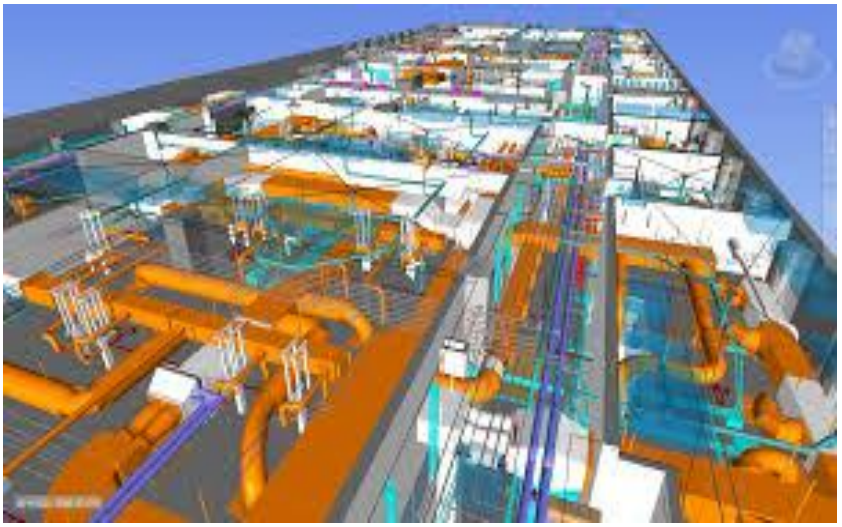
# Environmental Impact Assessment

**Emcon Chemicals (Pvt.) Ltd.**

Plot 4-A, Value Addition City, Tehsil Chak

Jhumra, District Faisalabad



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# EXECUTIVE SUMMARY

The executive summary is an outline of the key outcomes in EIA (Environmental Impacts Assessment). The proponent intends to take environmental approval of the project from Environment Protection Agency (EPA) in order to comply with all the rules and regulations. The name of the project is M/s Emcon Chemicals (Pvt.) Ltd located at Plot 4-A, Value Addition City, Tehsil Chak Jhumra, District Faisalabad. The project involves the chemical Formulation over an area of 88000 Sq. Ft. The basic detail of the project is provided in this chapter.

## Screening

According to projects categorization for environmental assessment studies, the project falls under **Schedule II** (list of projects requiring an EIA), **Category B** (Manufacturing and Processing), **Sub Section 02 (Chemical Manufacturing Units, including pharmaceuticals and cosmetics)** as per the IEE/EIA Regulations 2022, established under Section 12 of the Punjab Environment Protection Act 1997 (Amended 2012).

This project falls into the category of EIA (Environmental Impacts Assessment) which presents a detailed account of the foreseeable environmental and social impacts likely to emanate from the project. The EIA (Environment Impact Assessment) report is prepared to assess the potential impacts likely to occur from the project's entire life cycle on the local environmental quality and communities. The assessment produced a list of impact mitigation measures for the project to undertake to minimize the detrimental impacts on the environment and communities nearby. Details of the process description are given in Chapter 03 under the heading of process details.

## Title and location of the project

The proponent intends to build the chemical manufacturing unit by the title "M/s Emcon Chemicals (Pvt) Ltd" at Plot 4-A, Value Addition City, Tehsil Chak Jhumra, District Faisalabad over an area of 88000 Sq. Ft.

## Name of the Proponent

The detail of the proponent is given below:

**Table 1 Details of Proponent**

| Details of the Proponent |
|---|

| | |
|---|---|
| **Proponent name** | Mr. Muhammad Irfan |
| **CNIC #** | 33100-3449523-1 |
| **Address** | House # 25, Street 17, Yahya Town Tehsil & District Faisalabad |

## A brief outline of the proposal

M/s Emcon Chemicals (Pvt) Ltd, led by **proponent** Mr. Muhammad Irfan, is a chemical manufacturing unit **located** at Plot 4-A, Value Addition City, Tehsil Chak Jhumra, District Faisalabad. The facility spans a total area of 88000 sq. ft. The **coordinates** of project site are 31.513687 N, 73.270888 E. This project **aims** to establish a chemical manufacturing unit for manufacturing binders, pigment emulsions, and textile auxiliaries to cater to Pakistan's textile industry. The facility will **ensure** high-quality production, cost efficiency, and compliance with industrial safety and environmental standards. The **objective** is to meet the growing demand for specialized chemicals, reduce import reliance, and support the local manufacturing sector. The project ensures efficient and sustainable production while maintaining the highest standards of quality and safety. With a total **cost** of 95 million PKR, the **raw materials** include Monomers, solvents, and emulsifiers. The final **products** include Binders, Pigment, Textile Auxiliaries & Fixing Agents. The **detailed list** of raw materials and products with the capacity is provided in Chapter 3.

The project site is **industrial land** and operates on electricity supplied by FESCO. The construction phase engaged 20-25 workers, while the operational phase requires 30-35 workers. The construction period was approximately 06 months.

From an environmental perspective, the primary concerns include solid and liquid waste management. Solid waste generation is negligible and limited to domestic waste, while wastewater is treated before disposal into the drainage channel adjacent to the site. The facility adheres to Punjab Environmental Quality Standards (PEQS 2016) and follows the guidelines issued by the Environmental Protection Agency (EPA) and other relevant authorities. Additionally, all solid and liquid waste disposal is managed through EPA-approved vendors to ensure compliance with environmental regulations.

## Legal and Administrative Framework

The national guidelines and legislations relating to the environment considered for the project include, National Conservation Strategy (1992), National Environment Policy (2005), Pakistan

Labor Policy (2010), Punjab Environmental Protection Act (PEPA 1997), amended PEPA, (2012), Punjab Environmental Quality Standards (PEQS), Land Acquisition Act (1894), Cutting of Trees (Prohibition) Act (1975), Punjab Wildlife Act (1974), Punjab Plantation and Maintenance of Trees Act (1974), Antiquities Act (1975) etc.

Environment related documents have been reviewed including submission of environmental assessment study report to obtain environmental approval was made mandatory by the Pakistan Environmental Protection Ordinance (PEPO), 1983 and the Pakistan Environmental Protection Act (1997). Section 12(1) of the PEPA (1997) amended 2012 stipulates that no project involving construction or any change in the physical environment can be undertaken unless an IEE or an EIA is conducted, and approval (NOC) is received from the relevant provincial environmental agency.

This EIA report has been prepared with due consideration of PEPA, 1997, Punjab Environmental Protection (Amendments) Act, 2012 and all other legal requirements of Pakistan and Punjab Government Including LAA, 1894.

## Major Impacts

The establishment of a chemical manufacturing unit will have various environmental and social impacts during both the construction and operational phases. While the project is essential for industrial growth and economic development, it requires proper mitigation measures to minimize potential environmental risks and ensure regulatory compliance.

During the construction phase, several environmental impacts are anticipated. Air quality may be affected due to dust (particulate matter) generated from land clearing, excavation, and transportation of materials. Additionally, gaseous emissions from construction machinery, generators, and transport vehicles may contribute to local air pollution. Noise pollution is another concern, as heavy construction equipment and machinery will be in continuous operation, along with vehicle movement at the site. The project will also generate solid waste, including construction debris, discarded packaging materials, and excess building materials. However, on the socioeconomic front, the construction phase will have a positive impact by creating temporary job opportunities for construction workers, engineers, and laborers. A minor challenge may arise from transport congestion due to the movement of heavy machinery and raw materials required for construction activities.

In the operational phase, the environmental impacts will be more ongoing. Air pollution may result from raw material handling, chemical mixing processes, and vehicular emissions. Additionally, dust emissions from product handling and transport activities may contribute to local air quality concerns. Noise pollution will persist due to the continuous operation of industrial machinery, mixers, pumps, and the movement of transport vehicles. Another major concern is solid and hazardous waste generation, which will primarily include chemical residues, by-products, and packaging waste. Without proper waste management, these materials could pose environmental and health risks. There is also a potential for soil and water contamination if chemicals are not stored, handled, or disposed of correctly, leading to accidental spills or leaks that could seep into the ground and water sources. Wastewater generation will arise from industrial processes and domestic activities within the facility, necessitating a robust wastewater treatment system to ensure environmental compliance.

Despite these environmental concerns, the socioeconomic benefits of the project are significant. The chemical manufacturing unit will create long-term employment opportunities for skilled and unskilled labor, contributing to economic growth in the region. The project will support industries by providing essential chemical formulations for various applications, reducing reliance on imported chemicals. Transport congestion during operations is expected to be minimal due to a well-planned logistics system and supply chain management.

## Mitigation Measures

The mitigation measures of potential environmental impacts resulting during construction and operational phase of the project are given below:

**During construction phase:**

- Usage of water sprays to control dust during excavation and construction activities.
- Implement dust barriers or screens around construction sites to minimize dispersion.
- Use low-emission machinery and vehicles.
- Maintain and regularly service all construction equipment to minimize emissions.
- Use noise barriers or enclosures around high-noise equipment.
- Equip machinery with noise-reducing features.
- Segregate and properly dispose of construction waste, recycling materials where possible.
- Implement temporary wastewater systems for construction activities.
- Treat and manage wastewater from domestic sources appropriately.

- Limit vehicle movement during peak traffic hours to reduce congestion.
- Generators will be installed with proper enclosure, tuning and maintenance to control emissions.

**During operational Phase:**

- Adoption of effective solid waste management practices for domestic refuse.
- Installation of a septic tank with sufficient capacity before discharging into nearby wastewater channels.
- Erection of safety signage to prevent traffic-related incidents on adjacent roads.
- Disposal of process-related solid waste by an EPA-certified contractor.
- Establishment of a dedicated health and safety department to foster a secure and healthy workplace, aiming to reduce accidents and improve staff morale.
- Regular Health, Safety, and Environment (HSE) training for employees.
- Mandatory use of Personal Protective Equipment (PPE), such as gloves and masks, especially while handling hazardous materials.
- Direct reporting protocols for any incidents to the relevant authorities.
- Enhancement of the green zone and ongoing tree planting during the operational phase to further diminish dust emissions.
- A well-designed ventilation system and preventive maintenance schedule for generators and machinery to check air pollution levels.

## Proposed Monitoring

During the construction phase, regular monitoring will be conducted to ensure compliance with environmental and safety standards. Key focus areas will include ambient air quality (particularly dust levels), vehicle and equipment emissions, noise pollution, solid waste management, soil contamination, and worker safety. Dust levels and exhaust emissions from construction activities will be closely tracked to ensure adherence to air quality regulations. Noise levels generated by heavy machinery and vehicle movement will be monitored to minimize disturbances to nearby areas. Solid waste management practices will be enforced to ensure proper disposal of construction debris and packaging materials, reducing environmental hazards. Soil contamination risks will be assessed, especially during excavation and material handling. Worker safety will be a top priority, with ongoing safety inspections, the mandatory

use of Personal Protective Equipment (PPE), and adherence to occupational health and safety protocols.

In the operational phase, monitoring activities will be conducted on a quarterly basis to ensure environmental sustainability and workplace safety. Ambient air quality assessments will focus on dust levels from raw material handling, chemical processing, and vehicle movement within the facility. Noise levels from industrial machinery, mixers, pumps, and transport vehicles will be measured to maintain compliance with acceptable limits. Solid waste disposal will be systematically monitored, with a focus on proper handling and disposal of chemical residues, packaging waste, and industrial by-products. Soil contamination risks will be continuously evaluated to prevent potential leaks or spills from chemical storage and handling processes. Additionally, worker and community safety will remain a key aspect of monitoring, with periodic safety reviews to ensure a secure and hazard-free work environment.

## Conclusions and Recommendations

The proposed chemical manufacturing unit is expected to bring numerous economic and social benefits, including job creation, business growth, and increased local income levels, which will contribute to improving the social infrastructure in the area. The project will provide employment opportunities for both skilled and unskilled workers, fostering economic development and supporting industries reliant on chemical formulations. Additionally, the project will enhance industrial productivity by supplying essential chemicals to key sectors, thereby strengthening the local economy.

While the project may lead to some environmental challenges, such as air quality degradation, noise pollution, and dust emissions, these impacts can be effectively managed through well-planned mitigation measures. Proper air pollution control, noise reduction techniques, and waste management practices will help minimize the environmental footprint of the project. Cost-effective environmental management strategies have been incorporated into the project design to ensure sustainable operations while complying with environmental regulations.

To ensure long-term environmental sustainability, it is recommended to:

- Provide ongoing environmental training for workers and staff to ensure awareness of best practices and regulatory requirements.
- Implement effective water management strategies, including rainwater harvesting and wastewater treatment, to minimize water consumption and pollution risks.

- Adopt a comprehensive waste management plan to ensure proper handling, storage, and disposal of chemical residues and industrial waste.
- Conduct regular environmental monitoring and reporting to track air quality, noise levels, and waste disposal compliance.

Furthermore, it is essential that the project proponent obtains environmental approval (No Objection Certificate – NOC) from the Punjab Environmental Protection Agency (Punjab-EPA) before commencing construction, in compliance with local environmental regulations. By implementing these recommendations, the project can operate efficiently while minimizing its environmental impact and ensuring long-term sustainability.

# 1 INTRODUCTION

## 1.1 General

Faisalabad Industrial Estate, a key industrial hub in Pakistan, offers an ideal environment for establishing a chemical manufacturing unit due to its well-developed infrastructure, strategic location, and access to skilled labor. As a major center for textile and manufacturing industries, Faisalabad provides a strong demand for binders, pigment emulsions, and auxiliaries, ensuring business sustainability. The proximity to raw materials and an efficient transportation network facilitates cost-effective supply chain management and enhances export opportunities. Moreover, the industrial estate is equipped with modern facilities, including uninterrupted power supply and well-planned roads, ensuring smooth production operations. The establishment of a chemical manufacturing unit will contribute to economic growth by generating employment for skilled and unskilled workers while also strengthening related industries such as packaging, transportation, and raw material supply. Additionally, adopting eco-friendly production techniques and sustainable waste management practices will help meet environmental regulations and enhance the unit's reputation in both local and international markets. With a supportive industrial ecosystem and increasing global demand for high-quality chemicals, setting up a formulation unit in Faisalabad Industrial Estate presents a strategic opportunity for long-term business success.

## 1.2 Purpose of the Report

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

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

The proponent feels its social, moral, and legal obligation to protect the environment. It is in this context that the company initiated the process of gaining Environmental Approval from the EPA, Government of Punjab. According to the direction of the EPA, as detailed in the preceding para under "Introduction" this EIA (Environmental Impacts Assessment) is being submitted for issuance of the said Environmental Approval in compliance with the Punjab Environmental Protection Act -1997 (Amended 2012) Section 12.

The proponent affirms that environmental management order will prevail both during construction and regular operation in accordance with the Punjab Environment Quality Standards (PEQS).

The EIA (Environmental Impacts Assessment) report considers socio economic, physical, and environmental, land use, forestry, crops, water bodies, biodiversity (flora and fauna), heritage, and other relevant aspects associated with the project itself and the area around the project. The report also describes mitigation measures that will be adopted to undo environmental impacts on any segment of the environment, i.e., human health and environmental health around the project site both during construction and normal operation of the project. The report provides relevant information, as required under the officially approved format, to help the decision makers (EPA Punjab in the Present case) before issuing the desired environmental approval.

## 1.3 Identification of the project and proponent

The details of the project and proponent are given below:

**Table 2 Proponent & Project Details**

| Details of the Project and Proponent | |
|---|---|
| **Proponent name** | Mr. Muhammad Irfan |
| **Proponent designation** | Proponent |
| **Address of proponent** | House # 25, Street 17, Yahya Town Tehsil & District Faisalabad |
| **Project title** | M/s Emcon Chemicals (Pvt) Ltd |
| **Location of project** | Plot 4-A, Value Addition City, Tehsil Chak Jhumra, District Faisalabad |
| **Description of project** | This project aims to establish a chemical manufacturing unit for manufacturing binders, pigment emulsions, and textile auxiliaries to cater to Pakistan's textile industry. The facility will ensure high-quality production, cost efficiency, and compliance with industrial safety and environmental standards. |

## 1.4 Nature and size of the project

The project is spread over an area 88000 Sq. Ft. The land is industrial in nature. The project is categorized as chemical manufacturing unit. As a result of project, around 20-25 people got

jobs during the construction phase and around 30-35 people will be engaging during the operational phase of the project.

**Table 2 Schedule of area**

| Schedule of Area | | |
|---|---|---|
| I. | Total Area of Plot | 88000 Sq. Ft. |
| II. | Covered Area | 43205 Sq. Ft. |
| III. | Total Open Area | 44795 Sq. Ft. |

## 1.5 Location

The project site is located at Plot 4-A, Value Addition City, Tehsil Chak Jhumra, District Faisalabad. The coordinates of the project area are 31.513687 N, 73.270888 E.

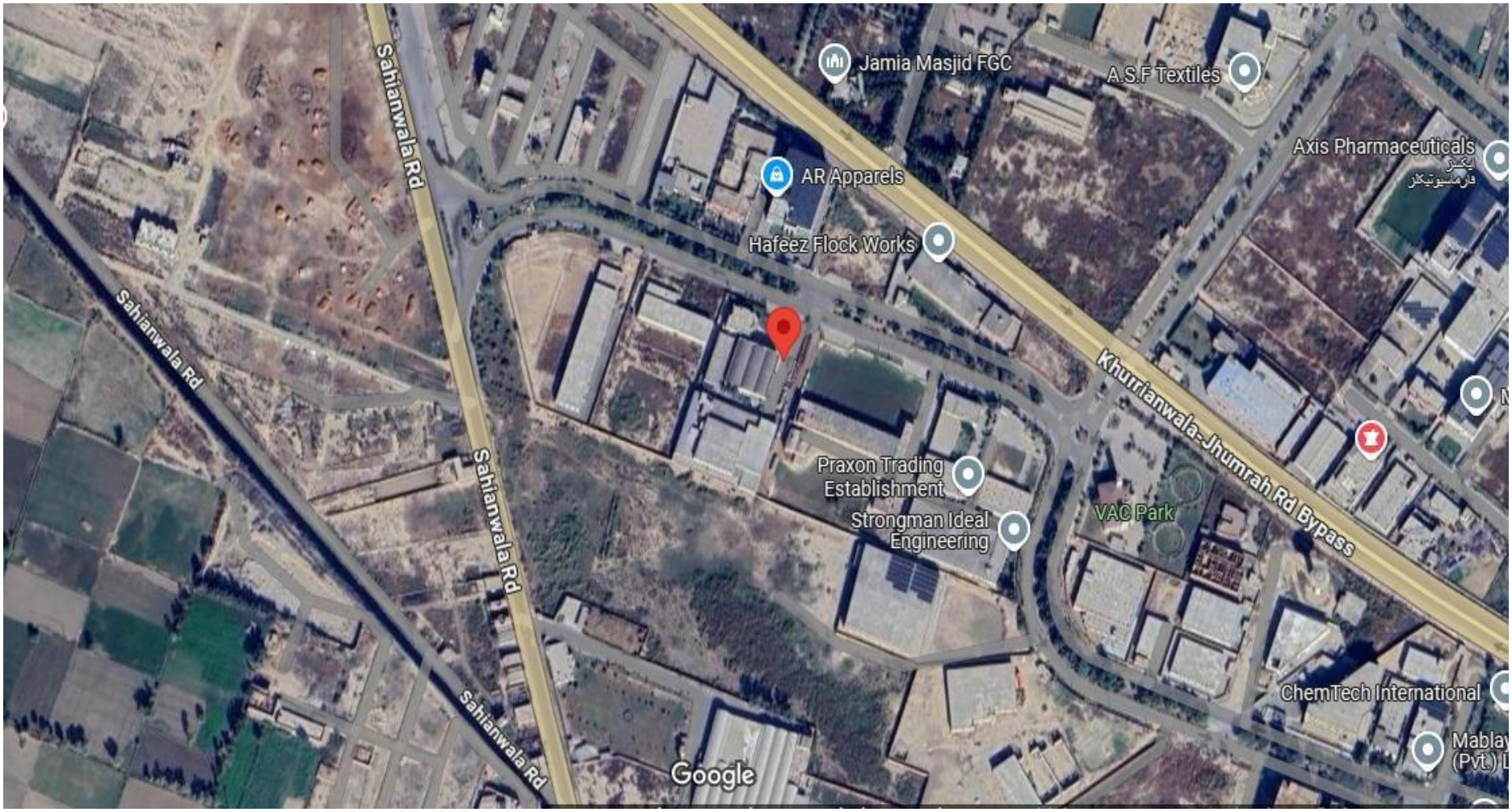



**Figure 1 Project Location**

## 1.6 Extent of the EIA study, scope of the study, magnitude of the efforts

This Environmental Impacts Assessment (EIA) study has been conducted in accordance with Serial 2.3 of the *Guidelines for the Preparation and Review of Environmental Reports, October 1997*. In compliance with the Pakistan Environmental Protection Act (PEPA), 1997 (amended 2012), the EIA report has been prepared by a team of environmental experts. This document evaluates the environmental impacts associated with the establishment and operation of the said project, covering the physical, ecological, and socio-economic aspects, while identifying potential positive and negative impacts. However, any external developmental activities beyond the project site, such as road rehabilitation or the establishment of unrelated industries, are not included in this EIA study.

# 2 POLICY, LEGISLATION, LEGAL & ADMINISTRATIVE FRAMEWORK

## 2.1 General

This section deals with the current policy as well as legal and administrative framework related to carrying out EIA (Environmental Impacts Assessment) of various projects. Several laws exist in Pakistan, containing a few clauses concerning protection of the environment. Like other Projects, this project is also required to go through an Environmental Assessment for getting a NOC under Section 12 of the Punjab Environmental Protection Act – 1997 (Amended 2012).

According to environmental laws of the country development projects must undergo the process of Environmental Impact Assessment (EIA) or Initial Environmental Examination (IEE) to predict and mitigate the impacts of the development at an early stage.

## 2.2 Screening

The project falls under **Schedule II** (list of projects requiring an EIA), **Category B** (Manufacturing and Processing), Sub Section 02 **(Chemical Manufacturing Units, including pharmaceuticals and cosmetics)** as per the IEE/EIA Regulations 2022, established under Section 12 of the Punjab Environment Protection Act 1997 (Amended 2012). Details of the process description are given in **Chapter 03** under the heading of project description.

## 2.3 Existing Regulation and Framework

This EIA study has been carried out in the light of the policy guidelines for the preparation of IEE/EIA Reports under the procedure and practices formulated by the Provincial Environmental Protection Agency (EPA).

## 2.4 Relevant Legal / Institutional Framework

The applicable laws for the environmental study of the project are briefly given below. The proponent of the project will abide by the applicable laws and regulations.

### 2.4.1 National Conservation Strategy, 1992

On March 1, 1992, the Cabinet of Pakistan approved the National Conservation Strategy. It describes the stark reality of the country's deteriorating resource base and its implications for what is still largely a natural resource-based economy. It sets forth the beginnings of a plan to integrate environmental concerns into virtually every aspect of Pakistani economic life. The strategy has three overriding objectives: conservation of natural resources, sustainable development, and improved efficiency in the use and management of resources.

### 2.4.2 PEPO, 1983 and PEPA 1997 (Amended 2012)

In 1983, the Government of Pakistan issued an Environmental Protection Ordinance (EPO), which was replaced by the Pakistan Environmental Protection Act (PEPA) 1997, through an Act of Parliament. Now the PEPA 1997 has been replaced by Punjab Environmental Protection Act 1997 (Amended 2012) on 18$^{th}$ April 2012.

Under Sec. 8 of Environment Protection Ordinance (EPO) 1983, it was necessary to carry out EIA/IEE for all development projects, but there were no EIA/IEE regulations under that ordinance.

Under section 12 of the Punjab Environmental Protection Act, 1997 (Amended 2012) it is mandatory to take an Environmental Approval Environmental Protection Agency for commencement of any construction of project.

### 2.4.3 National Environmental Policy 2005

The Government of Pakistan (GOP) has notified National Environmental Policy 2005, for different projects/aspects in which guidelines/priorities have been given to undertake the projects having significant environmental impacts.

### 2.4.4 Review of EIA and IEE Regulations, 2022

The GOP has issued Review of Initial Environmental Examination and Environmental Impact Assessment Regulations 2022, to review the Initial Environmental Examination (IEE) / Environmental Impact Assessment (EIA) Reports.

### 2.4.5 Guidelines for the Preparation and Review of Environmental Reports, 1997

The GOP has also framed guidelines for the preparation and review of IEE/EIA projects in various developmental sectors.

### 2.4.6 Punjab Environmental Quality Standards (PEQS)

According to Punjab Environmental Protection Act, 1997 (Amended 2012), Punjab Environmental Quality Standards (PEQS) were established for municipal and industrial effluents and air emissions.

### 2.4.7 Guidelines for Sensitive and Critical Areas

GOP issued Guidelines for Sensitive and Critical Areas in October 1997. The objective of the guideline is to provide guidance to project proponents and other stakeholders in the environmental assessment process, so that the projects are planned and sited in a way that protects the values of sensitive and critical areas.

### 2.4.8 Policy and procedures for the Filing, Review and Approval of Environmental Assessments, November-1997

Environmental Assessment is the Primary means of managing the approval of new development proposals in Pakistan. Environmental Assessment allows for the systematic examination of proposals, clear procedures which provide for the interests of relevant Government Departments and other stakeholders to carefully consider.

### 2.4.9 Guidelines for Public Consultation, Pakistan Environmental Protection Agency October 1997

This guideline is part of a package of regulations and guidelines which include:

- Punjab Environmental Protection Act, 1997 (Amended 2012)
- Policy and Procedures for filing, review, and approval of environmental assessments
- Guidelines for the preparation and review of Environmental Reports
- Guidelines for sensitive and critical areas
- National Environmental Quality Standards (NEQS)
- Detailed sectoral guidelines

### 2.4.10 Punjab Wildlife Protection Act, 1974

This act was framed in 1974 by the province Punjab and is about the protection and conservation of Wildlife.

### 2.4.11 Forest Act, 1927

This act was filmed in 1927. The Forest Act, 1927 is still the basic charter for the forest departments in Pakistan. This law empowers provincial governments to manage forest areas.

### 2.4.12 Explosive Act, 1884

This act deals with explosives in prohibiting either absolutely or subject to conditions, the manufacture, possession, or importation of any explosive which is so dangerous in character that, in the opinion of the appropriate Government, it is expedient for public safety to issue the notification.

### 2.4.13 Punjab Local Government Ordinance, 2001

Schedules 4 and 8 of this Ordinance pertain to environmental pollution. Under the Ordinance, the local councils are authorized to restrict projects causing pollution of air, water or land. They may also initiate schemes for improving the environment.

### 2.4.14 Pakistan Penal Code, 1860

This defines the penalties for violations concerning pollution of air, water bodies and land. Sections 268 to 291 are about offences affecting public health. The offences relating to public health, safety and environment are as under:

**Sec 268:** Public Nuisance

**Sec 269:** Negligent acts likely to spread infection of disease dangerous to life:

**Sec 270:** Malignant act likely to spread infection of disease dangerous to life:

**Sec 278:** Making atmosphere noxious to health:

**Sec 284:** Negligent conduct with respect to poisonous substances:

**Sec. 290**: Punishment for public nuisance in cases not otherwise provided for:

**Sec. 291**: Continuance of nuisance after injunction to discontinue.

### 2.4.15 Punjab Land Use Rules 2009

In January 2009 the Punjab Government notified **"**Punjab Land Use Rules 2009" for the clarification of Lahore Master Plan. In these rules permissible land use according to area type is defined.

### 2.4.16 Antiquities Act 1975

The law relates to the protection of Antiquities, monuments, and National &International heritage. Compliance of this Act is mandatory for the Installation of Generators. Under section 22 of the Act no development plan or scheme or new construction can be done within distance of 200ft from the boundary of the monuments/ National Heritage. There is no historical Site or monuments in the proximity of the project.

### 2.4.17 Solid Waste Management Rules 2005

The Solid Waste Management Department, CDGF, has notified these rules for proper waste management.

### 2.4.18 Labor Laws

The labor laws apply to child labor and measuring instruments.

### 2.4.19 Safety & Civil Defense Laws

The civil defense laws provide details about safety, fire protection and civil defense.

### 2.4.20 Guidelines for Critical and Sensitive Area

These guidelines have been prepared under section 12 of Punjab Environmental Protection Act 1997 (Amended 2012) for protection and safety of critical and sensitive localities.

# 3 PROJECT DESCRIPTION

The proponent intends to take environmental approval of the project from Environment Protection Agency (EPA) in order to comply with all the rules and regulations. The name of the project is M/s Emcon Chemicals (Pvt.) Ltd located at Plot 4-A, Value Addition City, Tehsil Chak Jhumra, District Faisalabad. The project involves the chemical Formulation over an area of 88000 Sq. Ft. The estimated cost for the subject project will be about 95 million PKR.

The project will pose positive impacts in terms of employment opportunities, will create jobs during operation and will contribute to the country's economy by meeting the market demands.

## 3.1 Type and category of the project

The project spreads over an area of 88000 Sq. Ft. As a result of the project, around 20-25 people got jobs during the construction phase and another around 30-35 people will be engaging during the operational phase of the project.

The project falls under **Schedule II** (list of projects requiring an EIA), **Category B** (Manufacturing and Processing), Sub Section 02 **(Chemical Manufacturing Units, including pharmaceuticals and cosmetics)** as per IEE/EIA Regulations 2022, established under Section 12 of the Punjab Environment Protection Act 1997 (Amended 2012).

## 3.2 Objective of the project

The objective of the aforesaid project i.e. M/s Emcon Chemicals (Pvt) Ltd for economic growth and to meet the demand of the market. The project will have the following advantages:

- To manufacture high-quality binders, pigment emulsions, auxiliaries, and specialty chemicals to meet the growing demand of Pakistan's textile and industrial sectors.
- Enhance local industrial capacity, reduce dependence on imported chemicals, and support the growth of allied industries such as textiles, packaging, and construction.
- To provide cost-effective and innovative chemical solutions while ensuring environmental sustainability
- To contribute to the socio-economic uplift of the proponent and the local community by adding value through this project.

## 3.3 Alternatives consideration

Alternatives are recommended and examined to determine the best method of achieving project objectives, while minimizing environmental impacts. The discussion and analysis of

alternatives in an EIA (Environmental Impacts Assessment) study should consider other practicable strategies that will promote the elimination of negative environmental impacts identified.

This section covers the project alternatives which were examined for the project. An analysis of the available alternatives is necessary to establish that the most suitable management and technology options will be adopted for the project, while minimizing environmental impacts. This evaluation explains the selection of the most feasible alternative in terms of economics, environment, and health & safety. It outlines the following options that were considered for this project:

- Site Alternative their selection and rejection criteria
- Design/technology alternatives, their selection and rejection criteria
- Environmental Alternatives, their selection and rejection criteria
- Economic Alternatives, their selection and rejection criteria

### 3.3.1 Site alternative their selection and rejection criteria

The chosen location for the project of M/s Emcon Chemicals (Pvt) Ltd is situated in Plot 4-A, Value Addition City, Tehsil Chak Jhumra, District Faisalabad, making it an ideal site for the project as the project site is industrial in nature. The location is spacious enough to accommodate the required facilities and infrastructure. With its existing infrastructure and strategic position, we believe this site is perfectly suited for the development. Additionally, there are no historical sites or recreational areas in the vicinity.

No alternative sites were considered for the establishment of the unit, as this location best meets all the necessary criteria, including accessibility, space requirements, and proximity to essential infrastructure. The chosen site is optimal for the successful implementation of the project, providing a secure, efficient, and sustainable environment for the project.

Key characteristics of the site include:

- ✓ Availability of transportation infrastructure, including a well-developed road network.
- ✓ No significant land damage is anticipated from the project's implementation.
- ✓ No alternative sites are considered due to the strategic advantages of this location.

## 3.4 Land Use of the Site

The selected land is industrial in nature ensuring that the project does not require any land use changes. Its status and location make it fully compatible with the development, in line with

existing land use policies. This not only simplifies the approval process but also minimizes any potential impact on nearby communities.

### 3.4.1 Environmental Alternatives, their selection and rejection criteria

Upon completion of construction, comprehensive plantation efforts will be carried out to improve the surrounding environment. A maximum number of trees will be planted in and around the project site to enhance the aesthetics of the infrastructure, reduce air pollution, and mitigate noise pollution. Additionally, a well-designed sewage and solid waste management system will be implemented to prevent contamination and ensure that waste is managed in an environmentally responsible manner.

To further minimize environmental impact, the project will focus on reducing workplace accidents and injuries through strict safety protocols and effective training programs. These measures aim to not only protect the workforce but also contribute to a safer and healthier working environment.

Moreover, a commitment to improving workforce morale will be emphasized by providing proper facilities and creating a conducive environment that promotes productivity and well-being. These initiatives are all part of the project's efforts to minimize its environmental footprint while maximizing its positive contributions to the community and the workforce. In terms of site selection, environmental factors such as air quality, noise levels, waste management capabilities, and the potential for enhancing the local ecosystem were critical considerations.

### 3.4.2 Economic Alternatives, Their Selection and Rejection Criteria

The project is expected to significantly boost local employment by creating opportunities for qualified and skilled workers. In line with this, the selection of technologies and machinery for the project has been carefully chosen to ensure economic efficiency, both in terms of initial investment and long-term operational costs. The selected technologies are cost-effective and provide high operational efficiency, ensuring the project remains financially viable and sustainable.

Additionally, tree plantation will be a key feature of the project, providing not only environmental benefits such as cooling the area and acting as a noise barrier but also contributing to the local economy through improved aesthetics and air quality

To further reduce operational costs, the project has been designed to maximize the use of natural daylight, reducing the need for artificial lighting during the day. For nighttime operations, energy-efficient LED lighting will be used, significantly lowering electricity consumption and minimizing energy expenses over time.

Economic alternatives were considered based on their ability to reduce operational costs, enhance energy efficiency, and create long-term employment opportunities.

## 3.5 Project Location and Layout

The site for the project of "M/s Emcon Chemicals (Pvt) Ltd" is located at Plot 4-A, Value Addition City, Tehsil Chak Jhumra, District Faisalabad. The location of the project is given below, and layout of project is attached within the file. The coordinates of the project site are 31.513687 N, 73.270888 E.

## 3.6 Road Access

The project site is easily accessible via the Khurrianwala-Jhumra Road and Sahianwala Road, providing convenient access for operational activities. This accessibility is essential for the smooth transportation of raw materials, products, and for employee commutes to and from the site. The well-maintained road network ensures minimal transportation delays, supporting the project's efficiency and overall productivity. Furthermore, road access is vital for quick distribution to local markets, enhancing supply chain operations. A road access map has been provided, offering a detailed overview of the site's connectivity and highlighting its strategic location for efficient logistics and seamless transportation operations.


**Figure 2 Project Location**

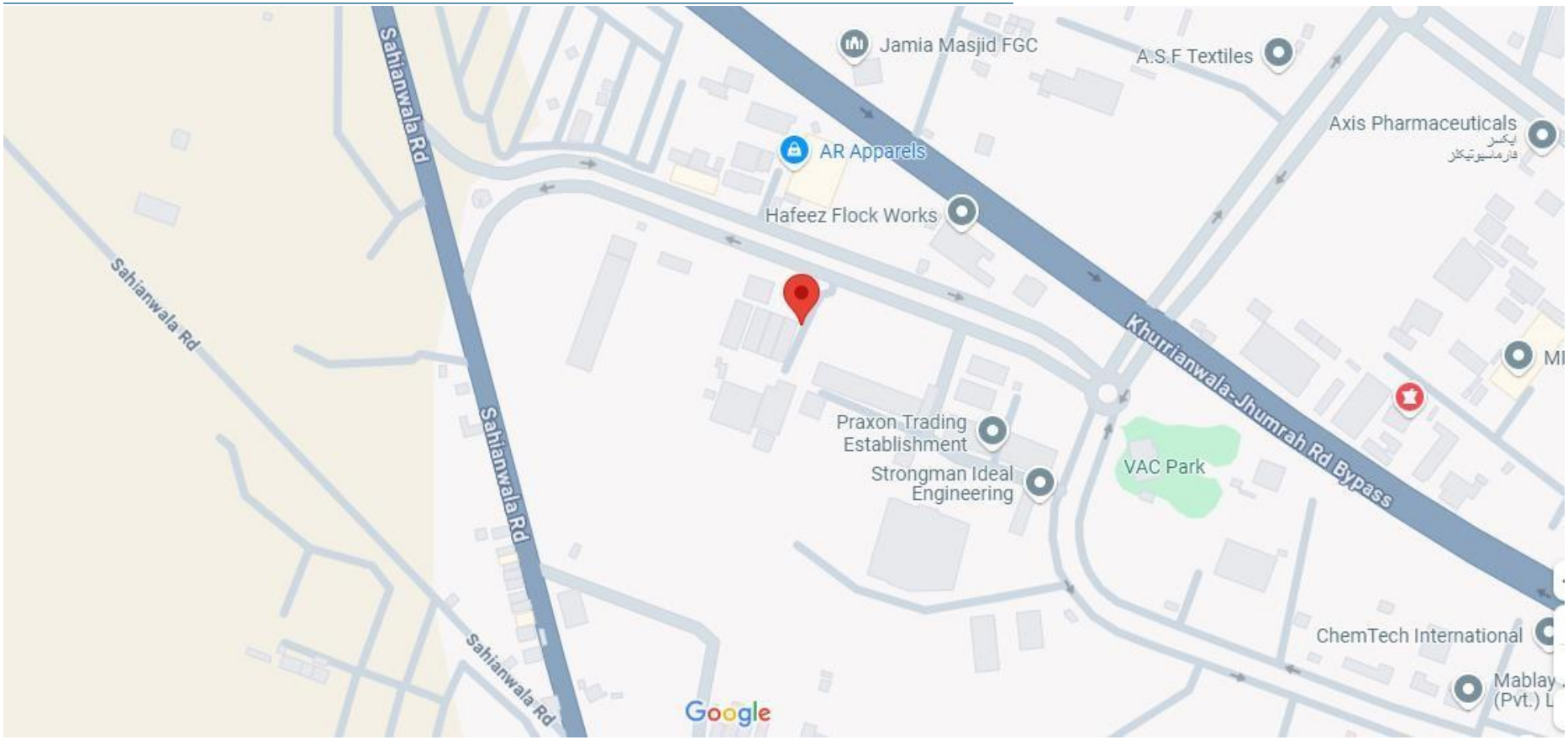



**Figure 3 Road Map**

## 3.7 Vegetative Features of the Site

The area surrounding the project site is primarily industrial, with some green patches scattered throughout. In line with the project's commitment to sustainable development, plans are in place to establish green belts around the site during its operational phase. These green belts will not only enhance the aesthetic appeal of the site but will also serve vital environmental functions. They will act as natural buffers to reduce pollution, particularly from vehicular emissions, and help mitigate noise pollution originating from the unit. The development of these green spaces is a strategic measure to improve air quality and create a peaceful environment surrounding the project's site.

## 3.8 Plantation Plan

To further enhance visual appeal and improve ambient air quality, the project will implement a plantation plan that includes the planting of approximately 500 to 1000 plants within and around the project area's vicinity. The selection will focus on a variety of plants, including ornamental species like Coreopsis and daylilies, alongside a strong emphasis on planting shade-providing trees. This initiative aligns with the project's environmental sustainability goals, aiming to create a greener, more pleasant environment that will benefit both the local ecosystem and the surrounding community.

**Maintenance Plan**

- **Watering:** Use drip irrigation to minimize water wastage. Ensure plants are watered according to their specific needs.
- **Trimming:** Regular pruning of trees and shrubs to maintain their shape and encourage healthy growth.
- **Pest Management:** Use organic pest control methods to avoid harmful chemicals and maintain a healthy ecosystem.

**Landscaping and Design Considerations:**

- **Sustainability:** The selection of drought-resistant and low-maintenance plants that are suited to the local climate of Multan will reduce the need for excessive irrigation and chemical fertilizers, aligning with sustainable landscape practices.
- **Seasonal Color:** Seasonal flowering plants are integrated to maintain aesthetic vibrancy throughout the year, ensuring visual appeal during all seasons.

- **Soil and Fertility:** To maintain soil fertility and reduce the dependence on chemical fertilizers, natural fertilizers are used to promote healthy soil conditions and support plant growth.

## 3.9 Magnitude & Cost of the Project

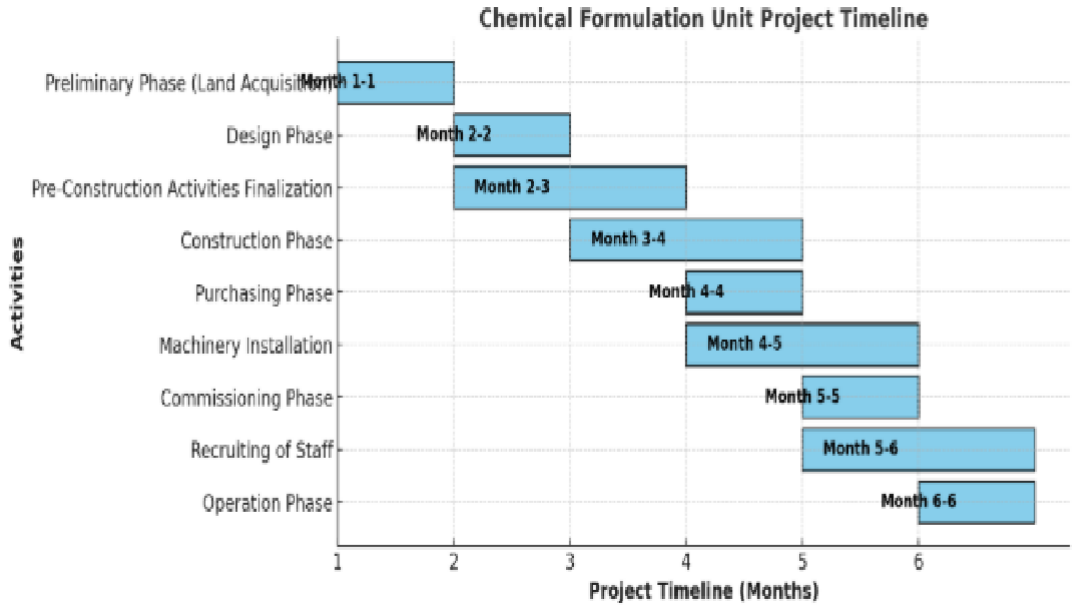
The project is poised to be a significant industrial venture with an estimated initial capital investment of approximately 95 million PKR. This investment will cover the costs related to the procurement of equipment, construction, raw materials, and the operational expenses necessary for the functioning. A key focus will be on ensuring the safety and efficiency of all equipment and operations, supported by diligent management practices. Notably, no separate funds are required for additional safety or operational assurances, as the budget plan comprehensively includes all necessary provisions for safety, environmental measures, and sustainability. This strategic financial planning highlights the project's dedication to both economic feasibility and environmental stewardship.

**Table 3 Cost Breakdown**

| **Amenities** | **Cost in PKR** |
|---|---|
| Land cost, Infrastructure development | 36.2 million |
| Machinery & Equipment | 34.3 million |
| Raw Material & Others | 14.7 million |
| Environmental Budget | 9.8 million |
| **Total Cost** | **95 million** |

## 3.10 Schedule for implementation (Tentative)

- **Stage I:** The clearing of land, and preparation of land for construction activity.
- **Stage II:** During this phase, machinery will be brought to the site and installed.
- **Stage III:** In this phase all the outstanding activities will be completed, and construction activities will be initiated.
- **Stage IV**: After completing construction, employees will be hired, and staff will be assigned their respective work. The operation activities will be initiated.




## 3.11 Project Description

The proponent intends to take environmental approval of the project from Environment Protection Agency (EPA) in order to comply with all the rules and regulations. The name of the project is M/s Emcon Chemicals (Pvt.) Ltd located at Plot 4-A, Value Addition City, Tehsil Chak Jhumra, District Faisalabad. The project involves the chemical Formulation over an area of 88000 Sq. Ft. There is a proper waste management system.

### 3.11.1 Process Description

The basic detail regarding the process is:

**Raw Material:** Monomers, solvents, and emulsifiers

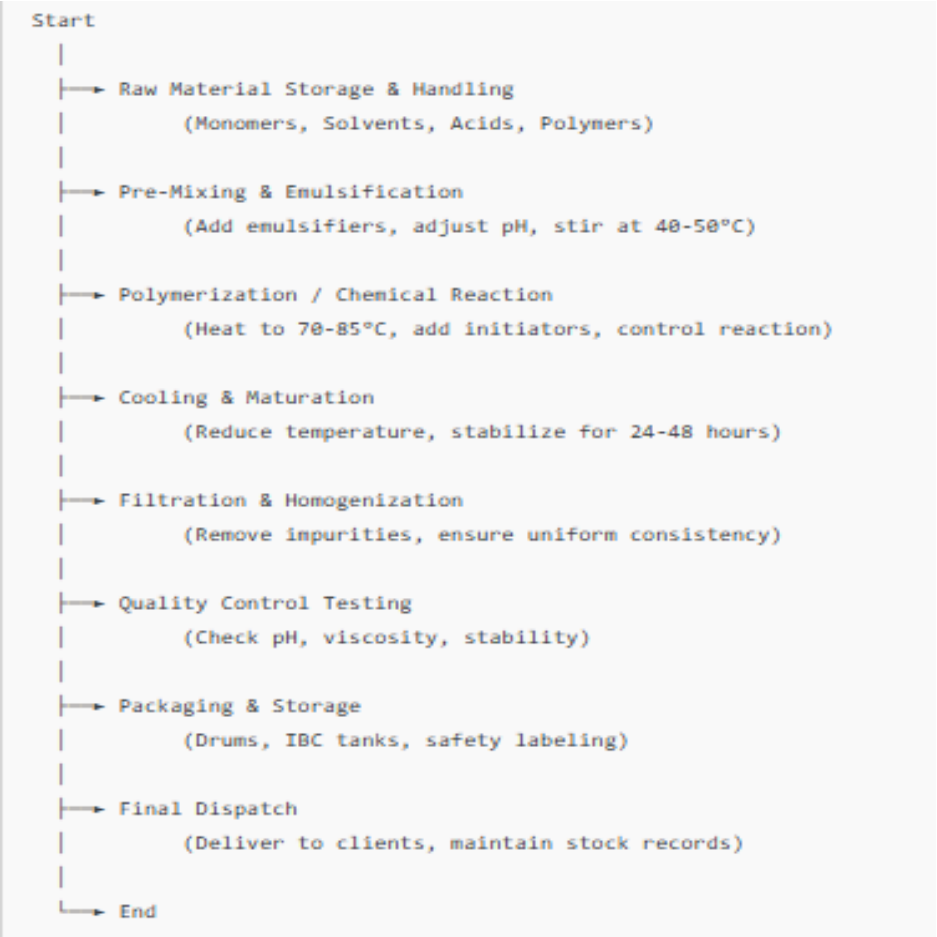
**Final Product:** Binders, Pigment, Textile Auxiliaries & Fixing Agents

**Capacity of production:**

| **Product** | **Capacity** |
|---|---|
| Vinyl Acetate Monomer | 100000 Kg/ Month |
| Iso Propyl Alcohol | 20000 Kg/ Month |
| Ethyl Acrylate | 20000 Kg/ Month |
| Acetic Acid / Glacial Acetic Acid | 20000 Kg/ Month |
| Butyl Acrylate / N-Butyl Acrylate | 10000 Kg/ Month |
| Acrylic Acid / Acrylic Acid Glacial | 24000 Kg/ Month |
| Styrene Monomer | 40000 Kg/ Month |

| | |
|---|---|
| Xylene | 20000 Kg/ Month |
| Formic Acid | 20000 Kg/ Month |
| Paraformaldehyde | 20000 Kg/ Month |
| Poly Vinyl Alcohol – PVA | 40000 Kg/ Month |

The process flow chart is as under:




1. **Raw Material Handling & Storage**

The raw materials used in the chemical formulation process include monomers such as Vinyl Acetate, Butyl Acrylate, Styrene Monomer, and Ethyl Acrylate; solvents like Iso Propyl Alcohol and Xylene; acids and stabilizers including Acetic Acid, Acrylic Acid, and Formic Acid; and polymers and additives such as Poly Vinyl Alcohol (PVA) and Paraformaldehyde.

2. **Pre-Mixing & Emulsification**

The pre-mixing and emulsification process begins with carefully weighing and transferring monomers and stabilizers into a reaction vessel. Emulsifiers such as Poly Vinyl Alcohol and surfactants are added to ensure better dispersion of components. The pH is adjusted to a range

of 5-7 using Acetic Acid or Formic Acid to create an optimal reaction environment. The mixture is stirred at 40-50°C for 30-60 minutes until a uniform emulsion is formed. A quality check is performed at this stage to ensure homogeneous mixing before proceeding to the polymerization phase.

**3. Polymerization / Reaction Process**

During the polymerization process, the emulsified mixture is heated to 70-85°C, where initiators such as ammonium persulfate are introduced to trigger the polymerization reaction. It is essential to control the reaction rate to prevent overheating, which can lead to undesirable product properties or safety hazards. The mixture is continuously agitated for 3-5 hours until the reaction stabilizes. Stringent safety measures are followed, including maintaining cooling systems in case of an exothermic reaction and regular monitoring of pH, viscosity, and temperature to ensure process stability.

**4. Cooling & Maturation**

Once the polymerization process is complete, the mixture is gradually cooled down to room temperature to prevent thermal shocks that could affect product stability. The cooled mixture is allowed to stabilize for 24-48 hours to ensure proper molecular arrangement and consistency. A series of quality tests, including viscosity, pH, and solids content analysis, are conducted to verify the product's compliance with specifications before proceeding to the next phase.

**5. Filtration & Homogenization**

In this phase, the stabilized polymer solution is passed through filtration units to remove impurities and undesired particles. To ensure uniform particle distribution and product consistency, the mixture undergoes homogenization using specialized equipment. A final quality check is conducted to confirm that the product meets required specifications. Key quality parameters include maintaining a pH range of 5.0 – 8.0, ensuring proper viscosity levels as per product requirements, and verifying stability by checking for phase separation after 48 hours.

**6. Packaging & Storage**

The final product is then transferred into plastic drums, IBC tanks, or bulk containers based on customer requirements and transportation logistics. Each package is properly labeled with essential product details, batch number, and safety information to ensure traceability and

compliance with regulatory standards. Proper storage conditions are critical to maintaining product integrity; thus, packaging units are stored in ventilated areas with controlled temperatures to prevent degradation. Direct sunlight and high temperatures must be avoided, and fire safety measures should be strictly adhered to for flammable products to mitigate risks.

| Sr. No | Class | Product Name | Flash Point (°C) | Flash Point (°F) | Storage Quantity per month |
|---|---|---|---|---|---|
| 1 | Class A – DP | Vinyl Acetate Monomer | -7.78 | 18 | 100000KG |
| 2 | Class A – DP | Iso Propyl Alcohol | 11.67 | 53 | 20000KG |
| 3 | Class A – DP | Ethyl Acrylate | 15.56 | 60 | 20000KG |
| 4 | Class B – NDP | Acetic Acid / Glacial Acetic Acid | 40 | 104 | 20000KG |
| 5 | Class B – NDP | Butyl Acrylate / N-Butyl Acrylate | 36 | 96.80 | 10000KG |
| 6 | Class B – NDP | Acrylic Acid / Acrylic Acid Glacial | 54.44 | 130 | 24000KG |
| 7 | Class B – NDP | Styrene Monomer | 31 | 87.80 | 40000KG |
| 8 | Class B – NDP | Xylene | 46.11 | 115 | 20000KG |
| 9 | Class C – HP | Formic Acid | 69 | 156.20 | 20000KG |
| 10 | Class C – HP | Paraformaldehyde | 70 | 158 | 20000KG |
| 11 | Class C – HP | Poly Vinyl Alcohol – PVA | 78.89 | 174 | 40000KG |

## 3.12 Available Facilities

### i. Firefighting System

The firefighting equipment/system has been designed and will be implement in project. Fire extinguisher has been provided in site.

### ii. Water Facility

The source of water for the site is ground water at the depth of 70-100 ft.

### iii. Electricity

FESCO will be the main source and generator will also be there.

### iv. Personal Protective Equipment

Following Personnel Protective equipment will be provided to the workers for their safety during construction and operational phase as per the requirement of specific activity:

- Protective Goggles
- Protective leather/rubber shoes
- Gloves
- Face masks
- Protective shields
- Helmets
- Overcoats

## 3.13 Restoration and Rehabilitation at the end of Project Life

The estimated lifespan of the project is approximately 25 years. However, well before reaching the end of its first lifecycle, the project will undergo complete renovation and refurbishment. Modern and advanced equipment will replace outdated machinery, ensuring efficiency and sustainability. Additionally, all civil structures and related infrastructure will be extensively renovated to maintain operational standards. All restoration activities will be conducted in compliance with prevailing environmental management laws to prevent any harm to the environment or human health. Given the planned refurbishment and modernization, rehabilitation of the site will not be required.

## 3.14 Government Approvals and Leases

In accordance with Section 12 of the Punjab Environmental Protection (Amendment) Act, 2012, approval from the Environmental Protection Agency (EPA), Government of Punjab, Lahore, is mandatory before project construction begins. Therefore, this Environmental Impacts Assessment (EIA) report has been prepared for submission to EPA Punjab.

## 3.15 Health, Safety & Hygiene

### 3.15.1 First Aid Facility

Workers and employers will be trained in first aid treatment to handle emergencies effectively.

### 3.15.2 Safety Training

All workers and staff will receive proper training on workplace safety measures and best practices.

### 3.15.3 Use of Drugs and Narcotics

The use of drugs and narcotics is strictly prohibited in the workplace. Smoking will only be permitted during designated break times in isolated smoking areas.

### 3.15.4 Fire Protection System

Firefighting arrangements will be in place at the project site. Fire extinguishers and firefighting equipment will be positioned at easily accessible, clearly marked locations. A first aid box will be provided at the site to handle injuries promptly.

### 3.15.5 Security Measures

The project site will be fully secured with a boundary wall and round-the-clock security guards. These measures will help ensure the safety of the site and its surrounding areas.

### 3.15.6 Safety Signs and Boards

Safety signs and symbols play a crucial role in preventing workplace accidents. Signs must be in a clear and understandable language for all workers. Workers will be trained to recognize and understand safety signs. Each department will provide safety signs and boards to protect employees from workplace hazards. Safety signs will be color-coded to enhance recognition and understanding. At this project site, safety signs and boards will be installed in key locations to minimize risks and promote a safe working environment.


**Figure 2 Safety Sing & Symbol**

# 4 DESCRIPTION OF ENVIRONMENT

An Environmental baseline data study is essential while preparing EIA reports. The basic purpose is to establish a clear understanding of existing environmental conditions in the project area and to identify potential impacts of the project. It refers to the collection of baseline information on biophysical, social, and economic aspects of project location.

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

## 4.1 Data Collection

The data collection phase involved several key activities aimed at understanding the existing environmental conditions and gathering community and stakeholder insights:

**Site Visits:**

A thorough survey of the field area was undertaken to collect pertinent data directly from the project site, ensuring a grounded understanding of the physical, ecological, and socioeconomic settings.

**Interviews with the Public and Stakeholders:**

Engaging with the public and project stakeholders provided valuable perspectives on the proposed project. These interactions offered insights into public opinion and expectations regarding the project's implementation.

**Consultations with Organizations:**

Meetings with various Governmental and Non-Governmental Organizations (NGOs) were conducted to gather additional relevant data. The views and feedback obtained from these organizations were documented to enrich the EIA report with diverse perspectives on the project's potential environmental impact.

The environmental baseline study focuses on three primary components:

- **Physical Environment**
- **Ecological/Biological Environment**
- **Socioeconomic Environment**

The comprehensive approach to data collection and analysis within the environmental baseline study ensures that all potential impacts of the proposed project are anticipated and addressed. This process not only aids in the responsible planning and implementation of the project but also aligns with regulatory requirements and community expectations, paving the way for sustainable development.

## 4.2 Physical Environment

The proposed project lies in Plot # 225, M-3 Industrial City, Phase II, FIEDMC, District Faisalabad, over an area of 144345 Sq. Ft. where proponent intends to develop the proposed project. There are different industrial units within the project area in operational, constructional, and planning phase. The project lies in Faisalabad, and it has a detailed background history.

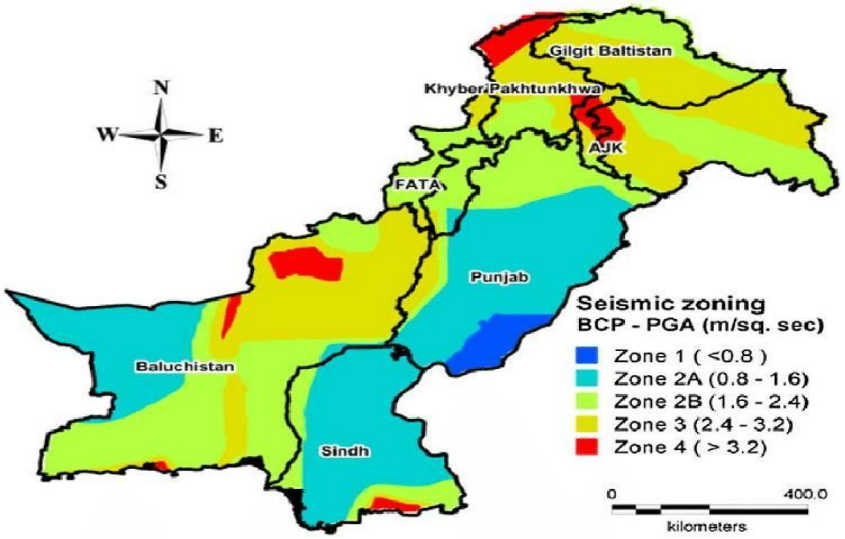
### 4.2.1 Geology

Faisalabad previously known as Lyallpur was established as a Mandi Town in 1895 as a part of the program of colonization of West Punjab. It was formerly a part of Tehsil Jhang of Multan Division. Because most of the area was un-cultivated and there were no regular crops, it served the purpose of only a meadow for the cattle of the indigence. The opening of Lower Chenab Canal in 1892 and its extension to the area in the form of Rakh Branch, Jhang Branch and Gogerah Branch coupled with the introduction of a Canal Irrigation system, brought the whole area under regular cultivation. The city was named in honor of Sir James Lyall, the then lieutenant Governor of the Punjab. The design of the Town was prepared by Mr. Young, and it was further improved by Sir Gunga Ram, a renowned Town Planner of the time. It was laid down on a parcel of land measuring 110 acres in a square form with eight bazaars radiating from the central Clock Tower. The district of Faisalabad is situated in the center of the lower Rachana Doab, the area between Chenab and Ravi rivers, which has a mild slope from North-East to South-West with an average of about 0.2-to-0.3-meter drop per kilometer or about 1 to 1.5 feet per mile. The city is situated at an elevation of about 183.35 meters above the Sea level. The topography is however marked by valleys, local depression, and relatively high ground.

### 4.2.2 Seismicity

Pakistan lies on an active seismic belt of earth. Seismic observations indicate that hundreds of shocks originate every year. Mostly, these seismic waves are of low intensity and do not have significant effect. According to seismic zones of UN- Habitat the project area falls under Zone 2A. The seismic zoning is shown in the figure.

**Map 1 Seismicity map of Pakistan.**




### 4.2.3 Climate

The meteorological data from Faisalabad has been used to identify the baseline climatic condition of the project area and surroundings. The proposed project lies in an arid climate region. The last five years data was obtained from Pakistan Meteorology Department, meteorological station at Faisalabad to have an overview of the area's climatic regime. The metrology data of the site is briefly described below:

**Table 11 Climatic data of project area**

| Month | Mean Temp. Max | Mean Temp. Min | Precipitation | Relative Humidity |
|---|---|---|---|---|
| January | 19.7 | 5.0 | 33.8 | 66.2 |
| February | 21.6 | 7.7 | 50.0 | 60.0 |
| March | 26.0 | 12.5 | 60.5 | 53.8 |
| April | 33.0 | 17.7 | 36.5 | 41.8 |

| | | | | |
|---|---|---|---|---|
| May | 38.1 | 22.0 | 31.8 | 32.5 |
| June | 40.5 | 25.8 | 51.6 | 37.8 |
| July | 35.7 | 25.8 | 23.3 | 67.8 |
| August | 34.4 | 25.3 | 22.2 | 70.8 |
| September | 35.0 | 23.0 | 77.7 | 65.5 |
| October | 33.1 | 16.6 | 12.2 | 55.6 |
| November | 27.8 | 9.9 | 9.9 | 62.7 |
| December | 21.5 | 5.7 | 30.4 | 68.9 |
| Annual mean | 30.6 | 16.4 | 36.6 | 56.4 |

### 4.2.4 Surface Water and Ground Water

Water resources of the area are discussed under two broad headings, surface water resources and groundwater resources.

**Surface Water**

Surface waters resources are usually exposed to the surface of earth in the form of mobile and immobile situations which includes snow-clad mountains, rivers, non-river streams, rain, sleet, wetlands, and oceans. Surface resourced waters are highly susceptible to natural and anthropogenic derived contamination in terms of Chemical and Biological contamination and thus are not used for sensitive applications such as drinking directly unless it is pre-treated. Among surface waters, district & near the project extremities there is a distributor canal of Rakh Branch, which is used for the irrigation purpose etc.

**Ground Water**

Ground water resources are found hidden and camouflaged into the surface of earth in the form of mobile and immobile state and exist as shallow and deep wells, confined and unconfined aquifers, springs and watersheds. Ground resourced waters are not easily susceptible to natural and anthropogenic derived contamination caused by Chemical/Biological pollution and thus

are directly used for sensitive applications such as drinking even if it is un-treated. Main visible pollutants such as turbidity, color and odor usually remain absent in ground extracted waters. Invisible biological contaminants such as Bacteria, Protozoa and Viruses are also not expected in sub- surface water regimes unless it is contaminated by un-expected upheaval. Water constitutes an important section of Physical Environment of an EIA Study to define its magnitude, quality, and occurrence throughout the entire project corridor. On geo-spheric earth water amounts to 3% as freshwater resource of the total water reserve. Of this groundwater comprises 95%, surface water 3.5% and soil moisture 1.5%. Out of all the fresh water on the earth, only 0.36% is readily available for diverse uses and applications. The project area lies in the district of Faisalabad; the groundwater table normally exists 25 to 30 meters below the ground level and contains a high level of salinity.

### 4.2.5 Season and rainfall.

The proposed project is situated in the district of Faisalabad which has hot summers and moderately cold in winter. It is in the region that encounters four seasons, the hot summer starts from May and continues till July, monsoon starts from July and continues to September while winter season end in February starting from November and spring season lasts for two months from March and April. The last five years annual rain fall data from 2009 to 2013 shows variation between -1 – 243.1 mm.

### 4.2.6 Temperature

The ambient temperature of the proposed project region varies from summer to winter. The change in temperature has a direct influence on the environment of the project area. Hot and dry conditions during summer season change the air quality by increasing in particulate matters due to drying of road pavements and open soil. According to the last five years data, mean monthly minimum temperature in the area varies from 3.5 to 28.6 C° and mean monthly minimum temperature were found 16.6 – 41.9 C°.

### 4.2.7 Ambient Air Quality

Atmospheric pollution means the imbalance in the normal air chemistry. It can occur due to the addition of a new chemical into the atmosphere or by the change in concentration of the chemicals already existing in the atmosphere. Atmospheric pollution particularly in urban areas has a strong impact upon daily life. The reasons for such changes can both be natural as well as anthropogenic. Ambient air quality is a key to measure the concentration of the various

chemicals in atmosphere; especially of the chemicals which pose detrimental effects on health, safety, and environment, to have a comparison with their safe concentrations, as established in WHO Standards and NAAQS.

### 4.2.8 Noise Levels

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

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

## 4.3 Ecological/Biological Environment

In this section, the baseline environmental conditions of the biological environment are described. These conditions have subsequently been used to identify the potential impacts on the biological environment that are likely to arise from the project activities.

### 4.3.1 Fauna

There are no natural forest trees, grassland, or ecologically important places. But the natural vegetation has been replaced by the crops. So, this sector consists generally of agricultural land irrigated by tube wells. Multan district is distinguished for its status in Agricultural production, especially cotton and Mango. It has renowned Agricultural research institutes like i.e, Central Cotton Research Institute, Cotton Research Station, Mango Research Station, and Agricultural College at Baha-ud-Din Zakria University.

| **Local Name** | **Fruiting Plant Specie** |
|---|---|
| Mango | Mangifera Indica |
| Guava | Psidium guajava |
| Date Palm | Phoenix dactylifera |

| Local Name | Trees Scientific Name |
|---|---|
| Kikar | Acacia nilotica |
| Sufaida | Eucalyptus camaldulensis |
| Albizia lebbeck | Siris |
| Peepal | Ficus religiosa |
| Tahli | Dalbergia sissoo |
| Beri | Ziziphus nummularia |

### 4.3.2 Flora

The project area, on account of the nature of vegetation and topography, is rich in vegetation and wildlife. Fauna of the project area consists of:

- Mammals
- Reptiles
- Amphibians
- Birds

## 4.4 Socio-Economic Environment Analysis

The socio-economic environment surrounding the proposed project site, situated within industrial land, is expected to experience minimal direct disturbances from project activities. The study area's scope extends to a 5km radius around the site, a boundary determined based on physical, ecological, and socioeconomic factors, to ensure a comprehensive collection of socioeconomic data.

### 4.4.1 Indigenous People

The demographic composition of the project area is diverse, with communities of different castes and races, many of whom have resided in the area for 20 to 25 years. This long-term settlement has fostered a homogeneous culture and a self-sustaining economy, with no anticipated threat to the indigenous community's continuity or cultural practices due to the project.

### 4.4.2 Religion, Ethnic Group, and Cast Patterns

The social fabric of the local villages is predominantly Punjabi speaking (99%), with a small representation (1%) from other ethnic groups such as Saraiki and Pashto. Religion significantly

influences the community's social structure, with Sunni Muslims being the primary inhabitants, alongside a few families of Ahl-e-Tashayyu and Ahl-e-Hadith.

## 4.5 Quality of Life Value

The overall quality of life in the project area, while not optimal, stands out positively compared to other rural regions in the province. A snapshot of the local education, health infrastructure, and economic activities is as follows:

### 4.5.1 Education

The literacy rate in the project area is lower than the district average of Multan (45%), with primary education being the average level achieved. Despite this, access to higher secondary, private schools, and colleges is available, with many seeking higher education in Multan and other cities.

### 4.5.2 Health Facility

Healthcare facilities, including Basic Health Units, dispensaries, and private clinics, serve the community, with prevalent diseases being fever, malaria, chest congestion, and Hepatitis C. Health conditions are relatively developed in comparison to similar areas.

### 4.5.3 Economy of Area

Multan's diverse economy offers various employment opportunities in industrial, commercial, and agricultural sectors. The local economy benefits from a mix of government and private employment, agriculture, and livestock farming, with a significant portion of the community engaged in manual labor and small businesses.

### 4.5.4 Agriculture

Agriculture is a cornerstone of the local economy, with major crops including wheat, fodder, rice, sugarcane, and seasonal vegetables. Irrigation is primarily achieved through tube-well and canal systems, supporting the agricultural livelihoods of the community.

### 4.5.5 Livestock

Livestock farming is a vital secondary source of income, particularly among poorer families. The community primarily raises native breeds of cows, goats, sheep, and donkeys, with dairy products being a key component of local livelihoods.

### 4.5.6 Archaeology and Cultural Sites

While no archaeological sites are present near the project area, local cultural landmarks include mosques, graveyards, and durbars, reflecting the area's rich cultural heritage.

This socio-economic analysis underscores the project's potential to integrate seamlessly into the existing community framework, with careful management to ensure minimal disruption and maximal benefit to the local socio-economic landscape.

# 5 Potential Environmental Impacts and Mitigation measures

This chapter provides a review of the potential impacts by the M/s Emcon Chemicals (Pvt) Ltd, located at Plot 4-A, Value Addition City, Tehsil Chak Jhumra, District Faisalabad, which could occur because of the project activities. These impacts could be both positive and negative in nature and have been classified accordingly by a thorough review of the construction and operational phases of the project. This assessment numerates the magnitude of these impacts with the aid of environmental matrices and presents effective mitigation measures to counter their adverse nature.

## 5.1 Purpose of Environmental mitigation measures

For the project to be running successfully and compliance with environmental regulations mitigation of impacts caused by the project is required. The purpose of the need for mitigation can be answered by various questions as follows:

1. **What is the problem?**

When the resources of the environment are being used ruthlessly, it results in degradation of the environment to the extent that the environment loses its resilience and the carrying capacity reduces the resources found and the recovery process is too slow or nearly no recovery is possible.

2. **When will the problem occur and when should it be addressed?**

The problems that would occur fall within the project premises, and near the boundaries of the project location. The impacts would range up to the distance where project related activities are performed or up to the geographical zone where the effects spread. Impacts would show their presence soon after the project development starts.

3. **Where should the problem be addressed?**

The problems should be addressed where they originated. That is at the project location.

4. **How should the problem be addressed?**

Problems can be addressed by using environmentally friendly practices. Such practices can be followed by the following mitigation plans.

## 5.2 Potential Environmental Impacts and Mitigation Measures due to project location

The location is well linked to the other parts of the city. There will be no enduring, high and adverse impact predicted due to the establishment of the project at this location. The selected site is in the industrial area. Moreover, the area is not inhabited by any ecologically important or protected flora and fauna specie as well as within 500-600 m vicinity of the project area. There is no archaeology and historically important site located.

## 5.3 Potential Environmental Impacts and Mitigation Measures due to project design

The design of a Emcon Chemicals located at Plot 4-A, Value Addition City, Tehsil Chak Jhumra, District Faisalabad, may lead to environmental concerns such as land degradation, water contamination, air pollution, noise disturbances, and waste accumulation. Improper waste disposal can impact water quality, while ammonia emissions and dust may affect air quality. Additionally, high energy consumption and biodiversity disruption are potential risks. However, these impacts can be mitigated by implementing efficient waste management systems, biosecurity measures, water conservation techniques, and renewable energy sources such as solar power and biogas. Establishing proper drainage, ventilation, composting, and tree buffers can help minimize environmental harm. With a well-planned design and sustainable practices, the unit can operate efficiently.

## 5.4 Potential Environmental Impacts and Mitigation Measures due to construction phase

The construction phase of the M/s Emcon Chemicals (Pvt) Ltd located at Plot 4-A, Value Addition City, Tehsil Chak Jhumra, District Faisalabad, could result in various environmental impacts, including soil degradation, dust emissions, noise pollution, water contamination, and waste generation. These impacts effectively managed to ensure minimal disruption to the environment and surrounding communities. Below are the key potential impacts and their corresponding mitigation measures:

### 5.4.1 Soil Degradation and Erosion

**Potential Impact:**

Land clearing, excavation, and leveling will lead to soil erosion and loss of topsoil fertility.
Heavy machinery movement will cause soil compaction, reducing groundwater infiltration.

**Mitigation Measures:**

Excavation will be limited to the required area, avoiding excessive land disturbance. Topsoil will be stored separately and reused for landscaping or farm boundaries. Erosion control measures like tree plantation, vegetation barriers will be implemented.

### 5.4.2 Air Pollution and Dust Emissions

**Potential Impact:**

Dust from excavation, material handling, and vehicular movement will deteriorate air quality. Emissions from construction machinery and generators will contribute to air pollution.

**Mitigation Measures:**

Water will be sprinkled regularly on dusty surfaces to minimize dust emissions. Covered trucks will be used to transport construction materials and reduce airborne dust. Construction equipment will be maintained properly to minimize emissions, and low-emission machinery will be preferred.

### 5.4.3 Noise Pollution

**Potential Impact:**

Construction activities, machinery operation, and material transportation will generate high noise levels, disturbing nearby communities and livestock.

**Mitigation Measures:**

Construction work will be restricted to daytime hours to minimize disturbances. Noise barriers, such as temporary walls or tree plantations, will be established around the construction site. Machinery will be regularly maintained to reduce noise levels.

### 5.4.4 Water Contamination and Wastewater Generation

**Potential Impact:**

Runoff from construction activities will carry sediments, oils, and chemicals, contaminating nearby water sources. Improper disposal of construction waste and wastewater will degrade water quality.

**Mitigation Measures:**

Drainage channels will be constructed to direct runoff away from water bodies and agricultural fields. Sediment traps will be installed to prevent soil erosion into nearby streams or

groundwater. Construction waste will be disposed of properly, and biodegradable or eco-friendly materials will be used where possible.

### 5.4.5 Construction Waste and Debris Management

**Potential Impact:**

Uncontrolled disposal of construction materials like cement, bricks, wood, and plastic will lead to land pollution.

**Mitigation Measures:**

Construction waste will be segregated into recyclable and non-recyclable categories. Materials like bricks and wood will be reused where possible to reduce waste generation.

### 5.4.6 Occupational Health and Safety Risks

**Potential Impact:**

Construction workers will face risks like injuries, exposure to dust, and heat stress. Lack of proper safety measures will lead to accidents and health hazards.

**Mitigation Measures:**

Personal protective equipment (PPE) such as helmets, gloves, and dust masks will be provided. Workers will be trained on health and safety protocols. First-aid kits and emergency response plans will be made available on-site.

## 5.5 Potential Environmental Impacts and Mitigation Measures Due to Operational Phase

The operational phase of the Emcon Chemicals will have several environmental impacts. Below are the key potential impacts and their corresponding mitigation measures:

The operational phase of the products manufacturing facility will bring about several environmental impacts, alongside strategies to mitigate these effects effectively.

### 5.5.1 Impact on Air Quality Potential Issues:

- Emissions of volatile organic compounds (VOCs) and hazardous air pollutants (HAPs) from solvents and chemical reactions.
- Dust generation from material handling and transportation.
- Odors from certain chemicals affecting surrounding communities.

**Mitigation Measures:**

- ✓ Use closed systems and sealed containers to minimize VOC emissions.
- ✓ Install scrubbers to control air pollutants.
- ✓ Ensure proper ventilation in storage and production areas.
- ✓ Implement dust suppression techniques, such as water sprays and covered conveyor belts.
- ✓ Conduct regular air quality monitoring to track emissions and ensure compliance with standards.

### 5.5.2 Impact on Noise

**Potential Issues:**

- Noise from machinery, pumps, and vehicle movement can affect workers and nearby residents.
- Prolonged exposure may lead to hearing impairments and discomfort in the workplace.

**Mitigation Measures:**

- ✓ Install noise barriers and silencers on noisy equipment.
- ✓ Maintain equipment regularly to reduce excessive noise.
- ✓ Enforce mandatory use of ear protection (PPE) for workers in high-noise areas.
- ✓ Schedule transportation and high-noise operations during non-peak hours to minimize disturbance.
- ✓ Monitor noise levels to ensure compliance with workplace safety standards.

### 5.5.3 Solid Waste Management

**Potential Issues:**

- Accumulation of hazardous waste, including used chemicals, sludge from treatment plants, and contaminated containers.
- Generation of non-hazardous waste, such as packaging material, plastic drums, and paper waste.
- Improper disposal leading to soil contamination and health risks.

**Mitigation Measures:**

- ✓ Implement a waste management plan with segregation of hazardous and non-hazardous waste.
- ✓ Ensure safe disposal of hazardous waste through certified vendors.
- ✓ Promote waste reduction and recycling of packaging materials.
- ✓ Store hazardous waste in designated storage areas with proper labeling.

### 5.5.4 Impacts of Wastewater Potential Issues:

- Discharge of process wastewater containing residual chemicals, acids, and stabilizers.
- Potential contamination of groundwater and nearby water bodies if effluent is improperly handled.

**Mitigation Measures:**

- ✓ Install an Effluent Treatment Plant (ETP) to treat wastewater before discharge.
- ✓ Ensure proper drainage systems to prevent spills or leaks into soil and water bodies.
- ✓ Conduct periodic testing of wastewater quality to meet environmental regulations.
- ✓ Train staff on proper handling of liquid waste to avoid accidental spills.

### 5.5.5 Health & Safety of Workers Potential Issues:

- Exposure to toxic fumes, flammable materials, and corrosive chemicals can pose health risks.
- Risk of fire and explosions due to improper handling of chemicals.
- Potential for slips, trips, and falls in the production area.

**Mitigation Measures:**

- ✓ Conduct regular safety training on chemical handling and emergency response.
- ✓ Equip workers with Personal Protective Equipment (PPE), including gloves, goggles, and masks.
- ✓ Install fire detection and suppression systems, including fire extinguishers and sprinklers.
- ✓ Develop and implement a Safety Management Plan and conduct periodic safety drills.
- ✓ Ensure proper storage of flammable and hazardous chemicals with adequate signage.

### 5.5.6 Impact on Flora and Fauna

**Potential Issues:**

The presence of common trees and animals in the area suggests a need to minimize ecological disturbance.

**Mitigation Measures:**

Post-construction tree planting and measures to avoid unnecessary habitat damage will help preserve local flora and fauna.

### 5.5.7 Soil Contamination

- Leakage or accidental spills of chemicals leading to contamination of soil.
- Poor waste disposal practices resulting in accumulation of toxic residues in the soil.

**Mitigation Measures:**

- ✓ Implement secondary containment systems for storage tanks to prevent leaks.
- ✓ Use spill kits and absorbents for immediate cleanup of accidental spills.
- ✓ Conduct regular soil quality testing to detect any signs of contamination.
- ✓ Train staff on safe material handling and emergency spill response.

## 5.6 Environmental Enhancement Measures

The implementation is designed with strong emphasis on environmental stewardship and safety. To mitigate potential environmental impacts and promote a safe, healthy workplace, the project will incorporate the following enhancement measures during both the construction and operational phases:

- At the workplace workers and employers have enough information, knowledge, and training regarding first aid treatment in case of any emergency. The project provides proper medical facilities to workers and staff to cope with any incidental accidents and tackle them.
- Drugs and narcotics are strictly prohibited during working hours in working areas.
- The staff/attendants of the machinery will use proper protective gear.
- Sprinkling water will be done on dusty roads and tracks.
- PPEs will be provided during construction activity.
- Constructional waste and domestic solid waste will be disposed of or utilized properly.
- Local people will be informed in advance when work is about to start in an area.
- Machinery will never be left unattended.

- Efforts should also be made to discuss traffic conditions so that regular traffic is not disturbed. Transporters engaged in the project would be forced to adhere to the load specifications of the access road. No overloading would be allowed in any case.
- Safety signs and boards will be placed during construction.
- Proper SOPs will be followed with a proper schedule along with the HSE conditions.
- The area will be restored with native plants. A proper tree plantation plan will be formulated to save the environment.
- Solid waste will be handed over to contractors and an agreement will be made.
- Noise will be controlled by adopting proper measures.
- PPEs will be provided for workers during work.
- Safety signs will be placed at all locations where required.
- First aid facilities will be made available.
- Any possible measure will be adopted to make the project safe and environmentally friendly.

# 6 ENVIRONMENTAL MANAGEMENT AND MONITORING PROGRAM

This chapter provides a detailed environmental management plan and strategies. The objective of the Environmental Management Plan (EMP) is to address all the major environmental issues and provide a framework for the implementation of the proposed mitigation measures during the operational phase of the project.

## 6.1 Objective of Environmental Monitoring Plan

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

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

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

## 6.2 Environment Management and Monitoring Plan (EMMP)

**Table 4 EMMP**

| ENVIRONMENT MANAGEMENT AND MONITORING PLAN | | | | |
|---|---|---|---|---|
| **S. #.** | **IMPACT** | **MITIGATION MEASURE** | **RESPONSIBILITY** | |
| | | | **IMPLEMENTATION** | **MONITORING** |
| A | **CONSTRUCTION PHASE** | | | |
| 1. | **AIR QUALITY** | | | |
| | Dust, $SO_2$, $NO_x$ & CO emissions from trucks, cause health issues to workers. Particulate matter will be generated during the Construction. | • Spray by water trucks to minimize the dust.<br>• Maintenance of construction machinery should be made mandatory to reduce emissions.<br>• Haul-trucks carrying earth, sand, aggregate and other materials will be kept covered with tarpaulin to reduce dust pollution. | Contractor | Proponent through Consultant |
| 2. | **NOISE** | | | |
| | The impact of noise generated during construction | • Engines of vehicles visiting project site should be properly tuned-up. The green zone of plants will also help decrease sound levels. | Contractor | Proponent through Consultant |
| 3. | **OCCUPATIONAL HEALTH & SAFETY** | | | |

| | | | | |
|---|---|---|---|---|
| | There will always be the possibility of hazard to health and safety of workers to occur during construction stage, lying of piles, and machines installation. | • First aid facilities should be readily available for the workers at the site. The contractor will ensure the availability of transport and driver to handle any mishap which may occur.<br>• Relevant safety devices like belts, gloves and testers should be strictly used by the Labor force at the work site.<br>• Implement training programs that support the achievement of the staff and personnel's competency in relation to HSE. | Contractor | Proponent through Consultant |
| 4. | **DISPOSAL OF CONSTRUCTION DEBRIS** | | | |
| | Each phase of the development shall produce solid waste, disposal of which, if not managed properly could have negative impacts on the site and surrounding area. | • A site waste management plan should be made the responsibility of the contractor. The waste should be properly segregated and separated to encourage recycling of some useful waste materials.<br>• Train or educate the involved stakeholders on the importance and means of waste management and handling. | Contractor | Proponent through Consultant |
| 5. | **GROUND WATER QUALITY** | | | |

| | | | | |
|---|---|---|---|---|
| | No appreciable impacts on the ground water quality are anticipated. | • Avoid accidental spills through good work practice. | Contractor | Proponent through Consultant |
| 6. | **SOIL CONTAMINATION** | | | |
| | Any improper storage or handling of materials including paints, fuels, solvents, oil, cement, etc. would result in soil contamination. | • The contractor should be required to impart proper training to their workforce in the storage and handling of materials | Contractor | Proponent through Consultant |
| 7. | **FLORA & FAUNA** | | | |
| | No negative impact on the ecological environment will take place on account of cutting of any trees in the project area and clearing of vegetation from the site. | • Trees and ornamental plants shall be planted along the project boundary which will increase the aesthetic value of the site and will combat pollution.<br>• Landscaping is deemed to be a powerful mitigation activity with a positive impact. | Contractor | Proponent through Consultant |
| 8. | **SOCIO-ECONOMIC ENVIRONMENT** | | | |
| | Several categories of employees will be required during the construction phase. This would have a positive impact on the local economy and on regional unemployment. | • The socially responsible attitude of the project management towards local people and resources can make project people friendly.<br>• Awareness and educational programs introduced by the project management can reduce the fear among the people regarding non-skilled people. | Contractor & Proponent | SIE |

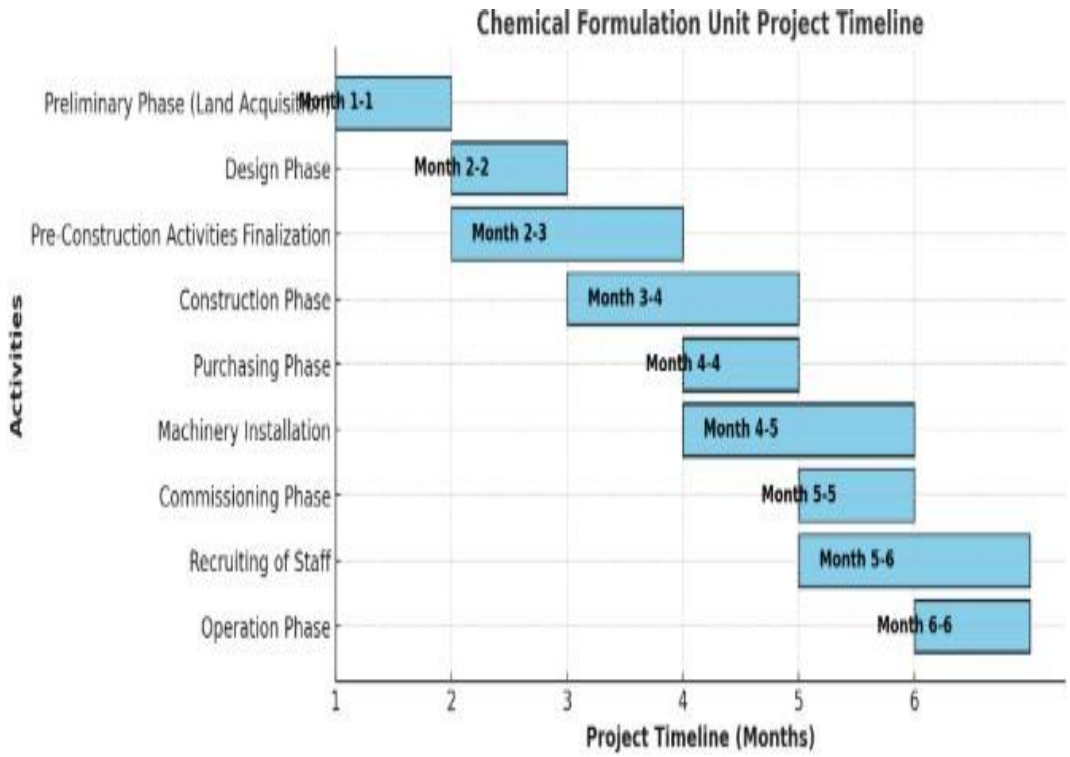
| | | | | |
|---|---|---|---|---|
| B. | **OPERATIONAL STAGE** | | | |
| 1. | **AIR QUALITY** | | | |
| | Air pollution is due to transport and vehicle. | • Proper maintenance and tuning of the vehicles can reduce it. | Proponent | EPA |
| 2. | **NOISE QUALITY** | | | |
| | Noise due to movement of vehicles, during traffic of materials | • Plantation along with boundary will make buffer zone to avoid noise. | Proponent | EPA |
| 3. | **OCCUPATION, HEALTH, AND SAFETY** | | | |
| | There will always be the possibility regarding hazards to health and safety of workers to occur during the operational phase of the project. | • All the workers involved in the transport of the materials will be suggested to wear boots, gloves, safety cap to avoid injury.<br>• Plantation of trees along the boundary walls will help in reducing the noise levels to enough extent. All the vehicles should be properly tuned up and regular maintenance and periodic monitoring must be done. | Proponent | EPA |
| 4. | **SOLID WASTE** | | | |
| | The domestic solid waste may negatively impact the site, the workers, the visitors, and the factory surrounding in different ways including aesthetically, | • Domestic solid waste will be collected in waste bins.<br>• Must use protective gloves while carrying the containers to avoid any hazardous effect. | Proponent | EPA |

| | | | | |
|---|---|---|---|---|
| | occupationally as well as from health, safety, and environment point of view. | | | |
| 5. | **WASTEWATER QUALITY** | | | |
| | Domestic wastewater will be produced. | • Domestic wastewater will be disposed of after treatment through septic tank.<br>• Wastewater will meet PEQS. | Proponent | EPA |
| 6. | **WATER QUALITY** | | | |
| | Due to mixing of contaminant sedimentation, will cause pollution. Water quality decreases. | • Septic tanks will be installed for the treatment of wastewater.<br>• No excess water will be extracted | | |
| 7. | **FLORA AND FAUNA** | | | |
| | Excessive plantation shall be done on the walls. | • The process of plantation should be kept sustainable throughout project life. | Proponent | EPA |
| 8. | **SOCIO-ECONOMIC ENVIRONMENT** | | | |
| | A few employees will be required in the operational phase, and this would have a positive impact on the local economy and on regional unemployment. | • The management of the project can capitalize the positive attitude of people of the study area towards this project by offering them maximum employment opportunities.<br>• Measurements and steps should be taken to keep undisturbed the privacy of adjoining workplaces. | Proponent | EPA |

## 6.3 Proposed schedule for implementation (Tentative)

- **Stage I:** The clearing of land, and preparation of land for construction activity.
- **Stage II:** During this phase, machinery will be brought to the site and installed.
- **Stage III:** In this phase all the outstanding activities will be completed, and construction activities will be initiated.
- **Stage IV**: After completing construction, employees will be hired, and staff will be assigned their respective work. The operation activities will be initiated.

**Table 8 Schedule of Implementation**




## 6.4 Environmental Budget

**Table 5 Environmental Budget**

| Sr.no. | Environmental Components | Quantity | Pak. Rs. | Details/ Basis |
|---|---|---|---|---|
| 1 | **Tree Plantation/ Landscaping** | 500-1000 | 2.5 million | Cost includes plantation and maintenance up to three years |

| | | | | |
|---|---|---|---|---|
| 2 | **Solid Waste Management** | L.S. | 1.5 million | Lump sum |
| 3 | **Wastewater management** | L.S. | 1.5 million | Lump sum |
| 4 | **Health & Safety Measures** | L.S. | 0.4 million | Lump sum |
| 5 | **Miscellaneous Cost** | L.S. | 03 million | Lump sum |
| 6 | **Air Quality Monitoring** | 2 | 10,000 | 2 samples @ 5000/Sample |
| 7 | **Water & Wastewater Quality Monitoring** | 2 | 10,000 | 2 samples @ 5000/Sample |
| 8 | **Noise Level Monitoring** | 2 | 10,000 | 2 samples @ 5000/Sample |
| 9 | **Soil Tests** | 2 | 10,000 | 2 samples @ 5000/Sample |
| 10 | **Training** | | 10,000 | Lump sum |
| 11 | **External Monitoring** | | 50,000 | Lump sum |
| | **Total Environmental and Social Management Cost** | | **Approx. 9.8 million PKR** | |

## 6.5 Environment Management Team

**Responsibilities of Proponent**

The project owner (proponent) will be responsible for the environmental management and supervisory affairs during the installation and operational phase of the project. Environment personnel designated by the management of project will look after the environment related issues during the operational phase. The responsibilities of environmental personnel are as follows:

1. Monitoring progress of the project as per planned schedule of activities
2. Exercising oversight over the implementation of environmental mitigation measures by the contractor
3. Documenting the experience in the implementation of the environmental process
4. Preparing training materials and implementing programs

5. Maintaining interfaces with the other lined departments/ stakeholders
6. Reporting the status of EMP implementation to the management

**Responsibilities of project contractor:**

Contractor appointed for the commissioning of the project including the auxiliary facilities is responsible for:

- Implementation of all provisions of the EMMP and with any environmental and other codes of conduct required by the project.
- Provision of proper Personal Protective Equipment (PPE) to the workers and train them for their proper use.

## 6.6 Monitoring Program to Access Performance

Following functionaries will be involved in the implementation of EMP or to access output:

1. The project owner (proponent) as the project proponent and owner of the EMP.
2. Project excavation contractor(s) as executors of the EMP during installation phase of the project.
3. Transportation & Maintenance (O&M) and the health, safety, and environment team of the project as an executor of the EMP during the transportation phase of the project.

## 6.7 EMP Reporting and Review Procedure

| Category | Impact | Project Activity | Monitoring Mechanism | Frequency | Monitoring Agency |
|---|---|---|---|---|---|
| **Construction and Operational Phase** | | | | | |
| Land Resource | Solid Waste | Implementation of Solid waste Management system | Record keeping and timely transfer of waste from bags to the disposal Site for disposal | Daily | Manager HSE/Project Proponent |
| | Soil Contamination | Implementation of Management Plan | Visual monitoring and complete soil analysis | Daily and annually | |
| Ecological | Flora | Uprooting of trees | Inventory of uprooted | During Baseline | |
| Air Resource | Air Emission | Dust emissions during Construction and Operation | Monitoring of the emissions as per applicable standards Water sprinkling will be done regularly to avoid dust emissions | Once before start of operation and after that as when required during operation | |
| | Dust | | | | |
| Noise | Noise Pollution | Development/operational material transportation | As per applicable standards | Fortnightly | |
| Water Quality | Wastewater generation | Domestic wastewater, due to construction activities | Water quality testing | Monthly | |
| Health and Safety | Health risk | During construction and operational phase mainly due to more chemical usage | Keep record of workers as they use PPE's and follow safety signs and instructions | Daily | |
| Resource | | During construction phase | Trees and vegetation during operation phase | Survey, once in a year and after the completion of the Project | |

## 6.8 Training Schedule

Proponent provides periodic Environmental and HSE training to workers working in their existing plants. The management of Proponent feels HSE is important for moral, legal, and financial reasons. The management of proponent has developed strict SOPs for Health and Safety of workers. These SOPs include SOPs for Personal protective equipment's, Risk Assessment, permit to work, SOP for work at height, Fire Safety and Prevention, Confined Space entry etc. A comprehensive annual training calendar has also been developed for training on topics of HSE for management as well as labors. A training log will be maintained by Site engineer and contractors.

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

# 7 STAKEHOLDERS CONSULTATION

Social acceptability of the project and the area is a key to success. Consultation with the stakeholders is a tool for managing two-way communication between the project proponent and the affected public. Its goal is to improve decision making and build understanding by actively involving individuals, groups, and organizations, which have a stake in the project. This involvement increases the project's long-term viability and enhances its benefits to locally affected people and other stakeholders.

To evaluate the socioeconomic and environmental impacts, filed surveys are extremely essential. In addition to the surveys at the preliminary stage, consultation with the community and their active participation plays a vital role in successful implementation of the project. To identify the different types of stakeholders and ascertain their perceptions about the project, an Environmental Impacts Assessment was conducted. Informal group discussions were also held as an additional tool for obtaining feedback from the stakeholders that are being discussed in the following pages.

## 7.1 Objective of Consultation

Public consultation plays a vital role in studying the effects of the project on the stakeholders and in the successful implementation and execution of the project. Public involvement is a compulsory feature of environmental assessment, which leads to better and more acceptable decision making. The objective of the consultation with stakeholders is to help verify the environmental and social issues that have been presumed to arise and to identify those which are not known or are unique to the construction of the unit.

## 7.2 Proponent's Environment Management Team

| Sr. No. | Managers | Responsibilities |
|---|---|---|
| 1 | Contract Manager | • Implementation of EMP<br>• Environmental issues identification during pre- construction phase.<br>• Communication EMP to all employees. |
| 2 | Contractor | • Ensure that the control measures identified during environmental surveys are implemented as they are relevant to their work/visit. |

| | | |
|---|---|---|
| | | • Ensure that the project management team is notified of any non-conformance of control measures or environmental incident where the environment has been put at risk. |
| 3 | Site manager | • Ensure site material and safe handling of hazardous waste.<br>• Controlled access arrangement to avoid hazards.<br>• Emergency arrangements to avoid any unfortunate incident.<br>• First aid facilities/services should be available on-site.<br>• Ensure good standards of workmanship. |
| 4 | Site HSE advisor | • Management plan to be followed and implemented.<br>• Daily checks & weekly checks.<br>• Regular consultation with workers. |
| 5 | Site Environment advisor | • According to legislation and consent develop EMP.<br>• Ensure application of EMP.<br>• Carry out regular site inspection. |
| 6 | Public Contact Officer | • First point of contact for members of the public.<br>• Arrange and manage public forums.<br>• Maintain relations with stakeholders.<br>• Door to door surveys as appropriate.<br>• Coordination with work. |

## 7.3 The responsible Authority

Overall responsibility for implementation of EMP will be that of project proponent. He will appoint an HSE/Project Manager of relevant qualification. HSE/Project Manager will act as Environmental Manager and will manage all HSE condition at the PEQS.

## 7.4 Other Department and Agencies

For the impact analysis detailed meetings were held with the management of said project, local community, education institutes, health institutes, hospital, and NGOs. Issues were discussed that may affect the environment and the implementation of the project. All possible mitigation measures were considered and incorporated in the Environmental Management Plan.

| Sr. No. | Designation | Concerns |
|---|---|---|
| **1.** | **Environment Protection Department (EPD)** | |
| | General Manager | To reduce environmental impacts following points are summarized:<br>• Solid waste should be managed in Environmentally friendly manner.<br>• Wastewater should be treated effectively & approval should be acquired from concerned agency before disposing of it in a nearby drain.<br>• HSE* at the site should be managed effectively.<br>• No impact is being foreseen due to the selected location.<br>• Locals should be given job opportunities. |
| | Environmental Inspector | |
| **2.** | **Social Welfare Department (SWD)** | |
| | Deputy Director Officer | Following comments are suggested by the Deputy Director on the behalf of SWD:<br>• Final goods should be affordable for the locals.<br>• The project should facilitate locals and they should be economical.<br>• Job opportunities should be given to the locals.<br>• Wages should be given according to the work assigned to them.<br>• Life insurance of the workers should be given as well as all the facilities should be given as per labor laws |
| **3.** | **Irrigation Department** | |
| | Subdivision | Following comments were suggested:<br>• Untreated wastewater should not be disposed of in the nearby drains without proper treatment.<br>• Beneficial as job opportunities will be available to the residents. |
| | Executive Engineer | |
| **4.** | **Forest Department** | |
| | District Forest Officer | Following recommendation were suggested by the forest department:<br>• Planation and landscape activities should be carried out on a broader scale.<br>• Proper drainage system must be available at site |
| HSE* | | Health and Safety Engineer |

## 7.5 Affected and Wider Community

There is no affected community present in the radius of our study area. Team has consulted with the inhabitants of the different areas. They provided positive remarks regarding the subject project and in favor of the subject activity for the project.

Stakeholders' participation Performa's and socioeconomic questionnaire were filled by the inhabitants to evaluate the project socio-economic impacts. The stakeholder category involves nearby residents, different industries, shopkeepers. The issues discussed with them are mostly related to the following:

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

## 7.6 Views, Concerns and Suggestions of Various Stakeholders

The major socio-economic concerns and problems of the affected persons of various communities have been given in tabulated from along with their main concerns and remarks. Community showed a lot of concerns; a few are being mentioned here:

- Removal of shrubs and trees should be avoided, if any, to the extent possible in the case of clearance green zones should be established within the facility. Indigenous trees around the facility should be planted to control air pollution and as the compensation of construction activity.
- The project will become the source of income for local to earn their livelihood easily and honorably, so locals should be preferred.
- For the solid waste management and waste disposal, proper disposal techniques should be adopted.
- Water spraying/sprinkling should be done on the regular basis during construction phase to avoid dust emissions.
- Employment opportunities will be generated and locals should be hired on the priority basis.
- The air pollution is one of the major impacts from which Punjab is being affected at the large scale. So, ambient air quality should be monitored regularly and air pollution expected to generate from the operation should be mitigated.

- Good relations with the local communities will be promoted by encouraging. Contractor to provide opportunities for skilled and unskilled employment to the locals as well as on-job training.
- Noise generated activities should be carried out during day hours.

# CONCLUSION

The aim of the project is to operate chemical manufacturing unit to meet the demand of the market. The name of the project is M/s Emcon Chemicals (Pvt.) Ltd located at Plot 4-A, Value Addition City, Tehsil Chak Jhumra, District Faisalabad. The project involves the chemical Formulation. The project falls under the category of Environmental Impacts Assessment (EIA).

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

- Environmental monitoring by the project proponent and a third party will also ensure that the project runs in accordance with the legal requirements.
- There's no sensitive area/element near the project site.
- The noise levels will be kept well within the required limiting values of the PEQS Pakistan.
- This project will create job opportunities during operation stages leading towards reduction of poverty.
- EMP, as recommended in this EIA Report, is to be put in place during operational stage of the project.
- All the protective measures for workers' health and safety will be followed.
- The availability of water for the project will be ensured without affecting the needs of the people around the project area.
- Proper safety measures will be followed.

# GLOSSARY

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

| | |
|---|---|
| Environmental impact statement (EIS) | A document prepared to analyze the impacts on the environment of a proposed action and released to the public for review and comment. An EIS must meet the requirements of NEPA, CEQ, and the directives of the agency responsible for the proposed action. |
| Emission | The storage and discharge of something, especially gas, or radiation." The effects of lead emission on health" |
| Evaluated | Estimate or determine the nature, value, quality, ability, extent, or Significance |
| Graded | Arranged in a sequence of grades or ranks; "stratified areas of the distribution" |
| Generation | The storage or creation of something |
| Incinerator | A furnace or a container for burning waste materials |
| Inadequate | Not capable or competent; lacking |
| Implementation | The process of putting a decision or plan into effect; execution |
| Intends | To have in mind as something to be done or brought about, plan:<br>to design or mean for a particular purpose, use, recipient, etc. |
| Landfill site | For the disposal of solid waste in which refuse is buried between layers of dirt to fill in or reclaim low-lying ground |
| Legislation | Law enacted by a legislative body |
| Mobilization | To release or make available, as cells or chemical substances |
| Mitigation | The action of lessening in severity or intensity |
| Noise | Loud, unpleasant, unexpected, or undesired sound that disrupts or interferes with normal human activities |
| Potential | Having or showing the capacity to develop into something in the future |
| Pedestrian | A person who goes or travels on foot; walker |
| Proponent | The person who proposes or intends to undertake a project |
| Sanitary | Relating to the conditions that affect hygiene and health, especially the supply of sewage facilities and clean drinking water |
| Segregate | Set apart from the rest or from each other; isolate or divide. "Disabled people should not be segregated from the rest of society |
| Settlement | An official agreement intended to resolve a dispute or conflict. "Unions succeeded in reaching a pay settlement |

| | |
|---|---|
| Ton | A short or net ton is equal to 2,000 pounds; a long or British ton is 2,240 pounds; a metric ton is approximately 2 to 205 pounds |
| Transportation | The action of transporting someone or something or the process of being Transported. "The era of global mass transportation" |
| Ultimate | Being or happening at the end of a process; final. "Their ultimate aim was to force his resignation" |
| Violations | the action of violating someone or something |
| Working place | From the out by side of the last open crosscut to the face |
| Flora | All the plant life in a particular region or period |
| Fauna | All the animal life in a particular region or period |
| Demarcated | Separately clearly, as if by boundaries |
| Screening | The display of a motion picture |
| Substitutions | An event in which one thing is substituted |
| Smelting | extract (metal) from its ore by a process involving heating and melting |
| Regulations | An authorized rule |
| Recycling | process of converting waste materials into new materials and objects |
| Stakeholders | A person or organization with an interest or concern in something |
| Rehabilitation | The conversion of waste land into land suitable for use of habitation or Cultivation |

# LIST OF ABBREVIATION

| | |
|---|---|
| AA | Ambient Air |
| APHA | American Public Health Association |
| AOI | Area of Influence |
| $BOD_5$ | Biological Oxygen Demand |
| CMS | Convention on Migratory Species |
| COD | Chemical Oxygen Demand |
| dB(A) | Decibel |
| EA | Environmental Assessment |
| EHS | Environmental Health Safety |
| EIA | Environmental Impact Assessment |
| EPD | Environmental Protection Department |
| PEPA | Pakistan Environmental Protection Act |
| EPA | Environmental Protection Agency |
| ESIA | Environmental and Social Impact Assessment |
| ESA | Environmental and Social Assessment |
| ESMP | Environmental/Social Management Plan |
| EMP | Environmental Management Plan |
| GIS | Geographical Information System |
| GOP | Government of Pakistan |
| GPS | Global Positioning System |
| GRC | Grievance Redress Committee |
| GRM | Grievance Redress Mechanism |
| HSE | Health Safety & Environment |
| HWMS | Hazardous Waste Management System |
| IEE | Initial Environmental Examination |
| IAIA | International Association for Impact Assessment |
| IWM | Industrial Waste Management |
| IUCN | International Union for Conservation of Nature |
| KM | Kilometers |

| | |
|---|---|
| LGO | Local Government Ordinance |
| MEAS | Multilateral Environmental Agreements |
| MSDS | Material Safety Data Sheets |
| NEQS | National Environmental Quality Standards |
| PPE | Personal Protective Equipment |
| PEQS | Punjab Environmental Quality Standards |
| NEAP | National Environmental Assessment Plan |
| Q&EHS | Quality, Environment, Health & Safety |
| O & M | Operation and Maintenance |
| PKR | Pak Rupees |
| PPM | Parts Per Millions |
| PEPC | Pakistan Environmental Protection Council/Punjab |
| QA/QC | Quality Assurance/Quality Control |
| RAP | Resettlement Action Plan |
| SWM | Solid Waste Management |
| TDS | Total Dissolved Solids |
| UNFCCC | United Nation Framework Convention on Climate Change |
| UNCC | United Nation Convention to Combat Desertification |
| UNEP | United Nations Environmental Programs |
| GOP | Government of Pakistan |
| WHO | World Health Organization |
| R&R | Rehabilitation and Resettlement |
| WWTP | Wastewater Treatment Plant |

**LIST OF PEOPLE CONSULTED WITH WRITTEN FEEDBACK**

| Sr.# | Name | Concerns |
|---|---|---|
| 1. | Kamran Ali Khan | During the survey in the study area following concerns of the local community were noted:<br>• Air pollution should be controlled effectively such as emissions generated from power generating activities.<br>• Locals should be preferred for the job opportunities.<br>• Wastewater should be treated prior to final disposal in nearby drain.<br>• Solid waste should be managed effectively by adopting the standard practices of the area.<br>• An effective EMMP should be designed and enforced with true spirit.<br>• Health of the workers should be ensured.<br>• Planation should be carried out at extensive scale.<br>• Noisy activities should be confined.<br>• Skilled and non-skilled persons both should get job. |
| 2. | Muhammad Waqas | |
| 3. | Qaiser Farooq | |
| 4. | Ghulam Mujtaba | |
| 5. | Mehboob Alam Shahid | |
| 6. | Muhammad Latif | |
| 7. | Mazhar Hussain | |
| 8. | Shahbaz Khan | |
| 9. | Waseem Ahmed | |
| 10. | Rab Nawaz | |
| 11. | ALLAH Yar | |
| 12. | Ahmed Saeed | |
| 13. | Muhammad Jabbar | |
| 14. | Muhammad Ramzan | |
| 15. | Ali Khan | |

# SOURCE OF DATA

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