PUNJAB SMALL INDUSTRIES CORPORATION (PSIC)

CONSULTANCY SERVICES FOR ESTABLISHMENT OF SMALL INDUSTRIAL ESTATE QUAIDABAD

ENVIRONMENTAL IMPACT ASSESMENT

(EIA)

DRAFT REPORT

OCTOBER 2025

National Engineering Services Pakistan (Pvt) Limited
1-C, Block N, Model Town Ext, Lahore 54700, Pakistan
Phone: +92-42-99090000 Ext 458 Fax: +92-42-99231950
Email: info@nespak.com.pk, cplle@nespak.com.pk
http://www.nespak.com.pk

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Table of Content

List of Tables

Page No.

List of Figures

Page No.

List of Plates

Page No.

List of Annexures

List of Abbreviation

PSIC	Punjab Small Industrial Corporation
ASTM	American Society for Testing and Materials
ERPs	Emergency Response Procedures
BDL	Below detection limit
BOD	Biochemical Oxygen Demand
CO	Carbon Mono Oxide
COD	Chemical Oxygen Demand
CETP	Combined effluent treatment plant
CC	Construction Contractor
CBD	Convention on the Biological Diversity
DG	Directorate General
DO	Dissolve Oxygen
ECO	Economic Cooperation Organization
EMMP	Environment Management and Monitoring Plan
EA	Environmental Assessment
EIA	Environmental Impact Assessment
EPA	Environmental Protection Agency
EP&CCD	Environmental Protection AND Climate Change Department
EHS	Environmental, Health & Safety
GHG	Greenhouse Gas
HSE	Health, Safety & Environment
IEE	Initial Environmental Examination
MW	Mega Watt
MGD	Million Gallon per Day
NCS	National Conservation Strategy
NESPAK	National Engineering Services Pakistan
NTU	Nephelometric Turbidity Unit
NO2	Nitrogen Di Oxide
NO	Nitrogen Oxide
NOC	No Objection Certificate
NGOs	Non-Governmental Organizations
OIC	Organization of the Islamic Conference
O3	Ozone
PKR	Pakistan Rupees
PM	Particulate Matter
PGA	Peak Ground Acceleration
PPE	Personal Protective Equipment
PEQS	Punjab Environmental Quality Standards
PEPA	Punjab Environmental Protection Agency
RCC	Reinforced Cement Concrete

ROW	Right of Way
SBC	Seismic Building Code
SMART	Self-Monitoring and Reporting
QSIE	Quaidabad Small Industries Estate
SWM	Solid Waste Management
SAARC	South Asian Association for Regional Cooperation
SOP	Standard Operating Procedures
SO2	Sulfer Di Oxide
SC	Supervision Consultant
SPM	Suspended particulate Matter
TA	Technical Assistant
THQ	Tehsil Head quarter
TC	Total Coliforms
TDS	Total Dissolve Solids
TSS	Total Suspended Solid
TCU	True Color Unit
USEPA	U.S Environmental Protection Energy
UNFCCC	United Nations Framework Convention on Climate Change
UNO	United Nations Organization
UCC	Upper Chenab Canal
WWTP	Wastewater Treatment Plant

EXECUTIVE SUMMARY

1. Introduction

The local salt industries are scattered across Quaidabad and are creating a nuisance throughout the Tehsil Quaidabad. A centralized facility is inevitable to ensure the streamlining of these scattered industrial units. Punjab Small Industries Corporation (PSIC) thus intends to establish Quaidabad Small Industries Estate (QSIE) in the south of Quaidabad City on Noorpur Road.

As per 'Punjab Environmental Protection Act, 2012', an Environmental Impact Assessment (EIA) study is mandatory to obtain environmental clearance from the Environmental Protection and Climate Change Department (EP&CCD) before commencement of construction works.

2. Policy, Legal and Administrative Framework

The national and provincial Government has promulgated laws/acts, regulations, and standards for the protection, conservation, rehabilitation, and improvement of the environment. The Environmental Protection and Climate Change Department (EP&CCD) is the regulatory authority, which has provided guidelines for conducting Environmental Impact Assessment (EIA) studies and has the authority to issue regulatory clearance/ No Objection Certificates (NOCs) for various projects.

The Key National Strategies/Policies, Legislation/Acts, Laws and Regulations for this project are:

- Fatal Accidents Act 1855
- Land Acquisition Act, 1894 (Including Later Amendments)
- Protection of Trees, and Brushwood Act, 1949
- National Conservation Strategy 1992
- Guidelines for Public Consultation, 1997
- National Sanitation Policy, 2006
- Pakistan Labor laws
- Protection Against Harassment of Women at the Workplace Act, 2010
- Canal and Drainage Act 1873 and Amendment Act, 2016
- National Climate Change Act, 2021
- Factories Act, 1934
- Industrial Relations Act, 2012

Key Provincial Strategies/Policies, Legislation / Acts, Laws, and Regulation for this project are:

- Punjab Land Revenue Act, 1967
- Punjab Plantation and Maintenance of Trees Act, 1974
- Punjab Land Acquisition Rules, 1983

- Guidelines and Checklists adopted by Government of Punjab after 18th Amendment
- Punjab Environmental Tribunal Rules, 2012
- Punjab Antiquities Amendment Act, 2012
- Punjab Environmental Quality Standards (PEQS), 2016
- Punjab Restriction on Employment of Children Act, 2016
- Punjab Protection of Women against Violence Act, 2016
- Punjab Policy on Controlling Smog, 2017
- Punjab Labor Policy, 2018
- Punjab Occupational Safety and Health Act, 2019
- Punjab Industrial Policy, 2018

Furthermore, Pakistan is a member of several international organizations such as the United Nations Organization (UNO), Organization of the Islamic Conference (OIC), South Asian Association for Regional Cooperation (SAARC), Economic Cooperation Organization (ECO), etc. so it has to follow the international protocol and obligations related to the environment.

3. Project Description

The proposed QSIE shall be spanned over an area of 133.67 Acres. The proposed project covers basic infrastructure facilities including water supply, sewerage, roads, Admin Building (2 Kanal), Public Buildings including Mosque, Dispensary & Rescue 1122 (3.99 Kanal), Overhead Tank (1 Kanal), Staff Residences (3.46 Kanal), CETP/Disposal Station (16.02 Kanal), and Grid Station (25.93 Kanal).

The QSIE is located in the South of Quaidabad City on Noorpur Road. The site is bounded by Noorpur Road in the east, a nullah stormwater drain in the north, and Piplan Road in the south.

Three project alternatives, including Alternative 1 (Business-as-usual/ No Project Scenario), Alternative 2 (Full Project Implementation), and Alternative 3 (Private Sector-Led Development /Self-Managed Development), were considered to work out the most environmentally, technically, and financially feasible option.

After a thorough assessment of the three proposed alternatives, Alternative 2 (Full Project Implementation) is recommended as the most effective and sustainable option for industrial development. It offers a centralized, government-led solution with well-planned infrastructure and mandatory environmental controls. This approach ensures organized growth, environmental protection, sustainability, and effective urban planning

The selected master plan for QSIE has been designed to ensure efficient allocation of land uses in line with industrial and support requirements. The land use distribution is given below:

Table ES 1: The land use distribution

Sr. No.	Land Use Category	Area in Acres	Percentage (%)
1	Industry	86.91	65.02
2	Commercial	5.59	4.18

Sr. No.	Land Use Category	Area in Acres	Percentage (%)
3	Public Amenities	6.55	4.90
4	Roads	24.46	18.30
5	Green Spaces	10.16	7.60
	Total	**133.67**	**100.00**

The types of industries are planned after studying Quaidabad city industrial profile and considering the socioeconomic setup of the area. The types of industries for the proposed industrial estate are summarized below;

Table ES 2: Types of industries for the proposed industrial estate

Sr. No.	Type of Industry	%Age share	Major Products
1	Salt & Mineral Processing Products	50%	Salt Based Products, Gypsum Products, Limestone Products, Byproducts & value addition
2	Food & Beverage (agriculture processing)	20%	Fruit & Vegetable, Grain & Pulse, Grain & Pulse, Beverages etc.
3	Agri. Implementation Products	10%	Farm Machinery & Equipment, Post-Harvest & Storage Equipment, Agri. Tools & Accessories
4	Storage & Warehouse	4%	General Warehousing, Agri. & Food Warehousing, Mineral & Salt Storage, Logistics & Distribution Centers
5	Light Manufacturing & Packaging Products	6%	Packaging Industry, Light Engineering / Fabrication, Supportive Light Manufacturing
6	Cottage Industry	5%	Carpets, embroidery, textiles etc.
7	Chemical Products	5%	Basic Industrial Chemicals, Food-Grade & Consumer Chemicals, Support Chemicals
	Total	**100%**	

The project is scheduled to be completed in 30 months with a cost of **PKR 7 billion (**the cost is tentative and may vary subject to the finalization of the design). The total manpower required for the construction of the entire project is 50 persons including skilled, semi-skilled, and unskilled staff.

4. Baseline Profile

The baseline covers the physical, biological as well as socioeconomic features of the project area.

A. Physical Environment

The project area is bordered by Khushab City, Jauharabad, Bhakkar, and Mianwali districts. The region forms part of Punjab's semi-arid plains, with limited vegetation and dry climatic conditions. The terrain is mostly flat to gently undulating, composed of sandy loam soil with ground levels ranging from 175 to 198 meters above mean sea level.

The geology of the project area is primarily characterized by Quaternary alluvial and aeolian deposits overlying Precambrian basement rocks.

The project area has a moderate climate. It has hot summer and cold winters with June being the hottest month and January being the coldest month. The mean maximum and minimum temperatures are 40 ºC and 27 ºC, respectively, for June and 18 ºC and 6 ºC in January. The maximum precipitation days are observed during July and August, ranging between 20-50 mm. Wind speeds between 10-20 km/h dominate throughout the year.

As per the groundwater studies, the depth to the water table in the area ranges from 4.8 to 15.2 feet. Total Dissolved Solids (TDS) in and around the project site range up to 4,466 ppm, which are significantly high. However, sweet water is available near canals and distributaries.

Miru Branch Drain flows adjacent to the boundary of the Quaidabad Industrial Estate site, serving as a key natural drainage channel in the area. It connects with downstream drainage networks and ultimately discharges into the Jhelum River, situated about 50 km to the southeast.

Quaidabad is located in Seismic Zone-2B which is moderate hazard earthquake zone. The Zone 2B has Peak Ground Acceleration (PGA) in the range of 0.16 g to 0.24 g.

B. Biological Environment

The project site is rich in biodiversity because of its diverse landscape and geographical location. The major floral species of the project area include:

Table ES 3: Major Floral species of the project area

Sr. No.	Common Name	Scientific Name
1	Chinaberry (Dharek)	Melia azedarach
2	Arabic Tree (Kikar)	*Acacia nilotica*
3	Gum trees (Sufaida)	*Eucalyptus camaldulensis*
5	Rosewood (Shisham)	*Dalbergia sissoo*
6	Sirris	*Albizzia lebbek*
7	Date Palm	*Phoenix dactylifera*

No crops are present within the project boundary. However, the major crops cultivated in the surroundings of the project area are Wheat, Gawarah and Chana etc.

The common animals found in the project area include dogs, cats, and bats. Domestic livestock that was observed during the field visit includes buffalo, cattle, goats, sheep, hens, and donkeys.

The noticeable fauna that has been observed in the project area by the locals as well as the concerned authorities include the followed:

Table ES 4: Fauna in the project

Sr. No.	Name
1	Grey Francolin (*Francolinus pondicerianus*) and Black Francolin (*Francolinus francolinus*)
2	Asian Koel (*Eudynamys scolopaceus*)
3	*Falco peregrinus*
4	Wild Hare (*Lepus nigricollis)*
5	Porcupine
6	Dove

The amphibian fauna mainly comprises species adapted to semi-arid environments and seasonal water bodies. Commonly observed species include the Indus Valley Toad (*Duttaphrynus stomaticus*) and the Skittering Frog (*Euphlyctis cyanophlyctis*), which thrive near ponds, irrigation channels, and cultivated lands.

Common tree lizard (*Calotes versicolor*), Monitor lizard (*Varnus bengalensis*) and fringed toed lizard (*Acanthodactylus cantoris*) are observed in and around the proposed site.

C. Social Environment

The current socioeconomic baseline profile covers various aspects, including demographics, socioeconomic factors, educational status, health conditions, and availability of amenities etc. The socioeconomic baseline profile was developed using both primary and secondary data.

Primary data was collected from September 28 through October 02, 2025, by a dedicated team of sociologists who utilized a structured questionnaire to gather the requisite information about the social settings of the project area. The sample size of 50 respondents was adopted through the simple random sampling technique. The collected data were analyzed for various socioeconomic features.

The survey revealed that most respondents were either illiterate or had attained a low level of education. Profession-wise, the majority of the respondents were either laborers or daily wagers, with a few shopkeepers and small business owners. Most households belong to the middle-income group, with monthly expenses ranging between PKR 30,000 and 50,000, showing moderate affordability levels. Groundwater in Quaidabad is mostly brackish and unfit for drinking, with residents relying on hand pumps installed along the canals. The absence of a sewerage system leads to direct wastewater seepage and potential environmental risks.

The nearest health facility is the Tehsil Head Quarter (THQ) Hospital Quaidabad, located approximately 10 km from the project site. Most residents rely on this government medical center for treatment and basic healthcare services due to their accessibility and affordability.

5. Stakeholder Consultation

Stakeholder consultation is a mandatory part of the EIA process. Stakeholder consultations' adequacy is one of the basic criteria to determine the project's compliance with the national/international safeguard policies.

Efforts were made to identify the possible categories of stakeholders and their stakes. Individual/community stakeholders and institutional stakeholders were identified during the field survey: The project stakeholders include locals near the project area, local business owners, Punjab Forest Department (PFD), Environmental Protection and Climate Change Department (EP&CCD), Punjab Wildlife Department (PWLD) and Punjab Irrigation Department etc.

The concerns and suggestions of the community recorded during the informal consultation meetings are summarized hereunder:

- The construction of the proposed project should be completed within the stipulated time;
- Arrangements should be made to suppress dust, curtail high-noise activities, and control the vibrations caused due to machinery;
- Residents of the local community should be given priority for jobs both in the construction and operation phases;
- The trees in the project area are planted/cultivated as a cash crop by landowners. Therefore, the owners who have planted them have the right to cut the trees within the project area.
- Tree cutting along the main road should be avoided as far as possible;
- The construction waste should be frequently collected and disposed of to the designated dumping sites.

6. Anticipated Environmental Impacts and Mitigation Measures

The impacts of the project activities are considered concerning the area of influence which is the project boundary in the current case owing to the limited impacts of the project.

The establishment of Quaidabad Industrial Estate will alter the existing topography through excavation, land leveling, and material storage activities. It may lead to soil contamination, surface and groundwater pollution, air and noise emissions, and solid waste generation during construction. The project could also disturb local flora and fauna, strain available resources, and pose health and safety challenges for workers. Moreover, increased vehicular movement may cause traffic congestion, accessibility constraints, and temporary social inconveniences in the surrounding areas.

Anticipated impacts during the operational stage will include air pollution due to the operation of a diesel generator for pumping and community health hazards.

The project will significantly enhance economic growth through increased employment opportunities, higher land values, and a notable contribution to the national GDP. It will

promote poverty reduction, improve infrastructure, ensure controlled waste management, and foster sustainable socioeconomic and green development within the region.

7. Environmental and Social Management and Monitoring Plan (ESMMP)

PSIC will be responsible for compliance with the environmental and social safeguard requirements of the proposed project. The whole Environmental and Social Management and Monitoring Plan (ESMMP) will be included as a clause in the contract documents.

The implementation of the proposed ESMMP involves inputs from various functionaries. The contractor will be primarily responsible for ensuring the implementation of the mitigation measures proposed in the ESMMP, which will be part of the contract documents. The provision of the environmental mitigation cost will be made in the total cost of the project. However, if the contractor fails to comply with the implementation of ESMMP and submission of the periodic compliance reports, deductions will be made from the payments to the Contractor claimed under the heads of environmental components.

Monitoring will be carried out to ensure that the mitigation plans are regularly and effectively implemented. It will be performed at three levels. At the PSIC level, the PSIC representative will do ESMMP monitoring to ensure that the mitigation plans are being effectively implemented. The Environmental Engineer (EE) of the Supervision Consultant will regularly monitor the ESMMP implementation by the contractor. At the contractor's level, the environmental monitoring checklist will be filled on regular basis by their environmental manager and countersigned by the EE of the Supervision Consultant. Implementation of environmental mitigation measures during construction is a key to avoiding and reducing short- and long-term potential environmental impacts. Environmental cost has also been given in the EMMP.

Environmental Budget

The total estimated cost for the implementation of EMMP is summarized below:

Table ES 5: EMMP Implementation Cost

Sr. No.	Description	Amount (Rs)	
		Construction	Operation
1	Tree Plantation	-	10,404,100
2	Health & Safety	2,994,500	212,500
3	Environmental Monitoring	2,180,000	740,000
4	Training Cost	400,000	-
	Sub-Total	**5,574,500**	**11,356,600**
	Contingencies @ 5%	278,725	567,830
	Total	**5,853,225**	**11,924,430**
		Grand Total	**17,777,655**

1 INTRODUCTION

1.1 Project Background

Quaidabad is a city and tehsil of Khushab District in Punjab, Pakistan, founded in 1951 by Sardar Abdur Rab Nishtar and named in honor of Quaid-e-Azam Muhammad Ali Jinnah. The region is agriculturally rich, producing wheat, rice, and black gram, with a well-known grain market and several rice mills, poultry farms, and salt processing units, while the nearby Warcha Salt Mine and Soon Sakesar Valley add economic and scenic value.

The industrial sector has the potential to be the driving force in achieving the target growth rates for income, employment and investment. This sector produces exports to help the balance of payments crisis and generates demand for a range of skills, thus creating jobs. The Government seeks to promote industry and investment in Punjab in order to generate employment, increase per capita income and ensure sustainable growth.

The local industries are scattered in Quaidabad, and in order to centralize and optimize the local industry, Quaidabad Small Industries Estate (QSIE) should be established. The major industries of Quaidabad are Salt processing units. On the persistent demand from Quaidabad Trade Association, Mines & Mineral Development Department and local industrialists, Punjab Small Industries Corporation (PSIC) intends to establish a Small Industries Estate (SIE) at Quaidabad through ADP with all facilities to local industrialists.

1.2 Need for EIA Study of the Proposed Project

Environmental clearance from the Environmental Protection and Climate Change Department (EP&CCD), Punjab is mandatory according to the Punjab Environmental Protection Act, 2012. Section 12 (1) of the Act 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."*

1.3 Category of the Project

According to the EP&CCD, Review of IEE/EIA Regulations 2022, the proposed project falls under the following category**.**

Punjab Environmental Protection Agency (Review of IEE and EIA) Regulations 2022	
Category H	Industrial Estate Projects

1.4 Nature, Size, and Location of the Project

A detailed description of the project is given in **Section 3** of the current report. However, a brief of the proposed project is given hereunder:

Nature	•Establismnet of Industrial Estate
Size	•Total Area 133.67 Acres
Location	•9 km in South of Quaidabad City on Noorpur Road, District Khushab

1.5 Scope of Study

The scope of this EIA Study aims at the collection and scrutiny of data related to the physical, biological, and socio-economic environment of the project area and to prepare the baseline environmental profile. It also aims at the identification, prediction & evaluation of the possible environmental and social impacts of the proposed project in immediate surroundings on short and long-term bases. Based on the nature and levels of those impacts, appropriate mitigation measures are proposed in this EIA Report.

1.6 Purpose of EIA Report

The purpose of this EIA Report is to assess significant adverse environmental and social impacts and to suggest mitigation and remedial measures to make the project environmentally friendly and sustainable during the construction and operational stages of the project and to initiate the process of Environmental Clearance from EP&CCD, Punjab.

1.7 The Proponent and Consultant

The proponent of the project is Punjab Small Industries Corporation (PSIC) while the Consultant is M/s NESPAK. The contact details are given as under:

PROPONENT

- Punjab Small Industries Corporation (PSIC)
- 2nd Floor, PSIC House, 23-A, Davis Road Lahore
- Telephone: +92-99203649
- Email: psicwd103@gmail.com

CONSULTANT

- National Engineering Services Pakistan Private Limited (NESPAK)
- EPHE Division, NESPAK House, 1-C, Block – N, Model Town Extension, Lahore
- Tel: 042-99090000

1.8 Study Team

A multidisciplinary team was formed to conduct the study. The team comprises the following professionals.

Mr. M. Ali Hamid	Principal Engineer/Environmental Expert
Mr. Syed Zeeshan Abbas	Senior Environmental Engineer
Mr. Abdul Manan	Senior Environmental Engineer
Mr. M. Ali Iqbal	Environmental Engineer
Mr. M. Anns Ali	Environmental Engineer
Ms. Hina Shahid	Sociologist

1.9 Study Approach & Methodology

1.9.1 Study Approach

The study is based on both primary and secondary data / information. Discussions were held with stakeholders including government officials, and local residents adjacent to project area. The main purpose of this approach was to obtain a fair impression of the people's perceptions of the project and its environmental impacts.

1.9.2 Methodology

The following methodology was adopted for carrying out the EIA study of the proposed Project:

a) Orientation

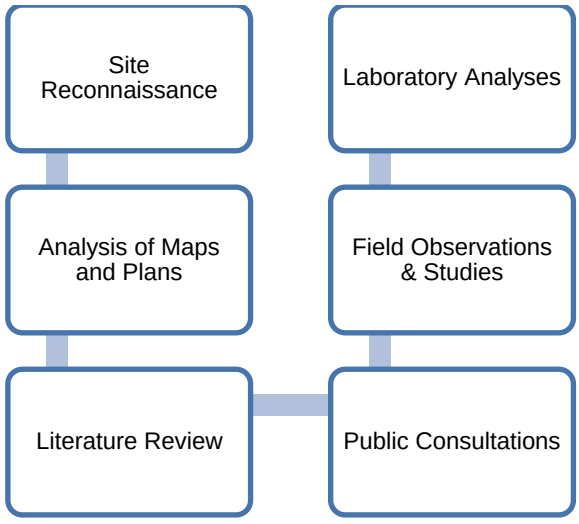
Meetings and discussions were held among the members of the EIA Consulting Team. This activity was aimed at achieving a common ground of understanding of the project and various issues of the study.

b) Planning for Data Collection

After the concept clarification and understanding obtained in the preceding step, a detailed data acquisition plan was developed for the internal use of the EIA Consulting Team. The plan included; the identification of specific data requirements and their sources; the determination of time schedules and responsibilities for their collection; and an indication of the logistics and other supporting needs for the execution of the data acquisition plan.

c) Data Collection

In this step, primary and secondary data was collected through field observations, environmental monitoring in the field, concerned departments, and published materials to establish a baseline profile for physical, biological, and socio-economic conditions. These activities were as under:



Baseline	***Physical Environment:*** Information was gathered on the existing physical environment, particularly as related to geology, topography, soils, hydrology and drainage, water quality, air quality, and noise in the project area.
	Biological Environment The status of flora and fauna of the study area was determined by an ecological survey, a review of literature relevant to the study area, and an assessment of terrestrial environments.
	Socio-Cultural Environment The consultants utilized a combination of desk research, field investigations, census data, structured interviews, and reports to generate the data required for a description of the existing social environment.

d) Identification and Evaluation of Environmental Impacts

The impacts of the proposed project on the physical, biological, and socio-economic environment prevalent in the project area were assessed at the design, construction, and operational phases with the help of baseline data.

e) Mitigation Measures and Implementation Arrangements

Adequate mitigation measures and implementation mechanisms were proposed so that the proponent could incorporate them beforehand in the design phase.

1.10 Structure of the Report

Section 1: Introduction briefly presents the project background, objectives, methodology, and need of the EIA study.

Section 2: Policy, Legal, and Administrative Framework comprise policy guidelines, statutory obligations, and roles of institutions concerning the EIA study of the proposed Project.

Section 3: Description of the Project furnishes information about the location of the proposed Project, cost and size of the project, and its major components.

Section 4: Environmental Baseline Profile describes baseline conditions for physical, biological, and socio-economic conditions prevalent in the project area.

Section 5: Public Consultation identifies the main stakeholders and their concerns raised through scoping sessions and deals with the measures to mitigate the social impacts.

Section 6: Anticipated Environmental Impacts and Mitigation Measures identifies, predicts, and evaluates impacts of the project activities during the construction and operation stages and deals with the measures proposed to mitigate potential environmental impacts of the proposed project.

Section 7: Environmental & Social Management and Monitoring Plan (ESMMP) outlines institutional arrangements for the implementation of the proposed mitigation measures, training needs of the staff for implementation of the mitigation measures, monitoring requirements, and monitoring cost.

2 LEGAL AND ADMINISTRATION FRAMEWORK

2.1 General

This section outlines the prevailing environmental policies, legal provisions, and administrative frameworks applicable to the establishment of the Quaidabad Industrial Estate. All relevant provisions of environmental policies, regulations, guidelines, etc. laid down by the Government of Pakistan and the Government of Punjab have been duly discussed, and the project proponent will be required to adhere to these regulations throughout the course of the project.

2.2 Summary of Key National Strategies, Policies, Acts, and Legislation

The summary of key national strategies, policies, acts, and legislation from an environmental perspective is briefly described in **Tables 2.1** below:

Table 2.1: Key National Strategies / Policies, Legislation / Acts, Laws and Regulations and Their Relevance to the Project

Sr. No.	Policy/Strategy	Brief Coverage	Relevance to project
1	Fatal Accidents Act 1855	An act to provide compensation to the family's loss occasioned by the death of a person caused by an actionable wrong. It is enacted as follows: • Suit for compensation to the family of a person for loss occasioned to it by his death by actionable wrong • Not more than one suit to be brought • Plaintiff shall deliver particulars etc. • Interpretation clause	The provisions of this act would be applicable if any fatal accident occurs during the execution of the proposed project.
2	Land Acquisition Act, 1894 (Including Later Amendments)	The primary law for the acquisition of land for public purposes in Pakistan is the "Land Acquisition Act, 1894", which determines the amount of compensation to be paid on account of land acquisition. The exercise of the power of acquisition has been limited to public purposes. The principles laid down for the determination of compensation, as clarified by judicial pronouncements made from time to time, reflect the anxiety of the law-giver to compensate those who have been deprived of property, adequately.	The proposed land for the industrial estate is owned by the locals, and it is private land. The land acquisition process will be carried out in accordance with the provisions of this Act.
3	Protection of Trees and Brushwood Act, 1949	This Act prohibits cutting or lopping of trees and brushwood without permission of the Forest Department.	The proposed project involves tree-cutting in large numbers, most of which are privately owned. The owners will be

Sr. No.	Policy/Strategy	Brief Coverage	Relevance to project
			compensated in cash for the loss of trees, and the environment will be compensated with the plantation of ten (10) trees in lieu of every single affected tree.
4	National Conservation Strategy 1992	Pakistan National Conservation Strategy (NCS), which was approved by the federal cabinet in March 1992, is the principal policy document on environmental issues in the Country. The NCS outlines the Country's primary approach towards encouraging sustainable development, conserving natural resources, and improving efficiency in the use and management of resources. The NCS has 68 specific programs in 14 core areas in which policy intervention is considered crucial for the preservation of Pakistan's natural and physical environment.	The core area that is relevant in the context of the proposed project is pollution prevention during construction, conserving, biodiversity, and supporting forestry and plantation.
5	Guidelines for Public Consultation, 1997	The Pakistan Environmental Protection Act 1997 requires public participation during the review of an EIA (Section 12(3)). The "Policy and procedures for the filing, review, and approval of environmental assessments" requires proponents to consult with the affected community and relevant NGOs during the preparation of an environmental report. Public involvement is a feature of environmental assessment and can lead to better and more acceptable decision-making. The objectives of public involvement include: • informing the stakeholders about what is proposed; • providing an opportunity for those otherwise unrepresented to present their views and values, therefore allowing more sensitive consideration of mitigation measures	These guidelines shall be complied with during consultations with the stakeholders, locals and affected community.

Sr. No.	Policy/Strategy	Brief Coverage	Relevance to project
		and tradeoffs	
6	National Sanitation Policy, 2006	The National Sanitation Policy of Pakistan, 2006, stresses on the safe disposal of excreta away from the dwellings, creation of an open defecation-free environment and, promotion of health and hygienic practices in the country.	This policy applies to the project for the efficient management of solid waste or wastewater during the construction or operation phase of the project.
7	Pakistan Labor laws	The labor laws are a comprehensive set of laws in Pakistan dealing with the following aspects: • Contract of Employment; • Termination of Contract; • Working Time and Rest Time; • Working hours; • Paid Leave; • Maternity Leave and Maternity Protection; • Other Leave Entitlements; • Minimum Age and Protection of Young Workers; • Equality; • Pay Issues; • Workers' Representation in the Enterprise; • Trade Union and Employers Association Regulation; and Other Laws.	The labor laws will be relevant as they will deal with the employment of labor during the construction as well as operation of the proposed Project.
8	Protection Against Harassment of Women at the Workplace Act, 2010	The Protection Against Harassment of Women at the Workplace Act refers to sexual harassment at the workplace.	This Act will apply to the project if women are employed for the construction of the proposed Project or women living in the near vicinity of the project area. This also relates to the employment of women during operational stage of the project.
9	Canal and Drainage Act 1873 and Amendment Act, 2016	This Act prohibits corruption or fouling of water in canals (defined to include channels, tube wells, reservoirs and watercourses), or obstruction of drainage.	This act applies to the project for the efficient management of wastewater during the construction or operation phase of the project.

Sr. No.	Policy/Strategy	Brief Coverage	Relevance to project
10	National Climate Change Act, 2021	The National Climate Change Policy provides a framework for addressing the issues that Pakistan faces or will face in future due to the changing climate. In view of Pakistan's high vulnerability to the adverse impacts of climate change, in particular extreme events, adaptation effort is the focus of this policy document. The vulnerabilities of various sectors to climate change have been highlighted and appropriate adaptation measures spelled out. The policy covers measure to address issues in various sectors such as water, agriculture, forestry, coastal areas, biodiversity, and other vulnerable ecosystems. Notwithstanding the fact that Pakistan's contribution to global Greenhouse Gas (GHG) emissions is very small, its role as a responsible member of the global community in combating climate change has been highlighted by giving due importance to mitigation efforts in sectors such as energy, forestry, agriculture, and livestock.	The project activities will be designed in a way to combat climate change rather than being a contributor to it.
11	Factories Act, 1934	The Act governs the regulation of labor conditions and safety standards in factories across Pakistan. It outlines provisions for health, safety, welfare, working hours, and employment of workers. The Act ensures proper ventilation, waste disposal, and machinery safety to protect labor welfare. It also mandates factory registration and regular inspections to ensure compliance with occupational health and safety requirements.	The Act is relevant to the project as it ensures compliance with occupational health, safety, and welfare standards for workers employed during construction and operation. It will guide the project in maintaining safe working conditions within the industry.
12	Industrial Relations Act, 2012	The Industrial Relations Act, 2012 governs the relationship between employers and workers in industrial establishments across Pakistan. It provides a legal framework for the formation of trade unions, collective bargaining, and resolution of industrial	The Act is relevant to the project as it ensures fair labor relations and protects the rights of workers within the industrial estate. It will help maintain effective communication

Sr. No.	Policy/Strategy	Brief Coverage	Relevance to project
		disputes. The Act promotes fair labor practices, protects workers' rights, and ensures industrial harmony. It also establishes mechanisms for arbitration and adjudication to maintain a balanced industrial environment.	between employers and employees.

2.3 Key Provincial Strategies / Policies, Legislation / Acts, Laws, and Regulations

The provincial policies, strategies, acts, and laws relevant to the environmental safeguard of the project activities are given below in **Table 22.**

After the 18th Amendment to the Constitution of Pakistan, many subjects, including environmental protection and pollution prevention, have been devolved to the provincial jurisdiction. Therefore, the apex environmental statute governing the proposed project will be the Punjab Environmental Protection Act 1997. However, detailed rules, regulations, and guidelines required for the implementation of the policies and enforcement of legislation are still in various stages of formulation and discussion. The following description presents a brief overview of the relevance of various existing provincial policies, legislation, and guidelines.

Table 2.2: Key Provincial Strategies / Policies, Legislation / Acts, Laws and Regulations and Their Relevance to the Project

Sr. No.	Strategies / Policies / Legislations / Acts / Laws & Regulations	Brief Coverage	Relevance to project
1	Punjab Land Revenue Act, 1967	It expedites the consolidation and maintenance of the record of rights, assessment and collection of land revenue, the appointment of land officers, and all the matters relating to and arising in connection with the administration of land revenue.	The provisions of this act would be applicable during the land acquisition process.
2	Punjab Plantation and Maintenance of Trees Act, 1974	The Punjab Plantation and Maintenance of Trees Act, (1974) regulates tree plantations and enforces measures for their protection.	Tree plantations would be carried out in the project site in view of the provisions of this Act.
3	Punjab Land Acquisition Rules, 1983	This Law provides for the acquisition of land needed for public purposes and for Companies and determines the amount of compensation to be made on account of such acquisition.	The provisions of this act would be applicable during the land acquisition process.
4	Guidelines and Checklists adopted by	Post the adoption of the 18th Constitutional Amendment in 2011, the	No Objection Certificate (NOC) shall be required

Sr. No.	Strategies / Policies / Legislations / Acts / Laws & Regulations	Brief Coverage	Relevance to project
	Government of Punjab after 18th Amendment	subject of environment was devolved and the provinces have been empowered for environmental protection and conservation. The Punjab Environmental Protection Act, 1997 (as Amended up to 2022) is comprehensive legislation and provides the legislative framework for the protection, conservation, rehabilitation, and improvement of the environment.	from Punjab Environmental Protection and Climate Change Department (EP&CCD) before the commencement of construction.
5	Punjab Environmental Tribunal Rules, 2012	According to Section-31 of the Punjab Environmental Protection Act, 1997 (XXXIV of 1997), the Tribunal shall make every effort to dispose of a complaint or an appeal or other proceedings regarding environmental problems associated with the construction and development of any project within sixty days from the date of filing of the complaint, appeal or other proceedings but any decision of the Tribunal shall not be rendered invalid by reason of any delay in the disposal of complaint, appeal or other proceedings.	Any environmental issue arising due to the implementation of the proposed project may be filed in the Environmental Tribunal.
6	Punjab Antiquities Amendment Act, 2012	The Punjab Antiquities Amendment Act, 2012 is adapted from the Pakistan Antiquities Act of 1975 with a few minor changes. The law declares that “any construction activity within 61 meters or 200 ft. of protected antiquities, are prohibited".	The provisions of this act would be applicable, if any accidental archaeological discoveries may occur during the excavation works for the construction of the proposed Project.
7	Punjab Environmental Quality Standards (PEQS), 2016	Punjab Environmental Quality Standards (PEQS), 2016 endow information on the permissible limits for discharges of municipal and industrial effluent parameters and industrial gaseous emissions in order to regulate environmental pollution.	These standards shall be complied with during all the stages of the project to confine the pollution loads within permissible limits.
8	Punjab Restriction on Employment of Children Act, 2016	According to the sub-section 11(a) of this act, an occupier who employs or permits a child (person under the age of 15 years) to work in an establishment shall be liable to punishment with	This Act will ensure that the Construction Contractor does not hire any labor under the age of 15.

Sr. No.	Strategies / Policies / Legislations / Acts / Laws & Regulations	Brief Coverage	Relevance to project
		imprisonment for a term which may extend to six months, but which shall not be less than seven days, and a mandatory fine between 10,000 and 50,000 rupees.	
9	Punjab Protection of Women against Violence Act, 2016	This act counters gender-based discrimination, violence against women, and economic and social empowerment of women.	This act will ensure the availability of equal opportunities for women. Further, any act of violence or harassment towards the women will be dealt strictly, as laid down by the law.
10	Punjab Policy on Controlling Smog, 2017	The Punjab Environmental Protection Department issued this policy on controlling smog in 2017. It imposes a complete ban on open burning of rice stubble, solid waste and other hazardous materials. It focuses the reasons behind the formation of dense smog in Punjab, especially in Lahore and its environs, on the onset of winters each year and provides a short and medium to long-term plan, including measures for the protection of school-going children; minimizing road accidents and creating mass awareness on precautionary measures for citizens at large.	Open burning of solid waste, and other hazardous materials will be avoided during all the stages of the project. The project in all stages, will play its part to combat the smog, under the provisions of this Act.
11	Punjab Labor Policy, 2018	Through this Labor Policy, the Government resolves to demonstrate its commitment to work for the protection of labor and ensuring its dignity through coordinated efforts and policy integration.	The labor policy will be applicable in all stages of the project to ensure the safety of workers' rights.
12	Punjab Occupational Safety and Health Act, 2019	This law was enacted to ensure occupational safety and health of the persons at workplace. It aims at protection of workers against risks arising out of occupational hazards and to promote a safe and healthy working environment catering to the physiological and psychological needs of the employees at the workplace.	A safe and secure working environment will be provided to the workers in the view of provisions of this Act.

Sr. No.	Strategies / Policies / Legislations / Acts / Laws & Regulations	Brief Coverage	Relevance to project
13	Punjab Industrial Policy, 2018	The Punjab Industrial Policy, 2018 aims to promote sustainable industrial growth through improved infrastructure, investment facilitation, and job creation. It emphasizes the establishment of industrial estates, public-private partnerships, and environmentally responsible development. The policy encourages technological innovation, resource efficiency, and export-oriented industries. It also supports inclusive economic growth by ensuring ease of doing business and balanced regional industrialization across Punjab.	The proposed Quidabad Industrial Estate aligns with the provisions of this policy in terms of its objectives of regional growth, employment generation, and environmentally responsible development.

2.4 International Protocol/Conventions

As Pakistan is a member of a number of international organizations such as United Nations Organization (UNO), Organization of the Islamic Conference (OIC), South Asian Association for Regional Cooperation (SAARC), Economic Cooperation Organization (ECO) etc., so it has to follow the international protocols and obligations related to the environment. The major protocols, ratification dates by Pakistan and obligations related to the proposed project are provided in the **Table 3.4** below.

Table 2.3: International Agreements/Conventions Relevant to the Project

Sr. No	Agreement/ Convention	Ratification	Description/Relevance
1	The Rio Declaration, 1992 Web Link: http://www.unesco.org/education/pdf/RIO_E.PDF	Pakistan signed the treaty on 13Jun 1992 and ratified on 1 June 1994	The Rio Declaration comprises 27 principles that address important issues such as; sustainable development to integrate environmental protection into the development process; common but differentiated responsibilities to conserve, protect and restore the earth's ecosystems; public participation and information access at the national level, reduce and eliminate unsustainable patterns of production and consumption.
2	Kyoto Protocol, 1992	Pakistan has ratified Kyoto Protocol in 2005	The Kyoto Protocol is a protocol to reduce Greenhouse gasses that cause climate change. It was agreed on 11th

Sr. No	Agreement/ Convention	Ratification	Description/Relevance
	Web Link: https://unfccc.int/kyoto_protocol		December, 1997 at the 3rd Conference of the countries to the treaty when they met in Kyoto, and entered into force on 16th February, 2005. As of November 2007, 175 countries have ratified the protocol. One hundred and thirty-seven (137) developing countries have ratified the protocol, including Brazil, China, India and Pakistan but have no obligation beyond monitoring and reporting emissions.
3	Convention on Biological Diversity, 1994 Web Link: https://www.cbd.int/	Pakistan signed this treaty in 1992 and it was ratified by cabinet in 1994.	The Convention on the Biological Diversity (CBD) has three main goals: Conservation of biological diversity (or biodiversity); sustainable use of its components; and fair and equitable sharing of benefits arising from genetic resources.

2.5 Institution Responsible for Planning, Policies and Regulations

2.5.1 Environmental Protection & Climate Change Department, Punjab

Implementation of Punjab Environmental Protection Act 1997 (Amended 2012, 2017 & 2022) is the mandate of the Punjab-EPA. Punjab-EPA is headed by a Director General, and sections are headed by Directors, i.e., Director Technical, Director Administration and Finance, and Director Laboratory. Punjab-EPA has established District Environment Offices at the district level.

As the proposed Project falls in District Khushab, Punjab; therefore, Punjab-EP&CCD will be responsible for reviewing the report, issuing environmental approval, and overall monitoring of the proposed project activities.

3 PROJECT DESCRIPTION

3.1 Rationale of the Project

In Quaidabad city, local industry is scattered, and to streamline the industry, a small industrial estate is needed in the area to create an enabling business environment for the business sector to grow and prosper to achieve the government's objectives of employment generation and establishing a linkage between small industries and household/cottage industry, resulting in poverty alleviation. Punjab Small Industries Corporation (PSIC) intends to establish a Small Industries Estate (SIE) at Quaidabad on a land measuring 133.67 Acres through Annual Development Plan (ADP) with all facilities for local industrialists. As per its charter, PSIC envisages the promotion & development of Small Industries in the province. In this regard, PSIC has developed 23 Small Industries Estates across the Punjab.

Quaidabad Small Industries Estate (QSIE) is in need of time to create a better quality of life for the citizens of Punjab by encouraging the private sector to invest in QSIE by providing necessary infrastructure facilities for economic uplift. The project will be promoting exports of value-added manufactured items from different sectors.

3.2 Project Objectives

The main objectives of this project are:

- To facilitate the development of an industrial estate through a planned scheme mechanism and development policies.
- To ensure state government facilitation for the needs of the Area.
- To maintain and improve the industrial estate for future industrial uses and infrastructure as per long-term strategic planning.
- To create more opportunities for investments, economic and social uplift of the region.
- To progress strategic government infrastructure projects and to ensure adequate facilitation for industries to support economic development.
- To create skilled and unskilled employment.
- To enhance exports.

3.3 Project Location

The QSIE is located in the South of Quaidabad City on Noorpur Road. The site is bounded by Noorpur Road in the east, a nullah stormwater drain in the north, and Piplan Road in the south. The location map and accessibility map of the project area are shown in **Figure 3.1** and **Figure 3.2**.

3.4 Project Administrative Jurisdiction

The proposed project lies in Khushab District. The Khushab District is under the general charge of the Deputy Commissioner.

3.5 Project Implementation Schedule

The project is expected to be completed in 30 months.

3.6 Land Acquisition

Private land (133.67 Acres) will be purchased for the proposed project. The government has imposed Section-4 on the land and is in the process of purchasing the land. The notification of the Section-4 from the District Collector/Deputy Comissioner Office Khushab is attached as **Annex-I.**

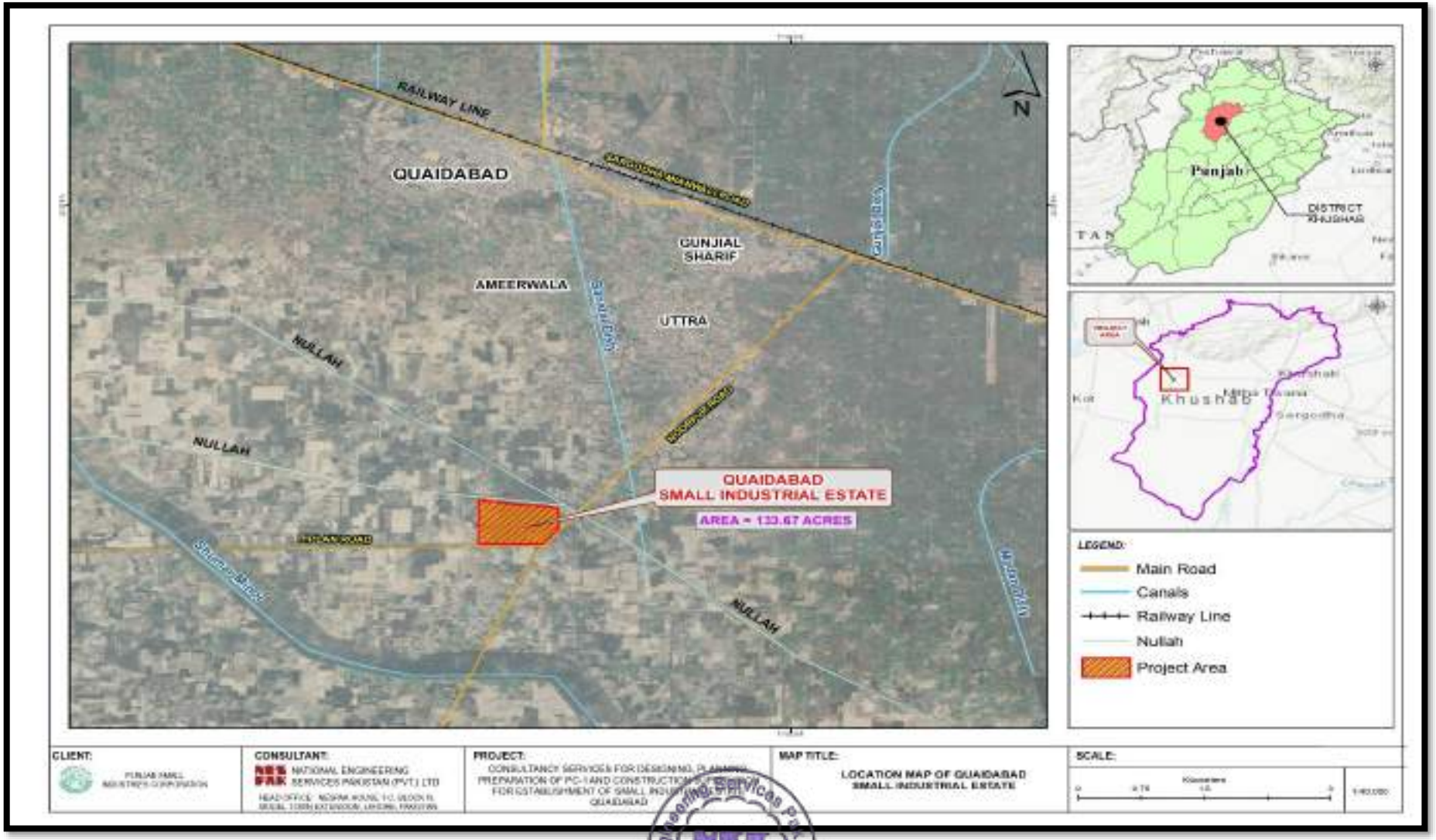


Figure 3.1: Location Map of Project Area

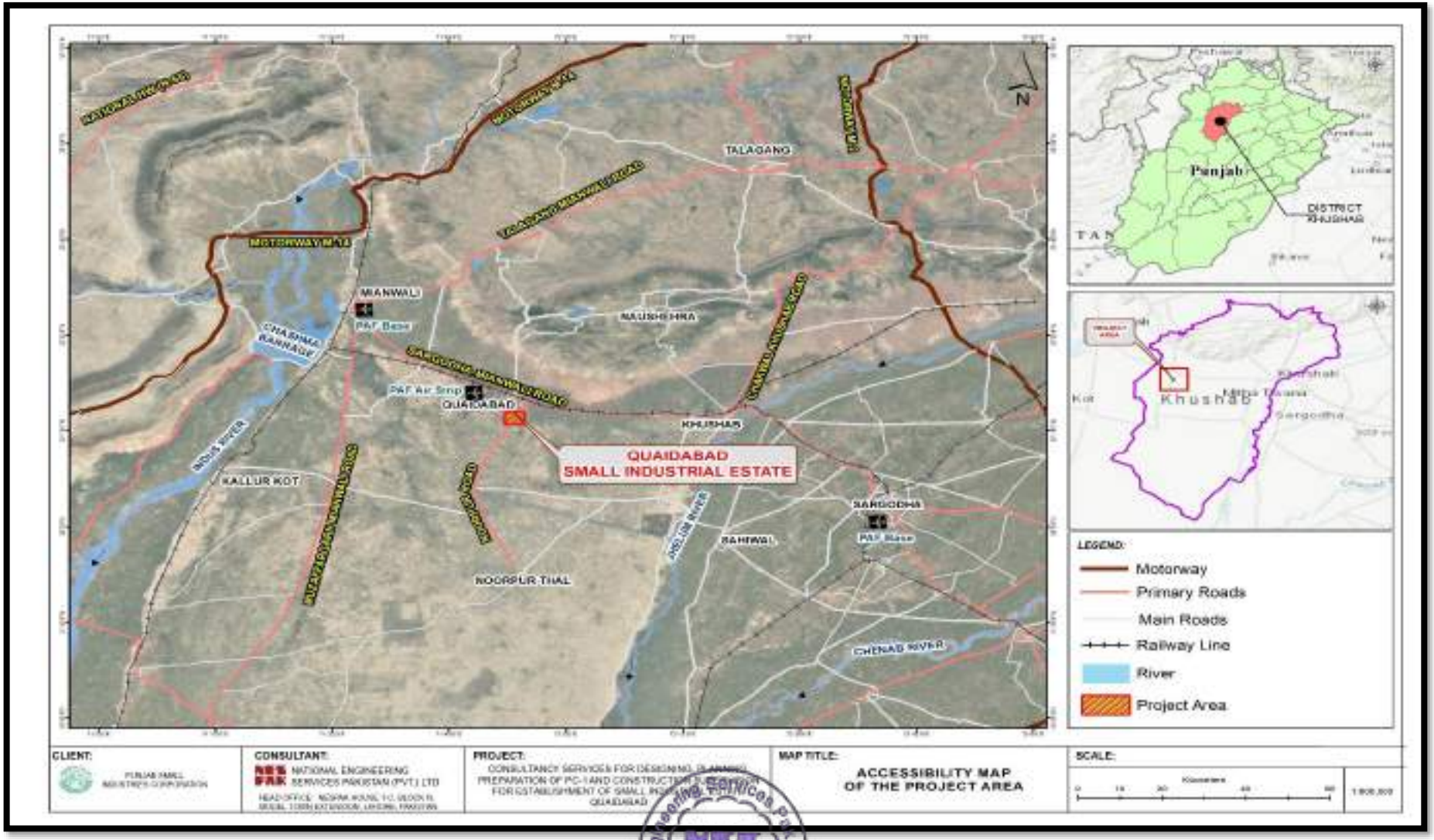


Figure 3.2: Accessibility Map of Project Area

3.7 Cost of the Project

The total project investment costs are estimated to be **Rs. (7) Seven Billion.**

3.8 Components of the Project / Land Use

As per the proposed master plan of the QSIE following are the different components of the project.

3.8.1 Industrial Use

A diverse range of plot categories has been incorporated into the concept master plan of the QSIE to accommodate the requirements of various types of industries, ranging from small-scale cottage industries to medium and large-scale enterprises. The variety offers flexibility and convenience to investors, making the QSIE more attractive and investment-friendly.

3.8.2 Amenity and Utility

Public and utility uses are the backbone of any industrial development, as they provide services of local nature for the workers and entrepreneurs as well as ensure socially and environmentally sound functioning of the area.

The public uses proposed in Quaidabad Small Industrial Estate (QSIE) include Mosque, Office Building, Dispensary, Rescue 1122 Center, Petrol Pump, Tube well, Disposal Station / Combined Effluent Treatment Plant, Grid Station and Staff residency etc. The infrastructure include Water supply, sewerage system and roads area etc. to serve the needs of power, effluent treatment of the Industrial Estate.

3.8.3 Commercial Use

As the project is located in relative isolation, the development of a commercial hub becomes inevitable to ensure the long-term sustainability of the QSIE and the convenience of its workers. To address this, a dedicated commercial area with adequate parking facilities has been integrated within the project's layout to serve commuters, workers, and visitors alike. The commercial areas are strategically placed at the entrance and center for easy accessibility from all corners of the QSIE.

3.8.4 Road Network

An efficient road network plays a key role in urban and industrial development as well as linkages with available Highways, Motorways, and Railways are essential. The site is already linked with the Sargodha Mianwali Highway through Nurpur road, which gives an edge to the location of the industrial estate. A good road network ensures efficient mobility and ease of access to any

locality/facility. There are various types of roads fulfilling various roles, and careful selection of type is very crucial, especially in the case of an industrial city where safe & efficient movement of large & loaded vehicles is of key importance.

The road network is to follow a grid pattern, with a hierarchy of main and local streets. All the main circulation arteries are planned as dual carriageways with adequate tree plantation, landscaping, street lighting, and footpath facilities to properly facilitate and segregate vehicular and pedestrian traffic.

3.8.5 Parks/ Green/ Open Spaces

It will be ensured that public parks and play areas are properly landscaped. As landscaping plays an important role in the proper development of industrial estate, it not only enhances the visual beauty but is also a viable means of managing environment. With the help of landscaping, visual barriers and noise control can be effectively achieved along with a neat, clean and healthy environment. Therefore, hard and soft landscaping along roads, in open spaces and at other appropriate spaces has to be carried out to make the industrial estate a pleasant development.

3.9 Alternative For Project Execution

The site for the proposed industrial estate has already been selected by the PSIC and is being acquired. The analysis of different project alternatives is discussed below;

3.9.1 Alternative 1: Business-as-usual/ No Project Scenario

This scenario represents the “no project” option, where the establishment of industrial estate project is not carried out. Industries will continue to operate in a scattered manner across the Tehsil or city, as they currently do. This alternative reflects the status quo, where no improvement in industrial organization or environmental conditions is expected.

3.9.2 Alternative 2: Full Project Implementation

This alternative involves the implementation of the proposed plan, including infrastructure development, zoning, and mandatory environmental controls within a newly established centralized industrial zone. A designated area will be developed to concentrate all industrial activities in one location. Targeted industries will either be relocated to or newly established within this zone. Modern infrastructure will be provided to support organized and efficient industrial growth, allowing for optimized land use and proper planning. The government will be responsible for the initial land acquisition, infrastructure development, and the construction and management of a Common Effluent Treatment Plant (CETP).

3.9.3 Alternative 3: Private Sector-Led Development /Self-Managed Development

In this case, the selected site is officially declared as an industrial estate, but the development responsibilities are transferred to the private sector. The government plays a minimal role, primarily providing regulatory support and facilitating necessary approvals. Once the zone is declared, investors and industrialists are encouraged to establish their industries on the site. All infrastructure development such as roads, utilities, and waste management are the responsibility of the industrial owners or investors. This model promotes private investment. However, it may result in inconsistent infrastructure quality and slower development if coordination among stakeholders is lacking.

Table 3.1: Comparison of Alternatives

Sr No.	Feature / Criteria	Alternative 1: Business-as-usual/No Project	Alternative 2: Full Project Implementation	Alternative 3: Private Sector Development
1	Development Status	No industrial estate is developed	A fully developed industrial estate by the government	Site declared, but development by the private sector
2	Infrastructure Development	No change	Provided by the government (roads, utilities, CETP)	Responsibility of investors/industry owners
3	Industry Location	Scattered across the city/Tehsil	Centralized in a designated zone	Centralized in a designated zone
4	Government Role	None	Full responsibility: land, infrastructure, CETP, zoning	Minimal: regulatory support and approvals only
5	Environmental Impact	High pollution, unregulated discharge	Controlled via zoning and communal CETP	Depends on individual investor compliance
6	Economic Development	Limited due to scattered growth	Boosts industrial and local business development	Encourages private investment, gradual growth
7	Implementation Speed	Immediate (no action taken)	Faster due to coordinated planning	It may be slower due to a lack of centralized control
8	Cost to Government	None	High (land, infrastructure, CETP)	Low
9	Standardization of Development	None	High (planned and uniform infrastructure)	Variable may lack standardization
10	Sustainability	Low	High (planned eco-friendly design)	Medium, depends on private commitment
11	Land Use Efficiency	Inefficient, scattered	Efficient, centralized planning	Moderate, depends on investor choices

3.9.4 Conclusion

After a thorough assessment of the three proposed alternatives, Alternative 2: Full Project Implementation is recommended as the most effective and sustainable option for industrial development. It offers a centralized, government-led solution with well-planned infrastructure and mandatory environmental controls, including a Common Effluent Treatment Plant (CETP). This approach ensures organized growth and environmental protection.

In contrast, Alternative 1 allows continued unregulated and disorganized industrial expansion, leading to further environmental degradation, while Alternative 3 poses risks of inconsistent development and delayed implementation due to limited government involvement and lack of coordination.

Therefore, Alternative 2 provides the most balanced and practical framework for promoting economic growth, environmental sustainability, and effective urban planning. It is strongly recommended that the project should be implemented under this model to ensure successful and responsible industrial development.

3.10 Study of Land Use Alternatives

Two (02) alternative options have been considered for land use planning of the proposed QSIE based on the above-stated Planning Principles, Sustainability Concepts, and on the ideology of best utilization of available land. The alternatives are shown in **Figure 3.3** and **Figure 3.4.**

Table 3.2: Comparison of Land Use Master Plan Options 1, & 2

Sr. No.	Description	Option-1	Option-2
Land Use Distribution			
1	Industry	66.2%	63.83
2	Commercial	2.8%	2.69
3	Public Amenities	8.4%	9.57
4	Roads	16.2%	15.61
5	Green Spaces	6.4%	8.30
	Total	**100.00%**	**100.00%**
Industrial Plot Composition			
1	1 Acre	24.12%	24.37 %
2	4 Kanals	37.49%	49.07 %
3	2 Kanals	29.49%	20.66 %
4	1 Kanal	8.90%	-
5	10 Marla	-	5.90 %
	Total	**100%**	**100%**

Figure 3.3: Conceptual Master Plan (Option- 1)

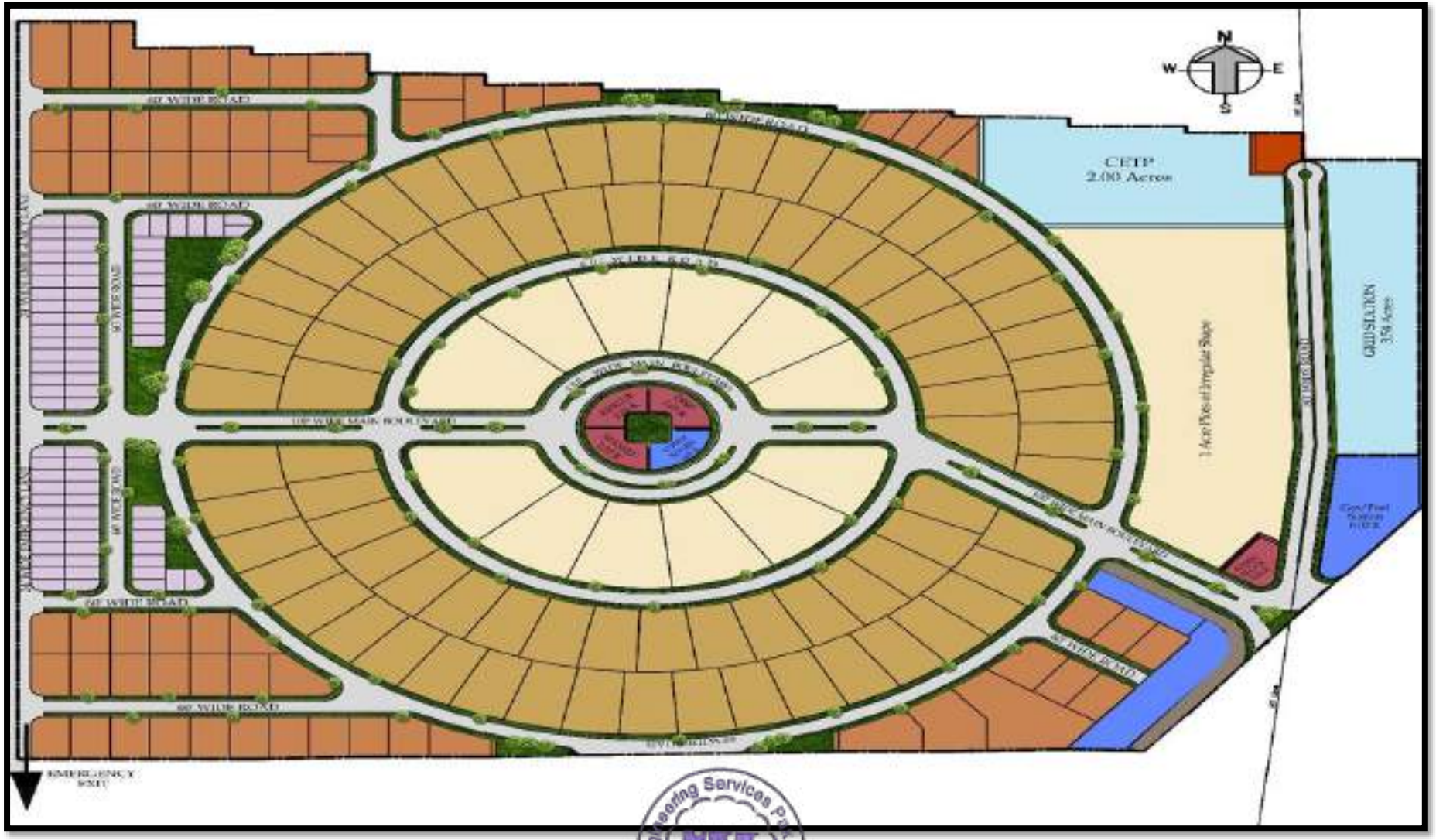


Figure 3.4: Conceptual Master Plan (Option- 2)

3.9.1 Selected Master Plan And Land Use Details

The selected Master Plan for QSIE has been designed to ensure efficient allocation of land uses in line with industrial and support requirements. The majority of the estate, nearly 65% of the total area, is earmarked for industrial plots of varying sizes (10 marla, 2 Kanals, 4 Kanals and 1 Acre) to cater to both small- and medium-scale enterprises. Supporting facilities, including an Office Building, staff residences, mosque, healthcare dispensary, and Rescue 1122 sheds, are strategically placed to provide essential services within easy reach of the workforce. Commercial plots including bank are allocated centrally and near the main entrance to facilitate commercial activities, business transactions and daily needs etc. Adequate green spaces, landscaped roundabouts, and road medians are integrated to enhance the environmental quality and create a sustainable working environment. The estate's circulation network design on grid iron pattern is anchored by wide primary and secondary roads, complemented by local roads and a continuous service corridor along the periphery to ensure smooth movement of goods and vehicles. Overall, the land use distribution emphasizes functionality, accessibility, and sustainability to promote industrial productivity and long-term growth.

Table 3.3: Land Use Distribution Percentages

Sr. No.	Land Use Category	Area in Acres	Percentage (%)
1	Industry	86.91	65.02
2	Commercial	5.59	4.18
3	Public Amenities	6.55	4.90
4	Roads	24.46	18.30
5	Green Spaces	10.16	7.60
	Total	**133.67**	**100.00**

The Final Master Plan of QSIE is given below in **Figure 3.5**.

i. Industrial Plots Composition

Four plot sizes have been planned i.e., 1 Acre, 4 Kanal, 2 Kanal, and 10 Marla. Following are the detail of proposed industrial plot sizes in QSIE Master Plan.

Table 3.4: Industrial Plots Composition

Sr. No.	Category	Area of Plots (Acres)	Percentage (%)
1	1 Acre	17.92	20.62
2	4 Kanal	42.97	49.44
3	2 Kanal	17.65	20.31
4	10 Marla	8.37	9.63
	Total	**86.91**	**100**

ii. Details of Amenities Plots

Provision has been made for the commercial and social amenities in the proposed industrial estate. **Table 3.5** shows the details of social amenities.

Table 3.5: Details of Amenities Plots

Sr. No.	Amenity	Area (Kanals)
1	Admin Building	2.00
2	Public Buildings (Mosque, Dispensary & Rescue 1122)	3.99
3	Overhead Tank	1.00
4	Staff Residences	3.46
5	CETP/Disposal Station	16.02
6	Grid Station	25.93
	Total	**52.40**

A land area measuring 6.55 Acres (52.40 Kanals) is reserved for amenity and utility uses which constitute 4.18 % of total area of QSIE.

iii. Type of Industries

After studying the Quaidabad city industrial profile and considering the socioeconomic setup of the area along with available resources, Different types of industries are planned in different plots of the proposed industrial estate. **Table 3.6** summarizes the types of industries for the proposed industrial estate.

Table 3.6: Type of Industries

Sr. No.	Type of Industry	%Age share	Major Products
1	Salt & Mineral Processing Products	50%	Salt Based Products, Gypsum Products, Limestone Products, Byproducts & value addition
2	Food & Beverage (agriculture processing)	20%	Fruit & Vegetable, Grain & Pulse, Grain & Pulse, Beverages etc.
3	Agri. Implementation Products	10%	Farm Machinery & Equipment, Post-Harvest & Storage Equipment, Agri. Tools & Accessories
4	Storage & Warehouse	4%	General Warehousing, Agri. & Food Warehousing, Mineral & Salt Storage, Logistics & Distribution Centers
5	Light Manufacturing & Packaging Products	6%	Packaging Industry, Light Engineering / Fabrication, Supportive Light Manufacturing
6	Cottage Industry	5%	Carpets, embroidery, textiles etc.

Sr. No.	Type of Industry	%Age share	Major Products
7	Chemical Products	5%	Basic Industrial Chemicals, Food-Grade & Consumer Chemicals, Support Chemicals
	Total	**100%**	

iv. Road Network

The various categories of roads have been proposed in the master plan; the minimum width has been maintained as 60 feet as shown in Table below.

Table 3.7: Proposed Roads Hierarchy

Sr. No.	Description	Right of Way
1	Main Boulevard	100’
2	Sector Roads	80’
3	Local streets	60’

A land area is allocated for road network i.e., 18.30% (24.46 Acres) of total area of the QSIE.

v. Parks/ Green/ Open Spaces

A central park of 4.09 Kanals is provided in the industrial estate to soften the impact of monotony of industrial developments. A total of 7.60 % (10.16 acres) of area is allocated for Parks/ Green/ Open Spaces of total area of the QSIE.

Figure 3.5 Final Master Plan

3.11 Fire Demands

The optimum water demand for firefighting is **63,352 gallons/ day** calculated by the National Guidance Document on the Provision of Water for Fire Fighting (U.K) is adopted. However, during incidents of firefighting, the supply to industries may be affected.

3.12 Water Requirement

Construction Phase

The water consumption is estimated to be 250 gallons/day for 50 construction workers during the construction phase of the proposed Project.

Operation Phase

The estimated water consumption at full development would be about 1.06 MGD.

3.13 Wastewater Generation and Treatment Mechanism

Construction Phase

The wastewater generation is estimated to be 200 gallons/day for 50 construction workers during the construction phase of the proposed Project.

Operation Phase

Total wastewater generation is estimated to be 0.848 MGD at full development.

3.14 Solid Waste Generation

Construction Phase

The domestic solid waste generation is estimated to be 25 kg/day for 50 construction workers during the construction phase of the proposed Project in addition to various construction and demolition waste.

3.15 Power Requirements

The electrical load has been estimated to be 30 MW for the operation phase.

3.16 Construction Materials

The materials used in the construction of the proposed project would include reinforced cement

concrete frame (RCC Frame), brick infill, brick cladding, textured paints, and standard paints, etc. The materials used in theconstruction of the road for the proposed project would include coarse aggregates (crush), fine aggregates (sand), water, asphalt, reinforcement, cement, etc.

3.17 Construction Camps

Campsites will be selected keeping in view the availability of adequate areas for establishing construction camps, including parking areas for machinery, stores, and workshops, access to communication and local markets, and an appropriate distance from sensitive areas in the vicinity. Final locations will be selected by the contractor in consent with Supervision Consultant after approval from QSIE.

3.18 Expected Equipment For Construction

The list of the machinery and the equipment required for the proposed project is provided in **Table 3.8**.

Table 3.8: Machinery and Equipment Requirement

- Concrete batching plant
- Transit mixer
- Formwork
- Pneumatic rollers
- Trucks
- Pumps (mobile and stationary)
- Graders
- Tractor trolleys
- Generator set
- Total station with level machine
- Transformers for construction
- Excavators
- Cranes
- Dumper
- Concrete
- Compactor Loaders and drilling rigs
- Cutting/bending machine
- Carriage Vehicles
- Water boozers
- Concrete vibrators (external and internal)

4 Baseline Profile

4.1 General

This section presents the current environmental conditions in and around the project area, which has been considered with respect to physical, ecological and socio-economic resources. The current environmental baseline study is intended to establish a database against which potential project impacts can be predicted and managed later.

Reconnaissance and detailed surveys of the project area were conducted for baseline data collection starting from September 28, 2025 through October 4, 2025. The prime objective of the field visits was to collect the baseline data on physical, eco-biological, and environmental & social aspects. The secondary data was collected from published sources/reports and relevant departments, which were also verified through visual observations during reconnaissance and detailed surveys.

4.2 Objective of the Baseline Study

The baseline description is intended to accomplish the following objectives:

- To deliver the proponent of the project adequate knowledge about socio-economic set-up, physical environment aspects, social aspects, ecological features, built-up structures, and infrastructure of the project area; and
- To allow the planners to assess the potential efficacy of the actions to alleviate the adverse impacts and improve benefits.

4.3 Delineation of Study Area/ Area of Influence (AoI)

The impacts associated with the project activities are localized and confined within the proposed project site. Hence, the entire boundary of the industrial estate is designated as the Area of Influence (AoI). **Figure 4.1**, represents the AoI of the project area.

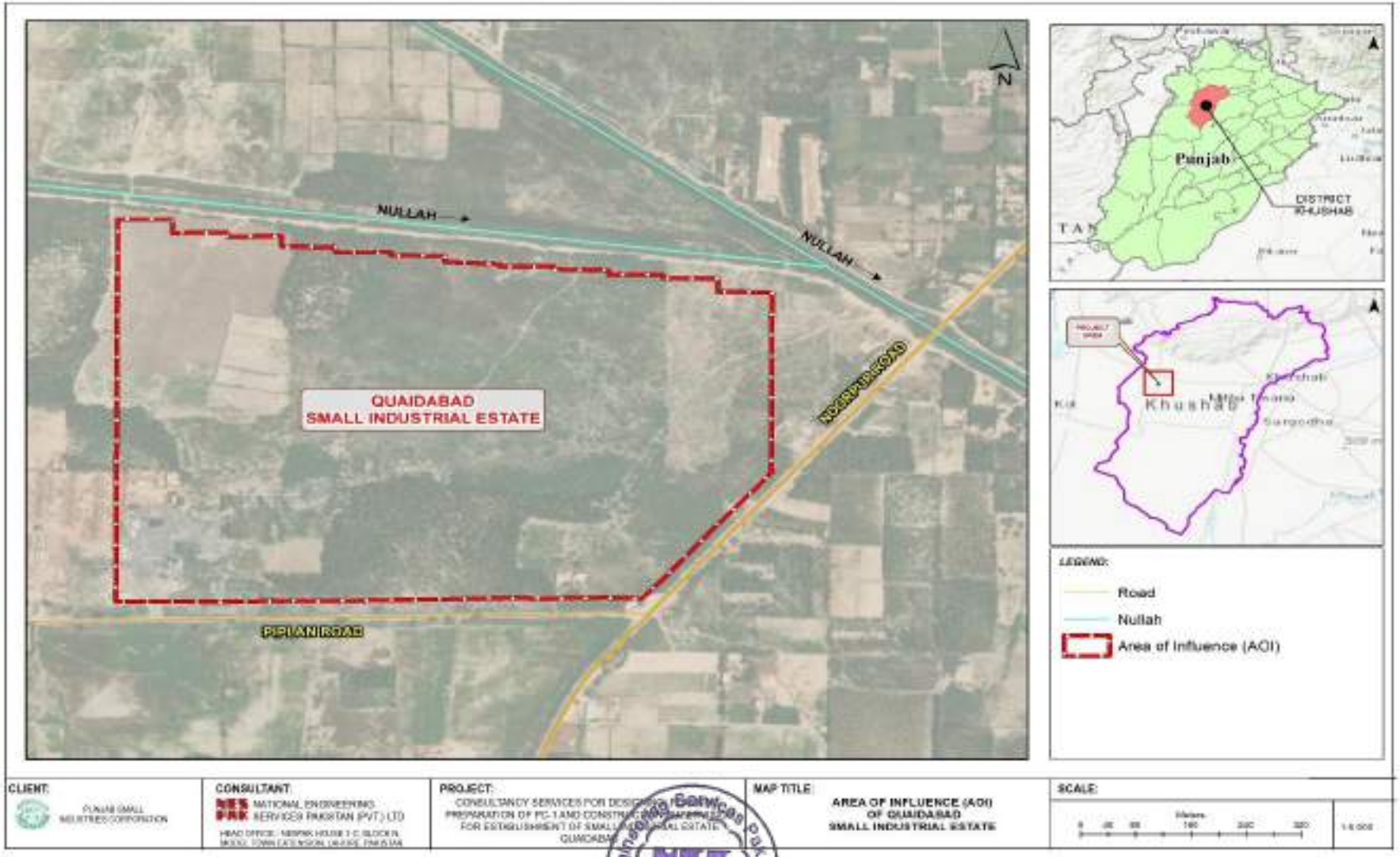


Figure 4.1: Study Area Map / AoI of Project Area

As per the national and provincial regulations, impacts and risks have been analyzed within the project AoI.

4.4 Physical Environment

The physical environment including topography, geology, soil, climate, hydrology, drainage, seismology, surface water, groundwater, land use, and ambient air is described below.

4.4.1 Topography

The project area is located in Quaidabad Tehsil, District Khushab. The geographical coordinates of Quaidabad are approximately 32°17'23.44" N latitude and 79°53'08.04" E longitude. Quaidabad Tehsil of District Khushab is geographically bounded by Khushab City in the west, Jauharabad in the northwest, Bhakkar District in the south, and Mianwali District in the west. The area lies within the semi-arid plains of Punjab, characterized by sparse vegetation and dry climatic conditions.

The topography of Quaidabad is generally flat to gently undulating, typical of the Thal region's semi-arid plains. The project area consists of sandy loam soil with scattered dunes and low-lying depressions. Ground levels within the project area range between 175 to 198 meters above mean sea level (MSL). The terrain facilitates surface runoff drainage toward natural depressions and seasonal streams during rainfall events. The digital elevation map of the project area is shown in **Figure 4.2** below;

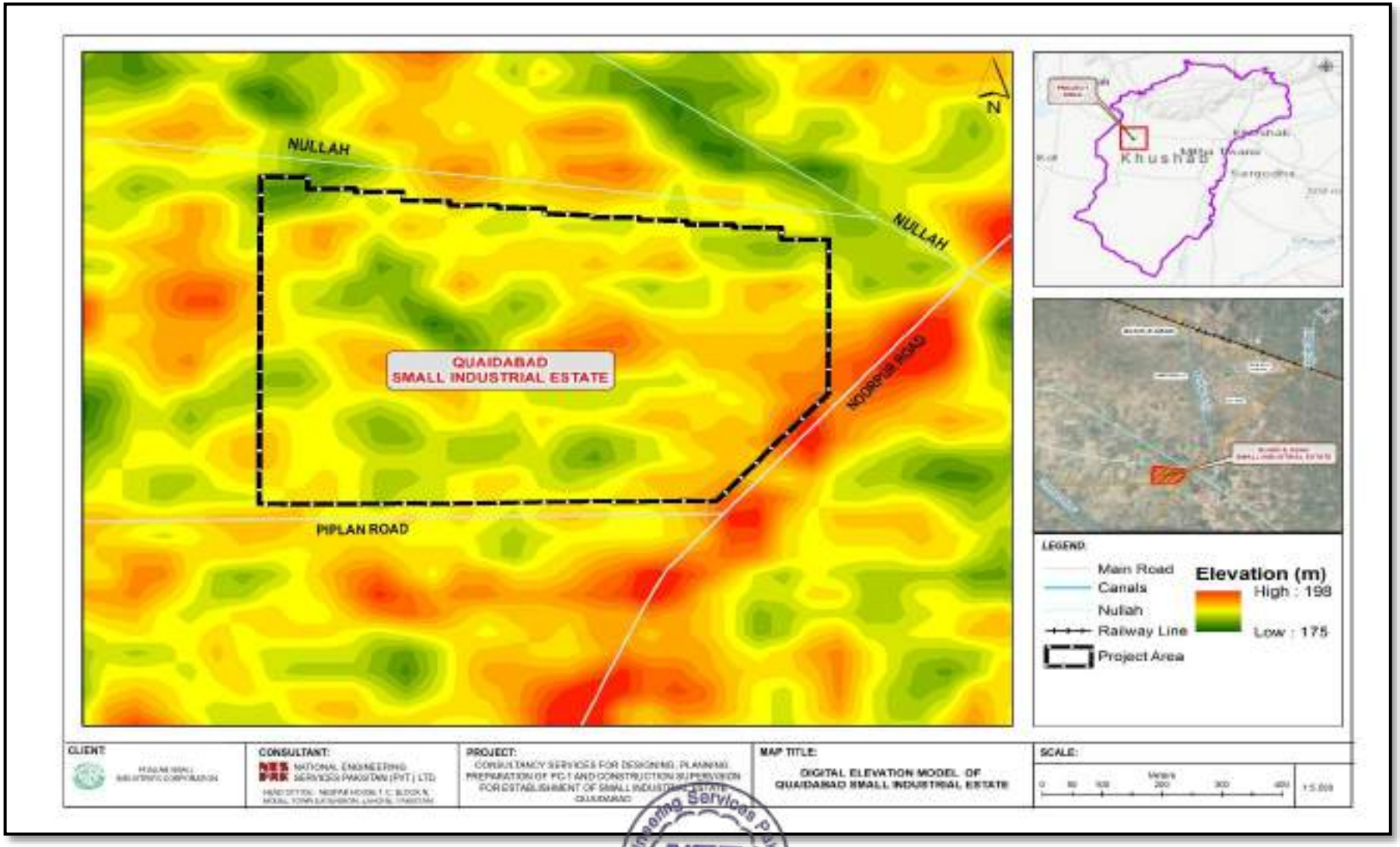


Figure 4.2: Degital Elevation Map of Project Area

4.4.2 Geology

The geology of Quaidabad, District Khushab, is primarily characterized by Quaternary alluvial and aeolian deposits overlying Precambrian basement rocks. The area forms part of the northeastern Thal Doab and consists mainly of fine to medium sand, silt, and clay, with occasional gravel beds extending to depths of about 180–300 meters. These unconsolidated sediments constitute highly permeable aquifers recharged through rainfall and seepage from the Jhelum River system. Toward the northern periphery near the Salt Range, the terrain exposes folded and fractured sedimentary formations of Precambrian to Pleistocene age, comprising limestone, gypsum, and rock salt deposits.

4.4.3 Climate and Meteorology

i. Average Temperatures

Figure 4.3 represents mean monthly maximum and minimum temperatures for different months of the last 30 years. The "mean daily maximum" (solid red line) shows the maximum temperature of an average day for every month. Likewise, "mean daily minimum" (solid blue line) shows the average minimum temperature. Hot days and cold nights (dashed red and blue lines) show the average of the hottest day and coldest night of each month of the last 30 years.[1]

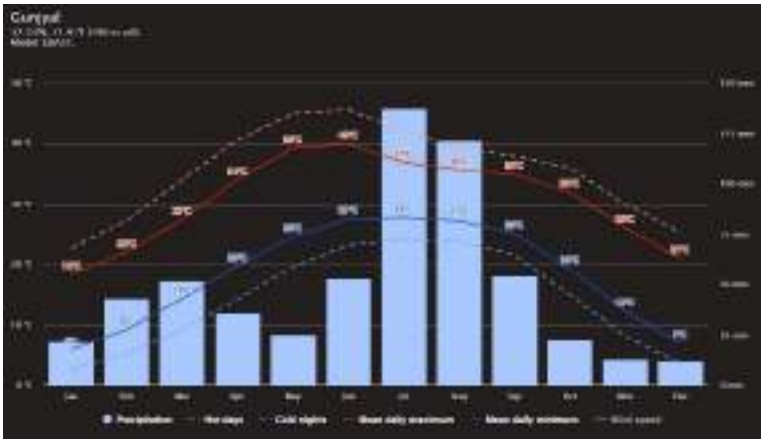


Figure 4.3: Average Temperatures

It is evident from the **Figure 4.3** that the project area has a moderate climate with relatively hot summer and cold winters. The summer starts from May and lasts till September. June is the hottest month. The mean maximum and minimum temperature are 40 ºC and 27 ºC respectively for month of June. The winter seasons lasts from December to February. January is the coldest month. The mean maximum and mean minimum temperature are 18 ºC and 6 ºC in January. The maximum temperatures days are presented in **Figure 4.4**.

[1] https://www.meteoblue.com/en/weather/historyclimate/climatemodelled/gunjyal_pakistan_1177526

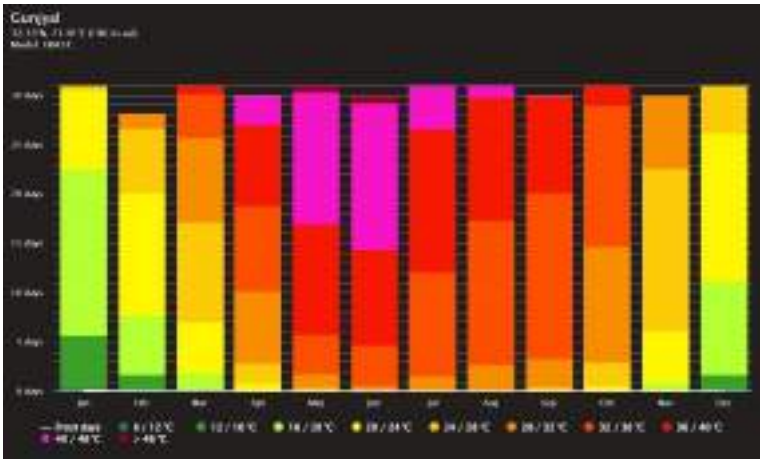


Figure 4.4: Maximum Temperature Days

ii. Solar Maximum

Solar Maximum is a significant phase within the Sun's approximately 11-year solar cycle, characterized by heightened solar activity, including increased numbers of sunspots, solar flares, and coronal mass ejections. The current solar cycle, Solar Cycle 25, commenced in December 2019. Based on projections by NASA and the National Oceanic and Atmospheric Administration (NOAA), the peak of Solar Maximum is anticipated to occur between mid and late 2025.

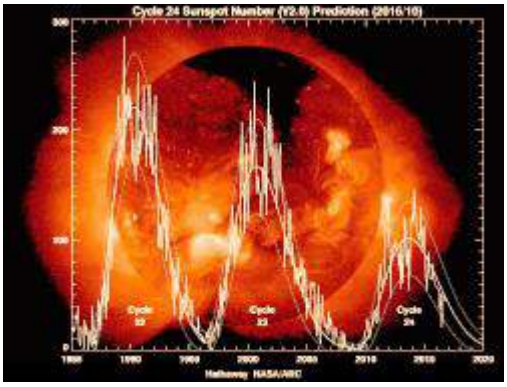


Figure 4.5: Solar Maximum

The upcoming Solar Maximum, expected around mid to late 2025, marks a peak in solar activity that can influence atmospheric and geomagnetic conditions on Earth. For the QIE Project, this period is important to consider in terms of potential impacts on communication systems, power infrastructure, and solar energy generation. Increased solar radiation could benefit renewable energy initiatives within the estate but may also pose risks of electrical or satellite interference. Therefore, the project design should incorporate resilient systems to ensure stable operations during high solar activity phases.[2]

[2] *https://www.swpc.noaa.gov/news/joint-solar-maximum-announcement-nasa-and-oaa?utm*

iii. Cloudy, Sunny and Precipitation Days

Figure 4.5 shows the monthly number of sunny, partly cloudy, overcast and precipitation days. Days with less than 20% cloud cover are considered as sunny, with 20-80% cloud cover as partly cloudy and with more than 80% as overcast.

It is clear from the chart that most of the times of year sunny days dominate. A few days per month are partly cloudy and with seldom overcast days. The maximum participation days are observed during June to August.

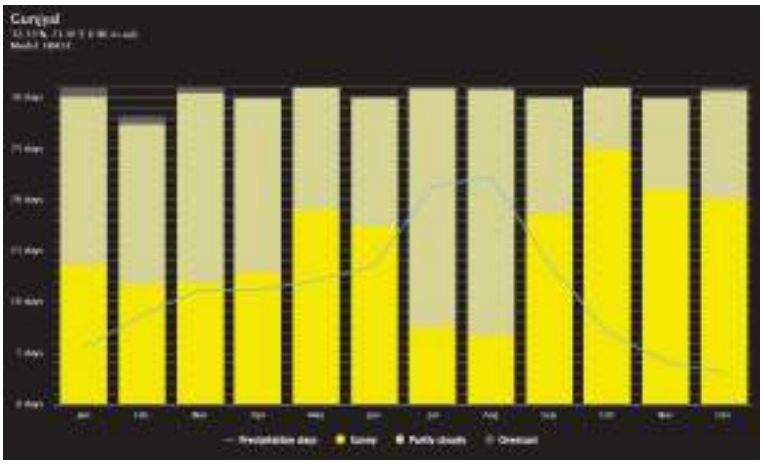


Figure 4.6: Cloudy, Sunny and Precipitation Days

Figure 4.6 shows on how many days per month, certain precipitation amounts are reached. It can be seen from the chart that the precipitation in June, July and August is maximum and ranges between 2-10 mm. Highest intensity of precipitation is also observed in the months of June, July and August ranges between 20-50mm or 50-100 mm as Shown in **Figure 4.6**.

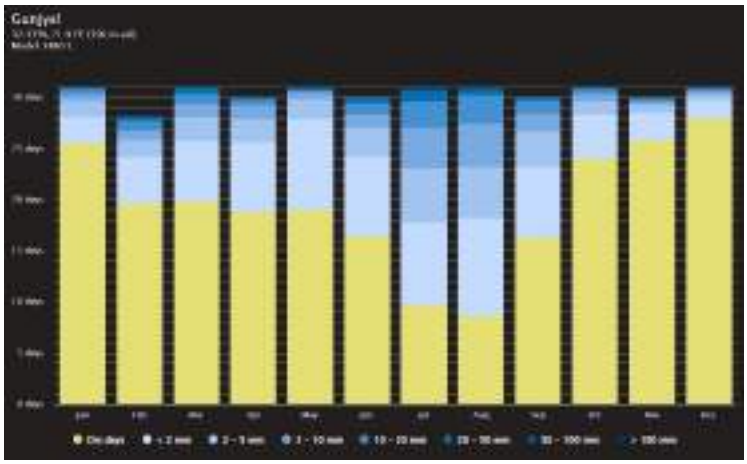


Figure 4.7: Precipitation Amounts

iv. Wind

Figure 4.7 shows the days per month, during which the wind reaches a certain speed. Maximum wind speeds can be observed in the months of April to July which is 20-30 km/h. Wind speed 10-20 km/h dominates throughout the year.

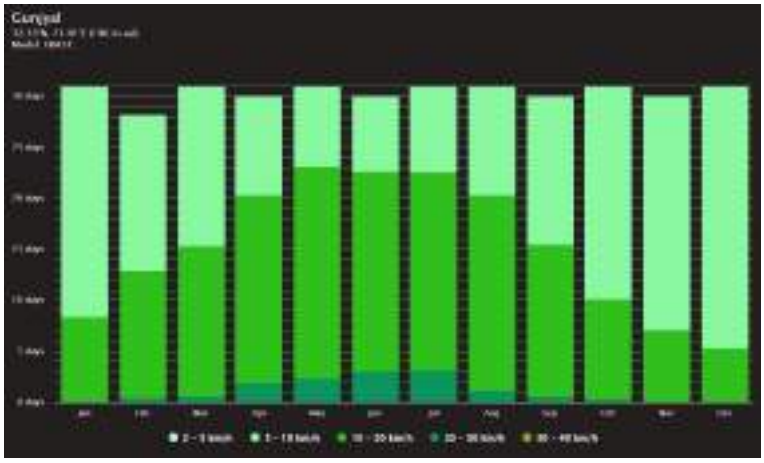


Figure 4.8: Wind Speed

The wind rose for Quaidabad shows how many hours per year the wind blows from the indicated direction. Wind rose is shown in **Figure 4.8**. It can be seen from the wind rose that dominant wind direction is towards North and NNE.

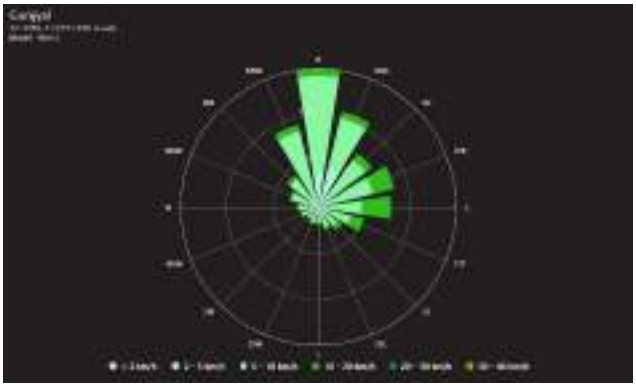


Figure 4.9: Wind Rose

4.4.4 Water Resources

The description of the water resources of Quaidabad is as under. Hydrology map is shown in **Figure 4.9**.

A. Surface water

The hydrology of Quaidabad is influenced by River Indus and River Jhelum. A network of major irrigation channels associated with the Indus Basin system is also in the close vicinity to the project site. The Indus River, located about 60 km west near Chashma Barrage, serves as the primary regional water source, while the Jhelum River flows approximately 52 km east of the project site. Locally, the area is supported by minor irrigation channels such as the Shumar Minor, located 3 km west and 2 km south of the site, and the Shah Wala Minor, about 8.7 km to the southwest, both originating from the Adhi Kot distributary. The CJ Link Canal, situated 23 km southwest, also derives from the Indus at Chashma Barrage and plays a role in irrigation supply as shown in hydrology map in **Figure 4.9**.

B. Groundwater

As per the groundwater studies, the depth to the water table in the area ranges from 4.8 to 15.2 feet. The shallow depth of the groundwater increases the chances of contamination during the execution of the project. Furthermore, the TDS in and around the project site ranges up to 4,466 ppm which is significantly high, however, sweet water is available near canals and distributaries.

C. Sewage Drain/Wastewater

Miru Branch Drain flows adjacent to the boundary of the Quaidabad Industrial Estate site, serving as a key natural drainage channel in the area. It has been identified as the most appropriate and feasible point for wastewater disposal from the proposed industrial estate. The nullah provides a flow path that facilitates safe conveyance of treated effluent away from the project site. Hydrologically, it connects with downstream drainage networks and ultimately discharges into the Jhelum River, situated about 50 km to the southeast. Its proximity and discharge capacity make it a vital component of the estate's wastewater management plan.

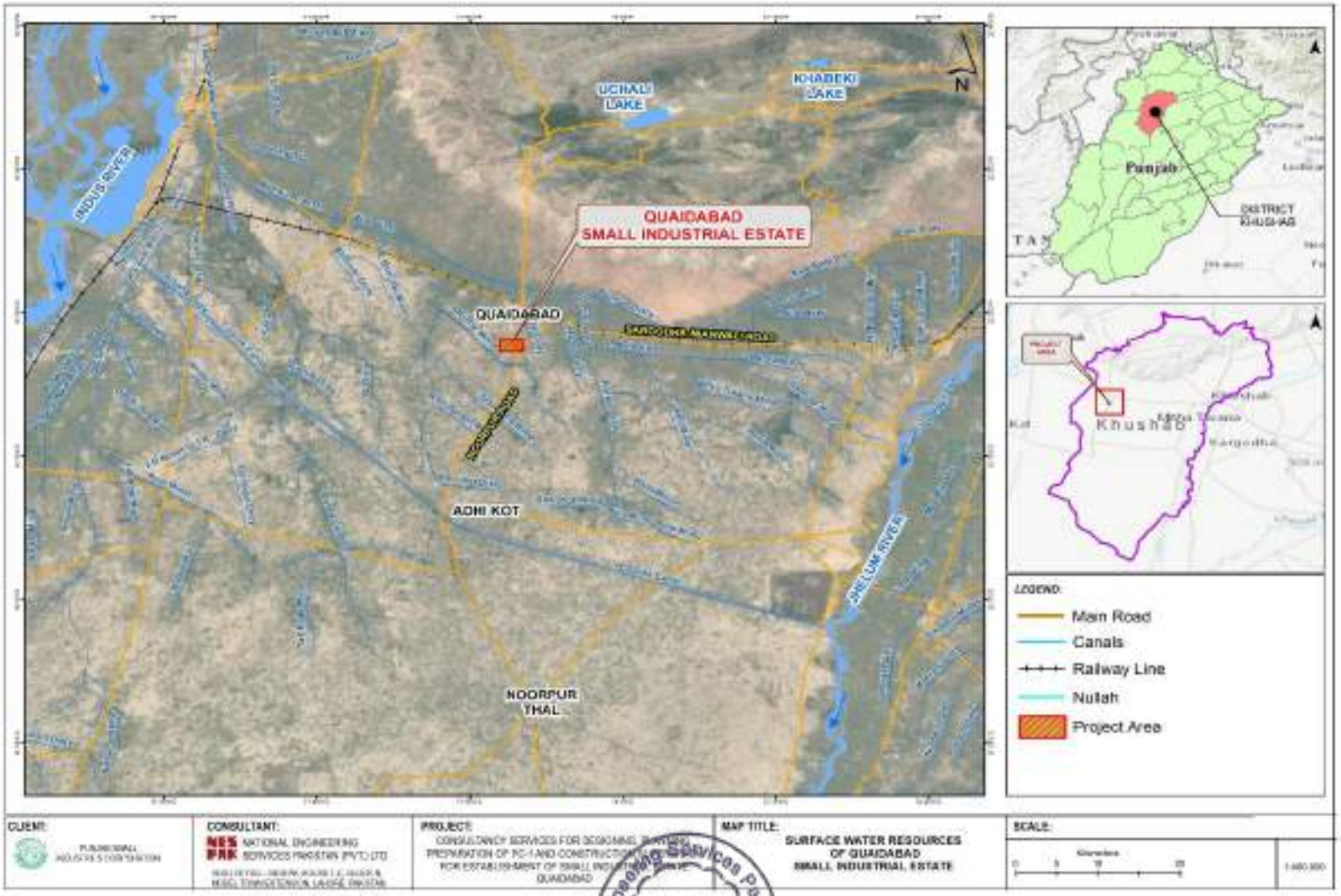


Figure 4.10: Hydrology Map of Project Area

4.4.5 Environmental Monitoring, Sampling and Testing for Proposed Project

In order to determine the ambient air, noise levels, groundwater/ drinking water and wastewater/Surface water quality of the study area environmental monitoring was conducted. The sampling locations are shown in **Figure 4.10.**

The task of environmental monitoring and testing was awarded to EPA approved environmental laboratory i.e., M/s WELCOS. The sampling pictures are given in **Plate 4.1** and Lab reports are provided in **Annex-II**.

Monitoring locations were strategically selected following a detailed reconnaissance survey conducted by the Environmental Engineers, ensuring coverage of the entire project area. The sampling points were identified to comprehensively reflect site-wide environmental conditions.

A. Ambient Air Quality

The ambient air quality testing for priority pollutants such as NO, NO_2, SO_2, CO, O_3, PM_{10}, and $PM_{2.5}$ was carried out on September 28, 2025 by Pakgreen Laboratory. The monitoring period was 24 hours. The results of ambient air quality monitoring are given in **Table 4.1** and Lab reports are attached as **Annex-II.**

Table 4.1: Ambient Air Quality Results

Sr. No.	Parameters	Avg. sampling time	Unit	Quaidabad A. A	PEQS
1	Carbon monoxide		mg/m^3 (8 Hour)	2.9	5
2	Sulphur dioxide		µg/m^3	88	120
3	Ozone		µg/m^3 (1 Hour)	77	130
4	Nitric oxide		µg/m^3	12	40
5	Nitrogen Dioxide		µg/m^3	42	80
6	PM (2.5)		µg/m^3	29	35
7	PM (10)		µg/m^3	122	150
8	Suspended particulate Matter (SPM)		µg/m^3	227	500

B. Noise Level

Noise level monitoring was carried out at the same locations where ambient air quality was monitored. Noise levels were monitored with the help of a potable digital sound meter at the project site for 24 (twenty-four) hours at an interval of 1-hour. The results of noise monitoring are given in **Table 4.2** and Lab reports are attached as **Annex-II.**

Table 4.2: Noise Monitoring Results

Sr. No.	Location	Average Noise Level dB(A)		PEQS Limit dB(A)	
		Day Time	PEQS Limit dB(A)	Day Time	PEQS Limit dB(A)
1	**Quaidabad A. A**	51.4	65	48.97	55

C. Groundwater/ Drinking Water Quality

Groundwater sample was collected from Handpump adjacent to site boundary for analyzing r Physical, chemical and microbiological parameters. The analysis results of groundwater samples are compared with PEQS. The detailed monitored results for drinking water quality are given in **Table 4.3** and attached as **Annex-I**I respectively.

Plate 4.1: Sampling At Different Project Locations

Table 4.3: Results of Groundwater

Sr. No.	Measuring Parameter	Units	PEQS Limits	Ground water Handpump (Near Mosque)
1	Total Coliform	TC (count/100ml)	0/100ml	TNTC
2	Feacal Coliform	F.Coli (count/100ml)	0/100ml	NIL
3	Escherichia Coli	E.Coli (count/100ml)	0/100ml	0
4	Taste	…..	Non-Objectionable	Objectionable
5	Odour	…..	Non-Objectionable	Non-Objectionable
6	PH @25˚C		6.5-8.5	7.71
7	Turbidity	NTU	5	4.4
8	Colour	TCU	<15TCU	Objectionable
9	Total Dissolved Solids	TDS (mg/L)	<1000	4466*
10	Total Hardness as CaCO3	(mg/L)	<500	1140*
11	Residual Chlorine	Cl_2 (mg/L)	0.2-0.5	BDL
12	Chloride	Cl1- (mg/L)	<250	1050*
13	Flouride	F^- (mg/L)	≤1.5	0.47
14	Cyanide	mg/l	≤ 0.05	BDL
15	Nitrate	NO_3^- (mg/L)	≤50	0.83
16	Nitrite	NO_2^- (mg/L)	≤3	BDL
17	Phenolic compound	Phol (mg/L)	-	BDL
18	Aluminium	Al +3 (mg/L)	≤0.2	BDL
19	Antimony	Sb (mg/L)	≤0.005	BDL
20	Arsenic	As (mg/L)	≤50	0.026
21	Barium	Ba (mg/L)	0.7	BDL
22	Boron	B(mg/L)	0.3	BDL
23	Cadmium	Cd^{+2} (mg/L)	0.003	BDL
24	Chromium	Cr (mg/L)	≤0.05	BDL
25	Copper	Cu2+ (mg/L)	2.0	BDL
26	Lead	Pb^{+2} (mg/L)	≤0.005	BDL

27	Manganese	Mn2+ (mg/L)	≤0.5	BDL
28	Mercury	Hg^{+2} (mg/L)	≤0.001	BDL
29	Nickel	Ni^{+2} (mg/L)	≤0.02	BDL
30	Selenium	Se^{+2} (mg/L)	0.01	BDL
31	Zinc	Zn^{+2} (mg/L)	5	BDL
32	Pesticides	(mg/L)	0.15	TNTC

BDL = Below detected Limit

The groundwater quality analysis of Quaidabad indicates that although most physicochemical parameters comply with standards, certain parameters show contamination. The hardness value of 1140 mg/L classifies the water as excessively hard, which can cause scaling in pipelines and domestic appliances. Similarly, the Total Dissolved Solids (TDS) level of 4466 mg/L indicates brackish water, making the water potentially harmful for long-term use.

Chloride concentration measured at 1050 mg/L is far above the allowable limit, reflecting possible mixing with brackish water or effluent intrusion from nearby sources. This elevated chloride level can corrode metallic fixtures and degrade soil productivity when used for irrigation. Metals are within compliance limit. Despite the compliance of other parameters, these values indicate that the groundwater is unsuitable for domestic consumption without proper desalination or treatment.
Moreover, the detection of total coliforms too numerous to count represents significant bacteriological contamination. Such microbial pollution poses a serious risk of waterborne diseases.

D. Surface Water/ Wastewater Quality

Surface water sample was collected from Adjacent Drain. The analysis of results compared with PEQS. The results are summarized in **Table 4.4** and lab report is attached as **Annex-II**.

Table 4.4: Results of Surface Water/Wastewater

Sr. No.	Measuring Parameter	Units	PEQS Limits	Surface Water (Drain)
1	PH @ 25˚C	PH	6.5 to 8.5	8.15
2	Total Suspended Solids	TSS (mg/L)	200	47
3	Total Dissolved Solids (TDS)	TDS (mg/L)	3500	2739
4	Chlorine	mg/L	1.0	BDL
5	Chloride	Cl1- (mg/L)	<250	750*
6	Fluoride	F^- (mg/L)	≤1.5	1.9*
7	Cyanide	CN^- (mg/L)	1.0	BDL
8	Ammonia	NH3 (mg/L)	40	2.4
9	Sulphide	S^{-2} mg/L)	1.0	0.4
10	Sulphate	SO_4-2(mg/L)	600	680*
11	Chemical Oxygen Demand	COD (mg/L)	150	133
12	Biological Oxygen Demand	BOD5 (mg/L)	80	61
13	Oil & Grease	O.Gr(mg/L)	10	3.6
14	Phenolic Compound	Phol (mg/L)	--	BDL
15	Anionic Detergent	Det (mg/L)	20	1.2
16	Arsenic	As (mg/L)	≤50	0.032
17	Barium	Ba (mg/L)	0.7	BDL
18	Boron	B(mg/L)	6.0	BDL
19	Cadmium	Cd^{+2} (mg/L)	0.01	BDL
20	Chromium	Cr (mg/L)	≤0.05	0.11
21	Copper	Cu2+ (mg/L)	2.0	BDL
22	Lead	Pb2+ (mg/L)	≤0.005	BDL
23	Mercury	(Hg) (mg/L)	≤0.001	BDL
24	Nickel	Ni^{+2} (mg/L)	≤0.02	BDL

25	Selenium	Se^{+2} (mg/L)	0.01	BDL
26	Zinc	Zn^{+2} (mg/L)	5.0	BDL
27	Total Toxic Metals	(mg/L)	2.0	0.228
28	Temperature	NGVS	32.00 C	30°C
29	Total Coliform	Cfu/100 ml	NGVS	TNTC

BDL = Below detected Limit

The high TDS level indicates excessive dissolved minerals, while chloride (750 mg/L) and sulfate (680 mg/L) concentrations exceed permissible limits, suggesting saline and industrial influence. The presence of toxic metals points to possible discharge from nearby anthropogenic activities. Total coliforms being numerous further confirm microbial pollution, indicating the water is unfit for human consumption without adequate treatment.

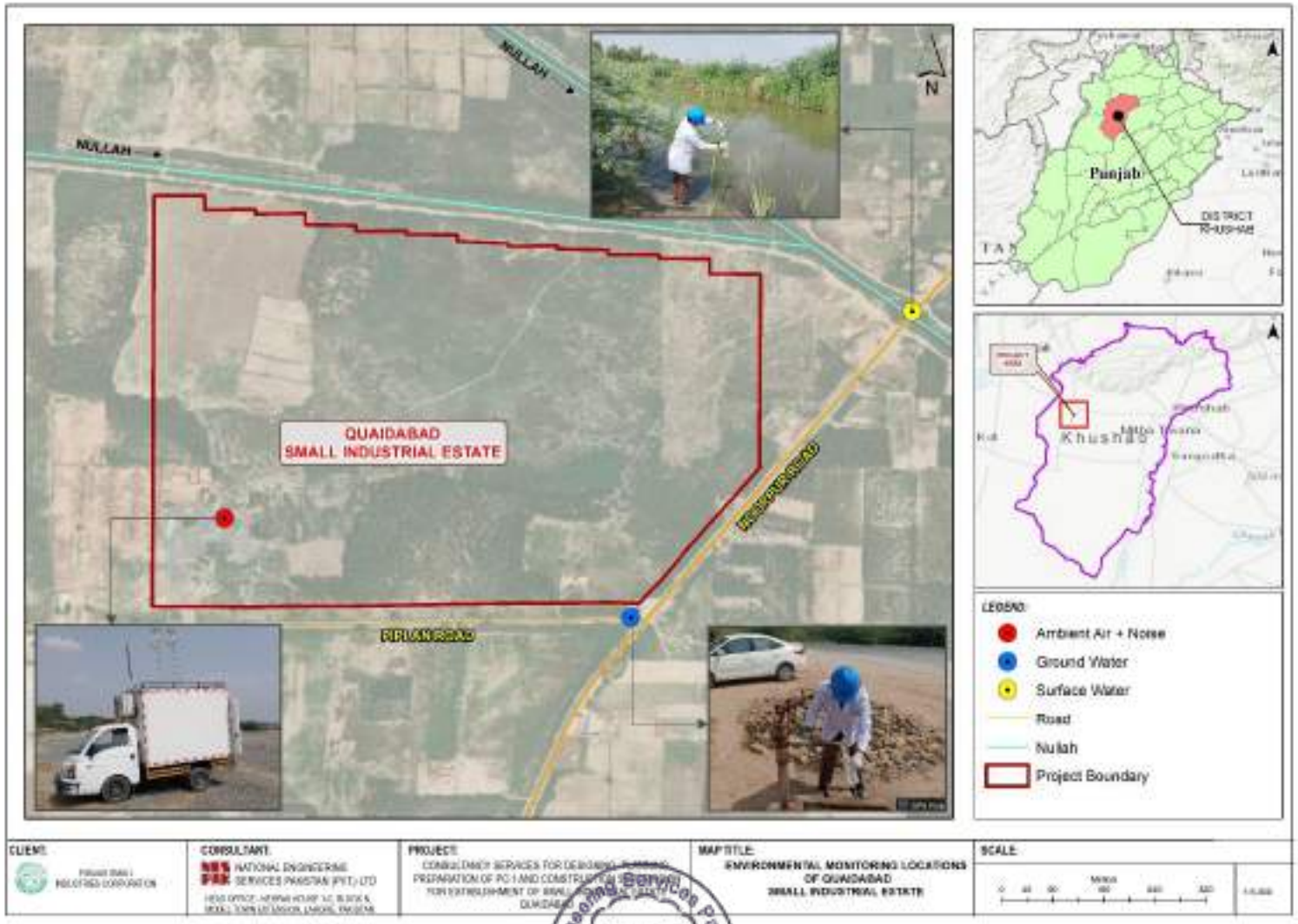


Figure 4.11: Environmental Monitoring Location Map

4.4.6 Seismology

Quaidabad is located in Seismic Zone-2B which is moderate hazard earthquake zone. **Figure 4.11** shows the seismic zoning map of project site. The Zone 2B has Peak Ground Acceleration (PGA) in the range of 0.16 g to 0.24 g.

Seismic Zone 2B represents a moderate seismic risk area where expected ground shaking can cause minor to moderate structural damage. Construction in this zone requires adherence to seismic-resistant design standards as per the Building Code of Pakistan (Seismic Provisions 2007).

The seismic zoning on the basis of Peak Ground Acceleration (PGA) is summarized in **Table 4.5**.

Table 4.5: Seismic Zones

Seismic Zone	Peak Horizontal Ground Acceleration "g" is the acceleration due to gravity
1	0.05 to 0.08g
2A	0.08 to 0.16g
2B	0.16 to 0.24g
3	0.24 to 0.32g
4	> 0.32g

Source: Building Code of Pakistan, Seismic Provisions – 2007

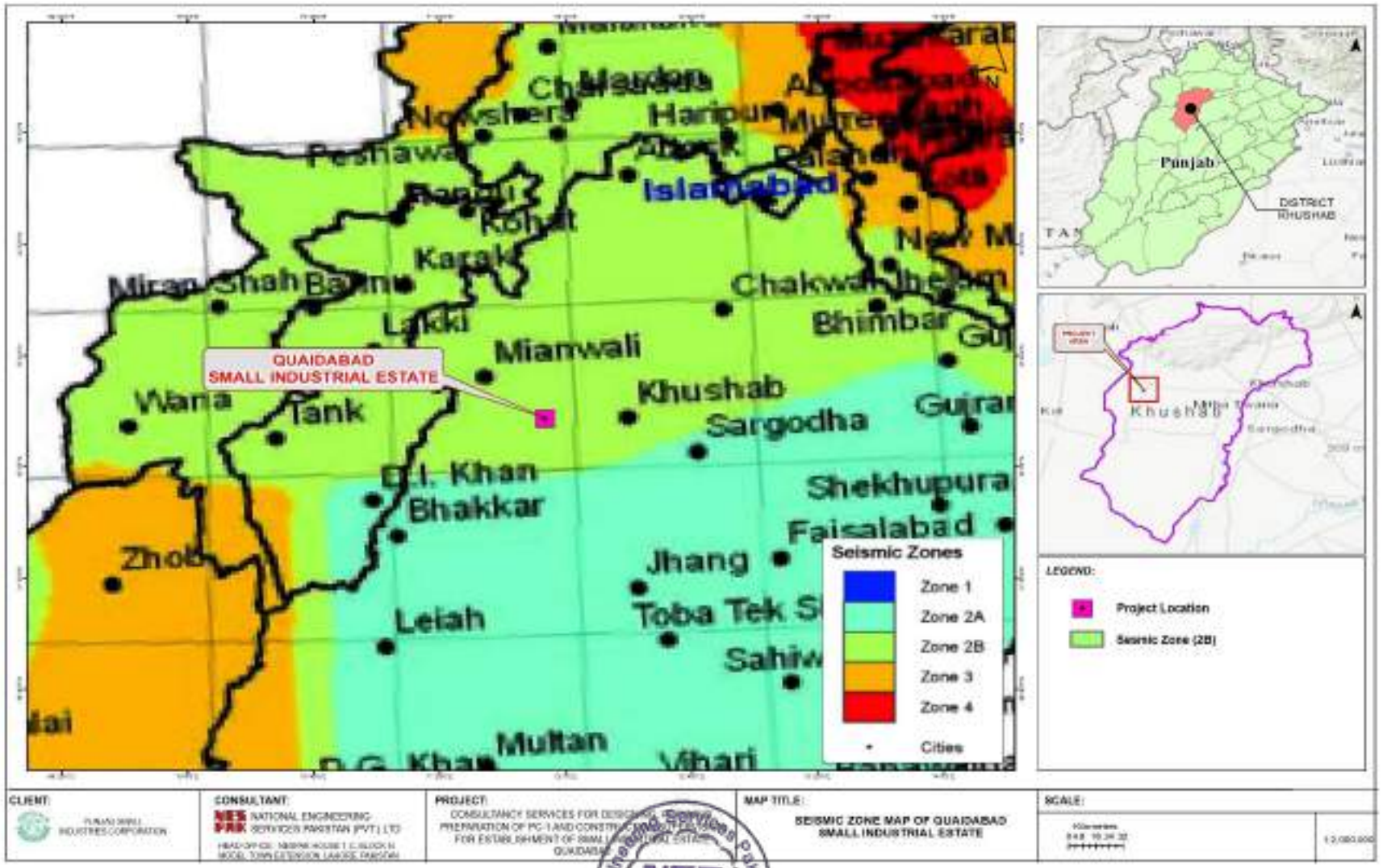


Figure 4.12: Seismic Zone Map of Project Area

4.4.7 Land use of Project Area

The project area predominantly comprises open land. Owing to the unfertile nature of the land, the land owners cultivate eucalyptus trees for commercial purposes. The remaining land is barren. A few abandoned structures are also present within the site, but no residential or commercial buildings exist in the project area.

Plate 4.2 depicts the present land use of the project area. Overall project area land use map is shown in **Figure 4.12.**

Plate 4.2: Land Use of Project Area

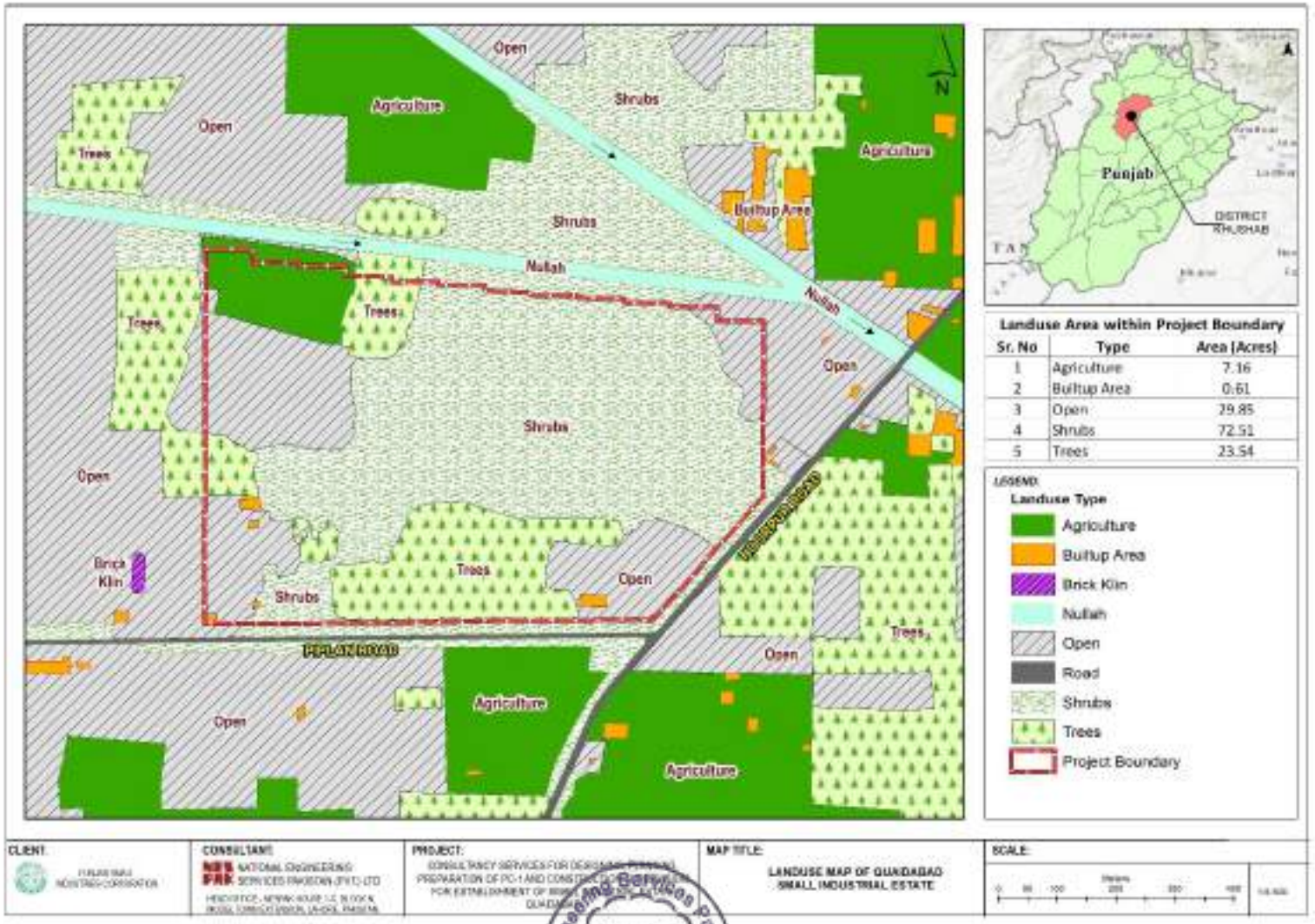


Figure 4.13: Land Use Map of Project Area

4.4.8 Sensitive Receptors

The physical and cultural resources are of immense importance for any community and hence need to be protected and preserved. Sensitive receptors include Mosques, Schools, graveyard and any other religious places. However, inside project area no such sensitive receptors were present, however a mosque was present adjacent to the project boundary. Map of sensitive receptor is shown in **Figure 4.13.**

Figure 4.14: Sensitive Receptor Map of Project Area

4.5 Biological Environment

Project site is rich in biodiversity because of its diverse landscape and geographical location. The following section describes the biological environment of the project area. **Plate 4.3** shows few existing tree species in project area.

4.5.1 Flora

The major floral species of the project area include:

Sr. No.	Common Name	Scientific Name
1	Chinaberry (Dharek)	Melia azedarach
2	Arabic Tree (Kikar)	*Acacia nilotica*
3	Gum trees (Sufaida)	*Eucalyptus camaldulensis*
5	Rosewood (Shisham)	*Dalbergia sissoo*
6	Sirris	*Albizzia lebbek*
7	Date Palm	*Phoenix dactylifera*


Plate 4.3: Visual of few Flora of Project Area

A. Natural Shrubs and Herb

Few Natural shrubs and herbs found in the project site shown below. **Plate 4.4** below shows few shrubs in project area.

Keekar Shrubs

Aak Tree (Milkweed)

Plate 4.4: Visual of Aak and Keekar Shrubs of Project Area

B. Major Crops

No crops are present within the project boundary. However, the major crops cultivated in the surroundings of the project area are Wheat, Gawarah and Chana mostly.

4.5.2 Fauna

In the area common animals found are dogs, cats and bats. Domestic livestock that was observed during field visit include buffalo, cattle, goats, sheep, hens and donkeys that are used by the local residents for their living. **Plate 4.5** shows few existing Fauna of project area. Some other fauna at project area is as followed;

Sr. No.	Name
1	Grey Francolin (*Francolinus pondicerianus*) and Black Francolin (*Francolinus francolinus*)
2	Asian Koel (*Eudynamys scolopaceus*)
3	*Falco peregrinus*
4	Wild Hare (*Lepus nigricollis)*
5	Porcupine
6	Dove

Plate 4.5: Visual of few Fauna of Project Area

A. Amphibians

The amphibian fauna mainly comprises species adapted to semi-arid environments and seasonal water bodies. Commonly observed species include the Indus Valley Toad (*Duttaphrynus stomaticus*) and the Skittering Frog (*Euphlyctis cyanophlyctis*), which thrive near ponds, irrigation channels, and cultivated lands.

B. Reptiles

Common tree lizard (*Calotes versicolor*), Monitor lizard (*Varnus bengalensis*) and fringed toed lizard (*Acanthodactylus cantoris*) are observed in and around the proposed site.

C. Endangered Species

There are no endangered species of flora and fauna observed in the Study Area.

4.6 Socio-Economic Environment

This sub-section presents the socioeconomic baseline profile of the project area. The current socioeconomic baseline profile covers various aspects including demographics, socioeconomic factors, educational status, health conditions and availability of amenities, etc. The socioeconomic baseline profile was developed using both primary and secondary data. The sources of data and methodology of data collection are discussed below in **Figure 4.14**:

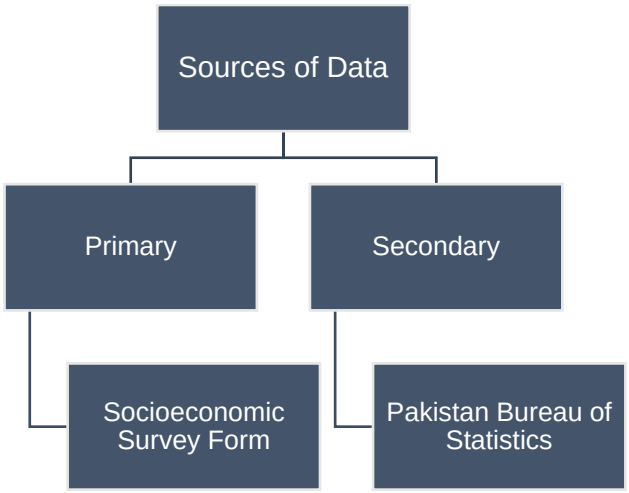


Figure 4.15: Source of Data

4.6.1 Secondary Data

Quaidabad is a tehsil located in the Khushab District of Punjab, Pakistan, known for its mixed rural and semi-urban population. The area comprises several small villages and settlements, with agriculture being the primary source of livelihood. The population consists mainly of farming communities, supported by local trades and small businesses. Population density remains moderate, with scattered housing patterns across fertile plains. The residents maintain traditional lifestyles, with strong social cohesion and community-based living practices.

1. Population of Quaidabad

According to the 2023 census data, Quaidabad Tehsil has a total population of 250,344. The literacy rate of the area is recorded at 53.4%, reflecting moderate educational attainment among residents. The tehsil covers an overall land area of 251,920 acres, comprising both agricultural and residential zones.

4.6.2 Primary Data

Primary data was collected during Sept. 28 and Oct 02 2025, by a dedicated team of sociologists who utilized a questionnaire (see **Annex-III**) to gather the requisite information about the social settings of the project area. The sample size of 50 respondents was adopted.

A. Demographic Characteristics of the Respondents

i. Age Composition

Interviews were conducted at the project site to gather public feedback regarding the proposed activities. Individuals living adjacent to the site were consulted. Most participants were between 25 and 40 years of age, while a few elderly individuals were also interviewed to share their concerns after being informed about the project details.
The survey primarily focused on mature-age individuals as they possess better awareness of local environmental conditions and community needs. Their experience and understanding provided more reliable insights into potential project impacts.

ii. Level of Education

The survey results show that most respondents were illiterate or had education only up to the matric level. The low literacy rate can be attributed to the rural background of the respondents, where access to quality education is limited and economic conditions often compel individuals to prioritize work over schooling. This reflects a generally low to moderate educational profile among the surveyed population.

iii. Source of Income

The survey findings indicate that most respondents are laborers and daily wagers, followed by few shopkeepers and small business owners. This trend reflects the semi-urban and rural character of the area, where limited formal employment opportunities force people to rely on manual work and informal labor for their livelihood. Only a few respondents were government or private employees, highlighting the predominance of low-income and self-sustained occupations in the region.

iv. Marital Status

Survey findings reveal that the majority of respondents were married which are almost 75% whereas 25 % were reported unmarried.

v. Family System

The family system in the project area is observed mix. Mostly joint families were observed; however, few of the nuclear family system were also reported.

vi. Religion

The survey area is predominantly made up of Muslims who account for maximum of the respondents. However, a few Christian families also reside in the surrounding villages.

vii. Caste / Ethnic Group

The major castes identified in the project area include Gunjyal, Musalli, Muhajir, and Kolar communities. These groups consist the most of local population in the region. Their livelihoods

are primarily based on agriculture, daily labor, and small-scale buisiness, reflecting the traditional social and economic structure of the area. Details are given below in **Figure 4.20**

viii. Language Spoken

The primary language spoken in Quaidabad, Khushab is Punjabi, which serves as the main medium of communication among the local population. Urdu is also widely understood and used for formal and educational purposes. In some areas, Saraiki and regional dialects are spoken, reflecting the linguistic diversity of the local communities.

B. Socio-Economic Characteristics

i. Monthly Income of the Respondents

The income pattern in the survey indicates that most respondents earn between PKR 25,000 and 40,000 per month, reflecting the modest earning potential of the area's laborers and small-scale workers. A few individuals earn above this range, mainly those involved in small businesses or skilled trades. Some respondents, however, were found to be unemployed, highlighting the limited availability of consistent income opportunities in the region.

ii. Household Expenses of the Respondents

The analysis shows that most respondents have moderate monthly expenses, as the surveyed population mainly consisted of laborers and few belongs to other profession e.g, shopkeepers they all are belonging to the middle-income group. The majority reported monthly expenses ranging between PKR 30,000 and 50,000, while some spend slightly less or more depending on family size and living conditions. This indicates a generally balanced expenditure pattern, reflecting average household affordability in the project area.

iii. Mode of Transport

In the project area, respondents utilized both public and private transportation options. However, the majority relied on their own means of transport, such as motorcycles, rickshaws, while a smaller portion is dependent on public transport for limited travel needs.

iv. Common Diseases

The respondents were enquired about the common diseases in their families and the project area to assess the health situation. It was assessed that the common diseases in the project area include, but are not limited to, hepatitis, gastrointestinal diseases, skin diseases, allergies and malaria. etc.

v. Health Facilities

The nearest health facility is the Basic Health Unit (BHU) Quaidabad, located approximately 5 km from the project site. Most residents rely on this government medical center for treatment and basic healthcare services due to their accessibility and affordability.

vi. Educational Facilities

A government school is located in Channa Village, situated close to the project site.

i. Source of Water

The groundwater in Quaidabad is brackish and unsuitable for human consumption. Residents in the project area primarily depend on this groundwater to meet their domestic needs through hand pumps installed at varying depths. Some hand pumps located near the canal are used for drinking purposes, as the water quality there is relatively better compared to hand pumps situated farther from the canal.

ii. Sewerage System

There is no sewerage system present in the project area. During interviews, respondents confirmed the absence of any sewerage network. Most of the generated sewage seeps directly into the ground without treatment, while some respondents mentioned that wastewater flows toward nearby agricultural fields, posing potential environmental and health risks.

iii. Solid Waste Management System

They mentioned that teams from Suthra Punjab occasionally visit the area, usually once or twice a week, to collect waste and clean the surroundings. In few areas, locals reported that they dispose of household waste on open places.

C. Major Concerns of Locals

The major concerns expressed by the local community revolve around inadequate water supply, absence of a proper sewerage system, and inefficient solid waste management. Residents reported that groundwater in Quaidabad is brackish and unfit for drinking, forcing them to rely on hand pumps near canals where water quality is slightly better. The lack of a drainage network leads to sewage seeping into the ground or flowing toward agricultural lands, creating sanitation and health issues. Solid waste disposal is also a problem, as waste is often dumped in nearby community bins without regular collection. Although Suthra Punjab occasionally visits for cleaning, the service is irregular and insufficient. Locals emphasized the need for improved water quality, proper sewerage, and a reliable waste collection system to enhance living conditions in the area.

D. Mechanism of Conflict Resolution

During the field survey, discussions were held with the locals about the disputes prevailing and their resolution system in their communities. It was revealed that most of the issues are resolved through local mediation and the police are only involved in severe cases.

E. Presence of NGOs/CBOs

Non-Governmental Organizations (NGOs) were not identified in the project area.

F. Willingness for the Implementation of the Project

The local community has shown strong willingness to support the implementation of the proposed Quaidabad industrial estate project. Residents believe the project will generate employment opportunities, improve infrastructure, and enhance the overall socio-economic condition of the area. They expressed readiness to cooperate during construction and operation phases, acknowledging that the project will bring long-term benefits such as better roads, improved utilities, and enhanced public services. Overall, the community's response reflects a positive and cooperative attitude toward the project's development.

5 STAKEHOLDER CONSULTATIONS

This section describes the outcome of the stakeholder consultation sessions held with different groups which are either interested in the execution of the project, or have official stakes into the project and with the affected community. Stakeholder consultations is mandatory part of the EIA process for development projects. Stakeholder consultation and information disclosure adequacy is one of the basic criteria used to determine the project's compliance with the national/international safeguard policies.

5.1 Objectives and Principles Guidelines for Consultation

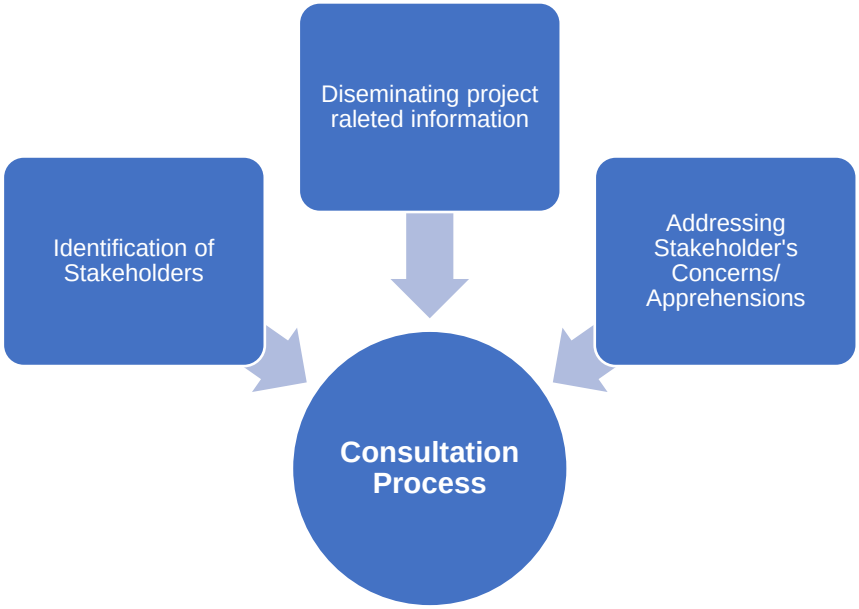
The consultation provides a forum where relevant information to the project is disseminated to and from the stakeholders. This participation is necessary because it paves a pathway between the investor and the public and enables the provision of much-needed local knowledge and indigenous know-how which can be integrated into the project design. This fosters goodwill and success in the project and leads the project to be conflict-free throughout the execution exercise.

The objectives of stakeholder consultations were to:

- Inform the stakeholder about the proposed project.
- Identify and involve all stakeholders, in the consultative and participative process;
- Share information with stakeholders on the design and implementation of the proposed project and expected impacts on the physical, biological, and socio-economic environment of the proposed project area;
- Understand stakeholders' concerns regarding various aspects of the project, including the existing available facilities and problems, the erection of the proposed project, and the likely impacts of construction and operation-related activities of the proposed project;
- Understanding the perceptions, assessment of social impacts, and concerns of the communities in the vicinity of the proposed project;
- Provide an opportunity to the public in the stakeholder consultation session to provide valuable suggestions for the project design optimistically.
- Reduce the chances of conflicts through the early identification of controversial issues, and consult them to find acceptable solutions.

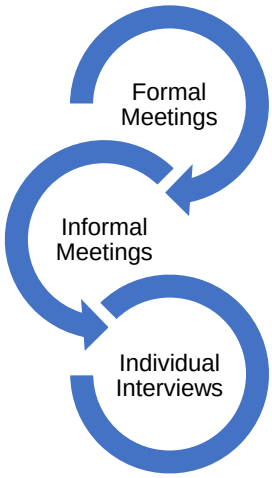
5.2 Consultation and Participation Process

Stakeholder consultations are the key to ascertaining the perception of different stakeholders about the project. Therefore, the identification and involvement of various stakeholders is a crucial part of the EIA process. The consultation and participation process adopted for the study is summarized hereunder:



5.3 Method of Consultation

Consultations were carried out to establish stakeholder's opinions regarding project implementation. The following methods were used for the consultations:



5.4 Identification of Stakeholders

Stakeholders are those who have a direct or indirect interest in the project development and will be involved in the consultation process. During the field survey, significant efforts were made to identify the possible categories of stakeholders and their stakes. The following stakeholders were identified during the field survey:

5.5 Consultation Meetings (Formal and Informal Group Discussions)

5.5.1 Informal Meetings and Individual Interviews

Informal meetings and individual interviews were conducted with the local workers/laborers and nearby residents. The project-related information was disseminated and their concerns/ apprehensions were recorded, & outcomes of informal consultations:

There project site is barren and no community is currently residing within the project area. The nearest settlement is the Mehboob Nagar, located approximately 720 m away. A brick kiln (Bhatta) is situated adjacent to the project boundary. Additionally, a few small businesses including a weighing station (Kanda) and a small-scale sawmill operate along the main road outside the project area.

These meetings were carried out within and around the project area. No specific concerns were raised during these sessions. Generally, it was found that almost all respondents including residents and other stakeholders showed their willingness for the proposed project. This project will provide the livelihood opportunities and contribute to local business growth in the area.

The photographic evidence of informal consultations is given in **Plate 5.1**.

i. Concerns / Suggestions the Stakeholders

The concerns and suggestions of the community recorded during the informal consultation meetings are summarized hereunder:

- The construction of the proposed project should be completed within the stipulated time;
- Arrangements should be made to suppress dust, curtail high-noise activities, and control the vibrations caused due to machinery;
- Residents of the local community should be given priority for jobs both in the construction and operation phases;
- The trees in the project area are planted/cultivated as a cash crop by landowners. Therefore, the owner who have planted them have the right to cut the trees within the project area.

- Tree cutting along the main road should be avoided as far as possible;
- The construction waste should be frequently collected and disposed of to the designated dumping sites;

ii. Responses to the Concerns of the Community

The concerns of the community were adequately addressed by the consultants during the consultation meetings. Following is the summary of the responses of consultants:

- The construction contractor will be advised to complete the construction within the agreed timelines;
- Regular sprinkling of water will be carried out over the loose soil to suppress the dust, the noisy activities will not be planned at night;
- The contractor will be advised to hire local labour, wherever feasible;
- Land owners will be allowed to cut the trees, they have planted as a cash crop;
- Tree cutting will be avoided along the main road, if necessary, compensatory plantation will be done to offset the impact of tree cutting;
- A solid waste management plan has been devised to avoid any nuisance due to solid waste.

Plate 5.1: Photolog of informal consultations

5.5.2 Detailed Meeting with the Institutional Stakeholders

The line departments are the primary stakeholders of the project and hence needs to be taken on board during the planning stage of the project. Furthermore, EP&CCD is the regulatory authority to ensure environmental compliance and hence need to be made aware of the project beforehand. The consultations with these stakeholders were conducted and a summary of these consultations is given in **Table 5.1.** The photolog of formal consultations is given in **Plate 5.2**.

Table 5.1: Schedule of Meetings with Institutional Stakeholders and their Concerns / Apprehensions

Sr. No	Departments	Date of Meeting	Participants	Points of Discussion	Responses
1.	Punjab Forest Department (PFD), Quaidabad	01-10-2025	Mr. Umar Farooq (Range Forest Officer, PFD) Mr. Syed Zeeshan Abbas (Sr. Env. Engineer, NESPAK) Mr. Muhammad Ali (Env. Engineer, NESPAK) Mr. Muhammad Anns Ali (Env. Engineer, NESPAK))	The consultant's team described the need, objective, location and proposed activities to RFO Punjab Forest Department and inquired about their apprehensions/ suggestions regarding the project. The representative of PFD welcomed the project, owing to its community benefits. • The trees in the project area are not under the ownership of the PFD • The project area is private land, where locals cultivate Eucalyptus trees as a cash crop, which they typically harvest & sale every two to three years. • The forest areas around the project site are the Forest near Shumar Minor (1.6 km away) and Adhi Kot (9.22 km away). • The types of trees found in these forests include Kikar, Bher, and Shisham	• The PFD is requested to share the KMZ file of the forest areas under its jurisdiction in district Khushab • PFD's suggestions regarding tree species will be considered during the preparation of the tree plantation plan

Sr. No	Departments	Date of Meeting	Participants	Points of Discussion	Responses
2.	Environmental Protection and Climate Change Department (EP&CCD), Punjab	01-10-2025	Mr. Ammar (Assistant Director, EP&CCD) Mr. Syed Zeeshan Abbas (Sr. Env. Engineer, NESPAK) Mr. Muhammad Ali (Env. Engineer, NESPAK) Mr. Muhammad Anns Ali (Env. Engineer, NESPAK))	The consultant's team described the need, objective, location and proposed activities to Assistant Director EP&CCD and inquired about their apprehensions/ suggestions regarding the project. • When conducting an EIA, it's important to hold sessions involving all stakeholders and project beneficiaries. • During the stakeholder consultation, effective communication should be maintained excluding all the communication gaps. • All critical points and aspects regarding the social aspects of the community should be clearly explained and noted that will come from the community concerns. • A sustainable water source must be selected so that current water usage is not affected. • CETP is a must for the proposed industrial estate. • Emission control equipment should be available with all the industries.	• All the suggestions will be incorporated. Stakeholder consultations are already underway and efforts will be made to take all the stakeholders on board. • CETP is already the part of master plan. • The PSIC will ensure strict monitoring for emissions and every industry will comply with the PEQS

Sr. No	Departments	Date of Meeting	Participants	Points of Discussion	Responses
3.	Punjab Wildlife Department (PWLD) Khushab	01-10-2025	Mr. Naeem Tahir (Assistant Director, PWLD) Mr. Munir (Clerk, PWLD) Mr. Syed Zeeshan Abbas (Sr. Env. Engineer, NESPAK) Mr. Muhammad Ali (Env. Engineer, NESPAK) Mr. Muhammad Anns Ali (Env. Engineer, NESPAK)	The consultant's team described the need, objective, location, and proposed activities to the representatives of PWLD and inquired about their apprehensions/ suggestions regarding the project. • The areas under the jurisdiction of the PWLD include the mountains and the forested regions on the mountains. However, the project area has flat and barren. • The wildlife found in the district Khushab that may be present in the project area: ➢ White & black teetar (Francolin) ➢ Koel (Cuckoos) ➢ Falcon ➢ Wild Hare ➢ Sparrow ➢ Dove ➢ Porcupine	• It will be ensured that no wildlife is harmed. • Hunting, poaching and harassing of animals will not be allowed.

Sr. No	Departments	Date of Meeting	Participants	Points of Discussion	Responses
4.	Punjab Irrigation Department (PID), Khushab	01-10-2025	Mr. Ali Raza (XEN, Irrigation Department) Mr. Syed Zeeshan Abbas (Sr. Env. Engineer, NESPAK) Mr. Muhammad Ali (Env. Engineer, NESPAK) Mr. Muhammad Anns Ali (Env. Engineer, NESPAK)	The consultant's team described the need, objective, location, and proposed activities to the XEN, PID, and inquired about their apprehensions/ suggestions regarding the project. • The PID is concerned about the total discharge and final disposal point of the wastewater from the industrial estate. • The PID inquired about the effluent, its properties, and the wastewater treatment technology. • QSIE will require NOC from PID before the execution of the project. • The PID will charge PKR 35,000 per cusec for the discharge of wastewater into any of their water bodies. • The drain adjacent to the project area falls under the jurisdiction of PID and has a total discharge capacity of 665 cusecs.	• The disposal point of the wastewater is the drain adjacent to QSIE. • The effluent from the industrial estate first treated with CETP than treated effluent will be discharge into the drain. • The total discharge will be shared with PID to acquire the NOC.

Meeting with
Assistant Director & Clerk
Punjab Wildlife Department

Meeting with Mr. Umar Farooq
Range Forest Office
Punjab Forest Department

Meeting with Mr. Ali Raza
Executive Engineer
Punjab Irrigation Department

Meeting with Mr. Ammar
Assistant Director
Environmental Protection and Climate Change Department (EP&CCD), Punjab

Plate 5. 2: Photolog of formal consultations

6 Environmental Impact & Mitigation Measures

This section deals with the identification and characterization of the impacts at each stage of the project. The identified impacts affect the biophysical and socioeconomic components of the project area either beneficially or adversely. Measures to mitigate or reduce the impacts are also briefly discussed in the section.

6.1 Impact Identification and Characterization

The identification of impacts is done on the basis of literature review, site surveys, and expert opinion on prevailing site conditions and sensitive receptors. The Characterization is done on the basis of the significance, probability, and prevalence of the potential impacts in the surrounding environment. To evaluate the impacts, *Environmental Impact Matrices* are used for the construction and operation stages. These matrices are given in **Tables 6.1** and **6.2** respectively. The following scale has been used for the evaluation of impacts:

LA = Low Adverse (low/short-term damage to the environment)
MA = Medium Adverse (moderate damage to the environment)
HA = High Adverse (severe damage to the environment)
LB = Low Beneficial (less beneficial to the environment)
MB = Medium Beneficial (moderate beneficial to the environment)
HB = High Beneficial (highly beneficial to the environment)
NA = Not Applicable
O = Insignificant / No Impact

6.1.1 Significance Rating

The overall significance of the impacts was defined based on the result of a combination of the consequence rating and the probability rating. Each identified impact was analyzed in terms of magnitude, extent, duration, and probability of occurrence, the value of the affected environment, and likely degree of recovery of the affected area. The results of the assessment of the significance of the residual impacts were then linked to decision-making in the following manner.

Significance Rating	Implication
Low	Should not have an influence on the decision to proceed with the proposed project, provided that recommended mitigation measures to mitigate impacts are implemented.
Medium	Should influence the decision to proceed with the proposed project, provided that recommended measures to mitigate impacts are implemented.
High	Should strongly influence the decision to proceed with the proposed project regardless of mitigation measures.

Table 6.1: Impact Matrix (Construction Phase)

Sr. No.		Physical Environment						Biological Environment		Socioeconomic Environment					
	Environmental Component / Project Activities	Topography	Air Quality	Noise & Vibration	Soil	Solid Waste Generation	Groundwater Quality/Surface Water Quality	Flora	Fauna	Health & Safety for Public and Worker	Disruption of Public Utilities	Employment	Public inconvenience	Cultural/Religious Values	Traffic Management
1	Site Clearance	LA	HA	MA	MA	MA	MA	HA	MA	MA	MA	B	LA	LA	LA
2	Construction camps	MA	LA	LA	LA	MA	MA	MA	MA	MA	LA	B	MA	MA	LA
3	Movement of construction machinery/vehicles	MA	HA	MA	MA	O	O	MA	MA	MA	LA	B	MA	LA	MA
4	Disposal of Wastewater	O	LA	O	MA	O	HA	LA	LA	MA	O	B	MA	LA	O
5	Relocation of the Utilities	HA	LA	LA	LA	MA	LA	LA	LA	LA	HA	B	MA	LA	LA
6	Excavation	HA	HA	MA	MA	HA	LA	MA	MA	MA	LA	B	MA	MA	MA
7	Concrete work	LA	MA	MA	LA	MA	MA	LA	LA	MA	LA	B	LA	LA	LA
8	Operation of batching plants	LA	HA	HA	MA	MA	LA	LA	LA	HA	NA	B	MA	O	LA
9	Solid Waste Management	HA	LA	O	HA	MA	MA	LA	MA	MA	NA	B	LA	NA	O
10	Disposal of Non Reuseable C&D Waste	LA	LA	O	MA	MA	MA	MA	MA	MA	NA	B	MA	NA	LA
11	Handling/Storage of fuels/chemicals	O	LA	O	MA	HA	MA	LA	LA	MA	NA	B	NA	NA	O
12	Landscaping and Horticulture	B	B	O	O	O	O	B	B	B	NA	B	NA	NA	NA

Table 6.2: Impact Matrix (Operation Phase)

Sr. No.		Physical Environment				Biological Environment		Socioeconomic Environment		
	Environmental Components / Project Activities	Soil	Air Quality	Noise	Groundwater Quality	Flora	Fauna	Employment	Community Development	HES Issues
1	Construction of industries	MA	MA	HA	HA	LA	LA	B	B	MA
2	Operation of industries	MA	HA	HA	HA	LA	LA	B	B	HA
3	Solid Waste Management	HA	LA	O	MA	MA	MA	B	B	MA
4	Storage/Use of chemicals	MA	MA	O	MA	O	LA	B	NA	MA
5	Landscaping	B	B	O	O	B	B	B	NA	O

Legend

LA - Low Adverse
MA - Medium Adverse
HA - High Adverse
B - Beneficial
O - Insignificant / no impact
NA - Not Applicable

6.2 Anticipated Impacts During Planning/Design Phase

The following are the impacts envisaged during the planning stage, and mitigation measures for these are also suggested.

6.2.1 Site Identification

According to site selection criteria outlined in Sectoral Guidelines for Environmental Reports – Industrial Estates (Pakistan Environmental Protection Act, 1997), based on World Bank guidelines (World Bank 1991), the following locations are automatically avoided in the consideration of alternative sites for industrial estates:

- Prime agricultural land,
- Within 25 km of ecologically or otherwise sensitive areas (including religious and historic places and archeological monuments, scenic, beach resorts, coastal areas and estuaries which are important breeding grounds, national parks and sanctuaries, natural lakes and swamps, and tribal settlements),
- Within 0.5 Km from the high tide line in coastal areas,
- Within 0.5 Km from the natural or modified flood plain boundary,
- Within 25 Km from the projected growth boundary of major settlements (population of 3 million or larger).

The selected site for the proposed industrial estate is neither a prime agricultural land nor within 25 kms of ecologically sensitive areas. Furthermore, there are no coastal areas, and the site is far away from the floodplains.

It is noteworthy to mention that the Punjab Forest Department has conducted significant plantations along various canals within a 25-km radius of the project site. However, these plantations are not expected to be affected by the proposed industrial estate. It will be noted that most of the industries to be housed in the proposed industrial estate are ‘salt processing’ industries which are haphazardly spread across the region. The proposed project will provide an adequate infrastructure to such industries and is expected to reduce the overall environmental footprint.

6.2.2 Land Acquisition

The total land required for the establishment of the Quaidabad industrial estate is 133.67 acres. Unfortunately, no state land is available at the identified site and private land will be acquired for the construction of the proposed industrial estate. The land acquisition process may slow down the project's pace. Furthermore, the land owners have planted Eucalyptus trees for commercial usage and they will have to lose the trees in addition to their land. The impact is high adverse and irreversible in nature.

Mitigation Measures

- The affected community will be compensated at fair market rates or as agreed upon and

accepted by the affected persons;
- The land owners will also be paid for the loss of their trees or any other structures on the site.

6.2.3 Solid Waste

Large quantities of industrial and hazardous waste along with municipal solid waste shall be generated at the different stages of the project. Without a proper solid waste management system and engineered landfilling practices, solid waste may result in odor generation, serve as the breeding ground for disease vectors, and will raise aesthetic concerns. Solid waste may result in leachate production, which can percolate into the groundwater.

Mitigation Measures

- Planning for disposal sites with a reasonable distance from the human settlements, following the siting criteria for landfill sites;
- Disallowing siting for work camps, including waste dump sites, at a distance closer than one (1) kilometer to any inhabited areas;
- Incorporating technical design features for refuse collection containers at sites that would minimize burning impacts;
- Devising plan(s) for safe handling, storage, and disposal of harmful materials; and
- Hazardous substance rule 2003 must be followed for the handling of hazardous waste.
- Burning of waste will not be allowed in any case.

6.2.4 Seismic Hazard

The project area is located in Seismic Zone 2B, where 2B represents peak horizontal ground acceleration from 0.16 to 0.24 g. In this Zone, the design of various types of structures will be done on the basis of Peak Ground Acceleration (PGA). A low to moderate-intensity earthquake impacting the project site can adversely impact the development. The proposed project shall be designed and constructed to withstand low to moderate earthquakes.

Mitigation Measures

- The structures of the proposed project will be designed and constructed to withstand moderate earthquakes. For seismic hazard analysis, updated structural and seismic evaluations will be consulted; and
- To mitigate the seismic hazard, Seismic Building Code of Pakistan 2007 (SBC-07) will be adopted. This code specifies minimum requirements for seismic safety of buildings/structures and has to be applied and used by engineers in conjunction with the necessary understanding of the concepts of structural, geotechnical and earthquake engineering.

6.2.5 Emergency Management

Disasters such as earthquakes, floods, fire events, explosions, spills, terrorist activities, and accidents may occur at any stage of the project. The losses may vary from minor injuries to mortalities and financial losses in the form of reduced man-hours and/or equipment damage. The impact is long-term and major negative in nature.

Mitigation Measures

- A comprehensive Emergency Response Plan will be devised and in place to account for any emergencies at any stage of the project, in close consultation with the Rescue 1122 Service, Fire Fighting Department, bomb disposal squad, and paramedics;
- Training of the staff/employees regarding the emergency procedures/plans will be regularly conducted;
- A medical facility will be provided in the industrial estate;
- Provision of firefighting and emergency exits will be given in the design. The Emergency Response Plan is attached as **Annex-IV**.

6.3 Potential Impacts & Mitigation Measures During the Construction Phase

6.3.1 Topography

The project site mainly comprises open land with clusters of eucalyptus trees on private property and patches of green crops. A few abandoned structures are also present within the project boundary. The conversion of this land into an industrial estate will significantly alter the topography and visuals of the site. Existing green fields will be replaced with modern infrastructure and industrial facilities, resulting in a highly adverse and irreversible topographic change.

Mitigation Measures

- Efforts shall be made to maintain the natural topography of the area, wherever possible;
- Any unwanted material either the construction & demolition waste, unused equipment/machinery and other items will be removed from the site immediately.

6.3.2 Soil

The following impacts on soil quality are envisaged due to construction activities and construction camps:

- The construction activities will involve land clearing, excavation, and construction activities, which can result in soil compaction, erosion, and loss of topsoil. These activities can degrade soil structure, reduce its fertility, and impair its ability to retain water and nutrients.
- The unspent materials and debris produced from consumed up materials, if left as such and allowed to mix with soil underneath, can degrade the quality of receiving soils;
- Non-provision of septic tanks with the temporary worksite toilets, constructed for the labour

and others, can contaminate the effluent receiving soils because of raw nature of the effluents; and
- Washing of the gadgets, machinery and equipment without proper drainage of the washout water can adversely affect the soil quality.

This impact is moderate negative in nature.

Mitigation Measures

- All spoils will be disposed of at designated site and the site will be restored back to its original conditions;
- Implementing measures to minimize soil disturbance such as using appropriate machinery and construction techniques. Additionally, adopting conservation practices like contour plowing, terracing, and erosion control measures can help prevent soil erosion and degradation;
- Non-bituminous wastes from construction activities will be dumped in approved sites, in line with the legal prescriptions for dump sites;
- Implement strict pollution control measures to minimize the release of contaminants into the soil.;
- Excavations would be kept confined to the specified foundation spots as per the approved engineering drawings. Unnecessary excavations will be avoided;
- Oils, lubricants, chemicals, and other listed hazardous materials will be stored safely at their designated spots, enclosures or store rooms, which will be safe from rainfall and away from any potential source of fire and Hazardous Substance Rule 2003 will be followed;
- Septic tanks of adequate capacities will be constructed for receiving and treating wastewater from all temporary worksite toilets and at the temporary container offices, if any. The toilet wastewater will not be discharged untreated onto the adjacent lands;
- Vehicles will be parked and repaired at designated site containing oil collection & sumps arrangement; and

6.3.3 Surface Water/Groundwater Quality

The potential sources of water pollution associated with the construction of proposed project are runoff from the construction works site into existing drain, which may contain increased load of sediments, suspended solids, dissolve solids, grease and oil, organic waste, inorganic wasteand other contaminants.Potential sources of pollution from the site include:

- Runoff and erosion from exposed soil surfaces, earth work areas and stockpiles e.g. grouting and cement material with the rain;
- Wash water from dust suppression sprays;
- Fuel and lubricants from maintenance of construction vehicles and mechanical equipment;
- Spillage of liquids stored on-site such as oil, diesel, and solvents etc. are likely to result in water pollution; and
- Uncontrolled discharge of debris and garbage such as packaging, construction material and refuse.

Wastewater would be generated from the workforce during the construction phase. However, wastewater can be adequately treated by interim sewage facilities, such as portable toilets, which can be installed within the construction site.

Construction waste, if left unattended will result in forming leachate that will percolate through the soil strata and will reach underground water table and hence, will end up contaminating groundwater. There is a probability that various materials like fuel, lubricant oil and other oily products, which are used during the construction phase may contaminate groundwater and channels carrying water.

Mitigation Measures

- Protection of groundwater reserves from any source of contamination such as the construction and oily waste;
- Water required for construction may be obtained in a sustainable way that the water availability and supply to nearby communities remain unaffected;
- Stockpiles of cement and other construction materials will be kept covered when not being used;
- Avoid fuel and other chemicals being stored at numerous locations around the site;
- Maintenance of vehicles and plant will be carried out only on impermeable areas where any oil spillages can be contained;
- All kinds of waste shall be stored in covered containers and disposed of safely as soon as possible;
- Temporary sanitary facilities, such as portable toilets, will be established on-site. A licensed contractor will be hired for appropriate disposal and maintenance of these facilities; and
- Sand/silt removal facilities such as sand traps, silt traps and sediment basins will be provided to remove the sand/silt particles from run-off. These facilities will be properly and regularly maintained. These facilities will be carefully planned to ensure that they would be installed at appropriate locations to capture all surface water generated on site.

6.3.4 Air Quality

Air quality will be affected by various construction activities especially during excavation or levelling of sand dunes. Emissions may be carried over longer distances depending upon wind speed, direction, temperature of surrounding air and atmospheric stability. In certain climatic condition such as hot summer, airborne dust can become a major nuisance if control techniques are not properly employed. The critical sources of air pollution during the construction phase will be:

- Unpaved road surface;
- Transportation of materials;
- Excavation operations;
- Chemicals and Materials used;
- Construction equipment;
- Construction Debris Burning;

- Vehicular exhaust; and
- Burning of fuel for cooking by workers.

The air emissions may cause health impacts such as dryness and roughness of the throat; eyes, nose, etc. to the workers and staff of the contractor. These emissions may also affect the bio-physical environment. The impact is major negative and temporary in nature.

Mitigation Measures

- All vehicles, machinery, equipment and generators used during construction activities will be kept in good working condition, properly tuned and maintained in order to minimize the exhaust emissions;
- Open burning of solid waste from the contractor's camps will be strictly banned;
- Proper disposal and recycling of construction debris can prevent burning and the release of harmful pollutants into the air.
- Use of fuel with substantially lower sulphur content;
- Utilizing low-emission or electric-powered equipment can help reduce air pollution associated with construction activities.
- Proper maintenance and repair of power generators and construction machinery is needed to minimize the hazardous emissions;
- Personal Protective Equipment (PPE) like masks, goggles and gloves etc. shall be provided to workers; and
- PEQS applicable to gaseous emissions generated by construction vehicles, equipment and machinery will be enforced during construction works.

Dust problems caused during the construction phase of the project could be effectively mitigated by the implementation of simple procedures by the contractor including but not limited to the following:

Mitigation Measures

- Regular water sprinkling on the site and access roads will be carried out to suppress excessive dust emission(s);
- Construction workers will be provided with masks for protection against the inhalation of dust;
- The vehicles carrying construction materials and the construction material storage areas will be covered with tarpaulin;
- Vehicle speed in the project area will be prescribed not more than 20 km/ hr and controlled accordingly;
- Tires of all the vehicles leaving the site will be washed. No earth, mud and dust shall be deposited on the public road; and
- Any material dropped on the paved roads will need to be cleaned up immediately to prevent dust nuisance.

6.3.5 Noise and vibration

Main sources of noise will be heavy machinery such as bulldozers, excavators, stabilizers, concrete mixing plant, pneumatic drills and other equipment. Noise generated by construction machinery is likely to affect sensitive receptors of the project area.

Health risks associated with exposure to continuous noise levels include increase in blood pressure, hypertension, annoyance and sleep disturbance. temporary threshold shift etc. The impacts of noise would be temporary and moderate in nature.

Mitigation Measures

- Provide construction workers with suitable hearing protection like ear cap, or earmuffs and training them in their use;
- Establish a feedback mechanism to address community concerns and respond promptly to complaints related to noise and vibrations.
- Use barriers and buffer zones, such as temporary fencing or walls, to block noise propagation towards sensitive areas.
- Establish specific working hours that limit noisy activities during sensitive times, such as early mornings, evenings, or weekends.
- Preferably, restrict construction vehicles movement during night time near the residential areas and camp sites;
- Locate the concrete mixing, and materials shipment yards at least 2km from residential areas, particularly schools and health centers;
- Selection of up-to-date and well-maintained plant or equipment with reduced noise levels ensured by suitable in-built damping techniques or appropriate muffling devices; and
- Heavy machinery like percussion hammers and pneumatic drills will not be used during the night.

Vibrations will be caused due to operation of heavy machinery. No structural damage, even for older or heritage buildings, will be expected as a result of construction activities.

All mitigation measures mentioned below will be taken in order to minimize the impacts of vibrations in the project area. These measures include, but are not limited to the following:

- Residents will be notified earlier before commencement of excavation operations, if any;
- Earth retaining walls will be constructed to contain the vibrations; and
- Excavation near old/historical buildings will be avoided. If needed, No Objection certificate (NOC) will be obtained from concerned departments.

6.3.6 Solid Waste

Due to construction activities municipal and construction waste will be generated from construction activities and contractors' camps. Improper dumping of waste may generate odour and attract mosquitoes and other disease vectors. Empty containers containing the toxic, flammable and corrosive materials may pose hazard to the workers. This may result in health

risk to work force and public, if disposal site is improperly selected. This impact is temporary and minor negative in nature.

Mitigation Measures

- The waste generated from the camp site will be disposed of at approved sites;
- Encourage separation of construction waste at the source. Provide clearly labeled containers for different types of waste, such as concrete, metal, wood, plastics, and general waste. This will facilitate recycling and proper disposal;
- Burning of waste shall be prohibited;
- Containers with covers shall be provided on site to store waste;
- General and hazardous waste shall be labelled and segregated;
- Educate construction workers and staff about the importance of waste management and provide training on proper waste handling procedures;
- Solid Waste shall be safely stored in demarcated waste disposal sites; and
- The contractor shall ensure implementation of waste management plan.

6.3.7 Ecological Environment

The proposed project site is predominantly barren/open land. The trees will cut/cleared during infrastructure development at the site. Approximately, 490 trees will be cut/affected due to proposed interventions. This will have significant environmental impacts as it may change the microclimatic conditions of the area. All the trees are native and have unique significance and importance and hence play their roles in ecological cycles. The clearing of these trees will thus have ecological impacts. Following are the possible impacts during Construction phase:

a) Flora

- Establishment of Contractor's camp and warehouses for storage of equipment, material etc. shall involve clearing of grassy vegetation, causing a negative impact on local ecology;
- During the entire construction period dust laden polluted air will form a dust film on leaves of surrounding trees, thus blocking sunshine and stomata consequently hindering photosynthesis processes causing detrimental effect on the plant health;
- Exhaust of noxious gases from movement of heavy machinery will pollute air which will adversely affect health and vigor of plants; and
- During construction activities the Contractor's workers may damage the vegetation and trees (for use as fire-wood to fulfill the camps requirements).

Mitigation Measures

- Massive tree plantation must be carried for environmental improvement and to contain foreseeable impacts of the industrial activities.
- Optimize the site layout and design to minimize the cutting or removal of trees. Preserve existing vegetation by integrating it into the project's green spaces:
- Campsites and asphalt plants will be established on vacant land;

- Construction vehicles, machinery and equipment will remain confined within their designated areas of movement; and
- The Contractor's staff and labor will be strictly directed not to damage any vegetation such as trees or bushes for cooking; and Contractor will provide gas cylinders at the camps for cooking purposes and cutting of trees/bushes for fuel will be strictly prohibited.

b) Fauna

- The trees provide nesting and resting places to the fauna. The cutting of these trees will have a negative impact on the fauna as well;
- Local wildlife department must be taken on board to discuss the impacts of any activity that may have broader impacts;
- During the construction phase, there will be negative impacts on the mammals and reptiles of the area, due to construction activities involving excavation, access roads, movement of labor, carriage of goods and machinery to various sites along the project corridor. Mammals, such as dogs, cats, rabbits etc. will avoid these areas for fear of being persecuted. Same will be the case with reptiles; some reptiles might be killed during the digging and piling operations;
- Due to establishment of labor camp, food storage, setting up of kitchens production of sewage and waste water may result in multiplication of rodents like rats, mice and shrew etc. and vectors like mosquitoes, bugs and flies which will have a negative impact;
- Birds will try to find shelter and food somewhere else and will tend to move away from the Project Area due to the activities mentioned above for fear of being hunted/caught; and

Mitigation Measures

- Noise control measures will be enforced during the construction phase such as provision of silencers on heavy construction vehicles. It is further recommended that activities, which are expected to generate more noise will be executed during the daytime only;
- Moreover, over speeding shall be prohibited and construction machinery, vehicles and equipment will remain confined within their designated areas of movement to avoid and minimize any accidental killing of Fauna;
- The camps will be properly fenced and gated to check the entry of wild animals in search of eatable goods. Similarly wastes of the camps will be properly disposed of to prevent the chances of its eating by wild animals, which may prove hazardous for them; and
- Hunting, poaching and harassing of animals and birds will be strictly prohibited and contractor shall be held responsible for any such act of his men;
- Local community and construction workers will be given awareness for protection of any animal as they have also right to live and it makes the surroundings more attractive and colorful. Promotion of awareness to individuals shall accelerate the process of fauna preservation; and
- During construction, fencing of area is mandatory to confine and protect the species

6.3.8 Resource Conservation

The materials used in construction of proposed project would include coarse aggregates (crush), fine aggregates (sand), steel, water, asphalt, reinforcement and cement etc. Almost all the materials to be used in the construction of proposed project are non-renewable and therefore their sustainable use is necessary for the future use.

Fuel will be used to operate construction machinery and asphalt and batching plants. Sustainable use of energy resources is very important not only to continue future use but also to help to reduce air emissions. For conservation of energy, efficiency of the engines and burning processes is very important. The impact is minor negative but is important as these fuels are nonrenewable resources of energy.

Construction activities require substantial energy inputs for various purposes, including site preparation, material production, transportation, and on-site operations. This can result in increased energy consumption and contribute to greenhouse gas emissions, negatively impacting energy conservation efforts.

Mitigation Measures

- Diesel and fuels with low sulphur content will be used to operate construction machinery and equipment.
- The efficient and well-maintained equipment and machinery shall be used;
- The equipment and machinery shall be turned off when not in use; and
- Regular maintenance of machinery to avoid fuel leakages.

The Resources Conservation Plan is attached as **Annex-V**.

6.3.9 Construction Camps/Camp Sites

The construction camps may lead to environmental and social impacts in the project area specially arising from camp sites. However, these impacts will be temporary and minor negative in nature.

Construction camps require space for their infrastructure, including accommodation, dining areas, offices, and storage facilities. Clearing land and preparing the site for camp construction can lead to the disruption or destruction of natural habitats, vegetation, and wildlife.

Labours also require a significant amount of water for various purposes, such as drinking, sanitation, cooking, and laundry. This increased demand can strain local water resources. Additionally, improper management of wastewater, including inadequate treatment or disposal practices, can result in the contamination of existing sewage drain as well as nearby water bodies or groundwater.

They also consume substantial amounts of energy for lighting, heating, cooling, and powering various facilities and equipment. This energy demand often relies on non-renewable sources, such as diesel generators, which contribute to greenhouse gas emissions and air pollution.

Improper waste management practices, such as open burning, uncontrolled dumping, or inadequate recycling efforts, can lead to environmental pollution, soil contamination, and negative impacts on local ecosystems. Construction camps can contribute to increased noise levels due to construction activities, machinery operation, and human activities within the camp.

The influx of labour will also arise social conflicts, specially related to females' harassment.

Mitigation Measures

- Select camp locations that minimize habitat disruption and avoid sensitive ecological areas.
- Optimize energy efficiency by using energy-efficient lighting, and appliances in camp facilities. Install renewable energy systems, such as solar panels;
- Develop waste management plans that include waste segregation, recycling, and proper disposal methods;
- Operate equipment in a manner sympathetic to the ambient noise environment. Do not leave equipment idling unnecessary;
- Provide adequate warnings of impeding works to all potential receptors;
- Aware workers to implement water conservation measures;
- Engage with local communities and stakeholders to understand and address their concerns. Implement measures to minimize disruptions to local communities, such as limiting construction noise during sensitive hours or implementing traffic control plans. Promote cultural sensitivity and respect local customs and traditions.
- Employment policies which aim to maximize job opportunities for local people will help to minimize tensions caused by different socio-cultural values.

Training will be provided to all staff on camp management rules and overall discipline and cultural awareness. This will include, in appropriate languages:

- A briefing on camp rules
- A community relations orientation to increase awareness about the local area, cultural sensitivities and the project Code of Conduct
- Awareness-raising on health considerations, including STDs.

6.3.10 Health and Safety

a) Occupational Health and Safety

Workers may be exposed to unsafe and/or unfavorable working environment due to storage, handling and transport of hazardous construction material. Workers will be provided with safe and healthy working environment taking into account the following mitigation measures. Health and safety plan is attached as **Annex-VI.**

Mitigation Measures

- Providing basic medical training to specified work staff and basic medical service and supplies to workers;
- Obligatory insurance against accidents for labourers/workers;
- Layout plan for camp site, indicating safety measures taken by the contractor, e.g. firefighting equipment, safe storage of hazardous material, first aid, security, fencing, and contingency measures in case of accidents;
- Work safety measures and good workmanship practices are to be followed by the contractor to ensure no health risks for labourers;
- Protection devices (ear muffs) will be provided to the workers doing job in the vicinity of high noise generating machines;
- Provision of adequate sanitation, washing, cooking and dormitory facilities including light up to satisfaction;
- Provision of protective clothing for labourers handling hazardous materials, e.g., helmet, adequate footwear for bituminous pavement works, protective goggles, gloves etc.;
- Ensure strict use of wearing these protective clothing during work activities;
- Elaboration of a contingency planning in case of major accidents;
- Ensure that the site is restricted for the entry of irrelevant people particularly children; and
- Adequate lightning devices, barriers, yellow tape and safety signage shall be posted.

b) Community Health and Safety

The construction activities and vehicular movement at construction sites and access service roads may also result in road side accidents particularly inflicting local communities who are not familiar with presence of heavy equipment and machinery.

This is a temporary and minor negative impact. Quality of groundwater and surface water resources available in the nearby local communities may get contaminated due to the construction activities, oil spillage and leakage, roadside accidents etc. The labourers work with different transmittable diseases may cause spread out of those diseases in the local residents.

Mitigation Measures

- There will be proper control on construction activities and oil spillage of vehicles;
- The labourers with different transmittable diseases will be restricted within the construction site;
- Efforts will be made to create awareness about road safety among the drivers operating construction vehicles;

- Timely public notification on planned construction works;
- Close consultation with local communities to identify optimal solutions for diversions to maintain community integrity & social links;
- Provision of proper safety signage, particularly at sensitive/accident-prone spots;
- If identified, consider guard rails at accident-prone stretches and sensitive locations;
- The communicable disease of most concern during construction phase, like sexually-transmitted diseases (STDs) such as HIV/AIDS, will be prevented by successful initiative typically involving health awareness; education initiatives; training heath workers in disease treatment; immunization program and providing health service;
- Reducing the impacts of vector borne diseases on long-term health effect of workers will be accomplished through implementation of diverse interventions aimed at eliminating the factors that lead to disease, which includes: Prevention of larval and adult propagation of vectors through sanitary improvements and elimination of breeding habitat close to human settlements and by eliminating any unusable impounding of water;
- Fencing around the camps will be strong enough so that it cannot be broken easily by local people for making passages; and
- Use of water will not disturb public water availability and source of water will be selected carefully.

6.3.11 Emergency Response

Natural disasters and accidents such as fire, falls, slips and trips may result in injuries, financial losses and may even lead to deaths. The workers shall be trained and facilitated to cope with such emergencies.

Mitigation Measures

- Implementation of emergency response plan shall be ensured by the contractor;
- Training of the staff/employees regarding the emergency procedures/plans shall be regularly conducted;
- Minor incidents and near misses shall be reported and preventive measures shall be formulated accordingly;
- Implement fire prevention measures to minimize the risk of fires breaking out. This includes regular inspection and maintenance of equipment and machinery to identify and address potential fire hazards; and
- Conduct regular inspections of the construction site to identify potential fire hazards and address them promptly. Inspect temporary electrical installations, fuel storage areas, heating equipment, and any other potential ignition sources.

6.3.12 Climate Change/ GHG Emissions

Construction machinery, transportation vehicles and burning of fossil fuels will generate greenhouse gases, such as CO2, CH4 and N2O which are a risk to the climate. Furthermore, cutting of large number of trees will also contribute in climate change Pakistan is signatory to the United Nations Framework Convention on Climate Change (UNFCCC) and adopted Kyoto

protocol in 1997. Under the Kyoto Protocol, Pakistan is committed to reduce GHG emissions into the environment to prevent interference with climate change.

Mitigation Measures

- Regular monitoring of air quality will be conducted from an EPA certified laboratory to comply with PEQS 2016.
- Renewable energy sources will be integrated into construction site operations. Solar panels or other clean energy technologies will be preferred to generate power for on-site operations. Utilize renewable energy providers or explore off-site renewable energy procurement options.
- GHG emissions accounting system will be implemented at the construction site. Emissions from equipment, vehicles, and other sources will be monitored. . Emissions data will be regularly reported to identify areas for improvement and set targets for reduction.

6.3.13 Traffic disruption

Traffic load on connecting access roads would be increased due to the project activities and movement of heavy machinery. Movement of heavy traffic will also deteriorate the condition of road and will reduce its designed life. This impact is temporary and minor negative in nature.

Mitigation Measures

- The mitigation will include devising a traffic management plan in coordination with traffic police; and
- The access will also be widened and to accommodate heavy traffic loads and to avoid traffic congestion issues.

6.3.14 Social Issues

Due to the proposed project, residents may face inconvenience in their daily activities. People will have problem of access to Masjid.

A traffic management plan or some alternate routes in order to minimize traffic hazardous and polluted environment.

Mitigation Measures

- Preparation of traffic management plan; and
- Public shall be notified before the commencement of the project.

6.4 Anticipated Impacts During Operation Phase

The anticipated potential environmental impacts related to the proposed project have been studied for the operational stage of the project and are discussed as under.

6.4.1 Water Quality

Industrial activities can generate contaminated runoff and wastewater that may contain pollutants such as heavy metals, chemicals, oil and grease and organic compounds. If not properly managed and treated, these pollutants can enter nearby surface water bodies through runoff or direct discharge and spills or leaks that can contaminate the underlying groundwater aquifers leading to water pollution. Wastewater from other industrial and commercial sectors may contain hazardous metals and compounds. If all this wastewater is not treated properly, it will be a continuous hazard for the aquatic life of nearby surface water bodies.

Mitigation Measures

- Combined Effluent Treatment plant (CETP) shall be operated as per Standard Operating Procedures (SOPs) to follow PEQS. Special concentrations shall be paid to sludge treatment and handling;
- Regular monitoring of water quality parameters will be conducted to ensure compliance with environmental regulations and early detection of any issues;
- Alternative options will be opted to reuse the treated wastewater for horticultural or agricultural reuse;
- Each industry will also comply with the PEQS;
- Industries shall be bound to submit monitoring reports of their effluents regularly.

6.4.2 Air Quality

The operation of industries will result in generation of large quantities of primary and secondary air pollutants including SO_x, NO_x, CO, CO_2, PM_{10}, $PM_{2.5}$, H_2S, volatile organic compounds (VOCs), and CH_4 etc. The gaseous emissions in form of plumes will create an air-shed of pollutants within 15–20 Km distance and affect the recipients in the downwind direction of the industries and may cause chronic or acute respiratory diseases like asthma and nausea.

SO_x, NO_x, PM_{10} and $PM_{2.5}$ will cause breathing problems, irritation in eyes, throat and nose. CO and H_2S are foul smelling poisonous gases, CO_2 and CH_4 are referred to as some greenhouse gases. Pakistan is signatory to the United Nations Framework Convention on Climate Change (UNFCCC) and adopted Kyoto protocol in 1997. Under the Kyoto Protocol, Pakistan is committed to reduce GHG emissions into the environment to prevent interference with climate change. The continuous emissions of GHGs for the proposed project are a concern in the operational phase. This impact is high adverse and permanent in nature.

Particulate matter and aerosols can impact the radiation balance by scattering and absorbing sunlight, affecting temperature and precipitation patterns. Concentrations of industrial activities and infrastructure within industrial zones can create urban heat.

Mitigation Measures

- Cleaner and efficient technologies will be adopted to reduce greenhouse gas emissions and air pollutants;

- Air Pollution Control Equipment will be installed in respective industries;
- Use of green infrastructure, such as rooftop gardens and tree planting will be encouraged to mitigate the heat effect.
- Efforts shall be made to capture CH_4 and H_2S that can be used commercially;
- Carbon offset and emissions trading programs will be adopted to offset greenhouse gas emissions.
- Management will ensure Compliance of PEQS; and
- SMART Rules will be followed.

6.4.3 Soil

Disposal of hazardous waste of industries and commercial areas is one of the major concerns during operational phase of the project. Industrial processes may release various pollutants into the soil, including heavy metals, chemicals, solvents, petroleum products, and other hazardous substances. These contaminants can seep into the soil through spills, leaks, improper waste disposal, or atmospheric deposition. Contaminated soil can pose risks to human health, ecological systems, and agricultural productivity. Improper handling and disposal of waste will pose serious threat to the physical and biological environment. This will also adversely impact the future use of the land where hazardous waste will be disposed of. This impact is high adverse and permanent in nature. Impacts of soil contamination can be minimized through following measures:

Mitigation Measures

- Each industry shall be bound to submit the inventory of use of hazardous chemicals, their use and final disposal including measures to control special waste;
- Containment and spill prevention measures will be implemented to minimize soil contamination risks.

6.4.4 Ecology

Movement of traffic in the area shall increase, causing noise and air pollution, which will be a permanent source of disturbance to fauna of the area and especially the birds, which shall avoid this area on account of noise and fear of being harassed or killed.

Most of the industries set up in the estate will cause toxic air emissions, resulting in deterioration of ambient air quality and ultimately affecting not only human health, but also it has negative impact on the surrounding flora and fauna. These emissions may be carried over long distances, depending on wind speed and direction, which generally varies with seasons.

Both the flora and fauna are an integral part of the eco-system. In many ways fauna of a tract is dependent upon flora for its resting, nesting and roosting activities. With the plantation of new trees, there will be significant environmental improvement in the area. The fauna specially the avi-fauna shall be attracted to the area.

The birds which were scared away due to noise and degradation of their habitat shall return or start visiting the area again. So, there will be a positive impact on the fauna.

Mitigation Measures

- The trees planted during the construction stage will be maintained under the tree maintenance program that includes regular watering, pruning, and monitoring for pests and diseases.
- Adequate care will be adopted for the long-term health and survival of the trees.

6.4.5 Solid Waste

Large quantities of municipal and hazardous waste will be generated in the operation phase of the project. Without a proper solid waste management system and engineered land filling practices, many environmental risks remain problematic for the workers and visitors. Such impacts will be minimized through following general mitigation measures:

Mitigation Measures

- Solid Waste management (SWM) system shall be operated as per SOPs and improved with time to time;
- Primary collection and storage of solid waste shall be performed in the closed containers;
- Secondary collection shall be done in the designated facility;
- Source separation of waste at its origin within industrial facilities will be encouraged, facilitating the sorting of different waste streams for proper treatment and recycling;
- Collaboration will be done with recycling companies and waste management service providers to ensure effective collection, segregation, and processing of recyclable waste;
- Stringent hazardous waste management protocols will be developed and adhered to, to ensure the safe handling, storage, and disposal of hazardous materials generated within the industrial estate. This includes proper labeling, containment, and coordination with authorized hazardous waste treatment and disposal facilities;
- Only unusable trash material shall be disposed of into the landfill site and all the reusable material shall be separated, processed and sold accordingly.

6.4.6 Emergency Response

Disasters such as earthquakes, flooding and other disasters such as fires may occur, and that must be considered for minimizing their impacts.

Mitigation Measures

- An Emergency Response Plan for earthquakes and manmade disasters will be developed;
- Emergency Response Plan will be implemented in close consultation with the Rescue 1122 Service, Fire Fighting Department, bomb disposal squad and paramedics;
- Also, evacuation plan will be developed in order to tackle with any emergency; and
- In addition, training of the staff/employees regarding the emergency procedures/plans will be regularly conducted.

6.4.7 Positive Impacts

Industries are the backbone of economic development and serve as pivotal stone for the prosperity of any nation. The development of industrial estates in a sustainable manner possesses multiple benefits and has a number of positive impacts as listed below:

- Contribution in economic development;
- Share in GDP;
- Employment generation;
- Poverty abatement;
- Increase in land values;
- Centralized management and control;
- Controllable waste and pollution discharge points;
- Socioeconomic development of area
- Green economy; and
- Infrastructural development etc.

7 ENVIRONMENTAL MANAGEMENT AND MONITORING PLAN

This section aims to address the measures which are needed to be adopted during each phase of the project to avoid, contain, mitigate or compensate the potential impacts identified in **Section 6**. Environmental Management and Monitoring Plan (EMMP) is the major part of this section and forms the gist of the EIA study. EMMP not only includes Best Management Practices (BMPs) but also includes Monitoring Indicators, frequency, responsibility and estimated Environmental Budget. This ensures that mitigation, monitoring and management consideration form a part of the documentation used for decision making and the basic benefit of defining the responsibilities is to make sure that the suggested mitigation measure will be implemented at construction and operation stages of the project. Summary of the mitigation measures for potential impacts have also been given in this section to support EMMP. Moreover, a framework for the implementation of EMMP has been discussed in this section.

7.1 Environmental Management and Monitoring Plan (EMMP)

Environmental Monitoring is undertaken during both the construction and operational phases to ensure the effectiveness of the proposed mitigation measures/BMPs. Responsibilities for the collection and analysis of data, as well as the reporting requirements, have been outlined in the Environmental Management and Monitoring Plan (EMMP) below in **Table 7.1**. The implementation of environmental mitigation measures during construction is a key to avoiding and reducing short- and long-term potential environmental impacts. Environmental cost has also been given in the EMMP. Once conditions or mitigation measures have been defined in the environmental review process, they will be included in the technical specifications of the contract documents. This incorporation of the environmental consideration into the tender and contract document is a fundamental prerequisite for effective implementation of the EMMP.

7.2 Objectives of EMMP

The main objectives of EMMP are to:

- Provide details of the project impacts along with the proposed mitigation measures and the corresponding implementation activities;
- Define the roles and responsibilities of the Project Proponent, Contractor, Supervisory Consultants, and other players and effectively communicate environmental issues among them;
- Define a monitoring mechanism, and reporting frequency and identify monitoring parameters to ensure that all the mitigation measures are completely and effectively implemented, and identify the resources required to implement the EMMP and outline the corresponding financing arrangements.
- Ensure that the project will adopt COVID-19 best international standard operating procedures (SOPs) during the construction and operational phases.

7.3 Implementation of Environmental Mitigation And Monitoring Plan (EMMP)

The following staff will be involved in the implementation of EMMP:

- Punjab Small Industries Corporation (PSIC) Environmental Compliance Manager
- Site Environmental Engineer of the Contractor.
- Environmental Engineer from Supervision Consultant

The Project Director shall be made bound through contractual documents to implement the suggested mitigation measures in the EMMP. The whole EMMP will be included as a clause of the contract documents. The organizational setup for the implementation of EMMP is given below in **Figure 7.1.**

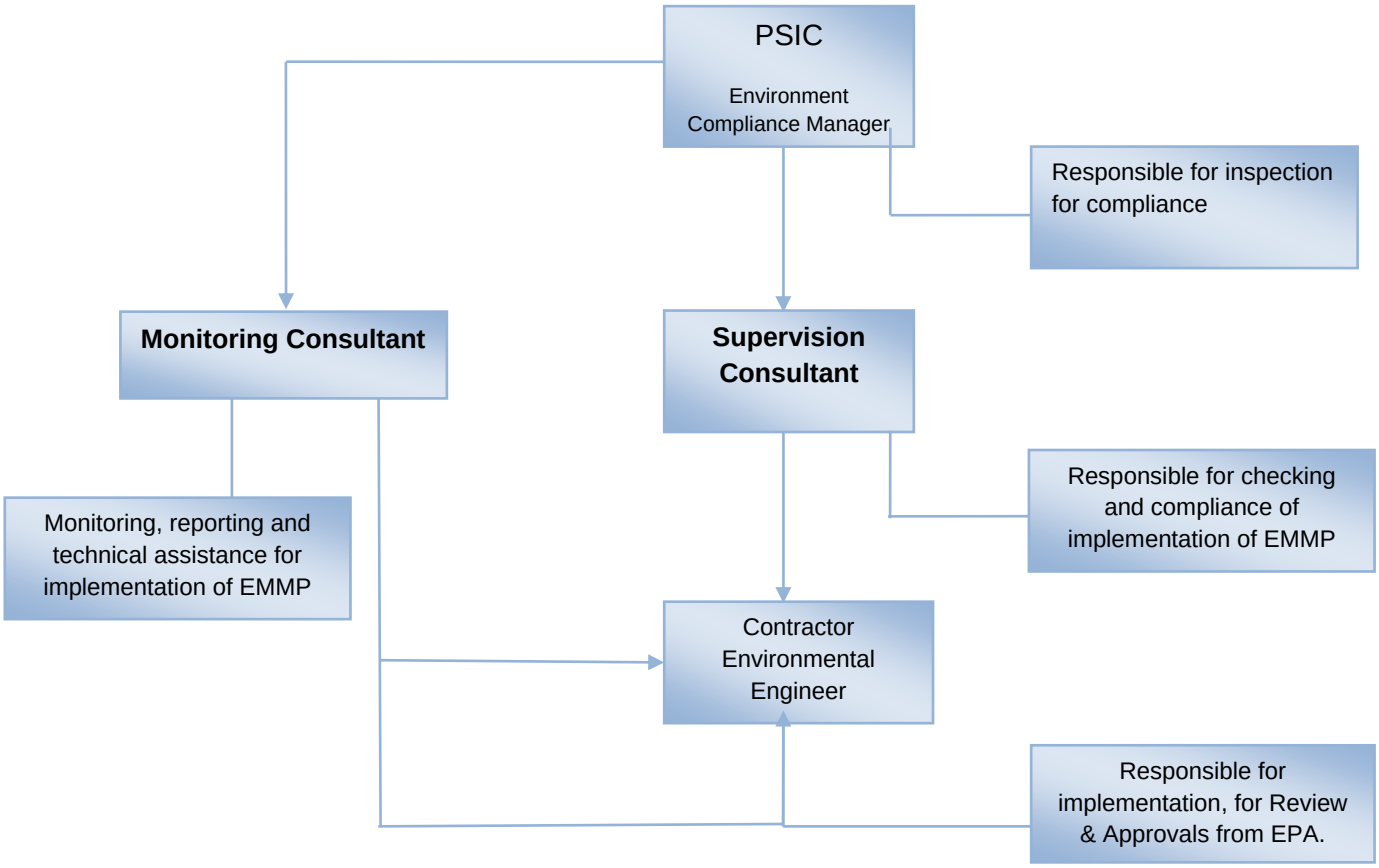


Figure 7.1: Organizational Setup for Implementation of EMMP

7.3.1 Roles and Responsibilities of the Functionaries Involved in EMMP Implementation

a) PSIC

An Environmental Representative of PSIC will review the Environmental Monitoring Reports and will direct the Environmental Engineer of the Supervision Consultant to provide any necessary information to ensure efficient monitoring of the EMMP.

b) Supervision Consultant

The Supervision Consultant will have responsibility for assuring the implementation of EMMP. This includes the following:

- Ensuring that the required environmental training is provided to the staff concerned.
- The Supervision Consultant (SC) will be responsible for carrying out visits to the construction sites to review the environmental performance of the contractors.
- Monitoring the progress of environment-related activities.
- Make sure that the contractor is implementing the additional measures suggested by the Monitoring Consultant in monthly environmental monitoring reports.

c) Contractor: Site Environmental Engineer

The Site Environmental Engineer of the contractor will carry out the implementation of the mitigation measures at the construction site. The contractor will be bound through the contract to take actions against all the special and general provisions of the contract document.

d) Punjab Environmental Protection Department

As per Punjab Environmental Protection (Amendment) Act, 2012, the Punjab EPD is responsible for environmental protection and pollution control. The Punjab EPD is responsible for the issuance of environmental clearance of all the developmental projects under their jurisdiction. As per Punjab Environmental Protection (Review of Initial IEE/EIA) Regulations 2022, Schedule-II, EIA is required for the said project. Based on the EIA, Punjab EPD will monitor (as and when required) the project activities.

7.4 Reporting Mechanism

Contractor's environmental engineer will be responsible for the implementation of mitigation measures and their records, while the monitoring consultant will determine if the mitigation is in place and its effectiveness, or any corrective action is required. The monitoring consultant will prepare a monthly compliance report based on his findings and records provided by the contractor's environmental engineer. The monthly compliance report will be submitted to the PSIC environmental compliance officer. The Environmental Engineer will also be responsible for submitting a monthly EMMP compliance report for the project to PIEDMC.

7.5 Non-Compliance of the EMMP

The implementation of the proposed EMMP involves inputs from various functionaries as discussed earlier. The contractor will be primarily responsible for ensuring implementation of the mitigation measures proposed in the EMMP, which will be part of the contract documents. The provision of the environmental mitigation cost will be made in the total cost of the project. However, if the contractor fails to comply with the implementation of EMMP and submission of the monthly compliance reports, deductions will be made from the payments to the Contractor claimed under the heads of environmental components.

Table 7. 1: Environmental Management Plan

Sr. No.	Parameters	Target	Mitigation	Responsibility
Design Phase				
1.	Land Acquisition	To mitigate and compensate land land-related issues.	• The affected community will be compensated at fair market rates or as agreed upon and accepted by the affected persons; • The land owners will also be paid for the loss of their trees or any other structures on the site.	PSIC, DC
2.	Solid Waste	To manage (i.e., collect and dispose) the solid waste safely at appropriate sites	• Planning for disposal sites with a reasonable distance from the human settlements, following the siting criteria for landfill sites; • Disallowing siting for work camps, including waste dump sites, at a distance closer than one (1) kilometer to any inhabited areas; • Incorporating technical design features for refuse collection containers at sites that would minimize burning impacts; • Devising plan(s) for safe handling, storage, and disposal of harmful materials; and • Hazardous substance rule 2003 must be followed for the handling of hazardous waste. • Burning of waste will not be allowed in any case.	PSIC, DC
3.	Seismic Hazard	To ensure that all the structures are seismically safe.	• The structures of the proposed project will be designed and constructed to withstand moderate earthquakes. For seismic hazard analysis, updated structural and seismic evaluations will be consulted; and • To mitigate the seismic hazard, Seismic Building	PSIC, DC

Sr. No.	Parameters	Target	Mitigation	Responsibility
			Code of Pakistan 2007 (SBC-07) will be adopted. This code specifies minimum requirements for seismic safety of buildings/structures and has to be applied and used by engineers in conjunction with the necessary understanding of the concepts of structural, geotechnical and earthquake engineering.	
4.	Emergency Management	To define a line of action to deal with the emergency situations.	• A comprehensive Emergency Response Plan will be devised and in place to account for any emergencies at any stage of the project, in close consultation with the Rescue 1122 Service, Fire Fighting Department, bomb disposal squad, and paramedics; • Training of the staff/employees regarding the emergency procedures/plans will be regularly conducted; • A medical facility will be provided in the industrial estate; • Provision of firefighting and emergency exits will be given in the design. The Emergency Response Plan is attached as **Annex-IV**.	PSIC, DC

Sr. No.	Parameters	Target	Mitigation	Responsibility
Construction Phase				
1	Topography	To minimize any major changes in the natural topography of the project area.	• Efforts shall be made to maintain the natural topography of the area, wherever possible; • Any unwanted material either the construction & demolition waste, unused equipment/machinery and other items will be removed from the site immediately.	PIEDMC, CC & SC
2.	Soil	To minimize soil erosion and contamination.	• All spoils will be disposed of at designated site and the site will be restored back to its original conditions; • Implementing measures to minimize soil disturbance such as using appropriate machinery and construction techniques. Additionally, adopting conservation practices like contour plowing, terracing, and erosion control measures can help prevent soil erosion and degradation; • Non-bituminous wastes from construction activities will be dumped in approved sites, in line with the legal prescriptions for dump sites; • Implement strict pollution control measures to minimize the release of contaminants into the soil.; • Excavations would be kept confined to the specified foundation spots as per the approved engineering drawings. Unnecessary excavations will be avoided;	PIEDMC, CC & SC

Sr. No.	Parameters	Target	Mitigation	Responsibility
			• Oils, lubricants, chemicals, and other listed hazardous materials will be stored safely at their designated spots, enclosures or store rooms, which will be safe from rainfall and away from any potential source of fire and Hazardous Substance Rule 2003 will be followed; • Septic tanks of adequate capacities will be constructed for receiving and treating wastewater from all temporary worksite toilets and at the temporary container offices, if any. The toilet wastewater will not be discharged untreated onto the adjacent lands; • Vehicles will be parked and repaired at designated site containing oil collection & sumps arrangement; and	
3	Surface water/ Ground water Quality	To avoid contamination of the surface and groundwater	• Protection of groundwater reserves from any source of contamination such as the construction and oily waste; • Water required for construction may be obtained in a sustainable way that the water availability and supply to nearby communities remain unaffected; • Stockpiles of cement and other construction materials will be kept covered when not being used; • Avoid fuel and other chemicals being stored at numerous locations around the site;	PIEDMC, CC & SC

Sr. No.	Parameters	Target	Mitigation	Responsibility
			• Maintenance of vehicles and plant will be carried out only on impermeable areas where any oil spillages can be contained; • All kinds of waste shall be stored in covered containers and disposed of safely as soon as possible; • Temporary sanitary facilities, such as portable toilets, will be established on-site. A licensed contractor will be hired for appropriate disposal and maintenance of these facilities; and • Sand/silt removal facilities such as sand traps, silt traps and sediment basins will be provided to remove the sand/silt particles from run-off. These facilities will be properly and regularly maintained. These facilities will be carefully planned to ensure that they would be installed at appropriate locations to capture all surface water generated on site.	
4	Air Quality	To minimize air pollution	• All vehicles, machinery, equipment and generators used during construction activities will be kept in good working condition, properly tuned and maintained in order to minimize the exhaust emissions; • Open burning of solid waste from the contractor's camps will be strictly banned; • Proper disposal and recycling of construction debris can prevent burning and the release of	PIEDMC, CC & SC

Sr. No.	Parameters	Target	Mitigation	Responsibility
			harmful pollutants into the air. • Use of fuel with substantially lower sulphur content; • Utilizing low-emission or electric-powered equipment can help reduce air pollution associated with construction activities. • Proper maintenance and repair of power generators and construction machinery is needed to minimize the hazardous emissions; • Personal Protective Equipment (PPE) like masks, goggles and gloves etc. shall be provided to workers; and • PEQS applicable to gaseous emissions generated by construction vehicles, equipment and machinery will be enforced during construction works. • Regular water sprinkling on the site and access roads will be carried out to suppress excessive dust emission(s); • Construction workers will be provided with masks for protection against the inhalation of dust;	
5	Noise	To minimize noise pollution.	• Provide construction workers with suitable hearing protection like ear cap, or earmuffs and training them in their use; • Establish a feedback mechanism to address community concerns and respond promptly to	PIEDMC, CC & SC

Sr. No.	Parameters	Target	Mitigation	Responsibility
			complaints related to noise and vibrations. • Use barriers and buffer zones, such as temporary fencing or walls, to block noise propagation towards sensitive areas. • Establish specific working hours that limit noisy activities during sensitive times, such as early mornings, evenings, or weekends. • Preferably, restrict construction vehicles movement during night time near the residential areas and camp sites; • Locate the concrete mixing, and materials shipment yards at least 2km from residential areas, particularly schools and health centers; • Selection of up-to-date and well-maintained plant or equipment with reduced noise levels ensured by suitable in-built damping techniques or appropriate muffling devices; and • Heavy machinery like percussion hammers and pneumatic drills will not be used during the night.	
6	Solid Waste	To minimize the nuisance due to solid waste	• The waste generated from the camp site will be disposed of at approved sites; • Encourage separation of construction waste at the source. Provide clearly labeled containers for different types of waste, such as concrete, metal, wood, plastics, and general waste. This will facilitate recycling and proper disposal; • Burning of waste shall be prohibited;	PIEDMC, CC & SC

Sr. No.	Parameters	Target	Mitigation	Responsibility
			• Containers with covers shall be provided on site to store waste; • General and hazardous waste shall be labelled and segregated; • Educate construction workers and staff about the importance of waste management and provide training on proper waste handling procedures; • Solid Waste shall be safely stored in demarcated waste disposal sites; and • The contractor shall ensure implementation of waste management plan.	
7	Ecological Environment	To minimize the impact on flora and fauna	• Massive tree plantation must be carried for environmental improvement and to contain foreseeable impacts of the industrial activities. • Optimize the site layout and design to minimize the cutting or removal of trees. Preserve existing vegetation by integrating it into the project's green spaces: • Campsites and asphalt plants will be established on vacant land; • Construction vehicles, machinery and equipment will remain confined within their designated areas of movement; and • The Contractor's staff and labor will be strictly directed not to damage any vegetation such as trees or bushes for cooking; and Contractor will	PIEDMC, CC & SC

Sr. No.	Parameters	Target	Mitigation	Responsibility
			provide gas cylinders at the camps for cooking purposes and cutting of trees/bushes for fuel will be strictly prohibited. • Noise control measures will be enforced during the construction phase such as provision of silencers on heavy construction vehicles. It is further recommended that activities, which are expected to generate more noise will be executed during the daytime only; • Moreover, over speeding shall be prohibited and construction machinery, vehicles and equipment will remain confined within their designated areas of movement to avoid and minimize any accidental killing of Fauna; • The camps will be properly fenced and gated to check the entry of wild animals in search of eatable goods. Similarly wastes of the camps will be properly disposed of to prevent the chances of its eating by wild animals, which may prove hazardous for them; and • Hunting, poaching and harassing of animals and birds will be strictly prohibited and contractor shall be held responsible for any such act of his men; • Local community and construction workers will be given awareness for protection of any animal as they have also right to live and it makes the surroundings more attractive and colorful.	

Sr. No.	Parameters	Target	Mitigation	Responsibility
			Promotion of awareness to individuals shall accelerate the process of fauna preservation; and • During construction, fencing of area is mandatory to confine and protect the species.	
8.	Resource Conservation	To ensure sustainable use of natural resources	• Diesel and fuels with low sulphur content will be used to operate construction machinery and equipment. • The efficient and well-maintained equipment and machinery shall be used; • The equipment and machinery shall be turned off when not in use; and • Regular maintenance of machinery to avoid fuel leakages.	PIEDMC, CC & SC
9.	Construction Camps/Camp Sites	To minimize the impacts of construction camps	• Select camp locations that minimize habitat disruption and avoid sensitive ecological areas. • Optimize energy efficiency by using energy-efficient lighting, and appliances in camp facilities. Install renewable energy systems, such as solar panels; • Develop waste management plans that include waste segregation, recycling, and proper disposal methods; • Operate equipment in a manner sympathetic to the ambient noise environment. Do not leave equipment idling unnecessary; • Provide adequate warnings of impeding works to	PIEDMC, CC & SC

Sr. No.	Parameters	Target	Mitigation	Responsibility
			all potential receptors; • Aware workers to implement water conservation measures; • Engage with local communities and stakeholders to understand and address their concerns. Implement measures to minimize disruptions to local communities, such as limiting construction noise during sensitive hours or implementing traffic control plans. Promote cultural sensitivity and respect local customs and traditions. • Employment policies which aim to maximize job opportunities for local people will help to minimize tensions caused by different socio-cultural values.	
10.	Health and safety	To minimize occupational and community health risks	• Providing basic medical training to specified work staff and basic medical service and supplies to workers; • Obligatory insurance against accidents for labourers/workers; • Layout plan for camp site, indicating safety measures taken by the contractor, e.g. firefighting equipment, safe storage of hazardous material, first aid, security, fencing, and contingency measures in case of accidents; • Work safety measures and good workmanship practices are to be followed by the contractor to	PIEDMC, CC & SC

Sr. No.	Parameters	Target	Mitigation	Responsibility
			ensure no health risks for labourers; • Protection devices (ear muffs) will be provided to the workers doing job in the vicinity of high noise generating machines; • Provision of adequate sanitation, washing, cooking and dormitory facilities including light up to satisfaction; • Provision of protective clothing for labourers handling hazardous materials, e.g., helmet, adequate footwear for bituminous pavement works, protective goggles, gloves etc.; • Ensure strict use of wearing these protective clothing during work activities; • Elaboration of a contingency planning in case of major accidents; • Ensure that the site is restricted for the entry of irrelevant people particularly children; and • Adequate lightning devices, barriers, yellow tape and safety signage shall be posted.	
11	Emergency Response	To define a line of action to deal with the emergency situations.	• Implementation of emergency response plan shall be ensured by the contractor; • Training of the staff/employees regarding the emergency procedures/plans shall be regularly conducted; • Minor incidents and near misses shall be reported and preventive measures shall be formulated accordingly;	PIEDMC, CC & SC

Sr. No.	Parameters	Target	Mitigation	Responsibility
			• Implement fire prevention measures to minimize the risk of fires breaking out. This includes regular inspection and maintenance of equipment and machinery to identify and address potential fire hazards; and • Conduct regular inspections of the construction site to identify potential fire hazards and address them promptly. Inspect temporary electrical installations, fuel storage areas, heating equipment, and any other potential ignition sources.	
12.	Climate Change/ GHG Emissions	To reduce GHG emissions and ensure sustainable Environment.	• Regular monitoring of air quality will be conducted from an EPA certified laboratory to comply with PEQS 2016. • Renewable energy sources will be integrated into construction site operations. Solar panels or other clean energy technologies will be preferred to generate power for on-site operations. Utilize renewable energy providers or explore off-site renewable energy procurement options. • GHG emissions accounting system will be implemented at the construction site. Emissions from equipment, vehicles, and other sources will be monitored. Emissions data will be regularly reported to identify areas for improvement and set targets for reduction.	PIEDMC, CC & SC
13	Traffic Disruption	To avoid the nuisance due to traffic disruption	• The mitigation will include devising a traffic management plan in coordination with traffic	PIEDMC, CC & SC

Sr. No.	Parameters	Target	Mitigation	Responsibility
			police; and • The access will also be widened and to accommodate heavy traffic loads and to avoid traffic congestion issues.	
14.	Social Issues	To avoid socio-cultural conflicts	• Preparation of traffic management plan; and • Public shall be notified before the commencement of the project.	PIEDMC, CC & SC
Operation Phase				
1.	Water Quality	To avoid deterioration of water quality of the project area	• Combined Effluent Treatment plant (CETP) shall be operated as per Standard Operating Procedures (SOPs) to follow PEQS. Special concentrations shall be paid to sludge treatment and handling; • Regular monitoring of water quality parameters will be conducted to ensure compliance with environmental regulations and early detection of any issues; • Alternative options will be opted to reuse the treated wastewater for horticultural or agricultural reuse; • Each industry will also comply with the PEQS; • Industries shall be bound to submit monitoring reports of their effluents regularly.	PIEDMC
2.	Air Quality	To minimize air pollution	• Cleaner and efficient technologies will be adopted to reduce greenhouse gas emissions and air pollutants; • Air Pollution Control Equipment will be installed	PIEDMC & EPA

Sr. No.	Parameters	Target	Mitigation	Responsibility
			in respective industries; • Use of green infrastructure, such as rooftop gardens and tree planting will be encouraged to mitigate the heat effect. • Efforts shall be made to capture CH_4 and H_2S that can be used commercially; • Carbon offset and emissions trading programs will be adopted to offset greenhouse gas emissions. • Management will ensure Compliance of PEQS; and • SMART Rules will be followed.	
3.	Soil	To avoid soil contamination	• Each industry shall be bound to submit the inventory of use of hazardous chemicals, their use and final disposal including measures to control special waste; • Containment and spill prevention measures will be implemented to minimize soil contamination risks.	PIEDMC
4.	Ecology	To protect the ecology of the area	• The trees planted during the construction stage will be maintained under the tree maintenance program that includes regular watering, pruning, and monitoring for pests and diseases. • Adequate care will be adopted for the long-term health and survival of the trees.	PIEDMC
5.	Solid waste	To safely collect, segregate, store, transport, and dispose the solid waste.	• Solid Waste management (SWM) system shall be operated as per SOPs and improved with	PIEDMC

Sr. No.	Parameters	Target	Mitigation	Responsibility
			time to time; • Primary collection and storage of solid waste shall be performed in the closed containers; • Secondary collection shall be done in the designated facility; • Source separation of waste at its origin within industrial facilities will be encouraged, facilitating the sorting of different waste streams for proper treatment and recycling; • Collaboration will be done with recycling companies and waste management service providers to ensure effective collection, segregation, and processing of recyclable waste; • Stringent hazardous waste management protocols will be developed and adhered to, to ensure the safe handling, storage, and disposal of hazardous materials generated within the industrial estate. This includes proper labeling, containment, and coordination with authorized hazardous waste treatment and disposal facilities; • Only unusable trash material shall be disposed of into the landfill site and all the reusable material shall be separated, processed and sold accordingly.	
6.	Emergency Response	To ensure emergency preparedness and safety	• An Emergency Response Plan for earthquakes and manmade	PIEDMC

Sr. No.	Parameters	Target	Mitigation	Responsibility
			• disasters will be developed; • Emergency Response Plan will be implemented in close consultation with the Rescue 1122 Service, Fire Fighting Department, bomb disposal squad and paramedics; • Also, evacuation plan will be developed in order to tackle with any emergency; and • In addition, training of the staff/employees regarding the emergency procedures/plans will be regularly conducted.	

KEY

CC	Construction Contractor
DC	Design Consultant
EPA	Environment Protection Agency
PSIC	Punjab Small Industries Corporation (PSIC)
SC	Supervision Consultant

7.6 Environmental Monitoring

Environmental Monitoring is undertaken during both the construction and operational phases to ensure the effectiveness of the proposed mitigation measures. The environmental parameters outlined in PEQS will be analyzed for possible disruption in their baseline values. Any variations in the baseline values will indicate the efficacy of ESMP's implementation. The parameters to be analyzed during the construction and operation of the project, and responsibilities for monitoring and reporting, have been discussed below. A cost estimate for this measurement of parameters is given in **Table 7.2.**

Construction Phase

a) Air Quality

Air quality monitoring will be carried out bi-annual basis during the construction phase at the representative locations.

The following parameters will be monitored:

- CO
- 0_3
- NO_X
- SO_2
- PM $_{2.5}$, PM_{10m}

b) Groundwater Quality

Groundwater quality monitoring will be conducted biannually during the construction phase at the representative locations. The parameters mentioned in PEQS will be monitored to assess groundwater quality.

c) Surface Water Quality

Surface water quality monitoring will be conducted biannuallyduring the construction phase at the representative locations. The parameters mentioned in PEQS for disposal in inland waters will be monitored to assess surface water quality.

d) Noise Levels

The noise levels monitoring will be carried out on a biannually at representative locations in the project area.

Operational Phase

a) Air Quality

Air quality monitoring will be conducted biannually during the operational phase at the representative locations. The following parameters will be monitored:

- CO
- O^3
- NO_X
- SO_2
- PM $_{2.5}$, PM_{10}

b) Ground Water Quality

Groundwater quality monitoring will be conducted biannually during the operation phase at the representative locations. The parameters mentioned in PEQS will be monitored to assess groundwater quality.

c) Surface Water Quality

Surface water quality monitoring will be conducted biannually during the operation phase at the representative locations. The parameters mentioned in PEQS for disposal in inland waters will be monitored to assess surface water quality.

d) Noise Levels

The noise level monitoring will be carried out biannually at representative locations in the project area.

Responsibilities for Monitoring and Reporting

The Construction Contractor (CC) will be responsible for environmental monitoring and reporting throughout the construction phase under the supervision of the Environmental Engineer of Supervision Consultant (SC), while the implementing agency will be responsible for monitoring at the operation phase. The contractor will submit the monthly report to SC. SC will review the report and will give its observations. The monthly report will be submitted to EPD through the client.

This should be included in the general clauses of the contract, and the contractor should be paid separately.

Parameters to be analyzed during construction and operation phase of the project and responsibilities for monitoring and reporting have been discussed in **Table 7.2.**

Table 7.2: Budget Estimate for Environmental Monitoring During the Construction and Operation Phases

Environmental Monitoring									
Components	**Parameters**	**No. of Samples**				**Rate (PKR)**	**Responsibility**	**Duration**	**Cost (PKR)**
		No. of Samples	**Frequency**	**Location**	**Total Samples**				
Construction Phase (30 month)									
Air Quality	All PEQS parameters	1	5	4	20	50000	Contractor/ PSIC	24 hours	1,000,000
Ground Water Quality	All PEQS parameters	1	5	4	20	30000	Contractor/ PSIC	-	600,000
Surface Water/ Waste Water Quality	All PEQS parameters	1	5	4	20	25000	Contractor/ PSIC	-	500,000
Noise Level	-	1	5	4	20	4000	Contractor/ PSIC	24 hours	80,000
								Sub-Total	**2,180,000**
Operation Phase (1st year)									
Air Quality	All PEQS parameters	1	2	4	8	50000	Contractor/ PSIC	24 hours	400,000
Drinking Water Quality	All PEQS parameters	1	2	4	8	30000	Contractor/ PSIC	-	240,000
Surface Water/ Waste Water Quality	All PEQS parameters	1	2	4	4	25000	Contractor/ PSIC	-	100,000
								Sub-Total	**740,000**
								GRAND TOTAL	**2,920,000**

7.7 Environmental Technical Assistance and Training Plan

In order to raise the level of professional and managerial staff, there is a need to upgrade their knowledge in the related areas. The CC and PSIC should play a key role in this respect and arrange the trainings.

An environmental and social training and Technical Assistance (TA) program is to be carried out before the implementation of the project. Contractor's environmental awareness and appropriate knowledge of environmental protection is critical to the successful implementation of the EMP because without appropriate environmental awareness, knowledge and skills required for the implementation of the mitigation measures, it would be difficult for the contractor(s) workforce to implement effective environmental protection measures. A suitable training program is proposed to train the contractor(s) staff who will be involved in the construction phase and the professional staff from the client involved at the operational stage of the project.

PSIC will engage TA consultant to manage the environmental training program. The objective of the TA will be to help in the establishment of appropriate systems, and to train senior PSIC staff responsible for managing environment, operations, and planning, who can then impart training at a broader level within and outside the PSIC (i.e., the training of trainers). The TA consultant will organize training courses for PSIC and contractor staff to train them in specialized areas such as air and noise pollution monitoring; develop environment operation manuals in consultation with the EPD Punjab. The details of this training program are presented in **Table 7.3** and budget estimate for Training of Workers & Institutional strengthening cost presented in **Table 7.4.**

Table 7.3: Personnel Training Program/ TA Services

Provided by	Contents	Trainees/Events	Duration
TA consultants/ organizations specializing in environmental management and monitoring	Short seminars and courses on: Environmental laws and regulations, daily monitoring and supervision	Three seminars for PSIC and Contractor project staff	3 days
TA consultants/ organizations specializing in social management and monitoring	Short seminars and courses on: Social awareness	Three seminars for project staff dealing in Social/lands matters	3 days
TA consultants/ organizations specializing in Occupational, health and safety issues	Short lectures relating to Occupational Safety and Health	Two seminars for contractor's staff	4 days

Table 7.4: Budget Estimate for Training of Workers & Institutional Strengthening Cost

Sr. No.	Training	Participants	Description	Quantity	Amount (PKR)
Training Cost of Workers					
1	Waste Management	Contractor Staff	Awareness associated with waste Storage, collection and safe disposal	Once	100,000
2	Workshop on Emergency Response	Contractor Staff	Potential natural and other hazard/emergencies and dealing with emergency to minimize damage	Once	150,000
3	Workshop on Community/ occupational health and safety	Contractor Staff	Awareness on EHS Guidelines	Once	150,000
				TOTAL	400,000

7.8 Health and Safety Cost

The cost to ensure occupational health and safety is summarized below in **Table 7.5** and cost breakup of PPE is given in **Table 7.6**.

Table 7.5: Budget Estimate for HSE

Sr. No.	Description	Quantity	Unit	Rate (PKR)	Amount (PKR)
1	Medical screening for workers	125	Persons	1500	187500
2	Tarpaulins	12	L.S.	10,000	120000
3	Handling of hazardous material	30	L.S.	10,000	300000
4	Handling of solid waste	30	L.S.	5,000	150000
5	DCP Fire extinguishers in case of fire	12	Each	3,500	42000
	CO2 Fire extinguishers in case of fire	12	Each	10,000	120000
6	Cost of Personal Protective Equipment (PPE)*		L.S.		2,075,000
				Sub total	**2,994,500**
Operation					
Sr. No.	**Description**	**Quantity**	**Unit**	**Rate (PKR)**	**Amount (PKR)**
1	Medical screening for workers	15	Persons	1500	22500
2	Handling of solid waste	12	L.S.	5,000	60000

3	Cost of Personal Protective Equipment (PPE)*		L.S.		130,000
				Sub total	**212,500**
				Grand Total	**3,207,000**

Table 7.6: Break-up Cost of Personal Protective Equipment (PPE)*

Personal Protective Equipment (PPE)

Construction					
Item No.	**Description**	**Quantity**	**Unit**	**Rate (PKR)**	**Amount**
					PKR
1	Ear plugs	250	Each	100	25,000
2	Helmets	100	Each	1500	150,000
3	Safety shoes	250	Each	3000	750,000
4	Protective goggles	150	Each	2000	300,000
5	Gloves	1,500	Each	300	450,000
6	Dust Mask	3,000	Each	100	300,000
7	First Aid Kit	20	Each	5000	100,000
				Sub total	**2,075,000**
Operation					
Item No.	**Description**	**Quantity**	**Unit**	**Rate (PKR)**	**Amount**
					PKR
1	Safety shoes	30	Each	3000	90,000
2	Gloves	30	Each	300	9,000
3	Dust Mask	60	Each	100	6,000
4	First Aid Kit	5	Each	5000	25,000
				Sub total	**130,000**

7.9 Tree Plantation Plan

A. Plantation Cost

A total of 5,173 trees will be planted as compensation for the 490 trees to be removed, ensuring a replacement ratio of more than 1:10 for each tree compensated. The plantation and O&M cost for 03 years is given in below **Table 7.8**.

Table 7.7: Cost Estimates for Plantation Against Removed Trees

Sr #	Plants	Size	Unit	Rate (Rs)	Quantity	Total
1	**Shady trees**		No.		5,173	
1.1	Bohar tree (Banyan) – Ficus benghalensis	18''(Bag)		500	560	280000
1.2	Pipal – Ficus religiosa	18''(Bag)		500	560	280000
1.3	Bakain (China berry / Persian lilac) – Melia azedarach	18''(Bag)		500	560	280000
1.4	Nim (Neem) – Azadirachta indica	18''(Bag)		650	560	364000
1.5	Daraik (Ailanthus / Tree of Heaven) – Ailanthus altissima	18''(Bag)		500	560	280000
1.6	Pilkan – Ficus virens	18''(Bag)		650	560	364000
1.7	Sukhchayn – Pongamia pinnata	18''(Bag)		600	620	372000
1.8	Jaman (Jamun / Black Plum) – Syzygium cumini	18''(Bag)		500	620	310000
1.9	Archan (Kachnar / Orchid Tree) – Bauhinia variegata	18''(Bag)		500	573	286500
1.10	Transportation charges		%	5	-	140,825
1.11	Mortality		%	15	-	422,475
1.12	Contractors Profit (of total cost)		%	20	-	563,300
	Sub Total (RS.)					**3,943,100**
2	**Input Requirements**					
2.1	Fertilizer (NPK) (Transportation charges included)		Bags	15,000	50	750,000
2.2	FYM (Transportation charges included)		Bags	2,000	500	1,000,000
2.3	Transportation, Handling, and Miscellaneous Charges		%	10	-	175,000
	Sub Total (RS.)					**1,925,000**
3	**Development (For 3 Years)**					
3.2	Head Gardner		Man-Month	45,000	1	1,620,000
3.3	Gardner		Man-Month	25,000	3	2,700,000
3.4	Miscellaneous (Vehicle expenditures, wear & tear of tools etc)		%	-	5	216,000
	Sub Total (RS.)					**4,536,000**
	Grand Total (RS.)					**10,404,100**

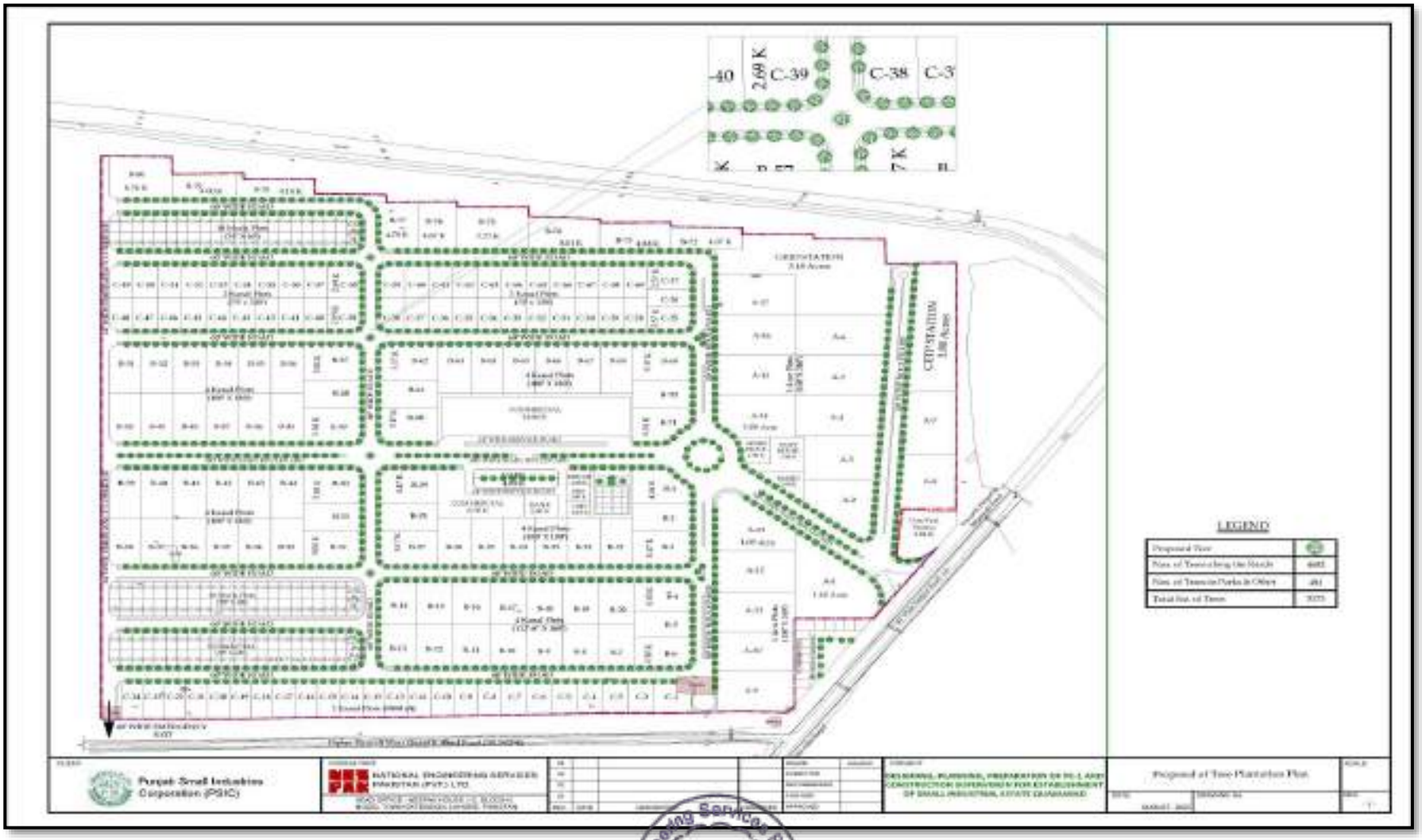


Figure 7.2: Cost Estimates for Plantation Against Removed Trees

7.10 EMMP Implementation Cost

The cost required to effectively implement the mitigation measures is important for the sustainability of the Project both in the construction and operation stages of the Project. The cost of EMMP is summarized below in **Table 7.9**:

Table 7.8: EMP Implementation Cost

Sr. No.	*Description*	*Amount (Rs)*	
		Construction	*Operation*
1	Tree Plantation		10,404,100
2	Health & Safety	2,994,500	212,500
3	Environmental Monitoring	2,180,000	740,000
4	Training Cost	400,000	-
	Sub-Total	**5,574,500**	**11,356,600**
	Contingencies @ 5%	278,725	567,830
	Total	**5,853,225**	**11,924,430**
		Grand Total	**17,777,655**

ANNEX-I

NOTIFICATION OF SECTION-4

PUNJAB SMALL INDUSTRIES CORPORATION
SARGODHA REGION SARGODHA
Mela Mandi, Road Opposite Federal Public School
Ph No: 9230102 048-3724810

No.PSIC/SR/SIE-Q/218 Dated: 01-09-2025

The Director (EM),
PSIC, Head Office,
Lahore.

Subject: **ESTABLISHMENT OF SMALL INDUSTRIAL ESTATE/MINERAL PROCESSING ZONE IN SALT RANGE PUNJAB**

Reference your office letter No. PSIC/EM/SIE-QUAIDABAD/1410, dated 25.08.2025, on the subject cited above.

Please find enclosed herewith the De-Notification, vide No. 918-M/DC/DRA, dated 28.08.2025, regarding cancellation of earlier Notification under Section 4 of the Land Acquisition Act, 1894, vide No. 800-M/DC/DRA, dated 28.07.2025, which was published in the Punjab Gazette on 31.07.2025.

Further, the latest Notification, vide No. 919-M/DC/DRA, dated 28.08.2025, pertaining to the land measuring 109 Acres, 5 Kanals and 9 Marlas, under Section 4 of the Land Acquisition Act, 1894, after incorporating the corrections as per the latest Revenue Staff Report, is also enclosed for your kind information and record.

Enclosure: **DA/AS Above.**

REGIONAL DIRECTOR

C.C.

1. The Director (EM), PSIC, Head Office, Lahore.
2. The Director (PEN), PSIC, Head Office, Lahore.
3. The Additional Deputy Commissioner (Rev.), Khushab.
4. The Deputy Director Mines & Mineral, Khushab.
5. P.S to Secretary Mines & Minerals, Lahore.
6. P.S to Managing Director, PSIC, Head Office, Lahore.
7. P.S to Deputy Managing Director PSIC, Head Office, Lahore.

Ph: 0454-920120
Fax:0454-920218
Email: akkhushab@gmail.com

No. 745-M/ADC(R)/DRA
OFFICE OF THE
ADDL: DEPUTY COMMISSIONER (REV),
KHUSHAB
Dated: 10/09 /2025

To

The Regional Director,
Punjab Small Industries Corporation,
Regional Office,
Sargodha.

Subject: - **MINUTES OF MEETING OF DISTRICT PRICE ASSESSMENT COMMITTEE KHUSHAB HELD UNDER THE CHAIRMANSHIP OF DEPUTY COMMISSIONER / DISTRICT COLLECTOR KHUSHAB ON 04.09.2025 REGARDING ESTATE/MINERAL PROCESSING ZONE IN SALT RANGE PUNJAB LAND MEASURING 109-ACRE, 05-KANAL, 09-MARLA AT MAUZA UTTRA JANUBI , TEHSIL QUAIDABAD DISTRICT KHUSHAB.**

The meeting of District Price Assessment Committee Khushab held under the chairmanship of Deputy Commissioner/District Collector, Khushab on 04.09.2025 in which the Committee approved the cost of land.

3. It is, therefore, desired that the amount according to the chart of estimated cost Rs. 37,84,00,313/- may be deposit as Land Revenue Deposit in LAC account under intimated to this office for further neeessary action. The chart of the estimated cost of the land under acquisition is sent herewith.

Encl: As above.

Addl: Deputy Commissioner (Rev),
Khushab

کاروائی اجلاس ڈسٹرکٹ پراپرٹی اسسمنٹ کمیٹی ضلع خوشاب

بابت اسٹیبلشمنٹ سہال انڈسٹریل اسٹرل پراسسنگ زون سالٹ رینج موضع اتراء جنوبی تحصیل قائدآباد

زیر صدارت فروہ عامر، ڈسٹرکٹ کلکٹر خوشاب منعقدہ مورخہ 04.09.2025

اجلاس میں ذیل آفسران نے شرکت فرمائی۔

1	فروہ عامر	ڈسٹرکٹ کلکٹر خوشاب	کنوینر
2	عبدالستار خاں	ایڈیشنل ڈپٹی کمشنر (ریونیو) خوشاب	معاون
3	علی رضا	ایگزیکٹو انجینئر خوشاب کینال ڈویژن خوشاب	ممبر
4	حسیب الرحمن	اسسٹنٹ کمشنر، قائدآباد	معاون

اجلاس کی کاروائی کا آغاز تلاوت کلام پاک سے ہوا۔

اجلاس کو آگاہ کیا گیا کہ ریجنل ڈائریکٹر، پنجاب سہال انڈسٹریز کارپوریشن، سرگودھا کی جانب سے موضع اتراء جنوبی، تحصیل قائدآباد کے رقبہ 109 ایکڑ، 5 کنال، 09 مرلے کی کنٹرٹ نوٹیفکیشن بمطابق دفعہ 4 لینڈ ایکوزیشن ایکٹ 1894، نمبر M-919-DC/DRA مورخہ 29.08.2025 موصول ہوا ہے۔ یہ اراضی انڈسٹریل اسٹرل پراسسنگ زون سالٹ رینج کے قیام کے لیے حاصل کی جارہی ہے۔ استدعا کی گئی کہ مذکورہ اراضی کی قیمت کی منظوری ڈسٹرکٹ پراپرٹی اسسمنٹ کمیٹی، ضلع خوشاب کے ذریعے دی جائے تاکہ منصوبے کی بروقت تکمیل ممکن ہو سکے۔

اس سلسلہ میں بذریعہ چٹھی نمبری M/ADCR/DRA-718 مورخہ 01.09.2025 اسسٹنٹ کمشنر قائدآباد اور ایکسین ارریگیشن خوشاب کو رقبہ مذکورہ کی قیمت بازاری، شیڈول ریٹ سال 2025-26 اوسط بیعہ یکسالہ 29.08.2024 تا 28.08.2025 کی فراہمی کے لئے ارسال کی گئی۔ بعد ازاں اسسٹنٹ کمشنر قائدآباد کی جانب سے بذریعہ چٹھی مورخہ 03.09.2025 اور ایکسین ارریگیشن خوشاب کی جانب سے بذریعہ چٹھی 2732 مورخہ 04.09.2025 مطلوبہ رپورٹس موصول ہوئیں۔ مطابق آمدہ رپورٹس ہائے اسسٹنٹ کمشنر قائدآباد اور ایکسین ارریگیشن خوشاب درج ذیل موصول ہوئیں:

نام موضع	قسم زمین	رقبہ			خسرہ نمبران	سال 29.08.2024 تا 28.08.2025 بحساب فی ایکڑ	شرح مال روڈ سال 2025-26 بحساب فی ایکڑ مین روڈ/آف روڈ	بازاری قیمت آمدہ محکمہ سال فی ایکڑ	بازاری قیمت آمدہ محکمہ ریونیو فی ایکڑ	منظور کردہ قیمت منجانب DPAC فی ایکڑ
		Acre	Kanal	Marla						
خراسوانی	زرعی	109	05	09	1085/6-7, 1086 /4min, 5-6,7min, 1087/4min-5-6/1-6/2-7min, 1088/5-6min, 1089/5min-6min, 1090/5min-6min, 1193/1-2/1-2/2-3to5, 1194/1 to 10, 1195/1 to 10, 1196/1 to 10, 1197/1 to 5-6-7-8-9-10, 1198/1 to 10, 1199/ 6 to 10, 1276/7-8 to 10, 1277/1to3-4-7-8 to 10, 1278/1to3-4-7-8-9-10, 1279/ 1to3-4-7-8-to 10, 1280/1-2-3/1-3/2-4-7-8to10, 1281/1to3-4-8/1-9-10, 1282/1	6,65,581	ان روڈ: 17,67,909 آف روڈ: 12,03,862	30,00,000	30,00,000	30,00,000
میزان:		109	05	09						

2- کوائف آمدہ کا کمیٹی نے بغور جائزہ لیا۔ اسسٹنٹ کمشنر قائدآباد نے مذکورہ رقبہ کی آمدہ قیمت کے بارے میں وضاحت کرتے ہوئے کہا کہ رقبہ زیر حصول مین روڈ قائدآباد/نور پور اور قائدآباد/پپلاں روڈ پر واقع ہے چونکہ کل رقبہ تعدادی 109 ایکڑ 5 کنال 9 مرلے ایک ہی پلاٹ کی صورت میں حاصل کیا جارہا لہٰذا رقبہ زیر حصول کی موقع پر بازاری قیمت 30,00,000/- روپے فی ایکڑ تجویز کی گئی ہے۔ جس پر ایکسین محکمہ نہر نے اسسٹنٹ کمشنر قائدآباد کے موقف کی تائید کی۔ لہٰذا مذکورہ حالات و واقعات اور تجویز کردہ قیمت کو مدنظر رکھتے ہوئے کمیٹی نے کافی بحث تمحیص کے بعد متفقہ طور پر رقبہ زیر حصول کی درج بالا قیمت منظور کی۔

معاون
اسسٹنٹ کمشنر، قائدآباد/LAC

ممبر
ایگزیکٹو انجینئر ہوشاب کینال ڈویژن
خوشاب

معاون
ایڈیشنل ڈپٹی کمشنر (ریونیو)
خوشاب

کنوینر:
ڈسٹرکٹ کلکٹر/
ڈسٹرکٹ پبلک اسسمنٹ کمیٹی،
خوشاب

National Engineering Services Pak (Pvt) Limited

PRO

ESTIMATED COST OF LAND MEASURING 109-ACRE-05-KANAL-09-MARLA [illegible] ESTABLISHMENT OF SMALL [illegible] LAND [illegible]
PROCESSING ZONE IN SALT RANGE PUNJAB [illegible] MAUZA ZAITTRA JANUBI
TEHSIL QUAIDABAD DISTRICT KHUSHAB.

Name of Project	Neme of village	Kind of land	Area under acquisition			Khasra No.	Average sale price rate per Acre 29.08.2024 to 28.08.2025	Schedule price rate per Acre 2025-26	Market Price per Acre (Field Staff)	Market Price per Acre (Irrigation Department)	Market Price Assessed by DPAC per Acre	15% Acquisition Charges	Total Compensation
			Acre	Kanal	Marla								
Acquisition Land measuring 109-acre-05-kanal,09-marla for establishment of Small Industrial Estate/Mineral Processing Zone in Salt Range Punjab at Mauza Uttra Janubi , Tehsil Quaidabad District Khushab.	Uttra Jajnubi	Agricultural	109	5	9	1085/6-7, 1086 /4min,5-6,7min, 1087/4min-5-6/1-6/2-7min,1088/5-6min,1089/5min-6min,1090/5min-6min,1193/1-2/1-2/2-3to5,1194/1 to 10, 1195/1 to 10,1196/1 to 10,1197/1 to 5-6-7-8-9-10,1198/1 to 10, 1199/ 6 to 10, 1276/7-8 to 10,1277/1to3-4-7-8 to 10, 1278/1to3-4-7-8-9-10, 1279/ 1to3-4-7-8-to 10, 1280/1-2-3/1-3/2-4-7-8to10, 1281/1to3-4-8/1-9-10, 1282/1	6,65,581	17,67,909	30,00,000	30,00,000	30,00,000	4,93,56,563	**32,90,43,750**
Total: -			**109**	**5**	**9**								**32,90,43,750**
												15% Compulsory Charges	**4,93,56,563**
												GRAND TOTAL:	**37,84,00,313**

EXECUTIVE ENGINEER IRRIGATION
CANAL DIVISION
KHUSHAB

DISTRICT COLLECTOR/
CHAIRMAN
DISTRICT PRICE ASSESSMENT
COMMITTEE KHUSHAB

National Engineering Services Pak (Pvt) Limited
NESPAK

PROFORMA-II

ESTIMATED COST OF LAND MEASURING 109-ACRE-05-KANAL-[illegible] FOR ESTABLISHMENT OF [illegible] ESTATE/MINERAL PROCESSING ZONE IN SALT RANGE PUNJAB AT MAUZA UTTRA JANUBI , TEHSIL QUAIDABAD DISTRICT KHUSHAB.

Location of land and its surroundings including distance from main road/roads	Composition / classification & measurement of Land being acquired				Khasra No.	Date of Vaulation of the same land Notified in the Valuation Table year 2025-26 Per Acre	Average sale of price similar land in the locality during preceding year when Notification under section 4 of the Land Acquisition Act, 1894 was issued Per Acre	Exact Basis / Rationale/Grounds on which cost of land is estimated.	Whether parameters laid down under section 23 and 24 of the Land Acquisition Act, 1894 and law Interperted by the Superior Courts observed.	Total Estimated cost of land approved by the DPAC Plus Compulsory Charges (Per Acre)
	Classification	Acre	Kanal	Marla						
Uttra Janubi	Agricultural	109	5	9	1085/6-7, 1086 /4min,5-6,7min, 1087/4min-5-6/1-6/2-7min,1088/5-6min,1089/5min-6min,1090/5min-6min,1193/1-2/1-2/2-3to5,1194/1 to 10,1195/1 to 10,1196/1 to 10,1197/1 to 5-6-7-8-9-10,1198/1 to 10, 1199/ 6 to 10, 1276/7-8 to 10,1277/1to3-4-7-8 to 10, 1278/1to3-4-7-8-9-10, 1279/ 1to3-4-7-8-to 10, 1280/1-2-3/1-3/2-4-7-8to10, 1281/1to3-4-8/1-9-10, 1282/1	17,67,909	6,65,581	The price of land approved on the basis of avarage sale price, D.C Rate 2025-26 and market price.	Considered while making assessment	32,90,43,750
Total: -		109	5	9						**32,90,43,750**
								15% Compulsory Charges		**4,93,56,563**
								GRAND TOTAL:		**37,84,00,313**

Signatures of Members of DPAC:

1 DISTRICT COLLECTOR/
CHAIRMAN
DISTRICT PRICE ASSESSMENT
COMMITTEE KHUSHAB

2 EXECUTIVE ENGINEER IRRIGATION,
CANAL DIVISION KHUSHAB

National Engineering Services Pak (Pvt) Limited
NESPAK

PUNJAB SMALL INDUSTRIES CORPORATION
SARGODHA REGION SARGODHA
Mela Mandi, Road Opposite Federal Public School
Ph No: 9230102 048-3724810

No.PSIC/SR/SIE-Q/276 Dated: 11-09-2025

The Director (EM),
PSIC, Head Office,
Lahore.

Subject: **ESTABLISHMENT OF SMALL INDUSTRIAL ESTATE/MINERAL PROCESSING ZONE IN SALT RANGE PUNJAB**

Ref: Letter No. 745-M/ADC(R)/DRA Dated: 10-09-2025

Please find enclosed herewith the Minutes of Meeting of District Price Assessment Committee (DPAC) Khushab regarding the subject purpose land Measuring 109 Acres, 05 Kanal and 09 Marla at Mauza Utra Janubi, Tehsil Quaidabad, District Khushab

It is conveyed by the Revenue Authorities of District Khushab that the estimated cost of the aforementioned land **Rs. 37,84,00,313/-** may be deposited into the Land Revenue Deposit under the LAC account to enable further proceedings in the matter.

This is submitted for your information and further necessary action, please.

Enclosure: **DA/AS Above.**

REGIONAL DIRECTOR

C.C.

1. The Director (PEN), PSIC, Head Office, Lahore.
2. The Additional Deputy Commissioner (Rev.), Khushab.
3. The Assistant Commissioner, Tehsil Quaidabad
4. P.S to Secretary Mines & Minerals, Lahore.
5. P.S to Managing Director, PSIC, Head Office, Lahore.
6. P.S to Deputy Managing Director PSIC, Head Office, Lahore.

EXTRA ORDINARY ISSUE REGISTERED No. L-7532

The Punjab Gazette

PUBLISHED BY AUTHORITY

LAHORE THURSDAY AUGUST 28, 2025

OFFICE OF THE DISTRICT COLLECTOR KHUSHAB

No. 918-M/DC/DRA Dated 28-08/2025

DE-NOTIFICATION

UNDER SECTION 4 OF THE LAND ACQUISITION ACT, 1894

The earlier Notification under section 4 of the Land Acquisition Act, 1894 vide No. 800-M-DC/DRA dated 28.07.2025 published in the Punjab Gazette on 31.07.2025 is hereby withdrawn due to review/reappraisal of the land by the acquiring agency for establishment of Small Industrial Estate / Mineral Zone in Salt Range-Punjab at Mouza Uttra Janubi Tehsil Quaidabad District Khushab.

SPECIFICATION OF LAND

District	Tehsil	Locality/Mouza	Khasra No./Square No.	Area	
				Kanal	Marla
Khushab	Quaidabad	Utra Januabi	1084/8	3	0
			1085/6-7	16	0
			1085/3	2	0
			1086/5-6	16	0
			1086/4-7	9	0
			1087/4-7	2	10

Price Rs. 10.00 Per Page

District	Tehsil	Locality/Mouza	Khasra No./ Square No.	Area	
Khushab	Quaidabad			Kanal	Marla
		Utra Januabi	1087/5-6	16	0
			1088/5	8	0
			1088/6	6	10
			1089/5-6	11	0
			1193/1-2-3-4-5	40	0
			1194/1-2-3-4-5-6-7-8-9-10	80	0
			1195/1-2-3-4-5-6-7-8-9-10	80	0
			1196/1-2-3-4-5-6-7-8-9-10,	80	0
			1197/1-2-3-4-5-6-7-8-9-10	80	0
			1198/1-2-3-4-5-6-7-8-9-10	80	0
			1199/6-7-8-9-10	40	0
			1276/4-7	10	16
			1276/8-9-10	24	0
			1277/1-2-3-8-9-10	48	0
			1277/4-7	9	10
			1278/1-2-3-8-9-10	48	0
			1278/4-7	9	15
			1279/1-2-3-8-9-10	48	0
			1279/4-7	9	7
			1280/1-2-3-8-9-10	48	0
			1280/4-7	9	0
			1281/1-2-3	24	0
			1281/8/1	2	14
			1281/9	7	7
			1282/1	6	0
Total (Acres – Kanals - Marlasss)			109 Acre	2 Kanal	9 Marla

LAND ACQUISITION COLLECTOR
ASSISTANT COMMISSIONER/
TEHSIL,QUAIDABAD

REGIONAL DIRECTOR
PSIC, REGIONAL OFFICE,
SARGODHA

DEPUTY COMMISSIONER/
DISTRICT COLLECTOR,
DISTRICT KHUSHAB

National Engineering Services Pak (Pvt) Limited

EXTRA ORDINARY ISSUE

REGISTERED No. L-7532

The Punjab Gazette

PUBLISHED BY AUTHORITY

LAHORE FRIDAY AUGUST 29, 2025

OFFICE OF THE DISTRICT COLLECTOR KHUSHAB

Notification Under The Section-4 Of Land Acquisition Act,1894

No. 919-M/DC/DRA Dated 28-08-/2025

WHEREAS, it appears to the District Collector Khushab that land measuring **109 Acres, 5 Kanals and 9 Marlas**, located in Tehsil Quaidabad District Khushab required for the establishment of Small Industrial Estate/ Mineral Processing Zone in salt range Punjab is likely to be acquired by the Punjab Small Industries Corporation (PSIC) at the expenses for the public purpose and in public interest and whereas it is expedient to carry out a detailed survey of the land proposed to be acquired.

2. The notification is made under the provision of Section-4 of Land Acquisition Act, 1894, to all whom it may concern.

3. In exercise of the powers conferred by the aforesaid section, the District Collector/ Deputy Commissioner, Khushab is pleased to authorize the officer for the time being engaged in undertaking, with the servants and workmen, to enter upon, survey the land in the locality and do all acts required or permitted by that section.

SPECIFICATION OF LAND

District	Tehsil	Locality/Mouza	Khasra No./ Square No.	Area	
				Kanal	Marla
Khushab	Quaidabad		1085/ 6-7	16	0
			1086 / 4min	5	0
			5-6	16	0
			7min	4	0
			1087/ 4min	2	0
			5	8	0
			6/1	3	8
			6/2	4	0
			7min	0	10
			1088/ 5	8	0
			6min	6	10
			1089/ 5min	6	0
			6min	5	0
			1090/ 5min	4	0
			6min	3	0
			1193/ 1	8	0
			2/1	4	0
			2/2	4	0
			3 to 5	24	0
			1194/ 1 to 10	80	0
			1195/ 1 to 10	80	0
			1196/ 1 to 10	80	0
			1197/ 1 to 5	40	0
			6	7	8
			7	7	8
			8	7	8
			9	7	8
			10	7	8
			1198/ 1 to 10	80	0
			1199/ 6 to 10	40	0
			1276/ 7	5	7
			8 to 10	24	0
			1277/ 1to3	24	0
			4	5	4
			7	4	13
			8 to 10	24	0
			1278/ 1to3	24	0
			4	5	2
			7	4	13
			8	7	8
			9	7	8
			10	7	8
			1279/ 1to3	24	0
			4	4	16
			7	4	11
			8 to 10	24	0

District	Tehsil	Locality/Mouza	Khasra No./ Square No.	Area	
				Kanal	Marla
Khushab	Quaidabad				
			1280/ 1-2	16	0
			3/1	6	0
			3/2	2	0
			4	4	13
			7	4	7
			8 to 10	24	0
			1281/ 1to3	24	0
			4	3	10
			8/1	2	14
			9	7	7
			10	8	0
			1282/ 1	6	0
Total (Acre – Kanal - Marla)			109-Acre	5-Kanal	9-Marla

LAND ACQUISITION COLLECTOR
ASSISTANT COMMISSIONER/
TEHSIL,QUAIDABAD

REGIONAL DIRECTOR
PSIC, REGIONAL OFFICE,
SARGODHA

DEPUTY COMMISSIONER/
DISTRICT COLLECTOR,
DISTRICT KHUSHAB

ANNEX-II

LAB REPORT

EPA CERTIFIED

EPA CERTIFIED

TEST REPORT OF GROUND WATER SAMPLE

Reference No. WELCOS/2025/DW/145-1 Date: 08 October, 2025

Project Name	Establishment of Small Industrial Estate Quida bad		
Address	Quida bad, District Khushab		
Sample Identification	Ground Water (Hand Pump - Near Mosque)		
Sample Collected/Provided	WELCOS Representative		
Coordinates:	Lat 32.288998° Long 71.889962°		
Sample Receiving date	02 October, 2025	**Analysis Start Date**	02 October, 2025
Analysis Completion Date	08 October, 2025	**Grab/Composite**	Grab
Environmental Conditions	**Temperature** 23-28 °C	**Humidity**	40-56% RH

Analysis Parameters

Sr.#	Parameters	Units	PEQS	Result	Test Method Used	Remarks
Field Analysis						
1.	pH @25°C	-	6.5-8.5	7.71	APHA 4500H⁺ B	Complies
Lab Analysis						
2.	**Color**	-	**Non-Objectionable**	**Objectionable**	**Sensory Method**	**Non-Complies**
3.	Odor	-	Non-Objectionable	Non-Objectionable	Sensory Method	Complies
4.	**Taste**	-	**Non-Objectionable**	**Objectionable**	**Sensory Method**	**Non-Complies**
5.	Turbidity	NTU	<5	4.4	APHA 2130 B	Complies
6.	**Hardness**	**mg/l**	**< 500**	**1140**	**APHA 2340 C**	**Non-Complies**
7.	**TDS**	**mg/l**	**< 1000**	**4466**	**APHA 2540 C**	**Non-Complies**
8.	Aluminum	mg/l	≤ 0.2	BDL	APHA-3113 B, APHA 3111 B	Complies
9.	Antimony	mg/l	≤ 0.005	BDL	APHA-3113 B, APHA 3111 B	Complies
10.	Barium	mg/l	0.7	BDL	APHA-3113 B, APHA 3111 B	Complies
11.	Boron	mg/l	0.3	BDL	APHA-3113 B, APHA 3111 B	Complies
12.	Cadmium	mg/l	0.01	BDL	APHA-3113 B, APHA 3111 B	Complies
13.	**Chloride**	**mg/l**	**< 250**	**1050**	**APHA 4500 Cl-B**	**Non-Complies**
14.	Chromium	mg/l	≤ 0.05	BDL	APHA-3113 B, APHA 3111 B	Complies
15.	Copper	mg/l	2	BDL	APHA-3113 B, APHA 3111 B	Complies
16.	Cyanide	mg/l	≤ 0.05	BDL	APHA-4500CN	Complies

No. 22610

Sr.#	Parameters	Units	PEQS	Result	Test Method Used	Remarks
17.	Fluoride	mg/l	≤ 1.5	0.47	APHA 4500 F D	Complies
18.	Lead	mg/l	≤ 0.05	BDL	APHA-3113 B, APHA 3111 B	Complies
19.	Manganese	mg/l	≤0.5	BDL	APHA-3113 B, APHA 3111 B	Complies
20.	Mercury	mg/l	≤ 0.001	BDL	APHA 3114 B	Complies
21.	Nickel	mg/l	≤ 0.02	BDL	APHA-3113 B, APHA 3111 B	Complies
22.	Nitrate (NO_3)	mg/l	≤50	0.83	APHA 4500 NO_3-B	Complies
23.	Nitrite (NO_2)	mg/l	≤ 3	BDL	APHA 4500 NO_2 B	Complies
24.	Selenium	mg/l	0.01	BDL	APHA 3114 B	Complies
25.	Chlorine	mg/l	0.5	BDL	APHA 4500 Cl B & G	Complies
26.	Arsenic	mg/l	≤ 0.05	0.026	APHA 3114 B	Complies
27.	Zinc	mg/l	5	BDL	APHA-3113 B, APHA 3111 B	Complies
28.	Pesticides	mg/l	-	ND	APHA 6619	-
29.	Phenolic Compounds as phenols	mg/l	-	BDL	APHA-5530-C & D USEPA method 420.1	-
30.	**Total Coliform**	**cuf/100ml**	**0**	**TNTC**	**APHA 9222 B**	**Non-Complies**
31.	Fecal Coliforms (*E. coli*)	cfu/100ml	0	0	APHA 9222 D	Complies

Abbreviations:

PEQS	Punjab Environmental Quality Standers	**TNTC**	Too numerous to count
NTU	Nephelometric Turbidity Unit	**APHA**	American Public Health Association
cfu	Colony Forming Unit	**ND**	Not Detected

Terms and Conditions:

- Analysis was conducted on the request of proponent for his own PEQs/WHO/NEQs compliance.
- This report should be produced as a whole and not in parts.
- The sample is retained for 15 days after the issuance date of report from the laboratory.
- There is no Retention time for Microbiological tested samples. In case of retesting requirement from client, sample will be collected again.
- The uncertainty of measurement will be submitted on customer's request, where available. The statement of conformity, if provided in report, is based on decision rule of sample acceptance or rejection.
- The test report cannot be used as evidence against any noncompliance SMR/Report issued by EPA official Laboratory.
- The validated sampling/monitoring of the tests report is for non-punitive actions such as baseline study EIA/IEE, self-monitoring, reporting, under conditions of EIA/IEE etc. While the report is not valid for any court case, EPO, compliance reporting for operational phase approvals, punitive actions such as Smog prevention & control Rules,2023, complaint cases etc.
- This responsibility of the ethical use of the results reported in this report lies with the client.
- Duly calibrated instruments were used for analysis.

Prepared By Reviewed By Approved By

Report End

PNAC ISO 17025 2017 ACCREDITED | EPA PUNJAB CERTIFIED | ISO 9001:2015 ISO 14001:2015 ISO 45001:2018

No. 22609

EPA CERTIFIED

EPA CERTIFIED

Test Report of Surface Water Sample

Reference No. WELCOS/2025/SW/145-2 Date: 08 October, 2025

Project Name	Establishment of Small Industrial Estate Quida bad				
Address	Quida bad, District Khushab				
Sample Identification	Surface water (Dhoda Wahan Drain)				
Sample Collected/Provided	WELCOS Representative				
Coordinates:	Lat 32.326864° Long 71.887705°				
Sample Received Date	02 October, 2025	**Analysis Start Date**	02 October, 2025		
Analysis Completion Date	08 October, 2025	**Grab/Composite**	Composite		
Lab Environmental Conditions	**Temperature**	23 - 28°C	**Humidity**	40-56% RH	

Analysis Parameters

Sr.#	Parameters	Units	PEQS	Result	Test Method Used	Remarks
Field Analysis						
1.	pH @25°C	-	6.5-8.5	8.15	APHA 4500 H^+ B	Complies
2.	Temperature	°C	N.S	30	APHA-2550	-
Lab Analysis						
3.	BOD_5	mg/l	NGVS	61	APHA-5210	-
4.	COD	mg/l	NGVS	133	APHA-5220	-
5.	**TDS**	**mg/l**	**< 1000**	**2739**	**APHA 2540 C**	**Non-Complies**
6.	TSS	mg/l	NGVS	47	APHA 2540 D	-
7.	Oil and grease	mg/l	10	3.6	APHA-5520-B	Complies
8.	**Color**	**TCU**	**Non-Obj.**	**213**	**Sensory Method**	**Non-Complies**
9.	Phenolic Compounds (as Phenol)	mg/l	0.1	BDL	APHA-5530-C & D USEPA method 420.1	Complies
10.	Cyanide (as CN^-) total	mg/l	1.0	BDL	APHA-4500-CN B & E	Complies
11.	**Chloride**	**mg/l**	**< 250**	**750**	**APHA 4500 Cl^- B**	**Non-Complies**
12.	Fluoride	mg/l	10	1.90	APHA 4500 F D	Complies
13.	Anionic Detergents	mg/l	20	1.2	APHA-5540-C	Complies
14.	**Sulphate (SO_4^{2-})**	**mg/l**	**600**	**680**	**APHA-4500 SO_4^{2-} E**	**Non-Complies**
15.	Sulfide (S^{2-})	mg/l	1.0	0.4	APHA-4500 S^{2-} F	Complies
16.	Ammonia (NH_3)	mg/l	40	2.4	APHA-4500 NH_3-B&C	Complies
17.	Cadmium	mg/l	0.01	BDL	APHA-3113 B, APHA 3111 B	Complies
18.	Chromium	mg/l	≤ 0.05	0.11	APHA-3113 B, APHA 3111 B	Complies
19.	Copper	mg/l	2	BDL	APHA-3113 B, APHA 3111 B	Complies
20.	Lead	mg/l	≤ 0.05	BDL	APHA-3113 B,	Complies

No. 22608

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Sr.#	Parameters	Units	PEQS	Result	Test Method Used	Remarks
					APHA 3111 B	
21.	Nickel	mg/l	≤ 0.02	BDL	APHA-3113 B, APHA 3111 B	Complies
22.	Zinc	mg/l	5	BDL	APHA-3113 B, APHA 3111 B	Complies
23.	Iron	mg/l	NGVS	0.24	APHA 3500 Fe B, APHA 3111 B	-
24.	Manganese	mg/l	≤0.5	0.08	APHA-3113 B, APHA 3111 B	Complies
25.	Selenium	mg/l	0.01	BDL	APHA 3114 B	Complies
26.	Silver	mg/l	NGVS	BDL	APHA-3113 B, APHA 3111 B	Complies
27.	Arsenic	mg/l	≤ 0.05	0.038	APHA 3114 B	Complies
28.	Barium	mg/l	0.7	BDL	APHA-3113 B, APHA 3111 B	Complies
29.	Boron	mg/l	0.3	BDL	APHA-3113 B, APHA 3111 B	Complies
30.	Mercury	mg/l	≤ 0.001	BDL	APHA 3114 B	Complies
31.	Chlorine	mg/l	1.0	BDL	APHA 4500 Cl B & G	Complies
32.	Pesticides	mg/l	NGVS	ND	APHA 6619	-
33.	Total Toxic metals	mg/l	2.0	0.228	Calculation	Complies
34.	**Total Coliform**	**cfu/100ml**	**NGVS**	**TNTC**	**APHA 9222 B**	-
35.	**Fecal Coliforms (*E. coli*)**	**cfu/100ml**	**NGVS**	**TNTC**	**APHA 9222 D**	-

Abbreviations:

PEQS	Punjab Environmental Quality Standards	**BDL**	Below Detectable Limit
APHA	American Public Health Association	**NGVS**	No Guide line Value set
TNTC	Too numerous to count	**cfu**	Colony Forming Unit
ND	Not Detected		

Terms and Conditions:

- Analysis was conducted on the request of proponent for his own PEQs/WHO/NEQs compliance.
- This report should be produced as a whole and not in parts.
- The sample is retained for 15 days after the issuance date of report from the laboratory.
- There is no Retention time for Microbiological tested samples. In case of retesting requirement from client, sample will be collected again.
- The uncertainty of measurement will be submitted on customer's request, where available. The statement of conformity, if provided in report, is based on decision rule of sample acceptance or rejection.
- The test report cannot be used as evidence against any noncompliance SMR/Report issued by EPA official Laboratory.
- The validated sampling/monitoring of the tests report is for non-punitive actions such as baseline study EIA/IEE, self-monitoring, reporting, under conditions of EIA/IEE etc. While the report is not valid for any court case, EPO, compliance reporting for operational phase approvals, punitive actions such as Smog prevention & control Rules,2023, complaint cases, etc.
- This responsibility of the ethical use of the results reported in this report lies with the client.
- Duly calibrated instruments were used for analysis.

WATER, ENVIRONMENT LABORATORIES & CONSULTANCY SERVICES WITH QUALITY (WELCOS)

Prepared By

Reviewed By

Approved By

National Engineering Services Pak (Pvt) Limited

PNAC ISO 17025 2017 ACCREDITED | EPA PUNJAB CERTIFIED | ISO 9001:2015 ISO 14001:2015 ISO 45001:2018 | IAF | UKAS

No. 22607

EPA CERTIFIED

EPA CERTIFIED

NOISE LEVEL MONITORING REPORT

Reference No. WELCOS/2025/NL/145-1 **Date:** 08 October, 2025

Project Name: Establishment of Small Industrial Estate Quida bad
Address: Quida bad, District Khushab
Monitoring Nature: Noise
Monitoring Point: Center of Site **Coordinates:** Lat 32.290083° Long 71.883498°
Monitoring Interval: 24 Hour
Intervention Date: 01 October, 2025
Completion Date: 02 October, 2025

Day			
Sr.	Time	Noise dB	NEQS
1.	07:00	52.2	Day 75 dB
2.	08:00	52.3	
3.	09:00	52.5	
4.	10:00	52.7	
5.	11:00	53.1	
6.	12:00	53.3	
7.	13:00	54.9	
8.	14:00	51.3	
9.	15:00	46.5	
10.	16:00	49.9	
11.	17:00	52.1	
12.	18:00	50.8	
13.	19:00	49.9	
14.	20:00	49.9	
15.	21:00	50.2	
Average:		**51.4 dB (A)**	
Night			
16.	22:00	49.7	Night 65 dB
17.	23:00	48.7	
18.	00:00	47.1	
19.	01:00	46.5	
20.	02:00	47.7	
21.	03:00	48.3	
22.	04:00	49.9	
23.	05:00	50.9	
24.	06:00	51.9	
Average:		**48.97 dB (A)**	

Prepared By Reviewed By Approved By

----------Report End----------

No. 22606

EPA CERTIFIED

EPA CERTIFIED

AMBIENT AIR QUALITY TEST REPORT

Reference No. WELCOS /2025/AA/145 Date: 08 October, 2025

Client Name: Establishment of Small Industrial Estate Quida bad
Address: Quida bad, District Khushab
Monitoring Nature: Ambient air
Monitoring Point: Center of Site **Coordinates:** Lat 32.290083° Long 71.883498°
Monitoring Date 1 October, 2025 to 2 October, 2025
Monitoring By: WELCOS Representative

Monitoring Parameters

Sr. No.	Parameters	Method	PEQS Limits		Results	Remarks
			Time-weighted Average	Concentration in Ambient Air (24 Hour)		
1	Sulphur Dioxide (SO_2)	UV Fluorescence/HORIBA APSA 370	24 Hours	120 µg/ m^3	88 µg/ m^3	Complies
2	Oxides Of Nitrogen as (NO)	Chemiluminescence HORIBA APNA 370	24 Hours	40 µg/ m^3	12 µg/m^3	Complies
3	Oxides Of Nitrogen as (NO_2)	Chemiluminescence HORIBA APNA 370	24 Hours	80 µg/ m^3	42 µg/m^3	Complies
4	Ozone (O_3)	UV Absorption Ozone monitor BMT 930	1 Hour	130 µg/ m^3	77 µg/m^3	Complies
5	*Suspended Particulate Matter (SPM)	USEPA Method HVS	24 Hours	500 µg/ m^3	227 µg/m^3	Complies
6	Respirable Particulate Matter PM_{10}	BAM	24 Hours	150 µg/ m^3	122 µg/m^3	Complies
7	Respirable Particulate Matter $PM_{2.5}$	BAM	24 Hours	35 µg/m^3	29 µg/m^3	Complies
8	Carbon Monoxide (CO)	NDIR	8 Hours	5 mg/m^3	2.9 mg/m^3	Complies

Abbreviations:
PEQS: Punjab Environmental Quality Standards *EPA non-certified

Terms and Conditions:

- Monitoring was conducted on the request of proponent for his own PEQs/NEQs compliance.
- This report should be produced as a whole and not in parts.
- The test report cannot be used as evidence against any noncompliance SMR/Report issued by EPA official Laboratory.
- The validated sampling/monitoring of the tests report is for non-punitive actions such as baseline study EIA/IEE, self-monitoring, reporting, under conditions of EIA/IEE etc. While the report is not valid for any court case, EPO, compliance reporting for operational phase approvals, punitive actions such as Smog prevention & control Rules 2023, complaint cases, etc.
- This responsibility of the ethical use of the results reported in this report lies with the client.
- Duly calibrated instruments were used for monitoring.

Prepared By Reviewed By Approved By

----------Report End----------

WATER ENVIRONMENT LABORATORIES & CONSULTANCY SERVICES (WELCOS) SERVICES WITH QUALITY

No. 22605

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AMBIENT AIR QUALITY MONITORING

Reference No. WELCOS/2025/AA/145-1 **Date:** 08 October, 2025

Client Name: Establishment of Small Industrial Estate Quida bad

Address: Quida bad, District Khushab

Monitoring Point: Center of Site **Monitoring Nature:** Ambient Air

Monitoring Interval: 24 Hours **Coordinates:** Lat 32.290083° Long 71.883498°

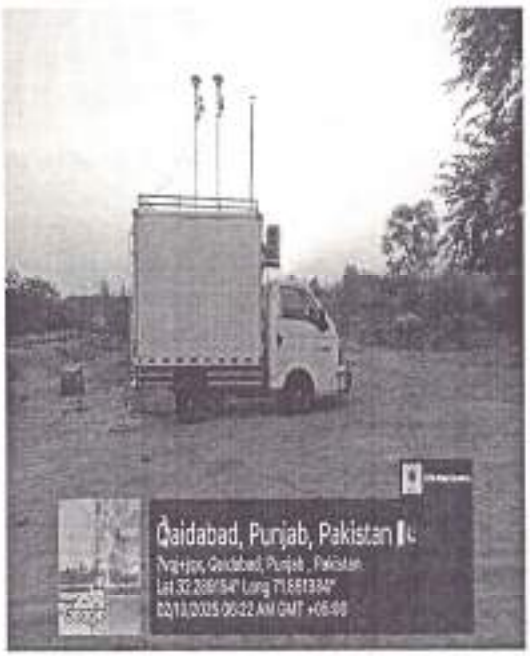
Intervention Date: 1 October,2025 **Completion Date:** 2 October, 2025

Sr.	Time	CO (mg/m^3)	SO_2 ($\mu g/m^3$)	NO ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	SPM ($\mu g/m^3$)	O_3 ($\mu g/m^3$)
1.	12:00	2	94	10	48	130	35	217	
2.	13:00	2.1	95	15	45	137	37	299	
3.	14:00	3.2	97	10	43	136	36	309	
4.	15:00	3.3	96	17	44	138	36	324	
5.	16:00	3.4	98	18	42	140	35	292	
6.	17:00	3.5	93	16	40	142	31	280	
7.	18:00	2.9	80	09	43	140	26	272	
8.	19:00	3.1	85	08	52	125	26	248	
9.	20:00		89	09	52	120	26	242	
10.	21:00		84	12	54	110	27	199	
11.	22:00		86	08	42	110	25	220	
12.	23:00		85	06	41	109	26	210	
13.	00:00		83	05	38	111	20	200	
14.	01:00		80	10	49	113	22	199	77
15.	02:00		79	11	42	110	21	193	
16.	03:00		82	13	30	100	23	195	
17.	04:00		85	12	35	96	24	197	
18.	05:00		88	15	34	104	26	190	
19.	06:00		89	14	36	111	28	195	
20.	07:00		90	16	37	115	30	180	
21.	08:00		92	15	37	119	32	190	
22.	09:00		89	14	38	135	34	190	
23.	10:00		91	13	40	139	36	201	
24.	11:00		90	12	45	137	33	200	
Average:		**2.9**	**88**	**12**	**42**	**122**	**29**	**227**	**77**

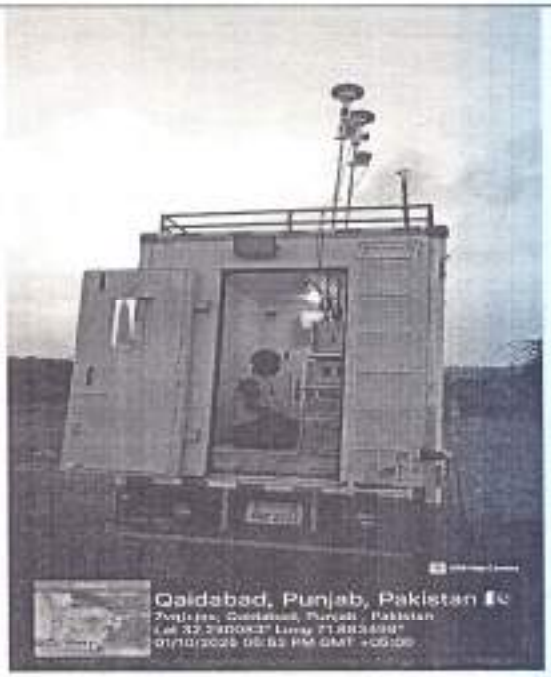
Prepared By Reviewed By Approved By

----------Report End----------

No. 22604



Ambient Air Monitoring



Ambient Air Monitoring

Noise Level Monitoring

Noise Level Monitoring

Waste Water Sampling

Waste Water Sampling

Ground Water Sampling

Ground Water Sampling

ANNEX-III

SOCIOECONOMIC SURVEY TOOL

PUNJAB SMALL INDUSTRIES CORPORATION (PSIC)

ESTABLISHMENT OF SMALL INDUSTRIAL ESTATE QUAIDABAD

Name _____ Date _____

Tehsil _____ District _____

1 Name _____ Contact _____ Age _____

2 Gender Male ☐ Female ☐

3 Marital Status Married ☐ Unmarried ☐

4 Caste _____ Mother Language _____ Relegion _____

5 Qualification

Illetrate ☐ Primary ☐ Middle ☐ Matric ☐

Intermediate ☐ Graduation ☐ Above ☐

6 Profession _____

7 Source of income? _____

8 Average monthly income (PKR)? _____

<15,000 ☐ 15,001-25,000 ☐ 25,0001-35,000 ☐

35,0001-50,000 ☐ >50,000 ☐

9 Average monthly savings (PKR)?

10 Type of family system? Joint ☐ Nuclear ☐

11 No. of family members? _____

12 Ownership status of house? Owned ☐ Rented ☐ Squatters ☐

13 Type of construction of house? Katcha ☐ Pacca ☐ Semi-pacca ☐

14 Available facilities?

Electricity ☐ Sui Gas ☐ Sewerage ☐ Water Supply ☐

Telephone ☐ Solid Waste ☐ Roads ☐ Public Transport ☐

Rescue ☐ Health ☐ School ☐ College ☐

Madrassa ☐ Graveyard ☐ Mosque ☐

15 Source of water in locality?

Piped Netwrok ☐ Hand pump ☐ Borehole ☐ Tube well ☐ Others ☐

16 Source of drinking water?

Filtration plant ☐ Hand pumps ☐ Boreholes ☐ Commercial vendors ☐

Water supply ☐ Others ☐

17 Type of sewerage system?

Piped network ☐ Open drains ☐ In fields/ Plots ☐ Sokage Pits ☐

National Engineering Services Pak (Pvt) Limited

18 Type of solid waste management system?

Door-to-door collection ☐ Community bin system ☐ Open dumping ☐

19 Major diseases?

Hepatitis ☐ Malaria ☐ Kidney ☐ Diabetes ☐

Hypertension ☐ Gastrointestinal ☐ Others ☐

20 Health facility visited? _____ Distance

21 Health expenditure? _____

22 Landholding House ☐ Agriculture ☐ Commercial ☐

23 Major crops

Wheat ☐ Cotton ☐ Sugarcane ☐ Fodder ☐ Vegetable ☐

Maize ☐ Fruits ☐ Others ☐

24 Soruce of water for irrigation?

Rainfall ☐ Canal ☐ Tube well ☐ Wastewater ☐

25 Any NGO/CBO working in the area? Yes ☐ No ☐

If yes, Name Scope

26 Willingness for project implementation? Yes ☐ No ☐

Pressing needs? _____

_____

Signature of interviewer

National Engineering Services Pak (Pvt) Limited

ANNEX-IV

EMERGENCY RESPONSE PLAN

EMERGENCY RESPONSE PLAN

1. Introduction

Emergency management can be defined as the organization, coordination and implementation of a range of measures to prevent, mitigate, respond to, overcome and recover from the consequences of emergency events affecting the community, its assets and the environment.

2. Purpose of Plan

This plan intends to provide a framework for safety and security to infrastructure, people and vehicles. It assigns responsibility to organizations and individuals for carrying out specific actions at projected times and places in an emergency situation that exceeds the capability or routine responsibility of any one agency.

The emergency response plan provides guidance to;

- Prevent any potential sources causing hazard to the resources during all stages of the project;
- Coordinate between various organizations to take actions in case of emergencies;
- Protect people and property in emergencies and disasters;
- Develop procedures to respond to the emergencies efficiently;
- Identify and ensure availability of personnel, equipment, facilities, supplies, and other resources for use in order to provide timely and efficient response and recovery operations; and
- Confirm that measures taken in an incident are adequate to recover the affected resources or further improvements are needed.

3. Planning

i. <u>Emergency Response Team</u>

A group/ team shall be dedicated to identify and control potential emergencies during the construction and operation of the project. The roles and responsibilities of the group members shall be clearly defined.

The primary responsibilities of the group are described below:

- Identify the potential hazard or risk sources that can lead to emergency situations; Ensure availability of adequate resources, procedures and communication system to deal with the identified emergency situations;
- Ensure awareness and training of the staff to facilitate implementation of the emergency response plan;
- Maintaining the records of any previous incidents; and
- Post-event analysis to bridge the gaps of the existing risk prevention procedures.

The emergency response team shall include but not limited to the following;

A. Site Incharge

- Approve/ modify devised measures to prevent or mitigate the risks associated with the identified risk sources;
- Arrange resources for dealing with potential emergencies including, financial, equipment and personnel required to deal with emergencies;
- Assure that the Emergency Response Plan is adequate, effective and implementable.

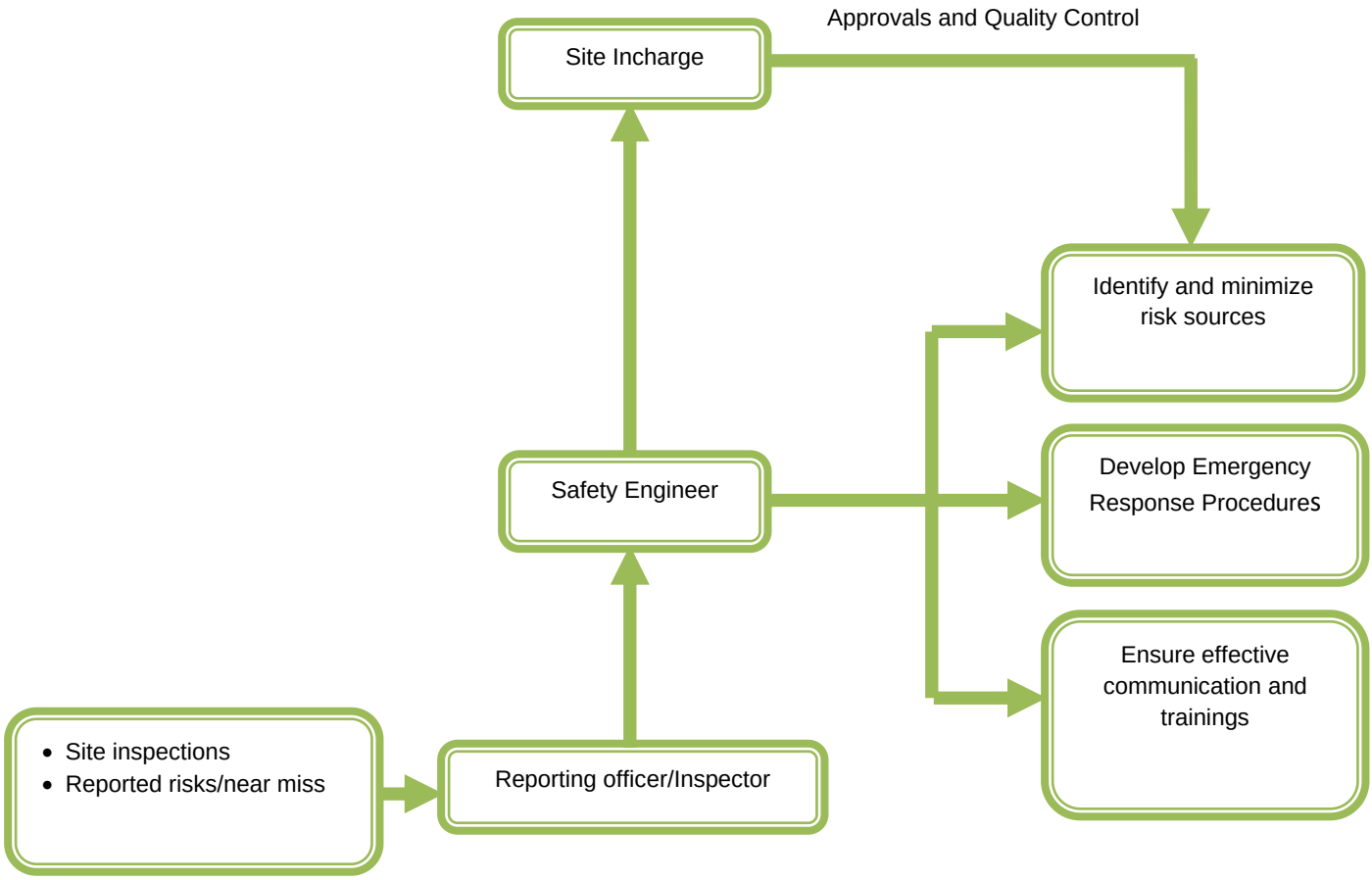
B. Safety Engineer

- Analyze the Identified risk sources and devise measures to prevent or mitigate the risks in close consultation with the Team Leader;
- Develop and implement the Emergency Response Procedures, in case of the possible emergencies arise;
- Ensure effective internal and external communication; and
- Provide regular trainings and arrange drills to make people aware of dealing with emergencies.

C. Reporting officer/Inspector

- Regular inspections of the site, to identify potential risks associated with equipment, materials and work practices;
- Anybody from the site can notify the reporting officer about potential risk and/ or near-misses on the site;
- Record any identified risks and mitigation measures to control the identified risk; and
- Notify the issue and control measures taken thereby to the safety engineer.

The designation, roles and responsibilities of each member shall be clearly defined and communicated to the employees. An outline of the framework of responsibilities is presented in the following organizational chart:



ii. Hazard Identification

A comprehensive identification and evaluation of the hazards/ risks likely to cause an emergency shall be done by Emergency Response Team (ERT). Major potential emergencies identified in projects are as follows:

- Fire
- Earthquake
- Terrorism (including bombing)
- Disease Outbreak
- Structural failure
- Disruption of Utilities (Power, Water, Telecommunications, Gas, etc.)
- Accidents (falls, slips, electric shocks etc.)
- Vehicular accident
- Failure of trenches
- Power/ equipment failure
- Vandalism

iii. Prevention and Mitigation

The ERT shall work to eliminate or reduce the impact of identified emergencies and increasing the resilience of an affected community to recover from the consequences of such events. These activities include:

- Design considerations to control flooding, earthquakes and adequate lightening for fog etc.;
- Regular inspection and maintenance of construction machinery and the structural integrity;
- Review of work schedules based on weather updates; and
- Security controls based on political situations.

4. Emergency Preparedness

The ERT shall be prepared with all necessary resources and the personnel shall be trained regularly.

i. Resources

Finance and administration

The financial resources shall be reserved for dealing with any emergencies arising on site during construction. Responsibilities of the person managing the resources in case of emergencies shall be clearly defined and the required resources shall be adequate and updated regularly.

Equipment

All the necessary equipment needed in an event of emergencies shall be made available, as a minimum, the equipment needed include;

- Personal Protective Equipment
- Alarms/ Warnings
- Fire extinguishers
- Crowd control, flashlights, signs, barricades
- First Aid Facility
- Detection instruments, e.g., personal alarm kits; smoke detection instruments
- Tools to fix minor vandalism

Communication

All external and internal communication systems shall be made available. Local emergency numbers shall be clearly posted and communicated to the personnel involved in construction.

The local emergency numbers are given below, which shall be regularly updated.

Emergency Numbers

	Service	Kot Momin
1	Edhi Ambulance	115
2	Emergency Police	15
3	Quaidabad Police Station	0454-770915
4	Rescue Service	1122
5	THQ Hospital Quaidabad	0300-6048597

Trainings

Personnel shall be made aware of the importance of safety, potential emergencies and how to respond in case of emergencies. One day training and mock exercise shall be done to prepare, the personnel to deal with emergencies.

5. Emergency Response

Response includes actions taken to reduce the impacts of an emergency event, and to limit the threat to life, property and the environment.

The emergencies can be dealt with:

- On-site Management of the situation
- Off-site coordination to arrange necessary resources to support the on-site management
- Providing advice and reports of the situation to stakeholders

i. Emergency Response Procedure:

Any person can report about an emergency, an on-site worker, an outside agency, or the public. Circumstances change during the course of an emergency in different events; thus, the procedure will vary as per the specific situation on ground. However, a basic action plan to be followed in an emergency is discussed below. This order of response is applicable to almost any emergency and should be followed in sequence.

Assess the situation:

The most important thing to do in case of emergency is to stay calm and avoid panic. Assess the situation, the cause and most immediate requirement to control, limit and/ or manage the immediate, ongoing, or further damage.

Immediate control:

The most senior person on the scene should take control and contact, or delegate someone to contact emergency services as posted and communicated by ERT and inform the reporting

officer of ERT and explain the situation. The area of emergency shall be restricted by barricades, tapes and adequate signage, if and as required.

Protection from further losses:

- Once the site is restricted, to provide protection and reduce further losses, the source causing the emergency shall be controlled including equipment, materials, environment and accident scene from continuing damage or further hazards to the area and people. e.g.: suppress fire, prevent objects from falling, shut down equipment or utilities, and take other necessary measures as required depending upon the type of emergency
- Provide first aid if required or in doing so.
- Designate people to emergency duties. e.g.: assign personnel to guide emergency services on arrival.
- Headcount People/ personnel to identify any missing persons.
- People/ personnel shall be directed to safe location.
- Arrange diversions for the traffic to reduce disturbance to the flow of traffic, if and as far as possible.
- Preserve the accident scene until experts mark it safe; only disturb what is essential to maintain life or relieve human suffering and prevent immediate or further losses.

ii. Communication:

Emergency service providers:

The emergency service providers' needs to be kept informed of the situation. On site, personnel from the emergency services shall be guided towards the emergency scene, brief about the event, ongoing and potential hazards and cause(s), if known.

Emergency Response Team and Management:

Members of ERT shall be immediately informed and the management shall also be kept informed.

Public:

Timely notifications to public shall be disseminated through electronic and print media depending upon the requirement and urgency of the emergency so that they can adopt alternate routes and avoid the hazards associated with the emergency encountered.

Utilities:

In case of disruption of utilities, the utility control authorities shall be immediately contacted to control the situation.

6. Recovery:

Emergency affected individuals, communities and infrastructure shall be restored in terms of emotional, economic, and physical wellbeing including the following as a minimum:

- A detailed analysis and assessment of causes of emergency, extent of damage and gaps if any, in managing the emergency;
- Recovery/ replacement of the assets and infrastructure;
- Reinstatement of disrupted services;
- Updating of safety arrangements and Emergency response procedures to ensure better safety and security in any other arising emergencies.

ANNEX-V

RESOURCE CONSERVATION PLAN

RESOURCE CONSERVATION PLAN

1. Introduction:

The resources in this world are not infinite. We are completely dependent on the resources of the earth to fulfill all our day-to-day requirements. Sustainable development calls for the need to conserve resources, especially the non-renewable resources.

2. Objective of the plan:

The Resource Conservation Plan is intended to make an effort towards achieving sustainable development. The objective of the resource conservation plan is to:

- Minimize the use of natural resources; and
- Mitigate/ prevent pollution contaminating the natural resources.

3. Planning:

Careful estimations of quantities of material, fuel, water and energy required directly or indirectly shall be done to avoid excessive or unnecessary wastage of these materials. In addition to this, pollution prevention strategies shall also be devised to prevent contamination of resources.

The estimations include the following:

1. Estimation of construction material required for the project
2. Estimation of fuel consumption for construction machinery, construction vehicles and generators etc.
3. Estimations of the energy requirements during all the stages of the project
4. Estimations of water consumption for construction activities and construction camp sites.

The pollution prevention strategies include the following

1. Strategies shall be planned to reduce loads on the identified resources to be consumed;
2. Best management practices shall be devised to control or reduce pollution resulting from the activities during different stages of the project; and
3. An inspector shall be assigned responsibility to oversee the ongoing activities to check the compliance of the planned strategies.

4. Execution of the plan:

The planned strategies shall be implemented to conserve the natural resources including but not limited to the following:

A. Material

- Material supplied shall be in conformance with the estimated quantities and excess material shall be returned to the supplier;
- Material wastage shall be avoided by using best management practices;
- Waste produced during the project execution shall be disposed of safely to the designated disposal sites through approved contractors; and
- Reuse of the materials shall be appreciated.

B. Fuel/Energy

- Reduce trips and optimize routes to and from the construction site for all kinds of activities;
- Regular maintenance of equipment and vehicles to avoid leaks and sustain efficient fuel consumption;
- Switch off/plug off idle equipment and vehicles to avoid wastage of fuel;
- Minimize warm up time, unnecessary acceleration and deceleration of the construction equipment and vehicles;
- Avoid unnecessary burning of fuel for cooking in construction camps;
- Avoid unnecessary heating/cooling systems during extreme weathers;
- Construction shall start in early hours of the day to avoid heat in summers and utilization of day light; and
- Alternate energy sources shall be considered for electricity generations during construction to conserve fossil fuel as it is nonrenewable resource.

C. Water

- Avoid using potable water for sprinkling, curing and washing of equipment/ vehicles. Surface water or treated effluent can be used instead;
- Wastage of water should be controlled through providing proper valves and through controlling pressure of the water;
- Unnecessary equipment washings should be avoided;
- Awareness amongst workers shall be raised to conserve water and immediately report for any leaks detected; and

D. Pollution:

- Emissions shall be reduced/controlled as far as possible and direct discharges to air shall be avoided by strictly adhering to the mitigation measures outlined in ESMP report;
- Waste water shall not be discharged directly into the water body and must be managed as per the recommendations presented in ESMP; and
- Construction & demolition waste and municipal solid waste shall not be dumped/ burnt openly and shall be handled according to the preventative measure given in ESMP study.

5. Checking and Corrective Actions

The proponent shall bind the construction contractor through contract agreement to comply the strategies outlined in Resources Conservation Plan. The proponent shall also appoint an Inspector who shall monitor the daily onsite activities and shall report any issues/ concerns raised in relation to Resource Conservation Plan. The inspector shall recommend adequate corrective actions to mitigate the issues raised.

ANNEX-VI
HEALTH & SAFETY MANAGEMENT PLAN
(HSMP)

HEALTH & SAFETY MANAGEMENT PLAN (HSMP)

1.0 Introduction

This health and safety management plan has been prepared to identify and outline the manner in which construction site health and safety aspects will be managed to ensure the safe and efficient performance of the construction phase activities and to minimize adverse effects on the existing community and workers arising from construction activities.

This plan is designed to identify, evaluate, and control health and safety hazards for the purpose of protecting employees. The plan provides for emergency response activities at the job site as well as covering site hazard analysis, training requirements, engineering controls, materials handling, and safe construction operations. This plan is intended to provide guidance and information in dealing with the hazards that may be faced on the construction site by the contractor and its workers.

The consultant as a third-party validator will monitor the compliance of the plan by the contractor and its workers on each construction site.

The purpose of this plan is to illustrate safety issues specific to the Punjab Small Industries Corporation (PSIC). This plan is intended to maintain a safe work environment and effectively reduce the number of accidents resulting in personal injury, property damage, and damage to construction equipment.

2.0 Scope of Project

2.1 Scope of Work

In Quaidabad city, local industry is scattered, and to streamline the industry, a small industrial estate is needed in the area to create an enabling business environment for the business sector to grow and prosper to achieve the government's objectives of employment generation and establishing a linkage between small industries and household/cottage industry, resulting in poverty alleviation. Punjab Small Industries Corporation (PSIC) intends to establish a Small Industries Estate (SIE) at Quaidabad on a land measuring 133.67 Acres through Annual Development Plan (ADP) with all facilities for local industrialists. As per its charter, PSIC envisages the promotion & development of Small Industries in the province. In this regard, PSIC has developed 23 Small Industries Estates across the Punjab.

Quaidabad Small Industries Estate (QSIE) is in need of time to create a better quality of life for the citizens of Punjab by encouraging the private sector to invest in QSIE by providing necessary infrastructure facilities for economic uplift. The project will be promoting exports of value-added manufactured items from different sectors.

2.2 Site Location

The QSIE is located in the South of Quaidabad City on Noorpur Road. The site is bounded by Noorpur Road in the east, a nullah stormwater drain in the north, and Piplan Road in the south.

3.0 Health and Safety Responsibilities

The effectiveness and success of the safety plan implementation depend upon the active participation and cooperation of all employees. The duties and responsibilities of all employees under this policy are the following:

3.1 Project Engineer

- Prepare the Site-Specific Safety Plan.
- Direct and coordinate health and safety regulations related to the construction site.
- Participate in post-accident investigations.
- Assist in formulating policy matters.
- Implement contractor Safety Program and Policy

3.2 Foremen/Supervisors

- Be familiar with, explain, and enforce health and safety plan under his jurisdiction.
- Direct and coordinate health and safety activities within the area or responsibility
- Ensure safety devices and proper PPE are used by employees under supervision.
- Instruct and train all employees within the area of responsibility in job health and safety requirements, including (but, not limited to) hazard recognition and avoidance. Also, foreman/front-line supervisors must require compliance by employees with the established safety rules.
- Direct the correction of unsafe conditions.
- Ensure safety equipment is available, maintained, used, and stored correctly.
- Ensure injuries are treated promptly and reported properly.
- Participate in post-accident investigations.
- Coordinate daily job site inspection.
- Implement health and safety plan at each site as per required.

3.3 Construction Workers

The main responsibility of every worker at the construction site will be to follow the health and safety instructions and procedures.

- Be familiar with and comply with proper health and safety practices.
- Use the required safety devices and proper PPE.
- Notify the supervisor immediately of unsafe conditions/- acts, accidents, and injuries.

- Implement the health and safety plan

3.4 Subcontractors

By the contract, the subcontractors will have to comply with and ensure the compliance of their employees with the provisions of health and safety policy as well as their own safety program. Failure to fulfill this requirement is a failure to meet the conditions of the subcontract.

3.5 Supervision Consultant (SC)

SC will validate the effective implementation of the health and safety plan at the site. PSIC will be overall responsible for the safe construction work at each site.

4.0 General Health and Safety Procedures

4.1 Personal Protective Equipment (PPE)

The contractor provides Personal Protective Equipment (PPE) to all employees. Hard hats, safety glasses, and safety work boots are required to be worn at all times when on the job site. Reflective vests are required when working outside around equipment or traffic. Exceptions may be made to this PPE requirement only under an approved contractor work plan. Employees learn where to get PPE during their new-hire orientation and are responsible for wearing and maintaining the required PPE. Additional PPE may be required depending on the task and if there is a potential for exposure to hazardous conditions. PPE requirements are reviewed by the foreman. Employees are expected to use reasonable judgment regarding whether additional PPE (beyond the required) is necessary for certain tasks. If employees are unsure of the type of PPE required for a specific task or job, they should ask the supervisor.

4.2 Equipment Use and Operation

Equipment is used only for its intended use and as recommended by the manufacturer. Using equipment for purposes other than what it is designed for is prohibited. Employees are prohibited from operating a vehicle in a reckless manner or at a speed greater than is reasonable and proper, with due regard for weather, traffic, the character of roadway, load, type of vehicle, and any other conditions which may affect the safe operation of the vehicle. The vehicle must be kept under control at all times and special care is exercised when transporting personnel.

Employees may only ride equipment if there are seats or equal protection available for each person. Seatbelts are worn at all times while operating equipment with seats. No cell phone or earbud is used while operating equipment.

4.3 Repair

Employees are prohibited from making repairs, alterations, or attachments to equipment in the field except with the permission of the superintendent, foreman, or equipment mechanic. Only qualified personnel will perform repairs on equipment. Such repairs, alterations, or attachments are documented on the appropriate shop forms.

Employees are prohibited from removing a guard, safety device, or appliance from equipment or machinery except to make repairs. While making repairs, employees use appropriate lockout/tag-out procedures. When repairs are complete, the guard, safety device, or appliance is replaced immediately.

4.4 Conduct

The following conduct is prohibited and may result in discipline up to and including termination:

- Horseplay and scuffling on the job.
- Making a false report or misrepresentation.
- Fighting.
- Use of alcohol or any other drugs
- -Dishonesty and theft of the property.
- Deliberate misuse of the equipment.
- Unnecessary risk-taking.
- Violating or disobeying any instruction given by a supervisor

5.0 General Jobsite Procedures

5.1 New Hire Orientation

New-hire orientation may consist of, but is not limited to, the following:

- Have the employee read the health and safety plan and other safety requirements, guidelines etc. Answer any questions the new hire may have about these policies and request a signature on the Statement of Understanding.
- Orient the employee to the job site indicating the location of the emergency facilities, portable fire extinguishers, first-aid station, emergency phone numbers, public notices, and any job site-specific information.
- Explain the injury and accident policy.
- Review the written hazard communication program. Discuss hazards, container labeling, and the use of protective equipment.
- Explain the emergency response plan for catastrophic events such as fire, explosion, etc.
- Issue PPE as required for the job

5.2 Training

Training and education are necessary for the success of this policy. Employees are trained to recognize job site hazards and the procedures to follow to minimize these hazards. Training may consist of (but is not limited to) the following:

- Weekly job site safety meetings.
- Orientation training for new hires.
- Individual job/task training, including the applicable regulations/standards for the specific job/task.
- Supervisors and management receive ongoing safety training throughout the year.

5.3 Safety Meetings

Weekly safety meetings are held on the job site. All employees and subcontractors are required to attend. The meetings may cover a range of safety-related topics. The format and content of the meetings are up to the discretion of the superintendent. Monthly safety meetings are held for all foremen, superintendents, project managers, project engineers, contractors, and other management personnel. These meetings are for the purpose of discussing companywide safety issues and providing continued safety training and education.

5.4 Safety Inspections

The superintendent and foreman conduct an initial safety inspection at the beginning of each project. In addition, a daily safety inspection of the job site is conducted by the contractor employees, employees of a subcontractor, or some combination thereof. The inspection is rotated between all workers on the job site. Any safety concern found during the inspection is reported. If a worker is unclear about any safety aspect, the foreman or project Engineer helps. If the area being inspected requires a *competent person*, the employee conducts the inspection with the competent person. Also, if time allows, the foreman for the worker conducting the inspection is encouraged to walk through it with them.

5.5 Hazard Communication

The contractor needs to develop a written hazard communication plan. It will be explained to each employee during the new-hire orientation. The purpose of the hazard communication plan is to provide employees with information on the chemical and physical hazards that may be present at the job site. Safety Data Sheets for all chemicals will be kept on site.

5.6 Job Hazard Analysis

A job hazard analysis may be developed covering the major activities of construction, the hazards associated with these activities, and ways to mitigate these hazards.

5.7 Housekeeping

Housekeeping is one of the most important factors for a safe job site. Form material should be scraped and all protruding nails pounded down. All other debris is cleared from work areas, passageways, and stairs. Excess materials are stacked neatly out of the way. Tools should be stored in the toolbox so these are available for all employees to use.

Combustible scrap and debris are removed at regular intervals during the course of construction. Containers with covers are provided for the collection and separation of waste, trash, oily and used rags, and other such refuse, which is removed safely and on a regular basis.

Foreign object and debris (FOD) is a significant concern in nearby occupied spaces and construction areas. It is extremely important to keep all trash and debris contained at this site. Housekeeping will be strictly enforced

5.8 Fall Protection

The contractor provides fall protection when employees are exposed to fall hazards.

Fall protection may consist of, but is not limited to, the following:

- A stairway or ladder is provided at any point of access where there is a break in elevation of 19 inches or more.
- Guardrails are installed for all leading-edge work. For loading bay locations fall-arrest systems or fall-restraint systems are used.
- Safety harnesses with approved lanyards and tie-off points are used for all other fall protection unless an appropriate procedure or device was approved in advance by a competent person.
- Stilts may be used on job sites but work area floors must be clean/clear of all debris, materials, and equipment.

5.9 Electrical Safety

Electrical safety may consist of, but is not limited to, the following:

- Live electrical parts are guarded against accidental contact by cabinets, enclosure, location, or guarding.
- Extension cords are kept in safe, working condition.
- All lamps for general illumination have the bulbs protected against breakage. All light sockets are filled with a working bulb.
- Employees will not work in such close (able to contact) proximity to any part of an electric power circuit unless the circuit is de-energized, grounded, or guarded by insulation.
- De-energized equipment or circuits are locked out and tagged out. The tags identify the equipment or circuits being worked on.

- All generators used for temporary power shall be grounded according to manufacturers' specifications.
- Equipment shall not be operated closer than 10 feet from power lines less than 50kV. Safe distance will increase near higher voltage power lines, (over 50kV)

5.10 Tools

The contractor provides tools for employees to use. Only trained employees are allowed to use such tools. The safe use of tools may consist of, but is not limited to the following:

- Unsafe or defective tools are removed from service and tagged out.
- Power tools are turned off and motion stopped before setting down.
- Tools are disconnected from the power source before changing drills, blades, or bits and before any repair or adjustment is made. Running tools are not left unattended.
- Portable abrasive grinders have guards installed covering the upper and back portions of the abrasive wheel.

5.11 Scaffolds

Scaffolds are erected, moved, dismantled, or altered under the supervision of a competent person for scaffolding. Scaffold use consists of, but is not limited to, the following procedures:

- Standard guardrails are installed on all open sides and ends of scaffold platforms and/or work levels more than ten feet below the ground.
- Scaffolds four to ten feet in height with a minimum horizontal dimension in any direction less than 45 inches have standard railings installed on all open sides/ends.
- Platforms at all working levels are fully planked. Planking is laid tight with no more than one inch space between them, overlap at least 12 inches, and extends over end supports 6-12 inches unless cleats are used.
- The front edge of all platforms is no more than 14 inches from the face of the work, except plastering/lathing may be 18 inches.
- Mobile scaffolds are erected no more than a maximum height of four times their minimum base dimension.
- Scaffold casters/wheels are locked whenever the platform is occupied.
- Scaffolds are not overloaded beyond their design loadings.
- Scaffold components are not used as tie-off/anchor points for fall-protection devices.
- Portable ladders, hook-on ladders, attachable ladders, integral prefabricated scaffold frames, walkways, or direct access from another scaffold or structure are used for access when platforms are more than two feet above or below a point of access.
- Cross braces are not used as a means of access to scaffolds.
- Scaffolds are not erected, used, dismantled, altered, or moved such that they or any conductive material handled on them might come close to exposed and energized power lines than the following:

- Three feet from insulated lines of less than 300 volts;
- Ten feet plus for any other insulated or uninsulated Lines

5.12 Excavation and Trenches

Excavation and trenching are done in the presence of a competent person and in compliance with, but not limited to, the following procedures:

- Any excavation or trench five feet or more in-depth is provided cave-in protection through shoring, sloping, benching, or the use of hydraulic shoring, trench shields, or trench boxes. Trenches less than five feet in depth and showing potential of cave-in are also provided cave-in protection. Specific requirements of each system are dependent upon the soil classification as determined by a competent person.
- A competent person inspects each excavation/trench daily prior to the start of work, after every rainstorm or other hazard-increasing occurrence, and as needed throughout the shift.
- Any material and equipment are kept at least two feet from the edge of the trench or excavation.

5.13 Ladders

Ladders are inspected during the weekly inspections to identify any unsafe conditions. Any ladders found to be unsafe are taken out of service. Extension ladders extend three feet above the work surface and are 100 percent tied off. Step ladders are only used in the open position. Ladders are stored lying down. No standing on the top step or first rung below the top of a step ladder.

5.14 Illumination

Construction areas and storage areas where work is in progress are lighted with either natural or artificial illumination.

5.15 Motor Vehicles and Mechanized Equipment

Vehicles and equipment are only operated by qualified persons (training or experience). All equipment operators are responsible for checking, on a daily basis, all fluid levels, drive components, and hydraulics. In addition, operators visually inspect the engine and look for structural breaks and cracks on the machine. Any and all deficiencies must be reported to a supervisor immediately.

When equipment is stopped or parked, parking brakes are set and other safety precautions are taken as required for the type of equipment such as placing the forks flat on the ground. Keys shall be removed from equipment at the end of each shift.

5.16 Severe Weather

Outside construction operations including, but not limited to site work, and concrete work are suspended if severe wind or rain conditions present safety hazards at the worksite. Rain and wind storm hazards are evaluated and appropriate measures are taken to abate potential hazards.

5.17 Accident

All accidents and near misses must be reported immediately to the foreman or superintendent. An accident report is then filled out by the employee and the supervisor. Filling out an accident report does not require the delay of medical attention. Any injury is treated first. Employees file such reports without fear of reprisal by management. The accident or incident may be discussed at weekly safety meetings to avoid that sort of accident in the future.

5.18 First Aid

First-aid kits are available in the project office, at the appropriate and accessible locations as indicated during orientation. In addition, foremen and superintendents maintain current first aid boxes at the site.

5.19 Fire Protection

The contractor maintains appropriate fire extinguishers at the fire-prone areas of the construction site. All equipment is fitted with portable fire extinguishers. Employees are instructed on the location and usage of these fire extinguishers. Emergency telephone numbers for fire protection and emergency medical services are posted on the field office bulletin board.

5.20 Emergency Action Plan

Each job site develops an emergency action plan that is reviewed with each employee during orientation. The emergency action plan covers emergency escape procedures, procedures followed by employees remaining to operate critical operations before they evacuate, procedures to account for all employees, rescue and medical duties, and how to report emergencies.

5.21 Environmental Protection Plan

This health and safety plan also contains an Environmental Protection Plan for the control, prevention, management, containment, cleanup, and disposal of petroleum products or other hazardous substances which may be generated on each project site. The Project Engineer directs measures to control and prevent accidental discharge of petroleum products or other hazardous substances during storage and transfer on all job sites. Any onsite storage is in approved containers. Absorbent pads and other recovery equipment shall available to contain and recover any fuel accidentally spilled. Any spills and contaminated soils are cleaned and disposed of in accordance with applicable requirements.

5.22 Traffic and Pedestrian Control

A traffic control plan will be developed and put in place prior to beginning work on the project for the protection of workers and the general public. Barricades and signage must place around job site areas to reroute vehicle traffic and keep pedestrians out of the job site.

Project Engineers and Superintendents will evaluate the site before work starts to plan site control. Fencing, signage, and barricades shall be erected and secured as to keep pedestrians out.

Any time while performing work near or on a roadway and a worker has a sense of traffic patterns not being controlled properly or speeds too extreme for conditions, the worker should remove himself from the area and notify Supervisor. The Project Engineer shall stress and discuss, at weekly meetings, for all workers to be aware of traffic hazards and pedestrians.

5.24 Concrete Work

The project involves concrete work. There are many hazards associated with this work including but not limited to; Slips Trips, Falls, Strains and Sprains, Eye Injuries, Chemical Burns, and Silica Exposure. The risk assessment shall be performed for all concrete work to minimize the associated hazards.

6.0 Monitoring and Reporting

Monitoring the implementation of the health and safety plan and progress reporting will be very important for the effective enforcement of the plan. PSIC project team along with the supervision consultant will validate effective reinforcement of HSMP. The supervision consultant will frequently visit the construction sites and monitor the effectiveness of the plan implementation. The status of implementation will be reported to the PSIC fortnightly.