Environmental Impact Assessment Report of

Amal Energies Private Limited

Mouza Mustafabad Near Rajba Paki Havaili, Tehsil & District Kasur

Submitted By:

Mr. Asif Ali

Prepared By:

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DISCLAIMER

The data was based on the originality of project site shown by the project proponent/ stakeholders/ promoters, provided maps, verbal communications and all other related documents. The authenticity of supra-mentioned relies with the proponent/ stakeholders/ promoters, not with the environmental consultant. The EIA report can't be negotiated in any court of law.

Representative: IEE & EIA Team

GUIDLINES FOR PREPARATION AND REVIEW OF ENVIRONMENTAL REPORTS CHECKLIST

EXECUTIVE SUMMARY

Introduction

The executive summary is an outline of the key outcomes in EIA (Environmental Impact Assessment). The proponent intends to establish an LPG storage and filling plant to meet the demand of LPG by the **title** "Amal Energies Private Limited" **located** at Khasra Number 8491, 8492, 8504, Khewat Number 251, Khatooni Number 555, 556, 557, Mouza Mustafabad, Near Rajba, Paki Havaili, Tehsil & District Kasur, over an **area** of 09 Kanal, 01 Marla. The **consultant** company for this project is Enviro Stewards Company (Pvt.) Limited.

This project specific EIA (Environmental Impact Assessment) presents a detailed account of environmental and social impacts likely to emanate from the establishment of storage unit. The Environmental Impact Assessment (EIA) report is prepared to assess the potential impacts likely to occur from the project's entire life cycle on the local environmental quality and communities.

The proposed project falls under **Schedule II** (list of projects requiring an EIA), **Category A** (Energy), **Sub sector 5** (Oil and gas extraction projects including exploration, production, gathering systems, separation and storage) of the IEE / EIA Regulations 2022 made under section 12 of Punjab Environment Protection Act 1997 (Amended 2012). Details of the process description are given in **Chapter 5** under the heading process details. The assessment came up with a set of impact mitigation measures for the project to pursue minimizing the adverse impacts on the environment and nearby communities.

Brief Outline of Project

Name of the Project	M/s Amal Energies Pvt. Ltd.
Representative/Proponent	Asif Ali
Total Area	09 Kanal, 01 Marla
Purpose of the Project	To fulfill the demand of LPG
GPS Location	**31.231778 N, 74.449103 E**

Cost of the Project	Approx. 150 million PKR
Current Status of Project	Open Land
Storage Product	LPG storage
Storage Capacity	100 M Tons
Filling Capacity	5 MT/Day
Ground Water	100-150ft
Manpower:	Construction: 30-35 Persons
	Operation: 25-30 Persons
Water Availability	Groundwater
Period of Construction	Approx. 01 Year
Assessed Environmental issues	Air, noise, solid and liquid waste will be environmental issues
Solid Waste Management	Will manage by EPA approved vendor
Waste water Management	Domestic Wastewater will be disposed of in the nearest sewerage waste water pipeline
Consultant Name	Enviro stewards Company (Pvt.) Limited
Compliance	Punjab Environmental Quality Standard (PEQS 2016) and time to time guidelines by EPA and other enforcement Department / Agencies.

Legal and Administrative Framework

The national guidelines and legislations related to the environment considered for the project include, National Conservation Strategy (1992), National Environment Policy (2005), Pakistan Labor Policy (2010), Punjab Environmental Protection Act (PEPA 1997), amended PEPA, (2012), Punjab Environmental Quality Standards (PEQS), Land Acquisition Act (1894), Cutting of Trees (Prohibition) Act (1975), Punjab Wildlife Act (1974), Punjab Plantation and Maintenance of Trees Act (1974), Antiquities Act (1975) etc.

Environment related documents have been reviewed including submission of environmental assessment study report to obtain environmental approval was made mandatory by the Pakistan Environmental Protection Ordinance

(PEPO), 1983 and the Pakistan Environmental Protection Act (1997). Section 12(1) of the PEPA (1997) amended 2017 stipulates that no project involving construction or any change in the physical environment can be undertaken unless an IEE or an EIA is conducted, and approval (NOC) is received from the relevant provincial environmental agency.

Major Impacts

As, the project is storage of liquefied petroleum gas, it is therefore likely to produce effects onto the air due to transportation or any explosion. Solid waste will also produce during construction activities and domestic waste. Domestic wastewater will be produced. The impacts will be more unless appropriate mitigation measures are employed for balancing out the identified adverse impacts. A lot of job opportunities will be created. Innumerable environmental and social impacts are expected during construction and operational phase, significant ones of which would be:

Impacts	Mitigation Measure	
	Construction Phase	**Operational Phase**
Air Pollution	• During the construction phase, transport vehicles must be covered with tarpaulin, and optimally loaded. • Regular sprinkling of water on sand or mud causes less spreading. • Proper maintenance of transport vehicles.	• Air masks, helmets and safety uniforms will be provided to the workers and proper monitoring will be made to check its compliance in the premises. • The engines of transport vehicles will be carefully monitored to control emission level. • Maximum number of tree plantation will be done.
Waste Water Pollution	• No water will be disposed of into sewer lines without proper treatment. • By keeping the solid waste away from sewerage so contamination will be less.	• The waste water will not dispose of without meeting PEQ's. • Sewerage system will not be contaminated with solid waste to avoid blockage in pipe lines.
Noise Pollution	• Noise control measures will take such as provision of silencers on the heavy construction vehicles. • Proper maintenance of machinery engines.	• Green belts will be provided to control noise pollution. • By avoiding the unnecessary use of horns.

Solid Waste Generation	• Solid waste generated will be disposed of on regular basis by appropriate means. • Avoid spreading of gravel, sand particles used in construction. • Provide waste handling facilities such as; waste bins in all sections of the factory.	• Proper solid waste handling and management practices will be adopted. • To avoid leaching solid waste will be dispose of on regular basis by appropriate means. • Separate bins will be provided in each section.
Socio Economic	• Positive impact due to generation of employment opportunity • Local people will also be preferred for the job	• Positive impact due to employment of job opportunities. • Economy rate will be increased.
Health & Safety	• Proper use of PPE's during construction activities. • Training program for the workers before the construction of said project.	• Proper use of PPE's during the operational phase. Use gloves, protective glasses and others. • Implementation of all safety rules and measures during the working hours.

Proposed Monitoring

It is the EIA project so the impacts will be long term, significant or adverse. These impacts can be reduced by regular monitoring and implementing all the mitigation measures. Environmental Monitoring Program should be formulated which ensures effective surveillance of the environmental parameters at various stages of the project development and compliances with PEQS and legal obligations.

An environmental management and monitoring plan provide a delivery mechanism to address the potential environmental impacts of a project during its construction and operational phase, to enhance project benefits, and to introduce health and safety standards of good practice to be adopted for proposed project.

The proponent will ensure the proper implementation of mitigation measures for the concerned installation and operation and maintenance phase through adequate monitoring.

Conclusion and Recommendation

The impacts include wastewater, solid waste, air quality, noise and are manageable by applying all the mitigation measures and by complying with environmental laws of the country. The major positive impacts of the project include job opportunities for local people. The Project will raise the worker's income, and can improve social-economic infrastructure. Nevertheless, to ensure long-term environmental sustainability of the project, institutional arrangements must be put into place for controlling the adverse impacts all during the life of the project.

It is recommended that the proponent should obtain an environmental approval (No Objection Certificate) from the Punjab-EPA before proceeding further into the construction activities as per regulatory requirements.

1. INTRODUCTION

1.1. General

Liquefied petroleum gas is a flammable mixture of hydrocarbon gases used as fuel in heating appliances, cooking equipment, and vehicles. It is a mixture of 48% propane, 50% butane, and 2% pentane. It is increasingly used as an aerosol propellant and a refrigerant, replacing chlorofluorocarbons in an effort to reduce damage to the ozone layer. When specifically used as a vehicle fuel it is often referred to as auto gas. Varieties of LPG bought and sold include mixes that are mostly propane (C_3H_8), mostly butane (C_4H_{10}), and, most commonly mixes including both propane and butane. In the northern hemisphere winter, the mixes contain more propane, while in summer, they contain more butane. In the United States, mainly two grades of LPG are sold: commercial propane and HD-5. These specifications are published by the Gas Processors Association (GPA) and the American Society of Testing and Materials. Propane/butane blends are also listed in these specifications.

This Section of the report provides an overview of the rational of the Project, objective of project, requirement of the project, purpose of the report and approach adopted to conduct the Environmental Impact Assessment (EIA).

1.2. Purpose of Report

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

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

The primary objective of this EIA study is to identify, screen out and evaluate those of the significant adverse environmental and social impacts of the project, which are likely to cause adverse impacts on the local and the general environment, at and around the project site. Viewing from this perspective,

the potential sources of environmental impacts would be various activities related to both environmental and the later inhabitation stages of the project. Such activities will include transportation of materials to the project site, generation of wastewater and solid wastes, air quality concerns. Therefore, the focus of the study is to discern the important environmental and social impacts of the project and to suggest the ways and means for countering these likely adverse environmental impacts.

1.3. Identification of Project & Proponent

Proponent name	Asif Ali
Address	PO Batapur, Tehsil Shalamar, District Lahore
Designation	Proponent/ Company Representative
Project title	M/s Amal Energies Pvt. Ltd.
Project location	Mouza Mustafabad, Near Rajba, Paki Havaili, Tehsil & District Kasur

1.4. Consultant Details

Consultant Details	
Consultant name	Enviro Stewards Company (Pvt.) LTD.
Contact No.	+92-301-1199600
Address	1st floor Allied Bank A Block Commercial Market, Canal View Housing Society, Lahore.
Team Leader	
Name	Miss Sara Fatima
Designation	Senior Environmentalist
Contact No.	+92-301-1198600

1.5. Nature and Size of Project

The project is storage unit. The total area of the project is approximately 09 Kanal, 01 Marla. The storage capacity of the project is 100 MT (metric ton) and filling capacity is 5 metric ton per day. The land is agricultural in nature. Currently it is open land.

1.6. Location of Project

The project site is located at Mouza Mustafabad, Near Rajba, Paki Havaili, Tehsil & District Kasur. The coordinates of the project site are **31.231778 N, 74.449103 E.** The map is attached to it.

Figure 1 Location of Project

1.7. Extent of the EIA study, scope of the study, magnitude of the efforts

This EIA study has been accomplished following the requirements serial 2.3 of the "Guidelines for the preparation and review of Environmental Reports, October 1997". In compliance of PEPA, 1997(amended 2012) requirements, an EIA report has been prepared by the team of environmental experts. This document covers all environmental impacts, due to the proposed project, in and around the project area comprising the physical, ecological and socio-economic aspects together with identification of the potential positive and negative impacts. Any developmental activities outside the project area like

rehabilitation of the road and establishment of the other factories outside the project vicinity have not been covered under this EIA study.

The EIA report covers the examination of the physical, biological and environmental socioeconomic impact of the following:

- Construction activities including the leveling and marking of land division.
- Relevant off-site construction activities like construction of access road.

2. POLICY, LEGISLATION, LEGAL AND ADMINISTRATIVE FRAMEWORK

2.1. General

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

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

2.2. Screening

The proposed project is the LPG storage unit. It falls under **Schedule II** (list of projects requiring an EIA), **Category A** (Energy) **Sub sector 5** (Oil and gas extraction projects including exploration, production, gathering systems, separation and storage) of the IEE / EIA Regulations 2022 made under section 12 of Punjab Environment Protection Act 1997 (Amended 2012). Details of the process description are given in Chapter 5 under heading process details.

2.3. Existing Regulation and Framework

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

2.4. Relevant Legal / Institutional Framework

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

2.4.1.National Conservation Strategy, 1992

On March 1, 1992, the Cabinet of Pakistan approved the National Conservation Strategy. It describes the stark reality of the country's deteriorating resource base and its implications for what

is still largely a natural resource-based economy. It sets forth the beginnings of a plan to integrate environmental concerns into virtually every aspect of Pakistani economic life. The strategy has three overriding objectives: conservation of natural resources, sustainable development, and improved efficiency in the use and management of resources.

2.4.2.PEPO 1983, PEPA 1997 (Amended 2012)

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

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

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

2.4.3.National Environmental Policy 2005

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

2.4.4.Review of EIA and IEE Regulations 2022

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

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

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

2.4.6. Punjab Environmental Quality Standards (PEQS)

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

2.4.7. Guidelines for Sensitive and Critical Areas

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

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

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

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

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

- Punjab Environmental Protection Act, 1997 (Amended 2012)
- Policy and Procedures for filing, review and approval of environmental assessments
- Guidelines for the preparation and review of Environmental Reports

- Guidelines for sensitive and critical areas
- National Environmental Quality Standards (NEQS)

2.4.10. Punjab Wildlife Protection Act, 1974

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

2.4.11. Forest Act, 1927

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

2.4.12. Explosive Act, 1884

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

2.4.13. Punjab Local Government Ordinance, 2022

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

2.4.14. Pakistan Penal Code, 1860

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

Sec 268: Public Nuisance

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

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

Sec 278: Making atmosphere noxious to health

Sec 284: Negligent conduct with respect to poisonous substance

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

Sec. 291: Continuance of nuisance after injunction to discontinue

2.4.15. Punjab Land Use Rules 2009

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

2.4.16. Antiquities Act 1975

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

2.4.17. Solid Waste Management Rules 2005

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

2.4.18. Labor Law

The labor laws apply on child labor and measuring instruments.

2.4.19. Safety & Civil Defense Laws

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

2.4.20. Guidelines for Critical and Sensitive Area

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

3. SCOPING

The scoping in Environmental Impact Assessment involves a comprehensive assessment of the potential impacts of a project or activity, including direct and indirect impacts, cumulative impacts, and potential long-term effects. This assessment is carried out by a team of environmental and social experts, who analyze the proposed project or activity in detail and identify potential risks and impacts on various aspects of the environment, such as air quality, water quality, biodiversity, and cultural heritage. In this Environmental Impact Assessment, a public consultation process is involved, where members of the public and other stakeholders can provide feedback and raise concerns about the proposed project or activity.

3.1. Spatial and Temporal Boundaries of Environmental Assessment

Due to construction of the current project, land use will change from open land to storage unit of LPG by M/s Amal Energies Pvt. Ltd. Within radius of 5-km, no industry can be seen but few commercial markets are there represents in figure given below but current project will be installed by adopting proper mitigation measures to avoid disturbance in nearby area and local community. In current project no significant emission will be observed because in proposed project there will be only storage. Wastewater quality will be measured to ensure PEQS. No environmentally sensitive area is present within safe distance that could be impacted due to proposed project.

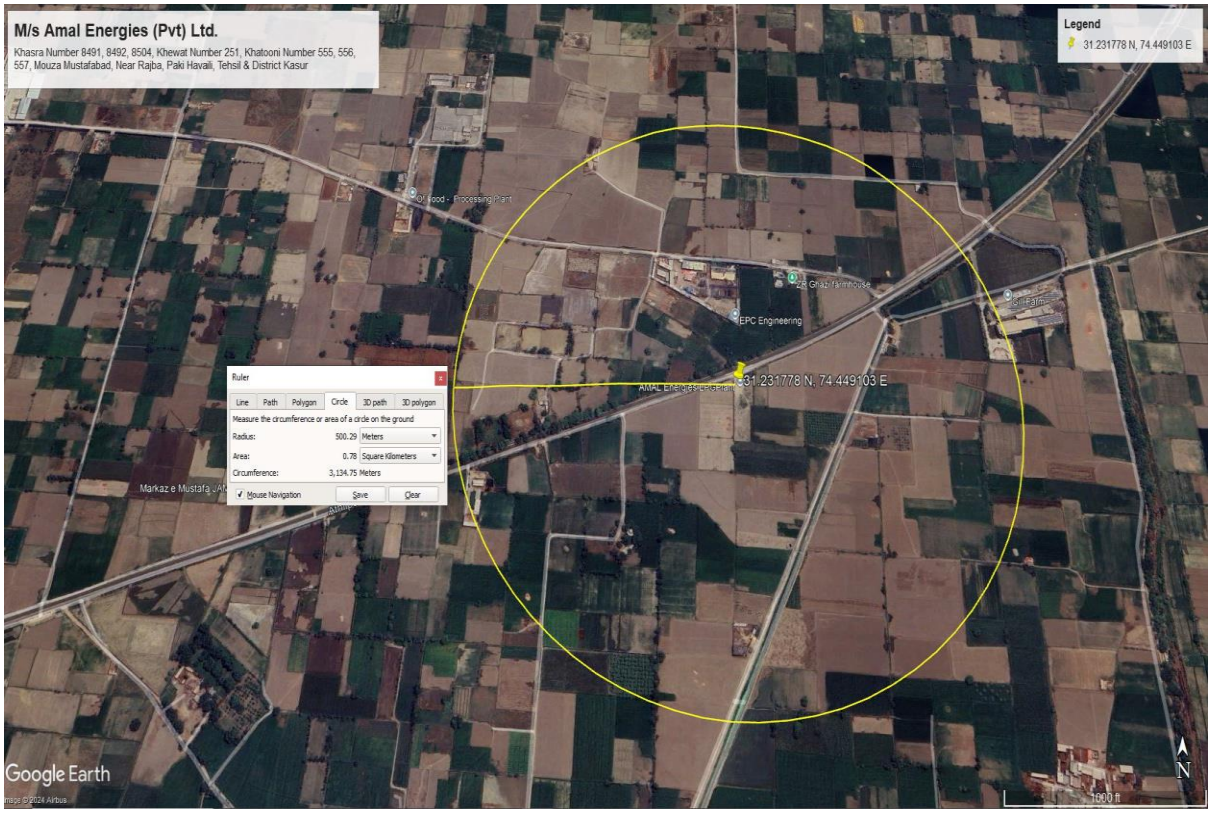


Figure 2 : 5 Km Radius from Project Site

3.2. Important Issues and Concerns Raised during Consultation

During consultation it was observed that many people were in favor of the project but some of the issues and concerns were raised. During survey following concerns of local community, Government Departments, Environmental Practitioners and Experts, nearby industries were noted:

- Local should be preferred for the job opportunities
- Proper training should be given to workers
- Noisy activities should be confined
- Air pollution should be controlled effectively
- There should be careful handling of LPG storage devices
- Wastewater should not dispose of without proper treatment
- Solid waste must be collected timely
- Gas measurement devices should be used for continuous monitoring
- A proper wastewater treatment plant should be installed
- Ensure the tree plantation in the vicinity of area

- Health and safety of workers should be ensured
- EMMP should be designed and enforced with great spirit
- Respective team officers should be responsible for the implementation of management plan and actions
- Avoid the excessive use of groundwater. Limited amount of water should be use
- Cleanliness of area should be ensured
- To reduce or avoid air pollution transport vehicles should be covered in the construction phase
- Proponent shall work for betterment of community

3.3. Significant Impacts and Factors to be Determined

The factors and impacts to be determined around the project site are:

- Dust and Particulate emissions
- Wastewater generation and its treatment
- Control Air emissions
- Solid waste management
- Occupational Health and safety
- Site Security
- Check and balance of storage unit
- Traffic Management
- Hygiene management
- Community impacts
- Job opportunities for locals
- Confined noisy activities.
- Resource conservation
- Avoid excessive water consumption.
- Energy efficient techniques must be adopted
- Proper site restoration after construction
- Tree plantation at designated green areas
- Emergency preparedness

4. ALTERNATIVE CONSIDERATIONS

Alternatives are examined to determine the best method of achieving project objectives and to reduce environmental impacts. Alternatives are recommended and examined to determine the best method of achieving project objectives, while minimizing environmental impacts (WB December 1996). The discussion and analysis of alternatives in an Environmental Impact Assessment (EIA) study should consider other practicable strategies that will promote the elimination of negative environmental impacts identified. Also, it is essential to develop most suitable technology or design option. This evaluation explains the selection of the most feasible alternative in terms of economics, environment and health & safety. It outlines the following options that were considered for this project: In particular most suitable options that were considered for this project are related to:

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

4.1. Site Alternative

The selected site is in an agricultural area, and some markets are present around the project site. No project site alternative was considered. The following factors are the main reason for selected land and **no alternative** is considered due to:

- Land is owned by Proponent
- There is no environmental sensitive area is present near the site
- No need of resettlement around the location
- Easy road access to the market
- Site is at a safe distance from sensitive receptors
- Availability of basic facilities (road, power, water, telephone etc.)

By considering these values the selected site is a source of development in the area. Also, away from protected and sensitive areas. So, site is suitable for establishment of said project.

4.2. Design/Technology Alternative

For development of current project latest technology will be selected to avoid long term environmental impact. Proponent will use updated technology and new machinery to run the process. This system emits less emissions and can work properly. Proponent is doing heavy investment for this project so state of art technology will be preferred to ensure good quality products. Fire pump shed will also be installed in case of any emergency.

4.3. Environmental Alternative

The unit site is located in an area which is away from any biodiversity including forestry, wildlife, migratory birds, flora and fauna, fishery. There is no cultural or any other heritage in the project area. There is no environmental sensitivity in the project area. These factors are also strongly supportive of the proposed project site. After completion of construction, proper landscaping will be done. The proponent is going to install fire frightening facility. Moreover, the proponent is very concerned and conscious about the quality and equally about the environmental protection and resource conservation.

4.4. Economic Alternative

Currently selected design is economically efficient. Tree plantation will be done that will reduce temperature of the area and act as noise barrier. Building design will be such that maximum use of day light and LED lights will be installed to minimize electricity consumption. Job opportunities for the local person as well as for the skilled person. The economy rate of the project site will also increase. The cumulative effect of this types of projects would result in noticeable economic growth.

5. PROJECT DESCRIPTION

5.1. Type and Category of Project

The project is construction of LPG storage and filling plant unit named as M/s **Amal Energies Pvt. Ltd.** located at Khasra Number 8491, 8492, 8504, Khewat Number 251, Khatooni Number 555, 556, 557, Mouza Mustafabad, Near Rajba, Paki Havaili, Tehsil & District Kasur. The cost of the project is around 150 million PKR. According to projects categorization for environmental assessment studies, the proposed project falls under **Schedule II** (list of projects requiring EIA), **Category A** (Energy) and **sub sector 5** (Oil and gas extraction projects including exploration, production, gathering systems, separation and storage) of the EIA Regulations 2022 made under section 12 of Punjab Environment Protection Act 1997 (Amended 2012) under which the Environmental Impact Assessment for (EIA) is mandatory for getting Environmental Approval.

5.2. Objective of Project

The main objectives for the establishment of said project unit are:

- To fulfill the market demand of LPG
- Provide low-cost Fuel
- To provide better job opportunities to the local community including skilled and un- skilled workers during construction phase

5.3. Location and Site Layout

The location of project is Mouza Mustafabad, Near Rajba, Paki Havaili, Tehsil & District Kasur. The coordinates of project site are **31.231778 N, 74.449103 E**. Total area of project site is 09 Kanal, 01 Marla out of which approximately 6207.25 square feet is covered area. Google map is attached with file.

5.4. Land Use On-Site

Project site land is industrial in nature and currently it is **open land** so no any activity is going on. After the issuance of NOC construction will be start.

5.5. Road Access

The project site boasts paved road access via the main road facilitating easy access for both construction and operational activities. This accessibility is crucial for the efficient transportation of materials and products, as well as for employees commuting to the site. The road access map provided offers detailed insight into the project site's connectivity.

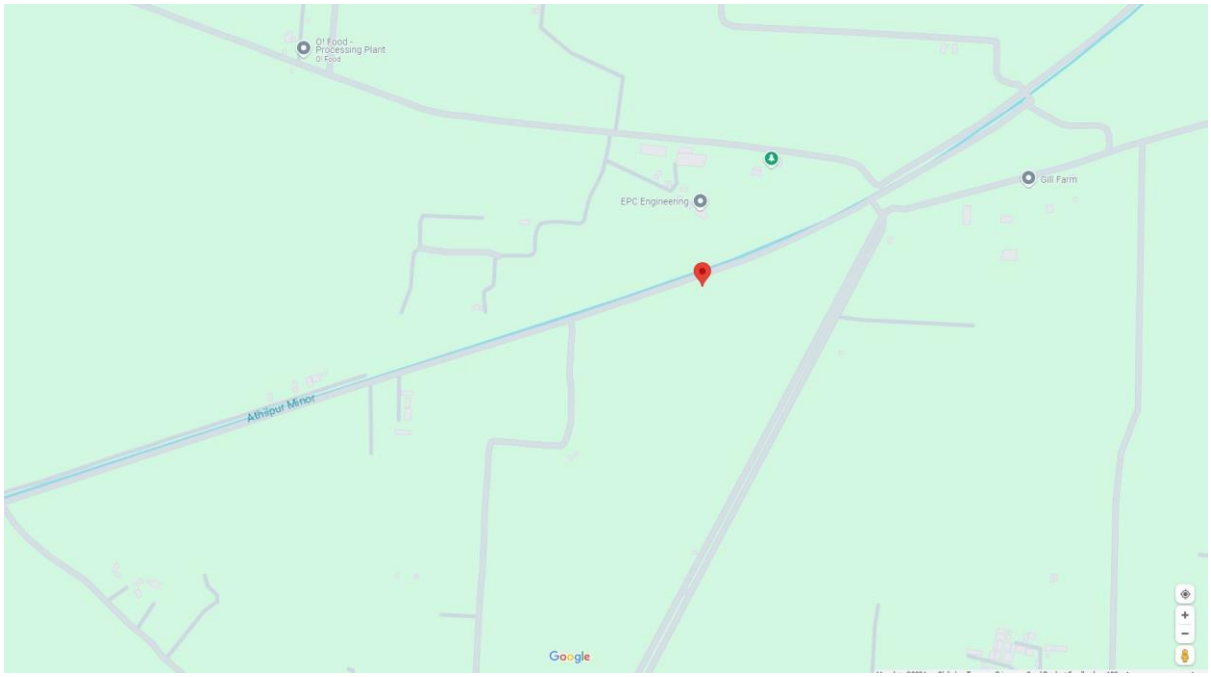


Figure 3 Road Access Map

5.6. Vegetative Features of Site

The area surrounding the proposed project site boasts a blend of agricultural characteristics, enriched with several green patches. Recognizing the importance of sustainable development, the project plans to introduce green belts around the site during its operational phase. These green belts are not only intended to augment the site's aesthetic appeal but also serve a critical environmental function. They will function as natural buffers to mitigate pollution emanating from various sources, particularly vehicular emissions, and will play a role in dampening noise pollution from within the premises. The development of a green belt is a strategic recommendation aimed at enhancing atmospheric quality and providing a serene environment around the project area.

5.7. Cost and Magnitude of Project

The total cost of the project is 150 million rupees and the coordinates **31.231778 N, 74.449103 E**.

Amenities	**Cost**
Land Cost	94 million
Infrastructure development, water supply, boundary walls, electric supply, roads etc.	45 million
Solid Waste Management	02 million
Wastewater Management	03 million
Environmental Management and Monitoring Plan	05 million
Tree Plantation	01 million
Total Cost	**150 million**

5.8. Proposed Schedule of Implementation

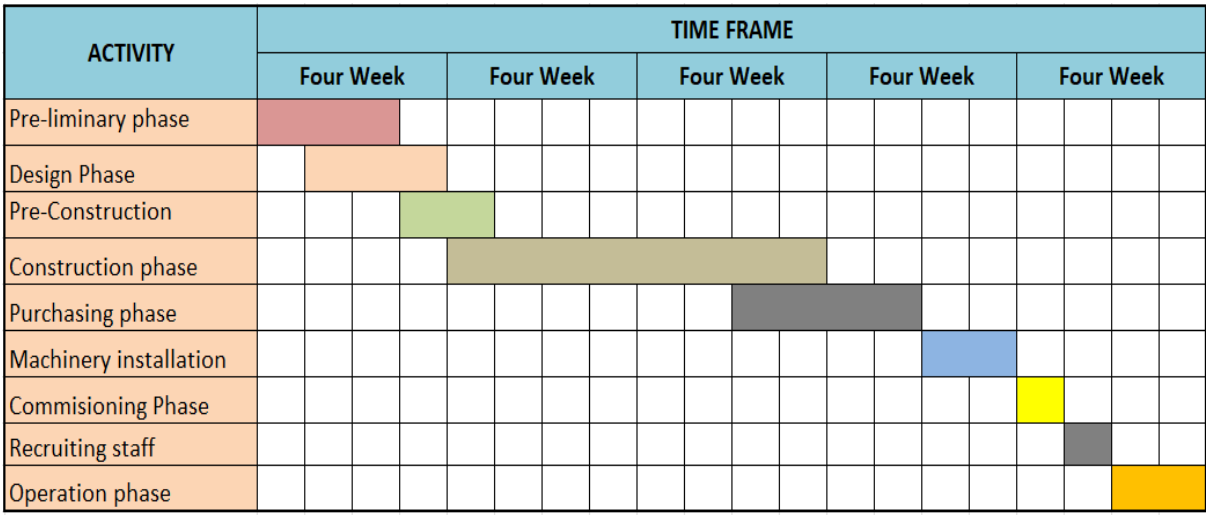
Project schedule (tentative) is described hereunder.

Stage I: The clearing of land, preparation of land for construction activity.

Stage II: During this phase machinery will be brought to the site and installed.

Stage III: In this phase all the outstanding activities will be completed, construction activities will be initiated.

Stage IV: After completing construction, employees will be hired, and staff will be assigned their respective work. The operation activities will be initiated.



5.9. Project Description

The purpose of proponent is to establish an LPG Storage and Filling Plant unit to fulfill the basic needs of local community and to provide cost efficient products. The basic details of the process are given below:

Features	Description
Storage Product	LPG storage
Storage Capacity	Storage: 100 MT (metric ton) Filling: 5 MT/day (metric ton per day)

General Description

The subject project will not be involved in any kind of manufacturing or production. It's the only LPG storage project.

LPG Storage

- **Storage Tanks:** LPG is stored in large, cylindrical tanks, either above ground or underground, depending on local regulations and space constraints. These tanks are designed to withstand high pressure and are made from thick steel to prevent leaks or ruptures.
- **Pressure Maintenance:** LPG is stored under pressure to keep it in a liquid state. The storage temperature is maintained below its boiling point to prevent vaporization.

Safety Features:

- **Automatic Shut-Off Systems:** These systems stop the flow of LPG if a leak is detected.
- **Leak Detection Systems:** Sensors and alarms are installed to detect leaks and prevent accidents.
- **Ventilation:** Proper ventilation is crucial to prevent the accumulation of gas in case of a leak, as LPG is heavier than air and can settle in low-lying areas.

Filling Process:

- **Pump and Dispenser System**: The LPG from the storage tank is pumped through pipelines to dispensers, where it is filled into smaller containers like cylinders or directly into vehicles. Dispensers are equipped with metering systems to measure the exact amount of gas filled.

Safety Precautions:

- **Emergency Shut-Off Systems**: These systems can be activated manually or automatically to stop the flow of LPG in case of an emergency.
- **Fire Suppression Systems**: Fire extinguishers, sand buckets, and automated fire suppression systems are installed to manage fires.
- **Signage**: Warning signs are posted to inform users of the potential hazards and safety protocols.

Activities Related to Project

Some aspects relevant to the project are listed below:

- Transportation and parking of mechanical instruments during construction phase
- Storage and handling of construction materials during construction
- Maintenance of records for safe handling, safe work methods, control PPEs etc.
- Measures for environmental management of the site including handling of materials, air & noise emissions
- Proper placement of safety signs at the working area

Salient Features of the Project

Total land area	09 Kanal, 01 Marla.
Cost of the project	150 million PKR
Total water usage during construction:	4-5 m^3/ day
Current status of the project	Proposed
No. of workers during construction phase	30-35

No. of workers during operational phase	25-30

Technical Specifications

- Design code of LPG storage tank is ASME Sec VIII DIV-1
- Design pressure is 250 PSIG.
- Plant Designed as per NFPA-58
- ASTM A516 Gr 70 Rolled Plate is a medium carbon alloy used for manufacturing of storage tanks.

Gas Leak Actions

Following action to be taken by person(s) discovering a gas leak:

- Attempt to prevent further leakage if considered safe to do so by closing valves or ceasing operations
- Eliminate any potential sources of ignition
- Ventilate the area
- Evacuate to appropriate muster point to LPG OPEN AREA

Raise the alarm by ringing and give the following information:

- Name, Rank and Telephone Number
- Exact location of gas leak (e.g. Unit, Building N°, Area)
- Type and size of gas leak (cylinder, bulk vessel & product if known)
- Container markings, e.g. HAZCHEM / UN Numbers etc.
- Any additional information

Waste Products of Project Process

Waste products and emissions during the project are following;

Wastewater

In construction phase, 4-5 m^3/ day water will be used for domestic & constructional activities and water source will be ground water.

Solid Waste

All raw materials will be recycled during the construction activities as road filling and maintenance purposes. Domestic waste will be placed in solid waste bins which will be placed at appropriate places within project site. This domestic waste will be collected and transported to the Municipality Dump Area nearest through a vendor.

Management of the society will depute an official who will manage the solid waste on regular basis, ensure the good housekeeping. Three color bins will be placed outside each house where biodegradable, non-biodegradable and recyclable will be handled separately.

Re-cyclable will be sold to the recycling market while other will be handed over to Municipality.

Infrastructure of Project:

Piped water from the Municipal water supply is not available to the project site. Water demand will be fulfilled by ground water. Sewage system of Municipality passing in front of the society will be used which is ultimately connected to sewer line passing along road. Electricity will be supplied by the LESCO.

Disaster Management

A complete disaster management plan has been made. The project site will be walled from all sides yet emergency exits will be constructed to cope any emergency situation.

5.10. Restoration and Rehabilitation

Given the project's location within an undeveloped area, it stands apart from residential communities, negating concerns related to displacement or disruption to local livelihoods. The absence of significant structures requiring relocation or demolition to facilitate the project underscores the minimal impact on existing land use. Consequently, the need for restoration, rehabilitation, or relocation does not arise, aligning with the project's commitment to sustainable development within pre-designated industrial estates. The project's estimated operational lifespan is 25 years, during which

all civil structures and infrastructure will undergo extensive renovation to maintain operational efficacy and safety standards, without necessitating rehabilitation at the site.

Government Approvals and Leases

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

Health, Safety & Hygiene

The project prioritizes health, safety, and hygiene through the implementation of comprehensive measures:

- **First Aid Facility:**

Adequate first aid resources and training will be available on-site to address emergencies, ensuring immediate response capabilities.

- **Safety Training:**

Employees will receive training on workplace safety and operational best practices to minimize risks and enhance overall safety awareness.

- **Substance Use Policy:**

The use of drugs and narcotics is prohibited within the workplace to maintain a safe and healthy working environment, with designated smoking areas provided during breaks.

Safety Signs/Safety Boards

Safety signage plays a crucial role in accident prevention and risk communication at the workplace. These signs and symbols, designed to be easily understood by all employees, are essential for conveying important safety information and instructions. The project will ensure that safety signs, symbols, and boards are prominently displayed across all departments, facilitating a culture of safety and awareness among workers and staff. This approach not only helps in mitigating hazards but also reinforces the project's commitment to maintaining secure and health-conscious work.

6. DESCRIPTION OF ENVIRONMENT

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

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

- Physical Environment
- Ecological Environment
- Socioeconomic Environment

6.1. Physical Environment

Kasur district is located between 30° 40′ to 31° 20′ north latitudes and 73° 38′ to 74° 41′ east longitudes. It is bounded on the north by Lahore district, on the east and southeast by India, on the southwest by Okara and on the northwest by Sheikhupura district. Kasur belongs to the Majha region of Punjab; historically, Majha was comprised of the older, settled, parts of the Bari Doab.[1] Major Pakistani towns in the Bari Doab region are Narowal, Lahore, Kasur, Sheikhupura, Nankana Sahib, Gujranwala, Sialkot, Wazirabad, Gujrat, and Tarn Taran Sahib. The people hailing from Majha are referred to as Majhis (or Majhhis).

6.1.1.Seismicity

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

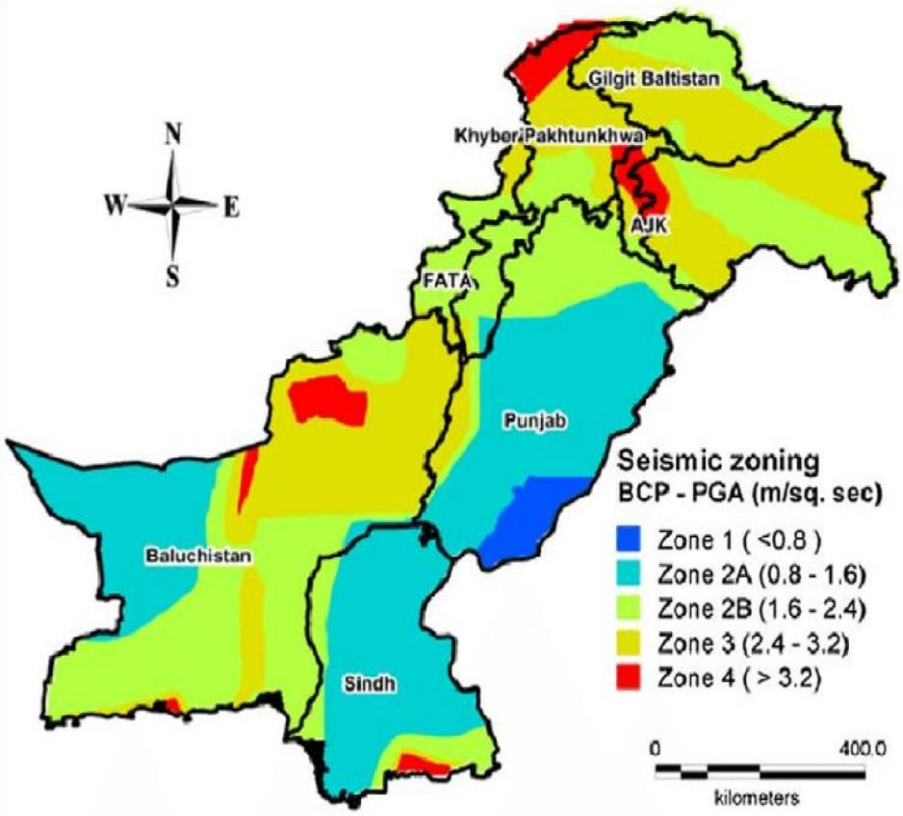


Figure 4 Seismic Zone of Pakistan

6.1.2.Climate

In Kasur, the summers are long, sweltering, humid, and clear and the winters are short, cool, dry, and mostly clear. Over the course of the year, the temperature typically varies from 41°F to 105°F and is rarely below 36°F or above 112°F.

6.1.3.Seasons and Rainfall

The mean maximum and minimum temperatures for June in Kasur are 40 °C and 27 °C respectively, and the temperature may even go up to 45 °C. The winter season lasts from November to March with January being the coldest

month. The mean maximum and minimum temperatures during this month are 20 °C and 6 °C respectively.

The Monsoon period is July to September. Average annual rainfall is 500 mm, with more than two-thirds of this rainfall occurring during the Monsoon period.

6.1.4.Soils

This soil of the riverine (hithar) area is generally sandy and rich in plant nutrients. The soils of the upland (uttar) area are sandy.

6.1.5.River, Stream, Lake

The River Sutlej, off-taking from the mountains of Tibet in China, flows through the Indian State of Himachal Pardesh, as well as Haryana and others before entering Pakistan through Kasur district. It flows in the district up to the Sulemanki Headworks, and then flows along the Indo-Pakistan border, before joining the other tributaries of River Indus at Panjnad.

The River Ravi enters Lahore district, and after flowing for 55 km, leaves the district at the borders of Kasur district. These two rivers, thus, form the southeast and northwest borders of the district respectively.

Other smaller perennial rivers of the district include the Rohi Nullah, Katora Nala, Sem Nala, and Ghana Nala.

Ghamaghar Lake is an important brackish water lake in the district. This lake is on the Ramsar List of Wetlands of International Importance.

6.1.6.Noise Levels

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

The perception and the complex pattern of sound waves is labeled noise, music speech, low altitude aero plane flying etc. The noise pollution in the project area is source of pollution and nuisance. Among eight noise

measurement locations in the cities, the study says, on average, the noise level ranged from 57-60 dB (A) in and around the project site.

6.1.7.Ambient Air Quality

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

6.2. Biological Environment

In this the baseline environmental conditions pertaining to biological environment are described. These conditions have subsequently been used to identify the potential impacts on the biological environment that are likely to arise from the project activities. A variety of vegetables are also grown in the district.

6.2.1.Flora

The Floral species commonly found in the area are:

Table 1 Flora of Kasur

Local Name	**Scientific Name**
Kikar	*Acacia nilotica*
Shisham	*Albergio sissoo*
Ber	*Zizyphus jujuba*
Neem	*Melia indica*
Dharek	*Malia azerdarach*

6.2.2.Fauna

Wolf, pigs, peafowls, and jackal are the main wild animals in the district. Wolves are more common in the lowland wastes of Chunian tehsil; jackals are common in all areas of the district. Bengal fox and the small Indian Mongoose are also found in Kasur district.

The Changa Manga Wildlife Park houses important endangered fauna, providing them sanctuary. The Rasul Barrage Game Reserve and Ghamaghar Lake are both bird watchers' paradises and are home to a large variety of wintering waterfowl. The birds in these reservoirs include grey and black partridges, little grebe, cormorants, egrets, Eurasian teal, pintail, common pochard, greyleg goose, gadwall, purple swamp hen, and the darter.

Mammals common in the Ghamaghar Lake and Rasul Barrage Game Reserve include pigs, golden jackal, and jungle cat. Fish species include knife fish, rohu, gonnia, and mori. Other aquatic fauna includes medical leeches, shrimps, frogs, turtles, and Indian flat shell turtles.

6.3. Socio-economic Assessment

Social change is the consequence of almost any intrusion into the community life of any society. The intrusion can be in the form of any developmental projects or nonspecific, less tangible forms such as increased exposure to other cultures, technological changes and so on. Community, with special reference to environment and conservation of natural resources.

6.3.1.Demographic Profile

According to 2017, Population and Housing Census, total population of Kasur district is 3494556 persons out of which 51.3% are males and 48.7% are females. The density of population in the district is 887.2 persons per square kilometer.

6.3.2.Languages and Major Casts

The principal tribes of the district are Pathans including Niazis, Khattak, and Balouch along them with are Syed, Qureshi, Jat, Rajput, Khawaja and Sheikh. Besides, there are working classes, the professionals like, Tarkhans,

Mochis and Pawlis etc. Of late, the professionals have asserted themselves to equal respect and honor and are no longer looked upon as menials. All the tribes are Muslims, very staunch in their faith.

A few hundred Christians are also living in the towns. They too enjoy perfect peace and freedom and are at liberty to profess their faith.

6.3.3.Religion

The population of District Kasur is over 95.5% Muslim.

6.3.4.Dress

The natives are gracefully dressed. Although a few elderly gents and ladies still put on Chola and Manjhla and Patks, the greater majority has taken to the Shalwar-Qameez. The headgear has disappeared altogether although Dhoti, Kukar (in winter) and Sindhi Ajrak over the shoulder are still very much in vogue. Khairee made of Tilla (called as Tillay walee khairee) is very popular over here.

6.4. Quality of Life Values

6.4.1.Health Facilities

Hospitals exist in the project area. People also access to private hospitals in city and sometimes to nearby private dispensaries. Fever, malaria and chest congestion, Hepatitis-C were reported as the common diseases of the project area. In the project area, health conditions are much developed.

The list of hospitals in Mianwali District is following.

- DHQ Hospital, Kasur
- Hameed Latif Hospital
- Sheikh Zaid Hospital
- Alama Iqbal Hospital

6.4.2.Customs

The peoples are very much concerned about castes and beliefs, visiting shrines is very common among them.

6.4.3.Electric Supply

Power supply line goes all along the project area, and approximately 90% of the community can acquire electricity. Gas supply has been provided to the area, but few of the houses cannot afford to avail the service, so these houses depend upon fuel wood. But the majority of the people belong to business communities, government sectors and have small jobs in district Kasur.

6.4.4.Telephone Facilities

PTCL telephone facility is available in all parts of the project area. Similarly, mobile service is also available and is being used efficiently as mode of communication in the project area.

6.4.5.Educational Facilities

In the 2017 census the literacy ratio of the district Kasur is 59%, with a split of 66% for males and 54% for females. There are sharp differences in the literacy ratios by sex and areas. There are different government and private sector school near the vicinity of project area.

6.4.6.Agriculture

Kasur district falls in arid and semi-arid zone of Pakistan. The land is of multiple type and can be classified as loamy with clay soil, which is suitable for wheat and maize, sandy soil, cultivated mainly for the rain-fed gram, Mong and Guara, and the irrigated areas which are mostly under wheat, cotton and sugarcane crops. Citrus plantation is also being carried out successfully in the area.

6.4.7.Site Suitability

As the site is surrounded by some other relevant excavation and exploration projects and no relocation is required for establishment of current project. The site does not fall in environmental sensitive area and all commodities are at a suitable distance from project site as they will not impact by the prospecting activities even locals will get more benefits and job opportunities. No replacement, relocation and rehabilitation are required for the development of above-said project.

6.4.8.Project Response

90%of the respondents believed this project should be implemented. In their opinion, prospecting of the project will create labor opportunities for locals, and it will help to improve economic conditions of area. The respondents also provided the mitigation measures like certified contractor must be hired, proper plantation should be done, proper procedures should be followed etc. They said, if mitigation measures will be implemented, they would have no objective.

7. IMPACT ASSESSMENT

As the project is related to the storage of LPG and filling plant so it can impose impacts majorly on-air quality and on land/soil. Impacts will also be seen on water quality, generation of solid waste and on workers' health. The further detail is given under here:

7.1. Impact Assessment Method

The EIA utilizes a Checklist Method to systematically evaluate the project's potential impacts on the geomorphology, soil, water, air, biological resources, and socio-economic conditions of the area. This method facilitates the identification of the significance, magnitude, nature, reversibility, and extent of potential impacts, assessed across the project's construction and operational phases.

Evaluation Methods Include:

1. **Checklists**

Simplified approach for identifying potential impacts.

2. **Matrices:**

It helps in visualizing the relationship between project actions and environmental aspects.

3. **Networks:**

Illustrates the interconnections between different environmental factors.

4. **Overlays:**

Utilized for spatial analysis, often in conjunction with GIS.

5. **GIS and Computer Expert Systems:**

Advanced tools for detailed spatial and environmental analysis.

The Checklist Method has been instrumental in delineating the significant environmental aspects to be addressed through the project lifecycle. Therefore, the method used to evaluate the impacts of the said project is the Checklist Method.

Evaluation of the Residual Impacts

While the incorporation of mitigation measures is expected to significantly reduce the project's environmental footprint, some residual impacts may persist. This stage assesses the anticipated impacts remaining after the application of mitigation strategies, underscoring the importance of ongoing management and monitoring to ensure they remain within acceptable bounds. The conclusion drawn highlights the suitability of the selected site and adopted technologies for mitigating environmental impacts effectively, assuming proper management practices are in place.

Characteristics of Impact

The nature of the project's impacts is further categorized into:

- **Positive and Negative Impacts:** Evaluating both the beneficial and adverse effects of the project.
- **Long and Short-Term Impacts:** Differentiating between immediate and enduring impacts.
- **Direct and Indirect Impacts:** Identifying impacts that occur as a direct result of project activities and those that are secondary.
- **Continuous and Intermediate Impacts:** Distinguishing between ongoing and sporadic effects.
- **Wide and Local Impacts:** Assessing the geographical extent of impacts, whether widespread or confined to the local area.
- **Large, Moderate, and Minor Impacts:** Classifying the severity of impacts based on their scale.

This structured approach to impact assessment ensures a comprehensive evaluation of all potential environmental and socio-economic effects, facilitating the development of effective mitigation and management strategies to support the sustainable implementation of said project.

DURING CONSTRUCTION PHASE

Basic Components	Impact Characteristics												
	Duration		Location		Frequency		Extent		Significant			Nature	
	Long	Short	Direct	Indirect	Continuous	Intermediate	Wide	Local	Large	Moderate	Minor	Positive	Negative
Soil Erosion		*		*		*		*			*		*
Air Quality		*	*			*		*			*		*
Ground Water Quality		*	*			*	*			*			*
Noise Level		*	*			*		*			*		*
Wastewater Generation	*		*		*		*		*				*
Solid Waste	*		*		*			*		*			*
Aesthetic		*		*		*		*			*		*
Flora		*		*		*		*			*		*
Fauna		*		*		*		*			*		*
Employment Rate		*	*			*	*			*		*	
Economic Uplift		*	*			*	*			*		*	
Health & Safety		*	*			*		*			*		*

DURING OPERATIONAL PHASE

Basic Components	Impact Characteristics												
	Duration		Location		Frequency		Extent		Significant			Nature	
	Long	Short	Direct	Indirect	Continuous	Intermediate	Wide	Local	Large	Moderate	Minor	Positive	Negative
Soil Erosion		*		*		*		*			*		*
Air Quality		*	*			*		*			*		*
Ground Water Quality	*		*			*	*			*			*
Noise Level		*	*			*		*			*		*
Wastewater Generation	*		*		*		*		*				*
Solid Waste	*		*		*			*		*			*
Machine Installation	*		*		*			*		*		*	*
Production		*	*			*		*		*			*
Aesthetic		*		*		*		*			*		*
Flora & Fauna		*		*		*		*			*		*
Economic Uplift	*		*		*		*		*			*	

Impact Analysis of Said Project

The establishment and operation of a manufacturing unit, such as M/S Qadbros Engineering (Pvt.) Ltd. (Unit II) has significant implications for various stakeholders, ranging from the animal health sector to the broader socio-economic landscape. This analysis explores both the positive contributions and potential challenges associated with such a facility.

Positive Impacts

Economic Contribution: The operation of the proposed facility stimulates the driving innovation, research, and development. It also creates direct employment opportunities and supports ancillary services.

Regulatory Compliance and Product Safety: Adherence to stringent quality and safety standards ensures the reliability of products, enhancing public trust in this sector.

Mitigation and Management Strategies

- **Environmental Management Practices (EMP):**
  Implementing comprehensive environmental management practices to minimize the release of residues into the environment.
- **Regulatory Compliance:**
  Ensuring strict adherence to guidelines for the responsible use of product.
- **Research and Development:**
  Investing in the development of alternative and sustainable practices to mitigate environmental impacts.
- **Public and Stakeholder Engagement:**
  Collaborating with regulatory bodies, and the public to promote awareness and responsible use of medicines.
- **Personal Protective Equipment (PPE):**
  Enforcing the use of appropriate PPE among workers to ensure their safety and minimize occupational exposure to hazardous substances.

By addressing these potential challenges through proactive management and mitigation measures, the facility can significantly contribute to economic growth while maintaining a commitment to environmental sustainability and regulatory compliance. The continuous improvement in practices and adherence to an effective Environmental Management Plan (EMP) are key to mitigating the associated impacts and ensuring the long-term viability.

8. ANTICIPATED IMPACTS AND MITIGATION MEASURES

This section provides the analysis of the potential impacts during construction and operational phases of the proposed project of storage and filling unit on the physical, biological, and socioeconomic environment of the project area. Environmental sensitivity of the project area is described through a thorough review of the project activities. This chapter then suggests effective mitigation strategies to help combat the adverse nature of these impacts and delivers a monitoring scheme to manage them.

Impact Significance

As the project related to gas storage unit that's why it can majorly impose impacts on water, land, air and on workers' health. The further detail is given under here:

8.1. Impact and mitigation measure related to Project Location

Since the project aims at development of LPG gas storage so it may affect the water body, air quality of the project location. Solid waste products may affect the aesthetics of the area.

Mitigation

- Plantation will be done around the project location to minimize the effect of vegetation removal.
- Proper solid waste management and waste water management will be done to avoid any pollution.

8.2. Anticipated Environmental Impacts related to Project Design

All the process will be fully controlled so impact due to design will be negligible. In case of any negligence in storage of LPG adverse effect may occur.

Mitigation

- Proper handling of storage equipment will be ensured
- Implementation of safety measures

8.3. Impacts and Mitigation Measure During Construction Phase

Environmental impacts due to project construction are as under:

Air quality:

Impacts

Due to the construction activities like excavation, clearing, leveling, compaction, etc., dust will be raised and also due to slightly increased traffic, slightly emissions of SO2, NOx, CO and SPM are inevitable. Uncovered vehicles for transportation of building materials as well as their storage, especially gravel, sand and cement on the construction site can lead to chance dispersal of materials during heavy rains or high winds during dry periods. This could have a negative impact on the workers of the nearby industries and the passers away. Also, the mixing of raw materials and blistering will generate solid waste composting of chemicals and when exposed to air can affect the environment and air as well.

Mitigations

Spray by water trucks after every 2 hours to minimize the dust of construction areas and exposed terrain should be done regularly. The construction machinery and equipment must be kept maintained on a regular basis. Tuning of vehicles should be made mandatory to reduce emissions of SO_2, NO_x, CO and PM_{10}. Vehicles or trucks carrying cement, sand, aggregate and other materials shall be kept covered with sheets to help contain construction materials being transported within the body of each carrier.

Noise:

Impact

During construction process compaction, blistering and mixing of raw material machinery granulation Process, use of heavy machinery for clearing

of the site and trolleys and trucks used for the transportation of construction materials will create some noise and vibration as well.

Mitigations

Engines of vehicles visiting the project site should be properly tuned-up. Truck/tractor drivers should be instructed not to play loud music and stop use of horn. Noise control measures should be taken such as provision of silencers on the heavy construction vehicles. The green zone of plants will also help decrease sound levels.

Health and safety:

Impacts

Possibility of health and safety hazard of workers is always present during construction phases like laying of pipes, installation of scaffolding and machines installations. To avoid cuts and damages to the skin during sterilization, packaging of the medicines certain medical facilities must be present at the site during construction.

Mitigations

To handle emergency medical situations, first aid facilities have already been made available for the workers at the site. Avoid all possible injuries during construction of the project. The contractor will ensure the availability of transport and driver to handle any emergency condition during construction activities at the project site. Safety equipment like belts, gloves and helmets should be strictly used by the labor at the work site. Implement training programs that support the achievement of the unit's staff and personnel's competency in relation to health, safety and environment. Wearing of personal protective equipment should be made mandatory. The supervisory staff and workers to the extent possible must.

Follow the messages and instructions displayed on HSE notice boards installed in the premises of the site.

- Be aware of emergency escape routes

- Promptly report all accidents to the concerned environmental manager
- Not smoke or produce flame in No Smoking Areas

Construction waste disposal:

Impacts

Disposal of construction debris produce shall be properly disposing of otherwise it would have negative impacts on the site and surrounding area. Material including concrete waste, wood, steel, plastics sheets, etc., may result in the drainage blockage.

Mitigation

A site waste management plan should be made the responsibility of the building contractor to provide for the designation of appropriate waste storage area on the site and a schedule for the timely collection and removal of construction debris to an approved dump site. The wastes should be properly segregated and separated to encourage recycling of some useful waste materials.

Change in drainage pattern:

Impacts

Excavation activities required for infrastructure installation (lying of water/sewage pipes, electrical cables, etc.) may adversely impact the existing drainage patterns in the area. Loss of topsoil due to soil erosion may remain a problem during clearing and construction phases of the project.

Mitigation

Site clearing activities should be conducted in stages to minimize the area of exposed soil at any given time.

Flora & fauna:

Impacts

Previously, no plants or trees existed on the project site. Hence, no negative impact on the ecological environment will take place on account of cutting of any trees in the project area and clearing of vegetation from the site.

Mitigation

In order to reduce construction impacts on surroundings and workers, a tree plantation program has been designed by the project proponent as it would help in cleaning the environment during operational life of the project too. The landscape plan would assure that designated trees are planted and that areas suitable for planting are identified and landscaped using majorly local trees and shrub species used for feeding by local bird species.

Socio-economic environment:

Impacts

A number of categories of employees will be required during the construction phase. This will include skilled and unskilled laborers, engineers, contractors and a small number of other professionals. These levels of short-term employment would have a positive impact on the local economy and on regional unemployment.

Mitigation

Strong and comprehensive plantation plans also lessen the fear of the local people towards environmental issues. Sustainable development approaches through conservation of natural resources would be the best strategy to compensate for negative socio-environmental impacts. Environmental aspects of the project should be well taken care of through the implementation of the Environmental Management and Monitoring Plan (EMMP) as recommended in this report. Socially responsible attitude of the project management towards local people and resources can make project people friendly.

8.4. Anticipated Environmental Impacts during Development Phase

Major impact associated with the installation of the project is the transportation. There are two areas of concern in this respect – one while importing the construction machinery to the project site and second installation phase on the site. The impact during transportation may include traffic congestion. Impacts during the installation phase may include disturbance to the nearby residents, aquatic ecosystem, flora and fauna in the project area.

Mitigation

The machinery would be shipped in the time when local transport load is minimum. Moreover, all the transported feed will be covered with tarpaulin sheet to avoid disturbance. Also, special care would be taken to avoid disturbance to flora and fauna of the area.

8.5. Impact and Mitigation Measures During Operational Phase

Air Quality Potential Impact:

Air emissions from project-related activities are likely to include the dust raised on dirt tracks by project-related vehicles. Vehicular Exhaust (nitrogen oxides, sulfur dioxide, particulate matter, carbon monoxide, and volatile organic compounds) from vehicles used for project-related activities and residents of the area. Any explosion causes the spreading of pollutant particles in the air.

Mitigation Measure:

Maintain the pressure of filled cylinders to avoid any explosion. Maintenance of transport vehicles regularly. Use the fuel that emits less carbon black.

Solid waste:

Impact:

Domestic solid waste will be produced during the working hours. In case of any damage to cylinders, this waste will also be produced.

Mitigation Measures:

Proper solid waste management system is necessary for the prompt, timely and efficient disposal of solid waste & sludge for the reduction of its impacts. Impacts due to solid waste are expected to be temporary and minor in nature. Separate bins will be provided for solid waste collection.

Noise Quality

Impacts:

Noise will be generated only from transport vehicles.

Mitigation Measure

Avoid unnecessary use of horns. Provide green belts to restrict the noise.

Potential Positive Impacts:

The project is envisaged to have followed major positive impacts,

Employment opportunities:

Construction of LPF gas storage and bottling unit will help in generating new jobs for the local population. The requirement of Managers, Engineers, Workers, technicians, skilled and unskilled labor etc. will generate employment opportunities. It is estimated about 25-30 persons will be employed during operations phase.

Increase in Business:

With the influx of laborers for the proposed project, there will be more opportunities for small scale business such as small food cafes etc.

Improved Infrastructure:

Construction of LPG gas storage and bottling will improve the infrastructure of the area as proponent has incorporated aesthetic values and regeneration of site in its planning stage.

8.6. Potential Environmental Enhancement Measures

The proposed project will be installed with all precautionary measures to enhance and safe the environment. Following necessary measures will be adopted during construction and operation:

- Sprinkling of water will be done on dusty road and tracks
- PPEs will be provided during construction activity
- Constructional waste and domestic solid waste will be disposed-off or utilized properly
- Local people will be informed in advance when work is about to start in an area
- Machinery will never be left unattended
- Efforts should also be made to discuss traffic conditions so that regular traffic is not disturbed. Transporters engaged for the project would be forced to adhere to the load specifications of the access road. No overloading would be allowed in any case.
- Safety signs and boards will be placed during construction
- Proper SOPs will be followed with proper schedule along with the HSE conditions
- Area will be restored with native plants. A proper tree plantation plan will be formulated to save the environment
- Solid waste will be handed over to contractors and agreement will be made.

- Noise will be controlled by adopting proper measures
- PPEs will be provided to workers during working
- Safety signs will be placed at all locations where required
- First aid facilities will be made available
- Any possible measure will be adopted to make the project safe and environmentally friendly.
- Fire safety management will be done
- Fire Fighting Equipment will be installed and managed

9. ENVIRONMENTAL MANAGEMENT AND MONITORING PROGRAM

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

9.1. Objective of Environmental Management Plan

The EMP has been prepared with the objectives of:

i. Defining roles and responsibilities of the project proponent for the implementation of EMP and identifying areas where these roles and responsibilities can be shared with other parties involved in the execution and monitoring of the project.
ii. Outlining mitigation measures required for avoiding or minimizing potential impacts assessed by the EIA.
iii. Developing a monitoring mechanism and identifying requisite monitoring parameters to confirm effectiveness of the mitigation measures recommended in the EIA
iv. Defining the requirements for communication, documentation, training and monitoring, management, and implementation of the mitigation measures.
v. A reduction in negative environmental impacts and improved reputation.

9.2. Proposed Mitigation Actions

Mitigation planning is the process used by state, tribal, and local leaders to understand risks from natural hazards and develop long-term strategies that will reduce the impacts of future events on people, property, and the environment

ENVIRONMENT MANAGEMENT AND MONITORING PLAN				
S. #.	**IMPACT**	**MITIGATION MEASURE**	**RESPONSIBILITY**	
			IMPLEMENTATION	**MONITORING**
A	**CONSTRUCTION PHASE**			
1.	**AIR QUALITY**			
	Dust, SO_2, NO_x & CO emissions from trucks, cause health issues to workers. Particulate matter will be generated during the Construction.	• Spray by water trucks to minimize the dust. • Maintenance of construction machinery should be made mandatory to reduce emissions. • Haul-trucks carrying earth, sand, aggregate and other materials will be kept covered with tarpaulin to reduce dust pollution.	Contractor	Proponent through Consultant
2.	**NOISE**			
	The impact of noise generated during construction	• Engines of vehicles visiting project site should be properly tuned-up. The green zone of plants will also help decrease sound levels.	Contractor	Proponent through Consultant
3.	**OCCUPATION, HEALTH, AND SAFETY**			
	There will always be the possibility regarding hazard to health and safety of workers to occur during construction stage,	• First aid facilities should be readily available for the workers at the site. The contractor will ensure the availability of	Contractor	Proponent through Consultant

	lying of piles, and machines installation.	transport and driver to handle any misshape which may occur. • Relevant safety devices like belts, gloves and testers should be strictly used by the Labor force at the work site. • Implement training programs that support the achievement of the staff and personnel's competency in relation to HSE.		
4.	**DISPOSAL OF CONSTRUCTION DEBRIS**			
	Each phase of the development shall produce solid waste, disposal of which, if not managed properly could have negative impacts on the site and surrounding area.	• A site waste management plan should be made the responsibility of the contractor. The wastes should be properly segregated and separated to encourage recycling of some useful waste materials. • Train or educate the involved stakeholders on the importance and means of waste management and handling.	Contractor	Proponent through Consultant
5.	**GROUND WATER QUALITY**			
	No appreciable impacts on the ground water quality are anticipated.	• Avoid accidental spills through good work practice.	Contractor	Proponent through Consultant
6.	**SOIL CONTAMINATION**			
	Any improper storage or handling of materials including paints, fuels, solvents, oil, cement, etc.	• The contractor should be required to impart proper training to their	Contractor	Proponent through Consultant

	would result in soil contamination.	workforce in the storage and handling of materials		
7.	**FLORA & FAUNA**			
	No negative impact on the ecological environment will take place on account of cutting of any trees in the project area and clearing of vegetation from the site.	• Trees and ornamental plants shall be planted along the project boundary which increase the aesthetic value of the site and will combat pollution. • Landscaping is deemed to be a powerful mitigation activity with a positive impact.	Contractor	Proponent through Consultant
8.	**SOCIO-ECONOMIC ENVIRONMENT**			
	Several categories of employees will be required during the construction phase. This would have a positive impact on the local economy and on regional unemployment.	• Socially responsible attitude of the project management towards local people and resources can make project people friendly. • Awareness and educational programs introduced by the project management or e area can reduce the fear among the people regarding non-local people.	Contractor & Proponent	SIE
B.	**OPERATIONAL STAGE**			
1.	**AIR QUALITY**			
	Air pollution due to transport and vehicle. Due to some fumes of chemical the toxic particles mix in the air	• Proper maintenance and tuning of the vehicles can reduce it. • Maintaining the pressure of cylinders, there will be less risk of explosion	Proponent	EPA
2.	**NOISE QUALITY**			

	Noise due to movement of vehicles, during transfer of materials	• Plantation along with boundary will make buffer zone to avoid noise.	Proponent	EPA
3.	**OCCUPATION, HEALTH, AND SAFETY**			
	There will always be the possibility regarding hazards to health and safety of workers to occur during the operational phase of the project. In Case of any leakage/evaporation skin burn issues will be there.	• All the workers involved in transport of the materials will be suggested to wear boots, gloves, safety cap to avoid injury. • All workers must know the safety measures regarding handling of cylinders	Proponent	EPA
4.	**SOLID & HAZARDOUS WASTE**			
	The solid waste may negatively impact the site, the workers, the visitors, and the factory surrounding in different ways including aesthetically, occupationally as well as from health, safety and environment point of view.	• Domestic solid waste will be collected in waste bins. Hazardous waste will be stored in separate bins. • Must use protective gloves while carrying the containers to avoid any hazardous effect	Proponent	EPA
5.	**WASTEWATER QUALITY**			
	Domestic wastewater will be produced	• Domestic wastewater will be disposed of by meeting PEQS	Proponent	EPA

6.	**FLORA AND FAUNA**			
	Excessive plantation shall be done on the walls. This will act as buffer zone and bring healthy change in environment during operational phase of project.	• The process of plantation should be kept sustainable throughout project life.	Proponent	EPA
7.	**SOCIO-ECONOMIC ENVIRONMENT**			
	A few employees will be required in the operational phase, and this would have a positive impact on the local economy and on regional unemployment.	• The management of the project can capitalize the positive attitude of people of the study area towards this project by offering them maximum employment opportunities. • Measurements and steps should be taken to keep undisturbed the privacy of adjoining workplaces.	Proponent	EPA

9.3. Schedule for Implementation and Environmental Budget

Schedule of Implementation

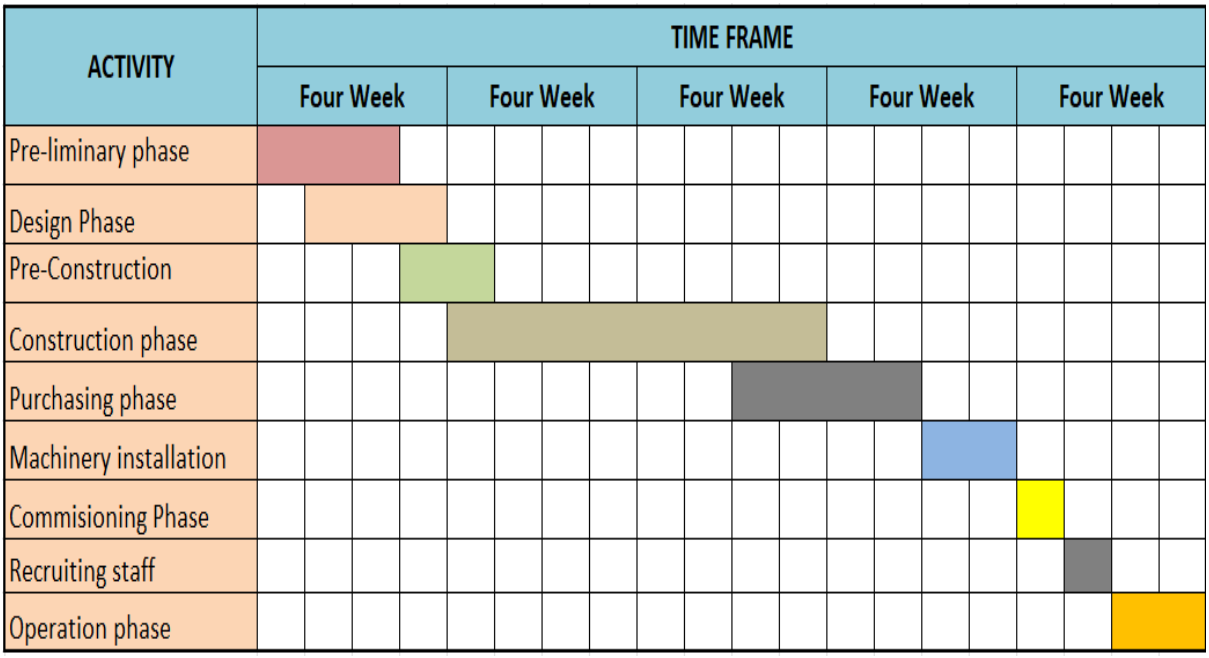
Project schedule (tentative) is described hereunder.

Stage I: The clearing of land, preparation of land for construction activity.

Stage II: During this phase machinery will be brought to the site and installed.

Stage III: In this phase all the outstanding activities will be completed, construction activities will be initiated.

Stage IV: after completing construction, employees will be hired, and staff will be assigned their respective work. The operation activities will be initiated.



Environmental Budget

Sr.no	Environmental Components	Quantity	Pak. Rs.	Details/ Basis
1	**Tree Plantation**	100-500	01 million	Cost includes plantation and maintenance up to three years
2	**Solid Waste Management/ Mortality Pits**	L.S.	02 million	Lump sum
3	**Wastewater management**	L.S.	03 million	Lump sum
4	**Health & Safety Measures**	L.S.	50,000	Lump sum
5	**Miscellaneous Cost**	L.S.	42,000	Lump sum
6	**Air Quality Monitoring**	2	15,000	Lump sum
7	**Water & Wastewater Quality Monitoring**	2	12,000	2 samples @ 6000/Sample
8	**Noise Level Monitoring**	2	10,000	2 samples @ 5000/Sample
9	**Soil Tests**	2	10,000	2 samples @ 5000/Sample
10	**Training**		30,000	Lump sum
11	**External Monitoring**		60,000	Lump sum
	Total Environmental and Social Management Cost		**Approx. 09 million PKR**	

9.4. Environment Management Team

Responsibilities of Proponent

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

1. Monitoring progress of the project as per planned schedule of activities
2. Exercising oversight over the implementation of environmental mitigation measures by the contractor
3. Documenting the experience in the implementation of the environmental process
4. Preparing training materials and implementing programs
5. Maintaining interfaces with the other lined departments/ stakeholders
6. Reporting the status of EMP implementation to the management

Responsibilities of project contractor:

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

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

9.5. Monitoring Program to Access Performance

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

1. The project owner (proponent) as the project proponent and owner of the EMP.

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

9.6. EMP Reporting and Review Procedure

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

9.7. Training Schedule

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

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

10. STAKEHOLDERS CONSULTATION

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

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

10.1. Objective of Consultation

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

10.2. Proponent's Environment Management Team

Sr. No.	Managers	Responsibilities
1	Contract Manager	• Implementation of EMP • Environmental issues identification during pre-construction phase. • Communication EMP to all employees.
2	Contractor	• Ensure that the control measures identified during environmental surveys are implemented as they are relevant to their work/visit. • Ensure that the project management team is notified of any non-conformance of control measures or environmental incident where the environment has been put at risk.
3	Site manager	• Ensure site material and safe handling of hazardous waste. • Controlled access arrangement to avoid hazards. • Emergency arrangements to avoid any unfortunate incident. • First aid facilities/services should be available on-site. • Ensure good standards of workmanship.
4	Site HSE advisor	• Management plan to be followed and implemented. • Daily checks & weekly checks. • Regular consultation with workers.
5	Site Environment advisor	• According to legislation and consent develop EMP. • Ensure application of EMP. • Carry out regular site inspection.
6	Public Contact Officer	• First point of contact for members of the public. • Arrange and manage public forums. • Maintain relation with stakeholders. • Door to door surveys as appropriate. • Coordination with work.

10.3. The responsible Authority

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

responsible for managing the task and implementation of all mitigation measures.

10.4. Other Department and Agencies

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

Sr. No.	Designation	Concerns
1.	**Environment Protection Department (EPD)**	
	General Manager	To reduce environmental impacts following points are summarized: • Solid waste should be managed in Environmentally friendly manner • Wastewater should be treated effectively & approval should be acquired from concerned agency before disposing off in nearby drain • HSE* at the site should be managed effectively • No impact is being foreseen due to the selected location • Locals should be given job opportunity
	Environmental Inspector	
2.	**Social Welfare Department (SWD)**	
	Deputy Director Officer	Following comments are suggested by the Deputy Director on the behalf of SWD: • Final goods should be affordable for the locals • The proposed product should facilitate locals and they should be economical • Job opportunities should be given to the locals • Wages should be given according to the work assign to them • Life insurance of the workers should be given as well as all the facilities should be given as per labor laws

3.	**Irrigation Department**	
	Sub Division	Following comments were suggested: • Untreated wastewater should not be disposed of in the nearby drains without proper treatment • Beneficial as job opportunities will be available to the local residents.
	Executive Engineer	
4.	**Forest Department**	
	District Forest Officer	Following recommendation were suggested by the forest department: • Planation and landscape activities should be carried out on broader scale • Proper drainage system must be available at site

10.5. Environmental Practitioners and Experts

Sr. No.	Name	Designation	Comment/ Suggestions
1.	Sara Fatima	Senior Environmentalist	• She said that the project will have positive impact on economy but its construction should be done in environmentally friendly way • Basic facilities should be provided to local community
2.	Zia Ur Rehman Farooqi	Ph.D. Scholar Environmental Sciences	• Tree plantation in designated green zones should be carried out • Proper disposal of the solid waste • HSE management measures should be adopted and implemented effectively
3.	Kanza Fatima	Junior Environmentalist	• Waste must be collected and dispose of properly • Ensure the use of PPE's during the operational activities. • Wastewater should be treated • Ensure the tree plantation
4.	Aleeza Kanwal	Junior Environmentalist	• Health and safety department and trained people should be there in case of any emergency • Periodic monitoring of every fire extinguisher (expiry date, type)

5.	Mr. Saffi Ahmed	Environmentalist	• He said that locals should be preferred for employment. • Value addition of area. Proper mitigation measures must be adopted while construction and operation of this project
6.	Engr. M. Bilal	Environmental Engineer	Following comments are summarized to control the air pollution generation during operational phase • It should be ensured that the pollution abatement technique

10.6. Affected and Wider Community

There is no affected community present in the radius of our study area. Enviro Stewards Company (Private) Limited team has consulted with the inhabitants of the different areas. They provided positive remarks regarding the subject project and in the favor of the subject activity for the proposed plant.

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

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

11. CONCLUSION

The aim of the project is to supply good quality product to end users. The project falls under the category of environmental impact assessment.

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

- Environmental monitoring by the project proponent and a third party will also ensure that the project runs in accordance with the legal requirements.
- Air quality will be maintained. Quality measure devices will be used.
- There's no any sensitive area/element near the project site.
- This project will create job opportunities during construction and operation stages leading towards economic uplift.
- EMP, as recommended in this EIA Report, is to be put in place during all constructional and operational stages of the project.
- All the protective measures for workers' health and safety will be followed.
- Availability of water for the project will be ensured without affecting the needs of the people around the project area.
- Wastewater will be disposed of after meeting PEQS.

GLOSSARY

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

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

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

Recycling	process of converting waste materials into new materials and objects
Stakeholders	A person or organization with an interest or concern in something
Rehabilitation	The conversion of waste land into land suitable for use of habitation or cultivation

LIST OF ABBREVIATION

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

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

LIST OF PEOPLE CONSULTED WITH WRITTEN FEEDBACK

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

SOURCE OF DATA

- Punjab Environmental Protection (Amendment) Act 2012 (PEPA)
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- Material Safety Data Sheet (MSDS) of chemicals
- /www.wsask.ca/Global/Water%20Programs/Water%20Conservation/SWA-
- Water_Efficiency_on_the_Farm_Booklet_WEB.pdf
- http://www.madehow.com/Volume-2/Lead.html
- http://www.ijirset.com/upload/2013/november/18_Disposal.pdf

TERM OF REFERENCE

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

1. Review Fee Payment:

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

2. Submission of Required Documents:

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

3. Financial Responsibility for Fines and Penalties:

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

4. Accuracy and Validity of Information:

The Authorized person is responsible for ensuring the correctness and validity of all information and documents provided to the consultant for onward submission to EPA Punjab. The consultant facilitating the EIA process will not bear any responsibility for inaccuracies or omissions in the information supplied by the Authorized person. It is imperative that the Authorized person conducts thorough due diligence to guarantee that all submitted materials accurately reflect the project's potential environmental impacts and proposed mitigation measures.

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

In M/s AMAL ENERGIES PVT. LTD

For Enviro Stewards Co. Pvt. Ltd.

Ms. Sara Fatima

Mr. Zia Ur Rehman

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

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

*