DRAFT ENVIRONMENTAL IMPACT ASSESSMENT REPORT

FOR

EXPANSION OF STEEL MANUFACTURING UNIT BY ADDITIONOF INDUCTION FURNACE AND CONCAST

CAPACITY

MS INGOTS – 19200 TPA to 96,600 TPA

BILLETS, ROUND, ANGLE, CHANNEL, TMT BARS AND FLATS – 77,280 TPA

Project Area- 4.44 Acres or 17995 sqm

[TOR letter no: IA-J-11011/180/2023-IA-II(IND-I)], Dated 30 MAY 2023

Study Period: April to June 2023

Base line study done by M/s CPTL, Mohali (NABL accredited), MoEF&CC recognized, NABL Certificate TC- 6728, Validity: valid upto 08.11.2024

[Project or Activity of Schedule; - 3(a) Metallurgical industries (ferrous & non-ferrous), Cat-A]

IN THE EXISTING STEEL MANUFACTURING UNIT OF

M/S. GOYAL FURNACE PVT LTD

Plot no. 168 to 179 & 146 to 160, Phase-III, Industrial Area, Sansarpur Terrace, Tehsil-Jaswan at Kasba Kotla, District – Kangra, Himachal Pradesh.

Prepared by

Chandigarh Pollution Testing Laboratory- EIA Division

(QCI/ NABET Certificate No: NABET/EIA/2225/RA 0250)

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PROJECT AT A GLANCE

Name of Project	M/s Goyal Furnace Pvt Ltd		
Type of Project	Steel Manufacturing Unit (expansion)		
Location	Plot no. 168 to 179 & 146 to 160, Phase-III, Industrial Area, Sansarpur Terrace, Tehsil- Jaswan at Kasba Kotla, District – Kangra, Himachal Pradesh.		
	Existing (TPA)	**Additional (TPA)**	**Proposed (TPA)**
Product & Bye Product			
MS Ingots	19,200	77,400	96,600
Round, Angle, Channel, TMT bars and Flats	NIL	77,280 TPA	77,280
Cost of the Project	₹ 12.92 Cr.	₹ 35.93 Cr.	₹48.85 Cr
Total Land	8695 Sqm	9300 Sqm	17995 Sqm
Power Requirement (KW)	3200	6800	10000
Source of power- Himachal Pradesh State Electricity Board Limited (HPSEBL)			
Consumption of Water (KLD)			
Domestic	2.0 KLD	3.0 KLD	5.0 KLD
Cooling (make up water)	30 KLD	60.0 KLD	90.0 KLD
Total	**32.0 KLD**	**63.0 KLD**	**95.0 KLD**
Source of Water Supply-Own Tube- well			
Effluent Quantity	Domestic = 4.0 KLD Cooling = Recirculation		
Effluent treatment	Domestic- through septic treatment and used for plantation		
Air Pollution Control	Bag Filter with efficiency more than 99.0% with offline cleaning technology will be installed.		
Solid Waste	Slag from furnace –An estimated 9.8 TPD Slag will be sent to cement manufacturing plant for final disposal.		
Hazardous	Hazardous Waste generated (0.5 kl/annum) from DG sets in the form of used oil is being re-used as lubricant for machines. About 3.5 ton/day APCD dust which is also covered under hazardous waste will be sent to TSDF/ or approved reprocessors of hazardous waste for final disposal.		

TOR Letter

Tor Compliance

S.NO.	TOR POINTS	STATUS Of COMPLIANCE
1.	**Preliminary requirements**	
1.1	EIA/EMP report cover page shall consist of project title with location, applicable schedule of the EIA Notification, 2006, ToR letter No. with date, study period along with EIA consultant & laboratory details with QCI/NABET/NABL accreditation certificate detail.	Noted and complied.
1.2	Besides, following points shall be compiled as per QCI/NABET norms: a. Disclaimer by the EIA consultant. b. Declaration by the Functional Area Experts contributed to the EIA study and declaration by the head of the accredited consultant organization/authorized person. c. Undertaking by the project proponent owning the contents (information and data) of the EIA/EMP report. d. Undertaking by the EIA consultant regarding compliance of ToR issued by MoEF&CC. e. Consultant shall submit the Plagiarism Certificate for the EIA/EMP Report.	Noted and complied.
2.	**Executive Summary**	
2.1	Table of Contents of the EIA report including list of tables/figures/annexures/abbreviations/symbols/notations.	Noted and complied.
2.2	Point wise compliance to the ToR issued by MoEF&CC.	Noted and complied.
3.	**Executive Summary**	
3.1	Introduction	
3.1.1	Name of the project along with applicable schedule and category as per EIA, 2006.	The project named; Goyal Furnace Private Ltd. is a secondary metallurgical project. As per EIA Notification, 2006 and its subsequent amendments, the project falls under category- B. But, since the project is located within 5 Km boundary of Punjab, the same will be considered as Category- 'A' and its Environment clearance is to be accorded by MoEF&CC, New Delhi.
3.1.2	Location and accessibility	The plant is located at plot no. 168 to 179 & 146 to 160, Phase-III, Industrial Area, Sansarpur Terrace, Tehsil- Jaswan at Kasba Kotla, District – Kangra, Himachal Pradesh.
4.	**Executive Summary**	
4.1	Project description	

4.1.1	Resource requirements (Land; water; fuel; manpower)	Land-17995sqm.Water-95KLD, Fuel-electricity.10000KW, Manpower-90 persons.
4.1.2	Operational activity	Mfg. of M.S ingots and structural steel via induction furnace, Concast and Rolling mill.
4.1.3	Key pollution concerns	Air, water, land and noise pollution.
5.	**Executive Summary**	
5.1	Baseline Environment Studies	The baseline environmental study has been conducted from 15th March to 15th June 2023.
5.1.1	Ambient air quality	The guidelines for selections of ambient air monitoring stations and analysis of air pollutants as given in IS – 5182 part 14, 2000 (Guidelines for planning the sampling of atmosphere) and 'Guidelines for Ambient Air Quality Monitoring' by CPCB respectively were followed.
5.1.2	Ambient Noise quality	At each station noise level was monitored for day and night once in a season as per IS 9989:1981. As sensitive receptors are the prime consideration for sound levels, the monitoring locations are the same as those decided for ambient air quality monitoring.
5.1.3	Traffic study	Traffic study has been done and mentioned in the Draft EIA in chapter 3.11
5.1.4	Surface water quality	Grab sampling was done for surface water. Water samples were analyzed as per IS;3025 for parameters prescribed my MoEFCC. Necessary precautions were taken during sampling and preservation was done for specific parameters.
5.1.5	Ground water quality	Grab sampling was done for ground water. Water samples were taken as per the Standard Methods, analyzed for parameters as per (IS 10500: 2012, and as per test methods in IS; 3025. Necessary precautions were taken during sampling and preservation of samples.
5.1.6	Soil quality	For soil, augur method was used and samples were collected at 15-25 cm depth after removing the upper crust.
5.1.7	Biological Environment	Primary and secondary data collection has been carried out by the Ecology and Biodiversity expert/ team for the study of flora and fauna in the core and buffer zone.
5.1.8	Land use	The land use/ land cover map has been generated on 1:50,000 scale using Satellite imagery and ground truth information.

5.1.9	Socio-economic environment	Socioeconomic status has been studied through secondary sources and by site visit and the social requirements were identified by questionnaire and focused group discussion. `
6.	**Executive Summary**	
6.1	**Anticipated impacts**	
6.1.1	Impact on ambient air quality	Air quality is likely to impacted in terms of particulates at gases.
6.1.2	Impact on ambient noise quality	There may be increase in the ambient noise level due to object activities.
6.1.3	Impact on road and traffic	No impact is likely on road and traffic due to meager increase in traffic due to transportation related activities.
6.1.4	Impact on surface water resource and quality	As the project is ZLD there will be no impact on surface water quality.
6.1.5	Impact on ground water resource and quality	Insignificant impact on ground water resource due to abstraction as water restoration measures in the form of RWH will be taken. As no waste will be discharge to the ground there will be no impact on ground water quality.
6.1.6	Impact on terrestrial and aquatic habitat	No impact, as the proposed expansion will be carried out within the existing facility involving no tree cutting and vegetation removal. Since there is no water body within the project site and no waste water will be discharged to the environment which may contaminate any river there will be no impact on aquatic habitat.
6.1.7	Impact on socio-economic environment	There will be substantial improvement in the socio-economic environment of surrounding area due to employment generation, indirect employment and the likelihood of coming up of ancillary units.
7.	**Executive Summary**	
7.1	Alternative analysis	Alternative site analysis and process as not been considered as the proposed expansion is being carried out within the existing unit located in industrial area. The induction furnace technology being adopted is proven in terms of least polluting potential and energy consumption
8.	**Executive Summary**	
8.1	Environmental Monitoring program	
8.1.1	Ambient air, noise, water and soil quality	Details given in DEIA report, refer chapter-3
8.1.2	Noise quality management plan	Details given in DEIA report, refer chapter-3
8.1.3	Emission and discharge from the plant	Details given in DEIA report, refer chapter-3

8.1.4	Green Belt	Details given in DEIA report, refer chapter-3
8.1.5	Social Parameters	Details given in DEIA report, refer chapter-3
9.	**Executive Summary**	
9.1.1	Risk assessment	Refer chapter-7
9.1.2	Public consultation	Will be conducted by HPSPCB after the submission of DEIA.
9.1.3	Action plan to address the issues raised during public consultation as per MoEF&CC O.M. dated30/09/2020	It will be addressed after Public consultation.
10.	**Executive Summary**	
10.1	Project Benefits	Far project benefits chapter-9.
11.	**Executive Summary**	
11.1	Environment management plan	Noted & complied
11.1.1	Air quality management plan	Complied, - Ensure that vehicle have a PUC certification which will be checked by security staff at the gate. - Material will be transported in covered trucks. - Induction furnace will be provided with adequate and appropriate APCS. - D.G. set provided adequate stack height. - Regular air quality monitoring.
11.1.2	Noise quality management plan	Noted & complied, - Noise level monitoring at start up and shut down activities for plant and equipments. - D.G. sets with acoustic enclosure.
11.1.3	Solid and hazardous waste management plan	Noted & complies, - Hazardous waste will be segregated at source and stored in hazardous waste storage area. - Hazardous waste will be stored in isolated covered area with impervious flouring. - Spill contribution mechanism will be implemented. - PPE shall be mandatory.
11.1.4	Effluent management plan	Noted & complied, - No process related effluent will be generated.

		- Domestic waste water and cooling tower blowdown will be treated in septic tank and treated water used in plantation and dust suppression.
11.1.5	Storm water management plan	Noted &complied, - Proper collection ditches. - Natural drainage not to be disturbed. - Proper channelization and rerouting of storm water generated by rainfall runoff.
11.1.6	Occupational health and safety management plan	Noted & complied, - Work area will be monitored to maintain safe working environment. - Provision of safety shower with eye wash. - Requisite PPE to be provided and their use made mandatory. - Provision of accident reporting and investigation. - Hand gloves of natural rubber, neoprene. - Medical checkup at regular interval. - Provision and maintenance of adequate fire protection system. - Prohibition of eating, smoking and drinking at work place - Provision of firefighting equipments.
11.1.7	Green belt development plan	Noted & complied, - The project area encompasses 5938 sqm (33% of project) as greenbelt in which over estimated 881trees requires to be planted. As 100 trees are already existing the balance 771 trees sampling of height 5-6 feet will be planted in stagged manner during the successive monsoon 2024. The trees varieties to be planted and year wise plantation schedule has been given in the EIA report. **Plantation Care-** Management of green belt will be done by regular watering, soil enrichment maneuvering and weeding. The maintenance includes: - Replacement of weak and dead plants. - Care against material and cattle damage. - Caring for five years till the saplings attains maturity. **Budgetary Allocation –** A total of Rs 26.5 lac including maintenance cost has been provided.
11.1.8	Socio-economic management plan	Noted & complied,

		- The goal of socio-economic management plan is to improvise the quality of life of surrounding population by providing safe healthy and pollution free environment. The planning includes; - Awareness in respect of health, hygiene and sanitization issues. - Awareness of project benefits in terms of improved livelihood by implementation during implement of technical and social remedial plans. **Implementation:** The social management plan will be implemented as part of EMP by project personnel and NGO.
11.1.9	Project cost and EMP implementation budget.	Noted & complied, - The total cost of project is Rs 48.85 crores and the budgetary province for EMP is Rs 78.0 lac as capital cost and Rs 16.1 as recurring cost.
12.	**Introduction**	
12.1	Background about the project	It is an existing project of which the expansion is proposed. The existing unit which is outside the preview of EIA notification is operated under the consent to operate.
12.2	Need of the project	The economy of India is the seventh-largest economy in the world measured by nominal GDP and the third-largest by purchasing power parity (PPP). The country is classified as a newly industrialized country, one of the G-20 major economies, a member of BRICS and a developing economy with an average growth rate of approximately 7% over the last two decades. This growth rate has a great impact on domestic consumption of steel as well as export potential to other countries. As a result of this, the demand for iron & steel remains extremely good, this would continue for next 10 years if not less, since the per capita consumption of steel in India is still very low compared to other developed countries. For rapid development of economy and infrastructure of the country it is necessary to increase the production of steel within the country. National Steel Policy – 2005 has the long-term goal of having a modern and efficient steel industry of world standards in India. The focus is to achieve global competitiveness not only in terms of cost, quality and product-mix but also in terms of global benchmarks of efficiency and productivity. The Policy aims to achieve over 100 million Metric Tons of Steel per year by 2020-21

		from the 2004-05 level of 38 mt. This implies an annual growth of around 7.3% per year since 2004-05. The above strategic goal is justified on the ground that steel consumption in the world, around 1000 million Metric tonnes in 2004, is expected to grow at 3.0 percent per annum to reach 1,395 million Metric Tonnes in 2020, compared to 2 percent per annum in the past fifteen years. China will continue to have a dominant share of the world steel demand. At home, the Indian growth rate of steel production over the past fifteen years was 7.0 percent per annum. The projected growth rate of 7.3 percent per annum in India compares well with the projected national income growth rate of 7-8 percent per annum, given an income elasticity of steel consumption of around 1.
12.3	Purpose of the EIA study	The purpose of EIA study is: - - To identify, predict and evaluate the economic, environmental and social impacts of development activities. - _To provide information on the environmental consequences for decision making. - - To promote environmentally sound and sustainable development through the identification of appropriate alternatives and mitigation measures.
12.4	Scope of the EIA study	The scope of EIA study is in conformity with MOEF&CC technical guidance manual are IF, EAF and CUPOLA furnaces and circular issued by MOEF&CC and the TOR issued by MOEF&CC.
13.	**Project description**	
13.1	Site Details	Refer chapter-2
13.1.1	Location of the project site covering village, Taluka/Tehsil, District and State.	The project is located at plot no. 168 to 179 & 146 to 160, Phase-III, Industrial Area, Sansarpur Terrace, Tehsil- Jaswan at Kasba Kotla, District – Kangra, Himachal Pradesh.
13.1.2	Site accessibility	The project is located adjacent to the link road which ultimately joins to Dada siba Sansarpur Terrace road. From this road which is 7.0 m wide carriage way with good quality shoulders joins the Dada siba -Sansarpur Terrace road on one side and the Talwara-Pong Dam Road on other side. It is two lane road.

<table>
<tr><td>13.1.3</td><td>A digital toposheet in pdf or shape file compatible to Google earth of the study area of radius of 10km and site location preferably on 1:50,000 scale. (Including all eco-sensitive areas and environmentally sensitive places).</td><td>The project site is covered under Toposheet No. H43D13, I43W4, H43E1, 43P/16 scale 1:5000 covering 10 km around the site has been attached as Figure 1.3</td></tr>
<tr><td>13.1.4</td><td>Latest High-resolution satellite image data having 1 m - 5 m spatial resolution like quickbird, Ikonos, IRS P-6 pan sharpened etc., along with delineation of plant boundary co-ordinates. Area must include at least 100 m all around the project location.</td><td>Complied, refer chapter-3</td></tr>
<tr><td>13.1.5</td><td>Environment settings of the site and it’s surrounding along with map.</td><td>Refer chapter-1</td></tr>
<tr><td>13.1.6</td><td>A list of major industries with name, products and distance from plant site within study area (10km radius) and the location of the industries shall be depicted in the study area map.</td><td><u>List of the industries within the study area is given below</u>
<table>
<tr><th>S.No.</th><th>Name of Industries</th><th>Type of Industries</th></tr>
<tr><td>1.</td><td>Surinder Steel Industry</td><td>Steel</td></tr>
<tr><td>2.</td><td>Aggarwal Steel Industries Pvt Ltd</td><td>Steel</td></tr>
<tr><td>3.</td><td>KDK Steels</td><td>Steel</td></tr>
<tr><td>4.</td><td>G.D. Steels Industries</td><td>Steel</td></tr>
<tr><td>5.</td><td>S D Steel industries</td><td>Steel</td></tr>
<tr><td>6.</td><td>Metalico Steel Industries</td><td>Steel</td></tr>
<tr><td>7.</td><td>R.N. Steel Industries</td><td>Steel</td></tr>
<tr><td>8.</td><td>Star Steel industries</td><td>Steel</td></tr>
<tr><td>9.</td><td>Maha Shiv Shakti Traders</td><td>Steel</td></tr>
<tr><td>10.</td><td>Barnala Steel Industries</td><td>Steel</td></tr>
<tr><td>11.</td><td>R.S. Steel Industries</td><td>Steel</td></tr>
<tr><td>12.</td><td>Salsan Steel Rolling Mill</td><td>Steel</td></tr>
<tr><td>13.</td><td>Surjit Steel Industries</td><td>Steel</td></tr>
<tr><td>14.</td><td>Surya Steel Industries</td><td>Steel</td></tr>
</table></td></tr>
<tr><td>13.1.7</td><td>In case if the project site is in vicinity of the water body, 50 meters from the edge of the water body towards the site shall be treated as no development/construction zone. If it’s near the wetland, Guidelines for implementing Wetlands (Conservation and Management) Rules, 2017 may be followed.</td><td>Does not apply-The project as located in the notified industrial area is neither within 50m from the edge of water body nor it is situated near the wet land.</td></tr>
</table>

13.1.8	In case if the project site is in vicinity of the river, the industry shall not be located within the river flood plain corresponding to one in 25 years flood, as certified by concerned District Magistrate/Executive Engineer from State Water Resources Department (or) any other officer authorized by the State Government for this purpose as per the provisions contained in the MoEF&CC Office Memorandum dated14/02/2022.	NA in view of 13.1.7 above
13.1.9	In case of canal/ nala/ seasonal drain and any other water body passing through project site, the PP shall submit the suitable steps /conservation plan/mitigation measures along with contouring, Run -off calculations, disposal etc. A robust and full proof Drainage Conservation scheme to protect the natural drainage/water bodies and its flow parameters; along with Soil conservation scheme and multiple Erosion control measures shall be provided in the report.	NA as no canal/nala/ seasonal drain and any other water body passing through project site.
13.1.10	Type of land, land use of the project site needs to be submitted.	The land use at project site is industrial as per documentary evidence enclosed.
13.1.11	Status of acquisition of land. If acquisition is not complete, stage of the acquisition process as per the MoEF&CC O.M. dated 7/10/2014 shall be furnished.	The project is already in position of 17995sqm of land.
13.1.12	Project proponent shall prepare Engineering layout plan showing all internal roads minimum 6 m width and 9 m turning radius for smooth traffic flow inside including fire tender as per NBC. Road network shall connect all service areas in layout. This drawing shall include area statement showing plot area, area under roads, parking, green belt with calculations and % with respect to plot area of project site and proper indexing. If located within an Industrial area/Estate/Complex, layout of Industrial Area indicating location of unit within the Industrial area/Estate.	Noted and complied, layout plan enclosed. Refer chapter-2
13.1.13	Project proponent shall submit contour map of project site along with drainage disposal system with calculations and drawings supported with proper indexing including Rain Water Harvesting details with calculations mentioning about GW recharge along with relevant drawing.	As it is located on a plain terrain, therefore, no contour map is required. Complied, refer chapter-3.
13.1.14	A detailed report covering all aspects of Fire Safety Management and Fire Emergency Plan shall be submitted.	Complied, refer chapter-7.
13.1.1	Details of drone survey for the site, needs to be included in report and presented	As the Drone survey is primarily used for mining and construction sites and since

<table>
<tr><td>5</td><td>before the EAC during appraisal of the project.</td><td>the present proposal pertains to expansion in the existing facility located in industrial area, drone survey has not been undertaken.</td></tr>
<tr><td>14.</td><td>Project description</td><td></td></tr>
<tr><td>14.1</td><td>Forest and wildlife related issues (if applicable)</td><td>Not applicable as no forest land is involved.</td></tr>
<tr><td>14.1.1</td><td>Status of Forest Clearance for the use of forest land shall be submitted.</td><td>Not applicable</td></tr>
<tr><td>14.1.2</td><td>Copy of application submitted for clearance under the Wildlife (Protection) Act, 1972, to the Standing Committee of the National Board for Wildlife if the project site located within notified Eco-Sensitive Zone, 10 km radius of national park/sanctuary wherein final ESZ notification is not in place as per MoEF&CC Office Memorandum dated 8/8/2019.</td><td>Not applicable</td></tr>
<tr><td>14.1.3</td><td>The projects to be located within 10 km of the National Parks, Sanctuaries, Biosphere Reserves, Migratory Corridors of Wild Animals, Eco-sensitive Zone and Eco-sensitive areas, the project proponent shall submit the map duly authenticated by Divisional Forest Officer showing the distance between the project site and the said areas.</td><td>Not applicable</td></tr>
<tr><td>14.1.4</td><td>Wildlife Conservation Plan duly authenticated by the Competent Authority of the State Government for conservation of Schedule I fauna along with budget and action plan, if any exists in the study area.</td><td>Not applicable</td></tr>
<tr><td>15.</td><td>Project description</td><td></td></tr>
<tr><td>15.1</td><td>Salient features of the project</td><td>
<table>
<tr><th>S. No.</th><th>Particulars</th><th>Details</th></tr>
<tr><td colspan="3">A. Location details</td></tr>
<tr><td>1.</td><td colspan="2">Location</td></tr>
<tr><td>a</td><td>Village/ Town/Plot No.</td><td>Plot No. 168 to 179 and 146 to 160, Phase -III, Industrial Area, Sansarpur Terrace</td></tr>
<tr><td>b</td><td>Tehsil</td><td>Jaswan at Kasba Kotla</td></tr>
<tr><td>c</td><td>District</td><td>Kangra</td></tr>
<tr><td>d</td><td>State</td><td>Himachal Pradesh</td></tr>
<tr><td>e</td><td>Latitude</td><td>
<table>
<tr><th>POINT</th><th>LATITUDE</th></tr>
<tr><td>A</td><td>31°55'26.15"N</td></tr>
</table>
</td></tr>
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</td></tr>
</table>

			B	31°55'26.75"N
			C	31°55'22.73"N
			D	31°55’22.17"N
			E	31°55’23.19"N
			F	31°55'21.92"N
			G	31°55'23.78"N
			H	31°55’25.04"N
		f	Longitude	**POINT** / **LONGITUDE** A 75°55'36.23"E B 75°55'38.74"E C 75°55'39.91"E D 75°55’37.39"E E 75°55’36.63"E F 75°55’30.93"E G 75°55’30.33"E H 75°55’36.03"E
		2.	Topo sheet No.	H43D13, I43W4, H43E1, 43P/16
		3.	Project Area	Existing Land = 8695 Sqm Additional Land = 9300 Sqm Total Land-=17995 Sqm
		C.	**Production Capacity**	**Existing:** 1) MS Ingots- 19,200 TPA 2) Billets, Round, Angle, Channel, TMT bars and Flats - NIL **After Expansion:** 1) MS Ingots- 96,600 TPA 2) Steel Ingots/Billets, Round,

		Angle, Channel, TMT bars and Flats – 77,280 TPA
D.	**Environmental settings**	
1.	Nearest Village	Reri Village – 0.63 Km, North East direction
2.	Nearest City	Kangra, approx. 36 km in East direction from the project site
3.	National Highway/State Highway/ Express Highway	State Highway – 27 at distance of 1.9 km in North direction National Highway 503 at a distance of 26.51 km in South direction
4.	Nearest Railway Station	Daulatpur Chowk Station at a distance of 19 km in South direction
5.	Nearest Airport	Gaggal Airport at a distance of 24.63km from the project site in the NE direction
6.	National Parks/ Wild Life Sanctuaries/ Biosphere Reserves within 10 km radius	Nil
7.	Reserved / Protected Forest within 10 km radius	Following are three reserved forests found in the study area along with their respective distance and direction from the

				(Boundary to boundary distance)	project site: - 1. Sambalian RF – 5.5 km in North direction. 2. Karanpur RF – 4.3 km in West direction. 3. Sansarpur RF- 0.67 Km in North direction. One Protected Forest was found within 10 km radius Dadhoa PF – 6.8 km, in South East direction.
			8.	Nearest water bodies	Beas river – 3.5 km, N
			9.	Source of Water	Ground water Existing tube-well
			10.	Seismic Zone	Seismic **Zone – IV**
			D.	**COST DETAILS**	
			1.	Capital Cost of the project	Existing cost -Rs 12.925 Cr Additional cost -Rs 35.93 Cr **Total - Rs 48.85 Cr**
			2.	Total cost for Environmental Management Plan (EMP)	Rs 78.0 Lacs
15.1.1	Products with capacities in Tons per Annum for the proposed project.				

Description	**Existing**	**Additional**	**After Expansion**
Production (TPA)			
Steel Ingot/Billets	19,200	77,400	96,600

<table>
<tr><td></td><td></td><td>
<table>
<tr><td>(TPA)</td><td></td><td></td><td></td></tr>
<tr><td>Rounds, TMT Bars, wire rode, Flats and structural steel.</td><td>NIL</td><td>77,280 TPA</td><td>77,280</td></tr>
</table>
</td><td></td></tr>
<tr><td>15.1.2</td><td>If expansion project, status of implementation of existing project, details of existing/proposed productswith production capacities in Tons per Annum.</td><td>
<table>
<tr><td>Description</td><td>Existing</td><td>Additional</td><td>After Expansion</td></tr>
<tr><td colspan="4">Production (TPA)</td></tr>
<tr><td>Steel Ingot/Billets (TPA)</td><td>19,200</td><td>77,400</td><td>96,600</td></tr>
<tr><td>Rounds, TMT Bars, wire rode, Flats and structural steel.</td><td>NIL</td><td>77,280 TPA</td><td>77,280</td></tr>
</table>
</td><td></td></tr>
<tr><td>15.1.3</td><td>Site preparatory activities.</td><td>The project is located in industrial area which is already developed. The expansion will be carried out within the existing unit which is plain, free of vegetation thereby requiring minimal site preparation.</td></tr>
<tr><td>15.1.4</td><td>List of raw materials required and their source along with mode of transportation.</td><td>
<table>
<tr><td>Particulars</td><td>Existing</td><td>Additional</td><td>Total</td></tr>
<tr><td>MS Scrap</td><td>10,500</td><td>59,052</td><td>69,552</td></tr>
<tr><td>Sponge Iron</td><td>11,400</td><td>34,968</td><td>46,368</td></tr>
</table>
</td></tr>
<tr><td>15.1.5</td><td>Other than raw materials, other chemicals and materials required with quantities and storage capacities.</td><td>No other chemical and materials except the raw materials listed above will be used in the process.</td></tr>
<tr><td>15.1.6</td><td>Manufacturing process details along with process flow diagram of proposed units.</td><td>Firstly, Raw Material i.e., M.S. Scrap/Spong Iron is tested in laboratory and if reports are satisfactory then it is issued for the further processing. Testing Raw Material is put in to the Furnace where 1200-18000C approximately. Temperature is provided to make the raw material melting. Hot raw material is poured into Concast to make steel billet. Hot Steel Billet is taken to seventeen strands (according to size) where it is passed through various sized rolls depending upon size to be produced.</td></tr>
</table>

<table>
<tr><td></td><td></td><td>After the product is passed through the finishing stand further go in to the coiler to make the coil of steel Round. Steel Round is taken and checked by the quality controller with the help of vernier. Whereas, in the existing setup the rolling mill was based on reheating furnace using coal as fuel, after expansion reheating furnace will be dispensed with and hot rolling will be practiced thereby eliminating air pollution due to reheating furnace. (Note- under the proposed dispenser hot billets from the caster will be duly charged into the rolling mill, thereby eliminating the requirement of reheating furnace thus there will be no emission from the rolling mill). This inspection is carried out by the quality controller after every hour. Different Bundles are prepared of different sized products and are well placed. Material balance chart & Layout of manufacturing process is given in Figure. 2.6</td></tr>
<tr><td>15.1.7</td><td>Consolidated materials and energy balance for the project.</td><td>Refer Figure 2.6 chapter-2.</td></tr>
<tr><td>15.1.8</td><td>Total requirement of surface/ ground water and power with their respective sources, status of approval.</td><td>
<table>
<tr><th>S. No</th><th>Particulars</th><th>Existing</th><th>Addition</th><th>Total</th></tr>
<tr><td>1</td><td>Domestic</td><td>2.0 KLD</td><td>3.0 KLD</td><td>5.0 KLD</td></tr>
<tr><td>2</td><td>Cooling (makeup water)</td><td>30.0 KLD</td><td>60.0 KLD</td><td>90.0 KLD</td></tr>
<tr><td>3</td><td>Total</td><td>32.0KLD</td><td>63.0 KLD</td><td>95.0 KLD</td></tr>
<tr><td>4</td><td>Power Requirement</td><td>3200 KW</td><td>6800 KW</td><td>10000 KW</td></tr>
<tr><td colspan="5">Source- Himachal Pradesh State Electricity Board Limited (HPSEBL) for power supply and bore well for water requirements.</td></tr>
</table>
</td></tr>
<tr><td>15.1.9</td><td>Water balance diagram</td><td>Refer Figure 2.4 in chapter 2.</td></tr>
<tr><td>15.1.10</td><td>Details of Emission, effluents, hazardous waste generation and mode of disposal during construction aswell as operation phase.</td><td>The following are the required details for the existing & proposed facility:
<table>
<tr><th>S. No</th><th>Source</th><th>No.</th><th>Fuel</th><th>APCD</th></tr>
<tr><td>1</td><td>Induction Furnace</td><td>1X7TPH</td><td>Electricity</td><td>Bag Filters</td></tr>
<tr><td>2</td><td>D.G. Set</td><td>2X325 KVA</td><td>HSD</td><td>Stack of adequate</td></tr>
</table>
</td></tr>
</table>

				height provided
After Expansion				
1.	Induction Furnace	1x7TPH 1x15 TPH	Electricity	Bag Filters
2.	D.G. Set	2X325 KVA	HSD	Stack of adequate height provided
Hazardous Waste				
1.	35.1 Flue gas cleaning residue	0.27 TPD	3.5 TPD	Send to TSDF Site/ or approved reprocessors of hazardous waste for Final disposal
2.	5.1 Used oil/Spent oil	0.5 Kl/annum	0.8 Kl/annum	Authorized Recyclers/Lubricant within the industry
Solid Waste				
1.	Slag	5.6 TPD	9.8 TPD	Sent to tile manufactures and brick pavers
2.	APCD DUST	0.27TPD	3.5 TPD	Send to TSDF site/ or approved reprocessors of hazardous waste for final disposal

15.1.11	Man-power requirement.	Description / Existing / Additional / After Expansion Manpower requirement: 34 / 56 / 90 *Mostly the manpower will be hired from local areas.*
15.1.12	Cost of project and scheduled time of completion.	Existing - Rs. 12.925 Cr. Proposed - Rs. 35.93 Cr. **Total- Rs. 48.85 Cr.** The proposed expansion will be completed within one year after grant of

		Environmental Clearance.
15.1.13	In case of expansion projects, project proponent shall submit structural stability certificate showing whether existing structure withstand for proposed expansion activity.	Not Applicable, as it is not a Building& construction project. However, structural safeguards will be taken during the erecting of plant and installation of machinery.
15.1.14	Brief on present status of compliance (Expansion/modernization proposals) a. Cumulative Environment Impact Assessment for the existing as well as the proposed expansion/modernization shall be carried out. b. Cumulative Impact Assessment need to be carried out by greenfield projects considering the nearby industries. c. In case of ground water drawl for the existing unit, action plan for phasing out of ground water abstraction in next two years except for domestic purposes and shall switch over to 100 % use of surface water from nearby source. d. Copy of all the Environment Clearance(s) including Amendments/validity of extension/transfer of EC, there to obtained for the project from MoEF&CC/SEIAA shall be attached as Annexures. A Certified Compliance Report (CCR) of the Integrated Regional Office of the Ministry of Environment, Forest and Climate Change/ or concerned authority as per OM No. IA3-22/10/2022-IA.III [E 1772581], dated 8th June, 2022 on the status of compliance of conditions stipulated in all the existing environment clearances including amendments shall be provided. A Certified Compliance Report (CCR) issued by the concerned Authority shall be valid for a period of one year from the date of inspection. e. In case the existing project has not obtained Environment Clearance, reasons for not taking EC under the provisions of the EIA Notification 1994 and/or EIA Notification 2006 shall be provided. A proper justification needs to be submitted along with documentary proof. Copies of Consent to Establish/No Objection Certificate and Consent to Operate (in case of units operating prior to EIA Notification 1994 or 2006, CTE and CTO of FY 2005-2006) obtained from the SPCB shall be submitted. Further, compliance report to the conditions of CTO from the Regional Office of the SPCB shall be submitted, as per OM No. IA3-22/10/2022-IA.III [E 1772581], dated 8th June, 2022. CCR on CTO conditions issued by the concerned SPCBs/PCCs shall be valid for a period of one year from the date of inspection of the project.	NA as the existing unit was not covered under the EIA notification/2006, thereby not requiring environmental clearance and its subsequent compliance. However, the unit has all along been complying with the consent conditions. Copies of CTO, NOC, authorization and CTO compliance are enclosed herewith.

16.	**Description of the Environment**				
16.1	Study Period				April to June 2023.
16.2	Attributes	Sampling		Remarks	Noted and complied.
		Network	Frequency		
	i. Air Environment Micro-Meteorological • Wind Speed (hourly) • Wind direction • Dry bulb temperature • Wet bulb temperature • Relative humidity • Rainfall • Solar radiation • Cloud cover • Environmental • Lapse Rate	Minimum 1 site in the project impact hourly continuous area	• The monitoring frequency was 24 hours, twice a week at each station spread over the entire monitoring period with gas sampling being done six times (at 4 hrs intervals)	IS 5182 Part 1-20 • Site specific primary date is essential. • Secondary data from IMD, New Delhi. • CPCB guidelines to be considered.	
	ii. Pollutants • PM10 • SO2 • NOx • CO • HC • Other parameters relevant to the project and topography of the	At least 8-12 Locations	As per National Ambient Air Quality Standards, CPCB Notification	• Sampling as per CPCB guidelines • Collection of AAQ data (except in monsoon season) • Locations of various stations	

	area			for different parameters should be related to the characteristic properties of the Parameters. • The monitoring stations shall be based on the NAAQM standards as per GSR 826(E) dated 16/11/2009 and take into account the predominant wind direction, population zone and sensitive receptors including reserved forests, • Raw data of all AAQ measurement for 12 weeks of all stations as per frequency given in the NAAQM Notification of		

				16/11/2009 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.		
	iii. Noise • Hourly equivalent noise levels	At least 8-12 Locations	As per CPCB norms			
	iv. Water Parameters for water quality • pH, temp, turbidity, magnesium hardness, total alkalinity, chloride, sulphate, nitrate, fluoride, sodium, potassium, salinity. • Total nitrogen, total phosphorus, DO, BOD, COD, Phenol. • Heavy metals • Total coliforms, faecal coliforms. • Phyto plankton	Samples for water quality should be collected and analyzed as per: • IS: 2488 (Part 1-5) methods for sampling and testing of Industrial Effluents. • Standard methods for examination of water				

	• Zoo plankton For River Bodies • Total Carbon • pH • Dissolved Oxygen • Biological Oxygen Demand • Free NH4 • Boron • Sodium Absorption Ratio • Electrical Conductivity	and wastewater analysis published by American Public Health Association Surface water quality of the nearest River (60m upstream and downstream) and other surface water bodies	•Yield of water sources to be measured during critical season •Standard methodology for collection of surface water (BIS standards)			
	For Ground Water	Ground water monitoring data should be collected at minimum of 8 locations (from existing wells				

	/tube wells/existing current records) from the study area and shall be included.			
v. Traffic Study Type of vehicles • Frequency of vehicles for transportation of materials. • Additional traffic due to proposed project	Land Environment			
vi. Soil • Particle size distribution • Texture • pH • Electrical conductivity • Cation exchange capacity • Alkali metals • Sodium Absorption Ratio (SAR) • Permeability water holding capacity • Porosity	Soil samples be collected as per BIS specifications.			

	vii. Land use/Landscape • Location code • Total project area • Topography • Drainage (natural) • Cultivated, forest, plantations, water bodies, roads and settlements.					
	viii. Biological Environment 1.Aquatic • Primary productivity • Aquatic weeds • Enumeration of phytoplankton, zoo plankton and benthos. • Fisheries Diversity indices • Trophic levels • Rare and endangered species • Marine Parks/Santuries/ Closed areas/ Costal regulation zone (CRZ) 2. Terrestrial •Vegetation- species	• 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. Indicator species which indicate ecological				

		list, economic importance, Forest produce, medicinal value. •Importance value index (IVI) of trees. •Fauna. •Avi fauna. •Rare and endangered. •Santuries/ National Park/ Biosphere reserve. •Migratory routes. Socio-economics Demographic structure • Infrasturure resources base • Economic resource base • Health status: Morbidity pattern	and environment degradation should be identified and included to clearly state whether the proposed project would result in to any adverse effect on any species. •Samples to collect from upstream and downstream of discharge point, nearby tributaries at downstream, and also from dug wells close to activity			

		site. • For forest studies, direction of wind should be considered while selecting forest. •Secondary data to collect from Government offices, NGOs, published literature. •Socio-economic survey is based on proportionate, stratified and random sampling method. • Primary data collection through questionnair				

		e •Secondary data from census records, statistical hard books, topo sheets, health records and relevant official records available with Govt. agencies.	
16.3	Interpretation of each environment attribute shall be enumerated and summarized as given below: •Ambient air quality • Ambient Noise quality • Surface water quality • Ground water quality • Soil quality • Biological Environment • Land use • Socio-economic environment.		Complied. Refer chapter- 3 Complied. Refer chapter-3
16.4	The PP should submit the photograph of monitoring stations & sampling locations. The photograph should bear the date, time, latitude & longitude of the monitoring station/sampling location. In addition to this PP should submit the original test reports and certificates of the labs which will analyze the samples.		Complied. Refer chapter-3
17.	**Anticipated Environment Impacts and mitigation measures (In case of expansion, cumulative impact assessment shall be carried out)**		Complied. Refer chapter-4
17.1	Identification of potential impacts in the form of a matrix for the construction and operation phase for allthe environment components		Complied. Refer chapter-4

Activity	**Environment**	**Ecological**	**Socio-economic**
Construction			

	Phase / Operation Phase	
17.2	Impact on ambient air quality (Sources; Embedded control measures; Assessment; Mitigation measures; Residual impact) a. Construction phase b. Operation phase • Details of stack emissions from the existing as well as proposed activity. • Assessment of ground level concentration of pollutants from the stack emission based on AQIP Modelling The air quality contours shall be plotted on a location map showing the location of project site, habitation nearby, sensitive receptors, if any along with wind rose map for respective period • Impact on ground level concentration, under normal, abnormal and emergency conditions. Measures to handle emergency situations in the event of uncontrolled release of emissions.	Noted & complied, the following embedded control measures are in place - Green belt development and maintenance. - Regular monitoring of air pollutant concentration. - Particulate removal by bag filters. - Shredding of scrap before charging. - Use of PUC certified vehicles. - D.G sets with adequate height. - Dust suppression on internal roads.
17.3	Impact on ambient noise quality (Sources; Embedded control measures; Assessment; Mitigation measures; Residual impact) a. Construction phase b. Operation phase	Noted & complied, the following embedded control measures are in place - Provisions of heavy-duty mufflers on noisy equipments. - Damping and absorption by pads. - PPE for ears e.g., Ear plugs/muffs. - Procurement of equipments with noise specification.
17.4	Impact on traffic (Sources; Embedded control measures; Assessment; Mitigation measures; Residual impact) a. Construction phase b. Operation phase	Noted & complied, - Proper parking space for transportation. - Separate entry and exit points. - Mechanically monitored vehicles.
17.5	Impact on soil quality (Sources; Embedded control measures; Assessment; Mitigation measures; Residual impact) a. Construction phase b. Operation phase	Noted & complied, - Construction in phased manner and in non-monsoon season. - Minimum scarification of surface. - Proper runoff management by ponds/ditches. - Construction of drainage. - Windscreens around site.
17.6	Impact on land use (Sources; Embedded control measures; Assessment; Mitigation measures; Residual impact) a. Construction phase b. Operation phase	Noted & complied, No change in land use, hence no mitigation measures.

17.7	Impact on surface water resource and quality (Sources; Embedded control measures; Assessment; Mitigation measures; Residual impact) a. Construction phase b. Operation phase	Noted & complied, No surface water body within 50m from the edge of project site.
17.8	Impact on ground water resource and quality (Sources; Embedded control measures; Assessment; Mitigation measures; Residual impact) a. Construction phase b. Operation phase	Noted & complied, - Storage of oil waste separately. - Monitoring of ground water. - Sanitary, sewage treatment and reuse. - Metering of ground water abstraction.
17.9	Impact on terrestrial and aquatic habitat (Sources; Embedded control measures; Assessment; Mitigation measures; Residual impact) a. Construction phase b. Operation phase	Complied. Refer chapter- 4
17.10	Impact on socio-economic environment (Sources; Embedded control measures; Assessment; Mitigation measures; Residual impact) a. Construction phase b. Operation phase	Noted & complied, - Health and safety measures for workers. - Upgradation of roads and intersections. - Exploring alternate routes for industry and locals.
17.11	Impact on occupational health and safety (Sources; Embedded control measures; Assessment; Mitigation measures; Residual impact) a. Construction phase b. Operation phase	Noted & complied, - Arrangement for periodic health checkup. - Disposal of waste in environmentally sound manner. - Preventive measure for hazardous waste. - Proper sanitization facilities.
18.	**Analysis of Alternatives (Technology & Site)**	
18.1	No project scenario	As the expansion will be undertaken in the existing project area therefore analysis in terms of no project scenario has been undertaken.
18.2	Site alternative	No alternative site has been explored as the proposed expansion within the existing unit located in industrial area.
18.3	Technical and social concerns	Provel technology has been proposed by the manufacturing process. This society will not be negatively impacted. Rather there will be a boost in the socio-economic conditions of the area in terms of employment generation, ancillary development and the execution of social and environmental activities by project authorities.
18.4	Conclusion	Refer chapter-5.
19.	**Environmental Monitoring Program**	Refer Chapter 10.
19.1	Details of the Environment Management Cell	Refer Para 10.3

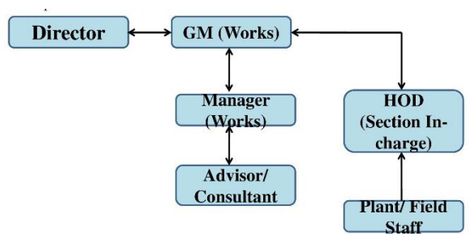
<table>
<tr>
<td>19.2</td>
<td>Performance monitoring schedule for all pollution control devices shall be furnished.</td>
<td>Noted the following schedule/procedure will be in place for bag filters:
<table>
<tr><th>Sr. No.</th><th>Frequency</th><th>Procedure</th></tr>
<tr><td>1</td><td>Daily</td><td>- Observe stack visually.
- Check pressure drop across the bag filters.
- Observe control panel indicator.
- Check that dust is removed from system.</td></tr>
<tr><td>2</td><td>Weekly</td><td>- Inspection of screw, conveyer bearings for lubrication.
- Checking the compressed air.
- Checking pressure drop for plugging line.</td></tr>
<tr><td>3</td><td>Monthly</td><td>- Checking drive belt for wear and tensions.
- Spot check for bag leakage.
- Inspection of fan corrosion and material deposition.
- Checking bags for tensions.</td></tr>
<tr><td>4</td><td>Annually</td><td>- Checking the welded parts.
- Inspection of Huppert’s wear.</td></tr>
<tr><td colspan="3">The record of temperature, pressure drop, flow rate dust and compressed air will be monitored</td></tr>
</table>
</td>
</tr>
<tr>
<td>19.3</td>
<td>Corporate Environment Policy

a. Does the company have a well laid down Environment Policy approved by its Board of Directors? Ifso, it may be detailed in the EIA report.

b. Does the Environment Policy prescribe for standard operating process / procedures to bring into focus any infringement / deviation / violation of the environment or forest norms / conditions? If so, it may be detailed in the EIA.

c. What is the hierarchical system or administrative order of the company to deal with the environment issues and for ensuring compliance with the environment clearance conditions? Details of this system may be given. Page 9 of 10

d. Does the company have system of reporting of non-compliances / violations of environment norms to the Board of Directors of the company and / or shareholders or stakeholders at large? This reporting mechanism shall be</td>
<td>A. The industry has well defined Environmental policy and the same is executed by EMC. The main objections of policy are:
➢ Waste minimization, recycling, energy conservation and use of alternative material which are practicable and cost effective.
➢ Training, education and information to employees.
➢ Compliance of provisions of applicable environmental laws.

B. The EMC is entrusted with the task of looking after all the environmental issues.
C. The hierarchical system of EMC is as:
 

D. Yes, the non-compliances are reported by EMC to the Directors of Industry.</td>
</tr>
</table>

<table>
<tr><td></td><td>detailed in the EIA report</td><td></td></tr>
<tr><td>19.4</td><td>Action plan for post-project environment monitoring matrix:
<table>
<tr><th>Activity</th><th>Aspect</th><th>Monitoring Parameter</th><th>Locations</th><th>Frequency</th><th>Responsibility</th></tr>
<tr><td>Construction Phase</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Operational Phase</td><td></td><td></td><td></td><td></td><td></td></tr>
</table></td><td>Refer Table 6.1 for Construction Phase and Table 6.2 for Operational Phase</td></tr>
<tr><td>20.</td><td>Additional Studies</td><td></td></tr>
<tr><td>20.1</td><td>Project proponent shall submit a study report on Decarburization program, which would essentially consist of company’s carbon emissions, carbon budgeting/ balancing, carbon sequestration activities and carbon capture, use and storage after offsetting strategies. Further, the report shall also contain time bound action plan to reduce its carbon intensity of its operations and supply chains, energy transition pathway from fossil fuels to Renewable energy etc. All these activities/ assessments should be measurable and monitor-able with defined time frames.</td><td>Complied, as the industry is not using any fossil fuel leading to CO_2 generation, the capture and storage of which is required for decarburization. The CO_2 thus generated can be used for the carburization of slag. This proposition is quite money intensive leading to an estimated 30% increase in cost of production. As no CO_2 is generated from the process operation, decarburization has not been explored.</td></tr>
<tr><td>20.2</td><td>Details of adoption/ implementation status/plan to achieve the goal of Glasgow COP26 Climate Submit with regard to enhance the non-fossil energy, use of renewable energy, minimization of net carbon emission and carbon intensity with long-term target of “net Zero” emission.</td><td>Complied. The industry will be using electricity generated from the Hydro power project in the state of Himachal Pradesh and there will be no use of fossil fuel. All external lightening will be standalone solar lights and LED for internal lightning.</td></tr>
<tr><td>20.3</td><td>Implementation status/measures adopted for avoiding the generation of single used plastic waste.</td><td>Although, there is no use of single use plastics in the manufacturing and dispatch of material their use by the employees will be banned.</td></tr>
<tr><td>20.4</td><td>In cases the project is located in Critically and Severely Polluted Areas, additional mitigation measures adopted and detailed action plan to be submitted in the EIA/EMP Report as per MoEF&CC O.M. No. 22- 23/2028-IA.III dated 31/10/2019 and MoEF&CC O.M. No. 22-23/2028-IA.III dated 5/07/2022 has to be submitted.</td><td>Not Applicable as the project is not located in CPA/SPA.</td></tr>
<tr><td>20.5</td><td>Public consultation details (Entire proceedings as separate annexure along with authenticated EnglishTranslation of Public Consultation proceedings).</td><td>Will be complied after the conduct of public hearing and detailed in EIA report.</td></tr>
</table>

<table>
<tr><td>20.6</td><td>As part of Corporate Environment Responsibility (CER) activity, company shall adopt nearby villages based on the socio-economic survey and undertake community developmental activities in consultation with the village Panchayat and the District Administration. In this regard, time bound action plan as per the MoEF&CC Office Memorandum dated 30/09/2020 shall be submitted.</td><td>Agreed for compliance detail will be in EIA report.</td></tr>
<tr><td>20.7</td><td>Summary of issues raised during public consultation along with action plan to address the same as perMoEF&CC O.M. dated 30/09/2020<table><tr><th>S.No.</th><th>Physical activity and action plan</th><th>Year of implementation (Budget in INR)</th><th>Total Expenditure (Rs. In Corers)</th></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr></table></td><td>Noted & the same will be detailed in EIA report.</td></tr>
<tr><td>20.8</td><td>Risk assessment
Methodology
Hazard identification
Frequency analysis
Consequence analysis
Risk assessment outcome</td><td>Refer Chapter 7.0</td></tr>
<tr><td>20.9</td><td>Emergency response and preparedness plan</td><td>Refer Chapter 7.0</td></tr>
<tr><td>21.</td><td>Project Benefits</td><td></td></tr>
<tr><td>21.1</td><td>Environment benefits</td><td>Refer Chapter 8.0</td></tr>
<tr><td>21.2</td><td>Social infrastructure</td><td>Refer Chapter 8.0</td></tr>
<tr><td>21.3</td><td>Employment and business opportunity</td><td>Refer Chapter 8.0</td></tr>
<tr><td>21.4</td><td>Other tangible benefits</td><td>Refer Chapter 8.0</td></tr>
<tr><td>22.</td><td>Environment Cost Benefit Analysis</td><td></td></tr>
<tr><td>22.1</td><td>Net present value</td><td>Details will be provided in EIA report</td></tr>
<tr><td>22.2</td><td>Internal rate of return</td><td>Details will be provided in EIA report</td></tr>
</table>

22.3	Benefit cost ratio	Details will be provided in EIA report
22.4	Cost effectiveness analysis	Details will be provided in EIA report
23.	**Environment Management Plan (Construction and Operation phase)**	
23.1	Air quality management plan	Refer Chapter 10
23.2	Noise quality management plan	Refer Chapter 10
23.3	Action plan for hazardous waste management	Refer Chapter 10
23.4	Action plan for solid waste management	Refer Chapter 10
23.5	Action plan for e-waste management.	Refer Chapter 10
23.6	Action plan for plastic waste management, considering the Plastic Waste Management Rules 2016.	Refer Chapter 10
23.7	Action plan for construction and demolition waste management.	Refer Chapter 10
23.8	Effluent management plan	Refer Chapter 10
23.9	Storm water management plan	Refer Chapter 10
23.10	Rain water harvesting plan	Refer Chapter 10
23.11	Plan for maximum usage of waste water/treated water in the Unit	Refer Chapter 10
23.12	Occupational health and safety management plan	Refer chapter 10
23.13	Green belt development plan: An action plan for Green Belt development consisting of 3 tiers of plantations of native species all along the periphery of the project of adequate width shall be raised in 33% of total area with a tree density shall not less than 2500 per ha within a time frame of one year shall be submitted. Survival rate of green belt shall be monitored on periodic basis to ensure that survival rate not be less than 80 %.	Agreed and complied.
23.	Socio-economic management plan	Refer chapter10
23.15	Wildlife conservation plan (In case of presence of schedule I species)	Not Applicable
23.16	Total capital cost and recurring cost/annum for environment pollution control measures shall be included.	Total capital cost of environmental protection measure will be Rs 78 Lakh and Total recurring cost will be Rs 16.1 lacs
23.17	Explore possibilities for recycling and reusing of treated water in the unit to reduce the freshwater demandand waste disposal.	Complied. The treated waste water (domestic) is being / will be reused in plantation and dust suppression thereby demand for fresh water will be reduced. In addition to this no other industrial waste water will be generated.
23.18	An Action Plan for improving the house-keeping activities in the raw material handling area need to besubmitted.	Complied.

23.19	Action plan for the stock piles with impervious floor, provision of garland drains and catch pits to trap runoff material shall be submitted.	Complied. The stock piles which primarily consist of raw material and products are being/will be stored in covered sheds with pucca flouring. There is least possibility of runoff and the material being non-hazardous in nature garland drains around the storage are therefore not required.
23.20	Action plan to limit the dust emission from all the stacks below 30 mg/Nm3 shall be furnished.	Complied.
23.21	Action plan for fugitive emission control in the plant premises shall be provided.	Complies. These pollutants are fugitive in the sense they escape from the source without being accounted for. The action plan includes: - - Dust suppression by water sprinkling. - Dry fog system. - Vacuum cleaning - Spillage cleaning. - Use of high capacity equipments. - Systematic, covered and impervious storage.
24.	Conclusion of the EIA study	It is concluded that with the adoption of appropriate mitigation and enhancement measures, there will be improvement in the development of commercial activities, generation of direct and indirect employment opportunities and the overall quality of life in the surrounding area.
25.	In addition to the above, any litigation pending against the project and/or any direction/order passed by any Court of Law against the project, if so, details thereof shall also be included. Has the unit received any notice under the Section 5 of Environment (Protection) Act, 1986 or relevant Sections of Air and Water Acts? If so, details thereof and compliance/ATR to the notice(s) and present status of the case.	Not Applicable.
26.	Air cooled condensers shall be used in the power plant.	NA.
27.	Details of Dry Ash handling system along with supplementary coal handling system shall be submitted.	NA.
28.	Plan for transportation of coal shall be submitted.	NA.
29.	8Plan along with technical details of SCR shall be submitted.	NA
30.	In case of expansion project, Status of Ash Utilization of previous years (up to 5	Not Applicable as there will be no boiler and no ash generating fuel will be used in

	years), action plan for 100% ash utilization along with timeline need to be submitted.	any process operation.

EXECUTIVE SUMMARY

1.0 Project Name and location

i) The Proposed project namely M/s **GOYAL FURNACE PVT LTD** is located at plot no. 168 to 179 & 146 to 160, Phase-III, Industrial Area, Sansarpur Terrace, Tehsil- Jaswan at Kasba Kotla, District – Kangra, Himachal Pradesh.

2.0 Products and capacities

At present, the industry manufactures only MS Ingots @19,200 TPA with Induction Furnace of capacity 7 TPH and one Rolling mill in an area of 8695 sqm. There is proposal to increase the capacity of ingots to 96,600 TPA and structural steel @77,280 TPA by installing another Induction Furnace of capacity 15 TPH and one Continuous Casting Machine. The project area after expansion will be 17,995 sqm.

After expansion the production details will be as under:

Product Name	**Existing (TPA)**	**Proposed (TPA)**	**Total (TPA)**
MS Ingots	19,200	77,400	96,600
Round Angle, Channel, TMT Bars and Flats	Nil	77,280	77,280

3.0 Requirement of land, raw material, water, power, fuel, with source of supply

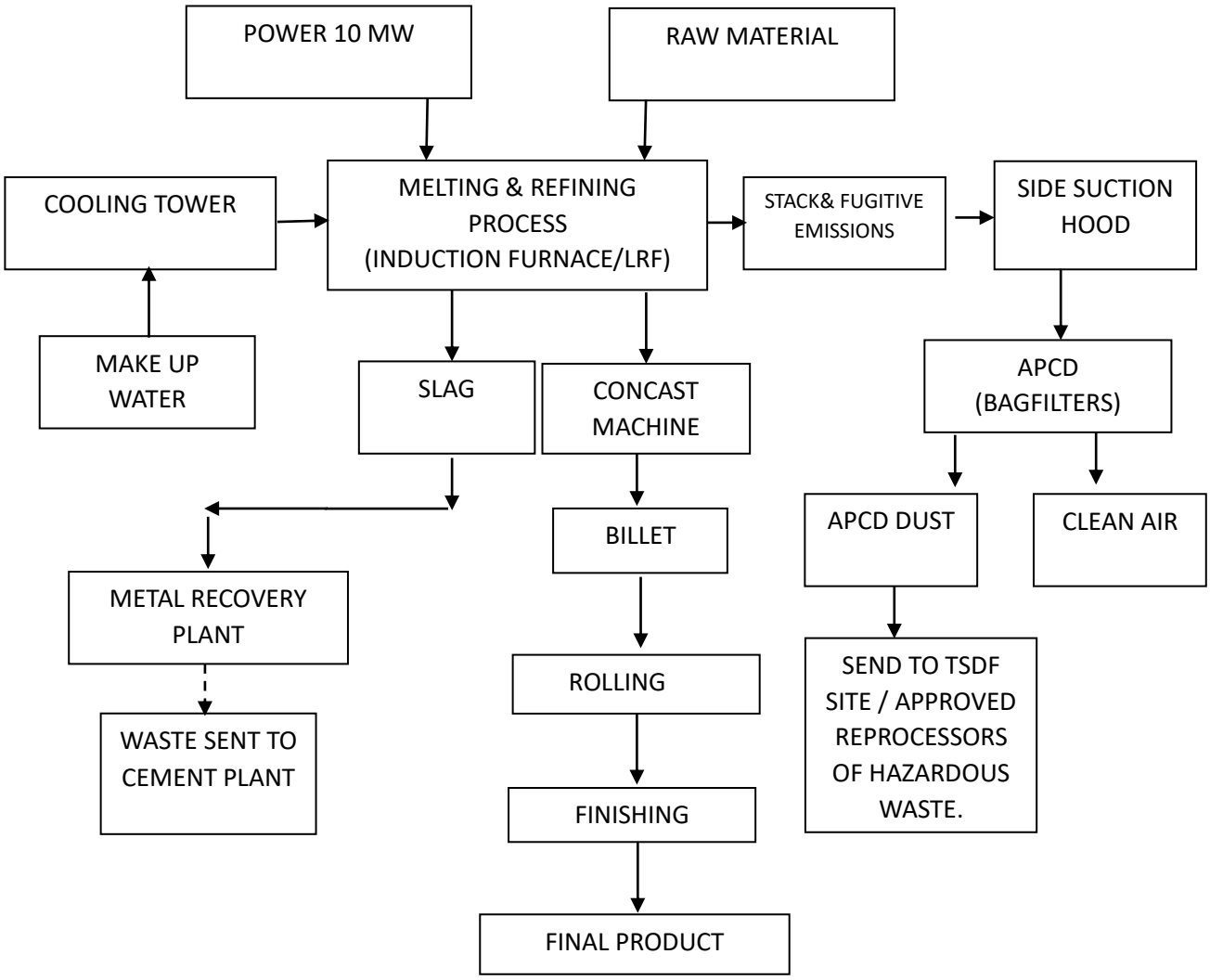
Detail of land, raw material, water, power fuel and source of supply is given below: -

Particulars		**Existing**	**Addition**	**Total**
i) Land		8695 sqm or 2.14 acres	9300 m^2 or 2.298 acre	17995 m^2 or 4.44 acre
		Total		
ii) Raw material (TPA)	MS Scrap (TPA)	10,500	59,052	69,552
	Ferro-alloys (TPA)	11,400	34,968	46,368
	Source & Transportation	Local & international markets and transport through covered trucks		
iii) Water requirement	Domestic	2.0 KLD	3.0 KLD	5.0 KLD
	Cooling (makeup water)	30.0KLD	60.0 KLD	90.0 KLD
	Total	**32.0 KLD**	**63.0KLD**	**95.0 KLD**
iv) Power requirement (KW)		3200 KW	6800 KW	10000 KW
	Source of supply	Himachal		

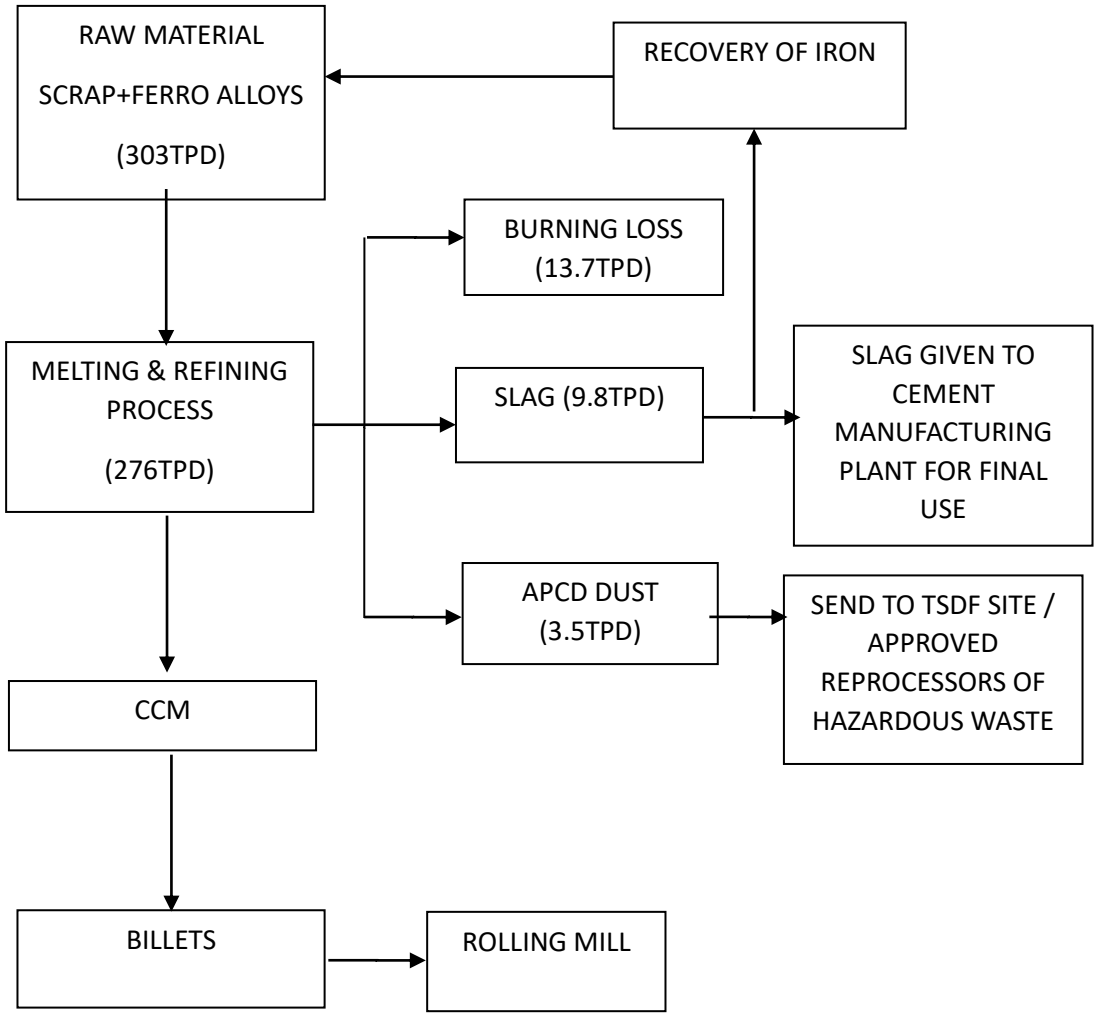
4.0 Process Description:

Firstly, Raw Material i.e., M.S. Scrap/Heavy Melting Scrap is tested in laboratory and if reports are satisfactory then it is issued for the further processing. Testing Raw Material is put in to the Furnace where 1200-1800^{0}C approximately. Temperature is provided to make the raw material melting. Hot raw material is poured into Concast to make steel billet. Hot Steel Billet is taken to seventeen stands (according to size) where it is passed through various sized rolls depending upon size to be produced. After the product is passed through the finishing stand further go in to the coiler to make the coil of steel Round. Steel Round is taken and checked by the quality controller with the help of venire. This inspection is carried out by the quality controller after every hour. Different Bundles are prepared of different sized products and are well placed. Material balance chart & Layout of manufacturing process is given

Manufacturing Process



Material Balance



5.0 Measures on mitigating the impact on the environment and mode of discharge or disposal

The purpose of mitigation measures is to avoid, reduce or minimize unwanted impacts on the environment. To minimize & control the emission from I.F, the exhaust after suction through side suction hood is passed through spark arrestor, air cooling and finally bag filters before its discharge to atmosphere. **The existing coal based reheating furnace for rolling mill will be dispensed with and hot rolling will be practiced thereby eliminating air pollution due to reheating furnace**. DG set is fitted with a canopy and adequate stack to take care of noise and particulate & gaseous emission. About 9.8 TPD of slag which is not a H.W will be generated and the same after recovering of iron will be supplied to manufacturers of cement concrete blocks, pavers & tiles under proper agreement. Treated waste water from septic tank will be used for plantation within the industrial premises. About 3.5 ton/day APCD dust which is also covered under hazardous waste will be sent to TSDF site/ or approved reprocessors of hazardous waste for final disposal.

6.0 Capital Cost of the project and Estimated time of Completion

The total cost of the project after expansion will be ₹ 48.85 Crores including ₹ 35.93 Crores as cost of expansion.

The proposed expansion will be done within one year after granting of Environment Clearance.

7.0 Site Details

4. The proposed project is located at plot no. 168 to 179 & 146 to 160, Phase-III, Industrial Area, Sansarpur Terrace, Tehsil- Jaswan at Kasba Kotla, District – Kangra, Himachal Pradesh. It is having its global coordinates as Latitude 31°55'26.15"N, 31°55'26.75"N, 31°55'22.73"N, 31°55'22.17"N, 31°55'23.19"N, 31°55'21.92"N, 31°55'23.78"N, 31°55'25.04"N & Longitude 75°55'36.23"E, 75°55'38.74"E, 75°55'39.91"E, 75°55'37.39"E, 75°55'36.63"E, 75°55'30.93"E, 75°55'30.33"E, 75°55'36.03"E. Kangra is the nearest city (about 36 Km) approx. and Reri is the nearest village (about 0.63 km, NE). Nearest airport is Gaggal which is at 24.63km. There are three reserved forests found in the study area along with their respective distance and direction from the project site (1) Sambalian RF – 5.5 km in North direction. (2) Karanpur RF – 4.3 km in West direction. (3) Sansarpur RF - 0.67 Km in North

direction. Nearest water body is Beas River which is 3.5 km north.

8.0 Baseline Environmental Data and environmental impacts

Various Environmental factors as existing in the study area which are liable to be affected by the activities have been assessed both quantitatively and qualitatively. Baseline environmental data generation of study area was carried out for the period April to June 2023.

(i) Ambient Air Quality

The $PM_{2.5}$, PM_{10}, SO_2, NO_2, CO levels were monitored at eight locations in the study area for three months. The P98 levels of criteria pollutants are as follows: $PM_{2.5}$ is 38.34 µg/m^3, PM_{10} is 81.76 µg/m^3, SO_2 is 7.79 µg/m3, NO2 is 14.8 µg/m3 and CO is 0.518 mg/ m^3. The baseline air quality level is within the National Ambient Air Quality Standards prescribed for industrial, residential, rural & other area. **(Standards are 60, 100, 80, 80µg/m^3 and 4.0mg/m^3 for $PM_{2.5}$, PM_{10}, SO_2, NO_x and CO respectively).** Due to better pollution abatement facilities in the proposed expansion, there will rather be improvement in the existing air.

(ii) Water Quality

Eight groundwater samples and one surface water sample were collected from the study area for physical, chemical and bacteriological analysis. The groundwater quality of the study is satisfactory. No physical or bacterial contamination was found in the water quality. But bacterial contamination is found in surface water. Since, no waste water will be discharged to the environment, water quality is not likely to be impacted.

(iii) Noise Environment

Ambient noise levels were monitored at 8 locations in the study area. Noise levels at the Project site was found to be 71.4 dB (A) during day time and 67.2 dB (A) at night. The baseline noise levels are borewell within the Noise Standards prescribed by the CPCB. Proposed expansion will not have insignificant impact as there will be no noise generating machinery and process.

(iv) Soil Quality

Eight soil samples were collected from the study area and analyzed. The texture of soil is silt loam. The organic matter, nitrogen, potassium and phosphorus content of the soil are moderate. The pH of all the soil samples is within the acceptable range. No impact on soil

will be there for proposed plant as no waste will be discharged on land.

(v) Biological Environment: Primary and secondary data collection has been done by the Ecology and Biodiversity team for the study of flora and fauna in the core and Buffer Zone.

(v) Socioeconomic Condition:

Socioeconomic status has been studied through secondary sources and by site visits. The study was conducted in respect of social and economic requirements such as health, education, communication, drinking water, employment and infrastructure. The area is well developed in terms of communication and road infrastructure but lacking in adequate drinking water, education and medical facilities for which the proponent will contribute in terms of CSR/ECR activities.

8.0 Possible Hazards & Risks from Secondary Metallurgical Industries

The various process operations, which are having potentially high risk to human exposure and which require highest attention are tabulated below.

Possible Risk

S.No.	Plant Area	Possible Deviation from normal operation	Likely Causes	Consequences
1	Furnace	Re-circulating and cooling water coming in contact with the molten iron or slag.	Leakage of water from the walls Spurting of metal/ slag.	Explosion under extreme cases.
		Presence of Oil & Grease and other Impurities in raw materials.	Fire	Sudden catches fire & flames
2	High Power Transformer	Oil temperature being very high.	Varying room Temperatures.	Sudden flashing of fire or bursting.
3	High Tension Electrical Installation	Heavy sparking at the pot heads and the joints.	Loose joints, cable cut, burning of fuses, short circuits etc.	Sparks in the beginning, devastating fire if neglected.

Likely impact of the project on air, water, land, flora-fauna and nearby population

Base on the study it is concluded that there is little likelihood of adverse impacts on the environment due to project operations

9.0 Emergency Plan

Emergency planning is primary for the protection of plant personnel and people in nearby areas and the environment that could be affected by unplanned hazardous events. Furnaces are associated with fire and electrical hazard due to sudden development of pressure or temperature that leads to damage, injury and death. Temperature and pressure are closely related, and when flammable or combustible mixture is present in process equipment that leads to worst consequences which requires engineering evaluation for worst case scenario.

10.0 CER Activities (Corporate Environmental Responsibility)

As part of CER the company shall adopt nearby villages based on the socio-economic study and the issues raised during the Public Hearing for executing social and environmental activities which will be detailed in the final year report.

11.0 Occupational Health measures

An amount of Rs. 10.0 lakhs have been provided for OHS in the EMP budget.

12.0 Environment Management Cell (EMC)

A duly constituted EMC comprises the following is already in place:

1. Project Promoter/ Director
2. Process Incharge/ GM
3. Environment Consultant

DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

CHAPTER 1.0
INTRODUCTION

1.1 PURPOSE OF THE REPORT

M/s GOYAL **FURNACE PVT LTD** is a renowned steel manufacturing company, located at plot no. 168 to 179 & 146 to 160, Phase-III, Industrial Area, Sansarpur Terrace, Tehsil- Jaswan at Kasba Kotla, District – Kangra, Himachal Pradesh. The project falls under category- B, but located within 5km boundary of Punjab the same as categorized A will be appraised at the Central Level. The purpose of the EIA report is:

- To identify, predict and evaluate the economic, environmental and social impacts of development activities.
- To provide information on the environmental consequences for decision making.
- To promote environmentally sound and sustainable development through the identification of appropriate alternative and mitigation measures.

1.2 IDENTIFICATION OF THE PROJECT & PROJECT PROPONENT

1.2.1 Identification of the Project

The project is brown field and identified by name and style as M/s Goyal Furnace Pvt Ltd. It is a secondary metallurgical process unit based at plot no. 168 to 179 & 146 to 160, Phase-III, Industrial Area, Sansarpur Terrace, Tehsil- Jaswan at Kasba Kotla, District – Kangra, Himachal Pradesh. The present proposal pertains to the enhancement of production to be tune of 96,600TPA ingots and 77,280 TPA of structural steel by induction furnace CCM and Rolling Mill.

1.2.2 Project Proponent

The unit is operated and maintained by Directors. The Directors of the company are:

1. Ilahi Noor Mohammad.

2. Vikas Kumar

All Directors have vast experience in various industries and trades including Steel industry.

1.3 BRIEF DESCRIPTION

1.3.1 Nature of the project

It is an existing unit. At present, the industry manufactures 19,200 TPA of MS Ingots

with Induction Furnace of capacity 7 TPH and one Rolling mill in an area of 8695 sqm.

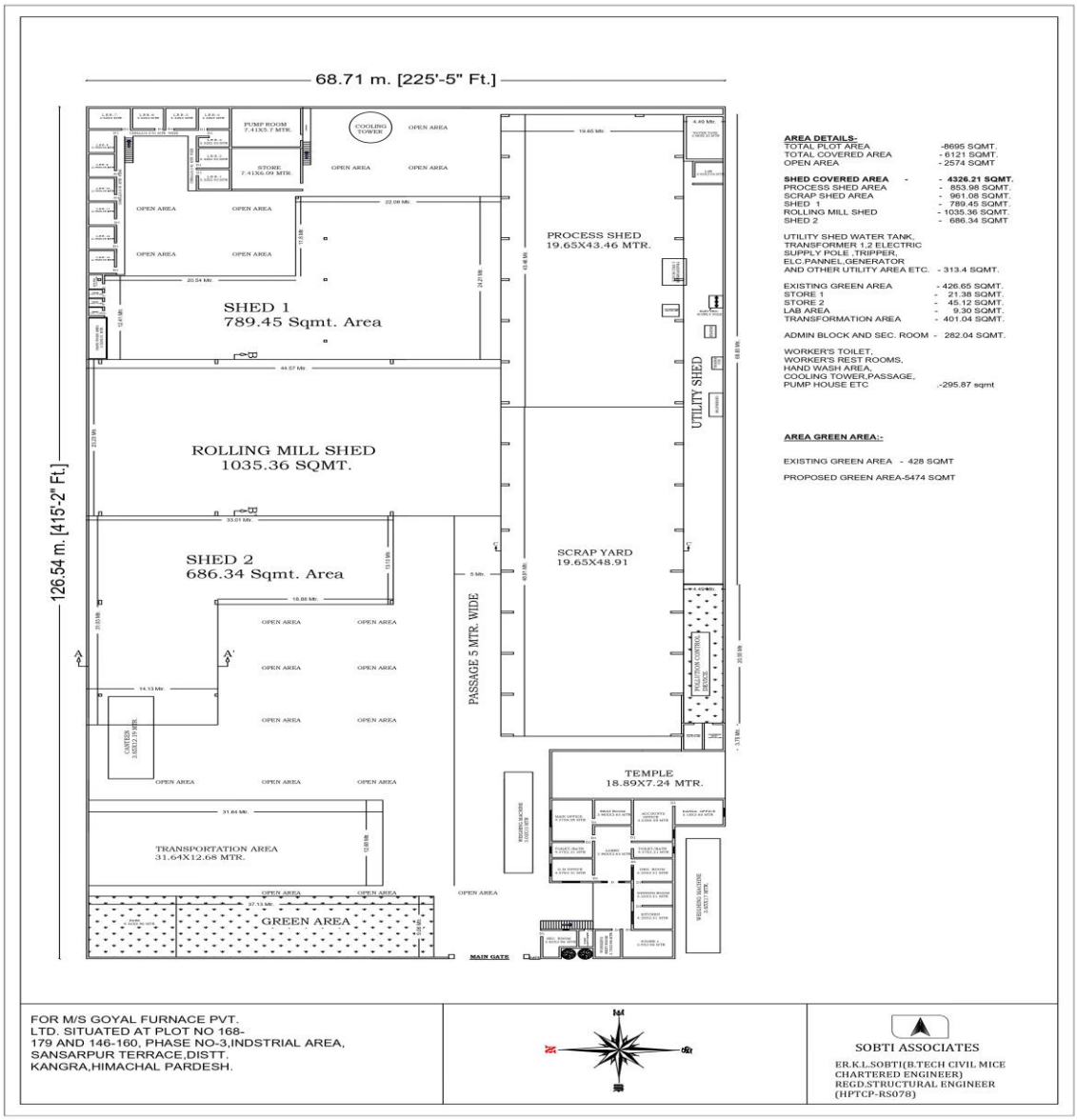
As per G.O.I Notification dated 14/09/2006 and subsequent amendments the project as listed in the Sch. Of EIA notification serial no 3(a) Metallurgical industries (ferrous and nonferrous) qualify for EC.

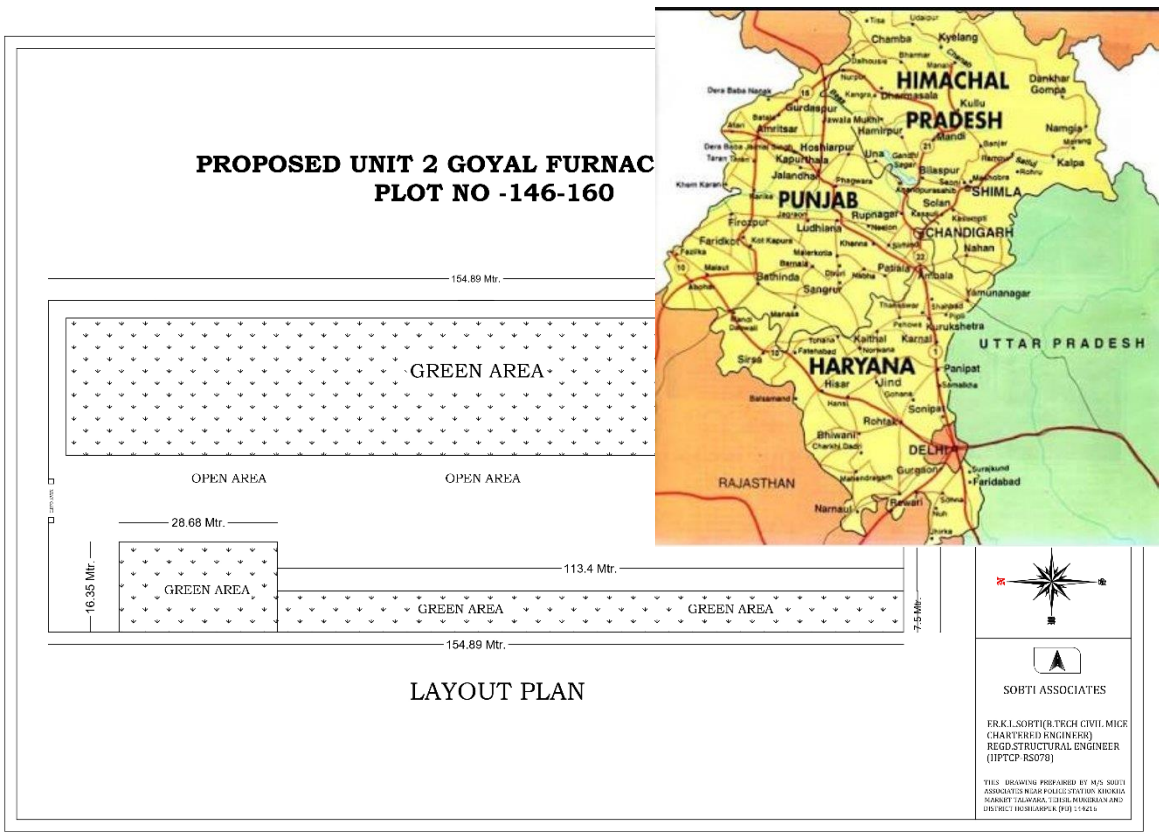
1.3.2 Size of the Project

The total project area of the project is 4.44 Acres. Total of 33% area is allotted for green belt. The current proposal of the project is of expansion for enhancement of capacity. To carry out expansion an additional land measuring 2.29 Acres is acquired by project proponent. Thus, after expansion total project area will be 4.44 Acres. The total production will increase from 19,200 TPA to 96,600 TPA of MS Ingots and 77,280 TPA of Steel Ingots/Billets, Round Angle, Channel, TMT Bars and Flats. The total plot area will be utilized as per the following tables:

Existing Land Measuring – 8695 Sqm	
Description	**Area (in sqm)**
Shed Covered Area	4326.21
Process Shed	853.98
Scrap Shed	961.08
Utility Shed Water Tank, Transformer 1,2, Electric Supply Pole, Tripper, Electricity panel, Generator and other Utility area, etc.	313.4
Existing Green Area	428
Store -1	21.38
Store-2	45.12
Lab Area	9.30
Transformation Area	401.04
Admin Block and Sec. Room	282.04
Worker's bathroom, Toilet, hand wash area, secondary room, workers rest room, colling Tower, Passage etc.	295.87
Total Area	**8695**
Proposed Additional Land Measuring – 9300 Sqm	
Green Area	5938
Open Area	3362
Total Area	**9300**
TOTAL LAND AREA (EXISTING +ADDITIONAL)	8695 + 9300 **= 17995 sqm**

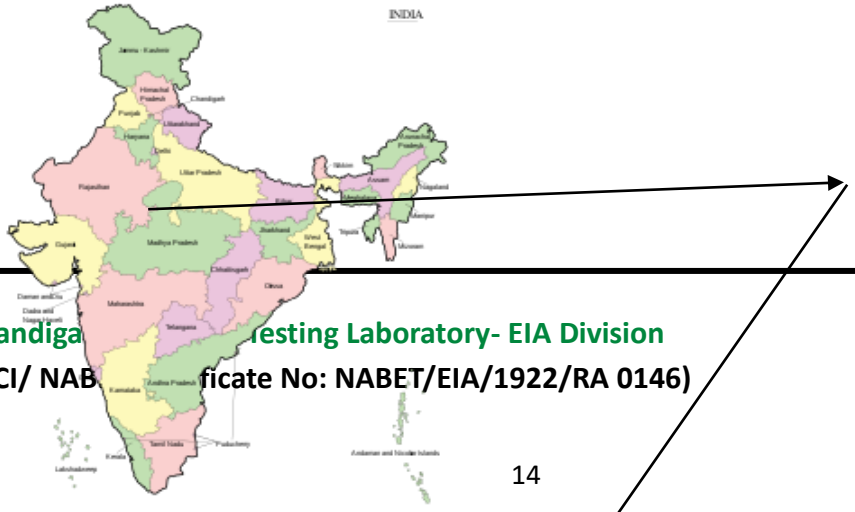
The layout plan of project is given below:





1.3.3 Location of the project

The proposed project is located at plot no. 168 to 179 & 146 to 160, Phase-III, Industrial Area, Sansarpur Terrace, Tehsil- Jaswan at Kasba Kotla, District – Kangra, Himachal Pradesh. The site location map is given below;



Location of Punjab State at Political Map of India

Location of District on Interstate boundary Map

Location of Project Site on District Map

Location of Project Site on Google Earth Map

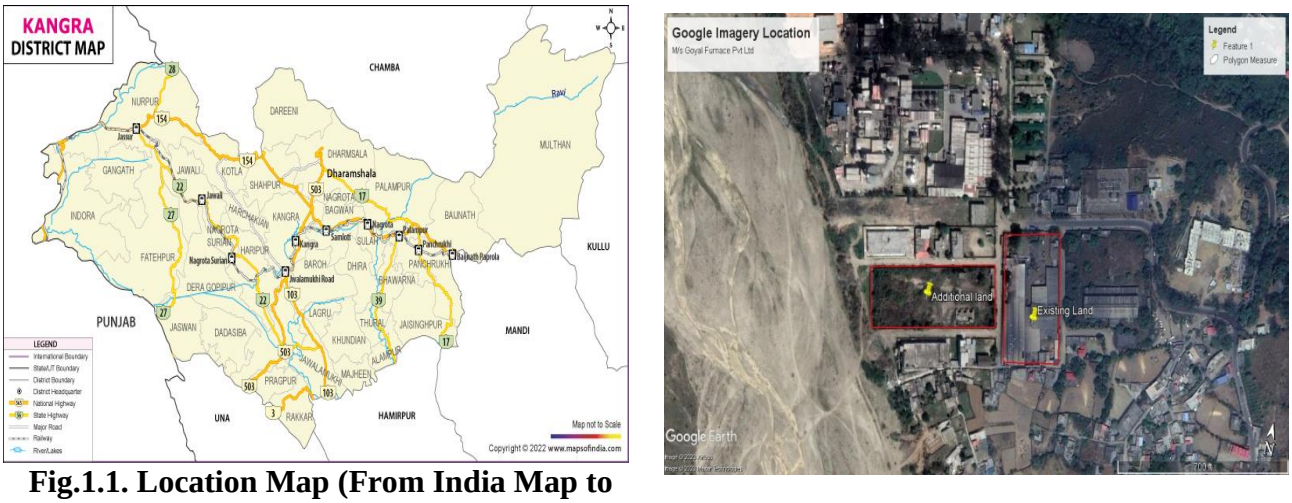


Fig.1.1. Location Map (From India Map to Local Map)

Coordinates of the Project Site

POINT	LATITUDE	LONGITUDE
A	31°55'26.15"N	75°55'36.23"E
B	31°55'26.75"N	75°55'38.74"E
C	31°55'22.73"N	75°55'39.91"E
D	31°55’22.17"N	75°55’37.39"E
E	31°55’23.19"N	75°55’36.63"E
F	31°55'21.92"N	75°55’30.93"E
G	31°55'23.78"N	75°55’30.33"E
H	31°55’25.04"N	75°55’36.03"E
Elevation		**254m**

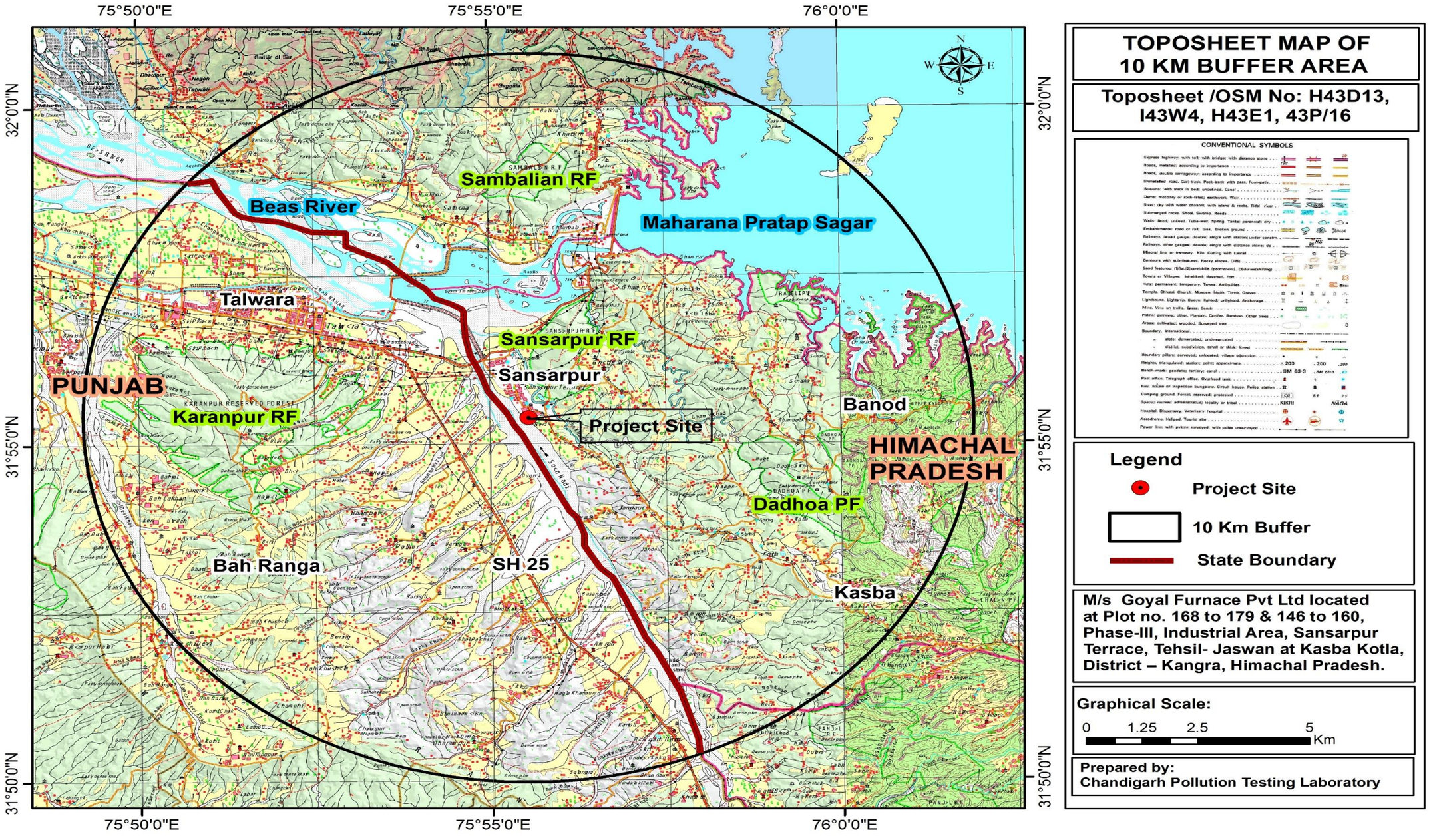
Table 1.1
Project Details

Description	Existing	Additional	After Expansion
Production (TPA)			
MS Ingots	19,200	77,400	96,600
Round, Angle, Channel, TMT bars and Flats	NIL	77,280	77,280
Raw Material (TPA)			
MS Scrap (TPA)	10,500	59,052	69,552
Sponge Iron (TPA)	11,400	34,968	46,368
Machinery			
Induction Furnace	1X7TPH	1X15 TPH	1X7 TPH 1X 15TPH
CCM	Nill	01 No.	01 No.
Rolling Mill	01 No.	Nill	01 No.
Generals			
Project Cost (Crores)	Rs 12.92 Cr	Rs 35.93 Cr	Rs 48.85 Cr
Land	8695 sqm	9300 sqm	17995 sqm
Power (KW)	3200	6800	10000
DG Set	2x325 KVA each	--	2x325 KVA each
Manpower (No’s)	34	56	90

Working days	24 hrs 350 working days in year

Fig 1.2 General Location map

Fig 1.3 Map showing Study Area and Project Site



1.3.4 Importance of the Project to the Country, Region

The growth in the Indian steel sector has been driven by domestic availability of raw materials such as iron ore and cost-effective labor. Consequently, the steel sector has been a major contributor to India's manufacturing output. India's crude steel output grew 10.7 per cent year-on-year to 25.76 million tons (MT) during January-March 2017. India's crude steel output during April 2017 grew by 5.4 per cent year-on-year to 8.107 MT. India's finished steel exports rose 102.1 per cent to 8.24 MT, while imports fell by 36.6 per cent to 7.42 MT in 2016-17. India's steel exports rose 142 per cent in April 2017 to 747,000 tons over April 2016, while imports fell by 23 per cent to 504,000 tons in April 2017 over April 2016. Total consumption of finished steel grew by 3.4 per cent year-on-year at 6.015 MT during April 2017 *(Source: Indian Brand Equity Foundation).*

For a developing country like India, Iron & Steel Industry has a pivotal role to play as a pre-requisite for industrial, construction and infrastructural development. As per report of World Steel Association (WSI), India has surpassed US and became third largest producer of Steel. The region will be benefited by:

- Economic upliftment of suppressed class
- Bridging demand –supply gap
- Infrastructural development of the area
- Employment to locals
- Revenue to state exchequer

1.4 Scope of the study

The work involved in EIA was in conformity with Sector specific EIA Technical Guidance manual and circulars issued by MOEFCC and TOR issued by Ministry Dated 30-05-2023.Summerized compliance details in respect of terms of reference have been addressed separately

1.4.1 Methodology

The methodologies mention in the Technical EIA Guidance Manuals for IEF, EAF, Cupola furnace prepared by MOEFCC is followed for conducting the baseline environmental survey. Field monitoring for meteorology, air quality, water quality, soil quality and noise was carried out to evaluate the baseline environmental conditions which constitutes major part of baseline study. Additionally, parameters and aspects like land use, ecology and biodiversity and socio-economic studies were carried out during study period. `

CHAPTER 2.0

PROJECT DESCRIPTION

2.1 TYPE OF PROJECT

The proposed project is a Brownfield project involving steel manufacturing by secondary metallurgy. Secondary metallurgical processes are the production processes that start with the output of the ore reduction process. Scrap, salvage and ingots as input to the industry and its products are semi-finished products and finished products. It includes the melting, giving the aimed shape to the final output, through forming, pouring liquid metal and alloys to the mould cavity and forging.

As per EIA Notification, 2006 and its subsequent amendments, the project falls under category- B. But due to interstate boundary of Himachal Pradesh and Punjab the project satisfies the General Conditions and will be appraised by GOI in the MOEFCC.

2.2 NEED FOR THE PROJECT

Metals constitute a key input to other manufacturing sectors like engineering, electrical and electronics, automobile and automobile components, packaging and infrastructure. The performance of the metal sectors is therefore a reflection of the overall economy. The outlook for the metal sector in India is bright. Sustained growth is expected across all key segments, aided by several factors, such as growing domestic demand, investment in capacity addition, increasing supply deficit in other countries and favorable government regulations. In order to cater to growing need of steel/ sponge iron in this competitive scenario of M/s GOYAL FURNACE PVT LTD has identified this opportunity and has decided to become a competitive leader in boosting field of metallurgical sector.

2.3 LOCATION

The proposed project site is located at plot no. 168 to 179 & 146 to 160, Phase-III, Industrial Area, Sansarpur Terrace, Tehsil- Jaswan at Kasba Kotla, District – Kangra, Himachal Pradesh. No, ecologically sensitive area such as National Park, Biosphere Reserve, Bird Sanctuary, Wet land, Migratory Corridor of Wild Elephant are found with-in 10 km radius of the project site. There is one water body near project site i.e., Beas River – 3.5 km, N. It is well connected by road.

Fig 2.1 Location at Google Image

Fig 2.2 500m radius Google Earth Map

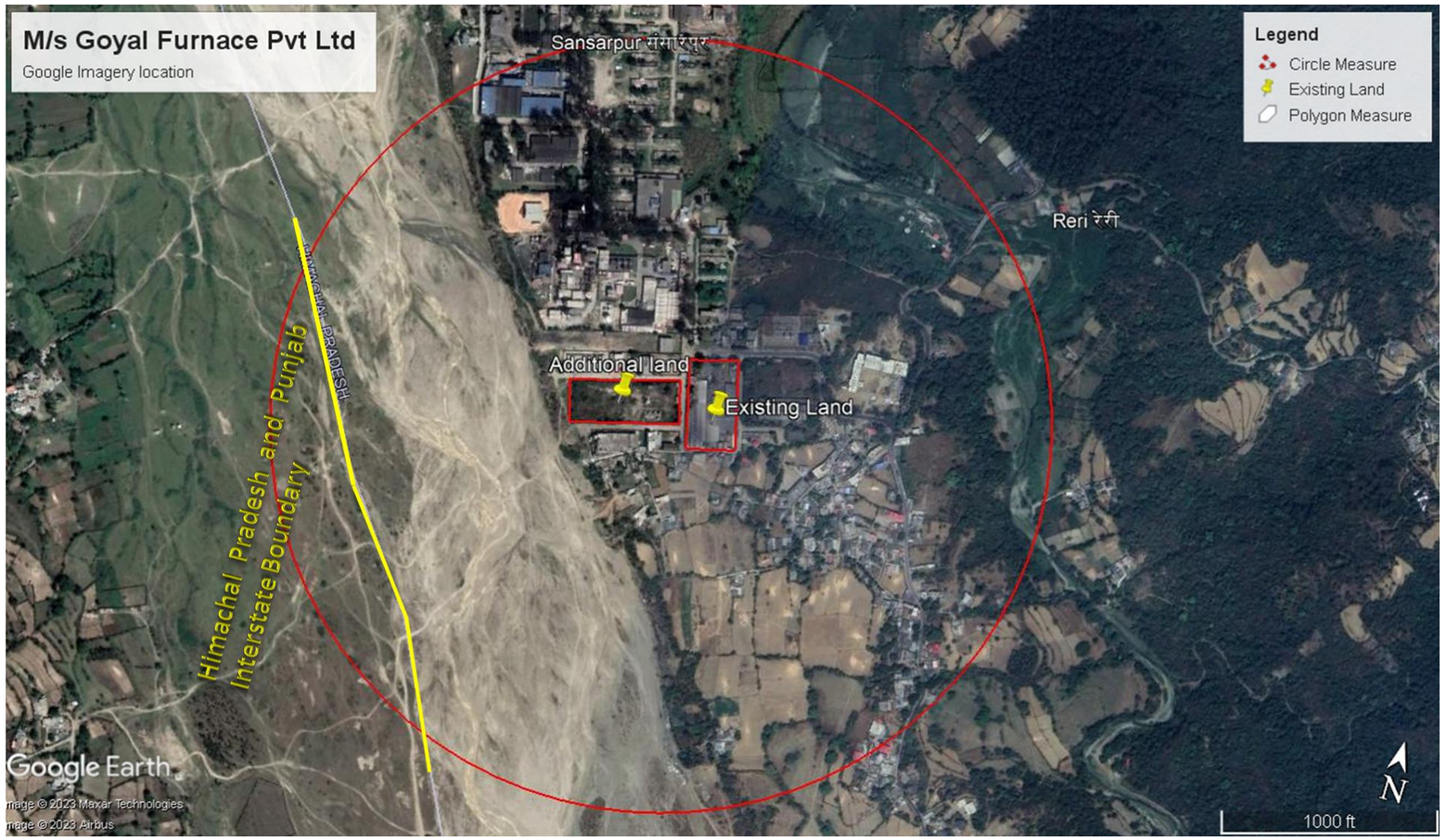


Figure 2.3
Pillar Co-ordinates

2.4 SIZE AND MAGNITUDE OF OPERATION

The total project area is 17995 sqm and 33% of the plot area amounting to 5938sqm is allotted for green belt. The site layout along with land distribution of existing unit and proposed expansion has already been given.

2.4.1 Proposed Product Details

The project is for substantial expansion in MS Ingots, Round, Angle, Channel, TMT bars and Flats by addition of one new Induction Furnace of capacity 15 TPH and one Continuous Casting Machine. Thus, the total production will increase from 19,200 TPA to 96,600 TPA of MS Ingots and 77,280 TPA of Steel Ingots/Billets, Round Angle, Channel, TMT Bars and Flats.

After expansion the production details will be as under:

Description	Existing	Additional	After Expansion
Production (TPA)			
Steel Ingot/Billets (TPA)	19,200	77,400	96,600
Rounds, TMT Bars, wire rode, Flats and structural steel	NIL	77,280 TPA	77,280

2.4.2 Raw Materials

The principle raw materials such as Iron Scrap, Ferro Alloys and sponge Iron are indigenously and internationally available. The details of raw material requirement and their mode of transportation is given in the table below:

Raw Materials	Existing	Proposed	After Expansion
MS Scrap (TPA)	10,500	59,052	69,552
Sponge Iron (TPA)	11,400	34,968	46,368
Source &Transport	Local & International Markets & transport through covered Trucks.		

2.4.3 Land Description

The project has already acquired land of 4.44 Acres (17995 Sqm.). Further, proposed expansion will be carried out in the existing land. Thus, no additional land is required for the proposed expansion. Land breakup detail is given in **Table 2.2** below:

Table 2. 1
Land Area Breakup

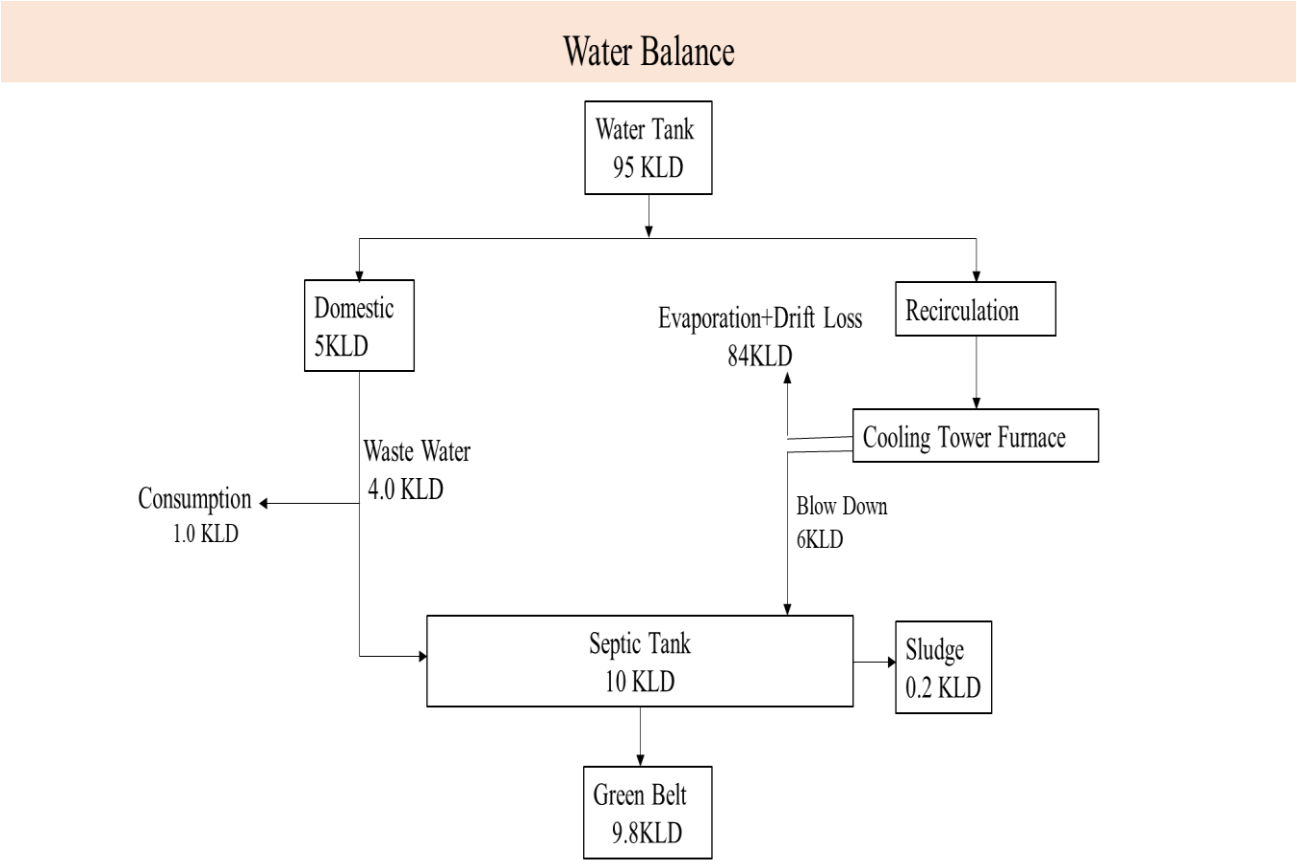
Existing Land Measuring – 8695 Sqm	
Description	**Area (in sqm)**
Shed Covered Area	4326.21
Process Shed	853.98
Scrap Shed	961.08
Utility Shed Water Tank, Transformer 1,2, Electric Supply Pole, Tripper, Electricity panel, Generator and other Utility area, etc	313.4
Existing Green Area	428
Store -1	21.38
Store-2	45.12
Lab Area	9.30
Transformation Area	401.04
Admin Block and Sec. Room	282.04
Worker's bathroom, Toilet, hand wash area, secondary room, workers rest room, cooling Tower, Passage etc	295.87
Total Area	**8695**
Proposed Additional Land Measuring – 9300 Sqm	
Green Area	5938
Open Area	3362
Total Area	**9300**
TOTAL LAND AREA (EXISTING +ADDITIONAL)	8695 + 9300 **= 17995 sqm**

2.4.4 Water Requirement

Water requirement for the unit which primarily will be makeup water for cooling and for domestic purpose will be met from the existing tube wells. The detail of water requirement is given below: -

DESCRIPTION	EXISTING REQUIREMENT	PROPOSED REQUIREMENT	TOTAL REQUIREMENT
Domestic	2.0 KLD	3.0 KLD	5.0 KLD
Cooling (makeup water)	30.0 KLD	60.0 KLD	90.0KLD
Total	**32.0 KLD**	**63.0KLD**	**95.0 KLD**

Fig 2.4. Water Balance Diagram



2.4.5 Power Requirement

The Power Requirement will be met by sourcing the power from Himachal Pradesh State Electricity Board as per the requirement Himachal Pradesh State Electricity Board as per the requirement given below

DESCRIPTION	EXISTING REQUIREMENT	ADDITIONAL REQUIRMENT	AFTER EXPANSION
Power Requirement	3200 KW	6800 KW	10000 KW
Source- Himachal Pradesh State Electricity Board (HPSEB)			

2.4.6 Manpower Requirement

The proposed project shall generate direct employment for additional 56 persons and the total men power after expansion will be 90 as per the details below:

S.No.	Description	Nos.
i)	Rolling Mill In charge	1
ii)	Quality In charge	2
iii)	Marketing In charge	2
iv)	Shift Engineers	3
v)	Supervisors	4
vi)	Foreman	4
vii)	Workers	66
viii)	Clerks	6
ix)	Accountants	2
	Total	**90**

The direct employment figure presented above is for the regular plant operations at full capacity.

2.4.7 Major Equipments & Machineries

There is proposal to install one new Induction Furnace of capacity 15 TPH and one Continuous Casting Machine. The following are the major equipments & machineries to be used in proposed manufacturing unit:

A	DETAILS OF EQUIPMENTS AND MACHINERIES			
1	Induction Furnace	1x7 TPH	1x15 TPH	1x7 TPH 1x15 TPH
2.	Rolling Mill	01 no.	NIL	01 No.
3.	CCM	NIL	01 No.	01 No.
4.	DG sets	2x325KVA	----	2x325KVA

2.5 PROPOSED SCHEDULE FOR APPROVAL AND IMPLEMENTATION

The proposed expansion will be completed within one year after granting of Environment Clearance.

2.6 TECHNOLOGY AND PROCESS DESCRIPTION

Firstly, Raw Material i.e., M.S. Scrap/Heavy Melting Scrap is tested in laboratory and if reports are satisfactory then it is issued for the further processing. Testing Raw Material is put in to the Furnace where 1200-1800^{0}C approximately. Temperature is provided to make the raw material melting. Hot raw material is poured into Concast to make steel billet. Hot Steel Billet is taken to seventeen strands (according to size) where it is passed through various sized rolls depending upon size to be produced. After the product is passed through the finishing stand further go in to the coiler to make the coil of steel Round. Steel Round is taken and checked by the quality controller with the help of venire. This inspection is carried out by the quality controller after every hour. Different Bundles are prepared of different sized products and are well placed. Material balance chart & Layout of manufacturing process is given **2.5 & 2.6**

Fig 2.5: Flow Chart of Manufacturing Process

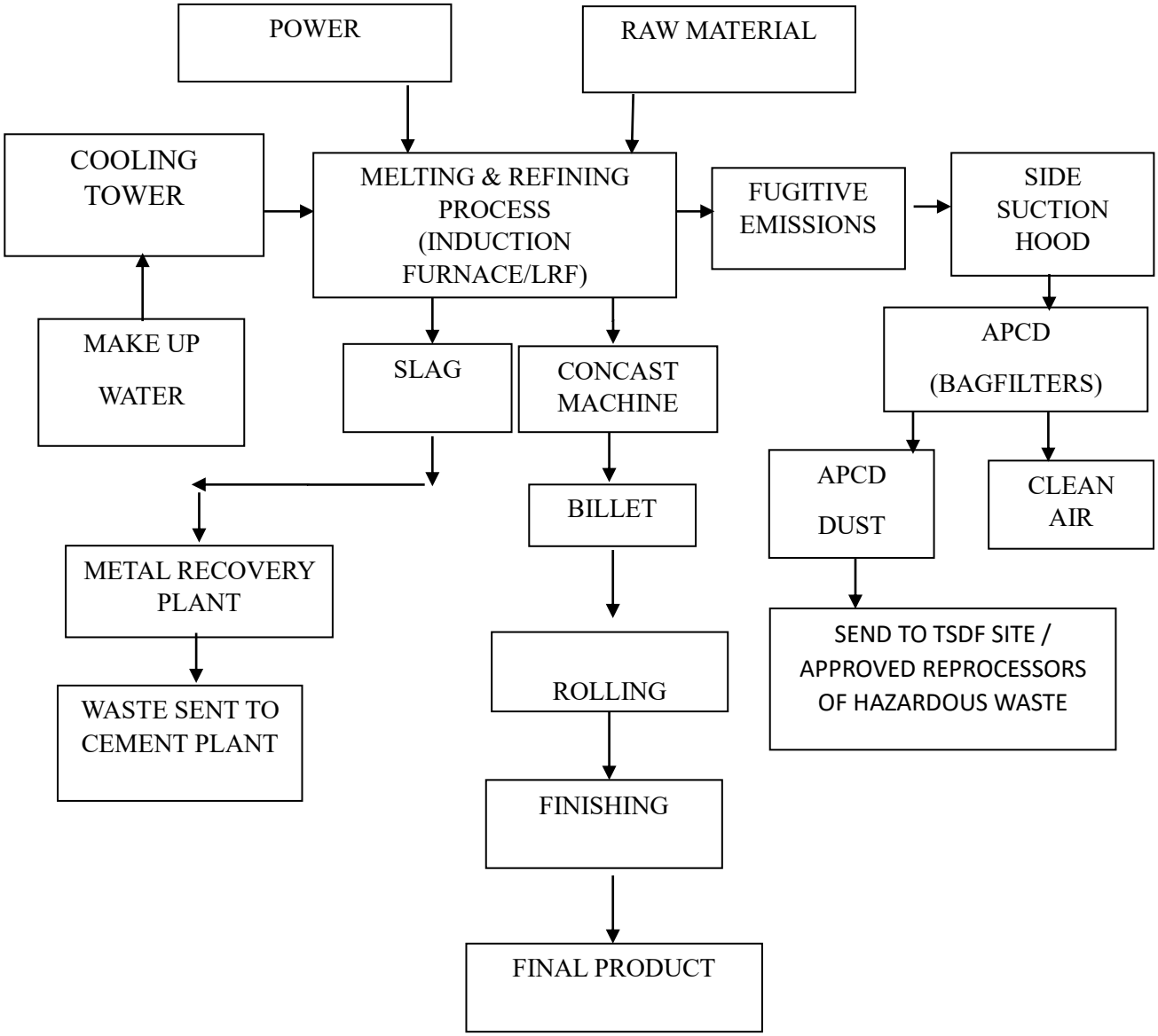
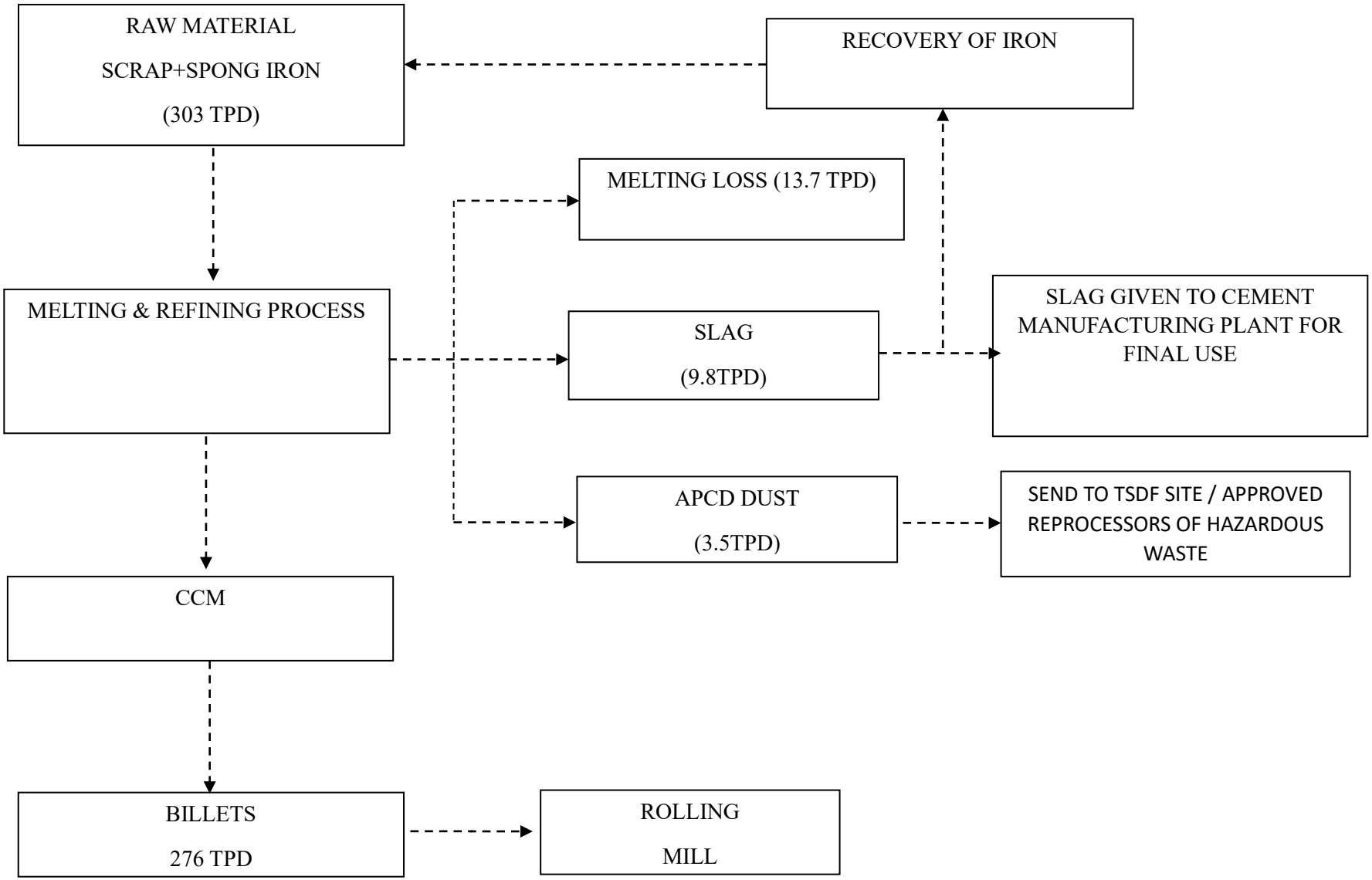


Figure 2.6 Material Balance



Standard Operating Procedure (SOP) as devised by CPCB for operation and maintenance of APCD shall be followed.

During Charging & melting

- Scrap will be segregated for explosives and closed containers.
- The segregated scrap will be freed from oil, paint and grease before charging the same to I.F, maintained at 300^0C and passing the volatile emission through bag filter via suction hood with adequate suction.
- The scrap will be cut to size less than the size of crucible.
- No overcharging of furnace will be practiced and dense charge as for as practicable will be charged.

Air Pollution Control

- Bag filters with pulse jet filtration will be used.
- Rotatory air lock will be operated for collection of dust from hopper.

Maintenance of bag filter

- The pressure drop across the bags will be maintained with U- tube manometer and maintained 3-6'' (76-152mm).
- Maintainace schedule shall be strictly followed and remained maintained.

Temperature

- The temperature of flue gas will be maintained between 100-120^0c by proper air cooling.

Compressor

- For pulse jet of air, a compressor capable of delivering compressed air of pressure 6-7 kg/cm^2 shall be provided. The air will be free of oil and moisture. Recommendation of manufacturer should be followed.

Fan Maintenance

Shall be carried out as per the maintenance schedule

2.7 DESCRIPTION OF MITIGATION MEASURES

The purpose of mitigation measures is to avoid, reduce or minimize unwanted impacts on the environment. The detailed impact prediction and its mitigation measures are given at Chapter 4. However, the generic detail with regard to mitigation measures to be taken is delineated as under:

2.7.1 Air pollution control

- To minimize & control the emission from Induction Furnace and ladle refining

furnace, the process emission will be collected and sucked by installing well designed side hood. The emissions so collected will be passed through spark arrestor, air cooling and finally bag filters before its discharge to atmosphere. The APCD will be installed based on latest technology to contain the concentration of particulate matter in the process of within the standards laid down by the MoEFCC/PPCB.

- DG set is attached with a stack of adequate height for dispersion of pollutants of exhaust gases into the atmosphere at the required height.

2.7.2 Solid and hazardous waste control

- About 9.8 TPD of slag will be generated and the same after recovering of iron contents will be supplied to manufacturers of cement concrete blocks, pavers & tiles under proper agreement.
- APCD dust of about 3.5 TPD will be sent to TSDF Site/ or approved reprocessors of hazardous waste for final disposal.

2.7.3 Water pollution control

No wastewater will be generated from process, only domestic wastewater will be generated which will be treated in septic tank. The treated wastewater will be used for irrigation of plantation area developed within the industrial premises.

2.7.4 Noise pollution control

- Loading and unloading of raw material and product will be carried out especially during day time by taking necessary mitigation measures at the sources to rule of the possibility of increase in the ambient noise levels due to these activities.
- DG set is fitted with a canopy to contain the sound pressure level within the prescribed limits. Further the machinery, which is lively to cause increase in the ambient noise level, will be kept in good condition at all the times to rule out the possibility of contribution of noise level in the atmosphere.
- Green belt will be provided in the open areas to attenuate the noise levels to be generated from various activities/sources as mentioned above. In addition, this green belt will help to attenuate the fugitive emissions to be generated from the premises of the unit.
- Ear muff/plug will be provided to all workers working at noisy area.

A tabular presentation of mitigation measures is given below:

	EXISTING			
S. No.	**Source**	**No.**	**Fuel**	**APCD**
1.	Induction Furnace	1x7 TPH	Electricity	Bag Filters
2.	D.G. Set	2x325KVA	HSD	Stack of adequate height provided

3.	Rolling Mill	01 no.	Coal	Two stage Alkali Scrubber.
After Expansion				
1.	Induction Furnace	1X7TPH & 1X15TPH	Electricity	Bag Filters
2.	D.G. Set	2X325 kVA	HSD	Stack of adequate height provided
3.	Concast	01 No	-	-
4	Rolling Mill	01 No.		Not required as Hot rolling will be practiced.
Hazardous Waste				
S.No.	**Waste Category**	**Quantity**		**Disposal**
1.	35.1 Flue gas cleaning residue	3.5 TPD	Send to TSDF site/ or approved reprocessors of hazardous waste for final disposal	
2.	5.1 Used oil/Spent oil	0.5 Kl/annum	Authorized Recyclers/Lubricant within the industry	
Solid Waste				
S.No.	**Waste Category**	**Quantity**		**Disposal**
1.	Slag	9.8 TPD	Sent to manufactures of tiles, blocks and pavers	

CHAPTER 3.0

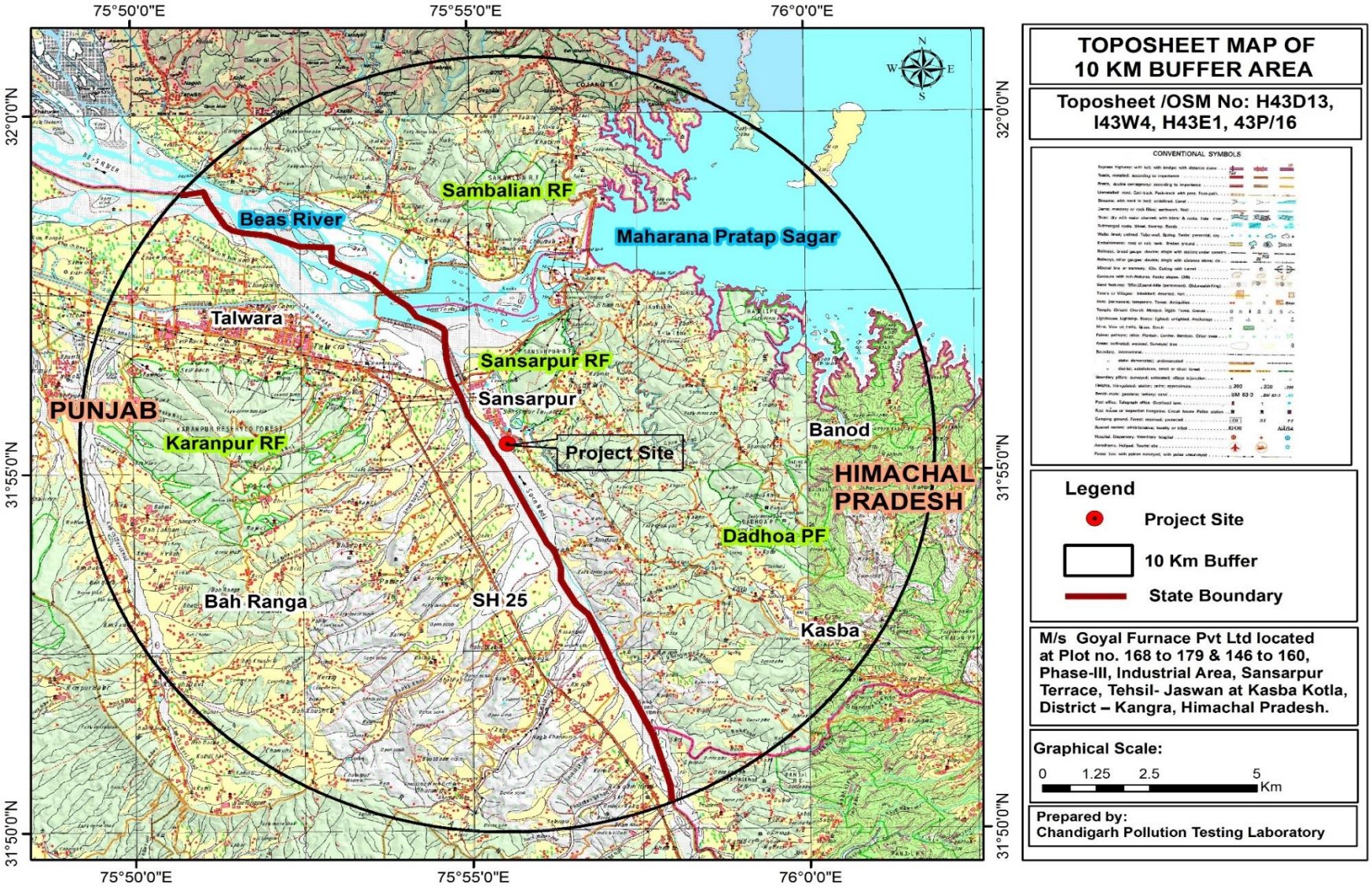
DESCRIPTION OF THE ENVIRONMENT

3.1.1 Study Area

As a precursor for the prediction of various types of environmental impacts likely to arise due to implementation of the project, it is essential to establish the baseline environmental setting of the physical, natural and socio-cultural environmental parameters along the project and within the project influence area. The data was generated through primary data collection (direct monitoring) and secondary sources (published data).

This chapter incorporates the description of existing environmental status in this study area encompassing 10 km radius around the project site. The 10 km radius map is attached below.

Figure 3.1: Map Showing Eco-Sensitivity of the Study Area



3.1.2 Study Period

The baseline environmental monitoring for the expansion project has been collected from to June 2023. Initially, a reconnaissance survey of the study area was carried out for monitoring station selection and then field monitoring for measuring primary data was carried out following the SOP of organization. In addition, certain aspects like land area, socio-economic status, past meteorological conditions, etc., have been analyzed based on secondary information available from sources like district census reports, district gazetteers, Indian meteorological department, etc. The baseline status of various environmental components is described in the succeeding sections.

3.1.3 Components of Study

This chapter contains information on existing environmental scenario for the following parameters.

1. Meteorology
2. Air Environment
3. Water Environment
4. Noise Environment
5. Soil Environment
6. Geology & Hydrology
7. Land Environment
8. Biological Environment
9. Socio-economic Environment

3.1.4 Methodology

For the present study, all the sampling locations are marked with the help of Google maps and site visits. The land use/ land cover map has been generated on 1:50,000 scale using Satellite imagery and ground truth information. The baseline environmental quality has been assessed during April to June 2023. Samples of Air, Water, Noise and Soil from the site and nearby areas have been collected and analyzed for the study of existing condition. The baseline data is generated through field study within the impact zone for various components of the environment viz. Air, Noise, Water, Land, Ecology and Socio-economic. While generating the baseline status of physical and biological environment of the study area, the concept of impact zone has been considered. The methodologies for various environmental facets are as follows:

1. Meteorological Data

Meteorological data of project site has been used for the study and for reference a secondary data was obtained from Indian Meteorological Department (IMD). The important parameters considered were temperature, humidity, wind speed, wind direction and rainfall.

2. Ambient Air Quality

The guidelines for selections of ambient air monitoring stations and analysis of air pollutants as given in IS – 5182 part 14, 2000 (Guidelines for planning the sampling of atmosphere) and 'Guidelines for Ambient Air Quality Monitoring' by CPCB respectively were followed.

3. Water Quality

Grab sampling was done for ground and surface water. Water samples were taken as per the Standard Methods (IS 10500: 2012 & APHA, 23rd Edition). Necessary precautions were taken during sampling and preservation of samples.

4. Noise Quality

At each station noise level was monitored for day and night once in a season as per IS 9989:1981. As sensitive receptors are the prime consideration for sound levels, the monitoring locations are the same as those decided for ambient air quality monitoring.

5. Soil Quality

For soil, augur method was used and samples were collected at 15-25 cm depth after removing the upper crust.

6. Geology and Hydrogeology

Field survey has been conducted to verify secondary data.

7. Land Use

The land use/ land cover map has been generated on 1:50,000 scale using Satellite imagery and ground truth information.

8. Biological Environment

Primary and secondary data collection has been carried out by the Ecology and Biodiversity expert/ team for the study of flora and fauna in the core and buffer zone.

9. Socio Economic Environment

For demography and socioeconomics, secondary data block wise data has been collected and used for the assessment of impacts. Field survey has been conducted to verify secondary data.

3.2 ENVIRONMENTAL BASELINE DATA COLLECTION

Baseline data for the proposed plant has been collected in non-monsoon season**.** Primary data has been collected by monitoring & surveying of various environmental components/ parameters, as per detail given in **Table - 3.1.**

Table-3.1

Primary Data

S. No.	Parameters	Description
1	Meteorology	Meteorological parameters on hourly basis at project site. Parameters: Temperature, Relative humidity, Wind Speed & Wind Direction.
2	Air	Ambient air quality monitoring (24 hourly), twice a week. Parameters are PM_{10}, $PM_{2.5}$, SO_2, NO_2 & CO. No. of Locations: 8 locations in core and buffer zone.
3	Noise	Noise level monitoring (Day & Night time), once in a season. No. of Locations: 8 locations in core and buffer zone.
4	Water	Ground water sampling, once in a season. No. of Locations: 8 locations in core and buffer zone. Tested for physical, metallic, bacteriological and chemical parameters.
5	Soil	Soil sampling, once in a season. No. of Locations: 8 locations in core and buffer zone.
6	Geology & Hydrogeology	Field survey, once in a season. Location: Core and buffer zone.
7	Biological Factors	Biodiversity survey, once in a season. Location: Core and buffer zone.
8	Socio-economic Environment	Socio-economic survey, once in a season. Location: Core and buffer zone.

3.3 METEOROLOGY

3.3.1Climatic conditions

The project area is located in the foot hills of Shivalik Range and experiences a pleasant Climate throughout the year. The average altitude of the region is from 350 meter to 700

meter above sea level. The region generally experiences three seasons. The winter season spans from October to February and the summer from March to June. By July the rainy season starts in the hilly region and ends in September. During winter the days and nights are very cold.

- Summer – March to June
- Monsoon – July to August
- Winter Season – October to February

In order to study the meteorology of the project area, site specific one season meteorological data was collected. Annual Weather Averages & Windrose diagram is provided at **Fig 3.1** and **Fig 3.2** respectively.

3.3.2 Temperature

April, May and June are the hottest months with daily average temperature going up to 30°C and minimum average daily temperature as 24°C. Hot scorching dust laden winds blow during the summer season and on individual days the temperature sometimes goes a little above 40°C. With the on-set of monsoons in July there is appreciable drop in temperature but due to increased moisture in the air the weather becomes uncomfortable. After monsoon in September the night temperature drops appreciably. December and January are the coldest months when the maximum average daily temperature is around 22°C and minimum about 6°C. Monthly average temperatures and rainfall of the area are given in **Table 3.2.**

3.3.3 Rainfall

The rainfall in the zone is caused by the Southwest monsoon. It starts in the month of July and extends up-to the end of September. During this period the monsoon rain-fall contributes about 70 to 80% of the total annual rainfall. The average annual rain fall is in the range of 1010mm. The annual numbers of rainy days on an average are about 62 in a year, out of which about 30 falls in the monsoon period of July to September. Annual weather averages in given in **Table 3.1`**

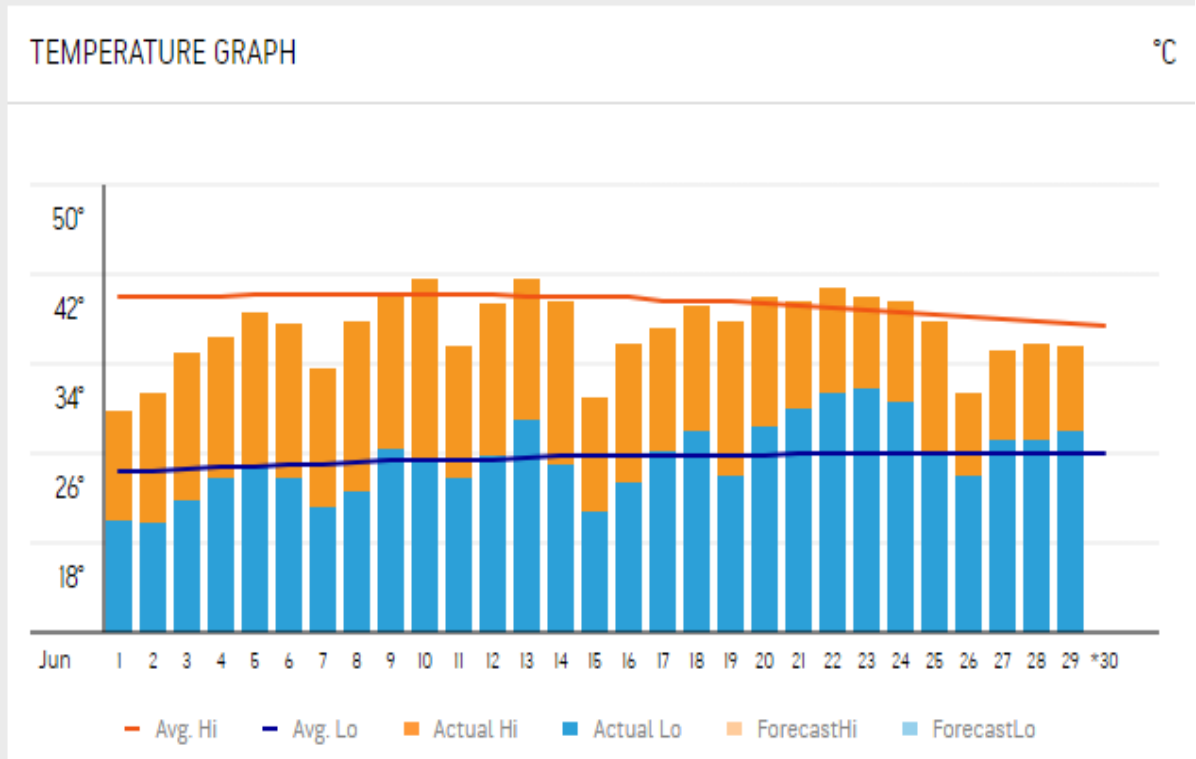
Source: WorldWeatherOnline.com

3.3.4 Micro-Meteorology at Site

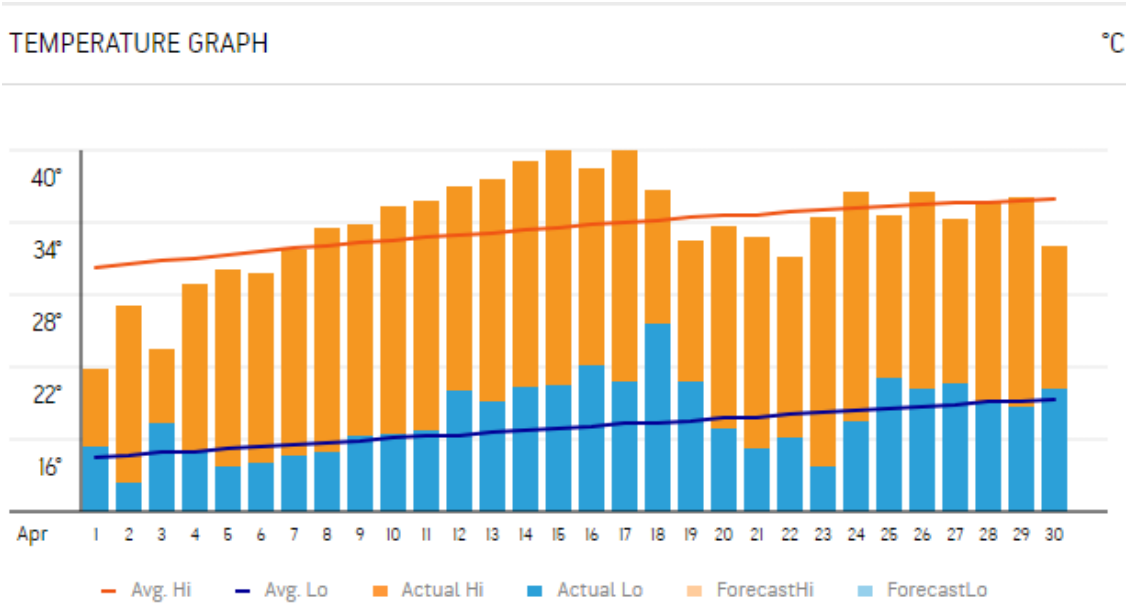
Meteorological station was set-up at site to record surface meteorological parameter during the study period. Wind rose diagram for the study period is given at Figure 3.2.

Summary of the micro-meteorology at site is given below**.**

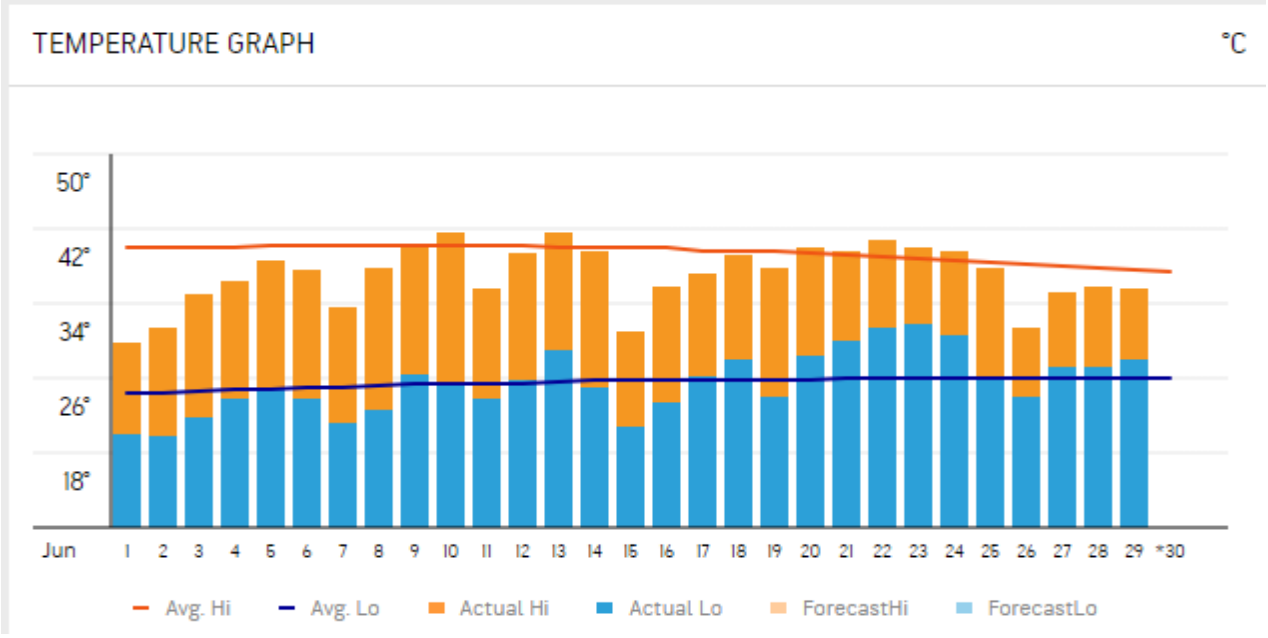
Month	Temperature(°C)		Relative Humidity (%)
	Max.	Min.	Average
April,2023	28	20°C	41%
May, 2023	31°C	18°C	34%
June 2023	32°C	20°C	47%



Tab. 3.2 Graph for the month of April2023



Graph for the month of May 2023



Graph for the month of June 2023

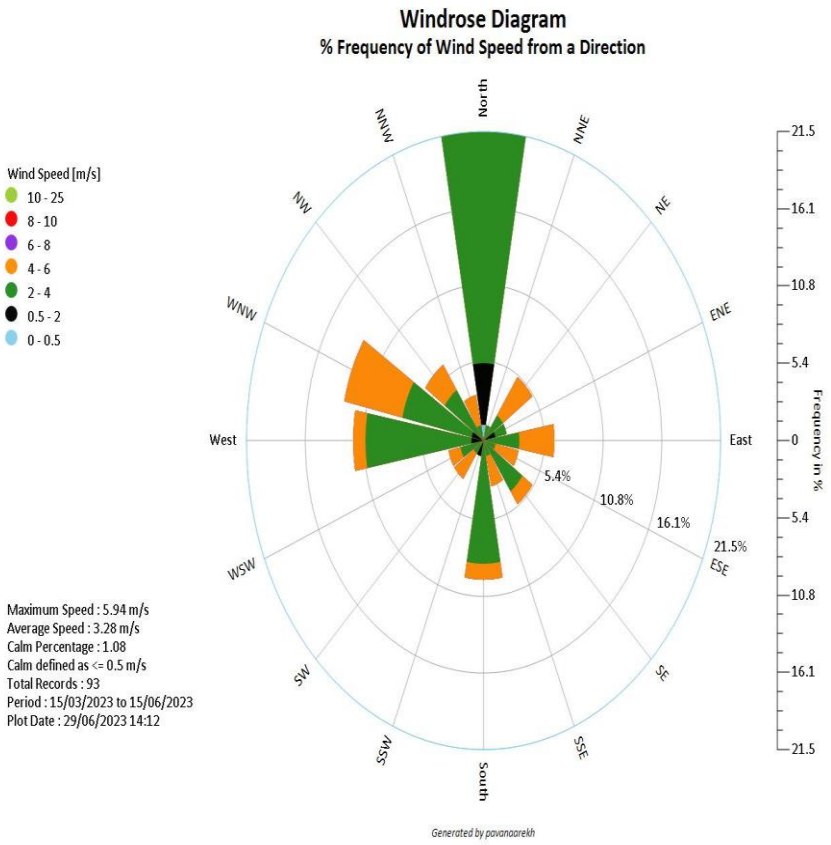


Fig. 3.2 Wind Rose Diagram for Study Period

(Source: IMD Chandigarh)
(Software name: - Pavanaarekh

3.4 Ambient Air Quality

The ambient air quality monitoring was done to assess the current status of air quality in the study area. Monitoring was carried out at eight stations from April to June 2023. The guidelines for selections of ambient air monitoring stations given in IS – 5182 part 14, 2000 and 'CPCB guidelines for air quality monitoring' were followed. These guidelines state that, "when the objective of air sampling is to identify the contribution from specific sources of pollution, the sampling locations should be located in upwind and the downwind direction of such sources".

The ambient air quality monitoring locations were selected considering the following criterion:

1. Location of sensitive receptors such as reserved forests, national parks, hospitals, archaeological sites, etc. in the vicinity of the study area.
2. The site should be representative of the area selected;
3. Topography of the study area.
4. The stations should be selected in a way so as to yield data that can be compared with another;
5. Certain physical requirements (electricity and other logistics) should be satisfied at the site.

3.4.1 Methodology

The prime objective of the baseline study with respect to ambient air quality is to establish the present air quality and its conformity to National Ambient Air Quality Standards. This data has been further used during impact assessment to predict the final air quality. This section describes the sampling locations, frequency of sampling and methodology adopted for monitoring ambient air quality.

To quantify the impact of the project on the ambient air quality, it is necessary first to evaluate the existing ambient air quality of the area. The existing ambient air quality, in terms of Particulate Matter (Size <10µm) or PM_{10}, Particulate Matter (Size <2.5 µm) or $PM_{2.5}$, Sulphur-di-oxide (SO_2), Oxides of Nitrogen (as NO_2), and Carbon Monoxide (CO), has been measured through a planned field monitoring.

3.4.2 Sampling Stations

To select the air sampling locations, meteorological data with respect to temperature, relative humidity, wind speed and direction plays a vital role. Predominant wind direction plays an important role in determining location of monitoring stations. List of Air & Noise sampling

stations are given in **Table 3.3** and Location Air & Noise Sampling Stations are given in **Figure 3.3**

Table 3.3
Ambient Air Monitoring Stations

Station	Name of Village/ Location	Distance from the Plant (Km)	Direction w.r.t Plant	Justification for the Selection
AAQ-1	Project Site	--	--	• Represent the project site
AAQ -2	Reri	2	S	• Downwind direction of the project site. • Further this station's AAQ data captures the baseline for residential
AAQ -3	Ghati	5.6	N	• Upwind direction of the project site. • Further this station's AAQ data captures the baseline for residential location.
AAQ -4	Sansarpur	3	N	• Downwind direction of the project site. • Further this station's AAQ data captures the baseline for residential location.
AAQ -5	Talwara	2.34	NW	
AAQ -6	Ambi	8	S	• Downwind direction of the project site. • Further this station's AAQ data captures the baseline for residential location.
AAQ -7	Basantpur	8.1	S	
AAQ -8	Jandaur	7	E	• Crosswind direction of the project site. • Further this station's AAQ data captures the baseline for residential location.

3.4.3 Monitoring Schedule

Ambient air quality monitoring was carried out twice a week with a frequency of 24 hours for 12 weeks.

3.4.4 Methods of Sampling and Analysis

Methodology of sampling analysis which was adopted during study period is tabulated below:

S. No.	Parameters	Analysis Method
1.	PM_{10} µg/m^3	IS:5182, (Part-23) 2006, By Gravimetric Method: 2006
2.	$PM_{2.5}$ µg/m^3	SP-57, Issue Date-01- 05-2019, CPCB Guideline Vol-I: 2011
3.	SO_2 µg/m^3	IS 5182 (P-2):2001 1st Rev (RA: 2012): 2001
4.	NOx µg/m^3	IS:5182, (P-6), RA 2012: 2006
5.	CO mg/m^3	IS 5182 (P- 10):RA2014: 1999

Sample Transportation and Sample Preservation: Proper preservation of samples was done after sampling. The Gaseous samples were preserved in an ice box (below 4°C) and transported to the laboratory for analysis. The filter papers were collected using forceps, kept in polythene bags and stored in desiccators during transportation.

Fig. 3.3 Monitoring Locations of Ambient Air

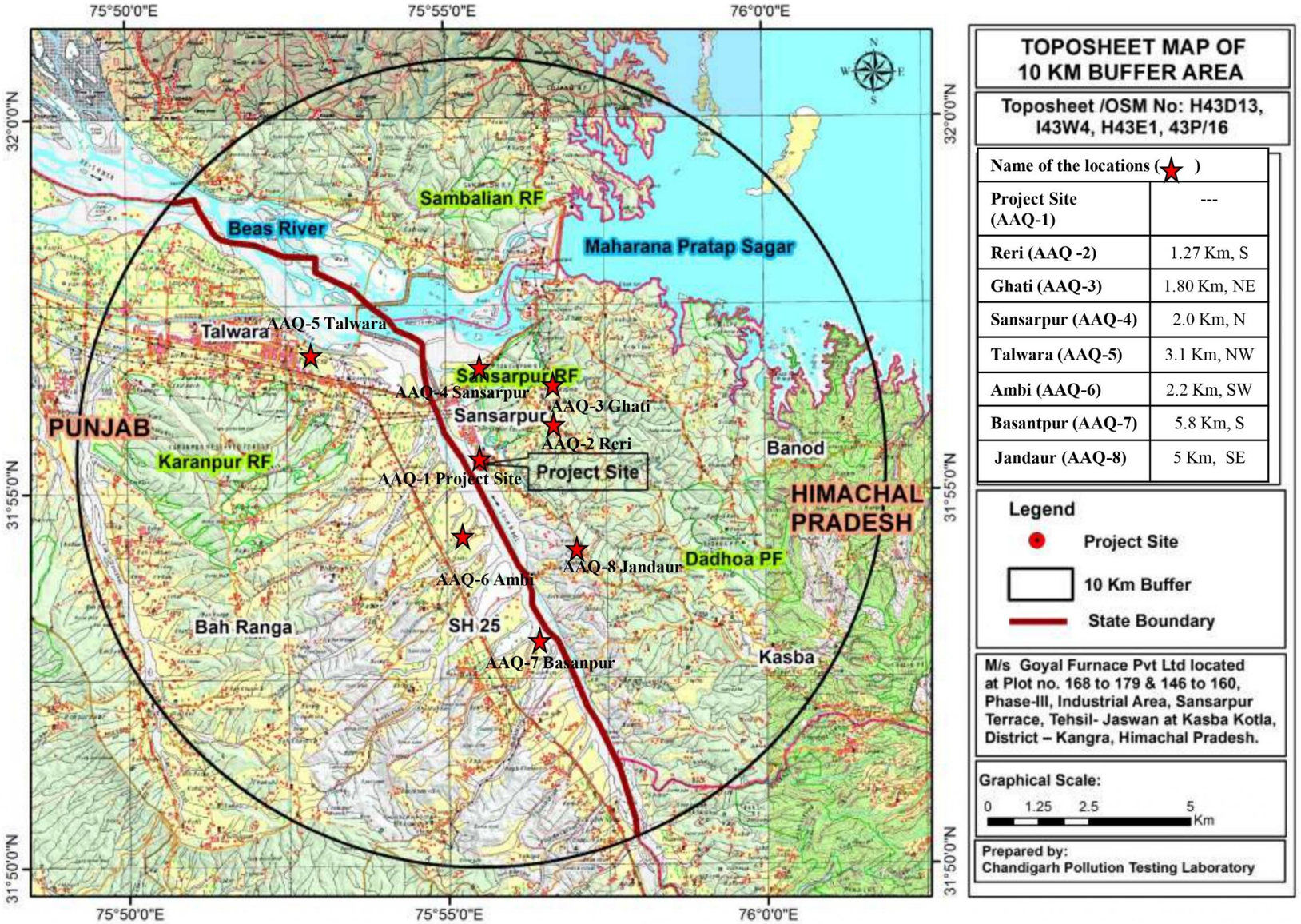
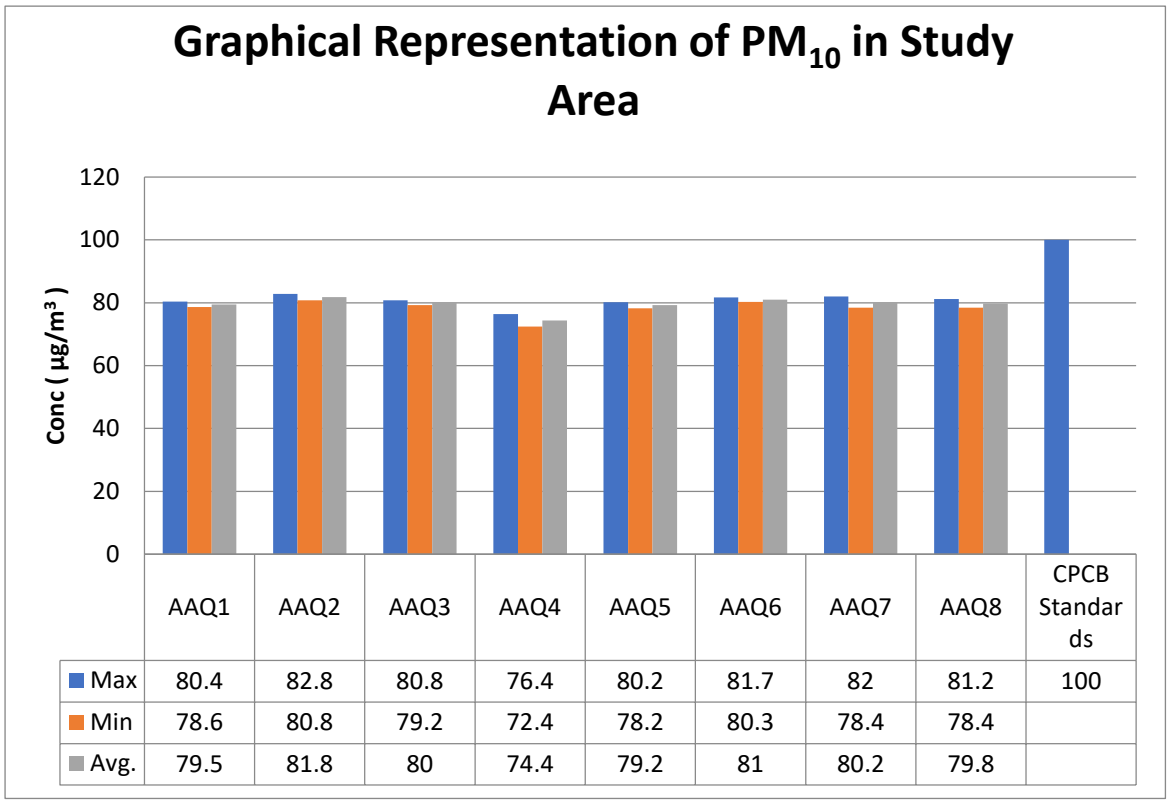


Table 3.4

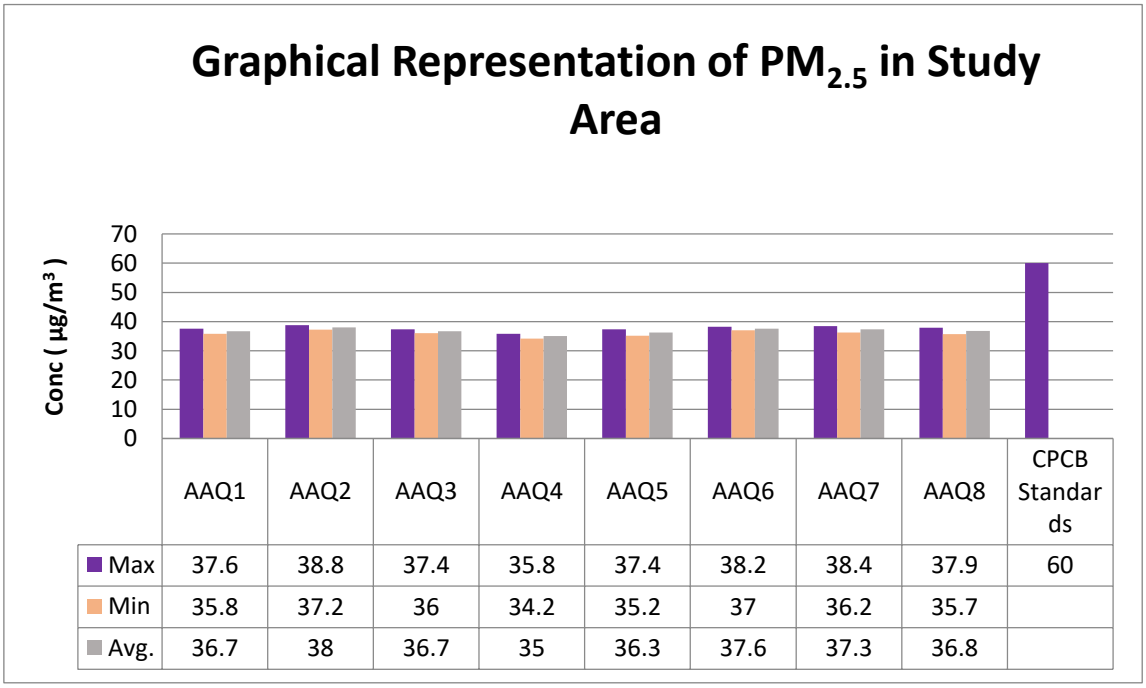
Ambient Air Quality Abstract (April-June, 2023)

Locations	PM_{10} (µg/m^3)			$PM_{2.5}$ (µg/m^3)			SO_2 (µg/m^3)			NO_x (µg/m^3)			CO (mg/m^3)		
	Max	Min	Avg.	Max	Min	Avg.	Max	Min	Avg.	Max	Min	Avg.	Max	Min	Avg.
Project Site - AAQ1	80.4	78.6	79.5	37.6	35.8	36.7	8.2	5.4	6.8	14.4	13.0	13.7	0.28	0.21	0.24
Reri - AAQ2	82.8	80.8	81.8	38.8	37.2	38	6.7	4.1	5.4	15.0	14.6	14.8	0.35	0.28	0.31
Ghati - AAQ3	80.8	79.2	80	37.4	36.0	36.7	6.1	5.5	5.8	14.2	13.6	13.9	0.42	0.35	0.38
Sansarpur - AAQ4	76.4	72.4	74.4	35.8	34.2	35	6.0	5.6	5.8	12.8	11.2	12	0.21	0.14	0.17
Talwara - AAQ5	80.2	78.2	79.2	37.4	35.2	36.3	6.5	5.9	6.2	14.0	12.6	13.3	0.31	0.25	0.28
Ambi - AAQ6	81.7	80.3	81	38.2	37.0	37.6	6.8	6.2	6.5	14.6	13.8	14.2	0.42	0.35	0.38
Basantpur - AAQ7	82.0	78.4	80.2	38.4	36.2	37.3	7.0	6.4	6.7	15.2	14.4	14.8	0.56	0.49	0.52
Jandaur - AAQ8	81.2	78.4	79.8	37.9	35.7	36.8	6.4	5.8	6.1	14.9	13.7	14.3	0.31	0.25	0.28
P98	**81.76**			**38.34**			**7.79**			**14.8**			**0.518**		
CPCB Stds.	**100**			**60**			**80**			**80**			**4.0**		

3.4.1 Graphical Representation of Air Monitoring of Study Area is Tabulated below:

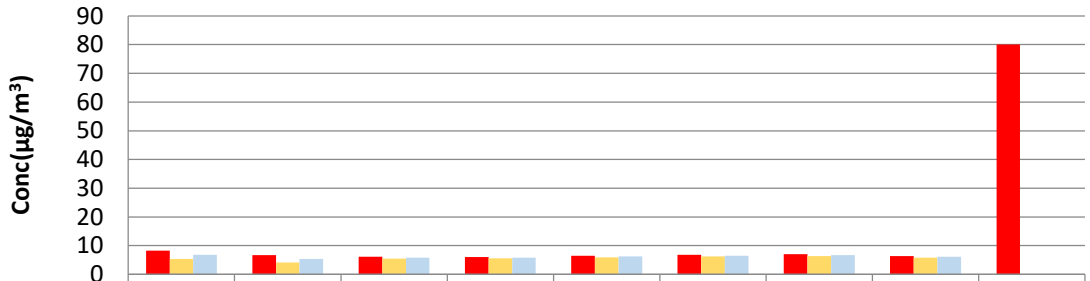


	AAQ1	AAQ2	AAQ3	AAQ4	AAQ5	AAQ6	AAQ7	AAQ8	CPCB Standards
Max	80.4	82.8	80.8	76.4	80.2	81.7	82	81.2	100
Min	78.6	80.8	79.2	72.4	78.2	80.3	78.4	78.4	
Avg.	79.5	81.8	80	74.4	79.2	81	80.2	79.8	



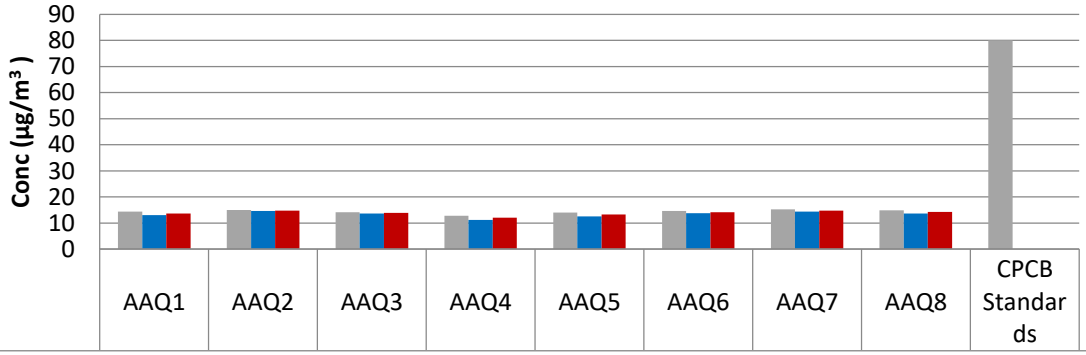
	AAQ1	AAQ2	AAQ3	AAQ4	AAQ5	AAQ6	AAQ7	AAQ8	CPCB Standards
Max	37.6	38.8	37.4	35.8	37.4	38.2	38.4	37.9	60
Min	35.8	37.2	36	34.2	35.2	37	36.2	35.7	
Avg.	36.7	38	36.7	35	36.3	37.6	37.3	36.8	

Graphical Representation of SO_2 in Study Area



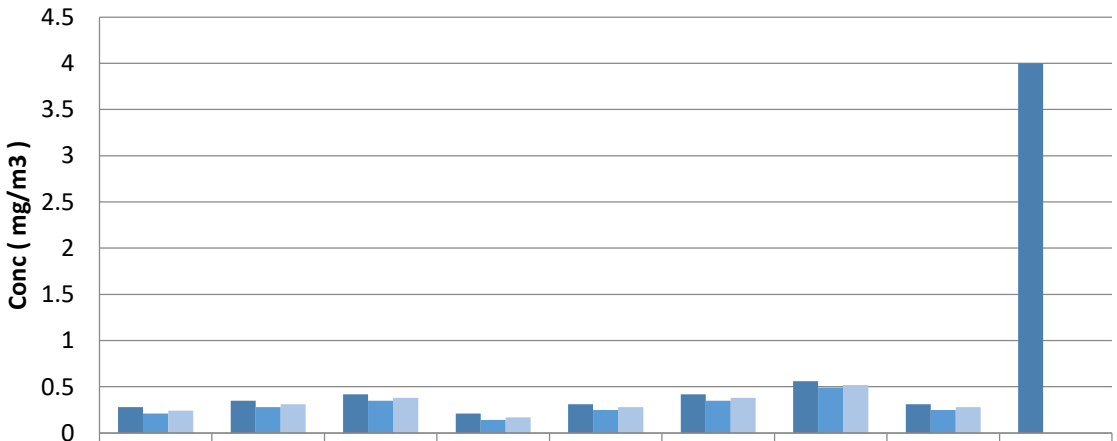
	AAQ1	AAQ2	AAQ3	AAQ4	AAQ5	AAQ6	AAQ7	AAQ8	CPCB Standards
Max	8.2	6.7	6.1	6	6.5	6.8	7	6.4	80
Min	5.4	4.1	5.5	5.6	5.9	6.2	6.4	5.8	
Avg.	6.8	5.4	5.8	5.8	6.2	6.5	6.7	6.1	

Graphical Representation of NO_2 in Study Area



	AAQ1	AAQ2	AAQ3	AAQ4	AAQ5	AAQ6	AAQ7	AAQ8	CPCB Standards

Graphical Representation of CO in Study Area



	AAQ1	AAQ2	AAQ3	AAQ4	AAQ5	AAQ6	AAQ7	AAQ8	CPCB Standards
Max	0.28	0.35	0.42	0.21	0.31	0.42	0.56	0.31	4
Min	0.21	0.28	0.35	0.14	0.25	0.35	0.49	0.25	
Avg.	0.24	0.31	0.38	0.17	0.28	0.38	0.52	0.28	

Key Findings:

- **The average concentration of PM_{10} recorded ranged from 70.4-81.8 µg/m^3.**
- **The average concentration of $PM_{2.5}$ recorded ranged from 35.2-38.0 µg/m^3.**
- **The average concentration of SO_2 recorded ranged from 5.4-6.8 µg/m^3.**
- **The average concentration of NO_x recorded ranged from 12.0-14.8 µg/m^3.**
- **The average concentration of CO recorded ranged from 0.17-0.52 mg/m^3.**

All these values of specific parameters are well within the NAAQS prescribed by CPCB.

- ***Conclusion:*** The descriptive statistics of the monitoring at all the locations are indicating that pollution levels w.r.t monitored parameters at the stations did not exceed the standards prescribed by the CPCB.

3.5 Water Environment

Water Quality

Water quality assessment is one of the essential components of EIA study. Such assessment helps in evaluating the existing health of water body and suggesting appropriate mitigation measures to minimize the potential impact from development projects. Water quality of ground water has been studied in order to assess water-use in construction, drinking, cooling and horticulture purpose. The water quality at the site and other locations within the 10 km impact zone was monitored during 16 April 2023.

Methodology:

The methodology involve in collection ground water sample from abstraction structure occurs in 5 steps listed below:

1. Sampling preparation
2. Accessing the well before sampling and securing the well after sampling
3. Measuring the water level
4. Purging the well
5. Collecting and delivering the water sample

Secondary Data:

No published secondary data is available for the area.

Primary Data:

The ground water samples were collected from April 2023.

Basis of selection of ground water sampling locations:

The ground water sampling location were based on local geology and hydrology. The occurrence, distribution and movement of aquifers are significantly important. The reference point which is the project site is fixed with respect to which upstream and downstream were considered based on local geomorphology. The areas of turbulence were avoided and only abstracting structures which were in continual use were considered.

Sampling frequency and technique

Parameters for analysis of water quality were selected based on the utility of the particular source of water as per MoEFCC guidance. Hence quality of ground water was compared with IS: 10500: 2012 for drinking purposes. As per the standard practice, one sample from each station was taken in the study period. Sampling was done by standard sampling technique as per the Standard Methods. Necessary precautions were taken for preservation of samples.

Sampling location of surface water & ground water are given in **Figure 3.4** and list of surface water sample is given in **Table 3.5.** The results of surface water are given in **Table 3.6 a.**

3.5.1 Surface water sources in the study area

The surface water resources in the study area as studied from the satellite imagery depicts that Beas River is flowing from northwest to southeast side of the project area. The sampling locations for the surface water were finalized after reconnaissance survey and consultation with the functional area experts from the respective areas.

Criteria for selection of surface water quality sampling locations

While selecting a sample it is always important to take care that the sample should be representative of the selected water body. In order to remove the bias in sample selection, grab samples were collected on random basis considering the following key aspects:

1. The sampling locations were selected based on upstream and downstream uses of the water body.
2. Drainage Pattern of study area in general.
3. Domestic discharge points from the near-by villages.

Table 3.5

Station	Sampling Location	Aerial Distance (Km) and Direction from Project Site

SW-1	Pong Dam	4.57 Km, NE

Surface Water Sampling Stations

Table – 3.6 (a)

Results of Surface Water Sample (Pong Dam) - (April- 2023)

Sr. No.	Parameters	Unit	Upstream	Downstream	Detection Limit
1.	pH	-	7.48	7.51	3
2.	Color	H. U	<5	<5	5.0 HU
3.	Odour	--	Agreeable	Agreeable	--
4.	Turbidity	NTU	4.4	5.2	0.5 NTU
5.	Dissolved Oxygen	mg/l	4.2	5.0	1.0 mg/l
6.	Chemical Oxygen Demand	mg/l	10.0	12.0	5.0 mg/l
7.	BOD at 27 ^{o}C for 3 days	mg/l	3.0	3.6	2.0 mg/l
8.	Total Dissolved Solids	mg/l	148	156	1.0 mg/l
9.	Total Suspended Solids	mg/l	10.2	12.4	1.0 mg/l
10.	Total Hardness as $CaCO_3$	mg/l	84.2	86.6	1.0 mg/l
11.	Chlorides as Cl	mg/l	14.4	16.2	1.0 mg/l
12.	Sulphates as SO_4	mg/l	8.6	12.6	1.0 mg/l
13.	Total alkalinity as $CaCO_3$	mg/l	ND	ND	1.0 mg/l
14.	Magnesium as Mg	mg/l	5.2	6.1	1.0 mg/l
15.	Calcium as Ca	mg/l	22.4	24.2	1.0 mg/l
16.	Nitrate as NO_3	mg/l	1.2	1.6	1.0 mg/l
17.	Zinc as Zn	mg/l	ND	ND	0.5 mg/l
18.	Iron as Fe	mg/l	0.68	0.72	0.1 mg/l
19.	Fluoride as F	mg/l	ND	ND	0.1 mg/l
20.	Sodium as Na	mg/l	18.4	20.2	1 mg/l
21.	Potassium as K	mg/l	6.6	8.4	1 mg/l
22.	Cadmium as Cd	mg/l	ND	ND	0.01 mg/l
23.	Total Chromium as Cr	mg/l	ND	ND	0.045 mg/l
24.	Mercury as Hg	mg/l	ND	ND	0.001 mg/l
25.	Aluminum as Al	mg/l	ND	ND	0.01 mg/l
26.	Boron as B	mg/l	ND	ND	0.1 mg/l
27.	Fecal Coliform	MPN/100 ml	372	558	<2MPN/100ml
28.	Total Coliform	MPN/100 ml	550	889	<2MPN/100ml
29.	Total Ammonia	Mg/l	1.0	1.0	0.5

Table 3.7 (a)

Designated Best Uses of Water

Designated Best Use	Class	Criteria
Drinking Water Source without conventional treatment but after disinfection	A	1. Total Coliforms Organism MPN/100ml shall be 50 or less 2. pH between 6.5 to 8.5 3. Dissolved Oxygen 6mg/l or more Biochemical Oxygen Demand 5 days 20^{o}C, 2 mg/l or less
Outdoor bathing (Organized)	B	Total Coliforms Organism MPN/100ml shall be 500 or less 2. pH between 6.5to 8.5 3. Dissolved Oxygen 5mg/l or more Biochemical Oxygen Demand 5 days 20^{o}C, 3 mg/l or less
Drinking after and water source conventional treatment disinfection	C	Total Coliforms Organism MPN/100ml shall be 5000 or less 2. pH between 6 to 9 3. Dissolved Oxygen 4mg/l or more Biochemical Oxygen Demand 5 days 20^{o}C, 3 mg/l or less
Propagation of Wild life and Fisheries	D	1. pH between 6.5 to 8.5 2. Dissolved Oxygen 4mg/l or more 3. Free Ammonia (as N) Biochemical Oxygen Demand 5 days 20^{o}C, 2 mg/l or less
Irrigation, Industrial Cooling, Controlled Waste disposal	E	1. pH between 6.0 to 8.5 2. Electrical Conductivity at 25^{o}C micro mhos/cm, maximum 2250 3. Sodium absorption Ratio Max.26 4. Boron Max.2 mg/l
	Below-E	Not meeting any of the A, B, C, D & E criteria

Source: CPCB

CPCB has identified water quality requirements in terms of a few chemical characteristics, known as primary water quality criteria. Further, Bureau of Indian Standards has also recommended water quality parameter for different uses in the standard IS 2296:1992 provided in Table 3.7 (b).

Table – 3.7(b) Water Quality Standards in India (Source IS 2296:1992)

Characteristics	Designated best use				
	A	B	C	D	E
Dissolved Oxygen (DO)mg/l, min	6	5	4	4	-
Biochemical Oxygen demand (BOD)mg/l, max	2	3	3	-	-
Total coliform organisms MPN/100ml, max	50	500	5,000	-	-
pH value	6.5-8.5	6.5-8.5	6.0-9.0	6.5-8.5	6.0-8.5
Colour, Hazen units, max.	10	300	300	-	-
Odour	Un-objectionable			-	-
Taste	Tasteless	-	-	-	-
Total dissolved solids, mg/l, max.	500	-	1,500	-	2,100
Total hardness (as $CaCO_3$), mg/l, max.	200	-	-	-	-
Calcium hardness (as $CaCO_3$), mg/l, max.	200	-	-	-	-
Magnesium hardness (as $CaCO_3$), mg/l, max.	200	-	-	-	-
Copper (as Cu), mg/l, max.	1.5	-	1.5	-	-
Iron (as Fe), mg/l, max.	0.3	-	0.5	-	-
Manganese (as Mn), mg/l, max.	0.5	-	-	-	-
Chlorides (as Cu), mg/l, max.	250	-	600	-	600
Sulphates (as SO_4), mg/l, max.	400	-	400	-	1,000
Nitrates (as NO_3), mg/l, max.	20	-	50	-	-
Fluorides (as F), mg/l, max.	1.5	1.5	1.5	-	-
Phenolic compounds (as C_2H_5OH), mg/l,max.	0.002	0.005	0.005	-	-
Mercury (as Hg), mg/l, max.	0.001	-	-	-	-
Cadmium (as Cd), mg/l, max.	0.01	-	0.01	-	-
Selenium (as Se), mg/l, max.	0.01	-	0.05	-	-
Arsenic (as As), mg/l, max.	0.05	0.2	0.2	-	-
Cyanide (as Pb), mg/l, max.	0.05	0.05	0.05	-	-
Lead (as Pb), mg/l, max.	0.1	-	0.1	-	-
Zinc (as Zn), mg/l, max.	15	-	15	-	-
Chromium (as Cr^{6+}), mg/l, max.	0.05	-	0.05	-	-
Anionic detergents (as MBAS), mg/l, max.	0.2	1	1	-	-
Barium (as Ba), mg/l, max.	1	-	-	-	-
Free Ammonia (as N), mg/l, max	-	-	-	1.2	-
Electrical conductivity, micromhos/cm, max	-	-	-	-	2,250
Sodium absorption ratio, max	-	-	-	-	26
Boron, mg/l, max	-	-	-	-	2

Findings: -

Based on the perusal of analytical results the following inference has been made on the baseline quality of surface water

1. The samples were analyzed for parameters as per IS 2296:1982 in respect of Indian Classification for use of water in 5 classes A, B, C, D and E as per CPCB guidelines.
2. The collected samples falls in class C- "Drinking water source with conventional treatment followed by disinfection"

3.5.2 Ground Water

Groundwater is an important source for the local needs of water consumption for various purposes, mainly domestic and agriculture. Keeping in view the importance of groundwater to the local population, samples of ground water were collected from the study area for the monitoring and assessment of groundwater quality.

Ground water is generally affected by activities such as uncontrolled discharge of treated and/or untreated industrial effluent, open discharge of treated and/or untreated sewerage in the surrounding area.

The Quality of ground water was studied by collecting 8 water samples from representative hand pumps, tube wells. Sampling points were decided using Google imagery and field survey. Standard procedures were followed for the sampling and analysis of physico–chemical parameters of water.

The sampling sites were selected considering the following criteria –

1. Topography of the study area Pattern.
2. Areas which may be affected due to the activity.
3. Any probable locations with open discharge of sewage or waste water.
4. Location of any solid waste dumping facility in the vicinity of the project site.

Table 3.8 shows the details of location of ground water sampling stations and results of different parameters are given in **Table 3.9.**

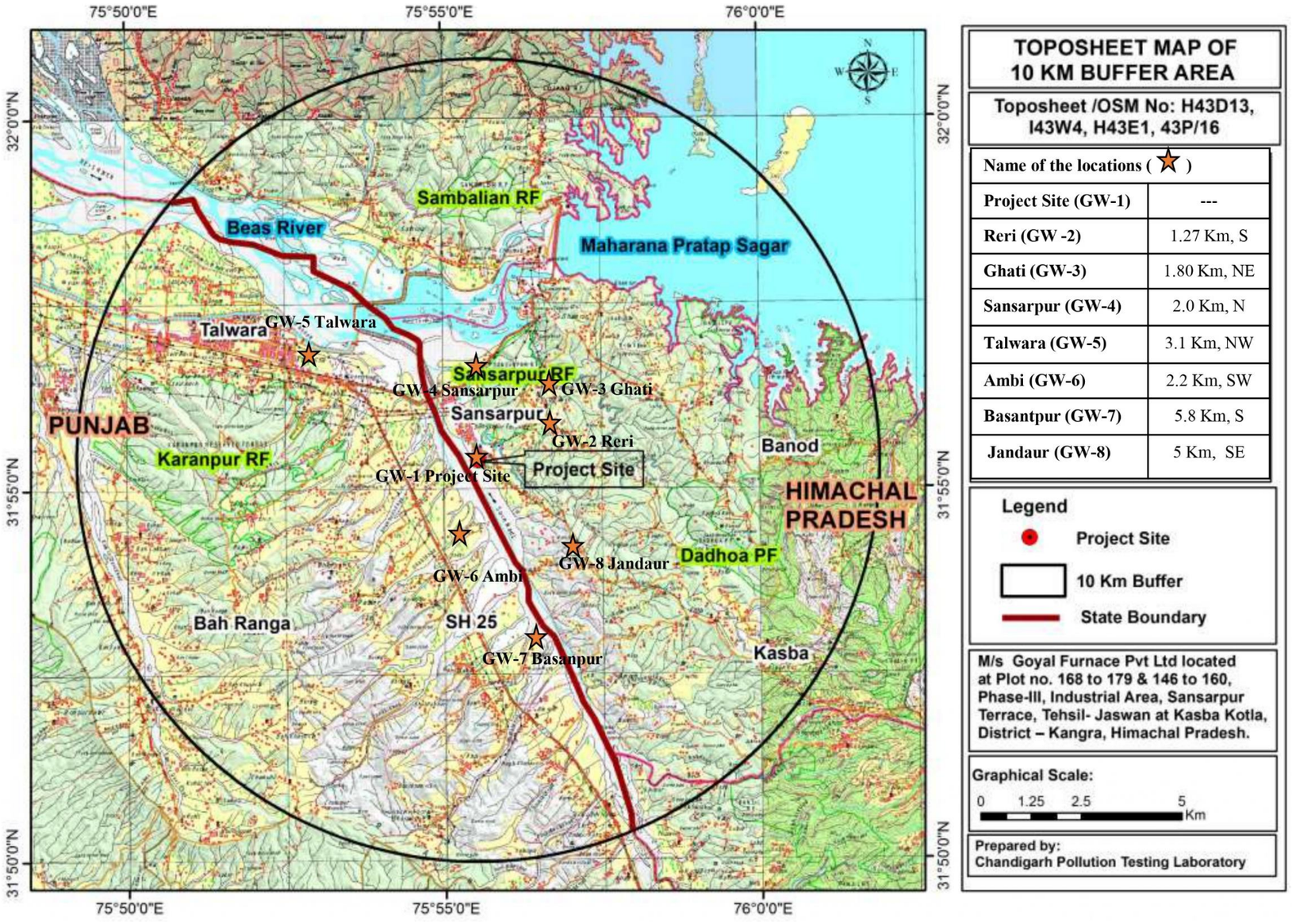
Table-3.8

Details of Ground Water Monitoring Stations

Sample Code	Sampling Location	Distance from the Plant (Km)	Direction w.r.t Plant	Justification for the Selection
GW-1	Project Site	--	--	Represent the Project Site
GW-2	Reri	1.27	S	Representing groundwater quality within a residential area and located in close vicinity to the project site towards S direction.
GW-3	Ghati	1.80	NE	Representing groundwater quality within a residential area and located in close vicinity to the project site towards NE direction.
GW-4	Sansarpur	2	N	Representing groundwater quality within a residential area and located in close vicinity to the project site towards N direction.
GW-5	Talwara	3.1	NW	Representing groundwater quality within a residential area and located in close vicinity to the project site towards NW direction.
GW-6	Ambi	2.2	SW	Representing groundwater quality within a residential area and located in close vicinity to the project site towards SW direction.
GW-7	Basantpur	5.8	S	Representing groundwater quality within a residential area and located in close vicinity to the project site towards S direction.
GW-8	Jandaur	5	SE	Representing groundwater quality within a residential area and located in close vicinity to the project site towards SE direction.

Figure -3.4

Locations of Surface water & Ground water



TOPOSHEET MAP OF 10 KM BUFFER AREA

Toposheet /OSM No: H43D13, I43W4, H43E1, 43P/16

Name of the locations (☆)	
Project Site (GW-1)	---
Reri (GW -2)	1.27 Km, S
Ghati (GW-3)	1.80 Km, NE
Sansarpur (GW-4)	2.0 Km, N
Talwara (GW-5)	3.1 Km, NW
Ambi (GW-6)	2.2 Km, SW
Basantpur (GW-7)	5.8 Km, S
Jandaur (GW-8)	5 Km, SE

Legend

- Project Site
- 10 Km Buffer
- State Boundary

M/s Goyal Furnace Pvt Ltd located at Plot no. 168 to 179 & 146 to 160, Phase-III, Industrial Area, Sansarpur Terrace, Tehsil- Jaswan at Kasba Kotla, District – Kangra, Himachal Pradesh.

Graphical Scale:

0 1.25 2.5 5 Km

Prepared by:
Chandigarh Pollution Testing Laboratory

Table – 3.9

Results of Ground Water Samples (April, 2023)

Parameters	Unit	GW1	GW_2	GW_3	GW_4	GW_5	GW_6	GW_7	GW_8	* Limits
pH	-	7.59	7.77	7.54	7.28	7.78	7.69	7.88	7.69	**6.5-8.5**
Colour	Hazen	<5	<5	<5	<5	<5	<5	<5	<5	**5.0**
Odour	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
Turbidity	NTU	<1	<1	<1	<1	<1	<1	<1	<1	**1.0**
Total Dissolved Solids	mg/l	348	325	336	389	354	338	345	359	**500**
Total Hardness as $CaCO_3$	mg/l	284	296	310	324	290	280	324	318	**200**
Calcium as Ca	mg/l	48.8	52.4	46.8	48.8	42.4	48.6	38.9	42.2	**75**
Magnesium as Mg	mg/l	26.7	22.4	24.8	26.4	24.4	26.2	20.6	24.8	**30**
Total alkalinity	mg/l	278	280	296	310	272	268	288	270	**200**
Chlorides as Cl^-	mg/l	18.8	24.9	22.6	26.8	24.4	20.2	24.4	18.4	**250**
Sulphates as SO_4	mg/l	22.6	26.8	18.8	24.8	16.6	18.2	22.4	18.6	**200**
Nitrate as NO_3	mg/l	4.0	3.1	3.2	2.9	ND	ND	ND	ND	**45**
Iron	mg/l	ND	ND	ND	ND	ND	ND	ND	ND	**1.0**
Fluoride	mg/l	1.0	1.18	1.16	1.14	ND	ND	ND	ND	**1.5**
Zinc	mg/l	ND	ND	ND	ND	ND	ND	ND	ND	**5.0**
Manganese	mg/l	ND	ND	ND	ND	ND	ND	ND	ND	**0.1**
Cadmium	mg/l	ND	ND	ND	ND	ND	ND	ND	ND	**0.003**
Total Chromium	mg/l	ND	ND	ND	ND	ND	ND	ND	ND	**0.05**
Mercury	mg/l	ND	ND	ND	ND	ND	ND	ND	ND	**0.001**
Selenium as Se	mg/l	ND	ND	ND	ND	ND	ND	ND	ND	**0.01**
Total Coliforms	per 100 ml	<2	<2	<2	<2	<2	<2	<2	<2	shall not be detectable in any of 100ml sample
E – Coli	per 100 ml	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	shall not be detectable in any of 100ml sample

***** *As per IS:10500: 2012 acceptable limits*

Observation And Analysis:

1. The TDS conc. Of all the samples is in permissible limits and indicative of fresh water.

2. The pH value indicate that the ground water is slightly alkaline in nature.

3. Chloride, Sulphate, Total hardness and alkalinity are within the acceptable limits and no metallic contamination was found in any sample.

3.5.3 Rain Water Harvesting

(A) INSIDE INDUSTRY

Due to polluting nature of Industry in terms of hazardous dust, the RWH inside the premises is not advisable and shall not be practiced. However, the runoff from the premises will be collected, stored and after imparting adequate treatment will be used for plantation and dust suppression.

Calculation for rainwater harvesting.

Total roof top area of building/sheds = 4326.61 m^2

Annual rainfall = 1010 mm

Annual Runoff Generated within the Premises

S.no.	Area Type	Area in m^2	Normal rainfall in mtr. /Year	Runoff Co-efficient	Total runoff available in cubic mtr/Annum
1.	Covered area/ roof top area	4326.61	1.010	0.85	2257.40
2.	Open Area	3362	1.010	0.30	2030.10
3.	Green Area	5938	1.010	0.15	899.61
4.	Total				5187.11

The average annual amount of rainy days = 62 days

Rain water harvesting potential per day = 5187.11/62= 83.66 m3

Storage for 6 days = 6×83.66= 502 m3

No. of water storage tanks proposed = 2 with capacity 300 KLD

(The tank design is taken 20% larger than required capacity)

(B) OUT SIDE INDUSTRY

The company will adopt one village pond for ground water recharge for which NOC from concerned panchayat will be obtained.

3.6 Noise Environment

Noise is one of the most undesirable and unwanted by-products of our modern life style. It may not seem as insidious or harmful as air and water pollutants but it affects human health and wellbeing and can contribute to deterioration of human well-being in general and cause neurological disturbances and physiological damage to the hearing mechanism in particular. It is therefore, necessary to measure both the quality as well as the quantity of noise in and around the site.

Methodology

The intensity of sound energy in the environment is measured in a logarithmic scale and is expressed in a decibel, dB (A) scale. In a sophisticated type of sound level meter, an additional circuit (filters) is provided, which modifies the received signal in such a way that it replicates the sound signal as received by the human ear and the magnitude of sound level in this scale is denoted as dB (A). The sound levels are expressed in dB (A) scale for the purpose of comparison of noise levels, which is universally accepted by the international community.

The day noise levels have been monitored during 6.00 am to 10.00 pm and night noise levels, during 10.00 pm to 6.00 am at all the 8 locations, which covers residential areas, commercial area, industrial area and silence zone within 10 km radius of the study area.

Sampling Locations

A preliminary survey was undertaken to identify the major noise generating sources in the area. The noise survey was conducted to assess the background noise levels in different zones. Gazettes Notification {S.O. 123(E)} of MoEF&CC dated February 14, 2000 under EPA-1986 on ambient noise standards has different noise levels for different zones viz industrial, commercial, and residential and silence zones. Eight sampling locations were selected for the sampling of noise levels.

Noise levels recorded at each station are computed for Equivalent noise levels. Equivalent noise level is a single number descriptor for describing time varying noise levels. Location of noise monitoring station in topo sheet is given in Figure 3.13. List of noise monitoring stations are shown in Table 3.10.

Table 3.10

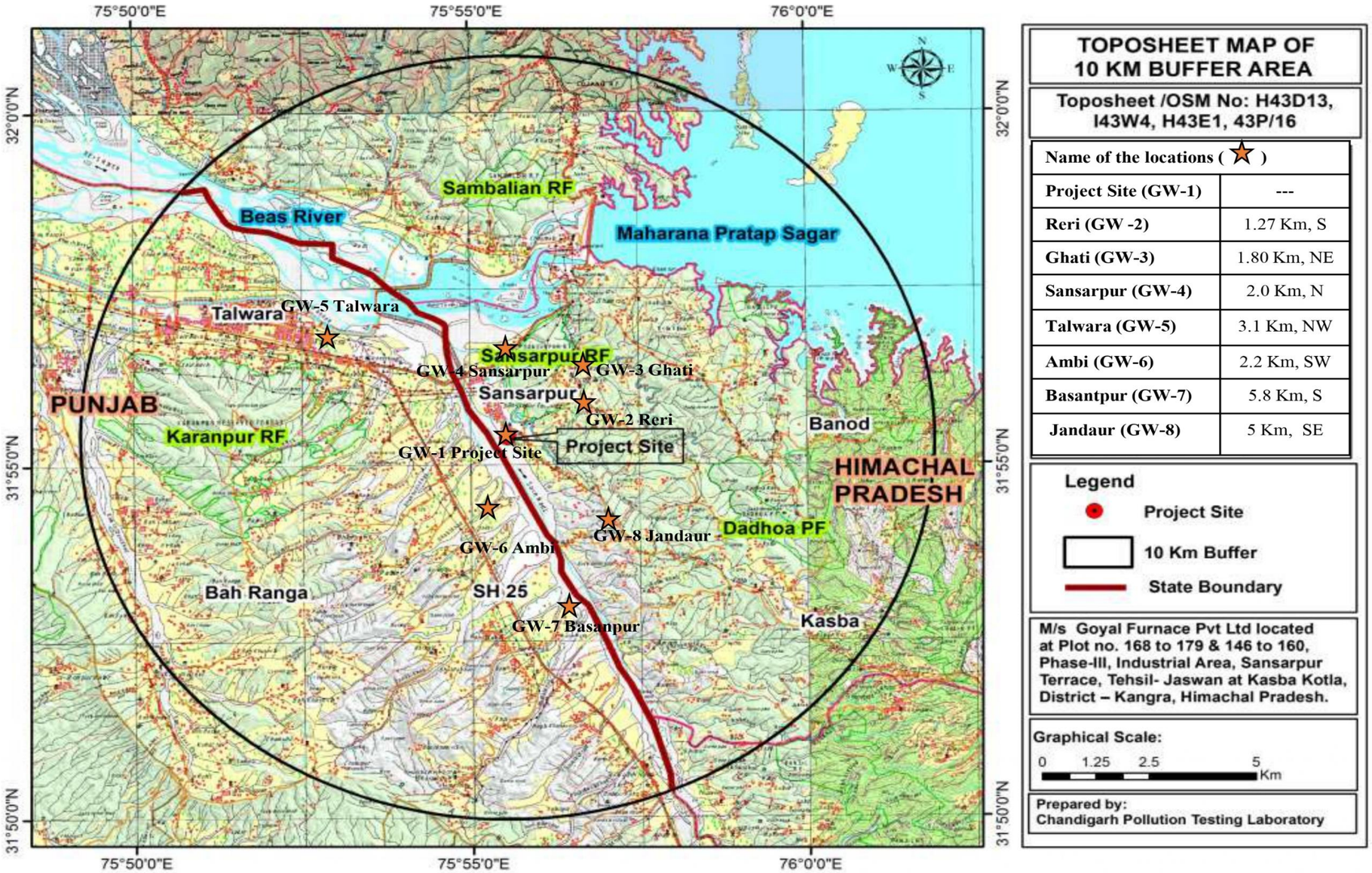
Details of Noise Monitoring Station

Sample Code	Name of Village/ Location	Distance from the Plant (Km)	Direction w.r.t Plant	Justification for the Selection
NMS-1	Project Site	--	--	Represent the noise level within the Project Site
NMS -2	Reri	1.27	S	Residential Area
NMS -3	Ghati	1.80	NE	
NMS -4	Sansarpur	2.0	N	
NMS -5	Talwara	3.1	NW	
NMS -6	Ambi	2.2	SW	
NMS -7	Basantpur	5.8	S	
NMS -8	Jandaur	5	SE	

Results of noise levels are shown in **Table 3.11** Ambient noise standards in respect of noise are given in **Table 3.12.**

Figure -3.5

Locations of Noise Monitoring Stations



TOPOSHEET MAP OF 10 KM BUFFER AREA

Toposheet /OSM No: H43D13, I43W4, H43E1, 43P/16

Name of the locations (★)	
Project Site (GW-1)	---
Reri (GW -2)	1.27 Km, S
Ghati (GW-3)	1.80 Km, NE
Sansarpur (GW-4)	2.0 Km, N
Talwara (GW-5)	3.1 Km, NW
Ambi (GW-6)	2.2 Km, SW
Basantpur (GW-7)	5.8 Km, S
Jandaur (GW-8)	5 Km, SE

Legend

- Project Site
- 10 Km Buffer
- State Boundary

M/s Goyal Furnace Pvt Ltd located at Plot no. 168 to 179 & 146 to 160, Phase-III, Industrial Area, Sansarpur Terrace, Tehsil- Jaswan at Kasba Kotla, District – Kangra, Himachal Pradesh.

Graphical Scale:

0 1.25 2.5 5 Km

Prepared by:
Chandigarh Pollution Testing Laboratory

Table 3.11

Noise Level Results Leq dB (A) in and Around Project Area –April, 2023

Sr. No.	Location No.	Day Time (Hourly Equivalent)	Night Time (Hourly Equivalent)
1.	Project Site	71.4	67.2
2.	Reri	51.2	34.6
3.	Ghati	48.4	35.4
4.	Sansarpur	46.6	37.2
5.	Talwara	45.8	36.9
6.	Ambi	47.8	34.6
7.	Basantpur	47.2	38.1
8.	Jandaur	46.6	36.5

Table 3.12

Noise Standards (Source-CPCB)

Area Code	Category of Area	Noise dB(A) Leq	
		Day Time (6.0am-10pm)	Night Time (10.0pm-6.0am)
A	Industrial Area	75	70
B	Commercial Area	65	55
C	Residential Area	55	45
D	Silence Zone	50	40

Interpretation

(For April, 2023)

Industrial zone

The day time noise level at the project premises which is located in industrial area was observed to be 71.4 dB (A), and during night time the noise level was recorded to be 67.2 dB (A).

Residential & Other Areas

The noise levels in residential and other areas for day & night was well within the standards prescribed by CPCB.

3.7 Soil Quality

Soil is generally considered as the upper layer of the earth that is dug or ploughed, especially the loose material in which plants grow. It is generally unconsolidated material composed of soil particles produced by disintegration of rocks. The void spaces between the particles may contain Air, Water or both.

Physical characteristics of soil influence its use and behavior towards plants growth. The plant support, root penetration, drainage, aeration, retention of moisture & plant nutrients is linked with the physical condition of soils. Normally following physical parameters are important for determining the quality of soil: -

(i) Texture

(ii) Porosity

(iii) Bulk density

i. Texture

On the basis of texture, the study area may be classified as loamy sand, sandy loam and silty loam.

ii. Porosity

Volume of soil mass that is not occupied by soil particles and usually occupied by air & water are known as pore space. The plant roots grow & exist in the pore spaces. Porosity, therefore, refers to that percentage of soil volume which is occupied by pore spaces.

iii. Bulk Density

The bulk density weight of a unit of volume of soil inclusive of pore spaces is called bulk density. Generally, the soil with low bulk density has favorable physical conditions.

The locations for collection of representative sample were selected considering - .

1. From different types of land uses in the study area.
2. From possible polluted & comparatively controlled locations in the study area
3. From the leeward and downward of the predominant wind direction

Locations of soil monitoring stations are given in **Figure 3.6.** List of soil monitoring station are given **in Table 3.13.**

Table 3.13

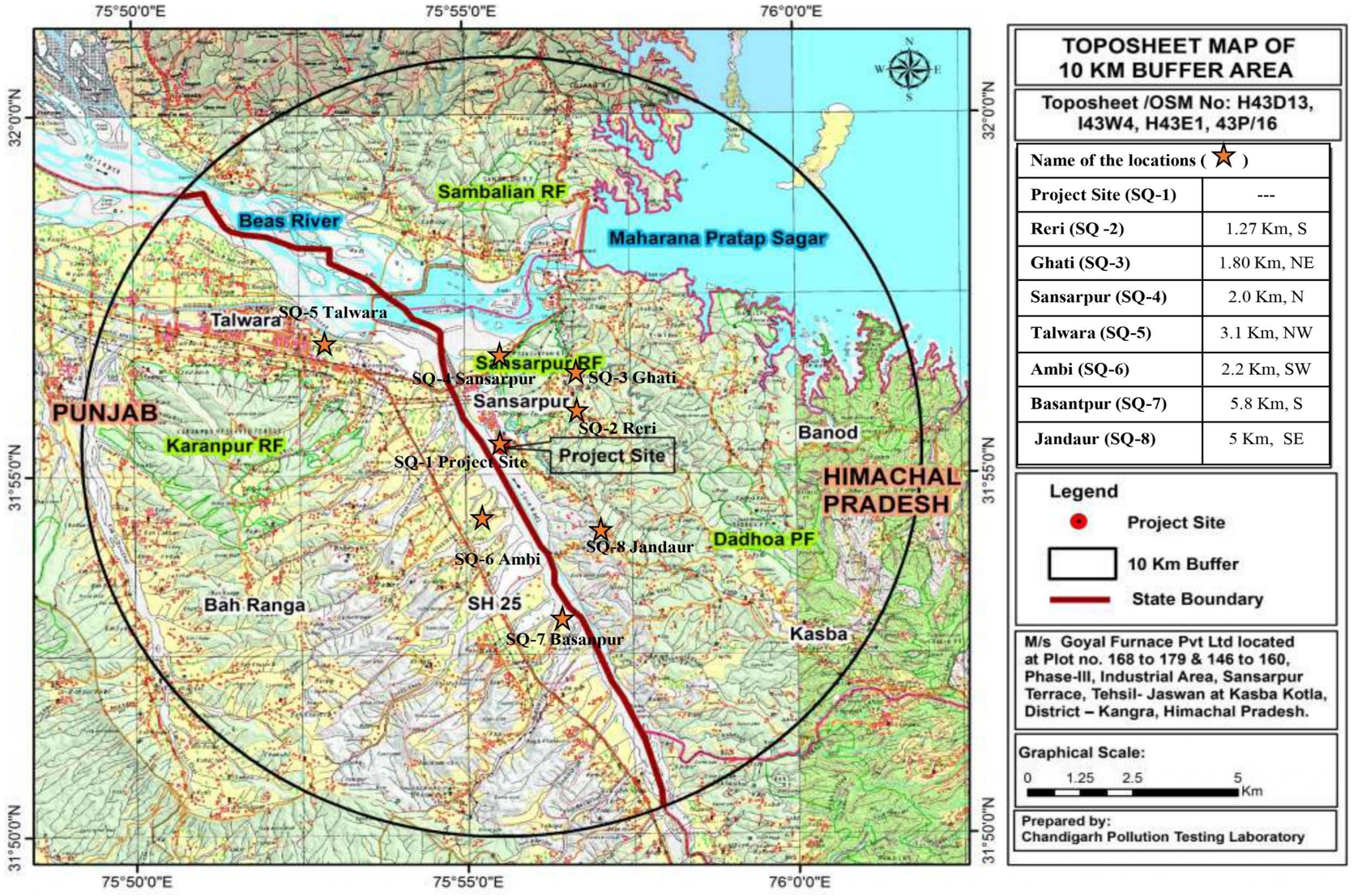
Detail list of Soil Quality Monitoring Stations

Station Code	Sampling Location	Distance from the Plant (Km)	Direction w.r.t Plant	Justification for the Selection
SQ-1	Project Site	--	--	Represent the Project Site
SQ-2	Reri	1.27	S	Representing soil quality within a agriculture area and located in close vicinity to the project site towards S direction.
SQ-3	Ghati	1.80	NE	Representing soil quality within a agriculture area and located in close vicinity to the project site towards NE direction.
SQ-4	Sansarpur	2	N	Representing soil quality within a agriculture area and located in close vicinity to the project site towards N direction.

SQ-5	Talwara	3.1	NW	Representing soil quality within a agriculture area and located in close vicinity to the project site towards NW direction.
SQ-6	Ambi	2.2	SW	Representing soil quality within a agriculture area and located in close vicinity to the project site towards SW direction.
SQ-7	Basantpur	5.8	S	Representing soil quality within a agriculture area and located in close vicinity to the project site towards S direction.
SQ-8	Jandaur	5	SE	Representing soil quality within a agriculture area and located in close vicinity to the project site towards SE direction.

Figure -3.6

Location of Soil Monitoring Stations



TOPOSHEET MAP OF 10 KM BUFFER AREA

Toposheet /OSM No: H43D13, I43W4, H43E1, 43P/16

Name of the locations (☆)	
Project Site (SQ-1)	---
Reri (SQ -2)	1.27 Km, S
Ghati (SQ-3)	1.80 Km, NE
Sansarpur (SQ-4)	2.0 Km, N
Talwara (SQ-5)	3.1 Km, NW
Ambi (SQ-6)	2.2 Km, SW
Basantpur (SQ-7)	5.8 Km, S
Jandaur (SQ-8)	5 Km, SE

Legend

- Project Site
- 10 Km Buffer
- State Boundary

M/s Goyal Furnace Pvt Ltd located at Plot no. 168 to 179 & 146 to 160, Phase-III, Industrial Area, Sansarpur Terrace, Tehsil- Jaswan at Kasba Kotla, District – Kangra, Himachal Pradesh.

Graphical Scale:

0 1.25 2.5 5 Km

Prepared by:
Chandigarh Pollution Testing Laboratory

Table –3.14 (a)
Result of Soil Samples (% W/W except pH) (For April-June, 20203)

S.No.	Parameter	Unit	SQ_1	SQ_2	SQ_3	SQ_4	SQ_5	SQ_6	SQ_7	SQ_8	Test Methods	Detection Limit
1	pH (1:2.5)	--	7.78	7.69	7.83	8.66	7.54	7.25	7.84	7.89	IS 2720(P-26),1987	1
2	Electrical Conductivity (1:2)	µmhos/cm	348	339	374	369	346	354	362	348	IS 14767,2000	2µs/cm
3	Texture	--	Silt loam	Silt loam	Silt loam	Silt loam	Silt loam	Silt loam	Silt loam	Silt loam	CPTL, Lab SOP No. 58	--
4	Bulk Density	(gm/cm^3)	1.42	1.55	1.38	1.42	1.64	1.44	1.58	1.63	IS 2720(P-3),1983	1g/cc
5	Soil Moisture Content	%	8.42	5.88	8.36	7.25	7.45	6.72	7.45	7.36	IS 2720(P-2,1973	1%
6	Color/ Visual Observation	--	Yellowish Brown	Yellowish Brown	Yellowish Brown	Yellowish Brown	Yellowish Brown	Yellowish Brown	Yellowish Brown	Yellowish Brown	Handbook of Agriculture, ICAR	--
7	Available Calcium	(mg/kg)	424	318	525	428	465	289	354	414	Handbook of Agriculture ,ICAR	--
8	Available Magnesium	(mg/kg)	145	244	264	189	254	189	242	311	Handbook of Agriculture, ICAR	--
9	Available Sodium	(mg/kg)	32.4	29.6	33.6	42.8	32.6	42.4	51.4	48.6	CPTL, Lab SOP No. 50	--
10	Available Potassium	(kg/hectare)	34.8	22.6	34.5	36.1	24.2	28.6	24.4	32.2	CPTL, Lab SOP No.50	1.0 kg/ha
11	Available Nitrogen	(kg/hectare)	2.36	4.52	3.26	3.44	2.45	2.38	2.14	2.54	CPTL, Lab SOP No. 53	10%

12	Organic Matter	(%)	0.54	0.63	0.48	0.38	0.47	0.65	0.55	0.48	IS 2720(P-22),2001	0.1%
13	Available Phosphorus	Kg/hac	6.54	4.58	3.84	4.55	5.84	3.42	4.45	3.89	CPTL, Lab SOP No. 51	1.0 kg/ha
14	Cation Exchange Capacity	(meqF/100gm)	0.22	0.34	0.28	0.36	0.45	0.55	0.48	0.46	CPTL, Lab SOP No. 58	--
15	Iron as Fe	(mg/kg)	3.28	2.54	2.66	3.68	4.45	3.48	6.54	4.56	CPTL, Lab SOP No. 54	--
16	Zinc as Zn	(mg/kg)	24.3	18.4	15.4	18.8	18.4	24.2	22.8	23.4	CPTL, Lab SOP No. 54	1.0 mg/kg
17	Lead as Pb	(mg/kg)	35.4	42.2	32.2	35.8	32.2	34.4	36.4	28.6	CPTL, Lab SOP No. 54	1.0 mg/kg
18	Manganese as Mn	(mg/kg)	245	125	241	222	302	254	222	196	CPTL, Lab SOP No. 54	1.0 mg/kg
19	Chromium as Cr	(mg/kg)	ND	ND	ND	ND	ND	ND	ND	ND	CPTL, Lab SOP No. 54	1.0 mg/kg
20	Cadmium as Cd	(mg/kg)	ND	ND	ND	ND	ND	ND	ND	ND	CPTL, Lab SOP No. 54	1.0 mg/kg
21	Copper as Cu	(mg/kg)	8.44	7.63	5.41	7.38	6.55	6.89	6.52	5.54	CPTL, Lab SOP No. 54	1.0 mg/kg
22	Permeability	cm/hr.	18.2	16.2	13.6	21.4	22.6	14.4	10.4	18.8	---	--
23	Porosity	(%)	22.6	18.8	14.2	25.8	26.2	16.2	12.4	22.4	--	---
24	Water Holding Capacity	(%)	38.8	42.2	48.2	36.4	36.6	41.8	46.4	38.2	--	---

3.7.1 Conclusion

Based on the analysis it is seen that organic matter is suitable for fertility and that nitrogen, phosphorous and potash levels are quite satisfactory. High water holding capacity and porosity may be accounted for sandy-to-sandy clay loam texture of soil and permeability was moderate to good due to variable soil texture.

Interpretation:

Soils in the area are neutral to slightly alkaline and do not require soil amelioration. Soil fertility of the project site was medium with respect to N & P but moderate in respect of potassium.

3.7.2 Geomorphology and Soil types:

Kangra district presents an intricate mosaic of mountain ranges, hills and valleys. It is primarily a hilly district, with altitudes ranging from 350 m amsl to 4880 m amsl in the hills of Dauladhar. Physiographical, the district can be divided into six units-viz. (i) high hills, which cover almost 60% of the district (ii) Flavio glacial outwash terraces, which is located in the north eastern part of the district (iii) structural terraces, in the central part (iv) valley fills (v) piedmont plain and (vi) flood plain. Six types of soils are observed in the district, they are: - 1. Histosols (Snow field, Peaty and Saline Peaty), 2. Ultisols (Brown red and yellow), 3. Alfisols (Sub Mountain), 4. Ardisols (Grey Brown), 5. Entisols (Younger alluvium).

Seismicity: -

The study area falls in Zone-IV according to Indian Standards Seismic Zone Map which is a high damage risk zone. The location is not susceptible to floods, landslides, cloud bursts. Adequate designing would be done to mitigate impacts of natural calamities on project and the subsequent impact on environment.

Hydrogeology:

The rock formations occupying the district range from pre-Cambrian to Quaternary period. Geological succession in the district is provided below.

Age	Formation	Lithology
Post Tertiary (Quaternary)	Fluvioglacial/glacial/Interglacial deposits	Moraine & Fluvial deposits
Tertiary	Upper Shivalik's	Conglomerate, Boulder and Sandstone

	Middle Shivalik's	Micaceous sandstone and shale
	Lower Shivalik's	Hard Sandstone and Shale
	Dharamshala	Maroon Sandstone and Shale
----------Main Boundary Fault----------		
	Subathu	Red and green shales
	Intrusive	Granites and gneisses
----------Chandpur thrust----------		
	Chamba and Chandpur	Slate, Phyllite, Quartzite and schist
Pre-Tertiary	Shali and Sundernagar	Limestone and Quartzite
	Jutogh	Schists and Gneisses
----------Jutogh Thrust----------		
Pre-Cambrian		Granites and Gneisses

Source: http://cgwb.gov.in/district_profile/hp/kangra.pdf

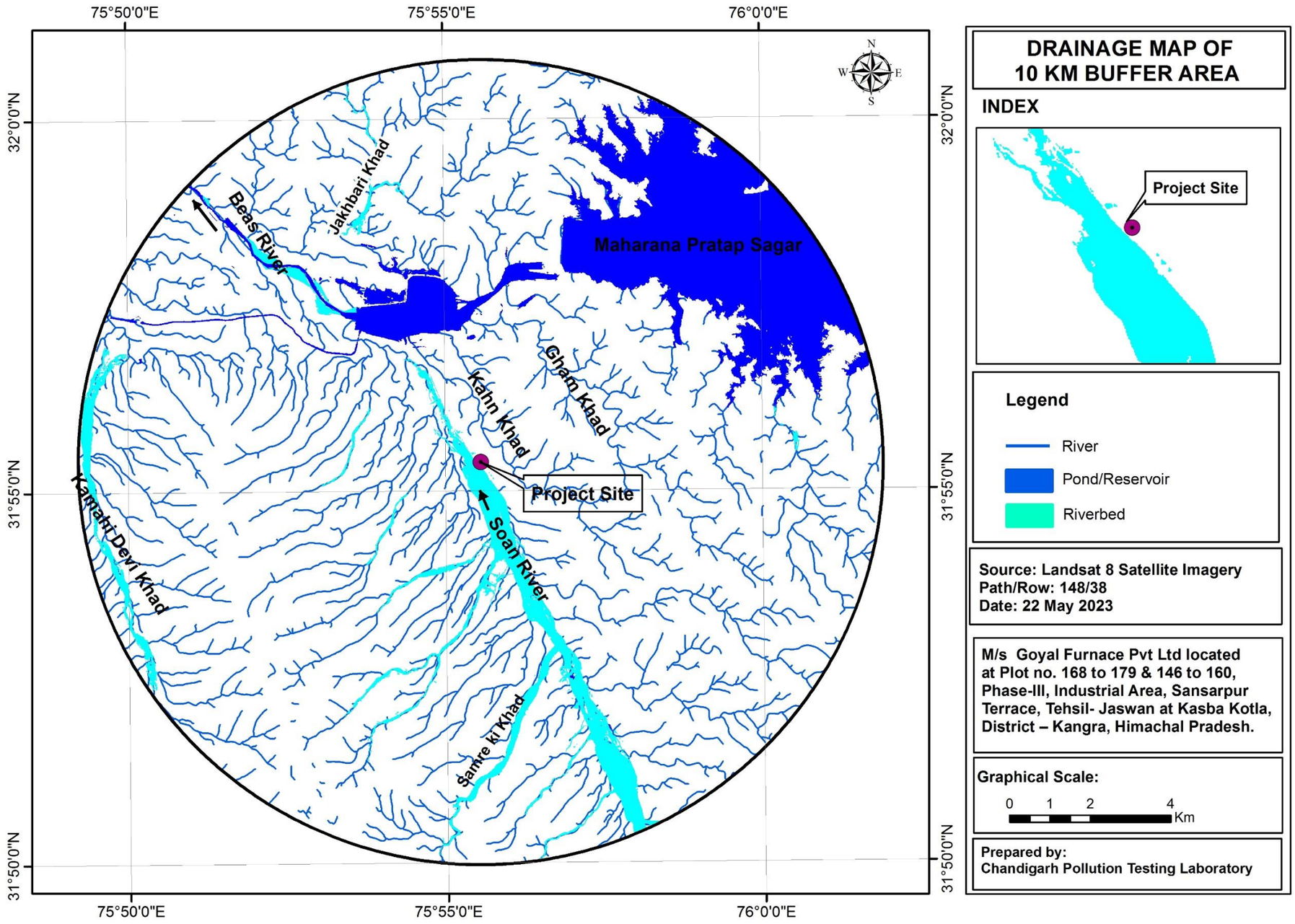
Water level behavior of the district:

Major Ground Water Sources	Wells & Tube wells
Pre-monsoon depth to water level	1.56 – 15.44 m bgl
Post-monsoon depth to Water level (Nov., 12)	0.48 – 12.30 m bgl

Source: http://cgwb.gov.in/district_profile/hp/kangra.pdf

Drainage map is given in **Figure 3.7**.

Figure 3.7: Drainage map of the study area



3.8 Land Environment

The objective of assessing the land use details of the area is to know the existing land use pattern of the area and enable one to know about the land that can be used for the proposed development activities in the study area. It also enables to envisage the scenario emerging due to the increase in demand for land with increase in population and the impacts arising due to the interface with the various project activities.

a) Geographical location of the study area

The study area comprises 10km around the project site. The study area is falling in H43J/13, H43J/14, 53B/1 & 53B/2 of Survey of India Topographic sheet.

b) Data Collection and Quality Assurance

Satellite data

The Indian Remote Sensing satellite data RESOURCESAT-2, LISS III is being used for the analysis of Land Use and Land Cover around 10 Km of the study area.

c) Methodology

The land use / land cover map is prepared by adopting the interpretation techniques of the image in conjunction with collateral data such as Survey of India topographical maps and census records. Image classification has been done by using visual interpretation techniques and digital classification using ERDAS image processing 10.0 software and ARC/GIS 10.0 software. The various activities for preparation of LULC include preprocessing, rectification, enhancements and classifying the satellite data for assessing the change in land use land cover due to proposed developmental activities.

The imagery is interpreted and ground checked for corrections. The final map is prepared after field check. The different land use/land cover categories in the study area have been carried out based on the NRSC land use / land cover classification system.

Flowchart showing the methodology adopted for land use/land cover mapping is provided as **Fig 3.8.**

Land Use / Land Cover Study

The land use land cover study has been done through digital image processing and visual interpretation technique to generate output of Land use / Land cover map of study area on

1:50,000 scale. Land Use / Land Cover Map of Study Area (10 Km Buffer) **Fig 3.9** and a 10 Km radius False Color Composite satellite map surrounding the project site is provided in **Fig 3.10**

Fig 3.8: Flowchart showing the methodology adopted for land use/land cover mapping

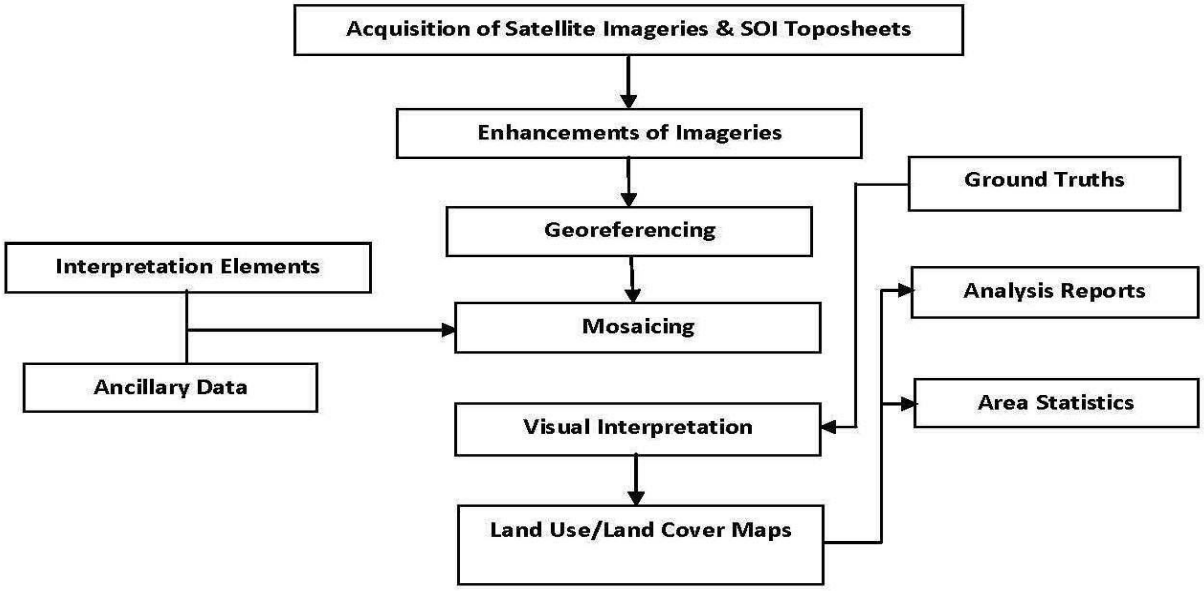


Table 3.15

Land Use/Land Cover Area Statistics

Land Use/Land Cover	Area (Ha)	Area Percentage
Built-Up Land	572.21	1.82%
Agricultural Land	4073.69	12.96%
Agricultural Fallow Land	4751.79	15.11%
Open Land	336.12	1.07%
Vegetation	983.15	3.13%
Water Bodies	3082.10	9.80%
Total Area	**32575.96**	**100.0** %

The study area comprises of agricultural land of about 4073.69ha (12.96%) including agricultural fallow land 4751.79ha (15.11%). Built up land in the study area cover an area of 572.211ha (1.82%) approximately. The study area has open land of 336.12(1.07%) distributed in & around study area. Study area has 205.11 ha (0.63%) of water bodies and 3082.10(9.80%) of vegetation. The land cover pattern and the respective coverage are given in **Table 3.15**

above.

Conclusion & Discussion

Based on the perusal of field visit and interaction with framers, it is seen that over the period of time variants of fruits, vegetable and fodder have been successfully grown in the study area are indicator of healthy & conducive land environment.

3.8.1 Industries within study area (10km radius)

A list of Industries within 10 Km radius of the Project site is provided at **Table 3.16.**

Table 3.16 List of Industries within study area (10km radius)

S.No.	Name of Industries	Type of Industries
1	Surinder Steel Industry	Steel
2	Aggarwal Steel Industries Pvt Ltd	Steel
3	KDK Steels	Steel
4	G.D. Steels Industries	Steel
5	S D Steel industries	Steel
6	Metalico Steel Industries	Steel
7	R.N. Steel Industries	Steel
8	Star Steel industries	Steel
9	Maha Shiv Shakti Traders	Steel
10	Barnala Steel Industries	Steel
11	R.S. Steel Industries	Steel
12	Salsan Steel Rolling Mill	Steel
13	Surjit Steel Industries	Steel
14	Surya Steel Industries	Steel

Fig 3.9: Land Use / Land Cover Map of Study Area (10 Km Buffer)

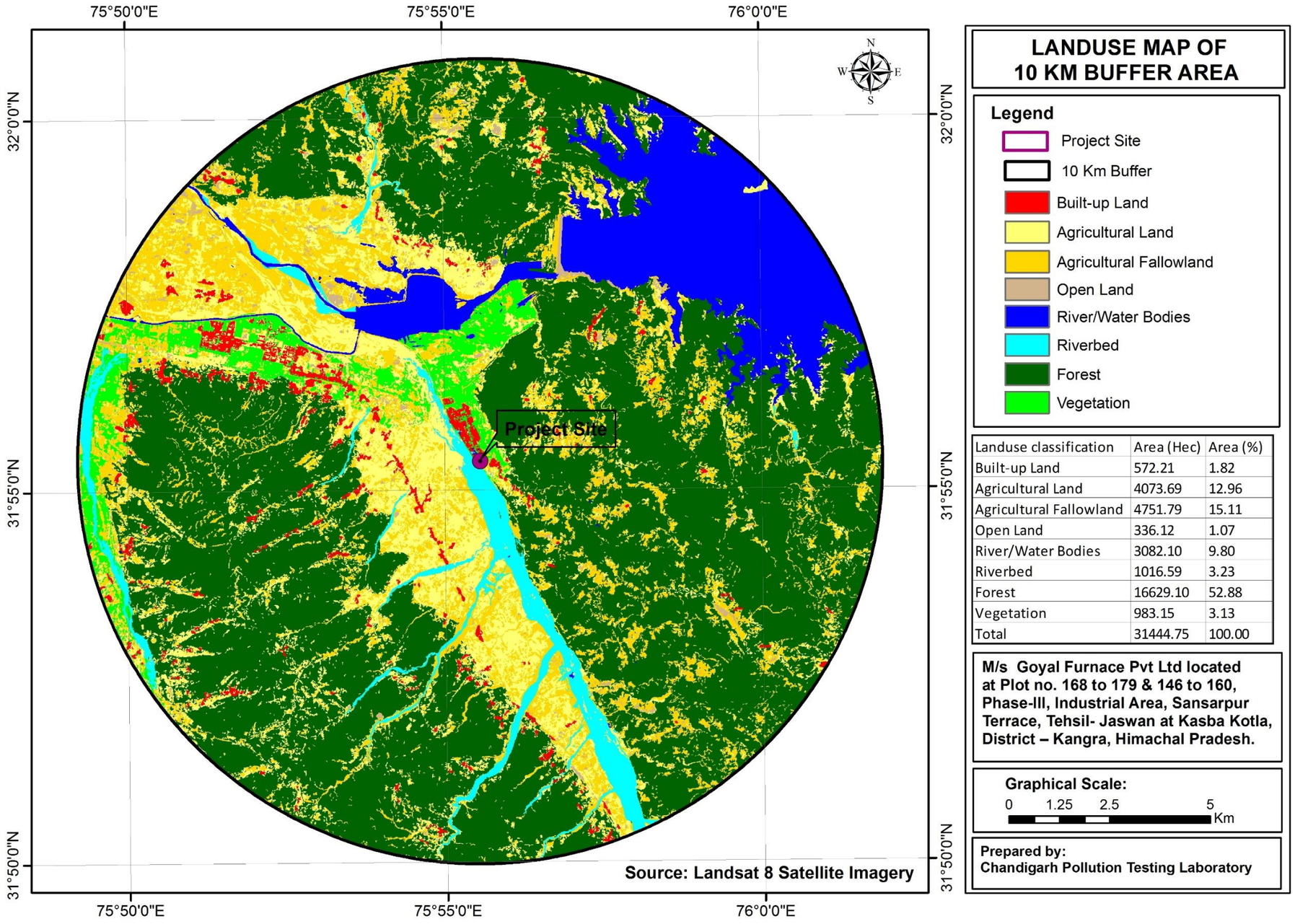
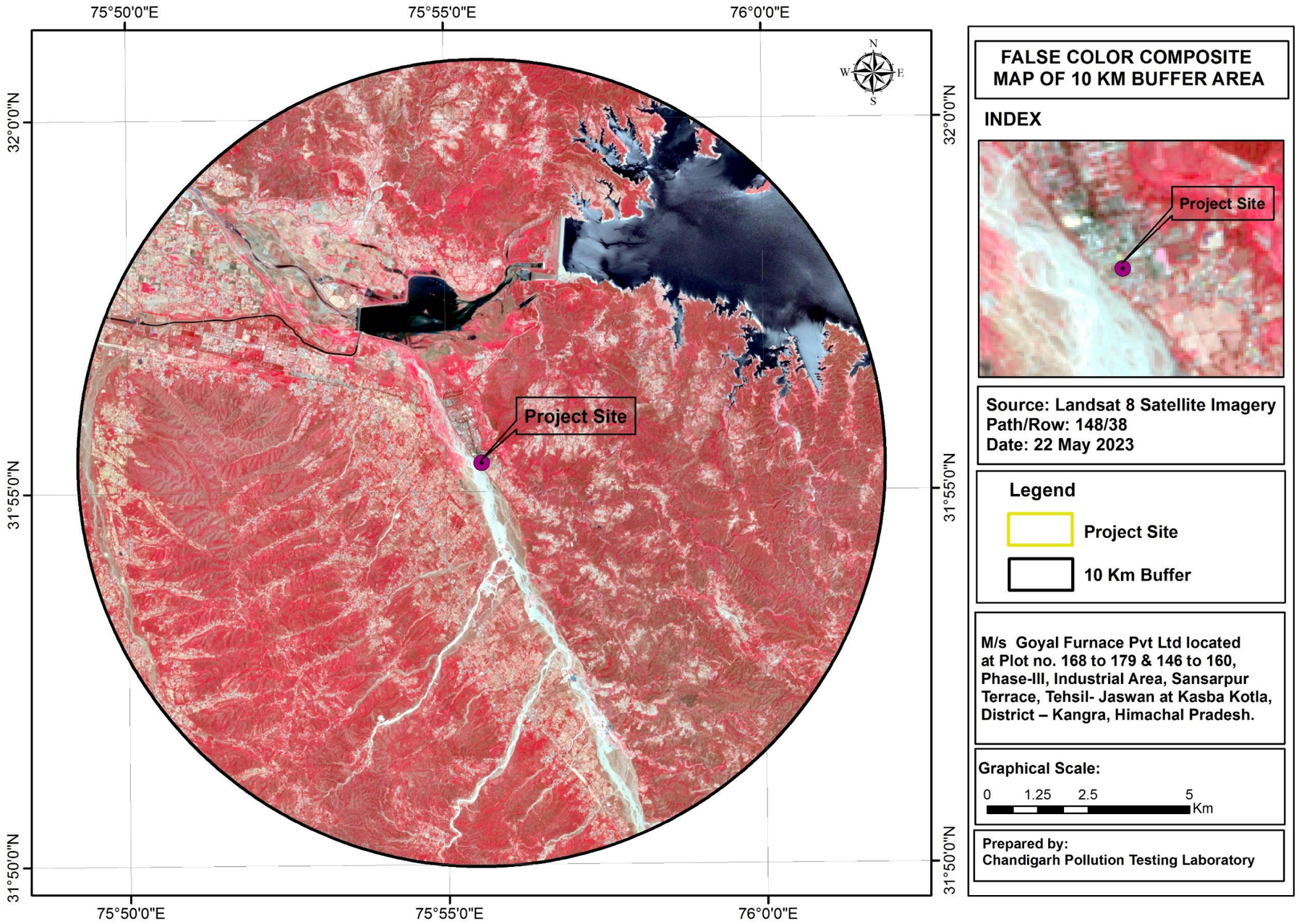


Fig 3.10: 10 Km radius False Color Composite Satellite Map



3.9 Biological Environment

A natural ecosystem is a structural and functional unit of nature. It has different biological and physical components, which are interrelated to each other and survive by interdependence. An ecosystem has self-sustaining ability and controls the number of organisms at any level by cybernetic rules. The basic purpose to explore the biological environment under Environmental Impact Assessment (EIA) is to assist the decision-making process and to ensure that the project options under consideration are environmental-friendly. An ecological survey of the study area was conducted, particularly with reference to listing of species and assessment of the existing baseline ecological conditions in the study area. The main objectives of the ecological survey were aimed at assessing the existing flora and fauna components in the study area, to understand the possible impacts on the biological environment caused by the proposed project activities, and to formulate, if necessary, the appropriate mitigation/preventive measures for such impacts. Data has been collected through secondary sources and by site visits.

The present study was carried out in two separate headings for floral and faunal community. The aspects to be covered in the study for the project are given in **Table 3.17**

Table-3.17

Aspect to be covered in the study Area

Aspect of Environment	**Impacts**
A. Terrestrial Ecology	Impacts on terrestrial flora and fauna
	Impacts on Rare-Endangered-Threatened (RET) wildlife
	Impacts on socially/ economically/ genetically/ biologically important species
B. Aquatic Ecology	Impacts on aquatic fauna/flora
	Impacts on spawning and breeding grounds for aquatic species

The information presented in this Chapter has been collected through field studies, consultation with various government departments and collation of available literature with various institutions and organizations. The summary of data collected from these sources as a part of the EIA study is outlined in **Table 3.18.**

Table-3.18

Summary of Data Collected from various sources

Aspect	Mode of data collection	Parameters Monitored	Frequency	Source(s)
Terrestrial Ecology	Primary field survey and secondary literature survey	Floral and Faunal Diversity and Their Importance	One Season (Winter)	Field studies, Forest & wild life Department and literature review
Aquatic Ecology	Primary field survey and secondary literature survey	Diversity of Species and Their Importance	One Season (Winter)	Field studies, Forest/ wild life Department and literature review

With the change in environmental conditions, the vegetation cover as well as animals reflects several changes in its structure, density and composition. The present study was carried out separately for floral and faunal community respectively.

Sampling

For field assessment, i.e., primary data collection, a standard statistical sampling method was followed. The sampling design followed random sampling method. The sampling area was decided based on prior land-use map of the project influence zone (within the 10 km radius around the project area), outlining forest areas and other types of habitats, topographic features and build-up area.

Flora

Methodology for floral study

1. Secondary literature survey: Published literature, including those from relevant organizations like the Botanical Survey of India (BSI), the Wildlife Institute of India (WII-Dehradun), the respective Forest Department of the State concerned etc., research papers, articles, books and reliable websites, available within and adjacent to the study area were compiled and inventoried as "Secondary Floral Diversity Database".
2. Primary field survey – herbs: Herbaceous plants were studied using the quadrat method as followed during vegetation survey. The size of each quadrat for herb survey was 1m x 1m. Field identification of the species and later identification through photographs were followed. Unidentified herbs were collected following proper procedure and prepared into herbarium sheets for later identification. For mosses, lichens and other plants the plot size was taken as 0.1m x 0.1m.
3. Primary field survey – shrubs: Shrubs were studied using the quadrat method as followed during vegetation survey. The size of each quadrat for shrub survey was 5m x 5m for shrubs of 3m height. Field identification of the species and later identification through photographs were followed. Unidentified shrubs were collected following proper procedure and prepared into herbarium sheets for later identification.
4. Primary field survey – trees: Trees were studied using the quadrat method as followed during vegetation survey. The size of each quadrat for tree survey was 20m x 20m. Field identification of the species and later identification through photographs were followed. Samples of unidentified trees were collected following proper procedure and prepared into herbarium sheets for later identification.
5. Primary database: Data generated from the field survey within and adjacent to the study area were meticulously compiled and inventoried as "Primary Floral Diversity Database".
6. Field instruments/materials for floral study: Measuring tape/s, herbarium sheets, newspaper, herbarium press, polythene bags (incl. zip-locked pouches), 83clinometers, and magnifying glass, camera, and GPS unit.

FLORA AND FAUNA

Kali basuti (Adatoda vesica), basuti (lpomea), deodonia viscose, dondathore (euphorbia royaliana), jharer (zizipusspecises) karipatta (murayaconigii), aluna (cassia tora), keore (aloe vera), agavaamearicana (Ramban), banjli (dendrcalamusspecies), wood fodiafruticosa, justice

asatoda, cumbopogan species. The common scrub species are acacia catechu (khair) anogeissuslatifolia (dhoa) albizzia lebbeck, (siris)albizzia odoratissima, (ka; Isiris) lanneacorromandelica, (ash tree) syzygiumcummini, (jamun), kydiacalycina, (bharanga) casearіatomentosa, cassia fistula (babul) but none of these species grow in abundance. Acacia catechu is found in substantial number. Following species are found i.e., Berberis asiatica, Berberis Iycium Cannabis sativa, Cassia fistula (Amaltas), Tinosporacordifolia (Giloe), Viola serpens, Vitex neguundo (Bana). Local people collect fodder and fuel wood from the study area plant species such as Adathodazeylanica, Albiziachinensis, Albizialebbeck, Anogeissuslatifolia, Boehmeriaplatphylla, Butea azadarach, Pyrus pashia,

etc. and fruits are mango, litchi, lemon, orange and laquat. Symplocospaniculata, Toona ciliate, Ougeiniaoogeinensis (Chandan) and Zizyphusmauritiana were collected for fodder.

Following wild grasses and sedges are frequently gathered by the local people or grazed by their cattle: Avenafatua, Branchiaria ramose, Cynodondactylon, Cyperusrotundus, Dactylocteniumaegytium, Digitariaciliaris, Echinochloacrusgalli, Eragrostis minor, E. tenella, Oplismenusburmannii, O. composites, Panicum psilodium, Paspalidiumflavidum, Paspalumpaspalodes, Phalaris minor, Poa annua, Setaria pumila and Sporobolusdiander. The main crops are grown in the area are Wheat, Makki, Paddy, Corn, and sugarcane etc. The vegetable grown in the area are brinjal, chilli, potato, bean, palak, cabbage and tomato

The plantation in the study area consists of local wild species with some ornamental species & fruit tree: important species found in the area are listed in table below:

FLORA IN THE STUDY AREA:

BOTANICAL NAME	COMMON NAME
Kydiacalycina	Bhargana
Azadirachtaindica	Neem
Acacia catechu	Khair
Albiziaodoratissima	Kali siris
Bauhinia variegate	Kanchnar
Lanneacorromandelica	Ash tree
Bombax Ceiba	Semal
Dalbergia sissoo	Shisham
Magnifera Indica	mango
Eucalyptus tereticornis	Eucalyptus
Adhatodavasica	Adosa, bansa
Ficus glomerata	Gular

Ficus religiosa	Pipal
Syzygiumcumini	Jamun
Psidium guajava	Guava
Cedrelatoona	Tun
Cassia fistula	Amaltas
Ficus benghalensis	Bar
Albizialebbeck	Siris
Diospyros cordifolia	Kendu
Acacia arabica	Kiker (Babul)
Mallotusphillippinesis	Kambel (Kamala)
Grewiaoppositifolia	Dhaman
Ziziphus mauritiana	Ber
Ziziphus nummularia	Jharber
Pinus roxburghii	Chir pine
Anogeissuslatifolia	Dhau
Jasminum officinale	Jasmine
Morus alba	Tuta
Punicagranatum	Anar
Tinosporacordifolia	Guduchi
Bambusaarundinacea	Bas
Aegle marmelos	Bael
Terminalia bellirica	Bibhitaki
Cordia dichotoma	Lasoda
Potentilla indica	Wild strawberry
Lawsoniainermis	Mehdi
Berberis aristata	Indian barberry
Parthenium hysterophorus	Gajarghas
Terminalia chebula	Harad
Mantha arvensis	Wild pudina
Acacia modesta	Phulai

B) FAUNA

Due to rich forest cover in the buffer zone many fauna is expected to be found in this area and it include mammals, reptiles, birds, etc. Domestic animals include cow, buffalo, moles, hen, dogs, goat, oxen and cat are common. The fauna includes in the area are Lomri, Kakkar, Chamgadar, Viper, Jangli Billi, Mirag Bagh, Parrot, Owl, Monkey, Fox, Newla, Barking Dear, Rabbit, Cheel, Peacock, Ajgar, Panther, Jungle cat, Samber, House Sparrow, Crow, Myna etc.

3.10 Socioeconomic Environment

Introduction

Modern day cities have complex structure comprising of numerous & intertwined/ interwoven relationships due to which town planning judgments cannot be merely treated as technical-oriented as they affect the lives and interests of the whole community. In the present context, the slogan "Planning by the people and Planning for the people "exhibits a shift from Physical design oriented basic concept of town planning to more of a socially relevant and sensitive model of town Planning encompassing socio-economic richness and viability of existing communities.

The economic sectors i.e., primary, secondary and tertiary form the economic base of the town. Nothing can hamper the physical growth/ development of an area more than the economic incompetence. The identity of a town depends upon the character of its population. Demographic profile determines the demographic character of the town area in terms of population, growth rate, density, literary rate etc. which further helps in determining the social as well as the economic character of the area. The natural population growth has special significance because it is a vital index of economic development, social awakening.

Kangra, Himachal Pradesh District

In 2011, Kangra had population of 1,510,075 of which male and female were 750,591 and 759,484 respectively. In 2001 census, Kangra had a population of 1,339,030 of which males were 661,254 and remaining 677,776 were females. Kangra District population constituted 22.00 percent of total Maharashtra population. In 2001 census, this figure for Kangra District was at 22.03 percent of Maharashtra population.

There was change of 12.77 percent in the population compared to population as per 2001. In the previous census of India 2001, Kangra District recorded increase of 14.05 percent to its population compared to 1991.

Description	2011	2001
Population	15.10 Lakhs	13.39 Lakhs
Actual population	1,510,075	1,339,030
Male	750,591	661,254
Female	759,484	677,776
Population Growth	12.77%	14.05%
Area Sq. Km	5,739	5,739
Density/km^2	263	233
Proportion to Himachal Pradesh Population	22.00%	22.03%
Sex ratio (per 1000)	1012	1025
Child Sex Ration (0-6 Age)	876	836
Average Literacy	85.67	80.08
Male Literacy	91.49	87.54
Female Literacy	80.02	73.01
Total Child Population (0-6 Age)	164,607	164,566
Child Proportion (0-6 Age)	10.90%	12.29%

Source: Kangra District Census-2011

Kangra, Himachal Pradesh District Density

The initial provisional data released by census India 2011, shows that density of Kangra district for 2011 is 263 people per sq. km. In 2001, Kangra district density was at 233 people per sq. km. Kangra district administers 5,739 square kilometers of areas.

Kangra, Himachal Pradesh Literacy Rate

Literacy rate of Kangra city is 93.31 % higher than state average of 82.80 %. In Kangra, Male literacy is around 95.63 % while female literacy rate is 90.87 %.

Kangra, Himachal Pradesh Sex Ratio

Kangra is one of districts of Himachal Pradesh in India, Kangra District population in 2023 is 2,099,005(estimates as per Aadhar uidai.gov.in Dec 2023 data). As per 2011 census of India, Kangra District has a population of 1,510,075 in 2011 out of which 750,591 are male and 759,484 are female.

Kangra, Himachal Pradesh Houseless Census

In 2011, total 180 families live on footpath or without any roof cover in Kangra district of Himachal Pradesh. Total Population of all who lived without roof at the numbers to 752. This approx. 0.049798851050445% of total population of Kangra district.

Kangra District Religion-wise Data

Description	Total	Percentage
Time of Census 2011 Hindu	1,461,140	96.76%
Muslims	19,797	1.31%
Christian	3,023	0.20%
Sikh	8,929	0.59%
Buddhist	14,511	0.96%
Jain	194	0.01%
Others	208	0.01%
Not Stated	2,273	0.15%

Kangra District Urban/Rural 2011

Out of the total Kangra population for 2011 census, 5.71 percent lives in urban regions of district. In total 86,281 people lives in urban areas of which males are 45,226 and females are 41,055. Sex Ratio in urban region of Kangra district is 908 as per 2011 census data. Similarly, child sex ratio in Kangra district was 856 in 2011 census. Child population (0-6) in urban region was 8,021 of which males and females were 4,322 and 3,699. This child population figure of Kangra district is 9.56 % of total urban population. Average literacy rate in Kangra district as per census 2011 is 89.70 % of which males and females are 92.60 % and 86.52 % literates respectively. In actual number 70,198 people are literate in urban region of which males and females are 37,879 and 32,319 respectively.

As per 2011 census, 94.29 % population of Kangra districts lives in rural areas of villages. The total Kangra district population living in rural areas is 1,423,794 of which males and females are 705,365 and 718,429 respectively. In rural areas of Kangra district, sex ratio is 1019 females per 1000 males. If child sex ratio data of Kangra district is considered, figure is 877 girls per 1000 boys. Child population in the age 0-6 is 156,586 in rural areas of which

males were 83,419 and females were 73,167. The child population comprises 11.83 % of total rural population of Kangra district. Literacy rate in rural areas of Kangra district is 85.42 % as per census data 2011. Gender wise, male and female literacy stood at 91.42 and 79.64 percent respectively. In total, 1,082,442 people were literate of which males and females were 568,564 and 513,878 respectively.

Description	Rural	Urban
Population (%)	40.84%	59.16%
Total Population	1,429,031	2,069,708
Male Population	753,444	1,114,372
Female Population	675,587	955,536
Sex Ratio	897	857
Child Sex Ratio (0-6)	859	860
Child Population (0-6)	148,970	235,144
Male Child (0-6)	80,113	126,389
Female Child (0-6)	68,857	108,755
Child Percentage (0-6)	10.42%	11.36%
Male Child Percentage	10.63%	11.34%
Female Child Percentage	10.19%	11.38%
Literates	1,002,069	1,558,156
Male Literates	557,296	871,052
Female Literates	444,773	687,104
Average Literacy	78.28%	84.93%
Male Literacy	82.77%	88.16%
Female Literacy	73.31%	81.16%

(Source: District Census Population, 2011)

Methodology applied for selection of sample & data collection

The methodology which is applied for primary source of data collection i.e., gathering data through field survey for socio- economic environment is depicted below:

A. Sampling Method

A judgmental and purposive sampling method was used for choosing respondents of various sections of the society i.e., Sarpanch, Adult Males and Females, Teachers, Medical Practitioners, Businessmen, Agriculture labourers, Unemployed Group etc. Judgmental and

purposive sampling methods were adopted to assess the total population that helps to fulfill the purpose of research needs.

B. Data Collection Method

For the process of data collection through primary source certain methods were used, amongst that are:

i. Field Survey and Observations

Field survey and observations were made in nearby sampling village and the socioeconomic status of that region was studied. Visits are made at Health Centers, Schools, Gurudwaras, Panchayat office etc.

ii. Interview Method

Structured interview method was used to collect data regarding the awareness and opinion from the samples selected of the various socio- economic sections of the community. Structured interviews involve the use of a set of predetermined projected questions that includes fixed and alternative questions. The questionnaire mainly highlights the parameters such as income, employment and working conditions, housing, food, water supply, sanitation, health, energy, transportation and communication, education, environment and to assess the standard of living of that particular region and general awareness, opinion and expectation of the respondents about the proposed project. Interview method helps to collect more correct and accurate information as the interviewer is present during the field survey.

Particulars	**Total**	**Male**	**Female**
Total No. of Houses	**156**	-	-
Population	**637**	336	301
Child (0-6)	**69**	37	32
Schedule Caste	**118**	66	52
Schedule Tribe	**0**	0	0
Literacy	**87.50%**	92.31%	82.16%

Total Workers	**165**	151	14
Main Worker	**136**	-	-
Marginal Worker	**29**	24	5

Socio-economic data of study area

We have chosen 4 villages in the study area for socioeconomic study:

i. Dhola Population - Hoshiarpur, Punjab

Dhola is a medium size village located in Mukerian Tehsil of Hoshiarpur district, Punjab with total 156 families residing. The Dhola village has population of 637 of which 336 are males while 301 are females as per Population Census 2011.

In Dhola village population of children with age 0-6 is 69 which makes up 10.83 % of total population of village. Average Sex Ratio of Dhola village is 896 which is higher than Punjab state average of 895. Child Sex Ratio for the Dholal as per census is 865, higher than Punjab average of 846.

Dhola village has higher literacy rate compared to Punjab. In 2011, literacy rate of Dholal village was 87.50 % compared to 75.84 % of Punjab. In Dhola Male literacy stands at 92.31 % while female literacy rate was 82.16 %.

ii. Bhambotar Population - Hoshiarpur, Punjab

Bhambotar is a large village located in Mukerian Tehsil of Hoshiarpur district, Punjab with total 862 families residing. The Bhambotar village has population of 4094 of which 2063 are males while 2031 are females as per Population Census 2011.

In Bhambotar village population of children with age 0-6 is 488 which makes up 11.92 % of total population of village. Average Sex Ratio of Bhambotar village is 984 which is higher than Punjab state average of 895. Child Sex Ratio for the Bhambotar as per census is 848, higher than Punjab average of 846.

Bhambotar village has higher literacy rate compared to Punjab. In 2011, literacy rate of Bhambotar village was 87.94 % compared to 75.84 % of Punjab. In Bhambotar Male literacy stands at 93.61 % while female literacy rate was 82.29 %.

Particulars	**Total**	**Male**	**Female**
Total No. of Houses	**862**	-	-
Population	**4,094**	2,063	2,031

Particulars	Total	Male	Female
Child (0-6)	**488**	264	224
Schedule Caste	**266**	130	136
Schedule Tribe	**0**	0	0
Literacy	**87.94%**	93.61%	82.29%
Total Workers	**1,344**	937	407
Main Worker	**890**	-	-
Marginal Worker	**454**	320	134

iii. Baggi Population - Mandi, Himachal Pradesh

Baggi is a medium size village located in Mandi Tehsil of Mandi district, Himachal Pradesh with total 236 families residing. The Baggi village has population of 1109 of which 572 are males while 537 are females as per Population Census 2011.

In Baggi village population of children with age 0-6 is 109 which makes up 9.83 % of total population of village. Average Sex Ratio of Baggi village is 939 which is lower than Himachal Pradesh state average of 972. Child Sex Ratio for the Baggi as per census is 730, lower than Himachal Pradesh average of 909.

Baggi village has higher literacy rate compared to Himachal Pradesh. In 2011, literacy rate of Baggi village was 87.50 % compared to 82.80 % of Himachal Pradesh. In Baggi Male literacy stands at 92.53 % while female literacy rate was 82.28 %.

Particulars	Total	Male	Female
Total No. of Houses	**236**	-	-
Population	**1,109**	572	537
Child (0-6)	**109**	63	46
Schedule Caste	**549**	281	268
Schedule Tribe	**13**	5	8
Literacy	**87.50%**	92.53%	82.28%
Total Workers	**392**	272	120
Main Worker	**292**	-	-

Particulars	Total	Male	Female
Marginal Worker	**100**	36	64

iv. Basantpur Population - Kangra, Himachal Pradesh

Basantpur is a medium size village located in Indora Tehsil of Kangra district, Himachal Pradesh with total 122 families residing. The Basantpur village has population of 641 of which 349 are males while 292 are females as per Population Census 2011.

In Basantpur village population of children with age 0-6 is 72 which makes up 11.23 % of total population of village. Average Sex Ratio of Basantpur village is 837 which is lower than Himachal Pradesh state average of 972. Child Sex Ratio for the Basantpur as per census is 756, lower than Himachal Pradesh average of 909.

Basantpur village has lower literacy rate compared to Himachal Pradesh. In 2011, literacy rate of Basantpur village was 81.20 % compared to 82.80 % of Himachal Pradesh. In Basantpur Male literacy stands at 86.69 % while female literacy rate was 74.71 %.

Particulars	Total	Male	Female
Total No. of Houses	**122**	-	-
Population	**641**	349	292
Child (0-6)	**72**	41	31
Schedule Caste	**94**	55	39
Schedule Tribe	**57**	32	25
Literacy	**81.20%**	86.69%	74.71%
Total Workers	**238**	173	65
Main Worker	**237**	-	-
Marginal Worker	**1**	1	0

Conclusion:

The salient observations recorded during socio economic survey in the study areas are below:

- Livelihood of the villagers is primarily based on industrial as well as agriculture sector. Majority of main workforce are engaged as industrial labourers.

- Most of the villages have Primary School (PS) while in some villages it is extended up to High School (HS). For higher education reputed educational institutes are available in 20-25 Km stretch area.
- The main source of drinking water supply is through hand pumps and bore wells in addition to govt. water supply schemes.
- The Government medical facilities in the form of primary health sub- centre and private medical practitioners are available in the villages. Villagers expressed satisfactory opinion regarding the facilities available at the centre. ANM (Auxiliary Nurse Midwife) frequently visits all the villages and regular vaccination and health check-ups camps are organized by the health centre.
- Two wheelers, cars, auto rickshaws & bus facility are the main mode of transportation used by natives in the study area.
- Power supply is available in all the villages in study area. Street lights are also available in all villages but frequent power cut/ load shedding problem is experienced by the people in the area. LPG is a major fuel used for cooking purpose. Availability Post office and banking facilities in the surveyed villages.
- Majority of surveyed population opined positive regarding the proposed project as most of the local population will be given preference in employment and the activity will help in development of auxiliary as well as ancillary facilities units.
- The agricultural operations in the study area were mostly mechanised. Manual work if any is given to locals.
- The local govt schemes such that pavement of streets etc in the villagers are executed by MNREGA workers from the villages.
- There was complete communal harmony and none reported violation of human rights.

Socio- economic survey was conducted in nearby villages of the project area.

The salient observations recorded during socio economic survey in the study areas are below:

- Livelihood of the villagers is primarily based on agriculture sector. Majority of main workforce are engaged as cultivators or agriculture labourers.
- Majority of workers are practicing farming activities without any irrigation source; it means that area under irrigation is very low and maximum area is covered by unirrigated land.
- Most of the villages have Primary School (PS) while in some villages it is extended up to

Middle School (MS). For higher education reputed educational institutes are available in 20-25 Km stretch area.

- The main source of drinking water supply is through hand pumps and bore wells in addition to govt. water supply schemes.
- The Government medical facilities in the form of primary health sub- centre and private medical practitioners are available in the villages. Villagers expressed satisfactory opinion regarding the facilities available at the centre. ANM (Auxiliary Nurse Midwife) frequently visits all the villages and regular vaccination and health checkups camps are organized by the health centre.
- Two wheelers, auto rickshaws & bus facility are the main mode of transportation used by natives in the study area.
- Power supply is available in all the villages in study area. Street lights are also available in all villages but frequent power cut/ load shedding problem is experienced by the people in the area. LPG is a major fuel used for cooking purpose. Availability Post office and banking facilities in the surveyed villages.
- Majority of surveyed population opined positive regarding the proposed project as most of the local population will be given preference in employment and the activity will help in development of auxiliary as well as ancillary facilities units.
- The people were optimistic about the employment opportunities in govt sectors and welfare schemes to be implemented by the state govt.
- The agricultural operations in the study area were mostly mechanised. Manual work if any is given to locals.
- The local govt schemes such that pavement of streets etc in the villagers are executed by MNREGA workers from the villages.
- There was complete communal harmony and none reported violation of human rights.
- There was complete communal harmony and none reported violation of human rights.

3.11 Traffic Study

Traffic & Transportation is considered as an inevitable function of land use planning. Urban transport is an integral part of urban planning because apart from defining the form of a town, the smooth functioning and productivity of any urban center clearly hinges on the efficacy of traffic & transportation system. Since roads and streets or transport network are equated with arteries/veins of human body whereas traffic on roads/streets is comparable to

blood flowing, so any blockage/obstruction in this system acts like clot in the blood invariably leading to numerous complications.

The project is located adjacent to the link road which ultimately joins to Dada siba-Sansarpur Terrace road. From this road which is 7.0 m wide carriage way with good quality shoulders joins the Dada siba-Sansarpur Terrace road on one side and the Talwara-Pong Dam Road on other side. It is two lane road.

Fig 3.11: Locations of Traffic Study

Traffic Scenario on Link Road near Sansarpur Terrace (Both Ways)

S. No.	Road	Width of road (m)	Types carriage ways	Recommended designed capacity (PUC/day)	Existing vehicle (PUC/day)	Existing V/C ratio	Existing LOS
1.	Sansarpur Terrace Link Road	7.0	1	7000	1542	0.22	Very Good

Existing Volume of Traffic on Sansarpur Terrace Link Road:

S.No.	Vehicle Type	No. of Vehicle/day	Equivalency Factor (PUC)	Total no. of vehicles PUC/day
1.	Two-Wheeler	600	0.5	300
2.	Three-wheeler	150	1.2	180
3.	Four-wheeler (Car/Jeep etc)	400	1.0	400
4.	Bus/Trucks	180	2.2	396
5.	LCV	190	-	266
Total		1520	4.9	1542

Existing Traffic scenario & LOS

(Design Services Vol. as per IRC- 64-1990)

Road	V	C PCC/day	Existing V/C ratio	LOS	Performance of road
Sansarpur Terrace Link Road	1542	7000	0.22	B	Very good

LOS represent a condition of free flow with average travel speed usually 90% of free flow speed for sub-arterial class. Individual user is generally unaffected by others in traffic stream.

Table: Level of service and Performance of road

V/C	LOS	Performance
0.0-0.2	A	Excellent
0.2-0.4	B	Very Good
0.4-0.6	C	Good/Average/Fair
0.6-0.8	D	Poor
0.8-1.0	E	Very Poor

Impact of traffic during operation phase

During the operational phase an estimated 10 trucks each @20 tons, 30 two-wheeler and 4 cars will be added which will transverse on either side of the road

Sr.No.	Vehicle Type	Vehicle/day	Equivalency Factor (PUC)	PUC/day	PUC/Day
1.	Two-Wheeler	30	0.5	15	15
2.	Car	4	1.0	4	4
3.	Trucks	10	2.2	22	22
Total PUC/Day					41

Modified traffic Scenario

Road	V	C	V/C ratio	LOS	Performance of road
Sansarpur Terrace Link Road	1583	7000	0.23	B	Very good

Conclusion:

With the proposed project coming into being on an average 41 PUC/day will be added to the existing traffic on both sides of Sansarpur Terrace Link Road. The existing V/C ratio of 0.22 stands modified to 0.23 which indicates that the LOS & performance of road will remain unaltered. Hence, the additional load with the proposed project coming into being on the concerned road [Sansarpur Terrace Link Road] will not result in significant adverse impact on the carriage way.

3.12 Slag Analysis

The furnace slag from the operating unit has been analyzed as per CPCB methods and the following are the analytical results:

Table 3.19- Slag Analysis

S.No.	Parameters	Result (mg/kg)
1.	Cu	6
2.	Cr	9
3.	Ni	5
4.	Pb	9
5.	Mn	22
6.	Zn	8
7.	Hg	<0.05
8.	Cd	5.0
9.	Sr	9
10.	Co	6.4
11.	As	<0.1

A perusal of above analytical values reveals that the presence of heavy metals as highly stable oxides is within the acceptable limits. Moreover, slag is not characterized as HW under the HWM rules. Columns Leachate study of slag has also been done as per CPCB methods for metals that Leachate out from materials and the same has been found <0.1mg/kg (The limits prescribed by USEPA) and therefore passes the TCLP test.

CHAPTER 4.0

ANTICIPATED ENVIRONMENTAL IMPACTS & MITIGATION MEASURES

4.1 GENERAL

Prediction of impacts is the most important component in the Environmental Impact Assessment studies. Several scientific techniques and methodologies are available to predict impacts of developmental activities on physical, ecological and socio-economic environments. Such predictions are superimposed over the baseline (pre-project) status of environmental quality to derive the ultimate (post-project) scenario of environmental conditions. The prediction of impacts helps to minimize the adverse impacts on environmental quality during pre and post project execution. Generally, the environmental impacts can be categorized as either primary or secondary. Primary impacts are those, which are attributed directly by the project and secondary impacts are those, which are indirectly induced and typically include the associated investment and changed patterns of social and economic activities by the proposed actions.

The primary function of an environmental impact assessment is to assertion the potential impacts of project on environmental components such as air, water, noise, soil, flora, fauna, land and socio-economic and their magnitude during construction and operation for adoption of satisfactory mitigation measure.

The Impacts of project are divided into two categories i.e., impacts of a project during construction phase and impacts during operation phase. Major project impacts will occur during operation phase as construction work will be done in staggered manner within a small area and for short degradation.

Environmental parameters considered for impact analysis are: -

1. Landform and Topography
2. Air Environment
3. Water Environment
4. Noise Environment
5. Biological Environment
6. Socioeconomic Environment

Table4.0 Matrix of potential impacts

Construction Phase	Environmental impact							Ecological impact	Soci-economic Impact
	LUCU	Air Quality	Noise	Solid Waste	Effluent/Sewage	Ground Water	Soil		
Excavation Work	•	•	•	X	X	•	•	X	•
Filling of Foundation	•	•	X	X	X	X	X	X	•
Vehicle movement for material transportation	X	•	•	X	X	X	•	•	X
Disposal of construction waste	X	X	X	X	X	•	•	•	X
Generation of waste water and sewage	X	X	X	X	•	X	X	X	X
Heavy Fabrication Work	X	•	•	X	X	X	X	X	•
Final Clearing of Site, Temporary Structure.	X	•	X	X	X	X	X	X	•
Operational phase									
Transportation of Raw Material	X	X	•	•	X	X	X	X	X

Handling Storage of Raw Material	X	X	X	X	X	X	X	•	X
Manufacturing process	X	•	X	•	•	X	X	X	X
Waste Water Management	X	X	X	•	X	X	X	X	X
Municipal Solid Waste generation & management	X	X	X	X	X	X	X	X	X
Storm Water management	X	X	X	•	•	X	X	X	X
Employment to Locals	X	X	X	X	X	X	X	X	•
Green Belt development	X	•	X	•	X	X	X	•	X
Use of Dg Set	X	•	•	X	X	X	X	•	X
Storage lifting of Transportation	X	•	X	•	X	X	X	•	X
Start up and start Down Activities	X	X	•	X	X	X	X	X	X

4.2CONSTRUCTION PHASE IMPACTS

4.2.1 Impacts & Mitigation measures due to location of the project Impacts

The proposed expansion shall be undertaken within the existing manufacturing unit. There will therefore be no impact on the land use of the study area.

Mitigation Measures

No negative impact is anticipated due to project location on the existing environment and no mitigation measures are required.

4.2.2 Impact and Mitigation measures due to project design Impacts

The expansion will be based on the proven I.F. technology available in the country and no adverse impacts are anticipated on this account.

Mitigation Measures

Best available technology practicable has been considered to minimize or avoid emissions. e.g.:

- APCS comprising side suction hood, spark arrestor, bag house and ID fan will be installed.
- The APCS will be operated & maintained as pet PPCB guidelines/SOP.
- Bag Filter cleaning will be done offline by compartmentalizing the bag house.

4.2.3 Impacts & Mitigation measures during Construction Phase

The components of environment likely to be affected includes: land use, ground water, water quality, air quality, noise etc. as discussed below:

i. Land Use

Impacts

Being proposed within the existing facility, almost all the construction will be limited to the plant boundaries within the existing area involving small scale excavation, loss of top soil and soil erosion. The meagre impacts if any will be limited to construction phase and short lived.

ii. Ambient Air Quality

Activity	Impact	Mitigation Measures
• Civil works e.g., excavation • Movement of vehicles • Laying of machineries.	• Fugitive dust • Vehicular emissions • Emission from the construction machinery	• The impacts due to excavation, vehicles and machinery will be limited to construction phase and within the plant boundary. • Proper planning, sequencing and scheduling of construction operation and timely availability of infrastructure support. • Covered transportation vehicles will be employed. • Adequate dust suppression at vulnerable areas to control fugitive dust. • Storing the construction materials in covered shed or enclosed space. • D.G. set conforming to emission norms will be used. • Proper servicing and maintainace of construction equipments will be done. • Construction workers will be provided with appropriate PPE's. • Monitoring of air quality at regular intervals will be done.

iii. Noise Levels

Activity	Impact	Mitigation Measures

• Operation of construction equipments, metal fabrication and vehicular traffic	• Generation of noise from 75 dB (A) – 90dB (A). However, this noise will be near the source with little effect outside the plant boundary.	• Construction equipments and machinery will be kept in good working conditions by proper lubrication, servicing & maintenance. • PPE's e.g., ear muffs will be provided to workers exposed to high noise as preventive measures.

iv. Water Quality- (a) Surface Water

Activity	Impact	Mitigation Measures
• Site cleaning, leveling, exaction • Storage of construction materials	• Increase in suspended solids in surface run off. However, for proposed expansion no large-scale exaction and leveling are required.	• Routing the storm water runoff through storm water drains through catch pits. • Quality of construction waste water will be controlled through existing drainage system. • Storing the construction materials in covered sheds. • Sediments traps & drainage network will be periodically cleaned especially before the onset of monsoon.

(b) Ground Water

The water requirement during construction will be met from the existing water sources. It is therefore unlikely that any significant impact will occur on the ground water regime of the area.

v. Socio- Economic

During the construction phase, substantial employment will be generated as direct and indirect employment which will be provided to locals. But these socio-economic impacts which are positive are temporary and limited to construction phase only.

4.3 OPERATIONAL STAGE: - (LONG TERM)

The environmental impacts during operation phase may arise from: Air Emission, Waste

water discharge, waste disposal & Noise. All these emissions, discharges & disposals are associated with direct environmental impacts and indirect /secondary impacts.

i. Ambient Air Quality

Activity	Impact	Mitigation Measures
• Operation of plant	• Emission of particulates, gases as point source and fugitive emissions from area sources such as R.M and intermediate material handling.	• PM from stack to be limited to 30mg/Nm^3 • Work zone fugitive dust shall be kept below to 10mg/Nm^3 • Water (plain) type dust suppression system is provided all around raw materials stock piles, dust extraction and filtration system comprising suction hood, fans and bag filters are installed. • Energy efficiency induction furnace requiring less heat time will be employed.

The following are the detail of stack emission:

Existing				
S.No.	**Source of stack emission**	**Capacity**	**Stack height (m)**	**APCD**
1.	Induction Furnace	1x7 TPH	30m above ground level	Cyclone Separator, Wet Scrubber
2.	D.G. Set	2x325KVA	3m above roof level	Stack of adequate height provided.
After Expansion				
1.	Induction Furnace	1x7 TPH 1x15 TPH	30m above ground level	pulse jet bag filter with off line cleaning technology. .

2.	D.G. Set	2x325KVA	3m above roof level	---

Specific Measures:

- The I.F shall be provided with APCS comprising side suction hood, spark arrestor, bag filter & ID fan will be provided.
- The APCS will be operated and monitored as per SOP prescribed by the board.
- Dispersal of gases & particulate through adequate stack height.
- Fugitive emission during process operation will be controlled by ventilation system.
- Heat dissipation in work zone will be affected by exhaust ventilation.

General Measures:

- Regular sweeping and sprinkling of roads.
- Speed limit for vehicles.
- Unnecessary blowing of horns and idling of vehicles will be prohibited.
- Vehicles meeting the vehicular emission norms will be employed.
- All internal roads are paved.

Air Pollution Impact Prediction through Modeling

- ***Aermod Cloud***

AERMOD is an air dispersion-modeling package, which seamlessly incorporates the popular USEPA Models, ISCST3, ISC-PRIME and AERMOD into one interface without any modifications to the models. These models are used extensively to assess pollution concentration and deposition from a wide variety of sources.

- ***Aermod Model***

The AMS/EPA REGULATORY MODEL (AERMOD) was specially designed to support the Environmental Regulatory Modeling Programs. AERMOD is a regulatory steady – state modeling system with three separate components;

- AERMOD (AERMIC Dispersion Model);
- AERMAP (AERMOD Terrain Preprocessor); and
- AERMET (AERMOD) Meteorological Preprocessor.

The AERMOD model includes a wide range of options for modeling air quality impacts of

pollution sources, making it popular choice among the modeling community for a variety of applications. AERMOD requires two types of meteorological data files, a file containing surface scalar parameters and a file containing vertical profiles. These two files are provided by AERMET meteorological preprocessor program.

- PRIME building downwash algorithms based on the ISC – PRIME model have been added to the AERMOD model;
- Use of arrays for data storage;
- Incorporation of EVENT processing for analyzing short-term source culpability;
- Explicit treatment of multiple – year meteorological data files and the annual average; and
- Options to specify emissions that vary by season, hour-of-day and day-of-week.

Deposition algorithms have been implemented in the AERMOD model – results can be output for concentration, total deposition flux, dry deposition flux, and / or wet deposition flux. The model contains algorithms for modeling the effects of settling and removal of large articulates and for modeling the effects of precipitation scavenging for gases or particulates.

- ***Aermet***

In order to conduct a refined air dispersion modeling project using the AERMOD short term air quality dispersion model, it is necessary to process the meteorological data representative of the study area being modeled. The collected meteorological data is not always in the format supported by the model; therefore, the meteorological data needs to be pre-processed using AERMET program.

The AERMET program is a meteorological preprocessor, which prepares hourly surface data and upper air data for use in the AERMOD air quality dispersion model. AERMET is designed to allow future enhancements to process other types of data and to compute boundary layer parameters with different algorithms. AERMET processes meteorological data in three stages and from this process two files are generated for use with the AERMOD model. A surface file of hourly boundary layer parameters estimates a profile file of multiple-level observations of wind speed, wind direction, temperature and standard deviation of the fluctuating wind components.

- ***Application of AERMOD***

The AERMOD model with the following assumptions has been used to predict the cumulative GLC due to emissions from the proposed activity:

- The stack tip down wash is not considered.

- Plume rise is estimated by Brigg's formula but the final rise is limited to that of mixing layer.
- Buoyancy induced dispersion is used to describe the increase in plume dispersion.
- Calm processing route is used by default.
- Complex terrain is used in computation.
- It is assumed that the pollutants don't undergo any physico-chemical transformation and there is no pollutant removal by dry deposition.
- Wash out due to rain is not considered.
- Receptors on that terrain with no flag pole have been considered.

Atmospheric Stability

The stability class has been estimated using the hourly monitored wind velocity along with the other computed data.

Mixing Heights

Due to non-availability of site-specific missing heights "Hourly Mixing Heights & Dissimilative Capacity of Atmosphere in India" published by Environment Monitoring & Research Centre, IMD, New Delhi has been referred for hourly mixing heights.

Meteorological Data

The hourly meteorological data recorded at site is converted to the mean hourly meteorological data as specified by CPCB and the same has been used in the model. Hourly mixing heights are taken from the "Atlas of Hourly Mixing Height and Assimilative Capacity of Atmosphere in India" published by India meteorological department, 2008, New Delhi. The meteorological data recorded during study period continuously on wind speed, wind direction, temperature etc., have been processed to extract the data required for simulation by AERMOD using AERMET.

Dispersion Modeling Results

The 24-hourly average ground level concentration (GLC) values from proposed project have been computed for PM considering topographical featured around the proposed project and applicable stability classes. Input data for air quality modeling is given in **Table 4.1 and 4.3**. The predicted 24-hourly short terms Maximum Incremental Concentration values for PM_{10} from the existing and proposed project are given in **Table- 4.2 and 4.4.** Corresponding isopleths plotted are shown in **Figure 4.1.**

Table 4.1

Air Modeling Existing Pollution Load

S. No.	Items	Existing Induction Furnace @ 7 TPH
1.	Stack height	30 m
2.	Stack diameter	1.5 m
3.	Velocity of gases	14.14 m/s
4.	Gas Volume, Nm3/hr.	34752 hr/Nm^3
5.	Discharge standard.	150 mg/Nm^3
6.	Pollution Load	125.10kg/day

With proposed expansion with Continuous Casting Machine, Hot Rolling Mill will be done & Re-heating Furnace dispersed with, PTFE non-woven bags having efficiency of more than 99.9% will be employed on the existing Induction furnace & the proposed one. The pollution load after expansion is tabulated below.

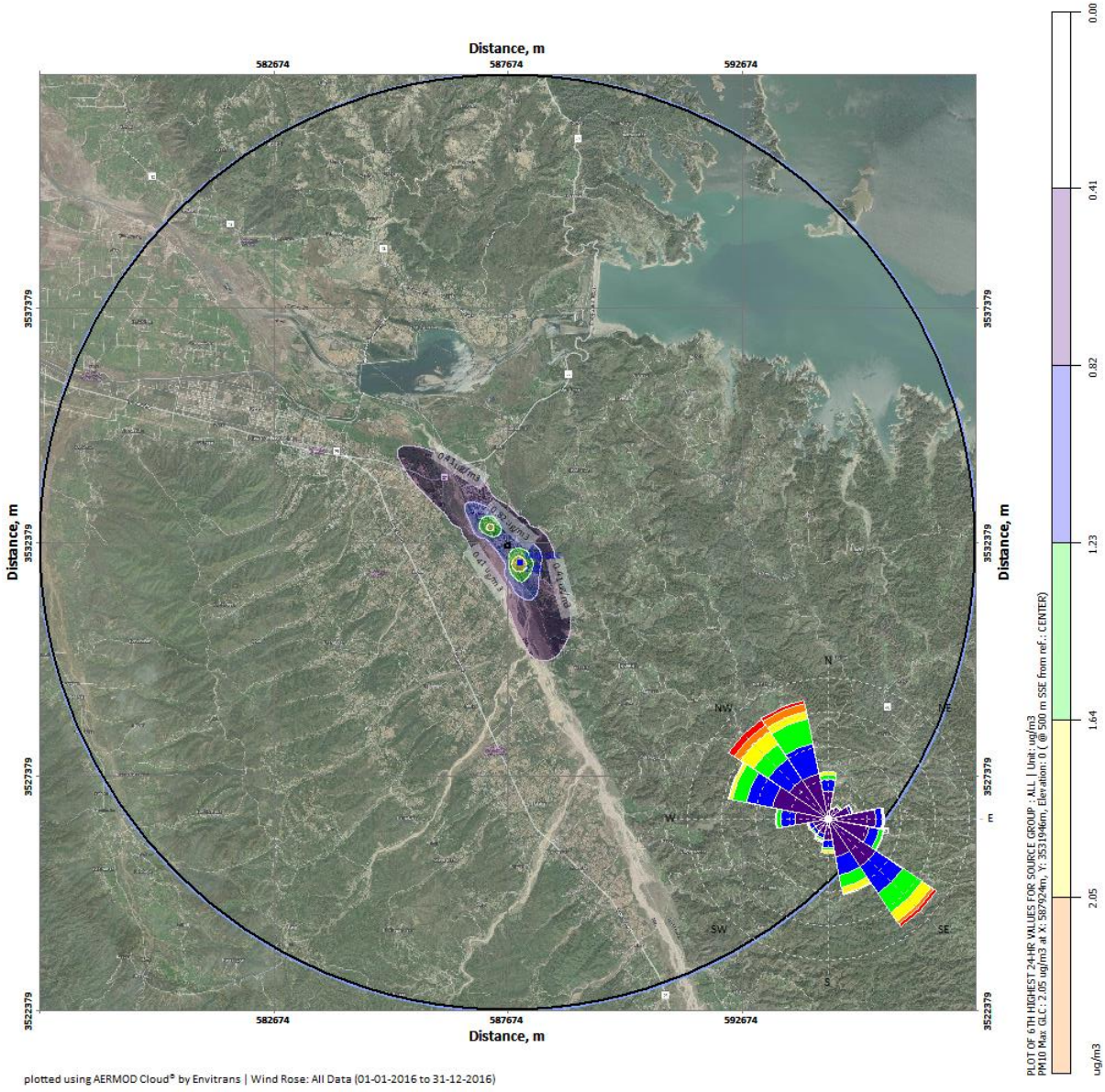
Table-4.2

Input Data for Proposed is tabulated below.

S.No.	Description	Induction Furnace (7TPH)	Induction Furnace (15TPH)
1.	Stack height	30	30
2.	Stack diameter	1.5	1.25
3.	Velocity of gases	14.14	18.1
4.	Gas Volume Nm3/hr.	34752	69504
5.	Discharge standard.	30mg/Nm3	30mg/Nm3
6.	Pollution Load	25.02 Kg/day	50.o4 Kg/day.
Total Pollution Load		**75.06**	

Hence, with the switching over to new dispensation, there will be decrease in pollution load on the envt.to the extent of 40% as compared to the existing pollution load.

Fig 4.1: Isopleths showing Existing 24 hourly predicted GLC's of PM_{10}



Predicted GLC's of the existing project

It is predicted that the maximum contribution in GLC's, with unit operation are 2.05 µg/m^3 for PM at 500 m SSE direction from stack.

Table 4.3

Input data for Air Quality Modeling for the Proposed Stacks

S. No.	Items	Value
1.	Stack height	30 m
2.	Stack diameter	1.5 m
3.	Temperature of stack gas	70°C
4.	Velocity of gases	18.1 m/s
5.	PM concentration	30 mg/Nm^3
6.	Emission rate of particulate matter from representative stack	0.96 g/s

Table-4.4

Predicted 24 hourly short terms Maximum Incremental Concentrations

Pollutants	Maximum GLC in µg/m^3	Baseline concentration in µg/m^3	Baseline Concentration after project implementation in µg/m^3
PM_{10}	2.05	81.76	83.81

ii) Water Environment

No water is used in the process and hence no waste water is generated. The only water requirement is for C.T in which the entire water is recycled and only makeup water equal to evaporation loss & blow down is added. The waste water from domestic use and the C.T blow down after treatment is used for plantation within premises. As water conservation measures the C.T is operated on high COC resulting in minimum blow down and make up water. Since, no waste water is discharged; there is no impact on ground water quality.

Water Conservation Measures:

- Installation of water closets.
- Urinals to reduce flushing demand.
- Septic treated water to be used in plantation/ & make up for C.T.
- Reheating furnace will be used occasionally to reduce C.W demand.
- Push type drinking water taps to be used in place of convention taps.

iii) Noise Environment

The main sources of noise are:

- Movement if transportation vehicles
- Mechanized handling of raw material
- Blowers, fans & compressors
- Operation of plant equipments

The noise level from these devices varies from 85-95 dB (A), for the control of which hoods, enclosures, laggings and screens are provided to the extent possible. Though there is likelihood of increase of noise levels but the personal exposure level will be less than 85 dB (A) over 8 hrs.

Mitigation Measures

- Noise level at 1m distance shall be kept below 85 dB (A).
- Reducing vibration in high-speed rotating machines.
- All the equipments will be processed in such a way as to keep noise level <85 dB (A).
- Periodic monitoring of noise level in and around the plant.
- Noisy machinery shall be enclosed in acoustic enclosures.
- Rotation of workers working in high noise areas will be practiced.
- Trees & shrubs of suitable varieties will be planted as noise attenuating measures.

iv) Land Environment

No additional land has been acquired for the unit. The machinery will be installed in the existing land. There will be no adverse effect on the land environment with the coming up of the unit.

SOURCE	IMPACT	MITIGATION MEASURES
Rainfall	Flooding and siltation problem inside industrial premises	To avoid any change in slope and drainage pattern, transport activity will not be allowed on muddy or wet area
Surface runoff water during rainy days	Flooding and siltation problem outside industrial premises	Care will be taken to avoid change in existing drainage pattern and proper drainage system is already provided for rain water

v) Socio Economic

Social aspects can be defined as the consequences to people of any proposed action that changes the way they live, work, relate to one another, organize themselves and function as individuals and members of society. This includes social-psychological changes, for example to people's values, attitudes and perceptions of themselves and their community and environment.

Sometimes impact on people can be by far the most important consideration. Adverse social impacts can reduce the intended benefits of a proposal, and can threaten its viability if they are severe enough.

Broadly social and economic aspects could be as under: -

1 **Individual Life Style** – These are ways people behave & relate to family, friends & cohorts on day-to-day basis.

2 **Community aspects**- These are infrastructure, services, voluntary organizations, activity networks and cohesion.

3 **Health aspects**- These include mental, physical and social wellbeing of the persons in general

4 **Rehabilitation and Resettlement**- These include displacement of families beyond defined thresholds. There is no rehabilitation and resettlement of people involved in the project.

vi) Soil Environment

SOURCE	IMPACT	MITIGATION
Solid waste Liquid waste Dust from Scrap	Soil contamination	i) About 9.8. TPD of slag which is not a H.W will be generated and the same after recovering of iron will be supplied to manufacturers of cement concrete blocks, pavers & tiles under proper agreement. ii) Sprinkling of water will be done on the scrap material to avoid dust generation and direct contact of scrap with the soil will be avoided.
Particulate matter from Stack emission	Particulate matter when settles down on agricultural fields, can reduce its Porosity and water and mineral soaking capacity and hence its fertility.	Proper stack height is provided to disperse the PM in air. Bag filters are provided to trap the maximum amount of PM.

(vii) Ecological Environment

As the proposed expansion is being undertaken in the existing premises involving no environmental sensitivities, there is little likelihood of impact on ecology of area as the impacts if any will be manifested over a few hundred meters radius having no wildlife. The threshold level of SO2 and No2 from the plant is 25 and 100 respectfully. Since, these gases will not be generated; there will be no impact on flora of the area.

However, an elaborate green belt in minimum 40% of project area will be developed to ameliorate fugitive emission & noise from plant.

(viii) Solid & Hazardous Waste

Secondary metallurgical operations generate solid waste some of which are hazardous. Therefore, arrangement will be in place for their disposal.

Solid Waste

Furnace slag after iron recovery will be disposed off to manufacturers of cement concrete blocks, pavers and tiles under proper off take agreement.

Hazardous Waste

i. Flue gas cleaning residue (APCD dust) which is a hazardous waste shall be disposed off to approved re-processors for metal recovery.

ii. Used oil from D.G. set is being used as lubricant within the industry or else will be given to approved recyclers.

Waste Refractory Material

This shall be given to suppliers under take back agreement.

Environmental sound technologies for Recycling of Hazardous Waste

The major H.W generated by M/s Goyal Furnace Pvt Ltd. is used oil, zinc & lead bearing flue gas cleaning residues. However, M/s Goyal Furnace Pvt Ltd. is not involved in recycling of any identified H.W. The same will be disposed of to approved reprocessors/recyclers.

(ix) Additional Management Approach

In order to ameliorate the adverse environmental impacts of project for scientific development, a comprehensive Environmental Management Plan (EMP) shall be prepared based on the existing environmental conditions, impacts appraisal and environmental prediction. The EMP will take care of formulation, implementation and the monitoring of environmental protection measures during the construction and operation of project.

4.4 Occupational Safety and Health

During construction phase, work force may be exposed to variety of physical hazards depending upon the specific work function. The most significant occupational hazards may include fall from height, carrying heavy loads, accidents due to malfunctioning of machinery and falling objects from height etc.

4.4.1 General Safety Measures

- Standard methods and machinery is being used.
- Use of Personal Protective Equipment (PPE) is mandatory.
- Elevated platforms and walkways, and stairways and ramps are equipped with handrails, toe boards and non-slip surfaces.

- Electrical equipment will be grounded, well insulated and conform to applicable codes.
- Employees are/will be provided with hard hats, safety boots, eye and ear protection, and snug fitting gloves as appropriate.
- Masks and dust-proof clothing are/will be provided to personnel working in areas with high dust levels.

4.4.2 General Health Measures

- Sanitation facilities are well equipped with supplies (e.g., protective creams) and employees are being encouraged to wash frequently, particularly those exposed to dust.
- Ventilation systems have been provided to control work area temperatures and humidity;
- Pre-employment and periodic medical examinations are being conducted for all personnel, and specific surveillance programs instituted for personnel potentially exposed to health hazards.

4.4.3 Occupational Health Monitoring

At the time of placement each worker is medically examined by a qualified doctor to ascertain his physical fitness for specific job. During the course of employment, the workers are examined for such parameters as

Chest X-ray

Vision

Audiometry

Spirometry

ECG,

The examination is conducted once in six months in the occupational health center by a part time factory medical officer, to evaluate the effect of exposure. The medical examination records are maintained and made available to workers as well as Inspectorate of Factories. The records are maintained in the following format.

Name of Employee	
Age	
Dept	
General physical condition	
Eye sight	
Color recognition	
ECG	

Chest x -ray	
Audiometry	
Spirometry	
Any Other observation	
Suitability for work	

Remark: In my opinion, the above employee is fit /unfit for the work in the manufacturing process operations in steel manufacturing unit.

Signature of Doctor

4.4.4 Occupational Audit, Frequency, Review and Corrective action

Occupational audit is conducted once in a year and self-certified as introduced by Directorate of Punjab. However, statutory compliance clarified by external agencies is employed

4.4.5 Corrective Measures

As a follow up of audit by external agencies, corrective actions are taken against major and minor non-conformances. A major non-conformance results from absence of documented and implementation process or absence of process, minor non-conformance results from partially documented and implementation process. An action plan is chalked, detailing the action to be taken to address any identified non-conformance by including the responsibility for personal and subsequent completion dates. The action is taken within 30 days of receiving the audit report.

4.6 Conclusion

It can be seen from the assessment of impacts that the proposed construction and operation of unit will not have any significant impact on the surrounding environment. Proper arrangements for collection and treatment of effluents and supply of water are unlikely to affect water environment adversely. Proper pollution control measures proposed for furnaces and disposal of hazardous waste would ensure that air, water, solid waste and noise environment do not have any adverse impact. It is concluded that with the adoption of appropriate mitigation and enhancement measures, there will be improvement in the development of commercial activities, generation of direct and indirect employment opportunities and the overall quality of life in the surrounding area.

CHAPTER - 5.0

ANALYSIS OF ALTERNATIVES

5.1 ANALYSIS OF ALTERNATIVE SITES FOR LOCATION OF PROPOSED EXPANSION

Since the proposed expansion is being carried out in existing premises, it is viable on account of the following

- No forest land is involved.
- The site has easy access to raw material, road, rail connectivity and market.
- Power connectivity from HPSEBL. The total 10,000 KW Power Grid is viable to meet the requirement of continuous power supply due to proposed expansion and there shall not be any impacts on the surrounding consumers.
- Water Requirement from own tube well already existing in a premises.
- Manpower availability from nearby areas.
- No resettlement and rehabilitation issues.
- Absence of areas of archeological and historical importance within 10 km radius.

Based on the above criterion, proposed site is conducive to undertake expansion.

5.2 ANALYSIS OF ALTERNATIVE FOR TECHNOLOGY SELECTION

The proposed expansion involves the replacement of existing I.F with furnace of higher capacity which has been considered technologically best on account of the following: Optimized consistency;

- Consistence in quality issues.
- Quick start up, production rate can be customized.
- Since, in I.F no direct contact with flame or heating elements is involved, the product quality is improved.
- Site specific heat is supplied to the small area without heating any other part thereby insuring extended life of fixtures
- Induction heating does not burn traditional fossils fuel. The system is environmentally sound.
- Reduced energy consumption thereby reduced utility bills.
- No warm up or cool down cycle is required.
- Least Environment Pollution.

5.3 CONCLUSION AND RECOMMENDATION:

Based on the analysis of alternatives site and technology, the undertaking of expansion at the existing site is justified.

CHAPTER -6

ENVIRONMENTAL MONITORING PROGRAM

6.0 Prelude

Assessment of environmental and social impacts arising due to implementation of the proposed project activities is at the technical heart of EIA process. An equally essential element of this process is to develop measures to eliminate, offset or reduce impacts to acceptable levels during implementation and operation of projects. The integration of such measures into project implementation and operation is supported by clearly defining the environmental requirements within an **Environmental Management Plan** (EMP).

6.1 Environment Monitoring Program

The monitoring of environmental parameters like air, water, noise, soil, and meteorological data and performance of pollution control facilities and safety measures in the plant are vital for Environmental management of any industrial project.

Therefore, the company shall create environmental monitoring facilities by the environmental and safety department to monitor air and water pollutants as per the guideline. Moreover, air, noise, drinking water, and soil shall be monitored by outside agencies authorized by SPCB at regular frequencies. This department shall also carry out periodically check of fire and safety equipment.

6.2 Objective of Monitoring Plan

The basic objective of implementing a monitoring plan on a regular basis is as follows:

- Know the pollution status within the plant and its vicinity. Generate data for corrective action in respect of pollution
- Examine the adequacy of pollution control system
- Assess the Environmental impacts

6.3 Schedules for Environment Monitoring

As no project can succeed unless it is monitored at regular intervals & results analyzed. Keeping this requirement in view an elaborate Monitoring programme has been developed for this project. Regular monitoring of all significant environmental parameters will be carried out to check the compliance status vis-à-vis the environmental laws and regulations.

The objectives of the monitoring will be as follows:

- To verify the results of the Impact Assessment Study with respect to the proposed projects.
- To study the trend of concentrated values of the parameters, which have been identified as critical and then planning the mitigating measures.
- To check and assess the efficacy of pollution control equipment.
- To ensure that any additional parameters, other than those identified in the impact, do not turn critical after the commissioning of proposed project.

A comprehensive Environmental Monitoring Program that has been prepared for the purpose of implementation in the proposed Industrial unit is given below:

- Identification of any environmental problems that are occurring in the area.
- Initiating or providing solution to those problems through designated channels and verification of the implementation status.
- Controlling activities inside the project, until the environmental problem has been corrected.
- Suitably responding to emergency situations.

To implement the EMP, a structured Environment Management Cell (EMC) interwoven with the existing management system will be created. EMC will undertake regular monitoring of the environment and conduct yearly audit of the environmental performance during the construction of the project. It will also check that the stipulated measures are being satisfactorily implemented and operated. It shall also co-ordinate with local authorities to see that all environmental measures are well coordinated. EMC detail is provided at Chapter- 10.

6.4 Environmental Monitoring during Construction Phase

The environmental monitoring cell of the construction team will be coordinating all the monitoring programs during the construction phase of the proposed expansion project. The proposed monitoring schedule during the construction phase of the project is outlined in

Table- 6.1

Environmental Monitoring Program for Construction Phase

Source	Monitoring Location	Parameters to be Monitored	Frequency
Ambient Air Quality	Two locations: upwind direction and downwind direction	$PM_{2.5}$, PM_{10}. SO_2, NO_x and CO	Twice a year or as per conditions of EC
Ambient Noise	Two locations	Day & Night Equivalent Noise Level	Twice a year or as per conditions of EC
Groundwater	One location	As per standards	Twice a year or as per conditions of EC
Soil Quality	2 locations outside the project site	As per standards	Twice a year or as per conditions of EC
DG Stack Monitoring	DG sets used during the construction	Particulate Matter, SO_2, NO_x	Twice a year or as per conditions of EC

6.5 Environmental Monitoring during Operation Phase

The environmental monitoring cell will co-ordinate all the monitoring programs at the industry and data thus generated will be regularly furnished to the State Regulatory Agencies.

6.5.1 Plantation

Plant growth, its maintenance and survival rate will be monitored. Suggestion of horticulturist will be taken for this purpose. About 33% of total area (i.e. 5938 m^2) is kept for green belt development. Total 881 No. of trees need to be planted. Out of which 100 plants are already planted. Thus 781 trees need to be planted more.

Plantation will be done in Phase- wise manner in following ways subject to grant of EC

Phase I (July 2024) - 195 trees will be planted.

Phase II (July 2025) - 195 trees will be planted.

Phase III (July 2026) - 195 trees will be planted.

Phase IV (July 2027) – 196 trees will be planted.

Selection of plant species

Tree species like Mulberry, Shishm, Bungania and False Ashok will be planted.

Budget Allocation

Budgetary allocation: Rs. 13.25 Lakhs under EMP cost, and Rs 13.25 Lakhs as maintenance cost for 5 years.

6.5.2 Budget allocation for Environment Management

To maintain the environmental parameters within the stipulated standards, regular monitoring of various environmental components is necessary which will be complied as per conditions. An amount of Rs. 78 lakhs have been earmarked under EMP budget as capital cost and Rs 15 lakhs per annum as recurring cost.

Table-6.2

Environmental Monitoring Program for Operation Phase

Source	Monitoring Location	Parameters to be Monitored	Frequency
Furnace Emissions	Stack attached to APCD	PM, SO_2, NO_X and CO	Twice a year or as per conditions of EC or as per requirement of SPCB
Furnace slag	Storage of slag	Na2O, MgO, Al2O3, SiO2, CaO, TiO2, MnO	Once a year
Ambient Air Quality	At 2 locations (one inside the project site & one at boundary of the project site along predominant wind direction)	PM_{10}, $PM_{2.5}$, SO_2, NO_x & CO	Twice a year or as per conditions of EC or as per requirement of SPCB
Ambient Noise	At 2 locations (one inside the project site & one at boundary of the project site)	Day & Night Equivalent Noise Level	Twice a year or as per conditions of EC or as per requirement of SPCB
Occupational Health	Continuous database management of causalities	General Health aspects	Yearly
DG Stack Monitoring	DG sets used during the construction	Particulate Matter, SO_2, NO_X	Twice a year or as per conditions of EC

CHAPTER -7.0

ADDITIONAL STUDIES

7.0 PREAMBLE

The Public hearing for the proposed project will be conducted by SPCB at the premises of project or elsewhere as decided by the authority. This Draft EIA-EMP report is therefore being submitted as a pre-requisite for the conduct of public hearing.

- **PUBLIC CONSULTATION**
- **RISK ASSESSMENT**

7.1 PUBLIC CONSULTATION

In order to conduct the public hearing, Draft ElA report has been prepared.

7.2 RISK ASSESSMENT

General

Industrial accidents result in great personal and financial loss. Managing these accidental risks in today's environment is the concern of every industry because the real or perceived incidents can quickly jeopardize the financial viability of a business. Many facilities involve various manufacturing processes that have the potential for accidents which may be catastrophic to the plant, work force and environment or public. The main objective of the risk management study is to propose a comprehensive but simple approach to carry out risk analysis and conducting feasibility studies for industries including planning and management of industrial prototype hazard analysis study in the Indian context.

Risk analysis and risk assessment provide details on Quantitative Risk Assessment (QRA) techniques used the world over to determine risk posed to people who work inside or live near hazardous facilities and to aid in preparing effective emergency response plans by delineating a Disaster Management Plan (DMP) to handle on-site and off-site emergencies. Hence, QRA is an invaluable method for making informed risk-based process safety and environmental impact planning decisions, as well as being fundamental to any facility-sitting decision making. QRA whether site specific or risk specific for any plant is complex. It needs extensive study that involves process understanding, hazard identification, consequence modeling, probability date, vulnerability model/data, local weather, terrain conditions and local population data. QRA may be carried out to serve the following objectives:

- Identification of safety areas.
- Identification of hazard sources.

- Generation of accidental release scenarios for escape of hazardous materials from the facility.
- Identification of vulnerable units with recourse to hazard indices.
- Estimation of damage distances for the accidental release scenarios with recourse to Maximum Credible Accident (MCA) analysis.
- Hazard and Operability Study (HAZOP) in order to identify potential failure cases of significant consequences.
- Estimation of probability of occurrences of hazardous events through fault tree analysis and computation of reliability of various control paths.
- Assessment of risk on the basis of above evaluation against the risk acceptability criteria relevant to the situation.
- Risk mitigation measures based on engineering judgment, reliability and risk analysis approaches.
- Delineation/up-gradation of DMP.
- Safety Reports with external safety report/ occupational safety report.

The Risk Assessment Report covers the following in terms of the extent of damage with recourse to MCA analysis and delineation of risk mitigation measures with an approach to DMP.

- Hazard identification: Identification of hazardous activities, hazardous materials, past accident records etc.
- Hazard quantification: Consequence analysis to assess the impacts.
- Risk presentation.
- Risk mitigation measures.
- Disaster Management Plan.

Identification of Hazards

Identification of hazards in the proposed plant is of primary significance in the analysis, quantification and cost-effective control of accidents involving materials and process. A classical definition of hazard stated that hazard is in fact the characteristics of system /plant/ process that presents potential for an accident. Hence, all the components of a system/ plant/ process need to be thoroughly examined to assess their potential for initiating or propagating an unplanned event/ sequence of events, which can be termed as an accident. The following two methods for hazards identification have been employed in the study:

- Identification of major hazardous units based on Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989 of Government of India (GOI Rules, 1989) and
- Identification of hazardous units and segments of plants and storage units based on relative ranking technique, viz. Fire-Explosion and toxicity Index **(FE & TI).** Details are given in EIA report. The brief of risk involved due to hazardous situation and the. safety systems are given below:

Table 7.0 Hazard Identification & proposed safety system

S. No	Plant Area	Causes	Consequences	Mitigation Measures
1.	Furnace Operation	Moisture containing scrap & recirculating water coming in contact with molten metal	Steam Explosion	• Usage of moisture free R.M • Drying of R.M
2.	Transformer Area	• Oil temperature build up • Unsafe electrical installation • Varying room temperature	Sudden flashing of fire & bursting	• Proper Electrical installation • Transformer room temperature monitoring
3.	H.T electrical installation	Loose Fowls, cable cut, short circuits & burning of fuse	Sparks in the beginning & devastative fire if neglected	Properly laid cables & switches & fuse
4.	Extremely Hot Working area	Heat from Furnace, Unsafe clothing, seasonal factors e.g., temperature, pH & air movement	Heat Shocks	• Rotation of workers • Exhaust air ventilation • Shielding from radiant heat

5.	Furnace & Molding	• Touching Hot Surface • Splashing of molten metal • Radiation	Burns	• Providing specific PPE are to measures risk of manual operation • Protective barriers to explosion
6.	Furnace & molding	UV & IR radiation of high intensities from molten metal pouring	High Radiation	• Safety education to workers • Labeling of risky areas • Providing suitable PPE

Exposure Limits

The exposure level of work zone concentrations is within the Permissible Exposure Level (PEL) as specified in Section 41F, Sch-II of Factories Act, 1948 (Permissible Level of certain Chemical Substance in Work Environment) and the OSHA standards for Permissible Noise Exposures which are reproduced below:

S.No.	Duration per day in Hours	Sound Level dB(A) slow response	Remarks
1.	8	90	1. No noise environment excess of 115 dB (A) is to be produced. 2. For any period of exposure falling between any figures indicated in column I, the permissible sound level is determined by exposure.
2.	6	92	
3.	4	95	
4.	3	97	
5.	2	100	
6.	1½	102	
7.	1	105	
8.	½	110	
9.	¼ or less	115	

All effects shall be made to comply with the standards after the operation of proposed expansion.

Ambient Air Quality Standards in respect of noise

Area Code	Category of Area	Level in dB (A) Leq	
		Day Time	Night Time
(A)	Industrial Area	75	70
(B)	Commercial Area	65	55
(C)	Residential Area	55	45
(D)	Silence Zone	50	40

Hazard Assessment & Evaluation

A preliminary hazard analysis shall be carried out to identify major hazards associated with storages in the facility. This is followed by consequence analysis to quantify these hazards. Finally, the vulnerable zones are plotted for which risk reducing measures are deduced and implemented.

Before evaluating the environmental risks, the following terms related to environmental risks are defined.

Term	Environmental Risks
Harm	Damage to person, property or the environment
Hazard	Situation that poses a threat to life, health, property or the environment
Risks	The likely hand of harm or harmful occurrence and its severity, Environmental risk is a measure of potential threats to the environment, life & property.
Consequences	Effect due to the occurrence of event endangering the environment temporarily or permanent.
Environmental Disorder	The consequences are so severe that it can extensively damage anyone or all the four components of environment namely: • Physiochemical • Biological • Humans & • Aesthetic

Environmental Risk Evaluation

Risk analysis (RA) is a sort of scrutinizing vehicle for establishing the perversely in risk management that concerns human health and the environmental quality in general. Though the proposed facility is not manufacturing, storage or handling any potentially hazardous/toxic chemicals as scheduled in the MSIHC Rules 1989 and its subsequent amendments, the Risk Management measures for the proposed project are:

- The adaption of best safety practices.
- Incorporation in design and engineering facilities/protection measures for release to air, water, environment and land.
- Electrical safety by quick response circuit breakers.
- Adequate fire protection system.

Frequent Causes of Accidents

- Fire and explosion, explosives, flammable material.
- Struck by falling objects.
- Snapping of cables, ropes, chains & slings.
- Handling heavy objects.
- Electricity (electrocution).
- Poor illumination.
- Falls from height inside industrial units or on the ground.
- Struck by moving objects.
- Slipping on wet surfaces.
- Sharp objects.
- Oxygen deficiency in confined spaces.
- Lack of personal protective equipment (PPE), housekeeping practices Safety signs.
- Hackles, hooks & chains.
- Cranes, winches, hoisting and hauling equipment.

Physical Hazards

- Noise.
- Extreme temperatures.
- Vibration.

Hazardous Substances & Wastes

- Heavy and toxic metals.
- Organo metallic substances.

- Lack of hazard communication (storage, labeling, material safety data sheets).
- Fire-fighting liquids.
- Welding fumes.
- Volatile organic compounds (solvents).
- Inhalation in confined and enclosed spaces.
- Physical hazards.
- Noise.
- Extreme temperatures.
- Vibration Radiation.
- (UV, radioactive materials).

Mechanical Hazards

- Trucks and transport vehicles.
- Scaffolding, fixed and portable ladders.
- Impact by tools, sharp-edged tools.
- Power-driven hand tools, saws, grinders and abrasive cutting wheels.
- Failure of machinery and equipment.
- Poor maintenance of machinery and equipment.
- Lack of safety guards in machines.
- Structural failure

Ergonomic & Psychosocial Hazards

- Repetitive strain injuries, awkward postures, repetitive & monotonous work, excessive workload.
- Long working hours, shift work, night work, temporary employment.
- Mental stress, human relations (aggressive behavior, alcohol and drug abuse, violence).
- Poverty, low wages, minimum age, lack of education and social environment.

General Concerns

- Lack of safety and health training.
- Poor work environment.
- Inadequate housing and sanitation.
- Inadequate accident prevention and inspection.
- Inadequate emergency, first-aid and rescue facilities.

- Lack of medical facilities and social protection.

Major Hazards

Induction Furnace

- Moist scrap being charged may cause explosion.
- Cooling water in contact with molten metal may cause explosion.
- Radioactive scrap being charged liberates extremely harmful radiation.
- Explosive material present in scrap may cause explosion.

Continuous Casting Machine

Spillage of molten metal can occur resulting in damage to mechanical and civil structures, electrical cables and hydraulic equipments.

Prevention and Control of Fire and Explosion

- Operational staff is being and shall be trained for safe work practices.
- Risk assessment to consider the potential impact of explosion in and outside the plant.
- Regular safety audits shall be undertaken.
- Refractories shall be preheated and dried before use.
- Scrap will be inspected, shredded and cut to size before put to use.

Nature of Hazards

Equipment/Process	Associated Hazard
Induction/LRF	Hot metal spillage/ steam and fire explosion
Continuous Casting Machine	Hot metal spillage
Rolling Mill	Hot metal spillage
Electrical rooms	Fire and Electrocution
Transformer area	Fire and Electrocution

Possible Hazards & Risks from Secondary Metallurgical Industries

The various process operations, which are having potentially high risk to human exposure and which have high levels of attention area identified in **Table 7.1.**

Table-7.1

Possible Risk

S.No.	Plant Area	Possible Deviation from normal operation	Likely Causes	Consequences
1	Furnace	Re-circulating and cooling water coming in contact with the molten iron or slag.	Leakage of water from the walls Spurting of metal/ slag.	Explosion under extreme cases.
		Presence of Oil & Grease and other Impurities in raw materials.	Fire	Sudden fire & flames
2	High Power Transforme	Oil temperature being very high.	Varying room Temperatures.	Sudden flashing of fire or bursting.
3	High Tension Electrical Installation	Heavy sparking at the pot heads and the joints.	Loose joints, cable cut, burning of fuses, short circuits etc.	Sparks in the beginning, devastating fire if neglected.

Table 7.2

Specific Hazard & their Control

S.No.	Hazard	Reason	Control Measures
1	Molten Metal Explosion - Steam Explosion - Chemical Explosion	- Use of oxidized or rusted iron. - Damp refractories or tools. - Containers of aerosols mobile & phone batteries. - Accidentally mixing of oxidizing substance e.g., KNO_3 $(NH_4)_2NO_3$ in furnace. - Incorrect combination/ ratio of metals being processed.	- Checking the refractories moisture & strategies for pre-heating the furnace & the refractories. - Proper storage system to ensure against accidental use and outside the excessive heat area. Storage paints, solvents and other combustible material specially.
2	Heat Stress	- Working in extreme hot condition.	- Shielding heat radiations from hot surface. - Supply of clean drinking water - Educating workers about the symptoms of excessive heat exposure. - Short breaks & rotation of workers.

3	Burns	- Splashing of molten material - Touching of hot surface - radiation	- Providing specific PPE's - Providing protective barriers to minimum exposure. - Proper design & Process Control. - Automation to minimize risk associated with material handling or casting.
4	Light Radiation	- UV & IR radiations of high intensity from molten metal especially the pouring areas.	- Educating the workers regarding risks and safety measures. - Proper labeling of risky areas w.r.t radiation. - Shielding of workers and providing proper PPE's.

First Aid Measures

Following first aid measures will be taken:

a. Eye Contact: Rinse eyes thoroughly with water for at least 15 minutes, including under lids, to remove all particles. Seek medical attention for abrasions and burns.

b. Skin Contact: Wash with cool water and a pH neutral soap or a milk skin detergent. Seek medical attention for rash, burns, irritation and dermatitis.

c. Inhalation: Move person to fresh air. Seek medical attention for discomfort or if coughing or other symptoms.

d. Ingestion: Do not induce vomiting. If conscious, have person drink plenty of water. Seek medical attention.

Exposure Controls & Personal Protection

Exposure Controls

- Control of dust through implementation of good housekeeping and maintenance.
- Proper fume and dust extraction system to control fume/dust emission in work zone.

- Use of PPE, as appropriate (e.g., masks and respirators).
- Use of mobile vacuum cleaning systems to prevent dust buildup on paved areas.

Personal Protective Equipment (PPE)

- Respiratory Protection: When the dust level is beyond exposure limits or when dust causes irritation or discomfort use respirator.
- Eye Protection: Wear Safety goggles to avoid dust contact with the eyes. Contact lenses should not be worn when handling the materials.
- Skin Protection: Wear impervious abrasion and alkali resistant gloves, boots, long sleeved shirt, long pants or other protective clothing to prevent skin contact.

Fire Fighting Facilities

- Keeping in view the nature of fire and vulnerability of the equipment and the premises, following fire protection facilities have been envisaged for the plant.

Hydrant System

- Internal hydrants will be provided in all major plant units at suitable locations and in different levels inside the plant buildings. Internal hydrants will also be provided for conveyor galleries. Yard hydrants will be provided in the vicinity of each plant unit, normally along the road to meet the additional requirement of water to extinguish fire.

Portable Fire Extinguishers

- All plant units, office buildings, laboratory, welfare buildings, etc. will be provided with adequate number of portable fire extinguishers to be used as first aid fire appliances. Sufficient quantities of the following extinguishers will be provided at strategic locations in the plant.

Other Safety Measures

- Safety training to the workers will be given.
- PPE will be provided to the workers.
- The maintenance and cleaning of bag filters will be carried out regularly.
- The dust removal efficiency of bag filters will be check regularly.
- Work place environment monitoring will be carried out regularly and records will be maintained.
- Good housekeeping will be implemented in the plant.
- First aid box will be provided.

- The industry will provide adequate lighting facility inside the plant premises.
- General ventilation will be provided to control dust levels below exposure limits.
- Fire extinguishers will be provided to withstand the fire or explosion condition.
- Pre-employment and periodical medical examination of workers will be done by government approved medical practitioners and the details will be recorded as per the Regulations.
- The industry will prepare on-site emergency plan.
- In case any emergency, arrangement of ambulance van will be done from nearest Hospital.
- Two main gates will be provided for entry and exit of the workers.

Disaster Management Plan (DMP)

Disaster

Disaster is an unplanned event that can cause death or significant injuries to employees, customers or public. It is a catastrophic situation in which suddenly, people are plunged into helplessness and suffering. As a result, they need protection, clothing, shelter, medical, social care and other necessities of life.

Disasters can be divided into two main groups, namely, natural and manmade. There can be no set criteria for assessing the gravity of a disaster, since this depends to a large extent on the physical, economic and social environment in which it occurs. However, all disasters bring in similar consequences that call for immediate action, whether at the local, national or international level for the rescue and relief of the victims.

Objectives of Disaster Management Plan

Disaster Management Plan (DMP) is the process of preparing for mitigating measures, responding to and recovering from an emergency. The DMP is aimed at ensuring safety of life, protection of environment, protection of installation, restoration of production and salvage operations, in this same order of priorities. For effective implementation of the DMP, it should be widely circulated and personnel training should be provided through rehearsals/ drills.

The DMP should reflect the probable consequences of the undesired event due to deteriorating conditions or through ‘Knock on’ effects. Further the management should be able to demonstrate that their assessment of the consequences uses good supporting evidence and is based on available and reliable information, incident data from internal and external

sources, and, if necessary, the reports of outside agencies.

The objective of the industrial DMP is to make use of the combined resources of the plant and the outside services to achieve the following:

- Effect the rescue and medical treatment of causalities.
- Safeguard other people.
- Minimize damage to property and the environment.
- Initially contain and ultimately bring the incident under control.
- Provide authoritative information to the news media.
- Secure the safe rehabilitation of affected area.
- Preserve relevant records and equipment for the subsequent inquiry into the cause and circumstances of the emergency.
- In effect, it is to optimize that the operational efficiency to rescue, rehabilitate and render medical help and restore normalcy.

Emergency Plan

Emergency planning is primary for the protection of plant personnel and people in nearby areas and the environment that could be affected by unplanned hazardous events. The emergency may arise from the leakage, explosion caused by over pressure in equipment, chemical storage and handling, fire due to combustible material and social disorder.

Furnace Hazard

Furnaces are associated with fire and electrical hazard due to sudden generation of pressure or temperature that leads to damage, injury and death. Temperature and pressure are closely related, and when flammable or combustible mixture is present in process equipment that leads to worst consequences. Thus, an engineering evaluation will be done for worst-case scenario.

Safety Measures

- Installation of automatic alarm.
- Explosion suppression system with detector technique and suppressant.
- Means of shutting off the power and raw material supply.
- Standard Operating Practices (SOPs) for starting sequence of furnace should include along with checkup for exhaust system prior to ignition
- Piping, valves and fitting should be metallic and be in accordance with NFPA-30.

(Flammable & combustible liquid code)

Fire & Explosion

Fire consequences can be disastrous, since they involve high voltage current and huge quantities of raw material with fuel either stored or in dynamic inventory in conveyors or hoppers or in nearby areas. Toxic releases can affect persons working around.

Preliminary Hazard Analysis has provided a basis for consequence estimation. Estimation can be made by using various pool fires, tank fire consequence calculations.

During the study of Risk Assessment, the nature of damages is worked out and probability of occurrence of such hazards is also drawn up. The aim of DMP is to introduce the pragmatic guidelines for safe storage and warehousing of hazardous/ combustible materials, thus protecting human health and environment. The following control/ mitigating measures should be adopted.

- Eliminate all sources of ignition. However, it is difficult to ascertain.
- All the sources of ignition, especially if there are any moving parts.
- DCP type extinguishers are recommended.
- All emergency and safety related equipment must be frequently and regularly checked and maintained to ensure that their condition is satisfactory. Records should be kept of all checks and maintenance carried out on this equipment.
- The necessary first aid equipment should include emergency showers and eyewash facilities.
- The firefighting media should be selected according to mode of action and their use in combating or preventing the spread of fire. It may be water, dry chemical powder, carbon dioxide and foam.
- Extinguishers should be fitted with means to provide visual indications that the unit has partially or wholly been discharged.
- A fire detection alarm and automatically activated CO or equal fire suppression system should be provided in the electrical room.

On-Site Emergency Plan

On-site emergency is caused by an accident that takes place in a hazardous installation and the effects are confined to factory premises involving the people working in the factory. Preparation of On-site Emergency plan is the responsibility of Factory Management. When

the consequences of an emergency situation are restricted essentially within plan boundaries/ premises, it becomes an on-site emergency. Site - Emergency is under the control of senior offer of the organization not below the rank of General Manager. Separate cell will be created to handle emergency occurred due to natural or man–made disasters. Evacuation plan will be prepared. Fire tenders, ambulance and mobile hospital facilities will be provided to the victims at the shortest time. One Health Centre equipped with modern technology will be identified which has tied up with Government district hospital to get services of the various areas.

Emergency Communication

Whoever notices an emergency situation such as fire, growth of fire, leakage etc. should inform his immediate superior and Emergency control center. The person on duty in the Emergency Control Centre should appraise the Site Main Controller (SMC).

Emergency Responsibilities

a. Site Controller

On receiving information about emergency, he would rush to Emergency Control Center (ECC). Declares Emergency and orders for operation of emergency siren. He has to organize announcement by public address system about the location of emergency. He would assess which areas are likely to be affected, or need to be evacuated or are to be alerted.

b. Incident Controller

The incident controller assembles the incident control team, directs operations within the affected areas, directs the shutting down and evacuation of plant, ensures that all key personnel help is sought, provides advice and information to the Fire and Security Officer, coordinates with emergency services at the site.

c. Emergency Coordinator

- Rescue, Fire Fighting.
- Medical, Mutual Aid, Rehabilitation, Transport and Communication.
- Updating emergency plan, organizing mock drills verification of inventory of emergency facilities and furnishing report to site controller.
- Maintains liaison with Civil Administration.
- Controls rehabilitation of affected areas on discontinuation of emergency.
- Maintains essential services like Diesel Generator, Water, Firewater, Compressed Air/

Instrument Air, Power Supply for lighting.

- Ensures availability of adequate quantities of protective equipment and other emergency materials & spares.

General Responsibilities of Employees during an Emergency

It becomes more enhanced and pronounced when an emergency warning is raised, the workers, if they are in-charge of process equipment, should adopt safe and emergency shut down and attend any prescribed duty as essential employee. If no such responsibility is assigned, he should adopt a safe course to assembly point and wait for instructions. He should not resort to spread panic. On the other hand, he must assist emergency personnel towards objectives of DMP.

Emergency Facilities

a. Emergency Control Centre

Emergency Control Centre (ECC) with intercom, telephone, self-contained breathing apparatus, fire suit, hand tools, wind direction indications, public address megaphone, hand bell, telephone directories, factory layout, site plan, emergency lamp, hazard chart, emergency shut-down procedures, address with telephone numbers and key personnel, emergency coordinator, and essential employees.

b. Assembly Point

Number of assembly point depending upon the plant location would be identified wherein employees who are not directly connected with the disaster management would be assembled for safety and rescue. Emergency breathing apparatus, minimum facilities like water, etc. would be organized there. In this project there is two assembly points in opposite direction.

c. Emergency Power Supply

Plant facilities would be connected to DG and would be placed in auto mode. Thus, water pumps, plants lighting and emergency control center, administrative building and other auxiliary services are connected to emergency power supply.

d. Fire Fighting Facilities

First Aid and Fire Fighting equipment suitable for emergency should be maintained in each and at bulk storage of fuel.

e. Location of Wind Sock

On the top of the administration block / security block / production blocks, wind socks would

be installed to indicate direction of wind for emergency escape.

f. Emergency Medical Facilities

Stretchers, gas masks and general first aid materials for dealing with fire burns etc. Apart from plant first aid facilities, external facilities would be augmented. Names of medical personnel, medical facilities in that particular area would be prepared and updated.

g. Emergency Warning

Communication of emergency would be made familiar to the personnel inside the plant and people outside. An emergency warning system would be established.

h. Emergency Shutdown

There could be a greater number of persons in the storage area and other areas in the vicinity. The area would have adequate number of exits, staircases, etc.

i. All Clear Signal

At the end of an emergency, the Site Controller orders for an all-clear signal. When it becomes essential, the Site Controller communicates to the District Emergency Authority, Police and Fire Service personnel regarding help required or development of the situation into an Off-Site Emergency.

j. Mutual Aid

Mutual aid in the form of technical personnel, runners, helpers, special protective equipment, transport vehicles, communication facility, etc., should be sought from the neighboring industrial management.

k. Mock Drills

Emergency preparedness is an important aspect of planning in Industrial Disaster Management. Personnel would be trained suitably and prepared mentally as well as physically in emergency response through carefully planned and simulated procedures. Similarly, the key personnel and essential personnel should be trained in the operations. List of Key persons during emergency situation will be mentioned in the **Table 7.3**

Table-7.3

List of Key persons

S. No.	Emergency Coordinator
1	General Manager
2	Manager (Project)
3	Manager (Maintenance)

4	Shift In charge

Hazardous Chemicals & Associated Hazards

There is no storage of any hazardous chemical in the industry.

Off-Site Emergency Plan

Major emergencies like bursting of tankers are classified as offsite emergency and it is not possible for single factory to handle the situation. The task of preparing the off-Site Emergency Plan lies with the District Collector. However, the off-site plan could be prepared as a Composite off-site Emergency Plan with the help of the local district authorities and the nearby industries in the Industrial Estate.

Off-site emergency plan follows the on-site emergency plan. When the consequences of an emergency go beyond the plant boundaries, it becomes an off-site emergency.

Off-site emergency is essentially the responsibility of the public administration. However, the factory management should provide the public administration with the technical information relating to the nature, quantum and probable consequences on the neighboring population.

The off-site plan in detail should be based on those events, which are most likely to occur, but other less likely events, which have severe consequence, should also be considered. An early decision will be required in many cases on the advice to be given to people living within the range of the accident. The main aspects, which should be included in the emergency plans, are:

a. Organization

Details of command structure, warning systems, implementation procedures, emergency control centers should be there. Names and appointments of the incident controller, site main controller, their deputies and other key personnel should be available.

b. Communications

Identification of personnel involved, communication center, call signs, network and list of telephone numbers.

c. Specialized Knowledge

Knowledge includes details of specialist bodies, firms and people upon whom it may be necessary to call, for example those with specialized knowledge, laboratories.

d. Chemical Information

Details of the hazardous substances stored or procedure on each site and a summary of the risk associated with them.

e. Meteorological Information

Arrangements for obtaining details of whether conditions prevailing at the time and weather forecasts

f. Humanitarian Arrangements

Transport, evacuation centers, emergency feeding treatment of injured, first aid, ambulances and temporary mortuaries.

g. Public Information

Arrangements for dealing with the media press office and informing relatives.

h. Assessment

Arrangements for: (a) collecting information on the causes of the emergency and reviewing the efficiency and effectiveness of all aspects of the emergency plan.

i. Role of the Emergency Co-ordination Officer (ECO)

The ECO should co-ordinate various emergency services. The ECO should coordinate closely with the site main controller. The external control should be passed to a senior local authority administrator or even an administrator appointed by the central or state government.

j. Role of the Local Authority

The duty to prepare the off-site plan lies with the local authorities. The Emergency Planning Officer (EPO) appointed should carry out his duty in preparing for a whole range of different emergencies within the local authority area. Rehearsals for off-site plans shall be organized by the EPO.

k. Role of Police

Formal duties of the police during an emergency include protecting life and property as well as controlling traffic movements.

l. Role of Fire Authorities

The cessation of a fire should normally be the responsibility of the senior fire brigade officer who would take over the handling of the fire from the site incident controller on arrival at the site.

m. Role of Health Authorities

Health authorities including doctors, hospitals, and ambulances and so on are a vital part of

the emergency plan. Major off-site incidents are likely to require medical equipment and facilities additional to those available locally. A medical "mutual aid" scheme should exist to enable the assistance of neighboring authorities to be obtained in the event of an emergency.

n. Role of Government Safety Authority

In the event of an accident, local arrangements regarding the role of the factory inspector will apply. List of key persons will be mentioned in the Off- Site Emergency Plan in **table 7.4.**

Table-7.4

List of Key persons of offsite EP

S. No.	Emergency Coordinator
1	District Magistrate
2	Fire Brigade
3	Controller of Explosive
4	SP
5	DHO
6	SPCB

7.3.1 SOCIAL IMPACT ASSESSMENT

The impact of the proposed expansion activity will begin with the starting up of the construction activities at the site. The proposed expansion activity will provide employment to considerable number of skilled, semi-skilled and un-skilled construction laborers. In normal circumstances, the local people will be given preference for the unskilled activities, as there are many construction laborers in the vicinity of the project and are expected to be available with normal wages.

Provision of wage employment to the local populace during construction period of the project will benefit the local area to some extent. This will enhance the income levels of the construction laborers and lead for their socio-economic wellbeing during the construction phase of the proposed expansion activity, which will be positive impact due to the project. Tertiary sector employment and provision of goods and services for daily need, including transport.

In line with the above, some more recommendations are given below:

- Local people will be given preference;
- All the guidelines under the Factories Act, 1948 will be implemented during the

construction work to avoid any accidents;

- The contractor will be instructed to provide cooking fuel to the workers to prevent damage to trees. This will be part of the contractual agreement between the project proponent and the contractor engaged for construction; and
- The construction site will be secured with fencing and will have guarded entry Points.

7.3.2 REHABILITATION & RESETTLEMENT PLAN

The expansion project shall be carried out within the existing plant boundary. No land shall be acquired for the proposed expansion. Hence the proposed expansion project does not involve any displacement of persons and no rehabilitation and resettlement is required.

CHAPTER -8.0

PROJECT BENEFITS

8.1 INTRODUCTION

The development of industrial projects plays a key role in the economic growth of any country. Iron is the most important metal to the mankind, which is widely used for domestic, agricultural, industrial and defense purposes. Per capita iron / steel consumption is a major indicator of economic status of any country. The growth of the steel industry significantly contributes to economic growth as it generates employment both directly and also due to development of downstream industries. Peripheral development takes place and due to more influx of money through the area, overall importance of the area increases and overall, the infrastructure improves.

8.2 EMPLOYMENT POTENTIAL

8.2.1 Direct Employment

Employment opportunities are moderate and not growing as per growth of education. People mainly depend on the agriculture and Industries for their living in the area. The present expansion project has employment generation potential by way of recruiting local people directly for different activities of the project.

The proposed project shall generate direct employment for additional 90 persons as per details below.

S.No.	Description	Nos.
1	Rolling Mill In charge	1
2	Quality In charge	2
3	Marketing In charge	2
4	Shift Engineers	3
5	Supervisors	4
6	Foreman	4
7	Workers	66
8	Clerks	6
9	Accountants	2
10	**Total**	90

The required manpower for the proposed expansion can be classified into categories such as managerial, supervisory, highly skilled, skilled, semi-skilled and unskilled. The direct

employment figure presented above is for the regular plant operations at full capacity.

8.2.2 Indirect Employment

Indirect employment and income effects of any steel plant are non-marginal and usually remain widespread across a long region. It is expected that substantial portion of the investment will trickle down to the local people in the form of employment and income. The project is expected to generate substantial indirect employment in other sectors such as service units. Employment and income indicate that the project has strong positive effect. Since the infrastructure for maintenance of the specialized plant and machinery may not be readily near site, adequate maintenance facilities for day- to- day and minor plant maintenance including a well- equipped workshop and trained technicians shall be developed for the project. Major maintenance and annual turn around will be contracted out to reputed agencies. Odd jobs, plant cleaning, hiring of vehicles, road and maintenance, plant security, gardening / green belt development etc. will be locally contracted out.

8.3 IMPROVEMENT IN INFRASTRUCTURE

M/s GOYAL FURNACE PVT LTD intended to provide the following infrastructure in the study area of 10 km radius:

Road Transport: There will be improved road communication due to the proposed project and timely maintenance will be done

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

Market for Consumer Goods: With the implementation of the project and development of area, demand patterns will change and local consumer market will grow thus more income opportunities for the local people will be there. The proposed project is going to have positive income effect and consequently, the multiplier effect is expected to lead to an overall increase in average consumption of the people of the study area.

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

8.4 EDUCATION

The local peoples' interest towards education will increase due to the expectation of getting

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

8.5 OTHER TANGIBLE BENEFITS

Steel plants by nature serve as the nuclei for development of small- scale industries in the areas around them. These small- scale units usually have input- output linkage with the steel plants. The demand for spares, assemblies and sub- assemblies by steel plants are generally met through the supply (of these items) from small- scale units located nearby. The present project is likely to accelerate such industrialization through "Bubble Effects" in the study area. It is important to note that the small- scale units are usually labor- intensive and high-priority industries from social point of view.

The proposed project is expected to serve as center of significant small- scale industrial economy around it complemented by the services sector. This is expected to play a major role in the future economic and social development of this area.

8.6 DETAILS OF INFRASTRUCTURE FACILITY

Most of the labor force during construction and operation phase will be hired from the local areas. Sanitation and rest rooms are available for the casual workers and truck drivers.

Sufficient toilet facility i.e. one toilet for ten persons is there.

8.7 ENTERPRISE SOCIAL COMMITMENT

Being a small industry and not covered under the Companies Act, the promoters are well aware of their role and responsibility toward the society and stack holders. For fulfilling the social responsibility, the company will earmark a specific amount towards enterprise ESC. Items wise detail and time bound action plan shall be chalked out based on the public consultation issues and the representative of surrounding villages. The same shall be submitted along with comprehensive EIA report. In addition to issues which may crop up during public hearing the following social activities have been planned.

- Awareness plan on girls education
- Spreading legal awareness amongst people and disadvantageous section of society about their rights & safeguards available.

- Formation of a task force of volunteers to educate people, regarding judicious use of water resources.
- Green belt development on village common land in association with concerned village Panchayat.
- Promotion of sports activities in nearby village.
- Development of crematorium in one village of study area.

8.8 LITIGATION AND PENDING CASES

The unit has never violated the provisions under the environmental protection rules. Neither any litigation is pending against the project nor any directions /order has ever been past by any court of law.

CHAPTER -9.0

ENVIRONMENTAL COST BENEFIT ANALYSIS

9.1 ESTIMATED PROJECT COST

The estimated project cost will be Rs 48.85 Cr. including Rs 35.93 Cr as cost of Expansion.

9 .2 SCHEDULE OF PROJECT IMPLEMENTATION

Schedule of implementation of the project is of utmost important reasonable time during which the proposed project can be implemented. This takes into account the time required for various activates i.e., detailed engineering of the unit including structural designs, civil construction, procurement of equipment and machinery including utilities and services, equipment test and trial runs etc. One year shall be needed for completion of the project after the EC is granted.

Key factors that would facilitate successful and timely project implementation:

a) Proper choice of technology and machinery suppliers.
b) Adequate diligence in formulating the technical concept and system design / selection of the plant.
c) Proper choice of contractors for civil construction and erection of equipment.
d) Formulation of effective project team led by an experienced Project Manager.
e) Establishment of efficient system for project planning & monitoring including reporting procedures for progress review & co- ordination.
f) Customization of project execution plan to suit the promoter's profile.

9.2.1 Implementation Strategy

Typically, project has four core dimensions viz:

a) Engineering: this directly impacts the smooth operations of the plant over its entire life
b) Procurement: is critical on account of the impact that it has on investment and performance benchmarks and also in ensuring the choice of appropriate technology.
c) Construction: is critical in terms of its impact on completion quality and duration of the project phase.
d) Project Management: other than its obvious impact on project time it also contributes to risk minimization for the promoter.

9.3 Environment Cost Benefit Analysis

9.3.1 Net Present Value

Net present values provide a basic to assessing the fairness of any future financial benefits and liabilities of a project. Considered Rs 54.00 as the full-on value of present investment of Rs 48.85cr and discounted rate of 5%. The present value of project will be for five years.

$\frac{54}{1.05^5}$=42.31 crore.

Hence, Rs 54Crore is worth Rs42.31 crore agreed lum-sum payment to five years.

9.3.2. Internal Rate of Return

Internal rate of return is calculated using the formulae $\frac{Future\ Value}{Present\ value}$

$\frac{54}{42.31}$=1.276

With ration of value (IRR)= $(1.276)^{0.2}$ = 1.04995

= (1.04995-1.0) X100

= (0.04995X 100) =4.99%.

9.3.3. Benefits Cost Ratio

Benefits cost ratio is sort of data driven approach for the organization in making solid investment decisions.

Benefit cost ratio is achieved by using the formulae:

$=\frac{Present\ Value\ of\ future\ benefits}{Present\ values\ of\ future\ cost}$

$=\frac{54.0}{48.85}$=1.105

Since the ratio is more then 1.0, the project is economically valuable.

9.3.4. Cost Effectiveness Analysis (CEA)

Generally, the cost effectiveness analysis is considered to compare the relative cost of two or more alternatives and is a sort of alternative to cost beneficial analysis. Since in this case no alternative to site and process is considered the cost effectiveness analysis hence therefore been not considered.

9.3.5. Environmental Benefits

- With the adoption of state-of-the-art laboratory for air pollution control there will be significant improvement in the air quality as the as the resultant pollution load in the environment will decrease.
- With the development and modernization of Greenbelt, the aesthetic seismic view of the area will improve in addition to general improvement on the environment.

- With the adaption of RWH within the premises and its subsequent reuse, the impact on GW absorption will be controlled.
- Since, it is ZLD unit, no component of the environment will be affected by its operation.

9.3.6. Improvement in Social Infrastructure

- There will be positive outcome in the surrounding population.
- The project worker collaborates the conservation of structural shield in the severity marked.
- As per MOEF&CC On dated 30.09.2020 to company will present in physical form and undertake social and environmental activities acrossed the project site in a time bond manner in consultation with local authorities, the implementation of listed will be done as per of EMP.
- The proposed expansion will result in direct and undirect employment in the nearby area subject to availability of skilled and unskilled manpower.
- The project is quite competent to state and central exchequer by way of taxes and duties

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CHAPTER -10

ENVIRONMENT MANAGEMENT PLAN

10.0 Introduction

Environmental management plan (EMP) describes the administrative aspects of ensuring that mitigation measures are implemented and their effectiveness monitored, after the grant of EC. It consists of various policies, control measures etc. for abatement of critical environmental impacts arising out of the proposed project. Mitigation measures are proposed on the basis of identified impacts. Further a suitable environment management plan will be introduced in the project to implement and practice measures to protect and enhance the quality of environment. The EMP is only as effective as its implementation. An appropriate environmental management strategy is developed and presented in the form of an EMS. It is the responsibility of the project proponents to control the utilization of resources and discharges of waste by adopting suitable control measures in the factory to avoid adverse effects of industrial activities on the environment and in turn to enhance the quality of the existing environment.

10.1 Summary of Potential Impacts with Mitigation Measures during Construction Phase

10.1.1 Land Environment

The site is flat and already leveled, hence no leveling is required. Earth excavated during civil foundations will be reused for raising the plinth and backfilling the columns. Dust generated due to earthwork including excavation and transportation activities, especially during dry weather conditions, will be controlled by water sprinkling.

10.1.2 Air Environment

Dust will be generated at work site during the construction activity like excavation and vehicular movement. Suitable surface treatment to ease the traffic flow and regular sprinkling of water will reduce the dust generation will be provided. All internal and external roads will be asphalted and cleaned daily, so as to minimize the regeneration of road dust.

10.1.3 Water Environment

Temporary drainage will be maintained, removed and reinstated as required, and all other

precautions will be taken for avoidance of damage by flooding and silt. Sedimentation pit of sufficient capacity will be constructed to trap silt-laden water during monsoon. The wastewater will be reused for dust suppression by adopting suitable mechanism. These will be cleaned on regular basis.

10.1.4 Noise Environment

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

10.1.5 Solid Waste Management

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

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

10.1.6 Sanitation, Welfare and Safety Measures of Construction Workers

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

10.2 Summary of Potential Impacts with Mitigation Measures during Operational Phase

10.2.1 Air Environment

The major source of air emission is fugitive dust from induction furnace. The dust emissions will be controlled by using fume capture devices and bag filters. The air pollution control

system will consist of air-cooled ducts, hood for furnace, bag house, ID fan and chimney. Adequate spares (bags, cages, compressors, pumps, and machine parts, etc.) shall be maintained by the industry. O&M of the bag filter shall be done as per schedule prescribed by the manufacturer.

Gaseous emission from DG stack will contribute significantly in particulate matter, SO_2 and NO_x level in ambient air. Stacks heights as per norms will be provided for the proper dispersion of pollutants. The resultant air quality will conform to the stipulated standards.

10.2.2 Water Environment

Pollution of groundwater, odor from waste water treatment plant and domestic sewage are some potential impacts of liquid effluent. There will be no use of water in the process and hence, no waste water generation requiring subsequent treatment. Domestic sewage will be treated in sewage treatment plant and treated effluent will be collected in treated effluent tank reused in sprinkling, watering, irrigation of green belt and horticulture, etc. The water for cooling of furnaces will be re-circulated and no wastewater will be discharged from outside the premises. Roof-top rain water will be collected, stored and used for non-process operations such as plantation and dust

10.2.3 Noise Environment

Noise level will increase due to equipment and machineries in the plant area. Equipments will be designed to conform to noise levels prescribed by regulatory agencies where necessary, high noise generating equipment should be acoustically treated or housed. Provision of and plantation would further help in attenuating noise. Acoustic enclosure will be provided for DG sets. Noise attenuation will be acquired to reduce noise level to 85 dB (A) at 1m distance. Ear plugs/ear muffs will be provided to employees working in high noise areas as protective device.

10.2.4 Solid and Hazardous Waste

Waste	Source	Quantity	Potential Impact
APCD Dust	Induction Furnace	3.5 TPD	Health Implication, land pollution
Sludge from septic tank	Septic tank	3.6 kg/d	No adverse environmental impact except little odor nuisance.

Furnace Slag	Induction Furnace	9.8 TPD	No adverse impact. It will be used in road making and land filling.
Used Oil	DG sets	0.5 Kl/A	possibility of soil and water contamination due to spillage
MSW from every day &Domestic	Employees	30 kg/d	Hazardous Gas Emission. Natural Habitat Degradation

Management

- Dust from bag filters shall be stored in a covered dumping pit of R.C.C. and disposed to designated TSDF site/ or approved reprocessors of hazardous waste for final disposal.
- Municipal solid waste due to everyday sweeping and domestic activities will be collected in bins.
- The sludge from waste water treatment systems shall be composted and used as manure in horticulture.
- Slag produced from manufacturing process as by-product will be periodically tapped and left to solidify. The slag will be then crushed and iron particles are taken out through the process of magnetic separation. Mill scales are either sold in the market or used back in I.F.

Summary of Environmental Impact and mitigation Measures:

S. No.	Component of Environment	Impact	Mitigation Measures
CONSTRUCTION PHASE			
1	Air	Particulates, NOx, SO_2	Personal protective equipments for workers, water sprinklers. Since the proposed project is within the industrial land, no impact is envisaged on the outside areas.

2	Noise and Vibration	Noise level increase due to vehicular movement, working of machineries and construction equipments.	Construction activity to be restricted in day time only. Proper servicing of vehicles, PPE to be provided.
3	Water	Water pollution due to disposal of water and domestic waste water.	Proper sanitation facilities are/will be provided. No change in land use as the project execution will be in the existing land.
4	Land	Land is already industrial which may be polluted due to untreated sewage and solid wastes.	Construction waste will be used within the site and sanitation facilities already exist which will be further strengthened.
5	Biological	Noise level may impact the fauna	Green Belt development takes care of this aspect.
6	Socio Economic	Employment of workers	Positive impact as people from the study area will be employed.
7	Occupational Health and Safety	Respiratory ailment due to dust and auditory due to noise.	Water sprinklers and PPE's
OPERATIONAL PHASE			
1	Air	Increase in the air pollution due to plant operation and vehicular movement.	Provisions of proper APCS and their operation as per SOP, adequate stacks and compliance as per SPCB norms. PPE for employees, regular monitoring and compliance with HWMTB management riles-2016.

2	Noise and Vibration	No noise is generated from Induction Furnace. However, small noise that too within the premises will also be generated from the operation of equipment.	Equipment will conform to noise level of 85 dB (A). Proper maintenance of equipment and PPE. General public will not be affected.
3	Water	No impact as no water is and, in the process, and entire cooling water is circulated. No industrial effluent generated and discharged.	Proper sanitation facilities. The sludge from domestic waste water treated to be used as manure and treated water for plantation.
4	Land	Discharge of sewage water	Domestic waste water shall be used in plantation after treatment.
5	Biological	Disturbance due to noise	Proper education to drivers and transportation in day time only.
6	Socio Economic	Employment to locals	Positive impact
7	Occupational Health and Safety	Accidents to operational activities and auditory ailments	Low noise equipments will be employed which conform to noise level of 85 dB (A). Proper PPE to be provided. Storage of H.W. as per rules. Proper safety training to staff.

10.2.5 Occupational Health & Safety

Sources and Impacts: Exposure to noise, dust, heat and gases like CO are occupational hazards identified in steel plant. Silicosis, Bronchitis and Noise induced hearing loss are the diseases that could occur due to prolonged exposure / concentration found to be above the Permissible Exposure Level. Workers involved in raw material handling section, dusty environment, near furnaces, and are exposed to high dust levels. Workers working near / close to the furnaces are exposed to heat stress. Over a long period of time such exposure is likely to result in respiratory problems / occupational health problems.

Management: Plant personnel working in dust prone areas shall wear personnel protective

equipment like air filters over their nose. Job rotation schemes shall be practiced for over-exposed persons, particularly for heat stress. Proper illumination shall be maintained at each and every nook and corner of the work places.

PPE like earplugs and muffs shall be provided to workers working near air compressors, pipe plant and mills, and administrative pressure applied to the workers to use them. Workers exposed to mechanical accident-prone areas are given personal protective equipment (PPE) like tight rubber goggles, safety helmets, welders hand shields and welding helmets, plastic face shields, ear plugs, ear muffs, rubber aprons, rubber gloves, shoes with non-skid soles, gum boots, safety shoe with toe protection.

Table 10.1 Safety and Occupational Hazards

Safety Hazards			
Risk	**Equipment**	**Causes**	**Mitigation Measures**
Steam Explosion	Furnace	• Cooling water coming in contact with molten metal as Slag • Excessive moisture in Slag • Due to refractors	• Making C.W. system leak proof • Pre heating of raw materials • Pre heating of refractors
Chemical Explosion	Furnace	• Accidental mixing of oxidants such as points/varnishing & oily scrap • Chemicals/substances in scrap	• Segregation of scrap before use
Fire & Explosion	Transformers	• High oil temperature • Varying room temperature	• Locating transformers at isolated place • Encompassing the oil filled equipment by RCC wall

Sparks followed by fire	Electrical installation/Sub-station	• Loose fowls, cable cut, short circuits etc.	• Due diligence in designing the electrical sub station

Occupational Health Hazards		
Hazard	**Causes**	**Mitigation/Control**
Heat Stress	• Working in extreme hot conditions	• Shielding heat radiations from hot surface • Supply of clean drinking water • Educating workers about the symptoms of excessive heat exposure • Short breaks & rotation of workers
Burns	• Splashing of molten material • Touching of hot surface • Radiation	• Providing specific PPE's • Providing protective barriers to minimum exposure • Proper design & process control • Automation to minimize risk associated with material handling or casting
Light Radiation	• UV & IR radiations of high intensity from molten metal especially the pouring areas	• Educating the workers regarding risks and safety measures • Proper labeling of risky areas w.r.t radiation • Shielding of workers and providing proper PPE's

Electrocution	• Contact with live wires • Flash over • Strong Electromagnetic filter	• Elimination of source of risk • Safety switches • Task specific PPE
Mechanical Hazard	• Accidental fall of heavy equipments	• PPE • Proper training
Hearing problems	• Excessive Noise	• Insulate ventilation proper • Compulsory use of PPE

10.3 STRUCTURE AND ADMINISTRATIVE RESPONSIBILITIES OF ENVIRONMENT MANAGEMENT CELL (EMC)

M/s GOYAL FURNACE PVT LTD is an existing company having qualified and experienced personnel in environmental management and pollution control. The company has existing environmental monitoring cell for environment monitoring and legal compliances. The details of cell are given below:

The EMC will be headed by two Directors of the Company. He will be assisted by General Manager (Environment) and Consultant. However, actual responsibility for execution of environmental mitigation measures will be General Managers, Deputy General Manager and their subordinates.

General Manager: He will be responsible for legal compliances of the company related to MoEF, CPCB & PPCB. He will arrange regular monitoring of the proposed pollution control system through his associates. He will arrange evaluation environmental performance of the systems and ensure that the stipulated measures are being satisfactorily implemented and operated. He will ensure that there shall not be any adverse impact on air, water, noise and land environment due to construction & operation of proposed expansion project. As per report of DGM Environment the plant management shall take effective steps through the concerned section head to curb the pollution and effective environmental management.

Consultant: He will supervise the monitoring & analysis of water and effluent quality by the laboratory. As per requirement he will arrange the additional tests through external agencies. He will also arrange regular measurement of ground water quality in the study area and implementation of rain water harvesting measures. He will monitor the performance of air

pollution control systems through on-line continuous stack emission monitoring systems and online continuous ambient air quality monitoring stations. He will also ensure the CPCB guidelines by arranging the outside agency to carry out monitoring & analysis of the air quality parameters which are not available in online systems. He will facilitate the inspection, monitoring & analysis of pollution control systems by the SPCB officials as and when required. His other functions would be hazardous waste management. He will co-ordinate for proper reuse or disposal of hazardous wastes. EMP costing detail is provided at **Table 10.2.**

Table-10.2

EMP Budget

S. No.	Title	Capital Cost Rs. Lakh	Recurring Cost Rs. Lakh/Annum
1	Pollution Control during construction stage (Water, Sprinkler etc.)	2	0.5
2	Air Pollution Control Measures Bag filters, dust extraction systems, online monitor, etc.	56	10.0
3	Water and waste water Management.	10	2.0
4	Solid Waste Management	5.0	1.0
5	Noise Reduction Systems	1	0.5
6	Occupational Health, Safety and Risk Management	5	1.0
	TOTAL	78 Lakhs	15
8	**Environmental monitoring Program**		**(Recurring Cost)**
a)	Air Quality Monitoring		0.35
b)	Noise monitoring		0.1
c)	Water and waste water monitoring		0.40
d)	Soil quality monitoring and Solid and hazardous waste quality		0.30
	TOTAL	**78 Lakhs**	**16.1 lakhs**

To maintain the environmental parameters within the stipulated standards, regular monitoring of various environmental components is necessary which will be complied as per conditions.

10.4 CORPORATE ENVIRONMENT POLICY

It is a company managed by directors. The promoters of the project are well aware of issues and concerns regarding environmental matters pertaining to the project. The company has

well established administrative set up to deal with the environmental issues and ensuring the compliance of statutory norms and EC conditions as per following.

Environment Policy of the Company:

- We will involve our customers, suppliers, vendors and contractors in environmental sustainability endeavors by sharing our expectations to collaboratively achieve our environmental objectives and adopting the 3-R' (Reduce, Reuse, Recycle) concept.
- We will survive to comply withal applicable and related legal and other requirements.
- To implement all these measures, we shall devise an Environmental Management Plan (EMP) which could consist of mitigation measures for each activity to be undertaken to minimizing environmental impacts, if any.
- We will communicate our environmental policy to all employers, business associates and other stockholders and ensure that the reporting of the environmental related compliance is done through appropriate communication channels.
- We will review the environmental policy and allied management systems periodically to ensure continuing and relevance to our operations.
- Preserve and enhance biodiversity in our unit ardently promote 'green procurement' for our all-upcoming projects.

CHAPTER -11.0

SUMMARY & CONCLUSION

11.1 Project name and location

The proposed Brownfield project is a Secondary Metallurgical Process based industry. The plant is located at plot no. 168 to 179 & 146 to 160, Phase-III, Industrial Area, Sansarpur Terrace, Tehsil- Jaswan at Kasba Kotla, District – Kangra, Himachal Pradesh. It is proposed to install one new Induction Furnace of capacity 15 TPH and one Continuous Casting Machine. Thus, the total production will increase from 19,200 TPA to 96,600 TPA of MS Ingots and 77,280 TPA of Steel Ingots/Billets, Round Angle, Channel, TMT Bars and Flats.

Tab. 11.1. Salient Features of the Project

Name of Project	M/s GOYAL FURNACE PVT LTD		
Type of Project	Steel Manufacturing Unit (Expansion)		
Location	plot no. 168 to 179 & 146 to 160, Phase-III, Industrial Area, Sansarpur Terrace, Tehsil- Jaswan at Kasba Kotla, District – Kangra, Himachal Pradesh.		
Product	MS Ingots & Round Angle, Channel, TMT Bars and Flats.		
Capacity (TPA)			
Product & Bye Product	**Existing (TPA)**	**Additional (TPA)**	**Total (TPA)**
MS Ingots	19,200	77,400	96,600
Rounds, TMT Bars, wire rode, Flats and structural steel	NIL	77,280	77,280

Cost of the Project	Existing -Rs 12.925 Cr Proposed -Rs 35.93 Cr **Total -Rs 48.85 Cr**		
Total Land	17995 Sqm or 4.44 Acres		
Power Requirement (KW)			
Existing	3200		
Additional	6800		
Total	10000		
Source of power	Himachal Pradesh State Electricity Board Limited (HPSEBL)		
Source of water supply	Ground Water- Tube-well Surface water - CETP		
Consumption of Water (KLD)			
	Existing	**Proposed**	**Total**
Domestic	2.0 KLD	3.0 KLD	5.0 KLD
Cooling	30.0 KLD	60.0 KLD	90.0 KLD
Total	**32.0 KLD**	**63.0 KLD**	**95.0 KLD**
Source of water supply	Own Tube Well		
Effluent Quantity	Domestic = 4.0 KLD Cooling = Recirculation		
Effluent treatment	Domestic- through septic tank and used for plantation		
Air pollution control	Bag filter		
Solid waste	About 9.8 TPD of slag which is not a H.W will be generated and the same after recovery of iron will be supplied to manufacturers of cement concrete blocks, pavers & tiles under proper agreement.		
Hazardous waste	Hazardous/solid waste generated (0.5kl/annum) from DG sets in the form of used oil is being re-used as lubricants for machines. APCD dust of 3.5 TPD will be sent to TSDF/ or approved reprocessors of hazardous waste.		
Environment Management Cell (EMC)	A duly constituted EMC comprises the following: 1. Director/ Owner 2. Process In charge/GM 3.Environment Consultant		

11.2 Description of the Environment

Various Environmental factors as existing in the study area which are liable to be affected by the activities have been assessed both quantitatively and qualitatively. Baseline environmental data generation of study area was carried out during the

period.

In Frequency: The monitoring frequency was 24hrs, twice a week at each station spread over the entire monitoring period with gas sampling done six times (at 4 hrs intervals)

S.No.	Sampling Parameters	Sampling Equipments	Analytical Equipments	Detection Limits	Methods
1	PM10	Respirable dust samples with cyclone and flow measurement	Gravimetric, Analytical balance	10.0 ug/m3	IS:5182 (P-3),208
2	PM2.5	Fine particulate samples	Gravimetric, Analytical balance	10.0 ug/m4	IS: 5182 (P-24, 2019
3	SO2	Gaseous flow Impinger with TCM with RDS	Spectro photometer	4.0 ug/m3	IS: 5182 (P-2) 2001 (RA-2017)
4	NOx	Gaseous flow Impinger with Sodium Arsenide with RDS	Spectro photometer	6.0ug/m3	IS: 5182 (P-6) 2006 (RA-2017)
5	CO	Teddler bag & Pump	IS. (GC method)	0.5mg/m3	IS: 5182 (P-10) 1999 (RA-2003)

Ambient Air Quality

The $PM_{2.5}$, PM_{10}, SO_2, NO_2, CO levels were monitored at eight locations in the study area for three months. The P98 levels of criteria pollutants are as follows: $PM_{2.5}$ is 38.34 µg/m^3, PM_{10} is 81.76 µg/m^3, SO_2 is 7.79 µg/m3, NO2 is 14.8 µg/m3 and CO is 0.518 mg/ m^3. The baseline air quality level is within the National Ambient Air Quality Standards prescribed for industrial, residential, rural & other area. **(Standards are 60, 100, 80, 80µg/m^3 and 4.0mg/m^3 for $PM_{2.5}$, PM_{10}, SO_2, NO_x and CO respectively).** Due to better pollution abatement facilities in the proposed expansion, there will rather be improvement in the existing air.

Water Quality

Eight groundwater samples and one surface water sample were collected from the study area for physical, chemical and bacteriological analysis. The groundwater quality of the study is

satisfactory. No physical or bacterial contamination was found in the water quality. But bacterial contamination is found in surface water. Since, no waste water will be discharged to the environment, water quality is not likely to be impacted.

Noise Environment

Ambient noise levels were monitored at 8 locations in the study area. Noise levels at the Project site was found to be 71.4 dB (A) during day time and 67.2 dB (A) at night. The baseline noise levels are borewell within the Noise Standards prescribed by the CPCB. Proposed expansion will not have insignificant impact as there will be no noise generating machinery and process.

Soil Quality

Eight soil samples were collected from the study area and analyzed. The texture of soil is silt loam. The organic matter, nitrogen, potassium and phosphorus content of the soil are moderate. The pH of all the soil samples is within the acceptable range. No impact on soil will be there for proposed plant as no waste will be discharged on land.

Ecological environment

Ecological data has been collected through secondary sources and by site visits. The tree species kikar, Jamun, Peepal and Mango etc. are the dominant plant species of the study area. Mongoose, porcupine, jungle cat, cobra, krait, snakes, hare, pigeon and variety of birds are the common animals of the study area. No endangered species of plants and animals are found in the study area, so no impact on ecological environment.

Sensitive Ecosystem

Within the study area, no plant or animal species were found to be on the endangered list. No ecologically sensitive area like biosphere reserve, tiger reserve, and migratory corridors of wild elephant, wetland, national park and wildlife sanctuary are present in the study area. Agriculture and industrial workers dominate the occupational structure of the study area. Several induction furnaces, rolling mills, ferroalloy plants, brick kilns, and other small units are present in the study area.

Socioeconomic Condition:

Socioeconomic status has been studied through secondary sources and by site visits. The social requirements identified such as Drinking water requirement, Promotion of Educational institutions and medical facilities to the villagers (especially Senior Citizens and infants or

pregnant ladies). Community centers, recreation facilities etc. will also be developed as part of social responsibility.

Possible Hazards & Risks from Secondary Metallurgical Industries

The various process operations, which are having potentially high risk to human exposure and which have high levels of attention area identified in Table provided below

Possible Risk

S.No.	Plant Area	Possible Deviation from normal operation	Likely Causes	Consequences
1	Furnace	Re-circulating and cooling water coming in contact with the molten iron or slag.	Leakage of water from the walls Spurting of metal/ slag.	Explosion under extreme cases.
		Presence of Oil & Grease and other	Fire	Sudden catches fire & flames
2	High Power Transformer	Oil temperature being very high.	Varying room Temperatures.	Sudden flashing of fire or bursting.
3	High Tension Electrical Installation	Heavy sparking at the pot heads and the joints.	Loose joints, cable cut, burning of fuses, short circuits etc.	Sparks in the beginning, devastating fire if neglected.

Likely impact of the project on air, water, land, flora-fauna and nearby population

No, likely impact of the project site on the air, water, land, flora-fauna and nearby population will be seen with the proposed expansion coming into being.

11.3 Anticipated Environmental Impacts and mitigation measures

The purpose of mitigation measures is to avoid, reduce or minimize unwanted impacts on the environment. The detailed impact prediction and its mitigation measures are given at Chapter 4. However, the generic detail with regard to mitigation measures to be taken is delineated as under:

- **Air pollution control**

➢ To minimize & control the emission from Induction Furnace and ladle refining furnace, the process emission will be collected and sucked by installing well designed side hood. The emissions so collected will be passed through spark arrestor, air

cooling and finally bag filters before its discharge to atmosphere. The APCD will be installed based on latest technology to contain the concentration of particulate matter in the process of within the standards laid down by the MoEFCC/PPCB.

- DG set is attached with a stack of adequate height for dispersion of pollutants of exhaust gases into the atmosphere at the required height.

- **Solid and hazardous waste control**

- About 9.8 TPD of slag will be generated and the same after recovering of iron contents will be supplied to manufacturers of Tiles under proper agreement.
- APCD dust of about 3.5 TPD will be sent to TSDF Site/ or approved reprocessors of hazardous waste for final disposal.

- **Water pollution control**

No wastewater will be generated from process, only domestic wastewater will be generated which will be treated in septic tank. The treated wastewater will be reused for cooling purposes and dust suppression

- **Noise pollution control**

- Loading and unloading of raw material and product will be carried out especially during day time by taking necessary mitigation measures at the sources to rule of the possibility of increase in the ambient noise levels due to these activities.
- DG set is fitted with a canopy to contain the sound pressure level within the prescribed limits. Further the machinery, which is lively to cause increase in the ambient noise level, will be kept in good condition at all the times to rule out the possibility of contribution of noise level in the atmosphere.
- Green belt will be provided in the open areas to attenuate the noise levels to be generated from various activities/sources as mentioned above. In addition, this green belt will help to attenuate the fugitive emissions to be generated from the premises of the unit. Ear muff/plug will be provided to all workers working at noisy area

A tabular presentation of mitigation measures is given below:

The following are the mitigation measures for the existing & proposed facility:

S. No.	Source	No.	Fuel	APCD
1.	Induction Furnace	1x7 TPH	Electricity	Bag Filters
2.	D.G. Set	2x325 KVA each	HSD	Stack of adequate height provided
After Expansion				

1.	Induction Furnace	1x7 TPH & 1x15 TPH	Electricity	Bag Filters
2.	D.G. Set	2x325 KVA each	HSD	Stack of adequate height provided
Hazardous Waste				
S.No.	**Waste Category**	**Existing**	**After Expansion**	**Disposal**
1.	35.1 Flue gas cleaning residue	0.27 TPD	3.5 TPD	Send to TSDF site/ or approved reprocessors of hazardous waste for final disposal
2.	5.1 Used oil/Spent oil	NIL	0.5 Kl/annum	Authorized Recyclers/Lubricant within the industry
Solid Waste				
S.No.	**Waste Category**	**Existing**	**After Expansion**	**Disposal**
1.	Slag	5.6 TPD	9.8 TPD	Sent to tile manufactures and brick pavers

11.4 Environmental Monitoring Programme

The monitoring of environmental parameters like air, water, noise, soil, and meteorological data and performance of pollution control facilities and safety measures in the unit are vital for environmental management of any industrial project.

Therefore, the company shall create environmental monitoring facilities by the environmental and safety department to monitor air and water pollutants as per the guideline. Moreover, air, noise, drinking water, and soil shall be monitored by outside agencies authorized by Pollution Control Board at regular frequencies. This department shall also carry out periodical check of fire and safety equipment.

11.5 Additional Studies

The various process operations, which are having potentially high risk to human exposure and which have high levels of attention area identified in Table provided below

Possible Risk

S.No.	Plant Area	Possible Deviation from normal operation	Likely Causes	Consequences

1	Furnace	Re-circulating and cooling water coming in contact with the molten iron or slag.	Leakage of water from the walls Spurting of metal/ slag.	Explosion under extreme cases.
		Presence of Oil & Grease and other Impurities in	Fire	Sudden catches fire & flames
2	High Power Transformer	Oil temperature being very high.	Varying room Temperatures.	Sudden flashing of fire or bursting.
3	High Tension Electrical Installation	Heavy sparking at the pot heads and the joints.	Loose joints, cable cut, burning of fuses, short circuits etc.	Sparks in the beginning, devastating fire if

11.6 Project Benefits

The proposed expansion will be carried out in existing premises; it is justified on account of the following:

- The implementation of proposed project will bring employment to many people
- Being one of the largest steel producers, the proposed project will contribute to the economic growth.
- No forest land is involved.
- The site has easy access to raw material, road, rail connectivity and market.
- Manpower availability from nearby areas.
- No resettlement and rehabilitation issues.
- Absence of areas of archeological and historical importance within 10 km radius.

11.7 Environmental Management Plan

Environmental management plan (EMP) describes the administrative aspects of ensuring that mitigation measures are implemented and their effectiveness monitored, after grant of EC. It consists of various policies, control measures etc. for abatement of critical environmental impacts arising out of the proposed project. Mitigation measures are proposed on the basis of identified impacts. Further a suitable environment management plan will be introduced in the project to implement and practice measures to protect and enhance the quality of environment. The EMP is only as effective as its implementation. An appropriate environmental management strategy is developed and presented in the form of an EMS. It is the responsibility of the project proponents to control the utilization of resources and

discharges of waste by adopting suitable control measures in the factory to avoid adverse effects of industrial activities on the environment and in turn to enhance the quality of the existing environment.

11.8 Conclusion of EIA Study

The proponent has proposed to expand the existing manufacturing facility with due concerns for the environment.

Proven technology coupled with adequate and appropriate pollution control equipments will lead to insignificant environmental impacts which will be further mitigated by taking preventive measures. The production activities will be undertaken in accordance with the well-established and time practices and procedures' project authorities being well versed with the process are capable of handling any abnormal and emergence situation

The project will result in a boost to commercial business, employment, increase revenue and infrastructural development. Based on the study its concluded that the project would be environmentally, socially and economically sustainable in accordance with the EIA legislation and standards**. The proposal may therefore may be considered for granting Environmental Clearance.**

CHAPTER -12

DISCLOSURE OF CONSULTANTS ENGAGED

12.1 Organizational Profile:

Chandigarh Pollution Testing Laboratory (C P T L) is incorporated in 1997. The Registered office of CPTL is at Plot no. E-126, Industrial Area, Phase-7, Mohali, Punjab. Its laboratory division has accreditation from NABL, recognition from MoEF & CC & PPCB (Punjab Pollution Control Board) and EIA division (i.e. CPTL-EIA) is accredited by QCI/ NABET as Category-A EIA consultancy organization. In addition, it has certification from ISO 9001: 2015, ISO 14001: 2015 and OHSAS 18001: 2007. C P T L is a venture of professionally qualified and experienced technical personnel. The main aim of the company is to provide consultancy services and analytical services to those industries which do not have complete in-house testing facilities with them.

12.2 Scope of Services

Laboratory Facilities	Consultancy Services
Surface/ Ground Water testing	Environment Impact Assessment
Drinking Water testing	Environment Audits
Construction Water testing	Environment clearance compliances
Sewage/ Effluent testing	Remote sensing
Soil testing	Sound level modeling
Ambient Air monitoring	Air quality modeling
Stack Emission monitoring	Risk Assessment
Noise level monitoring	Ecology & Biodiversity study
Micro-biological testing	Socio-economic studies
Manufacturing of ETP, STP & APCDs	Consent from Pollution Boards
Design and installation of ETP, STP & APCDs	Climate Change