	Distance	Direction
1	AAQ1	Project site		Within Site	
2	AAQ 2	Billakuppam	u/w	2.10	WNW
3	AAQ 3	Gummidipoondi	d/w	2.8	E
4	AAQ 4	Rajapalayam	d/w	6.10	NE
5	AAQ 5	Peria Soliampakkam	d/w	5.0	ENE
6	AAQ 6	Thandalacheri	c/w	3.8	S
7	AAQ 7	Papankuppam	c/w	0.9	NNW
8	AAQ 8	Chinna Obulapuram	c/w	4.0	NE

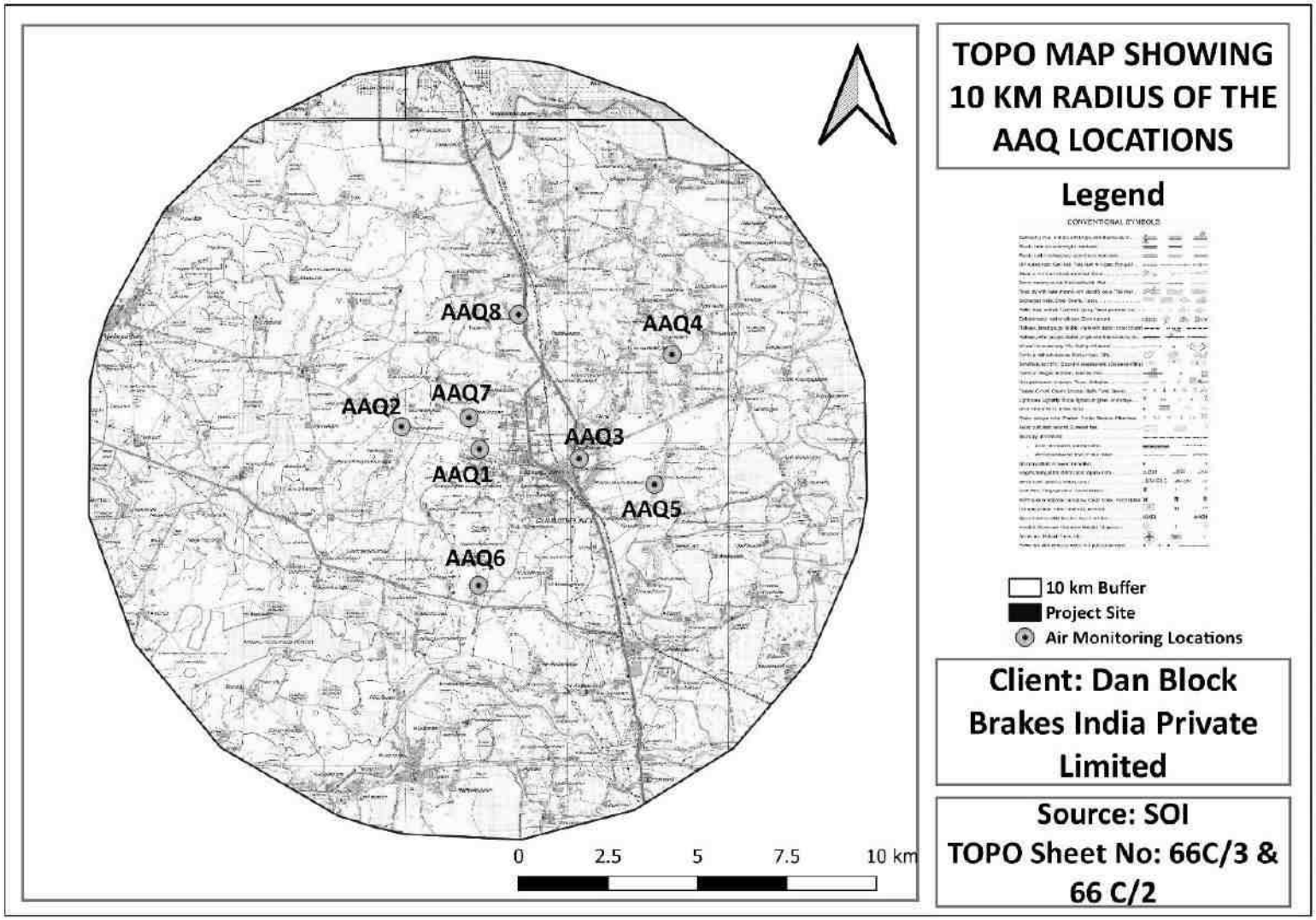


Figure 3.14 Ambient Air Quality Monitoring Locations

3.9.2 Ambient Air Quality Status

At each sampling station monitoring was carried out for 24 hours in a day for 2 days a week, and for three months. The major air pollutants monitored on 24 hourly basis are, Particulate Matter (Size Less than 10µm) or PM10 µg/m3, Sulfur dioxide, Nitrogen Oxide and CO are. Raw data is enclosed as **Annexure 17**. Sampling and analysis of the above variables is according to the guidelines of Central Pollution Control Board. Ambient air quality status is presented in **Table 3.14**.

Table 3.14 Ambient Air Quality Status

S. No	Parameters	Units	AAQ1	AAQ 2	AAQ 3	AAQ4	AAQ5	AAQ 6	AAQ7	AAQ 8	NAAQ Standards
1	Sulphur dioxide (as SO_2)	µg/ m3	13.9	12.1	12.8	9.82	16.2	12.9	14.5	13.3	80
2	Oxides of Nitrogen (as NO_2)	µg/ m3	20.8	19.3	21.7	23.1	19.7	20.4	24.7	21.7	80
3	Respirable Particulate Matter (PM_{10})	µg/ m3	57.6	56.8	58.1	58.4	58.4	54.1	61.2	54.1	100
4	Respirable Particulate Matter ($PM_{2.5}$)	µg/ m3	28.9	27.2	26.7	30.5	30.8	26.5	35.6	26.5	60
5	Ozone (as O_3)	µg/ m3	12.1	13.4	14.1	14.1	14.3	11.9	15.4	11.9	180**
6	Lead (as Pb)	µg/ m3	BDL(DL:0. 05)	BDL(DL:0. 05)	BDL(DL:0. 05)	BDL(DL:0. 05)	BDL(DL:0. 05)	BDL(DL:0. 05)	BDL(D L:0.05)	BDL(DL:0. 05)	1
7	Carbon Monoxide (as CO)	µg/ m3	BDL(DL:1. 14)	BDL(DL:1. 14)	BDL(DL:1. 14)	BDL(DL:1. 14)	BDL(DL:1. 14)	BDL(DL:1. 14)	BDL(D L:1.14)	BDL(DL:1. 14)	4**
8	Ammonia (as NH_3)	µg/ m3	5.25	4.96	5.11	5.63	5.05	5.34	4.74	5.34	400**
9	Benzene (C_6H_6)	µg/ m3	BDL(DL:1.	BDL(DL:1.	BDL(DL:1.	BDL(DL:1.	BDL(DL:1.	BDL(DL:1.	BDL(D L:1.0)	BDL(DL:1.	5*

			0)	0)	0)	0)	0)	0)		0)	
10	Benzo (a) Pyrene (BaP)	µg/m3	BDL(DL:1.0)	BDL(DL:1.0)	BDL(DL:1.0)	BDL(DL:1.0)	BDL(DL:1.0)	BDL(DL:1.0)	BDL(DL:1.0)	BDL(DL:1.0)	1*
11	Arsenic (as As)	µg/m3	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)	6*
12	Nickel (as Ni)	µg/m3	BDL(DL:10)	BDL(DL:10)	BDL(DL:10)	BDL(DL:10)	BDL(DL:10)	BDL(DL:10)	BDL(DL:10)	BDL(DL:10)	20*

- The 24-hourly average PM10 level varied between 54.1 mg/m3 (Thandalacheri Village) and 61.2 mg/m3 (Papankuppam). The level of PM10 in all the areas are within the NAAQS standards of 100 g/m3. In the papankulam village which is slightly high as it is located near by the industrial area.
- The 24-hourly averagePM2.5 level varied between 26.5 mg/m3 (at Thandalacheri Village) and 35.6 mg/m3 (at Papankuppam). The level of PM 2.5 in all the areas is within the NAAQS standards of 60 mg/m3.
- The mean of 24-hourly average values of SO2 over the study area was varying between 19.7 µg/m3 (at Rajapalayam) to 16.2 µg/m3 (at Peria Soliampakkam). The SO2 levels at all the locations were much below the permissible limit of 80 g/m3 stipulated for residential, rural & other areas.
- The mean of 24-hourly NOx level over the entire study area was varying between 19.3 mg/m3 (at Billakuppam) to 24.7 g/m3 (at Papankuppam). The 24-hourly average values of NOx at all the locations were within the prescribed limit of 80 g/m3 stipulated for residential, rural and other areas.

3.10 Noise Environment

Noise is an unwanted sound without musical quality. Artificial noise and its impact on environment, grown apace with advancing human civilization. Noise pollution is equally hazardous to environment as air, water and other forms of pollution. Various noise measurement units have been introduced to describe, in a single number, the response of an average human to a complex sound made up of various frequencies at different loudness levels. The most common scale is, weighted decibel dB (A), and measured as the relative intensity level of one sound with respect to another sound (reference sound).

The impact of noise depends on its characteristics (instantaneous, intermittent or continuous in nature), time of day (day or night) and location of noise source.

The assessment of noise pollution on neighbourhood environment due to the industry, traffic and other human activities was carried out at 8 locations in the study area. **Figure 3.15** shows noise level measured locations. The measured noise values are shown in **Table 3.15**. Noise levels are high at the traffic junctions compared to the industrial and village areas.

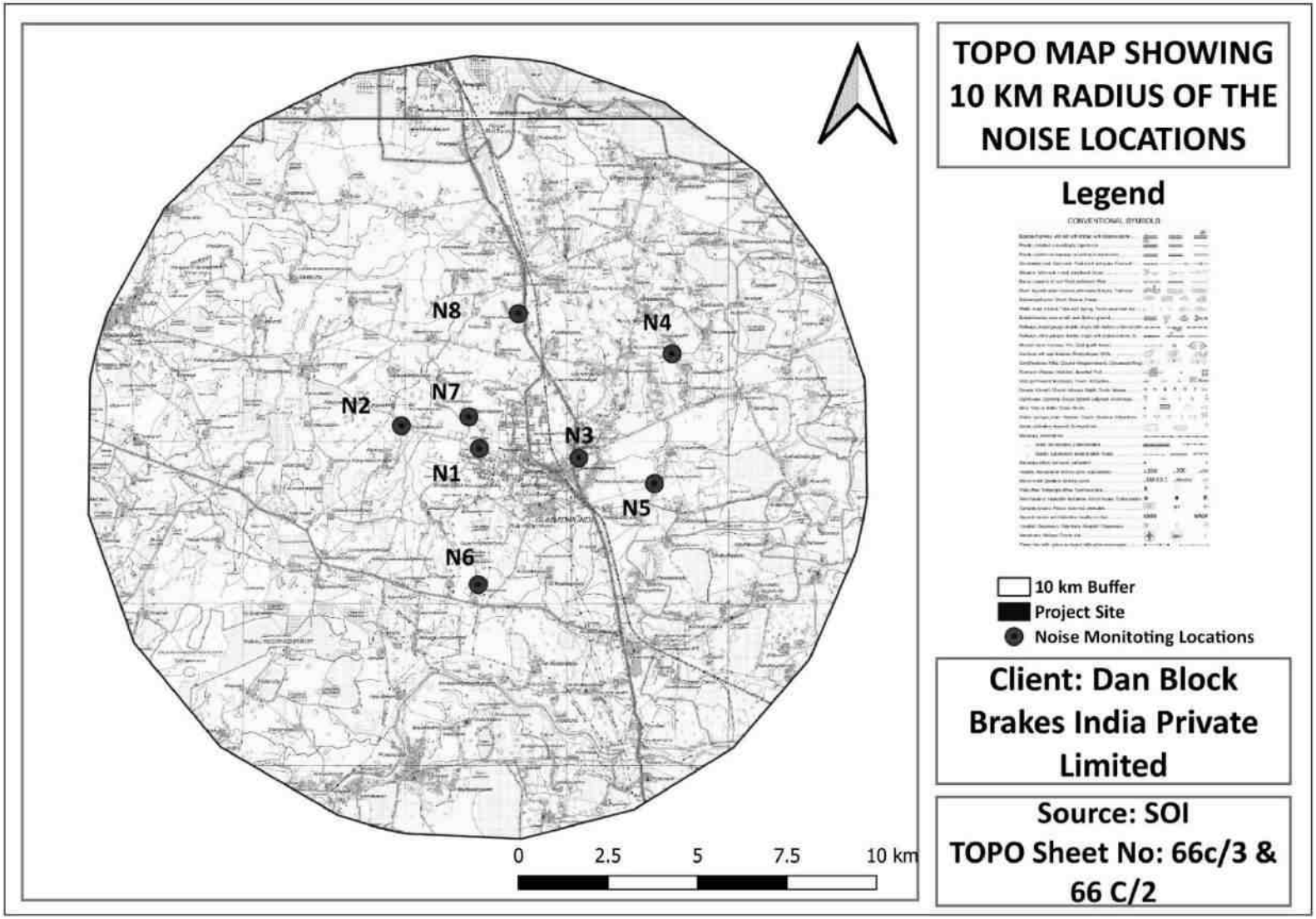


Figure 3.15 Noise Sampling Locations

Table 3.15 Equivalent Noise levels in the Study Area

S. No	Location	Location Code	Noise level in dB(A) Leq		CPCB Standard		Environmental Setting
			Day	Night	Lday (Ld)	LNight (Ln)	
1.	Project site	N1	59.7	50.6	75	70	Industrial
2.	Billakuppam	N2	52.4	40.2	55	45	Residential
3.	Gummidipoondi	N3	59.2	50.6	65	55	Commercial
4.	Rajapalayam	N4	48.0	40.0	55	45	Residential
5.	Peria Soliampakkam	N5	48.6	40.8	55	45	Residential
6.	Thandalacheri	N6	50.3	40.4	55	45	Residential
7.	Papankuppam	N7	53.4	43.9	55	45	Residential
8.	Chinna Obulapuram	N8	49.9	40.5	55	45	Residential

3.6.1 Observation

It is observed that the day equivalent and night equivalent noise levels at all locations are slightly exceeding the prescribed CPCB standards

Industry

- Day equivalent noise levels (Ld) ranged between 59.7 dB(A)
- Night equivalent noise levels (Ln) ranged between 50.6 dB (A).

Commercial

- Day equivalent noise levels (Ld) ranged between 59.2 dB(A)
- Night equivalent noise levels (Ln) ranged between 50.6 dB (A).

Residential

- Day equivalent noise levels (Ld) ranged between 48 dB(A) to 53.4 dB(A)
- Night equivalent noise levels (Ln) ranged between 40 dB (A) to 43.9 dB(A)

The field observations during the study period indicate that the ambient noise levels were within the prescribed standards by CPCB standards.

3.11 Socio Economic Environment

The growth of industrial sectors and infrastructure developments in and around the agriculture dominant areas, villages and towns are bound to create its impact on the socio-economic aspects of the local population. The impacts may be positive or negative depending upon the developmental activity. To assess the impacts on the socio-economics

of the local people, it is necessary to study the existing socio-economic status of the local population, which will be helpful for making efforts to further improve the quality of life in the area of study. To study the socio-economic aspects of people in the study area around the proposed project site, the required data has been collected from various secondary sources and supplemented by the primary data generated through the process of a limited door to door socio-economic survey.

3.11.1 Objectives

The primary objectives of the socio-economic assessment are:

- Understanding the baseline socio-economic environment obtaining in the impact zone.
- Identifying the key stakeholders who are likely to be impacted by the establishment of the proposed project.
- Predicting the positive and negative impacts of the project on the socio-economic environment in the area.
- Suggesting mitigation measures to minimize the negative impacts.

3.11.2 Scope

The scope of socio-economic impact assessment extends to:

- Assessing the baseline socio-economic environment prevailing in the impact area focusing the core and buffer zones.
- Identifying key economic sectors and major sources of livelihood in the study area.
- Understanding social structures and lifestyles of people in the area who are likely to be affected the most.
- Assessing physical and social infrastructure facilities accessible to the project affected people.
- Identifying heritage precincts and archaeological monuments, if any in the area which may be affected by the proposed project.
- Predicting the likely socio-economic impacts as a consequence of proposed project expansion.
- Suggesting adverse impact mitigation measures in line with the felt needs, aspirations and expectations of the project affected people.
- Preparing an appropriate Socio-economic Environment Management Plan.

3.11.3 Geographical Coverage

The geographical coverage for Socio economic survey of the project extends over the area falling within the 10 km radius from the project site and comprises as many as 46 villages and habitations spread across Gummidipoondi Sub- districts.

3.11.4 Methodology

The socio-economic impact assessment of the proposed project expansion has relied on a judicious mix of secondary and primary data collected from various sources. The socio economic survey was carried out in three distinct stages – Desk Research; Field Survey; Data Processing, Analysis and Report Preparation. The methodology adopted at each stage is explained in what follows.

3.11.4.1 Desk Research

A fairly comprehensive desk research to understand the socio-economic setting in and around the project site was the first initiative towards carrying out the socio survey of the project. Accordingly, published and unpublished information available on the subject was referred, reviewed and critical information gaps identified by the socio economic survey team. The major documents and information sources referred to are:

Sl. No.	Document	Source
1	Handbook of Statistics – Tiruvallur Districts, 2011	District Chief Planning Officer
2	Census – 2011 Provisional Population Tables for Tiruvallur District.	Registrar General of India
3	Industrial Profile of Tiruvallur District	Brief Industrial Profile of Tiruvallur District 2012-13
4	Socio-economic information about Tiruvallur District.	Web surfing
5	District Fact Sheet Tiruvallur District, Tamil Nadu	National Family Health Survey - 4 2015 -16
6	Brief Educational Institutional Details (Schools are Colleges)	District Profile and Census Hand Book

Besides, unpublished information of the Departments of Industries, Education, Health, Irrigation, Agriculture and Social Welfare was also referred to gain deeper insights into the socio-economic setting of Tiruvallur district in general and Gummidipoondi Taluk in particular. The desk research has enabled the study team to effectively leverage the macro level socio-economic information available and identify information gaps at the village and household levels.

It was during this stage, the key stakeholders were identified and study instruments – schedules and checklists – prepared, tested and finalized. Similarly, the sampling frame and sample size were also designed and finalized. The sampling frame for the study consisted of villages, households and District and Sub- district level officials as also local opinion leaders.

3.11.4.2 Field Survey

Field surveys helped collect fairly reliable primary data with respect to the major livelihood sources, family incomes and expenditure, education and health status, basic amenities available, lifestyles, standard of living etc., of residents in the project impact zone. They also helped in eliciting information from the natives about the negative environmental impacts of industrial units already existing in the area and the measures initiated by them to mitigate those impacts.

Field surveys were carried out in study area households. The potential respondents in the sample households were approached personally by the Field Investigators who explained the purpose of the visit and solicited their participation by sharing the intended information free and frankly. The Field Investigators also clarified the doubts and apprehensions expressed by the respondents. Once the respondents were willing and ready to participate, household level socio-economic information was collected with the help of a structured questionnaire. A number of questions were open ended to facilitate capturing perceptions of the respondents objectively.

3.11.4.3 Data Analysis

The data collected during the field survey and desk research phases was processed, tabulated and analyzed with the help of basic quantitative and qualitative analytical tools. The emerging results were validated through in-house brainstorming and discussions with a few district level officials.

The socio-economic impact of the proposed project expansion was assessed in terms of its effects on:

- Livelihoods and incomes
- Lifestyles and quality of life
- Community infrastructure – physical and social – facilities available

3.11.5 Geographical Coverage

The overall impact study area extends over 46 villages and habitations spread across 10 Km radius from the project site and forming part of 1 Sub- districts (Gummidipoondi). The details of these in terms of locational direction and key demographic features are presented in **Table – 3.16** below:

Table 3.16 Census data of Surrounding Village											
M/S. Danblock Brakes India private Limited,											
Details of Villages and Habitations Comprising Impact Area											
S.L No	Village/ Town	Sub-District	Distance (Km)	Direction	Total Households	Population (Census – 2011)			SC	ST	Average Literacy (%)
						Total	Male	Female			
	I	Villages within 3 Km Distance from the Site									
1	Pappankuppam	Gummidipoondi	0.8	NW	1113	4209	2099	2110	979	226	64.96
2	Theruali	Gummidipoondi	2.95	E	1640	6216	3118	3098	362	123	71.40
3	Chinnaobulapuram	Gummidipoondi	2.80	NNE	915	3412	1812	1600	1000	0	68.20
4	Sirupulalpettai	Gummidipoondi	2.3	SW	1104	4346	2230	2116	828	226	66.52
5	Peria obulapuram	Gummidipoondi	2.70	NNE	733	2810	1406	1404	587	4	60.25
6	Peddikuppam (CT)	Gummidipoondi	2.6	NE	2100	8044	4081	3963	769	12	74.88
Total I					**7605**	**29037**	**14746**	**14291**	**4525**	**591**	**69.24**
	II	Villages in 3-5 Km Distance from the Site									
7	Eguvarpalayam	Gummidipoondi	4.90	NW	1130	4052	2033	2019	1843	305	60.22
8	Gummidipoondi	Gummidipoondi	3.00	SE	50144	190541	95799	94742	49849	5100	63.72
9	Narasingapuram	Gummidipoondi			264	893	439	454	258	0	55.66
10	Thurapallam	Gummidipoondi	5	NE	877	3371	1658	1713	72	7	68.58
11	Authupakkam	Gummidipoondi	5	E	746	2576	1275	1301	255	51	59.01
12	Paleswarankandigai	Gummidipoondi	3.10	SE	1360	5039	2815	2224	387	18	72.22
13	Verkadu	Gummidipoondi	4.50	SE	227	794	423	371	9	4	81.74
14	Kuruvattucheri	Gummidipoondi	4.90	SE	47	187	92	95	1	0	75.40
15	Nangapallam	Gummidipoondi	3.90	NE	83	321	158	163	155	0	60.75
16	Thandalacheri	Gummidipoondi	3.9	SSW	417	1574	794	780	555	0	70.39

Table 3.16 Census data of Surrounding Village											
M/S. Danblock Brakes India private Limited,											
Details of Villages and Habitations Comprising Impact Area											
S.L No	Village/ Town	Sub-District	Distance (Km)	Direction	Total Households	Population (Census – 2011)			SC	ST	Average Literacy (%)
						Total	Male	Female			
	Total-II				**55295**	**209348**	**105486**	**103862**	**53384**	**5485**	**63.97**
	III	Villages in> 5-10 Km Distance from the site									
17	Getnamallee	Gummidipoondi	4.9	SSW	383	1465	712	753	3	0	60.34
18	Kanlur	Gummidipoondi			208	858	430	428	193	87	55.94
19	Palavakkam	Gummidipoondi			219	800	418	382	544	30	59.63
20	Pondavakkam	Gummidipoondi			401	1556	749	807	1009	165	52.83
21	Appavaram	Gummidipoondi	7.00	NE	247	872	430	442	7	0	54.70
22	Rettambedu	Gummidipoondi	7.80	E	248	965	476	489	369	94	65.80
23	Kuriviagaram	Gummidipoondi	9.00	E	231	818	394	424	552	5	62.22
24	Elavur	Gummidipoondi	5.30	NNE	1452	5390	2788	2602	661	116	52.36
25	Medhipalayam	Gummidipoondi	8.80	NNE	283	1052	503	549	0	0	52.19
26	Poovalambedu	Gummidipoondi	5.70	WSW	268	1056	547	509	692	0	65.15
27	Edur	Gummidipoondi			760	2939	1480	1459	1169	30	58.66
28	Vaniamallee	Gummidipoondi	7.60	W	416	1518	755	763	672	112	46.77
29	Periapuliyur	Gummidipoondi			195	683	345	338	405	0	62.52
30	Melakalani	Gummidipoondi	9.70	NE	547	1921	957	964	176	0	58.77
31	Annappa Naickankuppam	Gummidipoondi	6.50	S	624	2424	1215	1209	1006	0	61.06
32	Chinnasozhiambakkam	Gummidipoondi	5.10	ESE	82	335	169	166	0	0	58.21

Table 3.16 Census data of Surrounding Village											
M/S. Danblock Brakes India private Limited,											
Details of Villages and Habitations Comprising Impact Area											
S.L No	Village/ Town	Sub-District	Distance (Km)	Direction	Total Households	Population (Census – 2011)			SC	ST	Average Literacy (%)
						Total	Male	Female			
33	Ayanallur	Gummidipoondi	10.00	SE	578	2110	1072	1038	1247	0	54.79
34	Chinnapuliyur	Gummidipoondi			76	291	143	148	16	0	61.17
35	Enadhimelpakkam	Gummidipoondi	6.60	SE	182	709	353	356	328	0	73.91
36	Erukkuvoy	Gummidipoondi	9.80	SSW	198	711	363	348	321	19	49.65
37	Kilmudalambedu	Gummidipoondi	6.90	SW	2195	8648	4375	4273	2196	6	72.91
38	Mangavaram	Gummidipoondi	6.80	NE	464	1604	825	779	227	0	59.73
39	Kollanur	Gummidipoondi	10	SW	164	525	262	263	0	0	70.29
40	Manali	Gummidipoondi			88	311	166	145	118	0	51.45
41	Mangalam	Gummidipoondi			224	847	432	415	272	24	53.48
42	Melmudalambedu	Gummidipoondi	7.30	SSW	408	1534	771	763	1175	0	70.27
43	Naidukuppam	Gummidipoondi			203	706	354	352	594	0	46.32
44	Natham	Gummidipoondi			626	2183	1118	1065	91	15	57.86
45	Narasingapuram	Gummidipoondi			264	893	439	454	258	0	55.66
46	Peria Soliambakkam	Gummidipoondi	5.3	ESE	161	655	330	325	466	0	54.66
	Total-III				**12395**	**46379**	**23371**	**23008**	**14767**	**703**	**62.32**
	Grand Total				**75295**	**284764**	**143603**	**141161**	**72676**	**6779**	**64.18**

3.11.6 Impact Zones

It has been the experience that the social impacts of an industrial project are generally stronger in villages/habitations located close to the project than those located far away. Thus the impact area has been divided into 3 Impact Zones: Core Impact Zone (up to 3 km in aerial distance from the project site); Buffer Zone (3-5 Km) and Transition Zone (>5 Km and up to 10 Km).

Of the total 46 villages and habitations comprising the overall project impact zone, only 6 fall in the Core Impact Zone and 10 fall in the Buffer Zone while 30 fall in the Transition Zone.

In terms of population inhabiting the project impact area, a mere 9.76% reside in the core impact zone, while 71.74% reside in the buffer zone. A whopping 18.50% of the population resides in the transition zone. Therefore, a conscious effort has been made by the study team to cover more villages in the core and buffer zones.

The key demographic features of the 3 impact zones are given in **Table 3.17**:

Table 3.17 KEY Demographic Features of Impact Zones

S.no	Impact zone and distance from site	Number of villages	Total House Holds	Total population	Male	Female	SC	ST	% of Literacy
							population	population	
1	Core zone (0-3 KM from site)	6	7605	29037	14746	14291	4525	591	69.24
2	Buffer zone (3-5 KM from site)	10	55295	209348	105486	103862	53384	5485	63.96
3	Transit zone (5-10 KM from the site)	30	12395	46379	23371	23008	14767	703	60.32
Grand Total		**46**	**75295**	**284764**	**143603**	**141161**	**72676**	**6779**	**63.91**

3.11.7 Demographic Profile of Impact Area

The sociological aspects of this study include human settlements, demography, and social strata such as Scheduled Castes and Scheduled Tribes and literacy levels besides infrastructure facilities available in the study area. The economic aspects include

occupational structure and income levels of workers. Salient Features of Demographics in Study Area given in **Table 3.18**

Table 3.18 Salient Features of Demographics in Study Area

Sl. No.	Demographic Parameter	Data as per Census 2011	Salient Features
1	Total Population (No.) - Males - Females	2.84 lakh 1.43 lakh 1.41 lakh	Forms 7.64% of the district population Sex Ratio in the area is 983 compared to 971 for the district Nearly 15 % of the population in the study area is rural population compared to 45.4 % at the district level
2	SCs (No.)	0.72 lakh	Forms 9 % of the SCs in the district
3	STs (No.)	0.067 lakh	Forms 14 % Of the STs in the district
4	Average Literacy (%)	63.90 %	Notably lower than the district average of 76.9%
5	Households (No.)	0.75 lakh	Accounts for 7.95% of the total households in the district Average 3.78 persons per household – 1.91 males and 1.887females

3.11.7.1 Households and Population

It is understood that the study area, there are 75295 households and population is 284764 of which males are 50.43 % and females are 49.57 %. The sex ratio of the study area is 983 females over 1000 males. In the Project villages within 5 Kms radius, Sex ratio is the highest and the lease in the villages situated within 0-3 Kms radius. The details of households and population are presented in the below **Table 3.19**.

Table 3.19 Households and Population Details

S.No	Particulars	0-3km	3-5km	5-10km
1	Male Population	14746	105486	23371
2	Female Population	14291	103862	23008
3	Total population	29037	209348	46379
4	Total HouseHolds	7605	55295	12395

3.11.7.2 Scheduled Castes & Scheduled Tribe:

The Scheduled caste population of the study area is 72676 which constitute 25.52 % of total population in study area. The sex ratio of the SC population is 1008 females over

1000 males. In the 0-3 Kms villages' sex ratio is highest and in 5-10 Kms sex ratios are least.

Schedule Tribes Population is 6779 which aggregate to 2 % of total population in study area. Sex ratio of the ST population is 1016 females over 1000 males. In 0-3 Km village's sex ratio is highest and in 3-5 Kms sex ratio is zero. The details of the scheduled tribe population & Scheduled Caste Population are presented in the **Table 3.20.**

Table 3.20 Details of the Scheduled Tribe Population & Scheduled Caste Population

S.No	Particulars	0-3km	3-5km	5-10km
1	Total population	29037	209348	46379
2	SC Population	4525	43384	5485
3	ST Population	591	5485	703
4	% of SC Population	15.58	25.50	31.83
5	% of ST Population	2.03	2.62	1.51
6	Total SC & ST Population	5116	48869	6188

3.11.7.3 Literacy Levels

The literate population in study area aggregates 1,82,004 or 63.91% of the total. Average literacy among male population accounts for 71.18 % compared to 56.52 % among female population. Details of literacy levels in study area are presented in the **Table 3.21.**

Table 3.21 Details of literacy levels in study area

S.No	Particulars	0-3km	3-5km	5-10km
1	Male population	14746	105486	23371
2	Female Population	14291	103862	23008
3	Total Population	29037	209348	46379
4	Male literates	11176	75062	15980
5	Female literates	8930	58849	12007
6	Total literates	20106	133911	27987
7	% of Male literacy rate	75.79	71.16	68.38
8	%of Female literacy rate	62.49	56.66	52.19

3.11.7.4 Work Participation

As per Census-2011 data, the study area has a total workforce of 0.73 lakh persons – 0.50 lakh men and 0.22 lakh women. 87.7% of the workforce is constituted by Main Workers

and 12.3% marginal Workers. Work participation details in the study area are presented in the **Table 3.22.**

Table 3.22 Work participation details

S.No	Particulars	0-3km	3-5km	5-10km
1	Total Population	29037	209348	46379
2	Total workers	11821	93613	21832
3	Work participation rate (%)	40.71	44.72	47.07
4	Main workers	9538	71959	15906
5	% of main workers to total population	32.85	34.37	34.30
6	Marginal workers	2283	21654	5926
7	% of marginal workers to total population	7.86	10.34	12.78
8	Non-workers	17216	115735	24547
9	% of non-workers to total population	59.29	55.28	52.93

3.11.7.5 Occupational Distribution

As per Census-2011 data the occupational distribution of workers points to the predominance of Organized Industry and Service Sector Workers (34.20% of the total workforce) followed by Cultivators (4.13%); Agricultural Labor (11.77%) and House Hold Workers (0.66%).

3.11.7.6 Agriculture

Tiruvallur District is traditionally rich in diversity of Horticulture crops such as Fruits, Vegetables, Flowers, Spices, Medicinal and Aromatics crops. Area under Horticulture crops in Tiruvallur district was 20482 Ha. In general, Tiruvallur district has specifically known for Mango, watermelon and Jasmine cultivation and other prominent crops under cultivation are Greens, Brinjal , Bhendi, Chillies and other vegetable crops.

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Regarding Fruits cultivation, Gummidipoondi, Poondi and Thiruvalangadu blocks has major area. Vegetable crops are growing highly in Kadambattur and Gummidipoondi blocks. Flowers crops are majorly cultivated in Gummidipoondi,

The average rainfall is 1104 mm per annum in Thiruvallur district. Notwithstanding its significance as the major source of livelihood, younger generations in the area do not evince much interest in agriculture and farming. On the contrary, they are observed to be more interested in pursuing Government employment or skill-oriented jobs in private sector.

Agriculture allied activities such as rearing of milch cattle are other livelihood sources complementary to agriculture. Engagement of women in these activities is more common. Some of the women are also engaged in unorganised businesses as vegetable and flowers vending.

3.11.7.7 Industry

Over the past four decades, rapid industrialisation of the area has contributed to the development of alternative livelihoods. It is understood during field surveys that currently close to 31.2% of the workforce in the area depends on the industry and services sectors for livelihood. There are some large industries in the area, primarily engaged in the manufacture of parts of vehicles, allied products and food-based industries are there, which absorb a sizeable workforce. Besides, a fairly large number of survivalist micro enterprises exist essentially as self-employment ventures.

The younger population in the area looks more towards the industry and services sectors for exploring employment opportunities. A mere <10% of them are keen to explore self-employment through establishment of micro enterprises in manufacturing and servicing segments.

3.11.7.8 Lifestyles

No reliable information/data are available, either at the district or sub-district levels, on the lifestyles of people. As such it will be very difficult to assess the lifestyles in the area with reasonable accuracy. However, based on an impressionistic assessment during the field surveys, it is felt that a majority of the population in the area owns a residence to live

in. They have access to basic amenities such as protected drinking water, electric power, education and healthcare. A majority of the people in the area also have access to mobile phone and cable TV connection.

Generally, cultural and community participation among people in the area is more common during festivities, functions and religious events. Participation and interaction of people of the homogenous social groups is reportedly larger in marriages, mourning, cultural events and specific social issues.

The recreation facilities in the area are reflected in watching TV, playing and partying.

3.11.7.9 Physical Infrastructure

All the villages in the study area are electrified and connected with village roads. Transport is essentially provided by the State Road Transport Corporation. Regular bus facilities are available to the all the villages. Besides, private transportation, mostly shared autos and other small transport means are most common.

3.11.7.10. Social Infrastructure

Fairly dependable infrastructure exists in the area for primary, secondary and higher education through Primary and Upper Primary Schools, High Schools, Junior Colleges and a Degree College.

Healthcare infrastructure in the area comprises of Primary Health Centres, private clinics and hospitals. Super specialty medicare is accessible nearest at Gummidipoondi and Chennai city 30 km away.

3.12 Traffic studies

3.12.1 Impacts on Traffic

The access road to the project site is Gummidipoondi to Kallur Road (250m). The site is well connected to Chennai to Kolkata Highway at a distance of 1.30 Km. The traffic study is conducted on Gummidipoondi to Kallur Road access road. As per the IRC code 64-1990 Guidelines for capacity of the double lane road in plane area is 2900 PCUs/hour. Detailed Traffic data is given in **Table 3.23.**

Table 3.23 Traffic Data - Gummidipoondi to Kallur Road

Time	Heavy vehicles		Four-wheeler		Two Wheels		Autos		Total Vehicles	
	No.s	0.5 PCU/hr	No.s	1.2 PCU/hr	No.s	1.0 PCU/hr	No.s	2.2 PCU/hr	No.s	PCU/hr
6to7am	128	64	55	67	359	359	22	49	564	538
7to8am	160	80	69	83	448	448	28	61	705	673
8to9am	266	133	116	139	747	747	47	102	1175	1121
9to10am	**355**	**178**	**154**	**185**	**996**	**996**	**62**	**136**	**1567**	**1495**
10to11am	284	142	123	148	797	797	50	109	1254	1196
11to12pm	213	107	92	111	598	598	37	82	940	897
12to1pm	170	85	74	89	478	478	30	65	752	717
1to2pm	128	64	55	67	359	359	22	49	564	538
2to3pm	130	65	63	75	348	348	29	64	570	553
3to4pm	186	93	90	108	498	498	42	92	814	789
4to5pm	232	116	112	134	622	622	52	114	1018	987
5to6pm	**328**	**164**	**124**	**149**	**840**	**840**	**57**	**125**	**1349**	**1278**
6to7pm	262	131	99	119	672	672	46	100	1079	1023
7to8pm	197	98	74	89	504	504	34	75	809	767
8to9pm	177	89	67	80	454	454	31	68	728	690
9to10pm	159	80	60	72	408	408	28	61	656	621
10to11pm	128	64	48	58	327	327	22	49	524	497

3.12.2 Traffic Flow Patterns

The traffic study was conducted in Gummidipoondi to Kallur Road which is the main access to the project site. Based on the study, the peak traffic was observed from 9:00 AM – 10:00 AM of 1495 PCU/hr & the peak traffic during night time was observed from 5:00 – 6:00 PM of 1278 PCU/hr.

3.12.3 Volume Capacity Ratio

The Volume/Capacity Ratio indicates the congestion levels on a particular road. The IRC specifies a design service volume (DSV) for each road type therefore indicating a level of service. Level of service of roads depends on the volume/capacity ratio of the respective

roads. The level of service and performance as per IRC norms has been given in **Table 3.24.**

Table 3.24 Volume/Capacity ratio

Volume/Capacity ratio (range)	Level of service	Performance
0.0-0.2	A	Excellent
0.2-0.4	B	Very good
0.4-0.6	C	Good
0.6-0.8	D	Fair
0.8-1.0	E	Poor

3.12.4 Level of Service

Peak traffic was found to be 1495 PCU/hr at Gummidipoondi to Kallur Road. The capacity of road for 2 lanes (one way) is taken as 2900 PCU/hr as per IRC Standards. Hence the V/C Ratio for the road is found to be 1495/2900 = 0.5. Hence the level of service for the road is "C" & the performance is "Good". Volume of the Gummidipoondi to Kallur Road is moderate at present & a normal flow condition could be observed throughout the day.

3.13 Biological Environment

Introduction

Generally, biological communities are good indicators of climatic and edaphic factors. Studies on biological aspects of ecosystems are important in Environmental Impact Assessment for safety of natural flora and fauna. The biological environment includes terrestrial and aquatic ecosystems.

The animal and plant communities co-exist in a well-organized manner. Their natural settings can get disturbed by any externally induced anthropological activities or by naturally occurring calamities or disaster. So, once this setting is disturbed, it sometimes is either practically impossible or may take a longer time to come back to its original state. Hence, changes in the status of flora and fauna are an elementary requirement of Environmental Impact Assessment studies, in view of the need for conservation of environmental quality and biodiversity. Information on flora and fauna was collected

within the study area. Relevant details on aquatic life within the study area were collected from related government offices.

3.13.1 Terrestrial Ecology

3.13.1.1 Objectives of Ecological Study

The objectives of the present study are intended to

- Generate baseline data from field observations from various terrestrial and aquatic ecosystems;
- Compare the data so generated with authentic past records to understand changes; and
- Characterize the environmental components like land, water, flora and fauna.

3.13.1.2 Methods adopted for the study

To accomplish the above objectives, a general ecological survey covering an area of 10 km radius from the proposed project boundary was done as follows:

- Reconnaissance survey for selection of sampling sites in and around the site on the basis of meteorological conditions;
- Generation of primary data to understand baseline ecological status, important floristic elements;
- Generation of primary data to understand baseline fauna structure; and
- Collection of secondary data from Forest Working Plan and Gazetteers.

3.13.1.3 Review of Secondary Data

With reference to the vegetation of the district, Forests occupy 5.8% of the total area. The total extent of Reserved Forests and Reserve Lands are 19791 ha protected by this Division. About 1800 ha of Reserve Lands, notified under section 26 of Tamil Nadu Forest Act is also under active consideration for declaration of Reserve Forest.

It has different types of forest vegetation's such as thron, dry green forests, dry deciduous forests, and scrub jungles. Dry deciduous & shrub type of forests is observed the study area. Natural factors include factors such as the altitude, the soil conditions, the quantity and regularity of the rainfall.

3.13.1.4 Terrestrial Flora of the buffer zone

The buffer zone includes Bay of Bengal, creeks, Industrial areas as well as a few residential areas. But there are no National Parks / Wildlife Sanctuaries /Reserve forests within 10 Km radius of the project site. There a few saltpans along the creek but there are no Mangrove forests. Avicennia alba was found in some areas. Most of the areas are colonized by mesquite (Prosopis juliflora). Neem (Azadirachta indica) followed by Coconut (Cocos nucifera) are the most extensively cultivated trees in the entire buffer zone. Castor (Ricinus communis) was found widely scattered in all vacant places including road sides. All the common, widely grown Indian avenue and fruit trees and some exotic naturalized trees are found in the buffer zone.

3.13.1.5 Rare or endangered or threatened flora and fauna

There are no rare or endangered or threatened plant species in the core area. All the plants found in the core area are of common and widespread occurrence.

They include Sandal wood (Santalum album), Seetha Ashok (Saraca ndica), Swallow root (Decalepis hamiltonii), ornamental palm (Zamia furfuracea) and some other cultivated ornamental shrubs. Zamia furfuracea is critically endangered ornamental palm of Veracruz State in Eastern Mexico. It is now widely grown as an ornamental in India and it is performing extremely well. It was noticed to produce fertile cones as well as suckers. Swallow root (Decalepis hamiltonii) was the only uncultivated RET species while the rest were cultivated and protected. A list of trees of trees, shrubs and ornamentals growing currently within the 10 Km buffer zone of the industry is given in **Table 3.25.**

Table 3.25: List of trees, shrubs, and perennial climbers found in the buffer zone of the project site.

Botanical name	Common / local name	Family
Acacia catechu	Khair	Mimosaceae
Acacia leucophloea	White babul	Mimosaceae
Acacia nilotica	Black babul	Mimosaceae
Acacia auriculiformis	Australian wattle	Mimosaceae
Adenanthera pavonia	Red bead tree	Mimosaceae
Aegle marmelos	Bilva	Rutaceae
Agave americana	Agave	Agavaceae
Ailanthus excelsa	Maha Neem	Simaroubaceae

Alangium salvifolium	Azhinji	Alangiaceae
Albizia lebbeck	Siris / Vagai	Mimosaceae
Allamanda cathartica	Golden Trumpet Wine	Apocynaceae
Alstonia scholaris	Indian Tree of Heaven	Apocynaceae
Anthocephalus cadamba	Kadamb	Rubiaceae
Araucaria columnaris	Christmas tree	Araucariaceae
Artabotrys odoratissimus	Champak	Annonaceae
Artocarpus heterophyllus	Jackfruit	Moraceae
Asclepias currasavica	Milk weed	Asclepiadaceae
Avicennia alba	White Avicennia	Acanthaceae
Azadirachta indica	Neem	Meliaceae
Bambusa vulgaris	Yellow Bamboo	Poaceae
Barringtonia acutangula	Barringtonia	Lecythidaceae
Bauhinia purpurea	Purple Orchid Tree	Caesalpiniaceae
Bauhinia variegata	Mandaarai	Caesalpiniaceae
Beaucarnea recurvata	Ponytail Palm	Arecaeae
Bixa orellana	Lipstick tree	Bixaceae
Bombax malabaricum	Silk Cotton Tree	Bombacaceae
Borassus flabellifer	Palmyra palm	Arecaeae
Bougainvillea glabra	Bougainvillea	Nyctaginaceae
Bougainvillea spectabilis	Bougainvillea	Nyctaginaceae
Brassaia actinophylla	Octopus tree	Araliaceae
Brugmansia sp.	Tree Datura	Solanaceae
Butea monosperma	Palas	Fabaceae
Caesalpinia pulcherrima	Peacock Flower	Caesalpiniaceae
Callistemon lanceolatus	Bottle brush tree	Myrtaceae
Calophyllum inophyllum	Alexandrian laurel	Clusiaceae
Calotropis gigantea	Crown flower	Asclepiadaceae
Calotropis procera	Apple of Sodom	Asclepiadaceae
Cananga odorata	Kattu Chempakam	Annonaceae
Capparis zeylanica	Indian Caper	Capparaceae
Careya arborea	Wild Guava	Lecythidaceae
Carissa spinarum	Bush Plum	Apocynaceae
Caryota urens	Fishtail Palm	Arecaceae
Cassia fistula	Golden Shower Tree	Caesalpiniaceae
Cassia javanica	Java Cassia	Caesalpiniaceae
Cassia siamea	Siamese Cassia	Caesalpiniaceae
Cassia spectabilis	Golden Cassia	Caesalpiniaceae
Castanospermum australe	Black Bean	Fabaceae
Casuarina equisetifolia	Casuarina	Casuarinaceae
Chamaedorea sefritzii	Bamboo palm	Arecaceae
Chromolaena odorata	Siam weed	Asteraceae

Citrus aurantifolia	Orange	Rutaceae
Citrus limonum	Lemon	Rutaceae
Citrus sinensis	Sweet orange	Rutaceae
Clematis paniculata	Flower of the skies	Ranunculaceae
Clerodendrum splendens	Flaming glory	Verbenaceae
Cochlospermum gossypium	Butter cup tree	Bixaceae
Cocos nucifera	Coconut	Arecaceae
Colvillea racemosa	Colville's Glory	Caesalpiniaceae
Cordia sebestena	Scarlet *Cordia*	Boraginaceae
Couroupita guianensis	Cannon Ball tree	Lecythidaceae
Cryptostegia grandflora	Rubber Wine	Asclepiadaceae
Cycas revoluta	Sago palm	Cycadaceae
Cymbopogon citratus	Lemon grass	Poaceae
Daemia extensa	Uttamani	Asclepiadaceae
Dalbergia sissoo	Shisham	Fabaceae
Decalepis hamiltonii	Peru Nannari	Periplocaceae
Delonix elata	Gulmohar	Caesalpiniaceae
Delonix regia	Gulmohar	Caesalpiniaceae
Dendrocalamus strictus	Bamboo	Poaceae
Dodonaea viscosa	Hop Bush	Sapindaceae
Dolichandrone platycalyx	Nile Tulip Tree	Bignoniaceae
Duranta plumieri	Golden dew drops	Shrub
Dypsis decaryi	Triangle Palm	Arecaceae
Dypsis lutescens	Areca palm	Arecaceae
Enterolobium cyclocarpum	Elephant Ear Pod Tree	Mimosaceae
Erythrina crista-galli	Cockspur Coral Tree.	Fabaceae
Erythrina indica	Indian Coral tree	Fabaceae
Erythrina suberosa	Corky coral tree	Fabaceae
Eucalyptus citriodora	Lemon Scented Gum	Myrtaceae
Eucalyptus globulus	Blue gum	Myrtaceae
Eucalyptus tereticornis	Red Gum	Myrtaceae
Millingtonia hortensis	Tree Jasmine	Bignoniaceae
Mimosa rubicaulis	Rasne / Urisige	Mimosaceae
Mimusops elengi	Maghizham	Sapotaceae
Morinda pubescens	Nuna / Ivory Wood	Rubiaceae
Muntingia calabura	Singapore cherry	Muntingiaceae
Murraya paniculata	Vengarai	Rutaceae
Mussanda frondosa	Paper chase tree	Rubiaceae
Nerium odorum	Oleander	Apocynaceae
Nyctanthes arbor-tristis	Paarijatham	Oleaceae
Ochna obtusata	Golden Champak	Ochnaceae

Parkia biglandulosa	Shivalinga	Mimosaceae
Pelargonium graveolens	Rose Geranium	Geraniaceae
Peltophorum pterocarpum	Copper Pod	Caesalpiniaceae
Pentas lanceolata	Pentas	Rubiaceae
Petrea volubilis	Purple wreath	Verbenaceae
Phoenix acaulis	Dwarf Date Palm	Arecaceae
Phoenix sylvestris	Wild date	Arecaceae
Phyllanthus acidus	Star Gooseberry	Euphorbiaceae
Phyllanthus emblica	Nelli	Euphorbiaceae
Phyllanthus reticulatus	Karu Nelli	Euphorbiaceae
Pithecellobium dulce	Madras Thorn	Mimosaceae
Plumeria alba	Champa	Apocynacae
Plumeria pudica	White Frangipani	Apocynacae
Plumeria rubra	Champa	Apocynacae
Poinsettia pulcherrima	Poinsettia	Euphorbiaceae
Polyalthia longifolia	Ashoka	Annonaceae
Polyalthia pendula	Ashoka	Annonaceae
Pongamia pinnata	Honge	Fabaceae
Prosopis juliflora	Mesquite	Mimosaceae
Prosopis spicigera	Banni	Mimosaceae
Psidium guajava	Guava	Myrtaceace
Pterospermum acerifolium	Naradu	Sterculiaceae
Punica granatum	Pomeganate	Punicaceae
Putranjiva roxburghii (=Drypetes roxburghii)	Indian Amulet Tree / Karupala	Putranjivaceae
Pyrostegia purpurea	Flaming trumpet	Bignoniaceae
Pyrostegia venusta	Golden Shower	Bignoniaceae
Quisqualis indica	Rangoon Creeper	Combretaceae
Ricinus communis	Castor	Euphorbiaceae
Roystonea regia	Royal palm	Arecaceae
Russelia equisetiformis	Coral Plant	Srophulariaceae
Samanea saman	Rain Tree	Mimosaceae
Santalum album	Sandal wood	Santalinaceae
Saraca indica	Seetha Ashok	Caesalpiniaceae
Solanum trilobatum	Thoodhuvalai	Solanaceae
Spathodea companulata	Nirukai mara	Bignoniaceae
Sterculia foetida	Wild almond	Sterculiaceae
Syzygium cumini	Jamun /Naaval	Myrtaceae
Tabebuia argentea	Tree of Gold	Bignoniaceae
Tabebuia avellanedae	Pink Tabebuia	Bignoniaceae

Tabebuia rosea	Pink Trumpet Tree	Bignoniaceae
Tabernaemontana coronaria	Moon beam	Apocynaceae
Talipariti tiliaceum	Sea or Beach Hibiscus	Malvaceae
Tamarindus indica	Tamarind	Caesalpiniaceae
Tecoma stans	Yellow oleander	Bignonaceae
Tecomella undulate	Tecomella	Bignonaceae
Tectona grandis	Teak / Tekku	Verbenaceae
Terminalia arjuna	Arjun / Neer Marudhu	Combretaceae
Terminalia catappa	Almond	Combretaceae
Thespesia populnea	Indian Tulip Tree	Malvaceae
Thevetia peruviana	Yellow oleander	Apocynaceae
Thunbergia grandiflora	Heavenly blue	Acanthaceae
Trachelospermum jasminoides	Star Jasmine	Apocynacae
Tylophora indica	Naippalai	Assclepiadacae
Vallaris solanacea	Bread Flower	Apocynaceae
Vernonia elaeagnifolia	Curtain creeper	Asteraceae
Vitex negundo	Nirgundi	Verbenaceae
Wattakaka volubilis	Sneeze Wort	Asclepiadaceae
Wisteria sinensis	Chinese Wisteria	Fabaceae
Wodyetia bifurcate	Fox tail palm	Arecaceae
Woodfordia fruticosa	Red bell bush	Lythraceae
Wrightia tinctoria	Sweet Indrajao	Apocynaceae
Zamia furfuracea	Cardboard Palm	Cycadaceae
Ziziphus mauritiana	Yalachi	Rhamnaceae

The list of Common Avifauna of Indigenous and migratory birds & list of fauna in Thiruvallur forest division are given in **Table 3.26 & 3.27**.

Table 3.26: List of Avifauna of Indigenous and Migratory Birds

S.No.	Common Name	Scientific Name
1	*Grey Heron*	Ardca Sinerea
2	*Snake Darter*	Anbinga Rufa
3	*Spoon Bill*	Platalea Leucorodia
4	*Night Heron*	Nycticorax
5	*Cattle Egret*	Babulcusibis conomandus
6	*Common Teal*	Anas enecca erecca
7	*Water Hen*	Anaruornis phoenicirus

Table 3.27: List of Fauna in Thiruvallur Forest Division

S.No.	Common Name	Scientific Name
1	*Porcupine*	Hystrix Indica
2	*Mongoose*	Herpestes Edwardsi
3	*Wild Boar*	Sus Scrofa
4	*Common Monkeys*	Macaca Radiate
5	*Hare*	Lepus Rubicandelus
6	*Snakes*	Naja tripundians (Cobra)
7	*Jackal*	Canis aureus
8	*Jungle Cat*	Felis Ehaug

Chapter 4 IDENTIFICATION & PREDICTION OF IMPACTS

4.1 Identification of Impacts

Identification of impacts is one of the basic analytical steps of EIA for subsequent prediction and evaluation of impacts. A number of methodologies are available for the identification of impacts. "Net Work Method", which follows the cause – condition- Effect relationship is adopted for identifying impacts due to the activities of proposed expansion of M/s. Danblock Brakes India Pvt. Ltd.

The generation of cause –condition –effect networks (chain of events) should follow the above mentioned activities and actions. This type of method is advantageous in recognizing the series of impacts triggered by the plant activities. Thus this method had provided a "Road map" type of approach to the identification of second and third order effects.

The idea was to account for the project activity and identify the different types of impacts that would initially occur. The next was to select each impact and identify the impacts. The main advantage of this approach is that it allowed identifying the impacts by selecting and tracing out the events as they may occur.

4.2 Impact Networks

The purpose of identifying the impacts is that if it aids in making appropriate decision to mitigate the adverse consequences if any. It may be pointed out that the distinction between magnitude and importance of the impact should be appreciated. Thus the degree of extensiveness and scale of impacts and consequence based on value judgments are generalized while identifying impacts. As it is imperative that the impact will normally lead to a chain of reactions, the construction of network charts brings out to certain extent the appropriate levels of the risks that may occur due to the interventions while interacting with hydrogeological, biological and social systems.

Figure 4.1 to 4.6 represents the identified impacts for various components of environment viz. air, noise, and water land and socio economic aspects. In the above mentioned figure the lines mean – "had an effect on".

4.2.1 Air Environment

The Primary impact of air pollutants will be on the air quality. As dust emissions are the main pollutant from this type of industries, the air quality will change if dispersion is slow. This will lead to if pollution is for shorter period, immediate health problems. If it continues for a long period, it may also have an impact on climatic changes, ecological equilibrium and economic production of crops. The odor and visibility aspects of air pollutant can have impacts on aesthetics of region.

4.2.2 Water Environment

Waste water will affect the environment both directly and indirectly primarily it may affect the land and water quality. This leads to deterioration of re-production levels of both terrestrial and aquatic flora and fauna.

4.2.3 Noise Environment

The noise will primarily affect the ambient noise levels. Excessive noise will trigger health risks such as headaches, depression, deafness and retardation of sensory mechanisms.

4.2.4 Land Environment

The change in the land use during and after the construction phase is unavoidable. However as long as it is not affecting the soil quality chemistry and sedimentation, the impact is not an undesirable one

4.2.5 Biological Environment

The particulate matter tends to alter soil matrix and water quality. The impact will be on the native biota leading to density reduction and extinction of sensitive species. There may be change in the species diversity and food chain.

4.2.6 Socio Economic Environment

Primarily, the impact is expected on the economic environment. The generation of jobs will occur during operation and construction phases. There is scope of multiplier effect on secondary and tertiary employment. The socio economic structure will have a positive change and quality of life would improve due to increase in urbanization.

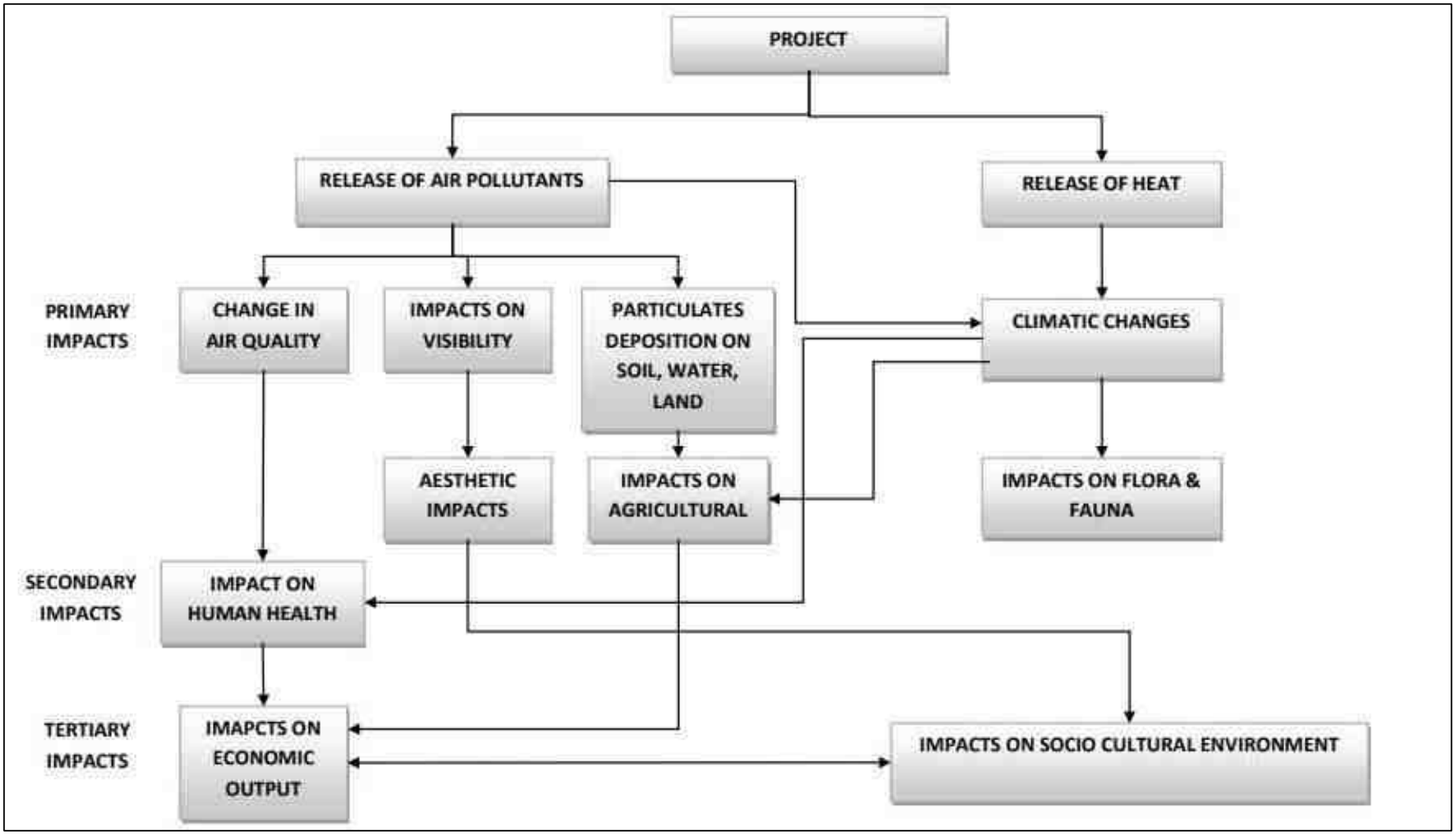

Figure 4. 1 Impacts Network for Air Environment

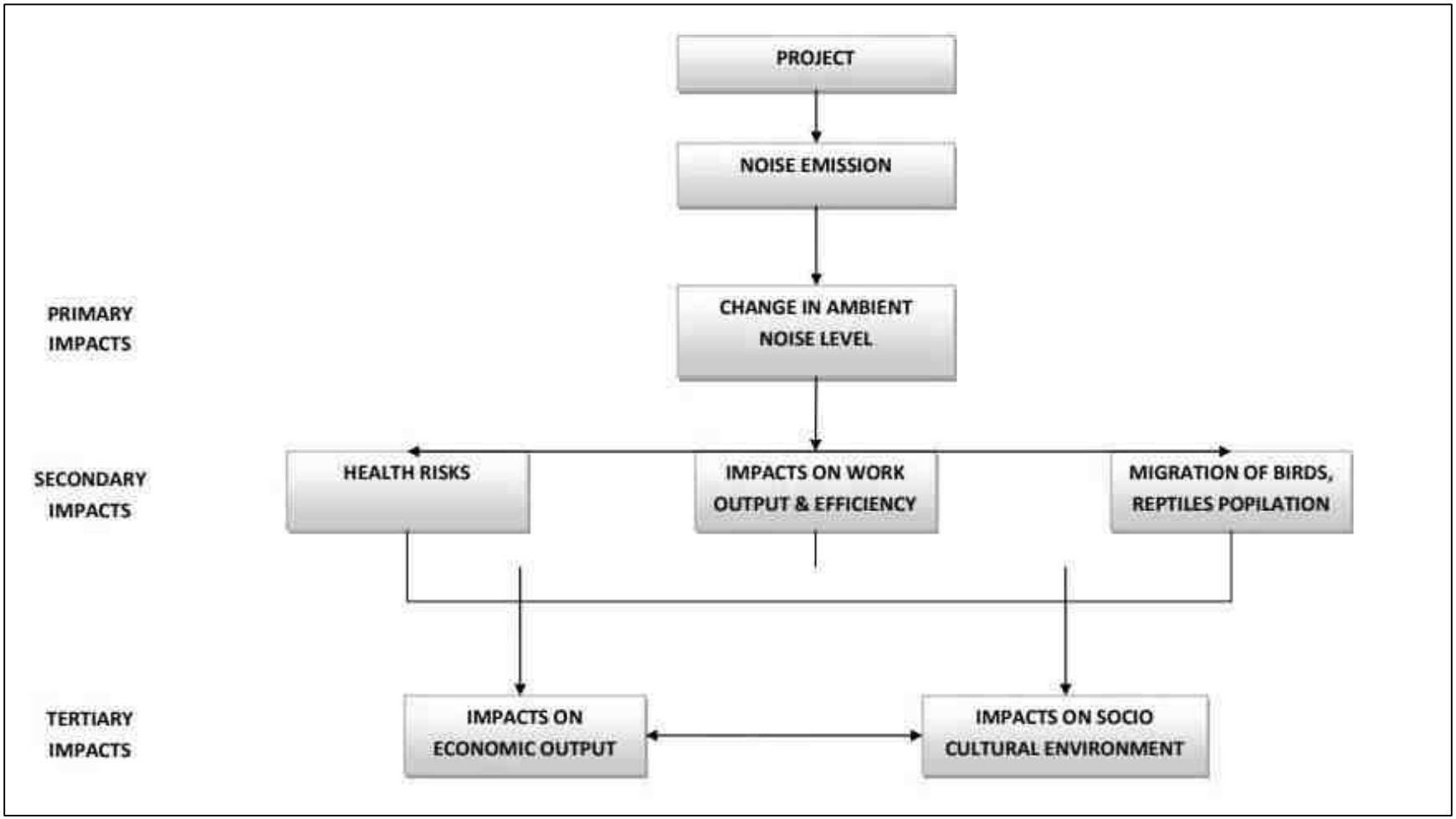

Figure 4. 2 Impacts Network for Noise Environment

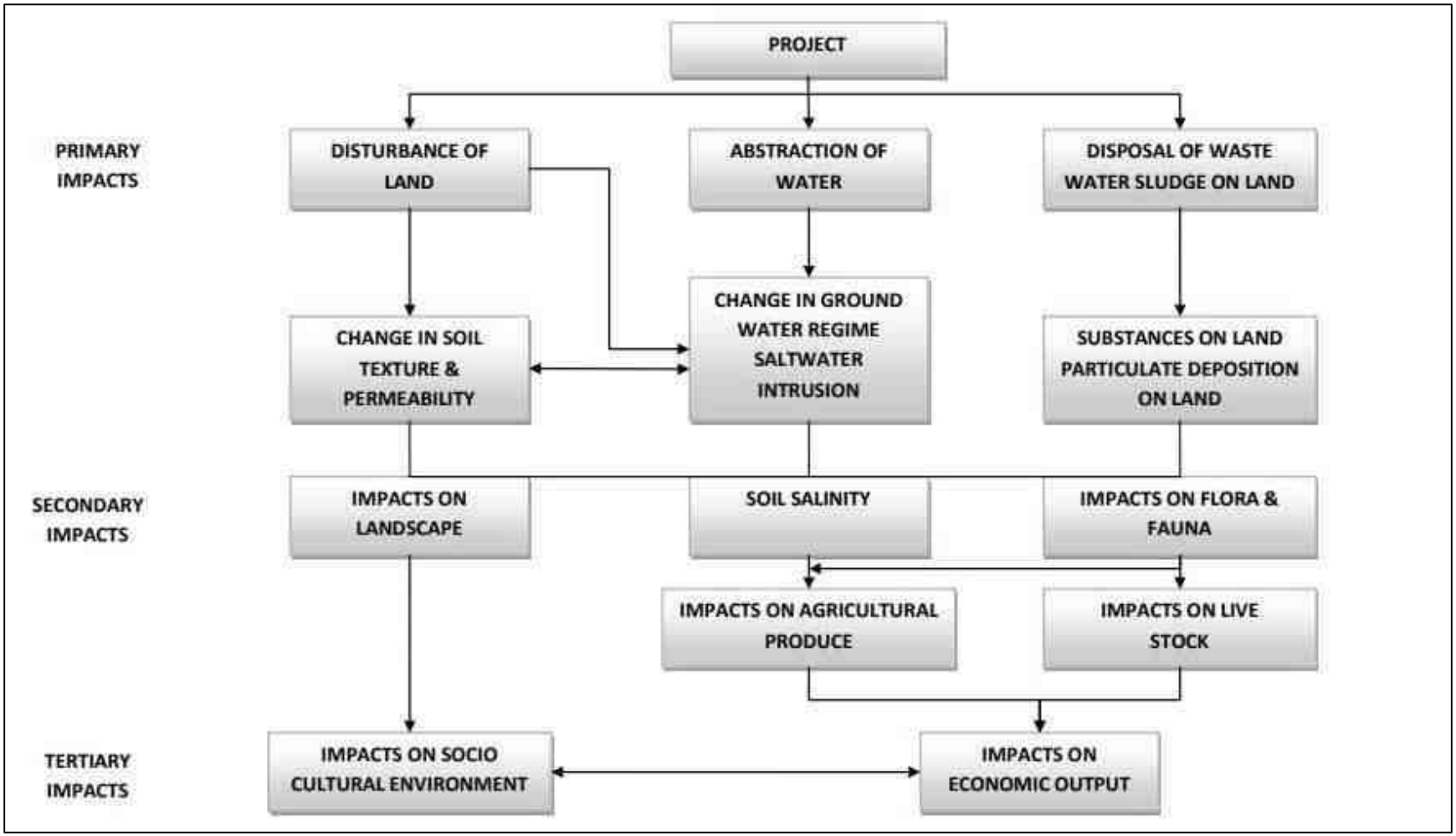

Figure 4. 3 Impacts Network for Land Environment

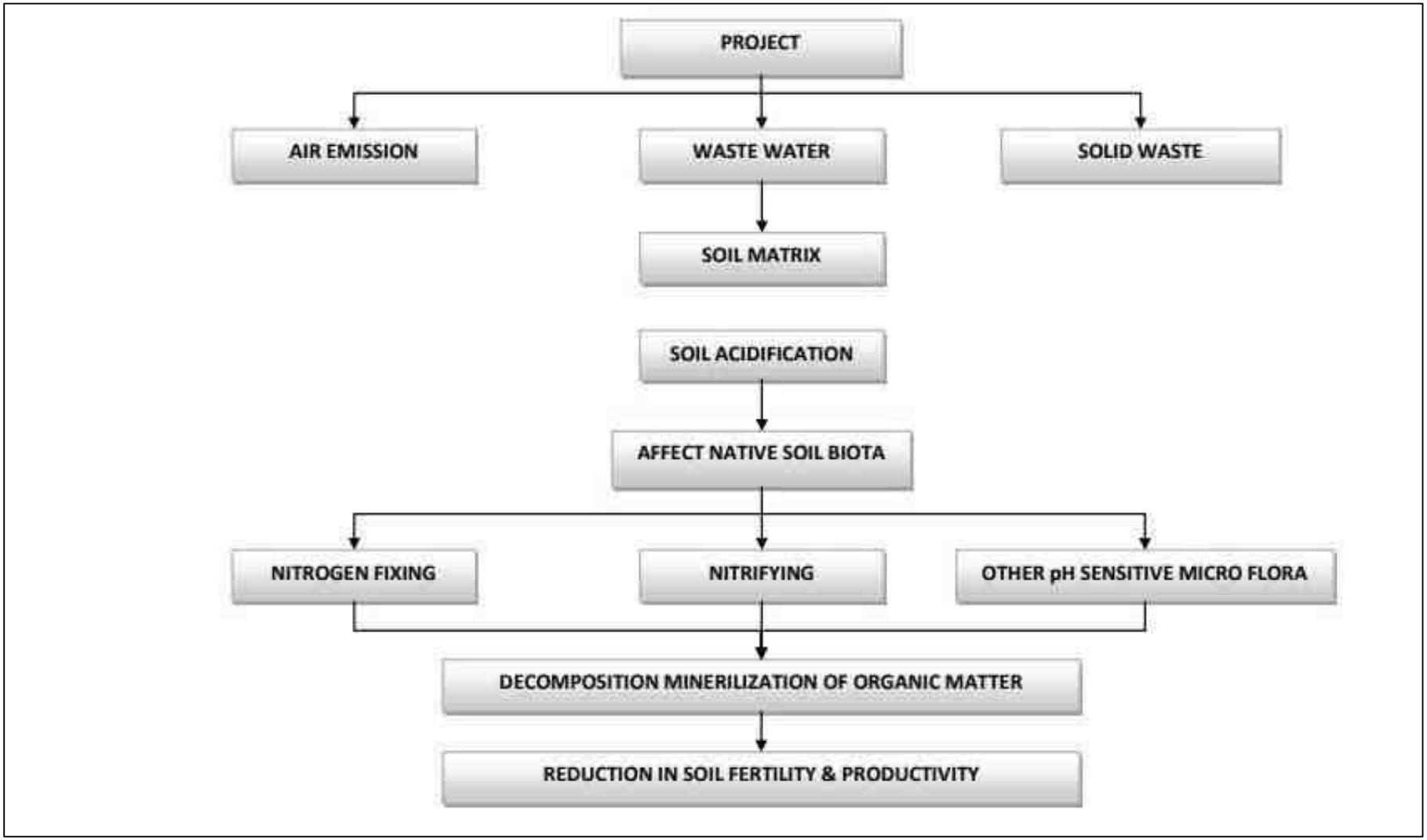

Figure 4. 4 Impacts Network for Biological Flora and Fauna

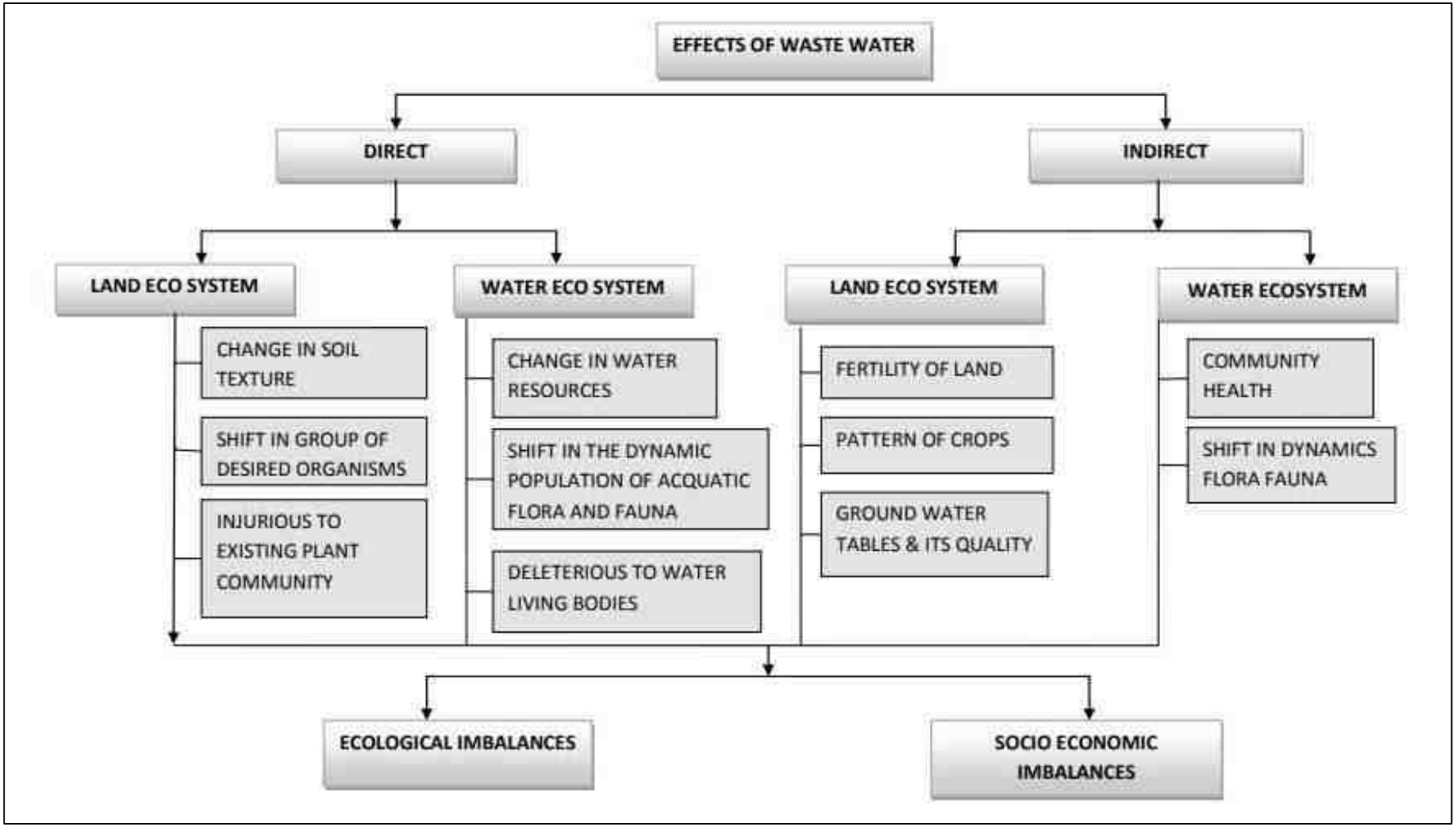

Figure 4. 5 Identification of Likely Impacts of waste water

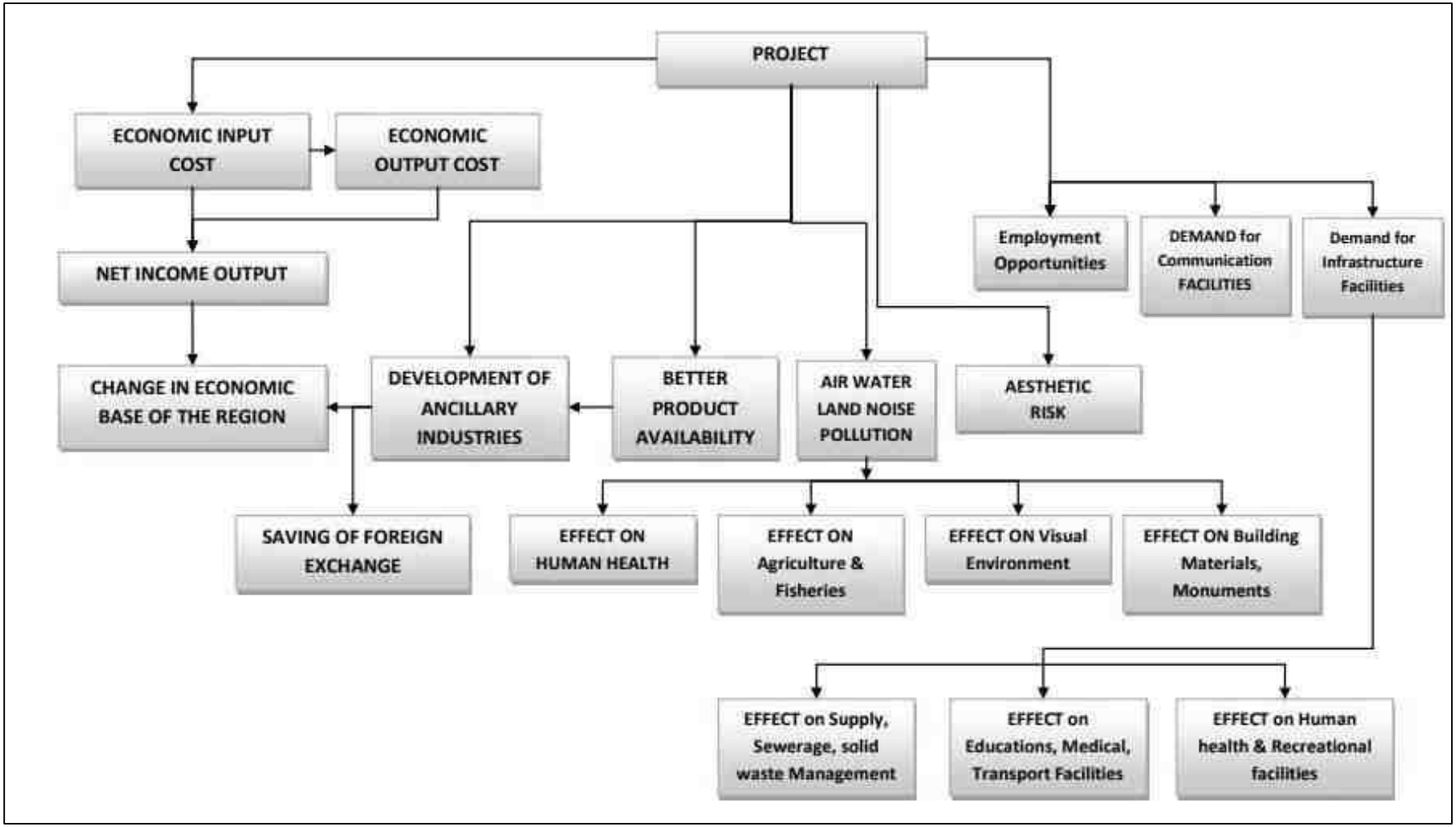

Figure 4. 6 Impacts Network for Socio Economic & Cultural Environment

4.3 Prediction of Impact and Mitigation Measures on Air Quality

Impacts

- The use of D.G. sets is anticipated only during power failure and hence is temporary and requires standard measures.
- Movements of vehicles for loading and unloading of raw material and final product.
- Dust emission from the transportation vehicles will mainly contribute to NOx and Carbon Monoxide.
- Emissions from manufacturing processes.
- Fugitive emissions from material handling.
- Emissions (NOx, CO, and PM) from vehicular movement.

Mitigation Measures

- Tree plantation would be provided to control and reduce odour and air pollution.
- Diesel generators will be operated only for emergency power backup. The emission source diesel generators will have adequate stack height will conformance to the set norms of CPCB and regular maintenance of diesel engines has to be ensured. Seasonal monitoring of air quality through an approved (NABL) monitoring agency will be carried out at these locations.
- Maintain good housekeeping practices
- Set speed limits of 10 km/hr on-site and off-site and cover trucks when necessary
- Management will ensure that all the private and commercial vehicles entering into the site are in proper condition and there is no visual sign of major emissions from the vehicles. Also it is to be ensured that all the vehicles are holding valid Pollution under Control Certificates.
- Ensure that vehicles are turned off when not in use.
- Ensure proper availability of fire-fighting system
- Prohibit any kind of smoke or fire on-site

Table 4.1 Air Pollution control are provided throughout the facility

S.No.	Sources of emission	Control Measures Proposed	Stack Height from GL(m)	Stack top dimension (in Metres)
Existing				
1	Induction Furnace (6T/H) - 2Nos with 2 Crucibles each	Common fumes extraction system, Cartridge bag filter with stack	30.0	1.0
2	Induction Furnace (1T/H) 3 Nos. with 3 Crucibles each	Common fumes extraction system, wet scrubber with stack	15.0	0.8
3	Sand Shake out plant (1)	Individual Cartridge Bag Filter with stack	30.0	1.2
4	Sand Plant (2)	Individual Cartridge Bag Filter with stack	30.0	1.2
5	Cool Drum	Cartridge Bag Filter with stack	30.0	1.45
6	DISA Shot Blasting	Cartridge Bag Filter with stack	8.0	0.3
7	Online Shot Blast	Cartridge Bag Filter with stack	13.0	0.6
8	Tumb Shot Blast Finishing 1T	Cartridge Bag Filter with stack	7.0	0.2
9	Span Core Shooter	Wet scrubber with stack	4.0	0.45
10	Laempe Core Shooter	Wet scrubber with stack	4.6	0.40
11	Core Shop	Cartridge Bag Filter with stack	9.3	0.40
12	Fettling Shop	Cartridge Bag Filter with stack	7.5	0.40
13	500 KVA DG Set	Acoustic enclosures with stack	9.8	0.23
Proposed				
1	Induction Furnace (10T/H) – 1 Nos with Dual track 2 Crucibles each	Common fumes extraction system, Cartridge bag filter with stack	30.0	1.0
2	Sand plant (1)	Individual Cartridge Bag Filter with stack	30.0	1.2
4	Cool Drum	Cartridge Bag Filter with stack	30.0	1.45
5	Online Shot Blast	Cartridge Bag Filter with stack	13.0	0.6
	Grinding Machine		13.0	0.6

4.4 Prediction of Impacts and Mitigation Measures on the Noise Environment

Impacts on Noise and Vibration

- Movements of vehicles and noise of motors, including other machineries like air blowers and centrifugations result in increase of ambient noise level and have adverse impact on the sensitive receptors.
- Improper handling and irregular maintenance of operating machines including pumps, generators, air diffusers, etc may lead to increased noise & vibration during operation activity
- The use of D.G. set during power failure.

Mitigation Measures

- Green Belt to be developed and maintained to abate the noise pollution created during the operation of machineries.
- Personal Protective Equipment (PPE) such as ear muffs, etc. to the workers exposed to heavy noise for longer duration.
- An acoustic enclosure D.G set will be provided to plant, this D.G set will be reduced the noise level upto 10 dB(A) to 15 dB(A). Noise level will be maintained less than 55 dB(A).
- Noise monitoring will be carried out in plant.
- The machineries to be used will be serviced and maintained to control generation of noise and vibration. Vehicles used for transportation will be serviced regularly and maintained properly to avoid any generation of unwanted noise.
- Employees working in noisy environment will be made mandatory to wear ear muffs/ear plugs to avoid any adverse impact of noise on them. Employees exposed to hand vibration while handling/operating heavy machineries will compulsorily wear anti vibration gloves made up of visco-elastic material

4.5 Prediction of Impacts and Mitigation Measures on Water Environment

Impacts

- Wastewater arising from operation phase for the workers at plant.
- Spillage of waste oil and spent oil will be generated from the D.G set.

- Bleed off water generation from Cooling Tower.

Mitigation Measures

- Existing 25 KLD of capacity sewage treatment plant is available. In future the unit will install capacity of 40 KLD STP. The treated water will be used for Greenbelt development.
- Spent oil will be stored in leak proof sealed barrels and disposed of to TNPCB authorized re-processors.
- Proper storage of oil and lubricants and spent oil/used oil will be handover to TNPCB authorized person.
- The cooling Tower bleed-off water collected and treated in Collection cum Re - circulation tank.

S. No	Description	Existing Quantity (KLD)	Proposed Quantity (KLD)	After Expansion (KLD)	Final Disposal Points
1	Sewage	20.5	4	24.5	Sewage is being treated in the STP (Existing capacity 25 KLD, Proposed Cap 40 KLD). Treated Sewage is being used for Green Belt. Sludge will be used as manure for Green Belt.
2	Cooing tower bleed off	30	10	40	Cooling Tower Bleed off is collected from the Collection cum Re - circulation tank and the treated water will be used in cooling tower.

4.6 Prediction of Impacts and Mitigation Measures on Soil

The overall impact on soil is negligible as the used water is recycled in the plant and the domestic sewage generated will be treated in STP and treated water will be used for greenbelt. The dust collected from bag filters, Mill waste generated from recycling water treatment shall be stored and disposed properly to avoid any soil contamination.

Green belt development surrounding the plant site would reduce the soil erosion and surrounding ecology and aesthetic appearance of the area. Trees will absorb specific air pollutants, reduce noise pollution, reduce soil temperature, help in holding moisture in the

soil, attract more birds and overall will help in maintaining the homeostasis of the environment. Further to existing green belt, an additional area of greenbelt is proposed to be developed which will significantly improve the environmental quality.

4.7 Prediction of Impacts and Mitigation Measures on Socio-Economic Environment

The socio-economic impacts of the proposed expansion project could be assessed in terms of demand-supply aspects for goods and services in the area, pressure on natural resources and infrastructure, growth of industry, sustainability of livelihoods and employment.

Some indirect impacts can also be understood in terms of public health and safety, preserving local culture and aesthetics of the area Based on a close understanding and assessment, the socio-economic impacts of DIPL's proposed secondary steel making project are predicted as follows:

Table 4.10: Socio Economic Impacts of the project

S.No	Impact Area	Predicted Impacts	
		Positive	Negative
1	Impact on land resources	No shifts in land use pattern would occur	Nil
2	Human Settlement	No land acquisition and displacement of people or habitations would be involved. Land required for project expansion already exists within factory premises of the project proponents in Gummidipoondi	Nil
3	Livelihoods	No loss of existing livelihoods in the area is expected to occur Additional livelihood opportunities are expected directly as also as spinoffs.	Increased influx of people in project construction and operation phases
4	Employment Generation	• Creation of employment opportunities for about 175 local skilled and semi-skilled workers during project construction phase. • Creation of sustainable employment for additional 25 skilled& semi-skilled workers during project operation phase, in production as also auxiliary activities. • Multiplier effect due to induced growth during construction and	Nil

		operational phases in downstream and upstream project activities will generate more employment opportunities to local women and youth.	
5	Spinoffs	Emergence of local entrepreneurs in complementary activities such as small business, transportation, education, housekeeping, repairs, Houses rents, Ration shops and maintenance etc	Possible emergence of increased and unfair competition in local markets adversely impacting businesses and livelihoods of some
6	Incomes and Revenues	Improved tax revenues to Devarapally Village and State exchequer	Nil
7	Demographics	• The population levels of the neighboring villages are not likely to change in any significant manner. • The lifestyles are expected to improve in tune with the rise in incomes and improvement in infrastructure facilities. • The skill sets of the local residents are expected to improve in keeping with the emerging employment opportunities.	Health of people residing in the buffer impact zone is likely to be impacted adversely if pollution control systems does not work efficiently
8	Impact on Physical Infrastructure such as roads and power distribution net work	Road and power network in the area is expected to be strengthened further as a sequel to industrial development around.	Increased vehicle traffic due to movement of raw material and finished products can increase traffic on existing roads
9	Social Infrastructure	Improvement to housing stock, educational facilities and healthcare facilities in the neighboring villages	Increased pressure on residential accommodation, water supply and sanitation in the neighborhood.

10	Community Aesthetics	• Housing construction in the area is expected to improve in the years to go as a sequel to industrial development. • There are no heritage precincts and archaeological monuments around the project location that would be adversely impacted.	Nil

4.8 Prediction of Impact and Mitigation Measures biotic environment

Impacts

This project is aimed at expansion of existing production capacity. Hence no physical changes happen in core area. No removal of existing buildings and tree cover in the expansion project. The activities associated with the proposed activity will have very less impacts on terrestrial flora and fauna of the core area and buffer zone area. There are no migratory corridors, nesting and Breeding sites within the core zone. No need to take any mitigation measures specific to these parameters. From the list of floral and faunal species it is very clear that there are no Rare or Endangered or Endemic or Threatened (REET) species present in core or buffer zones.

Mitigation Measures

The project site is devoid of any major vegetation cover and wild fauna. The project site is located industrial area. Therefore, no significant impact envisaged on biological environment. There are no rare or endangered species of flora or fauna in the project site. No migratory route of any wild/avian fauna in the project area is observed or recorded. The NBWL application details are enclosed in **Annexure 18.**

4.9 Positive impacts on and Mitigation Measures Ecological aspects

Aesthetics

Due the present plantation activities within the boundary of the site, the aesthetic value of the region will be enhanced. The beauty of the region will be enhanced through various flowering plants which intern attracts bird species of the region. More ornamental, palm trees, uncommon verities of the climbers and shrubs which are suitable to the region can be taken into criteria. Involving local villagers in plantation activities and educating the

people on importance of biodiversity leads to protection and conservation of flora and fauna in long term.

Carbon sink

Within the study area i.e in the buffer zone, the avenue plantation activities, rehabilitating degraded lands contribute to mitigating climate change. These actions increase the rate and quantity of carbon sequestration in biomass. Introduction of trees on non-forest or degraded forest lands, Village plantations, restoration of natural forest, watershed protection, orchards and perennial cultures, agro-forestry activities enhance the ecological and economic values.

Based on the above analysis, it can be concluded that even though there are no ecologically sensitive habitats in core and buffer zones, the impact will not be there on any habitat in any other manner. However, to promote the environmental sustainability of the total area, the above measures can be taken.

4.9.1 Anticipated general impacts due to Steel industry on Flora and fauna:

Steel production has a number of impacts on the environment, including air emissions (PM 10, PM2.5, SO2 & NOx), wastewater contaminants, hazardous wastes and solid wastes. Virtually all of the greenhouse gas emissions associated with steel production is from the carbon dioxide emissions related to energy consumption. Gaseous emissions and metal dust are the most prominent sources of waste from furnaces.

Dust may be generated during the operation phase of the unit. Fugitive dust is anticipated from slag crusher and material transportation. During operation of plant, dust particles may be emitted from the processes/activities. The generation of dust can have a negative effect on vegetation when emitted to the surrounding environment. Gaseous emissions may reduce air quality with impacts on human health.

4.9.2 Mitigation Measures for Habitat specific alternations

- Maintenance of the native plant species for conservation.
- Not to discharge and solid or liquid wastes directly or indirectly into the surrounding habitat.
- Regular consultation with local forest officials and NGOs to improve the degraded habitat and participate in conservation practices also with them.

- Conducting more awareness programmes near the surrounding villagers and local staff members.

The core project area, the adjoining areas shares similar habitat, and thus clearing of ground will not eliminate habitat of any species permanently. Overall, there are no threats for increasing the rarity of any species under this criterion.

Considering these aspects, a comprehensive green belt development plan is proposed which shall improve the existing status of ecosystems and associated biodiversity in the nearby area. These habitat improvement efforts shall not only cover the project core area but adjoining areas as well.

4.9.3 Impacts on traffic

Peak traffic was found to be 1495 PCU/hr at Gummidipoondi to Kallur Road. The capacity of road for 2 lanes (one way) is taken as 2900 PCU/hr as per IRC Standards. Hence the V/C Ratio for the road is found to be 1495/2900 = 0.5. Hence the level of service for the road is "C" & the performance is "Good". Volume of the Gummidipoondi to Kallur Road is moderate at present & a normal flow condition could be observed throughout the day.

4.10 Overall Environmental Impacts and mitigation measures of the project

The unit will be followed Zero liquid discharge (ZLD) method, the STP treated water will be utilized for Greenbelt development and cooling tower bleed off water will be recycled. The unit will provide air pollution control measures (Bag Filter and Dust Collector) with Adequate stack height. The solid and Hazardous waste disposed to TNPCB authorized person. The energy efficiency measures will be adopted in the plant. Hence the mitigation measures are reducing pollution load and climate change, GHG emission, temperature rise.

Chapter 5 ANALYSIS OF ALTERNATIVE SITES & TECHNOLOGIES

5.1 Proposed Project

M/s. Danblock Brakes India Pvt Ltd is located S No. 270 part, 256 part, Pappankuppam Village, Gummidipoondi Taluk and Tiruvallur District is manufacturing Grey and Ductile Iron in their plant spread over 15.54 acres. The unit is obtained CTEs/CTOs the copy is enclosed as **Annexure 3**. The current is CTO valid up to 31.03.2023.

Now the unit is applying Environmental Clearance for propose 70,000 T/Annum Grey and Ductile Iron castings manufacture. The existing manufacturing capacity of the unit is 25000 T/Annum; After Expansion the total quantities of products will 95,000 T/Annum.

5.2 Alternatives Site

The unit was established in 15.54 Acres of land at S No. 270 part, 256 part, Pappankuppam Village, Gummidipoondi Taluk and Tiruvallur District, Tamil Nadu. The current unit is operating since 15.06.2007. It is proposed to enhance the production capacity of existing Grey and Ductile Iron. As this is expansion activity of existing plant and enough infrastructure and land resources are available at the current plant location, alternative site evaluation does not arise.

5.3 Alternative Technologies

Grey and Ductile Iron are being manufactured by adopting three technologies:

- Blast Furnace
- Electrical Arc Furnace
- Induction Furnace

The Blast Furnace technology is highly capital intensive and small& medium scale units cannot make such high investment.

The Electrical Arc Furnace is also high capital intensive but low energy requirement. However, process complication is higher in this.

The Induction Furnace is well established technology for small and medium scale units. The existing unit is based on Induction Furnace, it is proposed to enhance the capacity of furnace to enhance the production capacity. Since efficient outcome is being achieved by the present technology, no alternatives are evaluated and proposed.

Chapter 6 ENVIRONMENTAL MONITORING

6.1 Introduction

The primary aim of environmental monitoring program is to formulate a systematic, site-specific plan for monitoring the environmental parameters within the impact area, during and after commissioning of the project, which would aid in assessing the effectiveness of mitigation and environmental protection measures implemented for the proposed project based on the existing environmental scenario and the probable environmental impacts appraisal.

The plan framed for the intended facility will describe:

- The details of the proposed mitigation measures taken for safeguarding the environment at the project site as well as in the vicinity of the industrial site.
- Details of management plans (Greenbelt development plan, Solid waste management plan etc).
- Post project environmental monitoring programme to be undertaken after commissioning of the project.
- The associated cost components of the pollution control systems are installed at the site.

For each of the environmental attributes, the monitoring plan specifies the parameters to be monitored, location of monitoring sites, frequency and duration of monitoring and it also denotes the applicable standards, implementation and supervising responsibilities.

6.2 Objectives

- Ensure day to day operational activities are conducted in a manner in compliance with the applicable regulatory approvals including legislation and industry standards.
- Evaluate the adequacy of mitigation and pollution control measures implemented for reducing the adverse impacts caused during operation stages and suggest additional mitigation measures, if appropriate, in the light of the results.
- Define a detailed framework to monitor and document for achieving full compliance with statutory requirements.

- Encourage good environmental management practices through planning, commitment and continuous improvement.
- Develop well defined environmental monitoring program designed to assess the nature and extent of environmental impacts of the proposed operations and progressively refine such programs against the targets.
- Define roles and responsibilities of site personnel and ensure that all people onsite are fully informed of their responsibilities and accountabilities with regard to the environment.
- To comply with all regulations stipulated by the Central Pollution Control Board (CPCB)/ State Pollution Control Board (SPCB) related to air emission and liquid effluent discharge as per air and water pollution control act/ laws.
- To handle hazardous wastes as per the Hazardous Waste (Management and Handling) Rules, 1989 and subsequent amendments.
- Review, improve and update environmental management procedures and standards.
- Establish response procedures for actual/potential environmental impacts including community complaints and ensure corrective action is taken.
- Perspective budgeting and allocation of funds for environmental management expenditure, Continuous development and search for innovative technologies for a cleaner and better environment.

6.3 Methodology

Monitoring methodology covers the following key aspects:

- Components to be monitored
- Parameters for monitoring of the above components
- Monitoring frequency
- Monitoring standards
- Responsibilities for monitoring & reporting
- Monitoring costs

Environmental monitoring of the parameters involved and the threshold limits specified are discussed below.

6.4 Ambient air Quality (AAQ) Monitoring

Ambient air quality parameters recommended are Particulate Matter (Size less than or equal to 2.5µm) or PM_{10} µg/m3, Particulate Matter (Size greater 2.5µm & less than or equal to 10 µm), Oxides of Nitrogen (NO_x) and Sulphur Dioxide (SO^2). These are to be monitored at designated locations starting from the commencement of project activity. Data should be generated at all identified locations in accordance to the National Ambient Air Quality Standards (**Table 6.1**) location, duration and the pollution parameters to be monitored and the responsible institutional arrangements are detailed out in the Environmental Monitoring Plan.

Table 6. 1 National Ambient Air Quality Standards

S.No.	Pollutant	Time Weighted Average	Concentration in Ambient Air		
			Industrial, Residential Rural and Other Area	Ecological Sensitive Area (Notified by Central Govt.)	Methods of Measurement
(1)	(2)	(3)	(4)	(5)	(6)
1	Sulphur Dioxide (SO2) µg/m3	Annual* 24 Hours**	50 80	20 80	- Improved west and Gaeke - Ultraviolet fluorescence
2	Nitrogen Dioxide (NO2) µg/m3	Annual* 24 Hours**	40 80	30 80	- Modified Jacob & Hochheiser (Nn-Arsenite) - Chemilumi nescence
3	Particulate Matter	Annual* 24 Hours**	60 100	60 100	- Gravimetri c - TOEM - Beta Attenuation
4	Particulate Matter (Size less than 2.5 µm)or PM2.5 µg/m3	Annual* 24 Hours**	40 60	40 60	- Gravimetri c - TOEM - Beta Attenuation
5	Ozone (O3) µg/m3	8 Hours** 1 Hour**	100 180	100 180	- UV Photometric - Chemilmin escence - Chemical Method
6	Lead (Pb) µg/m3	Annual* 24 Hours**	0.5 1.0	0.5 1.0	AAS / ICP method after sampling on

					EPM 2000 or equivalentfilter paper - ED-XRF using Teflon filter
7	Carbon Monoxide (CO) mg/m3	8 Hours** 1 Hour**	02 04	02 04	- Non Dispersive Infra Red (NDIR) - Spectrosco py
8	Ammonia (NH3) µg/m3	Annual* 24 Hours**	100 400	100 400	- Chemilumi nescence Indophenol blue method
9	Benzene C6H6	Annual*	05	05	- Gas Chromatograp hy based continuous analyzer - Absorption and Desorption followed by GC analysis
10	Benzo(o) Pyrene (BaP)- Particulate Phase only, ng/ m3	Annual*	01	01	Solvent extraction followed by HPLC/GC analysis
11	Arsenic (As), ng/ m3	Annual*	06	06	AAS/ICP method after sampling on EPM 2000 or equivalent filter paper
12	Nickel (Ni), ng/ m3	Annual*	20	20	AAS/ICP method after sampling on EPM 2000 or equivalent filter paper
Source Anon 1996-97, National Ambient Air Quality Monitoring Series NAQMS/a/1997- 97, Central Pollution Control Board, Delhi.					

*Average Arithmetic mean of minimum 104 measurements in a year taken for a week 24 hourly at uniform interval.

** 24 hourly / 8hourly values should meet 98 percent of the time in a year.

6.5 Water Quality Monitoring

The Physical and Chemical parameters recommended for analysis for water quality relevant are pH, Total Solids, Total Dissolved Solids, Total Suspended Solids, Oil and Grease, COD, chloride, lead, zinc and cadmium. The location, duration, and the pollution parameters to be monitored and the responsible institutional arrangements are detailed in the environmental monitoring Plan. The monitoring of the water quality is to be carried out at all identified locations in accordance to the Indian Standard Drinking Water Specification – IS 10500:1991 (State in **Table 6.2**)

Table 6. 2 Indian Standard Drinking Water Specifications IS: 10500:2012

S. No	Substance or Characteristics	Requirement (Desirable Limit)	Undesirable Effect Outside the Desirable Limit	Permissible Limit in the Absence of Alternate	Methods of Test (Ref. To IS)	Remarks
ESSENTIAL CHARACTERISTICS						
1	Colour, Hazen units, Max	5	Above 5, consumer acceptance decreases	25	3025 (Part 4) 1983	Extended to 25 only if toxic substance are not suspected, in absence of alternate sources
2	Odour	Unobjectable	-	-	3025 (Parts 5) 1984	a) Test cold and when heated b) Test at several dilutions
3	Taste	Agreeable	-	-	3025 (Parts 7&8) 1984	Test to be conducted only after safety has been established
4	Turbidity NTU, Max	5			3025 (Parts 10) 1984	-
5	pH Value	6.5 to 8.5	Beyond this range, the water will affect the mucous membrane and /	No relaxation	3025 (Parts 11) 1984	-

			or water supply system			
6	Total hardness (as CaCO3) mg/1, Max	300	Encrustation in water supply structure and adverse effects on domestic use	600	3025 (Parts 21) 1983	-
7	Iron (as Fe) mg/1, Max	0.3	Beyond this limit taste/apperance are affected, has adverse effect on domestic uses and water supply6 structures, and promotes iron bacteria	1	32 of 3025: 1964	-
8	Chlorides (as CI) mg/1, Max	250	Beyond this limit, taste, corrosion and palatability are affected	1000	3025 (Part 32) 1988	-
9	Residual free chlorine, mg/1, Min	0.2	-	-	3025 (Part 26) 1986	To be applicable only when water is chlorinated. Tested at consumer end. When protection against viral infection is required, it should be Min 0.5 mg/1
DESIRABLE CHARACTERISTICS						
1	Dissolved solids mg/1, Max	500	Beyond this palatability decreases and may cause gastro intestinal irritation	2000	3025 (Part 16) 1984	-
2	Calcium (as Ca) mg/1, Max	75	Encrustation in water supply structure and adverse effects on	200	3025 (Part 40) 1991	-

			domestic use			
3	Magnesium (as Mg), mg/1, Max	30	Encrustation to water supply structure and adverse effects on domestic use	100	16,33,34 of IS 3025:196 4	-
4	Copper (as Cu), mg/1, Max	0.05	Astringent taste, discoloration and corrosion of pipes, fitting and utensils will be caused beyond this	1.5	36 of 3025:196 4	-
5	Manganese (as Mn), mg/1, Max	0.1	Beyond this limit taste/appearance are affected, has adverse effects on domestic uses and water supply structures	0.3	35 of 3025:196 4	-
6	Sulphate (as 200 SO4), mg/1, Max	200	Beyond this causes gastro intestinal irritation when magnesium or sodium are present	400	3025 (Part 24) 1996	May be extended up to 400 provided (asMg) does not exceed 30
7	Nitrate (as NO2), mg/1, Max	45	Beyond this, may cause methaemo globinemia	100	3025 (Part 34) 1998	-
8	Fluoride (as F), mg/1, Max	1	Fluoride may be kept as low as possible. High fluoride may cause fluorosis	1.5	3025 (Part 23) 1964	-
9	Phenolic compounds (As C6H5OH) mg/1, Max	0.001	Fluoride may be kept as low as possible. High fluoride may cause fluorosis	0.002	3025 (Part 54) 1964	-
10	Mercury (as Hg), mg/1, Max	0.001	Beyond this, the water become toxic	No Relaxation	(See Note) Mercury ion analyser	To be tested when pollution is suspected
11	Cadmium (as Cd), mg/1, Max	0.01	Beyond this, the water become toxic	No Relaxation	(See Note)	To be tested when pollution is suspected
12	Selenium (as	0.01	Beyond this, the	No	3025 (Part	To be tested

	Se), mg/1, Max		water become toxic	Relaxation	28) 1964	when pollution is suspected
13	Arsenic (as As), mg/1, Max	0.05	Beyond this, the water become toxic	No Relaxation	3025 (Part 37) 1988	To be tested when pollution is suspected
14	Cyanide (as CN), mg/1, Max	0.05	Beyond this, the water become toxic	No Relaxation	3025 (Part 27) 1986	To be tested when pollution is suspected
15	Lead (as Pb), mg/1, Max	0.05	Beyond this, the water become toxic	No Relaxation	(See Note)	To be tested when pollution is suspected
16	Zinc (as Zn), mg/1, Max	5	Beyond this limit, it can cause astringent taste and an opalescence in water	15	39 of 3025:196 4	To be tested when pollution is suspected
17	Anionic detergents (as MBAS), mg/1, Max	0.2	Beyond this limit, it can cause light froth in water	1	Methylene -blue extraction method	To be tested when pollution is suspected
18	Chromium (as Cr6+), mg/1, Max	0.05	May be carcinogenic above this limit	No relaxation	38 of 3025; 1964	To be tested when pollution is suspected
19	Poly nuclear aromatic hydrocarbons (as PAH) mg/1, max	-	May be carcinogenic above this limit	-	-	-
20	Mineral oil mg/1, max	0.01	Beyond this limit undesirable taste and odour after chlorination take place	0.03	Gas Chromato graphic method	-
21	Pesticides mg/1, max	Absent	Toxic	0.01	-	-
22	Radioactive materials:				58 of 3025:196 4	-
23	Alpha emitters Bq/1, Max	-	-	0.1	-	-
24	Beta emitters pci/1, Naxmg/1, max	-	-	1	-	-
25	Aluminium (as	200	Beyond this limit	600	13 of	-

	A1), mg/1, Max		taste become unpleasant		3025:196 4	
26	Aluminium (as A1), mg/1, Max	0.03	Cumulative effect is reported to cause dementia	0.2	31 of 3025:196 4	-
27	Boron, mg/1, Max	1	-	5	29 of 3025:196 4	-

6.6 Noise Level Monitoring

The measurement for Monitoring noise levels would be carried out at all designated locations in accordance to the Ambient Noise Standards formulated by Central Pollution Control Board (CPCB) in 1989 (refer **Table 6.3**) Sound pressure levels would be monitored on twenty-four-hour basis. Noise should be recorded at an "A" weighted frequency using a "slow time response mode" of the measuring instrument. The location, duration and the noise pollution parameters to be monitored and the responsible institutional arrangements are detailed in the Environmental Monitoring Plan.

Table 6. 3 Noise Standards

Type	Noise level for Day Time Leq dB(A)	Noise level for Night Time Leq dB(A)
Industrial area	75	70
Commercial area	65	55
Residential area	55	45
Silence zone	50	40
Day time - 6.00 am – 10.00 pm (16 hours) Night time – 10.00pm – 6.00 am (8 hours)		

6.7 Environmental Monitoring plan

The monitoring plan along with the environmental parameters and the time frame is presented in the **Table 6.4**

Table 6. 4 Environmental Monitoring plan

S. No	Area of Monitoring	Number of Sampling Stations	Frequently of Sampling	Parameters to be Analyzed
1.	Meteorology	One	Hourly and Daily basis.	Wind speed and direction, Temperature, Relative Humidity, Atmospheric pressure, Rainfall.
2.	Ambient Air	2 Stations (In	Twice a week:24	PM_{10}, $PM_{2.5}$, SO_2, VOC and NO_2

	Quality	downwind)	hourly period (monthly)	
3.	Noise	4 (two within plant premises and two outside plant premises)	Once in a season	Ambient Equivalent Continuous Sound Pressure Levels (Leq) at day and Night time.
4.	Liquid Effluents	Main Plant Effluents	Weekly	pH, Temp, Conductivity, TSS, TDS, BOD, Phenol.
		Sanitary Effluents	Monthly	pH, TSS, BOD & COD
5.	Exhaust from DG set	Stack of DG set	Monthly	PM_{10}, $PM_{2.5}$, SO_2 & CO
6.	Vehicular Emissions	Parking area	Periodic monitoring of vehicles	Air emission and noise, PCU
7.	Solid waste / Hazardous waste	Check conformance to HWM rules	Quantity and Quality monitoring	Periodically
8.	Soil	Two Locations within the Project Site	Yearly Once	Physico chemical properties, Nutrients, Heavy metals
9.	Terrestrial Ecology	Within 10km, around the project	Once in three years	Symptoms of injuries on plants

6.8 Responsibility of Monitoring and Reporting System

The overall responsibility of monitoring the above parameters shall be lie with the Top Management of M/s. Danblock Brakes India Pvt. Ltd. The environment division shall be responsible for day to day monitoring of effluent, raw water and treated water quality. The Ambient air quality, Stack emissions, soil, noise and water quality shall be monitored by either third party or by the Environment Management Division of M/s. Danblock Brakes India Pvt. Ltd.

Records shall be maintained for the analysis of raw effluents and treated effluents, ambient air quality data, stack emissions monitoring results, and noise levels. These records are not only required for the statutory submission of the Pollution Control Board authorities but also to assess the efficiencies of the pollution control equipment as the objective of the project proponent is not only compliance with statutory regulations, but also a serious commitment towards clean environment.

Reporting system provides the necessary feedback for project management to ensure quality of the works and that the management plan in implementation. The rationale for a

reporting system is based on accountability to ensure that the measures proposed as part of the Environmental Management Plan get implemented in the project.

6.9 Environmental Monitoring Budget

The environmental budget for the various environmental management measures in the EMP is detailed in **Table 6.5**. There are several other environmental issues that have been addressed as part of good engineering practices, the costs for which have been accounted for in the Engineering Costs. Moreover, since environmental enhancements have not been finalized at this stage, the table projects the typical costs unit wise.

Table 6. 5 Estimated Environmental Monitoring Budget

S.No.	Particulars	Capital cost In Lakhs	Recurring cost in Lakhs
1.	Air Pollution Control measures	40.0	5.0
2.	Sewage treatment Plant	35.0	3.0
3.	Solid Waste Management & dust prevention measure	10.0	2.0
4.	Solar lighting/grit in unit	30.0	3.0
5.	Noise Pollution Control	10.0	3.0
6.	Environmental Monitoring & Management	-	5.0
7.	Green belt & open area development*	15.0	2.0
8.	Rainwater harvesting pits	15.0	2.0
Total		**155.0**	**25.0**

Chapter 7 OCCUPATIONAL HEALTH, RISK ASSESSMENT & DISASTER MANAGEMENT

7.1 Risk Assessment

7.1.1 Hazards Relating to Foundries

Working with molten metal is always a safety hazard. Many accidents occurred worldwide in steel melting industries. Primarily safety hazards relating to Induction Furnace can be classified into 3 categories

- Thermal hazards
- Electrical hazards
- Physical hazards

Use of proper personnel equipment, fire protection systems and continuous training of people working in the shop floor are the only measures which helps industries to avoid accidents.

7.1.2 Various possible Hazards & Emergencies from different operations

M/s. DANBLOCK BRAKES INDIA PVT LTD currently to have five Induction Furnaces, Sand plant, Cool Drum, DISA shot blasting, Online shot blasting, tump shot blasting, Span core shooter & Laempe core shooter. Apart from this material handling operation will be there in the raw material yard. Based on the type of operations, the possible Hazards and Emergencies are identified and mitigation measures are discussed below.

7.1.2.1 Induction Furnace

Induction Furnace produces heat using electricity. In that way Induction Furnace is cleaner method of melting the charge. AC current flows through coils made up of hollow copper tubes. The flowing current in induction coils creates magnetic field and creates electrical current in the metal charge thus by creating heat. This will help the metal to melt. The temperature in the furnace reaches up to 1500^{o}C to 1700^{o}C. Refractory lining is provided to the crucible.

Typical hazards relating to the Induction Furnace are

- Feeding of wet or damp metal or empty gas cylinders' scrap, into the furnace as charge can cause explosion.
- Lack of operator skill during sampling and addition of flux materials can cause splashes and cause physical burn injuries
- Dropping of large pieces of metal into melting furnace from overhead cranes causes splashes.
- Coming into contact with electrical conductors, over-riding safety interlock switches causes fatal electrical shocks.
- Failure of cooling water circulation system can cause over heating of magnetic coils and cause short circuits.
- Metal charge is loaded into furnace using overhead crane by magnets. During this process, possibility of charge coming down abruptly which can cause physical injuries.
- During the tilting of furnace for unloading of molten metal, splashes may occur and can injure people.
- Failure of refractory of furnace can cause serious spill of molten metal in shop floor can cause serious injuries to people.

7.1.3 Consequential fires outside the premises

As can be seen from the above, most of the hazards relating to Induction Furnace and continuous casting machines are related to occupational hazards. The only hazard that can cause problem surrounding public is consequential fires during fire accidents. However, there is no habitation nearby and possibilities of consequential fires are not there.

7.2 Risk Mitigation Measures

Following Risk Mitigation Measures suggested overcoming the risks identified

- Periodical inspection of mechanical equipment, Hot metal and Conveyors.
- Distance shall be maintained by operational staff while charging scrap to furnace
- Type of scrap charged shall be properly examined and any pressure cylinders, chemical tins etc. shall not be charged to furnace

- Tap holes should be checked regularly for damage and build-up of Scale, to prevent molten metal splashes.
- A competent person should regularly inspect ladle buckets and their supporting, locking and tipping mechanisms
- Before each filling, the pouring of, or transport of slag ladles and their related appliances should be visually inspected.
- The hot metal conveyor crossing points shall be thoroughly enclosed and heat shielded
- Goggles, face shields, heat resistant aprons, gloves, safety shoes, helmets shall be provided to the people working in furnace and Continuous casting machine areas
- Nose masks, gloves, shoes, helmets shall be provided to the people working in the coal pulveriser area. All conveyors in the coal crusher area shall be enclosed and suction points shall be connected to bag filter to control fugitive emissions
- Work force shall be continuously trained on operations, hazards and safety measures
- First aid boxes shall be maintained at all functional areas. Eye washing fountain shall be installed in furnace and CCM areas
- People working in hot areas shall be provided rest for every 2 hours' period to reduce fatigue due to heat and glare
- Fluids like butter milk shall be supplied to work force during summer period to reduce impact of heat on the body
- Periodic mock drill shall be conducted

7.3 Emergency Equipment/facilities

M/s. Danblock Brakes India Pvt. Ltd. is having portable fire extinguishers in Induction furnace area and other plant areas. Following equipment will be in place and details are given **Table 7.1**.

Table 7.1 List of Existing Fire Extinguishers

Sl.No	Location	Type	Capacity	Refilling Date	Next Refilling Date
1	Security Office	CO2	4.5 kg	11/3/2022	11/3/2027

Sl.No	Location	Type	Capacity	Refilling Date	Next Refilling Date
2	Pantry	CO2	2kg	12.7.2019	12.7.2024
3	Near lift	CO2	4.5 kg	16/02/2022	16/02/2027
4	Ambulance	CO2	2 kg	12/7/2019	12/7/2024
5	Admin	CO2	6.5 kg	7/5/2022	7/5/2027
6	Server Room In	CO2	4.5 kg	6/7/2021	6/7/2026
7	Server Room Out	CO2	4.5KG	3.10.2020	3.10.2025
8	Development Centre	CO2	4.5 KG	15.06.19	15.06.24
9	Store	Mech Foam	9L	28.12.2021	28.12.2023
10	Store	Foam	50L	16.02.2022	16.02.2023
11	Store	Mech Foam	9L	28.12.2021	28.12.2023
12	Resin Binder	ABC	6 Kg	27/01/2021	27/01/2024
13	Resin Binder	ABC	6KG	27.01.2021	27.01.2024
14	Pump House	ABC	6KG	05.08.2022	05.08.2025
15	PCC Room Out	ABC	6kg	27.01.2021	27.01.2024
16	PCC Room In	CO2	4.5kg	15.06.2019	15.06.2024
17	Generator Room	S/P Powder	6 kg	11/1/2020	11/1/2023
18	Generator Room	DCP	25kg	05.08.2022	05.08.2025
19	Compressor Room (Old)	ABC	6kg	05.01.2021	05.01.2024
20	Compressor Room (New)	ABC	6kg	05.08.2022	05.08.2025
22	110/ 11kv Control Room	abc	6kg	15.6.19	15.6.22
23	110/ 11kv Control Room	dcp	25kg	3.10.20	3.10.21
24	110/ 11kv Control Room	CO2	4.5kg	11.9.22	11.9.27
25	Outer Fettling	ABC	6 Kg	5.8.2022	5.8.2025
27	Vertical Core Shop	CO2	4.5 kg	03.10.2020	03.10.2025
28	Vertical Core Shop	DCP	25 kg	16.02.2022	16.02.2025
29	Horizontal Core Shop	DCP	25 kg	16.02.2022	16.02.2025
30	New Sand Plant Control Room	ABC	6 Kg	16.02.2022	16.02.2025
32	Vispouring	ABC	5 kg	11.03.2021	11.03.2024
33	Sand Lab	CO2	4.5 kg	7.5.2022	7.5.2027
34	6 Ton Furnace	CO2	4.5 kg	17.05.2022	17.05.2027
35	6 Ton Furnace	CO2	4.5 kg	16.02.2022	16.02.2027
36	6 Ton Furnace Staircase	CO2	4.5 kg	7.5.2022	7.5.2027
37	6 Ton Entrance	ABC	6 Kg	17.09.22	17.09.22
39	Spectro Lab	ABC	6 Kg	16.2.22	16.2.25
40	Furnace Transform Room	DCP	25 kg	28.12.2021	28.12.2024
41	Furnace Transform Room	ABC	6 Kg	7.5.2025	7.5.2025
44	1 Ton Moulding	DCP	25 kg	28.12.2021	28.12.2024
45	1 Ton Transformer (Near Staircase)	co2	4.5kg	17.09.22	17.09.27

Sl.No	Location	Type	Capacity	Refilling Date	Next Refilling Date
46	1 Ton Melting	co3	4.5kg	17.09.22	17.09.27
48	Scrap Yard	ABC	6 Kg	7.5.2022	7.5.2022
49	X-Ray Room In	CO2	4.5 kg	27.11.2020	27.11.2025
50	X-Ray Room Out	CO2	4.5 kg	29.10.2019	29.10.2024
51	Canteen	CO2	4.5 kg	16.2.22	16.2.27
52	Shake out	ABC	6 Kg	16/02/2022	16/02/2025
53	Machine Shop line-02	CO2	4.5 kg	16/02/2022	16/02/2027
54	Machine Shop line-04	ABC	6 Kg	17/09/2022	17/09/2025
55	Machine Shop line-06	CO2	4.5 kg	16/02/2022	16/02/2027
56	Machine Shop line-07	CO2	4.5 kg	30/01/2021	30/01/2026
57	Machine Shop line-08	ABC	6 Kg	16/02/2022	16/02/2027
58	Machine Shop line-10	CO2	4.5 kg	16/02/2022	16/02/2027
59	Machine Shop line-12	ABC	6 Kg	5/8/2022	5/8/2025
60	Machine Shop Store	CO2	4.5 kg	16/02/2022	16/02/2027
61	Machine Shop Entrance	CO2	4.5 kg	30.10.2021	30.10.2026
62	Machine Shop Packing Area	ABC	6 Kg	16.2.22	16.2.25
63	Quality 1st-Floor	ABC	6 Kg	16.2.22	16.2.25
65	Quality 1st-Floor	ABC	6 Kg	16.2.22	16.2.25
66	Spare	Co2	4.5 KG	7.5.22	7.5.27
67	Spare	ABC	6kg	5.5.22	5.5.25
68	Spare	ABC	6kg	27.1.21	27.1.24
69	Spare	ABC	6kg	16.2.22	16.2.25
70	Spare	ABC	6kg	11.3.21	11.3.24
71	Spare	DCP	25kg	03.05.2022	03.05.2025
72	Spare	DCP	25kg	28.12.2021	28.12.2024
73	Spare	DCP	25kg	17.9.2022	17.9.2025
74	Spare	Water	50l	16.2.22	16.2.23

Based on the existing emergency handling systems in the plant and keeping in view of expansion activities, the following additional measures are suggested.

7.4 House Keeping

Good housekeeping practices shall be adopted. Proper garbage bins will be provided at different areas of the plant. All roads will be swept and dirt will be removed. Water sprinkling system is established. Storm water drains shall be properly maintained and dirt traps shall be established.

7.5 Occupational Safety and Health

The secondary steel making involves handling and processing of sponge iron, metal scrap and ferro alloys like silica and manganese. The steel making and processing may generate fumes and dust, which can create health problems in the work area to the employees. The occupational safety and health plan shall follow the guidelines based on Factories Act, 1948 and shall be finalized in consultation with the local factory's inspectorate.

The occupational safety and health plan is prepared to identify the hazards due to the operations and process, with the mitigation measures. The mitigation measures are mainly engineering controls, work room conditions, personal protective equipment and training and education.

Table 7.2 Occupational hazards and mitigation plan Physical Hazards

Hazard	Impact	Mitigation
A. Physical Injuries due to hot metal handling	Severe burn injuries	a. Engineering Controls; • Splash curtains in Induction Furnace area b. Use of PPE shall be made mandatory for workers
B. Heat Stress	Heat endema, Heat Rashes, Heat Cramps, Heat Exhaustion, Heat Stroke and hyperpyrexia	a. Engineering Controls; • Rotation of employees working in heat zones • Ventilation b. Acclimatization of workforce C. Other measures • Intake of salts of K & Na, Liquids regularly • PPEs like Goggles, Helmets, Heat resistant suits, Shoes shall be mandatory in induction furnace and other plant area
C. Electrical equipment handling	Shock, Serious or fatal injury	a. Engineering controls • Isolation of systems • Tag Out • Appropriate tool selection • Interlock systems b. Safety protocols SOP's c. Provision of PPE
D. Working at DISA Shot Blasting	Serious fatal injury	Engineering Controls • Guards for conveyors • Interlocking Systems

		• Isolation • Maintenance Protocols • Appropriate Tool Selection I. Training and Education II. PPE: Helmets, Heat resistant gloves, Shoes, Hot suits
E. Cranes and Hoists	Serious or Fatal injury	Engineering Controls • Operation cabin isolation • Two holding breaks on hoist mechanism • Keep the crane clean without any loose materials and tools I. Obstruction Clearance II. Training and Education
F. Falling Objects	Serious or Fatal Injury	I. Engineering Controls • Slip resistance Flooring • Provisions of Platforms & Walk ways • Open mesh platforms & Walkways II. House keeping

Table 7.3 List of Personnel Protective Equipment

➢ Industrial Safety Helmet
➢ Hot metal resistant jackets and trousers
➢ Zero power Plain goggles with cut type filters on both ends
➢ Face shields or vented goggles
➢ Welders' equipment for eyes & face protection
➢ Cylindrical type earplug
➢ Ear Muffs
➢ Dust Masks
➢ Safety Belt/lime man's safety belt
➢ Hot metal resistant gloves
➢ Safety footwear insulated against heat
➢ Canvas cum leather hand gloves with leather palm

7.5.1 Health Surveillance Plan

The health surveillance plan consists of medical check-ups on recruitment to ascertain the health status of the employees. The data to be obtained includes.

Baseline health data is such as height, weight and Vital statistics. A detailed history of previous diseases and occupational exposures. The focus will be on previous lung problems and previous exposure to lung toxins such as silica, asbestos, irritant gases etc.,

Identification of personal habits (smoking, hygiene, alcohol consumption, fingernail biting) that may be relevant to work. History will be sufficiently detailed, complete physical examination with special attention to respiratory, fatigue, chest X-ray, Blood tests and urine tests.

The employees shall have annual Medical Check-up with special attention to respiratory, fatigue, dermal, audiometry tests depending on the areas they are working in the plant. The health records shall be maintained by M/s. Danblock Brakes India Pvt. Ltd., Personnel Department.

7.6 Disaster Management Plan

This Disaster Management Plan (DMP) has been designed based on the range, scales and effects of "Major Generic Hazards" described in the Risk Assessment Report just mentioned and on their typical behaviors predicted therein. The DMP addresses the range of thermal and mechanical impacts of these major hazards so that potential harm to people onsite and off-site, plant and environment can be reduced to a practicable minimum. The scenarios of loss of containment are credible worst cases to which this DMP is linked.

The emergency plan envisaged will be designed to intercept full range of hazards specific to steel melt shops. In particular, the DMP will be designed and conducted to mitigate those losses of containment situations, which have potentials to escalate into major perils.

Emergency medical aids to those who might be affected by incident heat radiation flux, electrical shocks, physical injuries will be inherent in the basic capabilities. The most important capability of this DMP will be the required speed of response to intercept a developing emergency in good time so that disasters such as explosion, major fire etc. are never allowed to happen.

7.7 Disaster Control Philosophy

The emergency control philosophy of the plant is in line with its normal operational controls. The emergency control room will be the existing administrative office, which will employ Distributed Control System (DCS). All emergency operations will be directed from the Emergency Control Room.

The principal strategy of DMP of the plant is "Prevention" of identified major hazards.

Hazard and Operability Study (HAZOP), accident consequence analysis etc. The Project Authority will be committed to this strategy right from the conceptual stage of the plant so that the objective

of prevention can have ample opportunities to mature and be realized in practice

The DMP or Emergency Preparedness Plan (EPP) will consist of:

A. On-site Emergency Plan

B. Off-site Emergency Plan

Disaster Management Plan preparation under the headlines of On-site Emergency Plan and Off-site Emergency Plan is in consonance with the guidelines laid by the Ministry of Environment and Forests (MOEF), Govt of India "Occupier" of the facility is responsible for the development of the On-site Emergency Plan as per the guidelines given by the Government, The Off-site Emergency Plan should be developed by the Government (District Authorities).

7.7.1 On-Site Emergency Plan

The objective of the On-site Emergency Plan should be to make maximum use of the combined resources of the plant and the outside service to

- Effect the rescue and treatment of casualties
- Safeguard other personnel in the premises
- Minimize damage to property and environment
- Initially contain and ultimately bring the incident under control
- Secure the safe rehabilitation of affected people

- Provide authoritative information to the news media
- Preserve relevant records and equipment for the subsequent enquiry into the cause and circumstances of emergency

7.7.2 Action Plan

The Action Plan consists of:

- Identification of Key Personnel
- Defining responsibilities of Key Personnel
- Designating Emergency Control Centres and Assembly Points
- Declaration of Emergency
- Sending All Clear Signal
- Defining actions to be taken by non-key personnel during emergency.

Table 7.4 Rolls and Responsibilities of Key Personnel Identified By M/S. Danblock Brakes India Private Limited

S. No.	Designation	Person Nominated	Responsibilities
1	Site Controller (SC)	Plant manager	➢ Overall, in-charge and decision maker during emergencies ➢ Receives communication on emergencies and declare emergencies in the plant ➢ Deploy adequate manpower and other resources to control the emergencies ➢ Declare normal status after handling the emergency ➢ Communicate with top management during and after the emergency
2	Incidental Controller (IC)	Shift In-Charge	➢ Receives communication on emergencies and communicate the same to the plant manager ➢ Rush to the place of emergency and assess the magnitude of emergency and deploy emergency teams to handle the emergencies ➢ Shut down the plant operations and restrict the movement of people and

			material from and to the plant ➢ Take the attendance from the rolls and alert the rescue teams for rescue of the people trapped ➢ Supervise the emergency activity at the site and provide the feedback to the plant manager from time to time
3	Liaison and Communication Officer (LCO)	EHS Manager	➢ Receives communication on emergencies and communicate the same to the nearby plants and other government agencies such as Fire Tenders, Ambulances and nearby Hospitals ➢ Guide the external and other rescue agencies to the plant site ➢ Send the injured people to the nearby hospitals by company vehicles and ambulances ➢ Record the emergency situation and rescue operation details to submit to the top management and government agencies as required.
4	Fire and Security Officer (FSO)	Security In-Charge	➢ On hearing of emergency entry of people and material into the plant is controlled ➢ Take the attendance and visitors list and count the people at the assembly point and give feed back to the incident controller ➢ Coordinate the fire control and rescue operations in the plant
5	Trained personnel in fire and other emergency	Ten People nominated covering all shifts	➢ Take the necessary fire extinguishers and other emergency equipment ➢ Start the fire control activities using fire hydrant lines and fire extinguishers
6	Rescue and first aiders	Ten People nominated covering all shifts	➢ Take the necessary rescue equipment such as ropes self-breathing equipment fire suits etc. to the incident site ➢ Participating in the rescue operations along with other outside agencies

			➢ Provide first aid to the injured people and shift them the nearest hospitals

7.7.3 Emergency Control Centre

The Emergency Control Centre will be the focal point in case of an emergency from where the operations to handle the emergency are directed and coordinated.

- ➢ It will control site activities.
- ➢ Emergency management measures in this case have been
- ➢ Proposed to carry out from single control Centre designated as Main Control Centre (MCC).
- ➢ MCC is the place from which messages to outside agencies will be sent other helps for the management of emergency will be arranged.
- ➢ It will be located office of Plant Manager. Following facilities would be available in the MCC:
  - Mobile phones, public address system
  - Site map
  - Location of water sump, fire hoses and fire extinguisher available at site
  - External emergency telephone number
  - Emergency lights
  - Requisite sets of personal protective equipment such as gloves, gumboots and aprons, self-breathing equipment

MCC will be furnished with call out list of key persons, fire, safety, first aid, medical, security, police and district administrative authorities. MCC will also contain well-defined procedures of fire-fighting, rescue operations, first aid etc.

7.7.4 Assembly Point

In an emergency, it will certainly be necessary to evacuate personnel from affected areas and as precautionary measure, to further evacuate non-essential workers, in the first instance, from areas likely to be affected, should the emergency escalate. The evacuation will be affected on getting necessary message from i.e., on evacuation, employees would be directed to a predetermined safe place called Assembly Point.

7.7.5 Emergency Management Training

The Key Personnel would undergo special courses on disaster management. This may preferably be in-plant training. The Managers, Senior Officers and Staff would undergo a course on the use of personal protective equipment. The Key Personnel belonging to various Teams would undergo special courses as per their expected nature of work at the time of emergency.

The plant management should conduct familiarization program to outside agencies like district fire services to make them familiar with the plant layout and other aspects, which will be helpful to them during an emergency.

7.7.6 Mock Drills

It is imperative that the procedures laid in this Plan are put to the test by conducting Mock Drills. To avoid any lethality, the emergency response time would be clocked below 2 minutes during the mock drill.

1st Step: Test the effectiveness of communication system

2nd Step: Test the speed of mobilization of the plant emergency teams

3rd Step: Test the effectiveness of search, rescue and treatment of casualties

4th Step: Test emergency isolation and shut down and remedial measures taken on the system

5th Step: Conduct a full rehearsal of all the actions to be taken during an emergency

It is suggested to make mock drill once in 6 months' time in M/s. Danblock Brakes India Pvt. Ltd.

7.7.7 Incident recording and revision of Disaster Management Plan

Every incident/accident in M/s Danblock Brakes India Pvt. Ltd. shall be recorded by safety & environmental officer. Root cause analysis and corrective actions shall be taken by responsible I/C of area and shall be reviewed by top management in safety committee meeting once in two months' time. The Disaster Management Plan would be periodically revised based on accident / incidents and experience gained from the mock drills.

7.8 Off site Emergency Plan

As this is a steel melting unit, the emergency situations will be limited to plant premises. As there is considerable distance between the habitation and the operation areas of the plant, there is no possibility of emergencies resulting outside. Hence, no specific off-site emergency plan is not suggested. However as and when district authorities and fire & emergency services authorities ask for any specific information, same shall be submitted by M/s. Danblock Brakes India Pvt. Ltd. Also, the unit will participate in any off-site mock drill programs conducted by District officials in the area

The highlights of plan are:

- The clock securely setup.
- Making 'First Aid' available & contact with nearly hospitals, police stations and industries.
- Deputing a responsible person to be contacted in case of emergency.
- Free access to areas where emergency is to be attended.
- Assembly points for workers/contact labour & the visitors.

Proper coding of equipments & their locations for attending the emergency.

Chapter 8 PROJECT BENEFITS

This chapter describes about benefits of the project on improvements in the physical infrastructure, social infrastructure, employment potential and other tangible benefits.

8.1 Employment Opportunity

Currently the total employees working in the plant are 480 people. The proposed expansion project is likely to provide employment to additional 300 people and the Total employment after expansion is 580 people. The preference will be given to local population for employment as per the qualifications of people; this will increase the employment opportunity in the surrounding area.

Indirect employment will also bound to be generated to provide day-to-day needs and services to the work force and industrial activity. The employed people will be benefited financially. This financial gain will increase their standard of living.

8.2 Likely Indirect Employment Opportunities

The industry requires higher quantities of raw materials and procures from various sources. This will enhance the employment opportunities at the source. Apart from this additional employment will be generated in the transport sector for increased material transportation.

The industry generates nearly 3019 Metric tons of slag per year after expansion. Slag is crushed in-house and crushed material can be disposed for filling low level areas and construction sites. Also extensively being used for brick manufacturing and which will generate additional employment.

8.3 Environmental Social Responsibility (ESR) & Socio Economic Development

The unit is aware of the obligations towards the society and to fulfil the social obligations, unit will employ semi-skilled and skilled labour from the nearby villages for the proposed project as far as possible. Unit will also help to generate indirect employment in the nearby villages by appointing local contractors during construction phase as well as

operation phase. After proposed expansion activity, the unit will make provision of fund every year towards CER activities in nearby villages.

A budget of Rs. 2.5 Crores is proposed as per the corporate environmental responsibility by the company towards these activities over a period of next 5 years. The required improvement for social infrastructure to the nearby villages will be addressed through these funds.

8.4 Direct Revenue Earning to the National and State Exchequer

The proposed project will also contribute revenue to the Central & State exchequer in the form GST & Corporate taxes etc. Indirect contribution to the Central & State exchequer will be there due to Income by way of registration of trucks, payment of road tax, income tax from individual as well as taxes from associated units. Thus, the proposed expansion project will contribute to state and central exchequer which will help in developing the area. Development with sustainable approach is the goal of the industry to maintain good environment.

8.5 Other Intangible Benefits

The proposed expansion project will have many employment & trade opportunities with the initiation of proposed activities. Thus, these considerable employment & trade opportunities will eventually result in appreciable economic benefits to the local people & businesses/contractors. At present the raw materials & finished goods are moved by trucks which provides indirect employment to people engaged in this sector. With increase in capacity, unit's contribution to growth of service sector shall increase.

Rain water harvesting is done for groundwater recharging that will improve the ground water table in the area. Green drive in the area will give a pleasant look and improves biodiversity of the area.

Chapter 9 ENVIRONMENTAL COST BENEFITS

There is no specific aspect recommended in the TOR on this.

Chapter 10 ENVIRONMENTAL MANAGEMENT PLAN

This chapter outlines the Environmental Management Plan for the project, budget provisions, institutional arrangements for implementation and monitoring of the EMP.

10.1 Introduction

An Environmental Management Plan (EMP) is required to manage environmental impacts from the proposed project. It is site specific plan developed to ensure that all necessary measures are identified and implemented in order to protect the environment. Site-specific EMP is formulated to mitigate significant adverse environmental impacts that are identified and quantified in the process of baseline and impact assessment. An EMP also ensures that the resources are utilized to maximum extent, waste generation is minimized, residuals treated adequately and by-products are recycled to the extent possible.

10.2 The Project Location

The existing facility has located at S No. 270 part, 256 part, Pappankuppam Village, Gummidipoondi Taluk and Tiruvallur District.

The project site is located between 80°6'2.69" & 80°6'1.11" East Longitude and Between 13°24'57.76" & 13°24'51.63"North Latitude

10.3 Site Sensitivity

- The Nearest human settlement is Gummidipoondi 2.30 kms from the project site in South East direction.
- The key demographics of the study area comprising 46 villages and Towns. The total population of the study area is 2,84, 764.
- Nearest town is Gummidipoondi at a distance of 2.3 Kms from the site
- The nearest waterbody major waterbody is Karumbukuppam Lake (1.80 km) (SSE)
- There Periya Puliur Reserved forest is located at 5.30km from the site.
- The access road to the Project site is Gummidipoondi –Kallur which is connected to Chennai - Kolkata National Highway.

- The Gummidpoondi Railway station is located at 2.30 Km from the site in the direction of South East.
- Interstate boundary of Tamil Nadu and Andhra Pradesh is at distance of 8.00 km in the direction of North.
- No archaeological monuments and heritage precincts are observed to be present in the project impact area.

10.4 Major Findings of EIA

An EIA was conducted as per the broader guidelines of TOR issued to the project and based on current deficiencies in the running plant, the major findings of the EIA study & Impacts of the project on environment due to the expansion activity are presented below:

10.4.1 Impact on Physical Resources

Expansion activities of the plant requires few natural resources like sand, sub grade & aggregate, and materials produced from natural resources like bricks, cement and steel. The material shall be drawn from local sources, and the lead distances range from 1- 100 km. The impacts on physical resources of sand will be irreversible while bricks will be brought from kilns. The material requirement of steel, cement etc. will be purchased from manufacturers with in state. There will be marginal impacts on physical resources as regards the availability and procurement of construction material are anticipated due to the project.

10.4.2 Impacts on Air Quality

Construction Phase

Impacts on Ambient Air

- The main sources of emission during the construction period are the movement of equipment at site and dust emitted during the leveling, grading, earthwork and foundation works.
- Vehicular emission of SO_2, NO_2, CO will add onto the air pollution. Movement of vehicles on unpaved roads will also add onto the dust emission.
- Operation of DG sets will also generate air pollutants like SO2, NO2, CO and HC.

- Fugitive emissions are envisaged such as dust in construction phase.
- The impact will be for short duration and confined within the project boundary and is expected to be negligible outside the plant boundaries.

Mitigation Measures

- Proper maintenance of vehicles and construction equipment will help in controlling the gaseous emissions.
- Water sprinkling on roads and construction site will prevent fugitive dust and road sweeping machine will also be used for cleaning the roads
- Green belt development along the road side and in the plant premises will be useful in dust suppression.
- Over loading of the trucks will be avoided.
- People working in and around the dust generating area, will be provided with Personal Protective Equipment (PPE) like dust mask to prevent inhalation of dust particles, and use of the same will be strictly enforced during working hours.
- The dust generated during the construction activities will however, settle quickly. Therefore, the impact will be for short duration and confined locally to the construction site.
- Regular maintenance of vehicles and proper speed check for the vehicles keeping 20 km/hr speed within the plant premises.
- Ensuring all the transportation vehicles are covered with Tarpaulin.
- The construction waste will be dumped at identified area and will be covered properly to avoid any fugitive dust emissions.
- Proper maintenance and inspection operations should be carried out to reduce the smoke from the Diesel Generators. Diesel Generators should be chosen with a high combustion efficiency to avoid smoke.

Operation Phase

Impacts

- The use of D.G. sets is anticipated only during power failure and hence is temporary and requires standard measures.

- Movements of vehicles for loading and unloading of raw material and final product.
- Dust emission from the transportation vehicles will mainly contribute to NOx and Carbon Monoxide.
- Emissions from manufacturing processes.
- Fugitive emissions from material handling.
- Emissions (NOx, CO, and PM) from vehicular movement.

Mitigation Measures

- Tree plantation would be provided to control and reduce odour and air pollution.
- Diesel generators will be operated only for emergency power backup. The emission source diesel generators will have adequate stack height will conformance to the set norms of CPCB and regular maintenance of diesel engines has to be ensured. Seasonal monitoring of air quality through an approved (NABL) monitoring agency will be carried out at these locations.
- Maintain good housekeeping practices
- Set speed limits of 10 km/hr on-site and off-site and cover trucks when necessary
- Management will ensure that all the private and commercial vehicles entering into the site are in proper condition and there is no visual sign of major emissions from the vehicles. Also it is to be ensured that all the vehicles are holding valid Pollution under Control Certificates.
- Ensure that vehicles are turned off when not in use.
- Ensure proper availability of fire fighting system
- Prohibit any kind of smoke or fire on-site.

10.4.2.1 Measures for fugitive emission control

- Regular & periodic sprinkling of water on all exposed surfaces to suppress emission of dust. Frequency of sprinkling may be increased to keep dust emissions under control.
- Provide Bag filter with adequate stack height to control the dust and fugitive emission.
- Vehicles shall be given speed limit of 30 km/hr within the premise.

- Implementation of correct loading and unloading practices.
- Materials shall be transported in securely covered trucks to reduce dust emission.
- The workers should be given dust masks to avoid inhalation of dust & fugitive emissions.

Regular monitoring of emissions from all stacks and ambient air quality to be carried out as per norms.

10.4.3 Impact on Water Resources

Construction Phase

Impacts

- Ground water degradation can take place when contaminants are leached through surface soils into the ground water table.
- Contaminants such as fuel and engine oil handled in the construction staging area and during equipment re-fuelling at construction areas can cause ground water contamination if spilled onto the ground and not properly cleaned up.
- Poorly installed sanitary facilities can also result in contamination.
- The possibility of water quality degradation in downstream water courses or water bodies due to soil runoff from the bare lands resulting from earth-moving activities, such as cutting and filling should be indicated.
- Discharge of waste water generated at the temporary project offices and temporary housing area for construction workers can have an impact.
- Increased water runoff and erosion from work sites could potentially result in siltation of downstream water courses and drainage systems.

Mitigation Measures

- Fuel management and vehicle maintenance will be controlled to ensure that spills are minimized.
- Adverse impacts on water quality will be minimized by ensuring that erosion control measures such as silt traps are put in place in all work areas near watercourse crossings or drainage channels.

- The quality of all drainage channels and ditches will be monitored and corrective actions taken where turbidity is unacceptably and stockpiles will be controlled to prevent uncontrolled runoff/erosion.
- Concrete and asphalt plants, equipment storage and maintenance areas will be located at a reasonable distance away from watercourses.
- The existing STP and toilet will be used for the wastewater generation from the workers.

Operation Phase

Impacts

- Wastewater arising out of toilets in operation phase for the labourers at site.
- Spillage of waste oil and spent oil will be generated from the D.G set.
- Bleed off water generation from Cooling Tower.

Mitigation Measures

- Existing 25 KLD of capacity sewage treatment plant is available. In future the unit will install capacity of 40 KLD STP. The treated water will be used for Greenbelt development.
- Spent oil will be stored in leak proof sealed barrels and disposed of to TNPCB authorized re-processors.
- Proper storage of oil and lubricants and spent oil/used oil will be handover to TNPCB authorized person.
- The cooling Tower bleed-off water collected and treated in Collection cum Re - circulation tank.

S. No	Description	Existing Quantity (KLD)	Proposed Quantity (KLD)	After Expansion (KLD)	Final Disposal Points
1	Sewage	20.5	4	24.5	Sewage is being treated in the STP (Existing capacity 25 KLD, Proposed Cap 40 KLD). Treated Sewage is being used for Green Belt. Sludge will be used as manure for Green Belt.

2	Cooing tower bleed off	30	10	40	Cooling Tower Bleed off is collected from the Collection cum Re - circulation tank and the treated water will be used in cooling tower.

10.5 Rain Water Harvesting and Recharge Methods

Adequate provision for artificial ground water structures can facilitate the replenishment of aquifers and judicious utilization of ground water. Precautionary measures should be taken up to conserve and judicious use of ground water resources in the area.

To keep the status of the groundwater storage intact no area should not be overexploited by over extraction of groundwater, as the excess usage disturbs the balance of storage, recharge, discharge aspects, resulting in the sharp decline of ground water levels and drying up of surface water bodies. The project area marks such phenomenon of fall in ground water levels and drying up of small water bodies like ponds.

To replenish water resources and rejuvenation of streams to some extent, suitable water conservation measures like artificial recharge can be adopted to minimize the ground water losses and maximize the replenishment of groundwater resources. It also provides an opportunity to utilize the surplus monsoon runoff which is otherwise lost unutilized. Rainwater harvesting, storm water management, ridges, ditch and furrow system are some of the popular artificial recharge methods suitable to the study area.

In the Project Site, rainwater harvesting methodology comprises of two components (A) the roof top rain water collection from the industrial sheds (B) overland flow collection from open areas within the project premises. Collected rainwater can be stored suitably for its use in subsequent periods or used simultaneously.

Harvested rain water can either be used directly; a part or full can be utilized simultaneously for artificial recharge of ground water source. Harvested rain water can be fruitfully utilised for augmenting the source.

10.5.1 Rain Water Harvesting Plans:

Open areas Over- land Flow:

The plant consists of Industrial sheds, utility buildings and Open areas.

Roof top Rain Water Collection

It is suggested to provide roof top rainwater collection system for the Industrial shed. Precipitated rainwater on the Roof top may be connected to storage reservoir/tank placed on the ground having a control valve in between to wash off initial rainfall water associated with dust / impurities. The stored water may be used for cooling tower make up.

Road top/paved areas Rain Water Collection

Rain water from the road top paved areas and also in the open areas may be diverted and stored in the lined ponds constructed within the green belt area. Rain water collected and stored in the lined Reservoirs / Ponds may be used for green belt development during dry spells.

Rain water harvest potential of the site and proposed Structures

To replenish water resources and rejuvenation of streams to some extent, suitable water conservation measures like artificial recharge can be adopted to minimize the ground water losses and maximize the replenishment of groundwater resources. It also provides an opportunity to utilize the surplus monsoon runoff which is otherwise lost unutilized. The best method suited for rain harvesting in this area is shall depth infiltration well.

Artificial Recharge Structures:

Rain Water Harvesting is the process of capturing and storing rain water for its efficient utilization and conservation. It is an effective tool to utilize a large quantity of fresh water which otherwise goes as runoff. Rain water harvesting has two components: collection of rain water for surface storage and recharge to ground water aquifers.

Fresh water accumulated through rains on the roof top areas of the complex can be diverted through drain pipes in to the rain water harvesting structures. Treatment of silt, oil, and grease removal will be provided to rainwater harvesting recharge well. The required quantity of the treated rainwater will be diverted into freshwater storage tank first.

The overflow from the storage tank will be collected through road side storm water drains and left into Recharge well. It is proposed one rain water recharge well with shallow depth (of about 5-7 m depth), The suitable locations for keeping the rain water harvesting structures or recharge well is on the southern direction of the site, as it is forming better recharge potential area.

Rainwater Harvesting Calculations for M/s Danblock Brakes India Pvt. Ltd.

Calculating runoff is an important step in designing water harvesting system. This includes the constituents like Catchment area, Coefficient of rainfall and average rainfall intensity.

Catchment Area

The area in which rain directly falls. For M/s. Danblock Brakes Private Limited the catchment area includes as following;

S No	Utilization	After Expansion	
		Acre	Sq.M
1	Total Built up area	6.23	25,211.92
2	Green Area	5.12	20,719.9
3	Roads	2.20	8,903.08
4	Parking	0.1	404.686
5	Other Utilities	0.2	809.371
6	Vacant Land	1.69	6,839.187
Total		**15.54**	**62,888.14**

Runoff Coefficient

The average percentage of rainfall that will run off from a particular surface. For M/S Danblock Brakes Pvt. Ltd. the coefficients of runoff for different catchment areas are considered as following:

For metal roof has a runoff coefficient of 0.9 or 90% runoff,

For landscape area 0.1,

For paved area 0.6 and for open areas 0.3.

Table 10. 1 Estimation of Quantity of Rain Water in Project Area

Type of Area	Area (in Sq.m)	Coefficient of run-off	Considering 15minute of the rainfall of the peak intensity (m)	Runoff At Hourly Rain Fall Intensity (50 Year Frequency In India) Of 90 Mm/ Hour, Ie., 25 mm/15min
Roof-top area	25212	0.85	0.025	536
Paved area	27558	0.75	0.025	517
Unpaved area	10118	0.2	0.025	51
Total storm water load on the site with per 15min retention is				**1104**
Taking the radius of 1.2 and effective depth as 2.5 m, volume of a RWH pit				4.7 m^3
The 40% of the area filter material in the harvesting pits				2.7 m^3
20% of Runoff will be harvested in Pits				220.8 m^3
No. of pits				**82**

The runoff coefficient will vary depending on the composition of the surface and the rainfall intensity. Higher the rainfall intensity, the runoff coefficient also higher.

The total rainwater harvesting potential of the project site is 411 Cum per Hour. The rainwater is proposed to be channelized for recharge through recharge pits, which can retain the water up to 15 min during the occurrence of precipitation in the site. Hence total rain water harvesting potential for 15 min time is 103.00Cum. It is proposed to construct 10No.s of recharge pits at low gradient leading areas. The excess water resulting from the overflow of pits in flooding time will leads the existing pond at the entrance of the plant.

Recharge pit

Recharge pit is a 'Sand Gravel Filter' constructed by brick masonry and filled by pebbles, gravel, charcoal, and sand as shown in the **Figure 10.1** The layer of charcoal is used to absorb odour if any. The size of the pit with side dimensions of 1.2 radius and 2.5m depth. The filter pack of recharge pits required periodic cleaning or replacement to ensure proper recharge.

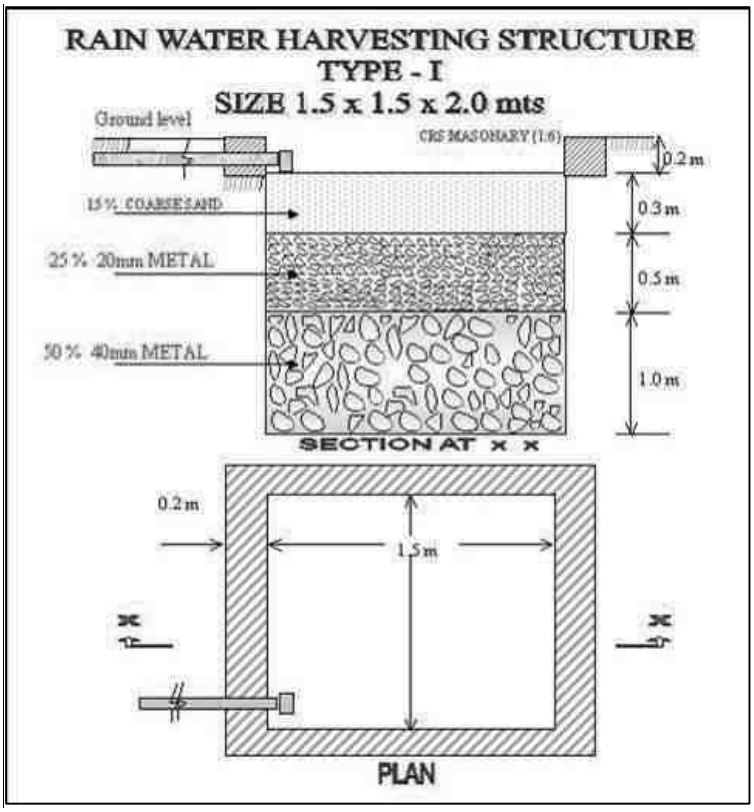

Figure 10. 1 Rain Water Harvesting Structure

10.6 Impact on Soil

Construction Phase

Impacts

- Impact of the project construction leading to soil contamination, soil erosion, destabilization of slopes, side- tipping of spoil materials, loss of properties, loss of fertile lands and diversion of natural surface water flows are to be studied in detail.
- Spillage of oil and lubricants during the construction phase may degrade the soil quality.
- In case of misuse and spillage of such hazardous substances such as paints and other toxic substances
- Improper treatment of sewage will be contaminated the soil.
- Solid waste generation from the workers.

Mitigation Measures

- Spillage of oil and grease from the vehicles shall be washed and collected separately
- Top soil shall be stored and used for filling low lying area within project site and other areas in consultation with the Engineer in charge.
- Proper treatment system will be provided for sewage
- The solid waste will be disposed to TNPCB authorized person.

Operation Phase

Impacts

- Solid waste generation from workers.
- Sludge from STP
- Poor management of such materials/wastes from the operations is a potential risk of soil contamination.
- Improper treatment of sewage from domestic, it will contaminate the soil.
- Hazardous waste and Non-Hazardous from the process.

Mitigation Measures

- Fence the site border to prevent any flying material to deposit in nature.
- STP sludge will be utilized for Manure.
- Provide proper sorting and labeling of different waste materials according to their nature.

Table 10.2 Solid Waste Generation and Management during Operation phase

S. No	Description	Existing quantity (Kg/day)	Proposed Quantity (Kg/day)	After quantity (Kg/day)	Method of Disposal
Operation Phase – Existing 480 Nos & Proposed – 100 Nos					
1	Organic	129.6	27	156.6	Disposed through local Panchayat collection system.
2	Inorganic	86.4	18	104.4	Send to TNPCB authorized vendors
Total		**216**	**45**	**261**	

(As per CPHEEO Guidelines -0.45 kg/capita/day)

Table 10.3 Solid Waste from process (Non-Hazardous)

Description	Unit	Existing	Proposed	After proposal	Disposal methods
Metal Scrap	MT/Year	80	30	110	Reused for Melting
Furnace Slag	MT/Year	810	2209	3019	Sold Out to Sri Balaji Enterprises
Cotton	Kg/Year	100	120	220	Tamil Nadu Waste Management
Wood	Kg/Year	50	55	105	Tamil Nadu Waste Management
Paper	Kg/Year	300	400	700	Tamil Nadu Waste Management

Table 10.4 Hazardous waste Generation and Management

Waste details	Schedule	Unit	Existing Quantity,	Proposed Quantity	After expansion Quantity	Disposal method
Used/ spent oil	5.1	T/Annum	0.5	0.5	1.0	Recover and Reuse – TNPCB Authorized recyclers
Wastes or residues containing oil	5.2	T/Annum	3.0	1.0	4.0	Recover and Reuse – TNPCB Authorized recyclers
Discarded containers / barrels / liners contaminated with hazardous wastes/ chemicals	33.3	T/Annum	2.5	12.5	15.0	Recover and Reuse – TNPCB Authorized recyclers

Table 10.5 E-waste and Battery waste generation from project site

Waste details	Unit	Existing Quantity,	Proposed Quantity,	After expansion Quantity	Disposal method
E-waste and Battery waste	T/ Annum	0.07	0.05	0.12	Send to TNPCB Authorized recyclers

10.7 Impact on Land Use

Impacts

The possible impact on topography and geology of the area will occur due to land grading, making internal roads, and plant related civil construction activity. Site development work will also involve excavation of earthworks for civil foundations. However, it's only an expansion of plant, not much excavation of the land is required. Replacement of equipment is expected, which requires minimum land levelling works. Hence impacts on the land environment are minimum.

There will be no negative impact of the project on the geology and topography of the plant surrounding areas since this will be within the industrial estate. Therefore the impact on the land will be only on short term, localized and reversible in nature. The visual aesthetics of the area will possibly be affected during construction period and would be restored after construction. The excavation for foundation of machinery will have minor, short period and restorable impact. But again, all these activities are within the project site.

Mitigation Measures

Based on the needs the drainage system on periphery of the property will be developed and, will be connected to the rainwater harvesting structures so that the runoff generated does not cause any flooding or siltation problems. There will be no change in the topography of the area in the post construction phase and the overall slope of the area will remain the same.

10.8 Impacts on Noise Quality

Construction Phase

Impacts

- Noise levels may increase during construction activity, due to operation of various machines and equipments.

- During the construction phase, the major sources of noise pollution will be movement of vehicles transporting construction materials to construction yards and the noise generated by activities at the yard itself.
- Concrete mixing, casting and material movement are primary noise generating activities in the yard which will be uniformly distributed over the entire construction period.
- The use of D.G. set

Mitigation Measures

- Noise barriers can be provided. Specifications for the installation of noise protection devices, clearly indicating the location, design and material, and also provide for future maintenance requirements should be provided.
- Contractor will be advised to provide earplugs to workers to reduce the impact of noise and follow guidelines prescribed by CPCB.
- The noisy construction operations and their duration will be scheduled in such a way to prevent night time activities.
- All construction equipments used for an 8-hour shift will conform to a standard of less than 90 dB. If required, machinery producing high noise such as concrete mixers, generators etc, must be provided with noise shields.
- Heavy machineries and DG sets will be operated during day time only.
- An acoustic enclosure D.G set will be provided, this D.G set will be reduced the noise level upto 10 dB(A) to 15 dB(A). Noise level will be maintained less than 55 dB(A).

Operation Phase

Impacts on Noise and Vibration

- Movements of vehicles and noise of motors, including other machineries like air blowers and centrifugations result in increase of ambient noise level and have adverse impact on the sensitive receptors.

- Improper handling and irregular maintenance of operating machines including pumps, generators, air diffusers, etc may lead to increased noise & vibration during operation activity.
- The use of D.G. set during power failure.

Mitigation Measures

- Green Belt to be developed and maintained to abate the noise pollution created during the operation of machineries.
- Personal Protective Equipment (PPE) such as ear muffs, etc. to the workers exposed to heavy noise for longer duration.
- An acoustic enclosure D.G set will be provided to plant, this D.G set will be reduced the noise level upto 10 dB(A) to 15 dB(A). Noise level will be maintained less than 55 dB(A).
- Noise monitoring will be carried out in plant.
- The machineries to be used will be serviced and maintained to control generation of noise and vibration. Vehicles used for transportation will be serviced regularly and maintained properly to avoid any generation of unwanted noise.
- Employees working in noisy environment will be made mandatory to wear ear muffs/ear plugs to avoid any adverse impact of noise on them. Employees exposed to hand vibration while handling/operating heavy machineries will compulsorily wear anti vibration gloves made up of visco-elastic material.

10.9 Impacts on Flora

The project site and its surroundings do not form a habitat to any endangered flora. The project will enhance the aesthetics of the site due to the provision additional green belt. Currently the unit is having a greenery of 5.12 Acres (33% of Total Land area).

10.10 Impact on Fauna

As there are no endangered species of wild life in and around the project site, it is likely to have minimal impact. The avifauna will find abode on the trees proposed to be planted.

This would enhance the aesthetics of the area. The Pulicate bird sanctuary is located 8.5 km from the project site.

10.11 Impact on Road Network

Peak traffic was found to be 1495 PCU/hr at Gummidipoondi to Kallur Road. The capacity of road for 2 lanes (one way) is taken as 2900 PCU/hr as per IRC Standards. Hence the V/C Ratio for the road is found to be 1495/2900 = 0.5. Hence the level of service for the road is "C" & the performance is "Good". Volume of the Gummidipoondi to Kallur Road is moderate at present & a normal flow condition could be observed throughout the day.

10.12 Impact on Power Distribution

Power is required for operating the Induction Furnace, Bag Filters ID Fan, Cooling Towers etc., and for general lighting in the plant. The total power requirement will be approximately Total power requirement is 23,000 KVA KW and the additional power required will be sourced from TANGEDCO.

10.13 Environmental Management Measures Proposed

A description of the various management measures during the various stages of the project is provided in the table below

Table 10.6 Environmental Management Plan

S.No	Potential Negative Impacts	Mitigation Measures	Responsible Agencies	Monitoring Agencies
		PRE-CONSTRUCTION		
1	Assessment of Environmental Parameters	Baseline parameters for Air, Water, Noise and Soil have been assessed prior to commencement of work.	Danblock	Danblock
2	NOC/EC/NBWL/CTE/ CTO	NOC/EC/NBWL/CTE will be obtained from the concern department before start the construction work. CTO will obtain before start the production.	Danblock	Danblock
		CONSTRUCTION		
2	Planning of temporary traffic arrangements	• Traffic must be re-routed to facilitate ease of movement. Proper signage should provide detailed information on the dates and duration of road closures and which detours will be available, ideally well in advance of actual construction so residents can plan accordingly. Strategic placement of traffic police at critical intersections will also facilitate better flow of traffic.	Contractor	Danblock
3	Transportation of building materials	• Vehicles transporting construction materials prone to fugitive dust emissions are covered. • Trucks carrying sand are provided with tarpaulin sheets to cover the bed and sides of the trucks. • Idling of delivery trucks or other equipment is avoided during loading and unloading. • Sprinkling of water (for materials such as blue metal, sand and brick) before unloading to suppress dust generation. • Adequate care taken to prevent spillage of earth or construction	Contractor	Danblock

		materials offsite and in haul routes. Any such spillage shall be removed immediately, and the area cleaned.		
4	Nuisance to neighbourhood community	• Materials are transported through the temporary approach road formed without disturbing the neighbourhood community. Supervisors at the site will guide the heavy vehicles carrying materials and machinery to the temporary access road and signage's if required may be provided. • Safety barricading is provided while construction of drains near the structures restricting entry to work place and signage's will be placed. Work site lighting during night where ever required will be provided during implementation. Adequate slope gradient is maintained while strengthening the bund in working in the boundary of the site. • Storage of materials is done only within the project area in earmarked areas.	Contractor	Danblock
5	Operation of construction machinery	• All construction vehicles should comply with emission standards and be maintained properly Wind shields should be installed all along the site boundary to abate the dust carry-over to the neighboring areas. • Use of Ready-mix Concrete wherever possible shall be explored. In the case of use of Concrete Mixer, Concrete Mixer should be mounted on shelter with top and sides closed. Sprinkling of water on metal & sand should be carried out before handling.	Contractor	Danblock
6	Construction of labour camps	• Contractor will follow all relevant provisions of the Factories Act, 1948 and the Building and the other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996 for construction and maintenance of labour camp). • The location, layout and basic facility provision of each labour camp will be submitted to Engineer prior to their construction. • The construction will commence only upon the written approval of the Engineer. • The contractor will maintain necessary living accommodation and	Contractor	Danblock

		ancillary facilities in functional and hygienic manner and as approved by the Engineer. • All temporary accommodation must be constructed and maintained in such a fashion that uncontaminated water is available for drinking, cooking and washing. The sewage system for the camp must be planned. Adequate health care is to be provided for the work force. The layout of the construction camp and details of the facilities provided will be prepared and will be approved by the Engineer. • Awareness about HIV/AIDS will be provided, grievance redressal mechanism for the camps, [only suggestion]		
8	Safety Aspects	• Adequate precautions will be taken to prevent the accidents and from the machineries. All machines used will conform to the relevant Indian standards Code. • Where loose soil is met with, shoring and strutting will be provided to avoid collapse of soil. • Protective footwear and protective goggles to all workers employed on mixing of materials like cement, concrete etc. • Welder's protective eye-shields will be provided to workers' who are engaged in welding works. • Earplugs will be provided to workers exposed to loud noise, and workers working in crushing, compaction, or concrete mixing operation • The contractor will supply all necessary safety appliances such as safety goggles, helmets, safety belts, ear plugs, mask etc to workers and staffs. • The contractor will comply with all the precautions as required for ensuring the safety of the workmen as per the International Labour Organization (ILO) Convention No.62 as far as those are applicable to this contract. • The contractor will make sure that during the construction work all	Contractor	Danblock

		relevant provisions of the Factories Act, 1948 and the Building and other Construction Workers (regulation of Employment and Conditions of Services) Act, 1996 and adhered to. • The contractor will not employ any person below the age of 18 years for any work and no woman will be employed on the work of painting with products containing lead in any form.		
9	Disposal of construction debris and excavated materials	• A suitable site identified for safe disposal, in low lying areas within the project area as approved by the Engineer in charge and to other low lying area in consultation with local body. • Wastes arising from the construction of regulators shall be safely stored and dispose.	Contractor	Danblock
10	Barricading site	The activities would be restricted to project sites and right of way for alignment. Barricading with adequate marking, flags, reflectors etc. will be provided along the alignment for safety of restricted traffic movement and pedestrians.	Contractor	Danblock
11	Clearing of construction camps and restoration	• On completion of the works, all temporary structures will be cleared away, all rubbish cleared, excreta or other disposal pits or trenches filled in and effectively sealed off and the site left clean and tidy, at the contractor's expenses, to the entire satisfaction of the engineer.	Contractor	Danblock
12	Pollution from Fuel and Lubricants	• The contractor will ensure that all construction vehicle parking location, fuel / lubricants storage sites, vehicle, machinery and equipment maintenance and re-fuelling sites will be located at least 500m from rivers and irrigation canal / ponds. • All location and layout plans of such sites will be submitted by the Contractor prior to their establishment and will be approved by the Engineer. • Contractor will ensure that all vehicle / machinery and equipment operation, maintenance and re-fuelling will be carried out in such a fashion that spillage of fuels and lubricants does not contaminate the	Contractor	Danblock

		ground. • Contractor will arrange for collection, storing and disposal of oily wastes to the pre-identified disposal sites (list to be submitted to Engineer) and approved by the Engineer. All spills and collected petroleum products will be disposed of in accordance with MoEF and state PCB guidelines.		
13	Pollution from Construction Wastes	All waste arising from the project is to be disposed of in the manner in consultation with Engineer	Contractor	Danblock
14	Dust Pollution near settlements	• All earth work will be protected in manner acceptable to the engineer to minimize generation of dust. Area under construction shall be covered & equipped will dust collector. • Construction material will be covered or stored in such a manner so as to avoid being affected by wind direction. • Unpaved haul roads near / passing through residential and commercial areas to be watered thrice a day. • Trucks carrying construction material to be adequately covered to avoid the dust pollution and to avoid the material spillage.	Contractor	Danblock
15	Vehicular noise pollution at residential/ sensitive receptors.	• Idling of temporary trucks or other equipment is not permitted during periods of loading / unloading or when they are not in active use. The practice must be ensured especially near residential /commercial/ sensitive areas. • Stationary construction equipment will be kept at least 500m away from sensitive receptors. • All possible and practical measures to control noise emissions during drilling shall be employed. The Contractor is ensuring adequate controls measures depending on site conditions.	Contractor	Danblock
16	Noise from vehicles, plants and equipment	• Servicing of all construction vehicles and machinery will be done regularly and during routine servicing operations, the effectiveness of exhaust silencers will be checked and if found defective will be	Contractor	Danblock

		replaced. • Maintenance of vehicles, equipment and machinery will be regularly monitored in order to keep the noise levels at the minimum.		
17	Storage of construction materials	Construction materials are being stored within the project area, without affecting the traffic and other common utilities by constructing Temporary shed.	Contractor	Danblock
18	Informatory signs and Hoardings	The contractor will provide, erect and maintain informatory/ safety signs hoardings written in English and local language, wherever required or as suggested by the Engineer	Contractor	Danblock
19	First Aid	The contractor will arrange for: • A readily available first aid unit including an adequate supply of sterilized dressing materials and appliances as per the Factories Rules in every work zone. • Availability of suitable transport at all times to take injured or sick person(s) to the nearest hospital	Contractor	Danblock
20	Risk from Electrical Equipment	The contractor will take all required precautions to prevent danger from electrical equipment and ensure that- • No material will be so stacked or placed as to cause danger or inconvenience to any person or the public • All necessary fencing and lights will be provided to protect the public in construction zones. All machines to be used in the construction will conform to the relevant Indian Standard (IS) codes, will be free from patent defect, will be kept in good working order, will be regularly inspected and properly maintained as per IS provision and to the satisfaction of the Engineer	Contractor	Danblock
21	Waste Disposal	• The contractor will provide garbage bins in the camps and ensure that these are regularly emptied and disposed of in a hygienic manner as	Contractor	Danblock

		per the Comprehensive Solid Waste Management Plan approved by the Engineer. Unless otherwise arranged by local sanitary authority, arrangements for disposal of night soils (human excreta) suitably approved by the local medical health or municipal authorities or as directed by Engineer will have to be provided by the contractor		
22	Environmental Monitoring	The water, air, soil and noise quality will be monitored in pre-construction and Construction phase.	Contractor	Danblock
23	Rainwater harvesting and Greenbelt development	• The Rainwater harvesting Pits 82 Nos will be provided in the project site. • The Green belt- 1700 Nos of trees will be developed in the project site.	Contractor	Danblock
SAFETY IN SITES				
1	Temporary flooding due to excavation	Excavation during the construction stage should be carried out with proper drainage arrangements to avoid the overflowing of existing drains.	Contractor	Danblock
2	Using of modern machineries	Using of modern machineries such as JCBs, backhoes etc., will be used to minimize the construction period, it will reduce the construction period impacts to the nearby residents.	Contractor	Danblock
3	Dust pollution near settlements	• All earth work will be protected in manner acceptable to the engineer to minimize generation of dust. Area under construction will be covered & equipped will dust collector. • Construction material will be covered or stored in such a manner so as to avoid being affected by wind direction. • Unpaved haul roads near / passing through residential and commercial areas to be watered thrice a day • Trucks carrying construction material to be adequately covered to avoid the dust pollution and to avoid the material spillage	Contractor	Danblock
4	Protection of	• Noisy construction operations in residential and sensitive areas will	Contractor	Danblock

	residential sensitive receptors	be done only between 7.30 am and 6.00 pm • Preventive maintenance of construction equipment and vehicles to meet emission standards and to keep them with low noise • Provision of enclosing generators and concrete mixers at site. • Sound barriers in inhabited areas will be installed during the construction phase. • Adequate barricading / other measures to protect dust pollution near sensitive receptors like schools and hospital etc. to be ensured		
5	Safety precaution for snake bites	• Wear appropriate over-the-ankle hiking boots, thick socks, and loose-fitting long pants. • Not to provide hiding places to snakes in construction material storage places. Avoid to construction work in night time. • Wear leather gloves during working in grass, weeds and heavy underbrush. • If identify any snake in work place inform to Forest Department official.	Contractor	Danblock
Operation Phase				
1	Air Environment	• Tree plantation would be provided to control and reduce odour and air pollution. • Diesel generators will be operated only for emergency power backup. The emission source diesel generators will have adequate stack height will conformance to the set norms of CPCB and regular maintenance of diesel engines has to be ensured. Seasonal monitoring of air quality through an approved (NABL) monitoring agency will be carried out at these locations. • Maintain good housekeeping practices • Set speed limits of 10 km/hr on-site and off-site and cover trucks when necessary • Management will ensure that all the private and commercial vehicles	Danblock	Danblock

		entering into the site are in proper condition and there is no visual sign of major emissions from the vehicles. Also it is to be ensured that all the vehicles are holding valid Pollution under Control Certificates. • Ensure that vehicles are turned off when not in use. • Ensure proper availability of fire fighting system • Prohibit any kind of smoke or fire on-site. • APC measures Big filter with Adequate stack height should provide for the process waste.		
2	Noise Environment	• Green Belt to be developed and maintained to abate the noise pollution created during the operation of machineries. • Personal Protective Equipment (PPE) such as ear muffs, etc. to the workers exposed to heavy noise for longer duration. • An acoustic enclosure D.G set will be provided to the unit, this D.G set will be reduced the noise level upto 10 dB(A) to 15 dB(A). Noise level will be maintained less than 55 dB(A). • Noise monitoring will be carried out in plant.	Danblock	Danblock
3	Solid waste management	• Fence the site border to prevent any flying material to deposit in nature. STP sludge will be utilized for Manure. • Provide proper sorting and labeling of different waste materials according to their nature. • Biodegradable waste is disposed through local Panchayat collection system. • Non- Biodegradable is waste Send to TNPCB authorized vendors. • Hazardous waste is disposed through TNPCB authorized vendors..	Danblock	Danblock

4	Water Environment	• Existing 25 KLD of capacity sewage treatment plant is available. In future the unit will install capacity of 40 KLD STP. The treated water will be used for Greenbelt development. • Spent oil will be stored in leak proof sealed barrels and disposed of to TNPCB authorized re-processors. • Proper storage of oil and lubricants and spent oil/used oil will be handover to TNPCB authorized person. • The cooling Tower bleed-off water collected and treated in Collection cum Re - circulation tank.	Danblock	Danblock
5	Traffic & Road Network	• Traffic must be re-routed to facilitate ease of movement. Proper signage should provide detailed information on the dates and duration of road closures and which detours will be available	Danblock	Danblock
6	Human Health & Occupational Safety	• Restrict unattended public access by proper fencing; • Use adequate safety barrier and signs; • Provision of guards on entrances to and exits from the site; • Proper labeling storage of chemicals, oils and fuel; • Promote safety education through training about the fundamentals of occupational health and safety procedures. • Provide appropriate personal protective equipment such as gloves, masks, ear plugs, gas detectors, brightly colored working overalls equipped with light reflecting stripes, safety boots, safety helmets, etc.; • Keep uniforms and PPE clean and in good conditions and replace them on a bi-annual basis during the operation process.	Danblock	Danblock

10.14 Green Belt Development

It is well known that trees help to reduce various types of pollution. Development of a green belt with selected plant species in and around the proposed project site reduces the intensity to pollution as well as improves the aesthetics. Hence species selection is very important. The direction, distance between the plants, maintaining the survival rate etc. are keen for greenbelt. The number of species and their size (individual numbers) depends on the budget and available space. Efforts will be taken for strengthening the existing greenbelt like replacing the exotic tree species with local & indigenous tree species in the project site.

Green Belt is recommended as one of the major components of Environmental Management Plan.

After the expansion, the Greenbelt will be further expanded up to an area of 5.12 Acre i.e. 33% of the total land area of the project Site. Proper attention and management are required to maintain the survival rate of the planted species. The species can be selected as per the availability of greenbelt area. Following guidelines has been suggested & shall be followed by the company for future operations of greenbelt development & maintenance.

As per the present project activities, it is recommended to raise the following plant species. These species can be also available near the forest department nurseries.

Small herbs, grass verities, climbers and other ornamental and flowering plants can also be raised as per the availability near the paths and corridors of the existing buildings. Certain plants are also recommended to raise in the buffer zone as per the budget availability.

Care shall be taken to plant ample trees along the road side, boundary wall as well as within the plant premises. It shall enable proper balance of atmosphere both outside the campus by absorbing noise and gaseous pollutants of the road side movement of vehicles and also absorption of noise and emissions within the premises of the plant.

Company shall follow the following five-year comprehensive

Company shall follow the following five-year comprehensive greenbelt development program after that the company shall keep following the prevailing practices of greenbelt management.

- Company shall maintain all necessary facilities for irrigation of greenbelt in good condition and necessary maintenance of irrigation facilities shall be done regularly.
- Company shall regularly assess survival rate of planted trees & shrub and if required necessary re-plantation shall be done to ensure healthy & dense greenbelt area in proposed premises.
- For re-plantation, if required, company shall acquire saplings from local private/government (Forest & Other) nursery.
- Company shall do fertilization as required for healthy & dense greenbelt development.

The Total Green Belt Area is 2.07 Hectare (33%). (As per MOEF&CC norms is 1500 trees to planted per **Hectare).** Hence 3000 trees will be planted in 2.07 Ha.

Existing 1368 trees are planted in project site, hence 1700 tress to be planted in project site area. List of Existing Trees in the project site is given in **Table 10.7.**

Table 10.7 List of Existing Trees in the project site

S.No	Names	Number of trees
1	Dypsis lanceolata	102
2	Leucaena	98
3	Banana	78
4	Melocana	38
5	Neem tree	76
6	Leucaena (river tamaind)	354
7	Indian elm	42
8	Padam Tree	7
9	Fagarea auriculata	1
10	Teak	7

S.No	Names	Number of trees
11	Guava	2
12	Mango	20
13	Sapota	1
14	Tabvebuia Rosea	1
15	Roystonea Regia	68
16	Cocunut	11
17	Lemon tree	4
18	Ficus bengaleness	8
19	Monun longifloiyum	31
20	Paulownia	1
21	Lecythis Ampla	1
22	Punga Tree	21
23	Tamrind	1
24	Abenium Obesum	2
25	Caesakpinia Pluviosa	16
26	Indian Jujube	1
27	Ilex Corallina	10
29	Jungle Geranium Ixora	193
30	Entacloo Pedilanthus	50
31	Calotropis Giganteen Leaf	1
32	Atlantla Buxifdia	3
33	Phoebe Bournei	15
34	Arabian Jasmine	6
35	Excoe Carialochinchinenis	12
36	Magilam	30
37	Others	56
	Total	**1368**

Table 10.8 Proposed Plantation within Project Site

S. No	Botanical name	Common name
1	Albizia lebbeck	Vaagai
2	Thespesia populnea	Puvarasu
3	Prosopis cinerea	Vanni maram
4	Madhuca hexandra	Illuppai
5	Syzygium cumini	Naval
6	Pterocarpus marsupium	Vengai
7	Pongamia pinnata	Pungam
8	Mimusops elengi	Magrzha maram

10.15 Environmental Management Cell

- All the activities will be monitored to ensure the appropriate implementation of all environmental mitigation activities and to identify areas where environmental management plan compliance is not satisfied.
- For effective implementation of the system, it is also necessary to have a permanent organizational set-up. Company has set-up permanent Environmental Management Cell (EMC) for the effective implementation and monitoring of environmental management system.
- The company assigned responsibility to the concerned for implementation of environmental control measures.
- The Environmental Management Cell (EMC) set-up by the company is shown in **Figure 10.2.**

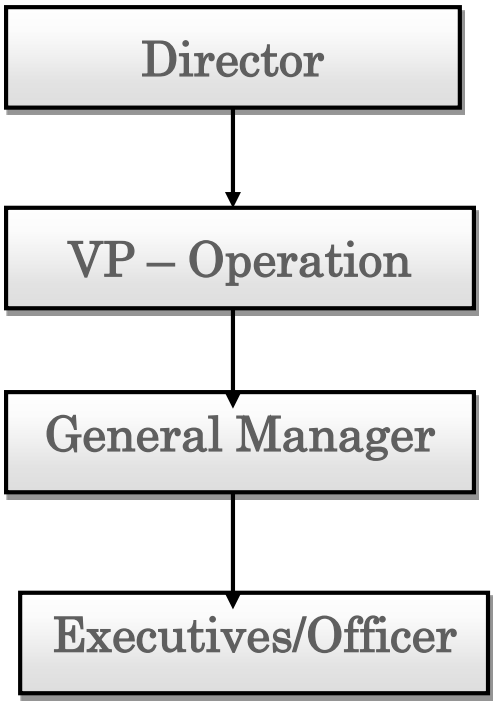

Figure 10.2 Organizational Chart for Environmental Management Cell

Table 10.9 Role and Responsibilities

S. No.	Name & Designation	Responsibilities
1	Director	• Establish an environment management cell. • Responsible for overall environmental management. Regularly coordinate with VP-Operations and take feedback regarding all the activities performed under EMC and give directions to succeeding component. • Provide sufficient funds for environmental management cell to reduce the environment impacts.
2	VP –Operations	• Keep aware the Management about all the activities performed under EMC. • To ensure and study the feasibility of working considering the present and future requirements and to suggest for improvements if any. • To ensure, implement and follow all the required safety procedures & facilities, avoid the unsafe act & conditions, organizing safety trainings, mock drills, availability of onsite &off site emergency plans. Plan & implement Good safety committee.
3	General Manager	• Treatment and disposal of sewage effluent as per consent.

		• Carryout ambient air quality monitoring as per consent. • Monitoring the stack / chimney. • Hazardous waste management handling and disposal. • Plant and maintain adequate numbers of trees and gardens around the Industry • Applying and getting the consent of operation of air & water and authorization to store the hazardous waste • Prepare Management Information System (MIS) reports and budget for environment management program. • To deal with the environmental issues and for ensuring compliance with the conditions prescribed by TNPCB. • Non compliance / violation of environmental norms, if any are reported to VP-Operations and immediate required action is taken.
4	Executive / Officers	• Daily department work plan execution. • Sampling of sewage and analyzing to check the efficiency of the plant such as pH, COD, BOD, TDS, and TSS & MLSS. • Record the readings in the log sheet and preparation of daily report. • Coordinating with outside agency to carry out the AAQ, stack, Fugitive emission, noise level monitoring and water quality parameters checking. • Preparation of monthly returns (Form No.1, Form No.3 & analysis report), Form No.13, Form No.4, Form No.5 and compliance to TNPCB. • Ensuring Plant and Process Safety

10.16 Reporting System & Monitoring System

Reporting system provides the necessary feedback for project management to ensure quality of the works and that the program is on schedule. The rationale for a reporting system is based on accountability to ensure the measures proposed as part of the Environment Management Plan get implemented in the project.

The reporting system will operate linearly with the contractor who is at the lowest rung of the implementation system reporting to the Supervision Consultant, who in turn shall report to the top management of M/s. Danblock Brakes India Pvt. Ltd. Every month, implementation of EMP shall be reviewed by top management during implementation stage and thereafter during operational stage.

10.17 Corporate Environmental Responsibility

As stipulated in the ToR issued by MoEF & CC, has to fulfil its Corporate Environment Responsibility (CER) by adopting an appropriate strategy to improve the socioeconomic environment in the project impact area in keeping with felt needs of the villages and people inhabiting there.

A tentative CER Management Plan is conceived for the project proponents based on the needs expressed during the household and village level SEIA. The plan however needs to be finalised as per the specific needs expressed and zeroed-in at the Public Consultation of the project and approved by the district administration.

It is assumed that project expansion by M/s. Danblock Brakes Private Limited will be completed and full-scale operations will commence in about two years from now and sustain on the project achieving the optimum operating capacity. The CER Management Plan for the project is conceived as detailed in **Table – 10.10.**

Table 10.10 Budget for CER Activities

S.No.	Description	Amount in Rs.
1	**Government Girls Higher Sec School, Thervazhi, Gummidipoondi,**	
I	Renovation of restrooms	2,00,000
Ii	Construction of compound wall	3,50,000
Iii	Compound wall full painting	2,50,000
Iv	Smart board	5,50,000
V	Tree plantation	2,00,000
	Sub Total 1	**15,50,000**
2.	**Government Panjayath Union Middle School New Gummidipoondi**	
I	Laying Foyer Blocks	2,50,000
Ii	School Building Painting with colorful pictures	4,00,000
Iii	Tree plantation	3,00,000
Iv	Smart board	3,50,000
V	Library facility	3,50,000
	Sub Total 2	**16,50,000**
	Total 1+2	**32,00,000**

10.18 Environmental Management Budget

The total project cost for the proposed expansion project is about Rs. 60 Cr. Out of this, Rs.155 lakhs will be spent on environment protection, management, pollution control, treatment and monitoring systems, appropriate budgetary provision would be made and provision for recurring expenditure for environment management of the project would be made. The details of budget allocation during functional phase are given in **Table. 10.11.**

Table 10.11 Environmental Management cost

S.No.	Particulars	Capital cost In Lakhs	Recurring cost in Lakhs
1.	Air Pollution Control measures	40.0	5.0
2.	Sewage treatment Plant	35.0	3.0
3.	Solid Waste Management & dust prevention measure	10.0	2.0
4.	Solar lighting/grit in unit	30.0	3.0
5.	Noise Pollution Control	10.0	3.0
6.	Environmental Monitoring & Management	-	5.0
7.	Green belt & open area development*	15.0	2.0
8.	Rainwater harvesting pits	15.0	2.0
Total		**155.0**	**25.0**

10.19 Environmental health and safety Policy

DANBLOCK BRAKES INDIA
A Member of MAT Holdings Inc.,

Quality, Environmental,Occupational Health and Safety (QEOHS) Policy

DANBLOCK BRAKES INDIA is committed to ensure customer satisfaction by consistently meeting their needs, Cost/Quality/Delivery requirements of the castings at competitive price, manufactured under environmentally sustainable healthy and safe working conditions.

We shall remain committed to:

- Integrating QEHS Requirements with business activities.
- Meet all applicable compliance obligations and Legal & other requirements related to Environment, Health & Safety to provide a safe working environment.
- Protections of the environment by adopting reduce waste, reuse and recycle methods and control the environment aspects.
- Conserve natural resources by optimum utilization of air, water and energy.
- Prevent environment pollution, injury and illness to employees, visitors, interested parties by eliminating hazards and reducing OH & S Risk.
- Develop a risk based approach through training and motivate workers to perform their activities in a safe and environmentally responsible manner by consultation and participation of workers and workers representatives.
- By meeting objectives scaling up department performance.
- Continually improve the performance of Quality, environmental, occupational health and safety management systems.

This policy is communicated, implemented and maintained at all levels of operations of the company and is available upon request. It is periodically reviewed and revised to ensure its continuing adequacy, relevance and sustainability.

R. Sureshkumar
Vice President