

EXECUTIVE SUMMARY

The pharmaceutical industry discovers, develops, produces, and markets drugs or pharmaceutical drugs for use as medications to be administered (or self-administered) to patients, with the aim to cure them, vaccinate them, or alleviate the symptoms. Pharmaceutical companies may deal in generic or brand medications and medical devices. They are subject to a variety of laws and regulations that govern the patenting, testing, safety, efficacy and marketing of drugs. In this regard, M/s Neutro Pharma (Pvt.) Ltd is aiming to construct a pharmaceutical products manufacturing plant at Lahore-Sargodha Road, Tehsil Ferozwala, District Sheikhupura. . Proposed project involves production facilities of pharmaceuticals products which are medicines for human use. Production and other facilities will be added.

M/s Neutro Pharma (Pvt.) Ltd at Lahore-Sargodha Road, Tehsil Ferozwala, District Sheikhupura. are planning to get NOC/approval for a pharmaceutical unit. The project site is situated at Self-developed Land.

According to section-12 of PEPA-1997 (Amended, 2012) Environmental Approval/NOC is a mandatory provision.

The said Environmental Impact Assessment Study will cover the sections-12 for Environmental Approval Punjab Environmental Protection Act, Amended 2012. Furthermore, the study provides relevant information, as required under the officially approved format, to help the decision makers i.e. EPA Punjab before issuing the Environmental Approval.

The main objectives of this Environmental Impact Assessment (EIA) Report are to identify the baseline environmental, biophysical and socio-economic conditions, to examine project alternatives including alternate sites, and to study the potential impacts along with formulation of suitable mitigation measures for an environment friendly implementation of the proposed project site and around the project area.

Table 1: Salient Features of the Project

1.	Project Title	M/s Neutro Pharma (Pvt.) Ltd
2.	Project Location	Lahore-Sargodha Road, Tehsil Ferozwala, District Sheikhupura.
3.	Proponent R/O CINC	Khurram Shehzad Alam S/o Khurshid Alam House no. 7/A, Street no. 35, Mohalla Babu Santnagar, Lahore. 35202-4321637-3
4.	Consultant	EnvironTech Consultants Private Limited Address: Office no.11 (2 nd floor) Centre point Plaza, Main Boulevard Lahore. Contact: 0303-4342302
5.	Total Area	10 Kanal 9 Marla
6.	Capacity of Project	Tablets 6 million tablets Capsules 7 million capsules

		Syrups 320,000 bottles Dry Suspensions 280,000 bottles
7.	Location of project	31°36'58.7"N 74°15'06.9"E
8.	Nature of Area	Self-developed
9.	Present status of Land Use	Open Plot
10.	Land use in the surroundings of project site. North South East West	The project is located in Self developed land. The surroundings are: Road Road Industry Industry
11.	Cost of Project	PKR 178 million
12.	Raw material	Liquid Solvent, Solids for Reaction and Gases
13.	Product	Pharmaceutical Products (medicines for human use)
14.	Purpose of proposed project	Manufacturing of pharmaceutical products
15.	Nearby emergency services i.e. Hospital, police station, rescue, fire brigade etc.	At a distance of 5-6 km
16.	Tree Planation	At Designated Green Areas
17.	Water Source	Ground Water
18.	Status of Project	Open/Vacant Land
19.	Source of Power	WAPDA (LESCO)

1.0 Project Description

The said project is basically a part of healthcare sector that deals with medications, it will be a pharmaceuticals industry namely M/s Neutro Pharma (Pvt.) Ltd at Lahore-Sargodha Road, Tehsil Ferozwala, District Sheikhupura. where Active Pharmaceutical Ingredients (API) for medicines will be produced.

The salient features of proposed unit are as under:

- Imported latest art of technology plant/machinery which incorporates the requirements of PEQS rather the plant based on International Standards which are more stringent as compared to standards of Punjab.
- Tablet section
- Dry Powder Suspension Section (General)
- Capsule Section
- Oral Liquid Section
- Quality Assurance / Quality Control Department

- Research & Development Department
- Air Handling System
- Ware House:
- Personnel
- Standard Operating Procedures:
- Effluent Treatment:
- Standard Operating Procedure
- Central fire hydrant system, fire alarm systems, fire extinguishers are placed.
- Emergency assembling points are mentioned in the factory and the workers are trained to cope with any emergency situation.
- Ornamental plants/trees are grown up, grassy lawns have been developed at open place.
- The stand by generators will be latest art of technology and well-tuned within time. Silencer and sound proof canopies are also installed.

Impacts and Recommended Mitigation Measures

In order to identify all the impacts associated with the project during construction and operational activity with potential to cause adverse environmental impacts, a thorough review has been conducted. Although, there is very low chances of any adverse impact occurrence on the surrounding environment. However, in case of impact arises from the project activity possible necessary measures will be adopted to control the same. Overall the project has positive social impacts specifically on the local population and generally contributes in Pakistan's GDP. The project may have some adverse environmental impacts of minor to moderate magnitude which will be controlled through mitigation measures proposed in Environmental Management and Monitoring Plan (EMMP). Moreover, there is no tree present on site, few patches of bushes and grass are present, and restoration and reclamation will be carried out by the plantation of native species in specified green areas. Environmental impacts have been identified and mitigation measures are recommended within the Project Area of Influence. The major impacts on physical, biological and social environments are described as under:

Table 2: Impact Summary

Environmental Parameters	Impact Assessment during Different Phases	
	Construction	Operational
A: Physical		
Land Resources		
Soil Erosion and Contamination	-2p	0
Transportation	-1t	-1t
Solid Waste and By-Products	-2t	-2p
Land Use	-2p	NA
Air Resources		
Noise Pollution	-1t	-1t

Air Emission	-1t	-1t
Dust	-1t	-1t
Odor	NA	-2t
Water Resources		
Ground Water	-1p	-1p
Surface Water	NA	NA
Wastewater	-1p	-2p
B: Ecological		
Flora		
Tree Cutting	-1p	+1p
Fauna		
Terrestrial Fauna	-1p	+1p
C: Socio-Economic		
Employment Opportunities	+1t	+1p
Land Value Appreciation	+1t	+2t
D: Hazards		
Biological Hazards	NA	NA
Physical Hazards	-1t	-1p
Chemical Hazards	0	-1p
Health and Safety	-1t	-1p
<i>Legends: 1= Low; 2= Medium; 3= High; 4= Extremely High; NA= Not Applicable; t= Temporary; p= Permanent; app= Applicable; 0= Negligible</i>		

2.0 Environmental and Social Monitoring Plan

Environmental Management and Monitoring Plan (EMMP) were developed for effective implementation of the recommended mitigation measures. The EMMP includes check and balance to control and minimize the identified impacts and monitoring programs to oversee residual impacts, if any, during the operational phase. The EMMP describes procedures to be followed throughout the construction and operation of the project. It also identifies the roles and responsibilities of all concerned personnel, including the persons reporting during the different project phases. Mitigations for physical, biological and socio-economic parameters will be measured to determine compliance with standards established in EMMP. The Monitoring Plan will record the inputs provided by various participants in the environmental and social management process. It will also check whether the prescribed national and provincial guidelines and plans are being followed and that the required mitigation measures and activities are being accomplished in time.

3.0 Monitoring Plans

During operational phase, monitoring is required to be carried out at least once in a month during rainy season to check the soil contamination and surface water level/condition. Moreover, periodic monitoring should also be carried out regarding ambient air quality, noise and dust level and worker safety. A detailed site monitoring plan has been developed and given in Chapter-7 of this EIA Report.

4.0 Conclusion

The findings of EIA Report showed that although the pharmaceutical manufacturing unit is expected to have significant minor to moderate negative impacts on the environment during the construction and

operational phases, but the severity of these adverse impacts can be reduced significantly by adopting EMMP with true spirit as proposed in the Chapter 7 of this EIA Report. The impacts were assessed by frequent site visits, studying related projects and by reviewing the documents. Generally, the project is planned to follow efficient environmental management systems. Specific environmental and social benefits have been mentioned below which depend on the proper application of mitigation measures suggested in EMMP and best engineering practices.

5.0 Recommendations

The intensity and severity of impacts occurred due to the processing varies with change in the nature and magnitude of the project as well as depends upon the baseline environmental conditions of the area. The mitigation measures will require constant information flow and consultation with the stakeholders to ensure the least adverse social-economic impact to outweigh the “no project development” scenario.

- ⊙ The adverse environmental impacts can be reduced significantly by adopting best management and monitoring practices as well as by implementation EMMP with true spirit
- ⊙ Proper PPEs including gloves, face masks, head gear etc. will be provided
- ⊙ No compromise on public health and environment should be allowed
- ⊙ Waste minimization practices should be introduced to workers by conducting lectures on spot to aware the workers about the long-term benefits of the same in lieu of surrounding environment
- ⊙ A proper tree plantation plan should also be developed in order to make the process environment friendly
- ⊙ Small domestic waste storage bins should be placed at different locations for proper collection and disposal of the solid waste
- ⊙ It is recommended that the Proponent should obtain an Environmental Approval (NOC) from the Punjab-EPA before proceeding further.

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1. SCREENING AND SCOPING

1.1 Screening/Type and Category of Project

Section 12 of Punjab Environmental Protection Act, 1997 (amended 2012) states “No proponent of a project shall commence construction or operation unless he has filed with the Government Agency designated by Federal Environmental Protection Agency or Provincial Environmental Protection Agencies, as the case may be, or, where the project is likely to cause an adverse environmental effects an Environmental Impact Assessment (EIA), and has obtained from the Government Agency approval in respect thereof.” Punjab Environmental Protection Act provided the guidelines for categorizing the projects. According to **Schedule-II** of IEE and EIA Regulations, 2022; the proposed project falls under **Category B (Manufacturing and Processing) Sub-Category 2 (Chemical Manufacturing Unit; including pharmaceuticals and cosmetics)** i.e., the project requires an EIA Study. Thus, an EIA Report is being prepared and submitted accordingly for approval.

The proposed project is the manufacturing of pharmaceutical products.

1.2 Scoping:

1. Spatial and Temporal Boundaries of Environmental Assessment:

Temporal and spatial boundaries for the effects assessment are defined by the characteristics of the project and the VECC being assessed. These boundaries encompass time periods and areas during and within which the VECCs are likely to interact with or be influenced by the project.

- Temporal Extent (during construction and operation)
- Spatial Extent (local or widespread)

2. Views, Concerns and Suggestions of Various Stakeholders

Community showed a lot of concerns; a few are being mentioned here:

- ✚ Removal of shrubs and trees should be avoided to the extent possible
- ✚ The project will become the source of income for local to earn their livelihood easily and honorably
- ✚ The area will become further industrialized
- ✚ For the solid waste management and waste disposal, proper disposal techniques should be adopted
- ✚ Employment opportunities will be generated, and locals should be hired on the priority basis
- ✚ The air pollution is one of the major impacts of the proposed project, so ambient air quality should be monitored regularly
- ✚ Water spraying/sprinkling should be done on the regular basis during construction phase to avoid dust emissions
- ✚ Removal of shrubs and trees should be avoided to the extent possible

- ✚ 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
- ✚ The contractor should prefer hiring local labor from adjacent nearby villages
- ✚ Indigenous trees around the facility should be planted to control air pollution and as the compensation
- ✚ Noise reducing barriers should be installed to reduce noise pollution as the nearest community lies within the radius of 0.5 KM

Concerns

- ❖ Workers should be hired from local community
- ❖ Proper disposal of solid waste should be practiced
- ❖ Proper disposal of wastewater should be practiced
- ❖ Indigenous trees around the facility should be planted to control air pollution
- ❖ Removal of shrubs and bushes should be avoided to the extent possible

3. Significant impacts and factors to be determined

The project is of manufacturing of pharmaceutical products. The nature of the land is Self-developed and current status of land is open vacant plot having native vegetation such as Neem, Kikar, Safeda and wild grass. The study area is leveled and Self-developed land. In addition, there are few minor impacts associated with the operation of manufacturing unit includes the management of the municipal solid waste generated during the, raw-material storage which will be managed according to local practices of area. The impacts from the establishment of M/s Neutro Pharma (Pvt.) Ltd. will occur during the operation due to the civil work involved and the people residing in the project area. These issues included; noise generation, fugitive dust emissions, solid waste management, wastewater disposal, Health and Safety issues and change in the geographic features of the area. These all problems should be addressed on-site where they are being generated, to avoid the residual or adverse impacts.

1.3 Alternatives

The details of the site alternatives and technology alternatives are discussed below:

Site Alternatives

No other site alternative was available to be consider as feasible option for the project as, it is under ownership of proponent. The proposed site was selected because of the following reasons;

- 1) The site is at the safe distance from the nearest residential area.
- 2) The site is present within the Self-developed Area.
- 3) The site is well connected to the other parts of the city through metalled road.
- 4) No human settlements displacement or relocation associated with the project development and operation

- 5) Operation of the proposed unit in the respective zone will provide job opportunities to local people and will improve their socio-economic status of the study area as 100+ employees will be hired during the operational phase

Design/technology alternative

Various design and technological options were evaluated to ensure that the pharmaceutical unit adopts environmentally sound and resource-efficient practices. The selected technology is based on GMP-compliant equipment featuring closed processing systems, automated operations, high-efficiency HVAC with HEPA filtration, and wastewater pre-treatment to minimize emissions and waste generation. Less efficient conventional options were not considered due to their higher environmental footprint and operational limitations. The adopted design is therefore regarded as the most sustainable and technically feasible option in compliance with national environmental standards and pharmaceutical best practices.

Environmental Alternatives:

No important religious, archaeological, recreational site or ecologically/declared protected area and human settlement exists within proximity of the selected site i.e., within 5 Km which is a safe distance. In view of these facts, it can be concluded that the selected site is best suited for the project and will not pose any adverse impact or threat on any component of the environment.

Economic Alternatives:

The technology selected for establishment of above stated project will be economical viable than alternatives present as compared to majority of the other available production technologies, but it will be most efficient and convenient to use.

2. DESCRIPTION OF PROJECT

This section of the study concentrates on details of the project and its salient features; such as its location, site layout, objectives, selection of alternative sites and technology, cost and magnitude of operation at various phases and process employed for the processing of the proposed project.

2.1 Type & Category of Project:

According to **Schedule-II** of IEE and EIA Regulations, 2022; the proposed project falls under **Category B (Manufacturing and Processing) Sub-Category 2 (Chemical Manufacturing Unit; including pharmaceuticals and cosmetics)** i.e., the project requires an EIA Study. Thus, an EIA Report is being prepared and submitted accordingly for approval.

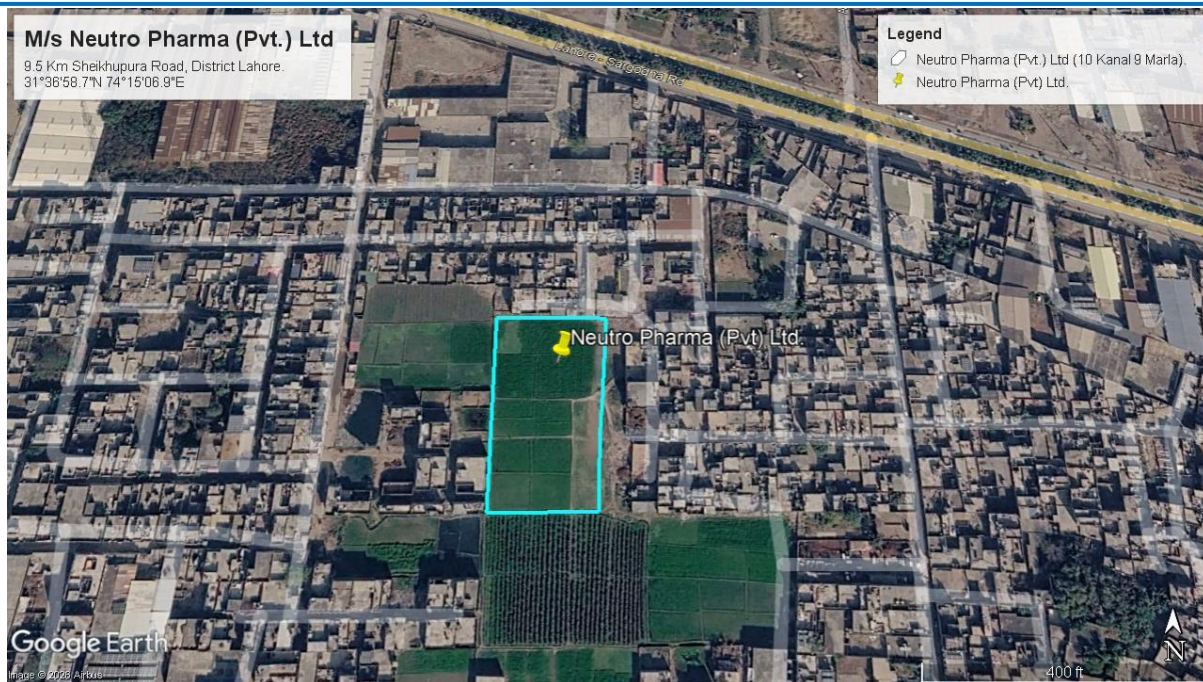
2.2 Objectives of Project

The main objectives of the proposed project are as under:-

- ❖ Responding to the country's national priorities to produce quality pharmaceutical products at latest art of technology plant with international health standards without polluting environment
- ❖ To develop long term strategic business relationship with customers and suppliers.
- ❖ Long-term relationship with multinational and quality conscious companies will ensure commitment to product quality and customer satisfaction,
- ❖ Delivering innovative, high-quality products that help people live better.
- ❖ To conserve and protect environment by using latest techniques.
- ❖ To provide the employment to the people.
- ❖ To change the social life style of the area
- ❖ Revenue generation for the Govt.
- ❖ To upgrade the socio-economic conditions of the area

2.3 Location and Layout of Project

The proposed location for the installation of proposed project of M/s Neutro Pharma (Pvt.) Ltd is at Lahore-Sargodha Road, Tehsil Ferozwala, District Sheikhupura. . The geographical location of the proposed area is 31°36'58.7"N 74°15'06.9"E



Proposed Project Site

2.4 Site Alternatives

No other site alternative was available to be consider as feasible option as, it is under ownership of proponent. The proposed site was selected because of the following reasons;

- 1) The site is at the safe distance from the nearest residential area.
- 2) The site is present within the Self-developed area.
- 3) The site is well connected to the other parts of the city through metaled road.
- 4) No human settlements displacement or relocation associated with the project development and operation
- 5) Operation of the proposed unit in the respective zone will provide job opportunities to local people and will improve their socio-economic status of the study area as 100+ employees will be hired during the operational phase

2.5 Design/technology alternative

Various design and technological options were evaluated to ensure that the proposed pharmaceutical unit adopts environmentally sound and resource-efficient practices. The selected technology is based on GMP-compliant equipment featuring closed processing systems, automated operations, high-efficiency HVAC with HEPA filtration, and wastewater pre-treatment to minimize emissions and waste generation. Less efficient conventional options were not considered due to their higher environmental footprint and operational limitations. The adopted design is therefore regarded as the most sustainable and technically feasible option in compliance with national environmental standards and pharmaceutical best practices

2.6 Pictures of Project Site



2.7 Land Use on Site:

The surface land in and around the project area is leveled and is Self-developed Industrial area in nature. No ecology sensitive receptor such as; forest or reserved area is present within 5 km vicinity that could be affected due to the construction and operation of the aforesaid project.

2.8 Road Access

The project site is linked to main Lahore-Sargodha road.

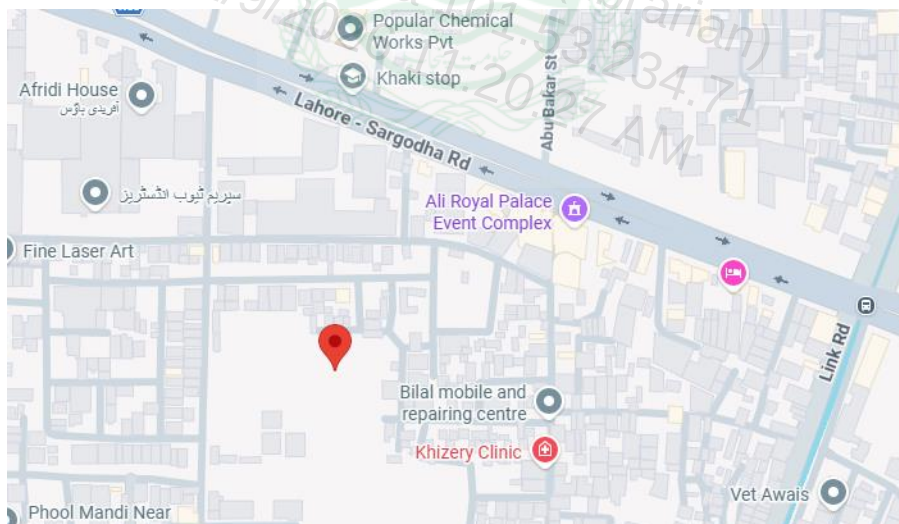


Figure 1: Road Access Map

2.9 Vegetative Features

The area around the project is Self-developed in nature. The main plantation around the project area includes; safeda, bari, neem and kikar.

2.10 Cost and Magnitude of Operation

The proposed project includes the production of different pharma products. List of machinery is attached as an annexure with the EIA report.

Table 3: Breakup of Project Cost

Sr. No.	Description	Amount (Rs. Million)
1	Civil Works	94.97
2	Plant and Machinery	55.39
3	Misc.	22.06
4	Licensing	3.08
5	Environmental Budget	2.50
	Total	178.00

2.11 Schedule of implementation

It is projected that the operational phase of entire project will be started after getting environmental approval from EPA Punjab and complete in the period of 1-2 months. Activities involved are:

- Assessment of environmental impacts and its mitigation measures
- EIA approval, other local issues
- Implementation of recommended alteration in system, if required
- Commencement of operation

2.12 Process Description

The project includes the manufacturing of pharmaceutical products.

a) Basic Raw Materials Required by the Proposed Unit

The basic raw materials such as Liquid Solvent, Solids will be used for manufacturing of finished products. 240 tonnes/Month of raw materials would be required for the project. Raw materials will be stored in a designated storage area. The storage facility will be clean, well-ventilated, and maintained under appropriate temperature and humidity conditions. Materials will be properly labeled, segregated, and stored.

In addition to basic drug or a combination of drugs commonly known as therapeutic ingredient or active ingredient, the tablet consists of a number of inert ingredients which are called excipients or additives.

These additives are added to give the qualities of a good tablet. These additives are formulated in the form of powder or granules before they are made in tablet form.

In case of capsules also the active ingredient are invariably use is more predominant in the production of tablets. These additives are classified in accordance with the function they play in the preparation of tablets or in imparting certain characterizes of the tablets.

Some of them are as follows:

- **Diluents:** Lactose Monohydrate, Microcrystalline Cellulose (MCC), Mannitol, Maize Starch, Dibasic Calcium Phosphate etc
- **Binders:** Povidone (PVP K-30), Pregelatinized Starch, Hydroxypropyl Methylcellulose (HPMC), Starch Paste etc
- **Disintegrants/Granulating Agents:** Maize Starch, Sodium Starch Glycolate, Croscarmellose Sodium, Crospovidone etc
- **Lubricants/Glidants:** Magnesium Stearate, Talc, Colloidal Silicon Dioxide (Aerosil), Stearic Acid etc
- The Project Would Also Require Packaging Materials and Consumables.

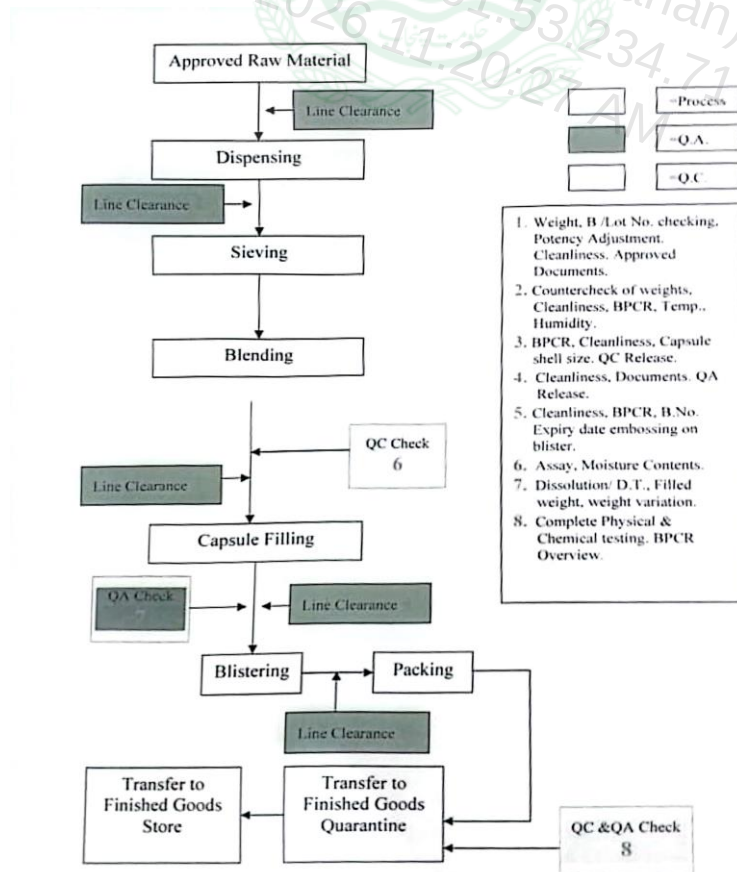
b) Finished Products

The list of products is attached as Annexure.

i. MANUFACTURING PROCEDURE FOR TABLET

- Use raw materials after released by QC Department.
- Weigh raw materials under dispensing booth under the supervision of pharmacist according to formulation.
- Add raw materials one by one in blade mixer.
- Mix it for one hour.
- Add starch paste.
- Further mix for half an hour.
- Make granules through granulator.
- Dry it in oven at 80°C for two hours.
- After making dry grains Intimate to QC department to collect sample for testing.
- Compress tablets in compression machine

Figure 2: Process Flow for manufacturing of Tablets



ii. Manufacturing Process for Capsules

- Use raw materials after released by QC Department.
- Weigh raw materials under dispensing booth under the supervision of pharmacist according to formulation.
- Add raw materials one by one in cone mixer.
- Mix it for one hour.
- Intimate to QC department to collect sample for testing.
- Add powder in a hopper of capsule filling machine and fill the capsule according to target weight.

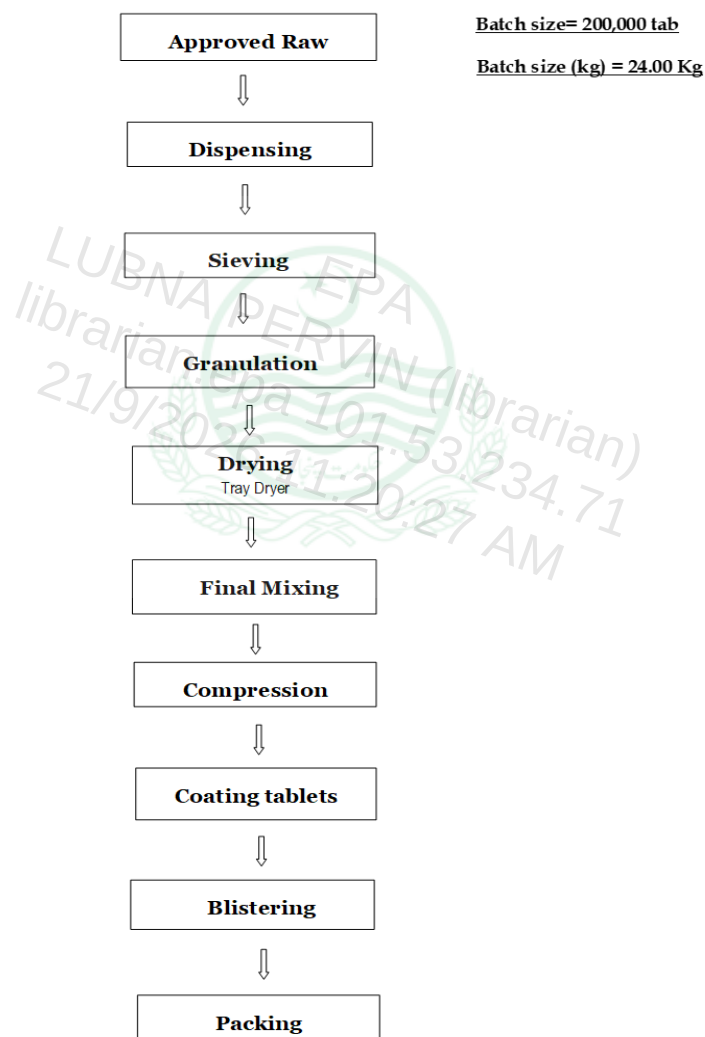


Figure 3: Process Flow for manufacturing of Capsule

iv. Formulation Process for Dry Powder Base Medicines:

Following steps are involved in the formulation of Powder Base Medicines:

i Weighing & Dispensing:

Required quantities are accurately weighed in a dedicated weighing area under controlled environmental conditions to avoid cross-contamination.

ii Dry Mixing / Blending

The weighed materials are transferred into a stainless-steel blender where uniform mixing is carried out to achieve homogeneity. As the product is powder-based, no solvents or water are used at this stage

iii Filling and sealing:

The sterile powder is aseptically filled into pre-washed and sterilized glass vials using an automatic powder filling machine under laminar airflow in a classified cleanroom environment. Sterilized rubber stoppers are placed on the vials, followed by aluminum crimp caps to ensure secure sealing. The closures are tamper-evident and maintain product integrity during handling, transport, and storage.

iv Labelling:

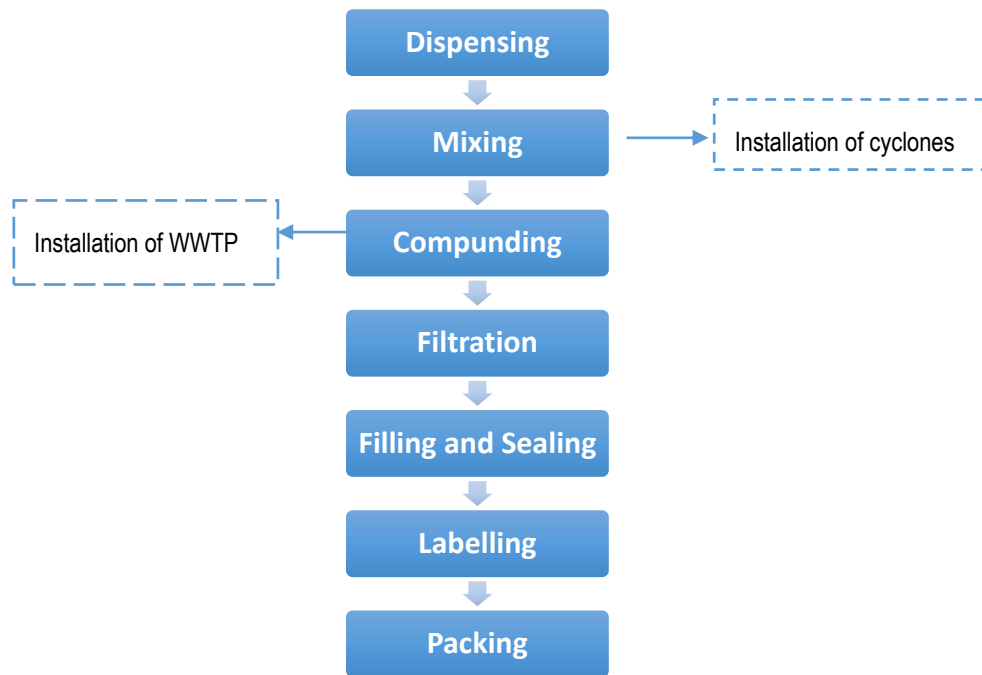
All finished drug products should be identified by labelling, as required by the national legislation, bearing at least the following information:

- a. the name of the drug product;
- b. a list of the active ingredients (if applicable, with the International Nonproprietary Names), showing the amount of each present, and a statement of the net contents, e.g. number of dosage units, weight or volume;
- c. the batch number assigned by the manufacturer;
- d. the expiry date in an encoded form;
- e. any special storage conditions or handling precautions that may be necessary;
- f. directions for use, and warnings and precautions that may be necessary;
- g. The name and address of the manufacturer or the company or the person responsible for placing the product on the market.

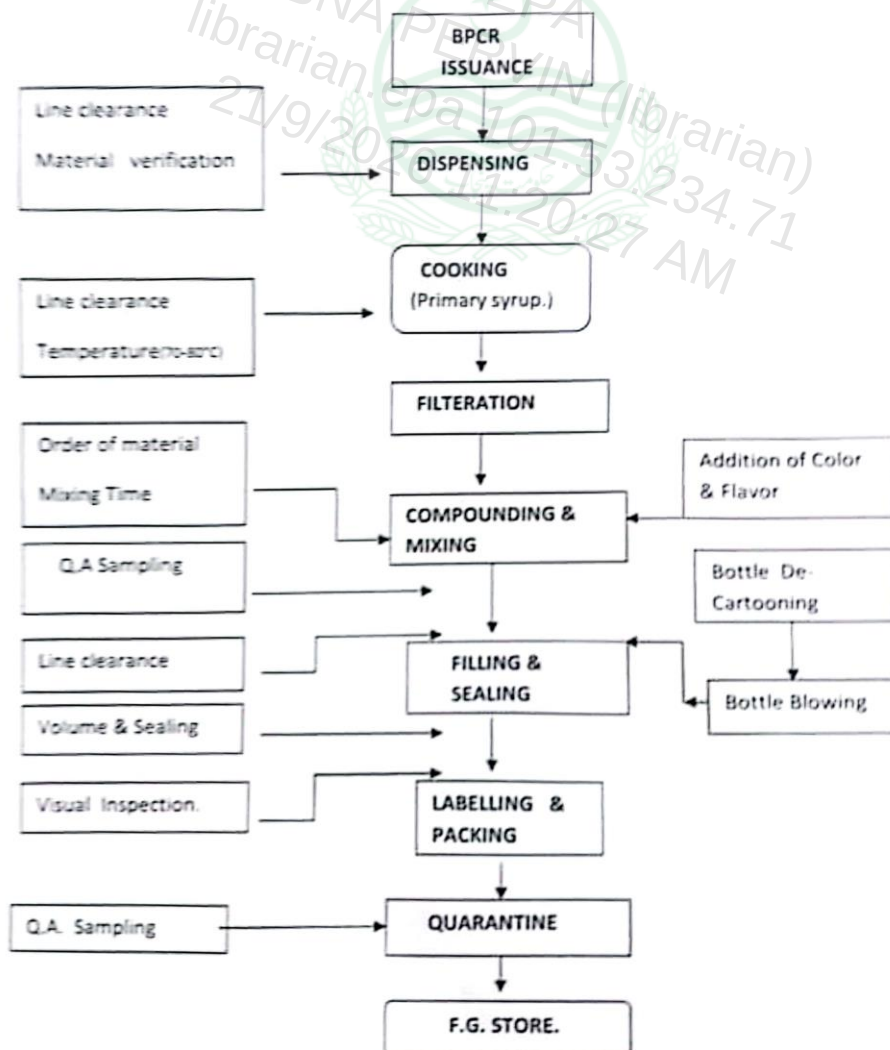
Hence in the following step labels will be pasted on filled and sealed pouches stating the above required data

v Packing

Last step involves packing of final product into boxes which will be ready to dispatch as per market requirement.



iii. Manufacturing Process of Syrups:



2.13 Management Plans

Following management plans will be employed to reduce the impact of the proposed activity

a) Air Emissions

Particulate dust will be generated during construction phase and to deal with the air emissions during the operational phase fume hood will be installed with the efficiency of more than 95% keeping in view of PEQs. For safety purpose the workers dealing with the process activities will be provided with masks, safety shoes and all other necessary PPEs. To reduce the public nuisance native trees will be planted on the boundary to reduce the nuisance and to reclaim the disturbed soil effectively.

Fume Hood design and working principle

A fume hood works by pulling air away from the user into the enclosure with a blower. The fume hood then filters and vents the air to the outdoors through a facility exhaust system. Alternatively, a fume hood may filter the air to remove dangerous fumes and then return the air to the room is sprayed into the exhaust is caught in a filter.

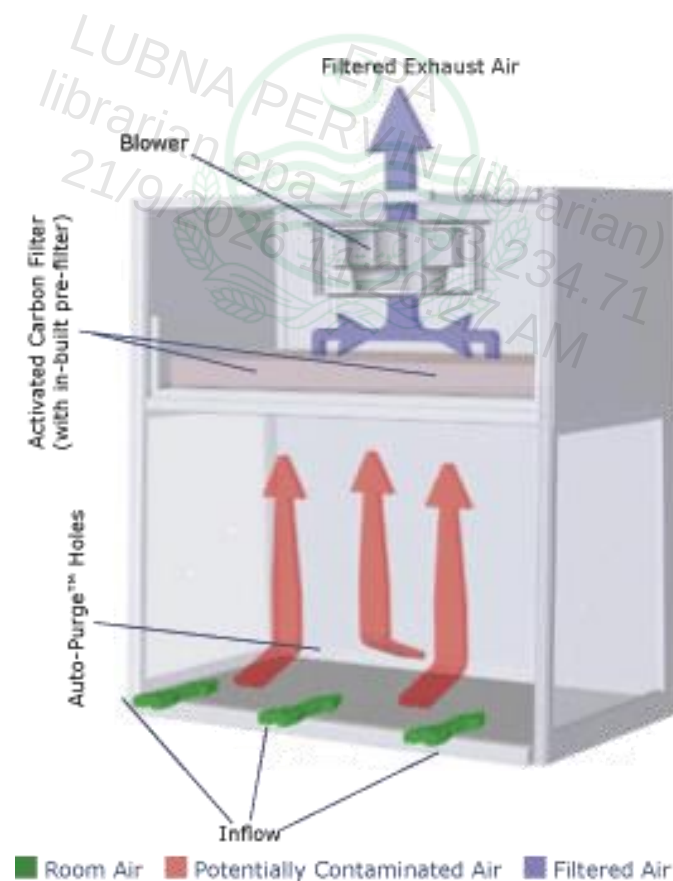


Figure 4: Design of Fume Hood

Specifications: Voltage 440 Volt

Airflow: (m^3/h or CFM) 1500- 5000 CFM

Orientation: Horizontal

Type: Fume hood

Automation: Grade Automatic

Material of Construction: Stainless Steel

Power Source: Electricity

Efficiency: >95

b) Wastewater Management and Disposal

Wastewater will be generated from both process and domestic activities. The process wastewater, estimated at approximately $38 \text{ m}^3/\text{day}$, will mainly originate from equipment washing, production operations, utility blowdown, and laboratory activities. This wastewater will be treated through a proposed Effluent Treatment Plant (ETP) having a treatment capacity of $50 \text{ m}^3/\text{day}$ before its safe discharge or reuse in accordance with the Punjab Environmental Quality Standards (PEQS). Domestic wastewater generated from sanitary facilities is estimated at approximately $9 \text{ m}^3/\text{day}$ based on the proposed workforce. This wastewater will be conveyed to a septic tank followed by a soakage pit (or connected to the municipal sewer/drain, if available) for appropriate disposal.

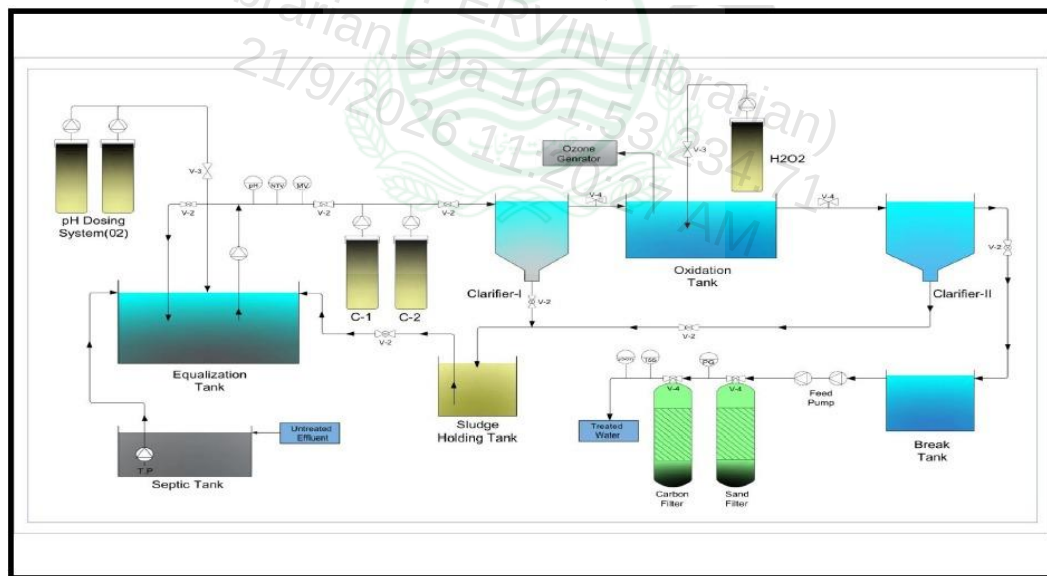


Figure 5: Design for WWTP

It is proposed that tree plantation will also be carried out. The generated wastewater will be consumed for on-site horticultural activities after primary treatment.

c) Solid Waste Management

Most of the solid wastes that will be generated during the daily work can be divided into 3 main categories:

- i. The ordinary household wastes that the workers and the staff generate all-day around; e.g. kitchen and food residues, clothing, personal unneeded articles, etc.
- ii. Municipal residues; e.g. grass clipping, strings, scraps je sort, etc.

iii. Waste medicines and Product Packing.

Total estimated solid waste quantity is 5-6 tonnes/month. Quantity of solid waste will 45 kg/day and is going to be dumped in the containers (number, capacity and type will be identified and sufficient for the needs) which will be emptied by the municipality trash collection cars according to the acting regulations under the supervision of the concerned authorities. Collecting the trash/garbage will be followed on daily basis in disposable environmentally friendly shopping bags. And the waste generated during the process activities or afterwards like waste medicines etc. will be send to a waste disposal facility.

2.14 Amenities

The following social amenities are present at site and the management of the waste (solid waste and effluents) is explained in sub-sections below:

a) Electricity

Electricity will be supplied by Industrial Estate sourced by WAPDA (LESCO).

b) Emergency Preparedness

Emergency response preparedness committee will be formulated consisted of heads of all departments and nominated members. Project Manager will be the head of the team who will chair the Committee. In the case of emergency, he will immediately inform the concerned authorities. HSE Manager will be responsible for on-site HSE management.

First aid facilities will be available at facility which will include; blankets, hot water bottles, sterilized dressing, snake bite kit, cotton and iodine (2% alcohol).

Safety Trainings

Skilled, semi-skilled and un-skilled staff will be provided with proper training about the work and safety practices that need to adopt during the process activities.

Use of Drugs and Narcotics

Drugs and narcotics are strictly prohibited during working hours in working area. Smoking will be only allowed during rest timings at properly isolated places.

Personal Protective Equipment's

Following Personal Protective Equipment (PPEs) will be provided to the workers:

- ✓ **Safety Helmet**
- ✓ **Safety Shoes/Dry Shoes**
- ✓ **Dust Mask**
- ✓ **Safety Gloves**
- ✓ **Safety Jackets**
- ✓ **Earmuffs**
- ✓ **Insulating Gloves and Suits**

Operational hours of facility

During operational phase of the proposed project about 8 Hours working shift/day will be engaged for the operation of the project.

2.15 Restoration and Rehabilitation Plans at the end to the Project Life

The estimated life of the first phase of the project is approximately 50 years. Much before the project approaches end of its first life cycle it will be completely renovated, refurbished and even new/latest state of the art machinery will replace the old one. All civil structures and related infrastructures will be extensively renovated. Even during its first life cycle, pre-emptive modifications, replacements and refurbishing will be carried from time to time under the “order of the day principle”. This will ensure enhancement of the life of the project at very nominal costs. In this way the project life will be further enhanced for another hundred years or so. All activities will be carried out in accordance with prevailing environmental management laws and controls so as to avoid any damage to any segment of environment of human health around the project site.

2.16 Green Features

a) Rainwater Harvesting System

A rainwater harvesting system has been incorporated into the project design to promote sustainable rainwater management and utilization. The system will consist of recharge pits connected to the site's storm water drainage network, enabling efficient collection and percolation of surface runoff within the project premises. Recharge pits measuring approximately 1.5 m in diameter and 4.0 m in depth, fitted with internal gravel filtration media, will be installed at the site.

b) Renewable Energy Production

At present, no solar system has been proposed as the project is still at its proposed stage. However, the proponent might intends to explore the feasibility of incorporating a solar power system in the future to partially meet the facility's electricity demand and promote the use of renewable energy for sustainable operations.

c) Tree Plantation Plan

A tree plantation plan has been integrated into the project, under which 10% of the total project area will be reserved for plantation and landscaping. In accordance with EPA guidelines, trees will be planted within the boundary walls of the project site. Native and pollution-tolerant species such as Neem (*Azadirachta indica*), Kikar (*Vachellia nilotica*), and Eucalyptus (*Eucalyptus globulus*) will be planted along the boundary walls, internal roads, and open areas within the premises.

3. DESCRIPTION OF THE ENVIRONMENT

This chapter provides baseline data (physical, biological and socio-economic parameters) related to the project and study area. The information has been compiled by using primary and secondary data resources. This chapter also refers to the theoretical analysis of the methodology adopted for collection of baseline data. The underlying principles and practices adopted in this regard are also discussed.

3.1 Methodology

The methodology employed to collect the baseline data and information regarding the social structure and various related parameters as discussed in sub-sections below:

3.1.1 Data Collection

The primary data was collected by visiting the project area and its communities in its nearby vicinity. The secondary data regarding physical parameters (topography, geology, seismology, and climate) was obtained by visiting relevant various government departments and their official websites. The biological parameters such as flora and fauna were studied by preparing a floristic list based on visual observation and fauna was studied by using opportunities approach. The species were recorded with reference to their existence in the project area. Information on wildlife fauna species (mammals, amphibians, reptiles, birds, etc.) in the assessment area was compiled based on opportunistic observation, gathering the existing information and consultation with local experts, community members and government and Non-Government Organizations (NGOs).

3.1.2 Social Survey

The purpose of social survey was to record the present condition of the people living in the project area and to assess the expected project impacts on their life, subsistence systems and socio-cultural conditions. Prior to conducting the field surveys, the following steps were taken:

- Clear boundaries of the project area were identified
- Decided the sampling procedure in order to draw a representative sample size of the target population and households
- Developed the tools for data collection i.e. questionnaires to access the socio-economic status of the area

3.1.3 Sampling Design

Social baseline data of the persons residing in the study area has been estimated and collected through random sampling by using pre-developed questionnaires.

3.1.4 Data Editing and Analysis

The filled questionnaires and recorded information were compiled by the same field investigators who were involved in the data collection. This was done immediately after completing the field investigations. Data sets were processed. Analysis of the data and preparation of conclusions in the minimum possible time was done using statistical techniques of data analysis.

3.2 Review of Legal and Administrative Framework

The objective of reviewing legal and administrative framework is to obtain information on all legislation pertaining project development. The Socio-Environment Team of Central Environment Services reviewed the environmental policies, national, international and provincial laws and guidelines relevant to the development of project which helped in systematic identification of impacts.

3.3 Baseline Conditions

This chapter provides baseline data (physical, biological and socio-economic parameters) related to the project and study area

3.4 Physical Environment

Pakistan Can be divided into five broad physiographical regions. These are the mountainous regions of the north, the western highlands and plateaus, the sub-mountains Indus region, the Potohar Plateau, Salt Range, and the Indus Plain. Brief description of these regions is given below:

Region	Characteristics	Location	Height
Northern Mountainous	Hindu Kush Karakoram and Himalayan Mountain Ranges	Northern Part of KPK, Gilgit Agency, Northern Areas and Kashmir.	Rises above 8,000m
Western Highlands and Plateaus	Toba Kakar, Sulaiman, Central Baruhi, Saihan, Central Makran, Makran Coastal and Kirthar Ranges	Mainly in Baluchistan, also parts of Sindh and KPK	Between 1,200 to 3,000 m
Sub-Mountains Indus	Alluvial filled Basins	Plains of Peshawar Kohat and Bannu	Less than 1,000 m
Potohar Plateau and Salt Range	Flat to gently undulating surface, broken by gullies,	Mainly northern parts of Punjab, some parts of KPK	Less than 1,000 m
Indus Plain	Flood plains of the Indus, Jhelum, Chenab Ravi and Sutlej Rivers	Punjab and Sindh	Less than 1,000 m

3.4.1 Topography

Sheikhupura the city of Punjab province, eastern Pakistan. In the town center stands a fort of the Mughal emperor Jahangir (completed 1619) that also served as the 19th-century residence of one of Ranjit Singh's queens; outside the city, the massive Hiran Minar tower overlooks the countryside. Sheikhupura is connected by road and rail with Lahore (25 miles [40 km] southeast) and various other cities. It is an industrial center that makes food products and textiles. The city is in a section of alluvial plain known as the Bar tract, which is irrigated by the Chenab Canal system.

Sheikhupura is an industrial city in the northwest of Punjab province, Pakistan. The city is also the administrative headquarter of the Sheikhupura district and is approximately 38 km from Punjab's provincial capital, Lahore. District Sheikhupura is bounded on the North by Gujranwala and Hafizabad

districts, on the North-East by Narowal district, on the West and South-West by Nankana Sahib District, on the East by Sheikhupura district.

Project Site:

The project site is located in District Sheikhupura.

3.4.2 Hydrology

Groundwater from depth of 100 ft can be used for drinking and other purpose. Groundwater is the major source of water in the study area, which is extracted with the help of pumps and motors. The groundwater extracted is used to fulfill various domestic, irrigation and industrial needs. Ground water quality report of area is annexed. No surface water body is present within 5 km radius of the project site.

3.4.3 Seismicity

According to Seismic Zoning of Pakistan, the project area lies in Zone 2A and represents minor to moderate damage due to earthquakes.

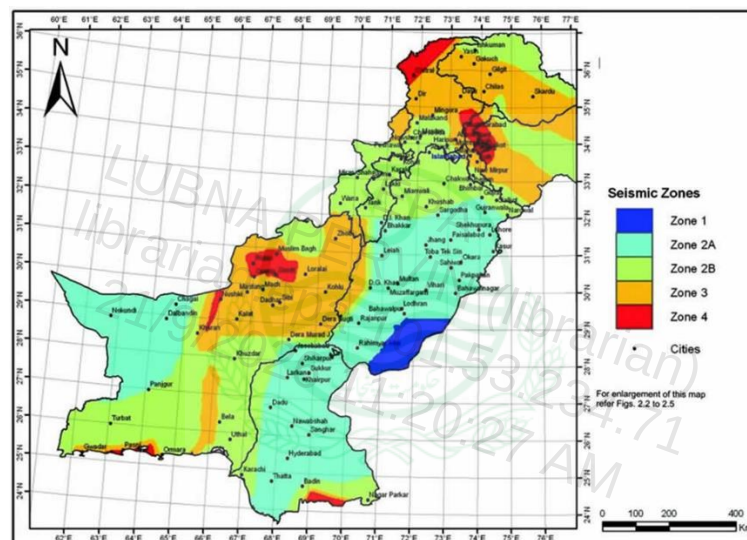


Figure 6: Seismic Zoning Map of Pakistan

3.4.4 Climate

Due to its high evaporation rate, Sheikhupura features hot desert-like climatic conditions according to Koppen-Geiger classification. The climate of the district can see extremes, with a summer maximum temperature 44°C and a winter temperature of 4.0°C. The mean maximum and minimum temperature in summer are 43.5°C and 18.0°C respectively. In winter it peaks at around 19.4°C and 4.1°C respectively. The summer season starts from April and continues till October. May, June and July are the hottest months. The winter season starts from November and continues till March. December, January and February are the coldest months. "The bulk of monsoon precipitation occurs in July and August, with monthly averages of 115.0 mm and 89.8 mm respectively. Minimum rainfall occurs in the month of November which is 3.0 mm" (PMD).

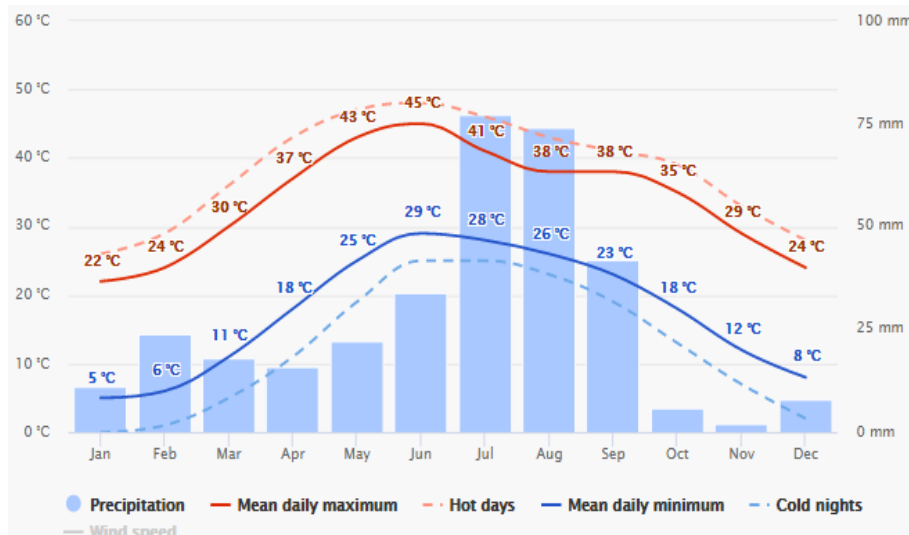


Figure 7: Average Annual Temperatures and precipitation in Sheikhupura

3.4.5 Wind

The diagram for Sheikhupura shows the Max and Average Wind speed and Wind Gust

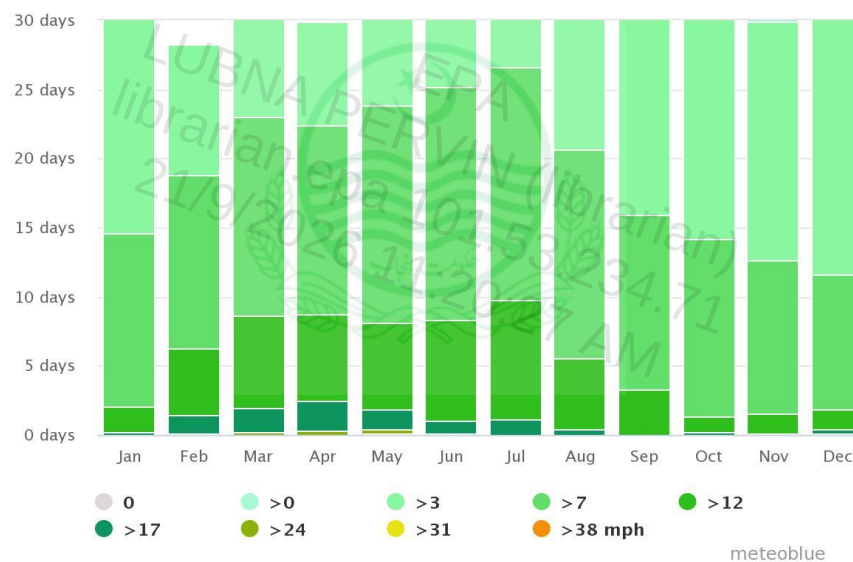


Figure 8: Annual average wind speed in Sheikhupura

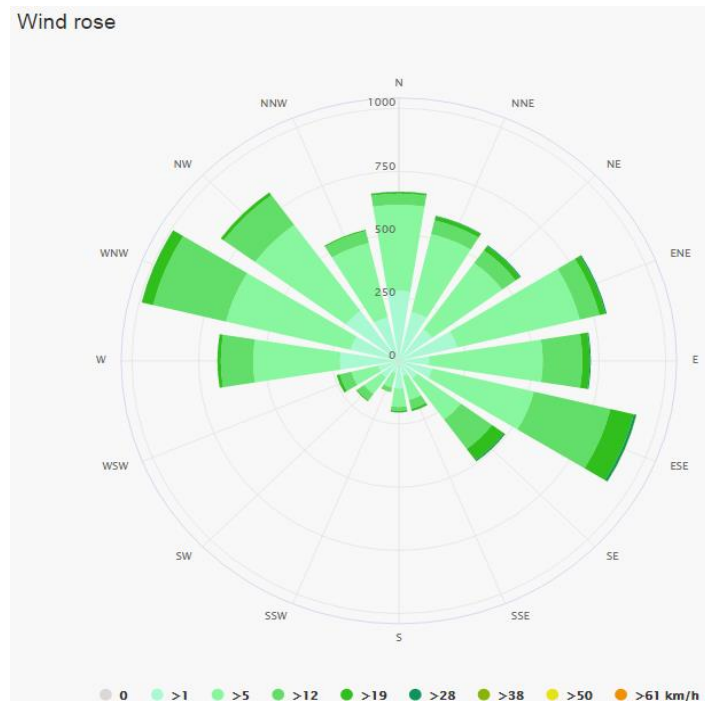


Figure 9: Wind Rose diagram of Sheikhupura

The wind rose for Sheikhupura shows how many hours per year the wind blows from the indicated direction. Example SW: Wind is blowing from South-West (SW) to North-East (NE).

3.5 Ecological Environment

Sheikhupura is enriched with the presence of natural flora and fauna, although with the growing population and development activities, the presence of some has been somewhat affected. They are discussed in detail below.

3.5.1 Flora

The project is located in industrial area. The project site has no vegetative cover, hence, no trees or vegetation will be removed. The dominant vegetation of Sheikhupura comprises a mix of native and introduced tree species are given in table below:

Table 4: Flora of the Study Site

S#	Common Name	Scientific Name
1	Peelu	<i>Salvadora oleoides</i>
2	Amaltas	<i>Cassia fistula</i>
3	Neem	<i>Azadirachta indica</i>
4	Eucalyptus	<i>Eucalyptus citriodora</i>
5	Mulberry	<i>Morus alba</i>
6	Mango	<i>Mangifera indica</i>
7	Poplar	<i>Populus alba</i>
8	Kikar	<i>Vachellia nilotica</i>

9	Safeda	<i>Eucalyptus globulus</i>
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3.5.3 Fauna

For study of fauna in the project area, field guides and books were consulted. On the other hand field observations were conducted along with the interviews of local community members about the fauna of the area. The equipment used in field included cameras, binoculars and GPS device (wherever required). It is important to note that there is a number of factors which can change the findings of such survey. It may be pointed out that the pattern of seasonal migration of small birds varies depending upon each specie. During the construction activity in project area, no important biological feature will be damaged or disturbed as the project falls in industrial area.

Since the district is fully urbanized, the only mammalian fauna are dogs, cats, house rats, and bats. Small Indian mongoose and Indian palm squirrel have also been seen. Reptiles such as cobra, and kraits were once common but are now rare.

Fauna of Sheikhupura include bank myna, blackbird, black drongo, rock pigeon, common babbler, common myna, garden warbler, Indian robin, white-rowed wagtail, little green bee-eater, Asian pied starling, red-vented bulbul, ring-necked dove, long-tailed strike, great spotted woodpecker, white-browed wagtail, Asian koel, common hawk-cuckoo, common koel, pied cuckoo, red turtle dove, dove, rose-ring parakeet, white-backed vulture, white-breasted kingfisher, finch, and lark.

Table 5: Mammals in Study Area

S#	Common Name	Scientific Name
1	Rat	<i>Rattus</i>
2	Bat	<i>Chiroptera</i>
3	Small Indian Mongoose	<i>Herpestes javanicus</i>
4	Indian Palm Squirrel	<i>Funambulus palmarum</i>
5	Porcupines	<i>Erethizon dorsatum</i>
6	Squirrels	<i>Sciuridae</i>

3.5.4 Water Resource

The main source of the water consumption is the ground water which is being pumped from 200 ft borehole and its being used in the study area for domestic purposes. To check the quality of the water in the area, ground water was collected and analyzed. The ground water was collected from bore hole adjacent to the project area.

3.6 Socio-Economic Resources

This section provides collective information about the existing socio-economic and environmental condition of the project area within the AOI. The different types of socio-economic aspects were covered

such as demographic profile, occupation, education and health facilities. This data helped in identifying major interventions for the development of Environmental Management and Monitoring Plan (EMMP). The study also helped to assess the positive or adverse impacts on local community.

3.7 Socio-Economic Profile of Study Area

This topic provides an overview of the baseline information relating to the socio-economic environment of the project area and the AOI. The socio-economic study gives information about the demographic profile, occupation, education and health facilities in the project area.

3.8 Demographic Profile

Mostly community around the purposed project area is the semi-urban. Most of them have their own business. Some of them have private jobs in different industries present in the industrial Area, agriculture and livestock profession. Only a few are government employees. Punjabi is the predominant language being spoken near the purposed project site, representing 55 % of the population, followed by Urdu and Pashto spoken by 40 % and 4.8 %. Sindhi is spoken by 0.2%.

3.8.1 Infrastructure

The project area is situated in Sheikhupura and provides round the clock transport access. All the areas are connected with metaled roads. The buses, motorcycle rickshaws, vans and pickups provide very convenient mode of transportation throughout the area. All bounded area have electricity provided by LESCO along with telephone and natural gas facilities. Sheikhupura has well developed drainage system which fulfills the requirement of the town in rain season as well as in dry weather. The project site area will also be provided with the modern facilities like electricity by LESCO, natural gas by Sui Northern gas pipelines limited, phone facilities by Pakistan Telecommunication Company limited, and very well-designed drainage system along with a septic tank for primary treatment of sanitary water before throwing it to public sewerage. No surface water is available to the area and only source of water to the area is groundwater, which is extracted by means of motor turbines, tube wells and hand pumps.

3.8.2 Educational Facilities

High level education is available near site area well renowned schools and colleges are present at very a lesser amount of distance. The private education schools also exist in surrounding of the project site. The project district has fortunately privileged of big colleges and universities.

3.8.4 Demographic Characteristics of the Population

The field survey (including interviews, focus group discussions, census, and area profile) was carried out to collect the socioeconomic data from the project affected people as well as other general population to accomplish the baseline information, which will provide the basis for subsequent monitoring and evaluation studies.

The demographic features include the information on household's profile, gender composition, occupations, and literacy status of the population residing in the project area. The information relating to the demographic profile of the people in the project area are described below.

3.8.5 Family Size

Based on the field survey of local population, the average family size computed to be 5-6.

3.8.6 Age Groups

Ages of the consulted population were also recorded. The people interviewed for the socio-economic assessment belongs to different age groups i.e. 20-35 years, 36-45 years, 46-55 years, and 56 years and above.

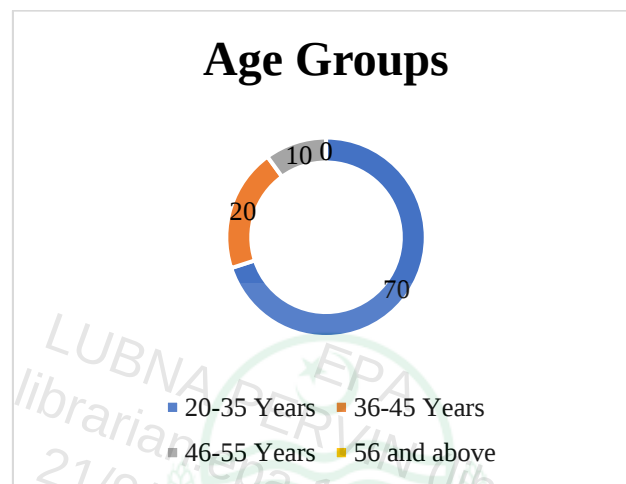


Figure 10: Consulted age groups in the area near project site

3.8.7 Occupation of Respondents

Majority of the respondents (26%) belongs to the business, 33% have their own business, 10% daily wagers, 13% attached with Govt. employee, 15% shopkeepers and remaining 18% are private employees. During survey, efforts were made to interact with people representing all walks of life. The detailed graphic representation of occupational status is given below:

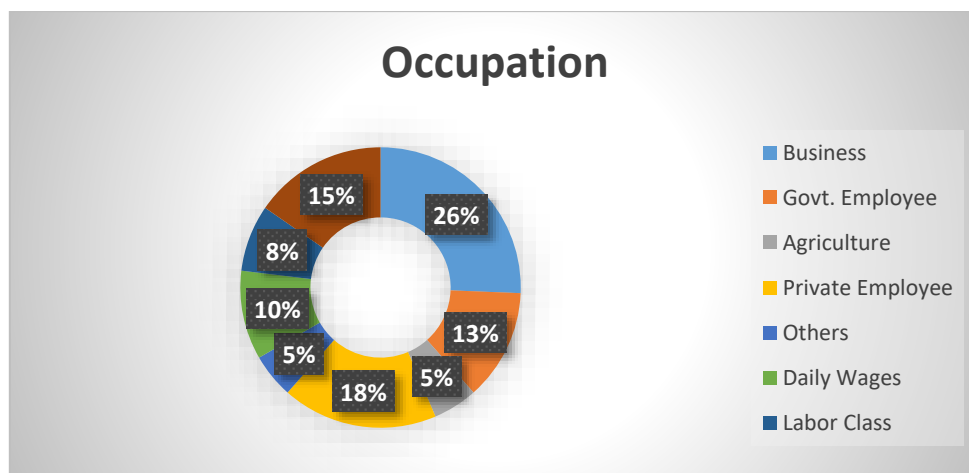


Figure 11: Occupation of Respondents

3.8.8 Literacy Rate

From survey results, it was found that 14% of the studied population was illiterate, 7% was up to primary level, 43% studied up to middle level and only 36% of the respondents studied up to higher secondary level.

3.8.9 Common Diseases

According to the survey the common diseases recorded in the project area were, Diabetes, Fever, Hepatitis, Hypertension, stomach problems, Malaria, Typhoid, Nephritis and Diarrhea.

3.9 Lab Reports of Environmental Analysis

Testing of different parameters was done from a certified laboratory named SEAL to check the quality of different environmental parameters. The copy of the lab reports of these parameters (ambient air analysis, water quality analysis and noise) is attached at Annexure of this EIA Report.

3.10 Suitability of Site:

Comprising all assessment of above baseline data there will be no significant ecological/ environmental impact expected in and around the present selected project site, hence it is suitable for the project.

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4. POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

4.1 General

The potential environmental impacts related to the proposed project have been studied related to design, location, construction and operational stages of the Project. Environmental protection measures are recommended to eliminate adverse environmental impacts or to reduce them to an acceptable level within the prevailing legislative and regulatory framework.

Impacts are evaluated on the basis of magnitude, immediacy and sustainability. Evaluation criteria are as follows:

Magnitude

Type of impact (direct, indirect, cumulative)

Immediacy

Temporal extent (during construction, after construction)

Spatial extent (local, widespread)

Sustainability and Reversibility

Mitigability (fully, partially)

Monitoring (fully, partially)

The basic purpose of mitigation measures is to reduce the impacts of the establishment of pharmaceutical manufacturing unit on the socio-environment up to the maximum possible extent. The mitigation measures are suggested based on the following parameters:

4.1.1 What is the problem?

The proposed project is of manufacturing of pharmaceutical products unit which are organic in nature. The nature of the land is open plot. In addition, to the noise and fugitive dust emissions during the development phase solid waste management and disposal issues may arise along with wastewater disposal issues. There are few minor impacts associated with the operation of manufacturing unit includes the management of the municipal solid waste generated during the, raw-material storage which will be managed according to local practices of area.

4.1.2 When problem will occur and when it should be addressed?

The impacts from the establishment of pharmaceutical manufacturing unit will occur during the operation due to the civil work. These issues included; noise generation, fugitive dust emissions, solid waste management, wastewater disposal, Health and Safety issues and change in the geographic features of the area. These all problems should be addressed on-site where they are being generated, to avoid the residual or adverse impacts.

4.1.3 Where problem should be addressed?

The problem will be generated from site development and operation of the unit. So, it should be addressed on source i.e. at site within the same timeframe.

4.1.4 How the problem should be addressed?

Proper mitigations measures will be provided according to the nature of the impacts/problems. For example, against dust emissions sprinkling of water may be done on regular basis, for solid waste proper solid waste management and disposal practices may be adopted, to manage liquid waste proper treatment may be made before discharging into the receiving body. The change landscape is estimated to be quite minor and the removed topsoil may be used to reclaim the disturbed areas.

4.2 Ways of Achieving Mitigation Measures?

Following ways will be adopted to reduce the impacts of the pharmaceutical manufacturing:

4.2.1 Changing in Planning Design

There is no endangered and threatened species present in the project area. Moreover, there is not any human settlement or infra-structure that will be dislocated or dismantled due to the proposed project development. Hence, there is no need to change the design of project.

4.2.2 Improved Management and Monitoring Practices

The anticipated impacts had been reduced significantly by adopting better management activities, as it will be carried out for betterment of the society. While environmental monitoring will be conducted on the regular basis to keep the sources of the air pollution, wastewater generation, noise and public nuisances in-check. Following practices that need to be adopted to reduce the impact significantly:

4.2.3 Replacement/Relocation/Rehabilitation

The proposed project is located in open land where there is no sensitive area, human population or preserved natural resource is present which could be impacted due to the commencement of the proposed project. No replacement, relocation and rehabilitation will be required for the commencement of the aforesaid project.

4.3 Impact Assessment Methodology

The impact assessment methodology for the installation of the pharmaceutical manufacturing unit is given below:

4.3.1 Screening of Potential Impacts

Based on site visit, observation, brain storming, provided information and social interviews, significant impacts were anticipated and evaluated. Then qualitative and quantitative (where possible) assessment of these anticipated impacts is to be carried out.

4.3.2 Identification of Mitigation Measures

After anticipation and screening of significant impacts, certain mitigation measures are to be provided in order to enhance benefits of project and reducing impacts. These measures can be classified as:

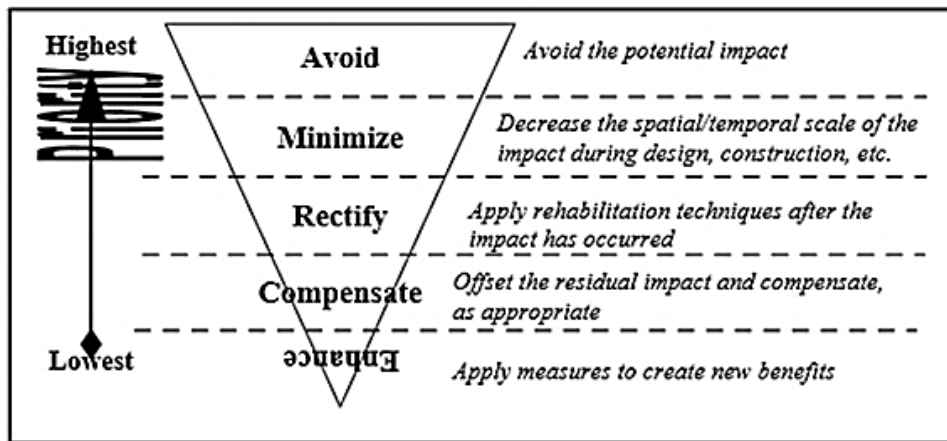


Figure 12: Impact Assessment Hierarchy

4.4 Impact Evaluation

Impact screening checklist and project impact evaluation matrix have been developed to evaluate the potential impacts of the establishment of pharmaceutical plant on the basis of set procedures as given in the environmental guidelines by Punjab EPA.

4.4.1 Methodology for Impact Evaluation

These tools have been used to identify the significance and magnitude of the impact as well as the nature, reversibility and extent:

1. An Impact Screening Checklist
2. Project Impact Evaluation Matrix

Following is given a brief description of assessment tools:

a) Impact Screening Checklist

The impact screening checklist is developed to screen out the potentially insignificant environmental and social impacts from the potentially significant adverse environmental and social impacts during operational phases of the project. The objective of the impact screening process is to assess the significance of the issues related to the air, water, noise, soil, transportation, communication, the hazards and external constraints. The positive and adverse impacts of the project operational phases are identified based on their duration, location, frequency, extent, significance and reversibility. Each activity impacts on various environmental parameters are given below:

Table 6: Impact Screening Checklist

Impact Characteristics														
Sr#	Environmental Component	Duration		Location		Frequency		Extent		Significance			Reversibility	
		Long	Short	Direct	Indirect	Cont.	Intermittent	Wide	Local	Large	Moderate	Minor	Rev.	Irrev.
Beneficial Impacts														
1.	Employment Opportunity	☒		☒		☒			☒		☒		☒	
2.	Availability of Raw-Material	☒		☒		☒			☒		☒		☒	
3.	Appreciation in Land Value	☒			☒	☒			☒			☒		☒
4.	Energy Availability	☒		☒		☒			☒		☒		☒	
Adverse Impacts														
1.	Air Pollution		•	•		•			•			•	•	
2.	Wastewater		•	•		•			•			•		•
3.	Solid Waste and By-Products	•		•		•			•		•			•
4.	Health and Safety		•		•	•			•			•	•	
5.	Chemical Hazards		•	•		•			•		•		•	
6.	Physical Hazards		•	•			•		•			•		•
7.	Security Risks		•		•		•		•		•		•	

b) Project Impact Evaluation Matrix

The Project Impact Evaluation Matrix was developed by placing different environmental parameters that are likely to be affected by the proposed project actions, grouped into categories i.e., physical, ecological and socio-economic environment. For the impact assessment risk assessment methodology was used. Moreover, the risk assessment was done on the basis of project phase (operation). A Project Impact Evaluation Matrix is attached as Table below:

Table 7: Impact Evaluation Matrix

Environmental Parameters	Impact Assessment during operational Phase
A: Physical	
Land Resources	
Soil Erosion and Contamination	0
Transportation	-1t
Solid Waste and By-Products	-2p
Land Use	NA
Air Resources	
Noise Pollution	-1t
Air Pollution	-2t
Dust Emissions	-1t
Water Resources	
Ground Water	-1p
Surface Water	NA
Wastewater	-2p
B : Ecological	
Flora	
Tree Cutting	+1p
Fauna	
Terrestrial Fauna	+1p
C: Socio-Economic	
Employment Opportunities	+3p
Land Value Appreciation	+2t
Availability of Local Raw-Material	+2p
Economic Uplift	+3p
D: Hazards	
Physical Hazards	-1p
Chemical Hazards	-1p
Health and Safety	-1p
Legends: 1= Low; 2= Medium; 3= High; 4= Extremely High; NA= Not Applicable; t= Temporary; p= Permanent; app= Applicable; 0= Negligible	

4.4.2 Impacts during Construction Stage

The potential environmental impacts of the proposed unit along with the mitigation measures during the construction stage of the project have been described as following:

- **Change in land use**

The proposed project site is a vacant plot in the premises of pharmaceutical industry and the area where the project is situated, vacant plot, however industrial units are also located in the near vicinity of the project area.

Mitigation

Proposed project will not impose any major negative impact on the area in view of changes in land use because the proposed site is situated in the premises of working unit as mentioned above.

- **Impacts on Topography**

The construction of the proposed project will not bring major changes in the existing topography of the project site. The changes due to the construction of the unit will be of localized nature. There will be no significant changes offsite the project area.

Mitigation

Not required.

- **Impacts on Soils**

The overall geology and soil quality of the project site is not expected to be adversely impacted due to the execution of the proposed project during the construction period.

Mitigation

Plantation needs to take place at the project site so that soil becomes stabilized.

- **Impacts on Surface and Ground water**

During the construction stage, the sanitary wastewater will be generated by the worker' camp(s).

Mitigation

At project site, the sanitation system already exists which will provide the safe disposal of wastewater produced from workers camp.

- **Impacts on Air Quality**

During construction phase, negligible change will occur in air quality due to the construction machinery used for the development of proposed project.

Mitigation.

No such heavy machinery will be used which has the capacity to change the air quality at project site.

- **Water Consumption**

During the construction of project a small quantity of water will be used because project is small. It will not exert any significant effect on water table.

Mitigation

Not required.

- **Health and Safety of Workers**

The construction activities will impose certain negative impacts on health and safety of the workers. This impact will be minor because the construction volume is small, however mitigation measures will be required to minimize/eliminate health and safety related negative impacts of the project.

Mitigation

Implementation of the following measures will ensure health and safety of the workers during the construction stage:

- The contractor will ensure that the construction workers / laborers are trained in safety procedures for all relevant aspects of construction:
- Proponent of the Project will make regular checks to ensure that the contractor is following safety working procedures/safety measures.
- Formal emergency procedures will be developed for construction site in case of any accident. First aid kits and other necessary equipment will be kept available at site along with the list of emergency phone numbers to be contacted in case of any accident.
- **Impacts on flora**

There are no trees or shrubs present at the proposed project site.

Mitigation

Not required.

- **Impacts on Fauna**

The usual fauna found at the project locality of sparrows, crows, common manias etc. the project will not have any significant impacts on fauna.

Mitigation

Extensive plantation will be done at open places to enhance the beauty of the locality and project site.

- **Change of Land Appearance/layout**

There would be no significant change in the land appearance, as minor execution will be involved in construction activities. The excavated earth material will be used for land filling / uplifting the floor level within the project site.

Mitigation

Not required because the project site is situated in the working unit.

- **Employment Generation**

During construction stage of the proposed project, about 30+ workers/laborers will be engaged. This will be positive change.

Mitigation

Not required.

4.5 IMPACTS DURING OPERATIONAL STAGE

The anticipated environmental impacts related to the proposed Project have been studied for the operational stage as discussed below:

4.5.1 Impacts on Climate

There will be no negative impacts expected to occur overall on climate of the area during the operational stage of the Project because the production process will be undertaken in the closed chamber machines or vessels. Generators and machinery will be maintained properly and will not impose any negative impacts on climate.

Mitigation

Not required

4.5.2 Employment Generation

When the project will be in full operation, it will generate employment for 250-300 persons. This will be a major positive impact.

4.5.3 Air Quality

During the regular operational stage of the proposed project no emissions will be generated from process however some negligible emissions from stand by generators and machinery will be produced to deal with that cyclones will be installed design and specifications are given in chapter-3.

Mitigation

Schedule of over hauling /maintenance of stand by generator/machinery will be developed.

Cyclone will also be installed at generator/machinery.

4.5.4 Noise

During the operational stage, noise will be generated only from the operation of the stand by generators and in the production hall but to the negligible level. No noisy process will be involved in the proposed project.

Mitigation

The proper foundation of the stand by generator will be constructed to cope with the problem of tremor / vibration which will consequently abate the noise problem.

- ❖ Sound proof canopy and silencer will also be installed.
- ❖ Schedule of over hauling /maintenance of stand by generator will be developed.
- ❖ Proper set back will be provided from the boundary wall, which will also help to minimize / eliminate the noise pollution.
- ❖ Extensive tree plantation along the boundary wall and at open places will also be done to act as sound barrier / sound absorber.

4.5.4 Vapor/Fumes in Production Hall

While production of the anti-biotic products some negligible fumes may be produced in the production hall. However, all the process will be undertaken in the closed chamber plan.

Mitigation

- ❖ Suction Hood will be installed in the production hall to suck the fumes if needed.
- ❖ These vapors or fugitive emissions will be captured into wet cotton filters.

4.5.5 Water Consumption

During the operational stage of the proposed project water will be used for washrooms, kitchen and process.

Mitigation

At open places the grassy lawns will be developed to recharge the water table, which will also help to control the surface runoff during rainy season. Treated wastewater will be sprinkled inside the industry premises on grassy plots.

4.5.6 Wastewater Generation

During the regular operation of the proposed project wastewater will be produced from different sources as process, kitchen or washrooms, floor washing etc.

Mitigation

- ❖ For the treatment of above mentioned, wastewater treatment plant will be installed.
- ❖ The treated wastewater will be sprinkled or used for watering of tree plantation and vegetation within the battery limits of factory.

4.5.7 Solvent Liquid Waste Generation

While operation of unit spent solvent, as liquid waste will also be generating from decontamination of mixing equipment.

Mitigation

Reuse spent solvent liquid waste from equipment decontamination as makeup in subsequent formulations.

4.5.8 Solid Waste Generation

No process solid waste or hazardous waste will be produced. Only plastic drums and packing material will be produced.

Mitigation

Packaging material and plastic drums are saleable items and will be sold to contractors and record will be maintained.

4.5.9 Health and Safety of Workers

The workers especially working in the production hall / area may be at health risk. Because they may be some exposure if they will not be properly trained and provide with Personal Protective Equipment (PPEs). This will be major negative impact if not mitigated properly.

Mitigation

To mitigate the hazards of health and safety of workers the following mitigations measures will be undertaken:

- ❖ No worker aged below 18 years or over 60 years shall be employed for any job involving physical handling of hazardous substances.
- ❖ All workers shall be thoroughly trained in safety precautions for handling hazardous substances and shall be supervised by qualified supervisors.
- ❖ Protective clothing and equipment comprising helmet of cloth cap, safety spectacles or goggles, respirators or masks, rubber or plastic gloves and workboots shall be available for all workers who may be exposed to any hazardous substances, and no worker shall be permitted on job unless and until he is wearing such protective clothing and equipment.
- ❖ To avoid any kind of potential environmental hazards the worker would be trained properly so that they know the potential hazard of chemical.
- ❖ Proper cross ventilation shall be under taken to avoid from any bad smell/odor.
- ❖ There will be proper arrangement to handle accidental / disastrous situation.
- ❖ The instructions for the workers, safety signs and precautionary / preventive measures for the costumers / visitors would be displayed at the suitable / prominent places.
- ❖ Adequate supply of water shall be made available to the workers for their personal washing as well as for washing their protective equipment's.
- ❖ Protective clothing and equipment's of the workers shall be washed and cleaned as often as required to ensure their efficiency.
- ❖ No worker shall be permitted to eat, drink or smoke till he has removed his protective clothing and equipment, washed his hands and face and left the place of work.
- ❖ All firefighting, emergency and safety equipment's shall be frequently checked and properly maintained.
- ❖ First aid medical facilities equipped with required antidotes shall be available in the premises, supervised by trained staff.
- ❖ Medical checkup of all workers shall be carried out at the time of employment and at least once a year thereafter.

4.5.10 Emergency Response

The operation of the proposed unit will handle workers and visitors who may become ill or have work related accidents. In addition, disasters such as earthquakes and fires may occur which have to be considered for minimizing their impacts.

Mitigation

- ❖ An Emergency Response Plan for earthquakes and manmade disasters will be prepared by the project management.
- ❖ Adequate supply of water shall be made available to the worker for personal washing as well as for washing their protective equipment's.
- ❖ All firefighting, emergency and Safety equipment's shall be frequently checked and properly maintained.
- ❖ Proper size and types of portable fire extinguishers will be kept near areas where flammable liquids are handled or stored.
- ❖ Adequate fire suppression system will be installed and properly functioning.
- ❖ The aesthetic conditions / outlook of the unit should be improved by tree plantation / ornamental plants and proper physical infrastructure.
- ❖ Proper disastrous and firefighting arrangements (fire extinguisher, fire hydrants, kits, instruments etc.) shall be ensured at many places of both sites.
- ❖ The internationally recognized health and safety standards will be adopted and the Emergency Response Plan will be developed and implemented in close consultation with the Fire Fighting Department.

4.6 POTENTIAL ENVIRONMENTAL ENHANCEMENT MEASURES

4.6.1 Tree Plantation

Tree plantation within and outside the premises is a potential environmental enhancement measure. A large area will be reserved for tree plantation and among plants native flora like Peepal, Kikar, Dherak, Safeeda and Amaltas will be planted in the specified green zone which will have the maximum capacity to reduce noise pollution and tolerance index of these species are more than 10. Some floral species like roses and other ornamental evergreen plants will also be introduced in the lawn which will enhance aesthetic beauty. In addition, trees like Safeeda and Amaltas will be planted as boundary wall inside the lawn which will look like green wall. The proponent will also make arrangements for protection and maintenance of trees.

4.6.2 Facility Design

The introduction of an ecologically effective and efficient design of a facility is the environmental enhancement measures planned by the proponent to be incorporated into the design of the intended project.

4.6.3 Social Enhancement Measures

Following measures will be adopted to improve the socio-economic condition of the area:

a. Employment/Poverty Alleviation

The employment opportunities in the project area will be increased due to the establishment of proposed project at the aforesaid location. During establishment of the aforesaid facility un-skilled workers will be required as labors, sanitary workers and sweepers as well as for the skilled workers such as; accounts and managers to run the administration office local community will be considered on the priority basis. In totality, the overall economic conditions of the area will be improved due to the establishment of the aforesaid project.

b. Local Economy

The employment opportunities and/or income sources generated by the project construction and operation will be long term in nature. These will be enhanced once the construction phase is completed. The local economy will experience a slight boom during development and operational period.

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5. ENVIRONMENTAL MANAGEMENT AND MONITORING PROGRAM

This chapter summarizes the various mitigation measures as outlined previously in this EIA Report that will be implemented during the construction, operational and decommissioning stages of project. It does not discuss further the mitigation measures which have been adopted within the design and planning of the project, as these are comprehensively covered in previous section of this EIA Report.

Outline and key features of the EMMP for operations phase is presented. As per the environmental legislation in Pakistan, the EMMP for the operations phase, along with other documents, is to be submitted to the environmental protection agency to obtain confirmation for compliance and Environmental Approval for project operation. Even after implementation of the suggested mitigation measures, the impact may remain significant, and require monitoring.

5.1 Objectives

An Environmental Monitoring Plan was outlined alongside Environmental Management Plan to ensure all the corrective actions to counter adverse impacts which gives a detailed EMMP. The EMMP will serve as a principal execution module of the project that would not only mitigate adverse environmental impacts during the construction and the operational phase of the project but also ensures that environmental standards and good in-housekeeping are being practiced. Continuous environmental monitoring is exercised to ensure that preventive measures are in place and effective to sustain environmental integrity.

The key objectives of EMMP are:

- ⊙ To outline functions and responsibilities of persons
- ⊙ To state and implement standards and guidelines which are required under environmental legislations particular in context to the Project
- ⊙ To facilitate the implementation of the mitigation measures by providing the technical details of each Project's impact and proposing implementation schedule of the proposed mitigation measures
- ⊙ Define a monitoring mechanism and identify monitoring parameters to ensure that all proposed mitigation measures are completely and effectively implemented
- ⊙ Identify the resources required to implement the EMMP and outline corresponding financing arrangements

5.2 Management Approach

The organizational roles and responsibilities of the key players are summarized below:

5.2.1 Proponent

The project proponent will undertake overall responsibility for compliance with the EMMP. The concerned departments will carry out verification checks to ensure that the contractors are effectively implementing their environmental and social requirements.

5.2.2 Contractors

The contractors will implement the majority of environmental and social mitigation measures. The contractors will carry out field activities as part of the project. The contractors are subject to certain liabilities under the environmental laws of the country, and under its contract with proponent.

5.3 Components of EMMP

The EMMP consists of the following:

- ⊙ Institutional arrangements
- ⊙ Mitigation plan to reduce the severity of associated impacts
- ⊙ Monitoring plan to monitor the impacts and their severity
- ⊙ Environmental and social trainings to raise awareness

5.3.1 Remedial and Mitigation Measures

The objective of remedial and mitigation measures in any project is to identify practices, technologies or activities that would prevent, minimize or mitigate all significant negativities that are likely to occur due to the proposed project.

5.4 Environmental Management and Monitoring Framework

The purpose of the environmental management and monitoring framework is to facilitate the implementation of environmental commitments, included in the environmental impact assessment. The proponent is committed for the protection of the environment and to the sustainable management of its related operations and activities.

Table 8: Environmental Management Plan

Sr. No.	Project Component or Impact	Target	Action	Responsibility
A- Pre-Construction / Design Related				
1	Seismic Hazard Analysis	To project the building structure from seismic hazard	The building will be designed to withstand moderate to large earthquakes	Proponent / Design Consultants
2	Emergency Response	To mitigate the emergency condition	The following mitigation measure will be adopted to minimize or eliminate the emergency situations: - The design of building will also include emergency exists which can be used during emergency situation. - Adequate internal and external water distribution system will be designed, which could also supply adequate quantity of water for firefighting during emergency. - Fire hydrants and firefighting extinguishers will be provided at locations where necessary.	Proponent / Design Consultants
B- Construction Stage				
1	Impacts on soil	To ensure the minimum changes in soil	Plantation needs to take place at the project site so that soil becomes stabilized	Contractor / Proponent
2	Impacts on surface and ground water	To mitigate the problem of contamination of surface and groundwater	At project site, the, sanitation system will be provided for the safe disposal of wastewater produced from workers camp.	Contractor / Proponent

3	Health and Safety of workers and public	To ensure health and safety of workers and public	Implementation of the following measures will ensure health and safety of the workers during the construction stage: - The Contractor will ensure that the construction workers / laborers are trained in safety procedures for all relevant aspects of construction; - Proponents of the Project will make regular checks to ensure that the contractor is following safety working procedures / safety measures. - Formal emergency procedures will be developed for construction site in case of an accident. First aid kits and other necessary equipment will be kept available at site along with the list of emergency phone numbers to be contracted in case of any accident. - The safety of the public at all stages of the construction will be ensured through appropriate public education and safety measures such as use of sign boards, barriers and flags and proper illumination at night.	Contractor / Proponent
4	Fauna	To ensure that fauna may be affected at minimum level	Extensive plantation will be done at open places to enhance the beauty of the locality and project site. This will also help to protect fauna, particularly birds.	Factory Management / Proponent
5	Disposal of Mucking Material	To avoid the degradation of soil	- The spoil will be carefully examined and disposed off in an environmental friendly manner by transporting it in closed containers and filling at appropriate sites. - It is also desirable to utilize the muck in such a way that it is consumed for the construction of any other structure within the Project Site or in the immediate vicinity. - Utilization of much in the vicinity of the Project Site is considered as the best option for its disposal.	Contractor / Proponent
C- Operational Stage				
1	Air Quality	To avoid the degradation of air quality	In order to minimize air pollution, following mitigation measures are recommended:	Factory

			- Schedule of over hauling/maintenance of stand by generator will be developed. - Installation of Cyclone	Management / Proponent
2	Vapors/Fumes in Production Hall	To mitigate the vapors/fumes impact in production hall	- Suction Hood will be installed in the production hall to suck the vapors or fugitive emissions (if needed). - These vapors of fugitive emissions will be captured into wet cotton filters and then these filters will be sent to lab for industrial waste incineration.	Factory Management / Proponent
3	Noise	To mitigate the Noise problem	- The proper foundation of the stand by generator will be constructed to cope with the problem of tremor / vibration which will consequently abate the noise problem. - Sound proof canopy and silencer will also be installed. - Schedule of over hauling / maintenance of stand by generator will be developed. - Proper set back will be provided from the boundary wall, which will also help to minimize / eliminate the noise pollution. - Extensive tree plantation along the boundary wall and at open places will also be done to act as sound barrier / sound absorber.	Factory Management / Proponent
4	Water Consumption	To mitigate this problem	- At open places the grassy lawns will be developed to recharge the water table, which will also help to control the surface runoff during rainy season. - Treated wastewater will be sprinkled inside the mill premises on grassy plots. However, the area is agricultural in nature, so the maximum rainwater will recharge the water table.	Factory Management / Proponent
5	Solvent Liquid Waste Generation	To proper reuse the liquid solvent waste	Reuse spent solvent liquid waste from equipment decontamination as makeup in subsequent formulations.	Factory Management / Proponent

6	Wastewater Generation	To mitigate the problem	- For the treatment of above mentioned wastewater treatment plant will be installed. - The treated wastewater will be sprinkled or used for watering of tree plantation and vegetation within the battery limits of factory.	Factory Management / Proponent
7	Solid Waste Generation	To establish a proper management plan for this solid waste	- No process solid waste or hazardous waste will be produced. - The dispensary waste will be incinerated through Shalimar Hospital incinerator.	Factory Management / Proponent
8	Health & Safety of Workers	To provide necessary health & safety facilities	To mitigate the hazards of health and safety of workers the following mitigations measures will be undertaken: - No worker aged below 18 years or over 60 years shall be employed for any job involving physical handling of hazardous substances. - All workers shall be thoroughly trained in safety precautions for handling hazardous substances and shall be supervised by qualified supervisors. - Protective clothing and equipment comprising helmet of cloth cap, safety spectacles or goggles, respirators or masks, rubber or plastic gloves and workboots shall be available for all workers who may be exposed to any hazardous substance, and no worker shall be permitted on job unless and until he is wearing such protective clothing and equipment. - To avoid any potential environmental hazards the workers would be trained properly so that they know the potential hazard of chemical. - Proper cross ventilation shall be undertaken to avoid from any bad smell/odor.	Factory Management / Proponent

			• There will be proper arrangement to handle accidental / disastrous situation. • The instructions for the workers, safety signs and precautionary / preventive measures for the costumers / visitors would be displayed at suitable / prominent places. • Adequate supply of water shall be made available to the workers for personal washing as well as for washing their protective equipment's. • Protective clothing and equipment of the workers shall be washed and cleaned as often as required to ensure their efficiency. • No worker shall be permitted to eat, drink or smoke till he has removed his protective clothing and equipment, washed his hands and face and left the place of work. • All firefighting, emergency and safety equipment's shall be frequently checked and properly maintained. • First aid medical facility equipped with required antidotes shall be available in the premises, supervised by trained staff. • Medical check-up of all workers shall be carried out at the time of employment and at least once a year thereafter.	
9	Emergency Response	To mitigate the problem of emergency situations	• An Emergency Response Plan for earthquakes and man-made disasters will be prepared by the project management. • Adequate supply of water shall be made available to the workers for personal washing as well as for washing their protective equipment's. • All firefighting, emergency and safety equipment's shall be frequently checked and properly maintained.	Factory Management / Proponent

			• Proper size and types of portable fire extinguishers will be kept near areas where flammable liquids are handled or stored. • Adequate fire suppression system will be installed and properly functioning. • The aesthetic conditions / outlook of the unit should be improved by tree plantation / ornamental plants and proper physical infrastructure. • Proper disastrous and fire fighting arrangements (fire extinguishers, fire hydrants, kits, instruments etc.) shall be ensured at many places of both sites. • The internationally recognized health and safety standards will be adopted and the Emergency Response Plan will be developed and implemented in close consultation with the Fire Fighting Department, Paramedics and Civil Defense.	
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5.4.1 Institutional Arrangements and Responsibilities

The proposed institutional arrangement for the implementation of EMMP is based on the discussions held with the Forest Department, Environmental Protection Department, Local Union Council Office and Proponent. The discussion concluded that three types of institutional arrangements are essential for the effective implementation of EMMP, these are follows:

- ⊙ Establishment of Environment/Social Management Group
- ⊙ External Monitoring by EPA certified laboratory
- ⊙ EMC established by Proponent after consultation with consultant

a) Roles and Responsibilities

Following are the designated roles and responsibilities of the employees involved in the monitoring and management of the adverse impacts:

Table 9: Roles and Responsibilities

Roles and Responsibilities		
Sr#	Concerned Persons	Duties
1	The Project Manager	Following will be the responsibilities of the Project Manager • Ensure that the contractor is aware of all specifications, legal constraints, standards and procedures pertaining to the project specifically with regards to environment. • Ensure that all stipulations within the EMMP are communicated and adhered to by contractor(s) • Monitor the implementation of the EMMP throughout the project by means of site inspections and meetings. This will be documented as part of the minutes of the site meeting documents • Ensuring project execution within defined budget and timelines • Conducting regular check of the project status and meetings with project team • Provide support and guidance to project team as and when needed • Project Manager is expected to continually monitor and improve the overall performance of their operation
4	HSE Manager	In addition to the health and safety responsibilities held by staff, managers and supervisors must do whatever is reasonably practical to ensure that both the workplace and the work itself are safe. This includes: • Ensuring that staff are appropriately trained and supervised • Identifying, assessing and managing health and safety risks • Consulting with workers (including staff, affiliates and contractors): i. Health and safety risk assessments ii. Decisions are made about the measures to be taken to eliminate or control these risks iii. Health and safety risk assessments

		• Implementing health and safety risk management programs relevant to their operations, teaching, research and consulting functions and work environment • Reporting (to the Human Resources Unit), investigating and responding to all hazards, accidents, incidents and taking action to control the risk • Assisting with the development, implementation and maintenance of a return to work program for injured staff. • Be fully conversant with the EIA and conditions of its approval • Be fully conversant with the EMMP • Be fully conversant with all relevant environmental legislation, policies and procedures, and ensure compliance • Convey the contents of this document to the contractor site staff and discuss the contents in detail with the Project Manager and Contractor • Undertake regular and comprehensive inspection of the site and surrounding areas in order to monitor compliance with the EMMP • Take appropriate action if the specifications contained in the EMMP are not followed • Monitor and verify that environmental impacts are kept to a minimum, as far as possible • Review and approve construction methods, with input from the Site Manager, where necessary • Ensure that activities on site comply with all relevant environmental legislation • Compile progress reports on regular basis, with input from the Site Manager, for submission to the Project Manager, including a final post excavation audit • Liaise with the Site Manager regarding the monitoring of the site • Report any non-compliance or remedial measures that need to be applied • All environmental problems arising on the construction area will be reported to the Site Manager by the Environmental Manager. Reports on such problems will be submitted to the Project Manager by the Site Manager
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5.4.2 Proposed Monitoring Program to Assess Performance or Output of EMP

The following environmental issues are considered to warrant specific management actions for the implementation of project. These issues have specific regulatory requirements (contained in the development consent or Environmental Approval) and/or are considered to have the potential to result in a non-compliance with a legislative requirement or generate community complaints. To manage the adverse environmental impacts on the physical parameters of the environment following management and monitoring plans will be adopted:

Table 10: Environmental Monitoring Plan

Aspect	Potential Impacts/ Risks	Likely Duration	Magnitude if not Mitigated	Proposed Mitigation Measures	Responsibility	Environmental Budget
A – Pre-Construction / Related						
Changes in land valve	Economic gains	Permanent	Minor positive	-	-	
Seismic Hazard	Damage due to earthquake	Permanent	Moderate negative	The structure of the proposed project has been designed in such a way that building may withstand moderate to large earthquakes.	Design Consultant / Proponent	
Emergency Response	There are always changes of earthquakes and other manmade disasters such as fires due to electrical short circuiting, over heating etc.	Permanent	Minor negative	The following mitigation measures will be adopted to minimize or eliminate the emergency situations: - The design of building will include emergency exits, which can be used during emergency situation. - Adequate internal and external water distribution system will be designed, which could also supply adequate quantity of water for firefighting during emergency. - Fire hydrants and firefighting	Design Consultant / Proponent	50,000/-

				extinguishers will be provided at locations where necessary		
B – Construction Stage						
Aspect	Potential Impacts/ Risks	Likely Duration	Magnitude if not Mitigated	Proposed Mitigation Measures	Responsibility	Environmental Budget
Topography	The construction of the proposed project will not bring major changes in the existing topography of the project site. The changes due to the construction of the unit will be of localized nature. There will be no significant changes off-site the project area.	-	-	-	-	
Impact on Soils	The overall geology and soil quality of the project site is not expected to be adversely impacted due to the execution of the proposed project during the construction period.	Temporary	Minor negative	Plantation needs to take place at the project site so that soil becomes stabilized.	Contractors / Proponent	25,000/-
Impact on surface and groundwater	During the construction stage, the sanitary wastewater will be generated by the workers' camp(s).	Temporary	Moderate negative	- At project site, the sanitation system already exists which will provide the safe disposal of wastewater produced from workers camp. - The storage of lubricant materials such as oil and	Contractors / Proponent	50,000/-

				grease will be confined to a specific area so that in case of any leakage or spillage, the lubricant materials do not contaminate the entire project site.		
Air Quality	During the construction phase, negligible change will occur in air quality due to the construction machinery used for the development of proposed project.	Temporary	Minor negative	No such heavy machinery will be used, which has capacity to change the air quality radically at project site	Contractor / Proponent	50,000/-
Health and safety of workers and public	The construction activities impose certain negative impacts on health and safety of the workers and public	Temporary	Moderate negative	Implementation of the following measures will ensure health and safety of the workers during the construction stage: - the construction workers / laborers are trained in safety procedures for all relevant aspects of construction; - Proponents of the project will make regular checks to ensure that the contractor is following safety working procedures/safety measure. - Formal emergency procedures will be developed for construction	Contractor / Proponent	30,000/-

				site in case of an accident. First aid kits and other necessary equipment will be kept available at site along • The contractor will ensure that • With the list of emergency phone numbers to be contracted in case of any accident.		
Water Consumption	During the construction of project, the small quantity of water will be used because project is small and building is double story. It will not exert any significant effect on water table.	-	-	-	-	
Flora	There are no trees or shrubs present at the project site.	-	-	-	-	
Fauna	The usual fauna found in the project area is sparrows, crows, common manias etc. the project will be having any significant impact on fauna.	Permanent	Minor negative	• Extensive plantation will be done at open places to protect birds and to enhance the beauty of the locality and project site.	Proponent	25,000/-
Disposal of Mucking Material	Inevitable cut and fill earthwork operations will open up scars on the land in and around the project	Temporary	Moderate negative	• The spoil will be carefully examined and disposed off in an environmental friendly manner by	Contractor / Proponent	

	site. The Excavated materials that are unsuitable for use need to be stored, transported and disposed off appropriately at the designated sites.			transporting it in closed containers and filling at appropriate sites		10,000/-
Employment Generation	During construction stage of the proposed project about 55 workers / laborers will be engaged. This will be minor positive change.	-	-	-	-	
C- Operational Stage						
Aspect	Potential Impacts/ Risks	Likely Duration	Magnitude if not Mitigated	Proposed Mitigation Measures	Responsibility	
Impact on climate	There will be no negative impacts expected to occur overall on climate of the area during the operational stage of the project because the production process will be undertaken in the closed chamber machines. Generators will be kept in closed room and cyclone will be installed to control the emissions hence it will not impose any negative impact on climate.	-	-	-	-	
Employment Generation	When the project will be in full operation, it will	Permanent	Major Positive	-	-	

	generate employment for 285 persons. This will be a major positive impact.					
Air Quality	During the regular operational stage of the proposed project no emissions will be generated from process however some negligible emissions from stand by generators will be produced which will be within the PEQS because green fuel Natural gas will be used.	Permanent	Moderate negative	•	Schedule of over hauling/maintenance of stand by generator will be developed.	70,000/-
Vapor/Fumes in Production Hall	While product of the anti-biotic products some negligible fumes may be produced in the production hall. However, all the process will be undertaken in the closed chamber machinery.	Permanent	Negative	• Cyclone will be installed in the production hall if needed. • These vapors or fugitive emissions will be captured into wet cotton filters.	Factory Management / Proponent	25,000/-
Noise	During the operational stage, noise will be generated only from the operation of the stand by generator. No noisy process will be involved in the proposed project.	Permanent	Moderate negative	• The proper foundation of the stand by generator will be constructed to cope with the problem of tremor / vibration which will consequently abate the noise problem.	Factory Management / Proponent	25,000/-

				• Sound proof canopy and silencer will also be installed. • Schedule of over hauling/maintenance of stand by generator will be developed. • Proper set back will be provided from the boundary wall, which will also help to minimize / eliminate the noise pollution. • Extensive tree plantation along the boundary wall and at open places will be done to act as sound barrier / sound absorber.		
Water Consumption	During the operational stage of the proposed project about water will be used for washrooms, kitchen and process.	Permanent	Negative	• At open places the grassy lawns will be developed to recharge the water table, which will also help to control the surface runoff during rainy season.		
Wastewater Generation	During the regular operation of the proposed project about wastewater will be produced from different sources as process, kitchen or washrooms, floor washing etc	Permanent	Major negative	The following mitigation measures will be adopted: • For the treatment of the above-mentioned wastewater treatment plant will be installed.	Factory management / Proponent	70,000/-

				- The treated wastewater will be sprinkled or used for watering of tree plantation and vegetation within the battery limits of factory. - The surplus treated wastewater will be drained out into the main Drain.		
Solvent Liquid Waste Generation	- While operation of the unit spent solvent - As liquid waste will also be generating from decontamination of mixing equipment.	Permanent	Major negative	- Reuse spent solvent liquid waste from equipment - Decontamination as makeup in subsequent formulations.	Factory Management /Proponent	20,000/-
Solid Waste Generation	No process solid waste or hazardous waste is will be produced. Only plastic drums and packaging material will be produced. The dispensary waste will be incinerated	Permanent	Moderate negative	No process solid waste or hazardous waste will be produced from proposed unit.	Factory Management / Proponent	30,000/-

	thought Shalimar Hospital incinerator.					
Health & Safety of Workers	The workers especially working in the production hall / area may be at health risk. Because they may be some exposure if they will not be properly trained and provide with Personal Protective Equipment's (PPEs). This will be major negative impact if not mitigated properly.	Permanent	Major Negative	To mitigate the hazards of health and safety of workers the following mitigations measures will be undertaken: - No worker aged below 18 years or over 60 years shall be employed for any job involving physical handling of hazardous substances. - All workers shall be thoroughly trained in safety precautions for handling hazardous substances and shall be supervised by qualified supervisors. - Projective clothing and equipment comprising helmet of the cloth cap, safety spectacles or goggles, respirators or masks, rubber or plastic gloves and Workboots shall be available for all workers who may be		50,000/-

				exposed to any hazardous substance, and no worker shall be permitted on job unless and until he is wearing such protective clothing and equipment. • To avoid any potential environmental hazards the workers would be trained properly so that they know potential hazard of chemical. • Proper cross ventilation shall be undertaken to avoid from any bad smell / odor. • First aid medical facility equipped with required antidotes shall be available in the premises, supervised by trained staff. • Medical check-up of all workers shall be carried out at the		
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				time of employment and at least once a year thereafter.		
Emergency Response	The operation of the proposed unit will involve workers and visitors who may become ill or have work related accidents. In addition, disasters such as earthquakes and fires may occur which have to be considered for minimizing their impacts.	Permanent	Major negative	- An Emergency Response Plan for earthquakes and manmade disasters will be prepared by the project Management. - Adequate supply of water shall be made available to the workers for personal washing as well as for washing their projective equipment's. - All firefighting, emergency and safety equipment's shall be frequently checked and properly maintained. Proper size and types of portable fire extinguishers will be kept near areas where flammable liquids are handled or stored.	Factory Management / Proponent	30,000/-

				• Adequate fire suppression system will be installed and properly functioning. • The aesthetic conditions / outlook of the unit should be improved by tree plantation / ornamental plants and proper physical infrastructure. • The internationally recognized health and safety standards will be adopted and the Emergency Response Plan will be developed and implemented in close consultation with the Fire Fighting Department, Paramedics and Civil Defense.		
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5.5 Proposed EMP Reporting and Reviewing Procedures

An effective mechanism to store and communicate environmental information during the project is an essential requirement of an EMP.

5.5.1 Meetings

As environment is multidisciplinary subject with environmentalist having a dynamic role therefore Environment Officer would be considered as integral part in both constructional and operational team. Participation of Environment Officer in daily morning meeting and any other special meeting is mandatory. Besides internal meeting HSE Engineer/Environment Officer is also responsible to conduct meeting with local in keeping administration in liaison.

5.5.2 Changes-Record Register

A change-record register will be maintained at the site, in order to document any changes in project design. These changes will be handled through the change management mechanism.

5.6 Impacts and their Mitigation Summary

Environmental and social impacts have been identified for the process of pharmaceutical plant; their impacts had been mitigation by adopting required measures as recommended in EMMP of this EIA Report within the Project Area of Influence. The major impacts on physical, biological and social environment are described as under:

Table 11: Impacts Summary of Pharmaceutical Industry Processing

Environmental Parameters	Impact Assessment during operational Phase
	Operational
A: Physical	
Land Resources	
Soil Erosion and Contamination	0
Transportation	-1t
Solid Waste and By-Products	-2p
Land Use	NA
Air Resources	
Noise Pollution	-1t
Air Pollution	-1t
Dust Emissions	-1t
Water Resources	
Ground Water	-1p
Surface Water	NA
Wastewater	-2p
B : Ecological	
Flora	
Tree Cutting	+1p
Fauna	
Terrestrial Fauna	+1p
C: Socio-Economic	
Employment Opportunities	+3p
Land Value Appreciation	+2t
Availability of Local Raw-Material	+2p

Economic Uplift	+3p
D: Hazards	
Physical Hazards	-1p
Chemical Hazards	-1p
Health and Safety	-1p
<i>Legends: 1= Low; 2= Medium; 3= High; 4= Extremely High; NA= Not Applicable; t= Temporary; p= Permanent; app= Applicable; 0= Negligible</i>	

5.7 Equipment Maintenance Details

The Client and Contractor will be responsible to maintain equipment with higher efficiency and in good working conditions. The equipment will be maintained twice a year as well as monthly inspection will be done on the regular basis to keep the process going without any interruption.

5.8 Environmental Budget

The environmental budget for the project is PKR 25 lac which will be used for the control of the air pollution by the installation of dust collection system, tree plantation at various designated sites, EMMP for the operational phase and monitoring of environmental parameters (such as ambient air, noise and wastewater). The total cost of the project is PKR 178 million. EMMP and the monitoring will be carried out on the regular basis. So, more than 1% of the total project cost will be allocated for the environmental protection.

5.9 Training and Capacity Building

Training and capacity building trainings are conducted on the regular basis to enhance the capacity of the workers hired for the working. Following is the detailed plan along with the schedules of the training:

Table 12: Training and Capacity Building Plan

Potential Impacts (Operation Phase)	Mitigation / Training Focus	Management Plan	Monitoring Indicators	Responsibility	Environm ental Budget
Noise from machinery, HVAC and vehicle movement	Training on equipment operation, preventive maintenance and noise control measures	Conduct awareness on use of acoustic enclosures, scheduled operation, and use of hearing protection	Noise levels within NEQS, use of PPE	HSE Manager / Production Manager	20,000/-
Improper handling of pharmaceutical solid waste	Training on segregation of hazardous, non-hazardous and expired medicines	Implementation of waste management SOPs, color coded bins, record keeping	Waste inventory and disposal manifests	HSE Officer / QA Manager	25,000/-
Contamination from process wastewater	Training on ETP operation, chemical dosing and monitoring	Capacity building of operators on wastewater sampling and NEQS compliance	pH, BOD, COD within limits	ETP Operator / HSE Manager	25,000/-

Chemical exposure to workers	Training on safe handling of APIs, solvents and MSDS understanding	Use of PPE, spill response and first aid procedures	Incident/accident record	QA/HSE Department	20,000/-
GMP and product contamination risks	GMP, hygiene and clean room practices	Training on SOPs, personal hygiene, cross contamination control	Internal audit findings	QA Manager	30,000/-
Fire and emergency risks	Emergency response and firefighting training	Mock drills, use of extinguishers, evacuation plan	Drill reports	Admin/HSE Manager	25,000/-

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6. PUBLIC CONSULTATION AND INFORMATION DISCLOSURE

Public consultation refers to the process by which the concerns of local affected persons and others who have a plausible stake in the environmental impacts of the project or activity are ascertained with a view to taking into account all the material concerns in the project or activity design as appropriate. According to the IEE and EIA Review Regulations, public consultation is mandatory for any socio-environmental study.

6.1 Proponent's Environment Management Team

Following are the designated roles and responsibilities of the employees involved in the monitoring and management of the adverse impacts and will be appointed after operation of project starts.

Roles and Responsibilities		
Sr#	Concerned Persons	Duties
1	The Project Manager	Following will be the responsibilities of the Project Manager • Ensure that the contractor is aware of all specifications, legal constraints, standards and procedures pertaining to the project specifically with regards to environment. • Ensure that all stipulations within the EMMP are communicated and adhered to by contractor(s) • Monitor the implementation of the EMMP throughout the project by means of site inspections and meetings. This will be documented as part of the minutes of the site meeting documents • Ensuring project execution within defined budget and timelines • Conducting regular check of the project status and meetings with project team • Provide support and guidance to project team as and when needed • Project Manager is expected to continually monitor and improve the overall performance of their operation
2	HSE Manager	In addition to the health and safety responsibilities held by staff, managers and supervisors must do whatever is reasonably practical to ensure that both the workplace and the work itself are safe. This includes: • Ensuring that staff are appropriately trained and supervised • Identifying, assessing and managing health and safety risks • Consulting with workers (including staff, affiliates and contractors): iv. Health and safety risk assessments v. Decisions are made about the measures to be taken to eliminate or control these risks vi. Health and safety risk assessments • Implementing health and safety risk management programs relevant to their operations, teaching, research and consulting functions and work environment • Reporting (to the Human Resources Unit), investigating and responding to all hazards, accidents, incidents and taking action to control the risk

		• Assisting with the development, implementation and maintenance of a return to work program for injured staff. • Be fully conversant with the EIA and conditions of its approval • Be fully conversant with the EMMP • Be fully conversant with all relevant environmental legislation, policies and procedures, and ensure compliance • Convey the contents of this document to the contractor site staff and discuss the contents in detail with the Project Manager and Contractor • Undertake regular and comprehensive inspection of the site and surrounding areas in order to monitor compliance with the EMMP • Take appropriate action if the specifications contained in the EMMP are not followed • Monitor and verify that environmental impacts are kept to a minimum, as far as possible • Review and approve construction methods, with input from the Site Manager, where necessary • Ensure that activities on site comply with all relevant environmental legislation • Compile progress reports on regular basis, with input from the Site Manager, for submission to the Project Manager, including a final post excavation audit • Liaise with the Site Manager regarding the monitoring of the site • Report any non-compliance or remedial measures that need to be applied • All environmental problems arising on the construction area will be reported to the Site Manager by the Environmental Manager. Reports on such problems will be submitted to the Project Manager by the Site Manager
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6.2 The Responsible Authority

Impact assessment survey and public consultation sessions held with different stakeholder groups that may be impacted by the proposed project commencement. The consultation process was carried out in accordance with the guidelines laid by Punjab-EPA. The objectives of this process were to:

- ⊙ **Share information with stakeholders on proposed project installation and operation**
- ⊙ **Access the impacts on the physical, biological, and socioeconomic environment**
- ⊙ **Understand stakeholder concerns regarding various aspects of the project commencement**
- ⊙ **Find out valuable suggestions by the stakeholders to improve the proposed project design**
- ⊙ **Understand the perceptions, assessment of social impacts and concerns of the affected people/communities of the project area**

- ⊙ Find out the awareness level and situation of acceptability to identify any issues for the implementation of the proposed project
- ⊙ Invite people to express their views about the positive/negative impacts on their lifestyles and environment
- ⊙ Disclose information about contact offices/officers for any complaints/queries

It is envisaged, there will be no social impact being foreseen due to the construction and operation of M/s Neutro Pharma (Pvt.) Ltd. at the proposed location. This EIA Report includes all the comments, which were taken into account during the social survey and preparing the definitive development concept for the installation and operation of M/s Neutro Pharma (Pvt.) Ltd.

6.3 Objectives of Consultation

Public consultation plays a vital role in studying the impacts of the proposed project on stakeholders in successful implementation and execution of the project. It provides an opportunity to exchange knowledge with the beneficiaries and affected parties. Referring particularly to a project related to environmental assessment, involvement of the public is all the more essential, as it leads to better and more acceptable decision-making. The overall objective of the consultation with the stakeholders is to help verify the environmental and social issues, besides technical ones, that have been presumed to arise and to identify those which are not known or are specific to the project. In fact, discourse with many who have thoroughly observed the site conditions in the pre-development phase, goes a long way in updating the knowledge and understanding.

6.4 Identification of Stakeholders

All the people who are directly or indirectly affected or concerned with the project are the stakeholder. Besides the living population of the surrounding areas, some other stakeholders were identified and contacted which enlisted below. They are the key players including; shops, public and government offices, schools, university, hospitals, hotels, international agencies and the NGOs. Not only published material, brief or other literature were obtained on request, but also noted their views and the concerns, in an official capacity as well as on the personal basis. Following stakeholders are identified for this project:

Project Affected Persons (PAPs) include the settled families, either property owners or the tenants, businessmen (big, shopkeepers, vendors, etc.), employees of the commercial entities. PAPs are of two types, for instance:

6.4.1 Direct Stakeholders

No disturbance in the local community is being foreseen due to the installation of the aforesaid project as the community is at a safe distance. No property loss is being envisaged due to the construction of the M/s Neutro Pharma (Pvt.) Ltd.

6.4.2 Indirect Stakeholders

Indirect impact will occur on those who are living or doing business within a Project Area of Influence (AOI). In the case of the proposed project, the citizens of nearby small towns) will get opportunities of being employed. So, in the early development stages and during the operational phase the people will be benefited due to the installation of the M/s Neutro Pharma (Pvt.) Ltd.

6.4.3 Other Departments and Agencies

Following departments are related to the project in public consultation:

- ➔ **Government agencies responsible to deal with the project related activities**
- ➔ **Government Agencies directly, indirectly or widely involved in the execution and monitoring of the proposed project**
- ➔ **Government departments such as TMA and Planning & Development Department, Forest Department, Agricultural Department, Industrialist around the estate and working on the other development activities are considered as indirect stakeholders**
- ➔ **Workers of political, cultural, religious or social scientific bodies, directly or indirectly related to the project**

6.5 Public Disclosure

Public disclosure is the outcome of all such activities where the public is involved at least in the information sharing process. This is an integral part of the process. So, before the proponent applies for NOC to the Punjab-EPA, this disclosure will be distributed properly among all stakeholders. It is the responsibility of the proponent and the consultants to display a public disclosure document in prominent places where community has easy access.

6.6 Consultation Process

Information disclosure, public consultation and discussion regarding the various aspects of the project with the people of the area are necessary. This process is intensified during the EIA Studies, and separate rounds of public consultations were held. Surveys were carried out in order to investigate physical, biological and socioeconomic resources falling within the immediate AOI of the project. Primary data collection included:

- ☒ **Data collection regarding the socioeconomic condition of the study area**
- ☒ **Pre-testing of socioeconomic survey tools in the field**
- ☒ **To consult the locals for collection of information on biological environment**

Various meetings with the stakeholders were held the following objectives:

- ➔ **Share information with stakeholders on the proposed project and expected impacts on community in the vicinity of the project**

- ➔ Understand stakeholders' concerns regarding various aspects of the project, including the existing condition of the upgrading requirements, and the likely impact of construction and operation activities
- ➔ Provide an opportunity to the public to influence the project design in a positive manner
- ➔ Obtain local and traditional knowledge, before decision making
- ➔ Increase public confidence about the proponent, reviewers and decision makers
- ➔ Reduce conflict through the early identification of controversial issues, and work through them to find acceptable solutions
- ➔ Dissemination of information through discussions, education and liaison
- ➔ Documentation of information narrated by the stakeholders and mitigation measures proposed by the stakeholders
- ➔ Incorporation of public concerns and their address in the EIA; and eliciting their comments and feedback
- ➔ Create a sense of ownership of the proposal in the mind of the stakeholders

6.7 Environmental Practitioners and Experts

Officers of government departments and industries were consulted by the socio-environmental team of the consultants and concerned details about the project were noted down through personal interviews, group meetings, etc., in their offices, for instance. List is attached as an annexure.

6.8 Affected and Wider Community

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

- ☒ **Disclose the proponent plan of the construction of the proposed facility**
- ☒ **To share information on the design and specifications of proposed project works**
- ☒ **To analyze the expected impact on the socioeconomic environment**
- ☒ **To understand their concerns regarding various aspects of construction and operation**

5.8.1 Views, Concerns and Suggestions of Various Stakeholders

Community showed a lot of concerns; a few are being mentioned here:

- ✚ **Removal of shrubs and trees should be avoided to the extent possible**
- ✚ **The project will become the source of income for local to earn their livelihood easily and honorably**
- ✚ **The area will become further industrialized**

- For the solid waste management and waste disposal, proper disposal techniques should be adopted
- Employment opportunities will be generated, and locals should be hired on the priority basis
- The air pollution is one of the major impacts of the proposed project, so ambient air quality should be monitored regularly.
- Water spraying/sprinkling should be done on the regular basis during construction phase to avoid dust emissions
- Removal of shrubs and trees should be avoided to the extent possible
- 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
- The contractor should prefer hiring local labor from adjacent nearby villages
- Indigenous trees around the facility should be planted to control air pollution and as the compensation
- Noise reducing barriers should be installed to reduce noise pollution

Concerns

- ☒ Workers should be hired from local community
- ☒ Proper disposal of solid waste should be practiced
- ☒ Indigenous trees around the facility should be planted to control air pollution
- ☒ Removal of shrubs and bushes should be avoided to the extent possible

7. CONCLUSION AND RECOMMENDATIONS

The findings of EIA Report showed that although the establishment of pharmaceutical plant is expected to have significant negative impacts on the environment during the construction and operational phases, but the severity of these adverse impacts can be reduced significantly by adopting the suggested mitigation measures in EMMP with true spirit. Moreover, their severity can be further reduced by adopting relative mitigation measures as proposed in the Chapter 7 of this EIA Report. The impacts were assessed by frequent site visits, studying related projects and by reviewing relevant documents. Generally, the project is planned to follow efficient environmental management systems. Specific environmental and social benefits have been mentioned below which depend on the proper application of mitigation measures suggested in EMMP and best engineering practices.

7.1 Merits and Demerits

The major positive impacts include;

- ⊙ **Increased job opportunities,**
- ⊙ **Business opportunities,**
- ⊙ **Availability to the locals.**
- ⊙ **Environmental enhancement through tree planation.**

The project will raise the income of the persons directly associated with project as well as it will also improve the socio-economic status of the area. The project is expected to stimulate the local economies of the community as the majority of the people living in the nearby areas are associated with the labor related activities.

In general, potential adverse environmental effects resulting from the proposed activities will be temporary in nature, short-term and of low magnitude. Through application of standards, recommended mitigation measures, adherence to applicable permit conditions and regulations, adverse impacts can be effectively minimized. The project is not likely to have significant adverse environmental impacts which cannot be mitigated. Negligible negative impacts that are likely occur during pharmaceutical plant processing includes; air pollution due to movements of vehicles, removal of bushes and shrubs, potential impact to the local water resources and social impacts may affect the locals residing in the nearby community can be foreseen. Mitigation measures will be implemented to minimize environmental impacts though they are still negligible. There are certain mitigations suggested to cater for the aforesaid issues.

7.2 Recommendations

The intensity and severity of impacts occurred due to the pharmaceutical plant processing varies with change in the nature and magnitude of the project as well as depends upon the baseline environmental conditions of the area. The mitigation measures will require constant information flow and consultation with the stakeholders to ensure the least adverse social-economic impact to outweigh the “no project development” scenario.

- ☒ The adverse environmental impacts can be reduced significantly by adopting best management and monitoring practices as well as by implementation EMMP with true spirit
- ☒ Proper PPEs including aprons, rubber gloves and shoes should be provided to workers
- ☒ No compromise on public health and environment should be allowed.
- ☒ Waste minimization practices should be introduced to workers by conducting lectures on spot to aware the workers about the long-term benefits of the same in lieu of surrounding environment.
- ☒ A proper tree plantation plan should also be developed in order to make the process environment friendly.
- ☒ Small domestic waste storage bins should be placed at different locations for proper collection and disposal of the solid waste.
- ☒ It is recommended that the Proponent should obtain an Environmental Approval (NOC) from the Punjab-EPA before proceeding further.

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LIST OF ABBREVIATIONS

ABBREVIATION	DESCRIPTION
ASR	Air Sensitive Receivers
BDL	Below Detection Limit
BOD	Bio-chemical Oxygen Demand
CC	Construction Contractor
CDM	Clean Development Mechanism
CO	Carbon Monoxide
DCO	District Co-ordination Officer
DD	Deputy Director
DG	Directorate General
DRR	Disaster Risk Reduction
DWQS	Drinking Water Quality Standards
EE	Environmental Engineer
EIA	Environmental Impact Assessment
EMMP Plan	Environmental Management and Monitoring
EPA	Environment Protection Agency
EPC	Engineering Procurement Construction
EPD	Environment Protection Department
EPHE	Environmental & Public Health Engineering
FGDs	Focused Group Discussion
GDP	Gross Domestic Product
gm	Gram
GoP	Government of Pakistan
IEE	Initial Environmental Examination
LGO	Local Government Ordinance
LDL	Lowest Detection Limit
mg/l	Milligrams per liter
MSL	Mean Sea Level
NCS	National Conservation Strategy
NEQS	National Environmental Quality Standards

NEP	National Environmental Policy
NO2	Nitrogen Dioxide
NOC	No Objection Certificate
OH & S	Occupational Health and Safety
PAPs	Project Affected Persons
PEPA	Pakistan Environmental Protection Act
PEPC	Pakistan Environmental Protection Council
PEQS	Punjab Environmental Quality Standards
PM	Particulate Matter
SO2	Sulfur Dioxide
SOP	Standard Operating Procedures
SWM	Solid Waste Management
TA	Technical Assistance
TORs	Terms of Reference
TSS	Total Suspended Solids
UNDP	United Nation Development Pro
WASA	Water and Sanitation Agency

LIST OF INDIVIDUALS CONSULTED AND THEIR VIEWS

SR. NO.	NAME	ID CARD NUMBER	OCCUPATION	CONCERN/VIEWS
1.	Ghulam Shabir	36303-7360882-5	farmer	Positive
2.	Ansar Ali	34101-5615463-9	Farmer	Positive
3.	Liaqat Ali	34101-527.5075-1	Farmer	Positive
4.	Abdul Rehman	34102-0434594-7	Shop Owner	Concerned about air pollution
5.	Muhammad Bilal	36303-9299987-3	Shop Owner	Concerned about Noise pollution
6.	Muhammad Yousaf	36302-5965175-3	Daily Wager	Positive
7.	Muhammad Asif	36303-4107290-1	Daily Wager	Positive
8.	Muhammad Iqbal	36303-1561962-1	Vendor	Positive
9.	Abdul Hameed	36302-0474840-7	Vendor	Positive
10.	Muhammad Imran	42201-3691562-7	Daily Wager	Positive
11.	Muhammad Sabir	36303-9221124-3	Vendor	Concerned noise pollution
12.	Muhammad Shahid	36306-4248907-7	School Teacher	Wastewater should be properly treated prior to final disposal in nearby drain
13.	Sohail Ahmad	35304-8398428-1	Field Officer Horticulture department	Plantation should be carried out at extensive scale

Sources of Data

- ✚ <https://www.pmd.gov.pk/en/>
- ✚ <https://www.pbs.gov.pk/>
- ✚ <http://www.weather-and-climate.com/>
- ✚ <https://www.investmentbank.com/pharma-industry-overview/>
- ✚ <https://www.ppma.org.pk/Profile/pakistan-pharmaceutical-industry/>
- ✚ <https://dysonlabs.com>.
- ✚ Lakdawalla, D. N. (2018). Economics of the pharmaceutical industry. *Journal of Economic Literature*, 56(2), 397-449.
- ✚ Tauqeer, F., Myhr, K., & Gopinathan, U. (2019). Institutional barriers and enablers to implementing and complying with internationally accepted quality standards in the local pharmaceutical industry of Pakistan: a qualitative study. *Health policy and planning*, 34(6), 440-449.
- ✚ Bhatti, S. H., Vorobyev, D., Zakariya, R., & Christofi, M. (2020). Social capital, knowledge sharing, work meaningfulness and creativity: evidence from the Pakistani pharmaceutical industry. *Journal of Intellectual Capital*.
- ✚ Field Surveys
- ✚ Public Consultations

TERMS OF REFERENCE (TORS)

The consultant is required to carry out an initial environmental examination study of the project under Section-12 of Pakistan Environmental Protection Act 1997/ Punjab Environmental Protection (Amendment) Act 2012.

The Study should be comprehensive and should cover all aspects which are envisaged under the relevant national and provincial laws & regulations including but not limited to:

- Identification and recommendation for suitable solution/treatment/mitigation measures for emissions and effluents such as wastewater and sludge etc. in accordance with Punjab Environmental Quality Standards (PEQS).
- Identification and recommendation for suitable solution/treatment/mitigation measures of solvents, oils (tar), hazardous waste, organic compounds, steam, flue gases, particulate matter and chemical compounds harmful for the environment and other substances leading to air, noise, water and soil pollution in accordance with PEQS.

The Study should be acceptable to the relevant national and/or provincial authorities (relevant authorities) in Punjab.

PROJECT TEAM AND RESPONSIBILITIES

Name of expert	Position held	Highest Qualification	TERM OF REFERENCES
Kamal Ahmed Cheema	Chief Environmentalist	M. Phil. Environmental Economics, PIDE, Islamabad	Mr. Kamal would be responsible for: ❖ Environmental Assessment & Management. ❖ Supervision of monitoring team for air water noise and soil analysis. ❖ Preparation of technical EMP
Mr. Shahzaib Ahmed	Social Scientist	M. Phil Development Studies, PIDE, Islamabad.	Mr. Shahzaib would be responsible for: ❖ Detailed social survey of project sites ❖ Social impact assessment
Arslan Iqbal	Environmentalist	MPhil Environmental Sciences, UOL	Mr. Arslan would be responsible for: ❖ Biodiversity assessment ❖ Detailed flora fauna survey of project sites ❖ Identification of threaten and endangered species ❖ Project impacts on flora and fauna ❖ Detailed social survey of project sites ❖ Social impact assessment ❖ Consultation with stakeholders
Amna Hafeez	Environmentalist	M.Sc Mountain Conservation and Watershed Management, University of the Punjab	Ms. Amna would be responsible for: ❖ Report writing ❖ Field surveys and consultation with stakeholders ❖ Preparation of Environment monitoring plan ❖ Preparation of technical EMP ❖ Capacity building & training ❖ Conducting and monitoring of health assessment surveys ❖ Detailed survey of project sites ❖ Environmental Assessment
Huda Ashfaq	Environmentalist	M.Phil. Environmental Sciences, UVAS, Lahore	Ms. Huda would be responsible for: ❖ Detailed flora and fauna survey of project sites ❖ Site Monitoring ❖ Socio-Economic survey & analysis ❖ Report Writing ❖ Environment health risk assessment and management.

Zeshan Ahmad	Environmental Scientist	BS Environmental Sciences	Mr. Zeshan would be responsible for: ❖ Biodiversity assessment ❖ Detailed flora fauna survey of project sites ❖ Identification of threaten and endangered species ❖ Detailed social survey of project sites ❖ Social impact assessment ❖ Consultation with stakeholders ❖ Site Monitoring
Muhammad Atif	Environmental Executive Officer	M.phil Environmental Sciences	Mr. Atif would be responsible for: ❖ Site Monitoring ❖ Socio-Economic survey & analysis ❖ Risk Assessment (OHS & EMP)

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EPA PUNJAB EIA CHECKLIST FOR PREPARATION AND REVIEW OF ENVIRONMENTAL REPORTS

Required Content	EIA Report		
	PAGE NO.	REMARKS (If Any)	LACKING
Executive summary:	1		
1. Title and location of project with GPS Co-ordinates			
2. Name of the proponent along with contact number and email	1		
3. Name and details of the organization preparing the report	1		
4. A brief outline of the proposal (type, production capacity, process, technology and land requirement)	2		
5. The major impacts	3		
6. Recommendations for mitigation measures	4		
7. Proposed monitoring	4		
Screening: Whether the Project requires IEE or EIA as per Regulations	13		
Scoping	13		
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