ENVIRONMENTAL IMPACT ASSESSMENT REPORT (2026)

M/S Ch. Electric Rewinding Company (SMC-Pvt.) Ltd

Plot No. 38/A, Bahawalpur Industrial Zone (BIZ), Bahawalpur

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DISCLAIMER

The information presented herein is derived from the unique attributes of the project site as disclosed by the project proponents, stakeholders, and promoters, through provided maps, verbal communications, and all associated documentation. The veracity of the detail's rests solely with the project proponents, stakeholders, and promoters, and not with the environmental consultant. The Environmental Impact Assessment (EIA) or Initial Environmental Examination (IEE) report is not subject to dispute in any court of law.

Representative: EIA & IEE Team

EXECUTIVE SUMMARY

This Environmental Examination (EIA) report presents a comprehensive overview of the key environmental and social considerations related to the proposed transformer manufacturing unit by **M/s Ch. Electric Rewinding Company (SMC-Pvt.) Ltd**, located at Plot No. 38/A, Bahawalpur Industrial Zone (BIZ), Bahawalpur, spanning a total area of 22205.40 SFT.

In accordance with the Punjab Environmental Protection Act 1997 (Amended 2026) and the Review of IEE & EIA Regulations, 2022, the project falls under Schedule II, categorized as Category B (Manufacturing and Processing), Sub sector 20 (Auto mobile manufacturing and assembling units). As such, the preparation and submission of an EIA is mandatory to obtain the required Environmental Approval from the relevant authorities. Enviro Stewards Company (Pvt.) Limited has been engaged as the environmental consulting firm responsible for preparing this assessment.

This report evaluates the potential environmental and social impacts of the project across its entire lifecycle. Key areas of focus include land use, water and air quality, solid waste management, traffic patterns, noise levels, and the socio-economic well-being of nearby communities. The findings are supported by field data, stakeholder consultations, and technical analysis.

To address potential adverse impacts, a range of mitigation and management measures have been proposed, aimed at minimizing harm to the environment and surrounding population. These include best practices in construction management, pollution control, and community engagement.

Further technical details and a full description of the project, including planning and construction methodology, are provided in Chapter 05: Project Detail.

Brief of Project

Table 1 Brief of Project

1.	Title of Project	M/s Ch. Electric Rewinding Company (SMC-Pvt.) Ltd
2.	Location of Project	Plot No. 38/A, Bahawalpur Industrial Zone (BIZ), Bahawalpur
3.	Area of Project	22205.40 SFT
4.	GPS Coordinates	29.322175 N, 71.584323 E
5.	Current Status of Project	Proposed
6.	Cost of Project	350 million PKR
7.	Proponent of Project	Mr. Muhammad Yaseen
8.	Description of Project	The proposed project is to construct transformer manufacturing unit.
9.	Raw Material	CRGO Silicon Steel, Copper/Aluminum Conductors, Insulation Materials, Transformer Oil, Mild Steel Sheet & other allied materials
10.	Final Product	Power & Distribution Transformers
11.	Production Capacity	Upto 6 MVA (6000KVA)
12.	Cutting of Trees	There will be no cutting of trees. After construction trees will be planted.
13.	Manpower	10-15 person during construction and 30-40 staff during operation
14.	Period of construction	06-07 months
15.	Assessed environmental issues	Dust emissions, noise generation, welding fumes, paint-related VOC emissions, solid waste generation, wastewater generation, traffic movement, and occupational health & safety concerns.

16.	Solid waste generation	Approximately 50–100 kg/day of solid waste, including steel scrap, CRGO scrap, insulation waste, packaging materials, and domestic waste, may be generated during the operational phase.
17.	Solid waste management	Segregation and temporary on-site storage of waste will be practiced. Recyclable materials such as steel, copper/aluminum, and CRGO scrap will be sold to authorized recyclers, while non-recyclable waste will be managed through EPA-approved waste handlers/vendors.
18.	Wastewater generation	Approximately 3–5 m^3/day of domestic wastewater will be generated during the operational phase. No significant industrial wastewater is anticipated except occasional equipment cleaning and floor washing activities.
19.	Wastewater management/ disposal	Domestic wastewater will be treated through a septic tank/soakage system or connected to the available sewerage network, subject to the availability of infrastructure in the industrial zone.
20.	Rainwater Harvesting Plan	Rainwater harvesting will be implemented through rooftop rainwater collection and storage/recharge arrangements. Details are provided under Chapter 5, Available Facilities (RWH).
21.	Air & Noise pollution & control measures	During construction, dust suppression through water sprinkling, covered

		transportation of materials, and vehicle maintenance will be practiced. During operation, welding fumes and paint emissions will be controlled through adequate ventilation, proper handling practices, and use of PPEs. Noise will be minimized through regular maintenance of machinery, installation of silencers where required, and provision of hearing protection to workers. Greenbelt development around the project site will also be undertaken.
22.	Protected Areas	As per field visits and consultations with wildlife and forest departments, the proposed project area **does not fall** in any protected area i.e. National Parks, Wildlife Sanctuaries, or Forest areas, etc.
23.	Consultant Company	Enviro Stewards Company (Pvt) Limited
24.	Compliance	In accordance with Punjab Environmental Protection Act 1997 (Amended 2026) & IEE/EIA Regulations 2022

Legal and Administrative Framework

These include the National Conservation Strategy (1992), National Environmental Policy (2005), Pakistan Labor Policy (2010), and the Punjab Environmental Protection Act 1997 (Amended 2026). Additionally, the project ensures compliance with the Punjab Environmental Quality Standards (PEQS), the Land Acquisition Act (1894), the Prohibition of Cutting of Trees Act (1975), the Punjab Wildlife Act (1974), the Punjab Plantation and Maintenance of Trees Act (1974), and the Antiquities Act (1975).

A thorough review of environmental documents has been conducted, underscoring the mandatory submission of an environmental assessment study report as required by the Pakistan Environmental Protection Ordinance (PEPO), 1983, and reinforced by the Pakistan Environmental Protection Act (1997). Specifically, Section 12(1) of the amended PEPA (2026) stipulates that any project involving the construction or modification of the physical environment must conduct an Environmental Impact Assessment (EIA) or an Initial Environmental Examination (IEE) and obtain approval (NOC) from the relevant provincial environmental authority.

In the preparation of the report for Said project, full consideration has been given to the PEPA (1997), the Punjab Environmental Protection (Amendment) Act (2012), and all other applicable legal requirements from both the Pakistan and Punjab governments, including the Land Acquisition Act (1894).

Assessment of Major Impacts

During Construction Phase

The construction phase of the Said project will involve significant land development and infrastructure activities, which are likely to result in several environmental impacts. These impacts will primarily include soil erosion, dust generation, noise pollution, and disruption of local ecosystems. Soil erosion may occur due to excavation and land grading, particularly during heavy rainfall, which can lead to sedimentation of nearby water bodies. The generation of dust during construction activities can have adverse effects on air quality, leading to health issues for workers and the surrounding community. Noise pollution from machinery and construction activities will likely impact both the local community and wildlife in the vicinity, especially during nighttime construction. Additionally, the project may disrupt local wildlife habitats, potentially leading to displacement of species, especially if there are areas of natural vegetation or wetland ecosystems within the project site.

During Operational Phase

Once operational, the proposed transformer manufacturing unit will generate environmental impacts primarily associated with electricity consumption, welding and fabrication activities, painting operations, transformer oil handling, solid waste generation, domestic wastewater generation, and transportation of raw materials and finished products.

The operation of machinery such as winding machines, cutting equipment, welding machines, testing equipment, drying ovens, and material handling equipment will consume electrical energy. Welding and metal fabrication activities may generate fumes, while painting operations may result in limited emissions of volatile organic compounds (VOCs). The handling and storage of transformer oil may pose a risk of spills if not properly managed.

Solid waste generated during operation will mainly comprise CRGO steel scrap, copper/aluminum scrap, mild steel scrap, waste insulation materials, packaging waste, used oil filters, and domestic waste from employees. Domestic wastewater generated from washrooms and associated facilities will require proper treatment and disposal. Transportation of raw materials and finished transformers may also contribute to noise, dust, and vehicular emissions in the surrounding area.

Proposed Mitigation Measures

Mitigation Measures During Construction Phase

- **Dust Control:** Water sprinkling on unpaved roads, construction sites, and material stockpiles will be carried out regularly to suppress dust. Construction materials such as sand and cement will be stored in covered areas or containers.
- **Noise Reduction:** Use of well-maintained and quieter machinery, along with limiting high-noise activities to daytime hours, will help reduce the impact on nearby communities and wildlife. Workers will be provided with protective hearing equipment where needed.

- **Erosion and Sediment Control:** Proper grading, construction of drainage channels, and installation of silt fences will help manage stormwater runoff and reduce soil erosion during excavation and site leveling.
- **Waste Management:** Construction waste will be segregated and disposed of by EPA approved vendor. Recyclable materials such as metal, wood, and concrete will be separated and reused where possible.
- **Protection of Flora and Fauna:** Vegetation clearance will be minimized, and native plants will be preserved where feasible. Construction zones will be clearly marked to avoid encroachment into ecologically sensitive areas.
- **Health and Safety:** Workers will be provided with safety gear and training. On-site medical aid and emergency response protocols will be established.
- **Traffic Management:** A traffic management plan will be implemented to control heavy vehicle movement and reduce inconvenience to local traffic, especially near residential areas.

Mitigation Measures During Operational Phase

- **Solid Waste Management:** Scrap CRGO steel, copper/aluminum conductors, and mild steel will be segregated and sold to authorized recyclers. Domestic waste will be collected separately and disposed of through approved waste management services.
- **Transformer Oil Management:** Transformer oil will be stored in designated areas with spill containment measures. Used oil and oil-contaminated materials will be handed over to EPA-approved vendors for proper disposal or recycling.
- **Wastewater Management:** Wastewater generated will be domestic in nature. It will be treated through a septic tank system and disposed of into the industrial sewer/drainage network in accordance with applicable regulations.
- **Air Pollution Control:** Adequate ventilation will be provided in welding and painting areas. Dust-generating activities will be minimized through good housekeeping practices, and machinery will be regularly maintained to ensure efficient operation.

- **Noise Control:** Equipment will undergo routine maintenance to minimize noise levels. Workers exposed to elevated noise levels will be provided with hearing protection devices.
- **Water Conservation:** Water-efficient fixtures will be installed, and rainwater harvesting will be implemented through rooftop collection systems to supplement water management efforts.
- **Energy Efficiency:** Energy-efficient machinery, LED lighting, and preventive maintenance programs will be adopted to optimize electricity consumption and reduce environmental impacts.
- **Greenbelt Development:** Plantation of native tree species around the project boundary will be undertaken to improve aesthetics, reduce dust dispersion, and enhance the local environment.
- **Environmental Monitoring:** Periodic monitoring of air quality, noise levels, wastewater management practices, and waste handling procedures will be carried out to ensure compliance with applicable environmental regulations and the Environmental Management Plan (EMP).

Proposed Monitoring Framework

Given the requirement for an impact assessment due to the potential long-term, significant, or adverse environmental impacts associated with the project, it is essential to implement a comprehensive Environmental Monitoring Program. This program will systematically monitor key environmental parameters throughout all phases of the project—planning, construction, and post-construction to ensure full compliance with the Punjab Environmental Quality Standards (PEQS) and other applicable legal requirements.

The Environmental Management and Monitoring Plan serves as a strategic tool to minimize potential negative environmental effects during the development and operational stages of the project. It also seeks to enhance the overall project value by enforcing high standards for health, safety, and environmental protection.

The project proponent is fully committed to implementing all proposed mitigation measures during the land development, construction, and habitation phases. Environmental monitoring is a core element of this commitment and will be conducted regularly to assess compliance and performance. The specific details of the monitoring approach and frequency are provided in Chapter 07 of the EIA report.

Conclusions and Recommendations

The proposed transformer manufacturing unit is expected to generate significant socio-economic benefits for the area by creating direct and indirect employment opportunities, promoting industrial development, and supporting local businesses involved in transportation, fabrication, maintenance, and supply of raw materials. The project will contribute to economic growth in the industrial zone and enhance the overall industrial infrastructure of the region.

During construction and operation, certain environmental impacts may arise, including temporary dust emissions, noise generation, welding fumes, paint-related emissions, solid waste generation, domestic wastewater generation, and increased vehicular movement. However, these impacts are anticipated to be localized, minor to moderate in nature, and manageable through the implementation of appropriate mitigation measures and environmental management practices.

A comprehensive Environmental Management Plan (EMP) has been proposed to address potential environmental concerns. The plan includes measures for air quality management, noise control, waste minimization, wastewater management, occupational health and safety, transformer oil handling, resource conservation, and environmental monitoring. With the effective implementation of these measures, the project is not expected to cause any significant adverse environmental impacts.

Based on the assessment, the proposed project is considered environmentally acceptable, provided that all recommended mitigation measures are implemented and relevant environmental regulations are complied with throughout the construction and operational phases.

It is recommended that the project proponent obtain the requisite environmental approval, including the No Objection Certificate (NOC), from the Punjab Environmental Protection Agency (Punjab-EPA) prior to the commencement of construction activities and ensure continued compliance with all applicable environmental laws, regulations, and guidelines.

1 INTRODUCTION

1.1 General

The proposed project is to construct a transformer manufacturing unit by Ch. Electric Rewinding Company (SMC-Pvt.) Ltd located on Plot No. 38/A, Bahawalpur Industrial Zone (BIZ), Bahawalpur, covering about 22205.40 SFT.

Given its scale and potential impact, an Environmental Impact Assessment (EIA) is being undertaken to assess and address any environmental and social concerns, in compliance with the Punjab Environmental Protection Act 1997 (Amended 2026) and IEE/EIA Regulations 2022.

1.2 Purpose of the Report

This report has been prepared to conform to the requirements of the Punjab Environmental Protection (Amendment) Act 2012 (PEPA), which states that:

"No proponent of a project shall commence construction or operation unless he has filed with the Provincial Agency an Initial Environmental Examination or where the project is likely to cause an adverse environmental effect, an Environmental Impact Assessment, and has obtained from the Provincial Agency approval in respect thereof."

The EIA report is comprehensive, covering socio-economic, physical, and environmental aspects, including land use, forestry, crops, water bodies, biodiversity (flora and fauna), heritage, and other factors relevant to the project and its surrounding area. It meticulously details mitigation strategies intended to address and neutralize potential environmental impacts on human and environmental health in the vicinity of the project site. These strategies are applicable during both the construction phase and the regular operation of the project.

Moreover, the report serves as a crucial document for decision-makers, particularly the EPA of Punjab, providing all necessary information in the officially approved format. This facilitates an informed decision-making process regarding the issuance of the required environmental approval. Through this EIA report, the proponent

demonstrates a commitment to adhering to the Punjab Environment Quality Standards (PEQS) and maintaining a robust environmental management order throughout the lifecycle of the project.

1.3 Identification of the project and proponent

The detail of the project and proponent is given below:

Name of project	M/s Ch. Electric Rewinding Company (SMC-Pvt.) Ltd
Location of project	Plot No. 38/A, Bahawalpur Industrial Zone (BIZ), Bahawalpur
Proponent name	Mr. Muhammad Yaseen
Address of proponent	PO Chak No.227/9 R, Chak No.228/9 R, Tehsil Fort Abbas, District Bahawalnagar

1.4 Consultant Information

The initiator has contracted with M/s Enviro Stewards Company (Private) Limited for the execution of an Environmental Impact Assessment (EIA) for the aforementioned project, in alignment with the standards and guidelines set forth by the Environmental Protection Agency (EPA) of Punjab. To fulfill this objective, M/s Enviro Stewards Company (Private) Limited has assembled a team of experts, including environmental specialists, environmental engineers, and chemical engineers. Further information on the consultancy team is provided below:

Detail of the Consultant	
Company name	Enviro Stewards Company (Private) Limited
Address	134-A, Block A-1, Guru Mangat Road Gulberg III, Lahore.
Contact No.	0301-1199600

1.5 Nature, Size and Location of Project

M/s Ch. Electric Rewinding Company (SMC-Pvt.) Ltd is a proposed transformer manufacturing unit. The project spans a total area of 22205.40 SFT and is situated at Plot No. 38/A, Bahawalpur Industrial Zone (BIZ), Bahawalpur, Area distribution is given as follow:

Total Area is 22205.40 SFT.

Total Covered Area is 9064.25 SFT.

Figure 1 Site Location

1.6 Scope of the EIA Study, Area of Influence, and Magnitude of Efforts

The Environmental Impact Assessment (EIA) study has been undertaken to evaluate the potential environmental and social impacts associated with the proposed development of Ch. Electric Rewinding Company (SMC-Pvt.) Ltd. The primary objective is to ensure that the project complies with environmental regulations and integrates mitigation measures from the planning stage.

The scope of this study includes assessment of baseline environmental conditions, identification of potential impacts during construction and operational phases, and formulation of practical mitigation and monitoring strategies. It also addresses compliance with the Punjab Environmental Protection Act 1997 (Amended 2026) and the Review of IEE & EIA Regulations, 2022.

The area of influence covers the project site and its immediate surroundings, extending up to a 01 km radius, encompassing local settlements, natural features, and infrastructure likely to be affected by project activities, such as air quality, water resources, noise levels, traffic flow, and waste disposal

The magnitude of efforts involved includes baseline surveys, consultations with stakeholders, site reconnaissance, and technical assessments of environmental components. The study aims to support informed decision-making for environmental approval and ensure long-term sustainability of the project.

2 POLICY, LEGISLATION, LEGAL & ADMINISTRATIVE FRAMEWORK

2.1 General Overview

Environmental compliance is a cornerstone of responsible development in Pakistan. As urbanization accelerates, particularly in housing developments, adhering to the established environmental regulations ensures that the project does not cause undue harm to local ecosystems or communities. Housing projects, are required to undergo environmental review under Section 12 of the Punjab Environmental Protection Act 1997 (Amended 2026). This law mandates the preparation of an Environmental Impact Assessment (EIA) for projects listed under Schedule II of the Review of IEE and EIA Regulations, 2022.

By adhering to these requirements, the project ensures a sustainable approach to urban development that aligns with both provincial and national environmental policies, contributing positively to the broader goals of sustainable development.

2.2 Screening

In accordance with the Punjab Environmental Protection Act 1997 (Amended 2026) and the Review of IEE & EIA Regulations, 2022, the project falls under Schedule II, categorized as Category B (Manufacturing and Processing), Sub sector 20 (Auto mobile manufacturing and assembling units). As such, the preparation and submission of an EIA is mandatory to obtain the required Environmental Approval from the relevant authorities.

In line with the Review of IEE & EIA Regulations, 2022, this classification mandates that the project must conduct an EIA for obtaining environmental approval from the Punjab Environmental Protection Agency (Punjab EPA). Since the project's size is below the threshold for requiring a full Environmental Impact Assessment (EIA), the EIA is sufficient unless significant impacts are identified during the initial environmental analysis. This ensures that the project is subject to appropriate regulatory oversight while not unduly burdening developers with excessive requirements.

2.3 Regulatory and Framework Compliance

The EIA study is guided by a range of legal, regulatory, and policy instruments that ensure environmental and planning compliance. These instruments collectively form a comprehensive framework that governs the environmental aspects of housing developments in Punjab.

2.4 Relevant Legal and Institutional Framework

2.4.1 Punjab Environmental Protection Act, 1997 (Amended 2026)

This Act is the cornerstone of environmental law in Punjab and mandates the preparation of an IEE/EIA for any project that could significantly impact the environment. It establishes the powers of the Punjab EPA to review, approve, and monitor environmental assessments, ensuring that development activities comply with environmental protection standards.

2.4.2 Review of IEE & EIA Regulations, 2022

These regulations under the Punjab Environmental Protection Act 1997 (Amended 2026) detail the procedures for the preparation, review, and approval of environmental reports. The regulations specify timelines, content requirements, and the classification of projects according to their potential environmental impact.

2.4.3 National Environmental Policy, 2005

The National Environmental Policy sets the overarching vision for environmental governance in Pakistan, promoting sustainable development across all sectors. It emphasizes the importance of integrating environmental considerations into the planning process and provides a framework for policy alignment at both federal and provincial levels. The housing sector must ensure that it aligns with this national policy, especially regarding urban planning, waste management, and resource conservation.

2.4.4 Punjab Land Use (Classification, Reclassification, and Redevelopment) Rules, 2009

These rules regulate land use in Punjab and ensure that zoning and land classifications are in accordance with environmental and urban planning standards. The rules govern

the conversion of agricultural land to residential or commercial purposes, a process crucial to housing developments. Environmental assessments must evaluate the impact of such land-use changes on local ecosystems and resources.

2.4.5 Punjab Municipal Solid Waste Management Rules, 2022

These rules regulate the collection, storage, transportation, and disposal of solid waste in Punjab. Project sites are required to establish waste management systems that comply with these rules, ensuring that the project does not contribute to environmental degradation through improper waste handling.

2.4.6 Punjab Water Act, 2019

The Punjab Water Act governs water resources, including the extraction of groundwater and the management of water systems. For the said project, it is crucial to ensure that water use is sustainable, that stormwater is managed effectively, and that any new water extraction activities do not deplete local aquifers.

2.4.7 Punjab Wildlife (Protection, Preservation, Conservation and Management) Act, 1974

This law is applicable if the project site is located near any protected or sensitive wildlife habitats. It governs the protection and management of biodiversity, including native plant and animal species. If the project area affects such habitats, appropriate mitigation measures will need to be implemented.

2.4.8 Forest Act, 1927

If the project site is located in or near forested areas, this Act requires that the developer obtain permission before clearing any forested land. It regulates deforestation activities and mandates the preservation of forest cover wherever possible.

2.4.9 Labor, Safety and Health Laws

These laws ensure the safety, health, and welfare of workers during construction activities. They set guidelines for workplace safety, worker health conditions, and risk management.

2.4.10 Public Consultation Guidelines, 1997

This guideline emphasizes the importance of early and inclusive public consultation with stakeholders, especially with communities living near the project site. It mandates that affected populations and municipal bodies are consulted before finalizing project plans, ensuring that the community's concerns are addressed.

2.4.11 Guidelines for Sensitive and Critical Areas

If the project site is located near sensitive or critical areas such as schools, hospitals, water bodies, wetlands, or areas of cultural heritage, these guidelines must be followed. They ensure that the project minimizes any adverse impacts on these sensitive environments.

2.5 Institutional Framework

The following institutions play key roles in regulating and overseeing environmental compliance for in Punjab:

- Punjab Environmental Protection Agency (Punjab EPA): Responsible for enforcing environmental laws and ensuring compliance with IEE/EIA regulations
- District Administration and Municipal Committees: Manage local governance and ensure that projects align with community needs and local laws.
- Punjab Local Government Board: Supervises local urban development and service delivery.
- Irrigation Department, Forest Department, and Wildlife Department: Responsible for issuing NOCs related to water management, forest conservation, and wildlife protection.

3 SCOPING

Scoping is a critical phase in the Environmental Impact Assessment (EIA) process, aimed at delineating the breadth and depth of examination required for a proposed project or activity. This phase involves a meticulous evaluation of potential impacts associated with the project, encompassing direct and indirect effects, cumulative impacts, and possible long-term consequences on the environment. A multidisciplinary team of environmental and social experts undertakes this evaluation, conducting an in-depth analysis of the project or activity to identify potential environmental risks and impacts. These impacts may affect various environmental domains, including air quality, water quality, biodiversity, and cultural heritage.

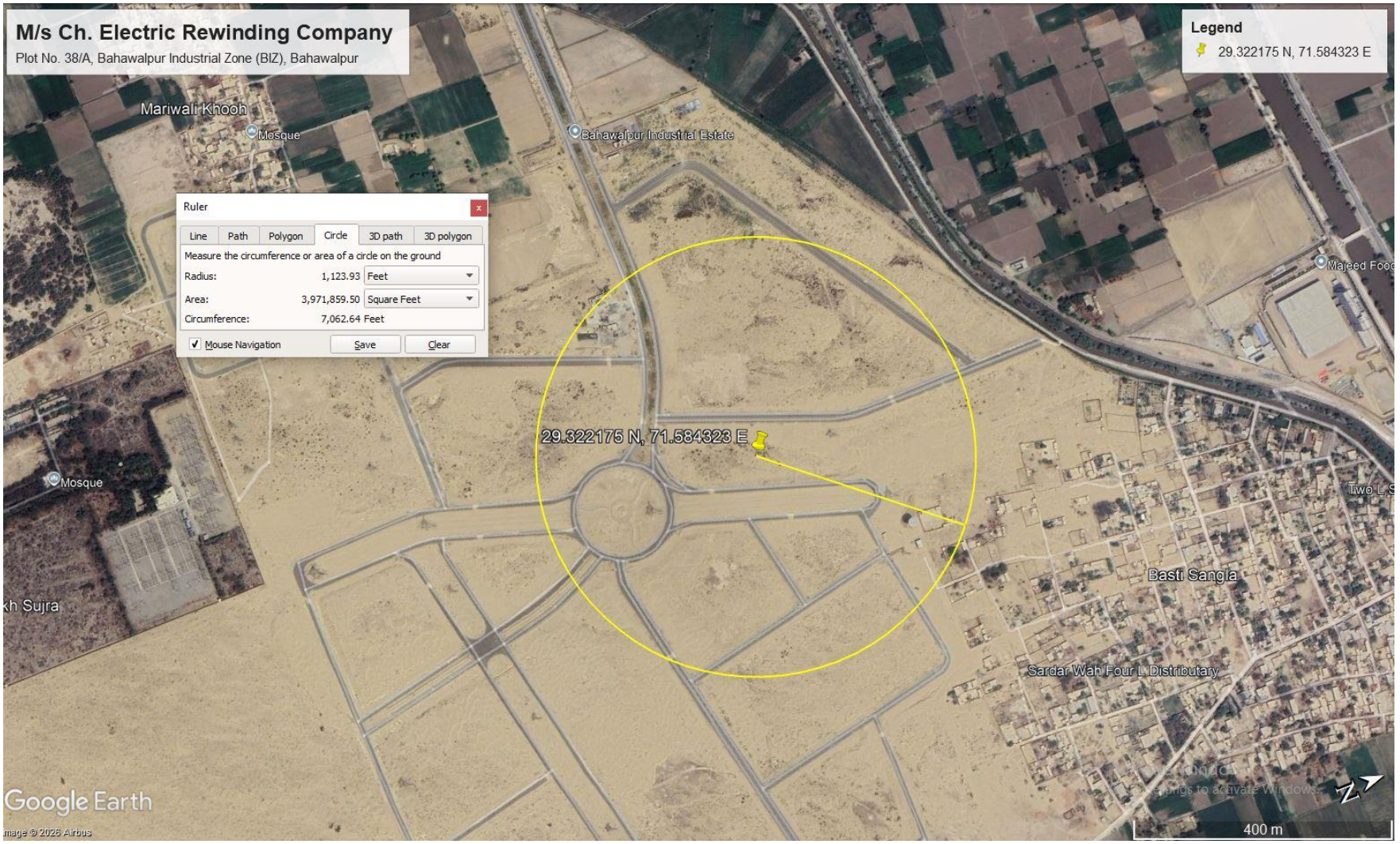
A distinctive feature of this EIA process is the inclusion of public consultation. This participatory approach allows members of the public and other interested stakeholders to offer their insights, express concerns, and contribute to the discussion regarding the proposed project or activity. Through this mechanism, the EIA process ensures that a broad spectrum of perspectives is considered, thereby enhancing the assessment's comprehensiveness and accuracy. Public consultation plays a vital role in fostering transparency, accountability, and community engagement in the decision-making process, ultimately contributing to more informed and sustainable environmental outcomes.

3.1 SPATIAL & TEMPORAL BOUNDARIES OF ENVIRONMENTAL ASSESSMENT

The initiation of the said project will not affect the land use as the land is already in the industrial zone and allocated for industrial use. No residence can be found in the proximity of the 1000-meter, as depicted in the accompanying figure, the project's implementation strategy includes the adoption of comprehensive mitigation measures. These measures are designed to minimize any potential disturbances to the nearby areas and the local community. A notable aspect of this project is its minimal environmental footprint concerning air emissions. The operation primarily involves

storage activities, which are not expected to result in significant emissions. This aspect ensures a negligible impact on air quality in the surrounding environment, aligning with sustainable operational practices.

Moreover, the project places a strong emphasis on water quality management. Wastewater generated from the facility will undergo rigorous testing to comply with the Punjab Environmental Quality Standards (PEQS), ensuring that the water quality remains within safe and acceptable limits. This commitment to monitoring and maintaining water quality underscores the project's dedication to environmental stewardship. An additional reassurance is the absence of environmentally sensitive areas within a defined safe distance from the project site. This factor significantly reduces the risk of adverse impacts on critical habitats, biodiversity, or ecologically sensitive zones due to the project's operations. Overall, the project's approach to land use change, coupled with its proactive measures to mitigate environmental impacts, demonstrates a responsible and sustainable commitment to minimizing its ecological footprint while ensuring compliance with relevant environmental regulations and standards.


M/s Ch. Electric Rewinding Company
Plot No. 38/A, Bahawalpur Industrial Zone (BIZ), Bahawalpur
Legend
29.322175 N, 71.584323 E
Mariwali Khooh
Mosque
Bahawalpur Industrial Estate
Ruler
Line
Path
Polygon
Circle
3D path
3D polygon
Measure the circumference or area of a circle on the ground
Radius: 1,123.93 Feet
Area: 3,971,859.50 Square Feet
Circumference: 7,062.64 Feet
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Google Earth
400 m

3.2 KEY ISSUES AND CONCERNS IDENTIFIED

During the stakeholder consultation process, representatives from the local community, government departments, industrial sector, and environmental professionals were consulted regarding the proposed Transformer Manufacturing Unit. Overall, stakeholders welcomed the project due to its expected contribution to industrial development and employment generation. However, several key concerns and recommendations were identified for both the construction and operational phases.

Employment Opportunities and Skill Development: Stakeholders emphasized that preference should be given to local residents for employment opportunities wherever feasible. It was also recommended that workers receive adequate technical training and occupational health and safety awareness to improve productivity and maintain a safe working environment.

Air Quality and Dust Management: During the construction phase, dust generation from site preparation and movement of vehicles was identified as a concern. During operation, welding fumes, painting activities, and vehicular emissions may affect local air quality. Appropriate dust suppression measures, proper ventilation, and regular equipment maintenance were recommended.

Noise Management: Construction activities and operation of fabrication, cutting, and testing equipment may contribute to elevated noise levels. Stakeholders recommended implementation of noise control measures, proper maintenance of machinery, and provision of personal protective equipment to workers.

Wastewater and Solid Waste Management: Proper management of domestic wastewater and industrial solid waste was highlighted as an important environmental consideration. Stakeholders stressed the need for wastewater treatment prior to disposal and segregation of recyclable waste such as steel, copper, aluminum, and packaging materials.

Occupational Health and Safety: Ensuring worker safety during construction and operational activities was considered a priority. Recommendations included provision of PPE, emergency response procedures, first-aid facilities, fire protection systems, and regular safety training.

Traffic and Community Impacts: Movement of construction vehicles, raw material transport, and dispatch of finished transformers may increase traffic activity in the area. Stakeholders recommended proper traffic management and adherence to designated transportation routes to minimize inconvenience to nearby communities.

Resource Conservation and Environmental Sustainability: Efficient use of water, electricity, and raw materials was considered essential for sustainable project operation. Stakeholders also encouraged implementation of rainwater harvesting, energy-efficient equipment, and tree plantation within the project premises.

Community Welfare and Environmental Responsibility: Stakeholders emphasized maintaining positive community relations through responsible environmental management practices and compliance with all applicable environmental regulations throughout the project lifecycle.

3.3 SIGNIFICANT ENVIRONMENTAL IMPACTS AND MANAGEMENT FACTORS

The consultation process helped identify the principal environmental impacts and management requirements associated with the proposed project during both construction and operational phases.

Air Quality Management: Potential impacts include dust emissions during construction and localized emissions from welding, painting, and vehicle movement during operation. Implementation of dust control measures, proper ventilation systems, and routine maintenance of machinery will help minimize these impacts.

Wastewater Management: Domestic wastewater generated from workforce facilities requires appropriate treatment and disposal. Septic tank treatment and proper discharge arrangements will be implemented to prevent contamination of soil and water resources.

Solid and Hazardous Waste Management: Operational activities will generate recyclable scrap materials such as CRGO steel, copper, aluminum, and mild steel. Used transformer oil, oil-contaminated materials, and paint waste will require careful handling and disposal through authorized vendors to prevent environmental contamination.

Occupational Health and Safety Management: Worker safety remains a critical management factor due to fabrication, welding, lifting, testing, and electrical activities. Appropriate safety procedures, PPE, emergency preparedness measures, and routine inspections will be implemented.

Noise and Vibration Control: Construction machinery and operational equipment may generate noise within the facility. Proper equipment maintenance, engineering controls, and worker protection measures will be adopted to maintain acceptable noise levels.

Traffic and Site Management: Efficient management of transportation activities, material storage areas, and internal traffic circulation will be necessary to ensure safe and orderly operations.

Resource Efficiency and Conservation: Efforts will focus on efficient utilization of electricity, water, transformer oil, and raw materials. Rainwater harvesting and energy-efficient technologies will support resource conservation objectives.

Environmental Enhancement Measures: Tree plantation and greenbelt development around the project boundary will be undertaken to improve the visual environment, reduce dust dispersion, and contribute to overall environmental sustainability.

The concerns and recommendations identified during the consultation process have been incorporated into the project's environmental management framework. Their implementation will assist in minimizing environmental impacts, ensuring regulatory compliance, and promoting sustainable operation of the proposed project.

4 ALTERNATIVE CONSIDERATIONS

The Environmental Impact Assessment for the said project involves a comprehensive analysis of various alternatives to ensure that the project achieves its objectives with minimal environmental impacts. Alternatives are recommended and examined to determine the best method of achieving project objectives, while minimizing environmental impacts. The discussion and analysis of alternatives in an EIA study should consider other practicable strategies that will promote the elimination of negative environmental impacts identified. This section covers the project alternatives which were examined for the proposed project in the said location. This analysis encompasses site selection, design and technology choices, environmental considerations, and economic strategies, aiming to identify the most suitable options based on environmental, economic, and health and safety criteria.

4.1 Site Alternatives

The proposed site for the project was selected based on its industrial nature. The land (22205.40 SFT) was earmarked for the industrial use. Because the project site falls in Bahawalpur Industrial Zone (BIZ), Bahawalpur.

Alternative sites were not pursued for the following reasons:

* The selected plot lies within the industrial area.
* Proximity to key infrastructure such as hospitals, road networks
* The land is non-agricultural, free from any protected ecosystems, water bodies, or heritage sites, thus minimizing ecological and cultural disruption.

Given these locational benefits and regulatory compatibility, no alternate site was found to offer similar viability and alignment with planning regulations.

4.2 Design and Layout Alternatives

Various design alternatives were explored during the planning phase, focusing on infrastructure efficiency, aesthetic appeal, environmental compatibility, and cost-effectiveness. The chosen layout includes:

* A balanced mix of industrial plots (varied sizes), green belt.
* Hierarchical road networks and walkways designed for safe, efficient circulation and emergency access.
* Allocation of green belts and open spaces.

4.3 Environmental Alternatives

Environmental sustainability was central to the project's planning. While alternative environmental strategies were reviewed, the final plan emphasizes:

* Green Space Allocation: Parks, tree-lined streets, and green belts are planned to mitigate the urban heat island effect
* Stormwater Management: A sustainable drainage system is designed to manage rainwater and prevent flooding.
* Solid Waste Management: Designated waste collection points and an agreement with municipal authorities ensure hygienic waste handling.
* Noise and Dust Mitigation: Plantation buffers and construction phase protocols help reduce temporary disturbances.

These features collectively minimize the project's ecological footprint while improving residential livability.

4.4 Economic Alternatives

To enhance the project's economic viability and community benefits, several cost-effective and resource-efficient strategies were selected over conventional methods:

* Energy-Efficient Street Lighting: Adoption of LED lighting reduces operational energy use.
* Water Conservation Measures: Provision for rainwater harvesting and water-efficient plumbing fixtures.
* Job Creation: The project supports employment for engineers, architects, laborers, and service providers, stimulating the local economy.

These economic considerations not only reduce project costs but also provide long-term social returns, making the selected approach more sustainable and inclusive.

5 PROJECT DESCRIPTION

This chapter presents the detailed project description along with project cost, land acquisition, implementation schedule, workforce and water requirements, etc.

5.1 Objective of Project

The main objectives of the project are:

- ✓ To establish a small-to-medium scale transformer manufacturing unit for the production of power and distribution transformers to meet the growing demand of the power distribution and industrial sectors.
- ✓ To promote local manufacturing and reduce dependency on imported electrical equipment by producing high-quality transformers in compliance with applicable national and international quality and safety standards.
- ✓ To generate skilled employment opportunities and contribute to industrial and economic growth through efficient utilization of resources, adoption of modern manufacturing practices, and implementation of environmentally responsible operations.

5.2 Location & Site Layout

5.2.1 Site Location

The proposed transformer manufacturing unit, M/s Ch. Electric Rewinding Company (SMC-Pvt.) Ltd, is located in the periphery within the administrative jurisdiction of District Punjab. The project area spans approximately 22205.40 SFT, earmarked for industrial development.

The site is strategically positioned to benefit from proximity to major transportation routes, public services. It is:

- Accessible via main Road.
- Free from ecologically sensitive areas, flood plains, and heritage zones.
- The land is non-forested, non-agricultural, and zoned for industrial use.

5.2.2 Site Coordinates

The GPS coordinates of the project site are 29.322175 N, 71.584323 E site location map is attached in next.

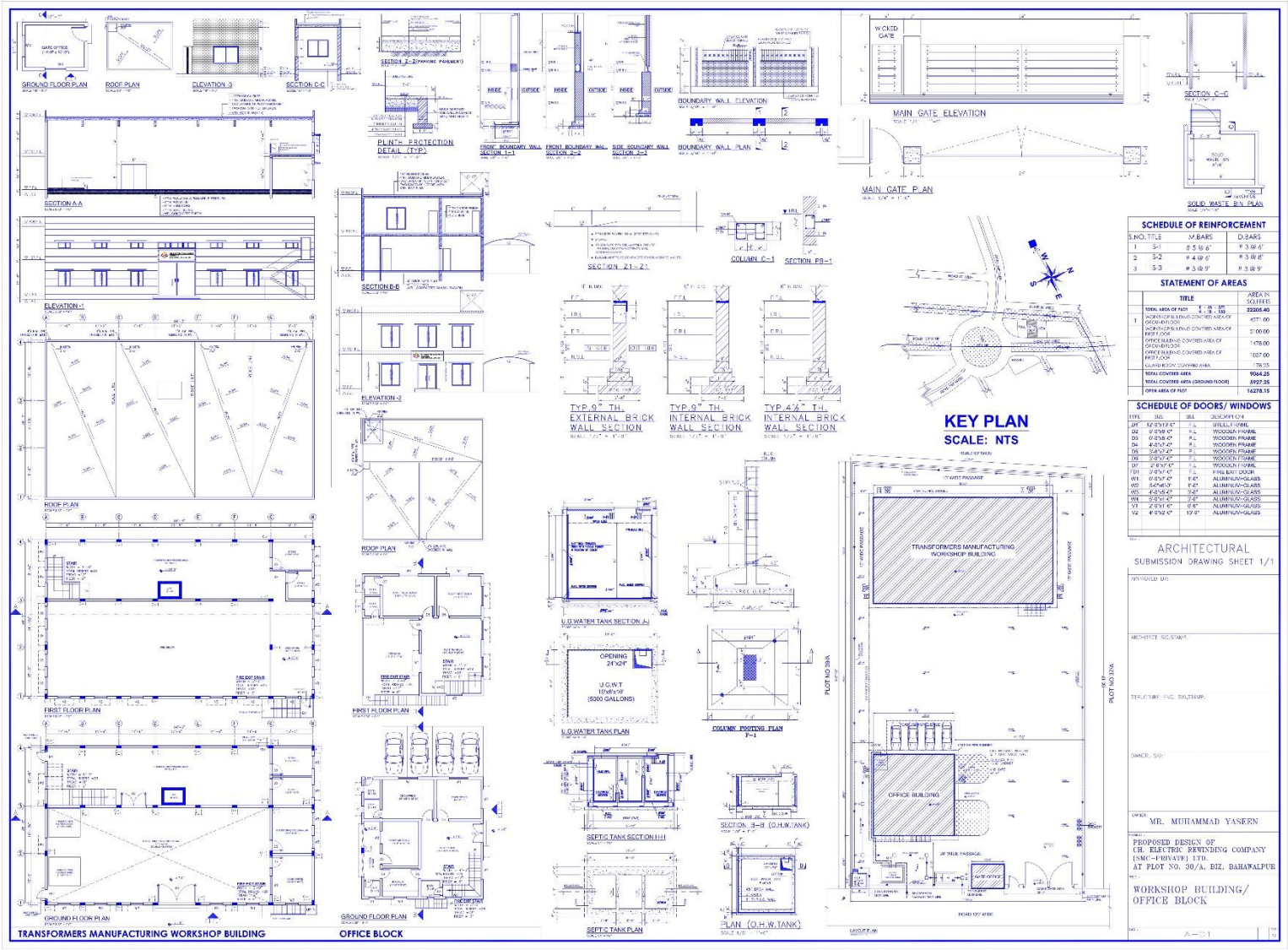
5.3 Land use of the site

The land of the project is industrial in nature and currently it is open land as well.

5.4 Road Access

The proposed project site is well-connected through paved roads providing direct and reliable access to the area. This road infrastructure is vital for facilitating the transportation of construction materials, machinery, and workforce during the development phase, and will also support smooth vehicular access for residents and service providers during the operational phase. The road access enhances the project's feasibility and aligns with sustainable planning objectives. A detailed road access map is included to illustrate the site's connectivity with the surrounding transport network.

M/s Ch. Electric Rewinding Company
Plot No. 38/A, Bahawalpur Industrial Zone (BIZ), Bahawalpur
Legend
29.322175 N, 71.584323 E
Mosque
Bahawalpur Industrial Estate
29.322175 N, 71.584323 E
220kV Grid Station N. DG Bahawalpur
Sardar Wah Four L Distributary
Zahid Kariyan
Google Earth
400 m


GROUND FLOOR PLAN
ROOF PLAN
ELEVATION -3
SECTION C-C
PLINTH PROTECTION DETAIL (TYP)
BOUNDARY WALL ELEVATION
BOUNDARY WALL PLAN
MAIN GATE ELEVATION
MAIN GATE PLAN
SECTION C-C
SOLID WASTE BIN PLAN
SECTION A-A
ELEVATION -1
SECTION B-B
ELEVATION -2
SECTION Z1-Z1
COLUMN C-1
SECTION PB-1
TYP. 9" TH. EXTERNAL BRICK WALL SECTION
TYP. 9" TH. INTERNAL BRICK WALL SECTION
TYP. 4½" TH. INTERNAL BRICK WALL SECTION
KEY PLAN
SCALE: NTS
SCHEDULE OF REINFORCEMENT
STATEMENT OF AREAS
SCHEDULE OF DOORS/ WINDOWS
ROOF PLAN
FIRST FLOOR PLAN
GROUND FLOOR PLAN
ROOF PLAN
FIRST FLOOR PLAN
GROUND FLOOR PLAN
U.G.WATER TANK SECTION A-A
U.G.WATER TANK PLAN
COLUMN FOOTING PLAN F-1
SEPTIC TANK SECTION H-H
SEPTIC TANK PLAN
SECTION B-B (O.H.W.TANK)
PLAN (O.H.W.TANK)
TRANSFORMERS MANUFACTURING WORKSHOP BUILDING
OFFICE BUILDING
ARCHITECTURAL
SUBMISSION DRAWING SHEET 1/1
MR. MUHAMMAD YASERN
PROPOSED DESIGN OF CH. ELECTRIC REWINDING COMPANY (SMC-PRIVATE) LTD. AT PLOT NO. 30/A, BIZ, BAHAWALPUR
WORKSHOP BUILDING/ OFFICE BLOCK
TRANSFORMERS MANUFACTURING WORKSHOP BUILDING
OFFICE BLOCK

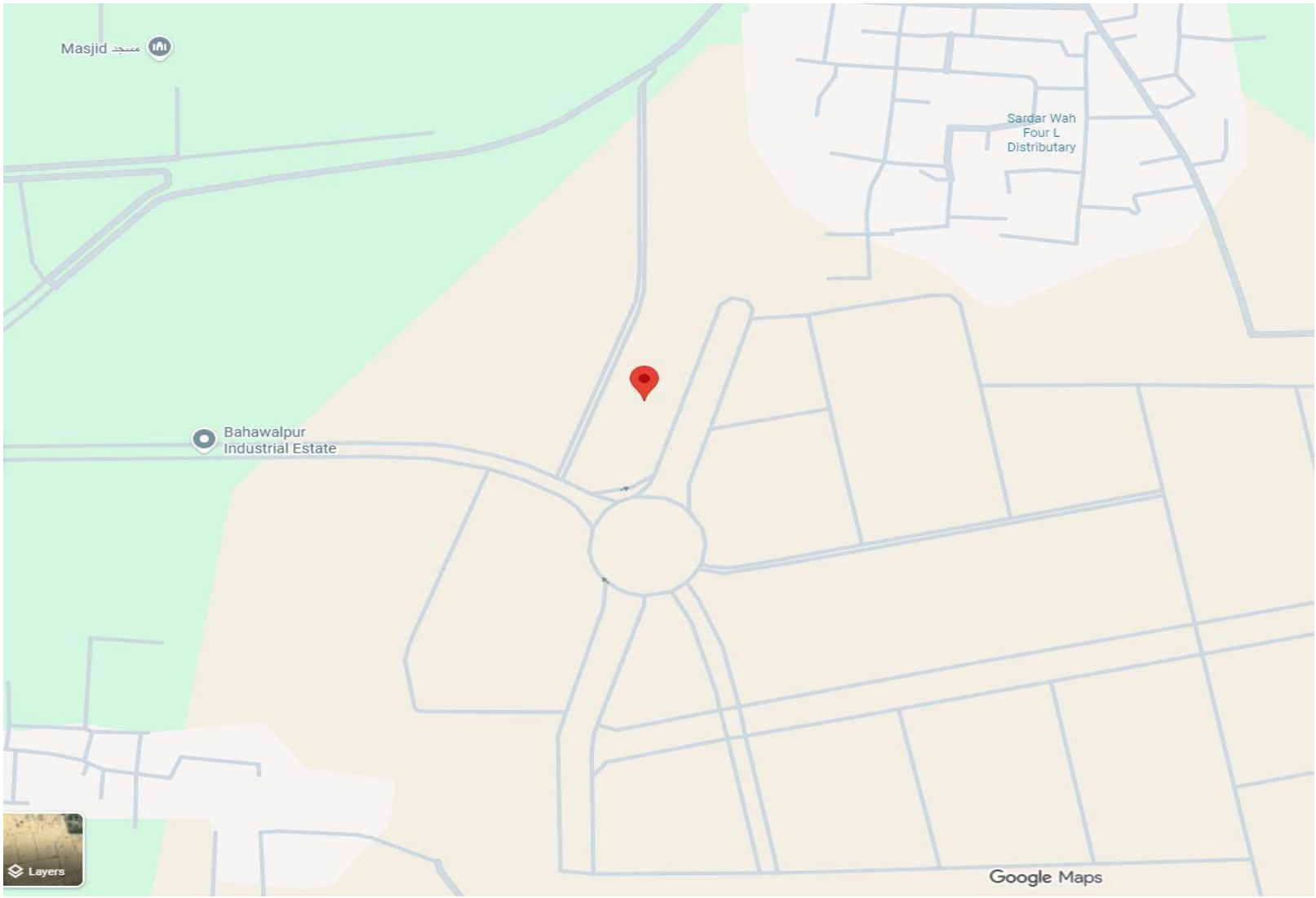


Figure 2 Road Access Map

5.5 Vegetative Features of Site

The project site features sparse to moderate vegetation, primarily consisting of native grasses, scattered shrubs, and a few trees like kikar and sheesham. No rare or protected plant species are present, and the area has historically been used for intermittent agriculture.

5.6 Plantation Plan

To enhance environmental sustainability and aesthetic appeal, the proposed project includes the plantation of approximately 1,000 to 2,000 trees and shrubs within and around the site. The plan emphasizes shade-providing, ornamental, and native species, ensuring long-term ecological balance and improved air quality.

5.6.1 Key Features

Boundary Plantation: Fast-growing, pollution-tolerant species such as Neem and Peepal will be planted along the perimeter for screening, dust control, and noise reduction.

Ornamental Trees and Shrubs: Selected for visual appeal, seasonal flowering, and biodiversity support.

Native Species Priority: Focus on low-maintenance, drought-tolerant plants suited to climate.

5.6.2 Maintenance Plan

- **Watering**: Efficient irrigation to meet species-specific needs and minimize water wastage.
- **Pruning & Trimming:** Regular maintenance to ensure healthy growth and landscape aesthetics.
- **Annual Evaluation:** Yearly health assessments with prompt replacement of dead or unhealthy plants.

5.6.3 Landscaping Considerations

- **Sustainability:** Use of natural fertilizers and drought-resistant species to reduce resource consumption.

- **Seasonal Variety:** Integration of flowering plants for year-round color and visual interest.
- **Soil Health:** Maintenance of fertility using organic methods to support long-term plant growth.

Recommended Species

S. No.	Common Name	Scientific Name	Benefits
1.	Neem	*Azadirachta indica*	Air purification, drought-tolerant
2.	Peepal	*Ficus religiosa*	Shade-providing, improves air quality
3.	Kikar	*Acacia nilotica*	Native, soil enrichment, fast-growing
4.	Shisham	*Dalbergia sissoo*	Timber value, soil stabilizer
5.	Siris	*Albizia lebbeck*	Fast-growing, nitrogen-fixing
6.	Dherek	*Melia azedarach*	Ornamental, pollution control
7.	Bakain	*Melia azadirachta*	Aesthetic, hardy tree
8.	Mulberry	*Morus alba*	Provides shade, supports bird habitat
9.	Amaltas	*Cassia fistula*	Seasonal flowers, ornamental
10.	Bottlebrush	*Callistemon citrinus*	Attractive flowers, pollution absorber

5.6.4 Plantation Impact Assessment

The proposed project site, located within site, consists mainly of open land with limited existing plantation, including a few scattered shrubs and small trees. Satellite imagery and on-site observations confirm that no dense or structured plantations currently exist within the project boundary. However, green patches are visible in surrounding areas, particularly toward the northeast and southeast.

Potential Impacts:

Vegetation Disturbance: Minor vegetation may be removed during land development, especially in zones designated for infrastructure such as roads and utilities.

Dust Emissions During Construction: Dust generated from earthworks, vehicle movement, and material handling may temporarily affect surrounding greenery, particularly during dry or windy conditions.

Soil Compaction: Heavy machinery could compact soil, potentially affecting soil fertility and plant growth in adjacent areas.

Mitigation Measures:

- Controlled and phased clearing of vegetation, preserving mature trees where feasible.
- Frequent water sprinkling during construction to suppress airborne dust.
- Use of green mesh barriers around the construction area to protect adjacent green patches.
- Post-construction plantation of native, shade-giving, and pollution-tolerant species along internal roads, plot boundaries, and open spaces.
- Development of green belts and community parks within the project site to enhance overall greenery and reduce environmental footprint.

5.7 Magnitude & Cost of Project

The said project spans a total area of 0.50 Acres, marking it as a significant industrial development initiative in the region. The project carries an estimated total capital investment of 350 million PKR, covering infrastructure construction, machinery installation, and operational setup. The financial plan includes all costs associated with ensuring operational safety and environmental protection, eliminating the need for separate allocations for these aspects. Strong emphasis will be placed on the safe management of equipment and operations through rigorous and proactive practices. This integrated financial and operational planning underscores the project's commitment to both economic viability and environmental responsibility.

5.7.1 Cost Breakdown

Machinery & equipment: PKR 130 million

Raw Material: 75 million

Civil works & utilities: PKR 55 million

Working capital: PKR 40 million

Environmental Budget & EMMP: 15 million

Contingencies, Engineering & Pre-operational Expenses: 35 million

Total Estimated Cost: Approx. PKR 350 million

5.8 Proposed Schedule of Implementation

Stage I: Preliminary Phase

The land will be cleared, surveyed, and prepared for construction activities. Initial documentation and preliminary planning will also be undertaken.

Stage II: Design and Approval Phase

During this phase, the detailed design of the project will be completed, and necessary approvals and NOCs from regulatory authorities will be obtained.

Stage III: Construction and Infrastructure Development Phase

Once approvals are in place, heavy machinery will be mobilized to the site. Core construction activities, including road networks, sewerage, water supply, and electrification works, will be initiated and completed.

Stage IV: Marketing, Sales, and Operations Phase

Upon substantial completion of infrastructure, marketing and plot sales will launch. Employees will be recruited, operational staff will be trained, and the project will transition into the possession handover phase, where operations will officially commence.

Table 2 Schedule of Implementation

ACTIVITY	TIME FRAME													
	Four Week		Four Week		Four Week		Four Week		Four Week		Four Weel		Four Week	
Preliminary Phase														
Design Phase														
Approval Phase														
Construction Phase														
Infrastructure Development														
Marketing and Plot Sales Launch														
Completion of Infrastructure Works														
Possession Handover & Operations Start														
Possession Handover & Operations Start														

5.9 Description of Project

5.9.1 Project Overview

The M/s Ch. Electric Rewinding Company (SMC-Pvt.) Ltd, located at Plot No. 38/A, Bahawalpur Industrial Zone (BIZ), Bahawalpur, Punjab. Spanning over an area of 22205.40 SFT. The proposed unit is designed for the manufacturing and assembly of power and distribution transformers with capacities up to 6 MVA (6000 kVA).

Types of transformers:

- Distribution Transformers
- Power Transformers
- Dry Type Transformers
- Oil Immersed Transformers
- Pole Mounted Transformers
- Pad Mounted Transformers
- Step up Transformers
- Step down Transformers

5.9.2 Process Description:

The manufacturing process of transformers involves a series of fabrication, assembly, insulation, oil filling, and testing operations. The process is designed to ensure production of reliable and high-quality power and distribution transformers in accordance with applicable technical standards.

1. Raw Material Receiving and Inspection

Raw materials including CRGO silicon steel sheets, copper/aluminum conductors, insulation materials, transformer oil, mild steel sheets, and accessories are received at the facility. Materials are inspected for quality, dimensions, and compliance with project specifications before being transferred to designated storage areas.

2. Core Cutting and Assembly

CRGO silicon steel sheets are cut into the required dimensions using precision cutting equipment. The cut laminations are then stacked and assembled to form the transformer core, which serves as the magnetic circuit of the transformer.

3. Coil Winding

Copper or aluminum conductors are wound into high-voltage (HV) and low-voltage (LV) coils using winding machines. The winding process is carried out according to the required electrical specifications and transformer rating.

4. Insulation and Core-Coil Assembly

Insulation materials such as insulation paper, pressboard, and insulating components are applied to the windings. The assembled coils are then mounted onto the transformer core to form the active part of the transformer.

5. Tank Fabrication and Welding

Transformer tanks are fabricated from mild steel sheets through cutting, bending, fitting, and welding operations. The tank is designed to house the active part and transformer oil while providing structural integrity and protection.

6. Surface Preparation and Painting

Fabricated tanks undergo surface cleaning and preparation prior to painting. Primer and protective paint coatings are applied to prevent corrosion and improve the durability of the finished product.

7. Drying / Vacuum Oven Treatment

The assembled active part is subjected to controlled drying in a hot-air or vacuum drying oven to remove moisture from insulation materials. This process enhances dielectric strength and ensures reliable transformer performance.

8. Transformer Oil Filtration and Filling

Transformer oil is filtered to remove moisture and impurities before being filled into the transformer tank. The oil serves both insulating and cooling functions during transformer operation.

9. Final Assembly of Accessories

Various accessories including bushings, radiators, conservators, tap changers, gauges, and protective devices are installed and connected to complete the transformer assembly.

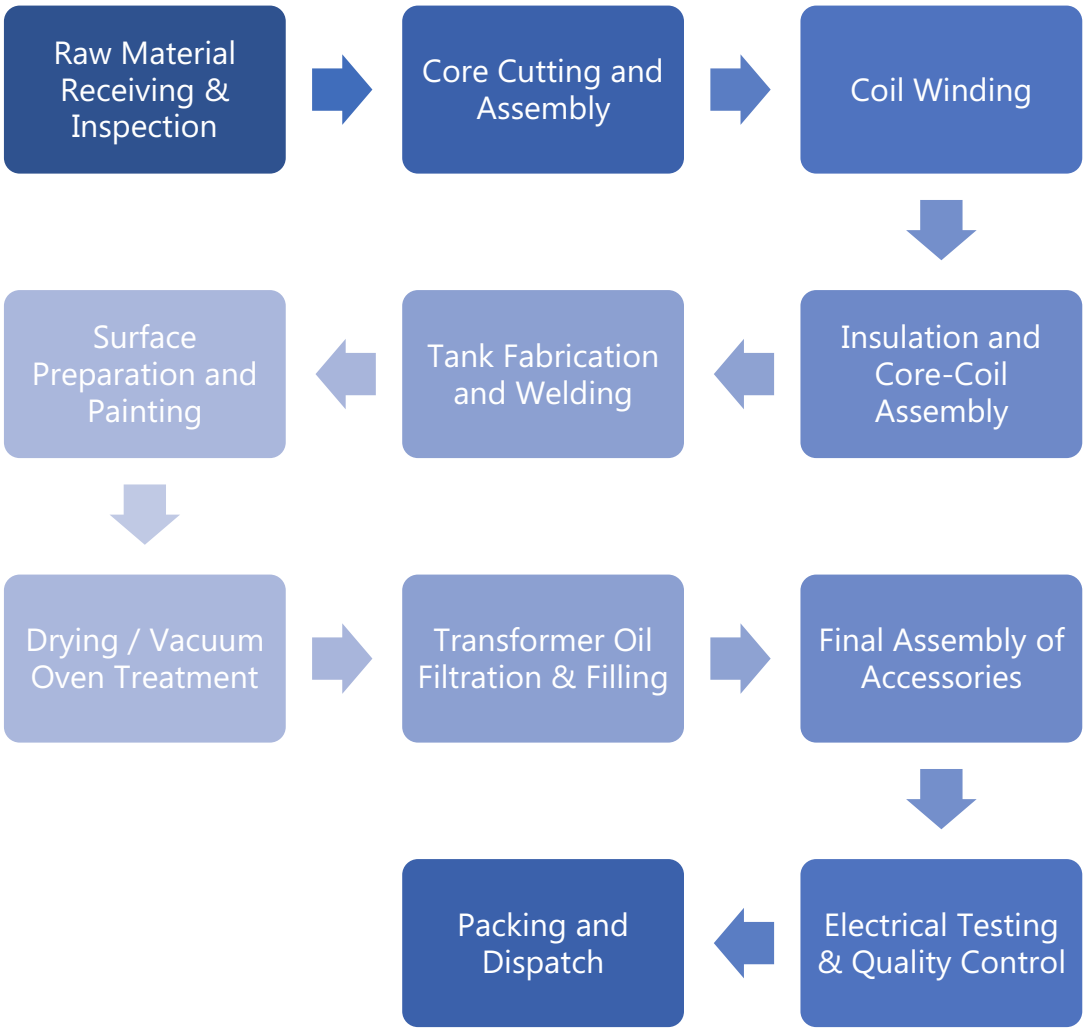
10. Electrical Testing and Quality Control

Each transformer undergoes comprehensive testing, including insulation resistance tests, turns ratio tests, winding resistance tests, oil quality checks, and routine electrical performance tests to verify compliance with applicable standards and customer requirements.

11. Packing and Dispatch

After successful testing and quality verification, transformers are cleaned, labeled, packed, and prepared for dispatch to customers. Finished products are loaded onto transport vehicles and delivered to the designated locations.

Process Flow Chart



5.9.3 List of Machinery:

List of machinery that will be used in the manufacturing of the transformer is given below:

- Core Stacking/Assembly Table
- HV & LV Coil Winding Machines - Automatic + Manual
- Vacuum Drying Oven
- Shearing Machine
- Oil Processing & Filtration Plant
- Insulation Paper Wrapping Machine
- Portable & Vertical grinder and Drill Machines
- Megger ,TTR , IR testing Devices
- Tank Fabrication & Welding Setup

- Transformer Testing Lab: HV Test, IR, Ratio, Vector Group, Load/No-load, Temperature Rise
- Overhead Cranes up to 10 Ton
- spray paint Machine

5.9.4 Key Facilities & Functional Areas

Water Supply and Wastewater Management:

Water will primarily be utilized for domestic purposes, cleaning activities, and landscape maintenance. Wastewater generated from washrooms and associated facilities will be treated through a septic tank system and disposed of through the designated industrial drainage/sewerage network.

Electricity Supply:

The facility will primarily operate on grid electricity supplied by the relevant utility provider. Electrical power will be used for core cutting machines, winding machines, welding equipment, drying ovens, testing facilities, lighting, and other operational activities. A standby diesel generator may be installed for emergency power backup.

Solid Waste Management:

The facility will implement a waste segregation and collection system for recyclable and non-recyclable waste streams. Metal scrap, including CRGO steel, copper/aluminum, and mild steel, will be sold to authorized recyclers, while other wastes will be managed through EPA-approved waste handling vendors.

External Development Features

Internal Road Network:

The project will include paved internal roads and circulation areas to facilitate the safe movement of raw materials, finished transformers, employees, and transport vehicles within the facility.

Greenbelt Development:

Tree plantation and landscaping will be carried out along the project boundary and available open spaces to improve aesthetics, reduce dust dispersion, and enhance the environmental quality of the site.

Stormwater Management:

A stormwater drainage system will be developed to safely convey runoff generated during rainfall events. Rainwater harvesting through rooftop collection and recharge/storage arrangements will also be incorporated to promote sustainable water management and groundwater recharge.

5.10 Available Facilities

1. Workforce

Manpower demand estimation is an essential component to facilitate deployment of manpower. Project will be constructed in phases. Tentative workforce required for proposed project during the construction phase will be about 30-40 workers/employees. Unskilled labor should be hired locally.

2. Source of Water

It is supposed that water tanks will be used by the contractor on the site for construction activities. The source of water during the operation phase for the proposed project will be the ground water.

3. Water requirement

The water requirement will be fulfilled by the OHWT.

4. Wastewater Generation and Treatment Mechanism

The wastewater generation is estimated to be 3-5 m^3/day of the proposed Project. Wastewater treatment system will be installed that will be septic tank.

5. Solid waste

The solid waste generation is estimated to be 40-50 kg/day which will be collected at designated place.

6. Power requirement / power source

The main source of electricity/electric power will be Water & Power Development Authority (WAPDA) and industrial grid.

7. Personnel Protective Equipment (PPE)

To safeguard workers during both construction and operational phases, the following personal protective equipment will be provided, tailored to the specific activities undertaken:

- Protective goggles
- Leather or rubber safety shoes
- Gloves
- Face masks
- Helmets
- Overcoats

These measures emphasize the project's dedication to maintaining high standards of workplace safety, environmental protection, and operational efficiency, aligning with best practices and regulatory requirements.

5.10.1 RAINWATER HARVESTING SYSTEM

1) Introduction

To promote sustainable water management and groundwater recharge, a rooftop rainwater harvesting system is proposed for the proposed unit. The system will collect rainwater from the roofs of the workshop building, office building, and guard room and direct it to a recharge structure through a network of gutters, downpipes, and filtration units.

2) Catchment Area

The total rooftop area available for rainwater harvesting is summarized below:

Description	Area (ft^2)
Workshop Building Ground Floor Roof	4,271.00
Office Building Ground Floor Roof	1,478.00
Guard Room Roof	178.25
Total Rooftop Catchment Area	5,927.25

Total Catchment Area = 5,927.25 ft^2 = 550.66 m^2

3) Rainfall Data

Bahawalpur receives an average annual rainfall of approximately 180 mm/year (0.18 m/year)**.**

4) Rainwater Harvesting Potential

The annual rainwater harvesting potential has been calculated using the following formula:

Annual Harvestable Rainwater = Catchment Area × Annual Rainfall × Runoff Coefficient

Where:

- Catchment Area = 550.66 m^2
- Annual Rainfall = 0.18 m/year
- Runoff Coefficient = 0.85 (for metal/concrete roofs)

Therefore,

Annual Harvestable Rainwater

= 550.66 × 0.18 × 0.85

= 84.25 m^3/year

= 84,250 liters/year

The proposed system will consist of:

- Rooftop collection through gutters and downpipes.
- Filtration chamber containing gravel, coarse sand, and mesh screens.
- Recharge pit for groundwater replenishment.
- Overflow connection to the stormwater drainage system.

5) Recharge Pit Design

A recharge pit of approximately 2.5 m × 2.5 m × 3.0 m depth is proposed. The pit will be filled with graded gravel, crushed stone, and coarse sand to facilitate infiltration of rainwater into the subsurface strata.

6) Environmental Benefits

Implementation of the rainwater harvesting system will:

- Reduce stormwater runoff from the site.
- Promote groundwater recharge.
- Minimize localized waterlogging during rainfall events.
- Support sustainable water resource management.
- Enhance environmental sustainability of the project.

5.11 Restoration and Rehabilitation Plan

The project is located within an industrial area, but given the nature of the development, there are no significant concerns related to displacement or disruption to local residents. The project is designed to avoid the need for relocation or demolition of any existing structures, ensuring minimal impact on the surrounding community. Therefore, there is no immediate need for restoration, rehabilitation, or relocation. The development will proceed in alignment with sustainable practices within the designated area. Over its estimated 25-year operational lifespan, all civil structures and infrastructure will undergo periodic renovations to maintain operational efficiency and safety standards, without requiring extensive rehabilitation or affecting the residential community.

5.12 Safety Signs/Safety Boards

Safety signage plays a crucial role in accident prevention and risk communication at the workplace. These signs and symbols, designed to be easily understood by all employees, are essential for conveying important safety information and instructions. The project will ensure that safety signs, symbols, and boards are prominently displayed across all departments, facilitating a culture of safety and awareness among workers and staff.

3 Safety Signs & Symbols

5.13 Government Approvals and Leases

Compliance with environmental regulations is paramount, necessitating approval from the Environmental Protection Agency (EPA) of Punjab, as per Section 12 of the Punjab Environmental Protection (Amendment) Act 2012. The preparation of this report for submission to EPA Punjab is a critical step towards securing the necessary governmental endorsements to commence construction, underscoring the project's adherence to legal and environmental mandates.

6 DESCRIPTION OF ENVIRONMENT

An environmental baseline study is intended to establish a database against which potential impacts can be predicted and managed subsequently. The EIA of the proposed project covers a comprehensive description of the project area, including regional resources which are expected to be affected by the project, as well as those which are not expected to be directly affected by the construction and operation of the project.

A site visit was conducted to survey the field area for collection of relevant data. Interviews were conducted with the public and stakeholders of the project area to seek public opinion on the implementation of the proposed project. Various Governmental and Non-Governmental Organizations (NGOs) were also visited for the collection of relevant data and their views on the proposed project were recorded for incorporation into the EIA report. The environmental impacts of any activity or process will be assessed based on deviation from the baseline or normal situation. The following components form part of the baseline:

- Physical Environment
- Ecological Environment
- Socioeconomic Environment

6.1 Physical Environment

The physical environment consists of existing land form and land use at the Project site, geology, pedology, hydrology, meteorology and climatology. The Pre-Project condition (i.e. baseline) of these components of the physical environment is described in detail in this chapter. To identify the potential impacts on the physical, biological and socio-economic environment that will likely to arise from the Project activities. The physical resources included in the study comprise of:

- Geology
- Pedology
- Topography
- Climatology
- Temperature

- Altitude
- Average annual rainfall
- Hydrology testing and monitoring

6.1.1 Geology

The Bahawalpur City is located in the South-East of Province Punjab and it is located at the Western side of Province Sindh. The soil of the Study Area is very fertile. The chief crops of this area are wheat, gram, cotton, sugarcane and dates. Typically, city is lying at the hub of trade routes from the North, East, South-East and south and favorable for commerce. It is a center for trade in many crops i.e. wheat, cotton, rice etc. grown in the surrounding region. The pH of the soil ranges from 7.6 to 8.5 which are closer to neutral with a trend towards alkalinity. The electrical conductivity (EC) of the soil is less than 4.00 and the texture of the soil is sandy loam. The concentration of basic nutrients such as Phosphorus (5.5-15.7 mg/ppm), Potassium (80 -120 mg/ppm) and Organic Matter (less than 0.87%) shows that the soil is fertile and suitable for the cultivation of many crops such as corn, wheat and cotton.

6.1.2 Seismicity

Bahawalpur lies in seismic zone map at 2A zone. Two major active fault lines located near the Study Area are Surjam Fault, about 50 km to the southwest and the Jhimpir Fault, about 45 km to the south. The maximum recorded earthquakes on the Surjam and Jhimpir Faults were 6.1 and 5.6 on the Richter scale, respectively.

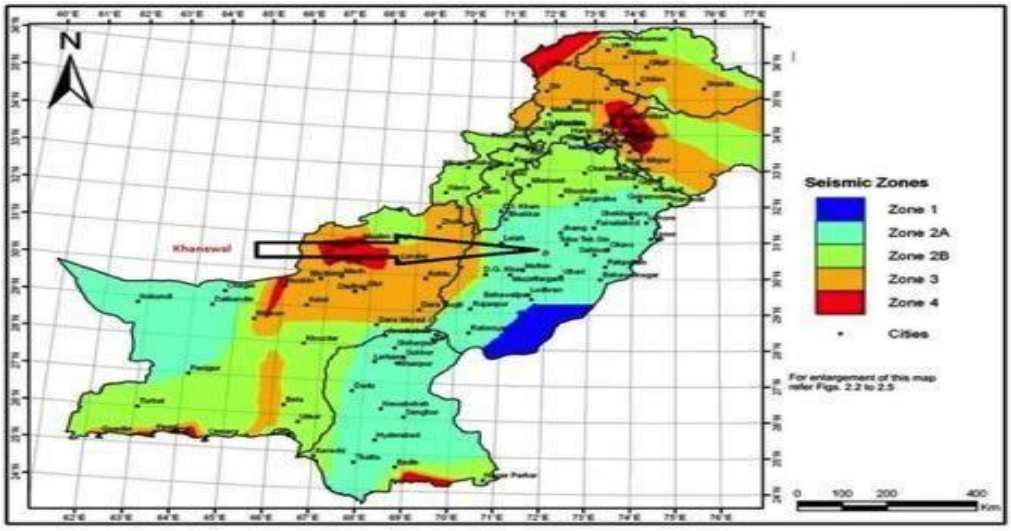


Figure 4 Seismic Zone of Pakistan

6.1.3 Climate

Bahawalpur has a fairly varied climatic condition and the area is classified as arid and subtropical. In the riverine areas of the North, the weather is relatively mild, hot and humid. The average daily wind speed is highest in August which is 81km/h, whereas in September it was around 74km/h. In recent years, the maximum sustained wind speed has reached 74 km/h and its equivalent to 46M/h.

6.1.4 Topography

The elevation of the Bahawalpur ranges between 20 and 45 m above mean sea level. It slopes towards the Indus River which runs along the eastern boundary of the Study Area. There are small sedimentary hills in the western and southwestern side of the Pakpattan that rise to an elevation of about one hundred meters.

6.1.5 Soils

The dominant soil group in both areas is Calciols, which are loamy soils with accumulation of secondary calcium carbonates.

6.1.6 Temperature

The summer season is very hot and long. Average day temperature from May to September is about 40 ° C. May and June are the hottest months recorded. The temperature sometimes raises up to 50°C, dust storms are common in the evening and bring relief for the community as the temperature falls considerably. Owing to the active radiation under clear sky, night is generally comfortable being cool and calm. The temperature falls up to 25°C at night. From July to September the heat is relatively less intense due to the interference of the monsoon, which tends to decrease the day temperature. The winter season spreads over December, January and half of the February, and is fairly cold. The average temperature, during day-time is only 20°C in January. Nights are very cold and temperature often falls down to 5°C.

Month	Mean temp. Max	Mean temp. min	Precipitation (%)	Humidity (%)
January	19.7	5.0	33.8	66.2
February	21.6	7.7	50.0	60.0
March	26.0	12.5	60.5	53.8

April	33.0	17.7	36.5	41.8
May	38.1	22.0	31.8	32.5
June	40.5	25.8	51.6	37.8
July	35.7	25.8	23.3	67.8
August	34.4	25.3	22.2	70.8
September	35.0	23.0	77.7	65.5
October	33.1	16.6	12.2	55.6
November	27.8	9.9	9.9	62.7
December	21.5	5.7	30.4	68.9

6.2 Baseline Monitoring of Environment

6.2.1 Ambient Air Quality

Atmospheric pollution means the imbalance in the normal air chemistry. It can occur due to the addition of a new chemical into the atmosphere or by the change in concentration of the chemicals already existing in the atmosphere. Atmospheric pollution particularly in urban areas has a strong impact upon daily life. The reasons for such changes can both be natural as well as anthropogenic. Ambient air quality is a key to measuring the concentration of the various chemicals in the atmosphere; especially of the chemicals which pose detrimental effects on health, safety and environment, to have a comparison with their safe concentrations, as established in WHO Standards and NAAQS.

It was observed during the visit that Petrol and Diesel operated vehicles are emitting smoke and exhaust gasses in excessive quantities which are the leading sources of environmental pollution and are responsible for the air quality worsening. In fact, exhaust emissions (including dangerous gases such as carbon monoxide, oxides of nitrogen, hydrocarbons, and particulates) and Evaporative emissions (including vapors of fuel, which is released into the atmosphere, without being burnt) are the prime reasons of deterioration of air quality. The following table presents the measured parameters of the ambient air look from the center of the project area for assessment of air quality.

Table 3 air quality

Parameters	CO	SO2	NO2	PM10	SPM	O3
Unit	**mg/m3**	**µg/m3**	**µg/m3**	**µg/m3**	**µg/m3**	**µg/m3**
Proposed Site	0.1	35.46	16.98	33.89	195	41.51
NEQS	5	120	80	150	500	130

6.2.2 Noise Levels

Noise is described as an unwanted sound emitted from unavoidable sources of anthropogenic activities. Daily based natural induced sources of noise are rare to none but human induced noise sources are plentiful and un-avoidable. Physically, there is no distinction between sound and noise. Sound is sensory.

The perception and the complex pattern of sound waves is labeled noise, music, speech, low altitude airplane flying etc. The noise pollution in the project area is a source of pollution and nuisance. Among eight noise measurement locations in the cities, the study says, on average, the noise level ranged from 57-60 dB (A) in and around the project site.

6.3 Ecological Environment

As the climatic conditions of Bahawalpur is semi-arid and subtropical. The vegetation of the area falls under scrub, dry and tropical thorn forest. Due to rapid increase in the population of the city and to cater for its housing and commercial requirements the agricultural lands were converted into business centers, multi-story plazas and housing colonies. The Project Area was

once covered with native vegetation consisting of trees like Keekar (*Acacia Karoo*), Wan (*Salvadoraoleoides*) and Jand (*Prosopisspicigera*). This native vegetation is under threat throughout its range with the onslaught of civilization and this vegetation was cleared for agricultural purposes.

6.3.1 Forestry

Approximately an area of 68,067.37 Hectares is under forest. This is about 10.21% of the total area of the district. There is also linear plantation of 2,211.94 Km alongside the roads/rails/canals in the district. The most common trees grown in the respective area are Shisham, Eucalyptus, Kikar, Tali, Safaeda, etc.

Table 3 (Tress Found near the Site)

Local name	Species
Kikar	Acacia Karoo
Tali	Erythrophleums
Safaeda	uaveolen
Sheesham	Eucalyptus

6.3.2 Grass

The establishment of grasses on Project and Study Area under hot weather conditions in Bahawalpur has successfully been demonstrated. Following grass species have a high growth potential of 0.4-0.6 t/ha. The most common species are; *Lasiurussindicus* (Gorkha) *Cenchrusciliaris* (US Buffel) *Cenchrusciliaris* (Cv. Bileola), *Pennisetumperpurum* and *Pancicumantidotale*.

Table 4 (Type of Flora)

Scientific Name	Common	Life form	Life trend
Lasiurusscindicus	Sewen	Phanerophyte	Perennial
Cenchrusciliaris	Dhaman	Therophyte	Perennial
Panicumantidotale	Morrot	Hemicryptophyte	Perennial
Pennisetumperpurum	Sarkanda	Hemicryptophyt	Annual

6.3.3 Fauna

The study on the terrestrial fauna at the Study Area is based on the field investigation, reports of Forest Department and Documents of Islamia University Bahawalpur. Due to scanty vegetation growth in this region, not much of variation is observed in the local animal life. Despite this, still a large variety of animals are found in this area.

Table 5 (Type of Herbs and Shrubs)

Local Name	Scientific Name
Chinkara	*Gazellabennetti*
Hare	*Lepusnigricolis*
Hedgehog	*Hemiechnusauritus*
Honey Badger	*Mellivoracapensis*
Indian Caracal	*Felis caracal*
Indian Mongoose	*Herpestesedwardsi*
Chinkara	*Gazellabennetti*

6.4 Socio Economic Environment

This section provides collective information about the existing socio-economic and environmental condition of the Project Area within the COI. The different types of socio- economic aspects were covered such as demographic profile, occupation, education and health facilities. This data helped in identifying major interventions for the development of EMMP of the poultry farm (control shed) for the proposed Project. The study also helped to assess the positive or adverse impacts on local community. Detail of crops that are being sown in the respective area, is given below

6.4.1 Demographic Profile

The main crops which are being cultivated in Bahawalpur City and its surroundings are; Cotton, Sugarcane, Wheat, Sun Flower Seed, Rape/Mustard Seed, Rice, Mangoes, Citrus, Dates and Guavas are some of the famous fruits exported out of the country as well as fodder crops such as, Onion, Tomato, Cauliflower, Potatoes and Carrot.

6.4.2 Religion

The population of Bahawalpur is over 99% Muslim.

6.4.3 Languages and Major Castes

Punjabi and Urdu are spoken in the city. Main castes are chishty, Rehmani, LAK, Chadhar, Jatt, Tagga, Ansari, Butt,Dulu, Sayal, Kamboh, Bhadru, Mughal, Dogar, Sanpal, Gujjar, Arain, Rajput, Tajra, Hiraj and Shaikh Awan.

6.5 Quality of Life Values

These sections discuss the social structure of this area. The consultant carried out a detailed survey in different villages and collected the desired information. The socio-economic questionnaire and environmental checklists were used as survey tools to collect required information. The details of this survey are discussed below:

6.5.1 Occupation of Respondent

The major occupation of the people residing in this area is agriculture but there is small number of people who work in private sector as labors (skilled and unskilled).

6.5.2 Road Access

The Bricks Industry is connected with its surrounding city Bahawalpur and other rural areas Jhangi Wala road. The major road which connects the Bricks Industry with Bahawalpur is metaled.

6.5.3 Common Diseases

In this area, common diseases are Common Cold, TB (Tuberculosis), Typhoid, Stomach Worms, Malaria, Goiter, Dysentery, Arthritis and Hepatitis.

6.5.4 Telephone Facilities

Both Landline and Cellular telephone facilities are present in the project area.

6.6 Site Suitability

6.6.1 Quality of Life

People of the proposed area have non-nomadic life style and are living here from times of their ancestors, possess all basic needs to survive. Both Family Systems (Joint and Nuclear Family System) are sound in the proposed area. The major occupation of the people, residing in the proposed area, is agriculture, business and labor (skilled and unskilled).

6.6.2 Project Response

90% of the respondents believed this project should be implemented. Construction of the project will create labor opportunities for locals, and it will help to improve the economic conditions of the area. Construction of the rice processing mill will also provide better living facilities for the people. The respondents also provided mitigation measures like certified contractors must be hired, proper plantation should be done, proper procedures should be followed etc. They said, if mitigation measures are implemented, they would have no objection.

7 IMPACTS AND MITIGATION MEASURES

This chapter provides a review of the potential impacts of the said project located at Plot No. 38/A, Bahawalpur Industrial Zone (BIZ), Bahawalpur over an area of 22205.40 SFT. The estimated cost for the subject project will be about 350 million PKR. These impacts could be both positive and negative and have been classified accordingly by a thorough review of the construction and operational phases of the project. This assessment numerates the magnitude of these impacts with the aid of environmental checklist and presents effective mitigation measures to counter their adverse nature.

7.1 Purpose of Environmental Mitigation Measures

Environmental mitigation measures are essential for ensuring the sustainable operation of the project, aligning with environmental compliance, and safeguarding ecological integrity. The rationale behind these measures is dissected through a series of critical inquiries:

1. **Identification of the Problem**

The core issue arises when environmental resources are exploited unsustainably, leading to significant degradation. Such exploitation diminishes the environment's resilience and carrying capacity, severely impeding its natural recovery processes. In the context of the proposed project, this could manifest as pollution, habitat disruption, or resource depletion, directly impacting the local ecosystem's health and functionality.

2. **Timing for Addressing the Problem**

The environmental impacts of the project will become apparent from the onset of construction activities and continue throughout the operational phase. These effects are not confined to the project site but may extend to surrounding areas influenced by project activities. Early identification and timely intervention are crucial for preventing long-lasting or irreversible damage. Mitigation efforts should be initiated at the planning stage and integrated into all phases of the project lifecycle.

3. Location for Mitigation Efforts

Mitigation strategies should be applied at the source of the environmental impact. This means implementing measures directly within the project site and, as necessary, in adjacent areas that might be affected by project-related activities. Focusing on the origin of potential problems ensures targeted and effective mitigation, reducing the overall environmental footprint of the project.

4. Approach to Addressing the Problem

Addressing environmental issues necessitates adopting eco-friendly practices and technologies throughout the project's development and operation. Mitigation plans should include:

- Resource Efficiency: Minimizing the use of natural resources and promoting recycling and reuse to reduce waste.
- Pollution Control: Implementing advanced pollution control technologies and practices to minimize emissions, effluents, and waste generation.
- Habitat Protection: Avoiding or minimizing impacts on natural habitats and biodiversity, including the development of green belts and conservation areas.
- Community Engagement: Involving local communities and stakeholders in decision-making processes to ensure that mitigation measures address their concerns and benefit the local environment and population.
- Monitoring and Compliance: Establishing rigorous monitoring systems to assess the effectiveness of mitigation measures and ensure compliance with environmental regulations.

7.2 Impact Identification Methodology

The methodology for identifying potential environmental impacts associated with the proposed facility involves a comprehensive approach. It includes:

Review of Project Activities: Detailed examination of all phases of the project to understand the range of activities and their potential environmental interactions.

Environmental Study: Assessment of the surrounding environment to identify sensitive areas, ecological value, and any existing vulnerabilities.

Literature Review: Analysis of existing studies, reports, and publications related to similar projects to draw parallels and learn from past experiences.

Expert Judgment: Utilization of insights from environmental experts to predict potential impacts based on their expertise and knowledge of similar projects.

7.3 Approaches for Mitigation Measures

Mitigation of environmental impacts involves several strategies:

* **Avoid:** Altering project plans such as route or site adjustments to protect ecological or archaeological features.
* **Replace:** Creating equivalent ecological habitats elsewhere if the original habitat is disturbed.
* **Reduce:** Implementing measures like filters, cyclones, noise barriers, and visual screening to lessen impacts.
* **Restore:** Rehabilitating the site post-operations to their original state or better.
* **Compensate:** Providing support to displaced communities or individuals through relocation, facilities, or financial means.

7.4 Impacts and Mitigation Measures due to Location

Development will permanently alter the existing land use from agricultural/open land to urban residential and commercial usage, impacting the rural character of the area. Construction activities will generate dust and noise, potentially affecting nearby communities and air quality temporarily. Movement of construction materials and, later, residential traffic could increase congestion on local access roads.

Mitigation Measures

Allocate green areas, parks, and open spaces within the project to maintain environmental balance. Sprinkle water on unpaved areas during construction to control dust emissions. Use noise barriers or schedule high-noise activities during

daytime hours to minimize disturbance. Ensure that construction machinery is fitted with appropriate noise suppression equipment. Implement landscaping plans that use native tree and shrub species.

7.5 Impacts and Mitigation Measures in Construction Phase

i. Air Pollution

Impacts:

During the construction phase, significant dust emissions are expected from activities such as land clearing, excavation, movement of vehicles, and material handling. Construction machinery powered by diesel engines will also release particulate matter (PM), carbon monoxide (CO), and nitrogen oxides (NOx) into the atmosphere, potentially deteriorating local air quality. Dust may cause respiratory problems among workers and nearby residents if left uncontrolled.

Mitigation Measure:

Dust emissions, one of the major concerns, will be controlled through regular water sprinkling on all unpaved roads, open construction sites, and storage areas, particularly during dry and windy conditions. Additionally, construction material transport vehicles will be covered with tarpaulin sheets to prevent dust dispersion. Machinery and equipment will be regularly maintained to ensure that emissions remain within permissible limits, reducing air pollution.

ii. Noise Pollution

Impacts:

Construction activities, including excavation, operation of heavy machinery, and material transport, will generate high noise levels, potentially affecting the quality of life of nearby residents and creating stressful working conditions for laborers. Prolonged exposure to elevated noise levels can cause hearing loss and increase stress.

Mitigation Measure

Noise pollution will be mitigated by limiting noisy construction activities to daytime hours, especially in proximity to residential areas. Construction machinery will be fitted with silencers and sound-dampening equipment to minimize noise levels. Workers will be provided with ear protection gear such as earmuffs and earplugs, and a noise monitoring program will be initiated to ensure compliance with National Environmental Quality Standards (NEQS).

iii. Soil Erosion and Degradation

Excavation, land leveling, and uncontrolled surface runoff during construction can cause soil erosion, leading to sediment deposition in local water bodies and loss of fertile topsoil. The disturbed soil surface becomes highly vulnerable to erosion by wind and water.

Mitigation Measures

To prevent this, temporary stormwater drainage channels and sediment control pits will be constructed around the site. Excavated soil will be stored properly with protective coverings to minimize erosion. Re-vegetation and re-compaction of exposed areas will be done promptly after construction activities to stabilize the soil.

iv. Water Pollution

Impacts:

During the construction phase, accidental spills of fuels, lubricants, and other hazardous substances could pollute nearby surface water resources or groundwater. In addition, improper disposal of wastewater from construction camps and equipment washing areas could contaminate water bodies.

Mitigation Measures

To mitigate this, all chemicals and fuels will be stored in designated areas with secondary containment. Mobile toilets and septic tanks will be provided for workers, and wastewater will be managed through proper drainage and treatment systems.

Construction sites will be designed to minimize runoff carrying pollutants into natural drainage courses.

v. Solid Waste Generation

Impacts:

Solid waste will be generated from packaging materials, construction debris, leftover concrete, discarded steel, wood, and plastic materials. Improper disposal of such waste can create land pollution, visual nuisance, and health hazards.

Mitigation Measure:

A proper waste management plan will be implemented where waste materials will be segregated into reusable, recyclable, and non-recyclable categories. Authorized vendors will be hired for the collection, recycling, and disposal of waste. Efforts will also be made to reuse construction material, such as wood and scrap metal, to minimize waste generation.

vi. Occupational Health & Safety

Impacts:

The construction phase will expose workers to numerous health and safety risks, including falling from heights, injuries from machinery, exposure to hazardous chemicals, and accidents due to inadequate site safety. Without proper precautions, these risks could result in serious injuries or fatalities.

Mitigation Measure:

A comprehensive Health and Safety Management Plan (HSMP) will be developed and enforced. Workers will be provided with personal protective equipment (PPE) such as helmets, safety boots, gloves, high-visibility jackets, and safety harnesses. Regular safety training sessions will be conducted, and first-aid kits and emergency medical services will be readily available onsite.

vii. Flora and Fauna Disruption

Impact:

Site preparation activities may require the removal of trees, shrubs, and other vegetation, leading to habitat loss for small wildlife species. The clearing of vegetation could also contribute to soil erosion.

Mitigation Measures:

To mitigate these impacts, vegetation clearance will be minimized as much as possible. Trees of significant ecological or aesthetic value will be preserved. After construction, compensatory plantation with native species will be undertaken to restore green cover and re-establish ecological balance in the area.

7.6 Impacts and Mitigation Measure During Operational Phase

i. Air Pollution

Impact:

During the operational phase, continuous vehicular movement around and within the project site may lead to the deterioration of ambient air quality. Dust emissions from internal roads, open plots, and landscaping activities can also contribute to particulate matter (PM) levels, impacting both human health and the surrounding environment.

Mitigation Measure:

To control air pollution, a comprehensive greenbelt development plan will be implemented, with the plantation of indigenous trees and shrubs along internal roads, parks, and open spaces. Paved roads and footpaths will help reduce dust. Residents will be encouraged to adopt environment-friendly practices such as carpooling and using fuel-efficient vehicles. Regular road cleaning with water sprinkling, especially in dry seasons, will be carried out to minimize dust generation.

ii. Solid Waste Generation

Impact:

The generation of solid waste during the operational phase from domestic and process could create unhygienic conditions, leading to pest infestations, unpleasant odors, and environmental degradation if not managed properly.

Mitigation Measure:

A structured solid waste management plan will be put into practice involving daily waste collection. Households will be encouraged to segregate waste at the source (biodegradable, recyclable, hazardous). Designated waste collection bins will be placed strategically, and the collected waste will be transported to an approved municipal landfill. Public awareness programs and signage promoting waste reduction and recycling will be conducted periodically.

iii. Water Resource Depletion

Impact:

The water usage is not very high as the process does not involve water usage. Water will be used only for domestic purpose.

Mitigation Measure:

Although no much water required during operational phase but after conservation strategies will be emphasized, including the installation of low-flow water fixtures, water-saving appliances, and. Rainwater harvesting systems will be incorporated. Moreover, treated wastewater from the sewerage system may be reuse.

iv. Wastewater Generation

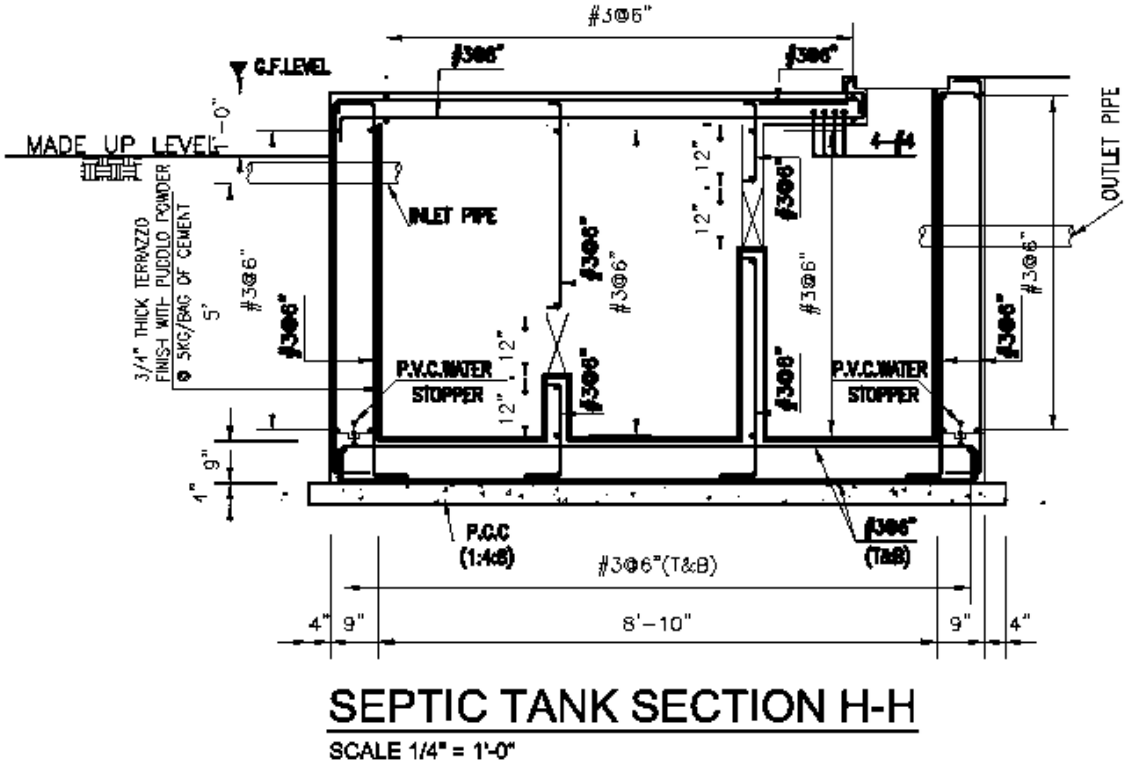
Impact:

Domestic sewage generated by the said units could lead to soil and groundwater contamination if untreated wastewater is discharged into the environment.

Mitigation Measure:

A septic tank system will be developed. Treated effluent will comply with Punjab Environmental Quality Standards (PEQS) before safe discharge or reuse in landscaping.

Regular maintenance and monitoring of the sewerage system will be ensured to prevent leakages and blockages.



v. Noise Pollution

Impact:

Vehicular traffic, machinery usage, process activities could contribute to an increase in noise levels, adversely affecting the quality of life for residents, especially during peak hours.

Mitigation Measure:

To minimize noise levels, green buffers (trees, shrubs) will be developed along the roads. Noise levels will be regularly monitored, and enforcement of Punjab Environmental Quality Standards (PEQS) for noise will be carried out.

7.7 Environmental Enhancement Measures

Here are the environmental and safety measures:

- ✓ Workers will be trained in first aid and provided with medical facilities.

- ✓ Drugs and narcotics are prohibited during working hours.
- ✓ Machinery operators will wear proper protective gear.
- ✓ Water will be sprinkled on dusty roads and tracks.
- ✓ Personal Protective Equipment (PPE) will be provided during construction activities.
- ✓ Construction and domestic waste will be properly disposed of or utilized.
- ✓ Local communities will be informed in advance about construction work.
- ✓ Machinery will never be left unattended.
- ✓ Traffic management will be implemented to avoid disruptions, and overloading will be prohibited.
- ✓ Safety signs and boards will be displayed during construction.
- ✓ Standard Operating Procedures (SOPs) will be followed, along with Health, Safety, and Environmental (HSE) conditions.
- ✓ Native plants will be used to restore the area, and a tree plantation plan will be created.
- ✓ Solid waste will be handed over to contractors with an agreement.
- ✓ Noise levels will be controlled using appropriate measures.
- ✓ PPE will be provided to all workers.
- ✓ First aid facilities will be available at the site.
- ✓ All possible measures will be adopted to ensure the project is safe and environmentally friendly.
- ✓ Detailed planning for occupational health and safety (OHS) mitigation measures will be implemented.
- ✓ Employees will be trained in Environmental, Health, and Safety (EHS) policies and practices.
- ✓ Environmental management and compliance monitoring will be strictly followed.

8 ENVIRONMENTAL MANAGEMENT & MONITORING PLAN

The Environmental Management and Monitoring Plan (EMMP) is a crucial component of the project's overarching strategy to ensure environmental sustainability and compliance throughout the construction and operational phases of said project. The primary aim of the EMMP is to effectively manage and mitigate adverse environmental impacts identified in the Initial Environmental Examination (IEE) report, promoting environmental stewardship and sustainable development practices.

8.1 Objectives of the Environmental Management Program

The objectives of the EMMP are multi-faceted, focusing on the comprehensive management of environmental aspects associated with the project:

- Defining Roles and Responsibilities
- Mitigation Measures
- Monitoring Mechanism
- Communication and Documentation
- Training and Capacity Building
- Management and Implementation

By addressing these objectives, the EMMP serves as a comprehensive guide for the project team to not only comply with regulatory requirements but also to adopt best practices in environmental management. This initiative-taking approach to environmental protection will help to minimize the project's ecological footprint, promote sustainability, and contribute positively to the local community and environment.

Table 4 Environmental Management Plan

Sr. #	Impacts	Mitigation Measure	Responsibility	
			Implementation	Monitoring
		Construction Phase		
1.	**Soil Erosion & Contamination** Due to the proposed construction activities, soil erosion and contamination may occur. Soil erosion may occur on roadside and excavation of earth/cutting operations whereas contamination of soil may be caused by oil and chemical spills at asphalt plant sites, equipment washing yards, camp sites and temporary construction site office. This impact is, however, temporary and low adverse in nature	• Excess spoil should be reused where possible and residual spoil can be disposed of at designated site to prevent erosion • Loss of topsoil can be avoided by stripping and storing topsoil prior to construction, then re-using it to cover the completed cell • Confining excavations to the specified spots as per the approved engineering drawings. Unnecessary excavations need to be avoided;	Construction Contractor	Proponent
2.	**Air Quality and Dust** Air quality will be affected by fugitive dust emissions from construction machinery; dust from the unpaved surface and construction vehicles. Emissions may be carried over longer distances depending upon the wind speed, direction, temperature of surrounding air and atmospheric	• All vehicles, machinery, equipment and generators used during construction activities should be kept in good working condition and be properly tuned and maintained in order to minimize the exhaust emissions • Preventive measures against dust should be adopted for on-site mixing and unloading operations;	Construction Contractor	Proponent

	stability. Besides, multifarious construction activities and increased vehicular traffic (construction vehicles) would also contribute to the localized airborne dust. The Suspended Particulate Matter (SPM) of the size smaller than 10 micrometre (PM_{10}) tends to remain suspended in the environment for much longer and persistent time and is an environmental hazard. The objectionable impacts of settling of the suspended dust would be its dry deposition on vegetation, motor vehicles, structures, and other exposed surfaces. Similarly, exhausts from generators can also have impacts on air quality in the vicinity. The deteriorated ambient air quality may cause health hazards to the residents of nearby residential colonies. The overall impact on the quality of air during the construction phase will be high adverse, however, it will be temporary and limited to the project's implementation phase only.	• Construction materials (sand, gravel, and rocks) and spoil materials will be transported through trucks covered with tarpaulins and all vehicles (e.g., trucks, equipment, and other vehicles that support construction works) will comply with the PEQS for carbon emissions and noise; • Regular water sprinkling of the site should be carried out to suppress excessive dust emission(s); • Emissions from power generators and construction machinery are important point sources at the construction sites. Proper maintenance and repair is needed to minimize the hazardous emissions		
3.	**Visual Aesthetics & Landscape Changes**	• Material stockpiles should be removed as soon as work is completed and the area re-landscaped. During work, these	Construction Contractor	Proponent

	Visual intrusion from large piles of excavated and construction material is one of the possible adverse impacts during the construction phase of the project. This impact is considered to be temporary and low adverse in nature.	stockpiles should be covered with tarpaulin and watered regularly.		
4.	**Noise and Vibration** The noise and vibration will be produced due to the operation of construction machinery equipment. Sources of noise and vibration during construction are heavy machinery. Noise and vibration are perceived as one of the most undesirable consequences of construction activity. The above machinery is expected to generate noise levels that would be severe in the Project Area. The noise and vibration may cause health hazards to the residents of nearby residential areas and sensitive receptors e.g. hospitals, educational institutes and mosques etc.	• The most common way to reduce the noise levels of common construction equipment is through worksite modifications. • All workers who need to work within the zone must wear hearing protection	Construction Contractors	Proponent
5.	**Solid Waste Generation** Different type of waste is likely to be generated during the construction phase of the proposed Project. The municipal waste will be in the form of	• Waste disposal plan must be reviewed during the entire construction phase • Solid Waste generated during construction will be safely disposed in demarcated waste	Construction Contractor	Proponent

	food, cans, paper and wastewater from construction camps toilets and washing yards. Construction waste will include excavated soil, sand, gravel, rocks, asphalt, pieces of concrete, bricks, wood, metal pieces and electrical wires. Whereas, hazardous waste can be comprised of paints and construction chemicals. All these, if left unattended, can become a source of nuisance and environmental pollution in the Project Area.	disposal sites and the contractor will provide a proper waste management plan; • Construction waste such as waste wood can be recovered and recycled into wood for new building projects, and cement, bricks, and plaster can be crushed and reused in other construction and building projects		
6.	**Wastewater Generation** Wastewater will be generated at the construction site by the workers. If the generated wastewater is not properly treated or disposed of, this may contaminate the surface water sources	• Proper monitoring to check the compliance of PEQS will be carried out	Construction Contractors	Proponent

7.	**Flora & Fauna** No negative impact on the ecological environment will take place on account of cutting of any trees in the project area and clearing of vegetation from the site.	• Trees and ornamental plants shall be planted along the project boundary which will increase the aesthetic value of the site and will combat pollution. • Landscaping seemed to be a powerful mitigation activity with a positive impact.	Construction Contractors	Proponent
OPERATIONAL PHASE				
8.	**Air Quality** Air quality of the Project Area may be affected in the operational phase mainly due to increased vehicular movement and open burning of solid waste and garden waste. Deteriorated air quality may result in causing public health risks, nuisance and other potential adverse impacts on bio-physical environment	• Regular vehicle checks to control/ensure compliance with PEQS. Vehicles with excessive smoke emissions should be monitored and penalties should be imposed in case of non-compliance. • Roadside tree plantations as applicable and feasible under local climatic conditions. Plants should be selected in accordance to their ability to absorb emissions;	Regular Monitoring	Proponent

9.	**Noise** During the operational phase, the noise levels are anticipated to increase mainly due to traffic related noise pollution and due to commercial activities in the Project Area.	• Penalties should be imposed for the use of vehicles having faulty silencers; and • People should be educated to promote using of less horns e.g. by placing signboards at road side	Regular Monitoring	Proponent
10.	**Wastewater** Improper operation and maintenance of sewerage system may lead to illegal ingress of municipal solid waste into manholes/sewers, deposition of silt/sludge reducing capacity of sewers significantly, choking of sewer resulting in stagnant of wastewater in the streets or in low lying areas. Stagnant wastewater may cause inconvenience to pedestrians, foul smell, unhygienic environment and health issues.	• Solid waste bins/containers should be placed at appropriate location along the roads and in streets to avoid entrance of solid waste into sewers. • Should be educated not to throw solid waste in wastewater sewers. • Installation of treatment plan for the treatment of wastewater	Regular Monitoring	Proponent
11.	**Solid Waste** Solid waste management is a critical issue in the operational phase. Improper management of solid waste and accumulation of solid waste due to non-collection give rise to various severe issues to environment and health. Presence of solid waste heaps results in degradation of soil and land, choking of	• An efficient and responsive general municipal solid waste collection, disposal, and management system should be strictly implemented • Waste bins should be provided at various convenient locations in the parks and the marketplaces for solid wastes by the passers-by. • Throwing of garbage and solid wastes onto greenbelts or vacant	Regular Monitoring	Proponent

	sewers if got way, create obnoxious odour	plots should be prohibited and fine should be imposed in the case of noncompliance		
12.	**Fauna** There is no protected area, game reserve, game sanctuary, or national park in the project area so, no major impact on wildlife and livestock in the area is expected through noise, vibration, and any type of normal activity in the project area. This impact is Insignificant.	• Maintenance of the green areas and the protection of saplings to ensure better environmental conditions • Use of fertilizers should be strictly monitored in order to avoid any incident. Natural nutrients should rather be preferred	Regular Monitoring	Proponent

Table 5 Environmental Monitoring Plan

ENVIRONMENTAL MONITORING PLAN			
Receptors	**Monitoring Parameters**	**Monitoring & Reporting Frequency**	**Responsibility**
Water Resources/ Water Quality	Monitoring of Physical, Chemical and Biological parameters and its compliance with PEQS, 2016 for surface water and drinking water.	Once before the start of construction activities; On quarterly basis during the construction phase; Bi-annually for at least one year during O&M phase; and Visual inspection daily.	Proponent/ Management
Soil Contamination	Soil contamination due to effluent / surface runoff and uncontrolled solid waste disposal activities at sites.	• Once before the start of construction activities; • On quarterly basis during the construction phase; • Bi-annually for at least one year during O&M phase	Proponent
Dust Emissions	Monitoring of PM_{10} and $PM_{2.5}$ and its compliance with PEQS, 2016 for Ambient Air.	• Once before the start of construction activities;	Proponent

		• On quarterly basis during the construction phase; • Bi-annually for at least one year during O&M phase	
Noise Pollution	Monitoring of Noise Level and its compliance with PEQS 2016 for Noise.	• Once before the start of construction activities; • On quarterly basis during the construction phase; • Bi-annually for at least one year during O&M phase	Proponent
Ecological Resources	Disturbance to natural habitat and uncontrolled floral cutting which can be avoidable.	• Start of construction activities; • Visual inspection daily / weekly during construction phase • Annually for at least one year during O&M	Proponent
Safety of workers	Medical record of workers	• On quarterly basis during the construction phase.	• Contractor
Restoration of work sites	Site cleared and no solid and construction waste along the alignment	• After completion of construction work	• Contractor

8.2 Training of Workers

Prior to the commencement of project activities, an environmental and social training and technical support program will be implemented for Said project. This program is essential to strengthen institutional capabilities and ensure effective management of environmental and social aspects throughout the project lifecycle.

Building environmental awareness and providing relevant technical knowledge to the Contractor's workforce is crucial for the successful execution of the Environmental Management Plan (EMP). Without adequate training, the workforce may lack the understanding and skills necessary to implement the required environmental protection measures effectively.

Ch. Electric Rewinding Company (SMC-Pvt.) Ltd Management will be responsible for engaging a Technical Assistance (TA) consultant to design and deliver comprehensive environmental and social training sessions.

The key objectives of the TA program will be:

- To assist in the development and establishment of effective environmental and social management systems;
- To deliver targeted training to Ch. Electric Rewinding Company (SMC-Pvt.) Ltd senior management, contractors, subcontractors, and supervision consultants involved in environmental and social planning and management during both construction and operational phases; and
- To conduct specialized training modules covering monitoring techniques for air quality, water quality, and noise pollution.

Table 6 Training Schedule

Participants	Date, Time & Location	Training Topics	Schedule	Responsible Authority
Staff of project and the contractor	As specified	• Introduction to project EIA and EMMP • EMMP communication, documentation, monitoring, and reporting requirements	Every month	Project Manager
All site personnel	As specified	• Site induction training on HSE system and requirements at Incinerating Site • Environmental sensitivities of the project area • Communication of environmental problems to corresponding officials	After every week	Project Manager
Drivers	As specified	• Road safety • Road restrictions • Vehicle restrictions • Waste disposal. • Defensive driving	After every 3 months	Project Manager
Camp Staff	As specified	• Camp operations. • Waste disposal. • Good housekeeping	Monthly	Project Manager

8.3 Environmental Management Team

The successful implementation of the Environmental Management and Monitoring Plan (EMMP) for the project hinges on the coordinated efforts of a dedicated environmental management team. This team comprises various functionaries, each with distinct roles and responsibilities throughout the construction and operational phases of the project.

8.3.1 Key Members of the Environmental Management Team:

Proponent:

Serves as the project proponent and owner of the Environmental Management Plan, overseeing its execution during both construction and operational stages.

Project Contractor(s):

Act as executors of the EMMP during the construction phase, responsible for integrating environmental mitigation measures into project activities.

Operational & Maintenance & Health, Safety, and Environment Team:

Execute the EMMP during the operational phase, ensuring ongoing compliance with environmental standards.

Environmental Protection Agency (EPA), Punjab:

Functions as the regulatory body for reviewing and monitoring the project's compliance with environmental remediation and mitigation measures outlined in the IEE.

8.3.2 Responsibilities of Functionaries:

a) Project Management:

Charged with overall environmental supervision, monitoring progress, overseeing mitigation measure implementation, documentation, training program development, and reporting on EMMP status.

b) Project Contractor

Responsible for adhering to all EMMP provisions, and environmental codes of conduct, and ensuring workers are equipped with and trained in the use of Personal Protective Equipment (PPE).

c) Environmental Protection Agency (EPA):

Reviews and monitors the project's adherence to the EIA's remedial and mitigation strategies.

8.4 Equipment Maintenance Details

A well-organized maintenance program is critical for ensuring the safety and efficiency of all tools, equipment, and vehicles used in the project. Regular inspections and adherence to safety regulations are mandatory to prevent accidents and injuries.

8.5 Proposed Environmental Monitoring

Environmental monitoring is vital for assessing the project's compliance with environmental regulations and its effects on the environment. It is divided into: Compliance Monitoring: Ensures the project's adherence to EIA and EMMP requirements through routine inspections and site monitoring.

8.5.1 Monitoring Components:

Comprehensive baseline monitoring will be conducted across several key environmental parameters, including:

- Noise Levels
- Ambient Particulate Matter
- Ambient Air Gases
- Ground Water Quality
- Wastewater Quality
- Soil Contamination
- Solid Waste Management
- Vehicular Traffic and Emissions
- Flora & Fauna
- Health & Safety Practices

- Machinery and Equipment Maintenance .

8.6 Environmental Budget

Table 7 Environmental Budget

Environmental Component	Quantity	Amount Pak Rs.	Details/Basis
Landscaping/Plantation	1000-2000 approx.	01 million	Cost includes plantation and maintenance up to three years
Solid waste management	L.S	1.5 million	Lump Sum
Health & Safety Measures	L.S.	0.5 million	Lump sum
Wastewater management	L.S.	1.5 million	Lump sum
Miscellaneous Cost	L.S.	01 million	Lump sum
Air Quality Monitoring	2	12,000	2 samples @ 6000/sample
Water Quality Monitoring	2	12,000	2 samples @ 6000/sample
Noise Level Monitoring	2	10,000	2 samples @ 5000/sample
Soil Tests	2	10,000	2 samples @ 5000/sample
Training		15,000	Lump sum
External Monitoring		100,000	
Total Environmental and Social Management Cost		**7.5 million PKR**	

9 STAKEHOLDER CONSULTATION

Stakeholder consultation is a critical component in the environmental assessment process for the proposed project. It fosters communication among diverse groups, facilitating information exchange, feedback collection, and collaborative decision-making.

9.1 Benefits and Objectives of Stakeholder Consultation

Engaging with stakeholders offers several advantages, including improved project understanding, identification of environmental concerns, and incorporation of local insights into project planning. Key objectives include:

- **Enhancing Understanding:** Clarifying the project's aims and potential impacts to ensure stakeholders are well-informed.
- **Addressing Concerns**: Identifying and resolving stakeholder issues to prevent opposition and build consensus.
- **Building Trust:** Establishing a foundation of trust and cooperation between the project Proponent and stakeholders.
- **Informed Decision-Making:** Leveraging stakeholder input to make informed decisions regarding project design and implementation.

9.2 Identification and Classification of Stakeholders

A comprehensive stakeholder identification process was undertaken to recognize all parties with a personal stake in the project, classified as:

- **Industries:** Businesses and institutions directly affected or influential to the project outcome.
- **Local Communities:** Residents and groups in proximity to the project site are likely to experience its direct impact.

9.3 Views, Concerns, and Suggestions of Various Stakeholders

Stakeholder feedback highlighted several areas of concern and interest:

- **Environmental Preservation:** Emphasis on minimizing tree removal and establishing green zones.
- **Local Employment:** Dedicated support for prioritizing local residents in hiring processes.
- **Dust and Air Pollution Control:** Recommendations for regular dust suppression measures and continuous air quality monitoring.
- **Noise Management:** Suggestion to limit noise-generating activities to daytime hours.
- **Solid Waste Management:** Advocacy for proper waste disposal techniques to mitigate environmental impacts.

9.4 Methodology for Consultation

The consultation process involved a dynamic exchange of ideas through discussions, meetings, and field visits, aimed at:

- **Scoping Sessions:** Initial meetings to define project scope and identify key stakeholder concerns.
- **Focus Group Discussions:** In-depth conversations with local communities and government representatives to gather detailed feedback.
- **Location-Based Meetings:** Engagements held at various sites to ensure broad stakeholder participation and input.

This stakeholder consultation process underscores the project's commitment to environmental stewardship, community engagement, and sustainable development. By incorporating stakeholder feedback into the EIA process, the project aims to achieve a balance between development objectives and environmental conservation, fostering positive relationships with all affected parties.

9.5 Environmental Management Team and Experts

Sr. #	Managers	Responsibilities
1.	**Contract Manager**	• Implementation of EMP • Environmental issues identification during pre-construction phase. • Communication EMP to all employees.
2.	**Contractor**	• Ensure that the control measures identified during environmental surveys are implemented as they are relevant to their work/visit. • Ensure that the project management team is notified of any non-conformance of control measures or environmental incidents where the environment has been put at risk.
3.	**Site Manager**	• Ensure site material and safe handling of hazardous waste. • Controlled access arrangement to avoid hazards. • Emergency egress arrangements to avoid any unfortunate incident. • First aid facilities/services should be readily available on-site.
4.	**Site HSE Advisor**	• Ensure good standards of workmanship. • Engaged health and safety to devise site waste management plan to be followed and implemented. • Daily checks & weekly checks. • Regular consultation with workers.
5.	**Site Environment Advisor**	• According to legislation and consent develop EMP. • Ensure application of EMP. • Conduct regular site inspection.
6.	**Public Contact Officer**	• First point of contact for members of the public. • Arrange and manage public forums. • Maintain relation with stakeholder

9.6 The Responsible Authority for EMP Implementation

The successful implementation of the Environmental Management Plan (EMP) is a pivotal aspect of ensuring the environmental integrity and sustainability of the proposed unit. The ultimate responsibility for overseeing and ensuring the effective execution of the EMP lies with the project Proponent.

Appointment of an HSE/Project Manager

To facilitate this, the project Proponent will appoint a Health, Safety, and Environment (HSE)/Project Manager possessing the necessary qualifications and expertise. This individual will assume the role of Environmental Manager, tasked with the comprehensive management of all health, safety, and environmental conditions as per the Punjab Environmental Quality Standards (PEQS).

Responsibilities of the HSE/Project Manager

As Environmental Manager, the HSE/Project Manager's responsibilities will encompass a broad spectrum of duties, designed to ensure that the project not only complies with all relevant environmental regulations but also adopts best practices in environmental stewardship.

9.7 Environmental Practitioners and Experts

Consultation with Environmental Practitioners and experts was done, and the following comments and suggestions were noticed.

Table 8 Environmental Consultant Team

Sr. No.	Name	Designation	Comment/ Suggestions
1.	Sara Fatima	Senior Environmentalist	• She said that the project will have a positive impact on the economy, but its construction should be done in an environmentally friendly way. • Basic facilities should be provided to local community

2.	Zia Ur Rehman Farooqi	Ph.D. Scholar Environmental Sciences	• Tree plantation in designated green zones should be conducted. • Proper disposal of the solid waste • HSE management measures should be adopted and implemented effectively
3.	Dr. Hina Ahmed Malik	Ph. D Environmental Sciences	• He said that locals should be preferred for employment. • Value addition of area. Proper mitigation measures must be adopted while construction and operation of this project
4.	Engr. Kanza Fatima	Junior Environmentalist	• Waste must be collected and disposed of properly. • Ensure the use of PPE's during the operational activities. • Wastewater should be treated. • Ensure the tree plantation
5.	Engr. Aleeza Kanwal	Environmental Specialist	• Health and safety department and trained people should be there in case of any emergency. • Periodic monitoring of every fire extinguisher (expiry date, type)
6.	Engr. M. Bilal	Environmental Engineer	• It should be ensured that the pollution abatement technique

9.8 Other Departments and Agencies

Following officers of government departments were consulted by the socio-environmental team of the consultants and concerned details about the project were noted down through personal interviews, group meetings, etc, in their offices, for instance.

Sr. No.	Designation	Concerns
1.	**Environment Protection Department (EPD)**	
	General Manager	• Solid waste should be managed in Environmentally friendly manner. • Wastewater should be treated effectively & approval should be acquired from concerned agency before disposing off in nearby drain. • HSE* at the site should be managed effectively. • No impact is being foreseen due to the selected location. • Locals should be given job opportunity.
	Environmental Inspector	
2.	**Social Welfare Department (SWD)**	
	Deputy Director Officer	• Final goods should be affordable for the locals. • The proposed product should facilitate locals and they should be economical. • Job opportunities should be given to the locals. • Wages should be given according to the work assigned to them. • Life insurance of the workers should be given as well as all the facilities should be given as per labor laws.
3.	**Irrigation Department**	
	Subdivision	Following comments were suggested: • Untreated wastewater should not be disposed of in the nearby drains without proper treatment.
	Executive Engineer	

		• Beneficial as job opportunities will be available to the residents.
4.	**Forest Department**	
	District Forest Officer	Following recommendation were suggested by the forest department: • Plantation and landscape activities should be conducted on a broader scale. • Proper drainage system must be available at site

9.9 Consultation with Affected and Wider Community

In addition, the use of direct methods to evince the response of the various stakeholders in targeted population residing in study area was ascertained by conducting a sample survey, through specially formatted questionnaires. Questions posed to the public were related to the creation of impacts, adverse impacts, and beneficial impacts, including employment opportunities, income generation activities, change in living standards and provision of the basic amenity.

Personal views of the respondents on the establishment of proposed project disturbance to the residents near the AOI and infringement of their privacy were also recorded. Various rounds of public meetings and consultations were arranged in the project and study area. The stakeholder category involves nearby residents, different industries, shopkeepers. The issues discussed with them are mostly related to the following:

- Activities of project.
- Impacts caused due to certain activities during construction and operational phase.
- The proposed mitigation measures.

10 CONCLUSION

The project aims at the construction of transformer manufacturing unit. The project falls under the category of projects requiring Environmental Impact Assessment (EIA).

At the end of this study, it has been found that:

- There are no sensitive elements/segments of environment around the project site.
- It has also developed ways and means for environmentally sustainable disposal of solid wastes to be generated from the project operations.
- The noise levels will be kept well within the required limiting values of the PEQS Pakistan.
- This project will create job opportunities during construction and operation stages leading towards reduction of poverty.
- Sewage will be passed through Septic Tanks before final treatment and disposal.
- It will help in the improvement of the community in the local area. It will also provide such facilities for people from other places.
- Project site means the development criteria like electricity supply, gas supply, water supply and sewage system.
- EMP, as recommended in this EIA Report, is to be put in place during all operational stages of the project.
- Environmental monitoring by the project proponent and a third party also ensures that the project will run in accordance with legal requirements.

Based on these findings of the EIA Report the project merits the issuing of Environmental Approval by the Environmental Protection Agency, Government of Punjab, and Lahore.

GLOSSARY

Accommodate	(of a building or other area) provide lodging or sufficient space for. "The cottages accommodate up to six people
Assessment	The action of assessing someone or something. "The assessment of educational needs"
Aspects	A distinct feature or element in a problem
Adverse	- Preventing success or development; harmful; unfavorable. "Taxes are having an adverse effect on production"
Authorized	- having official permission or approval. "An authorized dealer"
Amendment	a minor change or addition designed to improve a text, piece of legislation, etc. "an amendment to existing bail laws
Ambient Air	Ambient air quality refers to the quality of outdoor air in our surrounding environment. It is typically measured near ground level, away from direct sources of pollution
Archaeological	the scientific study of material remains (as fossil relics, artifacts, and monuments) of past human life and activities
Annunciation	A formal public statement
Baseline	The existing conditions against which impacts of the proposed action and its alternatives can be compared.
Crushing	Deform, pulverize, or force inwards by compressing forcefully. "You can crush a pill between two spoons"
Containers	An object for holding or transporting something. "The cakes will keep for up to two weeks if kept in an airtight container"
Compliance	Acting according to certain accepted standards
Discrepancies	A difference between conflicting fact, claims or opinions
Disposal	the action or process of getting rid of something
Dumped	Deposit or dispose of (rubbish, waste, or unwanted material), typically in a careless or hurried way

Effluent	Any material in solid, liquid or gaseous form or combination thereof being discharged from industrial activity or any other source and includes a slurry, suspension or vapor
Environmental impact statement (EIS)	A document prepared to analyze the impacts on the environment of a proposed action and released to the public for review and comment. An EIS must meet the requirements of NEPA, CEQ, and the directives of the agency responsible for the proposed action.
Emission	The production and discharge of something, especially gas, or radiation." The effects of lead emission on health"
Evaluated	Estimate the nature, value, quality, ability, extent or significance
Graded	Arranged in a sequence of grades or ranks; "stratified areas of the distribution"
Generation	The production or creation of something
Incinerator	A furnace or a container for burning waste materials
Inadequate	Not capable or competent; lacking
Implementation	The process of putting a decision or plan into effect; execution
Intends	To have in mind as something to be done or brought about, plan to design or mean for a particular purpose, use, recipient, etc.
Landfill site	for the disposal of solid waste in which refuse is buried between layers of dirt to fill in or reclaim low-lying ground
Legislation	Law enacted by a legislative body
Mobilization	To release or make available, as cells or chemical substances
Mitigation	The action of lessening in severity or intensity
Noise	Loud, unpleasant, unexpected, or undesired sound that disrupts or interferes with normal human activities
Potential	Having or showing the capacity to develop into something in the future

Pedestrian	A person who goes or travels on foot; walker
Proponent	The person who proposes or intends to undertake a project
Sanitary	Relating to the conditions that affect hygiene and health, especially the supply of sewage facilities and clean drinking water
Segregate	Set apart from the rest or from each other; isolate or divide. "Disabled people should not be segregated from the rest of society
Settlement	An official agreement intended to resolve a dispute or conflict. "Unions succeeded in reaching a pay settlement
Ton	A short or net ton is equal to 2,000 pounds; a long or British ton is 2,240 pounds; a metric ton is approximately 2 to 205 pounds
Transportation	The action of transporting someone or something or the process of being transported. "The era of global mass transportation"
Ultimate	Being or happening at the end of a process; final. "Their ultimate aim was to force his resignation"
Violations	the action of violating someone or something
Working place	From the out by side of the last open crosscut to the face
Flora	All the plant life in a particular region or period
Fauna	All the animal life in a particular region or period
Demarcated	Separately clearly, as if by boundaries
Screening	The display of a motion picture
Substitutions	An event in which one thing is substituted
Smelting	extract from its ore by a process involving heating and melting
Regulations	An authorized rule
Recycling	process of converting waste materials into new materials and objects
Stakeholders	A person or organization with an interest or concern in something
Rehabilitation	The conversion of waste land into land suitable for use of habitation or cultivation

LIST OF ABBREVIATIONS

AA	Ambient Air
APHA	American Public Health Association
AOI	Area Of Influence
BOD_5	Biological Oxygen Demand
CMS	Convention On Migratory Species
COD	Chemical Oxygen Demand
dB(A)	Decibel
EA	Environmental Assessment
EHS	Environmental Health Safety
EIA	Environmental Impact Assessment
EPD	Environmental Protection Department
PEPA	Pakistan Environmental Protection Act
EPA	Environmental Protection Agency
ESIA	Environmental And Social Impact Assessment
ESA	Environmental And Social Assessment
ESMP	Environmental/Social Management Plan
EMP	Environmental Management Plan
EC	Electrical Conductivity
GIS	Geographical Information System
GOP	Government Of Pakistan
GPS	Global Positioning System

GRC	Grievance Redress Committee
GRM	Grievance Redress Mechanism
HSE	Health Safety & Environment
HWMS	Hazardous Waste Management System
EIA	Environmental Impact Assessment
I & D	Irrigation And Drainage
IAIA	International Association for Impact Assessment
IWM	Industrial Waste Management
IUCN	International Union for Conservation of Nature
KM	Kilometers
LGO	Local Government Ordinance
MW	Mega Watt
MEAS	Multilateral Environmental Agreements
MSDS	Material Safety Data Sheets
NEQS	National Environmental Quality Standards
PMD	Pakistan Meteorological Department
PPE	Personal Protective Equipment
PEQS	Punjab Environmental Quality Standards
NEAP	National Environmental Assessment Plan
NWFP	Northwest Frontier Province
Q&EHS	Quality, Environment, Health & Safety
O & M	Operation And Maintenance
PKR	Pak Rupees

PAP	Project Affected People
PEPC	Pakistan Environmental Protection Council/Punjab
PSC	Project Steering Committee
QA/C	Quality Assurance/Quality Control
RAP	Resettlement Action Plan
ROG	Reactive Organic Gas
SWM	Solid Waste Management
TDS	Total Dissolved Solids
UNFC	United Nation Framework Convention on Climate Change
UNCC	United Nation Convention to Combat Desertification
UNEP	United Nations Environmental Programs
GOP	Government Of Pakistan
WHO	World Health Organization
R&R	Rehabilitation And Resettlement
WWTP	Waste Water Treatment Plant

LIST OF INDIVIDUALS AND THEIR FEEDBACK

Sr.#	Name	Concerns
1	Kamran Ali Khan	During the survey in the study area following concerns of the local community were noted: • Air pollution should be controlled effectively, such as emissions generated from power-generating activities. • Solid waste should be collected timely and avoid the spreading of waste. • Locals should be preferred for the job opportunities. • Wastewater should be treated prior to final disposal in a nearby drain. • Solid waste should be managed effectively by adopting the standard practices of the area. • The cleanliness of the area should be ensured. • An effective EMMP should be designed and enforced with true spirit. • The health of the workers should be ensured. • Planation should be carried out on an extensive scale. • Construction activity should be carried out during day hours.
2	Muhammad Waqas	
3	Qaiser Farooq	
4	Ghulam Mujtaba	
5	Mehboob Alam Shahid	
6	Muhammad Latif	
7	Mazhar Hussain	
8	Shahbaz Khan	
9	Waseem Ahmed	
10	Rab Nawaz	
11	Allah Yar	

12	Ahmed Saeed	• Noisy activities should be confined.
13	Muhammad Jabbar	
14	Muhammad Ramzan	
15	Kamran	

SOURCE OF DATA

- Punjab Environmental Protection (Amendment) Act 2026 (PEPA)
- Guidelines for the preparation and review of Environmental Reports, October 1997
- Review of IEE/ EIA Regulation, 2022
- The 2004 Baseline Survey on Millennium Development Goals in AACs, Pakistan
- World Weather Online.com
- Water and Sanitation Agency (WASA), Lahore.
- RED Data Book of IUCN
- Material Safety Data Sheet (MSDS) of chemicals
- www.wsask.ca/Global/Water%20Programs/Water%20Conservation/SWA
- Water_Efficiency_on_the_Farm_Booklet_WEB.pdf
- https://attock.punjab.gov.pk/district_profile
- https://pakistanalmanac.com/punjab-attock/
- http://www.madehow.com/Volume-2/Lead.html
- http://www.ijirset.com/upload/2013/november/18_Disposal.pdf

List Of Names, Qualifications and Roles of Team Members Carrying Out the IEE/EIA Study

Sr. #	Name	Qualification
Team Leader		
1.	Miss. Sara Fatima	M.Phil. Environmental Sciences
Environmental Scientist		
2	Dr. Hina Ahmed Malik	Ph.D. Environmental Sciences
3	Mr. Zia Ur Rehman Farooqi	Ph.D. Environmental Sciences (Scholar)
4	Hafiz Zeeshan Safdar	M.Sc. Analytical Chemistry
5	Mr. Saffi Ahmed	M.Phil. Environmental Sciences
6	Miss Hasham Fatima	BS Environmental Sciences
Environmental Engineers		
7	Engr. Kanza Fatima	B.Sc. Environmental Engineering
8	Engr. Aleeza Kanwal	B.Sc. Environmental Engineering
9	Engr. Hafiza Irsa Ashraf	B.Sc. Environmental Engineering
Sociologist		
10	Ahmed Raza	M. Phil Sociology

TERMS OF REFERENCES

Terms of References (TOR) for the Environmental Impact Assessment (EIA) process are designed to ensure compliance with the regulatory framework and facilitate a thorough review of the project's environmental implications. These terms are outlined as follows:

1. Review Fee Payment:

As stipulated in Regulation 7 of the Review of IEE and EIA Regulations, 2022, the proponent is required to submit a nonrefundable review fee to the Environmental Protection Agency (EPA) at the time of submitting the IEE/EIA report. The specific amount of this fee is determined by the rates specified in Schedule III of the regulations.

2. Submission of Required Documents:

The proponent must provide all necessary documents and details essential for the completion of the EIA/IEE report. This includes, but is not limited to, technical studies, environmental impact analyses, mitigation strategies, and any other information pertinent to assessing the project's environmental footprint.

3. Financial Responsibility for Fines and Penalties:

The proponent shall bear full responsibility for any fines or penalties levied by the EPA Punjab or the Environment Tribunal. This includes violations of environmental standards, non-compliance with regulatory requirements, or any other infractions identified during the review or implementation phases of the project.

4. Accuracy and Validity of Information:

The proponent is responsible for ensuring the correctness and validity of all information and documents provided to the consultant for onward submission to EPA Punjab. The consultant facilitating the EIA process will not bear any responsibility for inaccuracies or omissions in the information supplied by the proponent. It is imperative

that the proponent conducts thorough due diligence to guarantee that all submitted materials accurately reflect the project's potential environmental impacts and proposed mitigation measures.

These Terms of References are critical to ensuring that the EIA process is conducted in a transparent, accurate, and regulatory-compliant manner. Adherence to these terms will facilitate a comprehensive environmental review of the project, enabling informed decision-making by the EPA Punjab and contributing to the sustainable development and environmental stewardship goals of the region.

In **M/s Ch. Electric Rewinding Company (SMC-Pvt.) Ltd**

Proponent

Mr. Muhammad Yaseen

For Enviro Stewards Co. Pvt. Ltd.

Consultant