

ENVIRONMENTAL IMPACT ASSESSMENT

(EIA) REPORT



FOR

M/S STEEL COMPLEX (PRIVATE) LIMITED

(Manufacturers of Steel Wire, Steel Wire Rope,
Galvanized & Ungalvanized All Steel Conductors,
All Aluminium Conductors (AAC), Aluminium Conductor
Steel Reinforced (ACSR), PC Strand, Spring Wire
& XLPE Power Cables)



PROJECT ADDRESS:

21-KM off G.T. Road,
Tehsil Ferozewala,
District Sheikhupura,
Punjab

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EXECUTIVE SUMMARY

This Executive Summary presents the key findings of the Environmental Impact Assessment (EIA) carried out for M/S Steel Complex (Private) Limited, an established manufacturing unit producing steel wire, steel wire rope, galvanized and ungalvanized all-steel conductors, All Aluminium Conductors (AAC), Aluminium Conductor Steel Reinforced (ACSR), PC strand, spring wire, and XLPE power cables, situated at 21-KM off G.T. Road, Tehsil Ferozewala/Muridke, District Sheikhpura. The unit is one of the country's established manufacturers of steel wires, steel wire ropes, and aluminium/steel conductors, serving the power transmission, distribution, and general engineering sectors, and supplies conductors and cables to distribution companies including LESCO, under public-sector tenders.

Given that the facility involves aluminium melting, hot-dip galvanizing (including acid pickling), and wire drawing operations, the project falls within the category of projects for which the Punjab Environmental Protection (Review of IEE and EIA) Regulations, 2022 require the filing of a full Environmental Impact Assessment rather than an Initial Environmental Examination, on account of the potential for air emissions, process wastewater, and hazardous waste generation associated with metal melting and galvanizing activities. This EIA report has accordingly been prepared in accordance with the Punjab Environmental Protection Act (PEPA), 1997 (as amended), and the Review of IEE and EIA Regulations, 2022.

Project Title and Location

This EIA has been carried out for the existing manufacturing facility of M/S Steel Complex (Private) Limited, located on land measuring approximately 138 Kanal 18 Marla at Mouza Rakh

Bowly Jamadar, Tehsil Ferozewala/Muridke, District Sheikhupura, approximately 21 kilometers off G.T. Road, Muridke, in the outskirts of Lahore.

Project Proponent

Company	M/s Steel Complex (Private) Limited,
Registered Office	1st Floor, 48-C, Nishter/Brandreth Road, Lahore
Proponent	Mr. Raza Elahi
Project Site	21-KM off G.T. Road, Tehsil Ferozewala/Muridke, District Sheikhupura

The EIA Study Consultant

Zoom Consultancy & Services, Lahore, an independent firm of environmental consultants, has been engaged by the proponent to prepare this Environmental Impact Assessment report. Details of the consultant's team and their qualifications are provided in Chapter 1 of this report.

Positioning of the Project

Owing to the involvement of aluminium melting furnaces and hot-dip galvanizing operations (including acid pickling of steel wire), the project is classified under Schedule-III of the Punjab Environmental Protection (Review of IEE and EIA) Regulations, 2022, which covers metal processing, smelting, and allied industrial activities. Filing of a full EIA report with the Environmental Protection Agency (EPA), Punjab, is accordingly required under Section 12 of PEPA, 1997 (as amended), prior to grant of Environmental Approval.

Brief Description of the Project

M/S Steel Complex (Private) Limited manufactures steel wire, steel wire rope, galvanized and ungalvanized all-steel conductors, All Aluminium Conductors (AAC), Aluminium Conductor Steel Reinforced (ACSR), PC strand and spring wire, in accordance with applicable international standards. The facility further undertakes manufacturing of XLPE-insulated power cables (11kV and 15kV single-core and multi-core cables). The manufacturing process broadly comprises wire drawing, acid pickling and hot-dip galvanizing, aluminium melting and rod casting, stranding/bunching, and cable extrusion and sheathing, carried out within a covered production area of approximately 21,000 sq. ft. situated on a plot of approximately 43,485 sq. ft., with the balance of the company's landholding retained as open/expansion area. The rated monthly production capacity of the unit is approximately 2,500 km of AAC/ACSR conductor wire and approximately 250 tons of galvanized steel (G.S.) wire and conductors.

Major Impacts & their Mitigations

The principal environmental concerns associated with the project relate to fugitive dust and metal fume emissions from the melting and galvanizing operations, acidic fumes and spent pickling liquor from the wire pickling process, process wastewater containing dissolved metals, solid and hazardous waste in the form of zinc dross, scale, and spent acid, occupational noise from drawing and stranding machinery, and occupational health and safety risks associated with molten metal handling and acid use. These impacts are, in the main, manageable through good industrial housekeeping and are addressed through mitigation measures detailed in Chapters 5 and 6 of this report, including installation of fume extraction and scrubbing systems, neutralization and treatment of spent acid prior to disposal, secure storage and off-site disposal of hazardous waste

through EPA-licensed handlers, acoustic enclosures for high-noise machinery, and a comprehensive occupational health and safety program including mandatory personal protective equipment.

With the recommended mitigation measures and the Environmental Management Plan (EMP) fully implemented, the residual environmental impacts of the project are expected to be manageable and are not anticipated to result in significant, irreversible, or region-wide adverse effects.

Salient Features of the Project

Parameter	Details
Proponent Name	Mr. Raza Elahi
Project Title	Environmental Impact Assessment for the Manufacturing Facility of M/s Steel Complex (Private) Limited
Project Location	Mouza Rakh Bowly Jamadar, Tehsil Ferozewala/Muridke, District Sheikhpura (21-KM off G.T. Road, Muridke)
Consultant for Preparation of EIA Report	Zoom Consultancy & Services, Lahore
Project Type / Final Products	Steel Wire, Steel Wire Rope, Galvanized/Ungalvanized All-Steel Conductors, AAC, ACSR, PC Strand, Spring Wire, and XLPE Power Cables

Parameter	Details
Raw Materials Used	Steel wire rod, aluminium rod/ingot, zinc ingot, hydrochloric/sulphuric acid (pickling), fluxing salts, XLPE compound, cross-linking and insulation materials
Total Land Holding	Approximately 138 Kanal 18 Marla
Covered Production Area	Approximately 21,000 sq. ft. (two production sheds of 50 ft x 208 ft each), within an 8-Kanal (43,485 sq. ft.) built-up plot
Project cost	250 Million PKR
Production Capacity	Approx. 2,500 km AAC/ACSR conductor wire per month; approx. 250 tons G.S. wire and conductors per month
Source of Water	On-site tube well / ground water source, supplemented by overhead water (OHW) storage tank
Source of Power	Grid electricity supply with backup diesel generator(s)
Wastewater	Process wastewater (pickling rinse, cooling water) treated/neutralized on-site prior to disposal; domestic sewage routed to septic tank
Solid & Hazardous Waste	Metal scrap and zinc dross (recycled/sold), spent pickling acid (neutralized), general solid waste (municipal disposal)

Environmental Monitoring

An Environmental Monitoring Program has been developed to track the environmental performance of the facility and to ensure ongoing compliance with the Punjab Environmental Quality Standards (PEQS).

Sr. No.	Parameters	Monitoring Schedule
1	Stack Emissions (melting furnace / galvanizing kettle) — PM, SO _x , NO _x , CO	Quarterly
2	Ambient Air Quality (PM _{2.5} , PM ₁₀ , CO, NO _x , SO ₂)	Quarterly
3	Occupational / Ambient Noise Levels dB(A)	Quarterly
4	Wastewater Quality (pH, heavy metals, TSS, TDS) prior to disposal	Quarterly
5	Ground Water Quality (nearest supply well)	Bi-annual

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CHAPTER 1

INTRODUCTION

Industrial development brings about both opportunities and environmental change, the extent of which depends on the nature of the industrial process involved and the baseline environmental conditions of the project area. The manufacturing of steel and aluminium conductors, wire ropes, and power cables is an essential input to Pakistan's power transmission and distribution infrastructure, but the associated melting, pickling, and galvanizing operations carry a genuine potential for environmental impact if not properly managed. This report examines those impacts for the existing facility of M/S Steel Complex (Private) Limited and sets out the measures required to keep them within acceptable limits.

1.1 Purpose of the Report

This Environmental Impact Assessment (EIA) has been prepared for the manufacturing facility of M/S Steel Complex (Private) Limited, located at 21-KM off G.T. Road, Muridke, Tehsil Ferozewala, District Sheikhupura. In preparing this report, the consultant has regard to:

- The Pakistan Environmental Protection Act, 1997, and the Punjab Environmental Protection Act (PEPA), as amended.
- The Punjab Environmental Protection (Review of IEE and EIA) Regulations, 2022.
- The Punjab Environmental Quality Standards (PEQS) for industrial gaseous emissions, ambient air, noise, and municipal/industrial effluent.
- EPA Punjab's Guidelines for the Preparation and Review of Environmental Reports.
- EPA Punjab's Guidelines for Public Participation.

- Sectoral guidelines applicable to the metal processing and cable manufacturing industry.

The report identifies the environmental, social, and physical aspects associated with the operation of the facility, and recommends mitigation measures to minimize potential impacts on the surrounding environment, so as to assist the Environmental Protection Agency (EPA), Punjab, in reaching an informed decision on the grant of Environmental Approval.

1.2 Identification of the Project

The project comprises a steel and aluminium wire, rope, conductor, and cable manufacturing facility. Because the facility's operations include aluminium melting and hot-dip galvanizing with acid pickling, the project falls under Schedule-II of the Punjab Environmental Protection (Review of IEE and EIA) Regulations, 2022, for which the filing of a full Environmental Impact Assessment report is mandated under Section 12 of PEPA, 1997 (as amended). This report is accordingly being prepared and submitted for approval.

1.3 The Proponent

Name	Mr. Raza Elahi
Registered Office	1st Floor, 48-C, Nishtar/Brandreth Road, Lahore
Correspondence / Site Address	21-KM off G.T. Road, Tehsil Ferozewala/Muridke, District Sheikhpura
Nature of Ownership	Freehold; land acquired by the company through registered sale deeds executed in 2007, aggregating approximately 138 Kanal 18 Marla

Copies of the registered sale deeds, CNIC of the authorized representative, and other ownership documents are attached as annexures to this report.

1.4 The Consultant

Zoom Consultancy & Services, Lahore, as an independent environmental consultancy, has been retained by the proponent to prepare this Environmental Impact Assessment report.

Team & Qualification of Employees

Sr. No.	Names	Designation	Qualification
2	Nisha Ahmad	Environmentalism	MS Environmental Science
3	Tayyab Khuram	Reporting Officer	BS Environmental Science
4	Iqra Nasir	Business Development Manager	MBA Marketing

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1.5 Brief Description of Project

1.5.1 Nature & Size of Project

M/S Steel Complex (Private) Limited is an established manufacturer of steel wires, steel wire ropes, galvanized and ungalvanized all-steel conductors, All Aluminium Conductors (AAC), Aluminium Conductor Steel Reinforced (ACSR), PC strand, and spring wire, manufactured in accordance with applicable international standards, and further undertakes manufacturing of XLPE-insulated power cables. The company's landholding totals approximately 138 Kanal 18 Marla. The core production block, comprising two manufacturing sheds each measuring 50 ft x 208 ft, an overhead water (OHW) storage tank, and a septic tank, is developed on an approximately 43,485 sq. ft. (8-Kanal) portion of the site, with a covered area of approximately 21,000 sq. ft. and the remaining area kept open for storage, movement of material, and future expansion. The rated capacity of the plant is approximately 2,500 km of AAC/ACSR conductor wire and approximately 250 tons of galvanized steel wire and conductors per month.

1.6 Location

Approximate Coordinates	31.84° N, 74.02° E
North	Agricultural land / open fields
South	Agricultural land / vacant plots
East	Approach road connecting to G.T. Road, Muridke
West	Agricultural land, Mouza Rakh Bowly Jamadar

The site is located within an established industrial/peri-urban belt off G.T. Road in the Muridke–Ferozewala corridor of District Sheikhupura, an area that hosts a mix of light and heavy industrial units together with agricultural land. There are no protected forests, wetlands, or environmentally sensitive/critical areas within the immediate vicinity of the project site.

1.7 Screening

In terms of the Schedule to the Punjab Environmental Protection (Review of IEE and EIA) Regulations, 2022, industrial units engaged in metal smelting, melting, and galvanizing fall under Schedule-II, for which a full Environmental Impact Assessment is required rather than an Initial Environmental Examination. This categorization reflects the higher potential of such processes to generate air emissions, process effluent, and hazardous waste in comparison to lighter manufacturing or assembly-type operations. This EIA has accordingly been prepared and is being submitted to EPA Punjab for review and approval.

1.8 Objective of the Report

The objectives of this EIA study are as follows:

- To fulfil the mandatory statutory requirement for environmental approval under Section 12 of PEPA, 1997 (as amended), read with the Review of IEE and EIA Regulations, 2022.
- To describe the manufacturing process, raw materials, and utilities associated with the facility.
- To establish the baseline physical, ecological, and socio-economic conditions of the project area.

- To identify and evaluate the potential environmental impacts of the facility's construction and ongoing operation.
- To assess reasonable alternatives to the project as sited and designed.
- To recommend feasible mitigation measures to eliminate or reduce adverse impacts to acceptable levels, in line with the Punjab Environmental Quality Standards.
- To develop a comprehensive Environmental Management and Monitoring Plan (EMP) to guide implementation of the recommended measures.
- To document the outcome of consultation with relevant stakeholders.

1.9 Significant Impacts and Factors to be Determined

As the project involves aluminium melting, hot-dip galvanizing with acid pickling, and wire drawing/stranding operations, the significant issues examined in this study relate primarily to stack and fugitive air emissions (metal fume, particulate matter, and acid mist), generation and safe disposal of spent pickling liquor and process wastewater, management of zinc dross and other hazardous waste, occupational noise, and occupational health and safety of the workforce. Socio-economic issues relating to local employment and the interests of neighboring landholders and industries are also examined.

Chapter 2: Policy, Legal and Administrative Framework

2.1 Overview

This chapter presents the policy, legal, regulatory and institutional framework applicable to the Environmental Impact Assessment (EIA) of the existing manufacturing facility of **M/s Steel Complex (Private) Limited**, located at 21-KM off G.T. Road, Muridke, Tehsil Ferozewala, District Sheikhpura, Punjab.

The facility's operations may generate environmental aspects typically associated with steel manufacturing and metal-processing activities, including stack emissions, fugitive dust, wastewater or process effluent, solid waste, hazardous waste, noise, resource consumption, occupational-health concerns and traffic-related emissions. Accordingly, the facility must operate in accordance with the applicable environmental-approval requirements and Punjab Environmental Quality Standards (PEQS), as well as other relevant laws concerning land use, waste management, water, forests, wildlife and public safety.

The principal environmental regulator for the project is the **Environmental Protection and climate change Department (EPCCD), Government of Punjab**, acting through the Punjab Environmental Protection Agency (Punjab EPA). The EPA official legal portal lists the Punjab Environmental Protection Act, 1997 as amended up to 2017 together with the Review of IEE/EIA Regulations, 2022, environmental-approval delegation rules, motor-vehicle rules, administrative-penalty rules and other relevant instruments.

2.2 National Policy Framework

2.2.1 National Conservation Strategy, 1992

Pakistan's National Conservation Strategy (NCS), approved by the Federal Cabinet in 1992, provides an overarching policy basis for environmentally sustainable development. The Strategy promotes conservation of natural resources, improved environmental management, pollution prevention, efficient resource use and integration of environmental considerations into development planning.

The NCS is relevant to the Steel Complex facility because its objectives support:

- Prevention and control of industrial pollution.
- Efficient use of raw materials, water and energy.
- Reduction of particulate matter, gaseous emissions and waste generation.
- Conservation of soil, groundwater and surface-water resources.
- Promotion of cleaner production and recycling.
- Protection of vegetation, biodiversity and community health.
- Improvement of institutional monitoring and environmental compliance.

For the existing facility, the NCS principles are reflected through implementation of pollution-control systems, regular environmental monitoring, energy-efficiency measures, proper waste segregation, recycling of scrap metal where feasible and implementation of an environmental-management plan.

2.2.2 Pakistan Environmental Protection Act, 1997

The Pakistan Environmental Protection Act (PEPA), 1997, is the principal national environmental legislation that established the basic legal framework for environmental protection, pollution control, environmental assessment, environmental standards, environmental laboratories and environmental tribunals. The Act provides the underlying legal basis for regulating discharges, emissions, waste management and environmental approvals. The Pakistan Environmental Protection Act, 1997 remains published through Pakistan Code.

Following the Eighteenth Constitutional Amendment, environmental matters were substantially devolved to provincial governments. In Punjab, the applicable provincial framework is administered under the Punjab Environmental Protection Act, 1997, as amended, and its associated rules and regulations.

2.3 Punjab Environmental Protection Framework

2.3.1 Punjab Environmental Protection Act, 1997, as amended

The Punjab Environmental Protection Act, 1997, as amended through subsequent provincial legislation, is the principal environmental law applicable to projects and industrial facilities in Punjab. It provides for the establishment and functions of the Punjab EPA, environmental protection council, environmental tribunals, environmental laboratories, environmental standards and enforcement mechanisms.

The Act requires that industrial and development activities do not cause pollution beyond prescribed limits. It also provides the legal basis for requiring environmental assessment and

environmental approval before commencement, expansion or material modification of projects that fall within prescribed categories.

For M/s Steel Complex (Private) Limited, the key compliance implications include:

- Maintaining all emissions, effluent discharges and noise levels within applicable PEQS limits.
- Obtaining, renewing and complying with the conditions of environmental approval, where applicable.
- Preventing uncontrolled discharge of wastewater, oils, chemicals, sludge, dust and solid waste.
- Facilitating inspection, sampling and monitoring by Punjab EPA or other authorized agencies.
- Maintaining environmental monitoring records and compliance documentation.
- Implementing mitigation measures committed in the approved EIA and Environmental Management Plan (EMP).
- Avoiding any major change in production capacity, manufacturing process, fuel type, pollution-control equipment, site layout or waste-disposal arrangement without prior consultation with Punjab EPA/EPD.

The Punjab EPD identifies the Punjab Environmental Protection Act, 1997, as amended up to 2017, as a substantive law currently applicable in the province.

2.3.2 Punjab Environmental Protection Agency

The Punjab EPA is the principal implementing and enforcement authority for environmental legislation in Punjab. It operates under the administrative control of the Punjab Environmental Protection Department.

The Agency is responsible for, among other functions:

- Reviewing IEE and EIA reports and issuing environmental approvals.
- Enforcing the Punjab Environmental Protection Act and associated rules and regulations.
- Monitoring industrial emissions, effluent discharges and environmental performance.

- Issuing notices, environmental-protection orders and directions for corrective action where non-compliance is identified.
- Coordinating with district administrations and other government departments.
- Promoting compliance with PEQS and environmental-monitoring requirements.
- Taking action under applicable administrative-penalty and environmental-enforcement provisions.

The facility management shall provide complete, accurate and timely documentation to the Punjab EPA and shall remain committed to the approved project configuration and environmental commitments.

2.4 Environmental Assessment Regulations

2.4.1 Punjab Environmental Protection (Review of IEE and EIA) Regulations, 2022

The Punjab Environmental Protection (Review of Initial Environmental Examination and Environmental Impact Assessment) Regulations, 2022 provide the current procedural framework for environmental assessment and approval of projects in Punjab. These Regulations apply across Punjab and establish the process for determining whether a project requires an Initial Environmental Examination (IEE) or a full Environmental Impact Assessment (EIA), as well as the procedures for submission, review, public participation and approval.

The Regulations classify projects in schedules according to their likely environmental impacts.

Generally:

- Projects listed in **Schedule I** require an IEE.
- Projects listed in **Schedule II** require a full EIA.
- Projects not falling within the schedules may still require review or direction from Punjab EPA where potentially significant environmental impacts exist.

As this report concerns an existing steel-manufacturing facility, Punjab EPA may assess the need for environmental approval in light of the facility's production capacity, nature of processes, fuel use, emissions profile, waste generation, location, any expansion or modification, and proximity to sensitive receptors.

The EIA submitted for the Steel Complex should demonstrate that existing operations and proposed environmental improvements will prevent, minimize and manage adverse impacts to acceptable levels. It should include baseline conditions, impact assessment, alternatives where relevant, mitigation measures, monitoring requirements, institutional responsibilities and an EMP.

2.4.2 Environmental Approval Obligations

The project proponent shall ensure that:

- The EIA is submitted to the competent Punjab EPA/EPD authority in the prescribed format.
- All technical information, drawings, process descriptions, production data and pollution-control details are accurate and complete.
- Environmental approval conditions are integrated into routine facility operations.
- Construction, expansion or operational changes are not undertaken contrary to the approved environmental design.
- Environmental monitoring data are retained and provided to the regulatory authority when required.
- Any accidental release, significant pollution event or non-compliance is managed promptly and reported where legally required.

2.5 Punjab Environmental Quality Standards

2.5.1 Applicability of PEQS

Punjab Environmental Quality Standards (PEQS) are central to the compliance obligations of industrial facilities in Punjab. They regulate pollution from industries and other significant sources, particularly air emissions and effluent discharges.

The Steel Complex shall comply with the applicable PEQS during operation, maintenance, shutdown and any future expansion. The standards relevant to the facility may include:

- Ambient-air quality standards.
- Industrial gaseous-emission standards.
- Municipal and liquid-industrial-effluent standards.
- Drinking-water standards, where water is supplied for human consumption.
- Noise standards.
- Motor-vehicle exhaust and noise standards.
- Wastewater-treatment and waste-management requirements.

The Punjab EPD also lists the National Environmental Quality Standards (Self-Monitoring and Reporting by Industry) Rules, 2001, among the environmental instruments applicable within Punjab.

2.5.2 Air Emissions and Fugitive Dust

Steel manufacturing and associated material handling may generate particulate matter, smoke, metallic dust, combustion gases and fugitive emissions from raw-material storage, scrap handling, furnaces, chimneys, internal roads and loading/unloading activities.

The facility shall therefore:

- Operate and maintain air-pollution-control equipment effectively.
- Ensure appropriate stack height and emission-control arrangements.
- Use suitable fuel and combustion practices to reduce emissions.
- Provide enclosures, covers, extraction systems, bag filters, wet scrubbers or equivalent controls where technically appropriate.
- Maintain paved or regularly cleaned internal roads where feasible.
- Control dust through housekeeping, covered storage and controlled material transfer.
- Conduct periodic stack-emission and ambient-air monitoring through an authorized laboratory.

2.5.3 Effluent, Wastewater and Stormwater

Any industrial wastewater, domestic sewage, cooling water, wash water or contaminated stormwater generated by the facility shall be managed to prevent pollution of soil, drains, groundwater and surface-water bodies.

The facility shall:

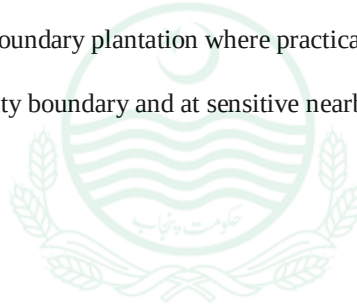
- Segregate domestic sewage, process wastewater, oily wastewater and stormwater where practicable.
- Install and maintain appropriate treatment arrangements before discharge or reuse.
- Avoid direct discharge of untreated wastewater into open drains, land, water bodies or municipal systems unless permitted and compliant with applicable standards.
- Provide oil traps, sedimentation arrangements or other suitable controls for contaminated runoff.
- Monitor wastewater quality at relevant discharge points.
- Maintain records of wastewater generation, treatment, reuse, discharge and laboratory analysis.

2.5.4 Noise Control

Industrial operations, including furnaces, blowers, compressors, cutting equipment, material handling, generators and vehicle movement, can generate occupational and community noise. The Punjab EPD recognizes provincial noise standards within its environmental-regulatory framework.

The facility shall implement practical noise-control measures, including:

- Regular preventive maintenance of machinery.
- Acoustic enclosures or silencers for high-noise equipment where required.
- Provision of personal protective equipment for exposed workers.
- Restriction of unnecessary idling and horn use by vehicles.
- Development of greenbelts or boundary plantation where practical.
- Periodic monitoring at the facility boundary and at sensitive nearby receptors.



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CHAPTER 3

DESCRIPTION OF THE PROJECT

3.1 Type and Category of the Project

M/s Steel Complex (Private) Limited is an industrial manufacturing facility located at 21-KM off G.T. Road, Muridke, Tehsil Ferozewala, District Sheikhupura, Punjab. The facility manufactures steel wire, steel wire rope, galvanized and ungalvanized all-steel conductors, All Aluminium Conductors (AAC), Aluminium Conductor Steel Reinforced (ACSR), prestressed concrete (PC) strand, spring wire and XLPE-insulated power cables.

The facility serves Pakistan's power-transmission and distribution sector as well as general engineering, construction and industrial customers. Its principal customers include public-sector electricity-distribution companies, including Lahore Electric Supply Company (LESCO), Faisalabad Electric Supply Company (FESCO), Tribal Areas Electric Supply Company (TESCO)/PMU and other relevant procurement agencies.

The manufacturing operations include wire drawing, acid pickling, hot-dip galvanizing, aluminium melting and casting, stranding, bunching, cable insulation/extrusion, finishing, testing and packing. Since the project includes aluminium melting and hot-dip galvanizing operations, it has the potential to generate particulate matter, metal fumes, acidic mist, wastewater containing metals and acidic residues, industrial sludge and noise.

Accordingly, the project falls under **Schedule-II** of the Punjab Environmental Protection (Review of Initial Environmental Examination and Environmental Impact Assessment) Regulations, 2022, which covers projects requiring an Environmental Impact Assessment (EIA), including relevant

metal-processing, smelting and industrial manufacturing activities. Punjab's environmental framework provides for IEE and EIA review under the 2022 Regulations, while projects listed in Schedule II are subject to the EIA route

3.1.1 Requirement of EIA

The project is located in District Sheikhpura, Punjab; therefore, the Punjab Environmental Protection Act, 1997, as amended from time to time, is the principal environmental law applicable to the facility. The Punjab Environmental Protection Department identifies the Punjab Environmental Protection Act, 1997, as amended up to 2017, and the Review of IEE/EIA Regulations, 2022, among the applicable environmental instruments in Punjab.

Under Section 12 of the Punjab Environmental Protection Act, no proponent of a public- or private-sector project may commence construction or operation without filing the required environmental assessment with the Punjab Environmental Protection Agency and obtaining environmental approval where the project is likely to cause adverse environmental effects.

The present EIA has therefore been prepared for the existing facility of M/s Steel Complex (Private) Limited to regularize and obtain its environmental approval status from the Punjab Environmental Protection Agency (Punjab EPA). The report assesses the environmental impacts associated with the existing manufacturing operations and specifies mitigation, monitoring and management measures necessary to keep these impacts within acceptable limits.

This EIA has been prepared with reference to applicable environmental laws, regulations and guidance, including:

- Punjab Environmental Protection Act, 1997, as amended.
- Punjab Environmental Protection (Review of Initial Environmental Examination and Environmental Impact Assessment) Regulations, 2022.
- Punjab Environmental Quality Standards (PEQS).
- Applicable National Environmental Quality Standards and self-monitoring requirements.
- Guidelines for preparation and review of environmental reports.
- Guidelines for public consultation and participation, where applicable.
- Sector-specific environmental, health and safety requirements.
- Applicable local-government, labour, fire-safety and building-control requirements.

The EIA addresses environmental, occupational-health, safety and social aspects associated with the operation of the facility. It also identifies measures for management of air emissions, wastewater, hazardous waste, noise, resource consumption, workplace safety and emergency response.

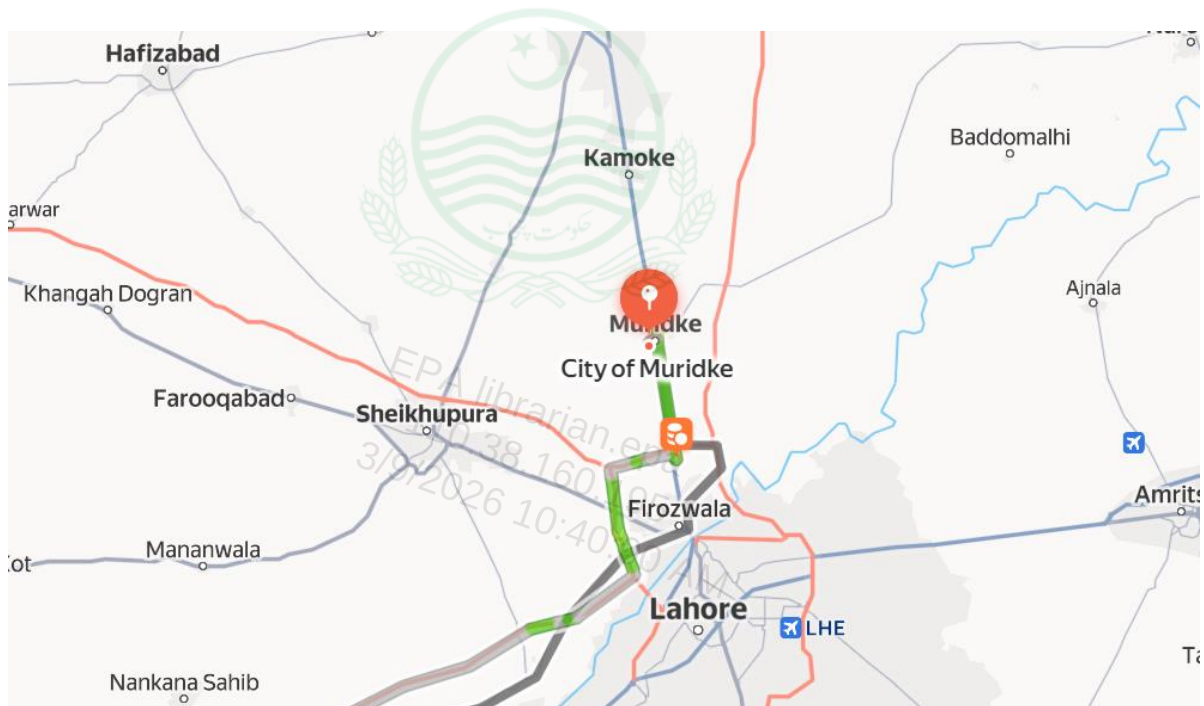
3.2 Objectives of the Project

The primary objective of M/s Steel Complex (Private) Limited is to manufacture and supply quality steel- and aluminium-based conductors, wire products, wire ropes and power cables for Pakistan's electricity-distribution, construction, engineering and industrial sectors.

Specific objectives of the project are as follows:

- Manufacture galvanized and ungalvanized steel wire and steel wire rope for engineering, construction, rigging and industrial applications.
- Produce all-steel conductors for overhead electricity-transmission and distribution systems.
- Manufacture AAC and ACSR conductors in standard sizes required by electricity-distribution companies.
- Produce PC strand for prestressed and reinforced concrete applications.

- Manufacture spring wire with controlled mechanical and tensile properties.
- Produce XLPE-insulated power cables for electricity-distribution networks.
- Support the local supply chain for electrical infrastructure and reduce dependence on imported conductor and cable products.
- Provide employment opportunities for skilled, semi-skilled and unskilled labour.
- Ensure product quality through quality-control testing and compliance with applicable manufacturing standards.
- Operate the facility in accordance with applicable environmental, occupational-health and safety requirements.
- Minimize environmental impacts through pollution-control equipment, wastewater treatment, waste recycling, safe chemical handling and environmental monitoring.



3.3 Analysis of Alternatives

The purpose of analysing alternatives is to identify practicable options that minimize environmental impacts while ensuring that the facility remains technically feasible, economically viable and capable of fulfilling market demand.

The following alternatives have been considered:

1. No-project option.
2. Existing site/location option.
3. Technology and process-control option.

3.3.1 No-Project Option

Under the no-project option, the existing Steel Complex facility would not continue its present manufacturing operations.

This option would avoid operational impacts such as stack emissions, galvanizing fumes, acidic wastewater, metal-bearing sludge, noise and industrial traffic. However, it would also result in several adverse economic and social consequences, including:

- Loss of employment for existing workers and associated service providers.
- Reduced local production of conductors, cable products, steel wire and wire rope.
- Increased reliance on imports or external suppliers for power-sector materials.
- Reduced support for electricity-transmission and distribution infrastructure.
- Loss of business opportunities for suppliers, transporters, recyclers and local contractors.
- Underutilization of existing industrial land, sheds, machinery and utility infrastructure.
- Reduced contribution to the local and national industrial economy.

The no-project option is therefore not preferred, provided that the facility adopts and maintains appropriate environmental-control, waste-management and occupational-safety measures.

3.3.2 Existing Site Option

The existing project site is considered suitable because it is located along the G.T. Road/Muridke industrial corridor, where industrial and agricultural land uses coexist. The facility has established access to transportation networks, electricity, groundwater supply, industrial labour and markets.

The site has the following advantages:

- The land is already owned by M/s Steel Complex (Private) Limited.
- No additional land acquisition or resettlement is required for existing operations.
- The site has established industrial sheds, storage space, internal access and utility arrangements.
- The location provides access to G.T. Road for transportation of raw materials and finished products.
- Skilled and semi-skilled labour is available from Muridke, Ferozewala, Sheikhpura and Lahore.
- The industrial setting is appropriate for metal processing, wire manufacturing and cable production, subject to environmental controls.
- Existing infrastructure reduces the need for extensive new civil works.

The site shall continue to require effective management of air emissions, wastewater, acid handling, waste storage, traffic movement, occupational hazards and emergency preparedness.

3.3.3 Technology Option

The facility uses a combination of wire-drawing, galvanizing, melting, casting, stranding and extrusion technologies. The preferred technology option is continued operation with cleaner-production practices and upgraded pollution-control arrangements.

The following environmental and operational measures are considered appropriate:

- Use of efficient wire-drawing equipment to reduce energy and lubricant consumption.
- Recovery and recycling of metal scrap, wire off-cuts, zinc dross and aluminium scrap.
- Installation and maintenance of fume-extraction systems, ducting, hoods and wet scrubbers.
- Use of suitable stack heights and periodic stack-emission testing.
- Segregation of acidic pickling wastewater from domestic wastewater and non-contact cooling water.
- Neutralization of spent pickling liquor and acidic rinse water before discharge or further management.
- Recovery, recycling or authorized disposal of zinc-bearing sludge and spent acid residues.
- Recirculation of cooling water where technically feasible.
- Use of covered containers and dedicated storage areas for chemicals, oils, sludge and hazardous waste.
- Use of energy-efficient motors, lighting and production equipment.
- Preventive maintenance of machinery to reduce leaks, noise, vibration and avoidable emissions.
- Provision of personal protective equipment and worker training for molten metal, acids, machinery and electrical hazards.

Table 3.1: Comparison of Project Alternatives

Alternative	Positive impacts	Potential adverse impacts	Preferred option
No-project option	Avoids industrial emissions, wastewater and operational noise	Loss of employment, reduced local manufacturing capacity, increased dependence on outside suppliers and underutilization of existing assets	Not preferred
Existing site/location	Land already owned; no resettlement; access to G.T. Road, labour, markets and utilities	Potential impacts from emissions, wastewater, noise, waste and industrial traffic	Preferred, subject to mitigation measures

Improved technology and controls	Reduced emissions, wastewater generation, energy use, metal losses and worker exposure	Requires capital investment, maintenance and staff training	Preferred
Conventional operation without controls	Lower immediate investment cost	Higher risk of non-compliance, pollution, occupational exposure and community complaints	Not preferred

3.4 Location and Site Layout

M/s Steel Complex (Private) Limited is located at **21-KM off G.T. Road, Muridke, Tehsil Ferozewala, District Sheikhupura, Punjab.**

The project land is situated at Mouza Rakh Bowly Jamadar and was acquired by the company through registered sale deeds executed in 2007 before the Sub-Registrar, Muridke. The total landholding comprises approximately **138 Kanal 18 Marla.**

The core production block is developed on an approximately **43,485 square feet**, equivalent to about **8 Kanal**, portion of the overall landholding. The facility includes industrial sheds, material storage areas, utility infrastructure, wastewater-management arrangements and internal access areas.

The general surrounding land use comprises agricultural land interspersed with industrial units, workshops, warehouses and commercial activity typical of the G.T. Road/Muridke industrial corridor.

The approved layout plan, foundation plan and elevation drawings of the production block are attached as annexures to this EIA report.



Figure 1: Google Map of project site

3.5 Land Use and Site Features

The project site is privately owned by M/s Steel Complex (Private) Limited. The existing land use is industrial, with manufacturing operations conducted within dedicated production sheds.

The core production block includes:

- Two production sheds, each measuring approximately 50 feet × 208 feet.
- Total covered production area of approximately 21,000 square feet.
- An overhead water-storage tank for process, domestic and firefighting water requirements.
- A septic tank for domestic sewage treatment and disposal.
- An open area of approximately 22,485 square feet for raw-material storage, finished-product storage, internal traffic, loading/unloading, parking and potential future expansion.
- Internal movement and material-handling space.

- Storage areas for steel wire rod, aluminium rod, zinc ingots, scrap metal, chemicals, finished conductors and cable reels.
- Areas for machinery, quality control, maintenance and administrative functions.

As the manufacturing facility is already established on land owned by the proponent, no additional acquisition of private or government land is required for existing operations.

3.6 Road Access

The project site is accessible through the G.T. Road corridor near Muridke. The location provides suitable access for transportation of steel wire rod, aluminium rod, zinc ingots, chemicals, XLPE compounds, packaging materials and other production inputs.

The same road network is used for dispatch of finished products, including steel wire, wire rope, AAC conductors, ACSR conductors, PC strand and XLPE-insulated power cables.

The site's road access offers the following operational advantages:

- Availability of road transport for delivery of raw materials.
- Efficient dispatch of finished goods to customers and distribution companies.
- Access to Lahore, Sheikhpura, Ferozewala, Gujranwala and other industrial markets.
- Availability of commercial, banking, telecommunication and repair services in nearby urban areas.
- Access for emergency vehicles, fire-fighting services and regulatory inspections.

The proponent shall ensure that loading, unloading and vehicle movement are managed to avoid obstruction of public roads, dust generation, excessive vehicle idling and unnecessary noise.

3.7 Vegetation Features at Site

The project site is located within an established industrial setting and has already been developed for manufacturing purposes. The core production block does not contain significant natural vegetation, forest land, protected habitat or ecologically sensitive features.

However, the company should promote plantation and landscaping in available open areas and along the site boundary, where practicable. Plantation can assist in improving site aesthetics, reducing dust dispersion, moderating noise and providing shade.

No tree cutting shall be undertaken without obtaining permission from the relevant authority where required. Any future removal of trees or plantation shall be followed by compensatory plantation.

3.8 Restoration and Rehabilitation Plan

As the facility is operational, restoration and rehabilitation measures shall apply during maintenance activities, future expansion, machinery replacement, accidental spills, decommissioning or closure of any production unit.

The project proponent shall be responsible for restoration of areas disturbed by industrial activity.

Key measures shall include:

- Removal and proper disposal of unused chemicals, spent oils, metal scrap, sludge and waste materials.
- Decontamination of areas affected by oil, acid, chemical or metal spills.
- Closure and cleaning of spent pickling tanks, rinse tanks and chemical-storage areas, where necessary.
- Removal of damaged or obsolete equipment through authorized recyclers.
- Safe disposal or recycling of zinc dross, galvanizing ash, used oils, metal-bearing sludge and contaminated containers.

- Filling and levelling of pits, drains, trenches or excavated areas created during maintenance or future construction.
- Restoration of drainage routes and prevention of stagnant water.
- Landscaping and plantation of suitable local tree and shrub species in available open areas.
- Site inspection at closure or decommissioning to ensure that no hazardous material remains exposed.

3.9 General Plant Layout

The existing plant layout has been designed to accommodate production, storage, utilities, quality control and worker-safety requirements. The layout generally comprises the following functional areas:

- Raw-material receiving and storage area.
- Steel and aluminium wire-drawing section.
- Acid-pickling, rinsing and fluxing section.
- Hot-dip galvanizing section, including zinc kettle and cooling arrangement.
- Aluminium melting, casting and rolling section.
- Stranding and bunching section.
- PC strand and spring-wire processing section.
- XLPE cable extrusion, sheathing and winding section.
- Quality-control and testing area.
- Finished-product storage and dispatch area.
- Water-storage tank and utility area.
- Domestic wastewater/septic-tank system.
- Internal roads, parking, loading/unloading and open storage areas.
- Firefighting and emergency-access arrangements.

The plant layout shall ensure segregation of chemical-handling areas from administrative spaces, worker rest areas and finished-product storage. Hazardous materials, acids, oils and industrial sludge shall be stored in properly marked and contained locations.



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3.10 Major Equipment Used During Construction Stage

As the facility is already established and operational, major construction activities have been completed. However, any future expansion, modification, repair or installation of additional production lines may require equipment such as:

- Excavators and loaders.
- Concrete mixers and batching equipment.
- Cranes and lifting equipment.
- Welding machines and cutting equipment.
- Fabrication tools.
- Mobile generators.
- Trucks and material-handling vehicles.
- Scaffolding and temporary-access equipment.

During any future construction activity, the contractor shall implement dust suppression, waste collection, noise control, worker safety, traffic management and emergency-response measures.

3.11 Major Equipment of M/s Steel Complex

The major machinery and equipment installed at the facility include:

- Dry and wet wire-drawing machines.
- Wire-drawing dies and lubricant application systems.
- Aluminium melting furnace.
- Continuous aluminium casting and rolling line.
- Hot-dip galvanizing line.
- Acid-pickling tanks.

- Rinse tanks.
- Flux tank.
- Zinc kettle.
- Galvanized-wire cooling arrangement.
- Stranding machines.
- Bunching machines.
- Wire-rope manufacturing equipment.
- PC-strand processing and stress-relieving equipment.
- Spring-wire drawing and tempering equipment.
- XLPE cable extrusion line.
- Cable sheathing line.
- Cable winding and reeling equipment.
- Material-handling equipment.
- Quality-control and testing equipment.
- Air-pollution-control equipment, including hoods, ducting and wet-scrubbing arrangements.
- Water-storage and pumping equipment.
- Diesel generator set(s) for backup power.
- Fire extinguishers, hydrant points and emergency equipment.

3.12 Raw Materials

The main raw materials used by the facility are listed in Table 3.2.

Table 3.2: Main Raw Materials and Uses

Raw material	Typical use
Steel wire rod	Base material for steel wire, steel wire rope, all-steel conductors and ACSR steel-core wires
Aluminium rod, ingot and scrap	Base material for AAC conductors and aluminium strands used in ACSR conductors
Zinc ingots	Zinc coating in the hot-dip galvanizing process
Hydrochloric acid or sulphuric acid	Pickling and removal of mill scale/oxide from steel wire
Fluxing salts	Surface preparation before galvanizing
Drawing lubricants and oils	Lubrication during wire-drawing operations
XLPE compound	Insulation material for power cables
Sheathing material	Protective outer sheath for insulated power cables
Packaging material	Packing of coils, reels, conductors, wire ropes and finished cable products

All chemicals, oils and hazardous materials shall be stored in labelled containers in designated areas with secondary containment, spill-control materials and restricted access.

3.13 Manufacturing Process

The facility manufactures steel wire products, aluminium conductors, ACSR conductors, PC strand, spring wire and XLPE-insulated power cables through a series of mechanical, thermal and surface-treatment processes.

3.13.1 Wire Drawing

Hot-rolled steel wire rod and aluminium rod are received as the primary raw materials. The wire rods are progressively reduced to the required diameter using wire-drawing machines equipped with drawing dies.

Drawing lubricants are used to reduce friction, improve surface finish and protect the dies. The resulting wire is wound into coils for further processing, including galvanizing, stranding, rope making or cable production.

3.13.2 Acid Pickling and Hot-Dip Galvanizing

Steel wire intended for galvanized products is first subjected to pickling to remove mill scale, rust and surface oxides. The process generally includes:

- Acid pickling using dilute hydrochloric acid or sulphuric acid.
- Rinsing to remove acid residues.
- Fluxing to prepare the wire surface for zinc coating.
- Immersion in molten zinc in the hot-dip galvanizing kettle.
- Cooling through air cooling or water cooling.
- Coiling and transfer for stranding, rope manufacturing or finishing.

The galvanizing process provides a zinc coating that improves corrosion resistance of steel wire, all-steel conductors, ACSR steel-core wires and wire-rope products.

3.13.3 Aluminium Melting and Rod Casting

Aluminium ingots and/or recyclable aluminium scrap are melted in the aluminium melting furnace. The molten aluminium is processed through casting and rolling equipment to produce aluminium rod of the required gauge.

The aluminium rod is subsequently transferred to wire-drawing machines for conversion into aluminium wires used in AAC and ACSR conductors.

3.13.4 Stranding and Bunching

Individual steel and aluminium wires are combined using stranding or bunching machines.

The process produces:

- Steel wire rope.
- Galvanized and ungalvanized all-steel conductors.
- AAC conductors.
- ACSR conductors.
- PC strand.

In ACSR conductors, galvanized steel wires form the reinforcing core, while aluminium wires are stranded around the steel core to provide electrical conductivity.

3.13.5 PC Strand and Spring Wire Processing

PC strand is produced by stranding multiple cold-drawn steel wires and applying stress-relieving heat treatment to achieve the required strength and performance characteristics.

Spring wire is manufactured through controlled cold drawing, followed by tempering or heat treatment where required, to obtain suitable elasticity, tensile strength and fatigue resistance.

3.13.6 Cable Manufacturing

For XLPE-insulated power cables, aluminium or copper conductors are stranded and passed through an extrusion line. XLPE insulation is applied to the conductor, followed by application of an outer protective sheath.

The cable is then tested, wound onto reels and prepared for dispatch. The facility may produce 11 kV single-core cable and 15 kV two-core, three-core and four-core cable in sizes specified by customers and electricity-distribution companies.

3.13.7 Finishing, Testing and Packing

Finished products are visually inspected and tested in accordance with applicable specifications and customer requirements. Testing may include dimensional checks, tensile testing, conductivity checks, galvanizing-coating checks, cable-insulation tests and other quality-control procedures.

After testing, products are coiled, wound onto reels, packed and dispatched to customers.

3.14 Schedule of Implementation

M/s Steel Complex (Private) Limited is an existing and operational industrial facility. This EIA has been prepared to regularize the environmental approval status of the facility and document its existing operations, environmental aspects and mitigation measures.

No major civil construction is presently proposed under this EIA. However, if the company proposes any future expansion, installation of additional machinery, increase in production capacity, change in raw materials, change in fuel, modification of the galvanizing line or establishment of new processing lines, the proponent shall inform Punjab EPA in advance.

Where required under the applicable regulations, the company shall obtain fresh, revised or amended environmental approval before implementing such changes.

3.15 Wastewater Generation and Management

3.15.1 Process Wastewater

The main process wastewater stream is generated from acid pickling, rinsing and galvanizing operations. This wastewater may contain acidity, dissolved iron, zinc salts, suspended solids and other contaminants.

Spent pickling liquor and acidic rinse water shall be collected separately and managed through an appropriate treatment system. The proposed treatment sequence includes:

- Collection of spent acid and rinse water in dedicated tanks.
- Neutralization using lime or another suitable alkaline reagent.
- Adjustment of pH to applicable PEQS limits.
- Settling of precipitated metal hydroxides and suspended solids.
- Separation and collection of generated sludge.
- Monitoring of treated wastewater before discharge, reuse or further management.

The facility shall not discharge untreated acidic wastewater into open drains, agricultural land, groundwater, surface-water bodies or public sewerage systems.

3.15.2 Cooling Water

Non-contact cooling water from galvanizing and aluminium-casting operations should be recirculated to the maximum extent practicable. This will reduce groundwater abstraction, fresh-water consumption and wastewater generation.

3.15.3 Domestic Sewage

Domestic wastewater from washrooms and staff facilities is directed to the on-site septic tank. The septic tank shall be maintained regularly, and its contents shall be removed and disposed of through an approved service provider when required.

3.16 Solid and Hazardous Waste

The major solid and hazardous waste streams expected from the facility are listed in Table 3.3.

Table 3.3: Waste Streams and Management Measures

Waste stream	Proposed management practice
Metal scrap and wire off-cuts	Segregated and sold to authorized scrap dealers or recycled internally where feasible
Aluminium scrap	Segregated and reused in the aluminium melting process where technically suitable or sold to recyclers
Zinc dross and zinc ash	Collected separately in covered containers and sold to authorized zinc-recovery recyclers
Spent pickling acid	Collected separately and neutralized or managed through an authorized hazardous-waste service provider
Neutralization sludge	Stored in labelled, lined and covered containers and disposed of through an EPA-authorized hazardous-waste handler
Used drawing oils and lubricants	Collected in sealed drums and sent to licensed used-oil recyclers or authorized handlers
Used chemical containers	Stored safely and returned to suppliers, recycled or disposed of through authorized waste handlers
Domestic solid waste	Collected in designated bins and disposed of through the local municipal waste-management system

Packaging waste	Segregated for reuse, recycling or disposal through authorized collectors
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Punjab's environmental framework regulates industrial emissions and effluent discharges through PEQS, which are intended to control pollution from industry and other large sources.

3.17 Air Emissions and Noise

3.17.1 Air Emissions

The principal air-emission sources at the facility include:

- Aluminium melting furnace.
- Zinc kettle used for hot-dip galvanizing.
- Acid pickling tanks.
- Wire-drawing and material-handling activities.
- Diesel generator set(s).
- Vehicle movement within the project site.
- Storage and handling of metal scrap and raw materials.

Potential pollutants may include particulate matter, metal fume, zinc oxide fume, acidic mist, carbon monoxide, carbon dioxide, nitrogen oxides, sulphur dioxide, volatile contaminants from lubricants and diesel-engine emissions.

The facility shall maintain the following control measures:

- Fume-extraction hoods over melting, galvanizing and pickling operations.
- Ducting and appropriate air-pollution-control equipment.
- Wet scrubbers or equivalent pollution-control systems for acidic mist and galvanizing fumes.
- Adequate stack heights for furnace and generator emissions.
- Routine maintenance of burners, furnaces, generators and extraction systems.

- Covered storage and handling of dust-generating materials.
- Good housekeeping and timely removal of scrap and residue.
- Periodic stack-emission and ambient-air monitoring through authorized laboratories.

3.17.2 Noise

Potential noise sources include wire-drawing machines, stranding equipment, cable-extrusion machinery, compressors, generators, material handling and truck movement.

Noise shall be controlled through:

- Preventive maintenance of machinery.
- Use of acoustic enclosures or silencers for generators and compressors where required.
- Provision of hearing protection to workers in high-noise areas.
- Proper lubrication and balancing of rotating equipment.
- Limiting unnecessary vehicle idling, horn use and nighttime loading activities.
- Boundary plantation, where practical.
- Periodic workplace and boundary noise monitoring.

3.18 Infrastructure and Utilities

3.18.1 Water Supply

Water is required for pickling-bath make-up, rinsing, cooling, washing, domestic use and firefighting. Water is sourced from an on-site tube well/groundwater source and stored in the overhead water-storage tank.

The company shall implement water-conservation measures, including recirculation of cooling water, monitoring of water use, prompt repair of leaks and avoidance of unnecessary water wastage.

3.18.2 Electricity Supply

Electrical power is supplied through the grid connection. Electricity is used to operate the aluminium melting furnace, galvanizing line, wire-drawing machinery, stranding machines, cable-extrusion line, pumps, lighting and testing equipment.

Backup diesel generator set(s) are available to maintain continuity of production and cooling of the galvanizing bath during power outages.

3.18.3 Sewerage and Drainage

Domestic sewage is managed through the on-site septic tank. Process wastewater shall be separately collected and treated through neutralization, settling and sludge-management arrangements.

The site drainage system shall be maintained to prevent mixing of uncontaminated stormwater with process wastewater, acids, oils, metal scrap or hazardous materials.

3.18.4 Security

The facility maintains security arrangements to control entry and exit, protect raw materials and finished goods, prevent unauthorized access to hazardous areas and support emergency response.

Security personnel shall be trained to report fire, chemical spills, accidents, unauthorized discharge and other emergency situations to the responsible management staff.

3.18.5 Telecommunication

Telephone, mobile communication and internet facilities are available for production coordination, procurement, dispatch, emergency communication, regulatory reporting and customer liaison.

3.18.6 Manpower

The facility employs personnel in production, quality control, administration, maintenance, material handling, security, marketing, procurement and accounts functions.

The workforce includes skilled, semi-skilled and unskilled workers. The company shall ensure appropriate training, supervision, personal protective equipment and occupational-health arrangements for all workers.

3.19 Occupational Health and Safety

The main occupational hazards associated with the facility include molten aluminium, molten zinc, acid handling, hot surfaces, moving wire and stranding equipment, sharp metal edges, electrical systems, heat stress, noise, dust, fumes and manual handling.

The facility maintains the following occupational-health and safety arrangements:

- Heat-resistant gloves, aprons, face shields and safety footwear for workers near furnaces and galvanizing operations.

- Acid-resistant gloves, goggles, face shields and protective clothing for workers handling acids and pickling solutions.
- Hearing protection for workers exposed to high-noise machinery.
- Safety shoes, helmets and gloves for production and material-handling staff.
- First-aid boxes and trained first-aid personnel.
- Safety signage and restricted access around acid tanks, furnaces, moving machinery and electrical panels.
- Periodic worker training on safe operating procedures, emergency response, fire safety, chemical handling and PPE use.
- Machine guarding and emergency-stop arrangements.
- Safe storage and handling procedures for acids, oils, gases, chemicals and molten metals.
- Incident reporting and investigation procedures.
- Regular inspection of electrical equipment, lifting equipment, fire extinguishers and machinery.

3.20 Fire Protection and Emergency Preparedness

The facility has fire risks associated with electrical systems, diesel generators, hot metal, lubricants, packaging materials, cable compounds and machinery.

The fire-protection system includes:

- Fire extinguishers appropriate for Class A, Class B, electrical and metal-related fire risks.
- Fire hydrant points supplied through the overhead water-storage tank.
- Clearly marked emergency exits.
- Emergency assembly points.
- Accessible internal routes for evacuation and emergency response.
- Fire alarm and emergency communication arrangements.
- Periodic fire drills for workers.
- First-aid facilities and emergency contact information.

- Safe storage of fuels, oils, chemicals and other flammable materials.
- Training of responsible staff in use of fire extinguishers and emergency equipment.

The company shall maintain and inspect all firefighting equipment regularly and shall ensure that emergency exits remain unobstructed at all times.

3.21 Organizational Structure

M/s Steel Complex (Private) Limited maintains an organizational structure for management of production, quality control, occupational health and safety, administration, marketing, procurement and accounts.

Table 3.4: Organizational Structure

Position	Reports to
Chief Executive Officer	—
OH&S Team Leader	Chief Executive Officer
Admin Incharge	Chief Executive Officer
Marketing Department	Chief Executive Officer
Production Department	Chief Executive Officer
Accounts and Purchase Department	Chief Executive Officer
Supervisor	Production Department
Quality Control Incharge	Production Department
Workers	Supervisor

The Chief Executive Officer has overall responsibility for the facility. The OH&S Team Leader is responsible for implementation of occupational-health, safety and emergency-management measures. The Production Department is responsible for operational control, maintenance, process efficiency and implementation of environmental measures within the production areas.

3.22 Government and Local Approvals

In addition to environmental approval from Punjab EPA, the project requires or maintains relevant approvals, registrations and compliance documentation, as applicable. These may include:

- Environmental Approval/NOC from Punjab Environmental Protection Agency.
- Approved building plan and layout plan from the relevant local authority.
- Land-ownership documents and registered sale deeds.
- Registration under applicable labour and factory laws.
- Compliance with the Factories Act, 1934, and applicable occupational-health and safety requirements.
- Fire-safety arrangements and any required clearance from the relevant authority.
- Electricity connection and approval from the relevant electricity-distribution company.
- Groundwater-use permissions or compliance requirements, where applicable.
- Wastewater-disposal and drainage approvals, where applicable.
- Agreements or records for collection, recycling and disposal of hazardous and non-hazardous waste.
- Any permits required for storage, handling or transport of acids, fuels, chemicals and hazardous materials.

Copies of relevant ownership documents, approved building/layout plans, machinery details, process flow diagrams, environmental-monitoring reports and other approvals shall be attached as annexures to this EIA report.

CHAPTER 4

DESCRIPTION OF THE ENVIRONMENT (BASELINE)

This chapter describes the physical, ecological, and socio-economic setting of the project area, forming the baseline against which the potential impacts of the project, discussed in Chapter 5, have been assessed.

4.1 Physical Environment

Geography and Topography

The project site lies in the Muridke–Ferozewala area of District Sheikhupura, within the Punjab plains, characterized by flat to gently undulating terrain typical of the Indus alluvial plain. Land use in the immediate vicinity is a mix of agricultural fields and scattered industrial units along the G.T. Road corridor.

Geology and Soils

The area is underlain by alluvial deposits of silt, clay, and fine sand typical of the central Punjab plains, generally supportive of both agricultural use and light-to-medium industrial construction with conventional shallow foundations.

Climate and Meteorology

The area experiences a semi-arid, continental climate typical of central Punjab, with hot summers (May–June, with maximum temperatures often exceeding 40°C), a monsoon season (July–September) bringing the bulk of annual rainfall, and cool winters (December–February) with occasional fog. Prevailing winds are generally from the west and southwest during summer, shifting seasonally, and these patterns influence the dispersion of stack emissions from the facility.

Hydrology and Groundwater

Groundwater in the Muridke–Sheikhupura area is generally available at moderate depths and is a common source of water supply for both domestic and industrial use in the area. There are no major perennial rivers or water bodies in the immediate vicinity of the project site; the nearest significant water body is the general drainage network associated with the Ravi River basin, well removed from the project site.

4.2 Ecological Resources

Flora

Vegetation in the vicinity is dominated by agricultural crops (wheat, sugarcane, fodder crops, and seasonal vegetables) and common roadside/field-boundary trees such as shisham (*Dalbergia sissoo*), kikar (*Acacia nilotica*), and eucalyptus. No forest reserve or protected green belt exists within or immediately adjacent to the project site.

Fauna

The area supports common peri-urban and agricultural fauna, including domestic livestock, common bird species associated with cultivated land, and small mammals typical of a settled agricultural landscape. No critical habitat, wildlife sanctuary, or protected area is located within or adjacent to the project site, and no rare or endangered species are known to be dependent on the site or its immediate surroundings.

4.3 Socio-Economic & Cultural Environment

Demographics

The population in the surrounding area of Tehsil Ferozewala/Muridke comprises a mix of agricultural households and workers/families associated with the numerous small and medium industries located along the G.T. Road corridor. Muridke town, the nearest significant urban settlement, provides basic civic amenities, schools, and a link to Lahore via the G.T. Road and the Lahore–Islamabad Motorway (M-2).

Land Use and Sensitive Receptors

Land use surrounding the site is predominantly agricultural with scattered industrial units; there are no schools, hospitals, religious sites, or other especially sensitive receptors located immediately adjacent to the project boundary, based on the information available for this assessment. Any such receptors identified closer to the site during ongoing operation should be given particular attention in the implementation of the mitigation measures in Chapter 5.

Infrastructure and Utilities

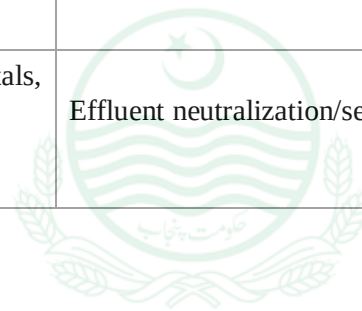
The site benefits from road access connecting to G.T. Road, Muridke, grid electricity supply, and access to ground water for its water requirement. The area is served by the local Tehsil Municipal Administration (TMA) for solid waste and municipal services.

4.4 Baseline Environmental Monitoring

As a first step in implementing the Environmental Management and Monitoring Plan (Chapter 6), it is recommended that quantitative baseline monitoring of the parameters below be carried out

through an EPA-certified laboratory, so as to establish a documented benchmark against which future compliance monitoring can be compared.

Baseline Parameter	Recommended Sampling Locations
Ambient Air Quality (PM2.5, PM10, SO ₂ , NO _x , CO)	At the facility boundary (upwind and downwind of the melting/galvanizing sheds)
Stack Emissions (melting furnace and galvanizing kettle)	At the stack sampling ports of each source
Ambient Noise, dB(A) — day/night	Facility boundary and nearest occupied structure, if any
Ground Water Quality	On-site tube well / nearest water supply source
Wastewater Quality (pH, heavy metals, TSS)	Effluent neutralization/settling point prior to disposal



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CHAPTER 5

ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

This chapter identifies the environmental impacts associated with the project's location, design, and ongoing operation, and sets out the corresponding mitigation measures.

5.1 Impacts due to Project Location

As the site is located within an established industrial corridor off G.T. Road, Muridke, and not within or adjacent to any protected area, wetland, or other environmentally sensitive zone, location-related impacts are limited. The principal consideration is the site's proximity to agricultural land, where dust and fume dispersion from the melting and galvanizing operations should be minimized through the fume extraction and stack management measures described in Section 5.4.

5.2 Impacts due to Project Design

The layout of the facility, with the two production sheds oriented to allow cross-ventilation and a defined open area separating the sheds from the site boundary, is broadly favorable from an environmental standpoint. It is recommended that the melting furnace and galvanizing kettle be provided with dedicated fume hoods and extraction ducting terminating at an adequately elevated stack, and that the pickling tanks be enclosed or hooded to capture acid mist at source, so as to minimize fugitive emissions within the work area and at the site boundary.

5.3 Impacts during Construction Phase

As the facility is already constructed and operational, construction-phase impacts are limited to any future civil works associated with expansion, maintenance, or the addition of new production lines. Where such works are undertaken, the following impacts and mitigation measures apply:

Potential Impact	Mitigation Measure
Fugitive dust from earthworks, material handling, and vehicle movement	Water sprinkling on exposed surfaces and unpaved access tracks; covering of sand, cement, and aggregate stockpiles
Construction noise and vibration	Restriction of high-noise activities to normal daytime working hours; use of well-maintained machinery
Construction debris and packaging waste	Segregation and reuse of debris where feasible; disposal of non-usable waste through TMA-approved sites
Worker safety during civil/erection works	Mandatory use of PPE (helmets, safety boots, harnesses at height); site safety briefings and supervision

5.4 Impacts during Operation Phase

(a) Air Emissions

The aluminium melting furnace and the zinc galvanizing kettle generate particulate matter and metal fume, while the acid pickling tanks generate acidic mist; the standby diesel generator is an additional, intermittent source of combustion emissions.

Mitigation: hooded fume extraction over the melting furnace and galvanizing kettle, discharging through an adequately elevated stack; wet scrubbing of extracted fume/mist where practicable,

particularly over the pickling tanks; regular maintenance of burners and the generator set to minimize incomplete combustion; and periodic stack emission testing through an EPA-certified laboratory to confirm compliance with the Punjab Environmental Quality Standards for industrial gaseous emissions.

(b) Process Wastewater

Spent pickling liquor and acidic rinse water, if discharged untreated, would be harmful to soil and groundwater quality on account of low pH and dissolved metal content.

Mitigation: segregated collection of pickling/rinse wastewater; on-site neutralization to bring pH within PEQS limits prior to any discharge; settling/removal of precipitated metal hydroxide sludge for disposal as hazardous waste; recirculation of non-contact cooling water; and periodic effluent quality testing.

(c) Solid and Hazardous Waste

Zinc dross, pickling sludge, metal scrap, and used lubricants are generated as part of normal operation.

Mitigation: segregation of waste streams at source; covered, banded storage for zinc dross and pickling sludge pending disposal; sale of recoverable metal scrap and zinc dross to authorized recyclers; disposal of hazardous residues (neutralization sludge, used oil) through EPA-licensed waste handlers; and maintenance of waste disposal manifests/records for EPA reporting purposes.

(d) Noise and Vibration

Wire drawing machines, stranding/bunching equipment, and the generator set generate elevated noise levels within the production sheds.

Mitigation: acoustic enclosures or barriers around the noisiest equipment (generator, high-speed drawing lines); mandatory hearing protection for workers in high-noise zones; and periodic occupational and boundary noise monitoring.

(e) Occupational Health and Safety

Workers handling molten aluminium/zinc, pickling acid, and mechanical wire-handling equipment face risks of burns, acid exposure, and mechanical injury.

Mitigation: mandatory PPE appropriate to each work area (heat-resistant gloves/aprons near molten metal, acid-resistant gloves/goggles/face shields at the pickling tanks, hearing protection, safety footwear); clearly marked hazard zones; availability of eyewash stations and first-aid facilities near the pickling and galvanizing lines; and regular safety training under the oversight of the OH&S Team Leader.

(f) Soil and Groundwater

Spillage of acid, zinc, or drawing oils, if not contained, could infiltrate soil and affect groundwater quality.

Mitigation: impervious, bunded flooring beneath the pickling tanks, galvanizing kettle, and chemical/oil storage areas; spill-response kits maintained on-site; and periodic inspection of storage and process areas for leaks.

(g) Traffic

Movement of raw material and finished goods trucks along the access road connecting to G.T. Road generates additional traffic and a minor increase in fugitive dust and vehicle emissions.

Mitigation: scheduling of heavy vehicle movement to avoid peak local traffic periods where practicable; use of tarpaulin covers on material trucks; and maintenance of the internal access road surface.

(h) Socio-Economic Impacts

The continued operation of the facility provides direct employment for production, technical, and administrative staff, together with indirect employment through the local supply chain and transport sector, representing a positive and ongoing socio-economic contribution to the Muridke/Sheikhupura area.

5.5 Impact Summary Table

Environmental Parameter	Construction Maintenance Phase	/ Operation Phase
A: Physical		
Air Emissions (furnace / galvanizing / generator)	-1t	-2p
Dust Dispersion	-1t	-1p
Noise & Vibration	-1t	-2p
Wastewater / Effluent Quality	N/A	-2p
Groundwater Quality	N/A	-1p
Soil Contamination (spillage risk)	N/A	-1p
Traffic / Transportation	-1t	-1p

Environmental Parameter	Construction / Maintenance Phase	Operation Phase
B: Ecological		
Flora / Land Clearing	N/A	N/A
Fauna Disruption	N/A	N/A
C: Waste		
Hazardous Waste (dross, spent acid, sludge)	N/A	-2p
General Solid Waste	-1t	-1p
D: Socio-Economic		
Employment Opportunities	+1t	+2p
Local Economic Activity	+1t	+2p
E: Hazards		
Fire / Molten Metal Hazard	-1t	-2p
Occupational Health & Safety (acid, burns, noise)	-1t	-2p

Legend: 1 = Low; 2 = Medium; 3 = High; N/A = Not Applicable; t = Temporary; p = Permanent/Ongoing (while facility operates); + = Positive impact; - = Negative impact. All negative impacts identified above are assessed as manageable to low residual significance

provided the mitigation measures of this chapter and the Environmental Management Plan in Chapter 6 are implemented in full.



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CHAPTER 6

ENVIRONMENTAL MANAGEMENT AND MONITORING PROGRAM

6.1 General

This chapter presents the Environmental Management and Monitoring Program (EMMP) for the existing manufacturing facility of **M/s Steel Complex (Private) Limited**, located at 21-KM off G.T. Road, Muridke, Tehsil Ferozewala, District Sheikhupura, Punjab.

The facility manufactures steel wire, steel wire rope, galvanized and ungalvanized all-steel conductors, AAC and ACSR conductors, PC strand, spring wire and XLPE-insulated power cables. The principal environmental aspects associated with the facility include emissions from aluminium melting and hot-dip galvanizing, acid mist from pickling operations, generation of spent pickling liquor and metal-bearing sludge, handling of zinc dross and used oils, noise from machinery, groundwater consumption, traffic movement and occupational-health and safety risks.

The potential environmental and social impacts of the project are manageable, provided that appropriate mitigation measures, operational controls, pollution-control systems, monitoring arrangements and emergency procedures are implemented effectively. The Environmental Management and Monitoring Program has therefore been prepared to ensure compliance with the Punjab Environmental Protection Act, 1997, applicable Punjab Environmental Quality Standards (PEQS), environmental-approval conditions and other applicable environmental, health and safety requirements.

Punjab's environmental framework includes quality standards for industrial emissions and effluent discharges, along with self-monitoring and reporting requirements for industries.

The EMMP shall be implemented throughout the operational life of the facility. In the event of future expansion, installation of additional production lines, change in process, change in fuel, increase in capacity or modification of pollution-control equipment, the EMMP shall be reviewed and updated before implementation of the proposed change.

6.2 Objectives of Environmental Management

The main objectives of the EMMP are to:

- Identify potential environmental, occupational-health, safety and social impacts associated with facility operations.
- Ensure that mitigation measures identified in this EIA are implemented effectively.
- Ensure compliance with applicable PEQS, environmental-approval conditions and regulatory requirements.
- Prevent or minimize air emissions, acid mist, wastewater pollution, hazardous-waste generation, noise, soil contamination and groundwater impacts.
- Define the environmental responsibilities of the Project Proponent, OH&S Team Leader, Production Department, Quality Control Incharge, Admin Incharge and workers.
- Establish a practical environmental-monitoring mechanism, including parameters, locations, frequency and responsible personnel.
- Ensure safe handling, storage, recycling and disposal of metal scrap, zinc dross, spent acid, neutralization sludge, used oils and domestic waste.
- Ensure that pollution-control equipment, including fume-extraction systems, scrubbers, stacks, neutralization arrangements and drainage controls, remains operational and effective.
- Protect workers from risks related to molten aluminium, molten zinc, acid handling, mechanical equipment, electrical systems, noise, fumes and fire.

- Ensure availability and proper use of personal protective equipment.
- Establish procedures for reporting, recording and responding to environmental incidents, accidents, spills, complaints and non-compliances.
- Build staff capacity through regular environmental, health and safety training.
- Maintain environmental monitoring records and submit compliance reports to Punjab EPA when required.
- Provide a basis for continual improvement in environmental performance.

6.3 Environmental Management and Monitoring Plan

The Environmental Management and Monitoring Plan provides a structured framework for implementation of mitigation measures during operation of M/s Steel Complex (Private) Limited. The Plan identifies potential impacts, desired environmental targets, mitigation measures, monitoring requirements and responsible personnel.

The Project Proponent shall ensure that all pollution-control, health and safety, waste-management and monitoring measures are incorporated into routine operations. The OH&S Team Leader shall supervise EMMP implementation and report directly to the Chief Executive Officer. The Production Department shall be responsible for day-to-day operational controls, while the Admin Incharge shall coordinate external laboratories, waste contractors, recordkeeping and correspondence with Punjab EPA.

Table 6.1: Environmental Management and Monitoring Plan

Sr. No.	Potential impacts / risks	Targets to be achieved	Mitigation measures and monitoring	Responsibility
I. Physical Environment				
1	Air emissions from aluminium melting furnace, galvanizing kettle and diesel generator. Potential pollutants include particulate matter, metal fumes, carbon monoxide, nitrogen oxides, sulphur dioxide and combustion gases.	Compliance with applicable PEQS for industrial gaseous emissions and prevention of visible smoke or excessive fume release.	Install and maintain fume-extraction hoods over furnace and galvanizing operations. Maintain suitable ducts, stacks, fans and wet scrubbers or equivalent control equipment. Conduct preventive maintenance of furnace, zinc kettle, generator and associated equipment. Use cleaner fuel and properly maintained generators. Avoid unnecessary idling of generators and vehicles. Conduct periodic stack-emission testing through an EPA-approved or competent laboratory.	Project Proponent / Production Department / OH&S Team Leader
2	Acid mist and fumes from pickling tanks. Acidic vapours may affect workers, indoor	Prevention of worker exposure and control of acid mist at source.	Provide local exhaust ventilation, hoods and ducting at pickling tanks. Keep pickling tanks covered	Production Department / OH&S Team Leader

	air quality and nearby receptors if not controlled.		when not in use. Install wet scrubbing or equivalent acid-mist-control equipment where practicable. Maintain adequate ventilation. Provide acid-resistant PPE, goggles, face shields and emergency eyewash facilities. Inspect tanks, pipes and fittings for leaks.	
3	Fugitive dust from raw-material handling, metal scrap, internal roads and vehicle movement.	Minimize dust emissions and maintain acceptable workplace and boundary air quality.	Store fine materials and metal residues in covered areas. Maintain good housekeeping. Clean internal roads and production floors regularly. Cover trucks carrying loose material. Ensure vehicles comply with speed limits within the site. Avoid overloading of vehicles. Develop and maintain boundary plantation where feasible.	Production Department / Admin Incharge
4	Noise and vibration from wire-drawing machines, stranding machines, compressors,	Compliance with applicable noise standards and protection of workers from	Maintain and lubricate machinery regularly. Provide acoustic enclosures, silencers or barriers for generators and compressors where required.	Production Department / QC Incharge / OH&S Team Leader

	extrusion equipment, generators and vehicle movement.	excessive noise exposure.	Avoid unnecessary horn use and vehicle idling. Schedule high-noise maintenance activities during suitable hours. Provide earplugs or earmuffs to workers in high-noise areas. Conduct quarterly workplace and boundary noise monitoring.	
5	Process wastewater from pickling, rinsing and galvanizing activities. Wastewater may contain acidity, dissolved iron, zinc salts and suspended solids.	No discharge of untreated wastewater; treated wastewater to comply with applicable PEQS before discharge, reuse or disposal.	Segregate process wastewater from domestic sewage and stormwater. Collect spent pickling liquor and acidic rinse water in designated tanks. Neutralize wastewater using lime or other suitable alkali. Provide settling arrangements for removal of metal hydroxide sludge. Monitor pH, total suspended solids and relevant heavy metals. Do not discharge untreated wastewater into drains, land, groundwater, canals or water bodies.	Production Department / OH&S Team Leader

6	Domestic sewage from workforce facilities.	Prevent contamination of soil and groundwater.	Direct domestic sewage to the existing septic tank. Inspect the septic tank regularly for leakage, overflow or blockage. Arrange periodic desludging through an appropriate service provider. Do not mix domestic sewage with acid-bearing process wastewater.	Admin Incharge / Production Department
7	Soil and groundwater contamination due to acid spills, used oils, zinc residues, sludge or chemical leakage.	Prevention of contamination of soil and groundwater.	Provide impermeable flooring and secondary containment in acid storage, pickling, galvanizing, oil-storage and hazardous-waste areas. Store chemicals and used oil in labelled containers on bunded floors. Maintain spill kits near chemical and oil-handling areas. Train workers in spill response. Inspect storage areas weekly. Immediately contain, collect and dispose of spilled materials through authorized arrangements.	Production Department / OH&S Team Leader
II. Waste Management				

8	Metal scrap, wire off-cuts and aluminium scrap.	Maximum recovery and recycling of metal waste.	Segregate steel, aluminium, copper and mixed-metal scrap. Store scrap in designated areas. Reuse suitable process scrap internally where technically feasible. Sell recyclable metal scrap only to authorized recyclers or dealers. Maintain records of scrap generation and dispatch.	Production Department / Admin Incharge
9	Zinc dross and galvanizing ash. These residues may contain recoverable zinc and require controlled storage.	Safe storage and recovery through authorized recyclers.	Collect zinc dross and ash separately. Store in covered, labelled and moisture-protected containers on impermeable flooring. Prevent mixing with domestic waste. Transfer only to authorized zinc-recovery recyclers. Maintain waste-transfer and sale records.	Admin Incharge / OH&S Team Leader
10	Spent pickling acid and neutralization sludge. May contain corrosive material and dissolved metals.	Safe treatment, storage and disposal without soil, drain or	Collect spent acid in dedicated acid-resistant tanks. Neutralize under controlled conditions. Dewater and collect sludge in	Production Department / Admin Incharge / OH&S Team Leader

		groundwater contamination.	lined, labelled and covered containers. Do not dispose of sludge on open land, in drains or with municipal waste. Dispose of sludge through an authorized hazardous-waste handler or as directed by Punjab EPA. Maintain manifests, receipts and disposal records.	
11	Used drawing oils, lubricants, oily rags and oil-contaminated filters.	Prevent leakage, fire hazard and improper disposal of used oil.	Collect used oils in sealed and labelled drums placed on bunded flooring. Store oily rags and filters in covered containers. Send used oil to authorized recyclers or licensed handlers. Maintain records of quantities generated and transferred.	Production Department / Admin Incharge
12	Domestic solid waste and packaging waste.	Clean facility and no accumulation of waste.	Provide segregated bins for paper, plastic, food waste and general waste. Arrange regular collection and disposal through the local municipal waste-management system or authorized contractor. Encourage reuse and	Admin Incharge / Supervisors

			recycling of cardboard, wooden reels and packaging material. Maintain housekeeping in all production and storage areas.	
III. Biological Environment				
13	Impact on vegetation due to dust, emissions and industrial activity.	Maintain and improve green cover within available site area.	Develop plantation along the site boundary and in available open spaces, subject to operational and safety requirements. Prefer native, hardy and pollution-tolerant species. Water and maintain plantation regularly. Replace dead plants during suitable planting seasons. Avoid unnecessary cutting of existing trees.	Project Proponent / Admin Incharge
14	Impact on birds and small fauna due to noise, dust, waste and lighting.	Avoid attraction, injury or disturbance to local fauna.	Maintain proper waste storage to prevent attraction of rodents and scavengers. Prohibit hunting or harassment of birds and animals by workers. Avoid uncontrolled nighttime lighting. Prevent open disposal of food waste and	Project Proponent / OH&S Team Leader

			chemical residues. Maintain noise-control and dust-control measures.	
IV. Occupational Health and Safety				
15	Exposure to molten aluminium, molten zinc, hot surfaces and hot wire.	Prevention of burns, fire and heat-related injuries.	Provide heat-resistant gloves, face shields, aprons, safety footwear and other PPE. Restrict access to furnace and galvanizing areas. Display warning signs. Maintain safe operating procedures for charging, melting, pouring and galvanizing. Provide emergency showers, first-aid facilities and trained first-aid personnel.	OH&S Team Leader / Production Department
16	Exposure to acids during pickling and chemical handling.	Prevention of chemical burns, inhalation exposure and eye injuries.	Provide acid-resistant gloves, goggles, face shields, aprons and boots. Ensure availability of eyewash stations and emergency shower facilities. Provide chemical-handling training and safety data sheets. Store acids in compatible labelled	OH&S Team Leader / Production Department

			containers with secondary containment. Prohibit manual handling without PPE.	
17	Mechanical hazards from wire-drawing, stranding, bunching and cable-extrusion machinery.	Prevention of entanglement, crushing, cuts and other machinery-related injuries.	Provide machine guards, emergency-stop switches and lockout procedures. Ensure only trained operators use machinery. Maintain safe clearance around moving machinery. Prohibit loose clothing, jewellery and unsafe practices near rotating equipment. Conduct regular safety inspections.	Production Department / Supervisor / OH&S Team Leader
18	Electrical hazards from furnaces, motors, control panels, cable-extrusion lines and generators.	Prevention of electric shock, arc flash, fire and equipment damage.	Ensure proper earthing, insulation and maintenance of electrical equipment. Restrict access to electrical panels. Display electrical safety warnings. Allow only qualified personnel to carry out electrical work. Maintain fire extinguishers near electrical panels and generator areas.	Production Department / OH&S Team Leader
19	Fire and emergency risks from hot work, fuel, oils, electrical	Effective preparedness and immediate	Maintain appropriate fire extinguishers, hydrant points, water storage, emergency	OH&S Team Leader / Admin

	equipment and molten metals.	response to emergency conditions.	exits and assembly areas. Inspect fire equipment monthly. Conduct periodic fire drills. Keep access routes and exits unobstructed. Maintain an emergency-response plan for fire, chemical spills, acid exposure, electrical accidents and medical emergencies.	Incharge / Supervisors
V. Social and Community Aspects				
20	Traffic, road safety and community disturbance due to material deliveries and product dispatch.	Prevent traffic congestion, accidents, dust and nuisance near the facility.	Schedule deliveries and dispatches to avoid peak traffic periods where practicable. Use covered trucks for loose material. Ensure trained drivers and safe loading practices. Maintain speed limits within the site. Prevent parking or loading on public roads. Address complaints related to vehicle movement, dust or noise promptly.	Admin Incharge / Transport Coordinator
21	Community health and complaints.	Maintain good relations with	Maintain environmental controls to prevent off-site	Project Proponent /

		neighbouring land users and communities.	impacts. Designate a focal person for complaints. Record, investigate and resolve complaints promptly. Keep records of complaint date, nature, action taken and closure status.	Admin Incharge / OH&S Team Leader
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6.4 Equipment Maintenance and Monitoring

All production machinery, pollution-control equipment and utility systems shall be maintained in accordance with a documented preventive-maintenance program. Proper maintenance is essential for reducing air emissions, acid mist, wastewater generation, noise, leakages, fire risk, equipment failure and occupational exposure.

The maintenance program shall cover the aluminium melting furnace, galvanizing kettle, pickling tanks, rinse tanks, fume hoods, ducting, scrubbers, fans, stacks, wire-drawing machines, stranding machines, cable-extrusion equipment, generators, pumps, electrical systems, septic tank, water-storage tank, drainage system, firefighting equipment and emergency-response facilities.

The following measures shall be implemented:

- Maintain preventive-maintenance schedules for all production and pollution-control equipment.
- Inspect furnace lining, burners, electrical connections, ducts, fans, hoods and scrubber systems regularly.
- Check pickling tanks, pipelines, valves, pumps and chemical-storage containers for corrosion, leakage and structural integrity.
- Inspect stacks and sampling ports before scheduled emission monitoring.
- Maintain records of equipment breakdowns, repairs, replacements and corrective actions.

- Ensure timely replacement of filters, scrubber media, damaged ductwork, worn machine parts and defective safety devices.
- Inspect generators regularly and ensure that generator exhaust systems are functional.
- Test fire extinguishers, hydrants, alarms, emergency lights and emergency exits regularly.
- Inspect spill kits, first-aid boxes, eyewash stations and PPE stocks every month.
- Maintain calibration records for monitoring instruments, including noise meters, pH meters and any in-house testing equipment.

The monitoring program shall provide information on the effectiveness of mitigation measures and shall allow the company to adopt corrective action where non-compliance or deterioration of environmental performance is identified.

Table 6.2: Environmental Monitoring Program

Parameter / activity	Monitoring location	Frequency	Responsible party
Stack emissions: particulate matter, sulphur oxides, nitrogen oxides, carbon monoxide and relevant parameters	Furnace, galvanizing kettle and diesel-generator stacks	Quarterly or as required by EPA Punjab	EPA-approved / competent laboratory and OH&S Team Leader
Ambient air quality: particulate matter and relevant gaseous pollutants	Site boundary at upwind and downwind locations	Quarterly	EPA-approved / competent laboratory
Acid mist and workplace air conditions	Pickling and galvanizing areas	Quarterly and whenever worker complaints occur	OH&S Team Leader / competent laboratory
Occupational and boundary noise levels	Production sheds, generator area and site boundary	Quarterly	OH&S Team Leader / competent laboratory

Process wastewater: pH, TSS, COD/BOD where applicable, iron, zinc and other relevant metals	Neutralization and settling point, prior to discharge/reuse	Quarterly or as required by EPA Punjab	EPA-approved / competent laboratory
Groundwater quality: pH, TDS, hardness, iron, zinc and relevant parameters	On-site tube well	Bi-annually	EPA-approved / competent laboratory
Septic tank and domestic wastewater system	Septic tank, drainage channels and washroom facilities	Monthly	Admin Incharge / Supervisor
Fume-extraction, scrubber and ventilation system	Furnace, galvanizing and pickling sections	Weekly inspection; monthly maintenance review	Production Department / OH&S Team Leader
Hazardous-waste records and manifests	Waste-storage area and administrative records	Monthly	Admin Incharge / OH&S Team Leader
Used-oil storage and transfer records	Used-oil storage area	Monthly	Admin Incharge
Metal-scrap and zinc-dross storage	Scrap yard and galvanizing waste-storage area	Weekly	Production Supervisor
Chemical and acid-storage inspection	Acid store, pickling section and chemical containers	Weekly	Production Department / OH&S Team Leader
PPE availability and compliance	All production and maintenance areas	Daily supervision; monthly audit	Supervisor / OH&S Team Leader
First-aid, eyewash and emergency-shower facilities	Production, galvanizing and pickling areas	Monthly	OH&S Team Leader

Fire extinguishers, hydrants, alarms and emergency exits	Throughout the facility	Monthly; fire drills at least twice annually	OH&S Team Leader
Housekeeping, drainage and spill-control arrangements	Entire facility, particularly process and storage areas	Daily housekeeping; weekly inspection	Production Supervisor / Admin Incharge
Tree plantation and greenbelt condition	Boundary and open areas	Quarterly	Admin Incharge

The Project Proponent shall maintain an **Environmental Monitoring Log Book** at the facility. The log book shall include monitoring reports, laboratory certificates, waste manifests, PPE inspection records, equipment-maintenance records, complaint records, accident reports, training records, inspection checklists and corrective-action reports.

6.5 Plantation of Trees

Plantation and landscaping shall be undertaken within available open areas and along the site boundary, without affecting emergency access, material handling, utility lines or production operations.

The plantation program will help reduce dust movement, improve visual conditions, provide shade, reduce noise dispersion and improve the overall working environment. Suitable native or pollution-tolerant tree species shall be selected in consultation with local nursery experts or the relevant forestry authority.

The plantation plan shall include:

- Plantation along the boundary wall and internal roads, where feasible.
- Use of drought-tolerant and pollution-tolerant species.

- Protection of young plants from vehicles and material handling.
- Regular watering, mulching, pruning and replacement of dead plants.
- Monitoring of plantation survival rate on a quarterly basis.
- Maintenance of a plantation register showing species, number of plants, planting date and survival status.

A minimum plantation target may be finalized by the company based on available land, safety requirements and the approved site layout.

6.6 Organizational Capacity and Responsibility

The Project Proponent shall be responsible for overall implementation of the EMMP. The organizational arrangement for environmental, health and safety management is as follows:

Position / department	Main EMMP responsibility
Chief Executive Officer	Overall policy direction, resource allocation, approval of corrective actions and regulatory compliance
OH&S Team Leader	Overall coordination of environmental, health and safety management; inspections; training; emergency preparedness; monitoring coordination; reporting to management
Production Department	Daily implementation of operational controls, pollution prevention, equipment maintenance, wastewater treatment and safe production practices
Production Supervisor	Supervision of workers, housekeeping, PPE use, waste segregation and safe machine operation
QC Incharge	Support for process control, quality testing, noise-control coordination and maintenance of production-quality records
Admin Incharge	Coordination with laboratories, waste handlers, recyclers, municipal services and Punjab EPA; recordkeeping; complaint management
Accounts and Purchase Department	Procurement of PPE, pollution-control equipment, monitoring services, waste-disposal services and maintenance resources

Workers	Compliance with work instructions, PPE use, reporting of unsafe conditions, participation in training and emergency response
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The company shall engage an EPA-approved or competent environmental laboratory for periodic air, wastewater, groundwater and noise monitoring. Monitoring reports shall be reviewed by the OH&S Team Leader and presented to the Chief Executive Officer for necessary corrective action.

6.7 Training and Capacity Building

Training of workers and supervisory staff is essential for effective implementation of the EMMP. All employees shall receive induction training before starting work, while personnel involved in furnace operations, galvanizing, acid pickling, chemical handling, electrical maintenance, waste management and emergency response shall receive task-specific training.

Table 6.3: Environmental and Safety Training Program

Training provider	Topics / contents	Trainees	Frequency / duration
OH&S Team Leader / external environmental consultant	Punjab environmental laws, PEQS, environmental approval conditions, EMP implementation, waste segregation, pollution prevention and environmental reporting	Management staff, supervisors and relevant workers	At least once annually; one-day session
OH&S Team Leader / qualified safety trainer	PPE use, machine safety, lockout procedures, safe material handling, electrical safety and housekeeping	Production workers, maintenance staff and supervisors	Quarterly toolbox talks; annual refresher training

Qualified chemical-safety trainer	Acid handling, chemical storage, spill response, use of eyewash station, acid burns and safety data sheets	Pickling, galvanizing and maintenance staff	At least twice annually
Fire-safety trainer / emergency-response staff	Fire prevention, extinguisher use, evacuation procedure, assembly points, emergency communication and firefighting drills	All staff, guards and supervisors	Fire drill at least twice annually
First-aid trainer / medical professional	Basic first aid, burns, chemical exposure, heat stress, cuts, electric shock and emergency referral	Selected first-aiders, supervisors and OH&S staff	Annual training and refresher as required
External laboratory / environmental consultant	Sampling procedures, interpretation of air, wastewater, groundwater and noise-monitoring results	OH&S Team Leader, QC Incharge and management representatives	Annual or as required
Admin Incharge / waste contractor	Waste manifests, hazardous-waste storage, used-oil handling, zinc-dross management and documentation	Admin, storekeepers, supervisors and relevant workers	At least once annually

Training attendance, training materials, photographs, assessments and refresher schedules shall be maintained in the facility records.

6.8 Reviewing and Reporting Procedure

The EMMP shall be reviewed periodically to ensure its continued suitability and effectiveness. The review shall assess whether mitigation measures are being implemented, monitoring results comply with applicable standards, waste records are complete, workers are using PPE and corrective actions are being completed within the required timeframe.

The EMMP shall be reviewed:

- At least once every six months.
- After a significant environmental incident, chemical spill, fire, accident or complaint.
- After any non-compliance with applicable PEQS or environmental-approval conditions.
- Before or after installation of new machinery, production lines or pollution-control equipment.
- Before a proposed increase in production capacity or material change in production process.
- When monitoring results indicate increasing emissions, wastewater pollution, noise, worker exposure or recurring equipment malfunction.
- When Punjab EPA issues new conditions, directions or standards relevant to the facility.

The OH&S Team Leader shall prepare periodic internal environmental-compliance reports. These reports shall include:

- Monitoring results and comparison with applicable standards.
- Status of pollution-control equipment.
- Waste generation, recycling and disposal records.
- Details of spills, accidents, complaints and corrective actions.
- PPE availability and safety-compliance status.
- Training conducted during the reporting period.
- Fire-drill and emergency-response records.
- Plantation and housekeeping status.
- Required actions, responsible persons and target completion dates.

The Project Proponent shall submit environmental monitoring and compliance reports to Punjab EPA as required under the Environmental Approval or any direction issued by the competent authority.

6.9 Environmental Management and Monitoring Cost

The Project Proponent shall allocate adequate annual financial resources for effective implementation of the EMMP. The exact cost will depend on laboratory charges, monitoring frequency, maintenance needs, waste quantities, pollution-control upgrades, training requirements and regulatory directions.

Table 6.4: Indicative Environmental Management and Monitoring Cost

Description	Frequency / quantity	Indicative annual allocation
Stack-emission monitoring for furnace, galvanizing kettle and generator	Quarterly or as required by Punjab EPA	As per laboratory quotation
Ambient-air-quality monitoring	Quarterly	As per laboratory quotation
Wastewater-quality monitoring	Quarterly	As per laboratory quotation
Groundwater-quality monitoring	Bi-annually	As per laboratory quotation
Occupational and boundary-noise monitoring	Quarterly	As per laboratory quotation
Fume-extraction, ducting and scrubber operation and maintenance	Ongoing	Operational cost
Pickling-wastewater neutralization chemicals and sludge handling	Ongoing	Operational cost
Hazardous-waste storage, collection, recycling and disposal	Ongoing	Operational cost
Used-oil collection and authorized recycling/disposal	As generated	Operational cost

PPE procurement and replacement	Ongoing	Operational cost
Safety, environmental and emergency-response training	At least annually	Operational cost
Fire-extinguisher servicing, hydrant maintenance and fire drills	Ongoing	Operational cost
Spill kits, eyewash stations and first-aid supplies	Ongoing	Operational cost
Plantation, landscaping and maintenance	Annual / seasonal	Operational cost
Environmental consultant and compliance-report preparation	Periodic	As per service agreement

The annual budget shall be finalized by the Finance and Accounts Department in consultation with the Chief Executive Officer, OH&S Team Leader, external monitoring laboratory, maintenance team and authorized waste-management contractors. The budget shall be reviewed every year and increased where monitoring results, regulatory requirements or operational changes justify additional environmental investment.

6.10 Summary

The environmental impacts associated with M/s Steel Complex (Private) Limited are primarily related to furnace and galvanizing emissions, acid pickling, wastewater, hazardous waste, noise, occupational exposure, fire risk and traffic movement. These impacts can be maintained within acceptable limits through effective operation of fume-control systems, treatment of pickling wastewater, authorized disposal of hazardous waste, regular monitoring, preventive maintenance, PPE use, worker training and emergency preparedness.

Effective implementation of this EMMP will support continued compliance with applicable environmental requirements and will help the facility maintain environmentally responsible manufacturing operations.



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CHAPTER 7

STAKEHOLDERS PARTICIPATION

7.1 Objectives of Consultation

Stakeholder consultation was carried out to inform interested and affected parties of the nature of the facility's operations, to identify any specific concerns held by the workforce and neighboring landholders, and to ensure that these concerns are reflected in the mitigation measures and Environmental Management Plan presented in this report.

7.2 Methodology

Consultation was carried out through informal meetings and discussions with facility management and supervisory staff, and with representatives of neighboring landholders and industrial units in the vicinity of the site, in line with EPA Punjab's Guidelines for Public Participation.

7.3 Stakeholders Identified

- Facility workforce (production, technical, and administrative staff).
- Neighboring agricultural landholders adjacent to the project site.
- Nearby industrial units within the G.T. Road/Muridke industrial corridor.
- Environmental Protection Agency, Punjab (regulatory stakeholder).
- Local Tehsil Municipal Administration (municipal services and solid waste).

7.4 Key Concerns and Responses

Stakeholder	Concern Raised	Response / Mitigation
Facility Workforce	Exposure to fumes near the melting and galvanizing lines; noise from drawing machines	Fume extraction and PPE provision; hearing protection; periodic safety training (Chapter 5, 6)
Neighboring Landholders	Possible dust/fume drift onto adjacent agricultural land	Hooded extraction with elevated stack discharge; periodic stack and ambient air monitoring
Nearby Industrial Units	Shared use of the local access road for material/goods transport	Scheduling of heavy vehicle movement; maintenance of the access road
Local Community	Employment opportunities for local residents	Facility maintains local hiring for production and support roles

7.5 Integration of Feedback into Project Design

The concerns raised during consultation have been incorporated into the mitigation measures and EMP presented in this report, in particular: prioritizing hooded fume extraction and elevated stack discharge at the melting and galvanizing lines to address concerns over dust/fume drift onto neighboring agricultural land; mandatory PPE and periodic safety training for the workforce to address occupational exposure concerns; and scheduled, tarpaulin-covered movement of heavy vehicles to minimize disruption to the shared local access road.

CHAPTER 8

CONCLUSION AND RECOMMENDATIONS

8.1 Conclusion

This Environmental Impact Assessment has been prepared for the manufacturing facility of M/S Steel Complex (Private) Limited, located at Mouza Rakh Bowly Jamadar, Tehsil Ferozewala/Muridke, District Sheikhpura, approximately 21-KM off G.T. Road, Muridke. The facility manufactures steel wire, steel wire rope, galvanized and ungalvanized all-steel conductors, All Aluminium Conductors (AAC), Aluminium Conductor Steel Reinforced (ACSR), PC strand, spring wire, and XLPE power cables, on a landholding of approximately 138 Kanal 18 Marla, with a core production block of approximately 21,000 sq. ft. covered area.

The project's principal environmental considerations relate to air emissions and metal fume from the aluminium melting furnace and hot-dip galvanizing kettle, acidic mist and spent liquor from the wire pickling process, generation of hazardous waste (zinc dross and neutralization sludge), occupational noise, and occupational health and safety risks associated with molten metal and acid handling. These impacts, while requiring active and sustained management, are well understood and are addressed through established engineering and procedural mitigation measures, including hooded fume extraction, on-site neutralization of acidic effluent, licensed disposal of hazardous waste, acoustic controls, and a structured occupational health and safety program.

As the site is located within an established industrial corridor, away from protected areas and significant sensitive receptors, and does not require any land acquisition, resettlement, or clearance of natural habitat, the assessment finds that the project's environmental impacts are manageable

and can be maintained within the limits prescribed under the Punjab Environmental Quality Standards, provided the Environmental Management and Monitoring Plan set out in Chapter 6 is implemented in full and monitored on an ongoing basis.

In conclusion, this EIA finds that the continued operation of the facility is environmentally acceptable, subject to full implementation of the recommended mitigation measures, and that the project contributes positively to the local economy through direct and indirect employment and continued production of essential conductor and cable products for Pakistan's power sector.

8.2 Recommendations

Based on the findings of this assessment, the following recommendations are made:

Environmental Approval

It is recommended that the Environmental Protection Agency (EPA), Punjab grant Environmental Approval for the continued operation of the M/S Steel Complex (Private) Limited manufacturing facility, subject to the proponent's commitment to implementing the mitigation measures and EMP detailed in this report.

Fume Extraction and Air Emission Control

The proponent should ensure hooded fume extraction is installed and properly maintained over the aluminium melting furnace, galvanizing kettle, and pickling tanks, with discharge through an adequately elevated stack, and should arrange quarterly stack emission testing through an EPA-certified laboratory.

Wastewater and Hazardous Waste Management

Spent pickling liquor and process rinse water should be neutralized and settled on-site prior to any discharge, with the resulting sludge, together with zinc dross and used lubricants, stored securely and disposed of exclusively through EPA-licensed hazardous waste handlers, with disposal manifests retained for inspection.

Occupational Health and Safety

The proponent should maintain a documented OH&S program, including mandatory PPE appropriate to each work area, first-aid and eyewash facilities near the pickling and galvanizing lines, and periodic safety training, under the oversight of the OH&S Team Leader.

Baseline and Ongoing Monitoring

Baseline monitoring of stack emissions, ambient air quality, noise, and wastewater/groundwater quality should be completed through an EPA-certified laboratory, followed by the ongoing quarterly (and bi-annual, for groundwater) monitoring program set out in Chapter 6, with results submitted to EPA Punjab as part of periodic compliance reporting.

Fire Safety

Fire extinguishers, hydrant points, and clearly marked emergency exits should be maintained across the production sheds, with periodic fire drills conducted for the workforce.

Record-Keeping and Reporting

The proponent should maintain an Environmental Monitoring Log Book on-site and submit periodic compliance monitoring reports to EPA Punjab throughout the operating life of the facility, to document ongoing regulatory compliance.